



Service provider information  
Beginning problem analysis and isolation







@server

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**Note**

Before using this information and the product it supports, be sure to read the information in "Notices," on page 657 and the manual *IBM eServer Safety Information*, G229-9054.

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## Service provider information

This topic is intended to provide IBM® service providers with complete instructions for diagnosing and isolating problems on system models 520, 550, 9124-720, 570, 590, and 595.

Before using this information and the products it supports, be sure to read Safety notices.

**“Start of call procedure” on page 2**

Provides a starting point for analyzing problems. You should begin all service actions with this procedure.

**“Detecting problems” on page 24**

Provides information on using various tools and techniques to detect and identify problems.

**“Analyzing problems” on page 32**

Provides instructions and procedures for determining the cause of the problem.

**“Isolating problems” on page 58**

Provides procedures for determining which part or assembly is failing.

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## Start of call procedure

This is the starting point for diagnosing and repairing servers. From this point, you will be guided to the appropriate information to help you diagnose server problems, determine the appropriate repair action, and then perform the necessary steps to repair the server. A system attention light indicates there is a serviceable event (panel SRC or in one of the serviceable event views) on the system. This procedure will guide you through finding the serviceable event.

**Note:** In this topic, **control panel** and **operator panel** are synonymous.

Before beginning, perform as many of the following tasks as possible:

**Note:** Ask the customer for the Problem reporting form (available in the Troubleshooting topic) that they should have completed when working with the support center.

- Verify the symptoms and service call data, including:
  - The server machine type, model number, and serial number.
  - The customer problem number.
  - A reference code (SRC, SRN or progress code). If you do not have a reference code, ask the customer for the date and time of the problem.
  - Any available location code information
  - Any data stored in:
    - the service action event log in Service Focal Point
    - the Service Action Log (i5/OS servers)
    - other operating system-specific logs as directed
  - Symptoms reported to you by the customer.
  - Symptoms reported to you by the service support center.
- Record information to help you return the server to the same state that the customer typically uses, such as:
  - The IPL type that the customer typically uses for the server.
  - The IPL mode that is used by the customer on this server.
  - The way in which the server is configured or partitioned.
- Ensure the customer has put the server into a state in which you can perform service tasks.
  1. Is there a Hardware Management Console (HMC) attached to the failing unit?
    - No:** Continue with the next step.
    - Yes:** Continue with step 4.
  2. Is this an HMC-managed system?

**Notes:**

    - a. Look for HMC=1 displayed in the control panel.
    - b. Ask the customer.
    - c. If the server does not have a control panel, then it should have an HMC.
    - No:** Go to step 6 on page 3.
    - Yes:** Continue with the next step.
  3. Inform the customer that an HMC is required to continue servicing the system, and ask the customer to reattach the HMC to the server. When the HMC is reattached to the managed system, continue with the next step.
  4. Is the HMC functional?
    - No:** Go to HMC isolation procedures. Once the HMC is functional, return here and continue with the next step.
    - Yes:** Continue with the next step.



5. Perform the following steps from the HMC that is used to manage the server. During these steps, refer to the service data that was gathered earlier:
  - a. In the Navigation Area, open **Service Applications**.
  - b. Select **Service Focal Point**.
  - c. Select **Repair Serviceable Event**.
  - d. On the Select Failing System window, select the managed system that has the problem, and click **OK**.
  - e. Scroll through the log and verify that there is a problem with the status of **Open** to correspond with the customer's reported problem.

**Note:** If you are unable to locate the reported problem, and there is more than one open problem near the time of the reported failure, use the earliest problem in the log.

Do you find the reported problem, or an open problem near the time of the reported problem?

**No:** Continue with the next step.

**Yes:** Select the serviceable event you want to repair, and select **Repair** from the **Selected** menu.

This launches a series of windows that guide you through the steps to repair the serviceable event. The system guides you through one of the two following methods of repair, depending on the type of FRU you need to exchange:

- An interactive step-by-step process that provides illustrations and video presentations to help you exchange the FRU.
- A link to the appropriate information center topic that provides instructions to help you exchange the FRU.

After you complete the repair procedure, the system automatically closes the serviceable event.

**This ends the procedure.**

**Note:** If the **Repair** procedures are not available, continue with the next step.

6. Is there an eight-digit reference code (except Cxxxxxxx) displayed in function 11 on the HMC (if applicable) or on the control panel?

**Note:** To check the HMC for operator panel values, perform the following steps:

- a. In the Navigation Area, expand **Server and Partition > Server Management**.
- b. Choose from the following options:
  - To view managed system reference codes:
    - 1) In the right pane, right-click the system and select **Properties**.
    - 2) Select the Reference Code tab to view the codes.
    - 3) When finished, click **Cancel**.
  - To view logical partition reference codes:
    - 1) In the right pane expand the system that contains the partition.
    - 2) Open **Partitions**.
    - 3) Right-click the logical partition and select **Properties**.
    - 4) Select the **Reference Code** tab to view the codes.
    - 5) When finished, click **Cancel**.

**No:** Continue with the next step.

**Yes:** Record all reference code data, including the values for functions 11 through 20 (see Collecting reference codes and system information), and note the failing partition. Then, go to the Reference codes topic to further isolate the problem. **This ends the procedure.**

7. Is an operating system console session available and can you log into the session?

**Yes:** Go to step 9 on page 4.

**No:** Continue with the next step.

8. Work with the customer to open an operating system console session. Can you successfully open an operating system console session?

**Notes:**

- a. For servers with logical partitions, the console session must be available for the **failing partition**.
- b. See 5250 Console in the Managing your server topic for details on accessing a 5250 console session on the HMC.

**Yes:** Continue with the next step.

**No:** Go to step 11.

9. Use the specific operating system service tools and system logs to locate a “serviceable event” in the logs:

- a. Ask the customer for the date and time of the problem.

**Note:** If you are unable to locate the reported problem and there is more than one open problem near the time of the reported failure, use the earliest failure.

- b. Go to the appropriate procedure depending on the operating system that is reporting a problem and then return here and continue with the next step:
  - If your server or partition is running **AIX**, go to “AIX fast-path problem isolation” on page 263.
  - If your server or partition is running **Linux**, go to “Linux fast-path problem isolation” on page 405.
  - If your server or partition is running **i5/OS**, go to “Using the Service Action Log” on page 24.
  - If you experience a problem with a Virtual I/O Server partition, go to Virtual I/O Server troubleshooting.

10. Did you find a reference code associated with this failure near the time of the reported problem?

**No:** Continue with the next step.

**Yes:** Collect all reference code data and note the failing partition. Go to the Reference codes topic to further isolate the problem. **This ends the procedure.**

11. Use the HMC or a customer PC with a Web browser to access the Advanced System Management Interface (ASMI). See Accessing the Advanced System Management Interface for details. Then, perform the following steps:

- a. Log in to the ASMI.
- b. Click the plus sign next to **System Service Aids**.
- c. Select **Error/Event Logs** to view the service processor error log.

**Note:** For more information on using the ASMI, see Managing your server using the Advanced System Management Interface.

Were you able to access ASMI and is there a reference code in the service processor error log that requires service?

**No:** Continue with the next step.

**Yes:** Collect all reference code data and note the failing partition. Go to the Reference codes topic to further isolate the problem. **This ends the procedure.**

12. The following examples show the possible formats of reference codes that display during the power-on process:

- C1xx xxxx codes are displayed during the time after power is connected to the server until the service processor initial power-on process completes (indicated by “01” in the upper-left corner of the physical or logical control panel).
- C2xx xxxx and C7xx xxxx codes are displayed after the power-on sequence is initiated.
- CAxx xxxx codes are displayed while an AIX or Linux partition is initializing its resources.

- xxx, 0xxx, 2xxxx, or C6xx xxxx, C9xx xxxx codes are displayed during the time that the operating system boots and configures resources.
- 888-xxx code

Does the power-on process for the server appear to be stopped, and does function 11 display a reference code of the format shown in the list above?

**No:** Go to the “Symptom index.” **This ends the procedure.**

**Yes:** Collect all reference code data and note the failing partition. Go to the List of progress codes topic to further isolate the problem. **This ends the procedure.**

## Symptom index

**Note:** If you were not guided here from the “Start of call procedure” on page 2, return there and follow the instructions given in that procedure.

Review the symptoms in the left column. Look for the symptom that most closely matches the symptoms on the server that you are troubleshooting. When you find the matching symptom, perform the appropriate action as described in the right column.

*Table 1. Determining symptom types*

Symptom	What you should do:
You do not have a symptom.	Go to the “Start of call procedure” on page 2.
The symptom or problem is on a server or a partition running i5/OS	Go to “i5/OS server or i5/OS partition symptoms.”
The symptom or problem is on a server or a partition running AIX.	Go to “AIX server or AIX partition symptoms” on page 8.
The symptom or problem is on a server or a partition running Linux.	Go to “Linux server or Linux partition symptoms” on page 16.

### i5/OS server or i5/OS partition symptoms

Use the following tables to find the symptom you are experiencing. If you cannot find your symptom, contact your next level of support.

- General symptoms
- Symptoms occurring when the system is not operational
- Symptoms related to a logical partition on a server that has multiple logical partitions
- Obvious physical symptoms
- Time-of-day symptoms

*Table 2. General i5/OS server or i5/OS partition symptoms*

Symptom	Service action
You have an intermittent problem or you suspect that the problem is intermittent.	Go to “Intermittent problems” on page 36.
DST/SST functions are available on the logical partition console and: <ul style="list-style-type: none"> <li>• The customer reports reduced system function.</li> <li>• There is a server performance problem.</li> <li>• There are failing, missing, or inoperable server resources.</li> </ul>	On most servers with logical partitions, it is common to have one or more missing or non-reporting system bus resource’s under Hardware Service Manager (see Hardware Service Manager in Service functions for more information).
Operations Console, or the remote control panel is not working properly.	Contact Software Support.

Table 2. General i5/OS server or i5/OS partition symptoms (continued)

Symptom	Service action
The system has a processor or memory problem.	Use the Service action log to check for a reference code or any failing items. See “Using the Service Action Log” on page 24 for instructions, replacing any hardware FRUs if necessary.
The system has detected a bus problem. An SRC of the form B600 69xx or B700 69xx will be displayed on the control panel or HMC.	Go to “Using the Service Action Log” on page 24.

Table 3. Symptoms occurring when the system is not operational

Symptom	Service action
A bouncing or scrolling ball remains on the operator panel display, or the operator panel display is filled with dashes or blocks.	<p>Verify that the operator panel connections to the system backplane are connected and properly seated.</p> <p>If a client computer (such as a PC with Ethernet capability and a Web browser) is available, connect it to the service processor in the server that is displaying the symptom.</p> <p>To connect a personal computer with Ethernet capability and a Web browser, or an ASCII terminal, to access the Advanced System Management Interface (ASMI), go to Managing your server using the Advanced System Management Interface.</p> <ul style="list-style-type: none"> <li>• If you can successfully access the ASMI, replace the operator panel assembly. Refer to Finding part locations to determine the part number and correct exchange procedure.</li> <li>• If you cannot successfully access the ASMI, replace the service processor. Refer to Finding part locations to determine the part number and correct exchange procedure.</li> </ul> <p>If you do not have a PC or ASCII terminal, replace the following one at a time (go to Finding part locations to determine the part number and correct exchange procedure):</p> <ol style="list-style-type: none"> <li>1. Operator panel assembly.</li> <li>2. Service processor.</li> </ol>
There is an IPL problem, the system attention light is on, and blocks of data appear for 5 seconds at a time before moving to the next block of data for 5 seconds, and so on until 5 seconds of a blank control panel is displayed at which time the cycle repeats.	These blocks of data are functions 11 through 20. The first data block after the blank screen is function 11, the second block is function 12, and so on. Use this information to fill out the Problem reporting forms. Then go to Reference codes.
You have a power problem, the system or an attached unit will not power on or will not power off, or there is a 1xxx-xxxx reference code.	Go to “Power problems” on page 46.
There is an SRC in function 11.	Look up the reference code (see Reference codes).
There is an IPL problem.	Go to “IPL problems” on page 41.
There is a Device Not Found message during an installation from an alternate installation device.	Go to “TUPIP06” on page 249.

Table 4. Symptoms related to a logical partition on a server that has multiple logical partitions

Symptom	Service action
<p>The console is not working for a logical partition.</p> <ul style="list-style-type: none"> <li>• There is an SRC on the panel of an I/O expansion unit owned by a logical partition.</li> <li>• You suspect a power problem with resources owned by a logical partition.</li> <li>• There is an IPL problem with a logical partition and there is an SRC on the HMC.</li> <li>• The logical partition's operations have stopped or the partition is in a loop and there is an SRC on the HMC.</li> </ul>	<p>See Recovering when the console does not show a sign-on display or a menu with a command line.</p> <ul style="list-style-type: none"> <li>• Search Service Focal Point (see Using Service Focal Point) for a serviceable event.</li> <li>• If you do not find a serviceable event in Service Focal Point, then record the partition's SRC from the Operator Panel Values field in the HMC: <ol style="list-style-type: none"> <li>1. In the Navigation Area, expand <b>Server and Partition &gt; Server Management</b>.</li> <li>2. In the right pane, expand or select your system or partition.</li> <li>3. Use that SRC and look up the reference code (see Reference codes).</li> </ol> </li> </ul>
<p>The logical partition's console is functioning, but the state of the partition in the HMC is "Failed" or "Unit Attn" and there is an SRC.</p>	<p>Use the logical partition's SRC. From the partition's console search for that SRC in the partition's Service Action Log. See "Using the Service Action Log" on page 24.</p>
<p>There is an IPL problem with a logical partition and there is no SRC displayed in the HMC.</p>	<p>Perform the following to look for the panel value for the partition in the HMC:</p> <ol style="list-style-type: none"> <li>1. In the Navigation Area, expand <b>Server and Partition &gt; Server Management</b>.</li> <li>2. In the right pane expand the system that contains the partition.</li> <li>3. Open <b>Partitions</b>.</li> <li>4. Right-click the logical partition and select <b>Properties</b>.</li> <li>5. Select the <b>Reference Code</b> tab to view the codes.</li> <li>6. When finished, click <b>Cancel</b>.</li> </ol> <p>Go to Reference codes. If no reference code could be found, contact your next level of support.</p>
<p>The partition's operations have stopped or the partition is in a loop and there is no SRC displayed on the HMC.</p>	<p>Perform function 21 from the HMC (see Control panel functions). If this fails to resolve the problem, contact your next level of support.</p>
<p>One or more of the following was reported:</p> <ul style="list-style-type: none"> <li>• There is a system reference code or message on the logical partition's console.</li> <li>• The customer reports reduced function in the partition.</li> <li>• There is a logical partition performance problem.</li> <li>• There are failing, missing, or inoperable resources.</li> </ul>	<p>From the partition's console search the partition's Service Action Log. Go to "Using the Service Action Log" on page 24. <b>Note:</b> On most systems with logical partitions, it is common to have one or more "Missing or Non-reporting" system bus resource's under Hardware Service Manager. See Hardware Service Manager in Service functions for details.</p>
<p>There is a Device Not Found message during an installation from an alternate installation device.</p>	<p>Go to "TUPIP06" on page 249.</p>

Table 4. Symptoms related to a logical partition on a server that has multiple logical partitions (continued)

Symptom	Service action
<p>There is a problem with a guest partition.  <b>Note:</b> These are problems reported from the operating system (other than i5/OS®) running in a guest partition or reported from the hosting partition of a guest partition. Is the problem appearing from a guest partition (to determine if the system has guest partitions, see Determining if the system has guest partitions).</p> <p>Is the problem appearing in the hosting partition of a guest partition? To determine if a partition is a guest partition, see Determining if the system has guest partitions or ask the customer if the problem is appearing in the hosting partition for a guest partition.</p>	<p>If there are serviceable events in the logical partition or hosting partition, work these problems first.</p> <p>To determine the hosting partition for a guest partition see Determining if the system has guest partitions. If there are no SAL entries in the logical partition and no SAL entries in the hosting partition, contact your next level of support.</p>

Table 5. Obvious physical symptoms

Symptom	Service action
A power indicator light or display on the system unit control panel or an attached I/O unit is not working correctly.	Perform "PWR1920" on page 193.
<p>One or more of the following was reported:</p> <ul style="list-style-type: none"> <li>• Noise</li> <li>• Smoke</li> <li>• Odor</li> </ul>	Go to System safety inspection.
A part is broken or damaged.	Go to the Part number catalog to get the part number. Then go to Removing and replacing parts to exchange the part.

Table 6. Time-of-day problems

Symptom	Service action
System clock loses or gains more than 1 second per day when the system is connected to utility power.	Replace the service processor. See symbolic FRU "SVCPROC" on page 547.
System clock loses or gains more than 1 second per day when the system is disconnected from utility power.	Replace the time-of-day battery on the service processor. Go to symbolic FRU "TOD_BAT" on page 548.

## AIX server or AIX partition symptoms

Choose the description that best describes your situation:

- You have a service action to perform
- An LED is not operating as expected
- Control (operator) panel problems
- Reference codes
- Hardware Management Console (HMC) Problem
- There is a display or monitor problem (for example, distortion or blurring)
- Power and cooling problems
- Other symptoms or problems

### You have a service action to perform

Symptom	What you should do:
You have an open service event in the service action event log.	Go to "Start of call procedure" on page 2.
You have parts to exchange or a corrective action to perform.	<ol style="list-style-type: none"> <li>1. Go to Removing and replacing parts.</li> <li>2. Go to the End-of-call procedure.</li> </ol>
You need to verify that a part exchange or corrective action corrected the problem.	<ol style="list-style-type: none"> <li>1. Go to Verifying the repair.</li> <li>2. Go to the End-of-call procedure.</li> </ol>
You need to verify correct system operation.	<ol style="list-style-type: none"> <li>1. Go to Verifying the repair.</li> <li>2. Go to the End-of-call procedure.</li> </ol>

### An LED is not operating as expected

Symptom	What you should do:
The system attention LED on the control panel is on.	Go to "Start of call procedure" on page 2.
The rack identify LED does not operate properly.	Go to the "AIX fast-path problem isolation" on page 263.
The rack indicator LED does not turn on, but a drawer identify LED is on.	<ol style="list-style-type: none"> <li>1. Make sure the rack indicator LED is properly mounted to the rack.</li> <li>2. Make sure that the rack identify LED is properly cabled to the bus bar on the rack and to the drawer identify LED connector.</li> <li>3. Replace the following parts one at a time: <ul style="list-style-type: none"> <li>• Rack LED to bus bar cable</li> <li>• LED bus bar to drawer cable</li> <li>• LED bus bar</li> </ul> </li> <li>4. Contact your next level of support</li> </ol>

### Control (operator) panel problems

Symptom	What you should do:
01 does not appear in the upper-left corner of the operator panel display after the power is connected and before pressing the power-on button. Other symptoms appear in the operator panel display or LEDs before the power on button is pressed.	Go to "Power problems" on page 46.

Symptom	What you should do:
A bouncing or scrolling ball remains on the operator panel display, or the operator panel display is filled with dashes or blocks.	<p>Verify that the operator panel connections to the system backplane are connected and properly seated.</p> <p>If an ASCII terminal is available, connect it to the system through serial port 1.</p> <ul style="list-style-type: none"> <li>• If the service processor menu is displayed, replace the operator panel assembly. Refer to Removing and replacing parts.</li> <li>• If the service processor menu is not displayed, replace the service processor. Refer to Removing and replacing parts.</li> </ul> <p>If an ASCII terminal is not available, replace the following one at a time.</p> <ol style="list-style-type: none"> <li>1. Operator panel assembly. Refer to Removing and replacing parts.</li> <li>2. Service processor. Refer to Removing and replacing parts.</li> </ol>
You have a blank display on the operator panel. Other LEDs on the operator panel appear to behave normally.	<ol style="list-style-type: none"> <li>1. Replace the operator panel assembly. Refer to Removing and replacing parts.</li> <li>2. Replace the service processor. Refer to Removing and replacing parts.</li> </ol>
You have a blank display on the operator panel. Other LEDs on the operator panel are off.	Go to "Power problems" on page 46.
An 888 sequence is displayed in the operator panel display.	Go to the "AIX fast-path problem isolation" on page 263.

## Reference codes

Symptom	What you should do:
You have an 8-digit error code displayed.	<p>Look up the reference code in the Reference codes section of the information center.</p> <p><b>Note:</b> If the repair for this code does not involve replacing a FRU (for instance, running an AIX<sup>®</sup> command that fixes the problem or changing a hot-pluggable FRU), then update the AIX error log by performing the following steps:</p> <ol style="list-style-type: none"> <li>1. In the online diagnostics, select <b>Task Selection &gt; Log Repair Action</b>.</li> <li>2. Select resource <b>sysplanar0</b>.</li> </ol> <p>On systems with a fault indicator LED, this changes the "fault indicator" LED from the "fault" state to the "normal" state.</p>
The system stops with an 8-digit error code displayed when booting.	Look up the reference code in the Reference codes section of the information center.
The system stops and a 4-digit code displays on the control panel that does <b>not</b> begin with 0 or 2.	Look up the reference code in the Reference codes section of the information center.
The system stops and a 4-digit code displays on the control panel that begins with 0 or 2 is displayed in the operator panel display.	Record SRN 101-xxxx where xxxx is the 4-digit code displayed in the control panel, then look up this reference code in the Reference codes section of the information center. Follow the instructions given in the Description and Action column for your SRN.



Symptom	What you should do:
The system stops and a 3-digit number displays on the control panel.	<p>Add 101– to the left of the three digits to create an SRN, then look up this reference code in the Reference codes section of the information center. Follow the instructions given in the Description and Action column for your SRN.</p> <p>If there is a location code displayed under the 3-digit error code, look at the location to see if it matches the failing component that the SRN pointed to. If they do not match, perform the action given in the error code table. If the problem still exists, then replace the failing component from the location code. If there is a location code displayed under the 3-digit error code, record the location code.</p> <p>Record SRN 101-xxx, where xxx is the 3-digit number displayed in the operator panel display, then look up this reference code in the Reference codes section of the information center. Follow the instructions given in the Description and Action column for your SRN.</p>

### Hardware Management Console (HMC) Problem

Symptom	What you should do:
Hardware Management Console (HMC) cannot be used to manage a managed system, or the connection to the managed system is failing.	<p>If the managed system is operating normally (no error codes or other symptoms), the HMC might have a problem, or the connection to the managed system might be damaged or incorrectly cabled. Do the following:</p> <ol style="list-style-type: none"> <li>1. Check the connections (serial cable) between the HMC and the managed system. Correct any cabling errors if found. If another serial cable is available, connect it in place of the existing cable and refresh the HMC interface. You may have to wait up to 30 seconds for the managed system to reconnect.</li> <li>2. Verify that any connected HMC is connected to the managed system by checking the Management Environment of the HMC. <p><b>Note:</b> The managed system must have power connected and the system running, or waiting for a power-on instruction (01 is in the upper-left corner of the operator panel.)</p> <p>If the managed system does not appear in the Navigation area of the HMC Management Environment, the HMC or the connection to the managed system might be failing.</p> </li> <li>3. Go to the Entry MAP in the Managing your server using the Hardware Management Console section.</li> <li>4. There might be a problem with the service processor card or the system backplane. If you cannot fix the problem using the HMC tests in the Managing your server using the Hardware Management Console section: <ol style="list-style-type: none"> <li>a. Replace the service processor card. Refer to Removing and replacing parts.</li> <li>b. Replace the system backplane. Refer to Removing and replacing parts.</li> </ol> </li> </ol>

Symptom	What you should do:
Hardware Management Console (HMC) cannot call out using the attached modem and the customer's telephone line.	<p>If the managed system is operating normally (no error codes or other symptoms), the HMC might have a problem, or the connection to the modem and telephone line might have a problem. Do the following:</p> <ol style="list-style-type: none"> <li>1. Check the connections between the HMC and the modem and telephone line. Correct any cabling errors if found.</li> <li>2. Go to the Entry MAP in the Managing your server using the Hardware Management Console section.</li> </ol>

### There is a display problem (for example, distortion or blurring)

Symptom	What you should do:
All display problems.	<ol style="list-style-type: none"> <li>1. If you are using the Hardware Management Console, go to the Managing your server using the Hardware Management Console section.</li> <li>2. If you are using a graphics display: <ol style="list-style-type: none"> <li>a. Go to the problem determination procedures for the display.</li> <li>b. If you do not find a problem: <ul style="list-style-type: none"> <li>• Replace the graphics display adapter. Refer to Removing and replacing parts.</li> <li>• Replace the backplane into which the card is plugged. Refer to Removing and replacing parts.</li> </ul> </li> </ol> </li> <li>3. If you are using an ASCII terminal: <ol style="list-style-type: none"> <li>a. Make sure that the ASCII terminal is connected to S1.</li> <li>b. If problems persist, go to the problem determination procedures for the terminal.</li> <li>c. If you do not find a problem, replace the service processor. Refer to Removing and replacing parts.</li> </ol> </li> </ol>
There appears to be a display problem (distortion, blurring, and so on)	Go to the problem determination procedures for the display.

### Power and cooling problems

Symptom	What you should do:
The system will not power on and no error codes are available.	Go to "Power problems" on page 46.
The power LEDs on the operator panel and the power supply do not come on or stay on.	<ol style="list-style-type: none"> <li>1. Check the service processor error log.</li> <li>2. Go to "Power problems" on page 46.</li> </ol>
The power LEDs on the operator panel and the power supply come on and stay on, but the system does not power on.	<ol style="list-style-type: none"> <li>1. Check the service processor error log.</li> <li>2. Go to "Power problems" on page 46.</li> </ol>
A rack or a rack-mounted unit will not power on.	<ol style="list-style-type: none"> <li>1. Check the service processor error log.</li> <li>2. Go to "Power problems" on page 46.</li> </ol>
The cooling fan(s) do not come on, or come on but do not stay on.	<ol style="list-style-type: none"> <li>1. Check the service processor error log.</li> <li>2. Go to "Power problems" on page 46.</li> </ol>

Symptom	What you should do:
The system attention LED on the operator panel is on and there is no error code displayed.	<ol style="list-style-type: none"> <li>1. Check the service processor error log.</li> <li>2. Go to "Power problems" on page 46.</li> </ol>

### Other symptoms or problems

Symptom	What you should do:
The system stopped and a code is displayed on the operator panel.	Go to "Start of call procedure" on page 2.
01 is displayed in the upper-left corner of the operator panel and the fans are off.	The service processor is ready. The system is waiting for power-on. Boot the system. If the boot is unsuccessful, and the system returns to the default display (indicated by 01 in the upper-left corner of the operator panel), go to "MAP 0020: Problem determination procedure" on page 272.
The operator panel displays STBY.	The service processor is ready. The server was shut down by the operating system and is still powered on. This condition can be requested by a privileged system user with no faults. Go to Start-of-call. <b>Note:</b> See the service processor error log for possible operating system fault indications.
All of the system POST indicators are displayed on the system console, the system pauses and then restarts. The term <i>POST indicators</i> refers to the device mnemonics (the words memory, keyboard, network, scsi, and speaker) that appear on the system console during the power-on self-test (POST).	Go to Problems with loading and starting the operating system.
The system stops and all of the POST indicators are displayed on the system console. The term <i>POST indicators</i> refers to the device mnemonics (the words memory, keyboard, network, scsi, and speaker) that appear on the system console during the power-on self-test (POST).	Go to Problems with loading and starting the operating system.
The system stops and the message starting software please wait...is displayed on the firmware console.	Go to Problems with loading and starting the operating system.
The system does not respond to the password being entered or the system login prompt is displayed when booting in service mode.	<ol style="list-style-type: none"> <li>1. If the password is being entered from the Hardware Management Console (HMC), go to the Managing your server using the Hardware Management Console.</li> <li>2. If the password is being entered from a keyboard attached to the system, the keyboard or its controller may be faulty. In this case, replace these parts in the following order: <ol style="list-style-type: none"> <li>a. Keyboard</li> <li>b. Service processor</li> </ol> </li> <li>3. If the password is being entered from an ASCII terminal, use the problem determination procedures for the ASCII terminal. Make sure the ASCII terminal is connected to S1. If the problem persists, replace the service processor.</li> </ol> <p>If the problem is fixed, go to "MAP 0410: Repair checkout" on page 310.</p>

Symptom	What you should do:
The system stops with a prompt to enter a password.	Enter the password. You cannot continue until a correct password has been entered. When you have entered a valid password, go to the beginning of this table and wait for one of the other conditions to occur.
The system does not respond when the password is entered.	Go to step "Step 1020-2" on page 30.
No codes are displayed on the operator panel within a few seconds of turning on the system. The operator panel is blank before the system is powered on.	Reseat the operator panel cable. If the problem is not resolved, replace in the following order: <ol style="list-style-type: none"> <li>1. Operator panel assembly. Refer to Removing and replacing parts</li> <li>2. Service processor. Removing and replacing parts.</li> </ol> <p>If the problem is fixed, go to "MAP 0410: Repair checkout" on page 310.</p> <p>If the problem is still not corrected, go to "MAP 0020: Problem determination procedure" on page 272.</p>
The SMS configuration list or boot sequence selection menu shows more SCSI devices attached to a controller/adaptor than are actually attached.	A device may be set to use the same SCSI bus ID as the control adapter. Note the ID being used by the controller/adaptor (this can be checked and/or changed through an SMS utility), and verify that no device attached to the controller is set to use that ID.  <p>If settings do not appear to be in conflict:</p> <ol style="list-style-type: none"> <li>1. Go to "MAP 0020: Problem determination procedure" on page 272.</li> <li>2. Replace the SCSI cable.</li> <li>3. Replace the device.</li> <li>4. Replace the SCSI adapter</li> </ol> <p><b>Note:</b> In a "twin-tailed" configuration where there is more than one initiator device (normally another system) attached to the SCSI bus, it may be necessary to use SMS utilities to change the ID of the SCSI controller or adapter.</p>
You suspect a cable problem.	Go to Adapters, Devices and Cables for Multiple Bus Systems.
You have a problem that does not prevent the system from booting. The operator panel is functional and the rack indicator LED operates as expected.	Go to "MAP 0020: Problem determination procedure" on page 272.
All other symptoms.	Go to "MAP 0020: Problem determination procedure" on page 272.
All other problems.	Go to "MAP 0020: Problem determination procedure" on page 272.
You do not have a symptom.	Go to "MAP 0020: Problem determination procedure" on page 272.
You have parts to exchange or a corrective action to perform.	<ol style="list-style-type: none"> <li>1. Go to "Start of call procedure" on page 2.</li> <li>2. Go to End of call procedure.</li> </ol>
You need to verify that a part exchange or corrective action corrected the problem.	Go to "MAP 0410: Repair checkout" on page 310.
You need to verify correct system operation.	Go to "MAP 0410: Repair checkout" on page 310.

Symptom	What you should do:
<p>The system stopped. A POST indicator is displayed on the system console and an eight-digit error code is not displayed.</p>	<p>If the POST indicator represents:</p> <ol style="list-style-type: none"> <li>1. Memory, go to “PFW1548: Memory and processor subsystem problem isolation procedure” on page 369.</li> <li>2. Keyboard <ol style="list-style-type: none"> <li>a. Replace the keyboard.</li> <li>b. Replace the service processor, location: model dependent.</li> <li>c. Go to “PFW1548: Memory and processor subsystem problem isolation procedure” on page 369.</li> </ol> </li> <li>3. Network, go to “PFW1548: Memory and processor subsystem problem isolation procedure” on page 369.</li> <li>4. SCSI, go to “PFW1548: Memory and processor subsystem problem isolation procedure” on page 369.</li> <li>5. Speaker <ol style="list-style-type: none"> <li>a. Replace the control panel. The location is model dependent, refer to Installing features</li> <li>b. Replace the service processor. The location is model dependent.</li> <li>c. Go to “PFW1548: Memory and processor subsystem problem isolation procedure” on page 369.</li> </ol> </li> </ol>
<p>The diagnostic operating instructions are displayed.</p>	<p>Go to “MAP 0020: Problem determination procedure” on page 272.</p>
<p>The system login prompt is displayed.</p>	<p>If you are loading the diagnostics from a CD-ROM, you may not have pressed the correct key or you may not have pressed the key soon enough when you were trying to indicate a service mode IPL of the diagnostic programs. If this is the case, try to boot the CD-ROM again and press the correct key.  <b>Note:</b> Perform the system shutdown procedure before turning off the system.</p> <p>If you are sure you pressed the correct key in a timely manner, go to step “Step 1020-2” on page 30.</p> <p>If you are loading diagnostics from a Network Installation Management (NIM) server, check for the following:</p> <ul style="list-style-type: none"> <li>• The bootlist on the client may be incorrect.</li> <li>• Cstate on the NIM server may be incorrect.</li> <li>• There may be network problems preventing you from connecting to the NIM server.</li> </ul> <p>Verify the settings and the status of the network. If you continue to have problems refer to Problems with loading and starting the operating system and follow the steps for network boot problems.</p>

Symptom	What you should do:
The System Management Services (SMS) menu is displayed when you were trying to boot standalone AIX diagnostics.	<p>If you are loading diagnostics from the CD-ROM, you may not have pressed the correct key when you were trying to indicate a service mode IPL of the diagnostic programs. If this is the case, try to boot the CD-ROM again and press the correct key.</p> <p>If you are sure you pressed the correct key, the device or media you are attempting to boot from may be faulty.</p> <ol style="list-style-type: none"> <li>1. Try to boot from an alternate boot device connected to the same controller as the original boot device. If the boot succeeds, replace the original boot device (for removable media devices, try the media first). If the boot fails, go to problems with loading and starting the operating system.</li> <li>2. Go to "PFW1548: Memory and processor subsystem problem isolation procedure" on page 369.</li> </ol>
The SMS boot sequence selection menu or remote IPL menu does not show all of the bootable devices in the partition or system.	If an AIX or Linux partition is being booted, verify that the devices that you expect to see in the list are assigned to this partition. If they are not, use the HMC to reassign the required resources. If they are assigned to this partition, go to Problems with loading and starting the operating system to resolve the problem.

### Linux server or Linux partition symptoms

Choose the description that best describes your situation:

- You have a service action to perform
- An LED is not operating as expected
- Control (operator) panel problems
- Reference codes
- Hardware Management Console (HMC) Problem
- There is a display or monitor problem (for example, distortion or blurring)
- Power and cooling problems
- Other symptoms or problems

### You have a service action to perform

Symptom	What you should do:
You have an open service event in the service action event log.	Go to "Start of call procedure" on page 2.
You have parts to exchange or a corrective action to perform.	<ol style="list-style-type: none"> <li>1. Go to Removing and replacing parts.</li> <li>2. Go to the End-of-call procedure.</li> </ol>
You need to verify that a part exchange or corrective action corrected the problem.	<ol style="list-style-type: none"> <li>1. Go to Verifying the repair.</li> <li>2. Go to the End-of-call procedure.</li> </ol>
You need to verify correct system operation.	<ol style="list-style-type: none"> <li>1. Go to Verifying the repair.</li> <li>2. Go to the End-of-call procedure.</li> </ol>

## An LED is not operating as expected

Symptom	What you should do:
The system attention LED on the control panel is on.	Go to "Linux fast-path problem isolation" on page 405.
The rack identify LED does not operate properly.	Go to the "Linux fast-path problem isolation" on page 405.
The rack indicator LED does not turn on, but a drawer identify LED is on.	<ol style="list-style-type: none"> <li>1. Make sure the rack indicator LED is properly mounted to the rack.</li> <li>2. Make sure that the rack identify LED is properly cabled to the bus bar on the rack and to the drawer identify LED connector.</li> <li>3. Replace the following parts one at a time: <ul style="list-style-type: none"> <li>• Rack LED to bus bar cable</li> <li>• LED bus bar to drawer cable</li> <li>• LED bus bar</li> </ul> </li> <li>4. Contact your next level of support</li> </ol>

## Control (operator) panel problems

Symptom	What you should do:
01 does not appear in the upper-left corner of the operator panel display after the power is connected and before pressing the power-on button. Other symptoms appear in the operator panel display or LEDs before the power on button is pressed.	Go to "Power problems" on page 46.
A bouncing or scrolling ball remains on the operator panel display, or the operator panel display is filled with dashes or blocks.	<p>Verify that the operator panel connections to the system backplane are connected and properly seated.</p> <p>If an ASCII terminal is available, connect it to the system through serial port 1.</p> <ul style="list-style-type: none"> <li>• If the service processor menu is displayed, replace the operator panel assembly. Refer to Removing and replacing parts.</li> <li>• If the service processor menu is not displayed, replace the service processor. Refer to Removing and replacing parts.</li> </ul> <p>If an ASCII terminal is not available, replace the following one at a time.</p> <ol style="list-style-type: none"> <li>1. Operator panel assembly. Refer to Removing and replacing parts.</li> <li>2. Service processor. Refer to Removing and replacing parts.</li> </ol>
You have a blank display on the operator panel. Other LEDs on the operator panel appear to behave normally.	<ol style="list-style-type: none"> <li>1. Replace the operator panel assembly. Refer to Removing and replacing parts.</li> <li>2. Replace the service processor. Refer to Removing and replacing parts.</li> </ol>
You have a blank display on the operator panel. Other LEDs on the operator panel are off.	Go to "Power problems" on page 46.

## Reference codes

Symptom	What you should do:
You have an 8-digit error code displayed.	<p>Look up the reference code in the Reference codes section of the information center.</p> <p><b>Note:</b> If the repair for this code does not involve replacing a FRU (for instance, running an AIX command that fixes the problem or changing a hot-pluggable FRU), then update the AIX error log by performing the following steps:</p> <ol style="list-style-type: none"> <li>1. In the online diagnostics, select <b>Task Selection &gt; Log Repair Action</b>.</li> <li>2. Select resource <b>sysplanar0</b>.</li> </ol> <p>On systems with a fault indicator LED, this changes the "fault indicator" LED from the "fault" state to the "normal" state.</p>
The system stops with an 8-digit error code displayed when booting.	Look up the reference code in the Reference codes section of the information center.
The system stops and a 4-digit code displays on the control panel that does <b>not</b> begin with 0 or 2.	Look up the reference code in the Reference codes section of the information center.
The system stops and a 4-digit code displays on the control panel that begins with 0 or 2 is displayed in the operator panel display.	Record SRN 101-xxxx where xxxx is the 4-digit code displayed in the control panel, then look up this reference code in the Reference codes section of the information center. Follow the instructions given in the Description and Action column for your SRN.
The system stops and a 3-digit number displays on the control panel.	<p>Add 101- to the left of the three digits to create an SRN, then look up this reference code in the Reference codes section of the information center. Follow the instructions given in the Description and Action column for your SRN.</p> <p>If there is a location code displayed under the 3-digit error code, look at the location to see if it matches the failing component that the SRN pointed to. If they do not match, perform the action given in the error code table. If the problem still exists, then replace the failing component from the location code. If there is a location code displayed under the 3-digit error code, record the location code.</p> <p>Record SRN 101-xxx, where xxx is the 3-digit number displayed in the operator panel display, then look up this reference code in the Reference codes section of the information center. Follow the instructions given in the Description and Action column for your SRN.</p>



## Hardware Management Console (HMC) Problem

Symptom	What you should do:
<p>Hardware Management Console (HMC) cannot be used to manage a managed system, or the connection to the managed system is failing.</p>	<p>If the managed system is operating normally (no error codes or other symptoms), the HMC might have a problem, or the connection to the managed system might be damaged or incorrectly cabled. Do the following:</p> <ol style="list-style-type: none"> <li>1. Check the connections between the HMC and the managed system. Correct any cabling errors if found. If another cable is available, connect it in place of the existing cables and refresh the HMC interface. You may have to wait up to 30 seconds for the managed system to reconnect.</li> <li>2. Verify that any connected HMC is connected to the managed system by checking the Management Environment of the HMC. <b>Note:</b> The managed system must have power connected and the system running, or waiting for a power-on instruction (01 is in the upper-left corner of the operator panel.) If the managed system does not appear in the Navigation area of the HMC Management Environment, the HMC or the connection to the managed system might be failing.</li> <li>3. Go to the Managing your server using the Hardware Management Console section.</li> <li>4. There might be a problem with the service processor card or the HMC system backplane. If you cannot fix the problem using the HMC tests in the Managing your server using the Hardware Management Console section:               <ol style="list-style-type: none"> <li>a. Replace the service processor card. Refer to Removing and replacing parts.</li> <li>b. Replace the HMC system backplane. Refer to Removing and replacing parts.</li> </ol> </li> </ol>
<p>Hardware Management Console (HMC) cannot call out using the attached modem and the customer's telephone line.</p>	<p>If the managed system is operating normally (no error codes or other symptoms), the HMC might have a problem, or the connection to the modem and telephone line might have a problem. Do the following:</p> <ol style="list-style-type: none"> <li>1. Check the connections between the HMC and the modem and telephone line. Correct any cabling errors if found.</li> <li>2. Go to the Managing your server using the Hardware Management Console for information about the HMC.</li> </ol>

### There is a display problem (for example, distortion or blurring)

Symptom	What you should do:
All display problems.	<ol style="list-style-type: none"> <li>1. If you are using the Hardware Management Console, go to the Managing your server using the Hardware Management Console section.</li> <li>2. If you are using a graphics display:               <ol style="list-style-type: none"> <li>a. Go to the problem determination procedures for the display.</li> <li>b. If you do not find a problem:                   <ul style="list-style-type: none"> <li>• Replace the graphics display adapter. Refer to Removing and replacing parts.</li> <li>• Replace the backplane into which the graphics display adapter is plugged. Refer to Removing and replacing parts.</li> </ul> </li> </ol> </li> </ol>
There appears to be a display problem (distortion, blurring, and so on)	Go to the problem determination procedures for the display.

### Power and cooling problems

Symptom	What you should do:
The system will not power on and no error codes are available.	Go to "Power problems" on page 46.
The power LEDs on the operator panel and the power supply do not come on or stay on.	<ol style="list-style-type: none"> <li>1. Check the service processor error log.</li> <li>2. Go to "Power problems" on page 46.</li> </ol>
The power LEDs on the operator panel and the power supply come on and stay on, but the system does not power on.	<ol style="list-style-type: none"> <li>1. Check the service processor error log.</li> <li>2. Go to "Power problems" on page 46.</li> </ol>
A rack or a rack-mounted unit will not power on.	<ol style="list-style-type: none"> <li>1. Check the service processor error log.</li> <li>2. Go to "Power problems" on page 46.</li> </ol>
The cooling fan(s) do not come on, or come on but do not stay on.	<ol style="list-style-type: none"> <li>1. Check the service processor error log.</li> <li>2. Go to "Power problems" on page 46.</li> </ol>
The system attention LED on the operator panel is on and there is no error code displayed.	<ol style="list-style-type: none"> <li>1. Check the service processor error log.</li> <li>2. Go to "Power problems" on page 46.</li> </ol>

### Other symptoms or problems

Symptom	What you should do:
The system stopped and a code is displayed on the operator panel.	Go to "Start of call procedure" on page 2.
01 is displayed in the upper-left corner of the operator panel and the fans are off.	The service processor is ready. The system is waiting for power-on. Boot the system. If the boot is unsuccessful, and the system returns to the default display (indicated by 01 in the upper-left corner of the operator panel), go to "MAP 0020: Problem determination procedure" on page 272.

Symptom	What you should do:
The operator panel displays STBY.	The service processor is ready. The server was shut down by the operating system and is still powered on. This condition can be requested by a privileged system user with no faults. Go to Start-of-call. <b>Note:</b> See the service processor error log for possible operating system fault indications.
All of the system POST indicators are displayed on the system console, the system pauses and then restarts. The term <i>POST indicators</i> refers to the device mnemonics (the words memory, keyboard, network, scsi, and speaker) that appear on the system console during the power-on self-test (POST).	Go to Problems with loading and starting the operating system.
The system stops and all of the POST indicators are displayed on the system console. The term <i>POST indicators</i> refers to the device mnemonics (the words memory, keyboard, network, scsi, and speaker) that appear on the system console during the power-on self-test (POST).	Go to Problems with loading and starting the operating system.
The system stops and the message starting software please wait...is displayed on the firmware console.	Go to Problems with loading and starting the operating system.
The system does not respond to the password being entered or the system login prompt is displayed when booting in service mode.	<ol style="list-style-type: none"> <li>1. If the password is being entered from the Hardware Management Console (HMC), go to the Managing your server using the Hardware Management Console.</li> <li>2. If the password is being entered from a keyboard attached to the system, the keyboard or its controller may be faulty. In this case, replace these parts in the following order: <ol style="list-style-type: none"> <li>a. Keyboard</li> <li>b. Service processor</li> </ol> </li> </ol> <p>If the problem is fixed, go to "MAP 0410: Repair checkout" on page 310.</p>
The system stops with a prompt to enter a password.	Enter the password. You cannot continue until a correct password has been entered. When you have entered a valid password, go to the beginning of this table and wait for one of the other conditions to occur.
The system does not respond when the password is entered.	Go to step "Step 1020-2" on page 30.
No codes are displayed on the operator panel within a few seconds of turning on the system. The operator panel is blank before the system is powered on.	<p>Reseat the operator panel cable. If the problem is not resolved, replace in the following order:</p> <ol style="list-style-type: none"> <li>1. Operator panel assembly. Refer to Removing and replacing parts</li> <li>2. Service processor. Removing and replacing parts.</li> </ol> <p>If the problem is fixed, go to "MAP 0410: Repair checkout" on page 310.</p> <p>If the problem is still not corrected, go to "MAP 0020: Problem determination procedure" on page 272.</p>

Symptom	What you should do:
The SMS configuration list or boot sequence selection menu shows more SCSI devices attached to a controller/adaptor than are actually attached.	<p>A device may be set to use the same SCSI bus ID as the control adapter. Note the ID being used by the controller/adaptor (this can be checked and/or changed through an SMS utility), and verify that no device attached to the controller is set to use that ID.</p> <p>If settings do not appear to be in conflict:</p> <ol style="list-style-type: none"> <li>1. Go to "MAP 0020: Problem determination procedure" on page 272.</li> <li>2. Replace the SCSI cable.</li> <li>3. Replace the device.</li> <li>4. Replace the SCSI adapter</li> </ol> <p><b>Note:</b> In a "twin-tailed" configuration where there is more than one initiator device (normally another system) attached to the SCSI bus, it may be necessary to use SMS utilities to change the ID of the SCSI controller or adapter.</p>
You suspect a cable problem.	Go to Adapters, Devices and Cables for Multiple Bus Systems.
You have a problem that does not prevent the system from booting. The operator panel is functional and the rack indicator LED operates as expected.	Go to "MAP 0020: Problem determination procedure" on page 272.
All other symptoms.	Go to "MAP 0020: Problem determination procedure" on page 272.
All other problems.	Go to "MAP 0020: Problem determination procedure" on page 272.
You do not have a symptom.	Go to "MAP 0020: Problem determination procedure" on page 272.
You have parts to exchange or a corrective action to perform.	<ol style="list-style-type: none"> <li>1. Go to "Start of call procedure" on page 2.</li> <li>2. Go to End of call procedure.</li> </ol>
You need to verify that a part exchange or corrective action corrected the problem.	Go to "MAP 0410: Repair checkout" on page 310.
You need to verify correct system operation.	Go to "MAP 0410: Repair checkout" on page 310.

Symptom	What you should do:
<p>The system stopped. A POST indicator is displayed on the system console and an eight-digit error code is not displayed.</p>	<p>If the POST indicator represents:</p> <ol style="list-style-type: none"> <li>1. Memory, go to “PFW1548: Memory and processor subsystem problem isolation procedure” on page 369.</li> <li>2. Keyboard <ol style="list-style-type: none"> <li>a. Replace the keyboard.</li> <li>b. Replace the service processor, location: model dependent.</li> <li>c. Go to “PFW1548: Memory and processor subsystem problem isolation procedure” on page 369.</li> </ol> </li> <li>3. Network, go to “PFW1548: Memory and processor subsystem problem isolation procedure” on page 369.</li> <li>4. SCSI, go to “PFW1548: Memory and processor subsystem problem isolation procedure” on page 369.</li> <li>5. Speaker <ol style="list-style-type: none"> <li>a. Replace the control panel. The location is model dependent, refer to Installing features</li> <li>b. Replace the service processor. The location is model dependent.</li> <li>c. Go to “PFW1548: Memory and processor subsystem problem isolation procedure” on page 369.</li> </ol> </li> </ol>
<p>The diagnostic operating instructions are displayed.</p>	<p>Go to “MAP 0020: Problem determination procedure” on page 272.</p>
<p>The system login prompt is displayed.</p>	<p>If you are loading the diagnostics from a CD-ROM, you may not have pressed the correct key or you may not have pressed the key soon enough when you were trying to indicate a service mode IPL of the diagnostic programs. If this is the case, start again at the beginning of this step.</p> <p><b>Note:</b> Perform the system shutdown procedure before turning off the system.</p> <p>If you are sure you pressed the correct key in a timely manner, go to step “Step 1020-2” on page 30.</p> <p>If you are loading diagnostics from a Network Installation Management (NIM) server, check for the following:</p> <ul style="list-style-type: none"> <li>• The bootlist on the client may be incorrect.</li> <li>• Cstate on the NIM server may be incorrect.</li> <li>• There may be network problems preventing you from connecting to the NIM server.</li> </ul> <p>Verify the settings and the status of the network. If you continue to have problems refer to Problems with loading and starting the operating system and follow the steps for network boot problems.</p>

Symptom	What you should do:
The System Management Services (SMS) menu is displayed when you were trying to boot standalone diagnostics.	<p>If you are loading diagnostics from the CD-ROM, you may not have pressed the correct key when you were trying to indicate a service mode IPL of the diagnostic programs. If this is the case, try to boot the CD-ROM again and press the correct key.</p> <p>If you are sure you pressed the correct key, the device or media you are attempting to boot from may be faulty.</p> <ol style="list-style-type: none"> <li>1. Try to boot from an alternate boot device connected to the same controller as the original boot device. If the boot succeeds, replace the original boot device (for removable media devices, try the media first). If the boot fails, go to problems with loading and starting the operating system.</li> <li>2. Go to "PFW1548: Memory and processor subsystem problem isolation procedure" on page 369.</li> </ol>
The SMS boot sequence selection menu or remote IPL menu does not show all of the bootable devices in the partition or system.	If an AIX or Linux partition is being booted, verify that the devices that you expect to see in the list are assigned to this partition. If they are not, use the HMC to reassign the required resources. If they are assigned to this partition, go to Problems with loading and starting the operating system to resolve the problem.

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## Detecting problems

**i5/OS™ problem determination**

**AIX and Linux partition problem determination**

**System unit problem determination**

**HMC machine code problem determination**

## i5/OS problem determination procedures

There are several tools you can use to determine a problem with an i5/OS system or partition. These include:

- "Using the Service Action Log"
- "Using the product activity log" on page 26
- "Using the problem log" on page 26

### Using the Service Action Log

Use this procedure to search for an entry in the Service Action Log (SAL) that matches the time, reference code, or resource of the reported problem.

1. On the command line, enter the Start System Service Tools command (STRSST). If you cannot get to SST, use function 21 to get to DST (see Dedicated Service Tools (DST)).
2. On the Start Service Tools Sign On display, type in a user ID with QSRV authority and password.
3. Select **Start a Service Tool > Hardware Service Manager > Work with service action log**.
4. On the Select Timeframe display, change the From: Date and Time to a date and time prior to when the customer reported having the problem.
5. Search for an entry that matches one or more conditions of the problem:
  - Reference code

- Resource
  - Time
  - Failing item list
6. Perform the following:
- Choose **Display the failing item information** to display the SAL entry.
  - Use the **Display details** option to display part location information.

All new entries in the SAL represent problems that require a service action. It may be necessary to handle any problem in the log even if it does not match the original problem symptom.

The information displayed in the date and time fields are the date and time for the first occurrence of the specific reference code for the resource displayed during the time range selected.

7. Did you find an entry in the SAL?

**Yes:** Continue with the next step.

**No:** Is i5/OS available?

**Yes:** Go to "Using the problem log" on page 26. **This ends the procedure.**

**No:** Go to "Problems with noncritical resources" on page 36. **This ends the procedure.**

8. Does "See the service information system reference code tables for further problem isolation" appear near the top of the display or are there procedures in the FRU list?

**Yes:** Perform the following steps:

- a. Go to the List of reference codes and use the reference code that is indicated in the log to find the correct reference code table and unit reference code.
- b. Perform all actions in the **Description/Action** column before exchanging failing items.

**Note:** When exchanging failing items, the part numbers and locations found in the SAL entry should be used.

**This ends the procedure.**

**No:** Display the failing item information for the SAL entry. Items at the top of the failing item list are more likely to fix the problem than items at the bottom of the list. Continue with the next step.

**Notes:**

- a. Some failing items are required to be exchanged in groups until the problem is solved.
- b. Other failing items are flagged as mandatory exchange and must be exchanged before the service action is complete, even if the problem appears to have been repaired.
- c. Use the "Part Action Code" field in the SAL display to determine if failing items are to be replaced in groups or as mandatory exchanges.
- d. Unless the "Part Action Code" of a FRU indicates group or mandatory exchange, exchange the failing items one at a time until the problem is repaired. Use the help function to determine the meaning of Part Action Codes.

9. Perform the following steps to help resolve the problem:

- a. For failing items, refer to "Using failing item codes" on page 430.
- b. For symbolic FRUs, see "Symbolic FRUs" on page 445.
- c. To display location information, choose the function key for **Additional details**. If location information is available, go to Finding part locations for the model you are working on to determine what remove and replace procedure to perform. To turn on the failing item's identify light, use the "indicator on" option.

**Note:** In some cases where the failing item does not contain a physical identify light, a higher level identify light will be activated (for example, the planar or unit containing the failing item). The location information should then be used to locate the actual failing item.

- d. If the failing item is Licensed Internal Code, contact your next level of support for the correct PTF to apply.
10. After exchanging an item, perform the following:
- a. Go to Verifying the repair and return here.
  - b. If the failing item indicator was turned on during the remove and replace procedure, use the "indicator off" option to turn off the indicator.
  - c. If all problems have been resolved for the partition, use the "Acknowledge all errors" function at the bottom of the SAL display.
  - d. Close the log entry by selecting **Close a NEW entry** on the SAL Report display. **This ends the procedure.**

### Using the product activity log

1. To locate a problem, find an entry in the product activity log for the symptom you are seeing.
  - a. On the command line, enter the Start System Service Tools command:  
STRSST  
If you cannot get to SST, select DST. See Dedicated Service Tools (DST) for details.  
  
**Note:** Do not IPL the system or partition to get to DST.
  - b. On the Start Service Tools Sign On display, type in a User ID with service authority and password.
  - c. From the System Service Tools display, select **Start a Service Tool > Product activity log > Analyze log.**
  - d. On the Select Subsystem Data display, select the option to view **All Logs.**  
  
**Note:** You can change the From: and To: Dates and Times from the 24-hour default if the time that the customer reported having the problem was more than 24 hours ago.
  - e. Use the defaults on the Select Analysis Report Options display by pressing the Enter key.
  - f. Search the entries on the Log Analysis Report display.

**Note:** For example, a 6380 Tape Unit error would be identified as follows:

**System Reference Code:** 6380CC5F  
**Class:** Perm  
**Resource Name:** TAP01

2. Find an SRC from the product activity log that best matches the time and type of the problem the customer reported.  
 Did you find an SRC that matches the time and type of problem the customer reported?  
**Yes:** Go to Reference codes and use the SRC information to correct the problem. **This ends the procedure.**  
**No:** Contact your next level of support. **This ends the procedure.**

### Using the problem log

Use this procedure to find and analyze a problem log entry that relates to the problem reported.

**Note:** For on-line problem analysis (WRKPRB), ensure that you are logged on with QSRV authority. During problem isolation, this will allow access to test procedures that are not available under any other log-on.

1. On the command line, enter the Work with Problems command:  
WRKPRB



**Note:** Use F4 to change the WRKPRB parameters to select and sort on specific problem log entries that match the problem. Also, F11 displays the dates and times the problems were logged by the system.

Was an entry that relates to the problem found?

**Note:** If the WRKPRB function was not available answer NO.

**Yes:** Continue with the next step.

**No:** Go to “Problems with noncritical resources” on page 36. **This ends the procedure.**

2. Select the problem entry by moving the cursor to the problem entry option field and entering option 8 to work with the problem.

Is Analyze Problem (option 1) available on the Work with Problem display?

**No:** Perform the following:

- a. Return to the initial problem log display (F12).
- b. Select the problem entry by moving the cursor to the problem entry option field and selecting the option to display details.
- c. Select the function key to display possible causes.

**Note:** If this function key is not available, use the customer reported symptom string for customer perceived information about this problem. Then, go to “Using the product activity log” on page 26.

- d. Use the list of possible causes as the FRU list and go to step 5.

**Yes:** Run Analyze Problem (option 1) from the Work with Problem display.

**Notes:**

- a. For SRCs starting with 6112 or 9337, use the SRC and go to the Reference codes topic.
- b. If the message on the display directs you to use SST (System Service Tools), go to “COMIP01” on page 117.

Was the problem corrected by the analysis procedure?

**No:** Continue with the next step.

**Yes: This ends the procedure.**

3. Did problem analysis send you to another entry point in the service information?

**No:** Continue with the next step.

**Yes:** Go to the entry point indicated by problem analysis. **This ends the procedure.**

4. Was the problem isolated to a list of failing items?

**Yes:** Continue with the next step.

**No:** Go to “Problems with noncritical resources” on page 36. **This ends the procedure.**

5. Exchange the failing items one at a time until the problem is repaired.

**Notes:**

- a. For failing items, see “Using failing item codes” on page 430, and symbolic FRUs, see “Symbolic FRUs” on page 445.
- b. When exchanging FRUs, go to Removing and replacing parts.

Has the problem been resolved?

**No:** Contact your next level of support. **This ends the procedure.**

**Yes: This ends the procedure.**

## Problem determination procedure for AIX or Linux servers or partitions

This procedure helps to produce or retrieve a service request number (SRN) if the customer or a previous procedure provided none. If your server is running AIX or Linux the procedure steps you through a process to test the server or partition resources to help you determine where a problem might exist.

Go to MAP 0020: Problem determination procedure

### System unit problem determination

Use this procedure to obtain a reference code if the customer did not provide you with one, or you are unable to load server diagnostics. If you are able to load the diagnostics, go to AIX partition problem determination.

The service processor may have recorded one or more symptoms in its error log. Examine this error log before proceeding (see the Advanced System Management Interface for details). The server may have been set up by using the HMC. Check the Service Action Event (SAE) log in the Service Focal Point. The SAE log may have recorded one or more symptoms in the Service Focal Point. To avoid unnecessary replacement of the same FRU for the same problem, it is necessary to check the SAE log for evidence of prior service activity on the same subsystem.

The service processor may have been set by the user to monitor system operations and to attempt recoveries. You can disable these actions while you diagnose and service the system. If the system maintenance policies were saved using the "save/restore hardware maintenance policies", all the settings of the service processor (except language) were saved and you can use the same service aid to restore the settings at the conclusion of your service action.

If you disable the service processor settings, note their current settings so that you can restore when you are done.

If the system is set to power on using one of the parameters in the following table, disconnect the modem to prevent incoming signals that could cause the system to power on.

Following are the service processor settings. See the Advanced System Management Interface information for more information about the service processor settings.

*Table 7. Service processor settings*

Setting	Description
Monitoring (also called surveillance)	From the ASMI menu, expand the System Configuration menu, then click on Monitoring. Disable both types of surveillance.
Auto power restart (also called unattended start mode)	From the ASMI menu, expand Power/Restart Control, then click on Auto Power Restart, and set it to disabled.
Wake on LAN	From the ASMI menu, expand Wake on LAN, and set it to disabled
Call out	From the ASMI menu, expand the Service Aids menu, then click on Call-Home/Call-In Setup. Set the call-home serial port and the call-in serial port to disabled.

#### Step 1020-1

Be prepared to record code numbers to help analyze a problem.

#### Analyze a failure to load the diagnostic programs

Follow these steps to analyze a failure to load the diagnostic programs.

**Note:** Be prepared to answer questions regarding the control panel and to perform certain actions based on displayed POST indicators. Please be observant of these conditions.

1. Run diagnostics on any partition. Find your symptom in the following table; then follow the instructions given in the Action column. If no fault is identified, continue to the next step.
2. Run diagnostics on the failing partition. Find your symptom in the following table, then follow the instructions given in the Action column. If no fault is identified, continue to the next step.
3. Power off the system. Refer to Stop the system.
4. Load the standalone diagnostics in service mode to test the full system partition; refer to Using AIX online and standalone diagnostics
5. Wait until the diagnostics are loaded or the system appears to stop. If you receive an error code or if the system stops before diagnostics are loaded, find your symptom in the following table, then follow the instructions given in the Action column. If no fault is identified, continue to the next step.
6. Run the standalone diagnostics on the entire system. Find your symptom in the following table, then follow the instructions given in the Action column. If no fault is identified, call service support for assistance.

Symptom	Action
One or more logical partitions do not boot.	<ol style="list-style-type: none"> <li>1. Check service processor error log. If an error is indicated, go to "Start of call procedure" on page 2.</li> <li>2. Check the Serviceable action event log, go to "Start of call procedure" on page 2.</li> </ol>
The rack identify LED does not operate properly.	Go to "Start of call procedure" on page 2.
The system stopped and a code is displayed on the operator panel.	Go to "Start of call procedure" on page 2.
The system stops with a prompt to enter a password.	Enter the password. You cannot continue until a correct password has been entered. When you have entered a valid password, go to the beginning of this table and wait for one of the other conditions to occur.
The diagnostic operating instructions are displayed.	Go to MAP 0020: AIX or Linux problem determination procedure.
The power good LED does not come on or does not stay on, or you have a power problem.	Go to Power problems.
The system login prompt is displayed.	<p>You may not have pressed the correct key or you may not have pressed the key soon enough when you were trying to indicate a service mode IPL of the diagnostic programs. If this is the case, start again at the beginning of this step.</p> <p><b>Note:</b> Perform the system shutdown procedure before turning off the system.</p> <p>If you are sure you pressed the correct key in a timely manner, go to "Step 1020-2" on page 30.</p>
The system does not respond when the password is entered.	Go to "Step 1020-2" on page 30.

Symptom	Action
The system stopped. A POST indicator is displayed on the system console and an eight-digit error code is not displayed.	If the POST indicator represents: <ol style="list-style-type: none"> <li>1. Memory, go to PFW1548: Memory and processor subsystem problem isolation procedure to do a slow boot. If an error code points to memory, replace that memory book and run slow boot again.</li> <li>2. Keyboard <ol style="list-style-type: none"> <li>a. Replace the keyboard cable.</li> <li>b. Replace the keyboard.</li> <li>c. Replace the service processor. Location is model dependent.</li> <li>d. Go to PFW1542: I/O problem isolation procedure.</li> </ol> </li> <li>3. Network, go to PFW1542: I/O problem isolation procedure.</li> <li>4. SCSI, go to PFW1542: I/O problem isolation procedure.</li> <li>5. Speaker <ol style="list-style-type: none"> <li>a. Replace the operator panel. Location is model dependent.</li> <li>b. Replace the service processor, Location is model dependent.</li> <li>c. Go to PFW1542: I/O problem isolation procedure</li> </ol> </li> </ol>
The System Management Services menu is displayed.	Go to PFW1542: I/O problem isolation procedure.
All other symptoms.	If you were directed here from the Entry MAP, go to PFW1542: I/O problem isolation procedure. Otherwise, find the symptom in the Start of call procedure.

### Step 1020-2

Use this procedure to analyze a keyboard problem.

Find the type of keyboard you are using in the following table; then follow the instructions given in the Action column.

Keyboard Type	Action
Type 101 keyboard (U.S.). Identified by the size of the Enter key. The Enter key is in only one horizontal row of keys.	Record error code M0KB D001; then go to "Step 1020-3."
Type 102 keyboard (W.T.). Identified by the size of the Enter key. The Enter key extends into two horizontal rows.	Record error code M0KB D002; then go to "Step 1020-3."
Type 106 keyboard. (Identified by the Japanese characters.)	Record error code M0KB D003; then go to "Step 1020-3."
ASCII terminal keyboard	Go to the documentation for this type of ASCII terminal and continue with problem determination.

### Step 1020-3

Perform the following steps:

1. Find the 8-digit error code in Reference codes.

**Note:** If you do not locate the 8-digit code, look for it in one of the following places:

- Any supplemental service manuals for attached devices

- The diagnostic problem report screen for additional information
  - The Service Hints service aid
  - The CERADME file (by using the Display service hints service aid)
2. Perform the action listed.

## HMC machine code problems

The support organization uses the *pesh* command to look at the HMC's internal machine code to determine how to fix a machine code problem. Only a service representative or support representative can access this feature.

### Launching an xterm shell

You may need to launch an xterm shell to perform directed support from the support center. This may be required if the support center needs to analyze a system dump in order to better understand machine code operations at the time of a failure. To launch an xterm shell, perform the following:

1. Open a terminal by right-clicking the background and selecting **Terminals > rshterm**.
2. Type the *pesh* command followed by the serial number of the HMC and press Enter.
3. You will be prompted for a password, which you must obtain from your next level of support.

Additional information: “Viewing the HMC console logs”

### Viewing the HMC console logs

The console logs display error and information messages that the console has logged while running commands. The service representative can use this information to learn more about what caused an error and how to resolve it. The HMC classifies log entries as either an informational message or an error message. Log entries are identified with an *I* or *E*, respectively. The HMC lists these log entries chronologically, with the most recent shown at the top of the list.

Use the HMC Console Log to view a record of HMC system events. System events are activities that indicate when processes begin and end. These events also indicate whether the attempted action was successful.

To view the HMC log, perform the following:

1. Launch an xterm shell.
2. Once you have entered the password, use the *showLog* command to launch the HMC log window.

The log includes the following information:

- The event's unique ID code
- The date the event occurred
- The time the event occurred
- The log's type
- The name of the attempted action
- The log's reference code
- The status of the log

To view a particular event, perform the following:

1. Select an event by clicking once on it.
2. Press Enter to get to a summary of the log you selected. From here, you must select a Block ID to display. The blocks are listed next to the buttons and include the following options:
  - Standard Data Block
  - Secondary Data Block

- Microcode Reason / ID Error Information
3. Select the data block you want to view.
  4. Press Enter. The extended information shown for the data block you selected includes the following:
    - Program name
    - Current process ID
    - Parent process ID
    - Current thread priority
    - Current thread ID
    - Screen group
    - Subscreen group
    - Current foreground screen process group
    - Current background screen process group

For information about error messages displayed and recovery for these messages, see the Troubleshooting topic.

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## Analyzing problems

**“Problems with loading and starting the operating system (AIX and Linux)”**

**“Problems with noncritical resources” on page 36**

**“Intermittent problems” on page 36**

**“IPL problems” on page 41**

**“Power problems” on page 46**

## Problems with loading and starting the operating system (AIX and Linux)

If the system is running partitions from partition standby (LPAR), the following procedure addresses the problem in which one partition will not boot AIX or Linux while other partitions boot successfully and run the operating system successfully.

It is the customer’s responsibility to move devices between partitions. If a device must be moved to another partition to run standalone diagnostics, contact the customer or system administrator. (If the optical drive must be moved to another partition, all SCSI devices connected to that SCSI adapter must be moved because moves are done at the slot level, not at the device level.)

Depending on the boot device, a checkpoint may be displayed on the operator panel for an extended period of time while the boot image is retrieved from the device. This is particularly true for tape and network boot attempts. If booting from an optical drive or tape drive, watch for activity on the drive’s LED indicator. A blinking LED indicates that the loading of either the boot image or additional information required by the operating system being booted is still in progress. If the checkpoint is displayed for an extended period of time and the drive LED is not indicating any activity, there might be a problem loading the boot image from the device.

### Notes:

1. For network boot attempts, if the system is not connected to an active network or if the target server is inaccessible (which can also result from incorrect IP parameters being supplied), the system will still attempt to boot. Because time-out durations are necessarily long to accommodate retries, the system may appear to be hung. Refer to checkpoint CA00 E174.

2. If the partition hangs with a 4-character checkpoint in the display, the partition must be deactivated, then reactivated before attempting to reboot.
3. If a BA06 000x error code is reported, the partition is already deactivated and in the error state. Reboot by activating the partition. If the reboot is still not successful, go to step 3.

This procedure assumes that a diagnostic CD-ROM is available, and that an optical drive or DVD-RAM drive is connected to the media backplane, or that diagnostics can be run from a NIM (Network Installation Management) server. Booting the diagnostic image from an optical drive or a NIM server is referred to as running standalone diagnostics.

1. Is a Hardware Management Console attached to the managed system?

**Yes:** Continue with the next step.

**No:** Go to step 3.

2. Look at the service action event error log in the HMC Service Focal Point. Perform the actions necessary to resolve any open entries that affect devices in the boot path of the partition or that indicate problems with I/O cabling. Then, try to reboot the partition. Does the partition reboot successfully?

**Yes: This ends the procedure.**

**No:** Continue with the next step.

3. Boot to the SMS main menu:

- If you are rebooting a partition from partition standby (LPAR), go to the properties of the partition and select **Boot to SMS**, then activate the partition.
- If you are rebooting from platform standby, access the ASMI (see Accessing the Advanced System Management Interface). Select **Power/Restart Control > Power On/Off System**. In the AIX/Linux partition mode boot box, select **Boot to SMS menu > Save Settings and Power On**.

At the SMS main menu, select **Select Boot Options** and check to see if the intended boot device is correctly specified in the boot list. Is the intended load device correctly specified in the boot list?

**Yes:** Perform the following:

- a. Remove all removable media from devices in the boot list from which you do not want to load the operating system.
- b. If you are attempting to load the operating system from a network, go to step 4.
- c. If you are attempting to load the operating system from a disk drive or an optical drive, go to step 7 on page 34.

**No:** Go to step 5.

4. If you are attempting to load the operating system from the network, perform the following:

- Verify that the IP parameters are correct.
- Use the SMS ping utility to attempt to ping the target server. If the ping is not successful, have the network administrator verify the server configuration for this client.
- Check with the network administrator to ensure that the network is up. Also ask the network administrator to verify the settings on the server from which you are trying to load the operating system.
- Check the network cabling to the adapter.

Restart the partition and try loading the operating system. Does the operating system load successfully?

**Yes: This ends the procedure.**

**No:** Go to step 7 on page 34.

5. Use the SMS menus to add the intended boot device to the boot sequence. Can you add the device to the boot sequence?

**Yes:** Restart the partition. **This ends the procedure.**

**No:** Continue with the next step.

6. Ask the customer or system administrator to verify that the device you are trying to load from is assigned to the correct partition. Then select **List All Devices** and record the list of bootable devices that displays. Is the device from which you want to load the operating system in the list?

**Yes:** Go to step 7.

**No:** Go to step 15 on page 35.

7. Try to load and run standalone diagnostics against the devices in the partition, particularly against the boot device from which you want to load the operating system. You can run standalone diagnostics from an optical drive or a NIM server. To boot standalone diagnostics, follow the detailed procedures in Running the online and standalone diagnostics.

**Note:** When attempting to load diagnostics on a partition from partition standby, the device from which you are loading standalone diagnostics must be made available to the partition that is not able to load the operating system, if it is not already in that partition. Contact the customer or system administrator if a device must be moved between partitions in order to load standalone diagnostics.

Did standalone diagnostics load and start successfully?

**Yes:** Go to step 8.

**No:** Go to step 14 on page 35.

8. Was the intended boot device present in the output of the Display Configuration and Resource List (which is run from the Task Selection Menu)?

**No:** Continue with the next step.

**Yes:** Did running diagnostics against the intended boot device result in a "No Trouble Found" message?

**Yes:** Go to step 12 on page 35.

**No:** Go to step 13 on page 35.

9. Did you boot standalone diagnostics from an IDE optical drive?

**Yes:** Continue with the next step.

**No:** Go to step 11 on page 35.

10. Perform the following actions:

- a. Perform the first item in the action list below.

- b. Restart the system.

- c. Stop at the SMS menus and select **Select Boot Options**.

- d. Is the device that was not appearing previously in the boot list now present?

**Yes:** Go to MAP 0410: Repair checkout. **This ends the procedure.**

**No:** Perform the next item in the action list and then return to step 10b.

**Action list:**

**Note:** See Finding part locations for part numbers and links to exchange procedures.

- a. Verify that the SCSI cables are properly connected.

- b. Remove all hot-swap disk drives (except the intended boot device, if the boot device is a hot-swap drive). If the boot device is present in the boot list after you boot the system to the SMS menus, add the hot-swap disk drives back in one at a time, until you isolate the failing device.

- c. Disconnect all other internal SCSI devices. If the boot device is present in the boot list after you boot the system to the SMS menus, reconnect the internal SCSI devices one at a time, until you isolate the failing device or cable.

- d. Replace the SCSI cables.

- e. Replace the SCSI backplane that the boot device plugs into.

- f. Replace the intended boot device.



- g. Replace the system backplane.
11. Choose from the following:
    - If the intended boot device is not listed, go to “MAP 0290: Missing Resource Problem Resolution” on page 307. **This ends the procedure.**
    - If an SRN is reported by the diagnostics, go to List of service request numbers and follow the action listed. **This ends the procedure.**
  12. Have you disconnected any other devices?
    - No:** Perform an operating system-specific recovery process or reinstall the operating system. **This ends the procedure.**
    - Yes:** Reinstall each device that you disconnected, one at a time. After you reinstall each device, reboot the system. Continue this procedure until you isolate the failing device. Replace the failing device, then go to step 13.
  13. Is the problem corrected?
    - Yes:** Go to MAP 0410: Repair checkout. **This ends the procedure.**
    - No:** If replacing the indicated FRUs did not correct the problem, or if the previous steps did not address your particular situation, go to PFW1548: Processor subsystem problem isolation. **This ends the procedure.**
  14. Is a SCSI boot failure (where you cannot boot from a SCSI-attached device) also occurring?
    - Yes:** Go to PFW1548: Processor subsystem problem isolation. **This ends the procedure.**
    - No:** Check the IDE cabling to the boot device and the device configuration jumpers. Is there a problem with the cabling?
      - **No:** Go to step 15.
      - **Yes:** Fix the problem with the cabling. **This ends the procedure.**
  15. Perform the following actions to determine if another adapter is causing the problem:
    - a. Remove all adapters except the one to which the optical drive is attached and the one used for the console.
    - b. Reload the standalone diagnostics. Can you successfully reload the standalone diagnostics?
      - No:** Continue with the next step.
      - Yes:** Perform the following:
        - 1) Reinstall the adapters that you removed (and attach devices as applicable) one at a time. After you reinstall each adapter, retry the boot operation until the problem reoccurs.
        - 2) Replace the adapter or device that caused the problem.
        - 3) Go to MAP 0410: Repair checkout. **This ends the procedure.**
  16. The graphics adapter (if installed), optical drive, IDE or SCSI cable, or system board is most likely defective. Does your system have an installed graphics adapter?
    - No:** Go to step 18
    - Yes:** Continue with the next step.
  17. Perform the following to determine if the graphics adapter is causing the problem:
    - a. Remove the graphics adapter.
    - b. Attach a TTY terminal to the serial port.
    - c. Try to reload standalone diagnostics. Do the standalone diagnostics load successfully?
      - Yes:** Replace the graphics adapter. **This ends the procedure.**
      - No:** Continue with the next step.
  18. Replace the following, one at a time, until the problem is resolved:
    - a. Optical drive
    - b. IDE or SCSI cable that goes to the optical drive
    - c. System board that contains the integrated SCSI adapters

If this resolves the problem, go to MAP 0410: Repair Checkout. If the problem still persists or if the previous descriptions did not address your particular situation, go to PFW1548: Processor subsystem problem isolation.

**This ends the procedure.**

## Problems with noncritical resources

1. Is there an SRC in an 8-character format available on the Problem Summary form?

**Note:** If the operator has not filled out the problem summary form, go to the problem reporting procedure for the operating system in use.

**No:** Continue with the next step.

**Yes:** Go to the Reference codes topic. **This ends the procedure.**

2. Does the problem involve a workstation resource?

**No:** Continue with the next step.

**Yes:** Perform the following steps:

- Check that the workstation is operational.
- Verify that the cabling and addressing for the workstation is correct.
- Perform any actions indicated in the system operator message.

If you need further assistance, contact your next level of support. **This ends the procedure.**

3. Does the problem involve a removable media resource?

**No:** Continue with the next step.

**Yes:** Go to “Using the product activity log” on page 26 to resolve the problem. **This ends the procedure.**

4. Does the problem involve a communications resource?

**No:** Contact your next level of support. **This ends the procedure.**

**Yes:** Are there any system operator messages that indicate a communications-related problem has occurred?

- **No:** Contact your next level of support. **This ends the procedure.**
- **Yes:** Perform any actions indicated in the system operator message. If you need further assistance, contact your next level of support. **This ends the procedure.**

## Intermittent problems

An intermittent problem is a problem that occurs for a short time, and then goes away. The problem may not occur again until some time in the future, if at all. Intermittent problems cannot be made to appear again easily.

Some examples of intermittent problems are:

- A reference code appears on the control panel (the system attention light is on) but disappears when you power off, then power on the system. An entry does not appear in the Product Activity Log.
- An entry appears in the problem log when you use the Work with Problems (WRKPRB) command. For example, the 5094 expansion unit becomes powered off, but starts working again when you power it on.
- The workstation adapter is in a hang condition but starts working normally when it gets reset.

**Note:** You can get equipment for the following conditions from your branch office or installation planning representative:

- If you suspect that the air at the system site is too hot or too cold, you need a thermometer to check the temperature.

- If you suspect the moisture content of the air at the system site is too low or too high, use a wet/dry bulb to check the humidity. See “General intermittent problem checklist” on page 38 for more information.
- If you need to check ac receptacles for correct wiring, you need an ECOS tester, Model 1023-100, or equivalent tester. The tester lets you quickly check the receptacles. If you cannot find a tester, use an analog multimeter instead. Do not use a digital multimeter.

Follow the steps below to correct an intermittent problem:

1. Read the information in “About intermittent problems” before you attempt to correct an intermittent problem. Then continue with the next step of this procedure.
2. Perform *all* steps in the “General intermittent problem checklist” on page 38. Then continue with the next step of this procedure.
3. Did you correct the intermittent problem?

**Yes: This ends the procedure.**

**No:** Go to “Analyzing intermittent problems” on page 40. **This ends the procedure.**

## About intermittent problems

An intermittent problem can show many different symptoms, so it might be difficult for you to determine the real cause without completely analyzing the failure. To help with this analysis, you should determine as many symptoms as possible.

- The complete reference code is necessary to determine the exact failing area and the probable cause.
- Product Activity Log (PAL) information can provide time and device relationships.
- Information about environmental conditions when the failure occurred can be helpful (for example, an electrical storm occurring when the failure happened).

**Note:** If you suspect that an intermittent problem is occurring, increase the log sizes to the largest sizes possible. Select the PAL option on the Start a Service Tool display (see Product Activity Log for details).

## Types of intermittent problems

Following are the major types of intermittent problems:

- Code (PTFs):
  - Licensed internal code
  - i5/OS
  - Licensed program products
  - Other application software
- Configuration:
  - Non-supported hardware that is used on the system
  - Non-supported system configurations
  - Non-supported communication networks
  - Model and feature upgrades that are not performed correctly
  - Incorrectly configured or incorrectly cabled devices
- Environment:
  - Power line disturbance (for example, reduced voltage, a pulse, a surge, or total loss of voltage on the incoming ac voltage line)
  - Power line transient (for example, lightning strike)
  - Electrical noise (constant or intermittent)
  - Defective grounding or a ground potential difference
  - Mechanical vibration

- Intermittent hardware failure

## General intermittent problem checklist

The following steps have been successful in correcting intermittent problems on the server. Performing these steps removes the known causes of most intermittent problems.

1. Discuss the problem with the customer. Look for the following symptoms:
  - A reference code that goes away when you power off and then power on the system.
  - Repeated failure patterns that you cannot explain. For example, the problem occurs at the same time of day or on the same day of the week.
  - Failures that started after system relocation.
  - Failures that occurred during the time specific jobs or software were running.
  - Failures that started after recent service or customer actions, system upgrade, addition of I/O devices, new software, or program temporary fix (PTF) installation.
  - Failures occurring only during high system usage.
  - Failures occur when people are close to the system or machines are attached to the system.
2. Recommend that the customer install the latest cumulative PTF package, since code PTFs have corrected many problems that seem to be hardware failures. The customer can order the latest cumulative PTF package electronically through Electronic Customer Support or by calling the Software Support Center.
3. If you have not already done so, use the maintenance package to see the indicated actions for the symptom described by the customer. Attempt to perform the on-line problem analysis procedure first. If this is not possible, such as when the system is down, go to “Start of call procedure” on page 2.

Use additional diagnostic tools, if necessary, and attempt to recreate the problem.

**Note:** Ensure that the service information you are using is at the same level as the operating system.

4. Check the site for the following environmental conditions:
  - a. Any electrical noise that matches the start of the intermittent problems. Ask the customer such questions as:
    - Have any external changes or additions, such as building wiring, air conditioning, or elevators been made to the site?
    - Has any arc welding occurred in the area?
    - Has any heavy industrial equipment, such as cranes, been operating in the area?
    - Have there been any thunderstorms in the area?
    - Have the building lights become dim?
    - Has any equipment been relocated, especially computer equipment?If there was any electrical noise, find its source and prevent the noise from getting into the system.
  - b. Site temperature and humidity conditions that are compatible with system specifications. See Temperature and humidity design criteria in the Planning topic.
  - c. Poor air quality in the computer room:
    - Look for dust on top of objects. Dust particles in the air cause poor electrical connections and may cause disk unit failures.
    - Smell for unusual odors in the air. Some gases can corrode electrical connections.
  - d. Any large vibration (caused by thunder, an earthquake, an explosion, or road construction) that occurred in the area at the time of the failure.

**Note:** A failure that is caused by vibration is more probable if the server is on a raised floor.

5. Ensure that all ground connections are tight. These items reduce the effects of electrical noise. Check the ground connections by measuring the resistance between a conductive place on the frame to building ground or to earth ground. The resistance must be 1.0 ohm or less.
6. Ensure proper cable retention is used, as provided. If no retention is provided, the cable should be strapped to the frame to release tension on cable connections.  
Ensure that you pull the cable ties tight enough to fasten the cable to the frame bar tightly. A loose cable can be accidentally pulled with enough force to unseat the logic card in the frame to which the cable is attached. If the system is powered on, the logic card could be destroyed.
7. Ensure that all workstation and communications cables meet IBM specifications:
  - All connections are tight.
  - Any twinaxial cables that are not attached to devices must be removed.
  - The lengths and numbers of connections in the cables must be correct.
  - Ensure that lightning protection is installed on any twinaxial cables that enter or leave the building.
8. Perform the following:
  - a. Review recent service calls. Contact your next level of support for assistance.
  - b. Review entries in the problem log (WRKPRB). Look for problems that were reported to the user.
  - c. Review entries in the PAL, SAL, and service processor log. Look for a pattern:
    - SRCs on multiple adapters occurring at the same time
    - SRCs that have a common time-of-day or day-of-week pattern
    - Log is wrapping (hundreds of recent entries and no older entries)
 Check the PAL sizes and increase them if they are smaller than recommended.
  - d. Review entries in the history log (Display Log (DSPLOG)). Look for a change that matches the start of the intermittent problems.
  - e. Ensure that the latest engineering changes are installed on the system and on all system I/O devices.
9. Ensure that the hardware configuration is correct and that the model configuration rules have been followed. Use the **Display hardware configuration** service function (under SST or DST) to check for any missing or failed hardware.
10. Was a system upgrade, feature, or any other field bill of material or feature field bill of material installed just before the intermittent problems started occurring?
 

**No:** Continue with the next step.

**Yes:** Review the installation instructions to ensure that each step was performed correctly. Then continue with the next step of this procedure.
11. Is the problem associated with a removable media storage device?
 

**No:** Continue with the next step.

**Yes:** Ensure that the customer is using the correct removable media storage device cleaning procedures and good storage media. Then continue with the next step of this procedure.
12. Perform the following to help prevent intermittent thermal checks:
  - Ensure that the AMDs are working.
  - Exchange all air filters as recommended.
13. If necessary, review the intermittent problems with your next level of support and installation planning representative. Ensure that all installation planning checks were made on the system. Because external conditions are constantly changing, the site may need to be checked again. **This ends the procedure.**

## Analyzing intermittent problems

Use this procedure to begin analyzing an intermittent problem only after you have first reviewed the information in “About intermittent problems” on page 37 and gone through the “General intermittent problem checklist” on page 38.

1. Is a reference code associated with the intermittent problem?
  - No:** Continue with the next step.
  - Yes:** Go to Reference codes. If the actions in the reference code tables do not correct the intermittent problem, return here and continue with the next step.
2. Is a symptom associated with the intermittent problem?
  - No:** Continue with the next step.
  - Yes:** Go to “Intermittent symptoms.” If the information there does not help to correct the intermittent problem, return here and continue with the next step.
3. Go to “Failing area intermittent isolation procedures.” If the information there does not help to correct the intermittent problem, return here and continue with the next step.
4. Send the data you have collected to your next level of support so that an Authorized Program Analysis Report (APAR) can be written. **This ends the procedure.**

## Intermittent symptoms

Use the table below to find the symptom and description of the intermittent problem. Then perform the corresponding intermittent isolation procedures.

Although an isolation procedure may correct the intermittent problem, use your best judgment to determine if you should perform the remainder of the procedure shown for the symptom.

**Note:** If the symptom for the intermittent problem you have is not listed, go to “Failing area intermittent isolation procedures.”

Table 8. Intermittent symptoms

Symptom	Description	Isolation procedure
System powered off.	The system was operating correctly, then the system powered off. A 1xxx SRC may occur when this happens, and this SRC info should be logged in the service processor log.	“INTIP09 Utility power and battery power units” on page 126
System stops.	The system is powered on but is not operating correctly. No SRC is displayed. The system attention light is off and the processor activity lights may be on or off. Noise on the power-on reset line can cause the processor to stop.	“INTIP18 PTFs not installed” on page 128
System or subsystem runs slow.	The system or the subsystem is not processing at its normal speed.	“INTIP20 Performance problems” on page 128

## Failing area intermittent isolation procedures

Use this table only if you do not have a system reference code (SRC), or cannot find your symptom in “Intermittent symptoms.”

1. Perform all of the steps in “General intermittent problem checklist” on page 38 for all failing areas. Then continue with the next step.
2. Refer to the table below, and perform the following:
  - a. Find the specific area of failure under **Failing area**.
  - b. Look down the column of the area of failure until you find an X.
  - c. Look across to the **Isolation procedure** column and perform the procedure indicated.

- d. If the isolation procedure does not correct the intermittent problem, continue down the column of the area of failure until you have performed all of the procedures shown for the failing area.
3. Although an isolation procedure may correct the intermittent problem, use your best judgment to determine if you should perform the remainder of the procedures shown for the failing area.

Table 9. Failing area intermittent isolation procedures

Failing area						Isolation procedure to perform:
Power	Work station I/O processor	Disk unit adapter	Comm	Processor bus	Tape optical	Perform all steps in:
X	X	X	X	X	X	"General intermittent problem checklist" on page 38
X	X			X		"INTIP05 External noise on twinaxial cables" on page 124
	X	X	X	X	X	"INTIP07 Electromagnetic interference (EMI)" on page 124
X						"INTIP09 Utility power and battery power units" on page 126
X						"INTIP14 Station protectors" on page 128
		X				"INTIP16 Licensed Internal Code" on page 128
X	X	X	X	X	X	"INTIP18 PTFs not installed" on page 128
	X	X	X	X	X	"INTIP20 Performance problems" on page 128

## IPL problems

Choose from the following scenarios to diagnose your IPL problem:

**Cannot perform IPL from the control panel (no reference code)**

**Cannot perform IPL at a specified time (no reference code)**

**Cannot automatically perform IPL after a power failure**

### Cannot perform IPL from the control panel (no SRC)

Use this procedure when you cannot perform an OS/400 IPL from the control panel (no SRC).

#### DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock. (D004)

1. Perform the following:
  - a. Verify that the power cable is plugged into the power outlet.
  - b. Verify that power is available at the customer's power outlet.
2. Start an IPL by doing the following:
  - a. Select Manual mode and IPL type A or B on the control panel. See Control panel functions for details.

b. Power on the system. See Powering on and powering off.

Does the IPL complete successfully?

**No:** Continue with the next step.

**Yes: This ends the procedure.**

3. Have all the units in the system become powered on that you expected to become powered on?

**Yes:** Continue with the next step.

**No:** Go to “Power problems” on page 46 and find the symptom that matches the problem. **This ends the procedure.**

4. Is an SRC displayed on the control panel?

**Yes:** Go to “Power problems” on page 46 and use the displayed SRC to correct the problem. **This ends the procedure.**

**No:** For all models, exchange the following FRUs, one at a time. Refer to the Removing and replacing parts for additional information.

a. SPCN card unit. See symbolic FRU “TWRCARD” on page 549.

b. Power Supply. See symbolic FRU “PWRSPPLY” on page 529. **This ends the procedure.**

### Cannot perform IPL at a specified time (no SRC)

Use this procedure when you cannot perform an OS/400 IPL at a specified time (no SRC). To correct the IPL problem, perform this procedure until you determine the problem and can perform an IPL at a specified time.

#### DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock. (D004)

1. Verify the following:

- a. The power cable is plugged into the power outlet.
- b. That power is available at the customer’s power outlet.

2. Power on the system in normal mode. See Powering on and powering off.

Does the IPL complete successfully?

**Yes:** Continue with the next step.

**No:** Go to the “Start of call procedure” on page 2 procedure. **This ends the procedure.**

3. Have all the units in the system become powered on that you expected to become powered on?

**Yes:** Continue with the next step.

**No:** Go to “Start of call procedure” on page 2 and find the symptom that matches the problem. **This ends the procedure.**

4. Verify the system date and time by doing the following:

a. On the command line, enter the Display System Value command:

```
DSPSYSVAL QIPLDATTIM
```

Observe the system value parameters.

**Note:** The system value parameters are the date and time the system operator requested a timed IPL.

**Figure 1. Display for QIPLDATTIM**

```

+-----+
| Display System Value
| System: S0000000
| System value . . . . . : QIPLDATTIM
+-----+

```



```

Description . . . . . : Date and time to automatically IPL
IPL date . . . . . : MM/DD/YY
IPL time . . . . . : HH:MM:SS
+-----+

```

- b. On the command line, enter the Display System Value command:

```
DSPSYSVAL QDATE
```

Check the system values for the date.

**Figure 2. Display for QDATE**

```

+-----+
Display System Value
System: S0000000
System value . . . . . : QDATE
Description . . . . . : System date
Date . . . . . : MM/DD/YY
+-----+

```

Does the operating system have the correct date?

**Yes:** Continue with this step.

**No:** Set the correct date by doing the following:

- 1) On the command line, enter the Change System Value command (CHGSYSVAL QDATE VALUE('mmddy')).
- 2) Set the date by entering
  - mm=month
  - dd=day
  - yy=year
- 3) Press **Enter**.

- c. On the command line, enter the Display System Value command: DSPSYSVAL QTIME

Check the system values for the time.

**Figure 3. Display for QTIME**

```

+-----+
Display System Value
System: S0000000
System value . . . . . : QTIME
Description . . . . . : Time of day
Time . . . . . : HH:MM:SS
+-----+

```

Does the operating system have the correct time?

**Yes:** Continue with this step.

**No:** Set the correct time by doing the following:

- 1) On the command line, enter the Change System Value command (CHGSYSVAL QTIME VALUE('hhmms')).
- 2) Set the time by entering
  - hh=24 hour time clock
  - mm=minutes
  - ss=seconds
- 3) Press **Enter** and continue with the next step.

5. Verify that the system can perform an IPL at a specified time by doing the following:

- a. Set the time to 5 minutes past the present time by entering the Change System Value command (CHGSYSVAL SYSVAL(QIPLDATTIM) VALUE('mmddy hhmss')) on the command line.  
mm = month to power on  
dd = day to power on  
yy = year to power on

hh = hour to power on  
mm = minute to power on  
ss = second to power on

- b. Power off the system by entering the Power Down System Immediate command (PWRDWSYS \*IMMED) on the command line.
- c. Wait 5 minutes.

Does the IPL start at the time you specified?

**No:** Continue with the next step.

**Yes: This ends the procedure.**

6. Power on the system in normal mode. See Powering on and powering off.

Does the IPL complete successfully?

**Yes:** Continue with the next step.

**No:** Go to "Start of call procedure" on page 2. **This ends the procedure.**

7. Find an entry in the Service Action Log that matches the time, SRC, and/or resource that compares to the reported problem.

- a. On the command line, enter the Start System Service Tools command:

STRSST

If you cannot get to SST, select DST. See Dedicated Service Tools (DST) for details.

**Note:** Do not IPL the system or partition to get to DST.

- b. On the Start Service Tools Sign On display, type in a user ID with service authority and password.
- c. Select **Start a Service Tool > Hardware Service Manager > Work with service action log.**
- d. On the Select Timeframe display, change the From: Date and Time to a date and time prior to when the customer reported having the problem.
- e. Find an entry that matches one or more conditions of the problem:
  - SRC
  - Resource
  - Time
  - FRU list (choose **Display the failing item information** to display the FRU list).

**Notes:**

- a. All entries in the service action log represent problems that require a service action. It may be necessary to handle any problem in the log even if it does not match the original problem symptom.
- b. The information displayed in the date and time fields are the time and date for the first occurrence of the specific system reference code (SRC) for the resource displayed during the time range selected.

Did you find an entry in the Service Action Log?

**No:** Continue with the next step.

**Yes:** Go to step 9 on page 45.

8. Exchange the following parts one at a time. See Removing and replacing parts. After exchanging each part, return to step 5 on page 43 to verify that the system can perform an IPL at a specified time.

**Note:** If you exchange the control panel or the system backplane, you must set the correct date and time by performing step 4 on page 42.

**Attention:** Before exchanging any part, power off the system. See Powering on and powering off.

- System unit backplane (see symbolic FRU “SYSBKPL” on page 547).
- System control panel
- System control panel cable

Did the IPL complete successfully after you exchanged all of the parts listed above?

**No:** Contact your next level of support. **This ends the procedure.**

**Yes:** Continue with the next step.

9. Was the entry isolated (is there a Y in the Isolated column)?

**No:** Go to the List of system reference codes and use the SRC indicated in the log. **This ends the procedure.**

**Yes:** Display the failing item information for the Service Action Log entry. Items at the top of the failing item list are more likely to fix the problem than items at the bottom of the list.

Exchange the failing items one at a time until the problem is repaired. After exchanging each one of the items, verify that the item exchanged repaired the problem.

**Notes:**

- a. For failing items see “Using failing item codes” on page 430.
- b. For symbolic FRUs see “Symbolic FRUs” on page 445.
- c. When exchanging FRUs, refer to the Removing and replacing parts procedures. If you are exchanging a disk unit, go to Disk unit recovery procedures.
- d. After exchanging an item, go to Verifying the repair.

After the problem has been resolved, close the log entry by selecting **Close a NEW entry** on the Service Actions Log Report display. **This ends the procedure.**

### **Cannot automatically perform an IPL after a power failure**

Use this procedure when you cannot automatically perform and OS/400 IPL after a power failure.

1. Normal or Auto mode on the control panel must be selected when power is returned to the system.

Is Normal or Auto mode on the control panel selected?

**Yes:** Continue with the next step.

**No:** Select **Normal** or **Auto** mode on the control panel. **This ends the procedure.**

2. Use the Display System Value command (DSPSYSVAL) to verify that the system value under QPWRRSTIPL on the Display System Value display is equal to 1.

Is QPWRRSTIPL equal to 1?

**Yes:** Continue with the next step.

**No:** Use the Change System Value command (CHGSYSVAL) to set QPWRRSTIPL equal to 1. **This ends the procedure.**

3. For Models 520 and 570, exchange the Tower card. See symbolic FRU “TWRCARD” on page 549. Refer to Removing and replacing parts for the model you are working on. Also, before exchanging any part, power off the system. See Powering on and powering off.

**Note:** If you exchange the tower card or the system unit backplane, you must set the system date (QDATE) and time (QTIME). **This ends the procedure.**

## Power problems

Use the following table to begin analyzing a power problem.

Table 10. Analyzing power problems

Symptom	What you should do
There may or may not be a reference code displayed on the control panel or in the HMC.  Perform the following steps to check the HMC for codes: 1. In the Navigation Area, expand <b>Server and Partition</b> --> <b>Server Management</b> . 2. In the right pane, expand or select your system or partition. View the associated value in the Operator Panel Value column.	Record the reference code shown. Go to (1xxx) System power control network (SPCN) reference codes and find the reference code.  Integrated xSeries® Server for iSeries™ frames will only have the frame number flashing on the failing unit's SPCN card assembly, which is visible after removing the cover.
System unit does not power on.	See "Cannot power on system unit."
The system or expansion unit does not power off.	See "Cannot power off system or I/O expansion unit" on page 55.
The system does not remain powered on during a loss of incoming ac voltage and has an Uninterruptible Power Supply (UPS) installed.	Refer to the UPS user's guide that came with your unit.
An I/O expansion unit does not power on.	See "Cannot power on I/O expansion unit" on page 50.

### Cannot power on system unit

Perform this procedure until you correct the problem and you can power on the system.

## DANGER

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn everything OFF (unless instructed otherwise).
2. Remove power cords from the outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

To Connect:

1. Turn everything OFF (unless instructed otherwise)
2. Attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

(D005)

1. Are you working with a model 590 or 595?

**No:** Continue with the next step.

**Yes:** Go to “PWR1912” on page 186. **This ends the procedure.**

2. Attempt to power on the system (see Powering on and powering off). Does the system power on, and is the system power status indicator light on continuously?

**Note:** The system power status indicator blinks at the slower rate (one blink per two seconds) while powered off, and at the faster rate (one blink per second) during a normal power-on sequence.

**No:** Continue with the next step.

**Yes:** Go to step 16 on page 49.

3. Are there any characters displayed on the control panel (a scrolling dot may be visible as a character)?

**No:** Continue with the next step.

**Yes:** Go to step 6 on page 48.

4. Are the mainline ac power cables from the power supply, power distribution unit, or external uninterruptible power supply (UPS) to the customer’s ac power outlet connected and seated correctly at both ends?

**Yes:** Continue with the next step.

**No:** Connect the mainline ac power cables correctly at both ends and go to step 2 on page 47.

5. Perform the following:
  - a. Verify that the UPS is powered on (if it is installed). If the UPS will not power on, follow the service procedures for the UPS to ensure proper line voltage and UPS operation.
  - b. Disconnect the mainline ac power cable or ac power jumper cable from the system's ac power connector at the system.
  - c. Use a multimeter to measure the ac voltage at the system end of the mainline ac power cable or ac power jumper cable.

**Note:** Some system models have more than one mainline ac power cable or ac power jumper cable. For these models, disconnect all the mainline ac power cables or ac power jumper cables and measure the ac voltage at each cable before continuing with the next step.

Is the ac voltage from 200 V ac to 240 V ac, or from 100 V ac to 127 V ac?

**No:** Go to step 9.

**Yes:** Continue with the next step.

6. Perform the following:
  - a. Disconnect the mainline ac power cable(s) from the power outlet.
  - b. Exchange the system unit control panel (see symbolic FRU "CTLPNL" on page 471).
  - c. Reconnect the mainline ac power cables to the power outlet.
  - d. Attempt to power on the system.

Does the system power on?

**No:** Continue with the next step.

**Yes:** The system unit control panel was the failing item. **This ends the procedure.**

7. Perform the following:
  - a. Disconnect the mainline ac power cable(s) from the power outlet.
  - b. Exchange the power supply or supplies (see Finding part locations).
  - c. Reconnect the mainline ac power cables to the power outlet.
  - d. Attempt to power on the system.

Does the system power on?

**No:** Continue with the next step.

**Yes:** The power supply was the failing item. **This ends the procedure.**

8. Perform the following:
  - a. Disconnect the mainline ac power cable(s).
  - b. Exchange the SPCN card. See symbolic FRU "TWRCARD" on page 549.
  - c. Reconnect the mainline ac power cables to the power outlet.
  - d. Attempt to power on the system.

Does the system power on?

**No:** Call your next level of assistance. **This ends the procedure.**

**Yes:** The SPCN card was the failing item. **This ends the procedure.**

9. Are you working on a system unit with a power distribution unit with tripped breakers?

**No:** Continue with the next step.

**Yes:** Perform the following:

- a. Reset the tripped power distribution breaker.
- b. Verify that the removable ac power cable is not the problem. Replace the cord, as installed, if it is defective.
- c. If the breaker continues to trip, install a new power supply (as installed) in each location until the defective one is found. **This ends the procedure.**

10. Does the system have an external UPS installed?
- Yes:** Continue with the next step.
- No:** Go to step 12.
11. Use a multimeter to measure the ac voltage at the external UPS outlets. Is the ac voltage from 200 V ac to 240 V ac or from 100 V ac to 127 V ac?
- No:** The UPS needs service. For 9910 type UPS, call IBM Service Support. For all other UPS types, have the customer call the UPS provider. In the meantime, go to step 13 to bypass the UPS.
- Yes:** Exchange the ac power cable, as installed (see the Part number catalog). **This ends the procedure.**
12. Perform the following:
- Disconnect the mainline ac power cable from the customer's ac power outlet.
  - Use a multimeter to measure the ac voltage at the customer's ac power outlet.
- Note:** Some system models have more than one mainline ac power cable. For these models, disconnect all the mainline ac power cables and measure the ac voltage at all ac power outlets before continuing with this step.
- Is the ac voltage from 200 V ac to 240 V ac, or from 100 V ac to 127 V ac?
- Yes:** Exchange the mainline ac power cable. See the Part number catalog. Then go to step 2 on page 47.
- No:** Inform the customer that the ac voltage at the power outlet is not correct. When the ac voltage at the power outlet is correct, reconnect the mainline ac power cables to the power outlet. **This ends the procedure.**
13. Perform the following to bypass the UPS unit:
- Power off your system and the UPS unit.
  - Remove the signal cable (see Part number catalog) used between the UPS and the system.
  - Remove any power jumper cords used between the UPS and the attached devices.
  - Remove the country or region specific power cord used from the UPS to the wall outlet.
  - Use the correct power cord (the original country or region specific power cord shipped with your system) and connect it to the power inlet on the system. Plug the other end of this cord into a compatible wall outlet.
  - Attempt to power on the system.
- Does the power-on standby sequence complete successfully?
- Yes:** Go to Verifying the repair. **This ends the procedure.**
- No:** Go to step 6 on page 48.
14. Display the selected IPL mode on the system unit control panel (see IPL information in the Service functions). Is the selected mode the same mode that the customer was using when the power-on failure occurred?
- No:** Go to step 16.
- Yes:** Continue with the next step.
15. Is a function 11 reference code displayed on the system unit control panel?
- No:** Go to step 17 on page 50.
- Yes:** Return to "Start of call procedure" on page 2. **This ends the procedure.**
16. Perform the following:
- Power off the system.
  - Select the mode on the system unit control panel that the customer was using when the power-on failure occurred.
  - Attempt to power on the system.
- Does the system power on?

**Yes:** Continue with the next step.

**No:** Exchange the system unit control panel. See symbolic FRU "CTLPNL" on page 471. **This ends the procedure.**

17. Continue the IPL. Does the IPL complete successfully?

**Yes:** **This ends the procedure.**

**No:** Return to "Start of call procedure" on page 2. **This ends the procedure.**

### Cannot power on I/O expansion unit

You are here because an I/O expansion unit cannot be powered on, and might be displaying a 1xxx-C62E reference code.

#### DANGER

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn everything OFF (unless instructed otherwise).
2. Remove power cords from the outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

To Connect:

1. Turn everything OFF (unless instructed otherwise)
2. Attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

(D005)

1. Is the unit that is not powering on a shared unit that is switched to a system unit that does not have an SPCN frame-to-frame cable attached to it?

**No:** Continue with the next step.

**Yes:** The shared unit *must* be switched to a system unit with an SPCN frame-to-frame cable attached to it to service it. Do this and continue with the next step.

2. Power on the system.



3. Starting from T3 or T4 on the system unit, go to the first unit in the SPCN frame-to-frame cable sequence that does not power on. Is the Data display background light on, or is the power-on LED blinking, or are there any characters displayed on the control panel?

**Note:** The background light is a dim (yellow) light in the Data area of the control panel.

**Yes:** Go to step 13 on page 52.

**No:** Continue with the next step.

4. Use a multimeter to measure the ac voltage at the customer's ac power outlet.

Is the ac voltage from 200 V ac to 240 V ac, or from 100 V ac to 127 V ac?

**Yes:** Continue with the next step.

**No:** Inform the customer that the ac voltage at the power outlet is not correct.

**This ends the procedure.**

5. Is the mainline ac power cable from the ac module, battery charger, power supply, or power distribution unit to the customer's ac power outlet connected and seated correctly at both ends?

**Yes:** Continue with the next step.

**No:** Connect the mainline ac power cable correctly at both ends.

**This ends the procedure.**

6. Perform the following:

- a. Disconnect the mainline ac power cable from the ac module, battery charger, power supply, or power distribution unit.
- b. Use a multimeter to measure the ac voltage at the ac module, battery charger, power supply, or power distribution unit end of the mainline ac power cable.

Is the ac voltage from 200 V ac to 240 V ac, or from 100 V ac to 127 V ac?

**No:** Continue with the next step.

**Yes:** Go to step 8.

7. Are you working on a power distribution unit with tripped breakers?

**No:** Exchange the mainline ac power cable or power distribution unit (as installed).

**This ends the procedure.**

**Yes:** Perform the following:

- a. Reset the tripped power distribution breaker.
- b. Verify that the removeable ac line cord is not the problem. Replace the cord, as installed, if it is defective.
- c. Install a new power supply (as installed) in all power locations until the defective one is found.

**This ends the procedure.**

8. Does the unit you are working on have ac power jumper cables installed?

**Note:** The ac power jumper cables connect from the ac module, battery charger unit, or the power distribution unit to the power supplies.

**Yes:** Continue with the next step.

**No:** Go to step 12 on page 52.

9. Are the ac power jumper cables connected and seated correctly at both ends?

**Yes:** Continue with the next step.

**No:** Connect the ac power jumper cables correctly at both ends.

**This ends the procedure.**

10. Perform the following:

- a. Disconnect the ac power jumper cables from the battery charger unit, ac module, or power distribution unit.
- b. Use a multimeter to measure the dc voltage at the battery charger unit outlets or ac voltage at the ac module and power distribution unit (that goes to the power supplies).

Is the dc voltage at the battery charger unit from 145 V dc to 259 V dc, or is the ac voltage at the ac module and power distribution unit from 200 V ac to 240 V ac?

**Yes:** Continue with the next step.

**No:** Exchange the following as they are installed (see Part number catalog):

- Battery charger unit
- AC module
- Power distribution unit

**This ends the procedure.**

11. Perform the following:

- a. Connect the ac power jumper cables to the ac module, battery charger unit, or power distribution unit.
- b. Disconnect the ac power jumper cable at the power supplies.
- c. Use a multimeter to measure the voltage of the power jumper cables input to the power supplies.

Is the dc voltage from 145 V dc to 259 V dc (200 V ac to 240 V ac for dual line cord units and power distribution units) for each power jumper cable?

**No:** Exchange the power jumper cable.

**This ends the procedure.**

**Yes:** Exchange the following parts one at a time:

- a. SPCN card unit (see “TWRCARD” on page 549).
- b. Display unit (see “CTLPNL” on page 471).
- c. Power supply 1 (see Part number catalog)
- d. Power supply 2 (see Part number catalog)
- e. Power supply 3 (see Part number catalog)

**This ends the procedure.**

12. Perform the following:

- a. Disconnect the mainline ac power cable (to the expansion unit) from the customer’s ac power outlet.
- b. Exchange one of the following FRUs:
  - SPCN card (see “TWRCARD” on page 549).
  - Power supply (see Finding part locations).
- c. Reconnect the mainline ac power cables (from the expansion unit) into the power outlet.
- d. Attempt to power on the system.

Does the expansion unit power on?

**Yes:** The unit you exchanged was the failing item.

**This ends the procedure.**

**No:** Repeat this step and exchange the next FRU in the list. If you have exchanged all of the FRUs in the list, ask your next level of support for assistance.

**This ends the procedure.**

13. Is there a reference code displayed on the control panel for the unit that does not power on?

**Yes:** Continue with the next step.

**No:** Replace the SPCN card (see “TWRCARD” on page 549).

**This ends the procedure.**

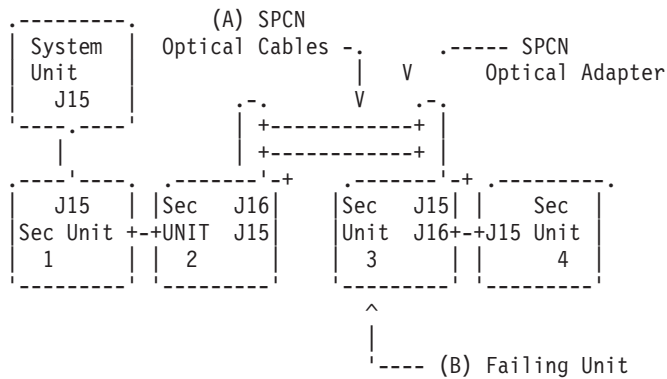
14. Is the reference code 1xxx xx2E?

**Yes:** Continue with the next step.

**No:** Use the new reference code and return to "Start of call procedure" on page 2.

**This ends the procedure.**

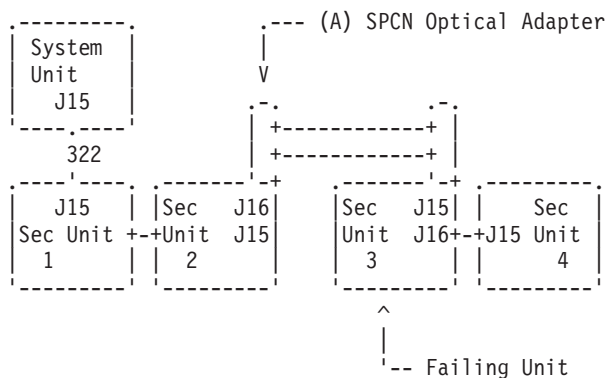
15. Do the SPCN optical cables (A) connect the failing unit (B) to the preceding unit in the string or loop?



**Yes:** Continue with the next step.

**No:** Go to step 19 on page 54.

16. Remove the SPCN optical adapter (A) from the preceding frame in the string that cannot become powered on (see Removing and replacing parts).



17. Perform the following:

**Notes:**

- a. The cable may be connected to either J15 or J16.
- b. Use an insulated probe or jumper when performing the voltage readings.
- a. Connect the negative lead of a multimeter to the system frame ground.
- b. Connect the positive lead of a multimeter to pin 2 of the connector from which you removed the SPCN optical adapter in the previous step of this procedure.
- c. Note the voltage reading on pin 2.
- d. Move the positive lead of the multimeter to pin 3 of the connector or SPCN card.
- e. Note the voltage reading on pin 3.

Is the voltage on both pin 2 and pin 3 from 1.5 V dc to 5.5 V dc?

**Yes:** Continue with the next step.

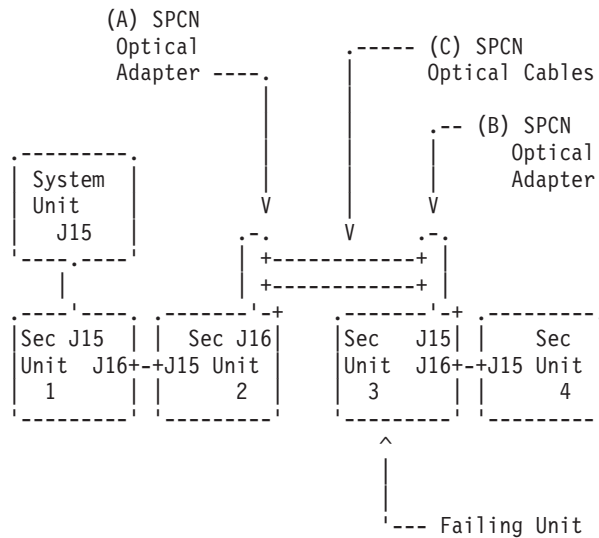
**No:** Exchange the SPCN card (see "TWRCARD" on page 549) in the unit from which you removed the SPCN optical adapter (see Removing and replacing parts).

**This ends the procedure.**

18. Exchange the following FRUs, one at a time (see Removing and replacing parts):

- a. SPCN card (see "TWRCARD" on page 549) in the failing unit (first frame with a failure indication).
- b. SPCN card (see "TWRCARD" on page 549) in the preceding unit in the string.
- c. SPCN optical adapter (A) in the preceding unit in the string.
- d. SPCN optical adapter (B) in the failing unit.
- e. SPCN optical cables (C) between the preceding unit in the string and the failing unit.

**This ends the procedure.**



19. Perform the following:
  - a. Power off the system.
  - b. Disconnect the SPCN frame-to-frame cable from the connector of the first unit that cannot be powered on.
  - c. Connect the negative lead of a multimeter to the system frame ground.
  - d. Connect the positive lead of the multimeter to pin 2 of the SPCN cable.

**Note:** Use an insulated probe or jumper when performing the voltage readings.

- e. Note the voltage reading on pin 2.
- f. Move the positive lead of the multimeter to pin 3 of the SPCN cable.
- g. Note the voltage reading on pin 3.

Is the voltage on both pin 2 and pin 3 from 1.5 V dc to 5.5 V dc?

**No:** Continue with the next step.

**Yes:** Exchange the following FRUs one at a time (see Removing and replacing parts):

- a. SPCN card (see "TWRCARD" on page 549) in the failing unit.
- b. SPCN card (see "TWRCARD" on page 549) in the preceding unit in the unit string.
- c. SPCN frame-to-frame cable.

**This ends the procedure.**

20. Perform the following:
  - a. Follow the SPCN frame-to-frame cable back to the preceding unit in the string.
  - b. Disconnect the SPCN cable from the connector.
  - c. Connect the negative lead of a multimeter to the system frame ground.
  - d. Connect the positive lead of a multimeter to pin 2 of the connector.

**Note:** Use an insulated probe or jumper when performing the voltage readings.

- e. Note the voltage reading on pin 2.
- f. Move the positive lead of the multimeter to pin 3 of the connector.
- g. Note the voltage reading on pin 3.

Is the voltage on both pin 2 and pin 3 from 1.5 V dc to 5.5 V dc?

**Yes:** Exchange the following FRUs one at a time (see Removing and replacing parts):

- a. SPCN frame-to-frame cable.
- b. SPCN card (see "TWRCARD" on page 549) in the failing unit.
- c. SPCN card (see "TWRCARD" on page 549) in the preceding unit of the string.

**This ends the procedure.**

**No:** Exchange the SPCN card (see "TWRCARD" on page 549) from the unit from which you disconnected the SPCN cable in the previous step of this procedure. See Removing and replacing parts.

**This ends the procedure.**

### **Cannot power off system or I/O expansion unit**

Use this procedure to analyze a failure of the normal command and control panel procedures to power off the system unit or an I/O expansion unit.

**Attention:** To prevent loss of data, ask the customer to verify that no interactive jobs are running before you perform this procedure.

## DANGER

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn everything OFF (unless instructed otherwise).
2. Remove power cords from the outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

To Connect:

1. Turn everything OFF (unless instructed otherwise)
2. Attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

(D005)

1. Is the power off problem on the system unit?  
**No:** Continue with the next step.  
**Yes:** Go to step 3.
2. Ensure that the SPCN cables that connect the units are connected and seated correctly at both ends. Does the unit power off, and is the power indicator light blinking slowly?  
**Yes: This ends the procedure.**  
**No:** Go to step 7 on page 57.
3. Attempt to power off the system (see Stopping the system in the Installing hardware topic). Does the system unit power off, and is the power indicator light blinking slowly?  
**No:** Continue with the next step.  
**Yes: This ends the procedure.**
4. Attempt to power off the system using the control panel power button (see Using the control panel power button). Does the system power off?  
**Yes:** Go to step 6 on page 57.  
**No:** Continue with the next step.
5. Attempt to power off the system using ASMI (see Powering the system on and off in the Advanced System Management Interface (ASMI) topic). Does the system power off?  
**Yes:** Continue with the next step.

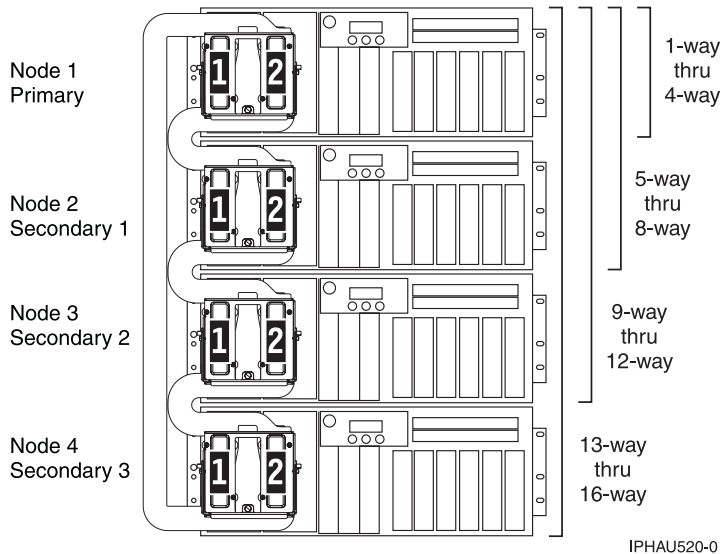
- No:** Go to step 10.
6. Is the system HMC-managed?
- Yes:** Go to the HMC isolation procedures. **This ends the procedure.**
- No:** Use ASMI to display error logs (see Displaying error and event logs in the Advanced System Management Interface (ASMI) topic) and service any errors you find. If you find no errors, or if you cannot access ASMI, then contact your next level of support. **This ends the procedure.**
7. Is the I/O expansion unit that will not power off part of a shared I/O tower loop?
- Yes:** Go to step 9.
- No:** Continue with the next step.
8. Attempt to power off the expansion unit (see Powering off an expansion unit). Were you able to power off the expansion unit?
- Yes: This ends the procedure.**
- No:** Go to step 10.
9. The unit will only power off under certain conditions:
- If the unit is in private mode, it should power off with the system unit that is connected by the SPCN frame-to-frame cable.
  - If the unit is in switchable mode, it should power off if the "owning" system is powered off or is powering off, and the system unit that is connected by the SPCN frame-to-frame cable is powered off or is powering off.
- Does the expansion unit power off?
- No:** Continue with the next step.
- Yes: This ends the procedure.**
10. Ensure there are no jobs running on the system or partition, and verify that the battery power unit or uninterruptible power supply (UPS) is not powering the system or I/O expansion unit. Then continue with the next step.
11. Perform the following:
- a. Remove the system or expansion unit ac power cord from the external UPS or, if an external UPS is not installed, from the customer's ac power outlet. If the system or expansion unit has more than one ac line cord, disconnect all the ac line cords.
  - b. Exchange the following FRUs in the system unit one at a time (see Removing and replacing parts and Part number catalog).  
If the system unit is failing:
    - 1) Power supply (see symbolic FRU "PWRSPPLY" on page 529)
    - 2) System SPCN card (see symbolic FRU "TWRCARD" on page 549)
    - 3) System control panel (see symbolic FRU "CTLPNL" on page 471)
    - 4) Control panel cableIf an I/O expansion unit is failing:
    - 1) Power supply (see symbolic FRU "PWRSPPLY" on page 529)
    - 2) Expansion SPCN card (see symbolic FRU "TWRCARD" on page 549)
    - 3) SPCN card (see symbolic FRU "TWRCARD" on page 549) in the unit preceding the unit that will not power off
    - 4) Battery charger unit (see symbolic FRU "BATCHGR" on page 458), if installed
    - 5) SPCN frame-to-frame cable**This ends the procedure.**

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## Isolating problems

This topic will help you identify and isolate the problem the server is experiencing. You will be directed to information about how to resolve the issue.

**Note:** To simplify this information, secondary units on the 570 server are numbered 1 through 3-secondary unit 1 being nearest to the primary unit and secondary unit 3 being furthest.



*“i5/OS isolation procedures”*

*“AIX fast-path problem isolation” on page 263*

*“Linux fast-path problem isolation” on page 405*

**HMC isolation procedures**

*“Using failing item codes” on page 430*

*“Symbolic FRUs” on page 445*

*“Failing Function Codes (FFCs)” on page 565*

## **i5/OS isolation procedures**

Use the procedures in this topic to isolate the problem.

*“Bus, high-speed link (HSL or RIO) isolation procedures” on page 59*

*“Communication isolation procedure” on page 116*

*“Disk unit isolation procedure” on page 119*

*“Intermittent isolation procedures” on page 122*

*“Licensed internal code (LIC) isolation procedures” on page 130*

*“Logical partition (LPAR) isolation procedure” on page 159*



“Operations Console isolation procedures” on page 162

“Power isolation procedures” on page 165

“Router isolation procedures” on page 195

“Service processor isolation procedures” on page 199

“Storage device I/O processor (SDIOP) isolation procedures” on page 215

“Tape unit isolation procedures” on page 240

“Twinaxial workstation I/O processor isolation procedure” on page 252

“Workstation adapter isolation procedure” on page 259

“Workstation adapter console isolation procedure” on page 261

### **Bus, high-speed link (HSL or RIO) isolation procedures**

Symbolic FRUs, failing items (FIs), and bus isolation procedures use the terms “partition” and “logical partition” to indicate any single partition in a system that has multiple partitions. If the system you are working on does not have multiple partitions, then the terms refer to the primary partition.

Please read all safety notices below before servicing the system and while performing a procedure.

**Note:** Unless instructed otherwise, always power off the system before removing, exchanging, or installing a field-replaceable unit (FRU).

## DANGER

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn everything OFF (unless instructed otherwise).
2. Remove power cords from the outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

To Connect:

1. Turn everything OFF (unless instructed otherwise)
2. Attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

(D005)

The following information provides tools and background needed to work through the isolation procedures:

- "Breaking down a RIO/HSL or PCI bus reference code" on page 61
- "DSA translation" on page 62
- "Card positions" on page 64
- "Converting the loop number to NIC port location labels" on page 72
- "PCI bus isolation using AIX, Linux, or the HMC" on page 75
- "Verifying a high-speed link, system PCI bus, or a multi-adapter bridge repair" on page 76
- "HSL loop configuration and status form" on page 78
- "Installed features in a PCI bridge set form" on page 80

"CONSL01" on page 81

HSL/RIO isolation procedures:

"RIOIP01" on page 82

"RIOIP02" on page 87

"RIOIP03" on page 89

"RIOIP04" on page 90

"RIOIP06" on page 92

"RIOIP07" on page 92

"RIOIP08" on page 93

"RIOIP09" on page 93

"RIOIP50" on page 95

"RIOIP55" on page 95

**IOP bus isolation procedures:**

"MABIP05" on page 96

"MABIP06" on page 96

"MABIP07" on page 98

"MABIP50" on page 101

"MABIP51" on page 102

"MABIP52" on page 103

"MABIP53" on page 105

"MABIP54" on page 107

"MABIP55" on page 110

**Multi-adapter bridge (MAB) isolation procedures:**

"MABIP02" on page 112

"MABIP03" on page 113

"MABIP04" on page 114

**Breaking down a RIO/HSL or PCI bus reference code:** Word 7 of the reference code allows you to determine the correct bus number, bus type, multi-adapter bridge number, multi-adapter bridge function number, and logical card number from the Direct Select Address (DSA). Physical card slot labels and card positions for PCI buses are determined by using the DSA and the appropriate system unit or I/O unit card positions. See "Card positions" on page 64 for details.

*Table 11. RIO/HSL and PCI reference code breakdown*

Word of the reference code	Control panel function	Panel function characters	Format	Description
1	11	1-8	B600 uuuu or B700 uuuu	uuuu = unit reference code (69xx)

Table 11. RIO/HSL and PCI reference code breakdown (continued)

Word of the reference code	Control panel function	Panel function characters	Format	Description
1 – extended reference code information	11	9–16	iiii	Frame ID of the failing resource
1 – extended reference code information	11	17–24	ffff	Frame location
1 – extended reference code information	11	25–32	bbbb	Board position
2	12	1–8	MIGVEP62 or MIGVEP63	See Hardware SRC formats.
3	12	9–16	cccc cccc	Component reference code
4	12	17–24	pppp pppp	Programming reference code
5	12	25–32	qqqq qqqq	Program reference code high order qualifier
6	13	1–8	qqqq qqqq	Program reference code low order qualifier
7	13	9–16	BBBB Ccbb	See “DSA translation”
8	13	17–24	TTTT MMMM	Type (TTTT) and model (MMMM) of the failing item (if not zero)
9	13	25–32	uuuu uuuu	Unit address (if not zero)

**DSA translation:** The Direct Select Address (DSA) may be coded in word 7 of the reference code. This is either a PCI system bus number or a RIO loop number, depending on the type of error. With the information obtained here, and the information in either the card position table (for PCI bus numbers) or the information in the loop-number-to-NIC-port table (for RIO loop numbers), you should be able to isolate a failing PCI bus or RIO loop. Follow the instructions below to translate the DSA:

- Break down the DSA into the bus number, multi-adapter bridge number, and multi-adapter bridge function number as shown in tables below. The DSA is of the form BBBB Ccxx, and breaks down into the following parts:
  - BBBB = bus number
  - C = multi-adapter bridge number
  - c = multi-adapter bridge function number
  - xx = not used
- Is the bus number less than 0684?

**Yes:** The bus number is a PCI bus number. Refer to Table 12 on page 63 to convert the number to decimal, and then continue with the next step.

**No:** The bus number is a RIO loop number. Refer to Table 13 on page 63 to convert the number to decimal, and then continue with the next step.
- Use one of the following guides to determine if the bus is located in the system unit or expansion unit:
  - If you are using an i5/OS interface, use the System Configuration List or Hardware Service Manager (HSM).

- If you are using a Hardware Management Console (HMC) interface, view the managed system's properties on the HMC.
4. Perform one of the following:
- Refer to "Card positions" on page 64 to search for the bus number, the multi-adapter bridge number, and the multi-adapter bridge function number that matches the system unit or I/O tower type where the bus is located. **This ends the procedure.**
  - Refer to "Converting the loop number to NIC port location labels" on page 72 to determine the starting ports for the RIO loop with the failed link. **This ends the procedure.**

Table 12. PCI bus numbers

Bus number in hexadecimal (BBBB)	Bus number in decimal	Multi-adapter bridge number (C)	Multi-adapter bridge function number (c)
0001	1	1	0 through 7
0001	1	2	0 through 7
0001	1	7	0
0002 or 0003	2 or 3	1	0 through 7
0002 or 0003	2 or 3	2	0 through 7
0004 through 0016	4 through 22 (not used)		
0017 through 067F	23 through 1663	1	0 through 7
0017 through 067F	23 through 1663	2	0 through 7

Table 13. RIO loop numbers

Bus number in hexadecimal (BBBB)	RIO loop number in decimal	RIO loop number as seen in i5/OS HSM
0684 through 0689	1668 through 1673	668 through 673
068A through 068F	1674 through 1679	674 through 679
0690 through 0699	1680 through 1689	680 through 689
069A through 069F	1690 through 1695	690 through 695
06A0 through 06A9	1696 through 1705	696 through 705
06AA through 06AF	1706 through 1711	706 through 711
06B0 through 06B9	1712 through 1721	712 through 721
06BA through 06BF	1722 through 1727	722 through 727
06C0 through 06C9	1728 through 1737	728 through 737
06CA through 06CF	1738 through 1743	738 through 743
06D0 through 06D9	1744 through 1753	744 through 753
06DA through 06DF	1754 through 1759	754 through 759
06E0 through 06E9	1760 through 1769	760 through 769
06EA through 06EF	1770 through 1775	770 through 775
06F0 through 06F9	1776 through 1785	776 through 785
06FA through 06FF	1786 through 1791	786 through 791
0700 through 0709	1792 through 1801	792 through 801
070A through 070F	1802 through 1807	802 through 807
0710 through 0719	1808 through 1817	808 through 817
071A through 071F	1818 through 1823	818 through 823
0720 through 0729	1824 through 1833	824 through 833

Table 13. RIO loop numbers (continued)

Bus number in hexadecimal (BBBB)	RIO loop number in decimal	RIO loop number as seen in i5/OS HSM
072A through 072F	1834 through 1839	834 through 839
0730 through 0739	1840 through 1849	840 through 849
073A through 073F	1850 through 1855	850 through 855
0740 through 0749	1856 through 1865	856 through 865
074A through 074F	1866 through 1871	866 through 871
0750 through 0759	1872 through 1881	872 through 881
075A through 075F	1882 through 1887	882 through 887
0760 through 0769	1888 through 1897	888 through 897
076A through 076F	1898 through 1903	898 through 903
0770 through 0779	1904 through 1913	904 through 913
077A through 077F	1914 through 1919	914 through 919
0780 through 0789	1920 through 1929	920 through 929
078A through 078F	1930 through 1935	930 through 935
0790 through 0799	1936 through 1945	936 through 945
079A through 079F	1946 through 1951	946 through 951
07A0 through 07A9	1952 through 1961	952 through 961
07AA through 07AF	1962 through 1967	962 through 967
07B0 through 07B9	1968 through 1977	968 through 977
07BA through 07BF	1978 through 1983	978 through 983
07C0 through 07C9	1984 through 1993	984 through 993
07CA through 07CF	1994 through 1999	994 through 999
07D0 through 07D9	2000 through 2009	000 through 009
07DA through 07DF	2010 through 2015	010 through 015
07E0 through 07E9	2016 through 2025	016 through 025
07EA through 07EF	2026 through 2031	026 through 031
07F0 through 07F9	2032 through 2041	032 through 041
07FA through 07FE	2042 through 2046	042 through 046

**Card positions:** Use the table for the model you are working on:

- Model 520
- Model 550 and 9124-720
- Model 570
- 5074, 5079, 8079-002, and 8093-002 expansion units
- 5088, 0588, 5094, 5294, and 8094-002
- 5095, 0595, and 7311-D20 expansion units
- External xSeries server, IBM eServer i5 adapter (machine type 1519)
- 7311-D10 and 7311-D11 expansion units
- 61D expansion unit

**Notes:**

1. Service 5079 expansion units as two independent 5074 units.
2. Service 5294 expansion units as two independent 5094 units.

*Table 14. Card positions for model 520*

Bus number in DSA (hexadecimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
0001	7	0	service processor	-P1-C7
0002	2	0	PCI IOP or IOA card	-P1-C1 (64 bit)
	2	1		-P1-C1 (64 bit)
	2	2		-P1-C2 (32 bit)
	2	3	Embedded USB controller	-P1 (32 bit)
	2	4	Embedded ethernet controller	-P1 (64 bit)
	2	5		
	2	6	PCI IOA card	-P1-C4 (64 bit)
	2	7		-P1-C4 (64 bit)
	2	F	Multi-adapter bridge	-P1
0003	2	0	PCI IOP or IOA card	-P1-C6 (64 bit)
	2	1		
	2	2	PCI IOP or IOA card	-P1-C3 (32 bit)
	2	3	Embedded IDE controller	-P1 (32 bit)
	2	4	Embedded SCSI controller	-P1 (64 bit)
	2	5		
	2	6	PCI IOA card	-P1-C5 (64 bit)
	2	7		
	2	F	Multi-adapter bridge	-P1

*Table 15. Card positions for model 550 and 9124-720*

Bus number in DSA (hexadecimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
0001	7	0	service processor	-P1

Table 15. Card positions for model 550 and 9124-720 (continued)

Bus number in DSA (hexadecimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
0002	2	0	PCI IOP or IOA card	-P1-C3 (64 bit)
	2	1		
	2	2	Embedded USB controller	-P1 (32 bit)
	2	3	Embedded IDE controller	-P1 (32 bit)
	2	4	PCI IOP or IOA card	-P1-C4 (64 bit)
	2	5		
	2	6	PCI IOA card	-P1-C5 (64 bit)
	2	7		
		F	Multi-adapter bridge	-P1
0003	2	0	PCI IOP or IOA card	-P1-C1 (64 bit)
	2	1		
	2	2	Embedded ethernet controller	-P1 (64 bit)
	2	3		
	2	4	Embedded SCSI controller	-P1 (64 bit)
	2	5		
	2	6	PCI IOA card	-P1-C2 (64 bit)
	2	7		
		F	Multi-adapter bridge	-P1

Table 16. Card positions for model 570

Bus number in DSA (hexadecimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
0001	7	0	service processor	-P1-C8
	2	0	embedded SCSI controller	-P1 (64 bit)
	2	1		
	2	2	embedded USB controller	-P1 (32 bit)
	2	3	embedded serial adapter	-P1 (32 bit)
	2	4	embedded ethernet controller	-P1 (64 bit)
	2	5		
	2	6	unused	-P1-T10 (64 bit)
	2	7		
		F	multi-adapter bridge	-P1



Table 16. Card positions for model 570 (continued)

Bus number in DSA (hexadecimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
0002	2	0	PCI IOP or IOA card	-P1-C3 (64 bit)
	2	1		
	2	2		
	2	3		
	2	4		
	2	5		
	2	6	PCI IOA card	-P1-C6 (64 bit)
	2	7		
	2	F	multi-adapter bridge	-P1
0003	2	0	PCI IOP or IOA card	-P1-C1 (64 bit)
	2	1		
	2	2	embedded SCSI controller	-P1 (64 bit)
	2	3		
	2	4	embedded IDE controller	-P1 (32 bit)
	2	5	unused	-P1 (32 bit)
	2	6	PCI IOA card	-P1-C2 (64 bit)
	2	7		
	2	F	multi-adapter bridge	-P1

Table 17. Card positions for 5074, 5079, 8079-002, and 8093-002 expansion units

Bus number	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to:	Position label and PCI data width
xxxx (assigned by LIC)	1	0	PCI IOP or IOA card	C01 (64 bit)
xxxx (assigned by LIC)	1	2	PCI IOP or IOA card	C02 (64 bit)
xxxx (assigned by LIC)	1	4	PCI IOP or IOA card	C03 (64 bit)
xxxx (assigned by LIC)	1	6	PCI IOP or IOA card	C04 (64 bit)
xxxx (assigned by LIC)	1	F	PCI IOP or IOA card	CB1
xxxx (assigned by LIC)	1	0	PCI IOP or IOA card	C05 (64 bit/INS)
xxxx (assigned by LIC)	1	2	PCI IOP or IOA card	C06 (32 bit)
xxxx (assigned by LIC)	1	3	PCI IOP or IOA card	C07 (32 bit)
xxxx (assigned by LIC)	1	4	PCI IOP or IOA card	C09 (64 bit)
xxxx (assigned by LIC)	1	6	PCI IOP or IOA card	C10 (64 bit)
xxxx (assigned by LIC)	1	F	Multi-adapter bridge	CB1
xxxx (assigned by LIC)	2	0	PCI IOP or IOA card	C11 (64 bit/INS)
xxxx (assigned by LIC)	2	2	PCI IOP or IOA card	C12 (32 bit)
xxxx (assigned by LIC)	2	3	PCI IOP or IOA card	C13 (32 bit)
xxxx (assigned by LIC)	2	4	PCI IOP or IOA card	C14 (64 bit)

Table 17. Card positions for 5074, 5079, 8079-002, and 8093-002 expansion units (continued)

Bus number	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to:	Position label and PCI data width
xxxx (assigned by LIC)	2	6	PCI IOP or IOA card	C15 (64 bit)
xxxx (assigned by LIC)	2	F	PCI IOP or IOA card	CB1

Table 18. Card positions for 5088, 0588, 5094, 5294, and 8094-002 expansion units

Bus number	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to:	Position label and PCI data width
xxxx (assigned by LIC)	2	0 and 1	PCI IOP or IOA card	C01
xxxx (assigned by LIC)	2	2 and 3	PCI IOP or IOA card	C02
xxxx (assigned by LIC)	2	4 and 5	PCI IOP or IOA card	C03
xxxx (assigned by LIC)	2	6 and 7	IOA card	C04
xxxx (assigned by LIC)	2	F	Multi-adapter bridge	CB1
xxxx (assigned by LIC)	2	0 and 1	PCI IOP or IOA card	C05
xxxx (assigned by LIC)	2	2	PCI IOP or IOA card	C06
xxxx (assigned by LIC)	2	3	PCI IOP or IOA card	C07
xxxx (assigned by LIC)	2	4 and 5	PCI IOP or IOA card	C08
xxxx (assigned by LIC)	2	6 and 7	IOA card	C09
xxxx (assigned by LIC)	2	F	Multi-adapter bridge	CB1
xxxx (assigned by LIC)	2	0 and 1	PCI IOP or IOA card	C11
xxxx (assigned by LIC)	2	2	PCI IOP or IOA card	C12
xxxx (assigned by LIC)	2	3	PCI IOP or IOA card	C13
xxxx (assigned by LIC)	2	4 and 5	PCI IOP or IOA card	C14
xxxx (assigned by LIC)	2	6 and 7	IOA card	C15
xxxx (assigned by LIC)	2	F	Multi-adapter bridge	CB1

Table 19. Card positions for 5095, 0595, and 7311-D20 expansion units

Bus number	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to:	Position label and PCI data width
xxxx (assigned by LIC)	2	0 and 1	PCI IOP	C01
xxxx (assigned by LIC)	2	2 and 3	PCI IOP or IOA card	C02
xxxx (assigned by LIC)	2	4 and 5	PCI IOP or IOA card	C03
xxxx (assigned by LIC)	2	6 and 7	IOA card	C04
xxxx (assigned by LIC)	2	F	Multi-adapter bridge	CB1
xxxx (assigned by LIC)	2	Not used	Not used	C05
xxxx (assigned by LIC)	2	0 and 1	PCI IOP	C06
xxxx (assigned by LIC)	2	2 and 3	PCI IOP or IOA card	C07
xxxx (assigned by LIC)	2	6 and 7	IOA card	C08
xxxx (assigned by LIC)	2	F	Multi-adapter bridge	CB1

Table 20. Card positions for external xSeries server, IBM eServer i5 adapter (machine type 1519)

Bus number	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to:	Position
xxxx	1	Other than F	Embedded IOP	Follow the HSL cables
xxxx	1	F	Multi-adapter bridge	Follow the HSL cables

Table 21. Card positions for 61D expansion unit

Bus number in DSA (hexadecimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
LEFT SIDE I/O PLANAR (-P1)				
Lower PCI bus number	2	0	PCI IOA card	-P1-I1 (64 bit)
Lower PCI bus number	2	1		
Lower PCI bus number	2	2	PCI IOA card	-P1-I2 (64 bit)
Lower PCI bus number	2	3		
Lower PCI bus number	2	4	PCI IOA card	-P1-I3 (64 bit)
Lower PCI bus number	2	5		
Lower PCI bus number	2	6	PCI IOA card	-P1-I4 (64 bit)
Lower PCI bus number	2	7		
Lower PCI bus number	2	F	multi-adapter bridge	-P1

Table 21. Card positions for 61D expansion unit (continued)

Bus number in DSA (hexadecimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
Middle PCI bus number	2	0	PCI IOA card	-P1-I5 (64 bit)
Middle PCI bus number	2	1		
Middle PCI bus number	2	2	PCI IOA card	-P1-I6 (64 bit)
Middle PCI bus number	2	3		
Middle PCI bus number	2	4	embedded SCSI controller 1	n/a
Middle PCI bus number	2	5		
Middle PCI bus number	2	6	PCI IOA card	-P1-I7 (64 bit)
Middle PCI bus number	2	7		
Middle PCI bus number	2	F	multi-adapter bridge	-P1
Higher PCI bus number	2	0	PCI IOA card	-P1-I8 (64 bit)
Higher PCI bus number	2	1		
Higher PCI bus number	2	2	PCI IOA card	-P1-I9 (64 bit)
Higher PCI bus number	2	3		
Higher PCI bus number	2	4	embedded SCSI controller 2	n/a
Higher PCI bus number	2	5		
Higher PCI bus number	2	6	PCI IOA card	-P1-I10 (64 bit)
Higher PCI bus number	2	7		
Higher PCI bus number	2	F	multi-adapter bridge	-P1
RIGHT SIDE I/O PLANAR (-P2)				
Lower PCI bus number	2	0	PCI IOA card	-P2-I1 (64 bit)
Lower PCI bus number	2	1		
Lower PCI bus number	2	2	PCI IOA card	-P2-I2 (64 bit)
Lower PCI bus number	2	3		

Table 21. Card positions for 61D expansion unit (continued)

Bus number in DSA (hexadecimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
Lower PCI bus number	2	4	PCI IOA card	-P2-I3 (64 bit)
Lower PCI bus number	2	5		
Lower PCI bus number	2	6	PCI IOA card	-P2-I4 (64 bit)
Lower PCI bus number	2	7		
Lower PCI bus number	2	F	multi-adapter bridge	-P2
Middle PCI bus number	2	0	PCI IOA card	-P2-I5 (64 bit)
Middle PCI bus number	2	1		
Middle PCI bus number	2	2	PCI IOA card	-P2-I6 (64 bit)
Middle PCI bus number	2	3		
Middle PCI bus number	2	4	embedded SCSI controller 1	n/a
Middle PCI bus number	2	5		
Middle PCI bus number	2	6	PCI IOA card	-P2-I7 (64 bit)
Middle PCI bus number	2	7		
Middle PCI bus number	2	F	multi-adapter bridge	-P2
Higher PCI bus number	2	0	PCI IOA card	-P2-I8 (64 bit)
Higher PCI bus number	2	1		
Higher PCI bus number	2	2	PCI IOA card	-P2-I9 (64 bit)
Higher PCI bus number	2	3		
Higher PCI bus number	2	4	embedded SCSI controller 2	n/a
Higher PCI bus number	2	5		
Higher PCI bus number	2	6	PCI IOA card	-P2-I10 (64 bit)
Higher PCI bus number	2	7		
Higher PCI bus number	2	F	multi-adapter bridge	-P2

Table 22. Card positions for 7311-D10, 7311-D11, and 5790 expansion units

Bus number in DSA (hexadecimal)	Multi-adapter bridge number in DSA	Multi-adapter bridge function number in DSA	Item DSA points to	Position label and PCI data width
Lower PCI bus number	2	0	PCI IOA card	-P1-C1 (64 bit)
Lower PCI bus number	2	1		
Lower PCI bus number	2	2	PCI IOA card	-P1-C2 (64 bit)
Lower PCI bus number	2	3		
Lower PCI bus number	2	4	unused	n/a
Lower PCI bus number	2	5		
Lower PCI bus number	2	6	PCI IOA card	-P1-C3 (64 bit)
Lower PCI bus number	2	7		
Lower PCI bus number	2	F	multi-adapter bridge	-P1
Higher PCI bus number	2	0	PCI IOA card	-P1-C4 (64 bit)
Higher PCI bus number	2	1		
Higher PCI bus number	2	2	PCI IOA card	-P1-C5 (64 bit)
Higher PCI bus number	2	3		
Higher PCI bus number	2	4	unused	n/a
Higher PCI bus number	2	5		
Higher PCI bus number	2	6	PCI IOA card	-P1-C6 (64 bit)
Higher PCI bus number	2	7		
Higher PCI bus number	2	F	multi-adapter bridge	-P1

**Converting the loop number to NIC port location labels:** Use the table below to convert the HSL/RIO loop number to NIC port location labels.

**Note:** If you are working on a 570, exchange the FRU on the correct unit (primary or secondary) by matching the serial number (if available in the FRU list on the serviceable event view) or by matching the loop number to the correct unit.

**Note:** To simplify this information, secondary units on the 570 server are numbered 1 through 3-secondary unit 1 being nearest to the primary unit and secondary unit 3 being furthest.

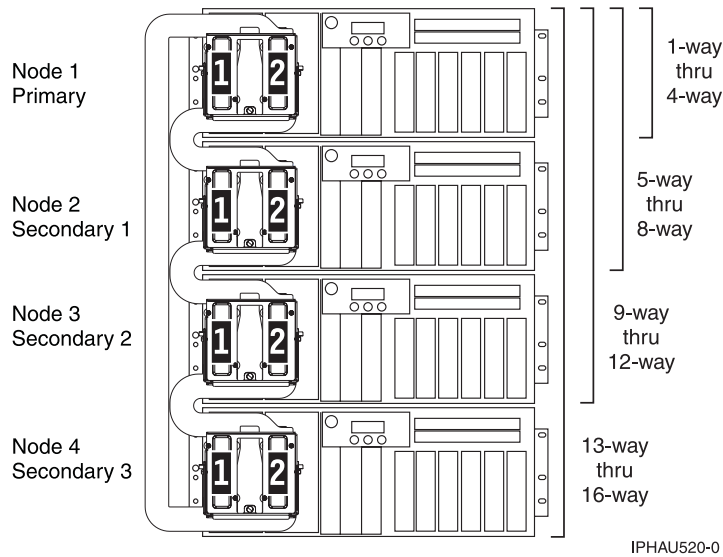


Table 23. Converting the loop number to NIC port location labels

Loop number (hex / dec)	Model	NIC's FRU position	HSL port labels on system unit or processor tower
0684 / 1668	520 550 9124-720 570 primary unit	-P1	Internal
	Node 0 on 590 or 595	-P2	Internal
0685 / 1669	520	-P1	-P1-T3 -P1-T4
	550 9124-720	-P1	-P1-T11 -P1-T12
	570 primary unit	-P1	-P1-T8 -P1-T9
	Node 0 on 590 or 595	-P2-C1	-P2-C1-T1 -P2-C1-T2
0686 / 1670	550 9124-720	-P1-C6	-P1-C6-T1 -P1-C6-T2
	570 primary unit	-P1-C7	-P1-C7-T1 -P1-C7-T2
	Node 0 on 590 or 595	-P2	Internal
0687 / 1671	570 secondary unit 1	-P1	Internal (see note above)
	Node 0 on 590 or 595	-P2-C3	-P2-C3-T1 -P2-C3-T2
0688 / 1672	570 secondary unit 1	-P1	-P1-T8 -P1-T9 (see note above)
	Node 0 on 590 or 595	-P2-C5	-P2-C5-T1 -P2-C5-T2

Table 23. Converting the loop number to NIC port location labels (continued)

Loop number (hex / dec)	Model	NIC's FRU position	HSL port labels on system unit or processor tower
0689 / 1673	570 secondary unit 1	-P1-C7	-P1-C7-T1 -P1-C7-T2 (see note above)
068A / 1674	570 secondary unit 2	-P1	Internal (see note above)
	Node 0 on 590 or 595	-P2-C6	-P2-C6-T1 -P2-C6-T2
068B / 1675	570 secondary unit 2	-P1	-P1-T8 -P1-T9 (see note above)
068C / 1676	570 secondary unit 2	-P1-C7	-P1-C7-T1 -P1-C7-T2 (see note above)
	Node 0 on 590 or 595	-P2-C8	-P2-C8-T1 -P2-C8-T2
068D / 1677	570 secondary unit 3	-P1	Internal (see note above)
068E / 1678	570 secondary unit 3	-P1	-P1-T8 -P1-T9 (see note above)
	Node 0 on 590 or 595	-P2-C9	-P2-C9-T1 -P2-C9-T2
068F / 1679	570 secondary unit 3	-P1-C7	-P1-C7-T1 -P1-C7-T2 (see note above)
0690 / 1680	Node 0 on 590 or 595	-P2-C11	-P2-C11-T1 -P2-C11-T2
0692 / 1682	Node 0 on 590 or 595	-P2-C13	-P2-C13-T1 -P2-C13-T2
0694 / 1684	Node 1 on 590 or 595	-P3	Internal
0695 / 1685	Node 1 on 590 or 595	-P3-C1	-P3-C1-T1 -P3-C1-T2
0696 / 1686	Node 1 on 590 or 595	-P3	Internal
0697 / 1687	Node 1 on 590 or 595	-P3-C3	-P3-C3-T1 -P3-C3-T2
0698 / 1688	Node 1 on 590 or 595	-P3-C5	-P3-C5-T1 -P3-C5-T2
069A / 1690	Node 1 on 590 or 595	-P3-C6	-P3-C6-T1 -P3-C6-T2
069C / 1692	Node 1 on 590 or 595	-P3-C8	-P3-C8-T1 -P3-C8-T2
069E / 1694	Node 1 on 590 or 595	-P3-C9	-P3-C9-T1 -P3-C9-T2
06A0 / 1696	Node 1 on 590 or 595	-P3-C11	-P3-C11-T1 -P3-C11-T2
06A2 / 1698	Node 1 on 590 or 595	-P3-C13	-P3-C13-T1 -P3-C13-T2



Table 23. Converting the loop number to NIC port location labels (continued)

Loop number (hex / dec)	Model	NIC's FRU position	HSL port labels on system unit or processor tower
06A4 / 1700	Node 2 on 590 or 595	-P4-C1	-P4-C1-T1 -P4-C1-T2
06A6 / 1702	Node 2 on 590 or 595	-P4-C3	-P4-C3-T1 -P4-C3-T2
06A8 / 1704	Node 2 on 590 or 595	-P4-C5	-P4-C5-T1 -P4-C5-T2
06AA / 1706	Node 2 on 590 or 595	-P4-C6	-P4-C6-T1 -P4-C6-T2
06AC / 1708	Node 2 on 590 or 595	-P4-C8	-P4-C8-T1 -P4-C8-T2
06AE / 1710	Node 2 on 590 or 595	-P4-C9	-P4-C9-T1 -P4-C9-T2
06B0 / 1712	Node 2 on 590 or 595	-P4-C11	-P4-C11-T1 -P4-C11-T2
06B2 / 1714	Node 2 on 590 or 595	-P4-C13	-P4-C13-T1 -P4-C13-T2
06B4 / 1716	Node 3 on 590 or 595	-P5-C1	-P5-C1-T1 -P5-C1-T2
06B6 / 1718	Node 3 on 590 or 595	-P5-C3	-P5-C3-T1 -P5-C3-T2
06B8 / 1720	Node 3 on 590 or 595	-P5-C5	-P5-C5-T1 -P5-C5-T2
06BA / 1722	Node 3 on 590 or 595	-P5-C6	-P5-C6-T1 -P5-C6-T2
06BC / 1724	Node 3 on 590 or 595	-P5-C8	-P5-C8-T1 -P5-C8-T2
06BE / 1726	Node 3 on 590 or 595	-P5-C9	-P5-C9-T1 -P5-C9-T2
06C0 / 1728	Node 3 on 590 or 595	-P5-C11	-P5-C11-T1 -P5-C11-T2
06C2 / 1730	Node 3 on 590 or 595	-P5-C13	-P5-C13-T1 -P5-C13-T2

**PCI bus isolation using AIX, Linux, or the HMC:** Use this procedure if you are isolating a PCI bus problem from the HMC or while running AIX or Linux.

#### Isolating a PCI bus problem while running AIX or Linux

1. Can the operating system be IPLed?

**No:** Perform "MABIP52" on page 103. **This ends the procedure.**

**Yes:** Choose from the following:

- If you are running AIX, go to Running the online and eServer stand-alone diagnostics to isolate the PCI bus failure with online diagnostics in concurrent mode.
- If you are running Linux, go to Running the online and eServer stand-alone diagnostics to isolate the PCI bus failure with stand-alone diagnostics.

**This ends the procedure.**

## Isolating a PCI bus problem from the HMC

If you have locations from the FRUs given in the serviceable event view of the error log, use those locations and exchange

1. Did the serviceable event view provide the location(s) for the failing FRU(s)?
  - Yes:** Use those locations to exchange the given FRUs one at a time until the problem is resolved. **This ends the procedure.**
  - No:** Continue with the next step.
2. Go to “DSA translation” on page 62 to determine the Direct Select Address (DSA).
3. Perform the following:
  - a. Record the bus number value (BBBB) from the DSA and convert it to decimal format.
  - b. Search for the decimal system bus number in the partition resources screens on the HMC.
  - c. Record the frame or unit type and continue with the next step.
4. Record the Cc value from the DSA. Is the Cc value greater than 00?
  - Yes:** Continue with the next step.
  - No:** The multi-adapter bridge number and the multi-adapter function number have not been identified, and so the card slot cannot be identified using the DSA. Look in the HMC partition resources for non-reporting or non-operational hardware. That will indicate which cards in which positions need to be replaced. Refer to Finding part locations for the model you are working on for information about the multi-adapter bridge that controls those card slots. That multi-adapter bridge is also a FRU. **This ends the procedure.**
5. Is the right-most character (c) F?
  - No:** Continue with the next step.
  - Yes:** Only the multi-adapter bridge number has been identified. Record the multi-adapter bridge number (left-most character of Cc) for later use. Since the card slot cannot be identified with the DSA, refer to Finding part locations for the model you are working on for information about the multi-adapter bridge that controls the card slots. Consider all card slots controlled by the multi-adapter bridge to be FRUs. **This ends the procedure.**
6. Refer to “Card positions” on page 64 and use the BBBB and Cc values that you recorded to identify the card position. Then return to the procedure that sent you here. **This ends the procedure.**

**Verifying a high-speed link, system PCI bus, or a multi-adapter bridge repair:** Use this procedure to verify a repair for the high-speed link, a system PCI bus, or for a multi-adapter bridge. Within this procedure, the terms “system” and “logical partition” are interchangeable when used individually.

1. Perform this procedure from the logical partition you were in when you were sent to this procedure, or from the HMC if this error was worked from the HMC.
2. If you previously powered off a system or logical partition, or an expansion unit during this service action, then you need to power it off again.
3. Install all cards, cables, and hardware, ensuring that all connections are tight. You can use the system configuration list to verify that the cards are installed correctly.
4. Power on any expansion unit, logical partition or system unit that was powered off during the service action. Is one of the following true?
  - If the system or a logical partition was powered off during the service action, does the IPL complete successfully to the IPL or does Install the System display?
  - If an expansion tower was powered off during the service action, does the expansion tower power on complete successfully?
  - If any IOP or IOA card locations were powered off using concurrent maintenance during the service action, do the slots power on successfully?
  - If you exchanged a FRU that should appear as a resource or resources to the system, such as an IOA, or I/O bridge, does the new FRU’s resource appear in HSM as operational?

**Yes:** Continue with the next step.

**No:** Verify that you have followed the power off, remove and replace, and power-on procedures correctly. When you are sure that you have followed the procedures correctly, then exchange the next FRU in the list. If there are no more FRUs to exchange, then contact your next level of support. **This ends the procedure.**

5. Does the system or logical partition have mirrored protection? Select Yes if you are not sure.

**No:** Continue with the next step.

**Yes:** From the Dedicated Service Tools (DST) display, select **Work with disk units**, and resume mirrored protection for all units that have a suspended status.

6. Choose from the following options:

- If you are working from a partition, from the Start a Service Tool display, select **Hardware service manager** and look for the I/O processors that have a failed or missing status.
- If you are working from a HMC, look at the CEC properties.
  - a. Choose the I/O tab.
  - b. Look for IOAs or IOPs that have a failed or missing status.

Are all I/O processor cards operational?

**Note:** Ignore any IOPs that are listed with a status of not connected.

**Yes:** Go to step 10.

**No:** Display the logical hardware resource information for the non-operational I/O processors. For all I/O processors and I/O adapters that are failing; record the bus number (BBBB), board (bb) and card information (Cc). Continue with the next step.

7. Perform the following:

- a. Return to the Dedicated Service Tools (DST) display.
- b. Display the Product Activity Log.
- c. Select **All logs** and search for an entry with the same bus, board, and card address information as the non-operational I/O processor. Do not include informational or statistical entries in your search. Use only entries that occurred during the last IPL.

Did you find an entry for the SRC that sent you to this procedure?

**No:** Continue with the next step.

**Yes:** Ask your next level of support for assistance. **This ends the procedure.**

8. Did you find a B600 6944 SRC that occurred during the last IPL?

**Yes:** Continue with the next step.

**No:** A different SRC is associated with the non-operational I/O processor. Go to the System reference code list and look up the new SRC to correct the problem. **This ends the procedure.**

9. Is there a B600 xxxx SRC that occurred during the last IPL other than the B600 6944 and informational SRCs?

**Yes:** Use the other B600 xxxx SRC to determine the problem. Go to the System reference code list and look up the new SRC to correct the problem. **This ends the procedure.**

**No:** You connected an I/O processor in the wrong card position. Use the system configuration list to compare the cards. When you have corrected the configuration, go to the start of this procedure to verify the bus repair. **This ends the procedure.**

10. If in a partition, use the hardware service manager function to print the system configuration list.

Are there any configuration mismatches?

**No:** Continue with the next step.

**Yes:** Ask your next level of support for assistance. **This ends the procedure.**

11. You have verified the repair of the system bus.

- a. If for this service action only an expansion unit was powered off or only the concurrent maintenance function was used for an IOP or IOA, then continue with the next step.
  - b. Otherwise, perform the following to return the system to the customer:
    - 1) Power off the system or logical partition. See Powering on and powering off for details.
    - 2) Select the operating mode with which the customer was originally running.
    - 3) Power on the system or logical partition.
12. If the system has logical partitions and the entry point SRC was B600 xxxx, then check for related problems in other logical partitions that could have been caused by the failing part. **This ends the procedure.**

**HSL loop configuration and status form:** Use this HSL loop configuration and status form to record the status of the HSL ports in the loop.

**Note:** You may copy this form as necessary.

HSL loop configuration and status worksheet for system \_\_\_\_\_, Loop number \_\_\_\_\_

**HSL loop configuration and status form**

HSL resource information	Leading port information	Trailing port information
Resource type: _____	Port number (may be internal): _____	Port number (may be internal): _____
Resource name: _____	Link status (operational / failed): _____	Link status (operational / failed): _____
Frame ID: _____		
Resource type: _____	Port number (may be internal): _____	Port number (may be internal): _____
Resource name: _____	Link status (operational / failed): _____	Link status (operational / failed): _____
Frame ID: _____		
Resource type: _____	Port number (may be internal): _____	Port number (may be internal): _____
Resource name: _____	Link status (operational / failed): _____	Link status (operational / failed): _____
Frame ID: _____		
Resource type: _____	Port number (may be internal): _____	Port number (may be internal): _____
Resource name: _____	Link status (operational / failed): _____	Link status (operational / failed): _____
Frame ID: _____		

HSL resource information	Leading port information	Trailing port information
Resource type: _____ Resource name: _____ Frame ID: _____	Port number (may be internal): _____ Link status (operational / failed): _____ _____	Port number (may be internal): _____ Link status (operational / failed): _____ _____
Resource type: _____ Resource name: _____ Frame ID: _____	Port number (may be internal): _____ Link status (operational / failed): _____ _____	Port number (may be internal): _____ Link status (operational / failed): _____ _____
Resource type: _____ Resource name: _____ Frame ID: _____	Port number (may be internal): _____ Link status (operational / failed): _____ _____	Port number (may be internal): _____ Link status (operational / failed): _____ _____
Resource type: _____ Resource name: _____ Frame ID: _____	Port number (may be internal): _____ Link status (operational / failed): _____ _____	Port number (may be internal): _____ Link status (operational / failed): _____ _____
Resource type: _____ Resource name: _____ Frame ID: _____	Port number (may be internal): _____ Link status (operational / failed): _____ _____	Port number (may be internal): _____ Link status (operational / failed): _____ _____
Resource type: _____ Resource name: _____ Frame ID: _____	Port number (may be internal): _____ Link status (operational / failed): _____ _____	Port number (may be internal): _____ Link status (operational / failed): _____ _____
Resource type: _____ Resource name: _____ Frame ID: _____	Port number (may be internal): _____ Link status (operational / failed): _____ _____	Port number (may be internal): _____ Link status (operational / failed): _____ _____

HSL resource information	Leading port information	Trailing port information
Resource type: _____	Port number (may be internal): _____	Port number (may be internal): _____
Resource name: _____	Link status (operational / failed): _____	Link status (operational / failed): _____
Frame ID: _____		
Resource type: _____	Port number (may be internal): _____	Port number (may be internal): _____
Resource name: _____	Link status (operational / failed): _____	Link status (operational / failed): _____
Frame ID: _____		
Resource type: _____	Port number (may be internal): _____	Port number (may be internal): _____
Resource name: _____	Link status (operational / failed): _____	Link status (operational / failed): _____
Frame ID: _____		
Resource type: _____	Port number (may be internal): _____	Port number (may be internal): _____
Resource name: _____	Link status (operational / failed): _____	Link status (operational / failed): _____
Frame ID: _____		
Resource type: _____	Port number (may be internal): _____	Port number (may be internal): _____
Resource name: _____	Link status (operational / failed): _____	Link status (operational / failed): _____
Frame ID: _____		
Resource type: _____	Port number (may be internal): _____	Port number (may be internal): _____
Resource name: _____	Link status (operational / failed): _____	Link status (operational / failed): _____
Frame ID: _____		

**Installed features in a PCI bridge set form:** Use this form to record the "PCI Bridge Set" card positions, and multi-adapter bridge function numbers.

**Note:** You may copy this form as necessary.

**Table 1. Installed features in a PCI bridge set**

PCI bridge set card positions	Multi-adapter bridge function number	Record if "IOP" or "IOA" is installed.
	0	
	1	
	2	
	3	
	4	
	5	
	6	
	7	

**CONSL01:** Use this procedure to exchange the I/O processor (IOP) for the system or partition console of i5/OS.

1. Is the system managed by an HMC?

**No:** Go to step 6.

**Yes:** The HMC will be required for this procedure. Move to the HMC and continue with the next step only if the HMC is functional.

2. Can the customer power off the partition at this time?

**Yes:** Power off the partition from the operating system console or the HMC. Then, continue with the next step.

**No:** The IOP controlling the partition's console may be controlling other critical resources. The partition must be powered off to exchange this IOP. Perform this procedure when the customer is able to power off the partition. Then, continue with the next step.

3. Perform the following to determine the unit machine type, model, and serial number where the console IOP is located and the location of the console IOP:

- a. From the *Navigation Area* of the HMC, select the **Management Environment**.

- b. Select and expand the HMC environment for this HMC.

- c. Select and expand **Server and Partition**.

- d. Select **Server Management**.

- e. Double-click the i5/OS partition you are working on.

- f. Select the **Settings** tab.

- g. Record the location of the load source IOP. The unit type, model, and serial number are the first three parts of the location code and are separated by periods.

- h. Continue with the next step.

4. Record the frame type or feature by using the frame ID and system configuration listing or by locating the frame with that ID and recording the frame type or feature.

5. Perform the following to exchange the IOP in that card position:

- a. Go to Finding part locations and select the unit type and model that you recorded.

- b. Locate the card position in the FRU locations table and use the exchange procedure that is identified.

- c. Power on the partition.

**This ends the procedure.**

6. The problem is in the i5/OS partition of a system with one or more partitions that is not managed by an HMC. Use the table below to determine the location of the load source IOP and the appropriate exchange procedure.

Model	Load source IOP location	Load source IOA location	Link to locations information.
520	-P1-C5	embedded SCSI in -P1	Locations — Model 520
570	-P1-C1	embedded SCSI in -P1	Locations — Model 570

**This ends the procedure.**

**RIOIP01:** Use this procedure to isolate a failure in a high-speed link (HSL) loop using i5/OS service tools. Follow the steps in the main task and you will be directed to the proper subtasks.

**Note:** During this procedure, you will be disconnecting and reconnecting cables. If errors concerning missing resources (such as disk units and HSL failures) occur, ignore them. Missing resources will report in again when the loop reinitializes.

### Main task

1. Were you directed here while working on a B700 xxxx reference code?
  - Yes:** Go to step 4.
  - No:** Continue with the next step.
2. Are you work on an 520 or 570?
  - No:** Go to step 4.
  - Yes:** Continue with the next step.
3. Were you sent here from a B600 xxxx reference code?
  - No:** Continue with the next step.
  - Yes:** Use the serviceable event view and the system service documentation to search for a B700 xxxx reference code with the same last four characters reported at approximately the same time. If you find one, perform service on that reference code first, and when you close that problem, close this one as well. If you do not find one, continue with the next step.
4. Before powering down any system unit or expansion unit, work with the customer to end all subsystems in all of the partitions using each partition's console.
5. From the partition control panel, IPL the system or partition to Dedicated Service Tools (DST).
  - Attention:** Do not use function 21!
6. Are all system and expansion units on the loop powered on?
  - Yes:** Go to step 8.
  - No:** Continue with the next step.
7. Perform the following:
  - a. Power on all system and expansion units on the loop. If a frame cannot be powered on, perform the Cannot power on unit subtask below, and then continue with step 8.
  - b. Was the HSL link error cleared up when the frames were powered back on?
    - No:** Continue with the next step.
    - Yes:** Go to Verifying the repair.

**This ends the procedure.**
8. Perform the following:
  - a. Access the Service Action Log (SAL) entry for this error; the field replaceable units (FRUs) should be listed there. Look for part numbers and descriptions for the FRUs containing the HSL port for two frames. There should also be a FRU for the cable between them. The locations information for the FRUs is the location of the failed ports on the failed link.



- b. Record the loop number from the SAL (if it is displayed there in one of the FRU descriptions) or from the first four characters of word 7 of the reference code. Go to "Converting the loop number to NIC port location labels" on page 72 to determine which HSL/RIO cables on the system you are working with.

Is this information in the SAL?

**Yes:** Continue with the next step.

**No:** Perform Manually detecting the failed link below, and then continue with the next step of the main task.

9. Is the cable connecting the failed ports an optical cable?

**No:** Go to step 11.

**Yes:** Continue with the next step.

10. Perform the following:

- a. Clean the HSL cable connectors and ports using the tools and procedures in symbolic FRU "OPT\_CLN" on page 521.
- b. To determine if cleaning the connectors and ports solved the problem, perform Manually detecting the failed link below and return to this point.

Did the ports you were working on have a status of "failed"?

**No:** Then the problem is fixed, go to Verifying the repair. **This ends the procedure.**

**Yes:** Continue with the next step.

11. There are now three cases to consider. Continue with the appropriate subtask of this procedure:

- The ports on both ends of the failed link are in different system units on the loop.
- The port on one end of the failed link is in a system unit and the port on the other end is in an I/O unit.
- The ports on both ends of the failed link are in an I/O unit.

### **The ports on both ends of the failed link are in different system units on the loop**

1. There may be failed hardware that will report a different error on the other system units. Perform the following:

- a. Work any other HSL/RIO problems in the serviceable event view on the other system units.
- b. Perform Manually detecting the failed link below and return to this point.

Did the ports you were working on have a status of "failed"?

**No:** Then the problem is fixed, go to Verifying the repair. **This ends the procedure.**

**Yes:** Continue with the next step.

2. Is the cable an optical HSL/RIO cable?

**Yes:** Go to step 4.

**No:** Continue with the next step.

3. Perform the following:

- a. Check the thumb screws on the cable connectors at both ends of the cable to be sure they are tight. For any thumb screw that was loose, disconnect the cable at that end, wait 30 seconds, reconnect the cable, and tighten the thumb screws. You must tighten both thumb screws within 30 seconds of when the cable makes contact with the port.
- b. If you disconnected and reconnected the cable at either end, perform Manually detecting the failed link below and return to this point. Did the ports you were working on have a status of "failed"?

**No:** Then the problem is fixed, go to Verifying the repair. **This ends the procedure.**

**Yes:** Continue with the next step.

4. Replace the cable between the two system unit ports on the failed link. To determine if replacing the cable resolved the problem, perform Manually detecting the failed link below and return to this point. Did the ports you were working on have a status of "failed"?

**No:** Then the problem is fixed, go to Verifying the repair. **This ends the procedure.**

**Yes:** Continue with the next step.

5. Exchange the FRU with the HSL/RIO port in one of the system units. If you are working with a serviceable event view and the HSL FRUs are listed, exchange the FRU corresponding to the first HSL/RIO cable port listed. Otherwise, exchange the FRU that is quickest and easiest to replace). To determine if replacing the FRU resolved the problem, perform Manually detecting the failed link below and return to this point. Did the ports you were working on have a status of "failed"?

**No:** Then the problem is fixed, go to Verifying the repair. **This ends the procedure.**

**Yes:** Continue with the next step.

6. Exchange the remaining FRU with the HSL/RIO port on the other system unit. To determine if replacing the FRU resolved the problem, perform Manually detecting the failed link below and return to this point. Did the ports you were working on have a status of "failed"?

**No:** Then the problem is fixed, go to Verifying the repair. **This ends the procedure.**

**Yes:** Continue with the next step.

7. Use symbolic FRU "HSL\_LNK" on page 492 to determine if there are any additional HSL/RIO cable-related FRUs, such as interposer cards and internal ribbon cables, that may be on either unit. Did you exchange any additional HSL/RIO FRUs?

**No:** Call your next level of support for further instruction. **This ends the procedure.**

**Yes:** Continue with the next step.

8. To determine if replacing the FRU resolved the problem, perform Manually detecting the failed link below and return to this point. Did the ports you were working on have a status of "failed"?

**No:** Then the problem is fixed, go to Verifying the repair. **This ends the procedure.**

**Yes:** Call your next level of support for further instruction. **This ends the procedure.**

#### **The port on one end of the failed link is in a system unit and the port on the other end is in an I/O unit**

1. Switch the two HSL/RIO cables on the I/O unit with the failed port, so that each cable is connected to the port where the other cable was previously connected. Disconnect both cables at the same time, wait 30 seconds, and then reconnect the cables one at a time.

**Attention:** For copper cables, you must fully connect the cable and tighten the connector's screws within 30 seconds of when the cable makes contact with the port. Otherwise, the link will fail and you must disconnect and reconnect again. Also, if the connector screws are not tightened, errors will occur on the link and it will fail.

2. Refresh the port status for the first failing resource by performing Refresh the port status below. Then continue with the next step.

3. Is the port on the system unit that was failed now working?

**No:** Continue with the next step.

**Yes:** Perform symbolic FRU "SIIOADP" on page 534 to exchange the HSL I/O bridge FRU in the I/O unit. Go to Verifying the repair. **This ends the procedure.**

4. Switch the cables back to their original positions by disconnecting both cables at the same time, waiting 30 seconds, and then reconnecting the cables one at a time.

**Attention:** For copper cables, you must fully connect the cable and tighten the connector's screws within 30 seconds of when the cable makes contact with the port. Otherwise, the link will fail and you must disconnect and reconnect again. Also, if the connector screws are not tightened, errors will occur on the link and it will fail.

5. Refresh the port status for the first failing resource by performing Refresh the port status below. Then continue with the next step.

6. Exchange the cable between the two ports on the failed link. To determine if replacing the cable resolved the problem, perform Manually detecting the failed link below and return to this point. Did the ports you were working on have a status of "failed"?

**No:** Then the problem is fixed, go to Verifying the repair. **This ends the procedure.**

**Yes:** Continue with the next step.

7. Exchange the HSL/RIO FRU that contains the failing port in the system unit. To determine if replacing the FRU resolved the problem, perform Manually detecting the failed link below and return to this point. Did the ports you were working on have a status of "failed"?

**No:** Then the problem is fixed, go to Verifying the repair. **This ends the procedure.**

**Yes:** Continue with the next step.

8. Use symbolic FRU "HSL\_LNK" on page 492 to determine if there are any additional HSL/RIO cable-related FRUs, such as interposer cards and internal ribbon cables, that may be on either unit. Did you exchange any additional HSL/RIO FRUs?

**No:** Call your next level of support for further instruction. **This ends the procedure.**

**Yes:** Continue with the next step.

9. To determine if replacing the FRU resolved the problem, perform Manually detecting the failed link below and return to this point. Did the ports you were working on have a status of "failed"?

**No:** Then the problem is fixed, go to Verifying the repair. **This ends the procedure.**

**Yes:** Call your next level of support for further instruction. **This ends the procedure.**

### The ports on both ends of the failed link are in an I/O unit

1. Switch the two HSL/RIO cables on the first (or "From") cable's I/O unit with the failed port so that each cable is connected to the port where the other cable was previously connected.

**Attention:** For copper cables, you must fully connect the cable and tighten the connector's screws within 30 seconds of when the cable makes contact with the port. Otherwise, the link will fail and you must disconnect and reconnect again. Also, if the connector screws are not tightened, errors will occur on the link and it will fail.

2. Refresh the port status for the first failing resource by performing Refresh the port status below. Then continue with the next step.

3. Is the port on the I/O unit on which you did not switch the cables now working?

**No:** Go to step 5

**Yes:** Use symbolic FRU "SIIOADP" on page 534 to exchange the HSL/RIO I/O bridge card in the I/O unit where you just switched the cables. The continue with the next step.

4. To determine if replacing the FRU resolved the problem, perform Manually detecting the failed link below and return to this point. Did the ports you were working on have a status of "failed"?

**No:** Then the problem is fixed, go to Verifying the repair. **This ends the procedure.**

**Yes:** Continue with the next step.

5. Switch the cables back to their original positions.

**Attention:** For copper cables, you must fully connect the cable and tighten the connector's screws within 30 seconds of when the cable makes contact with the port. Otherwise, the link will fail and you must disconnect and reconnect again. Also, if the connector screws are not tightened, errors will occur on the link and it will fail.

6. Switch the two HSL/RIO cables on the second (or "To") I/O unit with the failed port so that each cable is connected to the port where the other cable was previously connected.

**Attention:** For copper cables, you must fully connect the cable and tighten the connector's screws within 30 seconds of when the cable makes contact with the port. Otherwise, the link will fail and you must disconnect and reconnect again. Also, if the connector screws are not tightened, errors will occur on the link and it will fail.

7. Refresh the port status for the first failing resource by performing Refresh the port status below. Then continue with the next step.

8. Is the port on the I/O unit on which you did not switch cables now working?

**No:** Go to step 10 on page 86.

**Yes:** Use symbolic FRU "SIIOADP" on page 534 to exchange the HSL/RIO I/O bridge card in the I/O unit where you just switched the cables. Then continue with the next step.

9. To determine if replacing the FRU resolved the problem, perform Manually detecting the failed link below and return to this point. Did the ports you were working on have a status of "failed"?

**No:** Then the problem is fixed, go to Verifying the repair. **This ends the procedure.**

**Yes:** Continue with the next step.

10. Switch the cables back to their original positions.

**Attention:** For copper cables, you must fully connect the cable and tighten the connector's screws within 30 seconds of when the cable makes contact with the port. Otherwise, the link will fail and you must disconnect and reconnect again. Also, if the connector screws are not tightened, errors will occur on the link and it will fail.

11. Exchange the HSL/RIO cable between the two ports on the failed link. To determine if replacing the cable resolved the problem, perform Manually detecting the failed link below and return to this point. Did the ports you were working on have a status of "failed"?

**No:** Then the problem is fixed, go to Verifying the repair. **This ends the procedure.**

**Yes:** Continue with the next step.

12. Use symbolic FRU "HSL\_LNK" on page 492 to determine if there are any additional HSL/RIO cable-related FRUs, such as interposer cards and internal ribbon cables, that may be on either unit. Did you exchange any additional HSL/RIO FRUs?

**No:** Call your next level of support for further instruction. **This ends the procedure.**

**Yes:** Continue with the next step.

13. To determine if replacing the FRU resolved the problem, perform Manually detecting the failed link below and return to this point. Did the ports you were working on have a status of "failed"?

**No:** Then the problem is fixed, go to Verifying the repair. **This ends the procedure.**

**Yes:** Call your next level of support for further instruction. **This ends the procedure.**

### Cannot power on unit

1. Work the errors related to powering on the unit(s), and then continue with the next step. If a unit still cannot be powered on, re-cable the HSL/RIO loop without the I/O units and system units that cannot be powered on, allowing the loop to be complete (no disconnected cables).
2. To determine if re-cabling the loop resolved the problem, perform Manually detecting the failed link below and return to this point.

### Manually detecting the failed link

1. Get the loop number from the reference code if you do not already have it. The loop number is a hexadecimal number in word 7 of the reference code.
  - If you are working from the Product Activity Log (PAL<sup>®</sup>), then the loop number is the 4 leftmost characters of the DSA in word 7 (BBBB). Use the "DSA translation" on page 62 to convert the hexadecimal loop number to decimal format before continuing with this procedure.
  - If you are working from the Service Action Log (SAL), the loop number should be displayed in the FRU description area in decimal format.
2. Sign on to SST or DST (if you have not already done so). Select **Start a service tool > Hardware service manager > Logical hardware resources > High-speed link (HSL) resources**.
3. Select **Resources associated with loop** for the HSL loop with the failed link. The HSL bridges will be displayed under the loop.
4. Select **Display detail** for the loop with the failed link.
5. Record the name of the NIC/RIO controller resource you are starting from on the display. You will need to know this name to determine if you have followed the loop around and back to this resource.

6. If the leading port does not have a status of *"failed"*, select **Follow leading port** until a leading port with a *"failed"* status is found, or the display is showing information for the starting NIC/RIO resource you recorded. Did you find a leading port with a status of *"failed"*?
  - No:** The loop is functioning properly. Return to the subtask that sent you here.
  - Yes:** Record the resource name at the leading port with a *"failed"* status, and the type, model, and serial number for the resource with the failed status. Continue with the next step.
7. Select **Follow leading port** one more time and note all the information for the resource name with a failed trailing port.
8. Select **Display system information** and note the power controlling system's type, model, and serial number (and name, if available). This info may be needed for FRU replacement at a later time.
9. Select **Cancel** twice to return to the previous screen.
10. Go to each resource name (found above) and select **Associated packaging resource(s)**. This gives the description of the failing item and the frame ID.
11. Select **Display detail** to find the part number and location associated with the possible failing item. Then return to the step that sent you here.

### Refresh the port status

1. Wait one minute, and then sign on to SST or DST (if you have not already done so).
2. Select **Start a service tool > Hardware service manager > Logical hardware resources > High-speed link (HSL) resources**.
3. Move the cursor to the HSL loop that you want to examine and select **Display detail > Include non-reporting resources**.
4. If the display is not already showing the ports for one of the units you are working on, then select **Follow leading port**. Continue to select **Follow leading port** until the display is showing the ports for one of the units you are working on. Note the status of the port you were working on. Select **Follow leading port** until the display is showing the ports for the other unit you are working on, and note the status of the port you were working on.
5. Select **Cancel > Refresh > Display detail** for the failing resource you are checking. Note any change in the status for the resource. Then return to the step that sent you here.

**RIOIP02:** Use this procedure to determine the status of HSL/RIO ports in the loop and to identify failing resources.

1. Sign on to SST or DST (if you have not already done so).
2. Select **Start a service tool > Hardware service manager > Logical hardware resources > High-speed link (HSL) resources**.
3. Select **Include non-reporting resources**. Move the cursor to the HSL loop that you want to examine and select **Display detail**.
4. The display that appears shows the port status of the Network Interface Controller (NIC) for the loop that you selected. Record the resource name, type-model, and serial number, if it has not been previously recorded.
5. Is the status of the *"Leading port to next resource"* operational?
  - Yes:** Select **Follow Leading Port**. Then continue with the next step.
  - No:** You have found the first *"failed"* link. You will be directed to find the other *"failed"* link. Go to step 7.
6. Is the resource name the same name that you recorded for the NIC in step 4?
  - No:** The display that appears shows the status of the HSL ports for the next I/O bridge resource on the loop. Go to step 5.
  - Yes:** You have followed the HSL links around the loop and back to the NIC on the system, but did not find a failed link. Return to the procedure that sent you here. **This ends the procedure.**
7. Find the information for the first failing resource using the following steps:

- a. Record the information as the *first* failing resource on the link.
  - b. Record the resource name, card type-model, and part number.
  - c. Record the link status of each port. Record 'Internal' if the port is designated as internal.
  - d. Select **Cancel** to return to the Work with High-speed link (HSL) resources display.
  - e. For the loop with the failure, select **Resources associated with loop**.
  - f. For the HSL I/O bridge with the resource name that you recorded, select **Associated packaging resources**.
  - g. Record the frame ID for the *first* failing link.
  - h. Select **Display detail**, and record the card position for the *first* failing resource.
8. Find the information for the other (second) failing resource by following these steps:
- a. Record this information as the *second* failing resource on the link.
  - b. Select **Cancel** > **Cancel** to return to the Logical hardware associated with HSL loops display.
  - c. Move the cursor to the HSL I/O bridge with the name of the first failing resource, and select **Display detail** > **Include non-reporting resources**.
  - d. Follow the failed port by doing one of the following:
    - If the leading port is failed, select **Follow leading port**.
    - If the trailing port is failed, select **Follow trailing port**.
  - e. You have located the second failing resource on the link.
  - f. Record the resource name, card type-model, and part number.
  - g. Record the link status of each port for the second failing link. Record 'Internal' if the port is designated as internal.
  - h. Select **Cancel** to return to the Logical hardware associated with HSL loops display.
  - i. Select **Include non-reporting resources** > **Associated packaging resources** for the HSL I/O bridge or Network Interface Controller (NIC) with the resource name that you recorded for the second failed resource.
  - j. Record the frame ID (if present) and port for the second failing link.
  - k. Select **Display detail** and record the card position for the second failing resource.
9. Have you repeated steps 1 on page 87 through 8 for a second time during this procedure?
- No:** Continue with the next step.
- Yes:** Return to the procedure that sent you here. **This ends the procedure.**
10. Do the *first* failing link and the *second* failing link have the same frame ID?
- No:** Continue with the next step to determine if the HSL cable connectors between the first and second failing resources are properly seated and cleaned.
- Yes:** Return to the procedure that sent you here. **This ends the procedure.**
11. Disconnect the cable at the frame ID, card position, and port that you recorded for the first failing resource.
12. Is the connection an optical link?
- No:** Wait at least 30 seconds, and then continue with the next step.
- Yes:** Clean the HSL cable connector and port using the tools and procedures listed in symbolic FRU "OPT\_CLN" on page 521. Then continue with the next step.
13. Reconnect the cable to the port.
- Attention:** For copper cables you must fully connect the cable and tighten the connector's screws within 30 seconds of when the cable makes contact with the port. If you do not, the link will fail and you must disconnect and reconnect it again. If the connector screws are not tightened errors will occur on the link and it will fail.
14. Disconnect the cable at the frame ID, card position, and port that you recorded for the second failing resource.

15. Is the connection an optical link?
  - No:** Wait at least 30 seconds and then continue with the next step.
  - Yes:** Clean the HSL cable connector and port using the tools and procedures listed in symbolic FRU "OPT\_CLN" on page 521. Then continue with the next step.
16. Reconnect the cable to the port.
  - Attention:** For copper cables you must fully connect the cable and tighten the connector's screws within 30 seconds of when the cable makes contact with the port. If you do not, the link will fail and you must disconnect and reconnect it again. If the connector screws are not tightened errors will occur on the link and it will fail.
17. Wait one minute to allow the changes to be detected by LIC.
18. Determine if the link has become "operational" by repeating steps 1 on page 87 through 8 on page 88 for a second time. There is no need to duplicate any information you have already recorded. Return to the procedure that sent you here, when you are directed to do so in steps 1 on page 87 through 8 on page 88. **This ends the procedure.**

**RIOIP03:** RIOIP03, Use HSM to examine the HSL Loop to find *failing* items.

Use this procedure to determine the status of HSL links in the loop.

1. Sign on to SST or DST.
2. Select **Start a service tool > Hardware service manager > Logical hardware resources > High-speed link resources.**
3. Move the cursor to the HSL loop that you want to examine, and select **Display detail > Include non-reporting resources.** The display that appears shows the port status of the HSL controller for the loop that you selected.
4. Record the resource name, type-model, and serial number, if it has not been previously recorded.
5. Is the status of the "Leading port to next resource" *operational*?
  - Yes:** Select **Follow leading port.** Then, continue with the next step.
  - No:** You have found the first "failed" resource in the link. You will be directed to find the other "failed" resource on this link. Go to step 8.
6. Record the HSL resource name, type-model, part number, and port.
7. Is the resource name the same name that you recorded for the HSL controller in step 4?
  - No:** The display that appears is showing the status of the HSL ports for the next I/O adapter resource on the loop. Go to step 5.
  - Yes:** You have followed the HSL links around the loop and back to the HSL controller on the system. You did not find a "failed" link. Return to the procedure that sent you here. **This ends the procedure.**
8. Find and record the information for the "first" failing resource using the following steps:
  - a. Record the resource name, card type-model, part number, and port.
  - b. Select **Cancel** to return to the Work with system interconnect resources display.
  - c. Select **Resources associated with ring** for the loop with the failure.
  - d. Select **Associated packaging resources** for the HSL I/O adapter with the resource name that you recorded.
  - e. Record the frame ID, card position, and port. Record this information for the "first" failing link in (diagnosis form).
  - f. Select **Display detail** and record the card position for the "first" failing resource.
9. Find and record the information for the other (*second*) failing resource using the following steps:
  - a. Select **Cancel** to return to the Logical hardware associated with HSL ring display.
  - b. For the HSL I/O adapter with the name of the "first" failing resource, select **Display detail > Follow leading port.** You have located the "second" failing resource on the link.

- c. Record the resource name, card type-model, part number, port.
  - d. Select **Cancel** to return to the Logical hardware associated HSL rings display.
  - e. Select **Associated packaging resources** for the HSL I/O adapter with the resource name that you recorded for the "second" failed resource.
  - f. Record the frame ID, card position, and port. Record this information for the "second" failing link in (diagnosis form).
  - g. Select **Display detail**, and record the card position for the "second" failing resource.
10. Have you repeated steps 1 on page 89 through 9 on page 89 for a **second** time during this procedure?

**Yes:** Return to the procedure that sent you here. **This ends the procedure.**

**No:** Does the "first" failing resource and the "second" failing resource have the same frame ID?

**Yes:** Return to the procedure that sent you here. **This ends the procedure.**

**No:** Perform the following to determine if the HSL cable connectors between the *first* and *second* failing resources are properly seated and clean:

- a. Disconnect the cable at the frame ID, card position, and port that you recorded for the "first" failing resource, then wait 30 seconds and reconnect it.
 

**Attention:** You must fully connect the cable and tighten the connector's screws within **30 seconds** of when the cable makes contact with the port. Otherwise, the link will fail and you must disconnect and reconnect the cable again. If the connector screws are not tightened, errors will occur on the link and it will fail.
- b. Disconnect the cable at the frame ID, card position, and port that you recorded for the "second" failing resource, then wait 30 seconds and reconnect it. See the 30 second attention notice in step 10a.
- c. Refresh the port status by doing the following:
  - 1) Wait 1 minute.
  - 2) Select **Cancel** > **Refresh**.

Determine if the link has become "operational" by repeating steps 1 on page 89 through 9 on page 89 for a **second** time, returning to the procedure that sent you here when directed.

You **may** see a 6982 indicating that the loop went open and then a 6985 indicating that the loop recovered. **This ends the procedure.**

**RIOIP04:** Use HSM to examine the HSL Loop to find a failing I/O bridge resource.

- 1. Sign on to SST or DST.
- 2. Select **Start a service tool** > **Hardware service manager** > **Logical hardware resources** > **High-speed link (HSL) resources**.
- 3. Select **Include non-reporting resources**. Move the cursor to the HSL loop that you want to examine and select **Display detail**. The display that appears shows the port status of the Network Interface Controller (NIC) for the loop that you selected.
- 4. Record the resource name, type-model, and serial number, if it has not been previously recorded.
- 5. Is the status of the *Leading port to next resource* operational?
 

**Yes:** Select **Follow Leading Port**. Then continue with the next step.

**No:** You have found the first half of a "failing" link. Choose from the following options:

  - If this is your first time through steps 1 through 7, go to step 8 on page 91.
  - If this is your second time through steps 1 through 7, go to step 9 on page 91.
- 6. Record the HSL resource name, type-model, part number, and port.
- 7. Is the resource name the same name that you recorded for the NIC in step 4?
 

**No:** The display that appears is showing the status of the HSL ports for the next I/O bridge resource on the loop. Go to step 5.



**Yes:** You have followed the HSL links around the loop and back to the NIC on the system. You did not find a failed link. Return to the procedure that sent you here. **This ends the procedure.**

8. Follow the steps in Clean and properly seat the cables below.
9. Choose from the following options:
  - If the status of the *Leading port to next resource* has become "operational", the problem has been corrected. Return to the procedure that sent you here. **This ends the procedure.**
  - If the status is still not "operational", continue with the next step.
10. If the resource type (shown near the top of the screen, just below the bus number) is an HSL I/O bridge, then perform Collect the resource information below. Then continue with the next step.
11. Select **Follow leading port** to move to the resource with the failed link on the trailing port. If that resource is an HSL I/O bridge, then perform Collect the resource information below. Then return to the procedure that sent you here. **This ends the procedure.**

### Collect the resource information

Find the information for the failing HSL I/O bridge using the following steps:

1. Record the resource name, card type-model, part number, and port.
2. Select **Cancel** to return to the Work with high-speed link (HSL) resources display.
3. Select **Resources associated with loop** for the loop with the failure.
4. Select **Associated packaging resources** for the HSL I/O bridge with the resource name that you recorded.
5. Record the frame ID.
6. Select **Display detail** and record the card position.
7. Go to step 11.

### Clean and properly seat the cables

Determine if the HSL cable connectors for this HSL I/O bridge are properly seated and clean:

1. Disconnect one of the cables at the frame ID/unit of the *HSL I/O bridge*.
2. Is the connection an optical link?
  - No:** Wait at least 30 seconds, and then continue with the next step.
  - Yes:** Clean the HSL cable connector and port using the tools and procedures listed in symbolic FRU "OPT\_CLN" on page 521. Then continue with the next step.
3. Reconnect the cable to the port.
  - Attention:** For copper HSL/RIO cables, you must fully connect the cable and tighten the connector's screws within 30 seconds of when the cable makes contact with the port. Otherwise, the link will fail and you must disconnect and reconnect the cable again. If the connector screws are not tightened, errors will occur on the link and it will fail.
4. Disconnect the other cable at the frame ID/unit of the *HSL I/O Bridge*.
5. Is the connection an optical link?
  - No:** Wait at least 30 seconds, and then continue with the next step.
  - Yes:** Clean the HSL cable connector and port using the tools and procedures listed in symbolic FRU "OPT\_CLN" on page 521. Then continue with the next step.
6. Reconnect the cable to the port.
  - Attention:** For copper HSL/RIO cables, you must fully connect the cable and tighten the connector's screws within 30 seconds of when the cable makes contact with the port. Otherwise, the link will fail and you must disconnect and reconnect the cable again. If the connector screws are not tightened, errors will occur on the link and it will fail.
7. Refresh the port status by doing the following:

- a. Wait 1 minute.
- b. Select **Cancel > Refresh > Display detail for the failing resource**.
- c. Determine if the link has become *'operational'* by repeating steps 1 on page 90 through 7 on page 90 of the main procedure a second time.

**RIOIP06:** RIOIP06, Use HSM to examine the HSL Loop to determine if other systems are connected to the loop.

1. Sign on to SST or DST (if you have not already done so).
2. Select **Start a service tool > Hardware service manager > Logical hardware resources > High-speed link (HSL) resources**.
3. Move the cursor to the HSL loop that you want to examine, and select **Resources associated with loop**.
4. Search for Remote HSL NICs on the loop.

Are there any Remote HSL NICs on the loop?

**Yes:** You have determined that there **are** other systems connected to this loop. **This ends the procedure.**

**No:** You have determined that there are **not** any other systems connected to this loop. **This ends the procedure.**

**RIOIP07:** Starting with a frame ID, for a frame connected to an HSL loop, use this procedure to determine if there is another frame with the same frame ID on the loop. This is possible when more than one system is connected to an HSL loop.

1. Sign on to SST or to DST if you have not already done so.
2. Select **Start a service tool > Hardware service manager > Logical hardware resources > High-speed link (HSL) resources**.
3. Move the cursor to the HSL loop that you want to examine, and select **Resources associated with loop > Include non-reporting resources**. The display that appears shows the loop resource and all the "HSL I/O Bridge" and all the "Remote HSL NIC" resources connected to the loop.
4. Perform the following for each HSL I/O Bridge resource on the display:
  - a. Move the cursor to the HSL I/O Bridge resource and select **Associated packaging resource(s)**.
  - b. Compare the frame ID on the display with the frame ID (in hexadecimal format) that you are looking to find (Ignore leading zeros).
  - c. Are the frame IDs the same?

**No:** Select **Cancel** to return to the Logical Hardware Associated With HSL Loops display. Continue with the next step.

**Yes:** Perform the following steps:

- 1) Record the resource name and the Type-Model of the HSL I/O Bridge with the frame ID for possible use later.
- 2) Select **Display Detail** and record the "SPCN system serial number". The SPCN system serial number is the serial number of the system unit that controls the power subsystem on the frame (it connects to the frame with an SPCN cable).
- 3) Select **Cancel** to return to the Packaging Resources Associated with a Logical Resource display.
- 4) Select **Cancel** to return to the Logical Hardware Associated With HSL Loops display. Continue with the next step.

5. Repeat step 4 for each HSL I/O Bridge under the loop. Then, continue with the next step in this procedure.

6. Did you find more than one HSL I/O Bridge with the same frame ID?

**No:** There is only one frame on the loop with the frame ID you are working with. Return to the procedure that sent you here. **This ends the procedure.**

**Yes:** You have recorded the resource name, the Type-Model, and the Power Controlling system of every frame on the loop that matches the frame ID that you are looking to find. **This ends the procedure.**

**RIOIP08:** Starting with the frame ID and HSL port location label for one end of an HSL cable, determine the frame ID and port location label for the other end.

1. Sign on to SST or to DST if you have not already done so.
2. Select **Start a Service Tool > Hardware Service Manager > Logical Hardware Resources > High Speed Link (HSL) Resources.**
3. Move the cursor to the HSL loop that you want to examine, and select **Resources associated with loop > Include non-reporting resources.** The display that appears shows the loop resource and all the "HSL I/O Bridge" and all the "Remote HSL NIC" resources connected to the loop.
4. Perform the following for each of the HSL I/O Bridge resources listed until you are directed to do otherwise.
  - a. Move the cursor to the HSL I/O Bridge resource and select **Associated packaging resource(s).**
  - b. Compare the frame ID on the display with the frame ID (in hexadecimal format) that you are looking to find (Ignore leading zeros).

Are the frame IDs the same?

**Yes:** Continue with the next step.

**No:** Select **Cancel** to return to the Logical Hardware Associated with HSL Loops display. Continue with the next step, repeating it for each HSL I/O Bridge under the loop, until you are directed to do otherwise.

5. Perform the following:
  - a. Select **Associated logical resource(s).**
  - b. Move the cursor to the HSL I/O Bridge resource and select **Display detail.**
  - c. Examine the *Leading port* and *Trailing port* information. Search the display for the HSL port location label that you recorded prior to starting this procedure. If the label is part of the information for the *Leading port*, then select **Follow leading port.** If the label is part of the information for the *Trailing port*, then select **Follow trailing port.**
  - d. Perform the step below that matches the function you selected in the previous step:
    - If you selected **Follow leading port**, then examine the display for the *Trailing port* information. Record, on the worksheet that you are using, the HSL port location label shown on the "*Trailing port from previous resource*" line. Record this information as the "*To HSL Port Label*".
    - If you selected **Follow trailing port**, then examine the display for the *Leading port* information. Record, on the worksheet that you are using, the HSL port location label on the "*Leading port to next resource*" line. Record this information as the "*To HSL Port Label*".
  - e. Record the "*Link type*" (Copper or Optical) on the worksheet that you are using in the field describing the cable type.
  - f. Record the resource name on the display.
  - g. Select **Cancel > Cancel > Cancel** to return to the *Logical Hardware Associated With HSL Loops* display.
  - h. Move the cursor to the resource with the resource name you recorded in step 5f.
  - i. Select **Associated packaging resource(s).**
  - j. Record the frame ID on the worksheet that you are using for the "*To Frame ID*".
  - k. Return to the procedure that sent you here. **This ends the procedure.**

**RIOIP09:** This procedure offers a description and service action for HSL reference code B600 6982.

**Note:** A fiber optic cleaning kit may be required for optical HSL connections.

**Note:** This reference code can occur on an HSL loop when an I/O expansion unit on the loop is powered off for a concurrent maintenance action.

1. Is the reference code in the Service Action Log (SAL) or serviceable event view you are using?

**Yes:** There is a connection failure on an HSL link. A B600 6984 reference code may also appear in the Product Activity Log (PAL) or error log view you are using. Both reference codes are reporting the same problem. Continue with the next step.

**No:** The reference code is only informational, and requires no service action. **This ends the procedure.**

2. Multiple B600 6982 errors may occur due to retry and recovery activity. Is there a B600 6985 with "xxxx 3206" in word 4 logged after all B600 6982 errors for the same HSL loop in the PAL?

**Yes:** The recovery efforts were successful. Close all of the B600 6982 entries for the same loop in the SAL. No service is required. **This ends the procedure.**

**No:** Continue with the next step.

3. Is there a B600 6987 reference code in the SAL, or serviceable event view you are using, logged at about the same time?

**Yes:** Close this problem and work the B600 6987. **This ends the procedure.**

**No:** Continue with the next step.

4. Is there a B600 6981 reference code in the SAL, or serviceable event view you are using, logged at approximately the same time?

**Yes:** Go to step 9.

**No:** Continue with the next step.

5. Perform "RIOIP06" on page 92 to determine if this loop connects to any other systems and then return here.

**Note:** The loop number can be found in the SAL in the description for the HSL\_LNK FRU.

Is this loop connected to other systems?

**Yes:** Continue with the next step.

**No:** Go to step 9.

6. Check for HSL failures in the serviceable event views on the other systems. HSL failures are indicated by entries with HSL I/O bridge and Network Interface Controller (NIC) resources. Ignore B600 6982 and B600 6984 entries.

Are there HSL failures on other systems?

**Yes:** Continue with the next step.

**No:** Go to step 9.

7. Repair the problems on the other systems and return to this step. After making repairs on the other systems check the PAL of this system. Is there a B600 6985 reference code, with this loop's resource name, that was logged after the repairs you made on the other systems?

**Yes:** Continue with the next step.

**No:** Go to step 9.

8. For the B600 6985 reference code you found, use "SIRSTAT" on page 539 to determine if the loop is now complete.

Is the loop complete?

**Yes:** The problem has been resolved. Use "RIOIP01" on page 82 to verify that the loop is now working properly. **This ends the procedure.**

**No:** Continue with the next step.

9. The FRU list displayed in the SAL, or serviceable event view you are using, may be different from the failing item list given here. Use the FRU list in the serviceable event view if it is available.

Does the reference code appear in the serviceable event view with HSL\_LNK or HSLxxxx listed as a symbolic FRU?

**Yes:** Perform "RIOIP01" on page 82. **This ends the procedure.**

**No:** Exchange the FRUs in the serviceable event view according to their part action codes. **This ends the procedure.**

**RIOIP50:** If the system you are working on has an HMC, service this error using the HMC's interfaces.

This procedure will help you isolate failing items for HSL/RIO link errors. The basic FRU list for such errors is one RIO hub (NIC, bridge, or remote NIC), a cable, and the RIO hub on the other end of the cable. There are two initial conditions. Choose the scenario you are dealing with:

- You are working the problem from service documentation or from a Service Action Log (SAL) entry without complete part number and location information for each RIO hub. Start with the preliminary task to determine which segment of the HSL/RIO loop has failed.
- You are working this problem from the SAL with complete part number and location information for each RIO hub. Perform "RIOIP01" on page 82.

### Preliminary task

Perform the following to determine which segment of the HSL/RIO loop has failed:

1. Get the loop number from the reference code if you do not already have it. The hexadecimal loop number is the 4 leftmost characters of the DSA in word 7 of the reference code. Before continuing to the next step, use "DSA translation" on page 62 to find the loop number and translate it into decimal format.
2. Sign on to SST or DST (if you have not already done so). Select **Start a service tool > Hardware service manager > Logical hardware resources > High-speed link (HSL) resources**.
3. Select **Resources associated with loop** for the loop with the failed link. The HSL bridges will be displayed under the loop.
4. Select **Display detail** for the loop with the failed link.
5. Select **Follow leading port** until a port with a status of "failed" is found. Note the resource name, type-model, and serial number for the resource with the failed status.
6. Select **Follow leading port** one more time and note all the information for the resource name with a failed trailing port.
7. Select **Display system information** and note the power controlling system. This information may be needed for concurrent replacement at a later time.
8. Select **Cancel** twice to return to the previous screen.
9. Go to each resource name (found above) and select **Associated packaging resource(s)**. This gives the description of the failing item and the frame ID.
10. Select **Display detail** to find the part number and location associated with the possible failing item.
11. Now you have the same information you would have if the SAL had complete part number and location information. Perform "RIOIP01" on page 82.

**RIOIP55:** There is an open RIO/HSL loop at IPL time. The system may have tried multiple times to establish a complete RIO/HSL loop. This could result in multiple permanent B700 6985 errors for the same RIO/HSL loop. Check the following:

1. Look in the informational logs for a B700 6985 occurring on the same RIO/HSL loop with a value of xxxx 3206 or xxxx 3208 in word 4. These indicate a retry attempt was successful and the permanent B700 6985 errors for that loop can be closed with no further action necessary.
2. If there is a clustered system on the RIO/HSL loop that had not finished its IPL at the time of the error, you should check for a similar error on that system. These errors will occur until all systems on the loop have been completed their IPL. If there is a similar error on the last system to complete its IPL, work the error from that system. Otherwise you can close this error.
3. Check cable seating for the cable indicated in the locations given in the serviceable event view. If no locations are given, check the RIO/HSL Loop Status in the view on the operating system or on the

HMC. Find the failed link and check cable connections there. If the cable is an optical cable, use "OPT\_CLN" on page 521 for direction on cleaning the optical connections.

4. If the error persists after steps 1 and 2 above, continue working the error with the FRUs given in the serviceable event view or service documentation. **This ends the procedure.**

**MABIP05:** Use this procedure to reset an IOP.

**Attention:** When the IOP reset is performed, all resources controlled by the IOP will be reset. Perform this procedure only if the customer has verified that the IOP reset can be performed at this time.

1. Go to the SST/DST display in the partition which reported the problem. Use STRSST if i5/OS is running; use function 21 if STRSST does not work; or IPL the partition to DST.
2. On the Start Service Tools Sign On display, type in a user ID with service authority and password.
3. Select **Start a service tool > Hardware service manager > Logical hardware resources > System bus resources.**
4. Page forward until you find the IOP that you want to reset. For help in identifying the IOP from the Direct Select Address (DSA) in the reference code, see "DSA translation" on page 62.
5. Verify that the IOP are correct by matching the resource name(s) on the display with the resource name(s) in the Service Action Log (SAL) for the problem you are working on.
6. Move the cursor to the IOP that you want to reset, and select **I/O Debug > Reset IOP > IPL IOP.** **This ends the procedure.**

**MABIP06:** Use this procedure to isolate a failing I/O adapter under an IOP. The procedure will iterate through each IOA under the IOP, powering each one off, and then resetting the IOP. This process will be repeated until the failing IOA is isolated.

1. If the system is not IPLed, will it IPL to DST?

**No:** Perform "MABIP07" on page 98. **This ends the procedure.**

**Yes:** From the SAL display for the SRC, record the count. Continue with the next step.

2. Go to the SST/DST display in the partition which reported the problem:

- If is i5/OS running, use STRSST.
- If STRSST does not work, use function 21.
- Or IPL the partition to DST.

Continue with the next step.

3. On the Start Service Tools Sign On display, type in a user ID with service authority and password.
4. Select **Start a service tool > Hardware service manager > Logical hardware resources > System bus resources.**
5. Is there a resource name logged in the SAL entry?  
**No:** Continue with the next step.  
**Yes:** Go to step 11 on page 97.
6. Do you have a location for the I/O processor?  
**No:** Record the Direct Select Address (DSA) of the SRC (word 7) from the SAL display (see "DSA translation" on page 62). Then continue with the next step.  
**Yes:** Go to step 9 on page 97.
7. Return to the HSM System bus resources display. Locate the I/O processor by performing the following:
  - a. Select **Display detail.**
  - b. Compare the DSA from word 7 with the bus, card, and board information for the IOP.

**Note:** The card information on the HSM display is in decimal format. You must convert the decimal card information in to hexadecimal format to match the DSA format.

Decimal format	Hexadecimal format
16	10
17	11
18	12
19	13
20	14
21	15
22	16
23	17
32	20
33	21
34	22
35	23
36	24
37	25
38	26
39	27

- c. Repeat this step until you find the IOP with the same DSA. Then continue with the next step.
8. Select **Cancel**, and then go to step 12.
9. Locate the I/O processor in HSM by performing the following for each IOP:
  - a. Select **Associated packaging resource(s) > Display detail**.
  - b. Repeat until you find the IOP with the same location. Then continue with the next step.
10. Select **Cancel > Cancel** and go to step 12.
11. Page forward until you find the multi-adapter bridge and IOP where the problem exists. Verify that the multi-adapter bridge and IOP are correct by matching the resource name(s) on the display with the resource name(s) in the SAL for the problem that you are working on.
12. For the IOP that you are working on, select **Resources associated with IOP** (if the I/O adapters are not already displayed), and then **Include non-reporting resources**.
13. If there is an IOA that is listed in any state other than *operational*, then perform steps 14 through 17 on page 98, starting with the disabled IOA by moving the cursor to the disabled IOA. Otherwise, move the cursor to the first IOA that is assigned to the IOP.
14. Select **Associated packaging resource(s) > Concurrent maintenance > Power off domain**. Record the Frame ID and Location of the slot you are powering off. Did the domain power off successfully?
  - Yes:** Perform "MABIP05" on page 96, and then return here and continue with the next step.
  - No:** Choose from the following options:
    - If only one IOA was listed as failing, power down the system and replace the IOA. Re-IPL the system. If a different SRC occurs, go to "Start of call procedure" on page 2 and service that SRC. If there was no SRC, go to Verifying the repair. **This ends the procedure.**
    - If there were multiple failed IOAs and concurrent maintenance did not work on one, then move to the next failed IOA and repeat steps 14 through 17 on page 98.
    - If concurrent maintenance does not work for multiple failed IOAs, this procedure will not be able to identify a failing I/O adapter. Return to the procedure that sent you here. **This ends the procedure.**
15. Did the IOP reset and IPL successfully?

**No:** You will not be able to identify a *failing* I/O adapter with this procedure. Return to the procedure that sent you here. **This ends the procedure.**

**Yes:** Check for the same failure that sent you to this procedure. Check the system control panel, the SAL for the partition that reported the problem, or the Work with partition status display for the partition that reported the problem. In the SAL, the count will increase if the SRC occurred again. Continue with the next step.

16. Did the same SRC occur after the IOP was reset and IPL'd?

**No:** Go to step 18.

**Yes:** Perform the following steps:

- a. Go to the Hardware Service Manager display.
- b. Go to Packaging Hardware Resources.
- c. Power on the IOA by selecting **Power on domain**.
- d. Reassign the IOA to the IOP.
- e. Return to the HSL resource display, showing the IOP and associated resources.
- f. Continue with the next step.

17. Is there any other IOA, assigned to the IOP, that you have not already powered off and on?

**No:** Go to step 20.

**Yes:** Move the cursor to another IOA assigned to the IOP, choosing IOAs with a status of *unknown* or *disabled* before moving on to IOAs with a status of *operational*. Go to step 14 on page 97.

18. You have located the failing IOA. Exchange the I/O adapter that you just powered off. Use the location you recorded in step 14 to locate the IOA.

19. Power on the IOA that you just exchanged. Does the same SRC that sent you to this procedure still occur?

**Yes:** The IOA is **not** the failing item. Remove the IOA and reinstall the original IOA. Continue with the next step.

**No:** You have exchanged the failing IOA. Go to "Verifying a high-speed link, system PCI bus, or a multi-adapter bridge repair" on page 76. **This ends the procedure.**

20. No failing IOAs were identified. Return to the procedure that sent you here. **This ends the procedure.**

**MABIP07:** Use this procedure to isolate a failing PCI I/O adapter card from an SRC.

**Attention:** The removal and replacement of all FRUs in this procedure must be performed using dedicated maintenance.

1. Determine the "PCI bridge set" (multi-adapter bridge domain) by performing the following:
  - a. Record the bus number (BBBB), the multi-adapter bridge number (C) and the multi-adapter bridge function number (c) from the Direct Select Address (DSA). See "Breaking down a RIO/HSL or PCI bus reference code" on page 61 for help in determining these values.
  - b. Use the bus number that you recorded and the "System Configuration Listing" or ask the customer to determine what frame the bus is in.
  - c. Record the frame type where the bus is located.
  - d. The **PCI bridge set** is the group of card positions controlled by the same multi-adapter bridge on the bus that you recorded. Use the "System Configuration Listing", the card position table for the frame type that you recorded, the bus number, and the multi-adapter bridge number to determine the PCI bridge set where the failure occurred. Refer to the "Card positions" on page 64 to locate the card position table for the frame type that you recorded.
  - e. Print out the Installed features in a PCI bridge set form.
  - f. Using the card position table, record the PCI bridge set card positions, and multi-adapter bridge function numbers on the form.



- g. Examine the PCI bridge set in the frame and record the information on the form for all of the positions with IOP and IOA cards installed in them.
  - h. The IOP with a failing IOA is in the card position that matches the multi-adapter bridge function number that you recorded in the DSA. In the "IOP" or "IOA" column of the form, write the word "DSA" next to the IOP that is identified in the DSA.
  - i. Using the form, start at the card position for the IOP in the DSA and search down the "IOP" or "IOA" column (increasing multi-adapter bridge function numbers) and mark each IOA with an "X" until you hit the next IOP or the bottom of the column. The IOAs that you marked with "X" are all under the control of the IOP that is indicated in the DSA.
2. Did the SRC appear on the system control panel or the system console?
 

**No:** Continue with the next step.

**Yes:** This procedure will instruct you to power off and power on the system or partition with the problem. Perform that function as you would normally power off and power on the system. Continue with step 4.
  3. When this procedure instructs you to power on the system or partition, power off or power on **only** the partition that reported the problem by selecting **Work with system partitions** under SST/DST. Then, from the Primary partition, use HSM concurrent maintenance to power off the card positions that you are instructed to work with. The remove and replace procedures for those positions will guide you through the HSM concurrent maintenance functions. Use this procedure to find the correct remove and replace procedure for each card position that you are instructed to work with.
  4. Power off the system or partition.
  5. Remove all of the IOAs that you marked with an "X" in Installed features in a PCI bridge set form. Be sure to record the card position of each IOA so that you can reinstall it in the same position later. To determine the remove and replace procedures for the IOAs, locate the IOA card positions in the FRU locations and failing items table for the frame type that you recorded. See Finding part locations for details..
  6. Power on the system or partition.
 

Does the SRC or failure that sent you to this procedure occur?

**Yes:** Continue with the next step.

**No:** Power off the system or partition. Go to step 12 on page 100.
  7. Perform the following steps:
    - a. Power off the system or partition.
    - b. Exchange the IOP that is indicated in the DSA. Be sure to record the card position of the IOPs so that you can reinstall it in the same position later. To determine the remove and replace procedure for the IOP, locate the IOP's card position in the FRU locations and failing items table for the frame type you recorded. Refer to Finding part locations for details.
    - c. Power on the system or partition.

Does the SRC or failure that sent you to this procedure occur?

**No:** Power off the system or partition and continue with the next step.

**Yes:** Go to step 18 on page 100.
  8. Install all of the IOAs that you removed in step 5. Be sure to install them in their original positions.
  9. Power on the system or partition.
 

Does the SRC or failure that sent you to this procedure occur?

**Yes:** Power off the system or partition. Then, continue with the next step.

**No:** Perform "Verifying a high-speed link, system PCI bus, or a multi-adapter bridge repair" on page 76. **This ends the procedure.**
  10. Remove all of the IOAs that you marked with an "X" in Installed features in a PCI bridge set form. Be sure to record the card position of each IOA so that you can reinstall it in the same position later.
  11. Remove the IOP that you exchanged and install the original IOP in its original position.

12. Reinstall, in its original position, one of the IOA adapters that you removed.
13. Power on the system or partition.  
Does the SRC or failure that sent you to this procedure occur?  
**Yes:** The I/O adapter card that you just installed is the failing FRU. Continue with the next step.  
**No:** Power off the system or partition. Repeat step 12 for another one of the I/O adapter cards that you removed.  
If you have reconnected all of the I/O adapters and the SRC or failure that sent you to this procedure does not occur, the problem is intermittent. **This ends the procedure.**
14. Power off the system or partition.
15. Exchange the I/O adapter card that you last installed. Be sure to install the new I/O adapter card in the same position.
16. Power on the system or partition.  
Does the SRC or failure that sent you to this procedure occur?  
**No:** Power off the system or partition. Then, continue with the next step.  
**Yes:** Call your next level of support. **This ends the procedure.**
17. Reinstall, in their original positions, the remaining I/O adapter cards that you removed.  
Does the SRC or failure that sent you to this procedure occur?  
**Yes:** Call your next level of support. **This ends the procedure.**  
**No:** Does a different SRC occur?  
**Yes:** Go to "Start of call procedure" on page 2 and follow the service procedures for the new SRC. **This ends the procedure.**  
**No:** Perform "Verifying a high-speed link, system PCI bus, or a multi-adapter bridge repair" on page 76. **This ends the procedure.**
18. The problem is the multi-adapter bridge. Power off the system or partition.
19. Determine which FRU contains the multi-adapter bridge which controls the IOP in the DSA by performing the following:
  - a. Locate the card position table for the frame type that you recorded. Refer to the "Card positions" on page 64 to locate the card position table for the frame type that you recorded.
  - b. Using the multi-adapter bridge number that you recorded, search for the multi-adapter bridge function number "F" in the card position table to determine the card position of the multi-adapter bridge's FRU.
20. Is the multi-adapter bridge's FRU, a FRU that you have already exchanged?  
**No:** Remove the IOP that you exchanged. You will be reinstalling the original IOP later in this procedure. Then, continue with the next step.  
**Yes:** Call your next level of support. **This ends the procedure.**
21. Exchange the card multi-adapter bridge's FRU at the card position that you determined for it. To determine the remove and replace procedure for the multi-adapter bridge's FRU, locate the FRU's card position in the FRU locations and failing items table for the frame type that you recorded. FRU locations and failing items tables are in Finding part locations.
22. Install the original IOP in its original position.
23. Install all of the other IOPs and IOAs in to their original positions. Do **not** install the IOAs that you were instructed to remove in step 5 on page 99.
24. Power on the system or partition.  
Does the SRC or failure that sent you to this procedure occur?  
**No:** Install all of the IOAs that you removed in step 5 on page 99. Be sure to install them in their original positions. Then, continue with the next step.  
**Yes:** Call your next level of support.  
**This ends the procedure.**

25. Power on the system or partition.  
Does the SRC or failure that sent you to this procedure occur?
- **No: This ends the procedure.**
  - **Yes:** Call your next level of support.  
**This ends the procedure.**

#### **MABIP50:**

**Attention:** This procedure is for use with i5/OS only. Go to “PCI bus isolation using AIX, Linux, or the HMC” on page 75 to isolate a PCI bus problem from AIX, Linux, or the HMC.

This procedure will isolate a failing PCI card (either an IOA or IOP) under a multi-adapter bridge. The procedure will iterate through any IOPs under the multi-adapter bridge and any PCI cards operating without an IOP. It will power off each one, and then reset the multi-adapter bridge. This process will be repeated until the failing part is isolated.

1. Does the partition IPL to DST?  
**Yes:** Go to the SST/DST display in the partition that reported the problem. If i5/OS is running, use STRSST; if STRSST does not work, use function 21. If i5/OS is not running, IPL the partition to DST. Then, continue with the next step.  
**No:** Perform “MABIP52” on page 103. **This ends the procedure.**
2. On the Start Service Tools Sign On display, type in a user ID with QSRV authority and password.
3. Select **Start a service tool > Hardware service manager > Logical hardware resources > System bus resources.**
4. Page forward until you find the multi-adapter bridge where the problem was reported. For help in identifying the multi-adapter bridge from the Direct Select Address (DSA) in the reference code, see “DSA translation” on page 62. Verify that the multi-adapter bridge is the correct one by matching the resource name on the display with the resource name in the Service Action Log (SAL) for the problem that you are working on.
5. Select **Include non-reporting resources.**
6. Move the cursor to the first IOP under the multi-adapter bridge.
7. For each IOP that is under the multi-adapter bridge that you are working on, select **Associated packaging resource(s) > Display detail.**
8. Record the location of the IOP, except for virtual IOPs.
9. Select **Cancel > Cancel.**
10. Select **Resources associated with IOP.**
11. For each I/O adapter under the IOP, perform the following:
  - a. Select **Associated packaging resource(s) > Display detail.**
  - b. Record the location.

**Note:** There will be one IOA resource under each virtual IOP.

12. Perform the following:
  - a. Power off the frame or tower (see Powering on and powering off).
  - b. Remove one of the IOPs and all of its IOAs, or the one IOA resource under a virtual IOP.
  - c. Power on the frame or tower (see Powering on and powering off). Continue with the next step.
13. Check for the same failure that brought you to this procedure. Check the system control panel, the SAL for the partition that reported the problem, or the Work with partition status display for the partition that reported the problem.

Did the same reference code appear?

**Yes:** Power on the frame or tower. Then continue with the next step.

**No:** Go to step 15 on page 102.

14. Return to the System bus resources display showing the multi-adapter bridge and the associated resources. Is there another IOP under the multi-adapter bridge?

**No:** Go to step 17.

**Yes:** Return to step 12 on page 101.

15. The failing item is either the IOP or one of the I/O adapters that it controls. Reinstall the IOP and I/O adapters that you just removed. Perform “MABIP55” on page 110. If this procedure does not help you to identify a failing I/O adapter, then return here and continue with the next step in this procedure.

16. Perform the following:

- a. Exchange the IOP that you identified in step 15.
- b. Power on the frame or tower.

Does the same reference code that sent you to this procedure occur?

**No:** The failing item was the IOP that you just exchanged. Reinstall all of the other IOPs and I/O adapters that you removed during this procedure. Go to Verifying the repair. **This ends the procedure.**

**Yes:** Continue with the next step.

17. The failing item is the FRU containing the multi-adapter bridge which controls this IOP, or an IOA that is not under an IOP. Perform the following:

- a. Power off the unit that you are working on.
- b. Exchange the FRU containing the multi-adapter bridge using symbolic FRU “MA\_BRDG” on page 508.
- c. Power on the unit that you are working on.

Does the same reference code that sent you to this procedure occur?

**No:** The failing item was the multi-adapter bridge FRU that you just exchanged. Reinstall all of the other IOPs and I/O adapters that you removed during this procedure. Go to Verifying the repair. **This ends the procedure.**

**Yes:** Contact your next level of support. **This ends the procedure.**

## MABIP51:

**Attention:** This procedure is for use with i5/OS only. Go to “PCI bus isolation using AIX, Linux, or the HMC” on page 75 to isolate a PCI bus problem from AIX, Linux, or the HMC.

This procedure will determine if the multi-adapter bridge is failing when the symbolic FRU PIOCARD is in the failing item list. It will also determine if the symbolic FRU PIOCARD can be removed from the FRU list.

Use the Service Action Log (SAL) to check for other errors under the same multi-adapter bridge using the following steps:

1. Were you able to obtain a location for the PIOCARD FRU from the SAL?

**No:** Find the reference code in the SAL and record the Direct Select Address (DSA), which is in word 7 (see “DSA translation” on page 62). Then, continue with the next step.

**Yes:** Go to step 5 on page 103.

2. Record the bus number (BBBB) and the multi-adapter bridge number (C) of the DSA (see “DSA translation” on page 62).
3. Go to “MABIP53” on page 105 to determine the location of the PCI I/O card in the failing item list. Then return here and continue with the next step.
4. Using the card position table for the frame or I/O tower type that you recorded in “MABIP53” on page 105, determine which of the card positions within the frame or I/O tower are controlled by the same multi-adapter bridge that is controlling the PCI I/O card for which you determined the location in step 3. A card position is controlled by the same multi-adapter bridge if it has the same bus

number and multi-adapter bridge number as the PCI I/O Card that you located in step 3 on page 102. Record the card position and the DSA from the card position table for each card position that is controlled by the same multi-adapter bridge.

5. Look in the SAL (see "Using the Service Action Log" on page 24) for other failures in the same frame that are either located in any of the card positions that you recorded in step 4 on page 102 or are listed with the PIOCARD FRU.

Are any such failures listed in the SAL?

**No:** Use the failing item list that you were using when you started this procedure. **This ends the procedure.**

**Yes:** The multi-adapter bridge is failing. Remove symbolic FRU PIOCARD from the list of failing items, as it is not the failing FRU. **This ends the procedure.**

**MABIP52:** This procedure will isolate a failing PCI card from a reference code when the system or logical partition will not IPL.

**Attention:** The remove and replace procedure of all FRUs in this procedure must be performed using "Dedicated Maintenance".

1. Determine the PCI bridge set (multi-adapter bridge domain) by performing the following:
  - a. Record the bus number (BBBB), the multi-adapter bridge number (C) and the multi-adapter bridge function number (c) from the Direct Select Address (DSA) in word 7 of the reference code in the SAL entry. See "DSA translation" on page 62 for help in determining these values.
  - b. Use the bus number that you recorded and the System Configuration Listing (or ask the customer) to determine what frame the bus is in.
  - c. Record the frame type where the bus is located.
  - d. The PCI bridge set is the group of card positions controlled by the same multi-adapter bridge on the bus that you recorded. Use the System Configuration Listing, the card position table for the frame type that you recorded, the bus number, and the multi-adapter bridge number to determine the PCI bridge set where the failure occurred.
  - e. Print out the Installed features in a PCI bridge set form to use in the following steps.
  - f. Using the card position table, write the PCI bridge set card positions and multi-adapter bridge function numbers into the form.
  - g. Examine the PCI bridge set in the frame, and record the information in the form for all of the positions with IOP and IOA cards installed in them.
  - h. In the form, start at the top row and search down the "IOP" or "IOA" column (increasing multi-adapter bridge function numbers) and mark each IOP with an "X" until you hit the bottom of the column. The IOPs that you marked with "X" are all under the control of the multi-adapter bridge indicated in the DSA.
2. Did the reference code appear on the system control panel or the system console (this would happen if the system does not have multiple partitions or if the failure occurred in the Primary partition of a system with multiple partitions)?

**No:** When this procedure instructs you to power off and power on the system or partition, power off or power on **only** the partition that reported the problem by selecting **Work with system partitions** under SST/DST. Then, from the Primary partition, use HSM concurrent maintenance to power off the card positions that you are instructed to work with. The remove and replace procedures for those positions will guide you through the HSM concurrent maintenance functions. This procedure will guide you to the correct remove and replace procedure for each card position that you are instructed to work with. Continue with the next step.

**Yes:** This procedure instructs you to power off and power on the system or partition with the problem. Perform that function as you would normally power off and power on the system. Continue with the next step.

3. Perform the following:
  - a. Power off the system or partition.

- b. Remove all the IOPs you marked with an "X" and all the IOAs on the form. Be sure to record the card position of each IOP and IOA so that you can reinstall it in the same position later. To determine the remove and replace procedures for the IOPs and IOAs, go to Finding part locations.

- c. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

**No:** Continue with the next step.

**Yes:** The problem is the multi-adapter bridge. Continue with step 9.

4. Starting at the empty card position with the lowest multi-adapter bridge function number from the form, reinstall (in their original positions) one of the IOPs and all of the IOAs between it and the next IOP.

5. Power on the system or partition. Does the reference code or failure that sent you to this procedure occur?

**Yes:** The I/O processor card that you just installed is the failing FRU. Continue with the next step.

**No:** Power off the system or partition. Repeat step 4 for another one of the I/O processor cards that you removed. If you have reconnected all of the IOPs and the reference code or failure that sent you to this procedure does not occur, the problem is intermittent; contact your next level of support. **This ends the procedure.**

6. Perform the following:

- a. Power off the system or partition.

- b. Exchange the I/O processor card you last installed. Be sure to install the new I/O processor card in the same position.

- c. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

**No:** Power off the system or partition. Then, continue with the next step.

**Yes:** Remove the IOP that you just installed and reinstall the original IOP in its original position. Then perform "MABIP54" on page 107. **This ends the procedure.**

7. Reinstall, in their original positions, the remaining IOP and IOA cards that you removed.

Does the reference code or failure that sent you to this procedure occur?

**Yes:** Call your next level of support. **This ends the procedure.**

**No:** Continue with the next step.

8. Does a different reference code occur?

**Yes:** Return to "Start of call procedure" on page 2 and follow the service procedures for the new reference code. **This ends the procedure.**

**No:** Go to Verifying the repair. **This ends the procedure.**

9. Power off the system or partition.

10. Determine which FRU contains the multi-adapter bridge that controls the IOP in the DSA by performing the following:

- a. Locate the card position table for the frame type that you recorded.

- b. Using the multi-adapter bridge number that you recorded, search for the multi-adapter bridge function number "F" in the card position table to determine the card position of the multi-adapter bridge's FRU.

Is the multi-adapter bridge's FRU a FRU that you have already exchanged?

**No:** Remove the IOP that you exchanged. You will be reinstalling the original IOP later in this procedure. Then, continue with the next step.

**Yes:** Call you next level of support. **This ends the procedure.**

11. Perform the following:

- a. Exchange the multi-adapter bridge's FRU at the card position that you determined for it. See Finding part locations to determine the correct remove and replace procedure.
- b. Install all IOPs and IOAs in their original positions.
- c. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

**No:** Go to Verifying the repair. **This ends the procedure.**

**Yes:** Call your next level of support. **This ends the procedure.**

### MABIP53:

**Attention:** This procedure is for use with i5/OS only. Go to "PCI bus isolation using AIX, Linux, or the HMC" on page 75 to isolate a PCI bus problem from AIX, Linux, or the HMC.

This procedure will determine a card position if no location is given for a PCI card FRU. It will use the Direct Select Address given in the SRC.

1. If you were sent to this procedure with a specific Direct Select Address (DSA), then use it. Otherwise, use "DSA translation" on page 62 to find the DSA in the reference code.
2. Perform the following:
  - a. Record the bus number value, BBBB, in the DSA and convert it to decimal format.
  - b. Search for the decimal bus number in HSM or the System Configuration Listing to determine which frame or I/O unit contains the failing item. From the HSM screen select **Logical Hardware Resources > System Bus resources**. Move the cursor to a system bus object and select **Display Detail**. Do this for each bus until you find the bus on which you are working.
  - c. Record the frame or unit type.
3. Record the Cc value in the DSA. Is the Cc value greater than 00?
 

**No:** The multi-adapter bridge and the multi-adapter function number are not identified. Record that the multi-adapter bridge is not identified in the DSA. The card slot cannot be identified using the DSA. Go to step 7.

**Yes:** Continue with the next step.
4. Is the right-most character of the Cc value 'F'?
 

**No:** Continue with the next step.

**Yes:** Only the multi-adapter bridge number is identified. Record the multi-adapter bridge number (the leftmost character of the Cc value) for later use. The card slot cannot be identified using the DSA. Go to step 7.
5. Is SST/DST available?
 

**No:** Continue with the next step.

**Yes:** Go to step 11 on page 106.
6. Use the card position tables with the BBBB and Cc values that you recorded to identify the card position. Then return to the procedure, failing item, or symbolic FRU that sent you here. **This ends the procedure.**
7. Perform the following:
  - a. Sign onto SST or DST if you have not already done so.
  - b. Select **Start a service tool > Hardware service manager > Logical Hardware Resources > System bus resources**.
  - c. Put the bus number in the System bus(es) to work with field. Then select **Include non-reporting resources** and examine the display.

Is there more than one multi-adapter bridge connected to the bus resource you are working with?

**Yes:** Continue with the next step.

**No:** Go to step 10 on page 106.

8. Was there a multi-adapter bridge number identified in the Cc value of the DSA?

**Yes:** Continue with the next step.

**No:** From the Logical Hardware Resources on System Bus display, examine the status of all the resources under the bus, looking for a "failed" resource.

- To examine the status of the IOAs, select **Resources associated with IOP** for each IOP under the bus.
- To determine the card position of a failed resource, select **Associated packaging resource(s) > Display detail** and record the frame ID, card position, and part number.

Return to the procedure that sent you here. **This ends the procedure.**

9. Search for the multi-adapter bridge number that is identified in the DSA by moving the cursor to each multi-adapter bridge resource and selecting **Display detail**. Convert the system card value to hexadecimal (it is displayed in decimal format). The hexadecimal system card value is the Cc address of the multi-adapter bridge. When you find the multi-adapter bridge resource, where the multi-adapter bridge number (the leftmost character of the hexadecimal Cc value) matches the multi-adapter bridge number that you recorded from the DSA, then you have located the multi-adapter bridge identified in the DSA.

10. From the Logical Hardware Resources on System Bus display, examine the status of all the resources under the multi-adapter bridge, looking for a "failed" resource.

- To examine the status of the IOAs, select **Resources associated with IOP** for each IOP under the multi-adapter bridge.
- To determine the card position of a failed resource, select **Associated packaging resource(s) > Display detail** and record the frame ID, card position, and part number.

Did you find any failed resources?

**Yes:** One of the failing resources that you located is the problem. Return to the procedure that sent you here. **This ends the procedure.**

**No:** Use the System Configuration Listing and the card position tables for the frame type that you recorded to determine which card positions may have the failing card. If you recorded that the multi-adapter bridge was identified in the leftmost character of the Cc value, then the card position tables will help you identify which card slots (PCI bridge set) are controlled by the multi-adapter bridge that is identified in the Cc value. If the multi-adapter bridge was not identified in the Cc value (indicated by a value of '0' in the leftmost character) then the card position tables will identify which card slots are controlled by the bus (BBBB) that is identified in the DSA. Return to the procedure that sent you here. **This ends the procedure.**

11. Perform the following:

- a. Convert the hexadecimal Cc value in the DSA into a decimal value. You will be searching for the decimal value in HSM where it will be called "System card".
- b. Sign on to SST or DST if you have not already done so.
- c. Select **Start a Service Tool > Hardware Service Manager > Logical Hardware Resources > System Bus Resources**.
- d. Search for the "System Bus" resource identified in BBBB of the DSA by moving the cursor to each system bus resource and selecting **Display detail**. Do this until you locate the bus number that matches the decimal bus number value that you recorded from the DSA. Record the resource name of the bus for later use.
- e. From the Logical Hardware Resources on System Bus display, select **Include non-reporting resources**.

12. From the Logical Hardware Resources on System Bus display, examine all of the IOP and IOA resources under the bus. Look for a "System card" value that matches the decimal value of the Cc that you converted to decimal in step 11. Perform the following to display the "System card" value for each of the IOP and IOA resources:

**To examine the IOP resources:**



- a. Select **Associated packaging resource(s) > Display detail**. The "System card" value of the IOP will be shown on the display.
- b. If the "System card" value matches the decimal value of the Cc, then you have located the failing resource. Record the frame ID, card position, and part number, and then return to the procedure that sent you here. Otherwise, continue to examine all the IOP and IOA resources on the bus.

**To examine the IOA resources:**

- a. Move the cursor to an IOP resource and select **Resources associated with IOP > Associated packaging resource(s) > Display detail**. The "System card" value of the IOA will be shown on the display.
- b. If the "System card" value matches the decimal value of the Cc, then you have located the failing resource. Record the frame ID, card position, and part number, and then return to the procedure that sent you here. Otherwise, continue to examine all the IOP and IOA resources on the bus.

Have you examined all the IOP and IOA resources under the bus?

**No:** Repeat step 12 on page 106.

**Yes:** Continue with the next step.

13. Did you locate a resource with a "System card" value that matches the decimal Cc value from step 11 on page 106?

**Yes:** Record the frame ID, card position, and part number of the resource. Return to the procedure that sent you here. **This ends the procedure.**

**No:** You will not be able to locate the card using DST. Go to step 6 on page 105 to locate the card.

**MABIP54:**

**Attention:** This procedure is for use with i5/OS only. Go to "PCI bus isolation using AIX, Linux, or the HMC" on page 75 to isolate a PCI bus problem from AIX, Linux, or the HMC.

This procedure will isolate the failing PCI I/O adapter card from a reference code with a Direct Select Address when the serviceable event view does not indicate a location for the PCI card.

**Attention:** The removal and replacement of all FRUs in this procedure must be performed using dedicated maintenance.

1. Determine the PCI bridge set (multi-adapter bridge domain) by performing the following:
  - a. Record the bus number (BBBB), the multi-adapter bridge number (C), and the multi-adapter bridge function number (c) from the Direct Select Address (DSA) (see "Breaking down a RIO/HSL or PCI bus reference code" on page 61 for help in determining these values).
  - b. Using the bus number and the System Configuration Listing, or by asking the customer, determine which unit the bus is located in and record that unit type.
  - c. The PCI bridge set is the group of card positions controlled by the same multi-adapter bridge on the bus that you recorded. Use the System Configuration Listing, the card position table for the unit type that you recorded, the bus number, and the multi-adapter bridge number to determine in which PCI bridge set the failure occurred.
  - d. Print out the Installed features in a PCI bridge set form.
  - e. Using the card position table, record the PCI bridge set card positions, and the multi-adapter bridge function numbers on the form.
  - f. Examine the PCI bridge set and record the information on the form for all of the positions with IOP and IOA cards installed in them.
  - g. The IOP with a failing IOA is in the card position that matches the multi-adapter bridge function number that you recorded in the DSA. In the "IOP" or "IOA" column of the form, write the word "DSA" next to the IOP that is identified in the DSA.

- h. Using the form, start at the card position for the IOP in the DSA and search down the "IOP" or "IOA" column (increasing multi-adapter bridge function numbers) and mark each IOA with an "X" until you hit the next IOP or the bottom of the column. The IOAs that you marked with "X" are all under the control of the IOP that is indicated in the DSA.
2. Did the reference code appear on the system control panel or the system console?

**No:** When this procedure instructs you to power on the system or partition, power off or power on only the partition that reported the problem. On a multiple partition system, use interfaces on the HMC to power on or power off the partition or to perform concurrent maintenance. On a single partition system use the operating system interface to power on or power off the system. Use this procedure to find the correct remove and replace procedure for each card position that you are instructed to work with. Continue with the next step.

**Yes:** This procedure will instruct you to power off and power on the system or partition with the problem. Perform that function as you would normally power off and power on the system. Continue with the next step.
3. Perform the following:
  - a. Power off the system or partition.
  - b. Remove all of the IOAs that you marked with an "X" on the Installed features in a PCI bridge set form. Be sure to record the card position of each IOA so that you can reinstall it in the same position later. To determine the remove and replace procedures for the IOAs, locate the IOA card positions in the FRU locations and failing items table for the frame type that you recorded.
  - c. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

**Yes:** Continue with the next step.

**No:** Power off the system or partition. Go to step 7 on page 109.
4. Perform the following:
  - a. Power off the system or partition.
  - b. Exchange the IOP that is indicated in the DSA. Be sure to record the card position of the IOP so that you can reinstall it in the same position later. To determine the exchange procedure for the IOP, locate the IOP's card position in the FRU locations and failing items table for the frame type you recorded.
  - c. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

**No:** Continue with the next step.

**Yes:** Go to step 11 on page 109.
5. Perform the following:
  - a. Power off the system or partition.
  - b. Install all of the IOAs that you removed in step 3. Be sure to install them in their original positions.
  - c. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

**Yes:** Continue with the next step.

**No:** Perform "Verifying a high-speed link, system PCI bus, or a multi-adapter bridge repair" on page 76.

**This ends the procedure.**
6. Perform the following:
  - a. Power off the system or partition.
  - b. Remove all of the IOAs that you marked with an "X" on the Installed features in a PCI bridge set form. Be sure to record the card position of each IOA so that you can reinstall it in the same position later.

- c. Remove the IOP that you exchanged and install the original IOP in its original position. Continue with the next step.
7. Perform the following:
  - a. Reinstall, in its original position, one of the IOAs that you removed.
  - b. Power on the system or partition.Does the reference code or failure that sent you to this procedure occur?

**Yes:** The IOA that you just installed is the failing FRU. Continue with the next step.

**No:** Power off the system or partition. Repeat step 7 for another one of the IOAs that you removed. If you have reconnected all of the IOAs and the reference code or failure that sent you to this procedure does not occur, the problem is intermittent; contact your next level of support.

**This ends the procedure.**
8. Perform the following:
  - a. Power off the system or partition.
  - b. Exchange the I/O adapter card that you last installed. Be sure to install the new I/O adapter card in the same position.
  - c. Power on the system or partition.Does the reference code or failure that sent you to this procedure occur?

**No:** Continue with the next step.

**Yes:** Call your next level of support.

**This ends the procedure.**
9. Perform the following:
  - a. Power off the system or partition.
  - b. Reinstall, in their original positions, the remaining I/O adapter cards that you removed.Does the reference code or failure that sent you to this procedure occur?

**Yes:** Call your next level of support.

**This ends the procedure.**

**No:** Continue with the next step.
10. Does a different reference code occur?

**Yes:** Return to “Start of call procedure” on page 2 and follow the service procedures for the new reference code.

**This ends the procedure.**

**No:** Perform “Verifying a high-speed link, system PCI bus, or a multi-adapter bridge repair” on page 76.

**This ends the procedure.**
11. The problem is the multi-adapter bridge. Perform the following to determine which FRU contains the multi-adapter bridge that controls the IOP in the DSA.:
  - a. Power off the system or partition.
  - b. Locate the card position table for the frame type that you recorded.
  - c. Using the multi-adapter bridge number that you recorded, search for the multi-adapter bridge function number “F” in the card position table to determine the card position of the multi-adapter bridge’s FRU.Have you already exchanged the multi-adapter bridge’s FRU?

**No:** Continue with the next step.

**Yes:** Call your next level of support.

**This ends the procedure.**
12. Perform the following:
  - a. Remove the IOP that you exchanged.

- b. Exchange the multi-adapter bridge's FRU at the card position that you determined for it. To determine the exchange procedure for the multi-adapter bridge's FRU, locate the FRU's card position in the FRU locations and failing items table for the frame type that you recorded.
- c. Install the original IOP in its original position.
- d. Install all of the other IOPs and IOAs into their original positions. Do not install the IOAs that you were instructed to remove in step 3 on page 108.
- e. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

**No:** Continue with the next step.

**Yes:** Call your next level of support.

**This ends the procedure.**

13. Perform the following:

- a. Install all of the IOAs that you removed in step 3 on page 108. Be sure to install them in their original positions.
- b. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

**No:** The problem has been resolved.

**This ends the procedure.**

**Yes:** Call your next level of support.

**This ends the procedure.**

#### **MABIP55:**

**Attention:** This procedure is for use with i5/OS only. Go to "PCI bus isolation using AIX, Linux, or the HMC" on page 75 to isolate a PCI bus problem from AIX, Linux, or the HMC.

This procedure will isolate a failing I/O adapter. The procedure will iterate through each IOA without an IOP, then each IOA under the IOP, powering each one off, and then resetting the IOP. This process will be repeated until the failing IOA is isolated.

1. If the system is not IPLed, will it IPL to DST?

**No:** Perform "MABIP54" on page 107. **This ends the procedure.**

**Yes:** From the SAL display for the reference code, record the count. Continue with the next step.

2. Go to the SST/DST display in the partition which reported the problem. Use STRSST if i5/OS is running; use function 21 if STRSST does not work; or IPL the partition to DST.
3. On the Start Service Tools Sign On display, type in a user ID with QSRV authority and password.
4. Select **Start a service tool > Hardware service manager > Logical hardware resources > System bus resources.**
5. Is there a resource name logged in the SAL entry?

**No:** Continue with the next step.

**Yes:** Go to step 12 on page 111.

6. Do you have a location for the I/O processor?

**No:** Record the Direct Select Address (DSA), word 7 of the reference code, from the SAL display. Then continue with the next step.

**Yes:** Go to step 10 on page 111.

7. Return to the HSM System bus resources display.
8. Locate the I/O processor by performing the following:
  - a. Select **Display detail.**
  - b. Compare the DSA with the bus, card, and board information for the IOP.

**Note:** The card information on the HSM display is in decimal format. You must convert the decimal card information to hexadecimal format to match the DSA format.

Decimal format	Hexadecimal format
16	10
17	11
18	12
19	13
20	14
21	15
22	16
23	17

- c. Repeat this step until you find the IOP with the same DSA.
9. Select **Cancel**, and then go to step 13.
10. Locate the I/O processor in HSM by performing the following for each IOP:
  - a. Select **Associated packaging resource(s) > Display detail**.
  - b. Repeat until you find the IOP with the same location.
11. Select **Cancel > Cancel** and go to step 13.
12. Page forward until you find the multi-adapter bridge and IOP where the problem exists. Verify that the multi-adapter bridge and IOP are correct by matching the resource name(s) on the display with the resource name(s) in the SAL for the problem you are working on.
13. For the IOP you are working on, select **Resources associated with IOP** (if the I/O adapters are not already displayed).
14. If there is an IOA that is listed in any state other than *"operational"*, then perform steps 15 through 18 on page 112, starting with the disabled IOA by moving the cursor to the disabled IOA. Otherwise, move the cursor to the first IOA that is assigned to the IOP.
15. Select **Associated packaging resource(s) > Concurrent maintenance > Power off domain**.  
Record the frame ID and location of the slot you are powering off. Did the domain power off successfully?
 

**No:** Choose from the following options:

  - If only one IOA was listed as failing, power down the system and replace the IOA. Re-IPL the system. If a different reference code occurred, go to "Start of call procedure" on page 2 and work that reference code. If there was no reference code, go to Verifying the repair. **This ends the procedure.**
  - If there were multiple failed IOAs and concurrent maintenance did not work on one, then move to the next failed IOA and repeat steps 15 through 18 on page 112.
  - If concurrent maintenance does not work for multiple failed IOAs, this procedure will not be able to identify a failing I/O adapter. Return to the procedure that sent you here. **This ends the procedure.**

**Yes:** Perform "MABIP05" on page 96 and then return here and continue with the next step.
16. Did the IOP reset and IPL successfully?
 

**No:** This procedure will not be able to identify a *failing* I/O adapter. Return to the procedure that sent you here. **This ends the procedure.**

**Yes:** Check for the same failure that sent you to this procedure. Check the system control panel, the SAL for the partition that reported the problem, or the Work with partition status display for the partition that reported the problem. In the SAL, the count will increase if the reference code occurred again. Continue with the next step.
17. Did the same reference code occur after the IOP was reset and IPL'd?

**No:** Go to step 19.

**Yes:** Perform the following:

- a. Go to the Hardware Service Manager display.
- b. Go to Packaging Hardware Resources.
- c. Power on the IOA by selecting **Power on domain**.
- d. Reassign the IOA to the IOP.
- e. Return to the HSL resource display, showing the IOP and associated resources.
- f. Continue with the next step.

18. Is there any other IOA, assigned to the IOP, that you have not already powered off and on?

**No:** Go to step 21.

**Yes:** Move the cursor to another IOA assigned to the IOP, choosing IOAs with a status of *"unknown"* or *"disabled"* before moving on to IOAs with a status of *"operational"*. Go to step 15 on page 111.

19. The failing IOA is located. Exchange the I/O adapter that you just powered off. Use the location you recorded in step 15 on page 111 to locate the IOA.

20. Power on the IOA that you just exchanged. Does the same reference code that sent you to this procedure still occur?

**Yes:** The IOA is **not** the failing item. Remove the IOA and reinstall the original IOA. Continue with the next step.

**No:** You have exchanged the failing IOA. Go to "Verifying a high-speed link, system PCI bus, or a multi-adapter bridge repair" on page 76. **This ends the procedure.**

21. No failing IOAs were identified. Return to the procedure that sent you here. **This ends the procedure.**

**MABIP02:** Use this procedure to determine if the multi-adapter bridge is failing when the symbolic FRU PIOCARD is in the failing item list, with other failing items that have a multi-adapter bridge as a component. The procedure will start with the failing item list for the SRC that sent you here. It will determine if PIOCARD should be removed from the failing item list that you are working in.

Use the Service Action Log (SAL) to check for other errors under the same multi-adapter bridge. See "Using the Service Action Log" on page 24 for details.

1. Were you able to obtain a location for the PIOCARD FRU from the SAL?

**Yes:** Go to step 5.

**No:** Find the SRC in the SAL and record the Direct Select Address (DSA) in word 7. See "Breaking down a RIO/HSL or PCI bus reference code" on page 61 to find the DSA in the SRC. Then continue with the next step.

2. Record the Bus number (**BBBB** part) of the DSA and the Multi-adapter bridge number of the DSA.

The multi-adapter bridge number is the first character of the card identifier part (Cc) in the DSA. See "Breaking down a RIO/HSL or PCI bus reference code" on page 61 to find the DSA in the SRC.

3. Go to "MABIP53" on page 105 to determine the location of the PCI I/O Card in the failing item list. Return here and continue with the next step.

4. Using the card position table for the frame or I/O unit type that you recorded in "MABIP53" on page 105, determine which of the card positions within the frame or I/O unit are controlled by the same multi-adapter bridge that is controlling the PCI I/O card for which you determined the location in step 3. See "Card positions" on page 64. A card position is controlled by the same multi-adapter bridge if it has the same bus number and multi-adapter bridge number as the PCI I/O Card that you located in step 3. Record the card position and the DSA from the card position table for each card position that is controlled by the same multi-adapter bridge.

5. Look in the SAL for other failures in the same I/O unit that are located in any of the card positions that either you recorded in step 4 or that are listed in the SAL with the PIOCARD FRU.

6. Are there any other failures within the same I/O unit that correspond with any of the card positions that you recorded in step 4 on page 112 or that are listed in the SAL with the PIOCARD FRU?

**No:** Use the failing item list that you were using when you started this procedure.

**Yes:** The multi-adapter bridge is failing. Remove symbolic FRU PIOCARD from the list of failing items, it is not the failing FRU.

**MABIP03:** Use this procedure to isolate a failing I/O processor or I/O adapter under a multi-adapter bridge. The PCI cards will all be in a PCI bridge set. The serviceable event view you are working with may have all the PCI adapter locations for the PCI bridge set listed. The procedure will iterate through each IOP under the multi-adapter bridge, powering each one off, and then resetting the multi-adapter bridge. This process will be repeated until the failing part is isolated.

1. Does the system IPL to DST?

**Yes:** Go to the SST/DST display in the partition which reported the problem:

- If i5/OS is running, use STRSST.
- If STRSST does not work, use function 21.
- Or IPL the partition to DST.

Then, continue with the next step.

**No:** Perform “MABIP04” on page 114. **This ends the procedure.**

2. On the Start Service Tools Sign On display, type in a user ID with service authority and password.
3. Select **Start a service tool > Hardware service manager > Logical hardware resources > System bus resources.**
4. The resource name may be in the serviceable event view or you may have determined the resource name already in another procedure. Do you have the resource name where the problem was reported?

**Yes:** Continue with the next step.

**No:** Perform the following:

  - a. Record the bus number, which is the first four characters of word 7 in the SRC.
  - b. Convert the bus number from hexadecimal to decimal format using a calculator or similar tool that provides a conversion function.
  - c. Select **Display Details** for each system bus until you locate the bus with a matching decimal bus number. The multi-adapter bridge that reported the problem is a resource on that bus. Continue with the next step.
5. Page forward until you find the multi-adapter bridge where the problem was reported (for help with identifying the multi-adapter bridge from reference code, see “DSA translation” on page 62). Verify that the multi-adapter bridge is the correct one by matching the resource name on the display with the resource name in the Service Action Log (SAL) for the problem that you are working on.
6. Select **Include non-reporting resources.**
7. Move the cursor to the first IOP under the multi-adapter bridge.
8. For each IOP that is under the multi-adapter bridge that you are working on, select **Associated packaging resource(s) > Display detail.**
9. Record the location of the I/O processor (IOP).
10. Select **Cancel > Cancel.**
11. Select **Resources associated with IOP.**
12. For each I/O adapter under the IOP, perform the following:
  - a. Select **Associated packaging resource(s) > Display detail.**
  - b. Record the location. Then continue with the next step.
13. Perform the following:
  - a. Power off the frame or expansion unit (see Powering on and powering off).

- b. Remove one of the IOPs and all of its IOAs.
- c. Power on the frame or expansion unit (see Powering on and powering off).

Check for the same failure that brought you to this procedure. Check the system control panel, the Service Action Log (SAL) for the partition which reported the problem, or the Work with partition status display for the partition that reported the problem. Did the same SRC appear after the frame or expansion unit was powered on?

**Yes:** Continue with the next step.

**No:** Go to step 15.

14. Perform the following:
- a. Power on the frame or expansion unit (see Powering on and powering off).
  - b. Return to the System bus resources display showing the multi-adapter bridge and the associated resources.

Is there another IOP under the multi-adapter bridge?

**No:** Go to step 17.

**Yes:** Go to step 13 on page 113.

15. The failing item is either the I/O processor or one of the I/O adapters that it controls. Perform the following:
- a. Reinstall the IOP and I/O adapters that you just removed.
  - b. Perform “MABIP06” on page 96.
  - c. If you are unable to identify a failing I/O adapter with “MABIP06” on page 96, then return here and continue with the next step in this procedure.
16. Perform the following:
- a. Exchange the I/O processor that you identified in step 15.
  - b. Power on the frame or expansion unit (see Powering on and powering off).

Does the same SRC that sent you to this procedure occur?

**No:** The failing item was the IOP that you just exchanged. Reinstall all of the other IOPs and I/O adapters that you removed during this procedure. Go to “Verifying a high-speed link, system PCI bus, or a multi-adapter bridge repair” on page 76. **This ends the procedure.**

**Yes:** The failing item is the FRU containing the multi-adapter bridge which controls this IOP. Continue with the next step.

17. There are no failing IOPs. The failing item is the FRU containing the multi-adapter bridge that controls this IOP. Perform the following:
- a. Power off the system or expansion unit that you are working in (see Powering on and powering off).
  - b. Exchange the FRU containing the multi-adapter bridge using symbolic FRU “MA\_BRDG” on page 508.
  - c. Power on the system or expansion unit that you are working in (see Powering on and powering off).

Does the same SRC that sent you to this procedure occur?

**No:** The failing item was the multi-adapter bridge FRU that you just exchanged. Reinstall all of the other IOPs and I/O adapters that you removed during this procedure. Go to “Verifying a high-speed link, system PCI bus, or a multi-adapter bridge repair” on page 76. **This ends the procedure.**

**Yes:** Contact your next level of support. **This ends the procedure.**

**MABIP04:** Use this procedure to isolate a failing PCI I/O processor (IOP) card from a reference code, when the system or logical partition will not IPL.



**Attention:** The exchange procedure of all FRUs in this procedure must be performed using dedicated maintenance.

1. Determine the PCI bridge set by performing the following:
  - a. Record the bus number (BBBB), the multi-adapter bridge number (C), and the multi-adapter bridge function number (c) from the Direct Select Address (DSA) in word 7 of the reference code in the SAL entry (see "DSA translation" on page 62 for help in determining these values).
  - b. Use the bus number that you recorded and the System Configuration Listing, or ask the customer, to determine what frame the bus is in. Record the frame type where the bus is located.
  - c. The PCI bridge set is the group of card positions controlled by the same multi-adapter bridge on the bus that you recorded. Use the System Configuration Listing, the card position table for the frame type that you recorded, the bus number, and the multi-adapter bridge number to determine the PCI bridge set where the failure occurred.
  - d. Print out the Installed features in a PCI bridge set form to use in the following steps.
  - e. Using the card position table, record the PCI bridge set card positions and multi-adapter bridge function numbers in the form.
  - f. Examine the PCI bridge set in the frame, and record the information in the form for all of the positions with IOP and IOA cards installed in them.
  - g. In the form, start at the top row and search down the "IOP" or "IOA" column (increasing multi-adapter bridge function numbers) and mark each IOP with an "X" until you hit the bottom of the column. The IOPs that you marked with "X" are all under the control of the multi-adapter bridge indicated in the DSA.
2. Did the reference code appear on the system control panel (this would happen if the system does not have multiple partitions)?

**No:** When this procedure instructs you to power off and power on the system or partition, power off or power on **only** the partition that reported the problem. Then use HSM concurrent maintenance to power off the card positions that you are instructed to work with. The exchange procedures for those positions will guide you through the HSM concurrent maintenance functions. This procedure will guide you to the correct exchange procedure for each card position that you are instructed to work with. Continue with the next step.

**Yes:** This procedure instructs you to power off and power on the system or partition with the problem. Perform that function as you would normally power off and power on the system. Continue with the next step.

3. Power off the system or partition.
4. Remove all the IOPs you marked with an "X" and all the IOAs in the form. Be sure to record the card position of each IOP and IOA so that you can reinstall it in the same position later. To determine the exchange procedures for the IOPs and IOAs, locate the card positions in the FRU locations and failing items table for the frame type you recorded (see Finding part locations).
5. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?
6. Starting at the empty card position with the lowest multi-adapter bridge function number from the form, reinstall, in their original positions, one of the IOPs and all the IOAs between it and the next IOP.
7. Power on the system or partition. Does the reference code or failure that sent you to this procedure occur?

**Yes:** The IOP that you just installed is the failing FRU. Continue with the next step.

**No:** Power off the system or partition. Repeat step 6 for another one of the I/O processor cards that you removed. If you have reconnected all of the IOPs and the reference code or failure that sent you to this procedure does not occur, the problem is intermittent (see "Intermittent problems" on page 36). **This ends the procedure.**

8. Power off the system or partition.
9. Exchange the I/O processor card you last installed. Be sure to install the new I/O processor card in the same position.
10. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

**No:** Power off the system or partition. Then continue with the next step.

**Yes:** Remove the IOP that you just installed and replace the original IOP in its original position. Perform “MABIP07” on page 98. **This ends the procedure.**
11. Reinstall, in their original positions, the remaining IOP and IOA cards that you removed.

Does the reference code or failure that sent you to this procedure occur?

**Yes:** Call your next level of support. **This ends the procedure.**

**No:** Continue with the next step.
12. Does a different reference code occur?

**Yes:** Follow the service procedures for the new reference code (go to “Start of call procedure” on page 2). **This ends the procedure.**

**No:** Perform “Verifying a high-speed link, system PCI bus, or a multi-adapter bridge repair” on page 76. **This ends the procedure.**
13. Power off the system or partition.
14. Determine which FRU contains the multi-adapter bridge that controls the IOP in the DSA by locating the card position table for the frame type that you recorded. Using the multi-adapter bridge number that you recorded, search for the multi-adapter bridge function number “F” in the card position table to determine the card position of the multi-adapter bridge’s FRU.
15. Have you already exchanged the multi-adapter bridge’s FRU?

**No:** Remove the IOP that you exchanged. You will be reinstalling the original IOP later in this procedure. Then continue with the next step.

**Yes:** Call you next level of support. **This ends the procedure.**
16. Exchange the card multi-adapter bridge’s FRU at the card position that you determined for it. To determine the exchange procedure for the multi-adapter bridge’s FRU, locate the FRU’s card position in the FRU locations and failing items table for the frame type that you recorded (see Finding part locations).
17. Install all IOPs and IOAs in their original positions.
18. Power on the system or partition.

Does the reference code or failure that sent you to this procedure occur?

**No:** Perform “Verifying a high-speed link, system PCI bus, or a multi-adapter bridge repair” on page 76. **This ends the procedure.**

**Yes:** Call your next level of support. **This ends the procedure.**

### **Communication isolation procedure**

This topic contains the procedure necessary to isolate a communications failure. Please read and observe the following warnings when using this procedure.

## DANGER

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn everything OFF (unless instructed otherwise).
2. Remove power cords from the outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

To Connect:

1. Turn everything OFF (unless instructed otherwise)
2. Attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

(D005)

### “COMIP01”

**COMIP01:** Please read and observe the danger notices in “Communication isolation procedure” on page 116 before proceeding with this procedure.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions.
2. To determine which communications hardware to test, use the SRC from the problem summary form, or problem log. For details on line description information, see the Starting a Trace section of Work with communications trace.
3. Perform the following:
  - a. Vary off the resources.
  - b. On the Start a Service Tool display, select **Hardware service manager > Logical hardware resources > System bus resources > Resources associated with IOP** for the attached IOPs in the list until you display the suspected failing hardware.
  - c. Select **Verify** on the hardware you want to test. The **Verify** option may be valid on the IOP, IOA, or port resource. When it is valid on the IOP resource, any replaceable memory will be tested. Communications IOAs are tested by using the **Verify** option on the port resource.
4. Run the IOA/IOP test(s). This may include any of the following:

- Adapter internal test
- Adapter wrap test (requires adapter wrap plug - available from IBM or your hardware service provider).
- Processor internal test
- Memory test
- Serial/parallel port test

Does the IOA/IOP test(s) complete successfully?

**No:** The problem is in the IOA or IOP. If a verify test identified a failing memory module, replace the memory module. On multiple card combinations, exchange the IOA card before exchanging the IOP card. Exchange the failing hardware. See Removing and replacing parts. **This ends the procedure.**

**Yes:** The IOA/IOP is good. Do NOT replace the IOA/IOP. Continue with the next step.

5. Before running tests on modems or network equipment, the remaining local hardware should be verified. Since the IOA/IOP test(s) have completed successfully, the remaining local hardware to be tested is the external cable.

Is the IOA adapter type 2838, with a UTP (unshielded twisted pair) external cable?

**Yes:** Continue with the next step.

**No:** Go to step 8.

6. Is the RJ-45 connector on the external cable correctly wired according to the EIA/TIA-568A standard? That is,

- Pins 1 and 2 using the same twisted pair,
- Pins 3 and 6 using the same twisted pair,
- Pins 4 and 5 using the same twisted pair,
- Pins 7 and 8 using the same twisted pair.

**Yes:** Continue with the next step.

**No:** Replace the external cable with correctly wired cable. **This ends the procedure.**

7. Do the Line Speed and Duplex values of the line description (DSPLINETH) match the corresponding values for the network device (router, hub or switch) port?

**No:** Change the Line Speed and/or Duplex value for either the line description or the network device (router, hub or switch) port. **This ends the procedure.**

**Yes:** Go to step 9 on page 119.

8. Is the cable wrap test option available as a *Verify* test option for the hardware you are testing?

**Yes:** Verify the external cable by running the cable wrap test. A wrap plug is required to perform the test. This plug is available from IBM or your hardware service provider. Wrap plug part numbers can be found in Miscellaneous parts.

Does the cable wrap test complete successfully?

**Yes:** Continue with the next step.

**No:** The problem is in the cable. Exchange the cable. **This ends the procedure.**

**No:** The communications IOA/IOP is not the failing item. One of the following could be causing the problem.

- External cable.
- The network.
- Any system or device on the network
- The configuration of any system or device on the network.
- Intermittent problems on the network.
- A new SRC - go to "Start of call procedure" on page 2 or ask your next level of support for assistance.

Work with the customer or your next level of support to correct the problem. **This ends the procedure.**

9. All the local hardware is good. This completes the local hardware verification. The communications IOA/IOP and/or external cable is not the failing item.

One of the following could be causing the problem:

- The network
- Any system or device on the network
- The configuration of any system or device on the network
- Intermittent problems on the network
- A new SRC - go to "Start of call procedure" on page 2 or ask your next level of support for assistance

Work with the customer or your next level of support to correct the problem. **This ends the procedure.**

## Disk unit isolation procedure

This page contains the procedure to isolate a failure in a disk unit.

Please read and observe all safety procedures before servicing the system and while performing the isolation procedure below.

**Attention:** Unless instructed otherwise, always power off the system or expansion tower where the FRU is located, (see Powering on and powering off) before removing, exchanging, or installing a field-replaceable unit (FRU).

### "DSKIP03"

**DSKIP03:** Use this procedure to determine the reference code, which is used to isolate a problem and to determine the failing device.

**Note:** When exchanging a disk unit, go to the Disk unit recovery procedures.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions.
2. Look in the Service action log (see The Service Action Log (SAL)) for other errors logged at or around the same time as the 310x SRC. If no entries appear in the service action log, use the product activity log (see Product activity log). Use the other SRCs to correct the problem (see List of system reference codes) before performing an IPL. Contact your next level of support as necessary for assistance with SCSI bus problem isolation. If the problem is not corrected, continue with the next step.
3. Perform an IPL to dedicated service tool (DST). See Dedicated Service Tools (DST).

Does an SRC appear on the control panel?

**Yes:** Go to step 6 on page 120.

**No:** Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear?

**Yes:** Continue with the next step.

**No:** Go to step 5 on page 120.

4. Does one of the following messages appear in the list?

- Missing disk units in the configuration
- Missing mirror protection disk units in the configuration
- Device parity protected units in exposed mode

**No:** Continue with the next step.

**Yes:** Select option 5, press F11, and then press **Enter** to display the details.

If all of the reference codes are 0000, go to “LICIP11” on page 136 and use cause code 0002. If any of the reference codes are not 0000, go to step 6 and use the reference code that is not 0000.

**Note:** Use the characters in the *Type* column to find the correct reference code table.

5. Does the Display Failing System Bus display appear?

**No:** Look at all the Product activity logs by selecting **Product activity log** under DST (see Dedicated Service Tools (DST)). If there is more than one SRC logged, use an SRC that is logged against the IOP or IOA.

Is an SRC logged as a result of this IPL?

**Yes:** Continue with the next step.

**No:** You cannot continue isolating the problem. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure. See the failing item list for this reference code in the List of system reference codes. If the failing item list contains FI codes, see “Using failing item codes” on page 430 to help determine part numbers and location in the system. **This ends the procedure.**

**Yes:** Use the reference code that is displayed under *Reference Code* to correct the problem. **This ends the procedure.**

6. Record the SRC on the Problem summary form (see Problem reporting forms).

Is the SRC the same one that sent you to this procedure?

**Yes:** Continue with the next step.

**No:** Go to “Start of call procedure” on page 2 to correct the problem. **This ends the procedure.**

7. Perform the following:

- a. Power off the system or expansion tower. See Powering on and powering off.
- b. See “Using failing item codes” on page 430 to find the devices identified by FI code FI01106.
- c. Disconnect one of the disk units, (other than the load-source disk unit), the tape units, or the optical storage units that are identified by FI code FI01106. Slide it partially out of the system.

**Note:** Do not disconnect the load-source disk unit, although FI code FI01106 may identify it.

8. Power on the system or the expansion tower that you powered off.

Does an SRC appear on the control panel?

**No:** Continue with the next step.

**Yes:** Go to step 12 on page 121.

9. Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear with one of the following listed?

- Missing disk units in the configuration
- Missing mirror protection disk units in the configuration
- Device parity protected units in exposed mode

**Yes:** Continue with the next step.

**No:** Go to step 11.

10. Select option 5, press **F11**, and then press **Enter** to display details.

Does an SRC appear in the Reference Code column?

**No:** Continue with the next step.

**Yes:** Go to step 12 on page 121.

11. Look at all the Product activity logs by selecting **Product activity log** under DST.

Is an SRC logged as a result of this IPL?

**Yes:** Continue with the next step.

**No:** The last device you disconnected is the failing item. Exchange the failing device and reconnect the devices that were disconnected previously.

**Note:** Before exchanging a disk drive, you should attempt to save customer data. See the i5/OS data recovery information.

**This ends the procedure.**

12. Record the SRC on the Problem summary form. See Problem reporting forms.

Is the SRC the same one that sent you to this procedure?

**No:** Continue with the next step.

**Yes:** The last device you disconnected is not the failing item.

- a. Leave the device disconnected and go to step 7 on page 120 to continue isolation.
- b. If you have disconnected all devices that are identified by FI code FI01106 except the load-source disk unit, reconnect all devices. Then, go to step 15.

13. Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear with one of the following listed?

- Missing disk units in the configuration
- Missing mirror protection disk units in the configuration
- Device parity protected units in exposed mode

**Yes:** Continue with the next step.

**No:** Use the reference code to correct the problem. **This ends the procedure.**

14. Select option 5, press **F11**, and then press **Enter** to display details.

Are all the reference codes 0000?

**No:** Use the reference code to correct the problem. **This ends the procedure.**

**Yes:** The last device you disconnected is the failing item.

- a. Reconnect all devices except the failing item.
- b. Before exchanging a disk unit, go to the disk unit go to the Removing and replacing parts for the model you are working on. **This ends the procedure.**

15. Was disk unit 1 (the load-source disk unit) a failing item that FI code FI01106 identified?

**Yes:** The failing items that FI code FI01106 identified are not failing. The load-source disk unit may be failing. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure (see the failing item list for this reference code in the List of system reference codes. If the failing item list contains FI codes, see "Using failing item codes" on page 430 to help determine part numbers and location in the system. **This ends the procedure.**

**No:** The failing items that FI code FI01106 identified are not failing. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure. See the failing item list for this reference code in the List of system reference codes. If the failing item list contains FI codes, see "Using failing item codes" on page 430 to help determine part numbers and location in the system. **This ends the procedure.**

## Intermittent isolation procedures

### DANGER

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn everything OFF (unless instructed otherwise).
2. Remove power cords from the outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

To Connect:

1. Turn everything OFF (unless instructed otherwise)
2. Attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

(D005)

Use these procedures to correct an intermittent problem, if other problem analysis steps or tables sent you here. Only perform the procedures that apply to your system.

Read all safety procedures before servicing the system. Observe all safety procedures when performing a procedure. Unless instructed otherwise, always power off the system or expansion unit where the FRU is located. See Powering on and powering off before removing, exchanging, or installing a field-replaceable unit (FRU).

Use the procedure below to identify intermittent problems and the associated corrective actions.

**“INTIP03 External noise on ac voltage lines” on page 123**

**“INTIP05 External noise on twinaxial cables” on page 124**

**“INTIP07 Electromagnetic interference (EMI)” on page 124**

**“INTIP08 Grounding” on page 125**

**“INTIP09 Utility power and battery power units” on page 126**



“INTIP14 Station protectors” on page 128

“INTIP16 Licensed Internal Code” on page 128

“INTIP18 PTFs not installed” on page 128

“INTIP20 Performance problems” on page 128

“INTIP24 Service processor data collection” on page 129

**INTIP03 External noise on ac voltage lines:** Electrical noise on incoming ac voltage lines can cause various system failures. The most common source of electrical noise is lightning.

#### **DANGER**

**Electrical voltage and current from power, telephone, and communication cables are hazardous.**

**To avoid a shock hazard:**

- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.**
- **Connect any equipment that will be attached to this product to properly wired outlets.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.**

**To Disconnect:**

- 1. Turn everything OFF (unless instructed otherwise).**
- 2. Remove power cords from the outlet.**
- 3. Remove signal cables from connectors.**
- 4. Remove all cables from devices.**

**To Connect:**

- 1. Turn everything OFF (unless instructed otherwise)**
- 2. Attach all cables to devices.**
- 3. Attach signal cables to connectors.**
- 4. Attach power cords to outlet.**
- 5. Turn device ON.**

**(D005)**

1. Ask the customer if an electrical storm was occurring at the time of the failure to determine if lightning could have caused the failure.

Could lightning have caused the failure?

**No:** Go to step 3 on page 124.

**Yes:** Continue with the next step.

2. Determine if lightning protection devices are installed on the incoming ac voltage lines where they enter the building. There must be a dedicated ground wire from the lightning protection devices to earth ground.

Are lightning protection devices installed?

**Yes:** Continue with the next step.

**No:** Lightning may have caused the intermittent problem. Recommend that the customer install lightning protection devices to prevent this problem from recurring. **This ends the procedure.**

3. Have an installation planning representative perform the following:
  - a. Connect a recording ac voltage monitor to the incoming ac voltage lines of the units that contain the failing devices with reference to ground.
  - b. Set the voltage monitor to start recording at a voltage slightly higher than the normal incoming ac voltage.

Does the system fail again with the same symptoms?

**No: This ends the procedure.**

**Yes:** Continue with the next step.

4. Look at the recording and see if the voltage monitor recorded any noise when the failure occurred. Did the monitor record any noise when the failure occurred?

**Yes:** Review with the customer what was happening external to the system when the failure occurred. This may help you to determine the source of the noise. Discuss with the customer what to do to remove the noise or to prevent it from affecting the server. **This ends the procedure.**

**No:** Perform the next intermittent isolation procedure listed in the *Isolation procedure* column. **This ends the procedure.**

**INTIP05 External noise on twinaxial cables:** Electrical noise on twinaxial cables that are not installed correctly may affect the twinaxial workstation I/O processor card. Examples of this include open shields on twinaxial cables, and station protectors that are not being installed where necessary.

Check for the following on the system:

- There must be no more than 11 connector breaks in a twinaxial cable run.
- Station protectors must be installed (in pairs) where a cable enters or leaves a building.
- There can only be two station protectors for each twinaxial run.
- There is a maximum of seven devices (with addresses 0-6) for each cable run.
- There is a maximum cable length of 1524 meters (5000 feet) for each port.
- All cable runs must be ended (terminated).
- Disconnect all twinaxial cables that are not used.
- Remove any cause of electrical noise in the twinaxial cables.
- All workstations must be grounded.

**This ends the procedure.**

**INTIP07 Electromagnetic interference (EMI):** Use this procedure to lessen the effects of electrical noise on the system.

1. Ensure that air flow cards are installed in all adapter card slots that are not used.
2. Keep all cables away from sources of electrical interference, such as ac voltage lines, fluorescent lights, arc welding equipment, and radio frequency (RF) induction heaters. These sources of electrical noise can cause the system to become powered off.
3. If you have an expansion unit, ensure that the cables that attach the system unit to the expansion unit are seated correctly.

**Note:** If the failures occur when people are close to the system or machines that are attached to the system, the problem may be electrostatic discharge (ESD).

4. Have an **installation planning representative** use a radio frequency (RF) field intensity meter to determine if there is an unusual amount of RF noise near the server. You also can use it to help determine the source of the noise. **This ends the procedure.**

**INTIP08 Grounding:** Use this procedure to ensure that the system is electrically grounded correctly.

1. Have an **installation planning representative** or an electrician (when necessary), perform the following steps.
2. Power off the server and the power network branch circuits before performing this procedure.
3. Ensure the safety of personnel by making sure that all electrical wiring in the United States meets National Electrical Code requirements.
4. Check *all* system receptacles to ensure that each one is wired correctly. This includes receptacles for the server and all equipment that attaches to the server, including workstations. Do this to determine if a wire with primary voltage on it is swapped with the ground wire, causing an electrical shock hazard.
5. For each unit, check continuity from a conductive area on the frame to the ground pin on the plug. Do this at the end of the mainline ac power cable. The resistance must be 0.1 ohm or less.
6. Ground continuity must be present from each unit receptacle to an effective ground. Therefore, check the following:
  - The ac voltage receptacle for each unit must have a ground wire connected from the ground terminal on the receptacle to the ground bar in the power panel.
  - The ground bars in all branch circuit panels must be connected with an insulated ground wire to a **ground point**, which is defined as follows:
    - The nearest available metal cold water pipe, only if the pipe is effectively grounded to the earth (see *National Electric Code* Section 250-81, in the United States).
    - The nearest available steel beams in the building structure, only if the beam is effectively grounded to the earth.
    - Steel bars in the base of the building or a metal ground ring that is around the building under the surface of the earth.
    - A ground rod in the earth (see *National Electric Code* Section 250-83, in the United States).

**Note:** For installations in the United States only, by National Electrical Code standard, if more than one of the preceding grounding methods are used, they must be connected together electrically. See *National Electric Code* Section 250, for more information on grounding.

- The grounds of all separately derived sources (uninterruptable power supply, service entrance transformer, system power module, motor generator) must be connected to a **ground point** as defined above.
- The service entrance ground bar must connect to a **ground point** as defined above.
- All ground connections **must be tight**.
- Check continuity of the ground path for each unit that is using an ECOS tester, Model 1023-100. Check continuity at each unit receptacle, and measure to the **ground point** as defined above. The total resistance of each ground path must be 1.0 ohm or less. If you cannot meet this requirement, check for faults in the ground path.
- Conduit is sometimes used to meet wiring code requirements. If conduit is used, the branch circuits must still have a green (or green and yellow) wire for grounding as stated above.

**Note:** The ground bar and the neutral bar must never be connected together in branch circuit power panels.

The ground bar and the neutral bar in the power panels that make up the electrical power network for the server must be connected together. This applies to the first electrically isolating unit that is found in the path of electrical wiring from the server to the service entrance power panel. This isolating unit is sometimes referred to as a **separately derived source**. It can be an uninterruptable power supply, the system power module for the system, or the service entrance

transformer. If the building has none of the above isolating units, the ground bar and the neutral bar must be connected together in the service entrance power panel.

7. Look inside all power panels to ensure the following:
  - There is a separate ground wire for each unit.
  - The green (or green and yellow) ground wires are connected only to the ground bar.
  - The ground bar inside each power panel is connected to the frame of the panel.
  - The neutral wires are connected only to the neutral bar.
  - The ground bar and the neutral bar are not connected together, except as stated in step 6 on page 125.
8. For systems with more than one unit, ensure that the ground wire for each unit is not connected from one receptacle to the next in a string. Each unit must have its own ground wire, which goes to the power source.
9. Ensure that the grounding wires are insulated with green (or green and yellow) wire at least equal in size to the phase wires. The grounding wires also should be as short as possible.
10. If extension-mainline power cables or multiple-outlet power strips are used, make sure that they must have a three-wire cable. One of the wires must be a ground conductor. The ground connector on the plug must not be removed. This applies to any extension mainline power cables or multiple-outlet power strips that are used on the server. It also applies for attaching devices such as personal computers, workstations, and modems.

**Note:** Check all extension-mainline power cables and multiple-outlet power strips with an ECOS tester and with power that is applied. Ensure that no wires are crossed (for example, a ground wire crossed with a wire that has voltage on it).

11. For more information on grounding, see Power quality in the Planning topic. **This ends the procedure.**

**INTIP09 Utility power and battery power units:** Use this procedure to check the ac electrical power for the system.

1. Have an **installation planning representative** or an electrician (when necessary), perform the following steps.
2. Power off the server and the power network branch circuits before performing this procedure (see Powering on and powering off).
3. To ensure the safety of personnel, all electrical wiring in the United States must meet National Electrical Code requirements.
4. Check **ALL** system receptacles to ensure that each is wired correctly. This includes receptacles for the server and all equipment that attaches to the server, including workstations. Do this to determine if a wire with primary voltage on it has been swapped with the ground wire, causing an electrical shock hazard.
5. When three-phase voltage is used to provide power to the server, correct balancing of the load on each phase is important. The units should be connected so that all three phases are used equally.
6. The power distribution neutral must return to the "separately derived source" (uninterruptable power supply, service entrance transformer, system power module, motor generator) through an insulated wire that is the same size as the phase wire or larger.
7. The server and its attached equipment should be the only units that are connected to the power distribution network that the server gets its power.
8. The equipment that is attached to the server, such as workstations and printers, must be attached to the power distribution network for the server when possible.
9. Check all circuit breakers in the network that supply ac power to the server as follows:
  - Ensure that the circuit breakers are installed tightly in the power panel and are not loose.
  - Feel the front surface of each circuit breaker to detect if it is warm. A warm circuit breaker may be caused by:

- The circuit breaker that is not installed tightly in the power panel.
  - The contacts on the circuit breaker that is not making a good electrical connection with the contacts in the power panel.
  - A defective circuit breaker.
  - A circuit breaker of a smaller current rating than the current load which is going through it.
  - Devices on the branch circuit which are using more current than their rating.
10. Equipment that uses a large amount of current, such as: Air conditioners, copiers, and FAX machines, should not receive power from the same branch circuits as the system or its workstations. Also, the wiring that provides ac voltage for this equipment should not be placed in the same conduit as the ac voltage wiring for the server. The reason for this is that this equipment generates ac noise pulses. These pulses can get into the ac voltage for the server and cause intermittent problems.
11. Measure the ac voltage to each unit to ensure that it is in the normal range.  
Is the voltage outside the normal range?

**No:** Continue with the next step.

**Yes:** Contact the customer to have the voltage source returned to within the normal voltage range.

12. *The remainder of this procedure is only for a server that is attached to a separately derived source.*

Some examples of separately derived sources are an uninterruptable power supply, a motor generator, a service entrance transformer, and a system power module.

The ac voltage system must meet all the requirements that are stated in this procedure and also all of the following:

**Notes:**

- a. The following applies to an uninterruptable power supply, but it can be used for any separately derived source.
- b. System upgrades **must not** exceed the power requirements of your derived source.

The uninterruptable power supply must be able to supply the peak repetitive current that is used by the system and the devices that attach to it. The uninterruptable power supply can be used over its maximum capacity if it has a low peak repetitive current specification, and the uninterruptable power supply is already fully loaded. Therefore, a de-rating factor for the uninterruptable power supply must be calculated to allow for the peak-repetitive current of the complete system. To help you determine the de-rating factor for an uninterruptable power supply, use the following:

**Note:** The peak-repetitive current is different from the "surge" current that occurs when the server is powered on.

The de-rating factor equals the crest factor multiplied by the RMS load current divided by the peak load current where the:

- Crest factor is the peak-repetitive current rating of the uninterruptable power supply that is divided by the RMS current rating of the uninterruptable power supply. If you do not know the crest factor of the uninterruptable power supply, assume that it is 1.414.
- RMS load current is the steady state RMS current of the server as determined by the power profile.
- Peak load current is the steady state peak current of the server as determined by the power profile.

For example, if the de-rating factor of the uninterruptable power supply is calculated to be 0.707, then the uninterruptable power supply must not be used more than 70.7% of its kVA-rated capacity. If the kVA rating of the uninterruptable power supply is 50 kVA, then the maximum allowable load on it is 35.35 kVA (50 kVA multiplied by 0.707).

When a three-phase separately derived source is used, correct balancing of the load as specified in step 5 on page 126 is *critical*. If the load on any one phase of an uninterruptable power supply is more than the load on the other phases, the voltage on all phases may be reduced.

13. If the system is attached to an uninterruptable power supply or motor generator, then check for the following:
  - The system and the attached equipment should be the only items that are attached to the uninterruptable power supply or motor generator. Equipment such as air conditioners, copiers, and FAX machines should not be attached to the same uninterruptable power supply, or motor generator that the system is attached.
  - The system unit console and the Electronic Customer Support modem must get ac voltage from the same uninterruptable power supply or motor generator to which the system is attached. **This ends the procedure.**

**INTIP14 Station protectors:** Station protectors must be installed on all twinaxial cables that leave the building in which the server is located. This applies even if the cables go underground, through a tunnel, through a covered outside hallway, or through a skyway. Station protectors help prevent electrical noise on these cables from affecting the server.

1. Look at the Product Activity Log to determine what workstations are associated with the failure.
2. Determine if station protectors are installed on the twinaxial cables to the failing workstations.

Are station protectors installed on the twinaxial cables to the failing workstations?

**Yes:** Perform the next intermittent isolation procedure listed in the *Isolation procedure* column. **This ends the procedure.**

**No:** You may need to install station protectors on the twinaxial cables to the failing workstations. **This ends the procedure.**

**INTIP16 Licensed Internal Code:** Sometimes a dump of main storage is needed to analyze the problem. The data on the dump is analyzed by Software Support to determine the cause of the problem and how to correct it.

1. Copy the main storage dump to tape. See Copying a dump in the Troubleshooting topic.
2. Ask your next level of support to determine for assistance. **This ends the procedure.**

**INTIP18 PTFs not installed:** One or more PTFs may be available to correct this specific problem.

1. Ensure that all PTFs that relate to the problem have been installed.

**Note:** Ensure that the latest platform LIC fix has been installed before you exchange a service processor.

2. Contact your next level of support for more information. **This ends the procedure.**

**INTIP20 Performance problems:** Use this procedure to analyze system performance problems.

1. Look in the Product Activity Log (PAL), ASM log, or HMC to determine if any hardware errors occurred at the same time that the performance problem occurred. Did any hardware problems occur at the same time that the performance problem occurred?

**Yes:** Go to "Start of call procedure" on page 2 and correct the hardware errors. **This ends the procedure.**

**No:** The performance problems are not related to hardware. Continue with the next step.

2. Perform the following steps:
  - a. Ask the customer if they have asked software support for any software PTFs that relate to this problem.
  - b. Recommend that the customer install a cumulative PTF package if they have not done so in the past three months.
  - c. Inform the customer that performance could possibly be improved by having Software Support analyze the conditions.

- d. Inform the customer that IBM has performance tools. Contact Software Support for more information. **This ends the procedure.**

#### **INTIP24 Service processor data collection:**

The service processor reported a suspected intermittent problem. It is important that you collect data for this problem so that the problem can be corrected. Use this procedure to collect the data.

There are several ways the system can display the SRC. Follow the instructions for the correct display method, defined as follows:

- If this SRC is displayed in the Product Activity Log (PAL) or ASM log, then record all of the SRC data words, save all of the error log data, and contact your next level of support to submit an APAR.
- If the control panel is displaying SRC data words scrolling automatically through control panel functions 11, 12 and 13, and the control panel user interface buttons are not responding, then perform "FSPSP02" on page 202 instead of using this procedure.
- If the SRC is displayed at the control panel, and the control panel user interface buttons respond normally, then record all of the SRC words.

Do not perform an IPL until you perform a storage dump of the service processor. To get a storage dump of the service processor, perform the following:

1. Record the complete system reference code (SRC) (functions 11 through 20) on the Problem reporting forms.
2. Perform a service processor dump. See Performing a main storage or platform dump in the Troubleshooting topic.
3. Is a display shown on the console?  
**Yes:** Continue with the next step.  
**No:** The problem is not intermittent. Choose from the following options:
  - If you were sent here from Reference codes, return there and follow the procedure for a problem that is not intermittent.
  - If the problem continues, replace the service processor hardware. See symbolic FRU "SVCPROC" on page 547. **This ends the procedure.**
4. The problem is intermittent. Copy the IOP dump to tape. See Performing a main storage or platform dump in the Troubleshooting topic.
5. Complete the IPL.
6. Go to the "General intermittent problem checklist" on page 38 to find available program temporary fixes (PTFs) for this problem.
7. If you need to apply a PTF, see Getting fixes in the Customer Service and support information. Then, return here and answer the following question.

Did you find and apply a PTF for this problem?

**Yes: This ends the procedure.**

**No:** Record the following information, and contact your next level of support.

- The complete SRC you recorded in this procedure
- The service processor dump to tape you obtained in step 4.
- All known system symptoms:
  - How often the intermittent problem occurs
  - System environment (IPL, certain applications)
  - If necessary, other SRCs that you suspect relate to the problem
- Information needed to write an LICTR. See Authorized Program Analysis Report (APAR). **This ends the procedure.**

## Licensed internal code (LIC) isolation procedures

Use this section to isolate licensed internal code (LIC) problems.

Please read and observe all safety procedures before servicing the system and while performing a procedure.

**Attention:** Unless instructed otherwise, always power off the system or expansion tower where the FRU is located, (see Powering on and powering off) before removing, exchanging, or installing a field-replaceable unit (FRU).

### DANGER

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn everything OFF (unless instructed otherwise).
2. Remove power cords from the outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

To Connect:

1. Turn everything OFF (unless instructed otherwise)
2. Attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

(D005)

“LICIP01” on page 131

“LICIP03” on page 132

“LICIP04” on page 133

“LICIP07” on page 133

“LICIP08” on page 136



"LICIP11" on page 136

"LICIP12" on page 147

"LICIP13" on page 151

"LICIP14" on page 156

"LICIP15" on page 156

**LICIP01:** LIC detected an IOP programming problem. You will need to gather data to determine the cause of the problem. If using **OptiConnect**, and the IOP is connected to another system, then collect this information from both systems. Read the "Licensed internal code (LIC) isolation procedures" on page 130 before continuing with this procedure.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Is the system operational: Did the SRC come from the Service Action Log, Product Activity Log, problem log, or system operator message?
  - No:** Go to step 9.
  - Yes:** Is this a x6xx5121 SRC?
    - No:** Continue with the next step.
    - Yes:** Go to step 4.
3. If the IOP has DASD attached to it, then the IOP dump is in SID87 (or SID187 if the DASD is mirrored). Copy the IOP dump. See Working with storage dumps.
4. Print the Product Activity Log, including any IOP dumps, to removable media for the day which the problem occurred. Select the option to obtain HEX data.
5. Use the "Licensed Internal Code log" service function under DST/SST to copy the LIC log entries to removable media for the day that the problem occurred.
6. Copy the system configuration list. See Printing the System Configuration List.
7. Provide the dumps to IBM Service Support.
8. Check the Logical Hardware Resource STATUS field using Hardware Service Manager. If the status is not *Operational* then IPL the IOP using the I/O Debug option. Ignore resources with a status of *not connected*.

To IPL a failed IOP, the following command can be used: VRYCFG CFGOBJ(XXXX) CFGTYPE(\*CTL) STATUS(\*RESET) or use DST/SST Hardware Service Manager.

If the IPL does not work:

  - Check the Service Action Log for new SRC entries. See "Using the Service Action Log" on page 24. Use the new SRC and go to the Reference codes topic.
  - If there are no new SRCs in the Service Action Log, go to "Start of call procedure" on page 2. **This ends the procedure.**
9. Has the system stopped but the DST console is still active: Did the SRC come from the Main Storage Dump manager screen on the DST console?
  - Yes:** Continue with the next step.
  - No:** Go to step 15 on page 132.
10. Complete a Problem Summary Form using the information in words 1-9 from the control panel, or from the DST Main Storage Dump screen.
11. The system has already taken a partial main storage dump for this SRC and automatically re-IPLed to DST.
12. Copy the main storage dump to tape. See Working with storage dumps.

13. When the dump is completed, the system will re-IPL automatically. Sign on to DST or SST. Obtain the data in steps 3 on page 131, 4 on page 131, 5 on page 131, and 6 on page 131.
14. Provide the dumps to IBM Service Support. **This ends the procedure.**
15. Has the system stopped with an SRC at the control panel?
  - Yes:** Continue with the next step.
  - No:** Go to step 2 on page 131.
16. Complete a Problem Summary Form using the information in words 1-9 from the control panel, or from the DST Main storage dump screen.
17. Do **NOT** power off the system. Perform a manual IPL to DST, and start the Main storage dump manager service function.
18. Copy the main storage dump to tape.
19. Obtain the data in steps 3 on page 131, 4 on page 131, 5 on page 131, and 6 on page 131.
20. Re-IPL the system.
21. Has the system stopped with an SRC at the control panel?
  - Yes:** Use the new SRC and go to the Reference codes topic. **This ends the procedure.**
  - No:** Provide the dumps to IBM Service Support. **This ends the procedure.**

**LICIP03:** Dedicated service tools (DST) found a permanent program error, or a hardware failure occurred. Read the danger notices in the “Licensed internal code (LIC) isolation procedures” on page 130 before continuing with this procedure.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Does URC 50FF occur?
  - No:** Continue with the next step.
  - Yes:** Go to step 4.
3. Perform a main storage dump, then perform an IPL by doing the following:
  - a. Perform a main storage dump. See Working with storage dumps.
  - b. Select **Manual** mode and perform an IPL to DST. See Performing an IPL to DST.
  - c. When the IPL has completed, the system console should be at the DST display. Go to step 7. If the DST display does not appear on the system console, contact your next level of support.
4. Perform a main storage dump, then perform an IPL by doing the following:
  - a. Perform a main storage dump. See Working with storage dumps.
  - b. Select **Manual** mode and perform an IPL to DST. See Performing an IPL to DST.
 Does a display appear?
  - No:** Continue with the next step.
  - Yes:** Go to step 7.
5. If the problem is in the logical partition, exchange the first workstation I/O processor card on bus 1. See Removing and replacing parts.
6. Select **Manual** mode and perform an IPL to DST. See Performing an IPL to DST.
 Is the IPL or Install the System display shown?
  - Yes:** Continue with the next step.
  - No:** Ask your next level of support for assistance and report the problem. **This ends the procedure.**
7. Copy the main storage dump to removable media. See Working with storage dumps.
8. Report a Licensed Internal Code problem to your next level of support. **This ends the procedure.**

**LICIP04:** The IPL service function ended. Dedicated service tools (DST) was in the disconnected status or lost communications with the IPL console because of a console failure and could not communicate with the user. Read the danger notices in “Licensed internal code (LIC) isolation procedures” on page 130 before continuing with this procedure.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Select function **21** (Make DST Available) on the control panel and press **Enter** to start DST again.  
Does the DST Sign On display appear?  
**No:** Continue with the next step.  
**Yes:** Perform the following steps (see Dedicated Service Tools (DST) for details):
  - a. Select **Start a Service Tool > Licensed Internal Code log**.
  - b. Perform a dump of the Licensed Internal Code log to tape. See Start a service tool for details.
  - c. Return here and continue with the next step.
3. Perform a main storage dump. See Working with storage dumps for details.
4. Copy the main storage dump to removable media. See Working with storage dumps for details.
5. Report a Licensed Internal Code problem to your next level of support. **This ends the procedure.**

**LICIP07:** The system detected a problem while communicating with a specific I/O processor. The problem could be caused by Licensed Internal Code, the I/O processor card, or by bus hardware. Read the danger notices in “Licensed internal code (LIC) isolation procedures” on page 130 before continuing with this procedure.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Did a previous procedure have you power off the system, perform an IPL in Manual mode, **and** is the system in Manual mode now?  
**Yes:** Continue with the next step.  
**No:** Perform the following steps:
  - a. Power off the system. See Powering on and powering off for details.
  - b. Select **Manual** mode on the control panel. See IPL type, mode, and speed options for details.
  - c. Power on the system.
  - d. Continue with the next step.
3. Does the SRC that sent you to this procedure appear on the control panel?  
**No:** Continue with the next step.  
**Yes:** Use the information in the SRC to determine the card direct select address. If the SRC is B6006910, you can use the last 8 characters of the top 16 character line of function 13 (word 7) to find the card direct select address in BBBBCcbb format.  
**BBBB** Bus number  
**Cc** Card direct select address  
**bb** board address  
  
Go to step 11 on page 134.
4. Does the console display indicate a problem with missing disks?  
**Yes:** Continue with the next step.  
**No:** Go to step 6 on page 134.
5. Perform the following steps:
  - a. Go to the DST main menu.

- b. On the DST sign-on display, enter the DST full authority user ID and password. See Dedicated Service Tools (DST) for details.
- c. Select **Start a service tool >Hardware service manager**.
- d. Check for the SRC in the service action log. See “Using the Service Action Log” on page 24.

Did you find the same SRC that sent you to this procedure?

**Yes:** Note the date and time for that SRC. Go to the Product Activity Log and search all logs to find the same SRC. When you have found the SRC, go to step 9.

**No:** Perform the following steps:

- 1) Return to the DST main menu.
- 2) Perform an IPL and return to the Display Missing Disk Units display.
- 3) Go to “LICIP11” on page 136. **This ends the procedure.**

6. Does the SRC that sent you to this procedure appear on the console or on the alternative console?

**Yes:** Continue with the next step.

**No:** Does the IPL complete successfully to the IPL or Install the System display?

**Yes:** Continue with the next step.

**No:** A different SRC occurred. Go to the Reference codes topic and use the new SRC to correct the problem. **This ends the procedure.**

7. Perform the following:

- a. Use the full-authority password to sign on to DST.
- b. Search *All logs* in the product activity log looking for references of SRC B600 5209 and the SRC that sent you to this procedure.

**Note:** Search only for SRCs that occurred during the last IPL.

Did you find B600 5209 or the same SRC that sent you to this procedure?

**Yes:** Go to step 10.

**No:** Did you find a different SRC than the one that sent you to this procedure?

**Yes:** Continue with the next step.

**No:** The problem appears to be intermittent. Ask your next level of support for assistance. **This ends the procedure.**

8. Use the new SRC to correct the problem. See the Reference codes topic. **This ends the procedure.**
9. Use **F11** to move through alternative views of the log analysis displays until you find the card position and frame ID of the failing IOP associated with the SRC.

Was the card position and frame ID available, **and** did this information help you find the IOP?

**No:** Continue with the next step.

**Yes:** Go to step 12.

10. Perform the following steps:

- a. Display the report for the log entry of the SRC that sent you to this procedure.
- b. Display the additional information for the entry.
- c. If the SRC is B6006910, use characters 9-16 of the top 16 character line of function 13 (word 7) to find the card direct select address in BBBBCcbb format.

**BBBB** Bus number

**Cc** Card direct select address

**bb** board address

11. Use the BBBBCcbb information and refer to Finding part locations to determine the failing IOP and its location.
12. Go to “MABIP06” on page 96 to isolate an I/O adapter problem on the IOP you just identified. If this fails to isolate the problem, return here and continue with the next step.
13. Is the I/O processor card you identified in step 9 or step 11 the CFIOP?

**No:** Continue with the next step.

**Yes:** Perform the following steps:

- a. Exchange the failing CFIOF card. See Removing and replacing parts.

**Note:** You will be prompted for the system serial number. Ignore any error messages regarding system configuration that appear during the IPL.

- b. Go to step 16.

14. Perform the following steps:

- a. Power off the system.
- b. Remove the IOP card.
- c. Power on the system.

Does the SRC that sent you to this procedure appear on the control panel or appear as a new entry in the service action log or product activity log?

**No:** Continue with the next step.

**Yes:** Perform the following steps:

- a. Power off the system.
- b. Install the IOP card you just removed.
- c. Replace the multi-adapter bridge using symbolic FRU "MA\_BRDG" on page 508. **This ends the procedure.**

15. Perform the following steps:

- a. Power off the system.
- b. Exchange the failing IOP card.

16. Power on the system.

Does the SRC that sent you to this procedure appear on the control panel, on the console, or on the alternative console?

**No:** Continue with the next step.

**Yes:** Go to step 18.

17. Does a different SRC appear on the control panel, on the console, or on the alternative console?

**Yes:** Go to the Reference codes topic and use the new SRC to correct the problem. **This ends the procedure.**

**No:** On the IPL or Install the System display, check for the SRC in the service action log. See "Using the Service Action Log" on page 24 for details.

Did you find the same SRC that sent you to this procedure?

**Yes:** Continue with the next step.

**No:** Go to "Verifying a high-speed link, system PCI bus, or a multi-adapter bridge repair" on page 76. **This ends the procedure.**

18. Perform the following steps:

- a. Power off the system.
- b. Remove the IOP card you just exchanged and install the original card.
- c. Go to (Bus-PIP1). **This ends the procedure.**

19. Ask your next level of support for assistance and report a Licensed Internal Code problem. You may be asked to verify that all PTFs have been applied.

If you are asked to perform the following, see the following:

- Copy the main storage dump from disk to tape or diskette, see Working with storage dumps.
- Print the product activity log, see "Using the product activity log" on page 26.
- Copy the IOP storage dump to removable media, see Working with storage dumps. **This ends the procedure.**

**LICIP08:** Licensed Internal Code detected an operating system program problem. Read the danger notices in “Licensed internal code (LIC) isolation procedures” on page 130 before continuing with this procedure.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Select **Manual** mode and perform an IPL to DST. See Performing an IPL to DST.  
Does the same SRC occur?  
**Yes:** Go to step 5.  
**No:** Does the same URC appear on the console?  
**No:** Continue with the next step.  
**Yes:** Go to step 4.
3. Does a different SRC occur, or does a different URC appear on the console?  
**Yes:** Use the new SRC or reference code to correct the problem. See the Reference codes topic. If the procedure for the new SRC sends you back to this procedure, then continue with the next step.  
**This ends the procedure.**  
**No:** Select **Perform an IPL** on the IPL or Install the System display to complete the IPL.  
Is the problem intermittent?  
**Yes:** Continue with the next step.  
**No:** **This ends the procedure.**
4. Copy the main storage dump to removable media. See Working with storage dumps.
5. Report a Licensed Internal Code problem to your next level of support. **This ends the procedure.**

**LICIP11:** Use this procedure to isolate a system **STARTUP** failure in the initial program load (IPL) mode. Ensure you have read the danger notices in “Licensed internal code (LIC) isolation procedures” on page 130 before continuing with this procedure.

#### How to find the cause code

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions.
2. Were you given a cause code by another procedure?  
**No:** Continue with the next step.  
**Yes:** Use the cause code given by the other procedure. Then, go to step 4.
3. Look at the Data display characters in word 3. You can obtain these characters by either:
  - Looking at word 3 on the Problem summary form that was filled out earlier.
  - Selecting characters 9-16 of the top 16 character line of function 12 (word 3).
4. The 4 leftmost characters of word 3 represent the **cause code**. Select the cause code to go to the correct isolation instructions:

0001	0010	0020	0031
0002	0011	0021	0033
0004	0012	0022	0034
0005	0015	0023	0037
0006	0016	0024	
0007	0017	0025	0099
0008	0018	0026	
0009	0019	0027	

000A	001A
000B	001C
000C	001D
000D	001E
000E	001F

## 0001

Disk configuration is missing.

1. Select **Manual** mode and perform an IPL to DST for the failing partition (see Performing an IPL to DST). Does the Disk Configuration Error Report display appear?
  - Yes:** Continue with the next step.
  - No:** The IPL completed successfully. **This ends the procedure.**
2. Is Missing Disk Configuration information displayed?
  - Yes:** Continue with the next step.
  - No:** Go to step 1 for cause code 0002.
3. On the Missing Disk Configuration display, perform the following:
  - a. Select option 5 > **Display Detailed Report** > **Work with disk units** > **Work with disk unit recovery** > **Recover Configuration**.
  - b. Follow the instructions on the display. After the disk configuration is recovered, the system automatically performs an IPL. **This ends the procedure.**

## 0002

Disk units are missing from the disk configuration.

Data from the control panel can be used to find information about the missing disk unit. See System Reference Code (SRC) information for details.

1. Did you enter this procedure because all the devices listed on the Display Missing Units display (reached from the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display) have a reference code of 0000?
  - No:** Continue with the next step.
  - Yes:** Go to step 20 on page 139.
2. Have you installed a new disk enclosure in a disk unit and not restored the data to the disk unit?
  - No:** Continue with the next step.
  - Yes:** Ignore SRC A600 5090. Continue with the disk unit exchange recovery procedure (see Copy the contents of the LIC log). **This ends the procedure.**
3. Use words 1-9 from the information recorded on the Problem summary form to determine the disk unit that is missing from the configuration:
  - Characters 1-8 of the bottom 16 character line of function 12 (word 4) contain the IOP direct select address.
  - Characters 1-8 of the top 16 character line of function 13 (word 6) contains the disk unit type, level and model number.
  - Characters 9-16 of the top 16 character line of function 13 (word 7) contains the disk unit serial number.

**Note:** For 2105 and 2107 disk units, the 5 rightmost characters of word 7 contain the disk unit serial number.

- Characters 1-8 of the bottom 16 character line of function 13 (word 8) contains the number of missing disk units.

Are the problem disk units 432x, 660x, 671x, or 673x disk units?

**No:** Continue with the next step.

**Yes:** Go to step 5.

4. Attempt to get all devices attached to the MSIOP to Ready status by performing the following:
  - a. The MSIOP address (MSIOP Direct Select Address) to use is characters 1-8 of the bottom 16 character line of function 12 (word 4).

- b. Verify the following and correct if necessary before continuing with step 10.

- All cable connections are made correctly and are tight.
- All storage devices have the correct signal bus address, as indicated in the system configuration list.
- All storage devices are powered on and ready.

5. Did you enter this procedure because there was an entry in the Service Action Log which has the reference code B6005090?

**Yes:** Continue with the next step.

**No:** Go to step 10.

6. Are customer jobs running on the system now?

**Yes:** Continue with the next step.

**No:** Ensure that the customer is not running any jobs before continuing with this procedure. Then go to step 10.

7. Select **System Service Tools (SST) > Work with disk units > Display disk configuration > Display disk configuration status.**

Are any disk units missing from the configuration (indicated by an asterisk \*)?

**Yes:** Continue with the next step.

**No: This ends the procedure.**

8. Do all of the disk units that are missing from the configuration have a status of "Suspended"?

**Yes:** Continue with the next step.

**No:** Ensure that the customer is not running any jobs before continuing with this procedure. Then go to step 10.

9. Use the Service Action Log to determine if there are any entries for the missing disk units (see "Using the Service Action Log" on page 24). Are there any entries in the Service Action Log for the missing disk units that were logged since the last IPL?

**Yes:** Use the information in the Service Action Log, and go to the SRC information for the specific disk unit (see Reference codes). Perform the action indicated for the unit reference code. **This ends the procedure.**

**No:** Go to step 21 on page 139.

10. Select **Manual** mode and perform an IPL to DST for the failing partition (see Performing an IPL to DST). Does the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear?

**Yes:** Continue with the next step.

**No:** The IPL completed successfully. **This ends the procedure.**

11. Does one of the following messages appear in the list?

- Missing disk units in the configuration
- Missing mirror protected disk units in the configuration

**Yes:** Continue with the next step.

**No:** Go to step 16 on page 139.



12. Select option 5. Do the missing units have device parity protected status? (Device parity protection status is indicated by "DPY/" as the first four characters of the status.)
  - Yes:** Continue with the next step.
  - No:** Go to step 14.
13. Is the status DPY/Active?
  - Yes:** Continue with the next step.
  - No:** Use the Service Action Log to determine if there are any entries for the missing disk units or the IOA/IOP controlling them. See "Using the Service Action Log" on page 24 for details. **This ends the procedure.**
14. Press **F11**, and press **Enter** to display the details.
 

Do all of the disk units listed on the display have a reference code of 0000?

  - Yes:** Continue with the next step.
  - No:** Use the disk unit reference code shown on the display and go to the SRC information for the specific disk unit in the Reference codes topic. Perform the action indicated for the unit reference code. **This ends the procedure.**
15. Do all of the IOPs or devices listed on the display have a reference code of 0000?
  - No:** Use the IOP reference code shown on the display and go to Reference codes. Perform the action indicated for the reference code. **This ends the procedure.**
  - Yes:** Go to step 20.
16. Does the following message appear in the list: Unknown load-source status?
  - Yes:** Continue with the next step.
  - No:** Go to step 18.
17. Select option 5, press **F11**, and then press **Enter** to display the details.
 

Does the Assign Missing Load Source Disk display appear?

  - No:** Continue with the next step.
  - Yes:** Press **Enter** to assign the missing load-source disk unit. **This ends the procedure.**
18. Does the following message appear in the list?
 

Load source failure

  - Yes:** Continue with the next step.
  - No:** The IPL completed successfully. **This ends the procedure.**
19. Select option 5, press **F11**, and then press **Enter** to display the details.
20. The number of failing disk unit facilities (actuators) is the number of disk units displayed. A disk unit has a *Unit* number greater than zero.
 

Find the failing disk unit by type, model, serial number, or address displayed on the console.
21. Is there more than one failing disk device attached to the IOA or MSIOP?
  - Yes:** Continue with the next step.
  - No:** Go to step 24 on page 140.
22. Use the SAL to determine if there are any entries that occurred around the time of the A6xx/B6xx 5090 SRC (see "Using the Service Action Log" on page 24). Are there any such entries?
  - No:** Continue with the next step.
  - Yes:** Use the information in the SAL and go to the SRC information for the specific error (see Reference codes). Perform the action indicated for the unit reference code. **This ends the procedure.**
23. Are all the disk devices that are attached to the IOA or MSIOP failing? (If the disk units are using mirrored protection, select **Display Disk Status** to find out.)
  - No:** Continue with the next step.
  - Yes:** Go to step 25 on page 140.

24. Go to the service information for the specific disk unit listed below and perform the action indicated. Then return here and answer the question below the listed disk units.

- **2105, 2107 disk units:** Use SRC 3002 in (2105, 2107) Disk unit reference codes and exchange the FRUs shown one at a time.
- **432x, 660x, 671x, 673x disk units:** Use SRC 3002 in (432x, 660x, 671x, 673x) Disk unit reference codes and exchange the FRUs shown one at a time.

Did the disk unit service information correct the problem?

**No:** Continue with the next step.

**Yes: This ends the procedure.**

25. Exchange the IOA or MSIOP (see Removing and replacing parts).

If exchanging the IOA or MSIOP did not correct the problem, use the original SRC and exchange the failing items, starting with the highest probable cause of failure. If the failing item list contains FI codes, see "Using failing item codes" on page 430 to help determine parts and locations. **This ends the procedure.**

#### 0004

Some disk units are unprotected but configured into a mirrored ASP. These units were originally DPY protected but protection was disabled.

Perform the following:

1. Is the system managed by an HMC?

**Yes:** Select **DST** by performing the HMC action for Function 21 for the failing partition (see Control panel functions in the Hardware Management Console topic). Then continue with the next step.

**No:** Select **DST** using Function 21 for the failing partition (see Control panel functions in Service functions). Then continue with the next step.

2. Select **Work with disk units** and take the actions to protect the system.

If you do not know what actions to take, select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to DST.

When the Disk configuration error report appears, the recovery actions are listed in the Help text for the error message "Unprotected disk units in a mirrored ASP". **This ends the procedure.**

#### 0005

A disk unit using parity protection is operating in exposed mode.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to DST.

2. Choose from the following options:

- If the same reference code appears, ask your next level of support for assistance.
- If no reference code appears and the IPL completes successfully, the problem is corrected.
- If a different reference code appears, use it to correct the problem. See the Reference codes topic. **This ends the procedure.**

#### 0006

There are new devices attached to the system that do not have Licensed Internal Code installed. Ask your next level of support for assistance.

#### 0007

Some of the configured disk units have device parity protection disabled when the system expected device parity protection to be enabled.

1. Is the system managed by an HMC?

**Yes:** Select **DST** by performing the HMC action for Function 21 for the failing partition (see Control panel functions in the Hardware Management Console topic). Then continue with the next step.

**No:** Select **DST** using Function 21 for the failing partition (see Control panel functions in Service functions). Then continue with the next step.

2. Correct the problem by doing the following:
  - a. Select **Work with disk units > Work with disk unit recovery > Correct device parity protection**.
  - b. Follow the online instructions. **This ends the procedure.**

#### 0008

A disk unit has no more alternate sectors to assign.

1. Determine the failing unit by type, model, serial number or address given in words 4-7. See System Reference Code (SRC) information.
2. See the service information for the specific storage device. Use the disk unit reference code listed below for service information entry.

432x 102E, 660x 102E, 671x 102E, 673x 102E (see Reference codes).

**This ends the procedure.**

#### 0009

The procedure to restore a disk unit from the tape unit did not complete. Continue with the disk unit exchange recovery procedure. See Disk unit recovery procedures.

#### 000A

There is a problem with a disk unit subsystem. As a result, there are missing disk units in the system.

Perform the following:

1. Is the system managed by an HMC?

**Yes:** Select **DST** by performing the HMC action for Function 21 for the failing partition (see Control panel functions in the Hardware Management Console topic). Then continue with the next step.

**No:** Select **DST** using Function 21 for the failing partition (see Control panel functions in Service functions). Then continue with the next step.

2. On the Service Tools display, select **Start a Service Tool > Product activity log > Analyze log**.
3. On the Select Subsystem Data display, select the option to view **All Logs**.

**Note:** You can change the From: and To: Dates and Times from the 24-hour default if the time that the customer reported having the problem was more than 24 hours ago.

4. Use the defaults on the Select Analysis Report Options display by pressing **Enter**.
5. Search the entries on the Log Analysis Report display for system reference codes associated with the missing disk units.
6. Go to Reference codes to correct the problem. **This ends the procedure.**

#### 000B

Some system IOPs require cache storage be reclaimed.

1. Is the system managed by an HMC?

**Yes:** Select **DST** by performing the HMC action for Function 21 for the failing partition (see Control panel functions in the Hardware Management Console topic). Then continue with the next step.

**No:** Select **DST** using Function 21 for the failing partition (see Control panel functions in Service functions). Then continue with the next step.

2. Reclaim the cache adapter card storage. See Reclaiming IOP cache storage.

**Note:** The system operator may want to restore data from the most recent saved tape after you complete the repair.

**This ends the procedure.**

## 000C

One of the mirror protected disk units has no more alternate sectors to assign.

1. Determine the failing unit by type, model, serial number or address given in words 4-7. See System Reference Code (SRC) information.
2. See the service information for the specific storage device. Use the disk unit reference code listed below for service information entry.

432x 102E, 660x 102E, 671x 102E, 673x 102E (see Reference codes).

**This ends the procedure.**

## 000D

The system disk capacity has been exceeded.

For more information about disk capacity, see *iSeries Handbook*, GA19-5486-20.

## 000E

Start compression failure.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to DST.
2. Correct the problem by doing the following:
  - a. Select **Work with disk units > Work with disk unit recovery > Recover from start compression failure**.
  - b. Follow the on-line instructions. **This ends the procedure.**

## 0010

The disk configuration has changed.

The operating system must be installed again, and all customer data must be restored.

1. Select **Manual** mode on the control panel.
2. Perform an IPL to reinstall the operating system.
3. The customer must restore all data from the latest system backup. **This ends the procedure.**

## 0011

The serial number of the control panel does not match the system serial number.

1. Select **Manual** mode on the control panel.
2. Perform an IPL. You will be prompted for the system serial number. **This ends the procedure.**

#### 0012

The operation to write the vital product data (VPD) to the control panel failed.

Exchange the multiple function I/O processor card. See Finding part locations for the model you are working on for the location of the card and a link to the remove and replace procedure.

#### 0015

The mirrored load-source disk unit is missing from the disk configuration. Go to step 1 on page 137 for cause code 0002.

#### 0016

A mirrored protected disk unit is missing. Wait six minutes. If the same reference code appears, go to step 1 on page 137 for cause code 0002.

#### 0017

One or more disk units have a lower level of mirrored protection than originally configured.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to DST.
2. Review the detailed display, which shows the new and the previous levels of mirrored protection. **This ends the procedure.**

#### 0018

Load-source configuration problem. The load-source disk unit is using mirrored protection and is configured at an incorrect address. Ensure that the load-source disk unit is in device location 1.

#### 0019

One or more disk units were formatted incorrectly.

The system will continue to operate normally. However, it will not operate at optimum performance. To repair the problem, perform the following:

1. Record the unit number and serial number of the disk unit that is formatted incorrectly.
2. Sign on to DST. See Accessing Dedicated Service Tools.
3. Select **Work with disk units > Work with disk unit configuration > Remove unit from configuration.**
4. Select the disk unit you recorded earlier in this procedure.
5. Confirm the option to remove data from the disk unit. This step may take a long time because the data must be moved to other disk units in the auxiliary storage pool (ASP).
6. When the remove function is complete, select **Add unit to configuration.**
7. Select the disk unit you recorded earlier in this procedure.
8. Confirm the add. The disk unit is formatted during functional operation. **This ends the procedure.**

#### 001A

The load-source disk unit data is down-level.

The load-source disk unit is mirror protected. The system is using the load-source disk unit that does not have the current level of data.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to DST. Does the Disk Configuration Error Report display appear?

**No:** The system is now using the correct load-source. **This ends the procedure.**

**Yes:** Continue with the next step.

2. Does a "Load source failure" message appear in the list?

**Yes:** Continue with the next step.

**No:** The system is now using the correct load-source. **This ends the procedure.**

3. Select option **5**, press **F11**, and then press **Enter** to display details.

The load-source type, model, and serial number information that the system needs is displayed on the console.

Is the load-source disk unit (displayed on the console) attached to an MSIOP that cannot be used for a load-source?

**Yes:** Contact your next level of support. **This ends the procedure.**

**No:** The load-source disk unit is missing. Go to step 1 on page 137 for cause code 0002.

#### 001C

The disk units that are needed to update the system configuration are missing.

Perform an IPL by doing the following:

1. Select **Manual** mode on the control panel.
2. Perform an IPL. See IPL information to determine the cause of the problem. **This ends the procedure.**

#### 001D

1. Is the Disk Configuration Attention Report, or the Disk Configuration Warning Report displayed?

**Yes:** Continue with the next step.

**No:** Ask your next level of support for assistance. **This ends the procedure.**

2. On the Bad Load Source Configuration message line, select **5**, and press **Enter** to rebuild the load-source configuration information. If there are other types of warnings, select option **5** on the warnings, and correct the problem. **This ends the procedure.**

#### 001E

The load-source data must be restored. See Disk unit recovery procedures.

#### 001F

Licensed Internal Code was installed on the wrong disk unit of the load-source mirrored pair.

The system performed an IPL on a load source that may not contain the same level of Licensed Internal Code that was installed on the other load source. The type, model, and address of the active device are displayed in words 4-7 of the SRC.

1. Choose from the following options:
  - a. If the load-source disk unit in position 1 contains the correct level of Licensed Internal Code, perform the following:
    - 1) Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to DST. Is the Disk Configuration Attention Report or Disk Configuration Warning Report displayed?

**Yes:** Select option 5 on the Incorrect Licensed Internal Code Install message line. When the Display Incorrect Licensed Internal Code Install display appears on the console, press **Enter**.

**No:** The system is now using the correct load source. **This ends the procedure.**

- b. If the load-source disk unit in position 1 of the system unit does **not** contain the correct level of Licensed Internal Code, restore the Licensed Internal Code to the disk unit in position 1 of the system unit. See Utilities to Install and Restore Licensed Internal Code. **This ends the procedure.**

## 0020

The system appears to be a one disk unit system. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to DST.

## 0021

The system password verification failed.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to DST.
2. When prompted, enter the correct system password. If the correct system password is not available perform the following:
  - a. Select **Bypass the system password**.
  - b. Have the customer contact the marketing representative immediately to order a new system password from IBM. **This ends the procedure.**

## 0022

A different compression status was expected on a reporting disk unit. Accept the warning. The reported compression status will be used as the current compression status.

## 0023

There is a problem with a disk unit subsystem. As a result, there are missing disk units in the system. The system is capable of IPLing in this state.

1. Is the system managed by an HMC?

**Yes:** Select **DST** by performing the HMC action for Function 21 for the failing partition (see Control panel functions in the Hardware Management Console topic). Then continue with the next step.

**No:** Select **DST** using Function 21 for the failing partition (see Control panel functions in Service functions). Then continue with the next step.
2. On the Service Tools display, select **Start a Service Tool > Product activity log > Analyze log**.
3. On the Select Subsystem Data display, select the option to view All Logs.

**Note:** You can change the From: and To: Dates and Times from the 24-hour default if the time that the customer reported having the problem was more than 24 hours ago.
4. Use the defaults on the Select Analysis Report Options display by pressing **Enter**.
5. Search the entries on the Log Analysis Report display for system reference codes associated with the missing disk units.
6. Go to the Reference codes topic and use the SRC information to correct the problem. **This ends the procedure.**

## 0024

The system type or system unique ID needs to be entered.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to DST.
2. When prompted, enter the correct system type or system unique ID. **This ends the procedure.**

#### 0025

Hardware Resource Information Persistence disabled.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to DST.
2. Contact your next level of support for instructions on how to enable the Hardware Resource Information Persistence function. **This ends the procedure.**

#### 0026

A disk unit is incorrectly configured for an LPAR system.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to DST.
2. On the Service Tools display, select **Start a Service Tool > Product activity log > Analyze log.**
3. On the Select Subsystem Data display, select the option to view All Logs.

**Note:** You can change the From: and To: Dates and Times from the 24-hour default if the time that the customer reported having the problem was more than 24 hours ago.

4. Use the defaults on the Select Analysis Report Options display by pressing **Enter.**
5. Search the entries on the Log Analysis Report display for system reference codes (B6xx 53xx) that are associated with the error.
6. Go to the Reference codes topic and use the SRC information to correct the problem. **This ends the procedure.**

#### 0027

The user ASP has overflowed. Contact your next level of support.

#### 0031

A problem was detected with the installation of Licensed Internal Code service displays. The cause may be defective media, the installation media being removed too early, a device problem or a Licensed Internal Code problem.

- Ask your next level of support for assistance. Characters 13-16 of the top 16 character line of function 12 (4 rightmost characters of word 3) contain information regarding the install error.
- If the customer does not require the service displays to be in the national language, you may be able to continue by performing another system IPL. **This ends the procedure.**

#### 0033

System model not supported. This model of hardware does not support the System Licensed Internal Code version and release that is being used. Use a supported version and release of the System Licensed Internal Code.

#### 0034

Insufficient main storage capacity.



There is not enough main storage capacity. For details about how much more capacity is required, see the "Insufficient Main Storage Capacity" screen, which is displayed when the system is IPLed in manual mode. Typically, this error occurs when you have moved memory between logical partitions, and one partition no longer has a sufficient amount of main storage.

#### 0037

One or more functional connections to a disk unit in a multi-path environment have not been detected. The connections to the disk unit were established by running ESS Specialist. If you use the server in this state, you may cause a loss of data. You must ensure that all of the functional connections are still established between the disk and the Input/Output Adapters (IOAs) attached to this server and this logical partition. If there is an IOA which has a connection to the disk unit that has been moved to a different logical partition or different server, you should not continue with the IPL. Notify your next level of support.

#### 0099

A Licensed Internal Code program error occurred. Ask your next level of support for assistance.

**LICIP12:** Use this procedure to isolate an Independent Auxiliary Storage Pool (IASP) vary on failure. Message CPDB8E0 occurred if the user attempted to vary on the IASP. Read the **Danger** notices in "Licensed internal code (LIC) isolation procedures" on page 130 before continuing with this procedure.

#### How to find the cause code

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Were you given a cause code by another procedure?
  - No:** Continue with the next step.
  - Yes:** Use the cause code given by the other procedure. Then go to step 4.
3. Look at the characters in word 3. You can obtain these characters by doing the following:
  - a. On the command line, enter the Start System Service Tools (**STRSST**) command. If you cannot get to SST, use function 21 to get to DST. See Selecting Function 21 while the system is operational. Do not IPL the system to get to DST.
  - b. On the Start Service Tools Sign On display, type in a User ID with service authority and password.
  - c. Select **Start a Service Tool > Hardware Service Manager > Work with service action log**.
  - d. On the Select Timeframe display, change the From: Date and Time to a date and time prior to when the user attempted to vary on the IASP.
  - e. Search for a B6005094 system reference code that occurred at the time the user attempted to vary on the IASP. Display the failing item information for this entry.
  - f. Select the function key for **Additional details**.
  - g. The 4 leftmost characters of word 3 is the cause code to be used in this procedure.
4. Find the **cause code** below:

0002	000A	002C	0030
0004	000B	002D	0032
0007	000D	002E	0099
0009	000E	002F	

#### 0002

Disk units are missing from the IASP disk configuration.

1. Have you installed a new disk enclosure in a disk unit and not restored the data to the disk unit?

**No:** Continue with the next step.

**Yes:** Ignore SRC A600 5094.

Continue with the disk unit exchange recovery procedure. See Disk unit recovery procedures.

**This ends the procedure.**

2. Use words 1-9 from the information in the Service Action Log to determine the disk unit that is missing from the configuration:

- Word 4 contains the IOP direct select address.
- Word 5 contains the unit address.
- Word 6 contains the disk unit type, level and model number.
- Word 7 contains the disk unit serial number.
- Word 8 contains the number of missing disk units.

Are the problem disk units 432x, 660x, or 671x Disk Units?

**Yes:** Continue with the next step.

**No:** Attempt to get all devices attached to the IOP to Ready status by performing the following:

- a. The IOP address (IOP Direct Select Address) to use is Word 4.
- b. Verify the following, and correct if necessary:
  - Ensure all cable connections are made correctly and are tight.
  - Ensure the configuration within the device is correct.
  - Ensure all storage devices are powered on and ready.
- c. Continue with the next step.

3. Perform the following:

Select **System Service Tools (SST) > Work with disk units > Display disk configuration > Display disk configuration status.**

Are any disk units missing-indicated with an asterisk (\*)- from the IASP configuration?

**Yes:** Continue with the next step.

**No: This ends the procedure.**

4. Use the Service Action Log to determine if there are any entries other than B6xx 5094 for the missing disk units or the IOA or IOP that is controlling them. See “Using the Service Action Log” on page 24.

Are there any entries in the Service Action Log other than B6xx 5094 for the missing disk units or the IOA or IOP that is controlling them?

**No:** Continue with the next step.

**Yes:** Use the information in the Service Action Log to solve the problem. See “Using the Service Action Log” on page 24. **This ends the procedure.**

5. Did you enter this procedure because there was a B6xx 5094 cause code of 0030?

**No:** Continue with the next step.

**Yes:** Work with the customer to recover the unknown configuration source disk unit.

Use a workstation with iSeries Navigator installed to select the disk pool with the problem, and then select **Recover unknown configuration source** for this disk pool. **This ends the procedure.**

6. Use Hardware Service Manager to display logical resources connected to the IOP. See Hardware Service Manager.

7. Is every device attached to the IOP failing?

**Yes:** Continue with the next step.

**No:** Are all of the disk units that are attached to one IOA missing?

- **No:** Continue with the next step.

- **Yes:** Exchange the IOA. Use the IOP direct select address and the first character of the unit address from step 2 on page 148 to find the location. See Finding part locations. **This ends the procedure.**

8. Is there more than one storage IOA attached to the IOP?

- **Yes:** Exchange the IOP. Use the IOP direct select address from step 2 on page 148 to find the location. See Finding part locations. **This ends the procedure.**
- **No:** Go to step 10.

9. Go to the service information for the specific disk unit that is listed below and perform the action indicated. Then return here and answer the following question.

- **2105 Disk Units:** Use SRC 3002 in (2105, 2107) Disk unit reference codes and exchange the FRUs shown one at a time.
- **432x, 660x, 671x Disk Units:** Use SRC 3002 in the Reference codes list and exchange the FRUs shown one at a time.

Did the disk unit service information correct the problem?

**No:** Continue with the next step.

**Yes: This ends the procedure.**

10. Perform the following:

- a. Exchange the IOA. Use the IOP direct select address and the first character of the unit address from step 2 on page 148 to find the location. See Finding part locations.
- b. If exchanging the IOA does not correct the problem, exchange the IOP. Use the IOP direct select address from step 2 on page 148 to find the location. See Finding part locations.
- c. If exchanging the IOP does not correct the problem, exchange the failing items in the following FRU list starting with the first item in the list.
  - 1) FI01140
  - 2) "BACKPLN" on page 458
  - 3) FI00580
  - 4) AJDG301

**This ends the procedure.**

#### 0004

Some disk units are unprotected but configured into a mirrored IASP. These units were originally DPY protected but protection was disabled.

Direct the customer to take the actions necessary to start protection on these disk units. **This ends the procedure.**

#### 0007

Some of the configured disk units have device parity protection disabled when the system expected device parity protection to be enabled.

1. Select **Manual** mode and perform an IPL to DST. See Performing an IPL to DST.
2. Correct the problem by doing the following:
  - a. Select **Work with disk units > Work with disk unit recovery > Correct device parity protection mismatch.**
  - b. Follow the on-line instructions. **This ends the procedure.**

#### 0008

A disk unit has no more alternate sectors to assign.

1. Determine the failing unit by type, model, serial number or address given in words 4-7. See System Reference Code (SRC) information.
2. See the service information for the specific storage device. Use the disk unit reference code listed below for service information entry.  
432x 102E, 660x 102E, 671x 102E (see the Reference codes topic). **This ends the procedure.**

#### 0009

The procedure to restore a disk unit from the tape unit did not complete.

Continue with the disk unit exchange recovery procedure. See Disk unit recovery procedures. **This ends the procedure.**

#### 000A

There is a problem with a disk unit subsystem. As a result, there are missing disk units in the system.

Use the Service Action Log to find system reference codes associated with the missing disk units by changing the From: Date and Time on the Select Timeframe display to a date and time prior to when the user attempted to vary on the IASP. For information on how to use the Service Action Log, see "Using the Service Action Log" on page 24. **This ends the procedure.**

#### 000B

Some system IOPs require cache storage be reclaimed.

1. Start SST.
2. Reclaim the cache adapter card storage by performing the following:
  - a. Select **Work with disk units > Work with disk unit recovery > Reclaim IOP Cache Storage**.
  - b. Follow the on-line instructions to reclaim cache storage.
  - c. After you complete the repair, the system operator may want to restore data from the most recently saved tape. **This ends the procedure.**

#### 000D

The system disk capacity has been exceeded.

For more information about disk capacity, see the *iSeries Handbook*. **This ends the procedure.**

#### 000E

Start compression failure.

1. Select **Manual** mode and perform an IPL to DST. See Performing an IPL to DST.
2. Correct the problem by doing the following:
  - a. Select **Work with disk units > Work with disk unit recovery > Recover from start compression failure**.
  - b. Follow the on-line instructions. **This ends the procedure.**

#### 002C

A Licensed Internal Code program error occurred.

Ask your next level of support for assistance. **This ends the procedure.**

## 002D

The IASP configuration source disk unit data is down-level.

The system is using the IASP configuration source disk unit that does **not** have the current level of data.

Work with the customer to recover the configuration. On a workstation with iSeries Navigator installed, select the disk pool with the problem, and then select **Recover configuration**. **This ends the procedure.**

## 002E

The Independent ASP is assigned to another system or a Licensed Internal Code program error occurred.

Work with the customer to check other systems to determine if the Independent ASP has been assigned to it. If the Independent ASP has not been assigned to another system, ask your next level of support for assistance. **This ends the procedure.**

## 002F

The system version and release are at a different level than the IASP version and release.

The system version and release must be upgraded to be the same as the system version and release in which the IASP was created. **This ends the procedure.**

## 0030

The mirrored IASP configuration source disk unit has a disk configuration status of *unknown* and is missing from the disk configuration.

Go to step 1 on page 148 for cause code 0002.

## 0032

A Licensed Internal Code program error occurred.

Ask your next level of support for assistance. **This ends the procedure.**

## 0099

A Licensed Internal Code program error occurred.

Ask your next level of support for assistance. **This ends the procedure.**

**LICIP13:** A disk unit seems to have stopped communicating with the system. The system has stopped normal operation until the cause of the disk unit failure is found and corrected. Ensure you have read the **Danger** notices in “Licensed internal code (LIC) isolation procedures” on page 130 before continuing with this procedure.

If the disk unit that stopped communicating with the system has **mirrored protection active**, normal operation of the system stops for one to two minutes. Then the system suspends mirrored protection for that disk unit and continues normal operation. See Disk unit recovery procedures for more information on systems with mirrored protection.

**Note:** Do not power off the system or partition using the white button, function 08, ASMI, or HMC immediate power-off when performing this procedure. If this procedure or other isolation procedures referenced by this procedure direct you to IPL or power off the system,

- perform a partition main storage dump (see Performing a platform or main storage dump), or
  - if additional dump information is not needed, perform a function 03 IPL or restart the system or partition using the HMC.
1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
  2. Was a problem summary form completed for this problem?
    - No:** Continue with the next step.
    - Yes:** Use the problem summary form information and go to step 4.
  3. Fill out a problem reporting form completely with the instructions provided.
  4. Recovery from a device command time-out may have caused the communications loss condition (indicated by an SRC on the control panel or in the HMC). This communications loss condition has the following symptoms:
    - The A6xx SRC does not increment within two minutes.
    - The system continues to run normally after it recovers from the communications loss condition and the reference code is cleared from the control panel.

Does the communication loss condition have the above symptoms?

**Yes:** Continue with the next step.

**No:** Go to step 6.

5. Verify that all Licensed Internal Code PTFs have been applied to the system. Apply any Licensed Internal Code PTFs that have not been applied to the system. Does the intermittent condition continue?

**Yes:** Print all product activity logs. Print the LIC logs with a major code of 1000. Provide this information to your next level of support. **This ends the procedure.**

**No:** **This ends the procedure.**

6. A manual reset of the IOP may clear the attention reference code. Perform the following:

**If you are working from the control panel:**

- a. Select *Manual* mode on the control panel.
- b. Select **Function 25** and press Enter.
- c. Select **Function 26** and press Enter.
- d. Select **Function 67** and press Enter to reset the IOP.
- e. Select **Function 25** and press Enter to disable the service functions on the control panel.

**If you are working from the HMC:**

- a. In the Navigation Area, open the Service Applications folder.
- b. Select **Service Focal Point**.
- c. In the contents area, select **Service Utilities**.
- d. In the Service Utilities window, select the system you are working on.
- e. Select **Selected > Operator Panel Service Functions**.
- f. Select the logical partition, and then select **Partition Functions**.
- g. Select **Disk Unit IOP Reset/Reload (67)**.

Did the reset successfully clear the control panel SRC or HMC panel value and can commands be entered on the partition console?

**No:** Continue with the next step.

**Yes:** Look for a Service Action Log (SAL) entry since the last IPL, and use it to fix the problem (see "Using the Service Action Log" on page 24). If a B6xx 5090 SRC occurred since the last IPL, look for other SRC entries and take action on them first. **This ends the procedure.**

7. Is the SRC the same reference code that sent you here?

**Yes:** The same reference code occurred. Continue with the next step.

**No:** Collect all words of the reference code and go to Reference codes to resolve the new problem. **This ends the procedure.**

8. Powering off and powering on the affected IOP domain may clear the attention reference code. Perform the following:

**If you are working from the control panel:**

- a. Select *Manual* mode on the control panel.
- b. Select **Function 25** and press Enter.
- c. Select **Function 26** and press Enter.
- d. Select **Function 68** and press Enter to power off the domain.
- e. After the domain has been powered off, select **Function 69** and press Enter to power on the domain.
- f. Select **Function 25** and press Enter to disable the service functions on the control panel.

**If you are working from the HMC:**

- a. In the Navigation Area, open the Service Applications folder.
- b. Select **Service Focal Point**.
- c. In the contents area, select **Service Utilities**.
- d. In the Service Utilities window, select the system you are working on.
- e. Select **Selected > Operator Panel Service Functions**.
- f. Select the logical partition, and then select **Partition Functions**.
- g. Select **Power off domain (68)**.
- h. After the domain has been powered off, select **Power on domain (69)**.

Did this successfully clear the control panel SRC or HMC panel value, and can commands be entered on the partition console?

**No:** Continue with the next step.

**Yes:** Look for a SAL entry since the last IPL, and use it to fix the problem (see “Using the Service Action Log” on page 24). If a B6xx 5090 SRC occurred since the last IPL, look for other SRC entries and take action on them first. **This ends the procedure.**

9. Is the SRC the same reference code that sent you here?

**Yes:** The same reference code occurred. Continue with the next step.

**No:** Collect all words of the reference code and go to Reference codes to resolve the new problem. **This ends the procedure.**

10. Perform a main storage dump, then perform an IPL by performing the following:

**If you are working from the control panel:**

- a. Select *Manual* mode on the control panel.
- b. Select **Function 22** and press Enter to dump the main storage to the load-source disk unit.
- c. Wait for SRC A100 300x to occur, indicating that the dump is complete.
- d. Then perform an IPL to DST (see Performing an IPL to DST).

**If you are working from the HMC:**

- a. In the Navigation Area, open Server and Partition.
- b. Select **Server Management**.
- c. In the contents area, open the server on which the logical partition is located.
- d. Select **Partitions**.
- e. Right-click the logical partition profile and select **Restart Partition**.
- f. In the Restart Partition window, select the **Dump** restart option.

Does a different SRC occur, or does a display appear on the console showing reference codes?

**No:** Continue with the next step.

**Yes:** Go to Reference codes to service the new problem. **This ends the procedure.**

11. Does the same reference code occur?

**Yes:** Continue with the next step.

**No:** The problem is intermittent. Perform the following:

- a. Print the system product activity log for the magnetic storage subsystem and print the LIC logs with a major code of 1000.
- b. Copy the main storage dump to removable media (see Copying a current main storage dump).
- c. Contact your next level of support and provide them with this information. **This ends the procedure.**

12. Are characters 7-8 of the top 16 character line of function 12 (2 rightmost characters of word 2) equal to 13 or 17?

**Yes:** Continue with the next step.

**No:** Go to step 15.

13. Use the word 1 through 9 information recorded on the Problem summary form to determine the disk unit that stopped communicating with the system:

- Characters 9-16 of the top 16 character line of function 12 (word 3) contain the IOP direct select address.
- Characters 1-8 of the bottom 16 character line of function 12 (word 4) contains the unit address.
- Characters 1-8 of the top 16 character line of function 13 (word 6) may contain the disk unit type, level and model number.
- Characters 13-16 of the top 16 character line of function 13 (4 rightmost characters of word 7) may contain the disk unit reference code.
- Characters 1-8 of the bottom 16 character line of function 13 (word 8) may contain the disk unit serial number.

**Note:** For 2105 and 2107 disk units, characters 4-8 of the bottom 16 character line of function 13 (5 rightmost characters of word 8) contain the disk unit serial number.

14. Is the disk unit reference code 0000?

**No:** Using the information from step 13, find the table for the indicated disk unit type in the Reference codes topic. Perform problem analysis for the disk unit reference code. **This ends the procedure.**

**Yes:** Perform the following steps:

- a. Determine the IOP type by using characters 9-12 of the bottom 16 character line of function 13 (4 leftmost characters of word 9).
- b. Find the unit reference code table for the IOP type in the Reference codes topic. Determine the unit reference code by using characters 13-16 of the bottom 16 character line of function 13 (4 rightmost characters of word 9).
- c. Perform problem analysis for the unit reference code. **This ends the procedure.**

15. Are characters 7-8 of the top 16 character line of function 12 (the two rightmost characters of word 2) equal to 27?

**Yes:** Continue with the next step.

**No:** Go to step 19 on page 155.

16. Use the word 1 through 9 information recorded on the Problem summary form to determine the disk unit that stopped communicating with the system:

- Characters 9-16 of the top 16 character line of function 12 (word 3) contain the IOP direct select address.



- Characters 1-8 of the bottom 16 character line of function 12 (word 4) contains the disk unit address
- Characters 9-16 of the bottom 16 character line of function 12 (word 5) contains the disk unit type, level and model number.
- Characters 1-8 of the bottom 16 character line of function 13 (word 8) contains the disk unit serial number.

**Note:** For 2105 and 2107 Disk Units, characters 4-8 of the bottom 16 character line of function 13 (5 rightmost characters of word 8) contain the disk unit serial number.

- Characters 13-16 of the bottom 16 character line of function 13 (4 rightmost characters of word 9) contain the disk unit reference code.

17. Is the disk unit reference code 0000?

**No:** Continue with the next step.

**Yes:** Find the table for the indicated disk unit type in the Reference codes topic. Then find unit reference code (URC) 3002 in the table, and exchange the FRUs for that URC, one at a time.

**Note:** Do not perform any other isolation procedures that are associated with URC 3002.

**This ends the procedure.**

18. Are characters 9-16 of the bottom 16 character line of function 13 (word 9) B6xx 51xx?

**Yes:** Use the B6xx table in the Reference codes topic. Perform problem analysis for the 51xx unit reference code. **This ends the procedure.**

**No:** Using the information from step 16 on page 154, find the table for the indicated disk unit type in the Reference codes topic. Perform problem analysis for the disk unit reference code. **This ends the procedure.**

19. Are the 2 rightmost characters of word 2 on the Problem summary form equal to 62?

**No:** Use the information in characters 9-16 of the bottom 16 character line of function 13 (word 9) and go to the Reference codes topic. Use this information instead of the information in word 1 for the reference code. **This ends the procedure.**

**Yes:** Continue with the next step.

20. Are characters 9-16 of the top 16 character line of function 12 (word 3) equal to 00010004?

**Yes:** Continue with the next step.

**No:** Go to step 23.

21. Are characters 13-16 of the bottom 16 character line of function 12 (4 rightmost characters of word 5) equal to 0000?

**No:** Continue with the next step.

**Yes:** Go to step 24 on page 156.

22. Note the following:

- Characters 13-16 of the bottom 16 character line of function 12 (4 rightmost characters of word 5) contain the disk unit reference code.
- Characters 1-8 of the top 16 character line of function 13 (word 6) contains the disk unit address.
- Characters 9-16 of the top 16 character line of function 13 (word 7) contain the IOP direct select address.
- Characters 1-8 of the bottom 16 character line of function 13 (word 8) contains the disk unit type, level and model number.

Find the table for the disk unit type (characters 1-4 of the bottom 16 character line of function 13 - 4 leftmost characters of word 8) in the Reference codes topic, and use characters 13-16 of the bottom 16 character line of function 12 (4 rightmost characters of word 5) as the unit reference code. **This ends the procedure.**

23. Are characters 9-16 of the top 16 character line of function 12 (word 3) equal to 0002000D?

**Yes:** Continue with the next step.

**No:** Use the information in characters 9-16 of the bottom 16 character line of function 13 (word 9), instead of the information in word 1 for the reference code, and go to the Reference codes topic.

- Characters 1-8 of the top 16 character line of function 13 (word 6) may contain the disk unit address.
- Characters 9-16 of the top 16 character line of function 13 (word 7) may contain the IOP direct select address.
- Characters 1-8 of the bottom 16 character line of function 13 (word 8) may contain the disk unit type, level and model number. **This ends the procedure.**

24. Note the following:

- Characters 1-8 of the top 16 character line of function 13 (word 6) contains the disk unit address.
- Characters 9-16 of the top 16 character line of function 13 (word 7) contain the IOP direct select address.
- Characters 1-8 of the bottom 16 character line of function 13 (word 8) contains the disk unit type, level and model number.

Find the table for the disk unit type (characters 1-4 of the bottom 16 character line of function 13 (4 leftmost characters of word 8) in the Reference codes topic and use 3002 as the unit reference code. Exchange the FRUs for URC 3002 one at a time. **This ends the procedure.**

**LICIP14:** LIC detected a card slot test failure.

1. Has the I/O adapter moved to a new card location?

**Yes:** Continue with the next step.

**No:** Go to step 4.

2. Perform one of the following, and then continue with the next step:

- Use the concurrent maintenance option in Hardware Service Manager in SST/DST to power off, remove, reinsert, and power on the I/O adapter.

OR

- Power off the system, remove and reinsert the I/O adapter. Then IPL the system.

3. Does the reference code occur again for this same I/O adapter?

**Yes:** Continue with the next step.

**No:**No further service action is needed.

**This ends the procedure.**

4. Move the I/O adapter to a different card location, that has no I/O processors in the PCI bridge set, by performing one of the following, and then continue with the next step:

- Use the concurrent maintenance option in Hardware Service Manager in SST/DST to power off, remove the I/O adapter, install the I/O adapter in a different card location, and power on the I/O adapter.

OR

- Power off the system, remove the I/O adapter, install the I/O adapter in a different card location, and then IPL the system.

5. Does the same reference code occur again for this I/O adapter?

**Yes:** Replace the I/O adapter.

**This ends the procedure.**

**No:** Replace the backplane.

**This ends the procedure.**

**LICIP15:**

1. Is the system HMC-managed?

- Yes:** Continue with the next step.
- No:** Go to step 3.
2. Check the LPAR configuration to ensure that the load source and alternate load source devices are valid. Is the LPAR configuration correct?

**Yes:** Continue with the next step.

**No:** Correct the LPAR configuration problem. **This ends the procedure.**
  3. Did the failure occur when you were performing a type-D IPL?

**No:** Go to step 7.

**Yes:** Perform the following:

    - a. Ensure that the device is ready and has valid install media.
    - b. Ensure that the device has the correct SCSI address and that any cables are properly connected and terminated.

If a correction is made during the above checks, retry the IPL. If none of the above items resolve the problem, continue with the next step.
  4. Are the load source and alternate load source devices controlled by the same I/O adapter, and does the load source disk unit have SLIC loaded on it?

**Yes:** Continue with the next step.

**No:** Go to step 6.
  5. Perform a type-B IPL in manual mode. Does the same SRC occur?

**No:** Continue with the next step.

**Yes:** Replace the following items, one at a time, and retry the IPL until the problem is resolved (see Finding part locations):

    - a. The I/O adapter controlling load source and alternate load source devices.

**Note:** The I/O adapter may be embedded on the system unit backplane.

    - b. The I/O processor controlling the load source I/O adapter.
    - c. The common cable, if present, attached between both the load source and alternate load source and the controlling I/O adapter.
    - d. If none of the items above resolve the problem, contact your next level of support. **This ends the procedure.**
  6. Replace the following items, one at a time, and retry the type-D IPL until the problem is resolved (see Finding part locations):
    - a. Media in the alternate load source device
    - b. Device cables (if present)
    - c. Media device
    - d. Media backplane
    - e. I/O adapter controlling the alternate load source device

**Note:** The I/O adapter may be embedded on the system unit backplane

    - f. I/O processor controlling the alternate load source I/O adapter
    - g. If the problem persists after replacing each of these parts, contact your next level of support. **This ends the procedure.**
  7. You performed a type A or type B IPL. Is the device in a valid location (see Finding part locations)?

**Yes:** Continue with the next step.

**No:** Correct the device location problem and retry the IPL. If the problem persists, continue with the next step.
  8. Perform a type-D IPL in manual mode to DST. Is the type-D IPL successful?

**No:** Continue with the next step.

**Yes:** Look for other SRCs and use them to resolve the problem. If there are no SRCs, or the SRCs do not resolve the problem, replace the following items, one at a time, until the problem is resolved (see Finding part locations):

- a. Load source disk drive
- b. Cables (if present)
- c. Disk drive backplane
- d. I/O adapter controlling the load source device

**Note:** The I/O adapter may be embedded on the system unit backplane

- e. I/O processor controlling the load source I/O adapter
- f. Backplane that the I/O adapter and I/O processor are plugged into
- g. If the problem persists after replacing each of these parts, contact your next level of support.

**This ends the procedure.**

9. The type-D IPL in manual mode to DST was not successful. Is the I/O adapter embedded on the system unit backplane?

**No:** Continue with the next step.

**Yes:** Go to step 15.

10. Are the load source and alternate load source controlled by the same I/O adapter?

**No:** Go to step 14.

**Yes:** Continue with the next step.

11. Replace the I/O adapter and retry the IPL. Does the IPL complete successfully?

**Yes: This ends the procedure.**

**No:** Continue with the next step.

12. Are the load source and alternate load source controlled by different I/O adapters, but the same I/O processor?

**No:** Go to step 14.

**Yes:** Continue with the next step.

13. Replace the I/O processor and retry the IPL. Does the IPL complete successfully?

**Yes: This ends the procedure.**

**No:** Continue with the next step.

14. Replace the backplane that the I/O adapter and the I/O processor are plugged into and retry the IPL. If the IPL still fails, contact your next level of support. **This ends the procedure.**

15. Replace the I/O processor and retry the IPL. Does the IPL complete successfully?

**Yes: This ends the procedure.**

**No:** Replace the system unit backplane and retry the IPL. If the IPL still fails, contact your next level of support. **This ends the procedure.**

## Logical partition (LPAR) isolation procedure

### DANGER

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn everything OFF (unless instructed otherwise).
2. Remove power cords from the outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

To Connect:

1. Turn everything OFF (unless instructed otherwise)
2. Attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

(D005)

Use the procedure below to identify logical partition (LPAR) configuration conditions and the associated corrective actions.

“LPRIP01”

#### LPRIP01:

1. Is there **only one** B6005311 error logged, and is it against the load source device for the partition, in either the Primary or a secondary partition?
  - **Yes:** Is the reporting partition the Primary partition?
    - **Yes:** Continue with the next step.
    - **No:** Go to step 3 on page 160.
  - **No:** Go to step 4 on page 160.
2. Was the load source disk unit migrated from another partition within the same system?
  - **Yes:** Is this load source device intended to be the load source for the Primary partition?
    - **Yes:** To accept the load source disk unit: Go to SST/DST in the current partition and select **Work with system partitions**—>**Recover configuration data**—>**Accept load source disk unit**.  
**This ends the procedure.**

- **No:** Power off the system. Return the original load source disk to the Primary partition and perform a system IPL.  
**This ends the procedure.**
  - **No:** The load source disk unit has not changed. Contact your next level of support.  
**This ends the procedure.**
3. The reporting partition is a secondary partition.  
Since the last IPL of the reporting partition, have one of the following occurred?
- Has the Primary partition time/date been moved backward to a time/date earlier than the previous setting?
  - Has the system serial number been changed?
  - Was the load source disk unit in this secondary partition, replaced intentionally with a load source from another system or another partition from the same system?
  - **Yes:** To accept the load source disk unit: Go to SST/DST in the current partition and select **Work with system partitions**—>**Recover configuration data**—>**Accept load source disk unit**  
**This ends the procedure.**
  - **No:** Contact your next level of support.  
**This ends the procedure.**
4. Are there **multiple** B600 5311 SRCs logged in the same partition?
- **Yes:** Continue with the next step.
  - **No:** None of the conditions in this procedure have been met, call your next level of support.  
**This ends the procedure.**
5. Is the resource for **one** of the B600 5311 SRCs the load source device and are **all** of the other B600 5311 entries for resources which are non-configured disk units?
- Note:** To determine if a disk unit is a non-configured disk unit, refer to the "Work with disk unit options" section in the "DST options" section of the "DST chapter" in the *iSeries Service Functions* information.
- **Yes:** Is the partition that is reporting the error the **Primary** partition?
    - **Yes:** Continue with the next step.
    - **No:** Go to step 7.
  - **No:** Go to step 8 on page 161.
6. Was the load source disk unit migrated from another partition within the same system?
- **Yes:** Is this load source device intended to be the load source for the Primary partition?
    - **Yes:** To accept the load source disk unit: Go to SST/DST in the current partition and select **Work with system partitions**—>**Recover configuration data**—>**Accept load source disk unit**  
**This ends the procedure.**
    - **No:** Power off the system. Return the original load source disk to the Primary partition and perform a system IPL.  
**This ends the procedure.**
  - **No:** The load source disk unit has not changed. Contact your next level of support.  
**This ends the procedure.**
7. The reporting partition is a secondary partition.  
Since the last IPL of the reporting partition, have one of the following occurred:
- Has the Primary partition time/date been moved backward to a time/date earlier than the previous setting?
  - Has the system serial number been changed?
  - Was the load source disk unit in this secondary partition, replaced intentionally with a load source from another system or another partition from the same system?

- **Yes:** To accept the load source disk unit: Go to SST/DST in the current partition and select **Work with system partitions—>Recover configuration data—>Accept load source disk unit**  
**This ends the procedure.**
  - **No:** Contact your next level of support.  
**This ends the procedure.**
8. One or more B600 5311 SRCs have been logged in the same partition.  
Do all of the B600 5311 errors have a resource which is a non-configured disk unit in the partition?  
**Note:** To determine if a disk unit is a non-configured disk unit, refer to the "Work with disk unit options" section in the "DST options" section of the "DST chapter" in the *iSeries Service Functions* information.
- **Yes:** Continue with the next step.
  - **No:** None of the conditions in this procedure have been met, call your next level of support.  
**This ends the procedure.**
9. Were any disk unit resources associated with the B600 5311 SRCs added to the partition, since the last IPL of this partition?
- **No:** Continue with the next step.
  - **Yes:** Perform the following to clear non-configured disk unit configuration data:
    - a. Go to SST/DST in the partition and select **Work with system partitions—>Recover configuration data—>Clear non-configured disk unit configuration data.**
    - b. Select each unit in the list which is new to the system and press **Enter**.
    - c. Continue the system IPL.  
**This ends the procedure.**
10. None of the resources that are associated with the B600 5311 SRCs are disk units that were added to the partition since the last IPL of the partition.  
Has a scratch install recently been performed on the partition that is reporting the error(s)?
- **No:** Continue with the next step.
  - **Yes:** Go to step 13.
11. If a scratch install was not performed, was the clear configuration data option recently used to discontinue LPAR use?
- **Yes:** Continue with the next step.
  - **No:** The **Clear configuration data** option was not used. Contact your next level of support.  
**This ends the procedure.**
12. Perform the following to clear non-configured disk unit configuration data:
- a. Go to SST/DST in the partition and select **Work with system partitions—>Recover configuration data—>Clear non-configured disk unit configuration data.**
  - b. Select each unit in the list which is new to the system and press **Enter**.
  - c. Continue the system IPL.  
**This ends the procedure.**
13. Was the load source device previously mirrored before the scratch install?
- **Yes:** Continue with the next step.
  - **No:** Go to step 15.
14. Perform the following to clear the old configuration data from the disk unit that was mirroring the old load source disk
- a. Go to SST/DST in the partition and select **Work with system partitions—>Recover configuration data—>Clear non-configured disk unit configuration data.**
  - b. Select the former load source mirror in the list and press **Enter**.
15. Is the Primary partition reporting the B600 5311 error(s)?
- **No:** **This ends the procedure.**

- **Yes:** Does the customer want multiple partitions on the system?
    - **No:** **This ends the procedure.**
    - **Yes:** Use the **Recover primary partition configuration data** option to retrieve the LPAR configuration data from other devices in the system.
      - a. Go to SST/DST in the primary partition and select **Work with system partitions**—>**Recover configuration data**—>**Recover primary partition configuration data**. The system will perform an automatic IPL.
      - b. Verify the information that appears.
        - The device should be a former load source device from a secondary partition.
        - The time and date should reflect a time when that partition was active. It should be more recent than the last change to the logical partition configuration.
- This ends the procedure.**

## Operations Console isolation procedures

### DANGER

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn everything OFF (unless instructed otherwise).
2. Remove power cords from the outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

To Connect:

1. Turn everything OFF (unless instructed otherwise)
2. Attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

(D005)

For direct cable only.

This topic contains the procedures necessary to isolate a failure with the iSeries Operations Console.

The following symptoms can be caused by iSeries Operations Console failing to connect:



- SRC A600 5008
- The status in the iSeries Operations Console window remains "Connecting console".

The following symptoms can be caused by a defective remote control panel cable:

- Remote control panel (hung) System control panel functions.
- SRC 0000 DDDD with attention light on the system panel.
- Remote control panel accepts mode selections, however the system does not respond.
- The remote control panel does not function.
- The status in the iSeries Operations Console window remains "Connecting console".

The following safety notices apply throughout this section.

Read all safety procedures before servicing the system. Observe all safety procedures when performing a procedure. Unless instructed otherwise, always power off the system or expansion tower where the field-replaceable unit (FRU) is located. See Powering on and powering off before removing, exchanging, or installing a FRU.

#### **"OPCIP03"**

#### **OPCIP03:**

## DANGER

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn everything OFF (unless instructed otherwise).
2. Remove power cords from the outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

To Connect:

1. Turn everything OFF (unless instructed otherwise)
2. Attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

(D005)

Use this procedure to isolate an Operations Console bringup failure when the SRC on the panel is A6xx5008 or B6xx5008. If you are not using the Operations Console, see A6005004. This procedure only works with cable-connected and LAN configurations. It is not valid for dial connected configurations. Read the danger notices in "Operations Console isolation procedures" on page 162 before proceeding.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determine if the system has logical partitions before continuing with this procedure.
2. Is the SRC on the panel A6xx5008 or B6xx5008?
  - No: This ends the procedure.**
  - Yes:** Are you connecting Operations Console using the ASYNC adapter?
    - Yes:** Continue with the next step.
    - No:** You are connecting using a LAN adapter. Go to step 6 on page 165.
3. Are words 17, 18, and 19 all equal to 00000000?
  - Yes:** Report the problem to your next level of support. **This ends the procedure.**
  - No:** Is word 17 equal to 00000001?
    - No:** Continue with the next step.
    - Yes:** The ASYNC adapter was not detected. Ensure that the ASYNC adapter card is installed, or replace the IOA and try again. **This ends the procedure.**

4. Is word 17 equal to 00000002?

**Yes:** On the ASYNC adapter card that was found, no cable was detected. Word 18 contains the card position. Locate the ASYNC adapter card in this card position, and ensure that the external cable is attached. Install or replace the external cable. **This ends the procedure.**

**No:** Is word 17 equal to 00000003?

**No:** Continue with the next step.

**Yes:** The cable that was detected does not have the correct cable ID. Word 18 contains the card position. Word 19 contains the cable ID. Locate the ASYNC adapter card in this card position, and verify that the correct cable is attached, or replace the cable. **This ends the procedure.**

5. Is word 17 equal to 00000004?

**No:** Report the problem to you next level of support. **This ends the procedure.**

**Yes:** Operations Console failed to make a connection because the port is already being used. Word 18 contains the card position. Disconnect the active communications session and try using the resource again. **This ends the procedure.**

6. Are words 13, 14 and 15 all equal to 00000000?

**Yes:** Report the problem to you next level of support. **This ends the procedure.**

**No:** Is word 13 equal to 00000002?

**No:** Continue with the next step.

**Yes:** The LAN hardware failed to activate. Replace the LAN IOA being used. **This ends the procedure.**

7. Is word 13 equal to 00000003?

**No:** Continue with the next step.

**Yes:** A hardware error occurred. Word 14 contains the error code, (example: 53001A80). Word 15 contains the card position.

Is the error code equal to 53001A80?

**Yes:** The network cable is not attached to the LAN adapter, the cable is defective, or the network is not operational. **This ends the procedure.**

**No:** The LAN adapter hardware is not operational. Replace the hardware and try again. **This ends the procedure.**

8. Is word 13 equal to 00000004?

**Yes:** The console did not respond. Word 14 contains the number of attempts made. Word 15 contains the card position. The system is inserted into the network but there is no connection to the client (PC). Verify the configuration for the network at the system and client; verify the configuration of Operations Console. **This ends the procedure.**

**No:** Is word 13 equal to 00000005?

**No:** Report the problem to your next level support. **This ends the procedure.**

**Yes:** IP information was received from the console. Word 14 contains the received IP address. Verify the configuration data for the client (PC) or verify the configuration for the network. **This ends the procedure.**

## Power isolation procedures

This topic contains procedures for isolating a problem in the power system. Some field replaceable units (FRUs) can be replaced with the unit powered on. Follow the instructions in Removing and replacing parts when directed to remove, exchange, or install a FRU.

The following safety notices apply throughout the power isolation procedures. Please read all safety procedures before servicing the system and observe all safety procedures when performing a procedure.

## DANGER

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn everything OFF (unless instructed otherwise).
2. Remove power cords from the outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

To Connect:

1. Turn everything OFF (unless instructed otherwise)
2. Attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

(D005)

"PWR1900" on page 167

"PWR1902" on page 167

"PWR1903" on page 169

"PWR1904" on page 172

"PWR1906" on page 174

"PWR1907" on page 177

"PWR1908" on page 177

"PWR1909" on page 179

"PWR1911" on page 181

"PWR1912" on page 186

"PWR1916" on page 188

"PWR1917" on page 189

"PWR1918" on page 191

"PWR1920" on page 193

"PWR2402" on page 194

**PWR1900:** Follow the instructions for the model or expansion unit you are working on.

For Model 520 perform "PWR1902."

For Models 550 and 9124-720 perform "PWR1903" on page 169.

For Model 570 perform "PWR1904" on page 172.

For 5074, 5079, 5094, and 5294 units perform "PWR1906" on page 174.

For 5088 and 0588 units perform "PWR1908" on page 177.

For 5095, 0595, 5790, D10, D11, and D20 units, perform "PWR1909" on page 179.

**This ends the procedure.**

**PWR1902:** A system unit power supply load fault is occurring. Please see "Power isolation procedures" on page 165 for important safety information before servicing the system.

#### **PWR1902 instructions for model 520**

1. Perform the following steps:

- a. Disconnect the AC power cable or cables from the unit on which you are working.
- b. Disconnect all of the I/O devices (tape, diskette, optical, and disk units) by sliding them partially out of the system unit (see Removing and replacing parts).
- c. Remove and label all cards (PCI, memory DIMM, and RAID cards if installed).
- d. If the SRC is 1xxx-1B01, also remove the regulators (see Locations — Model 520).
- e. Reconnect the AC power cable or cables to the unit on which you are working.
- f. Power on the system (see Powering on and powering off).

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Go to step 6 on page 168.

2. Perform the following:

- a. Remove one of the fans from the system unit (if you have previously removed and reinstalled any fans using this procedure, remove one of the fans that has not been removed).

**Note:** Disregard a fan reference code if it occurs during this step.

- b. Power on the system (see Powering on and powering off).

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** The fan you removed in this step is the failing item. Replace the failing fan, go to Removing and replacing parts. **This ends the procedure.**

3. Have you tried removing each fan one at a time?

**Yes:** Reinstall all the fans and continue with the next step.

**No:** Perform the following:

- a. Power off the system (see Powering on and powering off).
- b. Install the fan that you removed in step 2 on page 167 to its original location.
- c. Repeat step 2 on page 167.

4. Perform the following:

- a. Power off the system (see Powering on and powering off).
- b. Disconnect the power cable from and then remove one of the power supplies (that you have not already tried removing) from the system unit and replace it with a new one (see Part number catalog).
- c. Power on the system (see Powering on and powering off).

Does a power reference code occur?

**No:** The power supply you just removed and replaced is the failing item. Power off the system (see Powering on and powering off) and reinstall the parts you removed in previous steps. Go to Verifying the repair. **This ends the procedure.**

**Yes:** Continue with the next step.

5. Remove the new power supply that you just installed in step 4 and reinstall the original power supply. Have you now tried exchanging all of the power supplies in the system?

**No:** Repeat step 4.

**Yes:** Replace the backplane (see symbolic FRU "SYSBKPL" on page 547). Then reinstall the parts you removed in step 1 on page 167. Go to Verifying the repair. **This ends the procedure.**

6. Perform the following steps:

- a. If you removed regulators in step 1 on page 167, reinstall all of the regulators. If not, go to step 9.
- b. Power on the system (see Powering on and powering off).

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Go to step 9.

7. Perform the following:

- a. Power off the system (see Powering on and powering off).
- b. Disconnect one of the regulators you reinstalled in step 6.
- c. Power on the system (see Powering on and powering off).

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Replace the last regulator you disconnected in this step (see Removing and replacing parts).

**This ends the procedure.**

8. Have you disconnected all the regulators?

**No:** Repeat step 7.

**Yes:** Reinstall all of the parts removed in this procedure and go to "Start of call procedure" on page 2. **This ends the procedure.**

9. Perform the following:

- a. Reinstall all of the cards you removed in step 1 on page 167.
- b. Power on the system (see Powering on and powering off).

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Go to step 12 on page 169.

10. Perform the following:

- a. Power off the system (see Powering on and powering off).
- b. Disconnect one of the cards you reinstalled in step 9 on page 168.
- c. Power on the system (see Powering on and powering off).

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Replace the last card you disconnected in this step (see Removing and replacing parts). **This ends the procedure.**

11. Have you disconnected all the cards?

**No:** Repeat step 10 on page 168.

**Yes:** Reinstall all of the parts removed in this procedure and return to “Start of call procedure” on page 2. **This ends the procedure.**

12. Perform the following:

- a. Power off the system (see Powering on and powering off).
- b. Reconnect all of the I/O devices (tape, diskette, optical, or disk units) that you disconnected in step 1 on page 167.
- c. Power on the system (see Powering on and powering off).

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** The system is working. The problem seems to be intermittent (see “Intermittent problems” on page 36). **This ends the procedure.**

13. Perform the following:

- a. Power off the system (see Powering on and powering off).
- b. Disconnect one of the I/O devices (tape, diskette, optical, or disk units) that you reconnected in step 12.
- c. Power on the system (see Powering on and powering off).

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Replace the last I/O device you disconnected in this step (see Removing and replacing parts). **This ends the procedure.**

14. Have you disconnected all the I/O devices?

**No:** Repeat step 13.

**Yes:** Reinstall all of the parts you removed in this procedure and return to “Start of call procedure” on page 2. **This ends the procedure.**

**PWR1903:** A system unit power supply load fault is occurring. Please see “Power isolation procedures” on page 165 for important safety information before servicing the system.

#### **Instructions for Models 550 9124-720**

1. Perform the following (see Locations — 9124-720 and Model 550 for links to exchange procedures when asked to remove a part):
  - a. Power off the system (see Powering on and powering off).
  - b. Disconnect the ac power cable(s) from the unit on which you are working.
  - c. Disconnect all of the I/O devices (tape, diskette, optical, and disk units) by sliding them partially out of the system unit.
  - d. Remove and label all cards (PCI, and RAID cards if installed).
  - e. If the SRC is 1xxx-1B01, also remove the voltage regulators located in P1-C10 and P1-C11 (if installed).
  - f. Reconnect the ac power cable(s) to the unit on which you are working.

g. Power on the system (see Powering on and powering off).

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Go to step 8.

2. Perform the following:

a. Power off the system (see Powering on and powering off).

b. Replace one of the processor cards (see Locations — 9124-720 and Model 550).

c. Power on the system (see Powering on and powering off).

Does the problem persist?

**No: This ends the procedure.**

**Yes:** Continue with the next step.

3. Have you replaced all of the processor cards?

**No:** Repeat step 2 and replace the next processor card.

**Yes:** Continue with the next step.

4. Perform the following:

a. Power off the system (see Powering on and powering off).

b. Remove one of the air moving devices (AMDs) from the system unit (see Locations — 9124-720 and Model 550).

**Note:** Disregard any AMD reference codes that occur during this step.

c. Power on the system (see Powering on and powering off).

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** The AMD you removed is the failing item, and should be replaced (see Locations — 9124-720 and Model 550). **This ends the procedure.**

5. Have you tried removing each of the AMDs?

**Yes:** Reinstall all of the AMDs and continue with the next step.

**No:** Perform the following:

a. Power off the system (see Powering on and powering off).

b. Reinstall the AMD that you removed in step 4.

c. Repeat step 4.

6. Perform the following:

a. Power off the system (see Powering on and powering off).

b. Replace one of the power supplies from the system unit (see Locations — 9124-720 and Model 550).

c. Power on the system (see Powering on and powering off).

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** The power supply you replaced is the failing item. Power off the system and reinstall any other parts you have removed in this procedure. **This ends the procedure.**

7. Reinstall the original power supply that you replaced in step 6. Have you now tried to replace each of the power supplies?

**No:** Repeat step 6 and replace the next power supply.

**Yes:** Replace the backplane (see symbolic FRU "SYSBKPL" on page 547). Then reinstall the parts you removed in step 1 on page 169. **This ends the procedure.**

8. Did you remove any voltage regulators in step 1 on page 169?



**Yes:** Continue with the next step.

**No:** Go to step 12.

9. Perform the following:
  - a. Power off the system (see Powering on and powering off).
  - b. Reinstall all of the regulators.
  - c. Power on the system (see Powering on and powering off).

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Go to step 12.

10. Perform the following:
  - a. Power off the system (see Powering on and powering off).
  - b. Disconnect one of the regulators you reinstalled in step 9.
  - c. Power on the system (see Powering on and powering off).

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** The regulator you just disconnected is the failing item and should be replaced (see Locations — 9124-720 and Model 550). **This ends the procedure.**

11. Have you tried disconnecting each of the voltage regulators?

**No:** Reconnect the regulator you just disconnected, and then repeat step 10 and try disconnecting the next regulator.

**Yes:** Reconnect the regulator your disconnected in this step and then continue with the next step.

12. Perform the following:
  - a. Power off the system (see Powering on and powering off).
  - b. Reinstall all of the cards you removed in step 1 on page 169.
  - c. Power on the system (see Powering on and powering off).

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Go to step 15.

13. Perform the following:
  - a. Power off the system (see Powering on and powering off).
  - b. Disconnect one of the cards you reinstalled in step 12.
  - c. Power on the system (see Powering on and powering off).

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** The card you just disconnected is the failing item and should be replaced (see Locations — 9124-720 and Model 550). **This ends the procedure.**

14. Have you tried disconnecting each of the cards?

**No:** Reconnect the card you just disconnected. Then repeat step 13 and try disconnecting the next card.

**Yes:** Reinstall all of the parts you've removed in this procedure and continue with the next step.

15. Perform the following:
  - a. Power off the system (see Powering on and powering off).
  - b. Reinstall all of the I/O devices you disconnected in step 1 on page 169.
  - c. Power on the system (see Powering on and powering off).

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** The problem appears to be intermittent. Go to “Intermittent problems” on page 36. **This ends the procedure.**

16. Perform the following:
  - a. Power off the system (see Powering on and powering off).
  - b. Remove one of the I/O devices you reinstalled in step 15 on page 171.
  - c. Power on the system (see Powering on and powering off).

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** The device you just removed is the failing item and should be replaced (see Locations — 9124-720 and Model 550). **This ends the procedure.**

17. Have you tried removing each of the I/O devices?

**No:** Reinstall the I/O device you just removed. Then repeat step 16 and remove the next I/O device.

**Yes:** Reinstall all of the parts you’ve removed in this procedure and contact your next level of support. **This ends the procedure.**

**PWR1904:** A power supply or regulator overcurrent fault is occurring in the system unit. Refer to “Power isolation procedures” on page 165 for important safety information before servicing the system.

#### Instructions for Model 570

1. Is the reference code 1xxx 1C02, 1C04, or 1C06?

**Yes:** Continue with the next step.

**No:** Go to step 5 on page 173.
2. Is the reference code 1xxx 1C02 or 1C04?

**No:** Continue with the next step.

**Yes:** Go to step 4.
3. Perform the following:
  - a. Power off the system.
  - b. Replace one of the memory DIMMs on the processor cards (see Locations — Model 570).
  - c. Power on the system.
  - d. Has this resolved the problem?

**No:** Continue with step 3e.

**Yes: This ends the procedure.**
  - e. Have you replaced all of the DIMMs?

**No:** Repeat step 3 and replace the next memory DIMM.

**Yes:** Go to step 4.
4. Perform the following:
  - a. Power off the system.
  - b. Replace one of the processor cards (see Locations — Model 570).
  - c. Power on the system.
  - d. Has this resolved the problem?

**No:** Continue with step 4e.

**Yes: This ends the procedure.**
  - e. Have you replaced all of the processor cards?

**No:** Repeat step 4 and replace the next processor card.

**Yes:** Go to step 8 on page 173.

5. Perform the following:
  - a. Power off the system and disconnect the ac power cable from the unit you are working on.
  - b. Disconnect all of the I/O devices (tape, diskette, optical, and disk units) from the unit you are working on by sliding them partially out of the unit (see Locations — Model 570).
  - c. Remove and label all PCI cards that are installed.
  - d. Reconnect the ac power cable to the unit you are working on.
  - e. Power on the system.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Go to step 10.

6. Perform the following:
  - a. Power off the system.
  - b. Replace one of the system fans (see Locations — Model 570).
  - c. Power on the system.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** The fan you just replaced was the failing item.

**This ends the procedure.**

7. Have you tried replacing all of the fans?

**Yes:** Reinstall all of the fans you replaced in step 6 and continue with the next step.

**No:** Perform the following:

  - a. Power off the system.
  - b. Reinstall the fan that you just removed in step 6 to its original location.
  - c. Repeat step 6.

8. Perform the following:
  - a. Power off the system.
  - b. Replace one of the voltage regulator cards. See Locations — Model 570.
  - c. Power on the system.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** The voltage regulator card you just replaced was the failing item.

**This ends the procedure.**

9. Have you tried replacing all of the voltage regulator cards?

**Yes:** Replace the regulator distribution connection backplane (see “SYSBKPL” on page 547). **This ends the procedure.**

**No:** Perform the following:

  - a. Power off the system.
  - b. Reinstall the voltage regulator card that you just removed in step 8 to its original location.
  - c. Repeat step 8.

10. Perform the following:
  - a. Power off the system.
  - b. Reinstall all of the PCI cards you removed in step 5 to their original locations.
  - c. Power on the system.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Go to step 13.

11. Perform the following:
  - a. Power off the system.
  - b. Disconnect one of the PCI cards you reinstalled in step 10 on page 173.
  - c. Power on the system.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Exchange the last card you disconnected in this step (see Locations — Model 570). **This ends the procedure.**

12. Have you tried disconnected all of the PCI cards?

**No:** Repeat step 11.

**Yes:** Reinstall all of the parts you have removed or exchanged in this procedure and return to “Start of call procedure” on page 2. **This ends the procedure.**

13. Perform the following:
  - a. Power off the system.
  - b. Reconnect all of the I/O devices (tape, diskette, optical, and disk units) that you disconnected in step 5 on page 173.
  - c. Power on the system.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** The problem has been resolved. **This ends the procedure.**

14. Perform the following:
  - a. Power off the system.
  - b. Disconnect one of the I/O devices (tape, diskette, optical, and disk units) that you reconnected in step 13.
  - c. Power on the system.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Exchange the last I/O device you disconnected in this step (see Locations — Model 570). **This ends the procedure.**

15. Have you tried disconnecting all of the I/O devices?

**No:** Repeat step 14.

**Yes:** Reinstall all of the parts you have removed or exchanged in this procedure and return to “Start of call procedure” on page 2. **This ends the procedure.**

**PWR1906:** Please see “Power isolation procedures” on page 165 for important safety information before servicing the system.

#### **PWR1906 Instructions for 5074, 5079, 5094, and 5294 expansion units**

1. Perform the following:
  - a. Power off the unit you are working on.
  - b. Disconnect all the I/O devices (tape, diskette, optical, and disk units) from the unit that you are working on by sliding them partially out of the unit. See Removing and replacing parts.
  - c. Remove and label all of the cards that are installed in the PCI card area.
  - d. Power on the unit you are working on.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Go to step 9 on page 176.

2. Perform the following:
  - a. Power off the unit you are working on.
  - b. Remove, in order, all power supplies except first one (either P00 or P01 depending on the configuration).
  - c. Power on the unit you are working on.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Go to step 4.

3. Perform the following:
  - a. Power off the unit you are working on.
  - b. Remove the power supply that was left installed in step 2.
  - c. Reconnect the next power supply in order (P01 or P02).
  - d. Power on the unit you are working on.

Does a power reference code occur?

**Yes:** Go to step 5.

**No:** Exchange the power supply you removed in step 3b (see Part number catalog).

**This ends the procedure.**

4. Perform the following:
  - a. Power off the unit you are working on.
  - b. Reconnect the next power supply in order.
  - c. Power on the unit you are working on.

Does a power reference code occur?

**No:** Repeat this step until all power supplies have been reconnected.

**This ends the procedure.**

**Yes:** Exchange the power supply that you reconnected in this step (see Part number catalog).

**This ends the procedure.**

5. Perform the following:
  - a. Remove one of the fans from the unit you are working on that you did not previously remove during this procedure.

**Note:** Disregard a fan reference code if it occurs during this step.

- b. Power on the unit you are working on.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** The fan that you removed in this step is the failing item (see Part number catalog).

**This ends the procedure.**

6. Have you removed all of the fans, one at a time?

**Yes:** Install all of the fans and continue with the next step.

**No:** Perform the following:

- a. Power off the unit you are working on.
  - b. Reinstall the fan that was removed in step 5 to its original location.
  - c. Repeat step 5.

7. Perform the following:

- a. Remove the power cable (that was not previously removed) from one of the lower DASD backplanes.

b. Power on the unit you are working on.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Replace the DASD backplane that the power cable was removed from in this step (see Part number catalog).

**This ends the procedure.**

8. Is a second lower DASD backplane installed?

**Yes:** Repeat step 7 on page 175.

**No:** Replace the following one at a time:

a. DASD backplane upper (DEVBPLN, see Part number catalog).

b. I/O tower unit backplane (TWRCARD, see Part number catalog).

**This ends the procedure.**

9. Perform the following:

a. Power off the unit you are working on.

b. Reinstall all of the cards that you removed in step 1 on page 174.

c. Reconnect the ac power cable to the unit that you are working on.

d. Power on the unit you are working on.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Go to step 12.

10. Perform the following:

a. Power off the unit you are working on.

b. Disconnect one of the cards that you connected in step 9.

c. Power on the unit you are working on.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Exchange the last card that you disconnected in this step (see Part number catalog).

**This ends the procedure.**

11. Have you disconnected all the cards?

**Yes:** Continue with the next step.

**No:** Repeat step 10.

12. Perform the following:

a. Power off the unit you are working on.

b. Reconnect all of the I/O devices (tape, diskette, optical, or disk units) that you disconnected in step 1 on page 174.

c. Power on the unit you are working on.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No: This ends the procedure.**

13. Perform the following:

a. Power off the unit you are working on.

b. Disconnect all of the I/O devices (tape, diskette, optical, or disk units)—if you have not already done so—that you reconnected in step 12.

c. Now reconnect one of the I/O devices (tape, diskette, optical, or disk units) that you just disconnected.

d. Power on the unit you are working on.

Does a power reference code occur?

**No:** Continue with the next step.

**Yes:** Exchange the last I/O device that you reconnected in this step (see Part number catalog).

**This ends the procedure.**

14. Have you reconnected all the I/O devices?

**Yes: This ends the procedure.**

**No:** Repeat step 13 on page 176 (you can skip part b).

**PWR1907:** A rack or unit was dropped from the SPCN configuration. This can be caused by any of the following:

- The rack or unit has lost all ac or dc power.
  - The SPCN function in the unit has an error.
  - The SPCN frame-to-frame cables have failed.
1. Use i5/OS or the ASMI to locate the failing unit:
    - **i5/OS:** Find the 1xxx 90F0 or 1xxx 90F2 SRC in the service action log (SAL) (see “Using the Service Action Log” on page 24). Use the *Display details* option to display the location information for the failing unit.
    - **ASMI:** Find the 1xxx 90F0 or 1xxx 90F2 SRC in the error log (see Displaying error and event logs). Use the *Show details* option to display the location information for the failing unit.
  2. After locating the failing unit, check both of the SPCN frame-to-frame cables that connect to the unit. Are the cables connected correctly?
    - Yes:** Continue with the next step.
    - No:** Reconnect them, or replace them if necessary. **This ends the procedure.**
  3. Are the ac line cords on the failing unit connected properly at both ends?
    - Yes:** Continue with the next step.
    - No:** Reconnect the ac line cords, or replace them if necessary. **This ends the procedure.**
  4. Check the voltage at the customer’s ac outlet. Is the voltage correct?
    - Yes:** Continue with the next step.
    - No:** Inform the customer that the voltage at the ac power outlet is incorrect. **This ends the procedure.**
  5. Are the power supplies functional?
    - Yes:** Continue with the next step.
    - No:** Perform the following to replace each power supply one at a time:
      - a. Refer to Finding part locations to determine the location and part number for each power supply, and to find the appropriate procedure for exchanging the power supplies.
      - b. Replace each power supply one at a time, until the problem has been resolved.
      - c. If the problem persists after replacing all of the power supplies, continue with the next step.
  6. Replace the SPCN in the failing unit. Go to symbolic FRU “TWRCARD” on page 549. **This ends the procedure.**

**PWR1908:** A power supply fault or load fault has occurred in a 5088 or 0588 expansion unit. Please see “Power isolation procedures” on page 165 for important safety information before servicing the system. For location information, see Locations — 5088 and 0588 expansion I/O units.

#### **PWR1908 instructions for 5088 and 0588 expansion units**

1. Perform the following:
  - a. Power off the frame that you are working on by removing the ac line cords from the power supplies on the expansion unit.

- b. Remove and label all cards installed in the PCI backplane area.
- c. Power on the frame by reconnecting the ac power cables to the unit.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Go to step 8 on page 179.

- 2. Is the reference code 1xxx 2603?

**No:** Continue with the next step.

**Yes:** Replace the PCI backplane (see "TWRCARD" on page 549).

**This ends the procedure.**

- 3. Perform the following:

- a. Power off the frame you are working on by removing the ac line cords from the power supplies on the expansion unit.
- b. Remove power supply P01.
- c. Remove fan assembly B01 from power supply P01 and install it on a new power supply P01 (see Part number catalog).
- d. Install the new power supply P01.
- e. Power on the frame by reconnecting the ac power cables to the unit you are working on.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** The power supply that you replaced in this step was the failing item.

**This ends the procedure.**

- 4. Perform the following:

- a. Power off the frame you are working on by removing the ac line cords from the power supplies on the expansion unit.
- b. Remove the new power supply P01 and replace it with the original power supply P01.
- c. Remove power supply P02.
- d. Remove fan assembly B02 from power supply P02 and install it on a new power supply P02.
- e. Install the new power supply P02.
- f. Power on the frame by reconnecting the ac power cables to the unit you are working on.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** The power supply that you replaced in this step was the failing item.

**This ends the procedure.**

- 5. Perform the following:

- a. Power off the frame you are working on by removing the ac line cords from the power supplies on the expansion unit.
- b. Remove both the new power supply P02 and the fan assembly B02.
- c. Reinstall the original power supply P02 and a new fan assembly B02 (see Part number catalog).
- d. Power on the frame by reconnecting the ac power cables to the unit you are working on.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** The fan assembly B02 that you replaced in this step was the failing item.

**This ends the procedure.**

- 6. Perform the following:

- a. Power off the frame you are working on by removing the ac line cords from the power supplies on the expansion unit.



- b. Remove power supply P02
- c. Replace the new fan assembly B02 with the original fan assembly B02.
- d. Reinstall power supply P02.
- e. Remove power supply P01
- f. Remove fan assembly B01 and replace it with a new fan assembly B01 (see Part number catalog).
- g. Reinstall power supply P01.
- h. Power on the frame by reconnecting the ac power cables to the unit you are working on.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** The fan assembly B01 that you removed in this step is the failing item.

**This ends the procedure.**

7. Perform the following:
  - a. Power off the frame you are working on by removing the ac line cords from the power supplies on the expansion unit.
  - b. Remove power supply P01.
  - c. Replace fan assembly B01 with the original fan assembly B01.
  - d. Reinstall power supply P01.
  - e. Replace the following FRUs one at a time:
    - Control panel (see “CTLPNL” on page 471).
    - PCI backplane assembly CB1 (see “TWRCARD” on page 549).

**This ends the procedure.**

8. Perform the following:
  - a. Power off the frame you are working on by removing the ac line cords from the power supplies on the expansion unit.
  - b. Reinstall one of the cards that you removed in step 1 on page 177.
  - c. Power on the frame by reconnecting the ac power cables to the unit you are working on.

Does a power reference code occur?

**No:** Continue with the next step.

**Yes:** Exchange the last card that you reinstalled in this step (see Part number catalog).

**This ends the procedure.**

9. Have you reinstalled all of the cards?
 

**Yes:** Replace the PCI backplane assembly CB1 (see “TWRCARD” on page 549).

**This ends the procedure.**

**No:** Repeat step 8, reinstalling the next card.

**PWR1909:** A power supply load fault is occurring in a system expansion unit or I/O tower. Please see “Power isolation procedures” on page 165 for important safety information before servicing the system.

#### **Instructions for 5095, 0595, 5790, D10, D11, D20**

1. Perform the following:
  - a. Power off the system.
  - b. Disconnect all the I/O devices (tape, diskette, optical, and disk units) from the expansion unit or I/O tower you are working on by sliding them partially out of the unit (see Removing and replacing parts).
  - c. Remove and label all cards installed in the PCI card area.
  - d. Power on the system.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Go to step 8 on page 181.

2. Perform the following:
  - a. Power off the system.
  - b. Remove one of the fans from the expansion unit or I/O tower that you have not previously removed during this procedure.

**Note:** Disregard a fan reference code if it occurs during this step.

- c. Power on the system.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** The fan you removed in this step is the failing item (see Part number catalog).

**This ends the procedure.**

3. Have you removed all of the fans one at a time?

**No:** Perform the following:

- a. Power off the system.
  - b. Reinstall the fan that you removed in step 2 into its original location.
  - c. Repeat step 2.

**Yes:** Reinstall all of the fans and continue with the next step.

4. Perform the following:

- a. Power off the system.
  - b. Remove the I/O tower power supply cable, at the DASD backplane, that you have not previously removed.
  - c. Power on the system.

Does a power reference code occur?

**No:** The DASD backplane that was disconnected in this step is the failing item (see Part number catalog).

**This ends the procedure.**

**Yes:** Continue with the next step.

5. Have you disconnected the power cables from each of the DASD backplanes one at a time?

**Yes:** Continue with the next step.

**No:** Repeat step 4.

6. Perform the following:

- a. Power off the system.
  - b. Remove a power supply that you have not previously removed, and replace it with a new one.
  - c. Power on the system.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** The power supply that was removed in this step is the failing item (see Part number catalog).

**This ends the procedure.**

7. Have you removed all of the power supplies one at a time?

**Yes:** Perform the following:

- a. Remove the new power supply that you installed in step 6 and reinstall the original power supply.
  - b. Replace the backplane (see "TWRCARD" on page 549).

**This ends the procedure.**

**No:** Remove the new power supply that you installed in step 6 on page 180 and reinstall the original power supply. Then, repeat step 6 on page 180.

8. Perform the following:
  - a. Power off the system.
  - b. Reinstall all of the cards you removed in step 1 on page 179.
  - c. Power on the system.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Go to step 11.

9. Perform the following:
  - a. Power off the system.
  - b. Disconnect one of the cards you reconnected in step 8.
  - c. Power on the system.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Exchange the last card you disconnected in this step (see Part number catalog).

**This ends the procedure.**

10. Have you disconnected all the cards?

**No:** Repeat step 9.

**Yes:** Reinstall all the parts and return to "Start of call procedure" on page 2.

**This ends the procedure.**

11. Perform the following:

- a. Power off the system.
- b. Reconnect all of the I/O devices (tape, diskette, optical, or disk units) that you disconnected in step 1 on page 179.
- c. Power on the system.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** **This ends the procedure.**

12. Perform the following:

- a. Power off the system.
- b. Disconnect one of the I/O devices you reconnected in step 11.
- c. Power on the system.

Does a power reference code occur?

**Yes:** Continue with the next step.

**No:** Exchange the last I/O device you disconnected in this step (see Part number catalog).

**This ends the procedure.**

13. Have you disconnected all of the I/O devices?

**No:** Repeat step 12.

**Yes:** Reinstall all the parts and return to "Start of call procedure" on page 2.

**This ends the procedure.**

**PWR1911:** You are here because of a power problem on a dual line cord system. If the failing unit does not have a dual line cord, return to the procedure that sent you here or go to the next item in the FRU list.

The following steps are for the system unit, unless other instructions are given. Please refer to “Power isolation procedures” on page 165 for important safety information before servicing the system.

1. Are you working with a model 590 or 595?
  - No:** Continue with the next step.
  - Yes:** Go to “PWR1912” on page 186. **This ends the procedure.**
2. If an uninterruptible power supply is installed, verify that it is powered on before proceeding.
3. Are all the units powered on?
  - Yes:** Go to step 8 on page 183.
  - No:** On the unit that does not power on, perform the following (reference code 1xxx-00AC may be displayed):
    - a. Disconnect the ac line cords from the unit that does not power on.
    - b. Use a multimeter to measure the ac voltage at the system end of both ac line cords.

Table 24. Correct ac voltage

Model or expansion unit	Correct ac voltage
Models 520, 550, and 570 5095 and 0595 expansion units	100V to 127V or 200V to 240V
5074, 5079, 5088, 0588, 5094, 5294 expansion units	200V to 240V

- c. Is the ac voltage correct (refer to Table 24)?
    - Yes:** Continue with the next step.
    - No:** Go to step 7 on page 183.
4. Are you working on a Model 520, 550, or 570, or a 5088, 0588, 5095, or 0595 expansion unit?
  - No:** Continue with the next step.
  - Yes:** Perform the following:
    - a. Reconnect the ac line cords.
    - b. Verify that the system fails to power on.
    - c. Replace the failing power supply. Use the tables below to find its position, and then see Finding part locations for part numbers and directions to the correct exchange procedures.

Table 25. Failing power supply for Models 520, 550, 570, and 5088, 0588, 5095, 0595 expansion units

Reference code	Position
1510	For Models 520, 550, 570: E1 For 5095, 0595: P01 For 5088, 0588: P02
1520	For Models 520, 550, 570: E2 For 5095, 0595: P02 For 5088, 0588: P01

**This ends the procedure.**

5. Perform the following:
    - a. Reconnect the ac line cord to the ac modules.
    - b. Remove the ac jumper cables at the power supplies.
    - c. Use a multimeter to measure the ac voltage at the jumper cable power supply end.
- Is the ac voltage from 200V to 240V?

**No:** Continue with the next step.

**Yes:** Replace the failing power supply. Use the table below to find its position, and then see Finding part locations for part numbers and directions to the correct exchange procedures.

**Attention:** Do not install power supplies P00 and P01 ac jumper cables on the same ac module.

Table 26. Failing power supply for 5074, 5079, and 5094 expansion units

Reference code	Position
1500	P00 (5094 only)
1510	P01
1520	P02
1530	P03 (5094 only)

**This ends the procedure.**

6. Perform the following:

- a. Disconnect the ac jumper cable at the ac module output.
- b. Use a multimeter to measure the ac voltage at the ac module output.

Is the ac voltage from 200V to 240V?

**Yes:** Exchange the ac jumper cable.

**This ends the procedure.**

**No:** Exchange the ac module (see Finding part locations).

**This ends the procedure.**

7. Perform the following:

- a. Disconnect the ac line cords from the customer's ac power outlet.
- b. Use a multimeter to measure the ac voltage at the customer's ac power outlet.

Is the ac voltage correct (refer to Table 24 on page 182)?

**Yes:** Exchange the failing ac line cord.

**This ends the procedure.**

**No:** Perform the following:

- a. Inform the customer that the ac voltage at the power outlet is not correct.
- b. Reconnect the ac line cords to the power outlet after the ac voltage at the power outlet is correct.

**This ends the procedure.**

8. Is the reference code 1xxx-00AC?

**No:** Continue with the next step.

**Yes:** This reference code may have been caused by an ac outage. If the system will power on without an error no parts need to be replaced. Otherwise, exchange the tower card in the failing unit (see "TWRCARD" on page 549). Then perform Verifying the repair.

**This ends the procedure.**

9. Is the reference code 1xxx-1510 or 1520?

**No:** Continue with the next step.

**Yes:** Perform the following:

- a. Determine the following locations (see Finding part locations):

Model	Reference code	Locate these parts
520, 550, 570	<ul style="list-style-type: none"> <li>• 1xxx 1510</li> <li>• 1xxx 1520</li> </ul>	<ul style="list-style-type: none"> <li>• Power supply E1 and ac line cord 1</li> <li>• Power supply E2 and ac line cord 2</li> </ul>
5088 and 0588 (see Figure 2 on page 185)	<ul style="list-style-type: none"> <li>• 1xxx 1510</li> <li>• 1xxx 1520</li> </ul>	<ul style="list-style-type: none"> <li>• ac jumper cable connected to power supply P02 and the ac module</li> <li>• ac jumper cable connected to power supply P01 and the ac module</li> </ul>

Model	Reference code	Locate these parts
5074, 5079, and 5094 (see Figure 1)	<ul style="list-style-type: none"> <li>• 1xxx 1510</li> <li>• 1xxx 1520</li> </ul>	<ul style="list-style-type: none"> <li>• ac jumper cable connected to power supply P02 and the ac module</li> <li>• ac jumper cable connected to power supply P01 and the ac module</li> </ul>
5095 and 0595	<ul style="list-style-type: none"> <li>• 1xxx 1510</li> <li>• 1xxx 1520</li> </ul>	<ul style="list-style-type: none"> <li>• Power supply P01 and ac line cord 1</li> <li>• Power supply P02 and ac line cord 2</li> </ul>

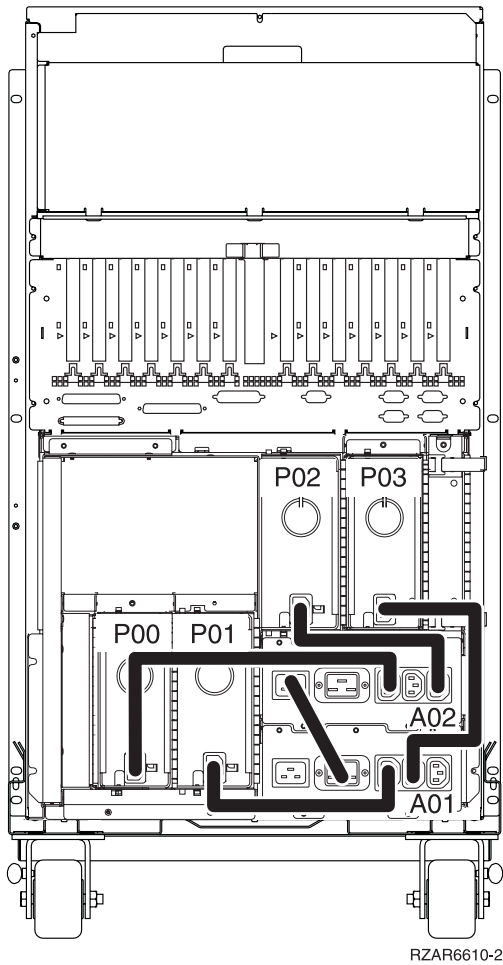


Figure 1. Dual line cord drawing for 5094



c. Go to step 11.

10. Is the reference code 1xxx 1500 or 1xxx 1530?

**No:** Return to “Start of call procedure” on page 2.

**This ends the procedure.**

**Yes:** Locate the ac jumper cables for the reference code you are working on, and then continue with the next step:

**Attention:** Do not disconnect the other ac jumper cable when powered on.

- If the reference code is 1xxx 1500, see Locations — 5094, 5294, and 8094-002 expansion I/O units to determine the locations of ac jumper cables that connect to P00.
- If the reference code is 1xxx 1530, see Locations — 5094, 5294, and 8094-002 expansion I/O units to determine the locations of ac jumper cables that connect to P03.

11. Perform the following:

- a. For the reference code you are working on, disconnect either the ac jumper cable from the power supply **or** the ac line cord from the expansion unit.
- b. Use a multimeter to measure the ac voltage at the power supply end of the ac jumper cable **or** the expansion unit end of the ac line cord.

Is the ac voltage correct (see Table 24 on page 182)?

**No:** Continue with the next step.

**Yes:** Exchange the failing power supply. Refer to Table 25 on page 182 and Table 26 on page 183 for its position, and then see Finding part locations for part numbers and directions to the correct exchange procedures. **This ends the procedure.**

12. Perform the following:

- a. Disconnect the ac line cords from the power outlet.
- b. Use a multimeter to measure the ac voltage at the customer’s ac power outlet.

Is the ac voltage correct (see Table 24 on page 182)?

**Yes:** Exchange the following, one at a time:

- failing ac line cord
- failing ac jumper cable (if installed)
- failing ac module (if installed) (see Finding part locations for part numbers and directions to the correct exchange procedures)

**This ends the procedure.**

**No:** Perform the following:

- a. Inform the customer that the ac voltage at the power outlet is not correct.
- b. Reconnect the ac line cords to the power outlet after the ac voltage at the power outlet is correct.

**This ends the procedure.**

**PWR1912:**



## DANGER

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn everything OFF (unless instructed otherwise).
2. Remove power cords from the outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

To Connect:

1. Turn everything OFF (unless instructed otherwise)
2. Attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

(D005)

1. Perform the following:
  - a. Ensure that both power line cords are properly connected.
  - b. Make sure that the unit EPO switch is in the *on* position.
  - c. Make sure that the unit EPO bypass switches on both bulk power controllers (BPCs) are in the *normal* position.
  - d. Ensure that the cable from unit EPO connector J00 to BPC-A connector J05 and the cable from unit EPO connector J01 to BPC-B connector J05 are secure and undamaged.
  - e. Ensure that the room temperature is not in excess of the maximum allowed (40° Celsius or 104° Fahrenheit).

**Note:** If the room temperature has exceeded the maximum allowed, the system may continually cycle on and off.

Were any problems discovered while performing the above checks?

**No:** Continue with the next step.

**Yes:** Correct any problems you found. **This ends the procedure.**

2. Make sure that the on/off switches on all the bulk power regulators (BPRs) are in the *on* (left) position.

**Note:** A switch set to the *off* position is not the cause of your problem, but they all need to be on before proceeding.

3. Check the state of the LEDs on both sides of the bulk power assembly (BPA) and then choose from the following conditions:
  - If all of the LEDs on both sides of the BPA are in the *off* position, go to step 4.
  - If the unit EPO power LED is turned on, the BPC **GOOD** LED is turned on, and all other LEDs are in the *off* position, go to step 5.
  - If neither of the above two conditions is true, independent faults are indicated on both sides of the BPA. Each side must be isolated separately. Call your next level of support. **This ends the procedure.**
4. Prepare a voltage meter to measure up to 600 V ac. Using the labelled test points on the frame, measure the voltage between phase A and phase B. Is the voltage greater than 180 V ac?
  - Yes:** Independent faults are indicated on both sides of the BPA. Each side must be isolated separately. Call your next level of support. **This ends the procedure.**
  - No:** Inform the customer that power line voltage at the input to the BPR is missing or too low and needs to be corrected. **This ends the procedure.**
5. Is a cable connected to connector J02 on the unit EPO card?
  - No:** Continue with the next step.
  - Yes:** Go to step 7 to determine if the room EPO circuit is the problem.
6. Is the internal toggle switch on the unit EPO card set to the *RM EPO BYPASS* position?
  - No:** Set the internal toggle switch on the unit EPO card to the *RM EPO BYPASS* position. **This ends the procedure.**
  - Yes:** The unit EPO card is the failing item. Go to Locations — model 590 and 595 to locate and replace the card. **This ends the procedure.**
7. Unplug the cable from connector J02 on the EPO card and set the toggle switch to the *RM EPO BYPASS* position. Does the EPO **CMPLT** LED on at least one BPC become lit?
  - Yes:** Inform the customer that the room EPO circuit is defective at this connection and requires service. **This ends the procedure.**
  - No:** The unit EPO card is the failing item. Go to Locations — model 590 and 595 to locate and replace the card. **This ends the procedure.**

**PWR1916:** Perform the following to isolate the failing item.

1. Try to IPL the system. If you cannot IPL and the reference code persists, then the configuration ID may not be accurate. When you set the system or frame ID, the system unit or frame must be powered off and have ac power applied.
2. Verify that all frame power cords are still plugged in.
3. Check the frame configuration ID:
  - a. Select function 07 on the system control panel. Press Enter (07\*\* will be displayed).
  - b. Use the arrow keys to increment/decrement to subfunction A8. 07A8 will be displayed. Press Enter (07A8 00 will be displayed).
  - c. Use the arrow keys to increment/decrement to the first byte of the unit address (usually 3C) for the box you want to check. An 07nn will display where nn is the first byte of the unit address. Press Enter (07nn 00 will be displayed).

**Note:** The display on the addressed non-system unit frame should be blinking on and off. For a system unit, press an arrow key (increment or decrement) twice to display the ID (first 07\*\* will be displayed then 07nn will be displayed, where nn is the Configuration ID).

  - d. Use the arrow keys to increment/decrement to the second byte of the unit address (usually 01, 02, etc. for I/O units and 00 for the system unit) for the box you want to check. 07nn will display, where nn is the second byte of the unit address. Press Enter (07nn 00 will be displayed).

- e. Use the table below to check the frame configuration ID, and then continue with the next step.

Table 27. Frame configuration IDs

Model or expansion unit	Configuration ID
Model 520	B4
Model 550	B5
Model 570	B2
Model 570 (with secondary units)	B3
5074 and 5079	81
5088 and 0588	89
5094 and 5294	8A
5095 and 0595	8B
D10	88
D11, 5790	B6
D20	8C

- 4. Is the configuration ID correct?

**Yes:** Go to step 6.

**No:** Continue with the next step.

- 5. Use the following steps to change the configuration ID:

- a. Select function 07 on the system control panel. Press Enter (07\*\* will be displayed).
- b. Use the arrow keys to increment/decrement to subfunction A9. 07A9 will be displayed. Press Enter (07A9 00 will be displayed).
- c. Use the arrow keys to increment/decrement to the first byte of the unit address (usually 3C) for the box that you want to change (07nn will be displayed, where nn is the first byte of the frame address). Press Enter (07nn 00 will be displayed).

**Note:** The display on the addressed frame will be blinking on and off (non-system unit frames only).

- d. Use the arrow keys to increment/decrement to the second byte of the unit address (usually 01, 02, etc. for I/O units and 00 for the system unit) for the box you want to check. 07nn will display, where nn is the second byte of the unit address. Press Enter (07nn 00 will be displayed).
- e. Use the arrow keys to increment/decrement to the correct configuration ID (refer to Table 27). 07xx will be displayed where xx is the configuration ID. Press Enter (07xx 00 will be displayed). After a few seconds, the display on the addressed non-system unit frame will stop blinking and return to displaying the frame address. On a system unit, the display will show the series of bring-up reference codes and then display function 01.

**Note:** To return the panel to normal display, scroll to 07\*\* and press Enter.

- f. Continue with the next step.

- 6. Try to re-IPL the system. If the system will not IPL and the reference code persists, go to "PWR1900" on page 167. **This ends the procedure.**

**PWR1917:**

- 1. Perform the following to display the configuration ID:

**Note:** You may choose to use the ASMI to display the configuration ID. Refer to Changing system configuration to view and change the configuration ID for the processing unit or an I/O enclosure.

**Attention:** If you are working on a model 590 or 595 you must use the ASMI to display the configuration ID.

**Note:** The system or frame that will display the ID **must** be powered off with ac power applied.

- a. Select function 07 on the system control panel. Press Enter (07\*\* will be displayed).
- b. Use the arrow keys to increment/decrement to subfunction A8. 07A8 will be displayed. Press Enter (07A8 00 will be displayed).
- c. Use the arrow keys to increment/decrement to the first byte of the unit address (usually 3C) for the box you want to check. 07nn will be displayed, where nn is the first byte of the frame address. Press Enter (07nn 00 will be displayed).

**Note:** The display on an addressed I/O expansion should be blinking on and off while displaying the configuration ID as the last two characters of the bottom line. For a system unit, press an arrow key (increment or decrement) twice to display the ID (first 07\*\* will be displayed then 07nn will be displayed, where nn is the Configuration ID).

- d. Use the arrow keys to increment/decrement to the second byte of the unit address (usually 01, 02, etc for I/O Expansion units and 00 for system unit frames) for the box you want to check. 07nn will be displayed, where nn is the second byte of the frame address. Press Enter (07nn 00 will be displayed).
- e. Use the table below to check the frame configuration ID.

Table 28. Frame configuration IDs

Model or expansion unit	Configuration ID
520	B4
550	B5
9124-720	BB
570	B2
570 (with one or more secondary units)	B3
590 and 595	B1
5074 and 5079	81
5088 and 0588	89
5094 and 5294	8A
5095 and 0595	8B
D10, D11, 5790	88
D20	8C

f. Is the correct configuration ID displayed for the tower selected?

- **No:** Continue with the next step.
- **Yes:** Go to step 3 on page 191.

2. Perform the following to set the frame configuration ID:

- a. Select function 07 on the system control panel. Press Enter (07\*\* will be displayed).
- b. Use the arrow keys to increment/decrement to subfunction A9 (07A9 will be displayed). Press Enter (07A9 00 will be displayed).
- c. Use the arrow keys to increment/decrement to the first byte of the unit address (usually 3C) for the box that you want to change. 07nn will be displayed, where nn is the first byte of the unit address. Press Enter (07nn 00 will be displayed).

**Note:** The display on the addressed frame will be blinking on and off (non-system unit frames only).

- d. Use the arrow keys to increment/decrement to the second byte of the unit address (usually 01, 02, etc for I/O Expansion units and 00 for system unit frames) for the box you want to check. 07nn will be displayed, where nn is the second byte of the frame address. Press Enter (07nn 00 will be displayed).
- e. Use the arrow keys to increment/decrement to the correct configuration ID (refer to Table 28 on page 190). 07xx will be displayed where xx is the configuration ID. Press Enter (07xx 00 will be displayed). After a few seconds, the display on the addressed I/O expansion unit will stop blinking and return to the normal display format. On a system unit, the display will show the series of bring-up reference codes and then display function 01.

**Note:** To return the panel to normal display, scroll to 07\*\* and press Enter.

- f. Is the reference code 1xxx 840D or 840E?

**No: This ends the procedure.**

**Yes:** Continue with the next step.

3. Perform the following:

- a. Power off the system.
- b. Exchange the SPCN card in the failing frame (see "TWRCARD" on page 549). **This ends the procedure.**

**PWR1918:** A voltage regulator card may be failing.

Instructions vary depending on the machine you are servicing. Please choose from the following:

Model 520

Model 550 or 9124-720

Model 570

#### **Instructions for model 520**

1. Is the reference code 1xxx 2632?

**No:** Continue with the next step.

**Yes:** The voltage regulator for 2.5V is the failing item and needs to be replaced (see Locations — Model 520 to locate and replace the regulator). If the problem is not resolved after you replace this part, exchange the following parts, one at a time:

- service processor
- system board

**This ends the procedure.**

2. Is the reference code 1xxx 2630?

**No:** Continue with the next step.

**Yes:** The voltage regulator for 1.2V is the failing item and needs to be replaced (see Locations — Model 520 to locate and replace the regulator). **This ends the procedure.**

3. Is the reference code 1xxx 2631?

**No:** Return to the "Start of call procedure" on page 2. **This ends the procedure.**

**Yes:** The voltage regulator for 1.5V is the failing item and needs to be replaced (see Locations — Model 520 to locate and replace the regulator). **This ends the procedure.**

#### **Instructions for Model 550 or 9124-720**

1. Is the reference code 1xxx 2632?

**No:** Continue with the next step.

**Yes:** The voltage regulator for 2.5V on system processor card 1 is the failing item and needs to be replaced (see Locations — 9124-720 and Model 550 to locate and replace the regulator). If the problem is not resolved after you replace this part, exchange the system processor card. **This ends the procedure.**

2. Is the reference code 1xxx 2642?

**No:** Continue with the next step.

**Yes:** The voltage regulator for 2.5V on system processor card 2 is the failing item and needs to be replaced (see Locations — 9124-720 and Model 550 to locate and replace the regulator). If the problem is not resolved after you replace this part, exchange the system processor card. **This ends the procedure.**

3. Is the reference code 1xxx 2630?

**No:** Continue with the next step.

**Yes:** The voltage regulator for 1.2V on system processor card 1 is the failing item and needs to be replaced (see Locations — 9124-720 and Model 550 to locate and replace the regulator). **This ends the procedure.**

4. Is the reference code 1xxx 2640?

**No:** Continue with the next step.

**Yes:** The voltage regulator for 1.2V on system processor card 2 is the failing item and needs to be replaced (see Locations — 9124-720 and Model 550 to locate and replace the regulator). If the problem is not resolved after you replace this part, exchange the following parts, one at a time:

- service processor
- system processor assembly P2

**This ends the procedure.**

5. Is the reference code 1xxx 2631?

**No:** Continue with the next step.

**Yes:** The voltage regulator for 1.5V on system processor card 1 is the failing item and needs to be replaced (see Locations — 9124-720 and Model 550 to locate and replace the regulator). If the problem is not resolved after you replace this part, exchange system processor card 1. **This ends the procedure.**

6. Is the reference code 1xxx 2641?

**No:** Return to the “Start of call procedure” on page 2. **This ends the procedure.**

**Yes:** The voltage regulator for 1.5V on system processor card 2 is the failing item and needs to be replaced (see Locations — 9124-720 and Model 550 to locate and replace the regulator). If the problem is not resolved after you replace this part, exchange system processor card 2. **This ends the procedure.**

### Instructions for Model 570

1. Is the reference code 1xxx 8450?

**No:** Continue with the next step.

**Yes:** You have fewer voltage regulator cards than processor cards. Add another regulator card in the next empty position (see Locations — Model 570). **This ends the procedure.**

2. Is the reference code 1xxx 8451?

**No:** Continue with the next step.

**Yes:** You have too few voltage regulator cards installed. Add another regulator card in the next empty position (see Locations — Model 570). **This ends the procedure.**

3. Is the reference code 1xxx 1611, 1612, or 1613?

**No:** Continue with the next step.

**Yes:** Voltage regulator 1 is the failing item and needs to be replaced (see Locations — Model 570 to locate and replace the regulator). **This ends the procedure.**

4. Is the reference code 1xxx 1621, 1622, or 1623?
  - No:** Continue with the next step.
  - Yes:** Voltage regulator 2 is the failing item and needs to be replaced (see Locations — Model 570 to locate and replace the regulator). **This ends the procedure.**
5. Is the reference code 1xxx 1631, 1632, or 1633?
  - No:** Continue with the next step.
  - Yes:** Voltage regulator 3 is the failing item and needs to be replaced (see Locations — Model 570 to locate and replace the regulator). **This ends the procedure.**
6. Is the reference code 1xxx 2602?
  - Yes:** Continue with the next step.
  - No:** Return to “Start of call procedure” on page 2. **This ends the procedure.**
7. Perform the following:
  - a. Remove one of the voltage regulator cards that you have not already removed in this procedure and replace it with a new one (see Locations — Model 570 to locate and replace the regulator).
  - b. Power on the system (see Powering on and powering off).

Does reference code 1xxx 2602 appear again?

  - Yes:** Continue with the next step.
  - No:** The voltage regulator card that you replaced was the failing item. **This ends the procedure.**
8. Have you replaced all of the voltage regulator cards?
  - Yes:** Replace the regulator distribution connection backplane (see Locations — Model 570). **This ends the procedure.**
  - No:** Reinstall the original regulator card, and then repeat step 7.

**PWR1920:** Use this procedure to verify that the lights and display on all attached expansion units are operating correctly. Please see “Power isolation procedures” on page 165 for important safety information before continuing with this procedure.

1. If the system has logical partitions, perform this procedure from the primary partition’s console and the system control panel. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Select function 04 **Lamp Test** on the control panel and press **Enter**.
3. Review the display panels on all attached I/O towers. The lamp test is only active on the I/O towers for 25 seconds after you press **Enter**. Are all of the following lights on for all attached I/O towers: power-on light, attention light, and all dots for the 32 character display?
  - No:** Exchange the following field replaceable units in the failing unit one at a time (see Removing and replacing parts):
    - Control panel (see “CTLPNL” on page 471)
    - Tower card (see “TWRCARD” on page 549)
    - Control panel cable**This ends the procedure.**
    - Yes:** These control panel lights are working correctly. Continue with the next step.
4. Are any abnormal characters or character patterns (not reference codes or normal display mode) displayed?
  - No:** Return to “Start of call procedure” on page 2.
  - This ends the procedure.**
  - Yes:** Exchange the following FRUs in the failing unit one at a time (see Removing and replacing parts):
    - Control panel (see “CTLPNL” on page 471)
    - Tower card (see “TWRCARD” on page 549)

- Control panel cable
- This ends the procedure.**

PWR2402:

**DANGER**

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn everything OFF (unless instructed otherwise).
2. Remove power cords from the outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

To Connect:

1. Turn everything OFF (unless instructed otherwise)
2. Attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

(D005)

1. Is the SRC 1xxx-8700 or 8701?

**No:** Return to the "Start of call procedure" on page 2. **This ends the procedure.**

**Yes:** Continue with the next step.

2. In this step you will be measuring voltages on one of the bulk power assemblies (BPAs). If the SRC is 1xxx8700, then you should measure the voltage on BPA-A (front). If the SRC is 1xxx8701, then you should measure the voltage on BPA-B (rear).

Using the labeled test points on the face of the BPA, measure the voltages between the following:

- phase A and phase B
- phase B and phase C
- phase C and phase A

Are all of the meter readings greater than 180 V ac?

**Yes:** Go to step 4 on page 195.



**No:** Inform the customer that power voltage at the input to the BPA could be missing or too low and needs to be checked. Continue with the next step once the check has been performed.

3. Does the check confirm that the customer's voltage levels missing or too low?

**Yes:** The customer must correct the voltage levels. **This ends the procedure.**

**No:** Replace the power cord (see Cables for the proper part number). **This ends the procedure.**

4. Exchange the following FRUs, one at a time, until the problem is resolved. Go to Locations — model 590 and 595 to locate and replace the part.
- Bulk power regulator (BPR) 1
  - BPR 2
  - BPR 3
  - Bulk power controller (BPC)
  - Bulk power assembly (BPA)

**This ends the procedure.**

## Router isolation procedures

### DANGER

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn everything OFF (unless instructed otherwise).
2. Remove power cords from the outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

To Connect:

1. Turn everything OFF (unless instructed otherwise)
2. Attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

(D005)

These procedures serve as a guide to the correct isolation procedures from the reference code tables and should only be performed when directed from another procedure.

"RTRIP01"

"RTRIP02"

"RTRIP03"

"RTRIP04"

"RTRIP05"

"RTRIP06" on page 197

"RTRIP07" on page 198

"RTRIP08" on page 198

**RTRIP01:** Perform "CONSL01" on page 81.

**RTRIP02:** Perform "TWSIP01" on page 253.

**RTRIP03:** If you have a twinaxial terminal for the console, perform "TWSIP01" on page 253. Otherwise, perform "WSAIP01" on page 259.

**RTRIP04:** Use the FRU list in the service action log if it is available. If it is not available, examine word 5 of the reference code.

Is word 5 of the reference code zero (0000 0000)?

**Yes:** Perform "SIIOADP" on page 534.

**No:** Perform "PIOCARD" on page 523.

**This ends the procedure.**

**RTRIP05:**

**Note:** This reference code can occur for the HSL/RIO loop resource when an I/O expansion unit on the loop is powered off for a concurrent maintenance action.

**Note:** A fiber optic cleaning kit may be required for optical HSL connections.

1. Multiple B600 6982 errors may occur due to efforts to retry and recover. If the recovery efforts were successful, there will be a B600 6985 reference code with xxxx 3206 in word 4 logged after all B600 6982 reference codes in the product activity log (PAL). If this is the case, close out all the B600 6982 entries. Then continue with the next step.
2. Is there a B600 6987 reference code in the service action log (SAL) logged at about the same time?  
**Yes:** Close this problem and work the B600 6987.  
**This ends the procedure.**  
**No:** Continue with the next step.
3. Is there a B600 6981 reference code in the SAL logged at approximately the same time?  
**Yes:** Go to step 8 on page 197.  
**No:** Continue with the next step.
4. Perform "RIOIP06" on page 92 to determine if any other systems are connected to this loop and then return here.

**Note:** The loop number can be found in the SAL in the description for the HSL\_LNK FRU. Are there other systems connect to this loop?

**Yes:** Continue with the next step.

**No:** Go to step 8.

5. Check for HSL failures in the SALs on the other systems before replacing parts. HSL failures are indicated by SAL entries with HSL I/O bridge and Network Interface Controller (NIC) resources. Ignore B600 6982 and B600 6984 entries.

Are there HSL failures on other systems?

**Yes:** Continue with the next step.

**No:** Go to step 8.

6. Repair the problems on the other systems and return to this step. After making repairs on the other systems check the PAL of this system. Is there a B600 6985, along with this loop's resource name, that was logged after the repairs you made on the other systems?

**Yes:** Continue with the next step.

**No:** Go to step 8.

7. For the B600 6985 reference code you found, use symbolic FRU "SIRSTAT" on page 539 to determine if the loop is now complete.

Is the loop complete?

**Yes:** The problem has been resolved.

**This ends the procedure.**

**No:** Go to step 8.

8. The FRU list displayed in the SAL may be different from the failing item list given here. Use the SAL's FRU list when it is available.

Does this reference code appear in the SAL with the symbolic FRU HSL\_LNK listed as a FRU?

**Yes:** Perform "RIOIP01" on page 82.

**This ends the procedure.**

**No:** Exchange the FRUs listed in the SAL according to their part action codes.

**This ends the procedure.**

#### **RTRIP06:**

**Note:** A fiber optic cleaning kit may be required for optical HSL connections.

1. Is the reference code in the service action log (SAL)?

**Yes:** Continue with the next step.

**No:** The reference code is informational. Use symbolic FRU "SIRSTAT" on page 539 to determine what the reference code means.

**This ends the procedure.**

2. This error can appear in the SAL if a tower or another system in the loop did not complete powering on before Licensed Internal Code (LIC) checked this loop for errors. Search the product activity log (PAL) for all B600 6985 reference codes logged for this loop and use symbolic FRU "SIRSTAT" on page 539 to determine if this error requires service.

Is further service required?

**Yes:** Continue with the next step.

**No: This ends the procedure.**

3. There may be multiple B600 6985 reference codes, with xxxx 3205 in word 4, for the same loop resource in the SAL. This is caused by attempts to retry and recover. If there is a B600 6985 reference code with xxxx 3206 or xxxx 3208 in word 4 after the above B600 6985 entries in the PAL, then the recovery efforts were successful. If this is the case, close all the B600 6985 entries for that loop resource in the SAL. Then continue with the next step.

4. Is there a B600 6981 reference code in the SAL?

**Yes:** Close that problem and go to step 9 on page 198.

**No:** Continue with the next step.

5. Perform "RIOIP06" on page 92 to determine if any other systems are connected to this loop and then return here.

**Note:** The loop number can be found in the SAL in the description for the HSL\_LNK FRU.  
Are there other systems connected to this loop?

**Yes:** Continue with the next step.

**No:** Go to step 9.

6. Check for HSL failures in the SALs on the other systems before replacing parts. HSL failures are indicated by SAL entries with HSL I/O bridge and Network Interface Controller (NIC) resources. Ignore B600 6982 and B600 6984 entries.

Are there HSL failures on other systems?

**Yes:** Continue with the next step.

**No:** Go to step 9.

7. Repair the problems on the other systems and return to this step. After making repairs on the other systems check the PAL of this system. Is there a B600 6985 reference code that was logged after the repairs you made on the other systems?

**Yes:** Continue with the next step.

**No:** Go to step 9.

8. For the B600 6985 log you found, use symbolic FRU "SIRSTAT" on page 539 to determine if the loop is now complete.

Is the loop complete?

**Yes:** The problem has been resolved.

**This ends the procedure.**

**No:** Go to step 9.

9. The FRU list displayed in the SAL may be different from the failing item list given here. Use the SAL's FRU list when it is available.

Does this reference code appear in the SAL with the symbolic FRU HSL\_LNK listed as a FRU?

**Yes:** Perform "RIOIP01" on page 82.

**This ends the procedure.**

**No:** Exchange the FRUs listed in the SAL according to their part action codes.

**This ends the procedure.**

**RTRIP07:** Perform "WSAIP01" on page 259.

**RTRIP08:** Perform a system IPL. Is the IPL successful?

**Yes:** Perform "LICIP01" on page 131 to determine the cause of the problem. **This ends the procedure.**

**No:** Perform the action described in the new reference code. **This ends the procedure.**

## Service processor isolation procedures

### DANGER

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn everything OFF (unless instructed otherwise).
2. Remove power cords from the outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

To Connect:

1. Turn everything OFF (unless instructed otherwise)
2. Attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

(D005)

These procedures will help you isolate problems with the service processor.

“FSPSP01” on page 201

“FSPSP02” on page 202

“FSPSP03” on page 202

“FSPSP04” on page 202

“FSPSP05” on page 202

“FSPSP06” on page 202

“FSPSP07” on page 202

“FSPSP08” on page 202

“FSPSP09” on page 203

"FSPSP10" on page 203  
"FSPSP11" on page 203  
"FSPSP12" on page 203  
"FSPSP16" on page 203  
"FSPSP17" on page 204  
"FSPSP18" on page 204  
"FSPSP19" on page 204  
"FSPSP20" on page 204  
"FSPSP21" on page 204  
"FSPSP22" on page 205  
"FSPSP23" on page 205  
"FSPSP24" on page 205  
"FSPSP26" on page 206  
"FSPSP27" on page 206  
"FSPSP28" on page 207  
"FSPSP29" on page 207  
"FSPSP30" on page 207  
"FSPSP31" on page 208  
"FSPSP32" on page 208  
"FSPSP33" on page 210  
"FSPSP34" on page 210  
"FSPSP35" on page 210  
"FSPSP36" on page 210  
"FSPSP37" on page 211  
"FSPSP38" on page 213  
"FSPSP39" on page 213  
"FSPSP40" on page 214  
"FSPSPC1" on page 214

**“FSPSPD1” on page 215**

**FSPSP01:** A part vital to system function has been deconfigured. Perform the following steps:

1. Is word 6 (the 8 leftmost characters of function 13) of the reference code 0000F234?

**No:** Go to step 5.

**Yes:** The system has detected a deconfigured memory controller that is required for the system to function, or it has detected that there is not enough memory or that the memory is plugged incorrectly. Continue with the next step.

2. Perform the following steps:

- a. Reseat all of the memory DIMMs. Refer to symbolic FRU “MEMDIMM” on page 516, but do not replace any memory DIMMs at this time.
- b. Perform a slow boot.

Does the problem persist?

**Yes:** Continue with the next step.

**No:** Go to Verifying the repair. **This ends the procedure.**

3. Perform the following for each of the memory DIMMs:

- a. Replace the memory DIMM using symbolic FRU “MEMDIMM” on page 516.
- b. Perform a slow boot between each replacement.
- c. Does the problem persist?

**Yes:** Repeat this step and replace the next memory DIMM. If you have replaced all of the memory DIMMs, then continue with the next step.

**No:** Go to Verifying the repair. **This ends the procedure.**

4. Perform the following for each of the memory controllers until the problem is resolved:

- a. Replace the memory controller using symbolic FRU “MEMCTLR” on page 513.
- b. Perform a slow boot between each replacement.
- c. Go to Verifying the repair. **This ends the procedure.**

5. Is word 6 of the reference code 0000F237?

**No:** Continue with the next step.

**Yes:** The system has detected a problem with a clock card. Perform the following for each of the clock cards until the problem is resolved:

- a. Replace the clock card using symbolic FRU “CLCKMOD” on page 470.
- b. Perform a slow boot between each replacement.
- c. Go to Verifying the repair. **This ends the procedure.**

6. Is word 6 of the reference code 0000F230?

**No:** Continue with the next step.

**Yes:** The system has detected that all of the planars are deconfigured. Perform the following steps:

- a. Review the system error logs for errors that called out planars. This will indicate which planars have problems and need to be replaced.
- b. Go to symbolic FRU “NODEPL” on page 520 to replace the appropriate planar or planars.
- c. Perform a slow boot after replacing the appropriate planar(s).
- d. Go to Verifying the repair. **This ends the procedure.**

7. Is word 6 of the reference code 0000F231?

**No:** Continue with the next step.

**Yes:** The system has detected that all of the I/O bridges are deconfigured. Perform the following:

- a. Review the system error logs for errors that called out I/O bridges. This will indicate which I/O bridges have problems and need to be replaced.
- b. Replace the appropriate I/O bridges using symbolic FRU “IOBRDG” on page 504.

- c. Perform a slow boot.
  - d. Go to Verifying the repair. **This ends the procedure.**
8. Is word 6 of the reference code 0000F236?
- No:** Return to “Start of call procedure” on page 2. **This ends the procedure.**
- Yes:** The system has detected that all of the I/O hubs are deconfigured. Perform the following:
- a. Review the system error logs for errors that called out I/O hubs. This will indicate which I/O hubs have problems and need to be replaced.
  - b. Replace the appropriate I/O hubs using symbolic FRU “IO\_HUB” on page 505.
  - c. Perform a slow boot.
  - d. Go to Verifying the repair. **This ends the procedure.**

**FSPSP02:** This procedure is for boot failures that terminate very early in the boot process. This error path is indicated when the SRC data words are scrolling automatically through control panel functions 11, 12, and 13, and the control panel interface buttons are not responsive.

Perform the following:

1. Push the white power button to reset the system and bring it up on the other side of platform LIC.

**Note:** The white power button will only reset the system and attempt to reach standby.

2. Did an SRC occur after bringing the system up on the other side?

**No:** Update the code on the other side by performing symbolic FRU “LICCODE” on page 506.

**This ends the procedure.**

**Yes:** Continue with the next step.

3. Is the SRC the same SRC that brought you to this procedure?

**No:** Return to “Start of call procedure” on page 2 to service this new SRC. **This ends the procedure.**

**Yes:** Perform the following:

- a. Replace the service processor using symbolic FRU “SVCPROC” on page 547.
- b. If the problem persists, replace the system backplane using symbolic FRU “SYSBKPL” on page 547.

**This ends the procedure.**

**FSPSP03:** A system operator or user error has occurred. Refer to the documentation for the function you were attempting to perform.

**FSPSP04:** A problem has been detected in the service processor firmware. Perform “LICCODE” on page 506.

**FSPSP05:** The service processor has detected a problem in the platform firmware. Perform symbolic FRU “LICCODE” on page 506.

**FSPSP06:** The service processor reported a suspected intermittent problem. Contact your next level of support.

**FSPSP07:** The time of day has been reset to the default value.

1. To set the time of day, refer to Changing the time of day.
2. If the problem persists, replace the TOD battery. See symbolic FRU “TOD\_BAT” on page 548.
3. After replacing the battery, perform a slow boot. **This ends the procedure.**

**FSPSP08:** A problem has been detected with a system processor, but it cannot be isolated to a specific processor.



Perform the following steps:

1. Replace system processors one at a time until the problem is resolved. See symbolic FRU “ANYPROC” on page 457 for details.
2. Perform a slow boot after replacing each processor. **This ends the procedure.**

**FSPSP09:** A problem has been detected with a memory DIMM, but it cannot be isolated to a specific memory DIMM.

1. Replace all memory DIMMs one at a time until the problem is resolved. See symbolic FRU “MEMDIMM” on page 516 for instructions.
2. Perform a slow boot after replacing each memory DIMM. **This ends the procedure.**

**FSPSP10:** The part indicated in the FRU callout that follows this procedure is invalid or missing for this system’s configuration. Perform the following to correct the problem:

1. Does word 8 (the 8 leftmost characters in the 2nd line of function 13) of the reference code end with 02 or 04?  
**No:** Go to step 3.  
**Yes:** Continue with the next step.
2. The FRU that is called out after this procedure is either missing or invalid. Is that FRU installed?  
**Yes:** Remove that FRU. Then contact your next level of support to determine the correct FRU. **This ends the procedure.**  
**No:** Contact your next level of support to determine the correct FRU. **This ends the procedure.**
3. Does word 8 end with 01 or 05?  
**No:** Return to the “Start of call procedure” on page 2. **This ends the procedure.**  
**Yes:** The FRU that is called out after this procedure has the same serial number as another FRU in the system. Remove all but one of the FRUs that are called out after this procedure and then perform a slow boot (see Performing a slow boot). **This ends the procedure.**

**FSPSP11:** The service processor has detected an error on the RIO/HSL port in the system unit.

1. Perform symbolic FRU “LICCODE” on page 506.
2. If the problem persists, replace the I/O hub using symbolic FRU “IO\_HUB” on page 505. **This ends the procedure.**

**FSPSP12:** The DIMM FRU that was called out failed to correct the memory error. Perform the following:

1. Power off the system (see Powering on and powering off).
2. Replace the board that the DIMM is plugged into using symbolic FRU “MEMBRD” on page 512.
3. Perform a slow boot.
4. Are you working on a model 590?  
**No: This ends the procedure.**  
**Yes:** Continue with the next step.
5. Does the problem persist?  
**No: This ends the procedure.**  
**Yes:** Continue with the next step.
6. Power off the system (see Powering on and powering off).
7. Replace the MCM related to the DIMM FRU using symbolic FRU “MEMCTLR” on page 513.
8. Perform a slow boot.

**This ends the procedure.**

**FSPSP16:** Save any error log and dump data and contact your next level of support for assistance.

**FSPSP17:** A system uncorrectable error has occurred. Look for other serviceable events and use the callouts listed with them to correct the problem.

**FSPSP18:** A problem has been detected in the platform LIC. Perform symbolic FRU "LICCODE" on page 506.

**FSPSP19:** The system processor's module interposers have a limit on the number of times modules can be plugged into them. This procedure is usually called out due to a maintenance action dealing with an MCM and indicates that the plug count has been exceeded or is incorrect.

**Note:** Refer to Changing the interposer plug count for more information when performing this procedure.

1. Log on to the ASMI (see Accessing the Advanced System Management Interface).
2. Select **System Configuration>Interposer Plug Count**.
3. Find the target location code for the corresponding interposer.
4. Increment the interposer count by one.
5. Does the plug count exceed 10?
  - Yes:** Perform the following:
    - a. Power off the system (see Powering on and powering off).
    - b. Replace the system processor for the interposer card that has exceeded 10 using symbolic FRU "ANYPROC" on page 457.
    - c. Reset the plug count to one (1) with the ASMI.
    - d. Perform a slow boot and handle any new serviceable events as new problems. **This ends the procedure.**
  - No:** Perform a slow boot and handle any new serviceable events as new problems. **This ends the procedure.**

**FSPSP20:** A failing item has been detected by a hardware procedure. Perform a slow boot to run full hardware diagnostics. If a new SRC occurs, go to Reference codes.

**FSPSP21:** The system has detected that all I/O hub are missing from the system configuration.

1. Power off the system (see Powering on and powering off).
2. Replace the service processor using symbolic FRU "SVCPROC" on page 547.
3. Perform a slow boot.
4. Does the problem persist?
  - Yes:** Continue with the next step.
  - No: This ends the procedure.**
5. Power off the system (see Powering on and powering off).
6. Replace the system backplane using symbolic FRU "SYSBKPL" on page 547.
7. Perform a slow boot.
8. Choose from the following:
  - If you are working on a model 520, 550, 9124-720, or 570 4-way, **this ends the procedure.**
  - If you are working on a model 570 8-way through 16-way, continue with the next step.
  - If you are working on a model 590 or 595, go to step 10 on page 205.
9. Does the problem persist?
  - No: This ends the procedure.**
  - Yes:** Perform the following:
    - a. Power off the system (see Powering on and powering off).

- b. Replace each of the node planars one at a time using symbolic FRU "NODEPL" on page 520, performing a slow boot between each exchange, until the problem is resolved. **This ends the procedure.**
10. Does the problem persist?
    - No: This ends the procedure.**
    - Yes:** Continue with the next step.
  11. Perform the following for each of the node planars:
    - a. Power off the system (see Powering on and powering off).
    - b. Replace one of the node planars using symbolic FRU "NODEPL" on page 520.
    - c. Perform a slow boot.
    - d. Does the problem persist?
      - No: This ends the procedure.**
      - Yes:** Continue with the next step.
  12. Have you replaced each node planar?
    - No:** Repeat step 11 and replace the next node planar.
    - Yes:** Replace each of the I/O hubs one at a time using symbolic FRU "IO\_HUB" on page 505, performing a slow boot between each exchange, until the problem is resolved. **This ends the procedure.**

**FSPSP22:** The system has detected that a processor chip is missing from the system configuration because JTAG lines are not working.

1. Power off the system (see Powering on and powering off).
2. Replace the service processor using symbolic FRU "SVCPROC" on page 547.
3. Perform a slow boot.
4. Does the problem persist?
  - Yes:** Continue with the next step.
  - No: This ends the procedure.**
5. Perform the following for each system processor until the problem is resolved:
  - a. Power off the system (see Powering on and powering off).
  - b. Replace one of the system processors using symbolic FRU "ANYPROC" on page 457.
  - c. Perform a slow boot after replacing each processor.

**This ends the procedure.**

**FSPSP23:** The system needs to perform a service processor dump.

1. Perform a service processor dump (see Performing a platform system or service processor dump).
2. Once the dump is complete, attempt to re-IPL the system.
3. Save the service processor dump to storage (see Copying a dump).
4. Contact your next level of support. **This ends the procedure.**

**FSPSP24:** The system is running degraded. Array bit steering may be able to correct this problem without replacing hardware.

1. Power off the system (see Powering on and powering off).
2. Perform a slow boot. **This ends the procedure.**
3. If the problem persists, replace the FRU that is called out after this procedure. **This ends the procedure.**

**FSPSP25:** The server has detected an over temperature thermal fault.

1. Before replacing any server hardware FRU callouts, look for thermal problems related to fans, power supplies, etc. Perform all service actions for the thermal problem SRCs first before continuing with any other callouts in the current SRC. Thermal problems are associated with 1100 xxxx SRCs, where xxxx may be any of the following:
  - 1514
  - 1524
  - 7201
  - 7203
  - 7205
  - 7610
  - 7611
  - 7620
  - 7621
  - 7630
  - 7631
2. If no thermal related SRCs or problems can be found, replace the server hardware FRU called out in the current SRC. **This ends the procedure.**

**FSPSP26:** The system has detected a problem with the system backplane.

1. Power off the system (see Powering on and powering off).
2. Replace the system backplane using symbolic FRU "SYSBKPL" on page 547.
3. Perform a slow boot. **This ends the procedure.**

**FSPSP27:** An attention line has been detected as having a problem.

1. Power off the system (see Powering on and powering off).
2. Are you working on a model 570?
  - No:** Go to step 4.
  - Yes:** Continue with the next step.
3. Perform the following:
  - a. Check the flex cables and replace them if necessary.
  - b. Perform a slow boot.
  - c. Does the problem persist?
    - No: This ends the procedure.**
    - Yes:** Continue with the next step.
4. Replace the service processor using symbolic FRU "SVCPROC" on page 547.
5. Perform a slow boot.
6. Does the problem persist?
  - No: This ends the procedure.**
  - Yes:** Choose from the following:
    - If you are working on a model 550 or 9124-720, go to step 8 on page 207.
    - If you are working on any other model, continue with the next step.
7. Perform the following:
  - a. Power off the system (see Powering on and powering off).
  - b. Replace the system backplane using symbolic FRU "SYSBKPL" on page 547.
  - c. Perform a slow boot.Does the problem persist?

**No: This ends the procedure.**

**Yes:** Continue with the next step.

8. Choose from the following:

- If you are working on a model 520, 550, 9124-720, or 570 (4-way), perform the following:
  - a. Power off the system (see Powering on and powering off).
  - b. Replace all system processors using symbolic FRU "ANYPROC" on page 457.
  - c. Perform a slow boot. **This ends the procedure.**
- If you are working on a model 570 (8-way through 16-way), 590, or 595, perform the following:
  - a. Power off the system (see Powering on and powering off).
  - b. Replace the node planer that is indicated in word 6 (the 8 leftmost characters of function 13) using symbolic FRU "NODEPL" on page 520
  - c. Perform a slow boot. **This ends the procedure.**

**FSPSP28:** The resource ID (RID) of the FRU could not be found in the Vital Product Data (VPD) table.

1. Find another callout that reads "FSPxxxx" where xxxx is a 4 digit hex number that represents the RID. Record the RID.
2. Use ASMI to find the RID in the VPD table (see Viewing vital product data).
3. Replace the RID that is called out.
4. Perform a slow boot to ensure full hardware diagnostics. **This ends the procedure.**

**FSPSP29:** The system has detected that all I/O bridges are missing from the system configuration.

1. Power off the system (see Powering on and powering off).
2. Replace the service processor using symbolic FRU "SVCPROC" on page 547.
3. Perform a slow boot.
4. Does the problem persist?

**No: This ends the procedure.**

**Yes:** Continue with the next step.

5. Power off the system (see Powering on and powering off).
6. Replace the system backplane using symbolic FRU "SYSBKPL" on page 547.
7. Perform a slow boot.
8. Choose from the following:
  - If you are working on a Model 520, 550, 9124-720, or 570 (4-way), **this ends the procedure.**
  - If you are working on a Model 570 (8-way through 16-way), 590, or 595, continue with the next step.

9. Does the problem persist?

**No: This ends the procedure.**

**Yes:** Perform the following:

- a. Power off the system (see Powering on and powering off).
- b. Replace each of the node planers one at a time using symbolic FRU "NODEPL" on page 520, performing a slow boot between each exchange, until the problem is resolved. **This ends the procedure.**

**FSPSP30:** A problem has been encountered accessing the VPD card or the data found on the VPD card has been corrupted. This error occurred before VPD collection was completed, so no location codes have been created.

Choose the appropriate system model:

- Models 520, 570, 590, or 595

- Models 550 or 9124-720

#### Instructions for models 520, 570, 590, and 595

1. Power off the system (see Powering on and powering off) and remove ac power.
2. Replace the VPD card using symbolic FRU "CAPACTY" on page 467.
3. Perform a slow boot using the ASMI (see Performing a slow boot). Does the error reoccur?  
**Yes:** Continue with the next step.  
**No:** Go to Verifying the repair. **This ends the procedure.**
4. Power off the system (see Powering on and powering off) and remove ac power.
5. Replace the service processor using symbolic FRU "SVCPROC" on page 547.
6. Perform a slow boot using the ASMI (see Performing a slow boot). Does the error reoccur?  
**Yes:** Choose from the following:
  - If you are working on a model 520 or 570, continue with the next step.
  - If you are working on a model 590 or 595, contact your next level of support. **This ends the procedure.****No:** Go to Verifying the repair. **This ends the procedure.**
7. Power off the system (see Powering on and powering off).
8. Replace the system backplane using symbolic FRU "SYSBKPL" on page 547.
9. Reinstall the service processor that you replaced in step 5.
10. Perform a slow boot using the ASMI (see Performing a slow boot). Does the error reoccur?  
**Yes:** Contact your next level of support. **This ends the procedure.**  
**No:** Go to Verifying the repair. **This ends the procedure.**

#### Instructions for models 550 and 9124-720

1. Power off the system (see Powering on and powering off) and remove ac power.
2. Replace the VPD card using symbolic FRU "CAPACTY" on page 467.
3. Perform a slow boot using the ASMI (see Performing a slow boot). Does the error reoccur?  
**Yes:** Continue with the next step.  
**No:** Go to Verifying the repair. **This ends the procedure.**
4. Power off the system (see Powering on and powering off) and remove ac power.
5. Replace the system backplane using symbolic FRU "SYSBKPL" on page 547.
6. Perform a slow boot using the ASMI (see Performing a slow boot). Does the error reoccur?  
**Yes:** Contact your next level of support. **This ends the procedure.**  
**No:** Go to Verifying the repair. **This ends the procedure.**

**FSPSP31:** The service processor has detected that one or more of the required fields in the system VPD has not been initialized.

1. Log into ASMI with authorized service provider authority (see Accessing the Advanced System Management Interface).
2. Set the system VPD values (see Programming vital product data).

**Note:** The service processor will automatically reset when leaving the ASMI after updating the system VPD.

3. Power on the system (Powering on and powering off). **This ends the procedure.**

**FSPSP32:** The problem is resulting from one of the following:

- the enclosure VPD cannot be found,
- the enclosure serial number is not programmed, or

- the enclosure feature code is not programmed.

Perform the following:

1. Record the reason code (the last 4 characters of word 11) from the SRC by looking at the operator panel or accessing the error log with the ASMI.
2. Is the reason code B06F?  
**No:** Go to step 6.  
**Yes:** Continue with the next step.
3. Check for and apply any server firmware updates (see Server firmware fixes). Does the problem persist?  
**No: This ends the procedure.**  
**Yes:** Continue with the next step.

4. Perform the following:
  - a. Replace the service processor using symbolic FRU "SVCPROC" on page 547.
  - b. Perform a slow boot (see Performing a slow boot).

Does the problem persist?

**No: This ends the procedure.**

**Yes:** Continue with the next step.

5. Perform the following:
  - a. Replace the system backplane using symbolic FRU "SYSBKPL" on page 547.
  - b. Perform a slow boot (see Performing a slow boot).

Does the problem persist?

**No: This ends the procedure.**

**Yes:** Contact your next level of support. **This ends the procedure.**

6. Is the reason code B071?

**No:** Go to step 8.

**Yes:** Continue with the next step.

7. Perform the following:
  - a. Set the enclosure serial number using the ASMI (see Setting the system identifiers).
  - b. The service processor will automatically reset when leaving the ASMI after updating the serial number.
  - c. Perform a slow boot (see Performing a slow boot).

Does the problem persist?

**No: This ends the procedure.**

**Yes:** Contact your next level of support. **This ends the procedure.**

8. Is the reason code B07D?

**No:** Contact your next level of support. **This ends the procedure.**

**Yes:** Continue with the next step.

9. Perform the following:
  - a. Set the enclosure feature code using the ASMI (see Setting the system enclosure type).
  - b. The service processor will automatically reset when leaving the ASMI after updating the serial number.
  - c. Perform a slow boot (see Performing a slow boot).

Does the problem persist?

**No: This ends the procedure.**

**Yes:** Contact your next level of support. **This ends the procedure.**

**FSPSP33:** A problem has been detected in the connection with the HMC.

1. Ensure that the cable connectors to the network from the HMC, managed system, managed system partitions, and other HMCs are securely connected. If the connections are not secure, plug the cables back into the proper spots and make sure that the connections are good.
2. Check to see if the HMC is working correctly or if the HMC was disconnected incorrectly from the managed system, managed system partitions, and other HMCs. If either has happened, reboot the HMC. For more information, see Shutting down, rebooting, and logging off the HMC.
3. Verify that the network connection between the HMC, managed system, managed system partitions, and other HMCs is working properly. If the connection is not working properly, contact the customer network support to correct the problems.
4. If the problem continues to persist, contact your next level of support. **This ends the procedure.**

**FSPSP34:** The memory cards are plugged in an invalid configuration and cannot be used by the system.

1. Is the SRC B1xx F642?

**Yes:** A memory card is missing from the system. The additional parts in the FRU callout list will include all memory cards in the group with the missing card. To correct the error, visually check the system to determine which of these cards is missing, and add the card. **This ends the procedure.**

**No:** Continue with the next step.

2. Is the SRC B1xx F643?

**Yes:** A memory card is a different type than the other memory cards in the same group. The additional parts in the FRU callout list will include all memory cards in the group that contain the error. To correct the error, exchange the memory cards of the incorrect type with those of the desired type. **This ends the procedure.**

**No:** Continue with the next step.

3. Is the SRC B1xx F688?

**Yes:** There are one or more memory cards that are incompatible with the other memory cards plugged into the same board in the system. The additional parts in the FRU callout list will include all memory cards that are incompatible. To correct the error, remove these cards from the system. **This ends the procedure.**

**No:** Return to "Start of call procedure" on page 2. **This ends the procedure.**

**FSPSP35:** The system has detected a problem with a memory controller. Perform the following to enable redundant utilization:

1. Power off the system (see Powering on and powering off).
2. Perform a slow boot. **This ends the procedure.**

**FSPSP36:** One or both of the SMP cables connecting the system processors on this system are incorrectly plugged, broken, or not the correct type of cable for this system configuration.

By analyzing the last 4 characters (reason code) of word 11 of the SRC, we can narrow down the reason for the error:

- If the reason code is B08E, then there was a mismatch or parity error in the SMP cables identity on the system processors in the system.
- If the reason code is F23E, then there was a mismatch on the SMP cables plugged into the system and the number of nodes detected in the system.
- If the reason code is FB53, then a system processor had an error that may have been caused by a bad SMP cable.

Perform the following, regardless of the reason code:



1. Re-plug the SMP cables that connect to the system processors.
2. Perform a slow boot.
3. Does the problem persist?
  - Yes:** Continue with the next step.
  - No: This ends the procedure.**
4. Replace the SMP cables.
5. Perform a slow boot.
6. Does the problem persist?
  - No: This ends the procedure.**
  - Yes:** Continue with the next step.
7. Perform the following for each system processor:
  - a. Power off the system (see Powering on and powering off).
  - b. Remove one of the processors using symbolic FRU "ANYPROC" on page 457.
  - c. Perform a slow boot.
  - d. Does the problem persist?
    - Yes:** Reinstall the processor you removed and then repeat this step, removing the next processor.
    - No:** Replace the processor you just removed, it is the failing item. **This ends the procedure.**

**FSPSP37:** A timeout has occurred while waiting for the system processor to access main storage. Choose the procedure for the model you are working on:

- Models 520, 550, 9124-720, and 570 (4-way)
- Model 570 (8-way through 16-way)
- Model 590

**FSPSP37 instructions for Models 520, 550, 9124-720, and 570 (4-way)**

1. Perform the following for each system processor:
  - a. Power off the system (see Powering on and powering off).
  - b. Replace one of the system processors using symbolic FRU "ANYPROC" on page 457.
  - c. Perform a slow boot.
  - d. Does the problem persist?
    - No: This ends the procedure.**
    - Yes:** Continue with the next step.
2. Have you replaced all of the system processors?
  - No:** Repeat step 1 and replace the next processor.
  - Yes:** Continue with the next step.
3. Perform the following:
  - a. Power off the system (see Powering on and powering off).
  - b. Replace the RIO/HSL adapter card using symbolic FRU "SI\_CARD" on page 533.
  - c. Perform a slow boot.
  - d. Does the problem persist?
    - No: This ends the procedure.**
    - Yes:** Continue with the next step.
4. Perform the following:
  - a. Power off the system (see Powering on and powering off).
  - b. Replace the system or I/O backplane using symbolic FRU "SYSBKPL" on page 547.

c. Perform a slow boot. **This ends the procedure.**

#### FSPSP37 instructions for Model 570 (8-way through 16-way)

1. Power off the system (see Powering on and powering off).
2. Replace the SMP cables.
3. Perform a slow boot.
4. Does the problem persist?
  - No: This ends the procedure.**
  - Yes:** Continue with the next step.
5. Perform the following for each system processor:
  - a. Power off the system (see Powering on and powering off).
  - b. Replace one of the system processors using symbolic FRU "ANYPROC" on page 457.
  - c. Perform a slow boot.
  - d. Does the problem persist?
    - No: This ends the procedure.**
    - Yes:** Continue with the next step.
6. Have you replaced all of the system processors?
  - No:** Repeat step 5 and replace the next processor.
  - Yes:** Continue with the next step.
7. Perform the following:
  - a. Power off the system (see Powering on and powering off).
  - b. Replace the RIO/HSL adapter card using symbolic FRU "SI\_CARD" on page 533.
  - c. Perform a slow boot.
  - d. Does the problem persist?
    - No: This ends the procedure.**
    - Yes:** Continue with the next step.
8. Perform the following:
  - a. Power off the system (see Powering on and powering off).
  - b. Replace each of the node planars, one at a time, using symbolic FRU "NODEPL" on page 520, performing a slow boot after replacing each planar, until the problem is resolved. **This ends the procedure.**

#### FSPSP37 instructions for Model 590

1. Determine which node on the system has the problem by performing the following:
  - a. Power off the system (see Powering on and powering off).
  - b. Replace one of the nodes.
  - c. Perform a slow boot.
  - d. Does the problem persist?
    - No:** The node you just replaced is causing the problem. Go to step 3.
    - Yes:** Continue with the next step.
2. Have you tried replacing all of the nodes?
  - No:** Repeat step 1 and replace the next node.
  - Yes:** Replace the system backplane using symbolic FRU "SYSBKPL" on page 547. **This ends the procedure.**
3. Determine what part in the failing node is causing the problem by performing the following:
  - a. Power off the system (see Powering on and powering off).

- b. Replace the RIO/HSL adapter card using symbolic FRU "SI\_CARD" on page 533.
- c. Reinstall the failing node.
- d. Perform a slow boot.
- e. Does the problem persist?

**No: This ends the procedure.**

**Yes:** Continue with the next step.

- 4. Perform the following:
  - a. Power off the system (see Powering on and powering off).
  - b. Replace one of the system processors on the failing node using symbolic FRU "ANYPROC" on page 457.
  - c. Perform a slow boot.
  - d. Does the problem persist?
    - No: This ends the procedure.**
    - Yes:** Continue with the next step.
- 5. Have you replaced all of the system processors on the failing node?
  - No:** Repeat step 4 and replace the next processor.
  - Yes:** Perform the following:
    - a. Power off the system (see Powering on and powering off).
    - b. Replace the failing node backplane using symbolic FRU "NODEPL" on page 520.
    - c. Perform a slow boot. **This ends the procedure.**

**FSPSP38:** The system has detected an error within the JTAG path.

- 1. Power off the system (see Powering on and powering off).
- 2. Replace the service processor using symbolic FRU "SVCPROC" on page 547.
- 3. Perform a slow boot.
- 4. Does the problem persist?
  - No: This ends the procedure.**
  - Yes:** Power off the system (see Powering on and powering off), and then choose from the following:
    - If you are working on a model 570, go to step 5.
    - If you are working on a model 520, 550, 9124-720, 590, or 595, go to step 8.
- 5. Replace the SMP cables.
- 6. Perform a slow boot.
- 7. Does the problem persist?
  - No: This ends the procedure.**
  - Yes:** Power off the system (see Powering on and powering off), and then go to step 8.
- 8. Replace the system backplane using symbolic FRU "SYSBKPL" on page 547.
- 9. Perform a slow boot. **This ends the procedure.**

**FSPSP39:** This procedure will isolate a DIMM failure after the DIMM FRU failed to correct the problem.

- 1. Power off the system (see Powering on and powering off).
- 2. Place the DIMM that was replaced by the FRU callout back into its original location.
- 3. Replace the DIMM that is paired with the DIMM FRU that was called out, according to the following table. See Finding part locations for part numbers and a link to the exchange procedure.

Model	DIMM pairings
520	C9, C10 C11, C12 C13, C14 C15, C16
550, 9124-720, 570	C1, C2 C3, C4 C5, C6 C7, C8

4. Perform a slow boot.
5. Does the problem persist?  
**No: This ends the procedure.**  
**Yes:** Continue with the next step.
6. Power off the system (see Powering on and powering off).
7. Replace the board that the DIMM is plugged into using symbolic FRU “MEMBRD” on page 512.
8. Perform a slow boot. **This ends the procedure.**

**FSPSP40:** This procedure is a warning due to an invalid login attempt to the service processor. No replacement action is required, and any other callouts associated with this error may be disregarded.

**FSPSPC1:** If the system hangs after the code that sent you to this procedure appears in the control panel, perform these steps to reset the service processor.

1. Activate the service processor pinhole reset switch on the system’s operator panel by carefully performing these steps:
  - a. Using an insulated paper clip, unbend the clip so that it has a straight section about two inches long.
  - b. Insert the clip straight into the hole, keeping the clip perpendicular to the plastic bezel.
  - c. When you engage the reset switch, you should feel the detent of the switch.
  - d. After you press the switch, the service processor is reset, then the system shuts down.
2. Reboot the system in slow mode from the permanent side using control panel function 02.
3. If the hang repeats, check with service support to see if there is a firmware update that fixes the problem. See Getting fixes in the Customer service and support topic for details.
4. Choose from the following options:
  - If there is no firmware update available, continue with the next step.
  - If a firmware update is available, apply it using the Service Focal Point in the HMC.  
Did the update resolve the problem and the system now boots?  
**Yes: This ends the procedure.**  
**No:** You are here because there is no HMC attached to the system, the flash update failed, or the updated firmware did not fix the hang. Continue with the next step.
5. Choose from the following options:
  - If you are a customer, contact your hardware service provider. **This ends the procedure.**
  - If you are an hardware service provider, continue with the next step.
6. Replace the service processor (see symbolic FRU “SVCPROC” on page 547).
7. If replacing the service processor does not fix the problem, contact your next level of support. **This ends the procedure.**

**FSPSPD1:** If the system hangs after the code that sent you to this procedure appears in the control panel, perform these steps to reset the service processor.

1. Activate the service processor pinhole reset switch on the system's operator panel by carefully performing these steps:
  - a. Using an insulated paper clip, unbend the clip so that it has a straight section about two inches long.
  - b. Insert the clip straight into the hole, keeping the clip perpendicular to the plastic bezel.
  - c. When you engage the reset switch, you should feel the detent of the switch.
  - d. After you press the switch, the service processor is reset, then the system shuts down.
2. If the hang repeats, boot the system from the permanent side.
3. If the hang repeats when booting from the permanent side, check with service support to see if there is a firmware update that fixes the problem. See Server firmware fixes in the Customer service and support topic for details.
4. Choose from the following options:
  - If there is no firmware update available, continue with the next step.
  - If a firmware update is available, apply it using the Service Focal Point in the HMC.  
Did the update resolve the problem and the system now boots?  
**Yes: This ends the procedure.**  
**No:** You are here because there is no HMC attached to the system, the flash update failed, or the updated firmware did not fix the hang. Continue with the next step.
5. Choose from the following options:
  - If you are a customer, contact your hardware service provider. **This ends the procedure.**
  - If you are a hardware service provider, continue with the next step.
6. Replace the service processor (see symbolic FRU "SVCPROC" on page 547).
7. If replacing the service processor does not fix the problem, contact your next level of support. **This ends the procedure.**

## **Storage device I/O processor (SDIOP) isolation procedures**

Use these procedures to isolate a failure in the multiple function I/O card.

Please read all safety procedures before servicing the system.

**Attention:** Unless instructed otherwise, always power off the system or expansion tower where the field replaceable unit (FRU) is located (see Powering on and powering off) before removing, exchanging, or installing a FRU.

**Attention:** Disconnecting the J15 and J16 cables will not prevent the system unit from powering on.

## DANGER

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn everything OFF (unless instructed otherwise).
2. Remove power cords from the outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

To Connect:

1. Turn everything OFF (unless instructed otherwise)
2. Attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

(D005)

"IOPIP01" on page 217

"IOPIP13" on page 219

"IOPIP16" on page 222

"IOPIP17" on page 225

"IOPIP18" on page 226

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"IOPIP34" on page 240

**IOPIP01:** Use this procedure to perform an IPL to dedicated service tool (DST) to determine if the same reference code occurs. If a new reference code occurs, more analysis may be possible with the new reference code. If the same reference code occurs, you are instructed to exchange the failing items.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions, before continuing with this procedure.
2. Was the IPL performed from disk (Type A or Type B)?
  - No:** Continue with the next step.
  - Yes:** Go to step 5.
3. Perform the following:
  - a. Ensure that the IPL media is the correct version and level that are needed for the system model.
  - b. Ensure that the media is not physically damaged.
  - c. Choose from the following options to clean the IPL media:
    - If it is cartridge type optical media (for example, DVD), do not attempt to clean the media.
    - If it is non-cartridge type media (for example, CD-ROM), wipe the disc in a straight line from the inner hub to the outer rim. Use a soft, lint-free cloth or lens tissue. Always handle the disc by the edges to avoid finger prints.
    - If it is tape, clean the recording head in the tape unit. Use the correct IBM Cleaning Cartridge Kit.
4. Perform a Type D IPL in **Manual** mode.

Does a system reference code (SRC) appear on the control panel?

  - No:** Go to step 8 on page 218.
  - Yes:** Is the SRC the same one that sent you to this procedure?
    - Yes:** You cannot continue isolating the problem. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure. Refer to the failing item column in the reference code list. See Reference codes for details. If the failing item list contains FI codes, see "Using failing item codes" on page 430 to help determine part numbers and location in the system. **This ends the procedure.**
    - No:** A different SRC occurred. Use the new SRC to correct the problem. See "Start of call procedure" on page 2. **This ends the procedure.**
5. Perform an IPL to DST. See Performing an IPL to DST.

Does an SRC appear on the control panel?

**No:** Continue with the next step.

**Yes:** Go to step 10.

6. Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear on the console?

**No:** Continue with the next step.

**Yes:** Select option 5, press **F11**, then press **Enter** to display the details. Then, choose from the following options:

- If all of the reference codes are 0000, go to “LICIP11” on page 136 and use cause code 0002.
- If any of the reference codes are not 0000, go to step 10, and use the reference code that is not 0000.

**Note:** Use the characters in the *Type* column to find the correct reference code table.

7. Look at the product activity log. See “Using the product activity log” on page 26 for details.

Is an SRC logged as a result of this IPL?

**Yes:** Continue with the next step.

**No:** The problem cannot be isolated any more. Use the original SRC and exchange the failing items. Start with the highest probable cause of failure in the failing item list for this reference code in the Reference codes topic and Removing and replacing parts. If the failing item list contains FI codes, see “Using failing item codes” on page 430 to help determine part numbers and location in the system. **This ends the procedure.**

8. Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear on the console?

**Yes:** Continue with the next step.

**No:** Look at the product activity log. See “Using the product activity log” on page 26 for details.

Is an SRC logged as a result of this IPL?

**Yes:** Continue with the next step.

**No:** The problem is corrected. **This ends the procedure.**

9. Select option 5, press **F11**, then press **Enter** to display the details. Then, choose from the following options:

- If all of the reference codes are 0000, go to “LICIP11” on page 136 and use cause code 0002.
- If any of the reference codes are not 0000, continue with the next step and use the reference code that is not 0000.

**Note:** Use the characters in the *Type* column to find the correct reference code table.

10. Record the SRC on the Problem summary form. See the Problem reporting forms for details.

Are the SRC and unit reference code (URC) the same ones that sent you to this procedure?

**Yes:** Continue with the next step.

**No:** Use the new SRC or reference code to correct the problem. See the Reference code topic. **This ends the procedure.**

11. Perform the following steps:

- a. Power off the system or expansion tower. See Powering on and powering off.
- b. Exchange the FRUs in the failing item list for the SRC you have now. Start with the highest probable cause of failure in the failing item column in the reference code list. See the Reference code topic. Perform the remaining steps of this procedure after you exchange each FRU until you determine the failing FRU.

**Note:** If you exchange a disk unit, do not attempt to save customer data until instructed to do so in this procedure.



12. Power on the system or the expansion unit.

Does an SRC appear on the control panel?

**No:** Continue with the next step.

**Yes:** Go to step 15.

13. Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear on the console?

**Yes:** Continue with the next step.

**No:** Look at the product activity log. See “Using the product activity log” on page 26 for details.

Is an SRC logged as a result of this IPL?

– **Yes:** Continue with the next step.

– **No:** The last FRU you exchanged was failing.

**Note:** Before exchanging a disk unit, you should attempt to save customer data. Go to Disk unit recovery procedures before exchanging a disk unit.

**This ends the procedure.**

14. Select option 5, press **F11**, then press **Enter** to display the details. Then, choose from the following options:

• If all of the reference codes are 0000, go to “LICIP11” on page 136 and use cause code 0002.

• If any of the reference codes are not 0000, go to step 10 on page 218, and use the reference code that is not 0000.

**Note:** Use the characters in the *Type* column to find the correct reference code table.

15. Record the SRC on the Problem summary form. See “Using the product activity log” on page 26 for details.

Is the SRC the same one that sent you to this procedure?

**Yes:** The last FRU you exchanged is not the failing FRU. Go to step 11 on page 218 to continue FRU isolation.

**No:** Is the SRC B100 4504 or B100 4505 and have you exchanged disk unit 1 in the system unit, or are all the reference codes on the console 0000?

**Yes:** The last FRU you exchanged was failing. **This ends the procedure.**

**Note:** Before exchanging a disk unit, you should attempt to save customer data. See Disk unit recovery procedures before exchanging a disk unit.

**No:** Use the new SRC or reference code to correct the problem. See the Reference code topic.

**This ends the procedure.**

**IOPIP13:** Use this procedure to isolate problems on the interface between the I/O card and the storage devices.

The unit reference code (part of the SRC that sent you to this procedure) indicates the SCSI bus that has the problem:

Unit reference code (URC)	SCSI bus
3100	0
3101	1
3102	2
3103	3

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions.
2. Were you performing an IPL from removable media (IPL type D) when the error occurred?
  - No:** Continue with the next step.
  - Yes:** Exchange the FRUs in the failing item list for the reference code that sent you to this procedure. **This ends the procedure.**
3. Perform the following steps:
  - a. Look in the service action log (see “Using the Service Action Log” on page 24) for other errors logged at or around the same time as the 310x SRC.
  - b. If no entries appear in the service action log, use the product activity log (see “Using the product activity log” on page 26).
  - c. Use the other SRCs to correct the problem before performing an IPL. See the System reference codes topic.
  - d. Contact your next level of support as necessary for assistance with SCSI bus problem isolation.
  - e. If the problem is not corrected, continue with the next step.
4. Perform an IPL to DST. See Performing an IPL to DST. Does an SRC appear on the control panel?
  - No:** Continue with the next step.
  - Yes:** Go to step 7.
5. Does one of the following displays appear on the console?
  - Disk Configuration Error Report
  - Disk Configuration Attention Report
  - Disk Configuration Warning Report
  - Display Unknown Mirrored Load-Source Status
  - Display Load-Source Failure
    - **Yes:** Continue with the next step.
    - **No:** Look at the product activity log. See “Using the product activity log” on page 26for details.

Is an SRC logged as a result of this IPL?

  - **Yes:** Continue with the next step.
  - **No:** You cannot continue isolating the problem. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure see the failing item list for this reference code in the Reference codes topic. If the failing item list contains FI codes, see the “Using failing item codes” on page 430 topic to help determine part numbers and location in the system. **This ends the procedure.**
6. Are all of the reference codes 0000? On some of the displays, you must press **F11** to display reference codes.
  - **No:** Continue with the next step. Use the reference code that is not 0000.
  - **Yes:** Go to “LICIP11” on page 136 and use cause code 0002. **This ends the procedure.**
7. Is the SRC the same one that sent you to this procedure?
  - Yes:** Continue with the next step.
  - No:** Record the SRC on the Problem summary form. Then go to the Reference codes topic to correct the problem. **This ends the procedure.**
8. Perform the following:
  - a. Power off the system or the expansion tower. See Powering on and powering off for details.
  - b. Find the I/O card identified in the failing item list.
  - c. Remove the I/O card and install a new I/O card. See Removing and replacing parts. This item has the highest probability of being the failing item.

d. Power on the system or the expansion tower.

Does an SRC appear on the control panel?

**No:** Continue with the next step.

**Yes:** Go to step 12.

9. Does one of the following displays appear on the console?

- Disk Configuration Error Report
- Disk Configuration Attention Report
- Disk Configuration Warning Report
- Display Unknown Mirrored Load-Source Status
- Display Load-Source Failure

**Yes:** Does the Display Unknown Mirrored Load-Source Status display appear on the console?

**Note:** On some of these displays, you must press **F11** to display reference codes.

– **Yes:** Continue with the next step.

– **No:** Are all of the reference codes 0000?

– **No:** Go to step 12 using the reference code that is not 0000.

– **Yes:** Go to “LICIP11” on page 136 and use cause code 0002. **This ends the procedure.**

**No:** Go to step 11.

10. Is the reference code the same one that sent you to this procedure?

**No:** Either a new reference code occurred, or the reference code is 0000. There may be more than one problem.

The original I/O card may be failing, but it must be installed in the system to continue problem isolation.

Install the original I/O card by doing the following:

- a. Power off the system or the expansion tower. See Powering on and powering off for details.
- b. Remove the I/O card you installed in step 8 on page 220 and install the original I/O card.

**Note:** Do not power on the system or the expansion unit now.

A device connected to the I/O card could be the failing item. Go to “IOPIP16” on page 222, step (9) to continue isolating the problem. **This ends the procedure.**

**Yes:** Go to step 13.

11. Look at the product activity log. See “Using the product activity log” on page 26 for details.

Is an SRC logged as a result of this IPL?

**Yes:** Continue with the next step.

**No:** The I/O card, which you removed in step 8 on page 220, is the failing item. **This ends the procedure.**

12. Is the SRC or reference code the same one that sent you to this procedure?

**Yes:** Continue with the next step.

**No:** Record the SRC on the Problem summary form. Then go to the Reference codes topic to correct the problem. **This ends the procedure.**

13. The original I/O card is not the failing item. Install the original I/O card by doing the following:

- a. Power off the system or the expansion tower. See Powering on and powering off for details.
- b. Remove the I/O card you installed in step 8 on page 220 of this procedure and install the original I/O card.

**Note:** Do not power on the system or the expansion unit now.

A device connected to the I/O card could be the failing item. Go to “IOPIP16” on page 222, step (9) to continue isolating the problem. **This ends the procedure.**

**IOPIP16:** Use this procedure to isolate failing devices that are identified by FI codes FI01105, FI01106, and FI01107.

During this procedure, you will remove devices that are identified by the FI code, and then you will perform an IPL to determine if the symptoms of the failure have disappeared, or changed. You should not remove the load-source disk until you have shown that the other devices are not failing. Removing the load-source disk can change the symptom of failure, although it is not the failing unit.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Use the Hardware Service Manager (HSM) verify function (use DST or SST), and verify that all tape and optical units attached to the SCSI bus (identified by FI01105, FI01106, or FI01107) are operating correctly. See Verification procedures for details.

**Note:** Do not IPL the system to get to DST.

3. Choose from the following options:
  - If verification was successful for all tape and optical units, then go to step 5.
  - If any tape or optical device could not be verified, or if it failed verification, then exchange the failing item. See the Removing and replacing parts and continue with the next step.
4. Use the Hardware Service Manager (HSM) verify function (use SST or DST) and verify that the exchanged item is operating correctly. See Verification procedures for details.

Was the verification successful?

**No:** Replace the exchanged device with the original. See Removing and replacing parts and continue with the next step.

**Yes:** The newly exchanged tape or optical device was the failing item. **This ends the procedure.**

5. Perform an IPL to DST. See Performing an IPL to DST.

Does an SRC appear on the control panel?

**No:** Continue with the next step.

**Yes:** Go to step 8 on page 223.

6. Does one of the following displays appear on the console?

- Disk Configuration Error Report
- Disk Configuration Attention Report
- Disk Configuration Warning Report
- Display Unknown Mirrored Load-Source Status
- Display Load-Source Failure

**Note:** On some of these displays, you must press **F11** to display reference codes. The characters under Type are the same as the 4 leftmost characters of word 1. The characters under Reference Code are the same as the 4 rightmost characters of word 1.

**No:** Continue with the next step.

**Yes:** Are all of the reference codes 0000?

**No:** Go to step 8 on page 223, and use the reference code that is not 0000.

**Yes:** Go to "LICIP11" on page 136 and use cause code 0002. **This ends the procedure.**

7. Look at the Product Activity Log. See "Using the product activity log" on page 26 for details.

Is a reference code logged as a result of this IPL?

**Yes:** Continue with the next step.

**No:** You cannot continue isolating the problem. Use the original reference code and exchange the failing items, starting with the highest probable cause of failure. See the failing item list for this

reference code in the Reference codes topic. If the failing item list contains FI codes, see “Using failing item codes” on page 430 for additional details. **This ends the procedure.**

8. Is the SRC or reference code the same one that sent you to this procedure?

**Yes:** Continue with the next step.

**No:** Record the SRC or reference code on the Problem reporting forms. Then, go to the Reference codes topic to correct the problem. **This ends the procedure.**

9. Isolate the failing device by doing the following:

- a. Power off the system or the expansion unit if it is powered on. See Powering on and powering off.
- b. Go to “Using failing item codes” on page 430 to find the devices identified by FI code FI01105, FI01106, or FI01107 in the failing item list.
- c. Disconnect one of the devices that are identified by the FI code, other than the load-source disk unit.

**Note:** The tape, or optical units should be the first devices to be disconnected, if they are attached to the SCSI bus identified by FI01105, FI01106, or FI01107.

- d. Go to step 11.

10. Continue to isolate the possible failing items by doing the following:

- a. Power off the system or the expansion unit. See Powering on and powering off.
- b. Disconnect the next device that is identified by FI codes FI01105, FI01106, or FI01107 in the FRU list. See the note in step 9. Do not disconnect disk unit 1 (load-source disk) until you have disconnected all other devices and the load-source disk is the last device that is identified by these FI codes.

11. Power on the system or the expansion tower.

Does an SRC appear on the control panel?

**No:** Continue with the next step.

**Yes:** Go to step 14 on page 224.

12. Does one of the following displays appear on the console?

- Disk Configuration Error Report
- Disk Configuration Attention Report
- Disk Configuration Warning Report
- Display Unknown Mirrored Load-Source Status
- Display Load-Source Failure

**Note:** On some of these displays, you must press **F11** to display reference codes. The characters under Type are the same as the 4 leftmost characters of word 1. The characters under Reference Code are the same as the 4 rightmost characters of word 1.

**Yes:** Go to step 14 on page 224.

**No:** Look at the Product Activity Log. See “Using the product activity log” on page 26 for details. Is a reference code logged as a result of this IPL?

**No:** Continue with the next step.

**Yes:** Go to step 14 on page 224.

13. You are here because the IPL completed successfully. The last device you disconnected is the failing item.

Is the failing item a disk unit?

**No:** Exchange the failing item and reconnect the devices you disconnected previously. See the Removing and replacing parts. **This ends the procedure.**

**Yes:** Exchange the failing FRU. Before exchanging a disk drive, you should attempt to save customer data. Go to Disk unit recovery procedures before exchanging a disk unit. **This ends the procedure.**

14. Is the SRC or reference code the same one that sent you to this procedure?

**Yes:** Continue with the next step.

**No:** Record the SRC or reference code on the Problem summary form. Then go to step 16.

15. The last device you disconnected is not failing.

Have you disconnected all the devices that are identified by FI codes FI01105, FI01106, or FI01107 in the FRU list?

**No:** Leave the device disconnected and return to step 10 on page 223 to continue isolating the possible failing items.

**Yes:** Replace the device backplane or backplanes associated with the devices you removed in the earlier steps. If the device backplane does not fix the problem, then you cannot continue isolating the problem. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure. See the failing item list for this reference code in the Reference codes topic. If the failing item list contains FI codes, see “Using failing item codes” on page 430 for additional information. **This ends the procedure.**

16. Is the SRC B1xx 4504, and have you disconnected the load-source disk unit? (The load-source disk unit is disconnected by disconnecting disk unit 1.)

**Yes:** Continue with the next step.

**No:** Does one of the following displays appear on the console, and are all reference codes 0000?

- Disk Configuration Error Report
- Disk Configuration Attention Report
- Disk Configuration Warning Report
- Display Unknown Mirrored Load-Source Status
- Display Load-Source Failure

**Note:** On some of these displays, you must press **F11** to display reference codes. The characters under Type are the same as the 4 leftmost characters of word 1. The characters under Reference Code are the same as the 4 rightmost characters of word 1.

**Yes:** Continue with the next step.

**No:** A new SRC or reference code occurred. Go to the Reference codes topic to correct the problem. **This ends the procedure.**

17. The last device you disconnected may be the failing item. Exchange the last device you disconnected. See the Removing and replacing parts.

**Note:** Before exchanging a disk drive, you should attempt to save customer data. Go to Disk unit recovery procedures before exchanging a disk unit.

Was the problem corrected by exchanging the last device you disconnected?

**No:** Continue with the next step.

**Yes:** **This ends the procedure.**

18. Reconnect the devices you disconnected previously in this procedure.

19. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure. See the failing item list for this reference code in the Reference codes topic. Do not exchange the FRU that you exchanged in this procedure. If the failing item list contains FI codes, see “Using failing item codes” on page 430 to help determine part numbers and location in the system. **This ends the procedure.**

**IOPIP17:** Use this procedure to isolate problems that are associated with SCSI bus configuration errors and device task initialization failures.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Were you performing an IPL from removable media (IPL type D) when the error occurred?
  - Yes:** Exchange the FRUs in the failing item list for the reference code that sent you to this procedure.
  - No:** Perform an IPL to DST. See Performing an IPL to DST.  
Does an SRC appear on the control panel?
    - No:** Continue with the next step.
    - Yes:** Go to step 5.
3. Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear on the console?
  - No:** Continue with the next step.
  - Yes:** Does one of the following messages appear in the list?
    - Missing disk units in the configuration
    - Missing mirror protection disk units in the configuration
    - Device parity protected units in exposed mode.
    - No:** Continue with the next step.
    - Yes:** Select option 5, press **F11**, then press **Enter** to display the details. Then, choose from the following options:
      - If all of the reference codes are 0000, go to “LICIP11” on page 136 and use cause code 0002.
      - If any of the reference codes are not 0000, go to step 5, and use the reference code that is not 0000.

**Note:** Use the characters in the *Type* column to find the correct reference code table.
4. Look at the product activity log. See “Using the Service Action Log” on page 24.  
Is an SRC logged as a result of this IPL?
  - Yes:** Continue with the next step.
  - No:** You cannot continue isolating the problem. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure (see the failing item list for this reference code in the (System Reference Codes)) topic. If the failing item list contains FI codes, see (Failing items) to help determine part numbers and location in the system. **This ends the procedure.**
5. Record the SRC on the Problem summary form. See Problem reporting forms for details.  
Is the SRC the same one that sent you to this procedure?
  - No:** A different SRC or reference code occurred. Use the new SRC or reference code to correct the problem. See “Start of call procedure” on page 2. **This ends the procedure.**
  - Yes:** Determine the device unit reference code (URC) from the SRC. If the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appears on the console, the device URC is displayed under *Reference Code*. This is on the same line as the missing device.  
Is the device unit reference code **3020**, **3021**, **3022**, or **3023**?
    - Yes:** Continue with the next step.
    - No:** Go to step 7 on page 226.
6. A unit reference code of **3020**, **3021**, **3022**, or **3023** indicates that there is a problem on an I/O card SCSI bus. The problem can be caused by a device that is attached to the I/O card that:
  - Is not supported.

- Does not match system configuration rules. For example, there are too many devices that are attached to the bus.
- Is failing.

Perform the following:

- Look at the characters on the control panel Data display or the Problem Summary Form for characters 9 - 16 of the top 16 character line of function 12 (word 3).  
Use the format BBBB-Cc-bb (BBBB = bus, Cc = card, bb = board) to determine the card slot location for the I/O card (see (Locations and addresses)).
- The unit reference code indicates the SCSI bus that has the problem:

URC	SCSI Bus
3020	0
3021	1
3022	2
3023	3

- To find the bus and device locations, see Finding part locations.
- Find the printout that shows the system configuration from the last IPL and compare it to the present system configuration.

**Note:** If configuration is not the problem, a device on the SCSI bus may be failing.

- If you need to perform isolation on the SCSI bus, go to “IOPIP16” on page 222. **This ends the procedure.**
7. The possible failing items are FI codes **FI01105** (90%) and **FI01112** (10%). Find the device unit address from the SRC (see The System Reference Code (SRC) Format Description). Use this information to find the physical location of the device. Record the type and model numbers to determine if the addressed I/O card supports this device.

Is the device given support on your system?

**No:** Continue with the next step.

**Yes:** Perform the following:

- Exchange the device.
- Perform an IPL to DST. See Performing an IPL to DST.

Does this correct the problem?

**No:** Ask your next level of support for assistance. **This ends the procedure.**

**Yes: This ends the procedure.**

8. Perform the following steps:
- Remove the device.
  - Perform an IPL to DST. See Performing an IPL to DST.

Does this correct the problem?

**No:** Ask your next level of support for assistance. **This ends the procedure.**

**Yes: This ends the procedure.**

**IOPIP18:** Use this procedure to isolate problems that are associated with SCSI bus configuration errors and device task initialization failures.

- If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
- Perform an IPL to DST. See Performing an IPL to DST.

Does an SRC appear on the control panel?



**Yes:** Go to step 5.

**No:** Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear on the console?

**Yes:** Continue with the next step.

**No:** Go to step 4.

3. Does one of the following messages appear in the list?

- Missing disk units in the configuration
- Missing mirror protection disk units in the configuration
- Device parity protected units in exposed mode.

**No:** Continue with the next step.

**Yes:** Select option 5, press **F11**, and then press **Enter** to display the details. Choose from the following options:

- If all of the reference codes are 0000, go to "LICIP11" on page 136 and use cause code 0002.
- If any of the reference codes are not 0000, go to step 5, and use the reference code that is not 0000.

**Note:** Use the characters in the *Type* column to find the correct reference code table.

4. Look at the product activity log (see (Log) for details).

Is an SRC logged as a result of this IPL?

**Yes:** Continue with the next step.

**No:** You cannot continue isolating the problem. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure in the failing item column in the reference code list. See the Reference codes topic. If the failing item list contains FI codes, see "Using failing item codes" on page 430 to help determine part numbers and location in the system. **This ends the procedure.**

5. Record the SRC on the Problem summary form. See the Problem reporting forms.

Is the SRC the same one that sent you to this procedure?

**Yes:** Continue with the next step.

**No:** A different SRC or reference code occurred. Use the new SRC or reference code to correct the problem. See "Start of call procedure" on page 2. **This ends the procedure.**

6. Determine the device unit reference code (URC) from the SRC. If the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appears on the console, the device URC is displayed under *Reference Code*. This is on the same line as the missing device.

Is the device unit reference code 3020?

**No:** Continue with the next step.

**Yes:** A device reference code of 3020 indicates that a device is attached to the addressed I/O card. Either it is not supported, or it does not match system configuration rules. For example, there are too many devices that are attached to the bus. Perform the following steps:

- a. Find the printout that shows the system configuration from the last IPL and compare it to the present system configuration.
- b. Use the unit address and the physical address in the SRC to help you with this comparison.
- c. If configuration is not the problem, a device on the SCSI bus may be failing. Use FI code FI00884 in the "Using failing item codes" on page 430 table to help find the failing device.
- d. If you need to perform isolation on the SCSI bus, go to "IOPIP16" on page 222. **This ends the procedure.**

7. The possible failing items are FI codes FI01105 (90%) and FI01112 (10%).

Find the device unit address from the SRC. Use this information to find the physical location of the device. Record the type and model numbers to determine if the addressed I/O card supports this device.

Is the device given support on your system?

**No:** Continue with the next step.

**Yes:** Perform the following steps:

- a. Exchange the device.
- b. Perform an IPL to DST. See Performing an IPL to DST.

Does this correct the problem?

**No:** Ask your next level of support for assistance. **This ends the procedure.**

**Yes: This ends the procedure.**

8. Perform the following steps:

- a. Remove the device.
- b. Perform an IPL to DST. See Performing an IPL to DST.

Does this correct the problem?

**No:** Ask your next level of support for assistance. **This ends the procedure.**

**Yes: This ends the procedure.**

**IOPIP19:** You were sent to this procedure from unit reference code 9010, 9011, or 9013. Contact your next level of support for assistance.

**IOPIP20:** Use this procedure to isolate the problem when two or more devices are missing from a disk array. You were sent to this procedure from URC 9020 or 9021.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions, before continuing with this procedure.
2. Access SST/DST by doing one of the following:
  - If you can enter a command at the console, access system service tools (SST). See System Service Tools (SST).
  - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to DST.
  - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
3. Have any other I/O card or device SRCs (other than a 902F SRC) occurred at about the same time as this error?

**Yes:** Use the other I/O card or device SRCs to correct the problem. See the Reference codes topic. **This ends the procedure.**

**No:** Has the I/O card, or have the devices been repaired or reconfigured recently?

– **Yes:** Continue with the next step.

– **No:** Contact your next level of support for assistance. **This ends the procedure.**

4. Did you perform a D IPL to get to DST?

**Yes:** Continue with the next step.

**No:** Perform the following steps:

- a. Access the Product Activity Log and display the SRC that sent you here and view the "Additional Information" to record the formatted log information. Record all devices that are missing from the disk array. These are the array members that have both a present address of 0 and an expected address that is not 0.

**Note:** There might be more than one Product Activity Log entry with the same Log ID.

Access any additional entries by pressing the enter key from the "Display Detail Report for Resource" screen. View the "Additional Information" for each entry to record the formatted log information.

For example: There might be an xxxx902F SRC entry in the Product Activity Log if there are more than 10 disk units in the array.

b. Continue with the next step.

5. A formatted display of hexadecimal information for Product Activity Log entries is not available. In order to interpret the hexadecimal information, see More information from hexadecimal reports. Record all devices that are missing from the disk array. These are the array members that have both a present address of 0 and an expected address that is not 0.

**Note:** There might be an xxxx902F SRC entry in the Product Activity Log if there are more than 10 disk units in the array. In order to interpret the hexadecimal information for these additional disk units, see More information from hexadecimal reports.

6. There are three possible ways to correct the problem:

- a. Find the missing devices and install them in the correct physical locations in the system. If you can find the missing devices and want to continue with this repair option, then continue with the next step.

- b. Stop the disk array that contains the missing devices.

**Attention:** Customer data might be lost.

If you want to continue with this repair option, go to step 8.

- c. Initialize and format the remaining members of the disk array.

**Attention:** Customer data will be lost.

If you want to continue with this repair option, go to step 9 on page 230.

7. Perform the following:

- a. Install the missing devices in the correct locations in the system. See the Removing and replacing parts.

- b. Power on the system. See Powering on and powering off.

Does the IPL complete successfully?

**No:** Go to "Start of call procedure" on page 2. **This ends the procedure.**

**Yes: This ends the procedure.**

8. You have chosen to stop the disk array that contains the missing devices.

**Attention:** Customer data might be lost.

Perform the following:

- a. If you are not already using dedicated service tools, perform an IPL to DST. See Performing an IPL to DST.

If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

- b. Select **Work with disk units**.

Did you get to DST with a Type D IPL?

**Yes:** Continue with the next step.

**No:** Select **Work with disk configuration >Work with device parity protection**. Then, continue with the next step.

- c. Select **Stop device parity protection**.

- d. Follow the on-line instructions to stop device parity protection.

- e. Perform an IPL from disk.

Does the IPL complete successfully?

**No:** Go to "Start of call procedure" on page 2. **This ends the procedure.**

**Yes: This ends the procedure.**

9. You have chosen to initialize and format the remaining members of the disk array. Perform the following steps:

**Attention:** Customer data will be lost.

- a. If you are not already using dedicated service tools, perform an IPL to DST. See Performing an IPL to DST.

If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

- b. Select **Work with disk units**.

Did you get to DST with a Type D IPL?

**Yes:** Continue with the next step.

**No:** Select **Work with disk unit recovery > Disk unit problem recovery procedures**, and continue with the next step.

10. Select **Initialize and format disk unit**.

11. Follow the online instructions to format and initialize the disk units.

12. Perform an IPL from disk. Does the IPL complete successfully?

**No:** Go to the "Start of call procedure" on page 2. **This ends the procedure.**

**Yes: This ends the procedure.**

**IOPIP21:** Use this procedure to determine the failing disk unit when, a disk unit is not compatible with other disk units in the disk array, or when a disk unit has failed. The disk array is running, but it is not protected.

You were sent to this procedure from a unit reference code (URC) of 9025 or 9030.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Is the device location information for this SRC available in the Service Action Log (see "Using the Service Action Log" on page 24 for details)?

**Yes:** Exchange the disk unit. See Disk unit recovery procedures. **This ends the procedure.**

**No:** Continue with the next step.

3. Access SST/DST by doing one of the following:

- If you **can** enter a command at the console, access system service tools (SST). See System Service Tools (SST).
- If you **cannot** enter a command at the console, perform an IPL to DST. See Performing an IPL to DST.

4. Perform the following steps:

- a. Access the Product Activity Log and display the SRC that sent you here.
- b. Press the **F9** key for address information. This is the I/O card address.

**Note:** There may be more than one entry with the same Log ID. Entries with the same Log ID may be accessed by pressing the **Enter** key from the "Display Detail Report for Resource" screen.

Example: There may be a device specific SRC and/or an xxxx902F SRC entry in the Product Activity Log. The xxxx902F SRC will occur if there are more than 10 disk units in the array.

- c. Continue with the next step.

5. Perform the following steps:

- a. Return to the SST or DST main menu.
- b. Select **Work with disk units > Display disk configuration > Display disk configuration status**.

- c. On the Display disk configuration status display, look for the devices attached to the I/O card that is identified in step 4 on page 230.
- d. Find the device that has a status of "DPY/Unknown" or "DPY/Failed". This is the device that is causing the problem. Show the device address by selecting **Display Disk Unit Details > Display Detailed Address**. Record the device address.
- e. See Finding part locations and find the diagram of the system unit, or the expansion unit and find the following:
  - The card slot that is identified by the I/O card direct select address
  - The disk unit location that is identified by the device address

Have you determined the location of the I/O card and disk unit that is causing the problem?

**Yes:** Exchange the disk unit that is causing the problem. See Disk unit recovery procedures. **This ends the procedure.**

**No:** Ask your next level of support for assistance. **This ends the procedure.**

#### IOPIP22:

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions, before continuing with this procedure.
2. Access SST/DST by doing one of the following:
  - If you **can** enter a command at the console, access system service tools (SST). See System Service Tools (SST).
  - If you **cannot** enter a command at the console, perform an IPL to DST. See Performing an IPL to DST.
  - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

3. Did you perform a D IPL to get to DST?

**Yes:** Continue with the next step.

**No:** Perform the following steps:

- a. Access the Product Activity Log and display the SRC that sent you here and view the "Additional Information" to record the formatted log information. Record all the information.

**Note:** There may be more than one Product Activity Log entry with the same Log ID. Access any additional entries by pressing the **Enter** key from the "Display Detail Report for Resource" screen. View the "Additional Information" for each entry to record the formatted log information. Example: There may be an xxxx902F SRC entry in the Product Activity Log if there are more than 10 disk units in the array.

- b. Continue with the next step.

4. A formatted display of hexadecimal information for Product Activity Log entries is not available. In order to interpret the hexadecimal information, see More information from hexadecimal reports. Record all the information. Then continue with the next step.

**Note:** There may be an xxxx902F SRC entry in the Product Activity Log if there are more than 10 disk units in the array. In order to interpret the hexadecimal information for these additional disk units, see More information from hexadecimal reports.

5. Ask your next level of support for assistance.

**Note:** Your next level of support may require the error information you recorded in the previous step. **This ends the procedure.**

**IOPIP23:** You were sent to this procedure from a unit reference code (URC) 9050. If the failing item is in a migrated tower, use the *(Migrated Expansion Tower Problem Analysis, Repair and Parts)* manual on the



to fix the problem. Otherwise, contact your next level of support for assistance.

**IOPIP25:** Use this procedure to isolate the problem when a device attached to the I/O card has functions that are not given support on the I/O card.

You were sent to this procedure from URC 9008.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions, before continuing with this procedure.

2. Have any other I/O card or device SRCs occurred at about the same time as this error?

**Yes:** Use the other I/O card or device SRCs to correct the problem. See the (System Reference Codes). **This ends the procedure.**

**No:** Has the I/O card, or have the devices been repaired or reconfigured recently?

– **Yes:** Continue with the next step.

– **No:** Contact your next level of support for assistance. **This ends the procedure.**

3. Access SST/DST by doing one of the following:

- If you **can** enter a command at the console, access system service tools (SST). System Service Tools (SST).

- If you **cannot** enter a command at the console, perform an IPL to DST. See Performing an IPL to DST.

- If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

4. Did you perform a D IPL to get to DST?

- **No:** Access the Product Activity Log and display the SRC that sent you here. Press the **F9** key for address information. This is the I/O card address. Then, view the "Additional Information" to record the formatted log information. Record the addresses that are not 0000 0000 for all devices listed.

Continue with the next step.

- **Yes:** Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the I/O Card is in the format BBBB-Cc-bb:

- BBBB = hexadecimal offsets 4C and 4D

- Cc = hexadecimal offset 51

- bb = hexadecimal offset 4F

The unit address of the I/O card is hexadecimal offset 18C through 18F.

A formatted display of hexadecimal information for Product Activity Log entries is not available. In order to interpret the hexadecimal information, see More information from hexadecimal reports.

Record the addresses that are not 0000 0000 for all devices listed. Continue with the next step.

5. See Finding part locations and find the diagram of the system unit, or the expansion unit. Then find the following:

- The card slot that is identified by the I/O card direct select address (DSA) and unit address. If there is no IOA with a matching DSA and unit address, the IOP and IOA are one card. Use the IOP with the same DSA.

- The disk unit locations that are identified by the unit addresses.

Have you determined the location of the I/O card and the devices that are causing the problem?

**No:** Ask your next level of support for assistance. **This ends the procedure.**

**Yes:** Have one or more devices been moved to this I/O card from another I/O card?

**Yes:** Continue with the next step.

**No:** Ask your next level of support for assistance. **This ends the procedure.**

6. Is the I/O card capable of supporting the devices attached, or is it in the correct mode to support the devices attached?

**Note:** For information on I/O card modes, see Storage I/O card modes and jumpers.

**No:** Remove the devices from the I/O card. See Disk unit recovery procedures.

**Note:** You can remove disk units without installing another disk unit, and the system continues to operate.

**This ends the procedure.**

**Yes:** Do you want to continue using these devices with this I/O card?

**Yes:** Continue with the next step.

**No:** Either change the I/O card mode or remove the devices from the I/O card. See Disk unit recovery procedures.

**Note:** You can remove disk units without installing other disk units and the system continues to operate.

**This ends the procedure.**

7. Initialize and format the disk units by performing the following steps:

**Attention:** Data on the disk unit will be lost.

- a. Access SST or DST.

- b. Select **Work with disk units**.

Did you get to DST with a Type D IPL?

**Yes:** Continue with the next step.

**No:** Select **Work with disk unit recovery > Disk unit problem recovery procedures**. Then continue with the next step.

- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This may take 30 minutes or longer. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

**IOPIP26:** Use this procedure to correct the problem when the I/O card recognizes that the attached disk unit must be initialized and formatted.

You were sent to this procedure from URC 9092.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.

2. Have any other I/O card or device SRCs occurred at about the same time as this error?

**Yes:** Use the other I/O card or device SRCs to correct the problem. See the Reference codes topic.

**This ends the procedure.**

**No:** Has the I/O card, or have the devices been repaired or reconfigured recently?

**Yes:** Continue with the next step.

**No:** Contact your next level of support for assistance. **This ends the procedure.**

3. Access SST/DST by doing one of the following:

- If you **can** enter a command at the console, access system service tools (SST). See System Service Tools (SST).

- If you **cannot** enter a command at the console, perform an IPL to DST. See Performing an IPL to DST for details.

- If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

4. Did you perform a D IPL to get to DST?

**Yes:** Continue with the next step.

**No:** Perform the following steps:

- a. Access the Product Activity Log and display the SRC that sent you here.
- b. Press the **F9** key for address information. This is the I/O card address.
- c. Then view the "Additional Information" to record the formatted log information.
- d. Record the addresses that are not 0000 0000 for all devices listed.
- e. Continue with the next step.

5. Perform the following steps:

- a. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the I/O card is in the format BBBB-Cc-bb:
  - BBBB = hexadecimal offsets 4C and 4D
  - Cc = hexadecimal offset 51
  - bb = hexadecimal offset 4F

The unit address of the I/O card is hexadecimal offset 18C through 18F.

- b. A formatted display of hexadecimal information for Product Activity Log entries is not available. In order to interpret the hexadecimal information, see More information from hexadecimal reports. Record the addresses that are not 0000 0000 for all devices listed.

c. Continue with the next step.

6. See Finding part locations and find the diagram of the system unit, or the expansion unit. Then find the following:

- The card slot that is identified by the I/O card direct select address (DSA) and unit address. If there is no IOA with a matching DSA and unit address, the IOP and IOA are one card. Use the IOP with the same DSA.
- The disk unit locations that are identified by the unit addresses.

Have you determined the location of the I/O card and the devices that are causing the problem?

**No:** Ask your next level of support for assistance. **This ends the procedure.**

**Yes:** Have one or more devices been moved to this I/O card from another I/O card?

**Yes:** Continue with the next step.

**No:** Ask your next level of support for assistance. **This ends the procedure.**

7. Do you want to continue using these devices with this I/O card?

**Yes:** Continue with the next step.

**No:** Remove the devices from the I/O card. See Disk unit recovery procedures.

**Note:** You can remove disk units without installing another disk unit, and the system continues to operate.

**This ends the procedure.**

8. Initialize and format the disk units by performing the following steps:

**Attention:** Data on the disk unit will be lost.

- a. Access SST or DST.
- b. Select **Work with disk units**.

Did you get to DST with a Type D IPL?

**Yes:** Continue with the next step.

**No:** Select **Work with disk unit recovery > Disk unit problem recovery procedures**. Then continue with the next step.

- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This may take 30 minutes or longer. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**



**IOPIP27:** You were sent to this procedure with a unit reference code of 9051.

**Note:** For some storage I/O adapters, the cache card is integrated and not removable.

I/O card cache data exists for a missing or failed device. The possible causes are:

- One or more disk units have failed on the I/O card.
- The cache card of the I/O card was not cleared before it was shipped as a MES to the customer. In addition, the service representative moved devices from the I/O card to a different I/O card before performing a system IPL.
- The cache card of the I/O card was not cleared before it was shipped to the customer. In addition, residual data was left in the cache card for disk units that manufacturing used to test the I/O card.
- The I/O card and cache card were moved from a different system or a different location on this system after an abnormal power off.
- One or more disk units were moved either concurrently, or they were removed after an abnormal power off.

**CAUTION:**

**Any Function 08 power down (including from a D-IPL) is an abnormal power off.**

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Access SST/DST by doing one of the following:
  - If you **can** enter a command at the console, access system service tools (SST). See System Service Tools (SST).
  - If you **cannot** enter a command at the console, perform an IPL to DST. See Performing an IPL to DST.
  - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
3. Did you perform a D IPL to get to DST?
  - Yes:** Continue with the next step.
  - No:** Perform the following steps:
    - a. Access the Product Activity Log and display the SRC that sent you here.
    - b. Press the **F9** key for address information. This is the I/O card address.
    - c. Then view the "Additional Information" to record the formatted log information. Record the device types and serial numbers for those devices that show a unit address of 0000 0000.
    - d. Continue with the next step.
4. Perform the following steps:
  - a. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the I/O card is in the format BBBB-Cc-bb:
    - BBBB = hexadecimal offsets 4C and 4D.
    - Cc = hexadecimal offset 51
    - bb = hexadecimal offset 4FThe unit address of the I/O card is hexadecimal offset 18C through 18F.  
A formatted display of hexadecimal information for Product Activity Log entries is not available. In order to interpret the hexadecimal information, see More information from hexadecimal reports.
  - b. Record the device types and serial numbers for those devices that show a unit address of 0000 0000.
  - c. Continue with the next step.

5. See Finding part locations and find the diagram of the system unit, or the expansion unit. Find the card slot that is identified by the I/O card direct select address (DSA) and unit address. If there is no IOA with a matching DSA and unit address, the IOP and IOA are one card. Use the IOP with the same DSA.
6. Choose from the following options:
  - If the devices from step 3 on page 235 of this procedure have never been installed on this system, continue with the next step.
  - If the devices are not in the current system disk configuration, go to step 9.
  - Otherwise, the devices are part of the system disk configuration; go to step 11.
7. Choose from the following options:
  - If this I/O card and cache card were moved from a different system, continue with the next step.
  - Otherwise, the cache card was shipped to the customer without first being cleared. Perform the following:
    - a. Make a note of the serial number, the customer number, and the device types and their serial numbers. These were found in step 3 on page 235.
    - b. Inform your next level of support.
    - c. Then go to step 10 to clear the cache card and correct the URC 9051 problem.
8. Install both the I/O card and the cache cards back into their original locations. Then re-IPL the system. There could be data in the cache card for devices in the disk configuration of the original system. After an IPL to DST and a normal power off on the original system, the cache card will be cleared. It is then safe to move the I/O card and the cache card to another location.
9. One or more devices that are not currently part of the system disk configuration were installed on this I/O card. Either they were removed concurrently, they were removed after an abnormal power off, or they have failed. Continue with the next step.
10. Use the Reclaim IOP cache storage procedure to clear data from the cache for the missing or failed devices as follows:
  - a. Perform an IPL to DST. See Performing an IPL to DST.  
If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
  - b. Reclaim the cache adapter card storage. See Reclaiming IOP cache storage.
11. Choose from the following options:
  - If this I/O card and cache card were moved from a different location on this system, go to step 8.
  - If the devices from step 3 on page 235 of this procedure are now installed on another I/O card, and they were moved there before the devices were added to the system disk configuration, go to step 7. (On an MES, the disk units are sometimes moved from one I/O card to another I/O card. This problem will result if manufacturing did not clear the cache card before shipping the MES.)
  - Otherwise, continue with the next step.
12. One or more devices that are currently part of the system disk configuration are either missing or failed, and have data in the cache card. Consider the following:
  - The problem may be because devices were moved from the I/O card concurrently, or they were removed after an abnormal power off. If this is the case, locate the devices, power off the system and install the devices on the correct I/O card.
  - If no devices were moved, look for other errors logged against the device, or against the I/O card that occurred at approximately the same time as this error. Continue the service action by using these system reference codes.

**IOPIP28:** You were sent to this procedure with a unit reference code of 9052. If the failing item is in a migrated tower, use the (*Migrated Expansion Tower Problem Analysis, Repair and Parts*) manual on the V5R1 Supplemental Manuals web site



to fix the problem. Otherwise, contact your next level of support for assistance.

**IOPIP29:** You were sent to this procedure from URC 9012. The failing item is in a migrated tower. Perform SDIOP-PIP29 in the (*Migrated Expansion Tower Problem Analysis, Repair and Parts*) manual on the V5R1 Supplemental Manuals web site



**IOPIP30:** Use this procedure to correct the problem when the system cannot find the required cache data for the attached disk units.

You were sent to this procedure from URC 9050.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Did you just exchange the storage input/output (I/O) adapter as a result of a failure?

**No:** Go to “IOPIP23” on page 231. **This ends the procedure.**

**Yes:** The storage I/O adapter you have just exchanged contains data which is required by the devices that were attached to that adapter. If the storage I/O adapter that you just exchanged is failing intermittently, reinstalling it and performing a manual IPL to DST may allow the data to be successfully written to the devices. Perform the following steps:

**Attention:** If the system is **not** powered down normally with the original card in an **operational** state, customer data may be lost.

- a. Replace the new cache directory card with the original cache directory card from the failed storage I/O adapter. See Removing and replacing type 2748, 2757, 2763, 2778, 2782, 4758, 4764, 5703 cards.
  - b. A 9010 URC will occur. Ignore this and continue with the next step.
3. Reclaim the cache storage. See Reclaiming IOP cache storage for details.

**Note:** The system operator may want to restore data from the most recent saved tape after you complete the repair.

4. Have any new SRCs occurred in the Service Action Log, or is the resource not operational?

**Yes:** Go to “Start of call procedure” on page 2. **This ends the procedure.**

**No:** Before completing this service action, perform the following steps:

- a. Replace the cache directory card from the failed storage I/O adapter with the cache directory card that came with the replacement storage I/O adapter that you exchanged in step 2. See Removing and replacing type 2748, 2757, 2763, 2778, 2782, 4758, 4764, 5703 cards.
  - b. Continue with the next step.
5. Have any new SRCs occurred in the Service Action Log, or is the resource not operational?  
**Yes:** Go to “Start of call procedure” on page 2. **This ends the procedure.**  
**No:** **This ends the procedure.**

**IOPIP31:** Cache data associated with the attached devices cannot be found.

You were sent to this procedure from URC 9010.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
2. Did you just exchange the storage I/O adapter as a result of a failure?

**No:** Go to step 4 on page 238.

**Yes:** Reclaim the cache storage. See Reclaiming IOP cache storage. Then continue with the next step.

**Note:** The system operator may want to restore data from the most recent saved tape after you complete the repair.

3. Does the IPL complete successfully?

**No:** Go to “Start of call procedure” on page 2. **This ends the procedure.**

**Yes:** Before completing this service action, perform the following steps:

- a. Power off the system. See Powering on and powering off.
- b. Replace the cache directory card from the failed storage I/O adapter with the cache directory card that came with the replacement storage I/O adapter. See Removing and replacing type 2748, 2757, 2763, 2778, 2782, 4758, 4764, 5703 cards.
- c. Select the IPL type and mode that are used by the customer.
- d. Power on the system.

Does the IPL complete successfully?

**No:** Continue with the next step.

**Yes: This ends the procedure.**

4. Have the I/O cards been moved or reconfigured recently?

**No:** Go to step 6.

**Yes:** Perform the following:

- a. Power off the system. See Powering on and powering off.
- b. Restore all I/O cards to their original position.
- c. Select the IPL type and mode that are used by the customer.
- d. Power on the system.

5. Does the IPL complete successfully?

**No:** Continue with the next step.

**Yes: This ends the procedure.**

6. Has the system been powered off for several days?

**No:** Ask your next level of support for assistance. **This ends the procedure.**

**Yes:** The cache battery pack may be depleted. Do NOT replace the I/O adapter or the cache battery pack. Reclaim the cache storage. See Reclaiming IOP cache storage.

**Note:** The system operator may want to restore data from the most recent saved tape after you complete the repair.

7. Does the IPL complete successfully?

**No:** Ask your next level of support for assistance. **This ends the procedure.**

**Yes: This ends the procedure.**

**IOPIP32:** You were sent to this procedure from URC 9011.

**Attention:** There is data in the cache of this I/O card, that belongs to devices other than those that are attached. Customer data may be lost.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.

2. Did you just exchange the storage I/O adapter as a result of a failure?

**No:** Continue with the next step.

**Yes:** Reclaim the cache storage. See Reclaiming IOP cache storage.

Does the IPL complete successfully?

**No:** Go to “Start of call procedure” on page 2. **This ends the procedure.**

**Yes: This ends the procedure.**

3. Have the I/O cards been moved or reconfigured recently?

**No:** Ask your next level of support for assistance. **This ends the procedure.**

**Yes:** Perform the following steps:

- a. Power off the system. See Powering on and powering off for details.
- b. Restore all I/O cards to their original position.
- c. Select the IPL type and mode that are used by the customer.
- d. Power on the system.

Does the IPL complete successfully?

**No:** Ask your next level of support for assistance. **This ends the procedure.**

**Yes: This ends the procedure.**

**IOPIP33:** You were sent to this procedure from URC 9001.

The I/O processor card detected a device configuration error. The configuration sectors on the device may be incompatible with the current I/O processor card.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to ( Determine if the system has logical partitions) before continuing with this procedure.
2. Has the I/O adapter been replaced with a different type of I/O adapter, or have the devices been moved from a different type of I/O adapter to this one?
  - **No:** Contact your next level of support.  
**This ends the procedure.**
  - **Yes:** Continue with the next step.
3. Does the disk unit contain data that needs to be saved?
  - **Yes:** Continue with the next step.
  - **No:** Initialize and format the disk units.  
**Attention:** Any data on the disk unit will be lost. Perform the following:
    - a. Access SST or DST.
    - b. Select **Work with disk units**.
    - c. Did you get to DST with a type D IPL?
      - **No:** Select **Work with disk unit recovery** —> **Disk unit problem recovery procedures**. Then, continue with the next step.
      - **Yes:** Continue with the next step.
    - d. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display will show that the status is complete. This may take 30 minutes or longer.
    - e. The disk unit is now ready to be added to the system configuration.  
**This ends the procedure.**
4. The disk unit contains data that needs to be saved.
  - If the I/O adapter has been replaced with a different type of I/O adapter, reinstall the original I/O adapter. Then continue with the next step.
  - If the disk units have been moved from a different type of I/O adapter to this one, return the disk units to their original I/O adapter. Then continue with the next step.

5. Stop parity protection on the disk units, and power down the system normally with the I/O adapter in an operational state. The I/O adapter or disk units can now be returned to the configuration at the beginning of this procedure.

**This ends the procedure.**

**IOPIP34:** You were sent to this procedure from unit reference code (URC) 9027.

The I/O processor card detected that an array is not functional due to the present hardware configuration.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to (Determine if the system has logical partitions) before continuing with this procedure.
2. Has the I/O adapter been replaced with a different I/O adapter, or have the devices been moved from a different I/O adapter to this one?
  - **No:** Perform (IOPIP22).  
**This ends the procedure.**
  - **Yes:** Perform the following:
    - a. Power off the system. See (Power on/off the system and logical partitions).
    - b. Restore all I/O cards or devices to their original position.
    - c. Power on the system.
3. Does the IPL complete successfully?
  - **No:** Ask your next level of support for assistance.  
**This ends the procedure.**
  - **Yes:** **This ends the procedure.**

### **Tape unit isolation procedures**

This topic contains the procedures necessary to isolate a failure in a tape device. In these procedures, the term *tape unit* may be any one of the following:

- An internal tape drive, including its electronic parts and status indicators
- An internal tape drive, including its tray, power regulator, and AMDs
- An external tape drive, including its power supply, power switch, power regulator, and AMDs

You should interpret the term *tape unit* to mean the tape drive you are working on. However, these procedures use the terms *tape drive* and *enclosure* to indicate a more specific meaning.

Read and observe all safety procedures before servicing the system and while performing the procedures in this topic. Unless instructed otherwise, always power off the system or expansion unit where the FRU is located (see Powering on and powering off) before removing, exchanging, or installing a field-replaceable unit (FRU).

## DANGER

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn everything OFF (unless instructed otherwise).
2. Remove power cords from the outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

To Connect:

1. Turn everything OFF (unless instructed otherwise)
2. Attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

(D005)

"TUPIP02"

"TUPIP03" on page 243

"TUPIP04" on page 245

"TUPIP06" on page 249

"Tape unit self-test procedure" on page 250

"Tape device ready conditions" on page 251

**TUPIP02:** Use this procedure to perform the 8mm tape drive read self-test and hardware self-test. The write test is performed in "TUPIP03" on page 243.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem (see Determining if the system has logical partitions).
2. Press the **Unload** switch on the front of the 8mm tape drive. Is a data cartridge present?
  - No:** Continue with the next step.
  - Yes:** Attempt to remove the data cartridge. Can you remove the data cartridge?

**Yes:** Continue with the next step.

**No:** The tape drive is the failing part. Go to (Tape cartridge - Manual removal). After removing the data cartridge, exchange the tape drive (see Removing and replacing parts). **This ends the procedure.**

3. Clean the tape drive by using the cleaning cartridge (part 16G8467). If the tape drive ejects the cleaning cartridge with the Disturbance light on, a new cleaning cartridge is needed. The tape drive unloads automatically when cleaning is complete. Cleaning takes up to 5 minutes.

Is the Disturbance light on continuously?

**No:** Continue with the next step.

**Yes:** Repeat this step while using a new cleaning cartridge. If you are using a new cleaning cartridge and the Disturbance light does not go off, the possible failing part is the 8mm tape drive. Go to "TUPIP03" on page 243. **This ends the procedure.**

4. Is the Disturbance light blinking?

**No:** Continue with the next step.

**Yes:** Choose from the following:

- If the 8mm tape drive is a type 6390, the possible failing part is the 6390 tape drive.
- If the 8mm tape drive is a type 7208, the possible failing parts are:
  - a. 7208 tape drive
  - b. Power supply
  - c. AMD

Go to "TUPIP03" on page 243. **This ends the procedure.**

5. Perform the read self-test:

**Notes:**

- a. The 8mm tape drive read self-test and hardware self-test can take up to 5 minutes to run.
- b. The tape drive runs the read self-test first. During the read self-test, the Read-Write light blinks, and the Disturbance and Ready lights are off.

To start the read self-test and hardware self-test, insert the diagnostic cartridge (part 46G2660) into the tape drive. The following conditions indicate that the read self-test ended successfully:

- The Read-Write light stops blinking.
- The diagnostic cartridge ejects automatically.
- The three status lights go on to indicate the start of the hardware test.

Does the read self-test end successfully?

**No:** Does the tape drive eject the diagnostic cartridge?

- **Yes:** Continue with the next step.

- **No:** The tape drive is the failing part.

Go to (Tape cartridge - Manual removal). After removing the diagnostic cartridge, exchange the tape drive (see Removing and replacing parts). **This ends the procedure.**

**Yes:** Go to step 8 on page 243.

6. Is the Disturbance light blinking approximately four times per second?

**No:** Continue with the next step.

**Yes:** The possible failing part is the diagnostic cartridge (part 46G2660).

- If this is your first time through this step, get a new diagnostic cartridge. Go to step 3 of this procedure to clean the tape drive again. Afterwards, run the read self-test and hardware self-test while using the new diagnostic cartridge.
- If this is your second time through this step, the possible failing part is the 8mm tape drive. Go to "TUPIP03" on page 243. **This ends the procedure.**

7. The Disturbance light is blinking approximately once per second.



- If the 8mm tape drive is a type 6390, the possible failing part is the 6390 tape drive.
- If the 8mm tape drive is a type 7208, the possible failing parts are:
  - a. 7208 tape drive
  - b. Power supply
  - c. AMD

Go to "TUPIP03." **This ends the procedure.**

8. The tape drive runs the hardware self-test. During the hardware self-test, the three tape drive status lights are on for 15 to 30 seconds. The three status lights go off when the hardware self-test ends successfully.

Does the hardware self-test end successfully?

**Yes:** Continue with the next step.

**No:** When the hardware self-test does not end successfully, the following conditions occur:

- The three status lights do not go off.
- The Ready and Read-Write lights go off.
- The Disturbance light blinks approximately once per second.

Possible failing parts are:

- If the 8mm tape drive is a type 6390, the possible failing part is the 6390 tape drive.
- If the 8mm tape drive is a type 7208, the possible failing parts are:
  - a. 7208 tape drive
  - b. Power supply
  - c. AMD

Go to "TUPIP03." **This ends the procedure.**

9. The read self-test and hardware self-test ended successfully.

Was the user's original tape identified as the probable cause of failure?

**Yes:** Perform the following:

- a. Mark and date the data cartridge to indicate that it failed with a permanent error.
- b. Discard this data cartridge when:
  - Volume statistics (if available) indicate a problem with the data cartridge.
  - A total of three permanent errors have occurred with the same data cartridge.
- c. If possible, continue operations with a new data cartridge.

Go to "TUPIP03." **This ends the procedure.**

**No:** Go to "TUPIP03." **This ends the procedure.**

**TUPIP03:** You were directed here because you may need to exchange a failing part. The failing part was determined from one of the following:

- Other problem isolation procedures
- The *Failing item* column of the tape unit reference code table
- Tape unit service guide

**Note:** Occasionally, the system is available but not performing an alternate IPL (type D IPL). In this instance, any hardware failure of the tape unit I/O processor, or any device attached to it is not critical. With the exception of the loss of the affected devices, the system remains available.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem (see Determining if the system has logical partitions).
2. Do you need to exchange a possible failing device?

**No:** Do you need to exchange the tape unit I/O processor?

**No:** Continue with the next step.

**Yes:** Exchange the tape unit I/O processor (see Removing and replacing parts). When you have completed the remove and replace procedure, continue with the next step.

**Yes:** Perform the following:

- For an internal tape unit, go to Removing and replacing parts.
- For an external tape unit, go to the remove and replace procedures in the device service information.

3. Are you working with a tape unit in the system unit or in an expansion unit?

**Yes:** Is the system available, and can you enter commands on the command line?

**No:** Continue with the next step.

**Yes:** Go to step 9.

**No:** Continue with the next step.

4. Display the selected IPL type (see IPL type, mode, and speed options in the Service functions).

Is the displayed IPL type D?

**No:** Do you want to perform an alternate IPL (type D)?

**No:** Continue with the next step.

**Yes:** Go to step 6.

**Yes:** Go to step 6.

5. Perform an IPL from disk by doing the following:

- a. Power off the system (see Powering on and powering off).
- b. Select IPL type A in manual mode.
- c. Power on the system.
- d. Go to step 8.

6. Place the first tape of the latest set of SAVSYS tapes or SAVSTG tapes, or the first IBM Software Distribution tape in the alternate IPL tape drive. The tape drive automatically becomes ready for the IPL operation (this may take several minutes).

7. Perform an alternate IPL by doing the following:

- a. Power off the system.
- b. Select IPL type D in Manual mode.
- c. Power on the system.

8. The IPL may take one or more hours to complete.

Does an unexpected reference code appear on the control panel, and is the System Attention light on?

**No:** Does the IPL complete successfully?

**Yes:** Continue with the next step.

**No:** Go to “Start of call procedure” on page 2 to continue analyzing the problem. **This ends the procedure.**

**Yes:** Go to step 10.

9. Perform the following to test the tape unit:

- a. Enter VFYTAP (the Verify Tape command) on the command line.
- b. Follow the prompts on the Verify Tape displays, then return here and answer the following question.

Does the VFYTAP command end successfully?

**No:** Continue with the next step.

**Yes: This ends the procedure.**

10. Record the SRC on the Problem summary form (see Problem reporting forms).

Is the SRC the same one that sent you to this procedure?

**Yes:** You cannot continue to analyze the problem. Use the original SRC and exchange the FRUs. Begin with the FRU which has the highest percent of probable failure (see the failing item list for this reference code).

**This ends the procedure.**

**No:** A different SRC occurred. Use the new SRC to correct the problem (see Reference codes).

**This ends the procedure.**

**TUPIP04:** Use this procedure to reset an IOP and its attached tape units. Read the (overview) before continuing with this procedure.

If disk units are attached to an IOP, you must power off the system, then power it on to reset the IOP.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem (see Determining if the system has logical partitions).

2. Is the tape unit powered on?

**No:** Continue with the next step.

**Yes:** Perform the following:

- a. Press the Unload switch on the front of the tape unit you are working on.
- b. If a data cartridge or a tape reel is present, do not load it until you need it.
- c. Continue with the next step of this procedure.

3. Verify the following:

- If the external device has a power switch, ensure that it is set to the **On** position.
- Ensure that the power and external signal cables are connected correctly.

**Note:** For every 8mm and 1/4 inch tape unit, the I/O bus terminating plug for the SCSI external signal cable is connected internally. These devices do not need and should not have an external terminating plug.

4. Did you press the Unload switch in step 2?

**Yes:** Can you enter commands on the command line?

**Yes:** Continue with the next step.

**No:** Go to step 11 on page 247.

**No:** Press the **Unload** switch on the front of the tape unit you are working on. If a data cartridge or a tape reel is present, do not load it until you need it. Continue with the next step of this procedure.

5. Has the tape unit operated correctly since it was installed? If you do not know, continue with the next step of this procedure.

**Yes:** Continue with the next step.

**No:** Go to step 11 on page 247.

6. If a system message displayed an I/O processor name, a tape unit resource name, or a device name, record the name for use in the next step. You may continue without a name.

Does the I/O processor give support to only one tape unit? If you do not know, continue with the next step of this procedure.

**No:** Continue with the next step.

**Yes:** Perform the following. You must complete all parts of this step before you press **Enter**.

a. Enter

```
WRKCFGSTS *DEV *TAP ASTLVL(*INTERMED)
```

(the Work with Configuration Status command) on the command line.

b. If the device is not varied off, select **Vary off** before continuing.

c. Select **Vary on** for the failing tape unit.

- d. Enter  
RESET(\*YES)

(the Reset command) on the command line.

- e. Press **Enter**.  
**This ends the procedure.**

- 7. This step determines if the I/O processor for the tape unit gives support to other tape units or to a disk unit.

**Notes:**

- a. If you cannot determine the tape unit you are attempting to use, go to step **11** (See 11 on page 247).
- b. System messages refer to other tape units that the I/O processor gives support to as *associated devices*.

Enter WRKHDWRSC \*STG (the Work with Hardware Resources command) on the command line.

Did you record an I/O processor (IOP) resource name in step 6 on page 245?

**No:** Perform the following:

- a. Select **Work with resources** for each storage resource IOP (CMB01, SIO1, and SIO2 are examples of storage resource IOPs).
- b. Find the Configuration Description name of the tape unit you are attempting to use, and then record the Configuration Description names of all tape units that the I/O processor gives support to.
- c. Record whether the I/O processor for the tape unit also gives support to any disk unit resources.
- d. Continue with the next step.

**Yes:** Perform the following:

- a. Select **Work with resources** for that resource.
- b. Record the Configuration description name of all tape units for which the I/O processor provides support.
- c. Record whether the I/O processor for the tape unit also gives support to any disk unit resources.
- d. Continue with the next step.

- 8. Does the I/O processor give support to any disk unit resources?

**No:** Continue with the next step.

**Yes:** The **Reset** option is not available. Go to step 11 on page 247.

- 9. Does the I/O processor give support to only one tape unit?

**No:** Continue with the next step.

**Yes:** Perform the following:

- a. Select **Work with configuration description** and press **Enter**.
- b. Select **Work with status** and press **Enter**.

**Note:** You must complete the remaining parts of this step before you press **Enter** again.

- c. If the device is not varied off, select **Vary off** before continuing.
- d. Select **Vary on** for the failing tape unit.
- e. Enter RESET(\*YES) (the Reset command) on the command line.
- f. Press **Enter**. **This ends the procedure.**

- 10. Perform the following:

- a. Enter  
WRKCFGSTS \*DEV \*TAP ASTLVL(\*INTERMED)

(the Work with Configuration Status command) on the command line.

- b. Select **Vary off** for the failing tape unit and associated devices (the devices you identified in step 7 on page 246), and then press **Enter**.

**Note:** You must complete the remaining parts of this step before you press **Enter** again.

- c. Select **Vary on** for the failing tape unit.
- d. Enter

RESET(\*YES)

(the Reset command) on the command line.

- e. Press **Enter**.
- f. Select **Vary on** for the associated devices (tape units) you identified in step 7 on page 246. It is not necessary to use the **Reset** option again.

Does a system message indicate that the vary on operation failed?

**Yes:** Continue with the next step.

**No: This ends the procedure.**

11. The **Reset** is not available, or you were not able to find the Configuration Description name when using

WRKHDWRSC \*STG

(the Work with Hardware Resources command).

You can perform an I/O processor (IOP) reset by performing an IPL of the I/O processor. All devices that are attached to the IOP will reset.

The following steps describe how to load an IOP, how to configure a tape drive, how to vary on tape devices, and how to make tape devices available.

12. Is the tape device you are working on an 8mm tape drive?

**No:** Continue with the next step.

**Yes:** Verify the following on the 8mm tape drive:

- The power and external signal cables are connected correctly.
- The Power switch is set to the On position (pushed in).

**Note:** The SCSI I/O bus terminating plug for the system-external signal cables is connected internally in the 8mm tape drive. The 8mm tape drive does not need, and must not have an external terminating plug.

Is the 8mm tape drive Power light on, and is the Disturbance light off?

**Yes:** Continue with the next step.

**No:** Go to “TUPIP02” on page 241 to correct the problem.

**This ends the procedure.**

13. Is a data cartridge or a tape reel installed in the tape device?

**No:** Continue with the next step.

**Yes:** Remove the data cartridge or tape reel. Continue with the next step.

14. Can you enter commands on the command line?

**Yes:** Continue with the next step.

**No:** Perform the following:

- a. Power off the system (see Powering on and powering off).
- b. Power on the system.

The system performs an IPL and resets all devices. If the tape device responds to SCSI address 7, the system configures the tape device.

**This ends the procedure.**

15. Verify that automatic configuration is on by entering  
DPSYSVAL QAUTOCFG

(the Display System Value command) on the command line.

Is the **Autoconfigure device** option set to 1?

**Yes:** Continue with the next step.

**No:** Perform the following:

- a. Press **Enter** to return to the command line.
- b. Set automatic configuration to On by entering  
CHGSYSVAL QAUTOCFG '1'  
(the Change System Value command) on the command line.

**Note:** QAUTOCFG resets to its initial value in step 21 on page 249.

- c. Continue with the next step.

16. Perform the following:

- a. Enter  
STRSST

(the Start SST command) on the command line.

- b. On the Start Service Tools Sign On display, type in a User ID with QSRV authority and Password.
- c. Select **Start a Service Tool**—>**Hardware Service Manager**—>**Logical Hardware Resources**—>**System Bus Resources**. The Logical Hardware Resources on System Bus display shows all of the IOPs.
- d. Find the IOP you want to reset. You **must** ensure that no one is using any of the tape units, communication channels, or display stations that are attached to the IOP you want to reset.

Does a "\*" indicator appear to the right of the IOP description?

**No:** Continue with the next step.

**Yes:** Disk units are attached to the IOP.

Perform the following:

- a. Press **F3** until the Exit System Service Tools display appears.
- b. Press **Enter**.
- c. Power off the system (see Powering on and powering off).
- d. Power on the system.

The system performs an IPL and resets all devices.

**This ends the procedure.**

17. Perform the following:

- a. Select **I/O debug > IPL the I/O processor**.
- b. When the IOP reset is complete, continue with the next step of this procedure.

18. Perform the following:

- a. Press **F12** to return to the Logical Hardware Resources on System Bus display.
- b. Select **Resources associated with IOP** for the IOP you reset.

Did the IOP detect the tape unit?

**Yes:** Continue with the next step.

**No:** The IOP did not detect the tape unit. Consider the following:

- Ensure that the tape unit is powered on and that the signal cables are connected correctly. If you find and correct a power or a signal cable problem, return to step 16.

- The tape unit may be failing. Go to the tape unit service information and perform the procedures for analyzing device problems. If you find and correct a tape unit problem, return to step 16 on page 248.
- If none of the above are true, ask your next level of support for assistance.

**This ends the procedure.**

19. Press **F3** until the Exit System Service Tools display appears. Then press **Enter**.

20. Was automatic configuration Off before you performed step 15 on page 248?

**Yes:** Continue with the next step.

**No:** **This ends the procedure.**

21. Enter

```
CHGSYSVAL QAUTOCFG '0'
```

(the Change System Value command) on the command line to reset QAUTOCFG to its initial value.

**This ends the procedure.**

**TUPIP06:** Use this procedure to isolate a Device Not Found message during installation from an alternate device. There are several possible causes:

- The alternate installation device was not correctly defined.
- The alternate installation device was not made ready.
- The alternate installation device does not contain installation media.
- The alternate installation device is not powered on.
- The alternate installation device is not connected properly.
- There is a hardware error on the alternate installation device or the attached I/O processor.

Read the danger notices in “Tape unit isolation procedures” on page 240 before continuing with this procedure.

1. Is the device that you are using for alternate installation defined as the alternate installation device?

**Yes:** Is the alternate installation device ready?

**Yes:** Continue with the next step.

**No:** Make the alternate installation device ready and retry the alternate installation. **This ends the procedure.**

**No:** Correct the alternate installation device information and retry the alternate installation. **This ends the procedure.**

2. Is there installation media in the alternate installation device?

**Yes:** Is the alternate installation device an external device?

**Yes:** Continue with the next step.

**No:** Go to step 5 on page 250.

**No:** Load the correct media and retry the alternate installation. **This ends the procedure.**

3. Is the alternate installation device powered on?

**Yes:** Make sure that the alternate installation device is properly connected to the I/O processor or I/O adapter card.

Is the alternate installation device properly connected?

**Yes:** Go to step 5 on page 250.

**No:** Correct the problem and retry the alternate installation. **This ends the procedure.**

**No:** Continue with the next step.

4. Ensure that the power cable is connected tightly to the power cable connector at the back of the alternate device. Ensure that the power cable is connected to a power outlet that has the correct voltage. Set the alternate device Power switch to the Power On position.

The Power light should go on and remain on. If a power problem is present, one of the following power failure conditions may occur:

- The Power light flashes, then remains off.
- The Power light does not go on.
- Another indication of a power problem occurs.

Does one of the above power failure conditions occur?

**No:** The alternate device is powered on and runs its power-on self-test. Wait for the power-on self-test to complete.

Does the power-on self-test complete successfully?

**No:** Go to the service information for the specific alternate installation device to correct the problem. Then retry the alternate installation. **This ends the procedure.**

**Yes:** Retry the alternate installation. **This ends the procedure.**

**Yes:** Perform the following:

- a. Go to the service information for the specific alternate device to correct the power problem.
- b. When you have corrected the power problem, retry the alternate installation. **This ends the procedure.**

5. Was a device error recorded in the Product Activity Log?

**No:** Contact your next level of support. **This ends the procedure.**

**Yes:** See Reference codes to correct the problem. **This ends the procedure.**

**Tape unit self-test procedure:** The following procedure is designed to allow you to quickly perform a complete set of diagnostic tests on a 6384 or 6387 tape unit, without impacting iSeries system operation. This test can also be used to verify good performance of individual tape cartridges.

Enter diagnostic mode:

1. Verify that a cartridge is not loaded in the tape unit. To unload a cartridge, press the **eject** button on the front of the tape unit. If the cartridge does not eject, refer to (Tape unit - manual removal).
2. Press and hold the **eject** button for about 6 seconds until the amber LED starts flashing slowly, then release the button. The amber (left) LED will flash, indicating that the tape unit is waiting for a cartridge to be inserted.

Running the self-test:

1. Self-testing begins when a scratch data cartridge is inserted into the tape unit. The Ready (left) LED will flash, indicating that self-testing is in progress.

**Note:** A cartridge must be loaded within 15 seconds, otherwise, the tape unit will automatically revert back to normal operation. If necessary, return to step 1 to reenter diagnostic mode.

2. For fastest results, we recommend using an IBM SLR100 Test Tape (P/N 35L0967) which was originally provided with your iSeries<sup>(TM)</sup> server.

**Attention:** Use a blank cartridge that does not contain customer data. During this self-test, the cartridge will be rewritten with a test pattern and any customer data will be destroyed.

**Note:** Use a cartridge that is not write-protected. If a write-protected cartridge is inserted while the tape unit is in diagnostic mode, the cartridge will be ejected, see 251 below.

Self-testing will only be performed using a write-compatible cartridge type, and with a cartridge that is not damaged, see 251 below.

If a cleaning cartridge is inserted while the tape unit is in diagnostic mode, drive cleaning will occur and the tape unit will then return to normal operating mode. Return to step 1 to reenter diagnostic mode.

3. **At any time, self-testing can be stopped by pressing the eject button.** After the current operation is completed, the cartridge will be ejected and tape unit will return to normal operating mode.



4. The Ready (left) LED will continue to flash during the following:
  - The **cartridge load sequence** has an approximate duration of 30 seconds. The center LED indicates tape movement.
  - The **hardware test** has an approximate duration of 2 and 1/2 minutes. During that time, a static test is performed on tape unit electrical components. No tape motion occurs during this step.
  - The **cartridge load/unload test** has an approximate duration of 1 and 1/2 minutes. During that time, the Ready LED will continue to flash while a dynamic test is performed on tape unit mechanical components. Two cartridge load cycles are included.
  - Duration of the **write/read test** will vary, depending on what type of cartridge is loaded into the tape unit. When an SLR100 Test Tape is used, typical duration will be 5 minutes. Use of other cartridge types can increase the write/read test duration to 30-40 minutes. During this test, the Ready LED will continue to flash. The center LED indicates tape movement.

#### **Interpreting the results:**

**Test Passed:** When self-testing has completed successfully, and no problems are detected, the cartridge is unloaded from the tape unit and all LEDs are off. Proper function of both the tape unit and tape cartridge have now been verified.

**Note:** A solid amber light indicates that self-testing has completed successfully, but the tape unit requires cleaning. Clean the tape unit by inserting an IBM Dry Process Cleaning Cartridge (P/N 35L0844).

**Test Failed:** The cartridge will remain loaded inside the tape unit, and the amber LED will flash when a problem is detected with either the tape unit or cartridge.

**Note:** To isolate failure to either tape unit or cartridge, return to step 1 on page 250 and repeat this self-test using a different scratch cartridge.

**Incorrect cartridge:** When the center (green) and right (amber) LEDs flash and a cartridge is unloaded, the tape unit has determined that an incorrect tape cartridge has been inserted, and self-testing cannot be performed. Verify that your tape cartridge is **not** one of the following:

- Write-protected
- Damaged
- Unsupported media type
- Media which is not write-compatible with tape unit.

Press the **eject** button, to end self-test and return the tape unit to normal operating mode. Then return to step 1 on page 250 and run the self-test using another cartridge, or one which is not write-protected. **This ends the procedure.**

**Tape device ready conditions:** All the conditions that are listed for the device, must be correct for the device to be ready. If the device is not ready, use the Action column or other instructions, and go to the service information for the specific tape device.

If the system has logical partitions, perform this procedure from the logical partition that reported the problem (see Determining if the system has logical partitions).

Table 29. Tape device ready conditions

Storage device	Ready description	Action
3480 or 3490	<ul style="list-style-type: none"> <li>• Power switch is set to the On position.</li> <li>• Power light is on.</li> <li>• DC Power light is on.</li> <li>• Control unit On-line switch is set to the On-line position.</li> <li>• Control unit Normal/Test switch is set to the Normal position.</li> <li>• Control unit channel Enable/Disable switch is set to the Enable position.</li> <li>• Tape unit On-line/Off-line switch is set to the On-line position.</li> <li>• Tape is loaded.</li> <li>• Tape unit displays Ready U or Ready F.</li> </ul>	See the <i>3480 Magnetic Tape Subsystem Operator's Guide</i> , SA32-0066, or <i>3490 Magnetic Tape Subsystem Operator's Guide</i> , SA32-0124, for instructions on making the tape unit ready.
7208	<ul style="list-style-type: none"> <li>• Power switch is on (pressed).</li> <li>• Power light is on.</li> <li>• Data cartridge is inserted.</li> <li>• Ready light is on.</li> <li>• System external signal cable is connected to the type 2621 I/O processor and to the 7208 tape drive.</li> </ul> <p><b>Note:</b> The SCSI I/O bus terminating plug for the system external signal cable is connected internally in the 7208 tape drive. The 7208 tape drive does not need, and must not have, an external terminating plug.</p>	See the <i>7208 8 mm Tape Drive Operator's Manual</i> for instructions on making the tape drive ready. If you cannot make the 7208 Model 012 tape drive ready, go to "TUPIP02" on page 241.
9348	<ul style="list-style-type: none"> <li>• Power switch is set to the On position.</li> <li>• Power light is on.</li> <li>• Tape is loaded.</li> <li>• Status display shows 00 A002.</li> <li>• On-line light is on.</li> </ul>	See the <i>9348 Customer Information manual</i> , SA21-9567, for instructions on making the tape unit ready. If you cannot make the tape unit ready, go to the "Analyzing Problems" section of <i>9348 Tape Unit Service Information</i> , SY31-0697.

### Twinaxial workstation I/O processor isolation procedure

Use the procedure below to isolate a failure which has been detected by the twinaxial workstation I/O processor. If you are using a personal computer, an emulation program must be installed and working.

Please read and observe all safety procedures before servicing the system and while performing the procedure below.

**Attention:** Unless instructed otherwise, always power off the system or expansion tower where the FRU is located (see Powering on and powering off) before removing, exchanging, or installing a field-replaceable unit (FRU).

## DANGER

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn everything OFF (unless instructed otherwise).
2. Remove power cords from the outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

To Connect:

1. Turn everything OFF (unless instructed otherwise)
2. Attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

(D005)

**Attention:** When instructed, remove and connect cables carefully. You may damage the connectors if you use too much force.

### “TWSIP01”

**TWSIP01:** The workstation IOP detected an error. Please read the danger notices in “Twinaxial workstation I/O processor isolation procedure” on page 252 before performing this procedure.

One of the following occurred:

- All of the workstations on one port are not working.
  - All of the workstations on the system are not working.
  - One of the workstations on the system is not working.
  - The reference code table instructed you to perform this procedure.
  - The Remote Operations Console is not working.
1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions before continuing with this procedure.
  2. Are you using a workstation adapter console?

**Note:** A personal computer (used as a console) that is attached to the system by using a console cable feature is known as a workstation adapter console. The cable (part number 46G0450, 46G0479, or 44H7504) connects the serial port on the personal computer to a communications I/O adapter on the system.

**No:** Continue with the next step.

**Yes:** Go to “WSAIP01” on page 259. **This ends the procedure.**

3. Is the device you are attempting to repair a personal computer (PC)?

**No:** Continue with the next step.

**Yes:** PC emulation programs operate and report system-to-PC communications problems differently. See the PC emulation information for details on error identification. Then, continue with the next step.

4. Perform the following steps:

- a. Verify that all the devices you are attempting to repair, the primary console, and any alternative consoles are powered on.
- b. Verify that all the devices you are attempting to repair, the primary console, and any alternative consoles have an available status. For more information on displaying the device status, see Hardware Service Manager.
- c. Verify that the workstation addresses of all workstations on the failing port are correct. Each workstation on the port must have a separate address, from 0 through 6. See the workstation service information for details on how to check addresses.
- d. Verify that the last workstation on the failing port is terminated. All other workstations on that port must not be terminated.
- e. Ensure that the cables that are attached to the device or devices are tight and are not visibly damaged.
- f. If there were any cable changes, check them carefully.
- g. If all of the workstations on the system are not working, disconnect them by terminating at the console.
- h. Verify the device operation (see the device information for instructions).
- i. The cursor position can assist in problem analysis.
  - If the cursor is in the upper right corner, it indicates a communication problem between the workstation IOP and the device. Continue with the next step.
  - If the cursor is in the upper left corner, it indicates a communication problem between the workstation IOP and the operating system. Perform the following steps:
    - 1) Verify that all current PTFs are loaded.
    - 2) Ask your next level of support for assistance. **This ends the procedure.**

5. Is the system powered off?

**Yes:** Continue with the next step.

**No:** Go to step 8 on page 255.

6. Perform the following:

- a. Power on the system in **Manual** mode. See IPL type, mode, and speed options for details.
- b. Wait for a display to appear on the console or a reference code to appear on the control panel.

Does a display appear on the console?

- **No:** Continue with the next step.
- **Yes:** If you disconnected any devices after the console in step 4, perform the following:
  - a. Power off the system.
  - b. Reconnect one device.

- Note:** Ensure that you terminate the device you just reconnected and remove the termination from the device previously terminated.
- c. Power on the system.
  - d. If a reference code appears on the control panel, go to step 9.
  - e. If no reference code appears, repeat steps a through d of this step until you have checked all devices disconnected previously.
  - f. Continue to perform the initial program load (IPL). **This ends the procedure.**
7. Does the same reference code that sent you to this procedure appear on the control panel?
- Yes:** Continue with the next step.
- No:** Go to “Start of call procedure” on page 2 for this new problem. **This ends the procedure.**
8. Perform the following to make DST available:
- a. Ensure that **Manual** mode on the control panel is selected.
  - b. Select function 21 **Make DST Available**.
  - c. Check the console and any alternative consoles for a display.
- Does a display appear on any of the console displays?
- No:** Continue with the next step.
- Yes:** If you disconnected any devices after the console in step 4 on page 254, perform the following:
- a. Power off the system.
  - b. Reconnect one device.
- Note:** Ensure that you terminate the device you just reconnected and remove the termination from the previously terminated device.
- c. Power on the system.
  - d. If a reference code appears on the control panel or on the HMC, go to step 9.
  - e. If no reference code, repeat steps a through d of this step until you have checked all devices disconnected previously.
  - f. Continue to perform the initial program load (IPL). **This ends the procedure.**
9. Ensure that the following conditions are met:
- The workstation addresses of all workstations on the failing port must be correct.
- Each workstation on the port must have a separate address, from 0 through 6. See the workstation service information if you need help with checking addresses.
- Did you find a problem with any of the above conditions?
- Yes:** Continue with the next step.
- No:** Go to step 11.
10. Perform the following:
- a. Correct the problem.
  - b. Select function 21 **Make DST Available**.
  - c. Check the console and any alternative consoles for a display.
- Does a display appear on any of the consoles?
- Yes:** Continue to perform the IPL. **This ends the procedure.**
- No:** Does the same reference code appear on the control panel?
- Yes:** Continue with the next step.
- No:** Go to “Start of call procedure” on page 2 for this new problem. **This ends the procedure.**
11. Is the reference code one of the following: 0001, 0003, 0004, 0005, 0006, 0101, 0103, 0104, 0105, 0106, 5004, 5082, B000, D010, or D023?
- No:** Continue with the next step.

**Yes:** Go to step 15.

12. Does the system have an alternative console on a second workstation IOP?

**Yes:** Continue with the next step.

**No:** Go to step 14.

13. There is either a Licensed Internal Code problem, or there are two device failures on the workstation IOPs, consoles, or cables. The console and any alternative consoles are the most probable causes for this failure.

- See the service information for the failing display to attempt to correct the problem. If a display is connected to the system by a link protocol converter, use the link protocol converter information to attempt to correct the problem. The link protocol converter may be the failing item.
- If you have another working display, you can exchange the console and alternative consoles and perform an IPL to attempt to correct the problem.
- Exchange the following parts one at a time until you determine the failing item:
  - a. Console
  - b. Alternative console
  - c. Cables
  - d. Workstation IOA for the console
  - e. The multi-adapter bridge. See symbolic FRU "MA\_BRDG" on page 508. **This ends the procedure.**

14. The console, cables, or the workstation IOP card is the most probable causes for this failure. If the console is connected to the system by a link protocol converter, the link protocol converter is possibly the failing item. Use one or more of the following options to correct the problem:

- a. See the service information for the failing displays for more information. If a display is connected to the system by a link protocol converter, see the link protocol converter information to attempt to correct the problem.
- b. If you have another working display, you can exchange the console and perform an IPL to attempt to correct the problem.
- c. Exchange the following parts one at a time until you determine the failing item:
  - 1) Console
  - 2) Workstation IOA
  - 3) The multi-adapter bridge. See symbolic FRU "MA\_BRDG" on page 508.
  - 4) Twinaxial attachment (cable) **This ends the procedure.**

15. To continue problem analysis, use a port tester, part 93X2040 or 59X4262, which you may have with your tools or the customer may have one. The port tester has either two or three lights.

Is a port tester available?

**Yes:** Continue with the next step.

**No:** Check or exchange the cables from the system to the failing display. Did this correct the problem?

**Yes:** You corrected the problem. **This ends the procedure.**

**No:** Go to step 12.

16. To use the port tester to isolate the problem, perform the following:

- Verify that the port tester is operating correctly by doing a self-test. A self-test can be made at any time, even when the port tester is attached to a port or cable. Perform the following steps to do a self-test:
  - a. Move the selector switch to the center (0) position.
  - b. Push and hold the test button until all lights go on. The yellow lights should go on immediately, and the green light should go on approximately 5 seconds later. The port tester is ready for use if all lights go on.

- Leave the system power on.
17. Find the input cable to the failing console or port.  
Is the failing console or the failing port attached to a protocol converter?
    - **No:** Perform the following:
      - a. Disconnect the input cable from the failing console.
      - b. Connect the port tester to the input cable.
      - c. Continue with the next step.
    - **Yes:** Perform the following:
      - a. Disconnect the cable that comes from the system at the protocol converter.
      - b. Connect the port tester to the cable.
      - c. Continue with the next step.
  18. Perform the following:
    - a. Set the selector switch on the port tester to the left (1) position for a twinaxial connection. Set the switch to the right (2) position for a twisted pair connection.
    - b. Press and hold the test switch on the port tester for 15 seconds and observe the lights.
    - c. Choose from the following options:
      - If the port tester has **three** lights, do the following:
        - If only the top (green) light is on, go to step 27 on page 258.
        - If both the top (green) and center (yellow) lights are on, go to step 20.

**Note:** The center (yellow) light is always on for twisted pair cable and may be on for fiber optical cable.

        - If only the bottom (yellow) light is on, go to step 21.
        - If all lights are off, go to step 22.
        - If all lights are on, go to step 19.
      - If the port tester has **two** lights, do the following:
        - If only the top (green) light is on, go to step 27 on page 258.
        - If only the bottom (yellow) light is on, go to step 21.
        - If both lights are off, go to step 22.
        - If both lights are on, continue with the next step.
  19. The tester is in the self-test mode. Check the position of the selector switch.
    - If the selector switch is not in the correct position, go to step 18.
    - If the selector switch is already in the correct position, the port tester is not working correctly. Exchange the port tester, and go to step 16 on page 256.
  20. The cable you are testing has an open shield.  
  

**Note:** The open shield can be checked only on the cable from the twinaxial workstation attachment to the device or from device to device. Only one section of cable can be checked at a time. See the SA41-3136, Port Tester Use information.

**This ends the procedure.**
  21. The cable network is bad. The wires in the cable between the console and the twinaxial workstation attachment are reversed. Go to step 26 on page 258.
  22. Perform the following:
    - a. Find the twinaxial workstation attachment to which the failing console is attached.
    - b. Disconnect the cable from port 0 on that twinaxial workstation attachment.
    - c. Connect the port tester to port 0 on the attachment.
    - d. Set the selector switch on the port tester to the left (1) position.

23. Perform the following:
  - a. Press and hold the test switch on the port tester for 15 seconds and observe the lights.
  - b. If the port tester has **three** lights, do the following:
    - If both the top (green) and center (yellow) lights are on, continue with step 24.

**Note:** The center (yellow) light is always on for twisted pair cable and may be on for fiber optical cable.

    - If only the bottom (yellow) light is on, continue with step 24.
    - If all lights are off, continue with step 24.
    - If only the top (green) light is on, go to step 26.
    - If all lights are on, go to step 25.
  - c. If the port tester has **two** lights, do the following:
    - If only the top (green) light is on, go to step 26.
    - If only the bottom (yellow) light is on, continue with step 24.
    - If both lights are off, continue with step 24.
    - If both lights are on, go to step 25.
24. The test indicated that there was no signal from the system. Reconnect the cable you disconnected and perform the following:
  - a. Exchange the following parts:
    - 1) Twinaxial workstation IOA card
    - 2) The multi-adapter bridge. See symbolic FRU "MA\_BRDG" on page 508.
  - b. Power on the system to perform an IPL. **This ends the procedure.**
25. The tester is in the self-test mode. Check the position of the selector switch:
  - If the selector switch is not in the left (1) position, set the switch to the left (1) position. Then go to step 23.
  - If the selector switch is already in the left (1) position, the port tester is not working correctly. Exchange the port tester and go to step 22 on page 257.
26. The cable to the workstation is the failing item. Cable maintenance is a customer responsibility. The cable must be repaired or exchanged. For information on correcting cable problems, refer to the Twinaxial cables information in the Planning topic. For other cabling instructions, see the Plan for cables topic. Then, power on the system to perform an IPL. **This ends the procedure.**
27. The port tester detects most problems, but it does not always detect an intermittent problem or some cable impedance problems. The tester may indicate a good condition, although there is a problem with the workstation IOP card or cables.
  - a. If the failing display is connected to a link protocol converter, the link protocol converter is the failing item. See the link protocol converter service information to correct the problem.
  - b. Exchange the following parts:
    - 1) Console
    - 2) Twinaxial workstation IOA
    - 3) The multi-adapter bridge. See symbolic FRU "MA\_BRDG" on page 508.
    - 4) Cables
  - c. If you have another working display, you can exchange the console and perform an IPL to attempt to correct the problem. See the service information for the failing display for more information.
  - d. If exchanging the failing items did not correct the problem and the reference code was a 5002, 5082, or 50FF, there may be a Licensed Internal Code problem. Go to "LICIP03" on page 132.
  - e. The problem may be caused by devices that are attached after the console on port 0. **This ends the procedure.**



## Workstation adapter isolation procedure

This topic contains the procedure necessary to isolate a failure that is detected by the workstation adapter, and is used when no display is available with which to perform on-line problem analysis.

The workstation adapter detected a problem while communicating with the workstation that is used as the primary console.

**Note:** If you are using a PC, you must install an emulation program.

Please read and observe all safety procedures before servicing the system and while performing the procedure below.

**Attention:** Unless instructed otherwise, always power off the system or expansion tower where the FRU is located (see Powering on and powering off) before removing, exchanging, or installing a field-replaceable unit (FRU).

### DANGER

**Electrical voltage and current from power, telephone, and communication cables are hazardous.**

**To avoid a shock hazard:**

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.

**To Disconnect:**

1. Turn everything OFF (unless instructed otherwise).
2. Remove power cords from the outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

**To Connect:**

1. Turn everything OFF (unless instructed otherwise)
2. Attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

(D005)

“WSAIP01”

WSAIP01:

**Note:** If the console has a keyboard error, there may be a "K" on the display. See the workstation service information for more information.

Perform the following procedure from the logical partition that reported the problem:

1. Select the icon on the workstation to make it the console (you may have already done this). You must *save* the console selection.
2. Access Dedicated Service Tools (DST) by performing the following:
  - a. Select **Manual** mode on the control panel.
  - b. Use the selection switch on the control panel to display function 21, **Make DST Available**, and press **Enter** on the control panel.
  - c. Wait for a display to appear on the console or for a reference code to appear on the control panel.

Does a display appear on the console?

**No:** Continue with the next step.

**Yes:** The problem is corrected. **This ends the procedure.**

3. Isolate the problem to one server and one workstation (console) by performing the following:
  - a. Disconnect the power cable from the workstation.
  - b. Eliminate all workstations, cables, and connector boxes from the network except for one server, one console, two connector boxes, and one cable.
  - c. Ensure that the cables that are connected to the console, the keyboard, and the server are connected correctly and are not damaged.

4. Perform the following:

- a. Ensure that the server console is terminated correctly.
- b. Set the Power switch on the console to the **On** position.
- c. Select the **SNA\*PS** icon on the console.
- d. See the workstation information for more information.

5. Access DST by performing the following:

- a. Select **Manual** mode on the control panel.
- b. Use the selection switch on the control panel to display function 21, **Make DST Available**, and press **Enter** on the control panel.
- c. Wait for a display to appear on the console or for a reference code to appear on the control panel.

Does a display appear on the console?

**No:** Continue with the next step.

**Yes:** The problem is in a cable, connector box, or device you disconnected in step 3. **This ends the procedure.**

6. Does the reference code A600 5005 appear on the control panel?

**Yes:** Continue with the next step.

**No:** Return to "Start of call procedure" on page 2. **This ends the procedure.**

7. Do you have another workstation, cable, and two connector boxes you can exchange with the workstation connected to the server?

**Yes:** Continue with the next step.

**No:** One of the following is causing the problem:

**Note:** The items at the top of the list have a higher probability of fixing the problem than the items at the bottom of the list.

- Workstation adapter Licensed Internal Code
- Workstation adapter configuration
- Workstation

- Cable
- Connector box
- Workstation IOA
- Workstation IOP

If you still have not corrected the problem, ask your next level of support for assistance. **This ends the procedure.**

8. Repeat steps 3 on page 260 through 7 on page 260 of this procedure, using a different workstation, cable, and connector boxes.

Do you still have a problem?

**Yes:** Continue with the next step.

**No:** The problem is in the cable, connector boxes, or workstation you disconnected. **This ends the procedure.**

9. One of the following is causing the problem:

**Note:** The items at the top of the list have a higher probability of fixing the problem than the items at the bottom of the list.

- Workstation adapter Licensed Internal Code
- Workstation adapter configuration
- Workstation IOA
- Communications IOP

To bring up a workstation other than the console, perform the following:

- a. Connect another workstation into this network.
- b. Select **Normal** mode on the control panel.
- c. Perform an IPL (see IPL information in the Service functions).

If the sign-on display appears, the following parts are good:

- Communications IOP
- Workstation IOA

**Note:** If a printer connected to this assembly is not working correctly, it may look like the display is bad. Perform a self-test on the printer to ensure that it prints correctly (see the printer service information).

If you still have not corrected the problem, ask your next level of support for assistance. **This ends the procedure.**

### **Workstation adapter console isolation procedure**

This topic contains the procedure necessary to isolate a failure that is detected by the workstation adapter console. Use this procedure when no display is available with which to perform online problem analysis.

**Note:** If you are using a PC, you must install an emulation program.

Read all safety procedures before servicing the system. Observe all safety procedures when performing a procedure. Unless instructed otherwise, always power off the system or expansion tower where the FRU is located, see Powering on and powering off before removing, exchanging, or installing a field-replaceable unit (FRU).

## DANGER

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn everything OFF (unless instructed otherwise).
2. Remove power cords from the outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

To Connect:

1. Turn everything OFF (unless instructed otherwise)
2. Attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

(D005)

Read and understand the following service procedures before using this section:

- Powering on and powering off
- Determining a primary or alternative console in Service functions.
- Card removal and replacement in Removing and replacing parts
- Finding part locations

**Note:** If the console has a keyboard error, there may be a K on the display. See the workstation service information for more information.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining if the system has logical partitions.
2. Ensure that your workstation meets the following conditions:
  - The workstation that you are using for the console is powered on.
  - The emulation program is installed and is working.
  - The input/output adapter (IOA) is installed and the workstation console cable is attached.

**Notes:**

- a. Card information: Hardware that is associated with 6A59 feature is the type 2745 card.
- b. Cable information: The cable attaches directly to the IOA.

Did you find a problem with any of the conditions listed above?

**No:** Continue with the next step.

**Yes:** Correct the problem. Then, perform an IPL of the system. **This ends the procedure.**

3. Perform the following to make dedicated service tool (DST) available:

- a. If there is an alternative console, ensure that it is powered on.
- b. Ensure that **Manual** mode on the control panel is selected. See Service functions.
- c. Select function 21, **Make DST Available** on the control panel, and press **Enter**.

Does a display appear on either the console or any alternative console?

**No:** Continue with the next step.

**Yes:** Complete the IPL. When the operating system display appears, use the Work with Problem command (WRKPRB) or Analyze Problem command (ANZPRB) to analyze and correct or report any console problems. **This ends the procedure.**

4. Do you have SRC A600 5001, A600 5004, A600 5007, or B075 xxxx (where xxxx is any value)?

**No:** Continue with the next step.

**Yes:** Perform the following:

- a. Disconnect any cables that are attached to the IOA.
- b. Install the wrap plug on the IOA. The 2745 wrap plug label is QQ.
- c. Perform an IPL in Manual mode.

5. Does SRC 6A59 5007 occur?

**No:** Continue with the next step.

**Yes:** One of the following is causing the problem:

- Workstation emulation program
- Workstation
- Workstation console cable

**This ends the procedure.**

6. Did SRC A600 5001, A600 5004, or 6A59 5008 occur?

**No:** This is a new problem. Use the new reference code to correct the problem, see Reference codes, or ask your next level of support for assistance. **This ends the procedure.** .

**Yes:** The Type 2745 workstation adapter is the failing item. **This ends the procedure.**

## AIX fast-path problem isolation

In most cases, AIX diagnostics are performed through automatic error log analysis. In some cases, these procedures direct you to run online diagnostics. Standalone diagnostics should only be used if you are unable to boot AIX or are otherwise specifically directed to do so.

**Notes:**

1. If you are servicing an SP system, go to the Start of Call MAP 100 in the *SP System Service Guide*.
2. If you are servicing a clustered server, go to the Start of Call MAP 100 in the *Clustered Installation and Service Guide*.

**Note:** If you already know the reference code or have another symptom other than a reference code, go directly to the AIX fast path table.

Use the following procedure to confirm and display a previously reported reference code including SRNs.

1. Log into the AIX operating system as the root user, or use the CE login. If you need assistance, contact the system operator.
2. Enter the **diag** command. The diag command allows you to load the diagnostic controller and display the online diagnostic menus.
3. Press **Enter**. This opens the **FUNCTION SELECTION** menu.
4. Select **Task Selection**.
5. Select **Display Previous Diagnostic Results**.
6. Select **DISPLAY DIAGNOSTIC LOG SUMMARY**. A display diagnostic log summary table is shown with a time ordered table of events from the error log.
7. Look for the most recent **S** entry in the **T** column. The most recent S entry is the one closest to the beginning of the DISPLAY DIAGNOSTIC LOG SUMMARY table.
8. Move your cursor over the row containing the S entry and press **Enter**.
9. Press **F7** to **Commit**.

A screen containing details from the table is displayed; look for the reference code (SRN or SRC) entry. The SRN or SRC entry is shown near the end of the screen.

10. Record the reference code.

The following screen example which shows an SRN for its example, is similar to what you should see on your terminal when you perform the above procedure.

```

DISPLAY DIAGNOSTIC LOG                                     802004
[TOP]
-----
IDENTIFIER:          DAFE

Date/Time:           Fri Aug 27 17:57:54
Sequence Number:     952
Event type:          SRN Callout

Resource Name:       ent1
Resource Description: Gigabit Ethernet-SX Adapter (e414a816)
Location:            U8842.P1Z.23A0781-P1-T7

Diag Session:        21546
Test Mode:           No Console,Non-Advanced,Normal IPL,ELA,Option Checkout

Error Log Sequence Number: 2189
Error Log Identifier:     6363CE4F

SRN:                 25C4-601

Description:         Download Firmware Error.

Probable FRUs:
  ent1                FRU: BCM95704A41          U8842.P1Z.23A0781-P1-T7
                    Gigabit Ethernet-SX Adapter (e414a816)

-----
[BOTTOM]
Use Enter to continue.

Esc+3=Cancel      Esc+0=Exit      Enter

```

11. If any reference codes are displayed, record all information provided from the diagnostic results, go to the appropriate reference code table.
- OR
- If a *no trouble found* is displayed continue to the next step.
12. When your results are complete, press **F3** to return to the Diagnostic Operating Instructions display.
  13. Press **Ctrl + D** to log off from being either the root user or CE login user.

### AIX fast path table

Locate the problem in the following table and perform the action indicated.

Symptoms	Action
<b>Eight-Digit Error Codes</b>	
You have an eight-digit error code.	Go to "Reference codes, read the notes on the first page, and do the listed action for the eight-digit error code. <b>Note:</b> If the repair for this code does not involve replacing a FRU (for instance, if you run an AIX command that fixes the problem or if you change a hot-pluggable FRU), then run the <b>Log Repair Action</b> option on resource <b>sysplanar0</b> from the Task Selection menu under online diagnostics to update the AIX error log.
<b>SRNs</b>	
You have an SRN.	Look up the SRN in the List of service request numbers and do the listed action. <b>Note:</b> Customer-provided SRNs should be verified. To verify the SRN use the Display Previous Diagnostic Results Service Aid. Choose the <b>Display Diagnostic Log Summary</b> when running this service aid.
An SRN is displayed when running diagnostics.	<ol style="list-style-type: none"> <li>1. Record the SRN and location code.</li> <li>2. Look up the SRN in the List of service request numbers and do the listed action.</li> </ol>
<b>888 Sequence in Operator Panel Display</b>	
An 888 sequence in the operator panel display.	Go to MAP 0070: 888 Sequence in operator panel display.
<b>The System Stops or Hangs With a Value Displayed in the Operator Panel Display</b>	
The system stopped with a 4-digit code that begins with a 2 (two) displayed in the operator panel display.	Record SRN 101-xxxx (where xxxx is the four digits of code displayed). The physical location code or device name displays on system units with a multiple-line operator panel display. If a physical location code or an AIX location code is displayed, record it, then look up the SRN in the List of service request numbers and do the listed action.
The system stopped with a 3-digit code operator panel display.	Record SRN 101-xxx (where xxx is the three digits of the code displayed). Look up the SRN in the List of service request numbers and do the listed action.
<b>System Automatically Reboots</b>	
System automatically reboots.	<ol style="list-style-type: none"> <li>1. Turn off the system unit power.</li> <li>2. Turn on the system unit power and boot from a removable media, disk, or LAN in service mode.</li> <li>3. Run the diagnostics in problem determination mode.</li> <li>4. Select the <b>All Resources</b> option from the Resource Selection menu to test all resources.</li> <li>5. If an SRN displays, look up the SRN in the List of service request numbers and do the listed action.</li> <li>6. If an SRN is not displayed, suspect a power supply or power source problem.</li> </ol>
<b>System does not Reboot When Reset Button is Pushed</b>	
System does not reboot (reset) when the reset button is pushed.	Record SRN 111-999. Look up the SRN in the List of service request numbers and do the listed action.

Symptoms	Action
<b>ASync Communication Problems</b>	
You suspect an async communication problem.	<ol style="list-style-type: none"> <li>1. Run the advanced async diagnostics on the ports on which you are having problems. If an SRN is displayed, look up the SRN in the List of service request numbers and do the listed action.</li> <li>2. If you suspect a problem with the async concentrator, remote async node, and so on, refer to the documentation in <i>RS/6000 @server pSeries Adapters, Devices, and Cable Information for Multiple Bus Systems</i> on these devices and perform any tests or checks listed.</li> </ol>
<b>SCSI Adapter Problems</b>	
<p>You suspect a SCSI adapter problem.</p> <p>SCSI adapter diagnostics can only be run on a SCSI adapter that was not used for booting. The POST tests any SCSI adapter before attempting to use it for booting. If the system was able to boot using a SCSI adapter, then the adapter is most likely good.</p> <p>SCSI adapters problems are also logged into the error log and are analyzed when the online SCSI diagnostics are run in problem determination mode. Problems are reported if the number of errors is above defined thresholds.</p>	<ol style="list-style-type: none"> <li>1. Run the online SCSI adapter diagnostic in problem determination mode. If an SRN is displayed, look up the SRN in the List of service request numbers and do the listed action.</li> <li>2. Use MAP 0050: SCSI bus problems. <b>Note:</b> If you cannot load diagnostics (standalone or online) go to "PFW1540: Problem isolation procedures" on page 316.</li> </ol>
<b>SCSI Bus Problems</b>	
You suspect a SCSI bus problem.	<ol style="list-style-type: none"> <li>1. Use MAP 0050: SCSI bus problems.</li> <li>2. Use the SCSI Bus Service Aid to exercise and test the SCSI Bus.</li> </ol>
<b>Tape Drive Problems</b>	
You suspect a tape drive problem.	<ol style="list-style-type: none"> <li>1. Refer to the tape drive documentation and clean the tape drive.</li> <li>2. Refer to the tape drive documentation and do any listed problem determination procedures.</li> <li>3. Run the online advanced tape diagnostics in problem determination mode. If an SRN is displayed, look up the SRN in the List of service request numbers and do the listed action.</li> <li>4. Use the Backup and restore service aid to exercise and test the drive and media.</li> <li>5. Use MAP 0050: SCSI bus problems.</li> <li>6. Use the SCSI bus service aid to exercise and test the SCSI bus.</li> <li>7. Refer to the device section of <i>RS/6000 @server pSeries Adapters, Devices, and Cable Information for Multiple Bus Systems</i> for additional information and MAP 0020: Problem determination procedure for problem determination procedures.</li> </ol> <p><b>Note:</b> Information on tape cleaning and tape-problem determination is normally either in the tape drive operator guide.</p>
<b>CD-ROM Drive Problems</b>	



Symptoms	Action
<p>You suspect a CD-ROM drive problem.</p>	<ol style="list-style-type: none"> <li>1. Refer to the CD-ROM documentation and do any listed problem determination procedures.</li> <li>2. Before servicing a CD-ROM drive ensure that it is not in use and that the power connector is correctly attached to the drive. If the load or unload operation does not function, replace the CD-ROM drive.</li> <li>3. Run the online advanced CD-ROM diagnostics in problem determination mode. If an SRN is displayed, look up the SRN in the List of service request numbers and do the listed action.</li> <li>4. If the problem is with a SCSI CD-ROM drive, use MAP 0050: SCSI bus problems.</li> <li>5. If the problem is with a SCSI CD-ROM drive, use the SCSI bus service aid to exercise and test the SCSI bus.</li> <li>6. Refer to the device section of <i>RS/6000 @server pSeries Adapters, Devices, and Cable Information for Multiple Bus Systems</i> for additional information and MAP 0020: Problem determination procedure for problem determination procedures.</li> </ol> <p><b>Note:</b> Information on CD-ROM problem determination is usually in the CD-ROM drive operator guide or the system user's guide.</p>
<b>SCSI Disk Drive Problems</b>	
<p>You suspect a disk drive problem.</p> <p>Disk problems are logged in the error log and are analyzed when the online disk diagnostics are run in problem determination mode. Problems are reported if the number of errors is above defined thresholds.</p> <p>If the diagnostics are booted from a disk, then the diagnostics can only be run on those drives that are not part of the root volume group. However, error log analysis is run if these drives are selected. To run the disk diagnostic tests on disks that are part of the root volume group, the standalone diagnostics must be used.</p>	<ol style="list-style-type: none"> <li>1. Run the online advanced disk diagnostics in problem determination mode. If an SRN is displayed, look up the SRN in the List of service request numbers and do the listed action.</li> <li>2. Run standalone disk diagnostics. If an SRN is displayed, look up the SRN in the List of service request numbers and do the listed action.</li> <li>3. Use the certify disk service aid to verify that the disk can be read.</li> <li>4. Use MAP 0050: SCSI bus problems.</li> <li>5. Use the SCSI bus service aid to exercise and test the SCSI Bus.</li> <li>6. Refer to the device section of <i>RS/6000 @server pSeries Adapters, Devices, and Cable Information for Multiple Bus Systems</i> for additional information and MAP 0020: Problem determination procedure for problem determination procedures.</li> </ol>
<p>Identify LED does not function on the drive plugged into the SES or SAF-TE backplane.</p>	<p>Use the identify a device attached to a SES device service aid listed under SCSI and SCSI RAID Hot-Plug Manager on the suspect drive LED. If the drive LED does not blink when put into the identify state, use FFC 2D00 and SRN source code "B" and go to MAP 0210: General problem resolution.</p>
<p>Activity LED does not function on the drive plugged into the SES or SAF-TE backplane.</p>	<p>Use the certify media service aid (see certify media) on the drive in the slot containing the suspect activity LED. If the activity LED does not intermittently blink when running certify, use FFC 2D00 and SRN source code "B" and go to MAP 0210: General problem resolution.</p>
<b>Diskette Drive Problems</b>	

Symptoms	Action
You suspect a diskette drive problem.	<ol style="list-style-type: none"> <li>1. Run the diskette drive diagnostics. If an SRN is displayed, look up the SRN in the List of service request numbers and do the listed action.</li> <li>2. Use the diskette media service Aid to test the diskette media.</li> <li>3. Use the backup/restore media service aid to exercise and test the drive and media.</li> </ol>
<b>Token-Ring Problems</b>	
You suspect a token-ring adapter or network problem.	<ol style="list-style-type: none"> <li>1. Run the online advanced token-ring diagnostics in problem determination mode. If an SRN is displayed, look up the SRN in the List of service request numbers and do the listed action.</li> <li>2. Use the <b>ping</b> command to exercise and test the network.</li> <li>3. Refer to MAP 0020: Problem determination procedure. for additional information and problem determination procedures.</li> </ol>
<b>Ethernet Problems</b>	
You suspect an Ethernet adapter or network problem.	<ol style="list-style-type: none"> <li>1. Run the online advanced Ethernet diagnostics in problem determination mode. If an SRN is displayed, look up the SRN in the List of service request numbers and do the listed action.</li> <li>2. Use the <b>ping</b> command to exercise and test the network.</li> <li>3. Refer to MAP 0020: Problem determination procedure. for additional information and problem determination procedures.</li> </ol>
<b>Display Problems</b>	
You suspect a display problem.	<ol style="list-style-type: none"> <li>1. Go to the problem determination procedures for the display.</li> <li>2. Run diagnostics on the adapter that the display is attached. If an SRN is displayed, look up the SRN in the List of service request numbers and do the listed action.</li> <li>3. Refer to MAP 0020: Problem determination procedure.</li> </ol>
<b>Keyboard or Mouse</b>	
You suspect a keyboard or mouse problem.	<p>Run the device diagnostics. If an SRN is displayed, look up the SRN in the List of service request numbers and do the listed action.</p> <p>If you are unable to run diagnostics because the system does not respond to the keyboard, replace the keyboard or system planar.</p> <p><b>Note:</b> If the problem is with the keyboard it could be caused by the mouse device. To check, unplug the mouse and then recheck the keyboard. If the keyboard works, replace the mouse.</p>
<b>Printer and TTY Problems</b>	

Symptoms	Action
You suspect a TTY terminal or printer problem.	<ol style="list-style-type: none"> <li>1. Go to problem determination procedures for the printer or terminal.</li> <li>2. Check the port that the device is attached to by running diagnostics on the port. If an SRN is displayed, look up the SRN in the List of service request numbers and do the listed action.</li> <li>3. Use the "Testing the Line Printer" procedure in General diagnostic information to test the connection to the printer. If a problem exists, replace the following in the order listed:               <ol style="list-style-type: none"> <li>a. Device cable</li> <li>b. Port to which the printer or terminal is connected.</li> </ol> </li> </ol>
<b>Other Adapter Problems</b>	
You suspect a problem on another adapter that is not listed above.	<ol style="list-style-type: none"> <li>1. Run the online advanced diagnostics in problem determination on the adapter you suspect. If an SRN is displayed, look up the SRN in the List of service request numbers and do the listed action.</li> <li>2. Refer to MAP 0020: Problem determination procedure. for additional information and problem determination procedures.</li> </ol>
<b>System Messages</b>	
A system message is displayed.	<ol style="list-style-type: none"> <li>1. If the message describes the cause of the problem, attempt to correct it.</li> <li>2. Look for another symptom to use.</li> </ol>
<b>Processor and Memory Problems</b>	
<p>You suspect a memory problem.</p> <p>Memory tests are only done during POST. Only problems that prevent the system from booting are reported during POST. All other problems are logged and analyzed when the <b>sysplanar0</b> option under the advanced diagnostics selection menu is run.</p> <p>System crashes are logged in the AIX error log. The <b>sysplanar0</b> option under the advanced diagnostic selection menu is run in problem determination mode to analyze the error.</p>	<ol style="list-style-type: none"> <li>1. Power off the system.</li> <li>2. Turn on the system unit power and load the online diagnostics in service mode.</li> <li>3. Run either the <b>sysplanar0</b> or the <b>Memory</b> option under the advanced diagnostics in problem determination mode.</li> <li>4. If an SRN is displayed, record the SRN and location code.</li> <li>5. Look up the SRN in the List of service request numbers and do the listed action.</li> </ol>
<b>Degraded Performance or Installed Memory Mismatch</b>	
Degraded performance or installed memory mismatch	<p>Degraded performance can be caused by memory problems that cause a reduction in the size of available memory. To verify that the system detected the full complement of installed memory do the following:</p> <ol style="list-style-type: none"> <li>1. From the task selection menu select the <b>Display Resource Attribute</b>.</li> <li>2. From the resource selection menu select one of the listed memory resources.</li> <li>3. Verify the amount of memory listed matches the amount actually installed.</li> <li>4. Use the service processor (ASMI) menus to see if the memory has been removed (garded out of) the system's configuration by the system or an administrator.</li> </ol>

Symptoms	Action
<b>Missing Resources</b>	
Missing resources	<p><b>Note:</b> ISA resources must be configured before they appear in the configuration. The ISA adapter configuration service aid is used to configure ISA adapter for standalone diagnostics. SMIT can be used to configure during online diagnostics.</p> <p>Use the Display Configuration and Resource List or Vital Product Data (VPD) Service Aid to verify that the resource was configured.</p> <p>If an installed resource does not appear, check that it is installed correctly. If you do not find a problem, go to MAP 0020: Problem determination procedure.</p>
<b>Missing Path on MPIO Resource</b>	
Missing path on MPIO resource	If a path is missing on an MPIO resource, shown as the letter P in front of the resource in the resource listing, go to MAP 0020: Problem determination procedure.
<b>System Hangs or Loops When Running the OS or Diagnostics</b>	
The system hangs in the same application.	<p>Suspect the application. To check the system:</p> <ol style="list-style-type: none"> <li>1. Power off the system.</li> <li>2. Turn on the system unit power and load the online diagnostics in service mode.</li> <li>3. Select the <b>All Resources</b> option from the resource selection menu to test all resources.</li> <li>4. If an SRN is displayed at anytime, record the SRN and location code.</li> <li>5. Look up the SRN in the List of service request numbers and do the listed action.</li> </ol>
The system hangs in various applications.	<ol style="list-style-type: none"> <li>1. Power off the system.</li> <li>2. Turn on system unit power and load the online diagnostics in service mode.</li> <li>3. Select the <b>All Resources</b> option from the resource selection menu to test all resources.</li> <li>4. If an SRN is displayed at anytime, record the SRN and location code.</li> <li>5. Look up the SRN in the List of service request numbers and do the listed action.</li> </ol>
The system hangs when running diagnostics.	Replace the resource that is being tested.
<b>You Cannot Find the Symptom in This Table</b>	
All other problems.	Go to MAP 0020: Problem determination procedure.
<b>Exchanged FRUs Did Not Fix the Problem</b>	
A FRU or FRUs you exchanged did not fix the problem.	Go to Additional problem determination.
<b>RAID Problems</b>	
You suspect a problem with a RAID.	<p>A potential problem with a RAID adapter exists. Run diagnostics on the RAID adapter. Refer to the <i>RAID Adapters User's Guide and Maintenance Information</i> or the service guide for the RAID.</p> <p>If the RAID adapter is a PCI-X RAID adapter, refer to the <i>PCI-X SCSI RAID Controller Reference Guide for AIX</i>.</p>

Symptoms	Action
<b>System Date and Time Problems</b>	
<ul style="list-style-type: none"> <li>• The system does not retain the calendar date after the system has been booted.</li> <li>• The system does not retain the time of day after the system has been booted.</li> </ul> <p><b>Note:</b> It is normal for the system time of day to gain or lose a few seconds each month.</p>	<ol style="list-style-type: none"> <li>1. Run the <b>sysplanar0</b> option under the advanced diagnostics in problem determination mode. If an SRN is reported, record the SRN and location code information. Look up the SRN in the List of service request numbers and do the listed action.</li> <li>2. Replace the TOD (NVRAM) battery. If this does not fix the problem, replace the service processor; its location is model-dependent.</li> </ol>
<b>SSA Problems</b>	
You suspect an SSA problem.	A potential problem with an SSA adapter exists. Run the SSA service aid. To perform a service aid see AIX service aids and follow the instructions.
<b>Power Indicator Light is Not On</b>	
A drawer power indicator is not on.	Return to "Start of call procedure" on page 2.
<b>System Power Problem</b>	
The system does not power on.	Return to "Start of call procedure" on page 2.
The system powers on when it should not.	Return to "Start of call procedure" on page 2.

- MAP 0020: Problem Determination Procedure
- MAP 0030: Additional Problem Determination
- MAP 0040: Intermittent Problem Isolation
- MAP 0050: SCSI Bus Problems
- MAP 0054: PCI-X SCSI Bus Problems
- MAP 0070: 888 Sequence in Operator Panel Display
- MAP 0080: System Bus Problem Isolation
- MAP 0210: General Problem Resolution
- MAP 0220: Hot-Swap FRU Problem Resolution
- MAP 0260: System Hangs During Resource Configuration
- MAP 0270: SCSI RAID Problem Resolution and Verification
- MAP 0280: Console and Keyboard Problem Resolution
- MAP 0290: Missing Resource Problem Resolution
- MAP 0291: Missing Device or Bus Problem Resolution
- MAP 0410: Repair Checkout
- MAP 0420: System Checkout
- Installation Checkout
- General diagnostic information for systems running the AIX operating system
- PFW1540: Problem isolation procedures
- PFW1542: I/O Problem isolation procedures
- PFW1542-520: I/O Problem isolation procedures
- PFW1542-550: I/O Problem isolation procedures
- PFW1542-570: I/O Problem isolation procedures
- PFW1542-590: Model 590 and Model 595 I/O problem isolation procedure
- PFW1543: Model 590 and model 595 MCM problem isolation procedure
- PFW1546: Model 590 and model 595 Memory problem isolation procedure

PFW1548: Memory and processor problem isolation procedures  
PFW1548-520: Memory and processor problem isolation procedures  
PFW1548-550: Memory and processor problem isolation procedures  
PFW1548-570: Memory and processor problem isolation procedures  
SCSI hints

## MAP 0020: Problem determination procedure

### Purpose of this MAP

Use this MAP to get a service request number (SRN) if the customer or a previous MAP provided none.

- **Step 0020-1**

Visually check the server for obvious problems such as unplugged power cables or external devices that are powered off.

**Did you find an obvious problem?**

**NO** Go to Step 0020-2.

**YES** Fix the problem; then go to MAP 0410: Repair Checkout.

- **Step 0020-2**

**Are the AIX online diagnostics installed?**

**Note:** If AIX is not the installed operating system on the server or partition, answer no to the above question.

**NO** If the operating system is running, perform its shutdown procedure. Get help if needed. Go to Step 0020-4.

**YES** Go to Step 0020-3.

- **Step 0020-3**

**Note:** When possible, run online diagnostics in service mode. Online diagnostics perform additional functions, compared to standalone diagnostics.

Run online diagnostics in concurrent mode when the customer does not let you power-off the system unit. To run online diagnostics in service mode, go to substep 5. If the system unit is already running in the service mode and you want to run online diagnostics, proceed to the question at the bottom of this MAP Step. Otherwise, continue with 1 through 4 in the following procedure.

1. Log in with root authority or use CE login. If necessary, ask the customer for the password.
2. Enter the **diag -a** command to check for missing resources.
  - a. If you see a command line prompt, proceed to substep 3 below.
  - b. If the DIAGNOSTIC SELECTION menu is displayed, with the letter M shown next to any resource, select that resource, then press Commit (F7 key). Follow any instructions displayed. If you are prompted with a message Do you want to review the previously displayed error select **Yes** and press Enter. If an SRN displays, record it, and go to Step 0020-15. If there is no SRN, go to substep 3 below.
  - c. If MISSING RESOURCE menu is displayed, follow any instructions displayed. If you are prompted with a message Do you want to review the previously displayed error select **Yes** and press Enter. If an SRN displays, record it, and go to Step 0020-15. If there is no SRN, go to substep 3 below.
3. Enter the **diag** command.
4. Go to Step 0020-5.
5. If the operating system is running, perform its shut down procedure (get help if needed).
6. Turn off the system unit power and wait 45 seconds before proceeding.
7. Turn on the system unit power.

8. Load the online diagnostics in service mode.
9. Wait until the Diagnostic Operating Instructions display or the system appears to have stopped.

**Are the Diagnostic Operating Instructions Displayed?**

**NO** Go to Step 0020-16.

**YES** Go to Step 0020-5.

• **Step 0020-4**

**Note:** If you are working on a partition, do not remove the power as directed in the following procedure. Only remove the power if you are working on a server that does not have multiple partitions.

1. If the server does not have multiple partitions, disconnect the power from the server, wait 45 seconds and reconnect the power.
2. If the server supports slow boot (See Performing a slow boot set the server to perform a slow boot for the next boot that is performed. If the system does not support slow boot, do a normal boot in the next step.
3. Refer to Loading the AIX online and @server standalone diagnostics to load the @server standalone diagnostics. Before continuing to the next step, ensure that the server power is turned on, or if you are working on a partition, the partition is started. The server or partition should be booting the @server standalone diagnostics from a CD-ROM or a network server.
4. Wait until the Diagnostic Operating Instructions display or the server boot appears to have stopped.

**Are the Diagnostic Operating Instructions Displayed?**

**NO** Go to Step 0020-16.

**YES** Go to Step 0020-5.

• **Step 0020-5**

**Are the Diagnostic Operating Instructions Displayed (screen number 801001) with no obvious problem (for example, blurred or distorted)?**

**NO** For display problems, go to Step 0020-12.

**YES** To continue with diagnostics, go to Step 0020-6.

• **Step 0020-6**

Press the Enter key.

**Is the FUNCTION SELECTION menu displayed (screen number 801002)?**

**NO** Go to Step 0020-13.

**YES** Go to Step 0020-7.

• **Step 0020-7**

1. Select the **ADVANCED DIAGNOSTICS ROUTINES** option.

**Notes:**

- a. If the terminal type is not defined, do so now. You cannot proceed until this is complete.
  - b. If you have SRNs from a Previous Diagnostics Results screen, process these Previous Diagnostics Results SRNs prior to processing any SRNs you may have received from an SRN reporting screen.
2. If the **DIAGNOSTIC MODE SELECTION** menu (screen number 801003) displays, select the **PROBLEM DETERMINATION** option.
  3. Find your system response in the following table. Follow the instructions in the Action column.

System Response	Action
Previous Diagnostic Results. Do you want to review the previously displayed error?	<p>You have a pending item in the error log for which there is no corresponding Log Repair Action. To see this error, select <b>YES</b> at the prompt.</p> <p>Information from the error log is displayed in order of last event first. Record the error code, the FRU names and the location code of the FRUs.</p> <p>Go to Step 0020-15</p>
The RESOURCE SELECTION menu or the ADVANCED DIAGNOSTIC SELECTION menu is displayed (screen number 801006).	Go to Step 0020-8.
The system halted while testing a resource.	Record SRN 110-xxxx, where xxxx is the first four digits of the menu number displayed in the upper-right corner of the diagnostic menu. Go to Step 0020-15.
The MISSING RESOURCE menu is displayed or the letter M is displayed alongside a resource in the resource list.	<p>If the MISSING RESOURCE menu is displayed, follow the displayed instructions until either the ADVANCED DIAGNOSTIC SELECTION menu or an SRN is displayed. If an M is displayed in front of a resource (indicating that it is missing) select that resource then choose the Commit (F7 key).</p> <p><b>Note:</b> Run any supplemental media that may have been supplied with the adapter or device, and then return to substep 1 of Step 0020-7.</p> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1. If the SCSI enclosure services device appears on the missing resource list along with the other resources, select it first.</li> <li>2. ISA adapters cannot be detected by the system. The ISA adapter configuration service aid in standalone diagnostics allows the identification and configuration of ISA adapters.</li> </ol> <p>If the ADVANCED DIAGNOSTIC SELECTION menu is displayed, go to Step 0020-11.</p> <p>If an 8-digit error code is displayed, go to Reference codes.</p> <p>If an SRN is displayed, record it, and go to Step 0020-15.</p>
The message The system will now continue the boot process is displayed continuously on the system unit's console.	Go to Step 0020-4.
The message Processing supplemental diagnostic diskette media is displayed continuously on the system unit's console.	Call your service support structure.
The diagnostics begin testing a resource. <b>Note:</b> If the problem determination option was selected from the DIAGNOSTIC MODE SELECTION menu, and if a recent error has been logged in the error log, the diagnostics automatically begin testing the resource.	<p>Follow the displayed instructions.</p> <p>If the No Trouble Found screen is displayed, press Enter.</p> <p>If another resource is tested, repeat this step.</p> <p>If the ADVANCED DIAGNOSTIC SELECTION menu is displayed, go to Step 0020-11.</p> <p>If an SRN is displayed, record it, and go to Step 0020-15.</p> <p>If an 8-digit error code is displayed, go to Reference codes.</p>



System Response	Action
The system did not respond to selecting the advanced diagnostics option.	Go to Step 0020-13.
A system unit with a beeper did not beep while booting.	Record SRN 111-947 and then go to Step 0020-15.
The system unit emits a continuous sound from the beeper.	Record SRN 111-947 and then go to Step 0020-15.
An SRN or an eight-digit error code is displayed.	Record the error code, the FRU names, and the location code for the FRUs. If a SRN is displayed, go to Step 0020-15.  If an 8-digit error code is displayed, go to Reference codes.
The system stopped with a 3-digit or 4-digit code displayed in the operator panel display.	Record SRN 101-xxx (where xxx is the rightmost three digits of the displayed code). Go to Step 0020-15.
An 888 message is displayed in the operator panel display. <b>Note:</b> The 888 may or may not be flashing.	Go to Isolation MAP 0070: 888 Sequence in operator panel display.

- **Step 0020-8**

On the DIAGNOSTIC SELECTION or ADVANCED DIAGNOSTIC SELECTION menu, look through the list of resources to make sure that all adapters and SCSI devices are listed including any new resources.

**Notes:**

1. Resources attached to serial and parallel ports may not appear in the resource list.
2. If running diagnostics in a partition within a partitioned system, resources assigned to other partitions will not be displayed on the resource list.

**Did you find the all the adapters or devices on the list?**

**NO** Go to "Step 0020-9."

**YES** Go to "Step 0020-11."

- **Step 0020-9**

**Is the new device or adapter an exact replacement for a previous one installed at same location?**

**NO** Go to "Step 0020-10."

**YES** The replacement device or adapter may be defective. If possible, try installing it in an alternate location if one is available; if it works in that location, then suspect that the location where it failed to appear has a defective slot; schedule time to replace the hardware that supports that slot. If it does not work in alternate location, suspect a bad replacement adapter or device. If you are still unable to detect the device or adapter, contact your service support structure.

- **Step 0020-10**

**Is the operating system software to support this new adapter or device installed?**

**NO** Load the operating system software.

**YES** The replacement device or adapter may be defective. If possible, try installing it in an alternate location if one is available; if it works in that location, then suspect that the location where it failed to appear has a defective slot; schedule time to replace the hardware that supports that slot. If it does not work in alternate location, suspect a bad replacement adapter or device. If you are still unable to detect the device or adapter, contact your service support structure.

- **Step 0020-11**

Select and run the diagnostic test problem determination or system verification on one of the following:

- The resources with which the customer is having problems. If the resource is not shown on the DIAGNOSTIC SELECTION menu, then run diagnostics on its parent (the adapter or controller to which the resource is attached).
- The resources you suspect are causing a problem.
- All resources.

**Note:** When choosing **All Resources**, interactive tests are not done. If no problem is found running **All Resources** you should choose each of the individual resources on the selection menu to run diagnostics tests on to do the interactive tests

Find the response in the following table or follow the directions on the test results screen.

Diagnostic Response	Action
An SRN or an eight-digit error code, is displayed on the screen.	Record the error code, the FRU names, and the location code for the FRUs. If an SRN is displayed, go to Step 0020-15. If an SRN or an 8-digit error code is displayed, go to the information center, and perform a search on the error code to obtain the name and location of the failing FRU. Perform the listed action.
The TESTING COMPLETE menu and the No trouble was found message are displayed, and you have not tested all of the resources.	Press Enter and continue testing other resources.
The TESTING COMPLETE menu and the No trouble was found message are displayed, and you have tested all of the resources.	Go to "Step 0020-14" on page 277. <b>Note:</b> If you have not run the <b>sysplanar</b> test, do so before going to "Step 0020-14" on page 277.
The system halted while testing a resource.	Record SRN 110-xxxx, where xxxx is the first three or four digits of the menu number displayed in the upper-right corner of the diagnostic menu screen.  Go to Step 0020-15.
When running the Online Diagnostics, an installed device does not appear in the test list.	Ensure that the diagnostic support for the device was installed. The display configuration service aid can be used to determine whether diagnostic support is installed for the device.  Record SRN 110-101. Go to Step 0020-15. <b>Note:</b> Supplemental diskettes may be required if service aids are run from Standalone Diagnostics.
The IBM ARTIC960 Quad T1/E1 adapter diagnostics display a message indicating that the interface board (PMC) is either not installed or is malfunctioning.	Install a PMC board if not already installed.  When running online diagnostics on any of the IBM ARTIC960 family of adapters and the message indicates that the PMC (daughter board) is not installed, but it is installed, do the following: <ul style="list-style-type: none"> <li>• Reseat the PMC board, then run diagnostics.</li> <li>• If the response is the same, replace the PMC and then go to MAP 0410: Repair Checkout.</li> </ul>
The symptom was not found in the table.	Go back to the Start of call procedure.

• **Step 0020-12**

The following step analyzes a console display problem.

Find your type of console display in the following table. Follow the instructions given in the Action column.

Type of Console Display	Action
TTY-type terminal	Be sure the TTY terminal attributes are set correctly. See "Running the Diagnostic Programs from a TTY Terminal" in Using Standalone and Online Diagnostics.  If you did not find a problem with the attributes, go to the documentation for this type of TTY terminal, and continue problem determination. If you do not find the problem, record SRN 111-259, then go the Step 0020-15.
Graphics display	Go to the documentation for this type of graphics display, and continue problem determination. If you do not find the problem, record SRN 111-82c, then go to Step 0020-15.
HMC (Hardware Management Console)	Go to PFW1540: Problem isolation procedures. If HMC tests find no problem, there may be a problem with the communication between the HMC and the managed system. If the HMC communicates with the managed system through a network interface, verify whether the network interface is functional. If the HMC communicates with the managed system through the HMC interface, check the cable between the HMC and the managed system, if it is not causing the problem, suspect a configuration problem of the HMC communications setup."

- **Step 0020-13**

There is a problem with the keyboard.

Find the type of keyboard you are using in the following table. Follow the instructions given in the Action column.

Keyboard Type	Action
Type 101 keyboard (U.S.). Identify by the size of the Enter key. The Enter key is in only one horizontal row of keys.	Record SRN 111-736, then go to Step 0020-15.
Type 102 keyboard (W.T.). Identify by the size of the Enter key. The Enter key extends into two horizontal rows.	Record SRN 111-922; then go to Step 0020-15.
Kanji-type keyboard. (Identify by the Japanese characters.)	Record SRN 111-923; then go to Step 0020-15.
TTY terminal keyboard	Go to the documentation for this type of TTY terminal and continue problem determination.
HMC (Hardware Management Console)	Go to PFW1540: Problem isolation procedures. If HMC tests find no problem, there may be a problem with the communication between the HMC and the managed system. If the HMC communicates with the managed system through a network interface, verify whether the network interface is functional. If the HMC communicates with the managed system through the HMC interface, check the cable between the HMC and the managed system, if it is not causing the problem, suspect a configuration problem of the HMC communications setup."

- **Step 0020-14**

The diagnostics did not detect a problem.

If the problem is related to either the system unit or the I/O expansion box, refer to the service guide for that unit.

If the problem is related to an external resource, use the problem determination procedures, if available, for that resource.

If a problem occurs when running Online Diagnostics but not when running the Standalone Diagnostics, suspect a software problem.

Check for the presence of supplemental diagnostic material, such as diskettes or documentation. This is possibly a problem with software or intermittent hardware. If you think that you have an intermittent hardware problem, go to MAP 0040: Intermittent problem isolation.

- **Step 0020-15**

Take the following actions:

1. Handle multiple SRNs and error codes in the following order:
  - a. 8-Digit Error Codes.
  - b. SRNs with a source code other than F or G.
  - c. SRNs with a source code of F. Run online diagnostics in advanced and problem determination mode to obtain maximum isolation.
  - d. SRNs with a source code of G.

**Note:** The priority for multiple SRNs with a source of G is determined by the time stamp of the failure. Follow the action for the SRN with the earliest time stamp first.

- e. Device SRNs and error codes (5-digit SRNs).

If a group has multiple SRNs, it does not matter which SRN is handled first.

2. Find the SRN in the List of service request numbers.

**Note:** If the SRN is not listed, look for it in the following:

- Any supplemental service manual for the device
- The diagnostic problem report screen for additional information
- The "Service Hints" service aid in Using standalone and online diagnostics
- The CERREADME file (by using the Service Hints service aid)

3. Perform the action listed.
4. If you replace a part, go to MAP 0410: Repair checkout.

- **Step 0020-16**

Refer to AIX IPL progress codes for definitions of configuration program indicators. They are normally 0xxx.

**Is a configuration program indicator displayed?**

**NO** Go to the Problems with loading and starting the operating system (AIX and Linux)

**YES** Record SRN 101-xxxx (where xxxx is the rightmost three or four digits or characters of the configuration program indicator). Go to Step 0020-17.

- **Step 0020-17**

**Is a physical location code or an AIX location code displayed on the operator panel display?**

**NO** Go to Step 0020-15.

**YES** Record the location code, then go to Step 0020-15.

## **MAP 0030: Additional Problem Determination**

### **Purpose of This MAP**

This MAP is used for problems that still occur after all FRUs indicated by the SRN or error code have been exchanged.

**Note:** Check the action text of the SRN before proceeding with this MAP. If there is an action listed, perform that action before proceeding with this MAP.

- **Step 0030-1**

Some external devices (including rack drawers that contain devices) have their own problem-determination procedures. If the problem is related to an external device that has its own problem-determination procedure, run those procedures if not already run. If they do not correct the problem, continue with this MAP.

- **Step 0030-2**

The problem may have been caused by a resource that has not been tested. System Checkout tests all resources. If the Online Diagnostics are installed and you are able to load them, then **All Resources** under the Diagnostic Selection menu should be run. If you get a different SRN, then look up the SRN in the SRN chapters and do the listed action. If you are unable to run **All Resources** under the Diagnostic Selection menu or you do not get another SRN when running it, continue with this MAP.

- **Step 0030-3**

If the problem is related to a SCSI device, SCSI bus, or SCSI controller, go to MAP 0050: SCSI bus problems. If you are unable to isolate the problem with MAP 0050, continue with “Step 0030-4.”

- **Step 0030-4**

1. Find the resource(s) that are identified by the SRN or error code in the following table.
2. Perform the first action listed for the resource.
3. If you exchange a FRU or change a switch setting, test the resource again.
4. If the action does not correct the problem, perform the next action until all actions have been tried. If an action says to exchange a FRU that you have already exchanged, go to the next action. If an action corrects the problem, go to “MAP 0410: Repair checkout” on page 310.
5. If you perform all of the actions and do not correct the problem, check the Service Hints service aid for information. If the service aid does not help, call your service support structure.

Failing Resource	Repair Action
SCSI Device	Exchange the SCSI Controller. Replace the power supply.
Pluggable SCSI or IDE Controller	Exchange the backplane into which the adapter is plugged.
Keyboard, tablet, mouse, dials, LPFK, diskette drive	Check the cable attaching the device to its adapter. If you do not find a problem, exchange the device’s adapter.
Pluggable adapters, CPU cards, and controllers	Determine whether the adapter contains any attached FRUs such as fuses, DRAMs, and crossover cables. <ol style="list-style-type: none"> <li>1. Check or exchange any attached FRU on the resource.</li> <li>2. If the adapter is plugged into a riser card, check or exchange the riser card.</li> <li>3. Exchange the backplane into which the adapter is plugged.</li> </ol>
System and I/O backplanes	Contact your service support structure.
Built-In serial ports	Replace the Service Processor if present.
A device attached to the system by a cable and an adapter.	<ol style="list-style-type: none"> <li>1. Replace the adapter for the device.</li> <li>2. Replace the cable to the device.</li> </ol>
IDE Device	Replace the cable between the IDE controller and the device. If the IDE controller is packaged on a backplane, replace that backplane, otherwise replace the adapter containing the IDE controller.

## MAP 0040: Intermittent Problem Isolation

### Purpose of This MAP

This MAP provides a structured way of analyzing intermittent problems. It consists of two tables: Hardware Symptoms and Software Symptoms.

Because software or hardware can cause intermittent problems, consider all symptoms relevant to your problem.

### How to Use This MAP

This MAP contains information about causes of intermittent symptoms. In the following tables, find your symptoms, and read the list of things to check.

When you exchange a FRU, go to MAP 0410: Repair Checkout to check out the system.

### Hardware Symptoms

**Note:** This table spans several pages.

Symptom of Hardware Problem	Things to Check For
Any hardware log entry in the error log.	<p>Use the Hardware Error Report service aid to view the error log and check for:</p> <ul style="list-style-type: none"> <li>• Multiple errors on devices attached to the same SCSI bus.</li> <li>• Multiple errors on devices attached to the same async adapter.</li> <li>• Multiple errors on internally installed devices only.</li> </ul> <p>Contact your service support structure for assistance with error report interpretation.</p>
Hardware-caused system crashes	<ul style="list-style-type: none"> <li>• The connections on the CPU planar or CPU card</li> <li>• Memory modules for correct connections</li> <li>• Connections to the system planar.</li> <li>• Cooling fans operational</li> <li>• The environment for a too-high or too-low operating temperature.</li> <li>• Vibration: proximity to heavy equipment.</li> <li>• If available, run the system memory test from the System Management Services menu to check for intermittent memory problems.</li> </ul>
System unit powers off a few seconds after powering On.	<ul style="list-style-type: none"> <li>• Fan speed. Some fans contain a speed-sensing circuit. If one of these fans is slow, the power supply powers the system unit off.</li> <li>• Correct voltage at the outlet into which the system unit is plugged.</li> <li>• Loose power cables and fan connectors, both internal and external.</li> </ul>
System unit powers off after running for more than a few seconds.	<ul style="list-style-type: none"> <li>• Excessive temperature in the power supply area.</li> <li>• Loose cable connectors on the power distribution cables.</li> <li>• Fans turning at full speed after the system power has been on for more than a few seconds.</li> </ul>

Symptom of Hardware Problem	Things to Check For
Only internally installed devices are failing.	<p>Check the following items that are common to more than one device:</p> <ul style="list-style-type: none"> <li>• Ground connections on all of the disk drives and other types of drives installed.</li> <li>• Loose connections on the power cables to the planars, drives, fans, and battery.</li> <li>• System unit cooling. Is the input air temperature within limits? Are all the fans running at full speed? Are any of the vent areas blocked?</li> <li>• Signal cables to the diskette drives, and the power supply.</li> <li>• SCSI device signal cables for loose connectors and terminators.</li> <li>• Loose SCSI device address jumpers.</li> <li>• Possible contamination of any device that has a cleaning procedure. See the operator guide for cleaning instructions.</li> <li>• Excessive static electricity.</li> <li>• Correct voltage at the system unit power outlet</li> </ul>
Only externally attached devices are failing.	<p>Check the following items that are common to more than one device.</p> <ul style="list-style-type: none"> <li>• Check the SCSI signal cables to the devices for loose connectors and terminators.</li> <li>• Check devices that use jumpers to set the SCSI address for loose jumpers.</li> <li>• Check any device that has a cleaning procedure for contamination. See the operator guide for cleaning instructions.</li> <li>• Check for excessive static electricity.</li> <li>• Check the outlet that the device is plugged into for correct voltage.</li> <li>• Check the error log for entries for the adapter driving the failing devices.</li> <li>• Check the temperature of the devices. Are the cooling vents blocked? Are the fans running?</li> <li>• Check for other devices near the failing device that may be radiating noise (displays, printers, and so on).</li> </ul>

## Software Symptoms

Symptom of Software Problem	Things to Check For
Any symptom you suspect is related to software.	<p>Use the software documentation to analyze software problems.</p> <p>Be sure to check RETAIN<sup>®</sup> for known problems with your type of system unit or software.</p>
Software-caused system crashes	<p>Check the following software items:</p> <ul style="list-style-type: none"> <li>• Is the problem only with one application program?</li> <li>• Is the problem only with one device?</li> <li>• Does the problem occur on a recently installed program?</li> <li>• Was the program recently patched or modified in any way?</li> <li>• Is the problem associated with any communication lines?</li> <li>• Check for static discharge occurring at the time of the failure.</li> </ul>

## MAP 0050: SCSI Bus Problems

### Purpose of This MAP

Use this MAP to analyze problems with a SCSI bus.

For additional information about this adapter, see the *RS/6000 @server pSeries Adapters, Devices, and Cable Information for Multiple Bus Systems*.

### Considerations

- Remove power from the system before connecting and disconnecting cables or devices to prevent hardware damage or erroneous diagnostic results.
- Also, use this MAP for SCSI adapters that are built into system boards or I/O boards. Replace the system board or I/O board when the procedure calls for replacing the adapter.
- If the failure is a terminator power failure (SRNs xxx-226, xxx-240, xxx-800), always allow five minutes for the PTC to cool.
- The differential version of the adapter has socket-type terminators to support high-availability. If this is the adapter's configuration, the terminators would have been removed from the adapter. MAP steps requiring the removal of the cable from the adapter are inapplicable, since an adapter that is not terminated always fails diagnostics. Proper SCSI diagnostics require proper termination. If the configuration involves a Y-cable, leave it, with the appropriate terminator, attached to the adapter. Or, place an external differential terminator on the external port.
- If the system uses shared DASD or high-availability configuration, be sure that the other system sharing the devices is not using those devices. For additional information concerning high-availability configurations, see "SCSI service hints" on page 398.
- For intermittent problems that cannot be resolved with this MAP, refer to "SCSI service hints" on page 398.
- If the SCSI bus is attached to a RAID subsystem, refer to the RAID subsystem documentation for any problem determination. If the RAID adapter is a PCI-X RAID adapter, refer to the *PCI-X SCSI RAID Controller Reference Guide for AIX*.

Follow the steps in this MAP to isolate a SCSI bus problem.

- **Step 0050-1**

**Have recent changes been made to the SCSI configuration?**

**NO** Go to Step 0050-2.

**YES** Go to Step 0050-5.

- **Step 0050-2**

**Are there any hot-swap devices controlled by the adapter?**

**NO** Go to Step 0050-3.

**YES** Go to Step 0050-11.

- **Step 0050-3**

**Are there any devices other than hot-swappable devices controlled by the adapter?**

**NO** Go to Step 0050-4.

**YES** Go to Step 0050-13.

- **Step 0050-4**

**Is an enclosure or drawer that supports hot-swap devices controlled by the adapter?**

**NO** Go to Step 0050-22.

**YES** Go to Step 0050-15.

- **Step 0050-5**

This step handles cases where recent changes have been made to the SCSI configuration.

Using the first three digits of the SRN, refer to the FFC listing and determine if the adapter is single-ended or differential.

**Is the adapter a single-ended adapter?**



- NO** Go to Step 0050-6.
- YES** Go to Step 0050-7.
- **Step 0050-6**

The adapter's termination jumper settings may be incorrect. Power off the system, and inspect Jumper J7. Refer to the "SCSI Cabling" section of the *RS/6000 @server pSeries Adapters, Devices, and Cable Information for Multiple Bus Systems* for the correct jumper settings.

**Are the jumpers correct?**

**NO** Go to Step 0050-8.

**YES** Go to Step 0050-9.
  - **Step 0050-7**

If the adapter *is not* being used in a high-availability configuration, be sure sockets RN1, RN2, and RN3 are populated.

If the adapter *is* being used in a high-availability configuration, be sure sockets RN1, RN2, and RN3 *are not* populated.

Go to Step 0050-9.
  - **Step 0050-8**
    1. Correct the jumper settings and reinstall the adapter and all cables.
    2. Power on the system, and run diagnostics in system verification mode on the adapter.

**Did the diagnostic pass?**

**NO** Go to Step 0050-9.

**YES** Go to Step 0050-10.
  - **Step 0050-9**

Check for the following problems:

    - Address conflicts between devices.
    - Cabling problems such as; configurations that exceed the maximum cable lengths, missing termination, or excessive termination.

Refer to the *RS/6000 @server pSeries Adapters, Devices, and Cable Information for Multiple Bus Systems* for more details about supported SCSI cabling.

**Did you find a problem?**

**NO** Go to Step 0050-2.

**YES** Go to Step 0050-10.
  - **Step 0050-10**
    1. Correct the problem.
    2. Power on the system, and run diagnostics in system verification mode on the adapter.

**Did a failure occur?**

**NO** Go to MAP 0410: Repair Checkout.

**YES** Go to Step 0050-2.
  - **Step 0050-11**

This step determines if a hot-swap device is causing the failure.

    1. Power off the system.
    2. Disconnect all hot-swap devices attached to the adapter.
    3. Power on the system, and boot the system in the same mode that you were in when you received the symptom that led you to this MAP.
    4. If the Missing Options menu displays, select the **The resource has been turned off, but should remain in the system configuration** option for all the devices that were disconnected.

5. Run the diagnostics in system verification mode on the adapter.

**Did a failure occur?**

**NO** Go to Step 0050-12.

**YES** Go to Step 0050-3.

• **Step 0050-12**

Power off the system. Reconnect the hot-swap devices one at time. After reconnecting each device, follow this procedure:

1. Power on the system.
2. Rerun the diagnostics on the adapter.
3. If the adapter fails, the problem may be with the last device reconnected. Perform these substeps:
  - a. Follow repair procedures for that last device.
  - b. Rerun diagnostics on the adapter.
  - c. If diagnostics fail, replace the SES backplane corresponding to the slot for the device.
  - d. Rerun diagnostics.
  - e. If diagnostics fail, replace the last device.
  - f. Rerun diagnostics on the adapter.
  - g. If diagnostics pass, go to “MAP 0410: Repair checkout” on page 310MAP 0410: Repair Checkout. Otherwise, contact your support center.

**Note:** A device problem can cause other devices attached to the same SCSI adapter to go into the Defined state. Ask the system administrator to make sure that all devices attached to the same SCSI adapter as the device that you replaced are in the Available state.

4. If no errors occur, the problem could be intermittent. Make a record of the problem. Running the diagnostics for each device on the bus may provide additional information.

• **Step 0050-13**

This step determines if a device other than a hot-swappable device is causing the failure. Follow these steps:

1. Power off the system.
2. Disconnect all devices attached to the adapter (except for the device from which you boot to run diagnostics; you may want to temporarily move this device to another SCSI port while you are trying to find the problem).
3. Power on the system.
4. If the Missing Options menu displays, select the **The resource has been turned off, but should remain in the system configuration** option for all the devices that were disconnected.
5. Run the diagnostics in system verification mode on the adapter.

**Did a failure occur?**

**NO** Go to Step 0050-14.

**YES** Go to Step 0050-4.

• **Step 0050-14**

Reconnect the devices one at time. After reconnecting each device, follow this procedure:

1. Rerun the diagnostics in system verification mode on the adapter.
2. If there is a failure, the problem should be with the last device reconnected. Follow the repair procedures for that device, then go to MAP 0410: Repair Checkout.
3. If no errors occur, the problem could be intermittent. Make a record of the problem. Running the diagnostics for each device on the bus may provide additional information.

• **Step 0050-15**

This step determines if the SCSI Enclosure Services (SES) is the problem. Note that the SES is referred to as the DASD controller in some systems.

Refer to the system or enclosure service guide to determine if the SES (DASD controller) is a FRU that plugs into the backplane or is integrated on the backplane.

**Does the SES (DASD controller) plug into the backplane?**

**NO** Go to Step 0050-18.

**YES** Go to Step 0050-16.

- **Step 0050-16**

Follow these steps:

1. Power off the system.
2. Remove the SES (DASD controller). Locate the SES (DASD controller) part number under FFC 199.
3. Power on the system.
4. If the Missing Options menu displays, select the **The resource has been turned off, but should remain in the system configuration** option for all the devices that were disconnected.
5. Run the diagnostics in system verification mode on the adapter.

**Did a failure occur?**

**NO** Go to Step 0050-17.

**YES** Go to Step 0050-18.

- **Step 0050-17**

Follow these steps:

1. Power off the system.
2. Replace the SES (DASD controller).
3. Go to MAP 0410: Repair Checkout.

- **Step 0050-18**

Follow these steps:

1. Power off the system.
2. Disconnect all cables attached to the adapter. For SCSI differential adapters in a high-availability configuration, see Considerations.
3. Power on the system.
4. If the Missing Options menu displays, select the **The resource has been turned off, but should remain in the system configuration** option for all the devices that were disconnected.
5. Run the diagnostics in system verification mode on the adapter.

**Did a failure occur?**

**NO** Go to Step 0050-19.

**YES** Replace the adapter, then go to MAP 0410: Repair Checkout.

- **Step 0050-19**

Follow these steps:

1. Power off the system.
2. Reconnect the cables to the adapter.

**Does the SES (DASD controller) plug into the backplane?**

**NO** Go to Step 0050-20.

**YES** Go to Step 0050-21.

- **Step 0050-20**

Follow these steps:

1. Replace the SES (DASD controller). Locate the SES (DASD controller) part number under FFC 199.
2. Power on the system.
3. If the Missing Options menu displays, select the **The resource has been turned off, but should remain in the system configuration** option for all the devices that were disconnected.
4. Run the diagnostics in system verification mode on the adapter.

**Did a failure occur?**

**NO** Go to MAP 0410: Repair Checkout.

**YES** Go to Step 0050-21.

- **Step 0050-21**

One of the cables remaining in the system is defective. Refer to FFC 190 for the cable part numbers. Replace the parts one at a time in the order listed. Follow these steps for each FRU replaced:

1. Rerun the diagnostics for the adapter.
2. If there is any failure, continue with the next FRU.
3. If there is no failure, go to MAP 0410: Repair Checkout.

- **Step 0050-22**

Follow these steps:

1. Power off the system.
2. Disconnect all cables attached to the adapter (except for the cable to the device from which you boot to run diagnostics; you may want to temporarily move this device to another SCSI port while you are trying to find the problem).
3. Power on the system.
4. If the Missing Options menu displays, select the **The resource has been turned off, but should remain in the system configuration** option for all the devices that were disconnected.
5. Run the diagnostics on the adapter.

**Did a failure occur?**

**NO** Go to Step 0050-23.

**YES** Replace the adapter, then go to MAP 0410: Repair Checkout.

- **Step 0050-23**

One of the cables remaining in the system is defective. Refer to FFC 190 for the cable part numbers. Replace the parts one at a time in the order listed. Follow these steps for each FRU replaced:

1. Rerun the diagnostics for the adapter.
2. If there is any failure, continue with the next FRU.
3. If there is no failure, go to MAP 0410: Repair Checkout.

## **MAP 0054: PCI-X SCSI Bus Problems**

### **Purpose of This MAP**

Use the following to determine what FRUs may need to be replaced in order to solve a SCSI bus related problem on a PCI-X SCSI or PCI-X SCSI RAID adapter.

### **Considerations**

- Remove power from the system before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage or erroneous diagnostic results.
- Note that some systems have SCSI and PCI-X bus interface logic integrated onto the system boards and use a pluggable RAID Enablement Card (a non-PCI form factor card) for these SCSI/PCI-X busses. An example of such a RAID Enablement Card is FC 5709. For these configurations, replacement of the RAID Enablement Card is unlikely to solve a SCSI bus related problem, since the SCSI bus interface logic is on the system board.

- Some adapters provide two connectors, one internal and one external, for each SCSI bus. For this type of adapter, it is not acceptable to use both connectors for the same SCSI bus at the same time. SCSI bus problems are likely to occur if this is one. However, it is acceptable to use an internal connector for one SCSI bus and an external connector for another SCSI bus. The internal and external connectors are labeled to indicate which SCSI bus they correspond to.

**Attention:** Replacing RAID adapters is not recommended without assistance from your service support structure when SCSI bus problems exist. Because the adapter may contain non-volatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter when SCSI bus problems exist.

Removing functioning disks in a disk array is not recommended without assistance from your service support structure. A disk array may become degraded or failed if functioning disks are removed, and additional problems may be created.

Follow the steps in this MAP to isolate a PCI-X SCSI bus problem.

- **Step 0054-1**

Identify the SCSI bus on which the problem is occurring on by examining the hardware error log. To view the hardware error log, do the following

1. Invoke diagnostics and select **Task Selection** on the Function Selection screen.
2. Select **Display Hardware Error Report**.
3. Choose one of the following options:
  - If the type of adapter is not known, select **Display Hardware Errors for Any Resource**.
  - If the adapter is a PCI-X SCSI adapter, select **Display Hardware Errors for PCI-X SCSI Adapters**.
  - If the adapter is a PCI-X SCSI RAID adapter, select **Display Hardware Errors for PCI-X SCSI RAID Adapters**.
4. Select the resource, or select **All Resources** if the resource is not known.

**Note:** If you had previously selected **Display Hardware Errors for Any Resource**, then select **All Resources**.

5. On the Error Summary screen, look for an entry with a SRN corresponding to the problem which sent you here, and select it.

**Note:** If multiple entries exist for the SRN it could be that some entries are old or that the problem has occurred on multiple entities (adapters, disk arrays, and/or devices). Older entries can be ignored; however, this MAP may need to be used multiple times if the same problem has occurred on multiple entities.

6. Select the hardware error log to view.

While viewing the hardware error log, under the Detail Data and SENSE DATA headings, identify the first four bytes of the hexadecimal data (for example, nnnn nnnn nnnn nnnn ...). The four bytes identified in the error log can be interpreted as:

00bb ssLL

where:

- bb, when not FF, identifies the adapter's SCSI bus
- ss, when not FF, identifies the SCSI ID of a device
- LL, when not FF, identifies the logical unit number (LUN) of a device

Go to Step 0540-2.

- **Step 0054-2**

**Are the last two bytes of the four bytes identified in Step 0540-1, equal to FFFF (for example, 00bb FFFF, where bb identifies the adapter's SCSI bus)?**

**NO** Go to Step 0540-4.

**YES** Go to Step 0540-3.

• **Step 0054-3**

While the error persists, replace the components of the failing SCSI bus in the following order:

1. Cable on bus bb (if present)
2. Adapter (if SCSI bus interface logic is on the adapter) or system board (if SCSI bus interface logic is on the system board)

To replace a component, and see if the problem was corrected, do the following:

1. Follow the removal and replacement procedure for the component as previously described in this step.
2. Run diagnostics in system verification mode on the adapter.

When the problem is resolved, go to MAP 0410: Repair Checkout.

• **Step 0054-4**

**Are the last two bytes of the four bytes identified in Step 0540-1, equal to FF00 (for example, 00bb FF00, where bb identifies the adapter's SCSI bus)?**

**NO** Go to Step 0540-6.

**YES** Go to Step 0540-5.

• **Step 0054-5**

While the error persists, replace the components of the failing SCSI bus in the following order:

1. Cable on bus bb (if present)
2. Adapter (if SCSI bus interface logic is on the adapter) or system board (if the SCSI bus interface logic is on the system board)
3. DASD backplane attached to bus bb (if present)

To replace a component, and see if the problem was corrected, do the following:

1. Follow the removal and replacement procedure for the component as previously described in this step.
2. Run diagnostics in system verification mode on the adapter.

When the problem is resolved, go to MAP 0410: Repair Checkout.

• **Step 0054-6**

While the error persists, replace the components of the failing SCSI bus in the following order:

1. Device on bus bb with SCSI ID ss
2. Cable on bus bb (if present)
3. Adapter (if SCSI bus interface logic is on the adapter) or system board (if SCSI bus interface logic is on the system board)

To replace a component and see if the problem was corrected, do the following:

1. Follow the removal and replacement procedure for the component as previously described in this step.
2. Run diagnostics in system verification mode on the adapter.

When the problem is resolved, go to MAP 0410: Repair Checkout.

## **MAP 0070: 888 sequence in operator panel display**

### **Purpose of this MAP**

An 888 sequence in operator panel display suggests that either a hardware or software problem has been detected and a diagnostic message is ready to be read.

**Note:** The 888 may or may not be flashing on the operator panel display.

- **Step 0070-1**

Perform the following steps to record the information contained in the 888 sequence message.

1. Wait until the 888 sequence displays.
2. Record, in sequence, every code displayed after the 888. On systems with a 3-digit or a 4-digit operator panel, you may need to press the system's "reset" button to view the additional digits after the 888. Stop recording when the 888 digits reappear.
3. Go to Step 0070-2.

- **Step 0070-2**

Using the first code that you recorded, use the following list to determine the next step to use.

**Type 102**        Go to Step 0070-3.

**Type 103**        Go to Step 0070-4.

- **Step 0070-3**

A Type 102 message generates when a software or hardware error occurs during system execution of an application. Use the following information to determine the content of the type 102 message. Descriptions of the crash codes and the dump status codes are in AIX Diagnostic Numbers and Location Codes AIX IPL Progress codes.

The message readout sequence is:

102 = Message type

RRR = Crash code (the three-digit code that immediately follows the 102)

SSS = Dump status code (the three-digit code that immediately follows the Crash code).

Record the Crash code and the Dump Status from the message you recorded in Step 0070-1. For an explanation of the Dump Status or the Crash Codes, see AIX Diagnostic Numbers and Location Codes AIX IPL Progress codes.

**Are there additional codes following the Dump Status?**

**No**        Go to Step 0070-5.

**YES**        The message also has a type 103 message included in it. Go to Step 0070-4 to decipher the SRN and field replaceable unit (FRU) information in the Type 103 message.

**Note:** Type 102 messages have no associated SRNs.

- **Step 0070-4**

A Type 103 message generates upon hardware error detection. Use the following steps and information you recorded in Step 0070-1 to determine the content of the Type 103 message.

The message readout sequence is:

103 = Message type

(x)xxx (y)yyy = SRN

(where (x)xxx = the three- or four-digit code following the 103 and (y)yyy is the three- or four-digit code following the (x)xxx code).

1. Record the SRN and FRU location codes from the recorded message.
2. Find the SRN in the Service Request Number List and do the indicated action.

**Note:** The only way to recover from an 888 type of halt is to turn off the system unit.

- **Step 0070-5**

Perform the following steps:

1. Turn off the system unit power.
2. Turn on the system unit power, and load the online diagnostics in service mode.
3. Wait until one of the following conditions occurs:
  - You are able to load the diagnostics to the point where the Diagnostic Mode Selection menu displays.

- The system stops with an 888 sequence.
- The system appears hung.

**Is the Diagnostic Mode Selection menu displayed?**

**No** Go to the Entry MAP in the system unit service guide.

**Yes** Go to Step 0070-6.

• **Step 0070-6**

Run the **All Resources** options under Advanced Diagnostics in Problem Determination Mode.

**Was an SRN reported by the diagnostics?**

**No** This is possibly a software-related 888 sequence. Follow the procedure for reporting a software problem.

**Yes** Record the SRN and its location code information. Find the SRN in the SRN Listing and do the indicated action.

**MAP 0080: System Bus Problem Isolation**

**Purpose of This MAP**

Use this MAP to analyze a bus problem that does not prevent the system from booting.

**Note:** Some devices installed in the system may require the loading of supplemental diskettes for diagnostic support.

• **Step 0080-1**

1. Perform a system shutdown and then, if necessary, turn off the system unit power.
2. Locate the diagnostic CD-ROM disc.
3. Turn on the system unit power, and then load the diagnostic CD-ROM disc into the CD-ROM drive.
4. Load the Standalone Diagnostics.
5. Wait until the "Please Define the System Console" screen displays or all system activity appears to have stopped.

**Is the "Please Define the System Console" screen displayed?**

**No** The symptom has changed. Use MAP 1540 in the system unit's service guide.

**Yes** Go to Step 0080-2.

• **Step 0080-2**

Follow the displayed instructions until the Installed Resources menu displays.

**Are all of the installed PCI adapters listed on the Installed Resources menu?**

**No** Go to Step 0080-3 and make a note of all PCI adapters not listed and their locations.

**Yes** You may have an intermittent problem. If you think that you have an intermittent problem, go to MAP 0040: Intermittent Problem Isolation.

• **Step 0080-3**

1. Perform a system shutdown, and then, if necessary, turn off the system unit power.
2. Remove all but one of the PCI adapters that was not listed on the Installed Resources menu.

**Note:** If only one adapter is present, do not remove it.

3. Turn on the system unit power, and load standalone diagnostics from the CD-ROM.
4. Wait until the "Please define the System Console" screen displays or all system activity appears to have stopped.

**Is the "Please Define the System Console" screen displayed?**



- No** The symptom has changed. Use MAP 1540 in the system unit's service guide.
- Yes** Go to Step 0080-4.
- **Step 0080-4**  
Follow the displayed instructions until the Installed Resources menu displays.  
**Is the adapter that you did not remove shown as an installed resource?**

**No** Record SRN 111-78C and make a note of the adapter you just installed. Look up the SRN in the SRN listings and perform the indicated action.

**Yes** Go to Step 0080-5.
  - **Step 0080-5**  
**Have you installed all of the removed adapters?**

**No** Go to Step 0080-6.

**Yes** Call your service support structure.
  - **Step 0080-6**
    1. Perform a system shutdown and then, if necessary, turn off the system unit power.
    2. Install one of the remaining removed adapters into its original location.
    3. Turn on the system unit power, and load Standalone Diagnostics from the CD-ROM.
    4. Wait until the "Please Define the System Console" screen displays or all system activity appears to stop.

**Is the "Please Define the System Console" screen displayed?**

**No** The symptom has changed. Use MAP 1540 in the system unit's service guide.

**Yes** Go to Step 0080-7.
  - **Step 0080-7**  
Follow the displayed instructions until the Installed Resources menu displays.  
**Is the adapter that you just installed shown as an installed resource?**

**No** Record SRN 111-78C and make a note of the adapter you just installed. Look up the SRN in the SRN listings and perform the indicated action.

**Yes** Go to Step 0080-5.

## General problem resolution

Use this procedure to exchange the FRUs in the order of their failure probability.

### Step 0210-1

**Did the problem report provide a part number for the FRU you are about to replace?**

**NO** Go to "Step 0210-2."

**YES** Go to "Step 0210-3."

### Step 0210-2

Find the failing function codes in the Failing function code list, and record the FRU part number and description of each FRU.

### Step 0210-3

Obtain the replacement part.

### Step 0210-4

Go to Removing and replacing parts, then follow the procedures for the FRU you are servicing.

## Hot-Swap FRU problem resolution

Use this procedure to exchange hot-swappable field replaceable units (FRUs).

**Note:** The FRU you want to hot plug might have a defect on it that can cause the hot-plug operation to fail. If, after following the hot-plug procedure, you continue to get an error message that indicates that the hot-plug operation has failed, schedule a time for deferred maintenance when the system containing the FRU can be powered down. Then go to MAP 0210: General problem resolution, Step 0210-2 and answer NO to the question **Do you want to exchange this FRU as a hot-plug FRU?**

**Attention:** If the FRU is a disk drive or an adapter, ask the system administrator to perform any steps necessary to prepare the device for removal.

- **Step 0220-1**

1. If the system displayed a FRU part number on the screen, use that part number to exchange the FRU.

If there is no FRU part number displayed on the screen, refer to the SRN listing. Record the SRN source code and the failing function codes in the order listed.

2. Find the failing function codes in the FFC listing, and record the FRU part number and description of each FRU.
3. To determine if the part is hot-swappable, refer to the removing and replacing parts procedure for the part .

**Does this system unit support hot-swapping of the first FRU listed?**

**NO** Go to MAP 0210: General problem resolution MAP 0210: General problem resolution.

**YES** Go to Step 0220-2.

- **Step 0220-2**

**Is the FRU a hot-swap power supply or fan?**

**NO** Go to Step 0220-4.

**YES** Go to Step 0220-3.

- **Step 0220-3**

**Note:** Refer to the removing and replacing parts procedure for the part .

1. Remove the old FRU.
2. Install the new FRU.
3. Enter the **diag** command.

Go to Step 0220-14.

- **Step 0220-4**

**Is the FRU a hot-plug PCI adapter?**

**NO** Go to Step 0220-5.

**YES** Go to Step 0220-12.

- **Step 0220-5**

**Is the FRU a SCSI hot-plug device?**

**NO** Go to Step 0220-11.

**YES** Go to Step 0220-6.

- **Step 0220-6**

**Is the hot-plug drive located within a system unit?**

**NO** Go to Step 0220-8.

**YES** Go to Step 0220-7.

- **Step 0220-7**

Refer to the removing and replacing procedures for your system in removing and replacing parts .

Go to Step 0220-13.

- **Step 0220-8**

**Does the hot-plug drive's enclosure have procedures for Removing and Replacing SCSI Disk drives?**

**NO** Go to Step 0220-9.

**YES** If a hot-plug procedure exists, use that procedure to remove the old hot-plug SCSI disk drive and replace it with a new hot-plug SCSI disk drive. Otherwise, if no hot-plug procedure exists, use the power off procedure to remove the old SCSI disk drive and replace it with a new SCSI disk drive. Go to Step 0220-13.

- **Step 0220-9**

1. Ask the customer to back up the data on the drive that you intend to replace onto another drive.
2. Verify that the disk drive is in the Defined state. The amber LED on the hot-plug disk drive should be off.

**Is the hot-plug disk drive's amber LED unlit?**

**NO** Ask the customer to remove the hot-plug disk drive from the operating system configuration (refer them to System Management guide for more information).

**YES** Go to Step 0220-10.

- **Step 0220-10**

Using the Hot-Plug task service aid described in Go to AIX tasks and service aids, replace the hot-plug drive using the following procedure:

1. Use the **List the SES Devices** option to show the configuration of the hot-plug slots. Identify the slot number of the adapter for the FRU you want to replace.
2. Select the **REPLACE/REMOVE a Device Attached to an SES Device** option.
3. Select the slot which contains the SCSI hot-plug drive you wish to replace. Press Enter. You will see a fast blinking green light on the front on the hot-plug drive indicating that it is ready for removal.

**Note:** Refer to service guide for the system unit or enclosure that contains the hot-plug drive for removal and replacement procedures.

4. Remove the old hot-plug drive.
5. Install the new hot-plug drive. Once the hot-plug drive is in place, press Enter.
6. Press the exit key. Wait while configuration is done on the drive, until you see the "hot-plug task" on the service aid menu.

Go to Step 0220-15.

- **Step 0220-11**

**Attention:** Removing functioning disks in a disk array attached to a PCI-X SCSI RAID Controller is not recommended without assistance from your service support structure. A disk array may become degraded or failed if functioning disks are removed and additional problems may be created. If you still need to remove a RAID array disk attached to a PCI-X SCSI RAID Controller, use the SCSI and SCSI RAID Hot Plug Manager as described in SCSI and SCSI RAID Hot-Plug Manager.

Using the Hot Plug Task service aid described in AIX tasks and service aids, replace the hot-plug drive using the hot plug RAID service aid:

**Note:** The drive you wish to replace must be either a SPARE or FAILED drive. Otherwise, the drive would not be listed as an IDENTIFY AND REMOVE RESOURCES selection within the RAID HOT PLUG DEVICES screen. In that case you must ask the customer to put the drive into FAILED state. Refer them to the System Management Guide for more information. Ask the customer to back up the data on the drive that you intend to replace.

1. Select the **RAID HOT PLUG DEVICES** option within the **HOT PLUG TASK** under **DIAGNOSTIC SERVICE AIDS**.

2. Select the RAID adapter that is connected to the RAID array containing the RAID drive you wish to remove, then select **COMMIT**.
3. Choose the **IDENTIFY** option in the IDENTIFY AND REMOVE RESOURCES menu.
4. Select the physical disk which you wish to remove from the RAID array and press Enter.
5. The disk will go into the **IDENTIFY** state, indicated by a flashing light on the drive. Verify that it is the physical drive you wish to remove, then press Enter.
6. At the IDENTIFY AND REMOVE RESOURCES menu, choose the **REMOVE** option and press Enter.
7. A list of the physical disks in the system which may be removed will be displayed. If the physical disk you wish to remove is listed, select it and press Enter. The physical disk will go into the REMOVE state, as indicated by the LED on the drive. If the physical disk you wish to remove is not listed, it is not a SPARE or FAILED drive. Ask the customer to put the drive in the FAILED state before you can proceed to remove it. Refer the customer to the System Management Guide for more information.
8. Refer to service guide for the system unit or enclosure that contains the physical drive for removal and replacement procedures for the following substeps:
  - a. Remove the old hot-plug RAID drive.
  - b. Install the new hot-plug RAID drive. Once the hot-plug drive is in place, press Enter. The drive will exit the REMOVE state, and will go to the NORMAL state once you exit diagnostics.

**Note:** There are no elective tests to run on a RAID drive itself under diagnostics (the drives are tested by the RAID adapter).

9. This completes the repair. Return the system to the customer. Ask the customer to add the physical disk drive to the original configuration within the RAID. Refer them to system management guide for more information.

- **Step 0220-12**

1. Remove the old adapter FRU and replace it with the new adapter FRU. Refer to the removing and replacing parts procedure for the part.
2. Enter the diag command.
3. Go to the FUNCTION SELECTION menu, and select the Advanced Diagnostics Routines option.
4. When the DIAGNOSTIC MODE SELECTION menu displays, select the System Verification option.
5. Go to Step 0220-14.

- **Step 0220-13**

1. If not already running diagnostics, enter the diag command.

**Note:** If you are already running service mode diagnostics and have just performed the **Configure Added/Replaced Devices** task (under the SCSI Hot Swap manager of the Hot Plug Task service aid), you must use the F3 key to return to the DIAGNOSTIC OPERATING INSTRUCTIONS menu before proceeding with the next step, or else the drive might not appear on the resource list.

2. Go to the FUNCTION SELECTION menu, and select the **Advanced Diagnostics Routines** option.
3. When the DIAGNOSTIC MODE SELECTION menu displays, select the **System Verification** option.

**Does the hot-plug SCSI disk drive you just replaced appear on the resource list?**

**NO** Verify that you have correctly followed the procedures for replacing hot-plug SCSI disk drives in the system service guide. If the disk drive still does not appear in the resource list, go to MAP 0210: General Problem Resolution to replace the resource that the hot-plug SCSI disk drive is plugged in to.

**YES** Go to Step 0220-14.

- **Step 0220-14**

- Run the diagnostic test on the FRU you just replaced.

**Did the diagnostics run with no trouble found?**

**NO** Go to Step 0220-15.

**YES** Go to MAP 0410: Repair checkout. Before returning the system to the customer, if a hot-plug disk has been removed, ask the customer to add the hot-plug disk drive to the operating system configuration. Refer to system management guide for more information."

• **Step 0220-15**

1. Use the **Log Repair Action** option in the TASK SELECTION menu to update the AIX error log. If the repair action was reseating a cable or adapter, select the resource associated with your repair action. If it is not displayed on the resource list, select **sysplanar0**.

**Note:** On systems with a Fault Indicator LED, this changes the Fault Indicator LED from the "Fault" state to the "Normal" state.

2. While in diagnostics, go to the FUNCTION SELECTION menu. Select the **Advanced Diagnostics Routines** option.
3. When the DIAGNOSTIC MODE SELECTION menu displays, select the **System Verification** option. Run the diagnostic test on the FRU you just replaced, or **sysplanar0**.

**Did the diagnostics run with no trouble found?**

**NO** Go to Step 0220-16.

**YES** If you changed the Service Processor or Network settings, restore the settings to the value they had prior to servicing the system. If you performed service on a PCI RAID subsystem involving changing of the RAID adapter cache card or changing the configuration on RAID disks, ask the customer to run PCI SCSI Disk Array Manager using smitty to resolve the PCI SCSI RAID Adapter configuration. The following is an example of how the customer would resolve the configuration:

1. At the AIX command line, type `smitty pdam`.
2. On the "PCI SCSI Disk Array Manager" screen, select **RECOVERY OPTIONS**.
3. If a previous configuration exists on the replacement adapter, this must be cleared. Select **Clear PCI SCSI RAID Adapter Configuration**. Press F3.
4. On the "Recovery Options" screen, select **RESOLVE PCI SCSI RAID ADAPTER CONFIGURATION**.
5. On the "Resolve PCI SCSI RAID Adapter Configuration" screen, select **ACCEPT CONFIGURATION on DRIVES**.
6. On the PCI SCSI RAID Adapter selection menu, select the adapter that you changed.
7. On the next screen, press Enter.
8. When you get the "Are You Sure?" selection menu, press Enter to continue.
9. You should get an OK status message when the recovery is complete. If you get a Failed status message, verify that you are doing recovery on the correct adapter, then do this complete procedure. When you complete the recovery, exit smitty to return to the AIX command line.

Go to MAP 0410: Repair checkout.

• **Step 0220-16**

**Does the original problem persist?**

**NO** If a FRU was replaced, run the Log repair action service aid under the online diagnostics for the resource that was replaced. If the resource associated with your action is not displayed on the Resource List, select **sysplanar0**. If steps were taken to make the device ready for removal, inform the system administrator of the steps required to return the system to the original state. Go to MAP 0410: Repair checkout.

**YES** Go to Step 0220-17.

- **Step 0220-17**

**Have you exchanged all the FRUs that correspond to the failing function codes?**

**NO** Go to Step 0220-18.

**YES** The SRN did not identify the failing FRU. Schedule a time to run diagnostics in service mode. If the same SRN is reported in service mode, go to MAP 0030: Additional Problem Determination.

- **Step 0220-18**

**Note:** Before proceeding, remove the FRU you just replaced and install the original FRU in its place.

**Does the system unit support hot-swapping of the next FRU listed?**

**NO** Go to MAP 0210: General Problem Resolution.

**YES** The SRN did not identify the failing FRU. Schedule a time to run diagnostics in service mode. If the same SRN is reported in service mode, go to Step 0220-14.

## **MAP 0260: System hangs during resource configuration**

### **Purpose of this MAP**

This MAP handles problems when the system unit hangs while configuring a resource.

- **Step 0260-1**

The last three or four digits of the SRN following the dash (-) match a failing function code number.

Look at the Failing Function Code List and find the failing function code that matches the last three or four digits of your SRN, following the dash. Record the FRU part number and description (use the first FRU part listed when multiple FRUs are listed).

The physical location code, AIX location code, or device name displays on system units with multiple-line LCD operator panel display if AIX 4.3.3 or higher operating system is installed.

**Do you have either a physical location code or AIX location code displayed?**

**NO** Go to Step 0260-4.

**YES** Go to Step 0260-2.

- **Step 0260-2**

**Are there any FRUs attached to the device described by the physical location code or AIX location code?**

**No** Go to Step 0260-6

**Yes** Go to Step 0260-3

- **Step 0260-3**

Remove this kind of FRU attached to the device described in the location code one at a time. Note whether the system still hangs after each device is removed. Do this until you no longer get a hang, or all attached FRUS have been removed from the adapter or device.

**Has the symptom changed?**

**No** Go to Step 0260-4

**Yes** Use the location code of the attached device that you removed when the symptom changed, and go to Step 0260-6.

- **Step 0260-4**

**Does your system unit contain only one of this kind of FRU?**

**NO** Go to Step 0260-5.

**YES** Go to Step 0260-6.

- **Step 0260-5**

One of the FRUs of this kind is defective.

Remove this kind of FRU one at a time. Test the system unit after each FRU is removed. When the test completes successfully or when you have removed all of the FRUs of this kind.

**Were you able to identify a failing FRU?**

**NO** Go to MAP 1540: Problem Isolation Procedure.

**YES** Go to Step 0260-6.

• **Step 0260-6**

1. Turn off the system unit.
2. Exchange the FRU identified by the location code or Step 0260-5.

**Is this system capable of running online diagnostics in Service Mode?**

**NO** Go to Step 02607.

**YES** Go to Step 02608.

• **Step 0260-7**

1. Turn on the system unit.
2. Load the Standalone diagnostics (if needed, refer to the Service Guide).
3. Wait until the Diagnostic Operating Instructions display or the system appears to have stopped.

**Are the DIAGNOSTIC OPERATING INSTRUCTIONS displayed?**

**NO** Go to Step 02609.

**YES** Go to MAP 0410: Repair Checkout.

• **Step 0260-8**

1. Turn on the system unit.
2. Load the Online Diagnostics in Service Mode (if needed, refer to the Service Guide).
3. Wait until the Diagnostic Operating Instructions display or the system appears to have stopped.

**Are the DIAGNOSTIC OPERATING INSTRUCTIONS displayed?**

**NO** Go to Step 0260-9.

**YES** Go to MAP 0410: Repair Checkout.

• **Step 0260-9**

Look at the operator panel display.

**Is the number displayed the same as the last three or four digits after the dash (-) of your SRN?**

**NO** The symptom changed. Check for loose cards, cables, and obvious problems. If you do not find a problem, go to MAP 0020: Problem Determination Procedure and get a new SRN.

**YES** Go to Step 0260-10.

• **Step 0260-10**

**Was the FRU you exchanged an adapter or a planar?**

**NO** Go to Step 0260-11.

**YES** Go to MAP 1540: Problem Isolation Procedure.

• **Step 0260-11**

**Was the FRU you exchanged a device?**

**NO** Go to MAP 1540: Problem Isolation Procedure.

**YES** Go to Step 0260-12.

• **Step 0260-12**

The adapter for the device may be causing the problem.

1. Turn off the system unit.
2. Exchange the adapter for the device.

**Note:** If the AIX operating system is not used on the system, start diagnostics from an alternate source.

3. Turn on the system unit. If c31 is displayed, follow the displayed instructions to select a console display.
4. Load the Online Diagnostics in Service Mode (if needed, refer to the service guide).
5. Wait until the DIAGNOSTIC OPERATING INSTRUCTIONS display or the system appears to have stopped.

**Are the DIAGNOSTIC OPERATING INSTRUCTIONS displayed?**

**NO** Go to MAP 1540: Problem Isolation Procedure.

**YES** Go to MAP 0410: Repair Checkout.

## **MAP 0270: SCSI RAID problem resolution and verification**

### **Purpose of This MAP**

Use this MAP to Resolve SCSI RAID Adapter, Cache, or drive problems.

#### **Notes:**

1. This MAP assumes that the RAID adapter and drive microcode is at the correct level. To check microcode level, see PCI SCSI RAID Descriptions and Diagnostic Procedures.
2. This MAP only applies to PCI, not PCI-X RAID adapters.

**Attention:** If the FRU is a disk drive or an adapter, ask the system administrator to perform any steps necessary to prepare the device for removal.

#### • **Step 0270-1**

1. If the system displayed a FRU part number on the screen, use that part number. If there is no FRU part number displayed on the screen, refer to the SRN listing. Record the SRN source code and the failing function codes in the order listed.
2. Find the failing function codes in the FFC listing, and record the FRU part number and description of each FRU.

Go to Step 0270-2.

#### • **Step 0270-2**

##### **Is the FRU a RAID drive?**

**NO** Go to Step 0270-6.

**YES** Go to Step 0270-3.

#### • **Step 0270-3**

If the RAID drive you want to replace is not already in the **failed** state, then ask the customer to run the **PCI SCSI Disk Array Manager** using **smit** to fail the drive that you wish to replace. An example of this procedure is:

1. Login as root.
2. Type `smit pdam`.
3. Select **Fail a Drive in a PCI SCSI Disk Array**.
4. Select the appropriate disk array by placing the cursor over that array and press Enter.
5. Select the appropriate drive to fail based on the Channel and ID called out in diagnostics.
6. The **Fail a Drive** screen will appear. Verify that you are failing the correct drive by looking at the Channel ID row. Press Enter when verified correct. Press Enter again.
7. Press **F10** and type `smit pdam`



8. Select **"Change/Show PCI SCSI RAID Drive Status -> Remove a Failed Drive**

9. Select the drive that just failed.

Go to Step 0270-4.

- **Step 0270-4**

Using the Hot Plug Task service aid described in Hot-Swap Task, replace the RAID drive using the RAID HOT PLUG DEVICES service aid:

**Note:** The drive you wish to replace must be either a SPARE or FAILED drive. Otherwise, the drive would not be listed as an IDENTIFY AND REMOVE RESOURCES selection within the RAID HOT PLUG DEVICES screen. In that case you must ask the customer to put the drive into FAILED state. For information on putting the drive in a FAILED state, refer the customer to the *PCI Dual Channel Ultra320 SCSI RAID Adapter Installation and Using Guide*, order number SC23-1324.

1. Select the RAID HOT PLUG DEVICES option within the HOT PLUG TASK under DIAGNOSTIC SERVICE AIDS.
2. Select the RAID adapter that is connected to the RAID array containing the RAID drive you wish to remove, then select COMMIT.
3. Choose the IDENTIFY option in the IDENTIFY AND REMOVE RESOURCES menu.
4. Select the physical disk which you wish to remove from the RAID array and press Enter.
5. The disk will go into the IDENTIFY state, indicated by a flashing light on the drive. Verify that it is the physical drive you wish to remove, then press Enter.
6. At the IDENTIFY AND REMOVE RESOURCES menu, choose the REMOVE option and press Enter.
7. A list of the physical disks in the system which may be removed will be displayed. If the physical disk you wish to remove is listed, select it and press Enter. The physical disk will go into the REMOVE state, as indicated by the LED on the drive. If the physical disk you wish to remove is not listed, it is not a SPARE or FAILED drive. Ask the customer to put the drive in the FAILED state before you can proceed to remove it. For information on putting the drive in a FAILED state, refer the customer to the *PCI Dual Channel Ultra320 SCSI RAID Adapter Installation and Using Guide*, order number SC23-1324.
8. Refer to service guide for the system unit or enclosure that contains the physical drive for removal and replacement procedures for the following substeps:
  - a. Remove the old hot-swap RAID drive.
  - b. Install the new hot-swap RAID drive. Once the hot-swap drive is in place, press Enter. The drive will exit the REMOVE state, and will go to the NORMAL state once you exit diagnostics.

**Note:** There are no elective tests to run on a RAID drive itself under diagnostics (the drives are tested by the RAID adapter).

Go to Step 0270-5.

- **Step 0270-5**

If the RAID did not begin reconstructing automatically, then perform the steps that follow.

**Adding a Disk to the RAID array and Reconstructing:**

Ask the customer to run the PCI SCSI Disk Array Manager using **smit**. An example of this procedure is:

1. Login as root.
2. Type `smit pdam`.
3. Select **Change/Show PCI SCSI RAID Drive Status**.
4. Select **Add a Spare Drive**.
5. Select the appropriate adapter.
6. Select the Channel and ID of the drive which was replaced.

7. Press Enter when verified.
8. Press F3 until you are back at the **Change/Show PCI SCSI RAID Drive Status** screen.
9. Select **Add a Hot Spare**.
10. Select the drive you just added as a spare.
11. If there was no hot spare previously installed in the array, then the array will begin reconstructing immediately. Reconstruction time will vary based on the size of the RAID array. Allow 1-2 hours for completion.

To check the progress of the reconstruction:

1. Login as root.
2. Type `smit pdam`.
3. Select **List PCI SCSI RAID Arrays**.
4. Choose the array containing the drive you replaced.  
If the state of the RAID Array is reconstructing then it is in process of reconstructing. If it is optimal, then reconstruction has completed.
5. Press F10 to exit.

Go to Step 027017.

- **Step 0270-6**

**Is the FRU a RAID adapter base card, RAID adapter cache card, or RAID adapter battery?**

**NO** Go to Step 0270-15.

**YES** Go to Step 0270-7.

- **Step 0270-7**

**Do you want to change the FRU using a hot-swap operation?**

**NO** Power down the system, and remove the RAID adapter, if necessary refer to the Removal and Replacement Procedures section of the system service guide. Go to Step 0270-8.

**YES** Remove the RAID adapter, if necessary refer to the **Replacing a Hot-Swap PCI Adapter** within the Removal and Replacement Procedures section of the system service guide. Go to Step 0270-8.

- **Step 0270-8**

**Is the FRU you want to replace a RAID adapter cache card or RAID adapter battery?**

**NO** Go to Step 0270-10.

**YES** Go to Step 0270-9.

- **Step 0270-9**

Replace the FRU onto the existing base card.

Go to Step 0270-11.

- **Step 0270-10**

After physically removing the base card from the system, remove any other good FRUs (RAID cache card or cache battery) from the RAID base card adapter. Plug these FRUs on to the replacement RAID base card adapter FRU.

Go to Step 0270-11.

- **Step 0270-11**

**Did you change the FRU using a hot-swap operation?**

**NO** Install the RAID adapter assembly into the system, if necessary, refer to the removal and replacement procedures section of the system service guide. Power up the system and login to AIX. Go to Step 0270-12.

**YES** Install the RAID adapter assembly into the system. If needed, refer to the **Replacing a Hot-Swap PCI Adapter** section within the Removal and Replacement Procedures section of the system service guide. Go to Step 0270-12.

- **Step 0270-12**

**Was the replacement FRU a RAID base card?**

**NO** NO Go to Step 0270-14.

**YES** Go to Step 0270-13.

- **Step 0270-13**

**Attention:** Prior to cabling the SCSI RAID adapter to the subsystem check for preexisting configurations on the replacement SCSI RAID Base Card. The replacement base card can overwrite your system's configuration data if it already has a configuration written to it! Check it before cabling up the SCSI RAID Subsystem Array.

Ask to customer to check for preexisting configuration on the SCSI RAID Base Card. Below is an example of this procedure:

1. Login as root (if not already root).
2. Type `smit pdam`.
3. Select **List PCI SCSI RAID Arrays**.
4. If no RAID Arrays are listed, then there are no preexisting configurations on the base card.
5. Press **F10** key to exit

If a preexisting configuration exists on the base card, ask the customer to run the PCI SCSI Disk Array Manager using **smitty**.

1. Login as root (if not already root)
2. Type `smit pdam` from the AIX Command prompt (if not already in the RAID manager)
3. Select **Recovery Options**
4. Select **Clear PCI SCSI RAID Adapter Configuration**. Select the adapter which you just installed. Press Enter" to confirm.
5. Return to the **Recovery Options** menu (if not already there). Select **Resolve PCI SCSI RAID Adapter Configuration**. Select **Accept Configuration on Drives**. Select the adapter which you just installed. Press Enter to confirm. The configuration on the new adapter should now match the configuration existent on the drives.
6. Press **F10** to exit

You may now proceed to cable up the RAID system array.

Go to Step 0270-16.

- **Step 0270-14**

Ask the customer to resynchronize the RAID Array configuration. Below is an example of this procedure:

1. Log in as root (if not already root).
2. Type `smit pdam`.
3. Select **Recovery Options**.
4. Select **Resolve PCI SCSI RAID Adapter Configuration**.
5. Select **Retry Current Configuration**.
6. Select the appropriate `sraid` (SCSI RAID) adapter.
7. A message will be displayed as to the success of the operation.
8. Press **F10** to exit.

Go to Step 0270-16.

- **Step 0270-15**

Other RAID FRUs require that the system be shut down prior to replacement.

1. If the operating system is running, perform the operating system shutdown procedure (get help if needed).
2. Turn off the system power.
3. Replace the FRU indicated by the FFC.

Go to Step 0270-16.

- **Step 0270-16**

Run the diagnostics in system verification mode on the RAID subsystem.

**Did the diagnostics run with no trouble found?**

**NO** Go to Step 0270-18.

**YES** Go to Step 0270-17.

- **Step 0270-17**

1. Use the **Log Repair Action** option in the TASK SELECTION menu to update the AIX error log. Select **scraidX** (where X is the RAID adapter number of the RAID subsystem you've been working on).

**Note:** On systems with Fault Indicator LED, this changes the Fault Indicator LED from the **Fault** state to the **Normal** state.

2. While in diagnostics, go to the FUNCTION SELECTION menu. Select the **Advanced Diagnostics Routines** option.
3. When the DIAGNOSTIC MODE SELECTION menu displays, select the System Verification option. Run the diagnostic test on **scraidX** (where X is the RAID adapter number).

**Did the diagnostics run with no trouble found?**

**NO** Go to the Step 0270-18.

**YES** If you changed the Service Processor or Network settings, restore the settings to the value they had prior to servicing the system. If the system you are servicing has a hardware management console (HMC) with service focal point (SFP) go to the **End of Call MAP for systems with Service Focal Point** in the system service guide.

This completes the repair, return the system to the customer.

- **Step 0270-18**

**Have you exchanged all the FRUs that correspond to the failing function codes?**

**NO** Go to Step 0270-19.

**YES** The SRN did not identify the failing FRU. Schedule a time to run diagnostics in service mode. If the same SRN is reported in service mode, go to MAP 0030: Additional Problem Determination.

- **Step 0270-19**

**Note:** Note: Before proceeding, remove the FRU you just replaced and install the original FRU in it's place.

Use the next FRU on the list and go to Step 0270-2.

•

## **MAP 0280: Console and Keyboard Problem Resolution**

### **Purpose of This MAP**

Use this MAP to resolve console and keyboard problems when the system is booting. For other boot problems and concerns, go to Problems with loading and starting the operating system (AIX and Linux).

Entry Table	
Entry 1	Go to Step 0280-1.
Entry 2	Go to Step 0280-2.
Entry 3	Go to Step 0280-3.

- **Step 0280-1**

The system fails to respond to keyboard entries.

This problem is most likely caused by a faulty keyboard, keyboard adapter, or keyboard cable.

Try the FRUs in the order listed below: (Test each FRU by retrying the failing operation.)

1. Keyboard
2. Keyboard adapter (normally located on the system board)
3. Keyboard cable (if not included with the keyboard)

**Were you able to resolve the problem?**

**NO** Go to MAP 0030: Additional Problem Determination.

**YES** Go to MAP 0410: Repair Checkout.

- **Step 0280-2**

1. Some systems have a graphic adapter POST. Check your system guide for information about graphic adapter POSTs. If a graphic adapter POST is supported and it indicates a failure, follow the procedures in the system guide to resolve the problem.
2. If a graphic adapter POST is supported and it does not indicate a failure, suspect the display or display cable.
3. If the system does not have a graphic adapter POST, go to the display problem determination procedures. If you do not find a problem, replace the graphics adapter.

**Were you able to resolve the problem?**

**NO** Go to MAP 0030: Additional Problem Determination.

**YES** Go to MAP 0410: Repair Checkout.

- **Step 0280-3**

Go to the problem determination procedure for the terminal. If you do not find a problem, suspect the serial port adapter or terminal cable.

**Were you able to resolve the problem?**

**NO** Call your support person.

**YES** Go to MAP 0410: Repair Checkout.

## **MAP 0285: Multipath I/O (MPIO) Problem Resolution**

### **Purpose of This MAP**

Use this MAP to handle SRN A23-001 and ssss-640 (where ssss is the 3 or 4 digit FFC of an SCSD drive) to check the path from adapter to device.

**Note:** Not all devices support MPIO. Before proceeding with this MAP, make sure that the devices on both ends of the missing path support MPIO.

- **Step 0285-1**

Look at the problem report screen for the missing path. After the resource name and FRU, the next column identifies the missing path between resources (for example, scsi0 -> hdisk1). This indicates the missing path between the two resources, scsi0 (the parent resource) and hdisk1 (the child resource).

**Is the cabling present between the two resources?**

**NO** Go to Step 0285-2.

**YES** Go to Step 0285-4.

**Note:** In the following MAP steps, if no path previously existed between a parent and child device, the child device will have to be changed from the "defined" to the "available" state, otherwise you will be unable to select the child device to which you want to establish a path.

• **Step 0285-2**

1. Power off the system.
2. Connect the proper cable between the two resources.
3. Power on the system, rebooting AIX.
4. At the AIX command line, type `smitty mpio`.
5. Choose **MPIO Path Management**.
6. Select **Enable Paths**.
7. Select **Enable Paths for a Device**.
8. In the **Device Name** selection, choose the name of the child device (the device at the end of the path).
9. In the **Paths to Enable** selection, select the missing path (between the parent and child device).
10. Press Enter.

**Did the smitty menu complete with no errors?**

**NO** Go to Step 0285-4.

**YES** Go to Step 0285-3.

• **Step 0285-3**

To verify that the device path is present, rerun `diag -a`.

When the resource list displays, select the child resource that had the missing path. If the letter P is shown in front of the resource, you still have a path problem. If no letter P is shown in front of the resource or if the system returns to the command prompt or you get a message without the resource list being displayed, then the problem has been resolved.

**Do you still have a path problem?**

**NO** Go to MAP 0410: Repair Checkout.

**YES** Go to Step 0285-4.

• **Step 0285-4**

1. Power off the system.
2. Reseat the cables between the device and the adapter that have the missing path.
3. Power on the system, rebooting AIX.
4. At the AIX command line, type `smitty mpio`.
5. Choose **MPIO Path Management**.
6. Select **Enable Paths**.
7. Select **Enable Paths for a Device**.
8. In the **Device Name** selection, choose the name of the child device (the device at the end of the path).
9. In the **Paths to Enable** selection, select the missing path (between the parent and child device).
10. Press enter.

**Did the smitty menu complete with no errors?**

**NO** Go to Step 0285-6.

**YES** Go to Step 0285-5.

- **Step 0285-5**

To verify that the device path is present, rerun `diag -a`

When the resource list displays, select the child resource that had the missing path. If the letter P is shown in front of the resource, you still have a path problem. If no letter P is shown in front of the resource or if the system returns to the command prompt or you get a message without the resource list being displayed, then the problem has been resolved.

**Do you still have a path problem?**

**NO** Go to MAP 0410: Repair Checkout.

**YES** Go to Step 0285-6.

- **Step 0285-6**

You may have a problem with the driver interface or connector on either the parent or child device.

1. Power off the system (refer to the system service guide if necessary).
2. Remove the cables to the parent device.
3. Replace the cable(s) that go between the parent and child device (if present).
4. Reattach the cables to the parent device.
5. Power on the system, rebooting AIX (refer to the system service guide if necessary).
6. At the AIX command line, type `smitty mpio`.
7. Choose **MPIO Path Management**.
8. Select **Enable Paths**.
9. Select **Enable Paths for a Device**.
10. In the **Device Name** selection, choose the name of the child device (the device at the end of the path).
11. In the **Paths to Enable** selection, select the missing path (between the parent and child device).
12. Press enter.

**Did the smitty menu complete with no errors?**

**NO** Go to Step 0285-7.

**YES** Go to Step 0285-8.

- **Step 0285-7**

To verify that the device path is present, rerun `diag -a`.

When the resource list displays, select the child resource that had the missing path. If the letter P is shown in front of the resource, you still have a path problem. If the letter P is not shown in front of the resource, or if the system returns to the command prompt, or you get a message without the resource list being displayed, then the problem has been resolved.

**Do you still have a problem?**

**NO** Go to MAP 0410: Repair Checkout.

**YES** Go to Step 0285-8.

- **Step 0285-8**

You may have a problem with the driver interface or connector on either the parent or child device.

1. Power off the system.
2. Remove the cables to the parent device.
3. Replace the parent device.
4. Reattach the cables to the parent device.
5. Power on the system, rebooting AIX.
6. At the AIX command line, type `smitty mpio`.
7. Choose **MPIO Path Management**.

8. Select **Enable Paths**.
9. Select **Enable Paths for a Device**.
10. In the **Device Name** selection, choose the name of the child device (the device at the end of the path).
11. In the **Paths to Enable** selection, select the missing path (between the parent and child device).
12. Press enter.

**Did the smitty menu complete with no errors?**

**NO** Go to Step 0285-9.

**YES** Go to Step 0285-10.

- **Step 0285-9**

To verify that the device path is present, rerun `diag -a`.

When the resource list displays, select the child resource that had the missing path. If the letter P is shown in front of the resource, you still have a path problem. If no letter P is shown in front of the resource or if the system returns to the command prompt or you get a message without the resource list being displayed, then the problem has been resolved.

**Do you still have a path problem?**

**NO** Go to MAP 0410: Repair Checkout.

**YES** Go to Step 0285-10.

- **Step 0285-10**

You may have a problem with the driver interface or connector on the child device.

1. Power off the system.
2. Remove the cables to the child device.
3. Replace the child device (in the case of a SCSI or SAF-TE backplane, replace the backplane first, followed by the child device).
4. Reattach the cables to the child device.
5. Power on the system, rebooting AIX.
6. At the AIX command line, type `smitty mpio`.
7. Choose **MPIO Path Management**.
8. Select **Enable Paths**.
9. Select **Enable Paths for a Device**.
10. In the **Device Name** selection, choose the name of the child device (the device at the end of the path).
11. In the **Paths to Enable** selection, select the missing path (between the parent and child device).
12. Press enter.

**Did the smitty menu complete with no errors?**

**NO** Neither the cabling, nor the parent, nor the child seem to be causing the problem. Contact your service support structure.

**YES** Go to Step 0285-11.

- **Step 0285-11**

Rerun `diag -a` to verify that the device path is present.

When the resource list displays, select the child resource that had the missing path. If the letter P is shown in front of the resource, you still have a path problem. If no letter P is shown in front of the resource or if the system returns to the command prompt or you get a message without the resource list being displayed, then the problem has been resolved.

**Do you still have a path problem?**



**NO** Go to MAP 0410: Repair Checkout.

**YES** Neither the cabling, nor the parent, nor the child seem to be causing the problem. Contact your service support structure.

## **MAP 0290: Missing Resource Problem Resolution**

### **Purpose of This MAP**

Use this MAP to handle problems when a resource is not detected by the diagnostics.

- **Step 0290-1**

Use the Display Configuration and Resource List to display the resources that were sensed by the configuration program when the diagnostic programs were loaded. Go to Step 0290-2.

**Notes:**

1. Supplemental diskettes may be required for specific adapters and devices if service aids are run from Standalone Diagnostics.
2. ISA adapters cannot be detected by the system. The ISA Adapter Configuration Service Aid in Standalone Diagnostics allows the identification and configuration of ISA adapters, based on user input.
3. A resource's software must be installed on the AIX operating system before a resource can be detected by the Online Diagnostics.
4. If a parent device and all of its children are the missing resources at the same time, first use the parent device as the missing resource when going through this MAP. If the problem with the parent device is resolved so that it is no longer missing, but any of its children are still missing, use the children when going through this MAP.

- **Step 0290-2**

**Is the undetected resource a SCSI device installed in an externally attached enclosure for a SCSI device(s)?**

**NO** Go to Step 0290-4.

**YES** Go to Step 0290-3.

- **Step 0290-3**

Go to the documentation for SCSI devices installed in an externally attached enclosure for a SCSI device(s), and check the device(s) for proper power, cabling, fans running, and any other checks available. Return to this step after you check the device.

**Did you find a problem?**

**NO** Go to Step 0290-4.

**YES** Correct the problem; then go to MAP 0410: Repair Checkout.

- **Step 0290-4**

**Are you running Standalone Diagnostics?**

**NO** Go to Step 0290-7.

**YES** Go to Step 0290-5.

- **Step 0290-5**

**Are multiple devices missing that are connected to the same adapter? (If the adapter itself is also missing, answer "No" to this question.)**

**NO** Go to Step 0290-7.

**YES** Suspect a problem with the device adapter. Run diagnostics in problem determination mode on the device adapter, then go to Step 0290-6.

- **Step 0290-6**

**Did the diagnostics detect a problem with the adapter?**

**NO** Go to Step 0290-8.

**YES** Record the SRN, then find the SRN in the SRN List and do the listed action.

- **Step 0290-7**

Take the following steps:

1. Exchange the undetected resource.
2. Use the Display Configuration and Resource List to display the resources sensed by the configuration program.

**Is the resource listed?**

**NO** Go to MAP 0030: Additional Problem Determination.

**YES** Go to MAP 0410: Repair Checkout.

- **Step 0290-8**

**Are the missing devices attached to a backplane?**

**NO** Go to Step 0290-7.

**YES** Exchange the backplane then go to Step 0290-9.

**Note:** Before exchanging the backplane check that all cables connected to the backplane are properly seated and that all cables and connectors are in good working condition. If a problem is found, correct it, and then go to MAP 0410: Repair Checkout.

- **Step 0290-9**

Load the standalone diagnostics; then use the list of resources in the DIAGNOSTIC SELECTION to determine if devices that were previously missing now appear on the resource list.

**Are the previously missing devices now listed on the resource list?**

**NO** Go to Step 0290-10.

**YES** Go to MAP 0410: Repair Checkout.

- **Step 0290-10**

**Is the missing resource (or resources) on a SCSI bus?**

**NO** Go to MAP 0030: Additional Problem Determination.

**YES** Go to Step 0290-11.

- **Step 0290-11**

Use the removal and replacement procedures for the backplane you are servicing for the following steps:

1. Remove all resources from the backplane.  
Repeat steps 2 through 4 for each device you removed from the backplane.
2. Reconnect the devices one at a time to the backplane.
3. After reconnecting each device, use the Display Configuration and Resource List to display the resources sensed by the configuration program.
4. If one or more previously missing resources not appear, put the resources you removed in step 1 into the backplane, then go to MAP 0410: Repair Checkout.
5. If after having reconnected each device to the backplane, the previously missing resource does not appear, go to MAP 0030: Additional Problem Determination.

## **MAP 0291: Missing Device or Bus Problem Resolution**

### **Purpose of This MAP**

Use this MAP when a bus or device (such as a disk drive) is reported as a missing resource by the diagnostics.

- **Step 0291-1**

The device may be missing because of a power problem.

If the missing device is located in a drawer or enclosure, do the following:

1. Check for any environmental problem indicators such as power or cooling that may indicate a problem. (if needed, refer to the service documentation.)
2. If a problem is indicated, follow the service documentation to resolve the problem.

Go to Step 0291-2.

- **Step 0291-2**

Inspect the cables (signal and power) of the missing device. Be sure all connections are in place and power is present. Refer to the system or enclosure documentation containing the power wiring diagram or system cable diagram to locate specific cables, determine the cable numbering, and check for a problem-determination procedure. Look for obvious power cabling problems, such as missing or loose cable connectors.

Power problems can sometimes be identified by checking other devices that use the same power source (such as a diskette drive and a SCSI tape drive, even though they have different controllers). If other devices that share a power source are reported as missing devices, suspect the power source as the problem.

If there is a power problem, refer to the system or enclosure documentation to resolve the problem.

**Did you find a problem?**

**NO** Go to Step 0291-3.

**YES** Correct the problem, then go to MAP 0410: Repair Checkout.

- **Step 0291-3**

**Is the missing device a SCSI device installed in a SCSI Enclosure Services (AIX resource SESx) or SAF-TE (AIX resource SAFTE<sub>x</sub>), or a SCSI device installed in either type of enclosure?**

**NO** Go to MAP 0210: General Problem Resolution.

**YES** Go to Step 0291-4.

- **Step 0291-4**

Run the Advanced Diagnostics in Problem Determination mode on the SCSI Enclosure Services or SAF-TE device.

**Note:** A no trouble found result or if you get another SRN with the same digits before the dash as you previously had from the diagnostics indicates that you did NOT get a different SRN.

**Did you get a different SRN than when you ran the diagnostics previously?**

**NO** Go to Step 0291-5.

**YES** Take the following action:

1. Find the SRN in List of service request numbers.

**Note:** If the SRN is not listed a Service Request Number Lists, look for additional information in the following:

- Any supplemental service manual for the device.
- The diagnostic Problem Report screen.
- The Service Hints service aid in Using Standalone and Online Diagnostics.

2. Perform the action listed.

- **Step 0291-5**

Power off the system (refer to the system service guide if necessary). Follow the removal and replacement procedures for the enclosure or system containing the hot-swap devices. Disconnect all hot-swap devices attached to the adapter. Reconnect the hot-swap devices one at a time. After reconnecting each device, do the following:

Power off the system. Disconnect all hot-swap devices attached to the adapter. Reconnect the hot-swap devices one at a time. After reconnecting each device, do the following:

1. Power on the system and boot the system in the same mode that you were in when you received the symptom that led you to this MAP (refer to the system service guide if necessary).
2. At AIX command prompt, run missing options (**diag -a**).
3. Verify whether the device you just added to the system is missing from the system configuration, or if additional devices have been made missing, the problem may be with the last device reconnected. Perform these substeps:
  - a. If the device you just added to the system shows as missing, or if additional devices were made missing, replace the last device.
  - b. Rerun missing options (**diag -a**).
  - c. If devices are no longer missing, go to MAP 0410: Repair Checkout. Otherwise, contact your support center.

**Note:** A device problem can cause other devices attached to the same SCSI adapter to go into the Defined state. Ask the system administrator to make sure that all devices attached to the same SCSI adapter as the device that you replaced are in the Available state.

4. If no devices were missing, the problem could be intermittent. Make a record of the problem. Running the diagnostics for each device on the bus may provide additional information. If you have not replaced FFCs B88, 190, and 152 go to MAP 0210: General Problem Resolution, using FFCs (in order): B88, 190, and 152.

## **MAP 0410: Repair checkout**

### **Purpose of this MAP**

Use this MAP to check out the server after a repair is completed.

**Note:** Only use Standalone diagnostics for repair verification when no other diagnostics are available on the system. Standalone Diagnostics do not log repair actions.

If you are servicing an SP™ system, go to the End-of-call MAP in the *SP System Service Guide*.

If you are servicing a clustered @server, go to the End of Call MAP in the *Clustered @server Installation and Service Guide*.

#### • **Step 0410-1**

**Did you use an AIX or online AIX diagnostics service aid hot-swap operation to change the FRU?**

**NO** Go to Step 0410-2.

**YES** Go to Step 0410-4.

#### • **Step 0410-2**

1. If the system supports Slow boot (See Performing a slow boot) do a slow boot on the system. If the system does not support slow boot, do a normal boot.
2. Power on the system.
3. Wait until the AIX operating system login prompt displays or until apparent system activity on the operator panel or display has stopped.

**Did the AIX Login Prompt display?**

**NO** Go to MAP 0020: Problem determination procedure.

**YES** Go to Step 0410-3.

• **Step 0410-3**

If the RESOURCE RERPAIR ACTION menu is already displayed, go to Step 0410-6. Otherwise, do the following:

1. Log into the operating system either with root authority (if needed, ask the customer to enter the password) or use the CE login.
2. Enter the `diag -a` command and check for missing resources. Follow any instructions that display. If an SRN displays, suspect a loose card or connection. If no instructions display, no resources were detected as missing. Continue on Step 0410-4.

• **Step 0410-4**

1. Enter the `diag` command.
2. Press Enter.
3. Select the **Diagnostic Routines** option.
4. When the DIAGNOSTIC MODE SELECTION menu displays, select **System Verification**.
5. When the DIAGNOSTIC SELECTION menu displays, select the **All Resources** option or test the FRUs you exchanged, and any devices that are attached to the FRU(s) you exchanged, by selecting the diagnostics for the individual FRU.

**Did the RESOURCE REPAIR ACTION menu (801015) display?**

**NO** Go to Step 0410-5.

**YES** Go to Step 0410-6.

• **Step 0410-5**

**Did the TESTING COMPLETE, no trouble was found menu (801010) display?**

**NO** There is still a problem. Go to MAP 0020: Problem determination procedure.

**YES** Use the **Log Repair Action** option, if not previously logged, in the TASK SELECTION menu to update the AIX Error Log. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your action is not displayed on the Resource List, select **sysplanar0**.

**Note:** This changes the Fault Indicator LED from the Fault state to the Normal state.

Go to Step 0410-8 .

• **Step 0410-6**

When a test is run on a resource in System Verification mode, and that resource has an entry in the AIX error log, if the test on the resource was successful, the RESOURCE REPAIR ACTION menu displays. After replacing a FRU, you must select the resource for that FRU from the RESOURCE REPAIR ACTION menu. This updates the AIX error log to indicate that a system-detectable FRU has been replaced.

**Note:** On systems with a Fault Indicator LED, this changes the Fault Indicator LED from the Fault state to the Normal state.

Do the following:

1. Select the resource that has been replaced from the RESOURCE REPAIR ACTION menu. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your action is not displayed on the Resource List, select **sysplanar0**.
2. Press **Commit** after you make your selections.

**Did another RESOURCE REPAIR ACTION menu (801015) display?**

**NO** If the No Trouble Found menu displays, go Step 0410-8.

**YES** Go to Step 0410-7.

- **Step 0410-7**

The parent or child of the resource you just replaced may also require that you run the Resource Repair Action service aid on it.

When a test is run on a resource in System Verification mode, and that resource has an entry in the AIX error log, if the test on the resource was successful, the RESOURCE REPAIR ACTION menu displays.

After replacing that FRU, you must select the resource for that FRU from the RESOURCE REPAIR ACTION menu. This updates the AIX error log to indicate that a system-detectable FRU has been replaced.

**Note:** This changes the Fault Indicator LED from the FAULT state to the NORMAL state.

Do the following:

1. From the RESOURCE REPAIR ACTION menu, select the parent or child of the resource that has been replaced . If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your action is not displayed on the Resource List, select **sysplanar0**.
2. Press **COMMIT** after you make your selections.
3. If the No Trouble Found menu displays, go Step 0410-8.

- **Step 0410-8**

If you changed the Service Processor or network settings, as instructed in previous MAPs, restore the settings to the value they had prior to servicing the system.

**Did you perform service on a RAID subsystem involving changing of the PCI RAID adapter cache card or changing the configuration?**

**NO** Go to Step 0410-10.

**YES** Go to Step 0410-9.

- **Step 0410-9**

Use the **Recover Options** selection to resolve the RAID configuration. To do this, do the following:

1. On the PCI SCSI Disk Array Manager screen, select **Recovery options**.
2. If a previous configuration exists on the replacement adapter, this must be cleared. Select **Clear PCI SCSI Adapter Configuration**. Press F3.
3. On the Recovery Options screen, select **Resolve PCI SCSI RAID Adapter Configuration**.
4. On the Resolve PCI SCSI RAID Adapter Configuration screen, select **Accept Configuration on Drives**.
5. On the PCI SCSI RAID Adapter selections menu, select the adapter that you changed.
6. On the next screen, press Enter.
7. When you get the Are You Sure selection menu, press Enter to continue.
8. You should get an OK status message when the recover is complete. If you get a Failed status message, verify that you selected the correct adapter, then repeat this procedure. When recover is complete, exit the operating system.
9. Go to Step 0410-10.

- **Step 0410-10**

**Did you come to this point by using hot-plug procedures?**

**NO** Go to Step 0410-11.

**YES** Go to Step 0410-12.

- **Step 0410-11**

Boot the operating system, with the system or partition in normal mode.

**Were you able to boot the operating system?**

**NO** Call your next level of support.

**YES** Go to Step 0410-12.

- **Step 0410-12**

If the system you are servicing has a Hardware Management Console (HMC) with Service Focal Point (SFP), go to the End-of-call procedure for systems with Service Focal Point.

This completes the repair, return the server to the customer.

## **MAP 0420: System checkout**

### **Purpose of this MAP**

Use this MAP to verify that the system is working correctly.

- **Step 0420-1**

1. If the operating system is running, perform the operating system's shutdown procedure (get help if needed).
2. Power off the system.
3. Power on the system.
4. Load either the Online or Standalone Diagnostics in Service Mode (refer to the system unit's service guide if necessary).
5. Wait until the diagnostics are loaded or the system appears to stop.

#### **Were you able to load the diagnostics?**

**NO** There is a problem. Go to the system unit's service guide.

**YES** Go to Step 0420-1.

- **Step 0420-2**

1. Press Enter.
2. When the FUNCTION SELECTION menu displays, select **Advanced Diagnostics**.
3. When the DIAGNOSTIC MODE SELECTION menu displays, select the **System Verification** option.

**Note:** If the terminal type is not defined, you are prompted to define it. You cannot continue until this is done.

4. On the DIAGNOSTIC SELECTION or ADVANCED DIAGNOSTIC SELECTION menu, look through the list of resources to make sure that all adapters and SCSI devices are listed including any new resources.

#### **Notes:**

- a. Resources attached to serial and parallel ports may not appear in the resource list.
- b. ISA adapters cannot be detected by the system. The ISA Adapter Configuration Service Aid in Standalone Diagnostics allows the identification and configuration of ISA adapters.
- c. If running diagnostics in a partition within a partitioned system, resources assigned to other partitions are displayed on the resource list.

#### **Did you find all the adapters or devices on the list?**

**NO** Go to Step 0420-3.

**YES** Go to Step 0420-5.

- **Step 0420-3**

**Is the new device or adapter an exact replacement for a previous one installed at same location?**

#### **Step 0420-1**

Go to Step 0420-4.

**YES** The replacement device or adapter may be defective. If possible, try installing it in an alternate

location if one is available. If it works in that location, suspect that the location where it failed to appear has a defective slot; schedule time to replace the hardware that supports that slot. If it does not work in an alternate location, suspect a bad replacement adapter or device. If you are still unable to detect the device or adapter, contact your service support structure.

- **Step 0420-4**

**Is the operating system software to support this new adapter or device installed?**

**NO** Load the operating system software.

**YES** The replacement device or adapter may be defective. If possible, try installing it in an alternate location if one is available. If it works in that location, suspect that the location where it failed to appear has a defective slot; schedule time to replace the hardware that supports that slot. If it does not work in an alternate location, suspect a bad replacement adapter or device. If you are still unable to detect the device or adapter, contact your service support structure.

- **Step 0420-5**

1. The MISSING RESOURCE menu only displays when a resource was removed or moved. If the MISSING RESOURCE menu is displayed, follow the instructions.
2. If the ADVANCED DIAGNOSTIC SELECTION menu displays, select the **System Verification** option, then use the **All Resources** option to test the system or select the individual tests you want to run. If the RESOURCE SELECTION menu is displayed, select the **All Resources** option to test the system or select each test you want to run.

**Did the test pass?**

**NO** There is a problem. Go to MAP 0020: Problem Determination Procedure.

**YES** This completes the system checkout.

## **Installation Checkout**

The installation checkout is used by the service representative to verify system quality after initial installation or after an MES or EC has been installed.

### **Installation Checkout Procedure**

To start the checkout, go to Step 1. Doing a Visual Check.

- **Step 1. Doing a Visual Check**

Perform the following actions after initial system installation or system alteration:

1. Be sure the system unit power switch is set to Off.
2. Be sure the power switches on all of the attached devices are set to Off.
3. Visually check the system unit and attached devices to ensure that:
  - All power cables are securely attached to the system unit or devices
  - All signal cables are connected at both ends
  - All power cables are plugged into the customer's outlet
  - All covers are installed and the vent openings are not obstructed
  - All ribbons, guides, and other attachments are in place.
4. Go to Step 2. Checking the TTY Terminal Attributes.

- **Step 2. Checking the TTY Terminal Attributes**

Checking the TTY Terminal Attributes usually needs to be accomplished only during the initial installation.

If you have trouble selecting the console display and you are using an attached terminal, check the TTY Terminal Attributes again.

When you run the diagnostic programs from an attached TTY terminal, the attributes for the terminal must be set to match the defaults of the diagnostic programs. The TTY terminal must be attached to the S1 serial port on the system unit.



**Are you going to run this procedure on an attached TTY terminal?**

**NO** Go to Step 3. Loading the Diagnostics.

**YES** Go to the TTY terminal attributes settings in the terminal's documentation, and check the terminal attributes. Return to Step 3 when you finish checking the attributes.

• **Step 3. Loading the Diagnostics**

The diagnostics can be run from a CD-ROM disc, from a locally attached disk, or from a server if the AIX operating system is installed on the system. If you are not sure whether the AIX operating system is installed, you can check by turning the system unit on. If the System Management Service menu displays, the AIX operating system is not installed.

If the AIX operating system is installed, the diagnostic programs load from a locally attached disk or from a server. If the AIX operating system is not installed, diagnostics can be loaded from the diagnostic CD-ROM disc.

The following procedure attempts to load the diagnostics from a disk or from a server. If they cannot be loaded from a disk or server, the diagnostic CD-ROM disc is used to load and run the checkout.

1. Set the power switches on all of the attached devices to On.
2. Set the power switch on the system unit to On.

**Note:** After the first icon displays on the system console, press F6 if you are using a directly attached console, or press 6 on a TTY console.

3. If the System Management Services menu displays, the AIX operating system is not installed. Do the following:

- a. Insert the diagnostic CD-ROM disc into the CD-ROM drive.
- b. Power off the system unit, wait 45 seconds and then power on the system unit.

**Note:** After the first icon displays on the system console, press F6 if you are using a directly attached console, or press 6 on a TTY console.

- c. If the system stops with an eight-digit error code displayed or stops with an icon or icons displayed, a problem was detected.

Check for loose cables or cards. If you do not find a problem, go to MAP 0020: Problem Determination Procedure.

4. When the diagnostic programs load correctly, the DIAGNOSTIC OPERATING INSTRUCTIONS display.

**Did the DIAGNOSTIC OPERATING INSTRUCTIONS display?**

**NO** Go to MAP 0020: Problem Determination Procedure.

**YES** Go to Step 4. Checking the Correct Resources.

• **Step 4. Checking for the Correct Resources**

Use the Display or Change System Configuration or VPD service aid to check the resources that are present (memory, SCSI devices, adapters, diskette drives, disk drives, and input devices).

**Notes:**

1. If the terminal type has not been defined, it must be defined before you can select the service aids. Use the **Initialize Terminal** option on the FUNCTION SELECTION menu to define the terminal.
2. If the Dials and LPFK are attached to serial ports S1 or S2, they are not listed by the service aid unless they have been configured by the user. Refer to the AIX operating system documentation to configure these devices.

**Were all the resources listed by the service aid?**

**NO** Check for loose cables or cards. If you do not find a problem, go to MAP 0020: Problem Determination Procedure.

**YES** Go to Step 5. Checking the Hardware.

- **Step 5. Checking the Hardware**

If you are running Online diagnostics from a disk, the system can be checked by one of the following methods; depending on the version of the diagnostic programs you are using:

1. Select **Advanced Diagnostics** on the FUNCTION SELECTION menu.
2. Select **System Verification** on the DIAGNOSTIC MODE SELECTION menu.

All resources can be checked out by selecting **System Verification** option on the ADVANCED DIAGNOSTIC SELECTION menu, then select the **All Resources** option, or you can select each resource individually.

3. Check each resource.

**Did all of resources check out good?**

**NO** Record the SRN; then go to AIX fast-path isolation procedure.

**YES** Go to Step 6. Completing the Installation.

- **Step 6. Completing the Installation**

Some of the following steps only apply to an initial installation. These steps are provided as reminders in completing the installation or finishing an MES or EC activity.

1. If present, remove the CD-ROM diagnostic disc from the appropriate drive, and store it in the binder with the operator guides.
2. Give the keys to the customer and explain the importance of keeping the reorder tag for the keys in a safe place.
3. Keep a copy of the following:
  - SCSI Address Record from System Records appendix in the User's Guide.
  - Machine History card for each system unit and device.

Microcode must be installed during system installation or after the AIX operating system is installed. If the system is using the AIX operating system, all microcode is preinstalled on the boot disk for all adapters and devices that were shipped with the system.

Microcode is shipped on microcode diskettes, option diskettes and on the boot disk. For the AIX operating system, runtime microcode maintenance can be selected from the SMIT INSTALLATION AND MAINTENANCE MENU or from the Diagnostic Service Aid. The **adfutil -m** (command and flag) is normally used to install microcode shipped on option diskettes.

If the system is using another type of operating system, that operating system should include microcode installation instructions.

If you have the X.25 Interface Coprocessor, the microcode for them is normally not shipped with the AIX operating system. The microcode for these adapters must be installed before the adapters can be used. The X.25 Interface Coprocessor microcode is shipped on an option diskette.

Contact the person that is going to install the software or turn the system over to the customer.

If needed, go to the AIX operating system Installation Kit to install and configure the AIX operating system.

## **MAP 1240: xxxxx**

MAP 1240

## **PFW1540: Problem isolation procedures**

The PFW1540 procedures are used to locate problems in the processor subsystem or I/O subsystem(s). If a problem is detected, these procedures help you isolate the problem to a failing unit. Find the symptom in the following table; then follow the instructions given in the Action column.

Problem Isolation Procedures	
Symptom/Reference Code/Checkpoint	Action
You have or suspect an I/O card or I/O subsystem failure. You received one of the following SRNs or reference codes: 101-000, 101-517, 101-521, 101-538, 101-551 to 101-557, 101-559 to 101-599, 101-662, 101-727, 101-c32, 101-c33, 101-c70	Go to PFW1542: I/O problem isolation procedure.
The service processor on your Model 590 or Model 595 posts a failure and halts the IPL before the server firmware standby is reached. The server logs an error code indicating a problem with one of the MCMs.	Go to PFW1543: Model 590 and model 595 MCM problem isolation procedure.
The service processor on your Model 590 or Model 595 posts a failure and halts the IPL before the server firmware standby is reached. The server logs an error code indicating a memory subsystem failure.	Go to PFW1546: Model 590 and model 595 Memory problem isolation procedure.
You have or suspect a memory or processor subsystem problem on a server other than a Model 590 or Model 595. You received one of the following SRNs or reference codes: 101-185	Go to PFW1548: Memory and Processor Problem Isolation Procedure.
If you were directed to the PFW1540 procedure by an SRN and that SRN is not listed in this table.	Go to PFW1542: I/O problem isolation procedure.

## FRU identify LEDs

Your system is configured with an arrangement of LEDs that help identify various components of the system. These include but are not limited to:

- Rack identify beacon LED (optional rack status beacon)
- Processor Subsystem drawer identify LED
- I/O drawer identify LED
- RIO port identify LED
- FRU identify LED
- Power subsystem FRUs
- Processor subsystem FRUs
- I/O subsystem FRUs
- I/O adapter identify LED
- DASD identify LED

The identify LEDs are arranged hierarchically with the FRU identify LED at the bottom of the hierarchy, followed by the corresponding processor subsystem or I/O drawer identify LED, and the corresponding rack identify LED to locate the failing FRU more easily. Any identify LED in the system may be flashed, refer to Managing your server using the Advanced System Management Interface.

Any identify LED in the system may also be flashed by using the “Identify and Attention Indicators” task through the AIX diagnostic programs. The procedure for operating the Identify and Attention Indicators task of the AIX diagnostics is outlined in “Tasks and Service Aids” in the Working with AIX diagnostics.

### **PFW1542: I/O Problem Isolation Procedure**

This I/O problem-determination procedure isolates I/O card and I/O subsystem failures. When I/O problem isolation is complete, all cables and cards that are failing will have been replaced or reseated.

**Notes:**

1. Be sure to unplug the power cords before removing or installing any part to avoid damage to it or the system or subsystem.
2. This MAP assumes that either:
  - An optical drive is installed and connected to the integrated EIDE adapter, and an AIX diagnostic CD-ROM is available.
  - OR
  - AIX standalone diagnostics can be booted from a NIM server.
3. If a power-on password or privileged-access password is set, you are prompted to enter the password before the AIX diagnostic CD-ROM can load.
4. The term POST indicators refers to the device mnemonics that appear during the power-on self-test (POST).
5. The service processor might have been set by the user to monitor system operations and to attempt recoveries. You might want to disable these options while you diagnose and service the system. If these settings are disabled, make notes of their current settings so that they can be restored before the system is turned back over to the customer.

The following settings may be of interest.

**Monitoring**

(also called surveillance) From the ASMI menu, expand the System Configuration menu, then click on Monitoring. Disable both types of surveillance.

**Auto power restart**

(also called unattended start mode) From the ASMI menu, expand Power/Restart Control, then click on Auto Power Restart, and set it to disabled.

**Wake on LAN**

From the ASMI menu, expand Wake on LAN, and set it to disabled. Call Out From the ASMI menu, expand the Service Aids menu, then click on Call-Home/Call-In Setup. Set the call-home serial port and the call-in serial port to disabled.

6. If this is a pSeries system, verify that the system has not been set to boot to the SMS menus or to the open firmware prompt. From the ASMI menu, expand Power/Restart Control to view the menu, then click on Power On/Off System. The AIX/Linux partition mode boot should say "Continue to Operating System".

Select the model number you are servicing from the following list:

PFW1542-520

PFW1542-550

PFW1542-570

PFW1542-590: Model 590 and Model 595 I/O problem isolation procedure

**PFW1542-520: Model 520 I/O problem isolation procedure**

**Purpose of this Procedure**

Use this procedure to locate defective FRUs not found by normal diagnostics when servicing a 520. For this procedure, diagnostics are run on a minimally configured system. If a failure is detected on the minimally configured system, the remaining FRUs are exchanged one at a time until the failing FRU is identified. If a failure is not detected, FRUs are added back until the failure occurs. The failure is then isolated to the failing FRU.

• **PFW1542-520-1**

1. Insure that the diagnostics and the operating system are shut down.

2. Turn off the power.
3. Select "Slow System Boot Speed" on the Power On/Off system menu under the Power/Restart Control menu on the ASMI.
4. Turn on the power.
5. Put the AIX diagnostic CD-ROM into the optical drive.

**Does the optical drive appear to operate correctly?**

**NO** Go to Problems with loading and starting the operating system..

**YES** Continue to "PFW1542-520-2."

• **PFW1542-520-2**

1. When the keyboard indicator is displayed (the word keyboard), if the system or partition gets that far in the IPL process, press the 5 key on the firmware console.
2. Enter the appropriate password if you are prompted to do so.

**Is the Please define the System Console screen displayed?**

**NO** Continue to "PFW1542-520-3."

**YES** Go to "PFW1542-520-4."

• **PFW1542-520-3**

The system is unable to boot standalone AIX diagnostics. Check the service processor error log (using the ASMI) and the operator panel for additional error codes resulting from the slow boot that was performed in PFW1542-520-1.

**Did the slow boot generate a different error code or partition firmware hang from the one that originally sent you to PFW1542?**

**NO** If you were sent here by an error code, and the error code did not change as the result of a slow boot, you have a processor subsystem problem. Go to PFW1548: Memory and Processor Problem Isolation. If you were sent here because the system is hanging on a partition firmware checkpoint, and the hang condition did not change as a result of the slow boot, go to "PFW1542-520-5" on page 320.

**YES** Restore fast boot on the power on/off system menu from the ASMI. Look up the new error code in the reference code index and perform the listed actions.

• **PFW1542-520-4**

The system stopped with the please define the system console prompt on the system console. Standalone diagnostics can be booted. Perform the following:

1. Follow the instructions on the screen to select the system console.
2. When the DIAGNOSTIC OPERATING INSTRUCTIONS screen is displayed, press Enter.
3. If the terminal type has not been defined, you must use the Initialize Terminal option on the FUNCTION SELECTION menu to initialize the AIX operating system environment before you can continue with the diagnostics. This is a separate operation from selecting the firmware console.
4. Select Advanced Diagnostic Routines.
5. When the DIAGNOSTIC MODE SELECTION menu displays, select System Verification to run diagnostics on all resources.

**Did running diagnostics produce a different symptom?**

**NO** Go to step 6 of PFW1542-520-6

**YES** Go to the Start-of-Call Procedure. Use the new symptom.

6. Record any devices missing from the list of all adapters and devices. Continue with this procedure. When you have fixed the problem, use this record to verify that all devices appear when you run system verification.

**Are there any devices missing from the list of all adapters and devices?**

**NO** Reinstall all remaining adapters, if any, and reconnect all devices. Return the system to its original configuration. Be sure to select fast boot on the power on/off system menu on the ASMI. Go to MAP 0410: Repair checkout.

**YES** The boot attempts that follow will attempt to isolate any remaining I/O subsystem problems with missing devices. Ignore any codes that may display on the operator panel unless stated otherwise. Continue to “PFW1542-520-5.”

• **PFW1542-520-5**

Examine RIO port 0 on the base system at Un-P1-T3.

**Are there any I/O subsystems attached to the base system?**

**NO** Go to PFW1542-520-22.

**YES** Continue to PFW1542-520-6.

• **PFW1542-520-6**

There may be devices missing from one of more of the I/O subsystems.

**Attention:** The 5094 Expansion Unit and the 7311/D20 I/O subsystem may both be connected to the pSeries 520. The 7311/D20 I/O subsystem is a full-width rack-mounted drawer; the 5094 Expansion Unit can be either a tower or a full-width drawer.

The RIO ports on these subsystems are :

	<b>5094</b>	<b>7311/D20</b>
RIO port 0	Un-CB1-C08-00 (bottom connector)	Un-CB1-C08-01 (top connector)
RIO port 1	Un-CB1-C08-01 (top connector)	Un-P1-C05-01 (top connector)

**Note:** Before continuing, check the cabling from the base system to the I/O subsystem(s) to insure that the system is cabled correctly. Refer to Connect your unit with HSL/RIO cables for valid configurations. Record the current cabling configuration and then continue with the following steps.

1. Turn off the power.
2. At the base system, disconnect the cable connection at RIO port 0 (Un-P1-T3).
3. At the other end of the RIO cable referred to in step 2 of PFW1542-520-6, disconnect the I/O subsystem port connector 0 (Un-CB1-C08-00 (bottom connector) or Un-P1-C05-00 (bottom connector) , depending on the I/O subsystem). The RIO cable that was connected to RIO port 0 in the base system should now be loose; remove it. Record the location of this I/O subsystem and call it "subsystem #1".
4. Examine the connection at the I/O port connector 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) of the I/O subsystem recorded in step 3 of PFW1542-520-6. If the RIO cable attached to I/O port connector 1 connects to the I/O port connector 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of subsystem #1, then go to step 9 of PFW1542-520-6.
5. This step is reserved.
6. At the base system, disconnect the cable connection at RIO port 1 (Un-P1-T4) and reconnect it to RIO port 0 (Un-P1-T3).
7. At the I/O subsystem recorded in step 3 of PFW1542-520-6, disconnect the I/O port connector 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) and reconnect to I/O port 0 (Un-CB1-C08-00 (bottom connector) or Un-P1-C05-00 (bottom connector)).
8. Verify that a single RIO cable connects base system RIO port 0 (Un-P1-T3) to the I/O subsystem recorded in step 4 of PFW1542-520-6 port 0 (Un-CB1-C08-00 (bottom connector) or Un-P1-C05-00 (bottom connector)). Go to step 21 on page 321 of PFW1542-520-6.
9. Record the location of the next I/O subsystem and call it "subsystem #2". This is the I/O subsystem that is connected to I/O port 1 of subsystem #1.

10. Examine the connection at the I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) of subsystem #2 recorded in step 9 on page 320 of PFW1542-520-6. If the RIO cable attached to I/O port 1 connects to the I/O port 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of subsystem #2 and call it "subsystem #3". Go to step 14 of PFW1542-520-6.
11. The RIO cable attached to the I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) of subsystem #2 is attached to port 1 (Un-P1-T4) of the base system. At the base system, disconnect the cable connection at RIO port 1 (Un-P1-T4) and reconnect it to RIO port 0 (Un-P1-T3).
12. On subsystem #2, disconnect the cable from I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) and reconnect it to I/O port 0 (Un-CB1-C08-00 (bottom connector) or Un-P1-C05-00 (bottom connector)) of subsystem #1.
13. Verify that a single RIO cable connect base system RIO port 0 to one or two I/O subsystems. Go to step 21 of PFW1542-520-6.
14. Examine the connection at the I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) of subsystem #3 recorded in step 10 of PFW1542-520-6. If the RIO cable attached to I/O port 1 connects to the I/O port 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of the subsystem #3 and call it "subsystem #4". Go to step 18 of PFW1542-520-6.
15. The RIO cable attached to the I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) of subsystem #3 is attached to port 1 (Un-P1-T4) of the base system. At the base system, disconnect the cable connection at RIO port 1 (Un-P1-T4) and reconnect it to RIO port 0 (Un-P1-T3).
16. On subsystem #3, disconnect the cable from I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) and reconnect it to I/O port 0 (Un-CB1-C08-00 (bottom connector) or Un-P1-C05-00 (bottom connector)) of subsystem #1.
17. Verify that a single RIO cable connects base system RIO port 0 to three I/O subsystems. Go to step 21 of PFW1542-520-6. The RIO cable attached to the I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) of subsystem #4 is attached to port 1 (Un-P1-T4) of the base system. At the base system, disconnect the cable connection at RIO port 1 (Un-P1-T4) and reconnect it to RIO port 0 (Un-P1-T3).
18. On subsystem #4, disconnect the cable from I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) and reconnect it to I/O port 0 (Un-CB1-C08-00 (bottom connector) or Un-P1-C05-00 (bottom connector)) of subsystem #1.
19. Verify that a single RIO cable connects base system RIO port 0 to four I/O subsystems. Continue to step 21 of PFW1542-520-6.
20. Turn on the power to boot the standalone AIX diagnostics from CD-ROM.
21. If the Please define the System Console screen is displayed, follow the directions to select the system console.
22. Use the Display Configuration and Resource List option to list all of the attached devices and adapters.
23. Verify that all adapters and the attached devices are listed.

**Did the Please define the System Console screen display and are all adapters and attached devices listed?**

**NO** Go to PFW1542-520-7.

**YES** The RIO cable that was removed in step 3 on page 320 of PFW1542-520-6 is defective. Replace this RIO cable.

- If four I/O subsystems are chained to RIO port 0 (Un-P1-T3) of the base system, connect the new RIO cable from subsystem #4 I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) to base system RIO port 1 (Un-P1-T4).

- If three I/O subsystems are chained to RIO port 0 (Un-P1-T3) of the base system, connect the new RIO cable from subsystem #3 I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) to base system RIO port 1 (Un-P1-T4).
- If two I/O subsystems are chained to RIO port 0 (Un-P1-T3) of the base system, connect the new RIO cable from subsystem #2 I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) to base system RIO port 1 (Un-P1-T4).
- If one I/O subsystem is chained to RIO port 0 (Un-P1-T3) of the base system, connect the new RIO cable from subsystem #1 I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) to base system RIO port 1 (Un-P1-T4). Restore the system back to its original configuration. Go to MAP 0410: Repair Checkout.

• **PFW1542-520-7**

The I/O in the base system will now be isolated. Power down the system. Disconnect the cable connection at RIO port 0 (Un-P1-T3) of the base system.

• **PFW1542-520-8**

1. Turn on the power to boot the standalone diagnostic CD-ROM.
2. If the Please define the System Console screen is displayed, follow the directions to select the system console.
3. Use the Display Configuration and Resource List option to list all of the attached devices and adapters.
4. Check that all adapters and attached devices in the base system are listed.

If the Please define the System Console screen was not displayed or all adapters and attached devices are not listed, the problem is in the base system.

**Was the Please define the System Console screen displayed and were all adapters and attached devices listed?**

**NO** Go to PFW1542-520-22.

**YES** Go to PFW1542-520-21.

• **PFW1542-520-9**

For subsystem #1:

- **Are there any adapters in slots 1, 2, 3, 4, 5, or 6 if it is a 7311/D20?**
- **Are there any adapters in slots 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, or 15 if it is a 5094 Expansion Unit?**

**NO** Go to PFW1542-520-10.

**YES** Go to PFW1542-520-13.

• **PFW1542-520-10**

For subsystem #2:

- **Are there any adapters in slots 1, 2, 3, 4, 5, or 6 if it is a 7311/D20?**
- **Are there any adapters in slots 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, or 15 if it is a 5094 Expansion Unit?**

**NO** Go to PFW1542-520-11.

**YES** Go to PFW1542-520-14.

• **PFW1542-520-11**

For subsystem #3:

- **Are there any adapters in slots 1, 2, 3, 4, 5, or 6 if it is a 7311/D20?**
- **Are there any adapters in slots 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, or 15 if it is a 5094 Expansion Unit?**

**NO** Go to PFW1542-520-12.



YES Go to PFW1542-520-15.

• **PFW1542-520-12**

For subsystem #4:

- Are there any adapters in slots 1, 2, 3, 4, 5, or 6 if it is a 7311/D20?
- Are there any adapters in slots 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, or 15 if it is a 5094 Expansion Unit?

NO Go to PFW1542-520-20.

YES Go to PFW1542-520-16.

• **PFW1542-520-13**

1. If it is not already off, turn off the power.
2. Label and record the locations of any cables attached to the adapters, then disconnect the cables.
3. Record the slot numbers of the adapters.
4. Remove all adapters from slots 1, 2, 3, 4, 6, and 7 in the I/O subsystem if it is a 7311/D20, or from slot 1-9 and 11-15 if it is a 5094 Expansion Unit.
5. Turn on the power to boot the standalone diagnostic CD-ROM.
6. If the ASCII terminal displays Enter 0 to select this console, press the 0 (zero) key on the ASCII terminal's keyboard.
7. If the Please define the System Console screen is displayed, follow the directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

**Was the Please define the System Console screen displayed and were all adapters and attached devices listed?**

NO Go to PFW1542-520-10.

YES Go to PFW1542-520-17.

• **PFW1542-520-14**

1. If it is not already off, turn off the power.
2. Label and record the locations of any cables attached to the adapters, then disconnect the cables.
3. Record the slot numbers of the adapters.
4. Remove all adapters from slots 1, 2, 3, 4, 6, and 7 in the I/O subsystem if it is a 7311/D20, or from slot 1-9 and 11-15 if it is a 5094 Expansion Unit.
5. Turn on the power to boot the standalone diagnostic CD-ROM.
6. If the ASCII terminal displays Enter 0 to select this console, press the 0 (zero) key on the ASCII terminal's keyboard.
7. If the Please define the System Console screen is displayed, follow the directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

**Was the Please define the System Console screen displayed and were all adapters and attached devices listed?**

NO Go to PFW1542-520-11.

YES Go to PFW1542-520-17.

• **PFW1542-520-15**

1. If it is not already off, turn off the power.
2. Label and record the locations of any cables attached to the adapters, then disconnect the cables.

3. Record the slot numbers of the adapters.
4. Remove all adapters from slots 1, 2, 3, 4, 6, and 7 in the I/O subsystem if it is a 7311/D20, or from slot 1-9 and 11-15 if it is a 5094 Expansion Unit.
5. Turn on the power to boot the standalone diagnostic CD-ROM.
6. If the ASCII terminal displays Enter 0 to select this console, press the 0 (zero) key on the ASCII terminal's keyboard.
7. If the Please define the System Console screen is displayed, follow the directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

**Was the Please define the System Console screen displayed and were all adapters and attached devices listed?**

**NO** Go to PFW1542-520-12.

**YES** Go to PFW1542-520-17.

• **PFW1542-520-16**

1. If it is not already off, turn off the power.
2. Label and record the locations of any cables attached to the adapters, then disconnect the cables.
3. Record the slot numbers of the adapters.
4. Remove all adapters from slots 1, 2, 3, 4, 6, and 7 in the I/O subsystem if it is a 7311/D20, or from slots 1-9 and 11-15 if it is a 5094 Expansion Unit.
5. Turn on the power to boot the standalone diagnostic CD-ROM.
6. If the ASCII terminal displays Enter 0 to select this console, press the 0 (zero) key on the ASCII terminal's keyboard.
7. If the Please define the System Console screen is displayed, follow the directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

**Was the Please define the System Console screen displayed and were all adapters and attached devices listed?**

**NO** Go to PFW1542-520-19.

**YES** Go to PFW1542-520-17.

• **PFW1542-520-17**

If the Please define the System Console screen was not displayed and all adapters and attached devices were not listed, the problem is with one of the adapter cards or attached devices that was removed or disconnected from the I/O subsystem.

1. Turn off the power.
2. Reinstall one adapter and device that was removed. Use the original adapter cards in their original slots when reinstalling adapters.
3. Turn on the power to boot the standalone diagnostic CD-ROM.
4. If the Please define the System Console screen is displayed, follow the directions to select the system console.
5. Use the Display Configuration and Resource List option to list all adapters and attached devices.
6. Check that all adapters and attached devices are listed.

**Was the Please define the System Console screen displayed and were all adapters and attached devices listed?**

**NO** Go to PFW1542-520-18.

**YES** Reinstall the next adapter and device and return to the beginning of this step. Repeat this process until an adapter or device causes the Please define the System Console screen to not display or all attached devices and adapters to not be listed.

After installing all of the adapters and the Please define the System Console screen does display and all attached devices and adapters are listed, return the system to its original configuration. Go to MAP 0410: Repair Checkout

- **PFW1542-520-18**

Replace the adapter you just installed with a new adapter and retry booting AIX standalone diagnostics from CD-ROM.

1. If the Please define the System Console screen is displayed, follow the directions to select the system console.
2. Use the Display Configuration and Resource List option to list all adapters and attached devices.
3. Check that all adapters and attached devices are listed.

**Was the Please define the System Console screen displayed and were all adapters and attached devices listed?**

**NO** The I/O subsystem backplane is defective. Replace the I/O subsystem backplane. In both the 7311/D20 and the 5094 Expansion Unit, the I/O subsystem backplane is Un-CB1. Then go to PFW1542-520-20.

**YES** The adapter was defective. Go to PFW1542-520-20.

- **PFW1542-520-19**

1. Turn off the power.
2. Disconnect the I/O subsystem power cables.
3. Replace the following parts, one at a time, if present, in the sequence listed:
  - a. I/O subsystem #1 backplane, Un-CB1.
  - b. I/O subsystem #2 backplane, Un-CB1.
  - c. I/O subsystem #3 backplane, Un-CB1.
  - d. I/O subsystem #4 backplane, Un-CB1.
4. Reconnect the I/O subsystem power cables.
5. Turn on the power.
6. Boot standalone AIX diagnostics from CD.
7. If the Please define the System Console screen is displayed, follow directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all attached devices and adapters are listed.

**Did the Please define the System Console screen display and are all attached devices and adapters listed?**

**NO** Replace the next part in the list and return to the beginning of this step. Repeat this process until a part causes the Please define the System Console screen to be displayed and all adapters and attached devices to be listed. If you have replaced all the items listed above and the Please define the System Console screen does not display or all attached devices and adapters are not listed, check all external devices and cabling. If you do not find a problem, contact your next level of support for assistance.

**YES** Go to PFW1542-520-20.

- **PFW1542-520-20**

1. Turn off the power.
2. The item just replaced fixed the problem.

3. If a display adapter with keyboard and mouse were installed, reinstall the display adapter card, keyboard, and mouse.
  4. Reconnect the tape drive (if previously installed) to the internal SCSI bus cable.
  5. Plug in all adapters that were previously removed but not reinstalled.
  6. Reconnect the I/O subsystem power cables that were previously disconnected.
- Return the system to its original condition. Go to MAP 0410: Repair Checkout.

• **PFW1542-520-21**

1. Turn off the power.
2. At the base system, reconnect the cable connection at RIO port 0 (Un-P1-T3) recorded in "PFW1542-520-6" on page 320.
3. At the base system, reconnect the cable connection at RIO port 1(Un-P1-T4) recorded in "PFW1542-520-6" on page 320.
4. Reconnect the power cables to the I/O subsystems that were found attached to the base system RIO ports mentioned in step 2 and step 3 of PFW1542-520-21. All I/O subsystems that were attached to the base system RIO port 0 and RIO port 1 should now be reconnected to the base system.
5. Make sure the I/O subsystem(s) are cabled correctly as shown in Connect your unit with HSL/RIO cables.
6. Turn on the power to boot standalone AIX diagnostics from CD-ROM.
7. If the Please define the System Console screen is displayed, follow the directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

**Did the Please define the System Console screen display and are all attached devices and adapters listed?**

**NO** Go to PFW1542-520-9 to isolate a problem in an I/O subsystem attached to the base system RIO bus on the system backplane.

**YES** Go to PFW1542-520-20.

• **PFW1542-520-22**

**Are there any adapters in slots 1, 2, 3, 4, 5, or 6 in the base system?**

**NO** Go to PFW1542-520-23.

**YES** Go to PFW1542-520-25.

• **PFW1542-520-23**

Replace the system backplane, Un-P1. Go to MAP 0410: Repair Checkout.

• **PFW1542-520-24**

1. Boot standalone AIX diagnostics from CD.
2. If the Please define the System Console screen is displayed, follow directions to select the system console.
3. Use the Display Configuration and Resource List to list all adapters and attached devices.
4. Check that all adapters and attached devices are listed.

**Did the Please define the System Console screen display and are all attached devices and adapters listed?**

**NO** Go to PFW1542-520-28.

**YES** Go to PFW1542-520-20.

• **PFW1542-520-25**

1. If it is not already off, turn off the power.
2. Label and record the location of any cables attached to the adapters.

3. Record the slot number of the adapters.
4. Remove all adapters from slots 1, 2, 3, 4, 5, and 6 in the base system that are not attached to the boot device.
5. Turn on the power to boot standalone diagnostics from CD-ROM.
6. If the ASCII terminal displays Enter 0 to select this console, press the 0 key on the ASCII terminal's keyboard.
7. If the Please define the System Console screen is displayed, follow directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

**Did the Please define the System Console screen display and are all attached devices and adapters listed?**

**NO** Go to PFW1542-520-23.

**YES** Go to PFW1542-520-26.

- **PFW1542-520-26**

If the Please define the System Console screen does display and all adapters and attached devices are listed, the problem is with one of the adapter cards or devices that was removed or disconnected from the base system.

1. Turn off the power.
2. Reinstall one adapter and device that was removed. Use the original adapter cards in their original slots when reinstalling adapters.
3. Turn on the power to boot standalone diagnostics from CD-ROM.
4. If the Please define the System Console screen is displayed, follow the directions to select the system console.
5. Use the Display Configuration and Resource List to list all adapters and attached devices.
6. Check that all adapters and attached devices are listed.

**Did the Please define the System Console screen display and are all attached devices and adapters listed?**

**NO** Go to PFW1542-520-27.

**YES** Reinstall the next adapter and device and return to the beginning of this step. Repeat this process until an adapter and device causes the Please define the System Console screen to not display or all attached devices and adapters to not be listed. After installing all of the adapters and the Please define the System Console screen displays and all attached devices and adapters are listed, go to PFW1542-520-20.

- **PFW1542-520-27**

Replace the adapter you just installed with a new adapter and retry the boot to standalone AIX diagnostics from CD-ROM.

1. If the Please define the System Console screen is displayed, follow directions to select the system console.
2. Use the Display Configuration and Resource List option to list all adapters and attached devices.
3. Check that all adapters and attached devices are listed.

**Did the Please define the System Console screen display and are all attached devices and adapters listed?**

**NO** Go to PFW1542-520-23.

**YES** Go to PFW1542-520-20.

- **PFW1542-520-28**

1. Turn off the power

2. Disconnect the base system power cables.
3. Replace the following parts, one at a time, in the sequence listed:
  - a. Internal SCSI cable
  - b. Disk drive backplanes, one at a time
  - c. Media backplane
  - d. IDE devices, one at a time
  - e. SCSI devices, one at a time
  - f. Service processor
4. Reconnect the base system power cables.
5. Turn on the power.
6. Boot standalone AIX diagnostics from CD.
7. If the Please define the System Console screen is displayed, follow directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

**Did the Please define the System Console screen display and are all adapters and attached devices listed?**

**NO** Replace the next part in the list and return to the beginning of this step. Repeat this process until a part causes the Please define the System Console screen to be displayed and all adapters and attached devices to be listed. If you have replaced all the items listed above and the Please define the System Console screen does not display or all adapters and attached devices are not listed, check all external devices and cabling. If you do not find a problem, contact your next level of support for assistance.

**YES** Go to PFW1542-520-20.

## **PFW1542-550: Model 550 I/O problem isolation procedure**

### **Purpose of this procedure**

Use this procedure to locate defective FRUs not found by normal diagnostics when servicing a 550. For this procedure, diagnostics are run on a minimally configured system. If a failure is detected on the minimally configured system, the remaining FRUs are exchanged one at a time until the failing FRU is identified. If a failure is not detected, FRUs are added back until the failure occurs. The failure is then isolated to the failing FRU.

#### • **PFW1542-550-1**

1. Insure that the diagnostics and the operating system are shut down.
2. Turn off the power.
3. Select slow system boot speed on the power on/off system menu under the power/restart control menu on the ASMI.
4. Turn on the power.
5. Put the AIX diagnostic CD-ROM into the optical drive.

**Does the optical drive appear to operate correctly?**

**NO** Go to Problems with Loading and Starting the Operating System..

**YES** Continue to "PFW1542-550-2."

#### • **PFW1542-550-2**

1. When the keyboard indicator is displayed (the word keyboard), if the system or partition gets that far in the IPL process, press the 5 key on the firmware console.
2. Enter the appropriate password if you are prompted to do so.

**Is the Please define the System Console screen displayed?**

**NO** Continue to "PFW1542-550-3."

**YES** Go to "PFW1542-550-4."

• **PFW1542-550-3**

The system is unable to boot standalone AIX diagnostics. Check the service processor error log (using the ASMI) and the operator panel for additional error codes resulting from the slow boot that was performed in PFW1542-550-1.

**Did the slow boot generate a different error code or partition firmware hang from the one that originally sent you to PFW1542?**

**NO** If you were sent here by an error code, and the error code did not change as the result of a slow boot, you have a processor subsystem problem. Go to PFW1548: Memory and Processor Problem Isolation. If you were sent here because the system is hanging on a partition firmware checkpoint, and the hang condition did not change as a result of the slow boot, go to "PFW1542-550-5."

**YES** Restore fast boot on the power on/off system menu from the ASMI. Look up the new error code in the reference code index and perform the listed actions.

• **PFW1542-550-4**

The system stopped with the please define the system console prompt on the system console. Standalone diagnostics can be booted. Perform the following:

1. Follow the instructions on the screen to select the system console.
2. When the DIAGNOSTIC OPERATING INSTRUCTIONS screen is displayed, press Enter.
3. If the terminal type has not been defined, you must use the Initialize Terminal option on the FUNCTION SELECTION menu to initialize the AIX operating system environment before you can continue with the diagnostics. This is a separate operation from selecting the firmware console.
4. Select Advanced Diagnostic Routines.
5. When the DIAGNOSTIC MODE SELECTION menu displays, select System Verification to run diagnostics on all resources.

**Did running diagnostics produce a different symptom?**

**NO** Go to step 6 of PFW1542-550-4.

**YES** Go to the Start-of-Call procedure. Use the new symptom.

6. Record any devices missing from the list of all adapters and devices. Continue with this procedure. When you have fixed the problem, use this record to verify that all devices appear when you run system verification.

**Are there any devices missing from the list of all adapters and devices?**

**NO** Reinstall all remaining adapters, if any, and reconnect all devices. Return the system to its original configuration. Be sure to select fast boot on the power on/off system menu on the ASMI. Go to Repair Checkout.

**YES** The boot attempts that follow will attempt to isolate any remaining I/O subsystem problems with missing devices. Ignore any codes that may display on the operator panel unless stated otherwise. Continue to "PFW1542-550-5."

• **PFW1542-550-5**

Examine RIO port 0 on the base system at Un-P1-T11.

**Are there any I/O subsystems attached to the base system?**

**NO** Go to "PFW1542-550-25" on page 339.

**YES** Continue to "PFW1542-550-6."

• **PFW1542-550-6**

There may be devices missing from one of more of the I/O subsystems, or one or more devices in the I/O subsystems may be causing the system or a partition to hang during IPL.

**Attention:** The 5094 Expansion Unit and the 7311/D20 I/O subsystem may both be connected to the 550. The 7311/D20 I/O subsystem is a full-width rack-mounted drawer; the 5094 Expansion Unit can be either a tower or a full-width drawer.

The RIO ports on these subsystems are :

	550 (base system)	5094	7311/D20
RIO port 0	Un-P1-T11	Un-CB1-C08-00 (bottom connector)	Un-P1-C05-00 (bottom connector)
RIO port 1	Un-P1-T12	Un-CB1-C08-01 (top connector)	Un-P1-C05-01 (top connector)

**Note:** Before continuing, check the cabling from the base system to the I/O subsystem(s) to insure that the system is cabled correctly. Refer to Connect your unit with HSL/RIO cables for valid configurations. Record the current cabling configuration and then continue with the following steps.

1. Turn off the power.
2. At the base system, disconnect the cable connection at RIO port 0 (Un-P1-T11).
3. At the other end of the RIO cable referred to in step 2, disconnect the I/O subsystem port connector 0 (Un-CB1-C08-00 (bottom connector) or Un-P1-C05-00 (bottom connector), depending on the I/O subsystem). The RIO cable that was connected to RIO port 0 in the base system should now be loose; remove it. Record the location of this I/O subsystem and call it "subsystem #1".
4. Examine the connection at the I/O port connector 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector) of the I/O subsystem recorded in step 3 of PFW1542-550-6. If the RIO cable attached to I/O port connector 1 connects to the I/O port connector 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of subsystem #1, then go to step 9 of PFW1542-550-6.
5. This step is reserved.
6. At the base system, disconnect the cable connection at RIO port 1 (Un-P1-T12) and reconnect it to RIO port 0 (Un-P1-T11).
7. At the I/O subsystem recorded in step 3 of PFW1542-550-6, disconnect the I/O port connector 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) and reconnect to I/O port 0 (Un-CB1-C08-00 (bottom connector) or Un-P1-C05-00 (bottom connector)).
8. Verify that a single RIO cable connects base system RIO port 0 (Un-P1-T11) to the I/O subsystem recorded in step 4 of PFW1542-550-6 port 0 (Un-CB1-C08-00 (bottom connector) or Un-P1-C05-00 (bottom connector)). Go to step 21 on page 331 of PFW1542-550-6.
9. Record the location of the next I/O subsystem and call it "subsystem #2". This is the I/O subsystem that is connected to I/O port 1 of subsystem #1.
10. Examine the connection at the I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) of subsystem #2 recorded in step 9 of PFW1542-550-6. If the RIO cable attached to I/O port 1 connects to the I/O port 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of subsystem #2 and call it "subsystem #3". Go to step 14 on page 331 of PFW1542-550-6.
11. The RIO cable attached to the I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) of subsystem #2 is attached to port 1 (Un-P1-T12) of the base system. At the base system, disconnect the cable connection at RIO port 1 (Un-P1-T12) and reconnect it to RIO port 0 (Un-P1-T11).
12. On subsystem #2, disconnect the cable from I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) and reconnect it to I/O port 0 (Un-CB1-C08-00 (bottom connector) or Un-P1-C05-00 (bottom connector)) of subsystem #1.
13. Verify that a single RIO cable connect base system RIO port 0 to one or two I/O subsystems. Go to step 21 on page 331 of PFW1542-550-6.



14. Examine the connection at the I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) of subsystem #3 recorded in step 10 on page 330 of PFW1542-550-6. If the RIO cable attached to I/O port 1 connects to the I/O port 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of the subsystem #3 and call it "subsystem #4". Go to step 18 of PFW1542-550-6.
15. The RIO cable attached to the I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) of subsystem #3 is attached to port 1 (Un-P1-T12) of the base system. At the base system, disconnect the cable connection at RIO port 1 (Un-P1-T12) and reconnect it to RIO port 0 (Un-P1-T11).
16. On subsystem #3, disconnect the cable from I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) and reconnect it to I/O port 0 (Un-CB1-C08-00 (bottom connector) or Un-P1-C05-00 (bottom connector)) of subsystem #1.
17. Verify that a single RIO cable connects base system RIO port 0 to three I/O subsystems. Go to step 21 of PFW1542-550-6.
18. The RIO cable attached to the I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) of subsystem #4 is attached to port 1 (Un-P1-T12) of the base system. At the base system, disconnect the cable connection at RIO port 1 (Un-P1-T12) and reconnect it to RIO port 0 (Un-P1-T11).
19. On subsystem #4, disconnect the cable from I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) and reconnect it to I/O port 0 (Un-CB1-C08-00 (bottom connector) or Un-P1-C05-00 (bottom connector)) of subsystem #1.
20. Verify that a single RIO cable connects base system RIO port 0 to four I/O subsystems. Continue to step 21 of PFW1542-550-6. Turn on the power to boot the standalone AIX diagnostics from CD-ROM.
21. If the Please define the System Console screen is displayed, follow the directions to select the system console.
22. Use the Display Configuration and Resource List option to list all of the attached devices and adapters.
23. Verify that all adapters and the attached devices are listed.

**Did the Please define the System Console screen display and are all adapters and attached devices listed?**

**NO** Go to "PFW1542-550-7."

**YES** Replace the RIO cable that was removed in step 3 on page 330 of PFW1542-550-6.

**Notes:**

1. If four I/O subsystems are chained to RIO port 0 (Un-P1-T11) of the base system, connect the new RIO cable from subsystem #4 I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) to base system RIO port 1 (Un-P1-T12).
2. If three I/O subsystems are chained to RIO port 0 (Un-P1-T11) of the base system, connect the new RIO cable from subsystem #3 I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) to base system RIO port 1 (Un-P1-T12).
3. If two I/O subsystems are chained to RIO port 0 (Un-P1-T11) of the base system, connect the new RIO cable from subsystem #2 I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) to base system RIO port 1 (Un-P1-T12).
4. If one I/O subsystem is chained to RIO port 0 (Un-P1-T11) of the base system, connect the new RIO cable from subsystem #1 I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) to base system RIO port 1 (Un-P1-T12).

Restore the system back to its original configuration. Go to MAP 0410: Repair checkout.

• **PFW1542-550-7**

The I/O attached to the RIO ports on the base system planar will now be isolated. Power down the system. Disconnect the cable connection at RIO port 0 (Un-P1-T11) of the base system.

- **PFW1542-550-8**
  1. Turn on the power to boot the standalone diagnostic CD-ROM.
  2. If the Please define the System Console screen is displayed, follow the directions to select the system console.
  3. Use the Display Configuration and Resource List option to list all of the attached devices and adapters.
  4. Check that all adapters and attached devices in the base system are listed. If the Please define the System Console screen was not displayed or all adapters and attached devices are not listed, the problem is in the base system.

**Was the Please define the System Console screen displayed and were all adapters and attached devices listed?**

**NO** Go to "PFW1542-550-25" on page 339.

**YES** Go to "PFW1542-550-21" on page 335.

- **PFW1542-550-9**

For subsystem #1:

**Are there any adapters in slots 1, 2, 3, 4, 5, or 6 if it is a 7311/D20?**

OR

**Are there any adapters in slots 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, or 15 if it is a 5094 Expansion Unit?**

**NO** Go to "PFW1542-550-10."

**YES** Go to "PFW1542-550-13" on page 333.

- **PFW1542-550-10**

For subsystem #2:

**Are there any adapters in slots 1, 2, 3, 4, 5, or 6 if it is a 7311/D20?**

OR

**Are there any adapters in slots 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, or 15 if it is a 5094 Expansion Unit?**

**NO** Go to "PFW1542-550-11."

**YES** Go to "PFW1542-550-14" on page 333.

- **PFW1542-550-11**

For subsystem #3:

**Are there any adapters in slots 1, 2, 3, 4, 5, or 6 if it is a 7311/D20?**

OR

**Are there any adapters in slots 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, or 15 if it is a 5094 Expansion Unit?**

**NO** Go to "PFW1542-550-12."

**YES** Go to "PFW1542-550-15" on page 333.

- **PFW1542-550-12**

For subsystem #4:

**Are there any adapters in slots 1, 2, 3, 4, 5, or 6 if it is a 7311/D20?**

OR

**Are there any adapters in slots 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, or 15 if it is a 5094 Expansion Unit?**

**NO** Go to "PFW1542-550-19" on page 335.

**YES** Go to "PFW1542-550-16" on page 334.

- **PFW1542-550-13**

1. If it is not already off, turn off the power.
2. Label and record the locations of any cables attached to the adapters, then disconnect the cables.
3. Record the slot numbers of the adapters.
4. Remove all adapters from slots 1, 2, 3, 4, 6, and 7 in the I/O subsystem if it is a 7311/D20, or from slot 1-9 and 11-15 if it is a 5094 Expansion Unit.
5. Turn on the power to boot the standalone diagnostic CD-ROM.
6. If the ASCII terminal displays Enter 0 to select this console, press the 0 (zero) key on the ASCII terminal's keyboard.
7. If the Please define the System Console screen is displayed, follow the directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

**Was the Please define the System Console screen displayed and were all adapters and attached devices listed?**

**NO** Go to "PFW1542-550-10" on page 332.

**YES** Go to "PFW1542-550-17" on page 334.

- **PFW1542-550-14**

1. If it is not already off, turn off the power.
2. Label and record the locations of any cables attached to the adapters, then disconnect the cables.
3. Record the slot numbers of the adapters.
4. Remove all adapters from slots 1, 2, 3, 4, 6, and 7 in the I/O subsystem if it is a 7311/D20, or from slot 1-9 and 11-15 if it is a 5094 Expansion Unit.
5. Turn on the power to boot the standalone diagnostic CD-ROM.
6. If the ASCII terminal displays Enter 0 to select this console, press the 0 (zero) key on the ASCII terminal's keyboard.
7. If the Please define the System Console screen is displayed, follow the directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

**Was the Please define the System Console screen displayed and were all adapters and attached devices listed?**

**NO** Go to "PFW1542-550-11" on page 332.

**YES** Go to "PFW1542-550-17" on page 334.

- **PFW1542-550-15**

1. If it is not already off, turn off the power.
2. Label and record the locations of any cables attached to the adapters, then disconnect the cables.
3. Record the slot numbers of the adapters.
4. Remove all adapters from slots 1, 2, 3, 4, 6, and 7 in the I/O subsystem if it is a 7311/D20, or from slot 1-9 and 11-15 if it is a 5094 Expansion Unit.
5. Turn on the power to boot the standalone diagnostic CD-ROM.
6. If the ASCII terminal displays Enter 0 to select this console, press the 0 (zero) key on the ASCII terminal's keyboard.
7. If the Please define the System Console screen is displayed, follow the directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.

9. Check that all adapters and attached devices are listed.

**Was the Please define the System Console screen displayed and were all adapters and attached devices listed?**

**NO** Go to "PFW1542-550-12" on page 332.

**YES** Go to "PFW1542-550-17."

• **PFW1542-550-16**

1. If it is not already off, turn off the power
2. Label and record the locations of any cables attached to the adapters, then disconnect the cables.
3. Record the slot numbers of the adapters.
4. Remove all adapters from slots 1, 2, 3, 4, 6, and 7 in the I/O subsystem if it is a 7311/D20, or from slots 1-9 and 11-15 if it is a 5094 Expansion Unit.
5. Turn on the power to boot the standalone diagnostic CD-ROM.
6. If the ASCII terminal displays Enter 0 to select this console, press the 0 (zero) key on the ASCII terminal's keyboard.
7. If the Please define the System Console screen is displayed, follow the directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

**Was the Please define the System Console screen displayed and were all adapters and attached devices listed?**

**NO** Go to "PFW1542-550-19" on page 335.

**YES** Go to "PFW1542-550-17."

• **PFW1542-550-17**

If the Please define the System Console screen was not displayed and all adapters and attached devices were not listed, the problem is with one of the adapter cards or attached devices that was removed or disconnected from the I/O subsystem.

1. Turn off the power.
2. Reinstall one adapter and device that was removed. Use the original adapter cards in their original slots when reinstalling adapters.
3. Turn on the power to boot the standalone diagnostic CD-ROM
4. If the Please define the System Console screen is displayed, follow the directions to select the system console.
5. Use the Display Configuration and Resource List option to list all adapters and attached devices.
6. Check that all adapters and attached devices are listed.

**Was the Please define the System Console screen displayed and were all adapters and attached devices listed?**

**NO** Go to "PFW1542-550-18."

**YES** Reinstall the next adapter and device and return to the beginning of this step. Repeat this process until an adapter or device causes the Please define the System Console screen to not display or all attached devices and adapters to not be listed. After installing all of the adapters and the Please define the System Console screen does display and all attached devices and adapters are listed, return the system to its original configuration. Go to MAP 0410: Repair Checkout.

• **PFW1542-550-18**

Replace the adapter you just installed with a new adapter and retry booting AIX standalone diagnostics from CD-ROM.

1. If the Please define the System Console screen is displayed, follow the directions to select the system console.
2. Use the Display Configuration and Resource List option to list all adapters and attached devices.
3. Check that all adapters and attached devices are listed.

**Was the Please define the System Console screen displayed and were all adapters and attached devices listed?**

**NO** The I/O subsystem backplane is defective. Replace the I/O subsystem backplane. In both the 7311/D20 and the 5094 Expansion Unit, the I/O subsystem backplane is Un-CB1. Then go to “PFW1542-550-20.”

**YES** The adapter was defective. Go to “PFW1542-550-20.”

• **PFW1542-550-19**

1. Turn off the power.
2. Disconnect the I/O subsystem power cables.
3. Replace the following parts, one at a time, if present, in the sequence listed:
  - a. I/O subsystem #1 backplane, Un-CB1.
  - b. I/O subsystem #2 backplane, Un-CB1.
  - c. I/O subsystem #3 backplane, Un-CB1.
  - d. I/O subsystem #4 backplane, Un-CB1.
  - e. The RIO interface in the base system that the RIO cables are presently attached to: either the base planar (Un-P1) if the cables are connected to Un-P1-T11 and Un-P1-T12, or the RIO expansion card (Un-P1-C6) if the RIO cables are attached to Un-P1-C6-T1 and Un-P1-C6-T2.
4. Reconnect the I/O subsystem power cables.
5. Turn on the power.
6. Boot standalone AIX diagnostics from CD.
7. If the Please define the System Console screen is displayed, follow directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all attached devices and adapters are listed.

**Did the Please define the System Console screen display and are all attached devices and adapters listed?**

**NO** Replace the next part in the list and return to the beginning of this step. Repeat this process until a part causes the Please define the System Console screen to be displayed and all adapters and attached devices to be listed. If you have replaced all the items listed above and the Please define the System Console screen does not display or all attached devices and adapters are not listed, check all external devices and cabling. If you do not find a problem, contact your next level of support for assistance.

**YES** Go to “PFW1542-550-20.”

• **PFW1542-550-20**

1. Turn off the power.
2. The item just replaced fixed the problem.
3. If a display adapter with keyboard and mouse were installed, reinstall the display adapter card, keyboard, and mouse.
4. Reconnect the tape drive (if previously installed) to the internal SCSI bus cable.
5. Plug in all adapters that were previously removed but not reinstalled.
6. Reconnect the I/O subsystem power cables that were previously disconnected.
7. Return the system to its original condition. Go to MAP 0410: Repair Checkout.

• **PFW1542-550-21**

1. Turn off the power.
2. At the base system, reconnect the cable connection at RIO port 0 (Un-P1-T11) recorded in "PFW1542-550-7" on page 331.
3. At the base system, reconnect the cable connection at RIO port 1(Un-P1-T12) recorded in "PFW1542-550-7" on page 331.
4. Reconnect the power cables to the I/O subsystems that were found attached to the base system RIO ports mentioned in Step 2 and Step 3 of PFW1542-550-21. All I/O subsystems that were attached to the base system RIO port 0 and RIO port 1 should now be reconnected to the base system.
5. Make sure the I/O subsystem(s) are cabled correctly as shown in Connect your unit with HSL/RIO cables.
6. Turn on the power to boot standalone AIX diagnostics from CD-ROM.
7. If the Please define the System Console screen is displayed, follow the directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

**Did the Please define the System Console screen display and are all attached devices and adapters listed?**

**NO** Go to "PFW1542-550-9" on page 332 to isolate a problem in an I/O subsystem attached to the base system RIO bus on the system backplane.

**YES** Go to "PFW1542-550-22."

• **PFW1542-550-22**

**Is there a RIO expansion card plugged into Un-P1-C6 in the base system, and if so, is there at least one I/O subsystem attached to it?**

**NO** Go to "PFW1542-550-25" on page 339.

**YES** Continue to "PFW1542-550-23."

• **PFW1542-550-23**

1. Turn off the power.
2. At the base system, reconnect the cable connection at RIO port 0 on the RIO expansion card (Un-P1-C6-T2) recorded in PFW1542-550-7.
3. At the base system, reconnect the cable connection at RIO port 1 on the RIO expansion card (Un-P1-C6-T1) recorded in PFW1542-550-7.
4. Reconnect the power cables to the I/O subsystems that were attached to the base system's RIO ports mentioned in step 2 and step 3 of PFW1542-550-23. All I/O subsystems that were attached to RIO port 0 on the RIO expansion card (Un-P1-C6-T2) and RIO port 1 on the RIO expansion card (Un-P1-C6-T1) in the base system should now be reconnected to the system.
5. Make sure that the I/O subsystem(s) are cabled correctly as shown in Connect your unit with HSL/RIO cables.
6. Turn on the power to boot the standalone AIX diagnostic CD-ROM.
7. If the Please define the System Console screen is displayed, follow the directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Verify that all adapters and attached devices are listed.

**Did the Please define the System Console screen display and are all adapters and attached devices listed?**

**NO** Go to "PFW1542-550-24" on page 337 to isolate the problems in the I/O subsystems that are attached to the RIO expansion card in the base system.

**YES** Go to "PFW1542-550-25" on page 339.

• **PFW1542-550-24**

At the base system, reconnect the second I/O subsystem to the RIO ports on the base system's expansion card at Un-P1-C6-T1 and Un-P1-C6-T2.

The 5094 Expansion Unit and the 7311/D20 I/O subsystem may both be connected to the 9113/550. The 7311/D20 I/O subsystem is a full-width rack-mounted drawer; the 5094 Expansion Unit can be either a tower or a full-width drawer. The RIO ports on these subsystems, and the RIO ports on the base system that will be used in this section of the procedure, are :

	550 (RIO expansion card)	5094	7311/D20
RIO port 0	Un-P1-C6-T2	Un-CB1-C08-00 (bottom connector)	Un-P1-C05-00 (bottom connector)
RIO port 1	Un-P1-C6-T1	Un-CB1-C08-01 (top connector)	Un-P1-C05-01 (top connector)

**Note:** Note: Before continuing, check the cabling from the base system to the I/O subsystem(s) to insure that the system is cabled correctly. Refer to Connect your unit with HSL/RIO cables for valid configurations. Record the current cabling configuration and then continue with the following steps.

1. Turn off the power.
2. At the base system, disconnect the cable connection at RIO port 0 (Un-P1-C6-T2).
3. At the other end of the RIO cable referred to in step 2, disconnect the I/O subsystem port connector 0 (Un-CB1-C08-00 (bottom connector) or Un-P1-C05-00 (bottom connector), depending on the I/O subsystem). The RIO cable that was connected to RIO port 0 on the expansion card should now be loose; remove it. Record the location of this I/O subsystem and call it "subsystem #1".
4. Examine the connection at the I/O port connector 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) of the I/O subsystem recorded in step 3 of PFW1542-550-24. If the RIO cable attached to I/O port connector 1 connects to the I/O port connector 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of subsystem #1, then go to step 9 of PFW1542-550-24.
5. This step is reserved.
6. At the base system, disconnect the cable connection at RIO port 1 on the RIO expansion card (Un-P1-C6-T1) and reconnect it to RIO port 0 on the RIO expansion card (Un-P1-C6-T2).
7. At the I/O subsystem recorded in step 3 of PFW1542-550-24, disconnect the I/O port connector 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) and reconnect to I/O port 0 (Un-CB1-C08-00 (bottom connector) or Un-CB1-C08-00 (bottom connector)).
8. Verify that a single RIO cable connects base system RIO port 0 on the RIO expansion card (Un-P1-C6-T1) to the I/O subsystem recorded in step 4 of PFW1542-550-24 port 0 (Un-CB1-C08-00 (bottom connector) or Un-P1-C05-00 (bottom connector)). Go to step 21 on page 338 of PFW1542-550-24.
9. Record the location of the next I/O subsystem and call it "subsystem #2". This is the I/O subsystem that is connected to I/O port 1 of subsystem #1.
10. Examine the connection at the I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) of subsystem #2 recorded in step 9 of PFW1542-550-24. If the RIO cable attached to I/O port 1 connects to the I/O port 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of subsystem #2 and call it "subsystem #3". Go to step 14 on page 338 of PFW1542-550-24.
11. The RIO cable attached to the I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) of subsystem #2 is attached to port 1 (Un-P1-C6-T1) of the base system. At the base system, disconnect the cable connection at RIO port 1 on the RIO expansion card (Un-P1-C6-T1) and reconnect it to RIO port 0 on the RIO expansion card (Un-P1-C6-T1).

12. On subsystem #2, disconnect the cable from I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) and reconnect it to I/O port 0 (Un-CB1-C08-00 (bottom connector) or Un-P1-C05-00 (bottom connector)) of subsystem #1.
13. Verify that a single RIO cable connect base system RIO port 0 to one or two I/O subsystems. Go to step 21 of PFW1542-550-24.
14. Examine the connection at the I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) of subsystem #3 recorded in step 10 on page 337 of PFW1542-550-24. If the RIO cable attached to I/O port 1 connects to the I/O port 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of the subsystem #3 and call it "subsystem #4". Go to step 18 of PFW1542-550-24.
15. The RIO cable attached to the I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) of subsystem #3 is attached to RIO port 1 on the RIO expansion card (Un-P1-C6-T1). At the base system, disconnect the cable connection at RIO port 1 on the RIO expansion card (Un-P1-C6-T1) and reconnect it to RIO port 0 on the RIO expansion card (Un-P1-C6-T1).
16. On subsystem #3, disconnect the cable from I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) and reconnect it to I/O port 0 (Un-CB1-C08-00 (bottom connector) or Un-P1-C05-00 (bottom connector)) of subsystem #1.
17. Verify that a single RIO cable connects base system RIO port 0 to three I/O subsystems. Go to step 21 of PFW1542-550-24.
18. The RIO cable attached to the I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) of subsystem #4 is attached to port 1 (Un-P1-C6-T1) on the RIO expansion card. On the RIO expansion card, disconnect the cable connection at RIO port 1 (Un-P1-C6-T1) and reconnect it to RIO port 0 (Un-P1-C6-T2).
19. On subsystem #4, disconnect the cable from I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) and reconnect it to I/O port 0 (Un-CB1-C08-00 (bottom connector) or Un-P1-C05-00 (bottom connector)) of subsystem #1.
20. Verify that a single RIO cable connects base system RIO port 0 to four I/O subsystems. Continue to step 21 of PFW1542-550-24.
21. Turn on the power to boot the standalone AIX diagnostics from CD-ROM.
22. If the Please define the System Console screen is displayed, follow the directions to select the system console.
23. Use the Display Configuration and Resource List option to list all of the attached devices and adapters.
24. Verify that all adapters and the attached devices are listed.

**Did the Please define the System Console screen display and are all adapters and attached devices listed?**

**NO** Go to "PFW1542-550-9" on page 332 to further isolate a problem in the I/O subsystem(s) attached to the RIO expansion card (Un-P1-C6).

**YES** The RIO cable that was removed in step 3 on page 337 of PFW1542-550-24 is defective. Replace this RIO cable.

**Notes:**

1. If four I/O subsystems are chained to RIO port 0 (Un-P1-C6-T1) of the base system, connect the new RIO cable from subsystem #4 I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) to RIO port 1 on the RIO expansion card (Un-P1-C6-T1).
2. If three I/O subsystems are chained to RIO port 0 (Un-P1-C6-T1) of the base system, connect the new RIO cable from subsystem #3 I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) to RIO port 1 on the RIO expansion card (Un-P1-C6-T1).
3. If two I/O subsystems are chained to RIO port 0 (Un-P1-C6-T1) of the base system, connect the new RIO cable from subsystem #2 I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) to RIO port 1 on the RIO expansion card (Un-P1-C6-T1).



4. If one I/O subsystem is chained to RIO port 0 (Un-P1-C6-T1) of the base system, connect the new RIO cable from subsystem #1 I/O port 1 (Un-CB1-C08-01 (top connector) or Un-P1-C05-01 (top connector)) to RIO port 1 on the RIO expansion card (Un-P1-C6-T1).
  5. Restore the system back to its original configuration. Go to MAP 0410: Repair Checkout.
- **PFW1542-550-25**  
**Are there any adapters in slots 1, 2, 3, 4, 5, or 6 in the base system?**  
**NO** Go to "PFW1542-550-26."  
**YES** Go to "PFW1542-550-28."
  - **PFW1542-550-26**  
Replace the system backplane, Un-P1. Continue to "PFW1542-550-27."
  - **PFW1542-550-27**
    1. Boot standalone AIX diagnostics from CD.
    2. If the Please define the System Console screen is displayed, follow directions to select the system console.
    3. Use the Display Configuration and Resource List to list all adapters and attached devices.
    4. Check that all adapters and attached devices are listed.**Did the Please define the System Console screen display and are all attached devices and adapters listed?**  
**NO** Go to "PFW1542-550-31" on page 340.  
**YES** Go to "PFW1542-550-20" on page 335.
  - **PFW1542-550-28**
    1. If it is not already off, turn off the power.
    2. Label and record the location of any cables attached to the adapters.
    3. Record the slot number of the adapters.
    4. Remove all adapters from slots 1, 2, 3, 4, 5, and 6 in the base system that are not attached to the boot device.
    5. Turn on the power to boot standalone AIX diagnostics from CD-ROM.
    6. If the ASCII terminal displays Enter 0 to select this console, press the 0 key on the ASCII terminal's keyboard
    7. If the Please define the System Console screen is displayed, follow directions to select the system console.
    8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
    9. Check that all adapters and attached devices are listed.**Did the Please define the System Console screen display and are all attached devices and adapters listed?**  
**NO** Go to "PFW1542-550-26."  
**YES** Continue to "PFW1542-550-29."
  - **PFW1542-550-29**  
If the Please define the System Console screen does display and all adapters and attached devices are listed, the problem is with one of the adapter cards or devices that was removed or disconnected from the base system.
    1. Turn off the power.
    2. Reinstall one adapter and device that was removed. Use the original adapter cards in their original slots when reinstalling adapters.
    3. Turn on the power to boot standalone AIX diagnostics from CD-ROM.

4. If the Please define the System Console screen is displayed, follow the directions to select the system console.
5. Use the Display Configuration and Resource List to list all adapters and attached devices.
6. Check that all adapters and attached devices are listed.

**Did the Please define the System Console screen display and are all attached devices and adapters listed?**

**NO** Continue to “PFW1542-550-30.”

**YES** Return to the beginning of this step to continue reinstalling adapters and devices.

• **PFW1542-550-30**

Replace the adapter you just installed with a new adapter and retry the boot to standalone AIX diagnostics from CD-ROM.

1. If the Please define the System Console screen is displayed, follow directions to select the system console.
2. Use the Display Configuration and Resource List option to list all adapters and attached devices.
3. Check that all adapters and attached devices are listed.

**Did the Please define the System Console screen display and are all attached devices and adapters listed?**

**NO** Go to “PFW1542-550-26” on page 339.

**YES** The adapter you just replaced was defective. Go to “PFW1542-550-20” on page 335.

• **PFW1542-550-31**

1. Turn off the power
2. Disconnect the base system power cables.
3. Replace the following parts, one at a time, in the sequence listed:
  - a. Internal SCSI cable
  - b. Disk drive backplanes, one at a time
  - c. Media backplane
  - d. IDE devices, one at a time
  - e. SCSI devices, one at a time
  - f. Service processor.
4. Reconnect the base system power cables.
5. Turn on the power.
6. Boot standalone AIX diagnostics from CD.
7. If the Please define the System Console screen is displayed, follow directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

**Did the Please define the System Console screen display and are all adapters and attached devices listed?**

**NO** Replace the next part in the list and return to the beginning of this step. Repeat this process until a part causes the Please define the System Console screen to be displayed and all adapters and attached devices to be listed. If you have replaced all the items listed above and the Please define the System Console screen does not display or all adapters and attached devices are not listed, check all external devices and cabling.

**YES** Go to “PFW1542-550-20” on page 335.

**PFW1542-570: I/O problem isolation**

**Purpose of this procedure**

**340** Service provider information Beginning problem analysis and isolation

Use this procedure to locate defective FRUs not found by normal diagnostics when servicing a 570. For this procedure, diagnostics are run on a minimally configured system. If a failure is detected on the minimally configured system, the remaining FRUs are exchanged one at a time until the failing FRU is identified. If a failure is not detected, FRUs are added back until the failure occurs. The failure is then isolated to the failing FRU.

#### **PFW1542-570-1**

1. Insure that the diagnostics and the operating system are shut down.
2. Turn off the power.
3. Select slow system boot speed on the power on/off system menu under the power/restart control menu on the ASMI.
4. Turn on the power.
5. Put the AIX diagnostic CD-ROM into the optical drive.

#### **Does the optical drive appear to operate correctly?**

**NO** Go to Problems with Loading and Starting the Operating System..

**YES** Continue to "PFW1542-570-2."

#### **PFW1542-570-2**

1. When the keyboard indicator is displayed (the word keyboard), if the system or partition gets that far in the IPL process, press the 5 key on the firmware console.
2. Enter the appropriate password if you are prompted to do so.

#### **Is the Please define the System Console screen displayed?**

**NO** Continue to "PFW1542-570-3."

**YES** Go to "PFW1542-570-4."

#### **PFW1542-570-3**

The system is unable to boot standalone AIX diagnostics. Check the service processor error log (using the ASMI) and the operator panel for additional error codes resulting from the slow boot that was performed in PFW1542-570-1.

#### **Did the slow boot generate a different error code or partition firmware hang from the one that originally sent you to PFW1542?**

**NO** If you were sent here by an error code, and the error code did not change as the result of a slow boot, you have a processor subsystem problem. Go to PFW1548: Memory and Processor Problem Isolation. If you were sent here because the system is hanging on a partition firmware checkpoint, and the hang condition did not change as a result of the slow boot, go to "PFW1542-570-5" on page 342.

**YES** Restore fast boot on the power on/off system menu from the ASMI. Look up the new error code in the reference code index and perform the listed actions.

#### **PFW1542-570-4**

The system stopped with the please define the system console prompt on the system console. Standalone diagnostics can be booted. Perform the following:

1. Follow the instructions on the screen to select the system console.
2. When the DIAGNOSTIC OPERATING INSTRUCTIONS screen is displayed, press Enter.
3. If the terminal type has not been defined, you must use the Initialize Terminal option on the FUNCTION SELECTION menu to initialize the AIX operating system environment before you can continue with the diagnostics. This is a separate operation from selecting the firmware console.
4. Select Advanced Diagnostic Routines.
5. When the DIAGNOSTIC MODE SELECTION menu displays, select System Verification to run diagnostics on all resources.

#### **Did running diagnostics produce a different symptom?**

**NO** Go to step 6 of PFW1542-570-4.

**YES** Go to the Start-of-Call procedure. Use the new symptom.

- Record any devices missing from the list of all adapters and devices. Continue with this procedure. When you have fixed the problem, use this record to verify that all devices appear when you run system verification.

**Are there any devices missing from the list of all adapters and devices?**

**NO** Reinstall all remaining adapters, if any, and reconnect all devices. Return the system to its original configuration. Be sure to select fast boot on the power on/off system menu on the ASMI. Go to MAP 0410: Repair Checkout.

**YES** The boot attempts that follow will attempt to isolate any remaining I/O subsystem problems with missing devices. Ignore any codes that may display on the operator panel unless stated otherwise. Continue to "PFW1542-570-5."

**PFW1542-570-5**

Examine RIO port 0 on the base system at Un-P1-T8.

**Are there any I/O subsystems attached to the base system?**

**NO** Go to "PFW1542-570-25" on page 351.

**YES** Continue to "PFW1542-570-6."

**PFW1542-570-6**

There may be devices missing from one of more of the I/O subsystems, or one or more devices in the I/O subsystems may be causing the system or a partition to hang during IPL.

**Attention:** The 5088 Expansion Unit, 5094 Expansion Unit, 5095 Expansion Unit, the 7311 Model D10/D11 I/O subsystem, and the 7311/D20 I/O subsystem may be connected to this system.

The RIO ports on these subsystems are shown in the following table. Use this table to determine the physical location codes of the RIO connectors that are mentioned in the remainder of this MAP.

	570 (base system)	5088	5094	7311-D10/11	7311/D20	5095
RIO port 0	Un-P1-T8	Un-CB1-C10-00	Un-CB1-C08-00	Un-P1-C7-00 (top connector)	Un-P1-C05-00 (bottom connector)	Un-CB1-C05-00
RIO port 1	Un-P1-T9	Un-CB1-C10-01	Un-CB1-C08-01	Un-P1-C7-01	Un-P1-C05-01	Un-CB1-C05-01

**Note:** Before continuing, check the cabling from the base system to the I/O subsystem(s) to insure that the system is cabled correctly. Refer to Connect your unit with HSL/RIO cables for valid configurations. Record the current cabling configuration and then continue with the following steps.

- Turn off the power. Record the location and machine type and model number, or feature number, of each I/O drawer or tower. In the following steps, use this information to determine the physical location codes of the RIO connectors that are referred to by their logical names. For example, if I/O subsystem #1 is a 7311/D20 drawer, RIO port 0 is Un-P1-C05-00.

**Attention:** On all I/O drawers and towers except the 7311-D10/D11, RIO port 0 is the bottom connector on the RIO adapter card. On the 7311-D10/D11, RIO port 0 is the top connector on the RIO adapter card.

- At the base system, disconnect the cable connection at RIO port 0 (Un-P1-T8).
- At the other end of the RIO cable referred to in step 2 of PFW1542-570-6, disconnect the I/O subsystem port connector 0. The RIO cable that was connected to RIO port 0 in the base system should now be loose; remove it. Record the location of this I/O subsystem and call it "subsystem #1".

4. Examine the connection at the I/O port connector 1 of the I/O subsystem recorded in step 3 on page 342 of PFW1542-570-6. If the RIO cable attached to I/O port connector 1 connects to the I/O port connector 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of subsystem #1, then go to step 9 of PFW1542-570-6.
5. This step is reserved.
6. At the base system, disconnect the cable connection at RIO port 1 (Un-P1-T9) and reconnect it to RIO port 0 (Un-P1-T8).
7. At the I/O subsystem recorded in step 3 on page 342 of PFW1542-570-6, disconnect the I/O port connector 1 and reconnect to I/O port 0.
8. Verify that a single RIO cable connects base system RIO port 0 (Un-P1-T8) to the I/O subsystem recorded in substep 4 port 0. Go to step 21 of PFW1542-570-6.
9. Record the location of the next I/O subsystem and call it "subsystem #2". This is the I/O subsystem that is connected to I/O port 1 of subsystem #1.
10. Examine the connection at the I/O port 1 of subsystem #2 recorded in step 9 of PFW1542-570-6. If the RIO cable attached to I/O port 1 connects to the I/O port 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of subsystem #2 and call it "subsystem #3". Go to step 14 of PFW1542-570-6.
11. The RIO cable attached to the I/O port 1 of subsystem #2 is attached to port 1 (Un-P1-T9) of the base system. At the base system, disconnect the cable connection at RIO port 1 (Un-P1-T9) and reconnect it to RIO port 0 (Un-P1-T8).
12. On subsystem #2, disconnect the cable from I/O port 1 and reconnect it to I/O port 0 of subsystem #1.
13. Verify that a single RIO cable connect base system RIO port 0 to one or two I/O subsystems. Go to step 21 of PFW1542-570-6.
14. Examine the connection at the I/O port 1 of subsystem #3 recorded in step 10 of PFW1542-570-6. If the RIO cable attached to I/O port 1 connects to the I/O port 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of the subsystem #3 and call it "subsystem #4". Go to step 18 of PFW1542-570-6.
15. The RIO cable attached to the I/O port 1 of subsystem #3 is attached to port 1 (Un-P1-T9) of the base system. At the base system, disconnect the cable connection at RIO port 1 (Un-P1-T9) and reconnect it to RIO port 0 (Un-P1-T8).
16. On subsystem #3, disconnect the cable from I/O port 1 and reconnect it to I/O port 0 of subsystem #1.
17. Verify that a single RIO cable connects base system RIO port 0 to three I/O subsystems. Go to step 21 of PFW1542-570-6.
18. The RIO cable attached to the I/O port 1 of subsystem #4 is attached to port 1 (Un-P1-T9) of the base system. At the base system, disconnect the cable connection at RIO port 1 (Un-P1-T9) and reconnect it to RIO port 0 (Un-P1-T8).
19. On subsystem #4, disconnect the cable from I/O port 1 and reconnect it to I/O port 0 of subsystem #1.
20. Verify that a single RIO cable connects base system RIO port 0 to four I/O subsystems. Continue to step 21 of PFW1542-570-6.
21. Turn on the power to boot the standalone AIX diagnostics from CD-ROM.
22. If the Please define the system console screen is displayed, follow the directions to select the system console.
23. Use the Display Configuration and Resource List option to list all of the attached devices and adapters.
24. Verify that all adapters and the attached devices are listed.

**Did the Please define the system console screen display and are all adapters and attached devices listed?**

**NO** Go to "PFW1542-570-7."

**YES** The RIO cable that was removed in step 3 on page 342 above is defective. Replace this RIO cable.

If four I/O subsystems are chained to RIO port 0 (Un-P1-T8) of the base system, connect the new RIO cable from subsystem #4 I/O port 1 to base system RIO port 1 (Un-P1-T9).

If three I/O subsystems are chained to RIO port 0 (Un-P1-T8) of the base system, connect the new RIO cable from subsystem #3 I/O port 1 to base system RIO port 1 (Un-P1-T9).

If two I/O subsystems are chained to RIO port 0 (Un-P1-T8) of the base system, connect the new RIO cable from subsystem #2 I/O port 1 to base system RIO port 1 (Un-P1-T9).

If one I/O subsystem is chained to RIO port 0 (Un-P1-T8) of the base system, connect the new RIO cable from subsystem #1 I/O port 1 to base system RIO port 1 (Un-P1-T9).

Restore the system back to its original configuration. Go to MAP 0410: Repair Checkout.

#### **PFW1542-570-7**

The I/O attached to the RIO ports on the base system planar will now be isolated. Power down the system. Disconnect the cable connection at RIO port 0 (Un-P1-T8) of the base system.

#### **PFW1542-570-8**

1. Turn on the power to boot the standalone diagnostic CD-ROM.
2. If the Please define the system console screen is displayed, follow the directions to select the system console.
3. Use the Display Configuration and Resource List option to list all of the attached devices and adapters.
4. Check that all adapters and attached devices in the base system are listed.

If the Please define the system console screen was not displayed or all adapters and attached devices are not listed, the problem is in the base system.

**Was the Please define the system console screen displayed and were all adapters and attached devices listed?**

**NO** Go to "PFW1542-570-25" on page 351.

**YES** Go to "PFW1542-570-21" on page 348.

#### **PFW1542-570-9**

For subsystem #1:

- Are there any adapters in slots 1, 2, 3, 5, 6, or 7 if it is a 7311-D10?
- Are there any adapters in slots 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, or 15 if it is a 5088 or 5094?

**NO** Go to "PFW1542-570-10."

**YES** Go to "PFW1542-570-13" on page 345.

#### **PFW1542-570-10**

For subsystem #2:

- Are there any adapters in slots 1, 2, 3, 5, 6, or 7 if it is a 7311-D10?
- Are there any adapters in slots 1, 2, 3, 4, 5, or 6 if it is a 7311/D20?
- Are there any adapters in slots 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, or 15 if it is a 5088 or 5094?

**NO** Go to "PFW1542-570-11."

**YES** Go to "PFW1542-570-14" on page 345.

#### **PFW1542-570-11**

For subsystem #3:

- Are there any adapters in slots 1, 2, 3, 5, 6, or 7 if it is a 7311-D10?
- Are there any adapters in slots 1, 2, 3, 4, 5, or 6 if it is a 7311/D20?

– Are there any adapters in slots 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, or 15 if it is a 5088 or 5094?

**NO** Go to “PFW1542-570-12.”

**YES** Go to “PFW1542-570-15” on page 346.

**PFW1542-570-12**

For subsystem #4:

– Are there any adapters in slots 1, 2, 3, 5, 6, or 7 if it is a 7311-D10?

– Are there any adapters in slots 1, 2, 3, 4, 5, or 6 if it is a 7311/D20?

– Are there any adapters in slots 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, or 15 if it is a 5088 or 5094?

**NO** Go to “PFW1542-570-19” on page 347.

**YES** Go to “PFW1542-570-16” on page 346.

**PFW1542-570-13**

1. If it is not already off, turn off the power.

2. Label and record the locations of any cables attached to the adapters, then disconnect the cables.

3. Record the slot numbers of the adapters.

4. Remove all adapters from slots 1, 2, 3, 5, 6, and 7 in the I/O subsystem if it is a 7311-D10, 1, 2, 3, 4, 6, and 7 in the I/O subsystem if it is a 7311/D20, or from slot 1-9 and 11-15 if it is a 5088 or 5094.

5. Turn on the power to boot the standalone diagnostic CD-ROM.

6. If the ASCII terminal displays Enter 0 to select this console, press the 0 (zero) key on the ASCII terminal’s keyboard.

7. If the Please select the system console screen is displayed, follow the directions to select the system console.

8. Use the Display Configuration and Resource List option to list all adapters and attached devices.

9. Check that all adapters and attached devices are listed.

**Was the Please define the system console screen displayed and were all adapters and attached devices listed?**

**NO** Go to “PFW1542-570-10” on page 344.

**YES** Go to “PFW1542-570-17” on page 346.

**PFW1542-570-14**

1. If it is not already off, turn off the power.

2. Label and record the locations of any cables attached to the adapters, then disconnect the cables.

3. Record the slot numbers of the adapters.

4. Remove all adapters from slots 1, 2, 3, 5, 6, and 7 in the I/O subsystem if it is a 7311-D10, slots 1, 2, 3, 4, 6, and 7 in the I/O subsystem if it is a 7311/D20, or from slot 1-9 and 11-15 if it is a 5088 or 5094.

5. Turn on the power to boot the standalone diagnostic CD-ROM.

6. If the ASCII terminal displays Enter 0 to select this console, press the 0 (zero) key on the ASCII terminal’s keyboard.

7. If the Please select the system console screen is displayed, follow the directions to select the system console.

8. Use the Display Configuration and Resource List option to list all adapters and attached devices.

9. Check that all adapters and attached devices are listed.

**Was the Please define the system console screen displayed and were all adapters and attached devices listed?**

**NO** Go to “PFW1542-570-11” on page 344.

**YES** Go to "PFW1542-570-17."

**PFW1542-570-15**

1. If it is not already off, turn off the power.
2. Label and record the locations of any cables attached to the adapters, then disconnect the cables.
3. Record the slot numbers of the adapters.
4. Remove all adapters from slots 1, 2, 3, 5, 6, and 7 in the I/O subsystem if it is a 7311-D10, slots 1, 2, 3, 4, 6, and 7 in the I/O subsystem if it is a 7311/D20, or from slot 1-9 and 11-15 if it is a 5088 or 5094.
5. Turn on the power to boot the standalone diagnostic CD-ROM.
6. If the ASCII terminal displays Enter 0 to select this console, press the 0 (zero) key on the ASCII terminal's keyboard.
7. If the Please select the system console screen is displayed, follow the directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

**Was the Please define the system console screen displayed and were all adapters and attached devices listed?**

**NO** Go to "PFW1542-570-12" on page 345.

**YES** Go to "PFW1542-570-17."

**PFW1542-570-16**

1. If it is not already off, turn off the power.
2. Label and record the locations of any cables attached to the adapters, then disconnect the cables.
3. Record the slot numbers of the adapters.
4. Remove all adapters from slots 1, 2, 3, 5, 6, and 7 in the I/O subsystem if it is a 7311-D10, slots 1, 2, 3, 4, 6, and 7 in the I/O subsystem if it is a 7311/D20, or from slots 1-9 and 11-15 if it is a 5088 or 5094.
5. Turn on the power to boot the standalone diagnostic CD-ROM.
6. If the ASCII terminal displays Enter 0 to select this console, press the 0 (zero) key on the ASCII terminal's keyboard.
7. If the Please define the system console screen is displayed, follow the directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

**Was the Please define the system console screen displayed and were all adapters and attached devices listed?**

**NO** Go to "PFW1542-570-19" on page 347.

**YES** Go to "PFW1542-570-17."

**PFW1542-570-17**

If the Please define the system console screen was not displayed and all adapters and attached devices were not listed, the problem is with one of the adapter cards or attached devices that was removed or disconnected from the I/O subsystem.

1. Turn off the power.
2. Reinstall one adapter and device that was removed. Use the original adapter cards in their original slots when reinstalling adapters.
3. Turn on the power to boot the standalone diagnostic CD-ROM.
4. If the Please define the system console screen is displayed, follow the directions to select the system console.



5. Use the Display Configuration and Resource List option to list all adapters and attached devices.
6. Check that all adapters and attached devices are listed.

**Was the Please define the system console screen displayed and were all adapters and attached devices listed?**

**NO** Go to "PFW1542-570-18."

**YES** Reinstall the next adapter and device and return to the beginning of this step. Repeat this process until an adapter or device causes the Please define the System Console screen to not display or all attached devices and adapters to not be listed.

After installing all of the adapters and the Please define the System Console screen does display and all attached devices and adapters are listed, return the system to its original configuration. Go to MAP 0410: Repair Checkout.

#### **PFW1542-570-18**

Replace the adapter you just installed with a new adapter and retry booting AIX standalone diagnostics from CD-ROM.

1. If the Please define the system console screen is displayed, follow the directions to select the system console.
2. Use the Display Configuration and Resource List option to list all adapters and attached devices.
3. Check that all adapters and attached devices are listed.

**Was the Please define the system console screen displayed and were all adapters and attached devices listed?**

**NO** The I/O subsystem backplane is defective. Replace the I/O subsystem backplane. In all 4 subsystem types, the I/O subsystem backplane is Un-CB1. Then go to "PFW1542-570-20" on page 348.

**YES** The adapter was defective. Go to "PFW1542-570-20" on page 348.

#### **PFW1542-570-19**

1. Turn off the power.
2. Disconnect the I/O subsystem power cables.
3. Replace the following parts, one at a time, if present, in the sequence listed:
  - a. I/O subsystem #1 backplane
  - b. I/O subsystem #2 backplane
  - c. I/O subsystem #3 backplane
  - d. I/O subsystem #4 backplane
  - e. The RIO interface in the base system that the RIO cables are presently attached to: either the base planar (Un-P1) if the cables are connected to Un-P1-T8 and Un-P1-T9, or the RIO expansion card (Un-P1-C7) if the RIO cables are attached to Un-P1-C7-T1 and Un-P1-C7-T2.
4. Reconnect the I/O subsystem power cables.
5. Turn on the power.
6. Boot standalone AIX diagnostics from CD.
7. If the Please define the System Console screen is displayed, follow directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all attached devices and adapters are listed.

**Did the Please define the System Console screen display and are all attached devices and adapters listed?**

**NO** Replace the next part in the list and return to the beginning of this step. Repeat this process until a part causes the Please define the System Console screen to be displayed and all adapters and attached devices to be listed. If you have replaced all the items listed above and

the Please define the System Console screen does not display or all attached devices and adapters are not listed, check all external devices and cabling. If you do not find a problem, contact your next level of support for assistance.

**YES** Go to "PFW1542-570-20."

**PFW1542-570-20**

1. Turn off the power.
2. The item just replaced fixed the problem.
3. If a display adapter with keyboard and mouse were installed, reinstall the display adapter card, keyboard, and mouse.
4. Reconnect the tape drive (if previously installed) to the internal SCSI bus cable.
5. Plug in all adapters that were previously removed but not reinstalled.
6. Reconnect the I/O subsystem power cables that were previously disconnected.

Return the system to its original condition. Go to MAP 0410: Repair Checkout.

**PFW1542-570-21**

1. Turn off the power.
2. At the base system, reconnect the cable connection at RIO port 0 (Un-P1-T8) recorded in "PFW1542-570-7" on page 344.
3. At the base system, reconnect the cable connection at RIO port 1(Un-P1-T9) recorded in "PFW1542-570-7" on page 344.
4. Reconnect the power cables to the I/O subsystems that were found attached to the base system RIO ports mentioned in step 2 and step 3 of PFW1542-570-21. All I/O subsystems that were attached to the base system RIO port 0 and RIO port 1 should now be reconnected to the base system.
5. Make sure the I/O subsystem(s) are cabled correctly as shown in Connect your unit with HSL/RIO cables.
6. Turn on the power to boot standalone AIX diagnostics from CD-ROM.
7. If the Please define the System Console screen is displayed, follow the directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

**Did the Please define the System Console screen display and are all attached devices and adapters listed?**

**NO** Go to "PFW1542-570-9" on page 344 to isolate a problem in an I/O subsystem attached to the base system RIO bus on the system backplane.

**YES** Go to "PFW1542-570-22."

**PFW1542-570-22**

**Is there a RIO expansion card plugged into Un-P1-C7 in the base system, and if so, is there at least one I/O subsystem attached to it?**

**NO** Go to "PFW1542-570-25" on page 351.

**YES** Continue to "PFW1542-570-23."

**PFW1542-570-23**

1. Turn off the power.
2. At the base system, reconnect the cable connection at RIO port 0 on the RIO expansion card (Un-P1-C7-T2) recorded in "PFW1542-570-7" on page 344.
3. At the base system, reconnect the cable connection at RIO port 1 on the RIO expansion card (Un-P1-C7-T1) recorded in "PFW1542-570-7" on page 344.

4. Reconnect the power cables to the I/O subsystems that were attached to the base system's RIO ports mentioned in substeps 2 and 3 in this step. All I/O subsystems that were attached to RIO port 0 on the RIO expansion card (Un-P1-C7-T2) and RIO port 1 on the RIO expansion card (Un-P1-C7-T1) in the base system should now be reconnected to the system.
5. Make sure that the I/O subsystem(s) are cabled correctly as shown in Connect your unit with HSL/RIO cables
6. Turn on the power to boot the standalone AIX diagnostic CD-ROM.
7. If the Please define the system console screen is displayed, follow the directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Verify that all adapters and attached devices are listed.

**Did the Please define the system console screen display and are all adapters and attached devices listed?**

**NO** Go to "PFW1542-570-24" to isolate the problems in the I/O subsystems that are attached to the RIO expansion card in the base system.

**YES** Go to "PFW1542-570-25" on page 351.

**PFW1542-570-24**

At the base system, reconnect the second I/O subsystem to the RIO ports on the base system's expansion card at Un-P1-C7-T1 and Un-P1-C7-T2.

**Attention:** The 5088 Expansion Unit, 5094 Expansion Unit, 5095 Expansion Unit, the 7311 Model D10/D11 I/O subsystem, and the 7311/D20 I/O subsystem may be connected to this system.

The RIO ports on these subsystems are shown in the following table. Use this table to determine the physical location codes of the RIO connectors that are mentioned in the remainder of this MAP.

	570 (base system)	5088	5094	7311-D10/11	7311/D20	5095
RIO port 0	Un-P1-T8	Un-CB1-C10-00	Un-CB1-C08-00	Un-P1-C7-00 (top connector)	Un-P1-C05-00 (bottom connector)	Un-CB1-C05-00
RIO port 1	Un-P1-T9	Un-CB1-C10-01	Un-CB1-C08-01	Un-P1-C7-01	Un-P1-C05-01	Un-CB1-C05-01

**Note:** Before continuing, check the cabling from the base system to the I/O subsystem(s) to insure that the system is cabled correctly. Refer to Connect your unit with HSL/RIO cables for valid configurations. Record the current cabling configuration and then continue with the following steps.

1. Turn off the power.
2. Record the location and machine type and model number, or feature number, of each I/O drawer or tower. In the following steps, use this information to determine the physical location codes of the RIO connectors that are referred to by their logical names. For example, if I/O subsystem #1 is a 7311/D20 drawer, RIO port 0 is Un-P1-C05-00.
3. At the base system, disconnect the cable connection at RIO port 0 (Un-P1-C7-T2).
4. At the other end of the RIO cable referred to in step 2 of PFW1542-570-24, disconnect the I/O subsystem port connector 0. The RIO cable that was connected to RIO port 0 on the expansion card should now be loose; remove it. Record the location of this I/O subsystem and call it "subsystem #1".
5. Examine the connection at the I/O port connector 1 of the I/O subsystem recorded in step 3 of PFW1542-570-24. If the RIO cable attached to I/O port connector 1 connects to the I/O port connector 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of subsystem #1, then go to step 9 on page 350 of PFW1542-570-24.

6. This step is reserved.
7. At the base system, disconnect the cable connection at RIO port 1 on the RIO expansion card (Un-P1-C7-T1) and reconnect it to RIO port 0 on the RIO expansion card (Un-P1-C7-T2).
8. At the I/O subsystem recorded in step 3 on page 349 of PFW1542-570-24, disconnect the I/O port connector 1 and reconnect to I/O port 0.
9. Verify that a single RIO cable connects base system RIO port 0 on the RIO expansion card (Un-P1-C7-T1) to the I/O subsystem recorded in step 4 on page 349 of PFW1542-570-24 port 0. Go to step 21 of PFW1542-570-24.
10. Record the location of the next I/O subsystem and call it "subsystem #2". This is the I/O subsystem that is connected to I/O port 1 of subsystem #1.
11. Examine the connection at the I/O port 1 of subsystem #2 recorded in step 9 of PFW1542-570-24. If the RIO cable attached to I/O port 1 connects to the I/O port 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of subsystem #2 and call it "subsystem #3". Go to step 14 of PFW1542-570-24.
12. The RIO cable attached to the I/O port 1 of subsystem #2 is attached to port 1 (Un-P1-C7-T1) of the base system. At the base system, disconnect the cable connection at RIO port 1 on the RIO expansion card (Un-P1-C7-T1) and reconnect it to RIO port 0 on the RIO expansion card (Un-P1-C7-T1).
13. On subsystem #2, disconnect the cable from I/O port 1 and reconnect it to I/O port 0 of subsystem #1.
14. Verify that a single RIO cable connect base system RIO port 0 to one or two I/O subsystems. Go to step 21 of PFW1542-570-24.
15. Examine the connection at the I/O port 1 of subsystem #3 recorded in 10 of PFW1542-570-24. If the RIO cable attached to I/O port 1 connects to the I/O port 0 of another I/O subsystem, record the location of the next I/O subsystem that is connected to I/O port 1 of the subsystem #3 and call it "subsystem #4". Go to step 18 of PFW1542-570-24.
16. The RIO cable attached to the I/O port 1 of subsystem #3 is attached to RIO port 1 on the RIO expansion card (Un-P1-C7-T1). At the base system, disconnect the cable connection at RIO port 1 on the RIO expansion card (Un-P1-C7-T1) and reconnect it to RIO port 0 on the RIO expansion card (Un-P1-C7-T1).
17. On subsystem #3, disconnect the cable from I/O port 1 and reconnect it to I/O port 0 of subsystem #1.
18. Verify that a single RIO cable connects base system RIO port 0 to three I/O subsystems. Go to step 21 of PFW1542-570-24.
19. The RIO cable attached to the I/O port 1 of subsystem #4 is attached to port 1 (Un-P1-C7-T1) on the RIO expansion card. On the RIO expansion card, disconnect the cable connection at RIO port 1 (Un-P1-C7-T1) and reconnect it to RIO port 0 (Un-P1-C7-T2).
20. On subsystem #4, disconnect the cable from I/O port 1 and reconnect it to I/O port 0 of subsystem #1.
21. Verify that a single RIO cable connects base system RIO port 0 to four I/O subsystems. Continue to step 22 of PFW1542-570-24.
22. Turn on the power to boot the standalone AIX diagnostics from CD-ROM.
23. If the Please define the system console screen is displayed, follow the directions to select the system console.
24. Use the Display Configuration and Resource List option to list all of the attached devices and adapters.
25. Verify that all adapters and the attached devices are listed.

**Did the Please define the system console screen display and are all adapters and attached devices listed?**

**NO** Go to “PFW1542-570-9” on page 344 to further isolate a problem in the I/O subsystem(s) attached to the RIO expansion card (Un-P1-C7).

**YES** The RIO cable that was removed in step 3 on page 349 of PFW1542-570-24 is defective. Replace this RIO cable.

If four I/O subsystems are chained to RIO port 0 (Un-P1-C7-T1) of the base system, connect the new RIO cable from subsystem #4 I/O port 1 to RIO port 1 on the RIO expansion card (Un-P1-C7-T1).

If three I/O subsystems are chained to RIO port 0 (Un-P1-C7-T1) of the base system, connect the new RIO cable from subsystem #3 I/O port 1 to RIO port 1 on the RIO expansion card (Un-P1-C7-T1).

If two I/O subsystems are chained to RIO port 0 (Un-P1-C7-T1) of the base system, connect the new RIO cable from subsystem #2 I/O port 1 to RIO port 1 on the RIO expansion card (Un-P1-C7-T1).

If one I/O subsystem is chained to RIO port 0 (Un-P1-C7-T1) of the base system, connect the new RIO cable from subsystem #1 I/O port 1 to RIO port 1 on the RIO expansion card (Un-P1-C7-T1).

Restore the system back to its original configuration. Go to MAP 0410: Repair Checkout.

#### **PFW1542-570-25**

**Are there any adapters in slots 1, 2, 3, 4, 5, or 6 in the base system?**

**NO** Go to “PFW1542-570-26.”

**YES** Go to “PFW1542-570-28.”

#### **PFW1542-570-26**

Replace the system backplane, Un-P1. Continue to “PFW1542-570-27.”

#### **PFW1542-570-27**

1. Boot standalone AIX diagnostics from CD.
2. If the Please define the System Console screen is displayed, follow directions to select the system console.
3. Use the Display Configuration and Resource List to list all adapters and attached devices.
4. Check that all adapters and attached devices are listed.

**Did the Please define the System Console screen display and are all attached devices and adapters listed?**

**NO** Go to “PFW1542-570-31” on page 352.

**YES** Go to “PFW1542-570-20” on page 348.

#### **PFW1542-570-28**

1. If it is not already off, turn off the power.
2. Label and record the location of any cables attached to the adapters.
3. Record the slot number of the adapters.
4. Remove all adapters from slots 1, 2, 3, 4, 5, and 6 in the base system that are not attached to the boot device.
5. Turn on the power to boot standalone AIX diagnostics from CD-ROM.
6. If the ASCII terminal displays Enter 0 to select this console, press the 0 key on the ASCII terminal’s keyboard.
7. If the Please define the System Console screen is displayed, follow directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

**Did the Please define the System Console screen display and are all attached devices and adapters listed?**

**NO** Go to “PFW1542-570-26” on page 351.

**YES** Continue to “PFW1542-570-29.”

**PFW1542-570-29**

If the Please define the System Console screen does display and all adapters and attached devices are listed, the problem is with one of the adapter cards or devices that was removed or disconnected from the base system.

1. Turn off the power.
2. Reinstall one adapter and device that was removed. Use the original adapter cards in their original slots when reinstalling adapters.
3. Turn on the power to boot standalone AIX diagnostics from CD-ROM.
4. If the Please define the System Console screen is displayed, follow the directions to select the system console.
5. Use the Display Configuration and Resource List to list all adapters and attached devices.
6. Check that all adapters and attached devices are listed.

**Did the Please define the System Console screen display and are all attached devices and adapters listed?**

**NO** Continue to “PFW1542-570-30.”

**YES** Return to the beginning of this step to continue reinstalling adapters and devices.

**PFW1542-570-30**

Replace the adapter you just installed with a new adapter and retry the boot to standalone AIX diagnostics from CD-ROM.

1. If the Please define the System Console screen is displayed, follow directions to select the system console.
2. Use the Display Configuration and Resource List option to list all adapters and attached devices.
3. Check that all adapters and attached devices are listed.

**Did the Please define the System Console screen display and are all attached devices and adapters listed?**

**NO** Go to “PFW1542-570-26” on page 351.

**YES** The adapter you just replaced was defective. Go to “PFW1542-570-20” on page 348.

**PFW1542-570-31**

1. Turn off the power.
2. Disconnect the base system power cables.
3. Replace the following parts, one at a time, in the sequence listed:
  - a. Internal SCSI cable
  - b. Disk drive backplanes, one at a time
  - c. Media backplane
  - d. IDE devices, one at a time
  - e. SCSI devices, one at a time
  - f. Service processor
4. Reconnect the base system power cables.
5. Turn on the power.
6. Boot standalone AIX diagnostics from CD.
7. If the Please define the System Console screen is displayed, follow directions to select the system console.
8. Use the Display Configuration and Resource List option to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

**Did the Please define the System Console screen display and are all adapters and attached devices listed?**

**NO** Replace the next part in the list and return to the beginning of this step. Repeat this process until a part causes the Please define the System Console screen to be displayed and all adapters and attached devices to be listed. If you have replaced all the items listed above and the Please define the System Console screen does not display or all adapters and attached devices are not listed, check all external devices and cabling. If you do not find a problem, contact your next level of support for assistance.

**YES** Go to "PFW1542-570-20" on page 348.

## **PFW1542-590: Model 590 and Model 595 I/O problem isolation procedure**

### **Purpose of this MAP**

This MAP is used to locate defective FRUs not found by normal diagnostics. For this procedure, diagnostics are run on a minimally configured system. If a failure is detected on the minimally configured system, the remaining FRUs are exchanged one at a time until the failing FRU is identified. If a failure is not detected, FRUs are added back until the failure occurs. The failure is then isolated to the failing FRU.

This I/O problem-determination procedure isolates I/O card and I/O subsystem failures. When I/O problem isolation is complete, all cables and cards exhibiting a failure will have been reseated or replaced.

### **Notes:**

1. This procedure assumes that an optical drive is installed in the integrated media drawer and connected to the SCSI LVD adapter, and that an AIX diagnostic CD-ROM is available.
2. If a power-on password or privileged-access password is set, you are prompted to enter the password before the AIX diagnostic CD-ROM can load.
3. The term POST indicators refers to the device mnemonics that appear during the power-on self-test (POST).
4. The service processor might have recorded one or more symptoms in its error/event log. Use the ASMI menus to view the error/event log.
  - If you arrived here after performing a slow boot, look for a possible new error that occurred during the slow boot. If there is a new error, and its actions call for a FRU replacement, perform those actions. If this does not resolve the problem, go to PFW1542-590-1.
  - If an additional slow boot has not been performed, or if the slow boot did not yield a new error code, look at the error that occurred just before the original error. Perform the actions associated with that error. If the problem is not resolved, go to PFW1542-590-1.
  - If a slow boot results in the same error code, and there are no error codes before the original error code, go to PFW1542-590-1.
5. The service processor might have been set by the user to monitor system operations and to attempt recoveries. You might want to disable these options while you diagnose and service the system. If these settings are disabled, make notes of their current settings so that they can be restored before the system is turned back over to the customer. The following settings may be of interest. Monitoring (also called surveillance) From the ASMI menu, expand the System Configuration menu, then click on Monitoring. Disable both types of surveillance. Auto power restart (also called unattended start mode) From the ASMI menu, expand Power/Restart Control, then click on Auto Power Restart, and set it to disabled. Wake on LAN From the ASMI menu, expand Wake on LAN, and set it to disabled. Call Out From the ASMI menu, expand the Service Aids menu, then click on Call-Home/Call-In Setup. Set the call-home serial port and the call-in serial port to disabled.

6. If this is a pSeries system, verify that the system has not been set to boot to the SMS menus or to the open firmware prompt. From the ASMI menu, expand Power/Restart Control to view the menu, then click on Power On/Off System. The AIX/Linux partition mode boot should say "Continue to Operating System".

#### **PFW1542-590-1**

1. Insure that the diagnostics and the operating system are shut down
2. Use the HMC to power down the system.
3. Access the ASMI menus, Power/Restart Control, Power On/Off System, set the System boot speed to slow.
4. Turn on the power to the system using the HMC.
5. Does the optical drive appear to boot the AIX diagnostic CD-ROM?

#### **Does the optical drive appear to boot the AIX diagnostic CD-ROM?**

**NO** Go to Problems With Booting and Loading the Operating System. After the problem has been corrected, return to PFW1542-590-1.

**YES** Go to PFW1542-590-2.

#### **PFW1542-590-2**

1. After the word keyboard is displayed on the firmware console, but before the word speaker is displayed, press the number 5 key.
2. If you are prompted to do so, enter the appropriate password.

#### **Is the Please define the System Console screen displayed?**

**NO** Go to PFW1542-590-3.

**YES** Go to PFW1542-590-4.

#### **PFW1542-590-3**

The system is unable to boot standalone diagnostics.

Check the service processor error log and the control panel for additional error codes resulting from the slow boot in step PFW1542-590-1.

#### **Did the slow boot generate a different error code from the one that originally sent you to PFW1542-590?**

**NO** It appears there is a problem in the processor subsystem. Call for support. This ends the procedure.

**YES** Go to the Start-of-call procedure with the new error code.

#### **PFW1542-590-4**

The system stopped with the Please define the system console prompt appearing on the system console.

Standalone diagnostics can be booted. Perform the following:

1. Follow the instructions on the screen to select the diagnostic console.
2. When the DIAGNOSTIC OPERATING INSTRUCTIONS screen is displayed, press Enter.
3. If the terminal type has not been defined, you must use the Initialize Terminal option of the FUNCTION SELECTION menu to initialize the AIX operating system environment before you can continue with the diagnostics. This is a separate operation from selecting the firmware console display.
4. Select Advanced Diagnostic Routines.
5. When the DIAGNOSTIC MODE SELECTION menu displays, select System Verification to run diagnostics on all resources.

#### **Did running diagnostics produce a different symptom?**

**NO** Go to substep PFW1542-590-4-6.



**YES** Go to the start-of-call procedure with the new symptom.

6. Record any devices missing from the list of all adapters and devices. Continue with this procedure. When you have fixed the problem, use this record to verify that all devices appear when you run system verification.

**Are there any devices missing from the list of all adapters and devices?**

**NO** Reinstall all remaining adapters, if any, and reconnect all devices. Return the system to its original configuration. Be sure to select fast-boot mode on the Power/Restart Control menu on the ASMI. Go to MAP 0410: Repair Checkout. This ends the procedure.

**YES** The boot attempts that follow will attempt to isolate any remaining I/O subsystem problems with missing devices. Ignore any codes that may display on the control panel unless stated otherwise. Continue to PFW1542-590-5.

**PFW1542-590-5**

There are missing devices associated with one or more I/O subsystems.

**Note:** Before continuing, check the cabling from the processor subsystem to the I/O subsystem(s) to insure that the system is cabled correctly. Refer to the following adapter plugging rules tables for valid configurations. Record the current cabling configuration and then continue with the following steps:

The 590 server must have a minimum of one I/O subsystem and one media subsystem attached to the processor subsystem. The following substeps reduce the system I/O to the minimum of one I/O subsystem.

1. Use the HMC to turn off the power to the managed system.
2. The RIO adapters should be populated, and cabled, according to one of the following tables:

**Note:** The tables are model dependent.

*Table 30. Model 590 GX+ adapter plugging rules*

16W System	32W System
Node 0 Slot D1	Node 0 Slot D1
Node 0 Slot D2	Node 1 Slot D2
Node 0 Slot D8	Node 0 Slot D8
Node 0 Slot D7	Node 1 Slot D8
Node 0 Slot D6	Node 0 Slot D7
Node 0 Slot D5	Node 1 Slot D7
Node 0 Slot D4	Node 0 Slot D6
Node 0 Slot D3	Node 1 Slot D6
	Node 0 Slot D5
	Node 1 Slot D5
	Node 0 Slot D4
	Node 1 Slot D4
	Node 0 Slot D3
	Node 1 Slot D3
	Node 0 Slot D2
	Node 1 Slot D1

Table 31. Model 595 GX+ adapter plugging rules

16W System	32W System	48W System	64W System
Node 0 Slot D1	Node 0 Slot D1	Node 0 Slot D1	Node 0 Slot D1
Node 0 Slot D2	Node 1 Slot D2	Node 1 Slot D2	Node 1 Slot D2
Node 0 Slot D8	Node 0 Slot D8	Node 2 Slot D8	Node 2 Slot D8
Node 0 Slot D7	Node 1 Slot D8	Node 0 Slot D8	Node 3 Slot D8
Node 0 Slot D6	Node 0 Slot D7	Node 1 Slot D8	Node 0 Slot D8
Node 0 Slot D5	Node 1 Slot D7	Node 2 Slot D7	Node 1 Slot D8
	Node 0 Slot D6	Node 0 Slot D7	Node 2 Slot D7
	Node 1 Slot D6	Node 1 Slot D7	Node 3 Slot D7
	Node 0 Slot D5	Node 2 Slot D6	Node 0 Slot D7
	Node 1 Slot D5	Node 0 Slot D6	Node 1 Slot D7
	Node 0 Slot D2	Node 1 Slot D6	Node 2 Slot D6
	Node 1 Slot D2	Node 2 Slot D5	Node 3 Slot D6
		Node 0 Slot D5	Node 0 Slot D6
		Node 1 Slot D5	Node 1 Slot D6
		Node 2 Slot D2	Node 2 Slot D5
		Node 0 Slot D2	Node 3 Slot D5
		Node 1 Slot D1	Node 0 Slot D5
		Node 2 Slot D1	Node 1 Slot D5
			Node 2 Slot D2
			Node 3 Slot D2
			Node 0 Slot D2
			Node 1 Slot D1
			Node 2 Slot D1
			Node 3 Slot D1

Leave the cables attached to the RIO adapter in the top-most position in the first node (Un-P1-C1). Unplug the rest of the RIO adapters in the first node and all additional nodes; carefully pull them out approximately 12 mm (1/2 inch) away from the node connector without disconnecting any cables.

3. Verify that the media subsystem still has a power cable connected. Removed the power cables from all I/O subsystems except the one who's RIO adapter is still plugged into the node.
4. At the first RIO adapter, disconnect the cable connection at RIO port 0 (Un-P1-C1-T1).
5. Disconnect the cable connection at I/O subsystem 1's (at U1.5) left RIO port connector 0 (U1.5-P1-T2). The RIO cable that was connected to RIO port 0 in step 2 should be loose and can now be removed.
6. At the first RIO adapter, disconnect the cable connection at RIO port 1 (Un-P1-C1-T2) and reconnect it to RIO port 0 (Un-P1-C1-T1).
7. Disconnect the cable connection at I/O subsystem 1's (at U1.5) right RIO port connector 1 (U1.5-P2-T1) and reconnect it to I/O subsystem 1's (at U1.5) left RIO port connector 0 (U1.5-P2-T2).
8. Verify that I/O subsystem 1's (at U1.5) left RIO port connector 1 (U1.5-P1-T1) is connected to I/O subsystem 1's (at U1.5) right RIO port connector 0 (U1.5-P2-T2).
9. Use the HMC to turn on the power to boot the AIX standalone diagnostics from CD-ROM.
10. Use the Display Configuration and Resource List option to list all adapters and attached devices.

11. Check that all adapters and attached devices are listed.

**Did the Please Define the System Console screen display and are all adapters and attached devices listed?**

**NO** Go to PFW1542-590-7.

**YES** The RIO cable that was removed in step 5 above is defective. Replace the RIO cable. Connect the new RIO cable from I/O subsystem 1's right port connector 1 (U1.5-P2-T1) to RIO connector 1's (at Un-P1-C1-T2) port 1. Return the system to its original configuration. Go to MAP 0410: Repair Checkout.

#### **PFW1542-590-6**

This step is reserved. Go to PFW1542-590-7.

#### **PFW1542-590-7**

The first I/O subsystem (at U1.5) and the media drawer are the only drawers connected to the processor subsystem.

1. Access the ASMI menus, Power/Restart Control, Power On/Off System, set the system boot speed to slow.
2. Turn on the power to the system using the HMC.
3. After the word keyboard is displayed on the firmware console, but before the word speaker is displayed, press the number 5 key.
4. If you are prompted to do so, enter the appropriate password.
5. As soon as the optical drive has power, insert the AIX diagnostic CD-ROM into the optical drive.
6. If the Please define the System Console screen is displayed, follow directions to select the system console.
7. Use the Display Configuration and Resource List to list all attached devices and adapters
8. Check that all attached devices and adapters are listed. If the Please define the System Console prompt did not display or all attached devices and adapters are not listed, the problem is in the media subsystem or I/O subsystem 1 (at U1.5).

**Did the Please define the System Console screen display and are all attached devices and adapters listed?**

**NO** Go to PFW1542-590-8.

**YES** Go to PFW1542-590-21.

#### **PFW1542-590-8**

Perform the following to deconfigure the media subsystem:

1. Use the HMC to turn off power to the managed system.
2. If you have not already done so, set the service processor settings with the instructions just before PFW1542-590-1 in this procedure, then return here and continue.
3. Disconnect the AC power cable going to the media subsystem.
4. If a graphics adapter with a keyboard and mouse is connected to a USB adapter in the first I/O subsystem, and is being used as the firmware console, locate an ASCII terminal (a 3151, for example) and attach it to the S1 port on the back of the CEC. You can also use a virtual terminal on the HMC as the firmware console.
5. If present, remove the keyboard and mouse from the USB adapter in the first I/O subsystem.
6. Unplug all other devices, in any, in the media subsystem except the optical drive.
7. Reconnect the AC power cable going to the media subsystem. Continue to PFW1542-590-9.

#### **PFW1542-590-9**

**Are there any adapters in slots 1, 2, 3, 4 or 5 (location codes Un-P1-C1 through C5) on the left side of the I/O subsystem?**

**NO** Go to PFW1542-590-10.

**YES** Go to PFW1542-590-13.

**PFW1542-590-10**

**Are there any adapters in slots 6, 7, 8, 9 or 10 (location codes Un-P1-C6 through C10) on the left side of the I/O subsystem?**

**NO** Go to PFW1542-590-11.

**YES** Go to PFW1542-590-12.

**PFW1542-590-11**

**Are there any adapters in slots 1, 2, 3, 4 or 5 (location codes Un-P2-C1 through C5) on the right side of the I/O subsystem?**

**NO** Go to PFW1542-590-12.

**YES** Go to PFW1542-590-13.

**PFW1542-590-12**

**Are there any adapters in slots 6, 7, 8, 9 or 10 (location codes Un-P2-C7 through C10) on the right side of the I/O subsystem?**

**NO** Go to PFW1542-590-19.

**YES** Go to PFW1542-590-16.

**PFW1542-590-13**

1. If it is not already off, turn off the power.
2. Remove all adapters from slots 1, 2, 3, 4 and 5 (location codes Un-P1-C1 through C5) from the left side of the I/O subsystem that are not attached to the boot device.
3. Label and record the location of any cables attached to the adapters.
4. Record the slot number of the adapters.
5. Turn on the power to boot standalone diagnostics from CD.
6. If the TTY screen displays enter 0 to select this console by pressing the 0 key on the TTY terminal's keyboard.
7. If the Please define the System Console screen is displayed, follow the directions to select the system console.
8. Use the Display Configuration and Resource List to list all attached devices and adapters.
9. Check that all attached devices and adapters are listed.

**Did the Please define the System Console screen display and are all attached devices and adapters listed?**

**NO** Go to PFW1542-590-10.

**YES** Go to PFW1542-590-17.

**PFW1542-590-14**

1. If it is not already off, turn off the power.
2. Remove all adapters from slots 6, 7, 8, 9 and 10 (location codes Ux.y-P1-C6 through C10) from the left side of the I/O subsystem that are not attached to the boot device.
3. Label and record the location of any cables attached to the adapters.
4. Record the slot number of the adapters.
5. Turn on the power to boot standalone diagnostics from CD.
6. If the TTY screen displays Enter 0 to select this console, press the 0 key on the TTY terminal's keyboard.
7. If the Please define the System Console screen is displayed, follow directions to select the system console.
8. Use the Display Configuration and Resource List to list all attached devices and adapters.

9. Check that all attached devices and adapters are listed.

**Did the Please define the System Console screen display and are all attached devices and adapters listed?**

**NO** Go to PFW1542-590-11.

**YES** Go to PFW1542-590-17.

**PFW1542-590-15**

1. If it is not already off, turn off the power.
2. Remove all adapters from slots 1, 2, 3, 4 and 5 (location codes Ux.y-P2-C1 through C5) from the right side of the I/O subsystem that are not attached to the boot device.
3. Label and record the location of any cables attached to the adapters.
4. Record the slot number of the adapters.
5. Turn on the power to boot standalone diagnostics from CD.
6. If the TTY screen displays Enter 0 to select this console, press the 0 key on the TTY terminal's keyboard.
7. If the Please define the System Console screen is displayed, follow directions to select the system console.
8. Use the Display Configuration and Resource List to list all attached devices and adapters.
9. Check that all attached devices and adapters are listed.

**Did the Please define the System Console screen display and are all attached devices and adapters listed?**

**NO** Go to PFW1542-590-11.

**YES** Go to PFW1542-590-16.

**PFW1542-590-16**

1. If it is not already off, turn off the power.
2. Remove all adapters from slots 6, 7, 8, 9 and 10 (location codes Ux.y-P2-C6 through C10) from the right side of the I/O subsystem that are not attached to the boot device.
3. Label and record the location of any cables attached to the adapters.
4. Record the slot number of the adapters.
5. Turn on the power to boot standalone diagnostics from CD.
6. If the TTY screen displays Enter 0 to select this console, press the 0 key on the TTY terminal's keyboard.
7. If the Please define the System Console screen is displayed, follow directions to select the system console.
8. Use the Display Configuration and Resource List to list all attached devices and adapters.
9. Check that all attached devices and adapters are listed.

**Did the Please define the System Console screen display and are all attached devices and adapters listed?**

**NO** Go to PFW1542-590-19.

**YES** Go to PFW1542-590-17.

**PFW1542-590-17**

If the Please define the System Console screen displays and all adapters and attached devices are listed, the problem is with one of the adapter cards or devices that was removed or disconnected from the I/O subsystem.

1. Turn off the power.
2. Reinstall one adapter or device that was removed. Use the original adapter cards in their original slots when reinstalling adapters.

3. Turn on the power to boot standalone diagnostics from CD.
4. If the Please define the System Console screen is displayed, follow directions to select the system console.
5. Use the Display Configuration and Resource List to list all attached devices and adapters.
6. Check that all attached devices and adapters are listed.

**Did the Please define the System Console screen display and are all attached devices and adapters listed?**

**NO** Go to PFW1542-590-18.

**YES** Reinstall the next adapter or device and return to the beginning of this step. Continue repeating this process until an adapter or device causes the Please define the System Console screen to not display or all attached devices and adapters to not be listed. After installing all of the adapters and the Please define the System Console screen does display and all attached devices and adapters are listed, return the system to its original configuration. Go to MAP 0410: Repair Checkout. This ends the procedure.

#### **PFW1542-590-18**

Replace the adapter you just installed with a new adapter and try to boot standalone diagnostics from CD again.

1. If the Please define the System Console screen is displayed, follow directions to select the system console.
2. Use the Display Configuration and Resource List to list all attached devices and adapters.
3. Check that all attached devices and adapters are listed.

**Did the Please define the System Console screen display and are all attached devices and adapters listed?**

**NO** The I/O subsystem backplane is defective. Replace the I/O subsystem backplane on the side of the problem adapter (Un-P1 or Un-P2). Go to PFW1542-590-21.

**YES** The adapter was defective. Go to PFW1542-590-21.

#### **PFW1542-590-19**

1. Turn off the power.
2. Disconnect the I/O subsystem power cables.
3. Replace the following parts, one at a time, in the sequence listed:
  - a. Boot device SCSI cable, if applicable.
  - b. Boot device SCSI adapter, if applicable.
  - c. Boot device SCSI backplane, if applicable.
  - d. Boot device, if applicable.
  - e. I/O subsystem backplane where boot device is located, if applicable.
  - f. Other I/O subsystem backplane
  - g. Both I/O subsystem DCAs
4. Reconnect the I/O subsystem power cables.
5. Turn on the power.
6. Boot standalone diagnostics from CD-ROM.
7. If the Please define the System Console screen is displayed, follow directions to select the system console.
8. Use the Display Configuration and Resource List to list all attached devices and adapters.
9. Check that all attached devices and adapters are listed.

**Did the Please define the System Console screen display and are all attached devices and adapters listed?**

**NO** Replace the next part in the list and return to the beginning of this step. Continue repeating this process until a part causes the Please define the System Console screen to be displayed and all attached devices and adapters to be listed. If you have replaced all the items listed above and the Please define the System Console screen does not display or all attached devices and adapters are not listed, check any external devices and cabling. If you do not find a problem, contact your next level of support for assistance.

**YES** Go to PFW1542-590-21.

**PFW1542-590-20**

1. Turn off the power.
2. The part just replaced fixed the problem
3. If a display adapter with keyboard, and mouse were used, reinstall the display adapter card, keyboard and mouse.
4. Reconnect the diskette drive cable to the diskette drive connector on the media subsystem.
5. Reconnect the tape drive (if previously installed) to the internal SCSI bus cable.
6. Plug in all adapters that were previously removed but not reinstalled.
7. Reconnect the I/O subsystem power cables that were previously disconnected. Reconfigure the system to its original condition. Go to MAP 0410: Repair Checkout. This ends the procedure.

**PFW1542-590-21**

If the boot is successful, the problem is with one of the remaining I/O subsystems. Use the HMC to turn off the power.

**Are there any RIO adapters left to connect to the processor subsystem?**

**NO** Return the system to its original configuration. Go to MAP 0410: Repair Checkout. This ends the procedure.

**YES** Reconnect the next RIO adapter in the sequence shown in PFW1542-590-5 plugging rules tables, then continue to PFW1542-590-22.

**PFW1542-590-22**

1. At the RIO adapter that was just replugged, disconnect the cable connection at RIO port 0 (Un-Px-Cy-T1).
2. Disconnect the cable connection at the I/O subsystem's left I/O port connector 0 (Ux.y-P1-T2). The RIO cable that was connected to RIO port 0 should now be loose and can be removed.
3. At the RIO adapter that was just replugged, disconnect the cable connection at RIO port 1 (Un-Px-Cy-T2) and reconnect it to port 0 (Un-Px-Cy-T1).
4. Disconnect the cable connection at the I/O subsystem's right I/O port connector 1 (Ux.y-P2-T1) and reconnect it to the I/O subsystem's left I/O port connector 0 (Ux.y-P1-T2).
5. Verify that the I/O subsystem's left I/O port connector 1 (Ux.y-P1-T1) is connected to the I/O subsystem's right I/O port connector 0 (Ux.y-P2-T2).
6. Use the HMC to turn on the power to boot AIX standalone diagnostics from CD.
7. If the Please define the System Console screen is displayed, follow the directions to select the system console.
8. Use the Display Configuration and Resource List to list all attached devices and adapters.
9. Check that all attached devices and adapters are listed.

**Did the Please define the System Console screen display and are all attached devices and adapters listed?**

**NO** Connect the previously removed RIO cable from I/O subsystem 2 right I/O port connector 1 (U1.5-P2/Q1) to processor subsystem RIO port B1 on primary I/O book (U1.18-P1-H2/Q4). Go to PFW1542-590-9.

**YES** The RIO cable that was removed in PFW1542-590-22-2 above is defective. Replace the RIO cable. Connect the new RIO cable from the I/O subsystem's right I/O port connector 1

(Ux.y-P2-T1) to RIO adapter port 1 (Un-Px-Cy-T2). Return the system to its original configuration. Go to MAP 0410: Repair Checkout. This ends the procedure.

## **PFW1543: Model 590 and model 595 MCM problem isolation procedure**

### **Purpose of this procedure**

This procedure is used to locate defective FRUs not found by normal diagnostics. It should be used when the service processor posts a failure and halts the IPL before server firmware standby is reached.

To perform this procedure, run diagnostics on a minimally configured system. If a failure is detected on the minimally configured system, the remaining FRUs are exchanged one at a time until the failing FRU is identified. If a failure is not detected, FRUs are added back until the failure occurs. The failure is then isolated to the failing FRU.

This MCM problem-determination procedure isolates processor subsystem failures.

### **Notes:**

1. The service processor might have recorded one or more symptoms in its error/event log. Use the Advanced System Management Interface (ASMI) menus to view the error/event log.
  - If you arrived here after performing a slow boot, look for a possible new error that occurred during the slow boot. If there is a new error, and its actions call for a FRU replacement, perform those actions. If this does not resolve the problem, go to PFW1543-1.
  - If an additional slow boot has not been performed, or if the slow boot did not yield a new error code, look at the error that occurred prior to the original error. Perform the actions associated with that error. If the problem is not resolved, go to PFW1543-1.
  - If a slow boot results in the same error code, and there are no error codes before the original error code, go to PFW1543-1.
2. The service processor might have been set by the user to monitor system operations and to attempt recoveries. You might want to disable these options while you diagnose and service the system. If these settings are disabled, make notes of their current settings so that they can be restored before the system is turned back over to the customer. The following settings may be of interest.

<b>Setting</b>	<b>Description</b>
Monitoring (also called surveillance)	From the ASMI menu, expand the System Configuration menu, then click on Monitoring. Disable both types of surveillance.
Auto power restart (also called unattended start mode)	From the ASMI menu, expand Power/Restart Control, then click on Auto Power Restart, and set it to disabled.
Wake on LAN	From the ASMI menu, expand Wake on LAN, and set it to disabled.
Call Out	From the ASMI menu, expand the Service Aids menu, then click on Call-Home/Call-In Setup. Set the call-home serial port and the call-in serial port to disabled.

3. If this is a pSeries system, verify that the system has not been set to boot to the SMS menus or to the open firmware prompt. From the ASMI menu, expand Power/Restart Control to view the menu, then click on Power On/Off System. The AIX/Linux partition mode boot should say "Continue to Operating System".

### **PFW1543-1**

Record the error code(s) and location codes(s) that sent you to this procedure.

### **PFW1543-2**



Use the HMC to power off the system.

Examine the amber logic-power LEDs on all of the processor subsystem DCAs.

#### **PFW1543-3**

**Are all of the amber logic-power LEDs on all of the processor subsystem DCAs off?**

**NO** Contact service support.

**YES** Continue to step 1543-4

#### **PFW1543-4**

**Attention:** Some of the parts in the following lists have a limit of xxx plug cycles.

You may be asked to replace one or more of the following cards and MCM modules. Before replacing any of the listed MCM modules, call for support.

- MCM module 0 at location Un-Px-??
- MCM module 0 at location Un-Px-??
- System clock card(s) at location Un-P1-C3 and Un -P1-C4

Replace, in the order listed, the following modules or cards, if present, one at a time:

1. Clock cards, Un-P1-C3 and Un-P1-C2.
2. First location code, if any, recorded in PFW1543-1.
3. Second location code, if any, recorded in PFW1543-1.
4. Third location code, if any, recorded in PFW1543-1.
5. Fourth location code, if any, recorded in PFW1543-1.
6. Fifth location code, if any, recorded in PFW1543-1.
7. Sixth location code, if any, recorded in PFW1543-1.
8. MCM 0 at Un-Pn-?? if not recorded in PFW1543-1.
9. MCM 1 at Un-Pn-?? if not recorded in PFW1543-1.

#### **PFW1543-5**

Turn on the power.

#### **PFW1543-6**

**Does the system stop with the same error code as recorded in step 1543-1?**

**NO** The module just replace was defective. Return the system to its original configuration. Go to MAP 0410: Repair Checkout. This ends the procedure.

**YES** Go to PFW1543-7.

#### **PFW1543-7**

**Have all of the modules listed in step 1543-4 been replaced?**

**NO** Go to PFW1543-2..

**YES** Go to PFW1543-8..

#### **PFW1543-8**

Turn off the power.

#### **PFW1543-9**

Examine the amber logic-power LEDs on all of the processor subsystem DCAs.

#### **PFW1543-10**

**Are all of the amber logic-power LEDs on all of the processor subsystem DCAs off?**

**NO** Contact service support.

**YES** Continue to PFW1543-11.

#### **PFW1543-11**

**Attention:** Before replacing the node's backplane, call service support.

Replace the node's backplane and chassis, Un-Px.

#### **PFW1543-12**

Turn on the power.

#### **PFW1543-13**

**Does the system stop with the same error code as recorded in step 1543-1?**

**NO** The part just replaced was defective. Return the system to its original configuration. Go to MAP 0410: Repair Checkout. This ends the procedure.

**YES** Go to PFW1543-14.

#### **PFW1543-14**

Turn off the power.

Make sure that all of the amber logic-power LEDs on all of the processor subsystem DCAs are off.

#### **PFW1543-15**

Call service support.

### **PFW1546: Model 590 and model 595 memory problem isolation procedure**

#### **Purpose of this procedure**

Use this procedure to locate defective FRUs not found by normal diagnostics. It should be used when the service processor posts a failure and halts the IPL before server firmware standby is reached.

To perform this procedure, run diagnostics on a minimally configured system. If a failure is detected on the minimally configured system, the remaining FRUs are exchanged one at a time until the failing FRU is identified. If a failure is not detected, FRUs are added back until the failure occurs. The failure is then isolated to the failing FRU.

This memory problem-determination procedure isolates memory subsystem failures. When memory problem isolation is complete, memory cards exhibiting a failure will have been reseated or replaced.

**Notes:**

1. The service processor might have recorded one or more symptoms in its error/event log. Use the Advanced System Management Interface (ASMI) menus to view the error/event log.
  - If you arrived here after performing a slow boot, look for a possible new error that occurred during the slow boot. If there is a new error, and its actions call for a FRU replacement, perform those actions. If this does not resolve the problem, go to PFW1546-1.
  - If an additional slow boot has not been performed, or if the slow boot did not yield a new error code, look at the error that occurred prior to the original error. Perform the actions associated with that error. If the problem is not resolved, go to PFW1546-1.
  - If a slow boot results in the same error code, and there are no error codes before the original error code, go to PFW1546-1.
2. The service processor might have been set by the user to monitor system operations and to attempt recoveries. You might want to disable these options while you diagnose and service the system. If these settings are disabled, make notes of their current settings so that they can be restored before the system is turned back over to the customer. The following settings may be of interest.

Setting	Description
Monitoring (also called surveillance)	From the ASMI menu, expand the System Configuration menu, then click on Monitoring. Disable both types of surveillance.
Auto power restart (also called unattended start mode)	From the ASMI menu, expand Power/Restart Control, then click on Auto Power Restart, and set it to disabled.
Wake on LAN	From the ASMI menu, expand Wake on LAN, and set it to disabled.
Call Out	From the ASMI menu, expand the Service Aids menu, then click on Call-Home/Call-In Setup. Set the call-home serial port and the call-in serial port to disabled.

3. If this is a pSeries system, verify that the system has not been set to boot to the SMS menus or to the open firmware prompt. From the ASMI menu, expand Power/Restart Control to view the menu, then click on Power On/Off System. The AIX/Linux partition mode boot should say "Continue to Operating System".

**PFW1546-1**

Record the error code(s) and location codes(s) that sent you to this procedure.

**PFW1546-2**

Use the HMC to power off the system.

Examine the amber logic-power LEDs on all of the processor subsystem DCAs.

**PFW1546-3**

**Are all of the amber logic-power LEDs on all of the processor subsystem DCAs off?**

**NO** Contact service support.

**YES** Continue to step 1546-4

**PFW1546-4**

**Attention:** Some of the parts in the following lists have a limit of three plugging cycles.

Replace the following memory cards, one at a time, in the order listed, if present.

1. The device at the first location code recorded in step 1546-1.
2. The device at the second location code recorded in step 1546-1.
3. The device at the third location code recorded in step 1546-1.
4. The device at the fourth location code recorded in step 1546-1.
5. The device at the fifth location code recorded in step 1546-1.
6. The device at the sixth location code recorded in step 1546-1.

#### **PFW1546-5**

Turn on the power.

#### **PFW1546-6**

**Did the system stop with the same error code as recorded in step 1546-1?**

**NO** The memory card just replace was defective. Return the system to its original configuration. Go to MAP 0410: Repair Checkout. This ends the procedure.

**YES** Go to PFW1546-7.

#### **PFW1546-7**

**Have all of the memory cards listed in step 1546-4 been replaced?**

**NO** Go to PFW1546-2..

**YES** Go to PFW1546-8..

#### **PFW1546-8**

Turn off the power.

#### **PFW1546-9**

Examine the amber logic-power LEDs on all of the processor subsystem DCAs.

#### **PFW1546-10**

**Are all of the amber logic-power LEDs on all of the processor subsystem DCAs off?**

**NO** Contact service support.

**YES** Continue to PFW1546-11.

#### **PFW1546-11**

Using the following table, depopulate the memory cards in the system according to the following.

**Note:** As each node is removed, record the configuration of memory cards before removing any.

- In a one-node system with only one MCM active (in a model 595 only), leave the first two memory cards in the table installed.
- In a one-node system with both MCMs active, leave the first four memory cards in the table installed.
- In a two-node system, leave the first eight memory cards in the table installed.
- In a three-node system, leave the first twelve memory cards in the table installed.
- In a four-node system, leave the first sixteen memory cards in the table installed.


Reinstall the nodes into the system.

After the system has been taken down to the minimum memory for the number of nodes in the system, power on the system using the HMC.

**Does the system boot to server firmware standby with no error codes on the control panel?**

**NO** Go to PFW1546-12.

**YES** Go to PFW1546-18.

**PFW1546-12**

The following steps will isolate the failing node. The nodes will be removed, repopulated with memory, and added back to the system one at a time.

Use the HMC to power down the system.

Remove all nodes from the system.

Reconfigure the memory in the first node according to the first column in the table in PFW1546-11.

Reinstall the first node, then use the HMC to power on the system.

**Does the system boot to server firmware standby with no error codes on the control panel?**

**NO** Go to PFW1546-13.

**YES** Go to PFW1546-14.

**PFW1546-13**

The failure has been isolated to the node that was just reinstalled. Do the following in the order listed:

1. Use the HMC to power down the system.
2. Remove the last node that was reinstalled. Replace the eight memory cards in the node with eight known-good cards, or eight cards from the ones that were removed in PFW1546-11.
3. Reinstall the node.
4. Use the HMC to power up the system.

**Does the system boot to server firmware standby with no error codes on the control panel?**

**NO** Before replacing the node's backplane and chassis, or one of the MCMs, call the support center. This ends the procedure.

**YES** One of the eight memory cards originally in this node is bad. Isolate to the failing quad first, then isolate the failing memory card. Replace the failing card, then go to MAP 0410: Repair Checkout. This ends the procedure.

#### **PFW1546-14**

Use the HMC to power down the system.

**Is there a second node in the system?**

**NO** Go to PFW1546-17.

**YES** Do the following:

1. Reconfigure the minimum memory in the first node and the second node according to the second column in the table in PFW1546-11.
2. Reinstall the second node, then use the HMC to power on the system.

**Does the system boot to server firmware standby with no error codes on the control panel?**

**NO** Go to PFW1546-13.

**YES** Go to PFW1546-15.

#### **PFW1546-15**

Use the HMC to power down the system.

**Is there a third node in the system?**

**NO** Go to PFW1546-17.

**YES** Do the following:

1. Reconfigure the minimum memory in the first node, the second node, and the third node according to the second column in the table in PFW1546-11.
2. Reinstall the third node, then use the HMC to power on the system.

**Does the system boot to server firmware standby with no error codes on the control panel?**

**NO** Go to PFW1546-13.

**YES** Go to PFW1546-16.

#### **PFW1546-16**

Use the HMC to power down the system.

**Is there a fourth node in the system?**

**NO** Go to PFW1546-17.

**YES** Do the following:

1. Reconfigure the minimum memory in the first node, the second node, the third node, and the fourth node according to the second column in the table in PFW1546-11.
2. Reinstall the third node, then use the HMC to power on the system.

**Does the system boot to server firmware standby with no error codes on the control panel?**

**NO** Go to PFW1546-13.

**YES** Go to PFW1546-17.

#### **PFW1546-17**

The system now boots to server firmware standby with the minimum configuration of memory cards. Go to PFW1546-18 to start adding back in the additional memory in the system.

### **PFW1546-18**

Power off the system using the HMC.

Add another set of four memory cards back in order, one set a time, according to the table in PFW1546-11.

After each set of four is added, reinstall the node into the system.

**Does the system boot to server firmware standby with no error codes on the control panel?**

**NO** Go to PFW1546-20.

**YES** Go to PFW1546-19.

### **PFW1546-19**

**Has the last set of four memory cards been installed (so the system has been returned to its original configuration)?**

**NO** Go to PFW1546-18.

**YES** The system is now booting to server firmware standby with all of the memory cards installed. Go to MAP 0410: Repair Checkout. This ends the procedure.

### **PFW1546-20**

The set of four memory cards that was reinstalled in step 18, or the slots into which they were installed, are causing the failure.

Do the following:

1. Power down the system using the HMC.
2. Remove the node into which the last set of memory cards was installed.
3. Replace the last set of memory cards that was installed with a known-good set.
4. Reinstall the node in the system.
5. Using the HMC, power on the system.

**Does the system boot to server firmware standby with no error codes on the control panel?**

**NO** One or more of the memory slots is bad. Before replacing the chassis, contact the support center. This ends the procedure.

**YES** Go to PFW1546-21.

### **PFW1546-21**

One or more of the memory cards in the last set installed is bad. Using the known good set, swap out the memory cards one at a time until the failing card is isolated. Replace it. Return the system to its original configuration, then go to MAP 0410: Repair Checkout. This ends the procedure.

## **PFW1548: Memory and processor subsystem problem isolation procedure**

**Attention:** This procedure is not applicable to an iSeries-branded system that is not managed by an HMC.

**Purpose of this procedure**

This MAP is used to locate defective FRUs not found by normal diagnostics. For this procedure, diagnostics are run on a minimally configured system. If a failure is detected on the minimally configured system, the remaining FRUs are exchanged one at a time until the failing FRU is identified. If a failure is not detected, FRUs are added back until the failure occurs. The failure is then isolated to the failing FRU.

**Notes:**

1. Be sure to unplug the power cords before removing or installing any part to avoid damage to it.
2. This MAP assumes that either:
  - a. An optical drive is installed and connected to the integrated EIDE adapter, and an AIX diagnostic CD-ROM is available.
  - OR
  - b. AIX standalone diagnostics can be booted from a NIM server.
3. If a power-on password or privileged-access password is set, you are prompted to enter the password before the AIX diagnostic CD-ROM can load.
4. The term POST indicators refers to the device mnemonics that appear during the power-on self-test (POST).
5. The service processor might have recorded one or more symptoms in its error/event log. Use the ASMI menus to view the error/event log.
  - If you arrived here after performing a slow boot, look for a possible new error that occurred during the slow boot. If there is a new error, and its actions call for a FRU replacement, perform those actions. If this does not resolve the problem, select one of the files listed below according to the system model you are servicing, then go to PFW1548-xxx-1 in that procedure.
  - If an additional slow boot has not been performed, or if the slow boot did not yield a new error code, look at the error that occurred just before the original error. Perform the actions associated with that error. If the problem is not resolved, select one of the files listed below according to the system model you are servicing, then go to PFW1548-xxx-1 in that procedure.
  - If a slow boot results in the same error code, and there are no error codes before the original error code, select one of the files listed below according to the system model you are servicing, then go to PFW1548-xxx-1 in that procedure.
6. The service processor might have been set by the user to monitor system operations and to attempt recoveries. You might want to disable these options while you diagnose and service the system. If these settings are disabled, make notes of their current settings so that they can be restored before the system is turned back over to the customer. The following settings may be of interest.

**Monitoring**

(also called surveillance) From the ASMI menu, expand the System Configuration menu, then click on Monitoring. Disable both types of surveillance.

**Auto power restart**

(also called unattended start mode) From the ASMI menu, expand Power/Restart Control, then click on Auto Power Restart, and set it to disabled.

**Wake on LAN**

From the ASMI menu, expand Wake on LAN, and set it to disabled.

**Call Out**

From the ASMI menu, expand the Service Aids menu, then click on Call-Home/Call-In Setup. Set the call-home serial port and the call-in serial port to disabled.

7. If this is a pSeries system, verify that the system has not been set to boot to the SMS menus or to the open firmware prompt. From the ASMI menu, expand Power/Restart Control to view the menu, then click on Power On/Off System. The AIX/Linux partition mode boot should say "Continue to Operating System".



To continue with this procedure select one of the following files according to the model system you are servicing.

PFW1548-520

PFW1548-550

PFW1548-570

## **PFW1548-520: Memory and Processor Problem Isolation Procedure**

### **PFW1548-520-1**

1. Insure that the diagnostics and the operating system are shut down.
2. Turn on the power.
3. Insert the AIX diagnostic CD-ROM into the optical drive.

**Note:** If you cannot insert the diagnostic CD-ROM, go to "PFW1548-520-2."

4. When the keyboard indicator is displayed on an ASCII terminal, a directly-attached keyboard, or hardware management console (HMC), press the number 5 key.
5. If you are prompted to do so, enter the appropriate password.

**Is the Please define the System Console screen displayed?**

**NO** Go to "PFW1548-520-2."

**YES** Go to "PFW1548-520-17" on page 378.

### **PFW1548-520-2**

1. Turn off the power.
2. If you have not already done so, configure the service processor (using the ASMI menus) with the instructions in note 6 at the beginning of this procedure, then return here and continue.
3. Exit the service processor (ASMI) menus and remove the power cords.
4. Disconnect all external cables (parallel, serial port 1, serial port 2, keyboard, mouse, Ethernet on the system planar, Ethernet on the service processor [if present], and so on).
5. Remove the service access cover (model xxx), or place the drawer (model yyy), into the service position and remove the service access cover.
6. Record the slot numbers of the PCI adapters. Label and record the locations of all cables attached to the adapters. Disconnect all cables attached to the adapters and remove all of the adapters.
7. Disconnect all of the power and signal cables from the media drives located in media bay 1 and media bay 2.
8. Remove the media drives.
9. Record the slot numbers of the memory DIMMs on the system backplane. Remove all memory DIMMs except for one pair from the system backplane.

#### **Notes:**

- a. Place the memory DIMM locking tabs in the locked (upright) position to prevent damage to the tabs.
  - b. Memory DIMMs must be installed in pairs and in the correct connectors. Refer to the memory DIMM section of Locations-Model 520 for information on memory DIMMs.
10. Disconnect the IDE cable from the IDE connector on the system backplane.
  11. If the system is equipped with a diskette drive, disconnect the diskette drive cable from the diskette drive connector on the system backplane.
  12. Disconnect the signal and power connectors from both disk drive backplanes.
  13. Disconnect the disk drives from both disk drive backplanes.
  14. Plug in the power cords and wait for "01" in the upper-left corner of the operator panel display.
  15. Turn on the power.

**Does the system stop with B1xxF22A, CA00E1F2, CA00E1F3, or STBY displayed on the operator panel?**

**NO** Go to "PFW1548-520-6."

**YES** Go to "PFW1548-520-3."

**PFW1548-520-3**

**Were any memory DIMMs removed from the system backplane?**

**NO** Go to "PFW1548-520-8" on page 373.

**YES** Go to "PFW1548-520-4."

**PFW1548-520-4**

1. Turn off the power, and remove the power cords.
2. Replug the memory DIMMs that were removed from the system backplane in "PFW1548-520-2" on page 371 in their original locations.

**Notes:**

- a. Place the memory DIMM locking tabs into the locked (upright) position to prevent damage to the tabs.
  - b. Memory DIMMs must be installed in pairs in the correct connectors. Refer to Memory DIMM locations for information on memory DIMMs.
3. Plug in the power cords and wait for "OK" in the operator panel display.
  4. Turn on the power.

**Does the system stop with B1xxF22A, CA00E1F2, CA00E1F3, or STBY displayed on the operator panel?**

**NO** A memory DIMM in the pair you just replaced in the system is defective. Turn off the power, remove the power cords, and exchange the memory DIMMs in that pair one at a time with new or previously removed memory DIMMs. Repeat this step until the defective memory DIMM is identified, or all memory DIMMs have been exchanged. If your symptom did not change and all the memory DIMMs have been exchanged, call your service support person for assistance. If the symptom changed, check for loose cards and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** Go to "PFW1548-520-8" on page 373.

**PFW1548-520-5**

This step is reserved.

**PFW1548-520-6**

One of the FRUs remaining in the system unit is defective.

**Note:** If a memory DIMM is exchanged, insure that the new memory DIMM is the same size and speed as the original memory DIMM.

1. Turn off the power, remove the power cords, and exchange the following FRUs in the order listed:
  - a. Memory DIMMs. Exchange one at a time with new or previously removed DIMMs
  - b. Service processor
  - c. System backplane
  - d. Power supplies.
2. Plug in the power cords and wait for "01" in the upper-left corner of the operator panel display.
3. Turn on the power.

**Does the system stop with B1xxF22A, CA00E1F2, CA00E1F3, or STBY displayed on the operator panel?**

**NO** Reinstall the original FRU. Repeat the FRU replacement steps until the defective FRU is identified or all the FRUs have been exchanged. If the symptom did not change and all the FRUs have been exchanged, call service support for assistance. If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** Go to MAP 0410: Repair Checkout.

**PFW1548-520-7**

This step is reserved.

**PFW1548-520-8**

1. Turn off the power.
2. Reconnect the system console.
  - a. If an ASCII terminal has been defined as the firmware console, attach the ASCII terminal cable to the S1 connector on the rear of the system unit.
  - b. If a display attached to a display adapter has been defined as the firmware console, install the display adapter and connect the display to the adapter. Plug the keyboard and mouse into the keyboard connector on the rear of the system unit.
3. Turn on the power.
4. If the ASCII terminal or graphics display (including display adapter) is connected differently from the way it was previously, the console selection screen appears. Select a firmware console.
5. When the word keyboard is displayed, press the number 1 key on the directly attached keyboard, an ASCII terminal or HMC. This activates the system management services (SMS).
6. Enter the appropriate password if you are prompted to do so.

**Is the SMS screen displayed?**

**NO** One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. If you are using the hardware management console (HMC) go to the Entry MAP in the Hardware Management Console Maintenance Guide, order number SA38-0603. If you cannot fix the problem using the HMC tests, there may be a problem with the system backplane. If you do not find a problem, do the following:
  - Replace the service processor, location Un-P1-C7.
  - Replace the system backplane, location Un-P1.
2. If you are using a graphics display, go to the problem determination procedures for the display. If you do not find a problem, do the following:
  - Replace the display adapter.
  - Replace the backplane in which the graphics adapter is plugged.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged. If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** Go to “PFW1548-520-9.”

**PFW1548-520-9**

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Plug the IDE cable into the IDE connector on the system backplane.
4. Connect the signal and power connectors to the IDE optical drive.

5. Plug in the power cords and wait for "01" in the upper-left corner of the operator panel display.
6. Turn on the power.
7. Insert the diagnostic CD-ROM into the optical drive.
8. After the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or an ASCII terminal keyboard.
9. Enter the appropriate password if you are prompted to do so.

**Is the Please define the System Console screen displayed?**

**NO** One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. IDE cable
2. Optical drive
3. Media backplane
4. System backplane

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** Go to "PFW1548-520-10."

**PFW1548-520-10**

The system is working correctly with this configuration. One of the SCSI devices that was disconnected may be defective.

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Plug the SCSI cable into the SCSI connector on the system backplane.
4. Connect the signal and power connectors to one of the SCSI devices if present (a SCSI LVD tape device in media bay #1, for example). Do not connect the signal and power connectors to the disk drive backplane at this time.
5. Plug in the power cords and wait for "01" in the upper-left corner of the operator panel display.
6. Turn on the power.
7. After the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

**Is the Please define the System Console screen displayed?**

**NO** One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. SCSI cable
2. Last SCSI device connected (for example, tape drive)
3. System backplane

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES**

Repeat this step, adding one SCSI device at a time, until all the SCSI devices that were attached to the integrated SCSI adapter, except the disk drive backplanes, are connected and tested. Go to "PFW1548-520-11."

**PFW1548-520-11**

The system is working correctly with this configuration. One of the disk drive backplanes may be defective.

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Connect the signal and power connectors to one of the disk drive backplanes.
4. Plug in the power cords and wait for "01" in the upper-left corner of the operator panel display.
5. Turn on the power.
6. If the Console Selection screen is displayed, choose the system console.
7. After the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

**Is the Please define the System Console screen displayed?**

**NO** One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. SCSI cable
2. Disk drive backplane

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** If both disk drive backplanes have been reconnected, go to "PFW1548-520-12." Otherwise, repeat "PFW1548-520-11" for the other disk drive backplane if present.

**PFW1548-520-12**

The system is working correctly with this configuration. One of the disk drives that you removed from the disk drive backplanes may be defective.

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Install a disk drive in a disk drive backplane.
4. Plug in the power cords and wait for the OK prompt to display on the operator panel display.
5. Turn on the power.
6. After the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

**Is the Please define the System Console screen displayed?**

**NO** Exchange the FRUs that have not been exchanged, in the following order:

1. Last disk drive installed
2. Disk drive backplane where the disk drive was installed

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged. If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** Repeat this step with all disk drives that were installed in the disk drive backplanes.

If the system has a diskette drive, go to "PFW1548-520-13," if not go to "PFW1548-520-14."

#### **PFW1548-520-13**

The system is working correctly with this configuration. The diskette drive may be defective.

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Plug the diskette drive cable into the diskette drive connector on the system backplane.
4. Connect the signal and power connectors to the diskette drive.
5. Plug in the power cords and wait for "01" in the upper-left corner of the operator panel display.
6. Turn on the power.
7. After the word keyboard displays, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

**Is the Please define the System Console screen displayed?**

**NO** One of the FRUs remaining in the system is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. Diskette drive
2. Diskette drive cable
3. System backplane

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged. If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem return, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** Go to "PFW1548-520-14."

#### **PFW1548-520-14**

The system is working correctly with this configuration. One of the devices that was disconnected from the system backplane may be defective.

1. Turn off the power and remove the power cords.
2. Attach a system backplane device (for example: parallel, serial port 1, serial port 2, serial port 3, keyboard, mouse, Ethernet, Ultra-2 SCSI,) that had been removed.
3. Plug in the power cords and wait for "01" in the upper-left corner on the operator panel display.
4. Turn on the power.
5. If the Console Selection screen is displayed, choose the system console.

6. After the word keyboard displays, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

**Is the Please define the System Console screen displayed?**

**NO** The last device or cable that you attached is defective.

To test each FRU, exchange the FRUs in the following order:

1. Device and cable (last one attached)
2. System backplane

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom. Go to MAP 0410: Repair Checkout.

**YES** Repeat this step until all of the devices are attached. Go to "PFW1548-520-15."

**PFW1548-520-15**

The system is working correctly with this configuration. One of the FRUs (adapters) that you removed may be defective.

1. Turn off the power and remove the power cords.
2. Install a FRU (adapter) and connect any cables and devices that were attached to the FRU.
3. Plug in the power cords and wait for the OK prompt to display on the operator panel display.
4. Turn on the power.
5. If the Console Selection screen is displayed, choose the system console.
6. After the word keyboard displays, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

**Is the Please define the System Console screen displayed?**

**NO** Go to "PFW1548-520-16."

**YES** Repeat this step until all of the FRUs (adapters) are installed. Go to MAP 0410: Repair Checkout.

**PFW1548-520-16**

The last FRU installed or one of its attached devices is probably defective.

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Starting with the last installed adapter, disconnect one attached device and cable.
4. Plug in the power cords and wait for the "01" in the upper-left corner on the operator panel display.
5. Turn on the power.
6. If the Console Selection screen is displayed, choose the system console.
7. After the word keyboard displays, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

**Is the Please define the System Console screen displayed?**

**NO** Repeat this step until the defective device or cable is identified or all devices and cables have been disconnected.

If all the devices and cables have been removed, then one of the FRUs remaining in the system unit is defective.

To test each FRU, exchange the FRUs in the following order:

1. Adapter (last one installed)
2. System backplane

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** The last device or cable that you disconnected is defective. Exchange the defective device or cable. Go to MAP 0410: Repair Checkout.

#### **PFW1548-520-17**

1. Follow the instructions on the screen to select the system console.
2. When the DIAGNOSTIC OPERATING INSTRUCTIONS screen is displayed, press Enter.
3. Select Advanced Diagnostics Routines.
4. If the terminal type has not been defined, you must use the initialize terminal option on the FUNCTION SELECTION menu to initialize the AIX diagnostic environment before you can continue with the diagnostics. This is a separate operation from selecting the console display.
5. If the NEW RESOURCE screen is displayed, select an option from the bottom of the screen.

**Note:** Adapters and devices that require supplemental media are not shown in the new resource list. If the system has adapters or devices that require supplemental media, select option 1.

6. When the DIAGNOSTIC MODE SELECTION screen is displayed, press Enter.
7. Select All Resources. (If you were sent here from "PFW1548-520-21" on page 379, select the adapter or device that was loaded from the supplemental media).

#### **Did you get an SRN?**

**NO** Go to "PFW1548-520-19."

**YES** Go to "PFW1548-520-18."

#### **PFW1548-520-18**

Look at the FRU part numbers associated with the SRN.

#### **Have you exchanged all the FRUs that correspond to the failing function codes (FFCs)?**

**NO** Exchange the FRU with the highest failure percentage that has not been changed.

Repeat this step until all the FRUs associated with the SRN have been exchanged or diagnostics run with no trouble found. Run diagnostics after each FRU is exchanged. Go to MAP 0410: Repair Checkout.

**YES** If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

#### **PFW1548-520-19**

#### **Does the system have adapters or devices that require supplemental media?**

**NO** Go to "PFW1548-520-20."

**YES** Go to "PFW1548-520-21" on page 379.

#### **PFW1548-520-20**

Consult the PCI adapter configuration documentation for your operating system to verify that all adapters are configured correctly. Go to MAP 0410: Repair Checkout.



If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

#### **PFW1548-520-21**

1. Select Task Selection.
2. Select Process Supplemental Media and follow the on screen instructions to process the media. Supplemental media must be loaded and processed one at a time.

**Did the system return to the TASKS SELECTION SCREEN after the supplemental media was processed?**

**NO** Go to "PFW1548-520-22."

**YES** Press F3 to return to the FUNCTION SELECTION screen. Go to "PFW1548-520-22" of PFW1548-520-17.

#### **PFW1548-520-22**

The adapter or device is probably defective.

If the supplemental media is for an adapter, replace the FRUs in the following order:

1. Adapter
2. System backplane

If the supplemental media is for a device, replace the FRUs in the following order:

1. Device and any associated cables
2. The adapter to which the device is attached

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom. Go to MAP 0410: Repair Checkout.

End of procedure.

### **PFW1548-550: Memory and Processor Problem Isolation Procedure**

#### **PFW1548-550-1**

1. Insure that the diagnostics and the operating system are shut down.
2. Turn on the power.
3. Insert the AIX diagnostic CD-ROM into the optical drive.

**Note:** If you cannot insert the diagnostic CD-ROM, go to "PFW1548-550-2."

4. When the keyboard indicator is displayed on an ASCII terminal, a directly-attached keyboard, or hardware management console (HMC), press the number 5 key.
5. If you are prompted to do so, enter the appropriate password.

**Is the Please define the System Console screen displayed?**

**NO** Go to "PFW1548-550-2."

**YES** Go to "PFW1548-550-17" on page 387.

#### **PFW1548-550-2**

1. Turn off the power.
2. If you have not already done so, configure the service processor (using the ASMI menus) with the instructions in note 6 at the beginning of this procedure, then return here and continue.
3. Exit the service processor (ASMI) menus and remove the power cords.
4. Disconnect all external cables (parallel, serial port 1, serial port 2, keyboard, mouse, USB devices, SPCN, Ethernet on the system planar, Ethernet on the service processor [if present], and so on).

5. Remove the service access cover (model xxx), or place the drawer (model yyy), into the service position and remove the service access cover.
6. Record the slot numbers of the PCI adapters. Label and record the locations of all cables attached to the adapters. Disconnect all cables attached to the adapters and remove all of the adapters.
7. Disconnect all of the power and signal cables from the media drives located in media bay 1 and media bay 2.
8. Remove the media drives.
9. Remove processor card #2 (if installed). If processor card #2 is removed, insure that processor card #1 is installed and contains at least one quad of DIMMs.
10. Record the slot numbers of the memory DIMMs on processor card #1. Remove all memory DIMMs except for one quad from processor card #1.

**Notes:**

- a. Place the memory DIMM locking tabs in the locked (upright) position to prevent damage to the tabs.
  - b. Memory DIMMs must be installed in pairs and in the correct connectors. Refer to the memory DIMM section of Locations-Model 550 for information on memory DIMMs.
11. Disconnect the IDE cable from the IDE connector on the system backplane.
  12. If the system is equipped with a diskette drive, disconnect the diskette drive cable from the diskette drive connector on the system backplane.
  13. Disconnect the signal and power connectors from the disk drive backplane.
  14. Disconnect the disk drives from both disk drive backplanes.
  15. Plug in the power cords and wait for "01" in the upper-left corner of the operator panel display.
  16. Turn on the power.

**Does the system stop with B1xxF22A, CA00E1F2, CA00E1F3, or STBY displayed on the operator panel?**

**NO** Go to "PFW1548-550-6" on page 381.

**YES** Go to "PFW1548-550-3."

**PFW1548-550-3**

**Were any memory DIMMs removed from processor card #1?**

**NO** Go to "PFW1548-550-8" on page 382.

**YES** Go to "PFW1548-550-4."

**PFW1548-550-4**

1. Turn off the power, and remove the power cords.
2. Replug the memory DIMMs that were removed from the system backplane in "PFW1548-550-2" on page 379 in their original locations.

**Notes:**

- a. Place the memory DIMM locking tabs into the locked (upright) position to prevent damage to the tabs.
  - b. Memory DIMMs must be installed in pairs in the correct connectors. Refer to Memory DIMM locations for information on memory DIMMs.
3. Plug in the power cords and wait for "01" in the upper-left corner of the operator panel display.
  4. Turn on the power.

**Does the system stop with B1xxF22A, CA00E1F2, CA00E1F3, or STBY displayed on the operator panel?**

**NO** A memory DIMM in the pair you just replaced in the system is defective. Turn off the power, remove the power cords, and exchange the memory DIMMs in that pair one at a time with

new or previously removed memory DIMMs. Repeat this step until the defective memory DIMM is identified, or all memory DIMMs have been exchanged.

If your symptom did not change and all the memory DIMMs have been exchanged, call your service support person for assistance.

If the symptom changed, check for loose cards and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** Go to "PFW1548-550-5."

**PFW1548-550-5**

**Was processor card #2 removed from the system?**

**NO** Go to "PFW1548-550-8" on page 382.

**YES** Go to "PFW1548-550-7."

**PFW1548-550-6**

One of the FRUs remaining in the system unit is defective.

**Note:** If a memory DIMM is exchanged, insure that the new memory DIMM is the same size and speed as the original memory DIMM.

1. Turn off the power, remove the power cords, and exchange the following FRUs in the order listed:
  - a. Memory DIMMs. Exchange one at a time with new or previously removed DIMMs
  - b. Processor card #1.
  - c. System backplane
  - d. Power supplies
2. Plug in the power cords and wait for "01" in the upper-left corner of the operator panel display.
3. Turn on the power.

**Does the system stop with B1xxF22A, CA00E1F2, CA00E1F3, or STBY displayed on the operator panel?**

**NO** Reinstall the original FRU.

Repeat the FRU replacement steps until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems.

If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** Go to MAP 0410: Repair Checkout.

**PFW1548-550-7**

No failure was detected with this configuration.

1. Turn off the power and remove the power cords.
2. Reinstall processor card #2.
3. Plug in the power cords and wait for "01" in the upper-left corner of the operator panel display.
4. Turn on the power.

**Does the system stop with B1xxF22A, CA00E1F2, CA00E1F3, or STBY displayed on the operator panel?**

**NO** One of the FRUs remaining in the system is defective.

Exchange the FRUs (that have not already been changed) in the following order:

1. Memory DIMMs (if present) on processor card #2. Exchange the DIMMs one at a time with new or previously removed DIMMs.
2. Processor card #2
3. System backplane

Repeat the FRU replacement steps until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** Go to "PFW1548-550-8."

**PFW1548-550-8**

1. Turn off the power.
2. Reconnect the system console.

**Notes:**

- a. If an ASCII terminal has been defined as the firmware console, attach the ASCII terminal cable to the S1 connector on the rear of the system unit.
  - b. If a display attached to a display adapter has been defined as the firmware console, install the display adapter and connect the display to the adapter. Plug the keyboard and mouse into the keyboard connector on the rear of the system unit.
3. Turn on the power.
  4. If the ASCII terminal or graphics display (including display adapter) is connected differently from the way it was previously, the console selection screen appears. Select a firmware console.
  5. When the word keyboard is displayed, press the number 1 key on the directly attached keyboard, an ASCII terminal or HMC. This activates the system management services (SMS).
  6. Enter the appropriate password if you are prompted to do so.

**Is the SMS screen displayed?**

**NO** One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. If you are using an ASCII terminal, go to the problem determination procedures for the display. If you do not find a problem, replace the system backplane, location: Un-P1-C8.
2. If you are using a graphics display, go to the problem determination procedures for the display. If you do not find a problem, do the following:
  - a. Replace the display adapter.
  - b. Replace the backplane in which the graphics adapter is plugged.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** Go to "PFW1548-550-9."

**PFW1548-550-9**

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.

2. Turn off the power and remove the power cords.
3. Plug the IDE cable into the IDE connector on the system backplane.
4. Connect the signal and power connectors to the IDE optical drive.
5. Plug in the power cords and wait for "01" in the upper-left corner of the operator panel display.
6. Turn on the power.
7. Insert the diagnostic CD-ROM into the optical drive.
8. After the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or an ASCII terminal keyboard.
9. Enter the appropriate password if you are prompted to do so.

**Is the Please define the System Console screen displayed?**

**NO** One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. IDE cable
2. Optical drive
3. Media backplane
4. I/O backplane

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** Go to "PFW1548-550-10."

**PFW1548-550-10**

The system is working correctly with this configuration. One of the SCSI devices that was disconnected may be defective.

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Plug the SCSI cable into the SCSI connector on the system backplane.
4. Connect the signal and power connectors to one of the SCSI devices if present (a SCSI LVD tape device in media bay #1, for example). Do not connect the signal and power connectors to the disk drive backplane at this time.
5. Plug in the power cords and wait for "01" in the upper-left corner of the operator panel display.
6. Turn on the power.
7. After the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

**Is the Please define the System Console screen displayed?**

**NO** One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. SCSI cable
2. Last SCSI device connected (for example, tape drive)
3. System backplane

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

#### **YES**

Repeat this step, adding one SCSI device at a time, until all the SCSI devices that were attached to the integrated SCSI adapter, except the disk drive backplanes, are connected and tested. Go to "PFW1548-550-11."

#### **PFW1548-550-11**

The system is working correctly with this configuration. One of the disk drive backplanes may be defective.

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Connect the signal and power connectors to one of the disk drive backplanes.
4. Plug in the power cords and wait for "01" in the upper-left corner of the operator panel display.
5. Turn on the power.
6. If the Console Selection screen is displayed, choose the system console.
7. After the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

#### **Is the Please define the System Console screen displayed?**

**NO** One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. SCSI cable
2. Disk drive backplane

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** If both disk drive backplanes have been reconnected, go to "PFW1548-550-12." Otherwise, repeat "PFW1548-550-11" for the other disk drive backplane if present.

#### **PFW1548-550-12**

The system is working correctly with this configuration. One of the disk drives that you removed from the disk drive backplanes may be defective.

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Install a disk drive in a disk drive backplane.
4. Plug in the power cords and wait for the OK prompt to display on the operator panel display.
5. Turn on the power.
6. After the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or an ASCII terminal keyboard.

7. Enter the appropriate password if you are prompted to do so.

**Is the Please define the System Console screen displayed?**

**NO** Exchange the FRUs that have not been exchanged, in the following order:

1. Last disk drive installed
2. Disk drive backplane where the disk drive was installed

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** Repeat this step with all disk drives that were installed in the disk drive backplanes.

If the system has an internal diskette drive, go to "PFW1548-550-13," if not go to "PFW1548-550-14."

**PFW1548-550-13**

The system is working correctly with this configuration. The diskette drive may be defective.

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Plug the diskette drive cable into the diskette drive connector on the system backplane.
4. Connect the signal and power connectors to the diskette drive.
5. Plug in the power cords and wait for "01" in the upper-left corner of the operator panel display.
6. Turn on the power.
7. After the word keyboard displays, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

**Is the Please define the System Console screen displayed?**

**NO** One of the FRUs remaining in the system is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. Diskette drive
2. Diskette drive cable
3. System backplane

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged. If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem return, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** Go to "PFW1548-550-14."

**PFW1548-550-14**

The system is working correctly with this configuration. One of the devices that was disconnected from the system backplane may be defective.

1. Turn off the power and remove the power cords
2. Attach a system backplane device (for example: parallel, serial port 1, serial port 2, serial port 3, keyboard, mouse, Ethernet, Ultra-2 SCSI) that had been removed.

3. Plug in the power cords and wait for "01" in the upper-left corner on the operator panel display.
4. Turn on the power.
5. If the Console Selection screen is displayed, choose the system console.
6. After the word keyboard displays, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

**Is the Please define the System Console screen displayed?**

**NO** The last device or cable that you attached is defective.

To test each FRU, exchange the FRUs in the following order:

1. Device and cable (last one attached)
2. System backplane

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom. Go to MAP 0410: Repair Checkout.

**YES** Repeat this step until all of the devices are attached. Go to "PFW1548-550-15."

**PFW1548-550-15**

The system is working correctly with this configuration. One of the FRUs (adapters) that you removed may be defective.

1. Turn off the power and remove the power cords.
2. Install a FRU (adapter) and connect any cables and devices that were attached to the FRU.
3. Plug in the power cords and wait for the OK prompt to display on the operator panel display.
4. Turn on the power.
5. If the Console Selection screen is displayed, choose the system console.
6. After the word keyboard displays, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

**Is the Please define the System Console screen displayed?**

**NO** Go to "PFW1548-550-16."

**YES** Repeat this step until all of the FRUs (adapters) are installed. Go to MAP 0410: Repair Checkout.

**PFW1548-550-16**

The last FRU installed or one of its attached devices is probably defective.

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Starting with the last installed adapter, disconnect one attached device and cable.
4. Plug in the power cords and wait for the "01" in the upper-left corner on the operator panel display.
5. Turn on the power.
6. If the Console Selection screen is displayed, choose the system console.
7. After the word keyboard displays, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.



**Is the Please define the System Console screen displayed?**

**NO** Repeat this step until the defective device or cable is identified or all devices and cables have been disconnected.

If all the devices and cables have been removed, then one of the FRUs remaining in the system unit is defective.

To test each FRU, exchange the FRUs in the following order:

1. Adapter (last one installed)
2. System backplane

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** The last device or cable that you disconnected is defective. Exchange the defective device or cable. Go to MAP 0410: Repair Checkout.

**PFW1548-550-17**

1. Follow the instructions on the screen to select the system console.
2. When the DIAGNOSTIC OPERATING INSTRUCTIONS screen is displayed, press Enter.
3. Select Advanced Diagnostics Routines.
4. If the terminal type has not been defined, you must use the initialize terminal option on the FUNCTION SELECTION menu to initialize the AIX diagnostic environment before you can continue with the diagnostics. This is a separate operation from selecting the console display.
5. If the NEW RESOURCE screen is displayed, select an option from the bottom of the screen.

**Note:** Adapters and devices that require supplemental media are not shown in the new resource list. If the system has adapters or devices that require supplemental media, select option 1.

6. When the DIAGNOSTIC MODE SELECTION screen is displayed, press Enter.
7. Select All Resources. (If you were sent here from "PFW1548-550-21" on page 388, select the adapter or device that was loaded from the supplemental media).

**Did you get an SRN?**

**NO** Go to "PFW1548-550-19."

**YES** Go to "PFW1548-550-18."

**PFW1548-550-18**

Look at the FRU part numbers associated with the SRN.

**Have you exchanged all the FRUs that correspond to the failing function codes (FFCs)?**

**NO** Exchange the FRU with the highest failure percentage that has not been changed.

Repeat this step until all the FRUs associated with the SRN have been exchanged or diagnostics run with no trouble found. Run diagnostics after each FRU is exchanged. Go to MAP 0410: Repair Checkout.

**YES** If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

**PFW1548-550-19**

**Does the system have adapters or devices that require supplemental media?**

**NO** Go to "PFW1548-550-20" on page 388.

**YES** Go to "PFW1548-550-21" on page 388.

#### **PFW1548-550-20**

Consult the PCI adapter configuration documentation for your operating system to verify that all adapters are configured correctly. Go to MAP 0410: Repair Checkout.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

#### **PFW1548-550-21**

1. Select Task Selection.
2. Select Process Supplemental Media and follow the on screen instructions to process the media. Supplemental media must be loaded and processed one at a time.

**Did the system return to the TASKS SELECTION SCREEN after the supplemental media was processed?**

**NO** Go to "PFW1548-550-22."

**YES** Press F3 to return to the FUNCTION SELECTION screen. Go to step 4 on page 387 of PFW1548-550-17.

#### **PFW1548-550-22**

The adapter or device is probably defective.

If the supplemental media is for an adapter, replace the FRUs in the following order:

1. Adapter
2. System backplane

If the supplemental media is for a device, replace the FRUs in the following order:

1. Device and any associated cables
2. The adapter to which the device is attached

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom. Go to MAP 0410: Repair Checkout.

End of procedure.

### **PFW1548-570: Memory and Processor Problem Isolation Procedure**

#### **PFW1548-570-1**

1. Insure that the diagnostics and the operating system are shut down.
2. Turn on the power.
3. Insert the AIX diagnostic CD-ROM into the optical drive.

**Note:** If you cannot insert the diagnostic CD-ROM, go to "PFW1548-570-2."

4. When the keyboard indicator is displayed on an ASCII terminal, a directly-attached keyboard, or hardware management console (HMC), press the number 5 key.
5. If you are prompted to do so, enter the appropriate password.

**Is the Please define the System Console screen displayed?**

**NO** Go to "PFW1548-570-2."

**YES** Go to "PFW1548-570-17" on page 396.

#### **PFW1548-570-2**

1. Turn off the power.
2. If you have not already done so, configure the service processor (using the ASMI menus) with the instructions in note 6 at the beginning of this procedure, then return here and continue.

3. Exit the service processor (ASMI) menus and remove the power cords.
4. Disconnect all external cables (parallel, serial port 1, serial port 2, keyboard, mouse, USB devices, SPCN, Ethernet on the system planar, Ethernet on the service processor [if present], and so on). Also disconnect all of the external cables attached to the service processor.
5. Remove the service access cover (model xxx), or place the drawer (model yyy), into the service position and remove the service access cover.
6. Record the slot numbers of the PCI adapters. Label and record the locations of all cables attached to the adapters. Disconnect all cables attached to the adapters and remove all of the adapters.
7. Disconnect all of the power and signal cables from the media drives located in media bay 1 and media bay 2.
8. Remove the media drives.
9. Remove processor card #2 (if installed). If processor card #2 is removed, insure that processor card #1 is installed and contains at least one quad of DIMMs.
10. Record the slot numbers of the memory DIMMs on processor card #1. Remove all memory DIMMs except for one quad from processor card #1.

**Notes:**

- a. Place the memory DIMM locking tabs in the locked (upright) position to prevent damage to the tabs.
  - b. Memory DIMMs must be installed in pairs and in the correct connectors. Refer to the memory DIMM section of Locations-Model 570 for information on memory DIMMs.
11. Disconnect the IDE cable from the IDE connector on the system backplane.
  12. Disconnect the signal and power connectors from the disk drive backplane.
  13. Disconnect the disk drives from both disk drive backplanes.
  14. Plug in the power cords and wait for "01" in the upper-left corner of the operator panel display.
  15. Turn on the power.

**Does the system stop with B1xxF22A, CA00E1F2, CA00E1F3, or STBY displayed on the operator panel?**

**NO** Go to "PFW1548-570-6" on page 390.

**YES** Go to "PFW1548-570-3."

**PFW1548-570-3**

**Were any memory DIMMs removed from processor card #1?**

**NO** Go to "PFW1548-570-8" on page 391.

**YES** Go to "PFW1548-570-4."

**PFW1548-570-4**

1. Turn off the power, and remove the power cords.
2. Replug the memory DIMMs that were removed from the system backplane in "PFW1548-570-2" on page 388 in their original locations.

**Notes:**

- a. Place the memory DIMM locking tabs into the locked (upright) position to prevent damage to the tabs.
  - b. Memory DIMMs must be installed in pairs in the correct connectors. Refer to Memory DIMM locations for information on memory DIMMs.
3. Plug in the power cords and wait for "01" in the upper-left corner of the operator panel display.
  4. Turn on the power.

**Does the system stop with B1xxF22A, CA00E1F2, CA00E1F3, or STBY displayed on the operator panel?**

**NO** A memory DIMM in the pair you just replaced in the system is defective. Turn off the power, remove the power cords, and exchange the memory DIMMs in that pair one at a time with new or previously removed memory DIMMs. Repeat this step until the defective memory DIMM is identified, or all memory DIMMs have been exchanged.

If your symptom did not change and all the memory DIMMs have been exchanged, call your service support person for assistance.

If the symptom changed, check for loose cards and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** Go to "PFW1548-570-5."

**PFW1548-570-5**

**Was processor card #2 removed from the system?**

**NO** Go to "PFW1548-570-8" on page 391.

**YES** Go to "PFW1548-570-7."

**PFW1548-570-6**

One of the FRUs remaining in the system unit is defective.

**Note:** If a memory DIMM is exchanged, insure that the new memory DIMM is the same size and speed as the original memory DIMM.

1. Turn off the power, remove the power cords, and exchange the following FRUs in the order listed:
  - a. Memory DIMMs. Exchange one at a time with new or previously removed DIMMs
  - b. Processor card #1, location: Un-P2-C1.
  - c. Processor backplane, location: Un-P2
  - d. Power supplies, locations: Un-E1 and Un-E2.
  - e. Processor regulators, locations: Un-P2-C3, Un-P2-C4, Un-P2-C5.
  - f. Service processor, location: Un-P1-C8.
  - g. I/O backplane, location: Un-P1.
2. Plug in the power cords and wait for "01" in the upper-left corner of the operator panel display.
3. Turn on the power.

**Does the system stop with B1xxF22A, CA00E1F2, CA00E1F3, or STBY displayed on the operator panel?**

**NO** Reinstall the original FRU.

Repeat the FRU replacement steps until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems.

If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** Go to MAP 0410: Repair Checkout.

**PFW1548-570-7**

No failure was detected with this configuration.

1. Turn off the power and remove the power cords.
2. Reinstall processor card #2.
3. Plug in the power cords and wait for "01" in the upper-left corner of the operator panel display.
4. Turn on the power.

**Does the system stop with B1xxF22A, CA00E1F2, CA00E1F3, or STBY displayed on the operator panel?**

**NO** One of the FRUs remaining in the system is defective.

Exchange the FRUs (that have not already been changed) in the following order:

1. Memory DIMMs (if present) on processor card #2. Exchange the DIMMs one at a time with new or previously removed DIMMs.
2. Processor card #2
3. Processor backplane, location: Un-P2.
4. Power supplies, locations: Un-E1 and Un-E2.
5. Processor regulators, locations: Un-P2-C3, Un-P2-C4, Un-P2-C5.
6. Service processor, location: Un-P1-C8.
7. I/O backplane, location: Un-P1.

Repeat the FRU replacement steps until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** Go to "PFW1548-570-8."

**PFW1548-570-8**

1. Turn off the power.
2. Reconnect the system console.

**Notes:**

- a. If an ASCII terminal has been defined as the firmware console, attach the ASCII terminal cable to the S1 connector on the rear of the system unit.
  - b. If a display attached to a display adapter has been defined as the firmware console, install the display adapter and connect the display to the adapter. Plug the keyboard and mouse into the keyboard connector on the rear of the system unit.
3. Turn on the power.
  4. If the ASCII terminal or graphics display (including display adapter) is connected differently from the way it was previously, the console selection screen appears. Select a firmware console.
  5. When the word keyboard is displayed, press the number 1 key on the directly attached keyboard, an ASCII terminal or HMC. This activates the system management services (SMS).
  6. Enter the appropriate password if you are prompted to do so.

**Is the SMS screen displayed?**

**NO** One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. If you are using an ASCII terminal, go to the problem determination procedures for the display. If you do not find a problem, do the following:
  - a. Replace the service processor, location: Un-P1-C8.
  - b. Replace the I/O backplane, location: Un-P1.
2. If you are using a graphics display, go to the problem determination procedures for the display. If you do not find a problem, do the following:
  - a. Replace the display adapter.
  - b. Replace the backplane in which the graphics adapter is plugged.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** Go to "PFW1548-570-9."

**PFW1548-570-9**

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Plug the IDE cable into the IDE connector on the system backplane.
4. Connect the signal and power connectors to the IDE optical drive.
5. Plug in the power cords and wait for "01" in the upper-left corner of the operator panel display.
6. Turn on the power.
7. Insert the diagnostic CD-ROM into the optical drive.
8. After the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or an ASCII terminal keyboard.
9. Enter the appropriate password if you are prompted to do so.

**Is the Please define the System Console screen displayed?**

**NO** One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. IDE cable
2. Optical drive
3. Media backplane, Un-P3.
4. I/O backplane, Un-P1.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** Go to "PFW1548-570-10."

**PFW1548-570-10**

The system is working correctly with this configuration. One of the SCSI devices that was disconnected may be defective.

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Plug the SCSI cable into the SCSI connector on the system backplane.
4. Connect the signal and power connectors to one of the SCSI devices if present (a SCSI LVD tape device in media bay #1, for example). Do not connect the signal and power connectors to the disk drive backplane at this time.
5. Plug in the power cords and wait for "01" in the upper-left corner of the operator panel display.
6. Turn on the power.

7. After the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

**Is the Please define the System Console screen displayed?**

**NO** One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. SCSI cable
2. Last SCSI device connected (for example, tape drive)
3. I/O backplane, location: Un-P1.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES**

Repeat this step, adding one SCSI device at a time, until all the SCSI devices that were attached to the integrated SCSI adapter, except the disk drive backplanes, are connected and tested. Go to "PFW1548-570-11."

**PFW1548-570-11**

The system is working correctly with this configuration. One of the disk drive backplanes may be defective.

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Connect the signal and power connectors to one of the disk drive backplanes.
4. Plug in the power cords and wait for "01" in the upper-left corner of the operator panel display.
5. Turn on the power.
6. If the Console Selection screen is displayed, choose the system console.
7. After the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

**Is the Please define the System Console screen displayed?**

**NO** One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. SCSI cable
2. SCSI backplane, location: Un-P3.
3. I/O backplane, location: Un-P1.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** If both disk drive backplanes have been reconnected, go to "PFW1548-570-12." Otherwise, repeat "PFW1548-570-11" on page 393 for the other disk drive backplane if present.

**PFW1548-570-12**

The system is working correctly with this configuration. One of the disk drives that you removed from the disk drive backplanes may be defective.

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Install a disk drive in a disk drive backplane.
4. Plug in the power cords and wait for the OK prompt to display on the operator panel display.
5. Turn on the power.
6. After the word keyboard is displayed, press the number 5 key on either the directly attached keyboard or an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

**Is the Please define the System Console screen displayed?**

**NO** Exchange the FRUs that have not been exchanged, in the following order:

1. Last disk drive installed
2. Disk drive backplane where the disk drive was installed

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** Repeat this step with all disk drives that were installed in the disk drive backplanes.

If the system has an internal diskette drive, go to "PFW1548-570-13," if not go to "PFW1548-570-14" on page 395.

**PFW1548-570-13**

The system is working correctly with this configuration. The diskette drive may be defective.

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Plug the diskette drive cable into the diskette drive connector on the system backplane.
4. Connect the signal and power connectors to the diskette drive.
5. Plug in the power cords and wait for "01" in the upper-left corner of the operator panel display.
6. Turn on the power.
7. After the word keyboard displays, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

**Is the Please define the System Console screen displayed?**

**NO** One of the FRUs remaining in the system is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. Diskette drive
2. Diskette drive cable
3. System backplane



Repeat this step until the defective FRU is identified or all the FRUs have been exchanged. If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem return, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** Go to "PFW1548-570-14."

**PFW1548-570-14**

The system is working correctly with this configuration. One of the devices that was disconnected from the system backplane may be defective.

1. Turn off the power and remove the power cords
2. Attach a system backplane device (for example: serial port 1, serial port 2, USB, keyboard, mouse, Ethernet, SCSI) that had been removed.  
After all of the I/O backplane device cables have been reattached, reattached the cables to the service processor one at a time.
3. Plug in the power cords and wait for "01" in the upper-left corner on the operator panel display.
4. Turn on the power.
5. If the Console Selection screen is displayed, choose the system console.
6. After the word keyboard displays, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

**Is the Please define the System Console screen displayed?**

**NO** The last device or cable that you attached is defective.

To test each FRU, exchange the FRUs in the following order:

1. Device and cable (last one attached)
2. If the last cable in this step was reconnected to the service processor, replace the service processor.
3. I/O backplane, location: Un-P1.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom. Go to MAP 0410: Repair Checkout.

**YES** Repeat this step until all of the devices are attached. Go to "PFW1548-570-15."

**PFW1548-570-15**

The system is working correctly with this configuration. One of the FRUs (adapters) that you removed may be defective.

1. Turn off the power and remove the power cords.
2. Install a FRU (adapter) and connect any cables and devices that were attached to the FRU.
3. Plug in the power cords and wait for the OK prompt to display on the operator panel display.
4. Turn on the power.
5. If the Console Selection screen is displayed, choose the system console.
6. After the word keyboard displays, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

**Is the Please define the System Console screen displayed?**

**NO** Go to "PFW1548-570-16."

**YES** Repeat this step until all of the FRUs (adapters) are installed. Go to MAP 0410: Repair Checkout.

**PFW1548-570-16**

The last FRU installed or one of its attached devices is probably defective.

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Starting with the last installed adapter, disconnect one attached device and cable.
4. Plug in the power cords and wait for the "01" in the upper-left corner on the operator panel display.
5. Turn on the power.
6. If the Console Selection screen is displayed, choose the system console.
7. After the word keyboard displays, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

**Is the Please define the System Console screen displayed?**

**NO** Repeat this step until the defective device or cable is identified or all devices and cables have been disconnected.

If all the devices and cables have been removed, then one of the FRUs remaining in the system unit is defective.

To test each FRU, exchange the FRUs in the following order:

1. Adapter (last one installed)
2. I/O backplane, location: Un-P1.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom.

**YES** The last device or cable that you disconnected is defective. Exchange the defective device or cable. Go to MAP 0410: Repair Checkout.

**PFW1548-570-17**

1. Follow the instructions on the screen to select the system console.
2. When the DIAGNOSTIC OPERATING INSTRUCTIONS screen is displayed, press Enter.
3. Select Advanced Diagnostics Routines.
4. If the terminal type has not been defined, you must use the initialize terminal option on the FUNCTION SELECTION menu to initialize the AIX diagnostic environment before you can continue with the diagnostics. This is a separate operation from selecting the console display.
5. If the NEW RESOURCE screen is displayed, select an option from the bottom of the screen.

**Note:** Adapters and devices that require supplemental media are not shown in the new resource list. If the system has adapters or devices that require supplemental media, select option 1.

6. When the DIAGNOSTIC MODE SELECTION screen is displayed, press Enter.
7. Select All Resources. (If you were sent here from "PFW1548-570-21" on page 397, select the adapter or device that was loaded from the supplemental media).

**Did you get an SRN?**

**NO** Go to "PFW1548-570-19."

**YES** Go to "PFW1548-570-18."

**PFW1548-570-18**

Look at the FRU part numbers associated with the SRN.

**Have you exchanged all the FRUs that correspond to the failing function codes (FFCs)?**

**NO** Exchange the FRU with the highest failure percentage that has not been changed.

Repeat this step until all the FRUs associated with the SRN have been exchanged or diagnostics run with no trouble found. Run diagnostics after each FRU is exchanged. Go to MAP 0410: Repair Checkout.

**YES** If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

**PFW1548-570-19**

**Does the system have adapters or devices that require supplemental media?**

**NO** Go to "PFW1548-570-20."

**YES** Go to "PFW1548-570-21."

**PFW1548-570-20**

Consult the PCI adapter configuration documentation for your operating system to verify that all adapters are configured correctly. Go to MAP 0410: Repair Checkout.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

**PFW1548-570-21**

1. Select Task Selection.
2. Select Process Supplemental Media and follow the on screen instructions to process the media. Supplemental media must be loaded and processed one at a time.

**Did the system return to the TASKS SELECTION SCREEN after the supplemental media was processed?**

**NO** Go to "PFW1548-570-22."

**YES** Press F3 to return to the FUNCTION SELECTION screen. Go to step 4 on page 396 of PFW1548-570-17.

**PFW1548-570-22**

The adapter or device is probably defective.

If the supplemental media is for an adapter, replace the FRUs in the following order:

1. Adapter
2. I/O backplane, location: Un-P1.

If the supplemental media is for a device, replace the FRUs in the following order:

1. Device and any associated cables
2. The adapter to which the device is attached

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Start-of-call procedure and follow the instructions for the new symptom. Go to MAP 0410: Repair Checkout.

End of procedure.

## SCSI service hints

Use one or more of the following procedures when servicing SCSI adapter or devices.

### General SCSI Configuration Checks

The following steps apply to all types of SCSI problems:

1. Verify that all SCSI devices on the SCSI bus have a unique address.
2. Verify that all cables are connected securely and that there is proper termination at both ends of the SCSI bus.
3. Verify that the cabling configuration does not exceed the maximum cable length for the adapter in use. Refer to *RS/6000 @server pSeries Adapters, Devices, and Cable Information for Multiple Bus Systems* for more details on SCSI cabling.
4. Verify that the adapters and devices that you are working with are at the appropriate microcode levels for the customer situation. If you need assistance with microcode issues, contact your service support structure.
5. If there are multiple SCSI adapters on the SCSI bus, verify that the customer is using the appropriate software (such as HACMP or HANFS) to support such an arrangement. If the correct software is not in use, some SCSI errors should be expected when multiple adapters attempt to access the same SCSI device. Also, each adapter should have a unique address.

### High Availability or Multiple SCSI System Checks

If you have a high-availability configuration, or if more than one system is attached to the same SCSI bus, do the following:

1. Verify that the adapters and devices have unique SCSI addresses. The default SCSI adapter address is always 7. If you have more than one adapter on the bus, change the address of at least one adapter. This can be done by using SMIT (SMIT Devices > SCSI Adapter > Change/Show characteristics of an adapter). You must make the changes to the database only, then reboot the system in order for the change to take effect.  
  
**Note:** Diagnostics defaults to using ID 7 (it is recommended that this ID not be used in high availability configurations).
2. If RAID devices such as the 7135 or 7137 are attached, be sure to run the proper diagnostics for the device. If problems occur, contact your service support structure for assistance. If the diagnostics are run incorrectly on these devices, misleading SRNs can result.
3. Diagnostics cannot be run against OEM devices; doing so results in misleading SRNs.
4. Verify that all cables are connected securely and that both ends of the SCSI bus is terminated correctly.
5. Verify that the cabling configuration does not exceed the maximum cable length for the adapter in use. Refer to the SCSI Cabling section in the *RS/6000 @server pSeries Adapters, Devices, and Cable Information for Multiple Bus Systems* for more details on SCSI cabling issues.
6. Verify that adapter and devices are at the appropriate microcode levels for the customer situation. If you need assistance with microcode issues, contact your service support structure.

### SCSI-2 Single-Ended Adapter PTC Failure Isolation Procedure

Before replacing a SCSI-2 single-ended adapter, use these procedures to determine if a short-circuit condition exists on the SCSI bus. The same positive temperature coefficient (PTC) resistor is used for both the internal and external buses. The PTC protects the SCSI bus from high currents due to shorts on the cable, terminator, or device. It is unlikely that the PTC can be tripped by a defective adapter. Unless instructed to do so by these procedures, do not replace the adapter because of a tripped PTC resistor.

A fault (short-circuit) causes an increase in PTC resistance and temperature. The increase in resistance causes the PTC to halt current flow. The PTC returns to a low resistive and low temperature state when the fault is removed from the SCSI bus or when the system is turned off. Wait 5 minutes for the PTC resistor to fully cool, then retest.

These procedures determine if the PTC resistor is still tripped and then determine if there is a short somewhere on the SCSI bus.

### Determining Where to Start

Use the following to determine the adapter configuration and select the proper procedure:

- If there are external cables attached to the adapter, start with the "External Bus PTC Isolation Procedure" for your type adapter. The procedures are found in this chapter.
- If there are no external cables attached, start with the 400.
- If there is a combination of external and internal cables start with the "External Bus PTC Isolation Procedure" for your type adapter. The procedures are found in this chapter. If this procedure does not resolve the problem, continue with the "Internal Bus PTC Isolation Procedure" for your type adapter. The procedures are found in this chapter.

### External SCSI-2 Single-Ended Bus PTC Isolation Procedure

Isolate the external SCSI bus PTC fault with the following procedure:

**Note:** The external bus is of single-ended design.

1. Ensure the system power and all externally attached device power is turned off. All testing is accomplished with the power off.
2. Disconnect any internal and external cables from the adapter and remove the adapter from the system.
3. Verify with a digital Ohmmeter that the internal PTC resistor, labeled Z1, (refer to the illustration after Internal SCSI-2 Single-Ended Bus PTC Isolation Procedure, step 3 on page 400) is cool and in a low resistance state, typically less than 1/2 Ohm. Measuring across, be sure to probe both sides of the PTC where the solder joints and board come together. The polarity of the test leads is not important. If necessary, allow the PTC resistor to cool and measure again.
4. This step determines if there is a short on the adapter. Locate Capacitor C1 and measure the resistance across it by using the following procedure:
  - a. Connect the positive lead to the side of the capacitor where the + is indicated on the board near C1. Be sure to probe at the solder joint where the capacitor and board come together.
  - b. Connect the negative lead to the opposite side of the capacitor marked "GND." Be sure to probe at the solder joint where the capacitor and board come together.
  - c. If there is no short present, then the resistance reading is high, typically hundreds of Ohms.

**Note:** Because this is a measurement across unpowered silicon devices, the reading is a function of the Ohmmeter used.

- If there is a fault, the resistance reading is low, typically below 10 Ohms. Because there are no cables attached, the fault is on the adapter. Replace the adapter.

**Note:** Some multi-function meters label the leads specifically for voltage measurements. When using this type of meter to measure resistance, the plus lead and negative lead may not be labeled correctly. If you are not sure that your meter leads accurately reflect the polarity for measuring resistance, repeat this step with the leads reversed. If the short circuit is not indicated with the leads reversed, the SCSI bus is not faulted (shorted).

- If the resistance measured was high, proceed to the next step.
5. Reattach the external cable to the adapter, then do the following:

- a. Measure across C1 as previously described.
- b. If the resistance is still high, in this case above 10 Ohms, then there is no apparent cause for a PTC failure from this bus. If there are internal cables attached continue to the 400.
- c. If the resistance is less than 10 Ohms, there is a possibility of a fault on the external SCSI bus. Troubleshoot the external SCSI bus by disconnecting devices and terminators. Measure across C1 to determine if the fault has been removed. Replace the failing component. Go to MAP 0410: Repair checkout.

### External SCSI-2 Single-Ended Bus Probable Tripped PTC Causes

The following list provides some suggestions of things to check when the PTC is tripped:

- A shorted terminator or cable. Check for bent pins on each connector and removable terminator.
- Intermittent PTC failures can be caused by improperly seated cable connectors. Reseat the connector and flex the cable in an attempt to duplicate the fault condition across C1.
- Plugging or unplugging a cable or terminator while the system is turned on (hot plugging).
- A shorted device.
- Differential devices or terminators are attached to the single-ended SCSI bus.

**Note:** The SCSI-2 Fast/Wide and Ultra PCI Adapters use an onboard electronic terminator on the external SCSI bus. When power is removed from the adapter, as in the case of this procedure, the terminator goes to a high impedance state and the resistance measured cannot be verified, other than it is high. Some external terminators use an electronic terminator, which also goes to a high impedance state when power is removed. Therefore, this procedure is designed to find a short or low resistance fault as opposed to the presence of a terminator or a missing terminator.

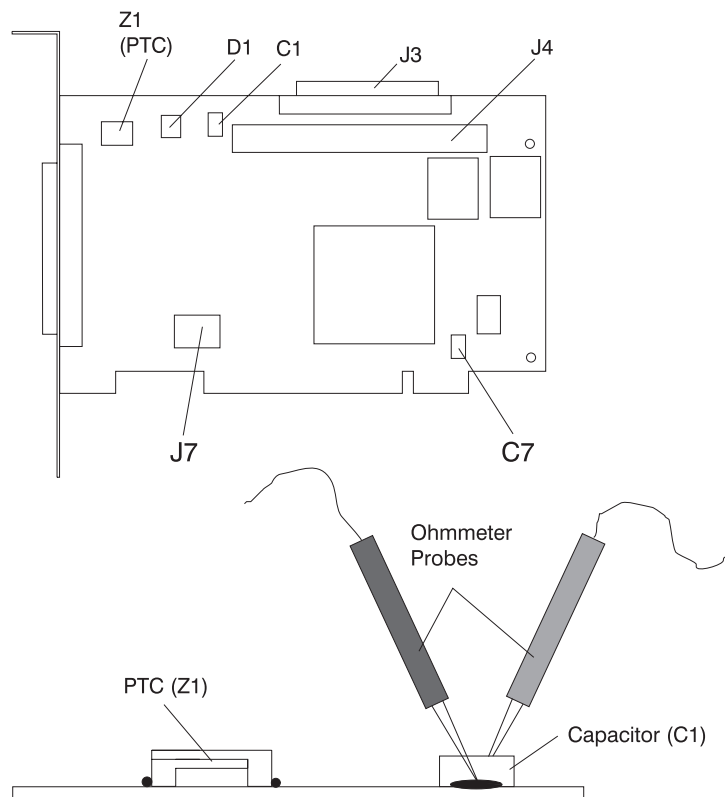
### Internal SCSI-2 Single-Ended Bus PTC Isolation Procedure

Isolate the internal SCSI bus PTC resistor fault with the following procedure:

**Note:** The internal bus is single-ended.

1. Ensure that system power and all externally attached device power is turned off.
2. Disconnect any internal and external cables from the adapter then remove the adapter from the system.
3. Verify with a digital Ohmmeter, that the internal PTC resistor, labeled Z1, is cool and in a low resistance state, typically less than 1/2 Ohm. Measuring across, be sure to probe both sides of the PTC where the solder joints and board come together. The polarity of the test leads is not important. If necessary, allow the PTC to cool and measure again. Refer to the following illustration.

### SCSI-2 Fast/Wide PCI Single-Ended Adapter



**Note:** Only the probe tips are touching the solder joints. Do not allow the probes to touch any other part of the component.

4. This step determines if there is a short on the adapter. Locate capacitor C1 and measure the resistance across it using the following procedure:
  - a. Connect the positive lead to the side of the capacitor where the + is indicated. Be sure to probe at the solder joint where the capacitor and board come together.
  - b. Connect the negative lead to the opposite side of the capacitor. Be sure to probe at the solder joint where the capacitor and board come together.
  - c. If there is no short present, the resistance reading is high, typically hundreds of Ohms.

**Note:** Because this is a measurement across unpowered silicon devices, the reading is a function of the Ohmmeter used.

- If there is a fault, the resistance reading is low, typically below 10 Ohms. Because there are no cables attached, the fault is on the adapter. Replace the adapter.

**Note:** Some multi-function meters label the leads specifically for voltage measurements. When using this type of meter to measure resistance, the plus lead and negative lead may not be labeled correctly. If you are not sure that your meter leads accurately reflect the polarity for measuring resistance, repeat this step with the leads reversed. Polarity is important in this measurement to prevent forward-biasing diodes which lead to a false low resistance reading. If the short circuit is not indicated with the leads reversed, the SCSI bus is not faulted (shorted).

- If the resistance is high and there is no internal cable to reattach, there is no apparent cause for the PTC resistor diagnostic failure.
  - If the resistance is high and there is an internal cable to reattach, proceed to the next step.
5. Reattach the internal cable to the adapter, then do the following:

- a. Measure across C1 as described above.
- b. If the resistance is still high, above 25 Ohms, there is no apparent cause for a PTC failure.
- c. If the resistance is less than 10 Ohms, a fault on the internal SCSI bus is possible. Troubleshoot the internal SCSI bus by disconnecting devices and terminators. Measure across C1 to determine if the fault has been removed.

**Note:** Some internal cables have nonremovable terminators.

### **Internal SCSI-2 Single-Ended Bus Probable Tripped PTC Resistor Causes**

The following list provides some suggestions of things to check when the PTC is tripped:

- A shorted terminator or cable. Check for bent pins on each connector and removable terminator.
- Intermittent PTC failures can be caused by incorrectly seated cable connectors. Reseat the connector and flex the cable in an attempt to duplicate the fault condition across C1.
- A shorted device.
- On some systems, the terminator is fixed to the internal cable and cannot be removed. If all devices are removed from the cable and the resistance is still low, then the cable should be replaced.

**Note:** The SCSI-2 Fast/Wide and Ultra PCI adapters use an onboard electronic terminator on the internal SCSI bus. When power is removed from the adapter, as in the case of this procedure, the terminator goes to a high impedance state and the resistance measured cannot be verified, other than it is high. Some internal terminators use an electronic terminator, which also goes to a high impedance state when power is removed. Therefore, this procedure is designed to find a short or low resistance fault as opposed to the presence of a terminator or a missing terminator.

### **SCSI-2 Differential Adapter PTC Failure Isolation Procedure**

Use this procedure when SRN *xxx-240* or *xxx-800* has been indicated.

The differential adapter can be identified by the 4-B or 4-L on the external bracket plate.

Before replacing a SCSI-2 differential adapter, use these procedures to determine if a short-circuit condition exists on the SCSI Bus. The PTC protects the SCSI bus from high currents due to shorts on the cable, terminator, or device. It is unlikely that the PTC can be tripped by a defective adapter. Unless instructed to do so by these procedures, do not replace the adapter because of a tripped PTC resistor.

A fault (short-circuit) causes an increase in PTC resistance and temperature. The increase in resistance causes the PTC to halt current flow. The PTC returns to a low resistive and low temperature state when the fault is removed from the SCSI bus or when the system is turned off. Wait 5 minutes for the PTC resistor to fully cool, then retest.

These procedures determine if the PTC resistor is still tripped and then determine if there is a short somewhere on the SCSI bus.

### **External SCSI-2 Differential Adapter Bus PTC Isolation Procedure**

Isolate the external SCSI bus PTC fault with the following procedure:

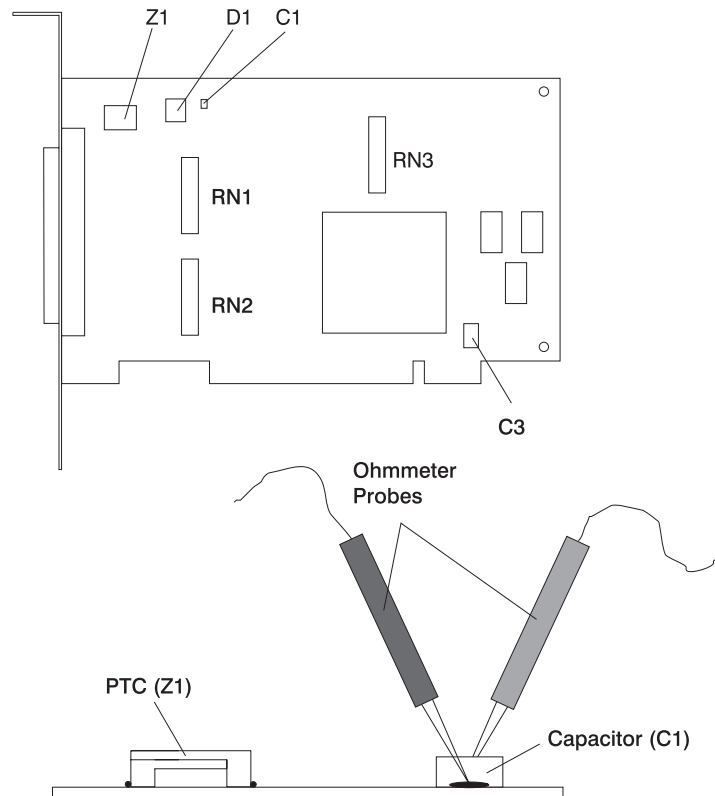
#### **Notes:**

1. Only the probe tips are touching the solder joints. Do not allow the probes to touch any other part of the component.
2. The external bus is differential.
  1. Ensure that system power and all externally attached device power is turned off.



2. Check to ensure all devices are marked SCSI Differential and that the terminator on the end of the SCSI bus is also marked differential. If not, you may have a single-ended SCSI device or terminator on the differential SCSI bus. Single-ended devices do not work on a differential SCSI bus and may cause a PTC type error to be reported. The entire SCSI bus may appear to be intermittent. After ensuring the system is completely differential, continue.
3. Disconnect the external cables from the adapter and remove the adapter from the system.
4. Verify with a digital Ohmmeter that the internal PTC resistor, labeled Z1, (refer to the illustration on page 402) is cool and in a low resistance state, typically less than 1/2 Ohm. Measuring across, be sure to probe both sides of the PTC resistor where the solder joints and board come together. The polarity of the test leads is not important. If necessary, allow the PTC resistor to cool and measure again.

SCSI-2 Differential Fast/Wide PCI Adapter



5. This step determines if there is a short on the adapter. Locate capacitor C1 and measure the resistance across it using the following procedure:
  - a. Connect the negative lead to the side of the capacitor marked "GND". Be sure to probe at the solder joint where the capacitor and board come together.
  - b. Connect the positive lead to the side of the capacitor marked "Cathode D1" on the board near C1. Be sure to probe at the solder joint where the capacitor and board come together.
    - If there is no fault present, then the resistance reading is 25 to 35 Ohms. The adapter is not faulty. Continue to the next step.
    - If the resistance measured is higher than 35 Ohms, check to see if RN1, RN2, and RN3 are plugged into their sockets. If these sockets are empty, you are working with a Multi-Initiators or High-Availability system. With these sockets empty, a resistive reading across C1 cannot be verified other than it measures a high resistance (not a short). If the resistance measurement is not low enough to be suspected as a fault (lower than 10 Ohms), continue to the next step.
    - If the resistance is high and there is no external cable to reattach, there is no apparent cause for the PTC diagnostic failure.

- If the resistance reading is low, typically below 10 Ohms, there is a fault. Because there are no cables attached, the fault is on the adapter. Replace the adapter.
  - If the resistance measured was high and there is an external cable to reattach, proceed to the next step.
6. Reattach the external cable to the adapter.
    - a. Measure across C1 as previously described.
    - b. If the resistance is between 10 to 20 Ohms, there is no apparent cause for a PTC resistor failure.
    - c. If the resistance is less than 10 Ohms, there is a possibility of a fault on the external SCSI bus. Troubleshoot the external SCSI bus by disconnecting devices and terminators. Measure across C1 to determine if the fault has been removed.

### SCSI-2 Differential Adapter Probable Tripped PTC Causes

The following list provides some suggestions of things to check when the PTC is tripped:

- A shorted terminator or cable. Check for bent pins on each connector and removable terminator.
- Intermittent PTC failures can be caused by incorrectly seated cable connectors. Reseat the connector and flex the cable in an attempt to duplicate the fault condition across C1.
- Plugging or unplugging a cable or terminator while the system is turned on (hot-plugging).
- A shorted device.
- Single-ended devices are attached to the differential SCSI bus.

### Dual-Channel Ultra SCSI Adapter PTC Failure Isolation Procedure

Use the following procedures if diagnostics testing indicates a potential positive temperature coefficient (PTC) resistor fault or the TERMPWR Shorted LED is lit.

This procedure is used for SRNs 637-240 and 637-800 on the Dual-Channel Ultra SCSI Adapter. If the TERMPWR Shorted LED is lit, use this procedure to help isolate the source of the problem on the failing channel.

1. Identify the adapter by its label of 4-R on the external bracket. Then, determine if the failure is on channel A or channel B.
2. The same PTC is used for both the internal and external buses. The PTC protects the SCSI bus from high currents due to shorts on the cable, terminator, or device. It is unlikely that the PTC can be tripped by a defective adapter. A fault (short-circuit) causes an increase in PTC resistance and temperature. The increase in resistance causes the PTC to halt current flow. The PTC returns to a low resistive and low temperature state when the fault is removed from the SCSI bus or when the system is turned off.

Wait 5 minutes for the PTC resistor to fully cool, then retest.

3. If this same error persists, or the TERMPWR Shorted LED is lit, replace the components of the failing channel in the following order (wait five minutes between steps):
  - a. If the failure is on the external cable, replace the following:
    - 1) Cable
    - 2) Device
    - 3) Attached subsystem
    - 4) Adapter
  - b. If the failure is on the internal cable, replace the following:
    - 1) Cable
    - 2) Device
    - 3) Backplane
    - 4) Adapter

- c. If the failure persists, verify that the parts exchanged are in the correct channel (internal or external, A or B).

If the errors are still occurring, continue isolating the problem by going to SCSI bus problems.

### 64-bit PCI-X Dual Channel SCSI Adapter PTC Failure Isolation Procedure

Use the following procedures if diagnostics testing indicates a potential self-resetting thermal fuse problem. This procedure is used for SRN 2524-702 on the integrated dual-channel SCSI adapter in a 7039/651 system.

1. Identify the adapter as the one embedded in the system board. Then, determine if the failure is on channel 0 or channel 1.
2. The thermal fuse protects the SCSI bus from high currents due to shorts on the terminator, cable, or device. It is unlikely that the thermal fuse can be tripped by a defective adapter. A fault (short-circuit) causes an increase in resistance and temperature of the thermal fuse. The increase in temperature causes the thermal fuse to halt current flow. The thermal fuse returns to a low resistive and low temperature state when the fault is removed from the SCSI bus or when the system is turned off. Wait 10 seconds for the thermal fuse to reset itself and recover, then retest.
3. If the same error persists, replace the components of the failing channel in the following order. Wait 10 seconds for the thermal fuse to reset itself between steps.
  - a. Cable
  - b. Device
  - c. DASD backplane (if present)
  - d. System board (adapter)
4. If the failure persists, verify that the parts exchanged are in the correct channel (0 or 1). If the errors are still occurring, continue isolating the problem by going to SCSI bus problems.




## Linux fast-path problem isolation


Linux problem isolation Use this link only when directed from the following table.


### Linux fast path table

Locate the problem in the following table and then go to the action indicated for the problem.

Symptoms	Action
You have an eight-digit reference code.	Go to "Reference codes, read the notes on the first page, and do the listed action for the eight-digit reference code.
You are trying to isolate a problem on a Linux server or a partition that is running Linux.	<b>Note:</b> This procedure is used to help display an eight-digit reference code using system log information. Before using this procedure, if you are having a problem with a media device such as a tape or DVD-ROM drive, continue through this table and follow the actions for the appropriate device. Go to "Linux problem isolation procedure" on page 408.
You suspect a problem with your server but you do not have any specific symptom.	Go to "MAP 0020: Problem determination procedure" on page 272 for problem determination procedures.
You need to run the @server standalone diagnostics	Go to Loading the AIX online and @server standalone diagnostics.
<b>SRNs</b>	
You have an SRN.	Look up the SRN in the List of service request numbers and do the listed action.
An SRN is displayed when running the @server standalone diagnostics.	<ol style="list-style-type: none"> <li>1. Record the SRN and location code.</li> <li>2. Look up the SRN in the List of service request numbers and do the listed action.</li> </ol>

Symptoms	Action
<b>Tape Drive Problems</b>	
You suspect a tape drive problem.	<ol style="list-style-type: none"> <li>1. Refer to the tape drive documentation and clean the tape drive.</li> <li>2. Refer to the tape drive documentation and do any listed problem determination procedures.</li> <li>3. Go to "MAP 0020: Problem determination procedure" on page 272 for problem determination procedures.</li> <li>4. Refer to the device section of <i>RS/6000 @server pSeries Adapters, Devices, and Cable Information for Multiple Bus Systems</i> for additional information (IBM @server pSeries Information Center  (<a href="http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base">http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base</a>)).</li> </ol> <p><b>Note:</b> Information on tape cleaning and tape-problem determination is normally either in the tape drive operator guide or the system operator guide.</p>
<b>CD-ROM Drive Problems</b>	
You suspect a CD-ROM drive problem.	<ol style="list-style-type: none"> <li>1. Refer to the CD-ROM documentation and do any listed problem determination procedures.</li> <li>2. Before servicing a CD-ROM Drive ensure that it is not in use and that the power connector is correctly attached to the drive. If the load or unload operation does not function, replace the CD-ROM drive.</li> <li>3. Go to "MAP 0020: Problem determination procedure" on page 272 for problem determination procedures.</li> <li>4. Refer to the device section of <i>RS/6000 @server pSeries Adapters, Devices, and Cable Information for Multiple Bus Systems</i> for additional information (IBM @server pSeries Information Center  (<a href="http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base">http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base</a>)).</li> </ol> <p><b>Note:</b> If the CD-ROM has its own user documentation, follow any problem determination for the CD-ROM drive.</p>
<b>SCSI Disk Drive Problems</b>	
<p>You suspect a disk drive problem.</p> <p>Disk problems are logged in the error log and are analyzed when the standalone disk diagnostics are run in Problem Determination mode. Problems are reported if the number of errors is above defined thresholds.</p>	<ol style="list-style-type: none"> <li>1. Go to "MAP 0020: Problem determination procedure" on page 272 for problem determination procedures.</li> <li>2. Refer to the device section of <i>RS/6000 @server pSeries Adapters, Devices, and Cable Information for Multiple Bus Systems</i> for additional information (IBM @server pSeries Information Center  (<a href="http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base">http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base</a>)).</li> </ol>
<b>Diskette Drive Problems</b>	
You suspect a diskette drive problem.	<ol style="list-style-type: none"> <li>1. Go to "MAP 0020: Problem determination procedure" on page 272 for problem determination procedures.</li> </ol>
<b>Token-Ring Problems</b>	
You suspect a Token-Ring Adapter or network problem.	<ol style="list-style-type: none"> <li>1. Check with the network administrator for known problems.</li> <li>2. Go to "MAP 0020: Problem determination procedure" on page 272 for problem determination procedures.</li> </ol>
<b>Ethernet Problems</b>	
You suspect an Ethernet Adapter or network problem.	<ol style="list-style-type: none"> <li>1. Check with the network administrator for known problems.</li> <li>2. Go to "MAP 0020: Problem determination procedure" on page 272 for problem determination procedures.</li> </ol>

Symptoms	Action
<b>Display Problems</b>	
You suspect a display problem.	<ol style="list-style-type: none"> <li>1. Go to the Problem Determination Procedures for the display.</li> <li>2. Go to "MAP 0020: Problem determination procedure" on page 272 for problem determination procedures.</li> </ol>
<b>Keyboard or Mouse</b>	
You suspect a keyboard or mouse problem.	<p>Go to "MAP 0020: Problem determination procedure" on page 272 for problem determination procedures.</p> <p>If you are unable to run diagnostics because the system does not respond to the keyboard, replace the keyboard or system planar.</p> <p><b>Note:</b> If the problem is with the keyboard it could be caused by the mouse device. To check, unplug the mouse and then recheck the keyboard. If the keyboard works, replace the mouse.</p>
<b>System Messages</b>	
A System Message is displayed.	<ol style="list-style-type: none"> <li>1. If the message describes the cause of the problem, attempt to correct it.</li> <li>2. Look for another symptom to use.</li> </ol>
<b>System Hangs or Loops When Running the OS or Diagnostics</b>	
The system hangs in the same application.	<p>Suspect the application. To check the system:</p> <ol style="list-style-type: none"> <li>1. Power off the system.</li> <li>2. Go to "MAP 0020: Problem determination procedure" on page 272 for problem determination procedures.</li> <li>3. If an SRN is displayed at anytime, record the SRN and location code.</li> <li>4. Look up the SRN in the List of service request numbers and do the listed action.</li> </ol>
The system hangs in different applications.	<ol style="list-style-type: none"> <li>1. Power off the system.</li> <li>2. Go to "MAP 0020: Problem determination procedure" on page 272 for problem determination procedures.</li> <li>3. If an SRN is displayed at anytime, record the SRN and location code.</li> <li>4. Look up the SRN in the List of service request numbers and do the listed action.</li> </ol>
The system hangs when running diagnostics.	Replace the resource that is being tested.
<b>Exchanged FRUs Did Not Fix the Problem</b>	
A FRU or FRUs you exchanged did not fix the problem.	Go to "MAP 0020: Problem determination procedure" on page 272.
<b>RAID Problems</b>	
You suspect a problem with a RAID.	<p>A potential problem with a RAID adapter exists. Run diagnostics on the RAID adapter. Refer to the <i>RAID Adapters User's Guide and Maintenance Information</i> or the service guide for the RAID.</p> <p>If the RAID adapter is a PCI-X RAID adapter, refer to the <i>PCI-X SCSI RAID Controller Reference Guide for AIX</i> (IBM @server pSeries Information Center (<a href="http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base">http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base</a>) ).</p>
<b>SSA Problems</b>	

Symptoms	Action
You suspect an SSA problem.	A potential problem with an SSA adapter exists. Run diagnostics on the SSA adapter. If the system has external SSA drives, refer to the <i>SSA Adapters User's Guide and Maintenance Information</i> (IBM @server pSeries Information Center ( <a href="http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base">http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base</a>  )), or the service guide for your disk subsystem.
<b>You Cannot Find the Symptom in This Table</b>	
All other problems.	Go to "MAP 0020: Problem determination procedure" on page 272.

## Linux problem isolation procedure

### DANGER

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn everything OFF (unless instructed otherwise).
2. Remove power cords from the outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

To Connect:

1. Turn everything OFF (unless instructed otherwise)
2. Attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

(D005)

These procedures define the steps to take when servicing a Linux partition or a server that has Linux as its only operating system.

**Note:** If the server is attached to an HMC and Service Focal Point is enabled, the various codes that might display on the HMC are all listed as reference codes by Service Focal Point (SFP). Use the following table to help you identify the type of error information that might be displayed when you are using this procedure.

Number of digits in reference code	Reference code	Name or code type
Any	Contains # (pound sign)	Menu goal
Any	Contains - (hyphen)	Service request number (SRN)
5	Does not contain # or -	SRN
8	Does not contain # or -	Service reference code (SRC)

**1. Is the server managed by use of an HMC and Service Focal Point (SFP)?**

**No** Go to 3.

**Yes** Go to 2.

**2. Servers with Service Focal Point**

If you are trying to diagnose a problem on a server that has multiple partitions and one partition that is running Linux, this operation may involve looking at reference codes using the Advanced System Management interface (to access service processor). Be sure you select all listed reference codes one at a time. Select **Details** to display all reference codes and location codes for the serviceable event with which you are working. Continue with the next step.

3. Look for and record any reference code information or software messages on the operator panel or the console (serial TTY, Vterm, or HMC).

4. Choose a Linux partition that is running correctly (preferably the partition with the problem).

**Is Linux usable in any partition with Linux installed?**

**No** Go to 11 on page 414.

**Yes** Go to 5.

5. Do the following steps:

**Attention:** Items 5 through 16 on page 414 must be performed on a server or partition running the Linux operating system.

a. Determine if there is a file named **platform** under **/var/log** directory of the server or partition. Log into the server or partition as the root user and enter the following command:

```
ls -l /var/log/platform
```

Does the **/var/log/platform** file exist?

**No** Continue with substep 5b.

**Yes** Go to substep 5c on page 410.

b. Record that, for this Linux partition, you performed substep 5b of 5 for later steps. Examine the Linux system log by entering the following command:

```
cat /var/log/messages |grep RTAS |more
```

Linux run-time RTAS error messages are logged in the **messages** file under **/var/log**. The following is an example of the Linux system RTAS error log messages.

```
Aug 27 18:13:41 rasler kernel: RTAS: ----- event-scan begin -----
Aug 27 18:13:41 rasler kernel: RTAS: Location Code: U0.1-P1-C1
Aug 27 18:13:41 rasler kernel: RTAS: WARNING: (FULLY RECOVERED) type: INTERN_DEV_FAIL
Aug 27 18:13:41 rasler kernel: RTAS: initiator: UNKNOWN target: UNKNOWN
Aug 27 18:13:41 rasler kernel: RTAS: Status: predictive new
Aug 27 18:13:41 rasler kernel: RTAS: Date/Time: 20020827 18134000
Aug 27 18:13:41 rasler kernel: RTAS: CPU Failure
Aug 27 18:13:41 rasler kernel: RTAS: CPU id: 0
Aug 27 18:13:41 rasler kernel: RTAS: Failing element: 0x0000
Aug 27 18:13:41 rasler kernel: RTAS: A reboot of the system may correct the problem
Aug 27 18:13:41 rasler kernel: RTAS: ----- event-scan end -----
```

**Did you find any RTAS error log messages that are similar to the above messages?**

**No** Go to Using AIX online and standalone diagnostics and run the @server Standalone Diagnostics on the server or partition. If you receive a reference code go to the reference code list. If you cannot determine the problem using the diagnostic programs, contact your next level of support.

**Yes** Go to 6 on page 412.

- c. Record that, for this Linux partition, you performed substep 5c of 5 on page 409 for later steps. Use the following command to list diagela messages recorded in the Linux system log: `cat /var/log/platform |grep diagela |more` Linux run-time diagela error messages are logged in the **platform** file under **/var/log**.

The following is an example of the Linux system error log diagela messages.

```
Aug 13 09:38:45 larry diagela: 08/13/2003 09:38:44
Aug 13 09:38:45 larry diagela: Automatic Error Log Analysis has detected a problem.
Aug 13 09:38:45 larry diagela: Aug 13 09:38:45 larry diagela: The Service Request Number(s)/Probable Cause(s)
Aug 13 09:38:45 larry diagela: (causes are listed in descending order of probability):
Aug 13 09:38:45 larry diagela:
Aug 13 09:38:45 larry diagela: 651-880: The CEC or SPCN reported an error. Report the SRN and the following
reference and physical location codes to your service provider.
Aug 13 09:38:45 larry diagela: Location: n/a FRU: n/a Ref-Code: B1004699
Aug 13 09:38:45 larry diagela:
Aug 13 09:38:45 larry diagela: Analysis of Error log sequence number: 3
Aug 29 07:13:04 larry diagela: 08/29/2003 07:13:04
Aug 29 07:13:04 larry diagela: Automatic Error Log Analysis has detected a problem.
Aug 29 07:13:04 larry diagela:
Aug 29 07:13:04 larry diagela: The Service Request Number(s)/Probable Cause(s)
Aug 29 07:13:04 larry diagela: (causes are listed in descending order of probability):
Aug 29 07:13:04 larry diagela:
Aug 29 07:13:04 larry diagela: 651-880: The CEC or SPCN reported an error. Report the SRN and the following
reference and physical location codes to your service provider.
Aug 29 07:13:04 larry diagela: Location: U0.1-F4 FRU: 09P5866 Ref-Code: 10117661
Aug 29 07:13:04 larry diagela:
Aug 29 07:13:04 larry diagela: Analysis of /var/log/platform sequence number: 24
Sep 4 06:00:55 larry diagela: 09/04/2003 06:00:55
Sep 4 06:00:55 larry diagela: Automatic Error Log Analysis reports the following:
Sep 4 06:00:55 larry diagela:
Sep 4 06:00:55 larry diagela: 651204 ANALYZING SYSTEM ERROR LOG
Sep 4 06:00:55 larry diagela: A loss of redundancy on input power was detected.
Sep 4 06:00:55 larry diagela:
Sep 4 06:00:55 larry diagela: Check for the following:
Sep 4 06:00:55 larry diagela: 1. Loose or disconnected power source connections.
Sep 4 06:00:55 larry diagela: 2. Loss of the power source.
Sep 4 06:00:55 larry diagela: 3. For multiple enclosure systems, loose or
Sep 4 06:00:55 larry diagela: disconnected power and/or signal connections
Sep 4 06:00:55 larry diagela: between enclosures.
Sep 4 06:00:55 larry diagela:
Sep 4 06:00:55 larry diagela: Supporting data:
Sep 4 06:00:55 larry diagela: Ref. Code: 10111520
Sep 4 06:00:55 larry diagela: Location Codes: P1 P2 Sep 4 06:00:55 larry diagela:
Sep 4 06:00:55 larry diagela: Analysis of /var/log/platform sequence number: 13
```

- d. Also use the following command to list RTAS messages recorded in the Linux system log:  
`cat /var/log/platform |grep RTAS |more`  
Linux RTAS error messages are logged in the **platform** file under **/var/log**. The following is an example of the Linux system error log RTAS messages.



Aug 27 12:16:33 larry kernel: RTAS: 15 ----- RTAS event begin -----  
Aug 27 12:16:33 larry kernel: RTAS 0: 04440040 000003f8 96008508 19155800  
Aug 27 12:16:33 larry kernel: RTAS 1: 20030827 00000001 20000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 2: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 3: 49424d00 55302e31 2d463400 00503034  
Aug 27 12:16:33 larry kernel: RTAS 4: 10117661 04a0005d 10110000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 5: 00007701 000000e0 00000003 000000e3  
Aug 27 12:16:33 larry kernel: RTAS 6: 00000000 01000000 00000000 31303131  
Aug 27 12:16:33 larry kernel: RTAS 7: 37363631 20202020 20202020 55302e31  
Aug 27 12:16:33 larry kernel: RTAS 8: 2d463420 20202020 20202020 03705a39  
Aug 27 12:16:33 larry kernel: RTAS 9: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 10: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 11: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 12: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 13: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 14: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 15: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 16: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 17: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 18: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 19: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 20: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 21: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 22: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 23: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 24: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 25: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 26: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 27: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 28: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 29: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 30: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 31: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 32: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 33: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 34: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 35: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 36: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 37: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 38: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 39: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 40: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 41: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 42: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 43: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 44: 00000000 00000000 00000000 00000000  
Aug 27 12:16:33 larry kernel: RTAS 45: 00000000 00000000 00000000 00000000

```

Aug 27 12:16:33 larry kernel: RTAS 46: 00000000 00000000 00000000 00000000
Aug 27 12:16:33 larry kernel: RTAS 47: 00000000 00000000 00000000 00000000
Aug 27 12:16:33 larry kernel: RTAS 48: 00000000 00000000 00000000 00000000
Aug 27 12:16:33 larry kernel: RTAS 49: 00000000 00000000 00000000 00000000
Aug 27 12:16:33 larry kernel: RTAS 50: 00000000 00000000 00000000 00000000
Aug 27 12:16:33 larry kernel: RTAS 51: 00000000 00000000 00000000 00000000
Aug 27 12:16:33 larry kernel: RTAS 52: 00000000 00000000 00000000 00000000
Aug 27 12:16:33 larry kernel: RTAS 53: 00000000 00000000 00000000 00000000
Aug 27 12:16:33 larry kernel: RTAS 54: 00000000 00000000 00000000 00000000
Aug 27 12:16:33 larry kernel: RTAS 55: 00000000 00000000 00000000 00000000
Aug 27 12:16:33 larry kernel: RTAS 56: 00000000 00000000 00000000 00000000Aug 27 12:16:33 larry kernel: RTAS 57:
00000000 00000000 00000000 00000000
Aug 27 12:16:33 larry kernel: RTAS 58: 00000000 00000000 00000000 00000000
Aug 27 12:16:33 larry kernel: RTAS 59: 00000000 00000000 00000000 00000000
Aug 27 12:16:33 larry kernel: RTAS 60: 00000000 00000000 00000000 00000000
Aug 27 12:16:33 larry kernel: RTAS 61: 00000000 00000000 00000000 00000000
Aug 27 12:16:33 larry kernel: RTAS 62: 00000000 00000000 00000000 00000000
Aug 27 12:16:33 larry kernel: RTAS 63: 00000000 00000000 00000000 00020000
Aug 27 12:16:33 larry kernel: RTAS: 15 ----- RTAS event end -----

```

Reference codes and location codes may appear as RTAS messages. The extended data is also provided in the form of an RTAS message. The extended data contains other reference code words that help in isolating the correct FRUs. The start of the extended data is marked, for example, by the line:

```
Aug 27 12:16:33 larry kernel: RTAS: 15 ----- RTAS event begin -----
```

The number after the colon is a sequence number that correlates this data any diagela data with the same sequence number. The end of the extended data is marked by the line:

```
Aug 27 12:16:33 larry kernel: RTAS: 15 ----- RTAS event end -----
```

with the same sequence number. Word 13 and word 19 are found in the RTAS messages. For example, to find word 13, first find the reference code in the left column of words of the extended data, 10117661. In this example, we find the reference code to the right of "RTAS 4:".

This is also word 11. To get word 13, 10110000, simply count the words left-to-right, beginning at word 11.

6. If you performed substep 5b on page 409 of 5 on page 409, then record any RTAS messages found in the Linux system log in 5 on page 409. Or, if you performed substep 5c on page 410 of 5 on page 409, then record any RTAS and diagela messages found in the Linux system log in 5 on page 409, and also record any extended data found in the RTAS messages, especially word 13 and word 19. Ignore all other messages in the Linux system log.

If the system is configured with more than one logical partition with Linux installed, repeat 5 on page 409 and 6 for all logical partitions that have Linux installed.

7. If you performed substep 5c on page 410 of 5 on page 409 for the current Linux partition, go to 8 on page 413, and when asked in 8 on page 413, do not record any RTAS messages from 7 for the current Linux partition.

Examine the Linux boot (IPL) log by logging in to the system as the root user and entering the following command:

```
cat /var/log/boot.msg |grep RTAS |more
```

Linux boot (IPL) error messages are logged into the **boot.msg** file under **/var/log**. The following is an example of the Linux boot error log.



11. Were any reference codes or checkpoints recorded in steps 3 on page 409, 6 on page 412, 8 on page 413, or 10 on page 413?

**No** Go to 12.

**Yes** Go to the Linux fast-path problem isolation with each recorded reference code or symptom. Perform the indicated actions one at a time for each reference code until the problem has been corrected. If all recorded reference codes have been processed and the problem has not been corrected, go to 12.

12. If no additional error information is available and the problem has not been corrected, do the following:

a. Shut down the system.

b. If an HMC is not attached, see Accessing the Advanced System Management Interface (ASMI) for instructions to access the ASMI.

**Note:** The ASMI functions can also be accessed by using a personal computer connected to serial port 1.

You need a personal computer (and cable, part number 62H4857) capable of connecting to serial port 1 on the system unit. The Linux login prompt cannot be seen on a personal computer connected to serial port 1. If the ASMI functions are not otherwise available, use the following procedure:

- 1) Attach the personal computer and cable to serial port 1 on the system unit.
- 2) With 01 displayed in the operator panel, press a key on the virtual terminal on the personal computer. The service ASMI menus are available on the attached personal computer.
- 3) If the service processor menus are not available on the personal computer, perform the following steps:
  - a) Examine and correct all connections to the service processor.
  - b) Replace the service processor.

**Note:** The service processor might be contained on a separate card or board. Or in some systems, the service processor is built into the system backplane. Contact your next level of support for help before replacing a system backplane.

c. Examine the service processor error log. Record all reference codes and messages written to the service processor error log. Go to 13.

13. Were any reference codes recorded in step 12?

**No** Go to 21 on page 416.

**Yes** Go to the Linux fast-path problem isolation with each reference code or symptom you have recorded. Perform the indicated actions, one at a time, until the problem has been corrected. If all recorded reference codes have been processed and the problem has not been corrected, go to 21 on page 416.

14. Reboot the system and bring all partitions to the login prompt. If Linux is not usable in all partitions, go to 18 on page 415.

15. Use the `lscfg` command to list all resources assigned to all partitions. Record the adapter and the partition for each resource.

16. To determine if any device(s) or adapter(s) are missing, compare the list of found resources and partition assignments to the customer's known configuration. Record the location of any missing devices. Also record any differences in the descriptions or the locations of devices.

You may also compare this list of found resources to a prior version of the device tree as follows:

**Note:** Every time that the partition is booted, the **update-device-tree** command is run and the device tree is stored in the **/var/lib/lsvpd/** directory in a file with the file name **device-tree-YYYY-MM-DD-HH:MM:SS**, where **YYYY** is the year, **MM** is the month, **DD** is the day, and **HH**, **MM**, and **SS** are the hour, minute and second, respectively, of the date of creation.

- At the command line, type the following:  
`cd /var/lib/lsvpd/`
- At the command line, type the following:  
`lscfg -vpd device-tree-2003-03-31-12:26:31.`  
This displays the device tree created on 03/31/2003 at 12:26:31.

The **diff** command offers a way to compare the output from a current **lscfg** command to the output from an older **lscfg** command. If the files names for the current and old device trees are **current.out** and **old.out**, respectively, type: `diff old.out current.out`. Any lines that exist in the old, but not in the current will be listed and preceded by a less-than symbol (<). Any lines that exist in the current, but not in the old will be listed and preceded by a greater-than symbol (>). Lines that are the same in both files are not listed; for example, files that are identical will produce no output from the **diff** command. If the location or description changes, lines preceded by both < and > will be output.

If the system is configured with more than one logical partition with Linux installed, repeat 15 on page 414 and 16 on page 414 for all logical partitions that have Linux installed.

**17. Was the location of one and only one device recorded in 16 on page 414?**

**No** If you previously answered Yes to 17, return the system to its original configuration. This ends the procedure. Go to MAP 0410: Repair checkout.

If you did not previously answer Yes to 17, go to 18.

**Yes** Perform the following steps one at a time. Power off the system before performing each step. After performing each step, power on the system and go to 14 on page 414.

- a. Check all connections from the system to the device.
- b. Replace the device (for example, tape or DASD)
- c. If applicable, replace the device backplane.
- d. Replace the device cable.
- e. Replace the adapter.
- f. If the adapter resides in an I/O drawer, replace the I/O backplane.
- g. If the device adapter resides in the CEC, replace the I/O riser card, or the CEC backplane where the device adapter is located.
- h. Call service support. Do not go to 14 on page 414.

**18. Does the system appear to stop or hang before reaching the login prompt or did you record any problems with resources in 16 on page 414?**

**Note:** If the system console or VTERM window is always blank, choose NO. If you are sure the console or VTERM is operational and connected correctly, answer the question for this step.

**No** Go to 19.

**Yes** There may be a problem with an I/O device. Go to PFW1542: I/O problem isolation procedure, when instructed to boot the system, boot a full system partition.

**19. Boot the @server standalone diagnostics, refer to Using AIX online and standalone diagnostics, and run diagnostics in problem determination mode on all resources. Be sure to boot a full system partition. Ensure that AIX diagnostics was run on all known resources. You may need to select each resource individually and run diagnostics on each resource one at a time.**

**Did standalone diagnostics find a problem?**

**No** Go to 23 on page 416.

**Yes** Go to the Reference codes and perform the actions for each reference code you have

recorded. For each reference code not already processed in 17 on page 415, repeat this action until the problem has been corrected. Perform the indicated actions, one at a time. If all recorded reference codes have been processed and the problem has not been corrected, go to 23.

**20. Does the system have Linux installed on one or more partitions?**

**No** Return to Start-of-call isolation procedure.

**Yes** Go to 3 on page 409.

**21. Were any location codes recorded in steps 3 on page 409, 6 on page 412, 8 on page 413, 10 on page 413, 11 on page 414, or 12 on page 414?**

**No** Go to 14 on page 414.

**Yes** Replace, one at a time, all parts whose location code was recorded in steps 3 on page 409, 6 on page 412, 8 on page 413, 10 on page 413, 11 on page 414, or 12 on page 414 that have not been replaced. Power off the system before replacing a part. After replacing the part, power on the system to check if the problem has been corrected. Go to 22 when the problem has been corrected, or all parts in the location codes list have been replaced.

**22. Was the problem corrected in Step 21?**

**No** Go to 14 on page 414.

**Yes** Return the system to its original configuration. This ends the procedure. Go to MAP 0410: Repair checkout.

**23. Were any other symptoms recorded in step 3 on page 409?**

**No** Call support.

**Yes** Go to the Start-of-call isolation procedure with each symptom you have recorded. Perform the indicated actions for all recorded symptoms, one at a time, until the problem has been corrected. If all recorded symptoms have been processed and the problem has not been corrected, call your next level of support.

## HMC isolation procedures

### DANGER

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn everything OFF (unless instructed otherwise).
2. Remove power cords from the outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

To Connect:

1. Turn everything OFF (unless instructed otherwise)
2. Attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

(D005)

Use this information to diagnose and repair problems that are related to the hardware management console (HMC). You should use these procedures when you have been directed from the Start of call procedure. Refer to the following procedures to service the HMC:


- Removing and replacing parts, go to HMC removal and replacement procedures.
- Backing up critical disk drive information on the HMC, refer to Backing up critical HMC data.
- Restoring disk drive information on the HMC, refer to the Recovering the HMC.
- Checking modem settings. Refer to Cabling the HMC .

For additional PC maintenance information, use the following table to access the PC hardware maintenance manuals:

Your HMC machine type and model number (available on the serial number plate of your HMC)	Equivalent PC server machine type and model number	Supporting hardware maintenance information
7310 Model CR2	8676 Model 22X	Hardware Maintenance Manual and Troubleshooting Guide (48P9908)

Your HMC machine type and model number (available on the serial number plate of your HMC)	Equivalent PC server machine type and model number	Supporting hardware maintenance information
7310 Model C03	8187 Model F4U (without POV)	Hardware Maintenance Manual (74P2661)

This information can also be obtained online:


1. Go to the Personal computing support Web site (<http://www.pc.ibm.com>) .
2. In the left navigation bar, select **Support**.
3. Select **Search PC support**.
4. Search on the machine type for the PC server on which your HMC is based. The following table contains a cross reference to help you match your HMC machine type and model number to the equivalent PC server machine type and model number.

### Entry MAP

To start, find the symptom in the Symptom column of the following table. Then, perform the action described in the Action column.

Symptom	Action
Operator reported that the HMC did not start, but no other problems were reported.	Go to HMC problem determination.
Operator reported "Communication not active" on the HMC.	Go to Ethernet MAP.
Operator reported communication problems with a remotely connected HMC or a managed system.	Go to Managed System Connection.
Power Problems	Go to MAP 1520 Power.
HMC Boot Problems	Go to HMC problem determination.
Display problem	Go to Display Problems.
DVD-RAM drive problem	Go to DVD RAM isolation procedure.
Disk drive problem	Go to Disk Drive MAP.
Diskette drive problem	Go to Diskette Drive MAP.
Ethernet LAN problem	Go to Ethernet MAP.
You need to test the system to verify a problem with any of the following: <ul style="list-style-type: none"> <li>• display</li> <li>• diskette drive</li> <li>• DVD-RAM Drive</li> <li>• disk drive</li> <li>• Ethernet LAN</li> </ul>	Go to System Unit Testing.
Eight character error code beginning with <i>HMC</i> received when using the HMC graphical user interface.	Go to HMC error codes.
HMC does not communicate through the modem.	Go to Modem problem isolation procedure.



Symptom	Action
PC Doctor diagnostic tests detected an error.	Refer to the Personal computing support Web site ( <a href="http://www.pc.ibm.com">http://www.pc.ibm.com</a> )  for available PC hardware maintenance manuals to help isolate the problem to a failing part.
Problems understanding the usage of the HMC.	Go to Managing your server using the Hardware Management Console.
All other problems (for example: HMC graphical user interface unresponsive, parity errors, power, POST codes, blank display, mouse, or keyboard).	Go to HMC problem determination.
Symptoms not in this list.	Go to HMC problem determination.

### HMC problem determination

Use this procedure to determine if there is a problem with the HMC hardware. This procedure might direct you to procedures in different sections of this information or to other books.

#### HMC1020-1

**Note:** If the HMC is running, shut down the console by exiting the graphical user interface, the PC should turn off the power automatically. If the PC cannot turn off the power, then turn the power switch off.

1. Turn on the HMC power.
2. Watch the console and allow enough time for the system to complete the POST and load the HMC machine code.
3. Watch and listen for the following failing symptoms during power-on:
  - POST error condition.
  - A series of beeps that indicate an error condition.
  - The HMC login screen and user interface fails to start.
  - A reference code or any other error information is displayed.

#### Do you have any of the failing symptoms during power on?

**No:** Go to "HMC1020-2."

**Yes:** Go to the "General Checkout" section of the hardware maintenance manual for your machine type.

#### HMC1020-2

Follow the procedures in System Unit Testing to run the PC diagnostic software (PC Doctor).

#### Does the PC Doctor diagnostics diskette boot and allow tests to be run on the PC system unit?

**No:** Go to MAP 1520 Power.

**Yes:** Go to "HMC1020-3."

#### HMC1020-3

Follow the procedures in System Unit Testing to test the PC hardware for the HMC. Select **System Unit** problem area and run the test for **Run All Selected**.

#### Did the system unit tests detect any errors?

**No:** Go to "HMC1020-4."

**Yes:** Go to "HMC1020-5" on page 420.

#### HMC1020-4

**Attention:** This step requires HMC support assistance. Contact HMC support before continuing.

The customer might need to reload the HMC from the recovery DVD and reload the customer's backup profile and configuration data (see Recovering the HMC for more information).

**After reloading the machine code from the recovery DVD, does the HMC start correctly?**

**No:** Contact your support representative.

**Yes:** This ends the procedure.

#### HMC1020-5

Use the PC Doctor diagnostics and the maintenance procedures for the type of PC that you are working on to isolate the failure and exchange FRUs. Refer to the publications that are available

through the following web site: Personal computing support Web site (<http://www.pc.ibm.com>) 

**When the problem is repaired, or if the problem cannot be isolated, continue with "HMC1020-6."**

#### HMC1020-6

**Note:** If you reach this step and you have not been able to isolate a failure, call your next level of support for assistance.

Reinstall all FRUs that did not fix the problem.

You must have performed a repair action to continue. If you have not already done so, verify the repair. For instructions, see System Unit Testing.

**Did the system unit tests run without errors?**

**No:** Return to System Unit Testing to troubleshoot the error. Return here and continue when the problem is resolved. Continue with "HMC1020-7."

**Yes:** Go to "HMC1020-7."

#### HMC1020-7

**Does the HMC communicate with all connected managed systems?**

**No:** Go to Managed System Connection.

**Yes:** Go to "HMC1020-8."

#### HMC1020-8

**Did you exchange the system board or the system board battery?**


**No:** This ends the procedure.

**Yes:** Go to "HMC1020-9."

#### HMC1020-9

The customer might need to do some recovery procedures, refer to Recovering the HMC. **This ends the procedure.**

### MAP 1520 Power

To troubleshoot a power problem on the PC, refer to the service documentation for the PC. Refer to the Personal computing support Web site (<http://www.pc.ibm.com>)  for available PC hardware maintenance manuals to help isolate the problem to a failing part.

### MAP 1530: Testing the HMC

This MAP tests each of the base parts of the HMC. If a failure is detected, you will be instructed to fix the failing part and then close out the service call.

This section describes diagnostics tests for the HMC. Use the information in this section when you are directed to test the HMC to isolate a problem or verify a repair.

### Diagnostic Procedures

You should have been directed here to test a specific part of the HMC. See System Unit Testing for the following problem areas:

- Display
- Keyboard
- Mouse
- Floppy Drive
- DVD-RAM
- DASD (disk drive)
- Memory
- Power
- Run All Selected
- SCSI
- Serial Port/Modem
- 16/4 Port Serial
- Ethernet


### System Unit Testing

This section provides information to help you use the PC Doctor diagnostic diskette to test the PC hardware parts of the HMC. The PC Doctor diagnostic diskette is bootable.

**Note:** Performing procedures other than those specified in the following procedures may cause errors.

1. If you know which device is failing or you were sent here by another procedure, do the following:
  - a. Shut down the HMC, and ensure that the PC power is off.
  - b. Insert the PC Doctor diagnostic diskette into drive A.
  - c. Power on the PC.
  - d. Wait until a diagnostic selection menu is displayed.
2. Select either **Diagnostics** or **Interactive Tests** for a list of devices to test.
  - Devices that require manual intervention (keyboard, video, mouse, diskette, CD-ROM) may be selected from the Interactive Tests task bar.
  - Devices that do not require manual intervention (processor, system board, I/O ports, fixed disks, memory) and predefined test sequences (Run Normal/Quick Test) can be selected from the Diagnostic task bar.

Select the task containing the device(s) or test(s) and follow the instructions. If you were instructed to **Run All Selected**, continue with that selection.

3. If the diagnostics report a failure on the PC hardware, refer to the Personal computing support Web site (<http://www.pc.ibm.com>)  for available PC hardware maintenance manuals to help isolate the problem to a failing part.
4. If the diagnostics do not report a failure, the HMC PC hardware is functioning correctly. If you still have a problem, go to HMC problem determination.

### Modem connection to the HMC

Use this procedure to test the modem connection to the PC for the HMC.

1. **Can the HMC be used to communicate through the modem?**
  - No:** Go to step 2.
  - Yes:** This ends the procedure.
2. **Is a device other than a modem attached to serial port 2 on the HMC?**

**Note:** If the HMC is a rack-mounted model, answer no to this question.

**No:** Go to step 422.

**Yes:** Go to step 3.

3. The HMC's serial port 2 is reserved for external modem use only. Move the serial cable from the HMC's serial port 2 to another HMC serial port. Connect the modem to serial port 2 and go to step 1 on page 421.

**Note:** If the HMC is a rack-mounted model, an internal modem is installed to handle the connection of the HMC to the phone line. If a redundant phone connection is required, connect an external modem to the serial port on the rear of the HMC.

### Modem problem isolation procedure

Use this procedure to test the modem connection to the PC for the HMC.

1. Verify that the modem and phone line are functioning properly.

To verify, do the following:

- a. On the HMC console, open the Service Agent application.
- b. Select **Test Tools**.
- c. Initiate a Test PMR.
- d. Monitor the call log to verify that the call is completed successfully. If the call is completed successfully, the modem is functioning correctly.

**Is the installed modem currently functioning on the HMC?**

**No:** Go to step 2.

**Yes:** The problem is not in the modem. **This the ends the procedure.**

2. **Are the HMC configurations, relating to the modem operation, correct?**

**No:** Go to step 3.

**Yes:** Go to step 4.

3. Correct the HMC configuration arguments. Go to step 1.

4. **Is the modem powered on? (Are any indicators lit?)**

**No** Go to step 5.

**Yes** Go to step 6.

5. **Ensure the modem is powered on.**

Go to step 1.

6. **Is the serial cable, between the HMC's serial (COM) port connector (HMC2) and the modem, attached?**

**No** Go to step 7.

**Yes** Go to step 8.

7. Attach the serial cable (as indicated by the preceding step).

Go to step 1.

8. Install the PC Doctor diskette into the HMC's drive A: (floppy drive). Reboot the HMC and wait until the PC Doctor main menu appears. Click **Diagnostics > Other Devices > Modem** to perform the modem diagnostic test.

**Did the diagnostic pass?**

**No** Go to step 9.

**Yes** Go to step 17 on page 424.

9. **Is the modem properly connected to a working telephone line (or equivalent)?**

**Note:** This can be checked by connecting a known good telephone to the line in place of the modem and making a phone call.

**No** Go to step 18 on page 424.

**Yes** Locate a serial port loopback plug for the next step. Go to step 10.

10. Do the following:

- a. Place a loopback plug on the end of the serial port connector that is attached to the modem.
- b. Return to PC Doctor main menu.
- c. Click **Diagnostics > Serial Ports** to access the serial port diagnostics screen.
- d. On the serial port diagnostics screen, select only the following tests for COM 2:
  - Register and Interrupts
  - Internal Loopback
  - External Loopback

**Note:** Do not select External Loopback if loopback plug is not used.

- FIFO Buffers (16550A)

**Did all the COM 2 tests pass?**

**No** Go to step 11.

**Yes** Go to step 14 on page 424.

11. **Did the external loopback test fail?**

**No** Go to step 12.

**Yes** Go to step 13.

12. The COM 2 port is defective. Replace the HMC hardware for COM 2 on your HMC.  
Go to step 1 on page 422.

13. Replace the serial port cable. Go to step 1 on page 422.

14. The fault appears to be within the modem operation.

**Are the modem's internal settings (for example, switches) correct?**

**Note:** If you are using a 7852-400 modem to enable communications, for proper operation, the dual inline package (DIP) switches must be set according to the following table:

Switch	Position	Function
1	Up	Force DTR
2	Up	Flow Control &E4
3	Down	Result Codes Enabled
4	Down	Modem Emulation Disabled
5	Down*	Auto Answer Enabled
6	Up	Maximum Throughput Enabled
7	Up	RTS Normal Functions
8	Down	Enable Command Mode
9	Down	Remote Digital Loopback Test Enabled
10	Up	Dial-Up Line Enabled
11	Down	AT Responses Enabled (Extended Responses Disabled)
12	Down*	Asynchronous Operation
13	Up	28.8KB Line Speed
14	Up	
15	Up	CD and DSR Normal Functions
16	Up	2-Wire Leased Line Enabled

\* Only switches 5 and 12 are changed from the factory default settings.

**No** Go to step 15.

**Yes** Go to step 16.

15. Correct the modem's internal settings. Go to step 1 on page 422.

16. The modem appears to be faulty. Replace the modem. Go to step 1 on page 422.

17. **Is the modem properly connected to a working telephone line (or equivalent)?**

**Note:** This can be checked by connecting a known good telephone to the line in place of the modem and making a telephone call.

**No** Go to step 18.

**Yes** Go to step 19.

18. Properly connect the telephone line (or equivalent) to the modem. Go to step 1 on page 422.

19. The failure mode is undetermined. Call service support.

## Ethernet MAP

Use this procedure to test the Ethernet adapter in the PC for the HMC.

1. **Is the Ethernet port currently functioning though normal operation of the HMC?**

**No** Go to step 2.

**Yes** This is the end of the procedure.

2. **Are the Ethernet configuration values set correctly? (IP address, Subnet Mask, and so on.)**

**No** Go to step 3 on page 425.

**Yes** Go to step 4 on page 425.

3. Set the Ethernet configuration values to their proper settings. Go to step 1 on page 424.
4. **Can the HMC's IP address be 'pinged' by another system that should be able to 'see' the HMC on the customer's network?**
  - No** Go to step 5.
  - Yes** Go to step 13.
5. **Is the Ethernet cable properly attached to the HMC and the customer's network?**
  - No** Go to step 6.
  - Yes** Go to step 7.
6. Attach the HMC to the customer's network using an Ethernet cable with the correct pinout. Go to step 1 on page 424.
7. **Is the Ethernet cable the proper pinout? (There are two types of Ethernet cables in use, which are distinguished by different pinouts. The customer's network will determine which version of cable to use.)**
  - No** Go to step 8.
  - Yes** Go to step 9.
8. Replace the Ethernet cable with the correct version. Go to step 1 on page 424.
9. Install the PC Doctor diskette into the HMC's drive A: (floppy drive). Reboot the HMC and wait until the PC Doctor main menu appears.  
Click **Diagnostics > Other Devices > Intel Ethernet** to run the Ethernet diagnostic.  
**Did the diagnostic pass?**
  - No** Go to step 10.
  - Yes** Go to step 13.
10. Refer to the Ethernet hardware's hardware maintenance manual to determine if there are any internal settings/jumpers that may disable the Ethernet port.  
**Are there any internal settings/jumpers?**
  - No** Go to step 11.
  - Yes** Go to step 12.
11. Replace the Ethernet hardware in the HMC. (This may be a PCI card or system board replacement, depending on the HMC hardware.) Go to step 1 on page 424.
12. Set the internal settings/jumpers to enable the HMC's Ethernet port. Go to step 1 on page 424.
13. The failure appears not to be in the HMC.

#### Disk Drive MAP

Use this procedure to test the disk drive in the PC for the HMC.

1. Use the information in System Unit Testing to test the PC. Select **Hard Disk Drive** problem area.  
Return here when the test is complete.
2. **Did the disk drive test fail?**
  - No** Go to step 6 on page 426.
  - Yes** Continue with the next step.
3. Exchange the FRUs called by the diagnostics one at a time. For FRU removal and replacement instructions, refer to the PC hardware maintenance manual for the system on which you are working. The publications are available through the following web site:  
<http://www.pc.ibm.com>

When each FRU is exchanged, test the repair using the information in System Unit Testing. Select **Hard Disk Drive** problem area.

**Did the disk drive test fail?**

**No** Continue with the next step.

**Yes** Call for assistance.

4. If you exchanged the disk drive and there are jumpers or tab settings on the new disk drive, ensure they are set the same as the old drive. If there is a SCSI cable-terminating resistor device, ensure it is secured to the cable and (if necessary) reattached to its original location on the PC.

Go to "Hard Disk Jumper Settings" in the PC hardware maintenance manual. Refer to the publications that are available through the following web site: Personal computing support Web site

(<http://www.pc.ibm.com>) .

Continue with the next step.

5. If you exchanged the disk drive, restore the HMC image to the new disk drive.
6. Use the information in System Unit Testing to test the PC. Select **Run All Selected** problem area.
  - If the tests fail, go to HMC problem determination to isolate the problem.
  - If the tests run without errors, turn off the PC power and then turn on the power. Ensure that the system boots and the HMC screen displays.

**This ends the procedure.**

### DVD RAM isolation procedure

Use this procedure to test the DVD drive in the PC for the HMC.

1. Determine the media in the DVD RAM drive:
  - Compact Disk Recordable (CD-R) similar to a CD
  - DVD-RAM media cartridge

**Is the media a CD-R?**

**No** Go to step 4.

**Yes** Continue with the next step.

2. Clean the compact disk as follows:
  - Hold the disk by its edges. Do not touch the surface.
  - Remove dust and fingerprints from the surface by wiping from the center to the outside using a dry, soft cloth.

Reinstall the CD, with the label-side facing up.

Continue with the next step.

3. Retry the failing task using the original media.

**Does the failure occur again?**

**No** Continue with the next step.

**Yes** Go to step 5.

This ends the procedure. Go to Verifying the repair for AIX.

4. Ensure the write protect tab is in the "disabled" (down) position.

**Was the write protect tab in the "disabled" (down) position?**

**No** Go to step 3.

**Yes** Continue with the next step.

5. Leave the original media in the drive.
  - If you are attempting a restore procedure, turn off the PC power.



- For any other operation, shut down the HMC, and then turn off the PC power.

**Note:** For shutdown procedures, see Powering on and off.

Turn on the PC power and test the DVD-RAM drive using the information in System Unit Testing. Select **DVD-RAM Drive** problem area.

When the test is complete, return here and continue with the next step.

6. **Did the DVD-RAM test fail while testing with the original media?**

**No** Go to step 11 on page 428.

**Yes** Continue with the next step.

7. Exchange the original media with a new one.

**Note:** If you are replacing DVD-RAM media, the new cartridge must be formatted. If possible, use another HMC to format the new cartridge.

Turn off the PC power.

Turn on the PC power, and test the DVD-RAM drive with the new media. Use the information in System Unit Testing to test the PC. Select **DVD-RAM Drive** problem area.

8. **Did the DVD-RAM test fail while testing with the new media?**

**No** The original media was defective. **This ends the procedure.**

**Yes** Continue with the next step.

9. Verify the following:

- All DVD-RAM drive data and power cables are secure.
- The DVD-RAM drive is jumpered as "Master" and is cabled to the Secondary IDE Bus.

If the diagnostics continue to fail, exchange the DVD-RAM drive. When complete, run the DVD-RAM test again.

**Note:** If there are any jumpers or tab settings on the new drive, ensure they have the same settings as the old drive.

**Did the DVD-RAM Drive test continue to fail?**

**No** The original DVD-RAM drive was defective. **This ends the procedure.**

**Yes** Continue with the next step.

10. Continue exchanging FRUs from the FRU list and running the DVD-RAM drive tests.

- If the FRUs fix the problem, this ends the procedure.
- If you cannot isolate the problem, call your next level of support for assistance.

11. The PC resources (for example: interrupt, I/O address) may be configured incorrectly. Verify the PC resources are correctly configured.

Select **System Unit** for the configuration area, and verify configuration for the system unit and all adapters.

When you complete the verification, retry the failing procedure and continue with the next step.

12. **Does the failing procedure continue to fail?**

**No** The resource settings were incorrect. **This ends the procedure.**

**Yes** If you cannot isolate the problem, call your next level of support for assistance.

**This ends the procedure.**

## Diskette Drive MAP

Use this procedure to test the diskette drive in the PC for the HMC.

1. Turn on the PC power and test the diskette drive using the information in System Unit Testing. Select **System Unit** problem area and the test of **Diskette Drive**.

**Note:** Do not test with the diskette on which the errors occurred. Use a new diskette.


When the test is complete, continue with the next step.

2. **Did the diskette test fail while testing with a new diskette?**

**Note:** Answer "Yes" if you were not able to run the test because of the diskette errors.

**No** Go to step 5 on page 429.

**Yes** Continue with the next step.

3. Exchange the diskette drive.  
When complete, run the diskette test again.  
**Did the diskette test fail again?**  
**No** The original diskette drive was failing. **This ends the procedure.**  
**Yes** Continue with the next step.
4. Continue exchanging FRUs from the FRU list and running tests. If the FRUs fix the problem, this ends the procedure.  
If you cannot resolve the problem, call your next level of support for assistance.
5. **Did the original failure occur while writing to a diskette?**  
**No** Go to step 7.  
**Yes** Continue with the next step.
6. Retry the original task using a new diskette.
  - If the failure occurs again, go to step 8.
  - If no failures occur, the original diskette was failing. **This ends the procedure.**
7. Re-create the information on the diskette, or get a new diskette with the information.  
Retry the original task.
  - If the failure occurs again, continue with the next step.
  - If no failures occur, the original diskette was failing. **This ends the procedure.**
8. Test the diskette drive, using the information in System Unit Testing. Select **System Unit** problem area and the test of **Diskette Drive**.
  - If the tests fail, isolate the problem using the procedures found in the PC hardware maintenance manual. For additional PC maintenance information, use the following procedure to access the PC hardware maintenance manuals:
    - a. Go to the Personal computing support Web site (<http://www.pc.ibm.com>) .
    - b. In the left navigation bar, select **Support**.
    - c. Select **Search PC support**.
    - d. Search on the machine type for the PC server on which your HMC is based. The following table contains a cross reference to help you match your HMC machine type and model number to the equivalent PC server machine type and model number.

Your HMC machine type and model number (available on the serial number plate of your HMC)	Equivalent PC server machine type and model number	Supporting hardware maintenance
7310 Model CR2	8676 Model 22X	48P9908
7310 Model C03	8187 Model F4U	74P2661

- If the tests do not or if you cannot isolate the problem, call your next level of support for assistance.

## Display Problems

Use this procedure when the customer reports a display problem.

### 1. Is the display type a 95xx (17P, 17X, 21P)?

- No** Continue with the next step.
- Yes** 95xx-xxx repairs may require replacing internal display FRUs.

Repair and test the display using the procedures in *Monitor Hardware Maintenance Manual Vol 2*, S41G-3317.

## 2. Is the display type a 65xx (P70, P200)?

**No** Continue with the next step.

**Yes** 65xx-xxx repairs may require replacing the entire display. There are no internal display FRUs. Repair and test the display using the procedures in *Monitor Hardware Maintenance Manual Vol 3, P and G series, S52H-3679*.

When the test and repair are complete, continue with step 5.

## 3. Is the display type a 65xx (P72, P202)?

**No** Continue with the next step.

**Yes** 65xx-xxx repairs may require replacing the entire display. There are no internal display FRUs. Repair and test the display using the procedures in *Color Monitor Operating Instructions*.

When the test and repair are complete, continue with step 5.

## 4. Repair and test the display using the documentation shipped with the display.

When the test and repair are complete, continue with step 6.

## 5. Verify the repair using the information in System Unit Testing. Select **System Unit** for the problem area and the **Test for Display**.

When the test and repair are complete, step 6.

## 6. Return the system to normal operations. **This ends the procedure.**

## Using failing item codes

Use this table to find the field replaceable unit (FRU) parts identified by a failing item code. If only a type number is listed, go to Part number catalog to determine the part number.

Failing item code	Description/Action
FI00015	FI00015 is not supported on these models. Continue with the next FRU in the list.
FI00017	FI00017 is not supported on these models. Continue with the next FRU in the list.
FI00020	FI00020 is not supported on these models. Continue with the next FRU in the list.
FI00021	FI00021 indicates that the combined function I/O processor (CFIOP) is the failing item. Use the CFIOP type to determine the part number.
FI00022	FI00022 indicates that the Licensed Internal Code for the service processor may be the failing item. Ask your next level of support for assistance.
FI00040	See the symbolic FRU "BACKPLN" on page 458.
FI00047	FI00047 is not supported on these models. Continue with the next FRU in the list.
FI00050	FI00050 is not supported on these models. Continue with the next FRU in the list.
FI00055	FI00055 indicates that a primary optical link cable is the failing item. This is either the optical bus cable for the bus you are working with or its paired bus cable on the optical link card.
FI00056	FI00056 indicates that any optical bus cable or a missing optical bus wrap connector is the failing item.
FI00057	FI00057 indicates that the secondary optical link cable is the failing item. This is the optical cable that runs between the bus expansion adapter cards in two separate expansion units.
FI00060	FI00060 is not supported on these models. Continue with the next FRU in the list.
FI00062	FI00062 is not supported on these models. Continue with the next FRU in the list.

Failing item code	Description/Action
FI00065	FI00065 is not supported on these models. Continue with the next FRU in the list.
FI00070	<p>FI00070 indicates that a storage device attached to the IPL device IOP is the failing item.</p> <p>Determine the IPL device that is failing by doing the following:</p> <ol style="list-style-type: none"> <li>1. In the Navigation Area, open <b>Server and Partition</b>.</li> <li>2. Select <b>Server Management</b>.</li> <li>3. In the contents area, open the server on which the logical partition is located.</li> <li>4. Open <b>Partitions</b>.</li> <li>5. Right-click the logical partition and select <b>Properties</b>.</li> <li>6. In the Properties window, click the <b>Settings</b> tab.</li> </ol> <p>If the IPL storage device is not the failing item, then any storage device attached to the IPL device IOP may be the failing item.</p>
FI00072	<p>FI00072 indicates that the load-source media is the failing item.</p> <ol style="list-style-type: none"> <li>1. Choose from the following options: <ul style="list-style-type: none"> <li>• If the load source is tape, exchange the tape in the alternate IPL tape unit.</li> <li>• If the load source is an optical storage unit, exchange the compact disk.</li> <li>• If the load source is a hard disk drive, exchange the hard disk drive.</li> </ul> </li> <li>2. If replacing the media does not work, try replacing the drive.</li> </ol>
FI00090	<p>FI00090 indicates that the removable media device for an alternate IPL is the failing item. <b>Note:</b> Determine if the system has logical partitions. Go to Determining if the system has logical partitions before continuing with this procedure.</p> <p>Determine the device that is failing by doing the following:</p> <ol style="list-style-type: none"> <li>1. Select function <b>01</b> (Select IPL) on the control panel and press <b>Enter</b> to verify that the active IPL type is D. <b>Note:</b> Use the system configuration list to identify the device. See Hardware Service Manager for details.  The possible failing devices are the following type numbers: 3490, 3570, 3590, 632x, 6382, 6383, 6386, 6387, 63A0, 7208, 9348, and 9427.</li> <li>2. Use the service information for the specific removable media unit for an alternate IPL to analyze the device failure.</li> </ol>
FI00092	<p>FI00092 indicates that the load source for an alternate IPL or the interface to the load source is the failing item. Perform the following steps:</p> <ol style="list-style-type: none"> <li>1. Determine if the system has logical partitions. Go to Determining if the system has logical partitions before continuing with this procedure.</li> <li>2. If the load source is an optical unit, you may need to perform function 3 to IPL the system again. This will make the unit ready.</li> <li>3. To locate the alternate load source for a system, see Load-source disks and alternate IPL devices.</li> <li>4. Use the device type to determine the part.</li> </ol>

Failing item code	Description/Action
FI00096	<p>FI00096 indicates that the IOP attached to the load-source device is the failing item.</p> <ol style="list-style-type: none"> <li>Determine if the system has logical partitions. Go to Determining if the system has logical partitions before continuing with this procedure.</li> <li>Verify that the IPL type is correct by choosing one of the following: <ul style="list-style-type: none"> <li><b>If you are using a control panel:</b> Select function 01 on the control panel and press <b>Enter</b> to display the present IPL mode.</li> <li><b>If you are using the HMC,</b> perform the following steps: <ol style="list-style-type: none"> <li>In the Navigation Area, open <b>Server and Partition</b>.</li> <li>Select <b>Server Management</b>.</li> <li>In the contents area, open the server on which the logical partition is located.</li> <li>Open <b>Partitions</b>.</li> <li>Right-click the logical partition and select <b>Properties</b>.</li> <li>In the Properties window, click the <b>Settings</b> tab.</li> </ol> </li> </ul> </li> <li>The failing CFIO or IOP may have a removable storage I/O adapter FRU. Replace the storage IOA using symbolic FRU "STORIOA" on page 547.</li> <li>To locate the load source for a system, see Load-source disks and alternate IPL devices.</li> </ol>
FI00098	<p>FI00098 indicates that the load-source disk device is the failing item.</p> <ol style="list-style-type: none"> <li>Determine if the system has logical partitions. Go to Determining if the system has logical partitions before continuing with this procedure.</li> <li>Determine the disk unit 1 type number. It is printed on a label on the front of the system frame.</li> <li>If the system does not have a label that identifies the disk unit type, you can determine the part number of the disk unit by looking at a label located on the disk unit. You must remove the disk unit to see this label.</li> <li>Exchange the disk drive and logic card for the disk unit type you have. See System parts.</li> <li>To locate the load source for a system, see Load-source disks and alternate IPL devices.</li> </ol>
FI00099	<p>FI00099 indicates that the Licensed Internal Code failed or responded in an unpredictable way.</p> <p>Ask your next level of support for assistance.</p>
FI00121	<p>FI00121 indicates that any tape or optical storage device attached to the I/O (SCSI) bus of this IOP may be the failing item.</p> <p>Use the device type to determine the part.</p>
FI00122	<p>FI00122 indicates that a reserved IOA port on the IOP is the failing item.</p> <p>If the IOP is type 2624, the failing item is type 6146 IOA.</p>
FI00123	<p>See symbolic FRU "DEVTERM" on page 472.</p>
FI00124	<p>FI00124 is not supported on these models. Continue with the next FRU in the list.</p>
FI00130	<p>FI00130 indicates that the Licensed Internal Code for one of the IOPs or IOAs is the failing item.</p> <p>Determine the IOP or IOA type and location:</p> <ol style="list-style-type: none"> <li>Determine the address of the IOP or IOA card. See System reference code (SRC) address formats.</li> <li>Determine the location of the IOP or IOA card. See Finding part locations for the model you are working on, and get the type from the card at that address.</li> <li>Look for PTFs associated with the reference code and the identified hardware type and have the customer apply them.</li> </ol>

Failing item code	Description/Action
FI00131	<p>FI00131 indicates that one of the IOPs or IOAs, if active, is the failing item.</p> <p>Determine the IOP or IOA type and location:</p> <ol style="list-style-type: none"> <li>1. Determine the address of the IOP or IOA card. See System reference code (SRC) address formats.</li> <li>2. Determine the location of the IOP or IOA card. See Finding part locations for the model you are working on and get the type from the card at that address.</li> <li>3. Use the IOP or IOA type to determine the part.</li> </ol>
FI00132	<p>FI00132 indicates that one of the IOAs is the failing item.</p> <p>Perform "MABIP06" on page 96 to isolate the failing IOA.</p>
FI00141	<p>FI00141 indicates that the IOP for the 7208 tape drive is the failing item.</p> <p>The failing IOP is the type 2621 IOP.</p>
FI00142	<p>FI00142 is not supported on these models. Continue with the next FRU in the list.</p>
FI00180	<p>FI00180 is not supported on these models. Continue with the next FRU in the list.</p>
FI00182	<p>For Models 270 and 820, FI00182 indicates that the local optical link card is the failing item. For Models 830, 840, SB2, and SB3, FI00182 indicates that the SPD optical bus driver is the failing item.</p> <ul style="list-style-type: none"> <li>• If the fifth character of word 5 (xxxx _xxx) is 1, 5, 9, or D-2686 (266 MB/s)</li> <li>• If the fifth character of word 5 (xxxx _xxx) is 3, 7, B, or F-2688 (1062 MB/s)</li> </ul>
FI00185	<p>FI00185 indicates that the 12-port ASCII workstation attachment cable is the failing item.</p>
FI00186	<ul style="list-style-type: none"> <li>• For the Model 270 and 820, FI00186 indicates that the optical cable in the top position (even bus) of the optical link card is the failing item.</li> <li>• For the Model 830, 840, SB2, and SB3, FI00186 indicates that the optical cable in the top position (lower number bus) of the SPD optical Bus Driver is the failing item.</li> </ul>
FI00187	<p>FI00187 is not supported on these models. Continue with the next FRU in the list.</p>
FI00189	<p>FI00189 is not supported on these models. Continue with the next FRU in the list.</p>
FI00200	<p>FI00200 indicates that the ac module or the removable power cable is the failing item.</p> <p>The following list shows the possible failing ac modules. See System parts for part numbers:</p> <ul style="list-style-type: none"> <li>• System unit – part SPNLCRD</li> <li>• System unit expansion (FC 5070, 5072), storage expansion unit (FC 5080, 5082)</li> <li>• System unit expansion (FC 5071, 5073), storage expansion tower (FC 5081, 5083)</li> </ul> <p>See Plan for cables in the Planning topic for more information.</p>
FI00203	<p>For the Models 270 and 820, FI00203 indicates that the remote bus expansion adapter card in the bus expansion unit is the failing item.</p> <p>Use the adapter card type in the bus expansion unit to determine the part.</p> <p>For Models 830, 840, SB2, and SB3, FI00203 indicates that the remote SPD optical bus receiver card in the expansion tower is the failing item.</p> <p>Use the receiver card type in the expansion tower to determine the part.</p>
FI00204	<p>For Models 270 and 830, FI00204 indicates that the bus cable between the system unit and the bus expansion unit is the failing item.</p> <p>For Models 830, 840, SB2, and SB3, FI00204 indicates that the bus cable between the migrated tower and the expansion tower is the failing item.</p>

Failing item code	Description/Action
FI00205	<p>For Models 270 and 830, FI00205 indicates that the remote bus expansion adapter for the paired bus is the failing item. Use the adapter card type in the bus expansion unit to determine the part.</p> <p>For Models 830, 840, SB2, and SB3, FI00205 indicates that the remote SPD optical bus receiver on the paired bus is the failing item. Use the receiver card type in the expansion unit bus to determine the part.</p>
FI00206	FI00206 is not supported on these models. Continue with the next FRU in the list.
FI00230	<p>FI00230 indicates that the Licensed Internal Code for the failing node is the failing item and needs to be restored.</p> <p>Determine the type of node and select the Licensed Internal Code load.</p> <ul style="list-style-type: none"> <li>• <b>Primary node</b> - AJSFDJ04</li> <li>• <b>Secondary node</b> - AJSFDJ05</li> </ul>
FI00235	<p>FI00235 indicates that an SPCN cable that connects two frames or a frame to a node is the failing item. This failing item is applicable only if an SPCN cable is installed.</p> <p>The following list shows the lengths of the possible failing items. Click the device description to go to the part number in the Cables topic.</p> <ul style="list-style-type: none"> <li>• SPCN cable (6 meters)</li> <li>• SPCN cable (15 meters)</li> <li>• SPCN cable (30 meters)</li> <li>• SPCN cable (60 meters)</li> <li>• Optical SPCN cable (100 meters)</li> <li>• SPCN optical adapter</li> <li>• SPCN port cable (frame-to-node)</li> <li>• Frame-to-frame cable</li> <li>• SPCN optical adapter</li> </ul>
FI00236	FI00236 is not supported on these models. Continue with the next FRU in the list.
FI00237	FI00237 is not supported on these models. Continue with the next FRU in the list.
FI00238	FI00238 is not supported on these models. Continue with the next FRU in the list.
FI00239	FI00239 is not supported on these models. Continue with the next FRU in the list.
FI00240	<p>FI00240 indicates that an SPCN node is the failing item.</p> <p>The system cannot identify the type of node. Determine the failing node and exchange the failing item.</p> <p>The following list shows the possible failing items. See System parts for part numbers:</p> <ul style="list-style-type: none"> <li>• SPCN unit .</li> <li>• SPCN unit – part 21H6961 (if installed)</li> <li>• Secondary ac module (if installed)</li> <li>• For 9251 base I/O (if installed)</li> <li>• Power control compartment – part 21F9008</li> </ul>
FI00244	FI00244 is not supported on these models. Continue with the next FRU in the list.
FI00245	<p>FI00245 indicates that the card enclosure for an unknown unit type is the failing item.</p> <p>See symbolic FRU “BACKPLN” on page 458.</p>
FI00246	FI00246 is not supported on these models. Continue with the next FRU in the list.
FI00248	FI00248 is not supported on these models. Continue with the next FRU in the list.
FI00253	FI00253 is not supported on these models. Continue with the next FRU in the list.



Failing item code	Description/Action
FI00255	FI00255 is not supported on these models. Continue with the next FRU in the list.
FI00256	FI00256 is not supported on these models. Continue with the next FRU in the list.
FI00300	<p>FI00300 indicates that media is the failing item.</p> <p>If the load source is:</p> <ul style="list-style-type: none"> <li>• Tape, exchange the tape in the alternate IPL tape unit.</li> <li>• An optical storage unit, exchange the compact disc.</li> <li>• A hard disk drive, exchange the hard disk drive.</li> </ul> <p>If installing from:</p> <ul style="list-style-type: none"> <li>• Tape, exchange the tape in the alternate IPL tape unit.</li> <li>• An optical storage unit, exchange the compact disc.</li> </ul>
FI00301	<p>FI00301 indicates that the magnetic storage I/O processor (MSIOP) or the combined function I/O processor (CFIOP) is the failing item.</p> <p>Use the IOP type to determine the part.</p>
FI00302	<p>FI00302 indicates that the Licensed Internal Code for the magnetic storage I/O processor (MSIOP) or the combined function I/O processor (CFIOP) is the failing item.</p> <p>Ask your next level of support for assistance.</p>
FI00310	FI00310 is not supported on these models. Continue with the next FRU in the list.
FI00315	FI00315 indicates that the battery power unit installation time life has been exceeded.
FI00316	<p>FI00316 indicates that no I/O processors were found on the bus.</p> <p>Verify the configuration information for the system. If a bus is configured to be empty, there is no problem.</p>
FI00317	<p>FI00317 indicates that the I/O processor cards at consecutive direct select addresses appear to be failing.</p> <p>The I/O processor cards or a damaged backplane could cause this problem.</p>
FI00318	FI00318 indicates that an I/O adapter attached to an I/O processor card on the failing bus is the failing item.
FI00319	<p>FI00319 indicates that the Licensed Internal Code on an I/O processor is the failing item. Install a PTF to correct the problem.</p> <p>Ask your next level of support for assistance.</p>
FI00320	FI00320 indicates that the display station used as the console is the failing item.
FI00350	<p>For Models 830, 840, SB2, and SB3 only, FI00350 indicates that the alternate IPL device is the failing item.</p> <p>See the service information for the specific device type and model installed on the system to determine the part number.</p>
FI00360	FI00360 indicates that the IPL disk device is the failing item.
FI00380	On the bus with the system console or the failing logical partition's console, the failing item is the first workstation IOP card or the workstation IOA card. The bus with the system console is bus 0001. For systems with multiple logical partitions, the logical partition's console is on bus 0001 and the consoles for other logical partitions are determined by the LPAR configuration.
FI00500	See FI01140.
FI00580	<p>FI00580 indicates that any storage device may be the failing item.</p> <p>The address of the failing storage device cannot be determined.</p>

Failing item code	Description/Action
FI00581	FI00581 indicates that a storage device at the address identified by the problem isolation procedures for the reference code is the failing item.  Use the service information of the I/O device to continue analyzing the problem.
FI00584	FI00584 indicates that any storage device may be the failing item.  The address of the failing storage device cannot be determined.
FI00601	FI00601 indicates that the display station is the failing item.  If a link protocol converter is used to connect the console to the system, the protocol converter is the failing item.
FI00602	FI00602 indicates that the cable between the workstation attachment and the device is the failing item.
FI00603	FI00603 indicates that the 5299 multiconnector is the failing item.
FI00604	FI00604 indicates that a printer is the failing item.  Use the printer device information to analyze the problem.
FI00605	FI00605 indicates that a magnetic stripe reader on a display station is the failing item.
FI00606	FI00606 indicates that the storage media is the failing item.
FI00607	FI00607 indicates that a selector light pen attached to a display station is the failing item.
FI00608	FI00608 indicates that the link protocol converter is the failing item.
FI00610	FI00610 indicates that the twinaxial workstation IOP or the twinaxial workstation IOA attached to a combined function I/O processor (CFIOP), communications IOP, or combined function IOP is the failing item.  Use the workstation IOP or IOA type to determine the part.
FI00611	FI00611 is not supported on these models. Continue with the next FRU in the list.
FI00612	FI00612 is not supported on these models. Continue with the next FRU in the list.
FI00613	FI00613 indicates that the display station used as the console is the failing item.
FI00614	FI00614 indicates that a unit reference code of FFFF was indicated when the user entered the ANZPRB (Analyze Problem) command from a workstation.  The failing items for this error can be identified by running the complete ANZPRB command. The failing items are also in the problem log when the WRKPRB command is entered.
FI00615	FI00615 indicates that the twinaxial workstation attachment cable is the failing item.  Check the twinaxial workstation attachment cable for the part number.
FI00616	FI00616 indicates that the 5259 migration data link is the failing item.  Exchange the 5259 migration data link.
FI00626	FI00626 indicates that the modem on the failing port is the failing item.  Exchange the modem.
FI00630	FI00630 indicates that the multi-line communications IOP is the failing item.  Use the IOP type to determine the part.
FI00631	FI00631 indicates that a cable other than the cable from the workstation IOA to the first device is the failing item.
FI00632	FI00632 indicates that the cable from the workstation IOA to the first device is the failing item.

Failing item code	Description/Action
FI00700	FI00700 indicates that the remote data terminal equipment (DTE) or an attached device is the failing item.  Report this problem to the operator of the remote equipment.
FI00701	FI00701 indicates that a local communications cable is the failing item.  Use the cable to determine the part.
FI00702	FI00702 indicates that the local cable for the automatic call unit is the failing item.  Check the automatic call unit interface cable for the part number.
FI00703	FI00703 indicates that the automatic call unit is the failing item.
FI00704	FI00704 indicates that the local data circuit-terminating equipment (DCE) is the failing item.
FI00705	FI00705 indicates that the remote data circuit-terminating equipment (DCE) is the failing item.  Report this problem to the operator of the remote equipment.
FI00708	FI00708 indicates that the local communications cable (X.21 interface) is the failing item.  Check the communications cable for the part number.
FI00709	FI00709 indicates that the local communications cable (V.35 interface) is the failing item.  Check the communications cable for the part number.
FI00710	FI00710 indicates that the local communications cable (V.24 interface with remote power on) is the failing item.  The remote power-on feature is given support by using an available pin on the EIA-232/V.24 enhanced or EIA-232/V.24 non-enhanced cables. Check the communications cable for the part number.
FI00711	FI00711 indicates that the local communications cable (token-ring interface cable) is the failing item. <b>Note:</b> An IBM Cabling System Patch Cable or a comparable cable may have been supplied by the user to increase the length of this cable. Any cable attached to the token-ring interface cable may also be the failing item.
FI00712	FI00712 indicates that the token-ring access unit is the failing item.
FI00716	FI00716 indicates that the EIA-232/V.24 enhanced cable is the failing item.  Check the communications cable for the part number.
FI00717	FI00717 indicates that the EIA-232/V.24 non-enhanced cable is the failing item.  Check the communications cable for the part number.
FI00718	FI00718 indicates that an IOP card is the failing item.  Use the IOP type to determine the part.

Failing item code	Description/Action
FI00719	<p>FI00719 indicates that an IOA card is the failing item.</p> <ol style="list-style-type: none"> <li>Is the IOA location information available in the Service Action Log entry, Hardware Service Manager (HSM), or in Service Focal Point on the Hardware Management Console? <ul style="list-style-type: none"> <li><b>Yes:</b> Exchange the IOA. See Finding part locations for the model you are working on and get the type from the card at that location. Use the type to look up the part number in System parts. The part locations table provides a link to the correct failing item remove and replace procedure.</li> <li><b>No:</b> Continue with the next step.</li> </ul> </li> <li>Determine the address of the IOA card. See System reference code (SRC) address formats.</li> <li>Determine the location of the IOA card. See Finding part locations for the model you are working on and get the type from the card at that address.</li> <li>Use the type to look up the part number in System parts. The part locations table provides a link to the correct failing item remove and replace procedure.</li> </ol>
FI00720	<p>FI00720 indicates that the Ethernet transceiver is the failing item.</p> <p>Verify that the signal quality error switch in the transceiver that the Ethernet is attached to is set to active.</p> <p>See the transceiver operator's guide for the correct operation or the correct remove and replace procedure.</p>
FI00721	<p>FI00721 indicates that the token-ring IOA card is the failing item.</p> <p>Use the IOA type to determine the part.</p>
FI00722	<p>FI00722 indicates that the cable attached to the local area network IOA is the failing item.</p>
FI00723	<p>FI00723 indicates that the communications two-port adapter cable for the communications IOA card is the failing item.</p> <p>Exchange the communications two-port adapter cable.</p> <p>If this does not correct the problem, use the IOA type to determine the part.</p>
FI00725	<p>FI00725 indicates that the Ethernet IOA card is the failing item.</p> <p>Use the IOA type to determine the part.</p>
FI00726	<p>FI00726 indicates that a communications IOA card is the failing item:</p> <p>Use the IOA type to determine the part.</p>
FI00727	<p>FI00727 indicates that one of the IOAs attached to either a combined x function I/O processor (CFIOP), multiline communications IOP or an Integrated xSeries Server (IXS) for iSeries server is the failing item.</p> <p>Perform "MABIP06" on page 96 to isolate the failing IOA.</p>
FI00728	<p>FI00728 indicates that the local communications cable (RS449/V.36 interface) is the failing item.</p> <p>Check the communications cable for the part number.</p>
FI00730	<p>FI00730 indicates that the Licensed Internal Code module for an I/O card may be the failing item.</p> <p>Ask your next level of support for assistance.</p>
FI00731	<p>FI00731 is not supported on these models. Continue with the next FRU in the list.</p>
FI00732	<p>FI00732 is not supported on these models. Continue with the next FRU in the list.</p>
FI00733	<p>FI00733 is not supported on these models. Continue with the next FRU in the list.</p>


Failing item code	Description/Action
FI00734	FI00734 is not supported on these models. Continue with the next FRU in the list.
FI00735	FI00735 is not supported on these models. Continue with the next FRU in the list.
FI00741	FI00741 indicates that the telephone cable to the wall outlet is the failing item. Check the cable for the part number.
FI00742	FI00742 indicates that the communications coupler is the failing item. Check the coupler for the part number.
FI00751	FI00751 indicates that the Licensed Internal Code module is the failing item. Ask your next level of support for assistance.
FI00810	FI00810 indicates that the magnetic tape is the failing item. Exchange the magnetic tape.
FI00830	FI00830 indicates that the external signal cable is the failing item. See "EXTSCSI" on page 478 for cable part numbers.
FI00832	FI00832 indicates that the external signal cable is the failing item. See "EXTSCSI" on page 478 for cable part numbers.
FI00841	FI00841 indicates that the terminating plug for the attached device is the failing item. • For tape devices—see FI00880
FI00842	FI00842 indicates that the external signal cable for the attached device is the failing item. See symbolic FRU "EXTSCSI" on page 478.
FI00844	FI00844 indicates that the device controller for the attached device is the failing item. • For tape devices see FI00882.
FI00845	FI00845 indicates that the external signal cable is the failing item. See symbolic FRU "EXTSCSI" on page 478.
FI00850	FI00850 indicates that the interface cables attached to the tape IOP are the failing items.
FI00851	FI00851 indicates that the I/O device attached to the tape IOP is the failing item. Use the service information of the I/O device to continue analyzing the problem.
FI00856	FI00856 indicates that an active tape IOP is the failing item. Use the IOP type to determine the part.
FI00870	FI00870 indicates that a storage device is the failing item.  Use the device type to determine the part. If a device location is not listed in the Service Action Log entry or in Hardware Service Manager (HSM), then the failing device is either externally attached or the failing device may be part of an unsupported configuration.  <b>Note:</b> The 636x tape unit is located in the FC 5032 removable storage unit.

Failing item code	Description/Action
FI00871	<p>FI00871 indicates that the attached tape device is the failing item.</p> <p>For part number information, select the type number to go to the part number information in the System parts.</p> <ul style="list-style-type: none"> <li>• <b>3490</b> - External 1/2 inch cartridge drive: Refer to the device information to determine the part number to replace.</li> <li>• <b>3570</b> - External 3570 cartridge drive: Refer to the device information to determine the part number to replace.</li> <li>• <b>358x</b> - External Ultrium drive: Refer to the device service information to determine the part number to replace.</li> <li>• <b>3590</b>- External 1/2 cartridge tape drive: Refer to the device service information to determine the part number to replace.</li> <li>• <b>3592</b> - External 1/2 inch cartridge drive: Refer to the device service information to determine the part number to replace.</li> <li>• <b>4685</b> - VXA2 drive.</li> <li>• <b>6381</b> - Internal 1/4 inch cartridge drive with QIC-2GB (DC) on the door.</li> <li>• <b>6382</b> - Internal 1/4 inch cartridge drive with QIC-4GB (DC) on the door.</li> <li>• <b>6383</b> - Internal 1/4 inch cartridge drive with MLR1-S on the front cover. <i>Continued....</i></li> </ul>
FI00871	<p><i>Continued...</i></p> <p>FI00871 indicates that the attached tape device is the failing item.</p> <ul style="list-style-type: none"> <li>• <b>6384</b> - Internal 1/4 inch cartridge drive with SLR60 on the front cover.</li> <li>• <b>6386</b> - Internal 1/4 inch cartridge drive with MLR3 on the front cover.</li> <li>• <b>6387</b> - Internal 1/4 inch cartridge drive with SLR100 on the front cover.</li> <li>• <b>7207</b> Model 122 - External 1/4 inch cartridge drive with QIC-4GB-DC on the door.</li> <li>• <b>7208</b> - External 8mm tape drive; refer to the device service information to determine the part number(s) to replace.</li> <li>• <b>7239</b> Model 308 - External 1/4 inch cartridge tape library.</li> <li>• <b>9348</b> - External 1/2 inch reel tape unit. Is one of the following status codes displayed anywhere on the 9348 control panel? (x = any number) <ul style="list-style-type: none"> <li>- Exxx</li> <li>- Fxxx</li> <li>- ***xx</li> <li>- *****</li> </ul> <p style="margin-left: 40px;"><b>No:</b> Refer to the 9348 Service Information and use the "Running Diagnostic Tests" procedure to run Diagnostic Test 1. If the test fails, use the 9348 Service Information to determine the failing items.</p> <p style="margin-left: 40px;"><b>Yes:</b> Use the "Status Codes" section of the 9348 Service Information to determine the failing items.</p> </li> </ul>
FI00872	<p>FI00872 indicates that the interface is the failing item.</p> <ul style="list-style-type: none"> <li>• Internal device: See FI01140.</li> <li>• External device: See symbolic FRU "EXTSCSI" on page 478.</li> </ul>

Failing item code	Description/Action
FI00880	<p>FI00880 indicates that a terminating plug on the device bus to this IOP is the failing item.  <b>Note:</b> If the unit is a 9427, an internal terminating plug is used See the service information for the specific device.</p> <p>The following list shows the possible failing items:</p> <ul style="list-style-type: none"> <li>• Terminating plug for 2440 Tape Unit – part 79X3795</li> <li>• Terminating plug for 3490, 3570, 3590, and 7208 Model 342 Tape Units – part 61G8324</li> <li>• SCSI differential terminating plug for 3995 iSeries<sup>(TM)</sup> Optical Library Dataserver – part 79X3795</li> <li>• SCSI single-ended terminating plug for 3995 iSeries<sup>(TM)</sup> Optical Library Dataserver Models C4x – part 34H5608</li> <li>• Terminator for 637x, 638x, and 6390 Tape Units – Terminator is part of the disk unit backplane. Use the IOA type and see the symbolic FRU“DEVTERM” on page 472 to determine the correct part.</li> <li>• Terminating plug for 63A0 Tape Unit – See device documentation.</li> <li>• Terminating plug for 7208 Model 002 Tape Drive – part 91F0721</li> <li>• Terminating plug for 7208 Model 012 Tape Drive – part 46G2599</li> <li>• Terminating plug for 7208 Model 222 Tape Drive – part 46G2599</li> <li>• Terminating plug for 7208 Model 232 Tape Drive – part 79X3795</li> <li>• Terminating plug for 7208 Model 234 Tape Drive – part 79X3795</li> <li>• Terminating plug for 9348 Tape Unit – part 79X3795</li> </ul>
FI00882	<p>FI00882 indicates that the addressed unit is the failing item.</p> <p>Determine the address and type of the failing unit System reference code (SRC) address formats.</p> <p>If one of the following device types is the failing item, see the service information for the device model installed on the system: * 2440 * 3490 * 3570 * 3590 * 3995 * 63A0 * 7208 * 9347* 9348 * 9427.</p>
FI00883	<p>FI00883 indicates that a unit attached to the same IOP, other than the addressed unit identified by FI00882, is the failing item.</p>
FI00884	<p>FI00884 indicates that any unit attached to the IOP may be the failing item.</p> <p>See FI00882 for the list of possible units.</p>
FI01040	<p>FI01040 indicates that you have an OptiConnect system, and the error is on an iSeries<sup>(TM)</sup> server that is connected to it.</p>
FI01101	<p>FI01101 indicates that the addressed IOA card on the I/O processor is the failing item.</p> <p>Perform the following:</p> <ol style="list-style-type: none"> <li>1. Determine the address of the IOA card. See System reference code (SRC) address formats.</li> <li>2. Determine the location of the IOA card. See Finding part locations.</li> <li>3. Exchange the failing device. Use the device type to determine the part.</li> </ol>
FI01103	<p>FI01103 and FI01104 indicate that an attached IOA card is the failing item.</p> <p>Perform “MABIP06” on page 96 to isolate the failing IOA.</p>
FI01104	<p>See FI01103.</p>

Failing item code	Description/Action
FI01105	<p>FI01105 indicates that the addressed storage device is the failing item.</p> <p>Perform the following steps:</p> <ol style="list-style-type: none"> <li>Is the device location information available in the Service Action Log? <ul style="list-style-type: none"> <li><b>No:</b> Continue with the next step.</li> <li><b>Yes:</b> Exchange the failing item. See Disk unit recovery procedures.</li> </ul> </li> <li>Find the IOP address and the device address. See System reference code (SRC) address formats.</li> <li>To determine the location of the I/O processor card, see Finding part locations and find the diagram of the system. Then find: <ul style="list-style-type: none"> <li>The IOP card location identified by the direct select address.</li> <li>The addressed storage device location identified by the device address.</li> </ul> </li> <li>Exchange the failing device. Use the device type to determine the part.</li> </ol>
FI01106	<p>FI01106 indicates that a storage device other than the addressed storage device is the failing item.</p> <ol style="list-style-type: none"> <li>See FI01105 to find the addressed device. The failing item could be any device with the same IOP address and I/O (SCSI) bus number but with a different device unit number.</li> <li>If the reference code that called out this failing item does not have a problem analysis procedure, perform "IOPIP16" on page 222 to isolate the possible failing device.</li> </ol>
FI01107	<p>FI01107 indicates that any storage device attached to the I/O (SCSI) bus of this IOP may be the failing item.</p> <p>Perform the following:</p> <ol style="list-style-type: none"> <li>Find the IOP address. See System reference code (SRC) address formats.</li> <li>To determine the location of the I/O processor card, see Finding part locations. The unit reference code indicates the I/O (SCSI) bus that has the problem: <ul style="list-style-type: none"> <li>URC 3020, 3100 – I/O Bus 0</li> <li>URC 3021, 3101 – I/O Bus 1</li> <li>URC 3022, 3102 – I/O Bus 2</li> <li>URC 3023, 3103 – I/O Bus 3</li> <li>Any Other URC – Any I/O bus on the I/O card</li> </ul> </li> <li>See Finding part locations to find the diagram of the system unit or the expansion unit and find: <ul style="list-style-type: none"> <li>The IOP card location identified by the direct select address.</li> <li>All the storage devices on the same I/O (SCSI) bus. <ul style="list-style-type: none"> <li><b>Note:</b> The I/O (SCSI) bus number is the first character of the device unit address.</li> </ul> </li> </ul> </li> <li>Exchange the failing device. Use the device type to determine the part.</li> <li>If the reference code that called out this failing item does not have a problem analysis procedure, perform "IOPIP16" on page 222 to isolate the possible failing device.</li> </ol>
FI01108	<p>FI01108 indicates that the I/O (SCSI) bus or power cable is the failing item.</p> <p>See FI01140 and FI01141.</p>
FI01109	<p>A backplane or a connection to the backplane may be failing.</p> <p>See the symbolic FRU "BACKPLN" on page 458.</p>
FI01110	<p>FI01110 indicates that the diskette unit is the failing item.</p> <p>Use the diskette device type to determine the part.</p>



Failing item code	Description/Action
FI01112	<p>FI01112 indicates that the active IOP is the failing item.</p> <p>Perform the following steps:</p> <ol style="list-style-type: none"> <li>1. Find the IOP address. See System reference code (SRC) address formats.</li> <li>2. To determine the location of the I/O processor card, see Finding part locations.</li> <li>3. Use the IOP type to determine the part.</li> </ol>
FI01117	<p>FI01117 indicates that any IOA, card, cable, or device attached to the IOP may be the failing item.</p> <ol style="list-style-type: none"> <li>1. Find the IOP address. See System reference code (SRC) address formats.</li> <li>2. To determine the location of the I/O processor card, see Finding part locations.</li> <li>3. Identify the IOAs, cards, cables, and devices attached to the IOP found in the preceding steps.</li> <li>4. Exchange the IOAs, cards, cables, and devices attached to the IOP one at a time until you have corrected the problem.</li> </ol>
FI01119	See symbolic FRU (BACKPLN).
FI01121	FI01121 is not supported on these models. Continue with the next FRU in the list.
FI01130	<p>For Models 270 and 820: FI01130 indicates that the disk drive and logic card is the failing item.</p> <p>Find the disk unit type number in the (Type, model, and part number list) to determine the part number.</p> <p>For Models 830, 840, SB2, and SB3: This failing item is in a migrated tower. See the failing item table for this failing item in the <i>(Analysis, Repair and Parts)</i> manual on the V5R1 Supplemental Manuals web site</p> 
FI01131	FI01131 is not supported on these models. Continue with the next FRU in the list.
FI01132	FI01132 is not supported on these models. Continue with the next FRU in the list.
FI01140	<p>FI01140 indicates that the I/O (SCSI) bus cable is the failing item.</p> <p>Perform the following steps:</p> <ol style="list-style-type: none"> <li>1. Are there external devices attached? <ul style="list-style-type: none"> <li><b>No:</b> Continue with the next step.</li> <li><b>Yes:</b> Choose from the following options: <ul style="list-style-type: none"> <li>– For SCSI attached external devices, see “EXTSCSI” on page 478.</li> <li>– For Fibre Channel attached external devices, see “FCCABLE” on page 480.</li> </ul> </li> </ul> </li> <li>2. Find the IOP address. See System reference code (SRC) address formats.</li> <li>3. To determine the location of the I/O processor card, see Finding part locations.</li> <li>4. Exchange the failing item associated with the IOP address. <p><b>Note:</b> Any of the SCSI cables or backplanes between the IOA and the device could be the failing item. See Cables.</p> </li> </ol>

Failing item code	Description/Action
FI01141	<p>FI01141 indicates that a loss of power to an IOP, to an internal device, or to an external device may have occurred.</p> <ol style="list-style-type: none"> <li>1. Are 0000 xxxx, 1xxx xxxx, or A6xx 698x SRCs displayed on the control panel? <ul style="list-style-type: none"> <li><b>No:</b> Continue with the next step.</li> <li><b>Yes:</b> Go to the Reference codestopic and use the SRC displayed on the control panel.</li> </ul> </li> <li>2. Did the SRC that directed you to this FI code involve an externally attached device or an IOP with an externally attached device? <ul style="list-style-type: none"> <li><b>No:</b> Continue with the next step.</li> <li><b>Yes:</b> Verify that there is no obvious problem with power to the device. If you suspect a power problem with the device, go to the service information for that external device.</li> </ul> </li> <li>3. The power supply cables or connections to internal disk units, tape units, diskette units, or optical storage units may be the failing item. <ul style="list-style-type: none"> <li>• For cable information, see Cables.</li> <li>• For part numbers, see the System parts.</li> </ul> </li> </ol>
FI01201	<p>FI01201, FI01202, and FI01203 indicates that the disk drive and logic card is the failing item. Find the disk unit type number in the (Type, model, and part number list) to determine the part number.</p>
FI01202	See FI01201.
FI01203	See FI01201.
FI02092	See FI00092.
FI02112	<p>FI02112 indicates that the addressed storage device is the failing item.</p> <p>Perform the following steps:</p> <ol style="list-style-type: none"> <li>1. Is the device location information available in the Service Action Log? <ul style="list-style-type: none"> <li><b>No:</b> Continue with the next step.</li> <li><b>Yes:</b> Exchange the failing item. See Disk unit recovery procedures.</li> </ul> </li> <li>2. Find the IOP address and the device address. See System reference code (SRC) address formats.</li> <li>3. To determine the location of the I/O processor card, see the Finding part locations and find the diagram of the system unit or the expansion unit. Then, find: <ul style="list-style-type: none"> <li>• The IOP card location identified by the direct select address.</li> <li>• The addressed storage device location identified by the device address.</li> </ul> </li> <li>4. Exchange the failing device. Use the device type to determine the part.</li> </ol>

## Symbolic FRUs

### DANGER

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn everything OFF (unless instructed otherwise).
2. Remove power cords from the outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

To Connect:

1. Turn everything OFF (unless instructed otherwise)
2. Attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

(D005)

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## Z

### **ACMODUL**

An ac module or power supply may be failing. This procedure will help you determine the failing part. If the system powers on normally, or stays powered on after an ac power failure, no replacement of parts may be needed.

Find the model and/or expansion unit in the table below. The link to locations information will provide you with all of the information you will need to replace the appropriate part.

**Attention:** On dual line cord units, “PWR1911” on page 181 must be performed before replacing any parts.

Model or expansion unit	Failing part(s)	Link to locations
Model 520	Power supply 1 Power supply 2	Locations — Model 520
Models 550 and 9124-720	Power supply 1 Power supply 2	Locations — Model 550 and 9124-720
Model 570	Power supply 1 Power supply 2	Locations — Model 570
Models 590 and 595		Go to “PWR1912” on page 186.
5074 and 5079 (single line cord)	Power supply 1 Power supply 2 Power supply 3	Locations — 5074, 8079-002, and 8093-002 expansion units or Locations — 5079 expansion unit
5074 and 5079 (dual line cord)	Power supply 1 Power supply 2 AC module 1 AC module 2	
5088 and 0588	Power supply 1 Power supply 2	Locations — 0588 and 5088 expansion units
5094	Power supply 1 Power supply 2 Power supply 3 Power supply 4 AC module 1 AC module 2	Locations — 5094, 5294, and 8094-002 expansion units
5095 and 0595	Power supply 1 Power supply 2	Locations — 0595 and 5095 expansion units
D10, D11, D20, 5790	Power supply 1 Power supply 2	Locations — 7311-D10 7311-D11 and 5790 expansion unit or Locations — 7311-D20 expansion unit

**This ends the procedure.**

## AIRMOVR

A fan may be failing. Before replacing any field replaceable units (FRUs), verify that all cables are seated correctly.

Use the following tables to determine the failing fan. Then, see Finding part locations for the model you are working on to determine the location of the failing item, information on the part number, and a link to the removal and replacement procedure.

*Table 32. For Model 520*

Unit reference code	FRU
7610, 7611	A1
7620, 7621	A2
7630, 7631	A3

*Table 33. For Model 550 and 9124-720*

Unit reference code	FRU
7610, 7611	A3

Table 33. For Model 550 and 9124-720 (continued)

Unit reference code	FRU
7620, 7621	A4
7630, 7631	A2
7640, 7641	A1

Table 34. For Model 570

Unit reference code	FRU
7610, 7611	A1
7620, 7621	A2

Table 35. For 5074, 5079, 5094, 5294 expansion units

Unit reference code	FRU
7610, 7611	B01
7620, 7621	B02

Table 36. For 5088 and 0588 expansion units

Unit reference code	FRU
7610, 7611, 7620, 7621	B02 Cable fan controller card BB1
7630, 7631, 7640, 7641	B01 Cable fan controller card BB1

Table 37. For 5095 expansion unit

Unit reference code	FRU
7610, 7611	B01
7620, 7621	B02
7630, 7631	B03
7640, 7641	B04

Table 38. For D10, 7311-D11, and 5790 expansion units

Unit reference code	FRU
7650, 7651	A5

Table 39. For D20 expansion unit

Unit reference code	FRU
7610, 7611	A1
7620, 7621	A2
7630, 7631	A3
7640, 7641	A4

This ends the procedure.

**AJDGP01**

Licensed Internal Code is the failing item. Look for PTFs associated with the reference code and have the customer apply them.

**AJDG301**

Licensed Internal Code is the failing item. Look for PTFs associated with the reference code and have the customer apply them.

**AJEDA00**

Licensed Internal Code is the failing item. Look for PTFs associated with the reference code and have the customer apply them.

**AJEGP01**

Licensed Internal Code is the failing item. Look for PTFs associated with the reference code and have the customer apply them.

**AJEQU00**

Licensed Internal Code is the failing item. Look for PTFs associated with the reference code and have the customer apply them.

**AJGAM01**

Licensed Internal Code is the failing item. Look for PTFs associated with the reference code and have the customer apply them.

**AJGDF01**

Licensed Internal Code is the failing item. Look for PTFs associated with the reference code and have the customer apply them.

**AJGFN00**

Licensed Internal Code is the failing item. Look for PTFs associated with the reference code and have the customer apply them.

**AJGJQ01**

Licensed Internal Code is the failing item. Look for PTFs associated with the reference code and have the customer apply them.

**AJGLD01**

Licensed Internal Code is the failing item. Look for PTFs associated with the reference code and have the customer apply them.

**AJGJ601**

Licensed Internal Code is the failing item. Look for PTFs associated with the reference code and have the customer apply them.

**AJGW701**

Licensed Internal Code is the failing item. Look for PTFs associated with the reference code and have the customer apply them.

**AJLAF01**

Licensed Internal Code is the failing item. Look for PTFs associated with the reference code and have the customer apply them.

**AJLAG01**

Licensed Internal Code is the failing item. Look for PTFs associated with the reference code and have the customer apply them.

## AJLYC01

Licensed Internal Code is the failing item. Look for PTFs associated with the reference code and have the customer apply them.

## AJLYD01

Licensed Internal Code is the failing item. Look for PTFs associated with the reference code and have the customer apply them.

## AJSDJ01

Licensed Internal Code is the failing item. Look for PTFs associated with the reference code and have the customer apply them.

## ALTMANL

An Integrated xSeries server (IXS) for iSeries service call may be needed to fix the problem on the IXS.

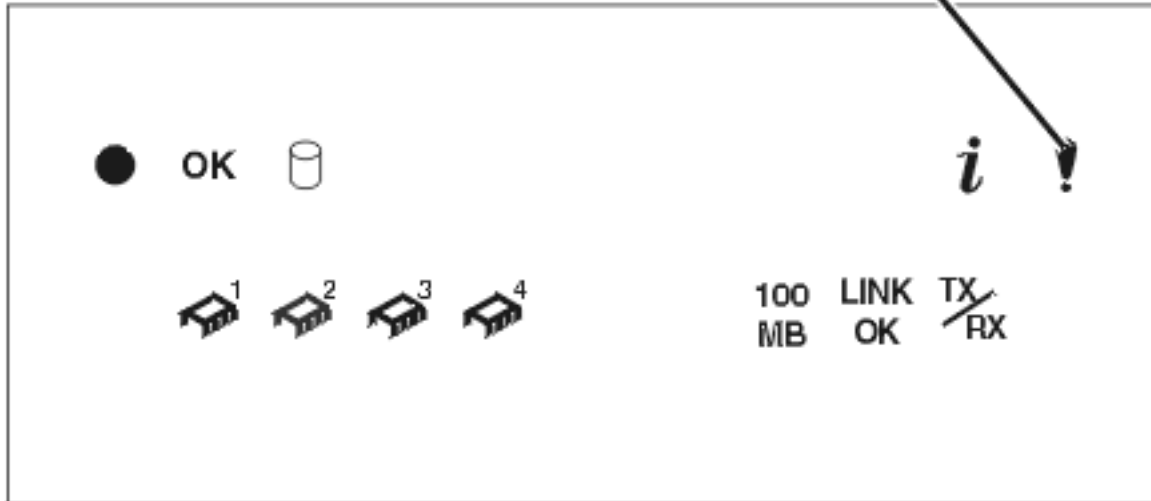
**Note:** An error condition is indicated by the blinking frame ID on the IXS card. When an error occurs, it can take up to ten minutes for the frame ID to start blinking, and up to one minute (after the error is reset) for the frame ID to stop blinking.

Use the following table to find instructions for the reference code you are experiencing.

*Table 40. IXS reference codes and instructions*

Reference code	Instructions
1xxx-8910	<p>Check the system error light (amber exclamation point, see figure below) on the IXS panel.</p> <ul style="list-style-type: none"><li>• If the system error light is on, call the customer's IXS service provider.</li><li>• If the system error light is not on, see "TWRCARD" on page 549.</li></ul> <p><b>Note:</b> Removal of the ac line cord on the IXS unit is required to reset the flashing frame-indicating LEDs on the tower card.</p>
1xxx-8920	<p>Call the customer's IXS service provider.</p> <p><b>Note:</b> Removal of the AC line cord on the IXS unit is required to reset the flashing frame-indicating LEDs on the tower card.</p>

## System error light



RZAQ4802-0

This ends the procedure.

### AMBTEMP

A processor (critical/warning) over-temperature fault has occurred. Perform the following procedure.

1. Is the room ambient temperature within normal range (less than 35 degrees C or 95 degrees F)?
  - No:** Notify the customer. The customer must bring the room temperature within normal range.
  - Yes:** Continue with the next step.
2. Are the system front and rear doors free of obstructions?
  - No:** Notify the customer. The system must be free of obstructions for proper air flow.
  - Yes:** Continue with the next step.
3. Do all the positions in the processor subsystem contain processors or fillers?
  - Yes:** Continue with the next step.
  - No:** Fill any open positions with processors or fillers. Then go to Verifying the repair. **This ends the procedure.**
4. Do all the power supply positions contain power supplies or fan books?
  - Yes:** Continue with the next step.
  - No:** Fill any open positions with supplies or fan books. Then go to Verifying the repair. **This ends the procedure.**
5. Perform the following:
  - **For models 520, 9124-720, and 550,** exchange the control panel (see “CTLPNL” on page 471). Then continue with the next step.
  - **For Model 570,** exchange processor 1 and processor 2, one at a time, until either the problem is resolved or you have replaced both processors (see Finding part locations). Then continue with the next step.
6. After each FRU is exchanged, is the error code that sent you to this procedure still reported?
  - No:** The problem has been corrected. Go to Verifying the repair. **This ends the procedure.**
  - Yes:** Replace the next FRU on the list. If all FRUs on the list have been replaced, call your next level of support. **This ends the procedure.**

## ANYBRDG

Find the location of the card reporting the problem and its corresponding PCI bridge set. Any cable, card, or card enclosure—not necessarily the card that reported the problem—connected to the PCI bridge set may be causing the problem.

## ANYBUS

Any cable, card, or card enclosure may be causing an IOP-detected bus error, although the IOP that is reporting the problem may not be causing the problem.

## ANYFC

Any IOA, hub, gateway, or device attached to the same Fibre Channel interface may be failing.

## ANYPROC

The failing component is one of the system processors. Use the table below to determine what FRU to replace and how to replace it.

**Note:** To simplify this information, secondary units on the 570 server are numbered 1 through 3—secondary unit 1 being nearest to the primary unit and secondary unit 3 being furthest.

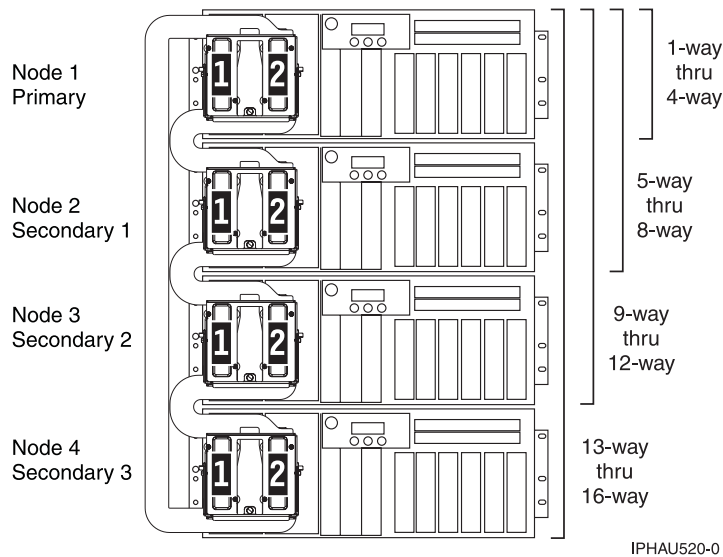


Table 41. ANYPROC failing components

System model	Name of symbolic FRU to locate	FRU name (replace in order, one at a time)	Link to locations information
520	ANYPROC	System backplane	Locations — Model 520
550 and 9124-720	ANYPROC	Processor card 1 Processor card 2	Locations — 9124-720 and Model 550
570	ANYPROC	For each unit, starting with the primary unit and then the secondary units: Processor card 1 Processor card 2	Locations — Model 570
590 and 595	ANYPROC	For each node, starting with node 0: MCM 0 MCM 1	Locations — model 590 and 595

This ends the procedure.

## AS4NTDD

The Windows NT® server application processor device driver may be causing the problem. Refer to Windows® environment on iSeries in the iSeries information center, or contact your next level of support for assistance.

## BACKPLN

A backplane or a connection to the backplane may be failing. Use this procedure to identify which backplane may be failing.

**Note:** Before replacing any parts, verify the connections to the backplane.

1. Were you sent here by a power reference code (1xxx xxxx)?

**No:** Continue with the next step.

**Yes:** Go to “SYSBKPL” on page 547. **This ends the procedure.**

2. Determine the location of the device by performing the following:
  - a. Use the location information in the error log if it is available. If no location information for the device is available, use the location information for the I/O adapter instead.
  - b. If no location information is available for either the device or the I/O adapter, find the address of the device or I/O adapter (see System reference code (SRC) address formats). Use the address to find the location (see Finding part locations).
  - c. Use Cables to locate the device, cable, and backplane. Any backplane connecting the device or I/O adapter may be the cause of the problem. For backplane part numbers and remove and replace procedures, see Finding part locations.

**This ends the procedure.**

## BATCHGR

A battery power unit charger is the failing item. Exchange the battery power unit charger. See Part number catalog.

**Note:** When a part number is displayed on the control panel of a system or expansion unit, replace that part first.

**This ends the procedure.**

## BATRY

The battery may be the failing item.

**Note:** When a part number is displayed on the control panel of a system or expansion unit, replace that part first.

The failing battery is in a 5074 or 5079 expansion I/O tower. The battery includes all four battery power units. See Finding part locations before exchanging the battery.

**This ends the procedure.**

## BRDGSET

The multi-adapter bridge hardware is having a problem with one or more PCI cards or adapters in the PCI bridge set, but the exact card or adapter cannot be identified. The problem may be with a card, a card slot, or an embedded adapter. The PCI bridge set is indicated by the Direct Select Address (DSA) in word 7 of the reference code. This symbolic FRU only appears in the serviceable event user interface when the LIC could not determine which PCI bridge set has the problem.

1. Are you working from a serviceable event user interface of an operating system, service processor, or the HMC that is giving you a card position or list of card positions for this FRU?

**Yes:** Go to step 5 on page 459.



**Note:** When there is a list of locations in this FRU's location code, the card locations will be separated by commas. A range of card positions will show the starting card position, a colon, and the ending card position.

**No:** Perform the following:

- Determine the location of the cards in the group using the DSA. Record the DSA (word 7 of the reference code) from the user interface you are using.
- Locate the card(s) specified in the DSA by going to “MABIP53” on page 105. Return here and continue with the next step after locating the card(s).

2. Did “MABIP53” on page 105 identify a single card location?

**Yes:** This is the location of the failing item. Go to step 5.

**No:** Perform the following (refer to Removing and replacing parts and the table below):

- a. Remove all of the adapter and/or IOP cards in the locations that are identified in the given range of card slots. Do not remove any FRUs with embedded adapters, only FRUs in PCI card slots.
- b. Replace each card one at a time.

**Note:** For i5/OS adapters controlled by IOPs, replace the IOP before any of the adapters. Power on the unit after you replace each card until either the problem reappears or you have replaced each card. Then continue with the next step.

3. Did the problem reappear?

**Yes:** The last card that you replaced before the problem reappeared is the failing item. **This ends the procedure.**

**No:** Continue with the next step.

4. Did “MABIP53” on page 105 identify a FRU with embedded adapters?

**Yes:** The problem is in the FRU with the embedded adapter. Continue with the next step and exchange that FRU using the following table to link to the service information for that FRU.

**No:** The problem may be intermittent. Contact your next level of support. **This ends the procedure.**

5. Use the links in the following table to locate and replace the failing item(s).

*Table 42. Failing items for symbolic FRU BRDGSET*

Model, expansion unit, or machine type	Symbolic FRU to locate	Link to locations information
520	BRDGSET	Locations — model 520
550 and 9124-720	BRDGSET	Locations — 9124-720 and model 550
570	BRDGSET for correct system unit (the primary or a secondary)	Locations — model 570
5074, 8079-002, 8093-002	BRDGSET	Locations — 5074, 8079-002, and 8093-002 expansion units
5079	BRDGSET	Locations — 5079 expansion unit
5088, 0588	BRDGSET	Locations — 5088 and 0588 expansion units
5094, 5294, 8094-002	BRDGSET	Locations — 5094, 5294, and 8094-002 expansion units
5095, 0595	BRDGSET	Locations — 5095 and 0595 expansion units
Type 1519 — external xSeries server	BRDGSET	Locations — Integrated xSeries adapter card (IXA)

Table 42. Failing items for symbolic FRU BRDGSET (continued)

Model, expansion unit, or machine type	Symbolic FRU to locate	Link to locations information
7311-D10, 7311-D11, and 5790	BRDGSET	Locations — 7311-D10, 7311-D11, and 5790 expansion units
7311-D20	BRDGSET	Locations — 7311-D20 expansion unit
5791, 5794, and 7040-61D	BRDGSET	Locations — 5791, 5794, and 7040-61D expansion units

**This ends the procedure.**

## BRDGST1

The multi-adapter bridge hardware is having a problem with one or more PCI cards or adapters in the first PCI bridge set in the enclosure, but the exact card or adapter cannot be identified. The problem can be with a card, a card slot, or an embedded adapter. The PCI bridge set is indicated by the Direct Select Address (DSA) in word 7 of the reference code.

1. Are you working from a serviceable event user interface of an operating system, service processor, or the HMC and there is a card position or list of card positions given for this FRU?

**Yes:** Then the position(s) given is the location of the failing component(s). When there is a list of locations in this FRU's location code, the card locations will be separated by commas. A range of card positions will show the starting card position, a colon, and the ending card position. Go to step 5 on page 461.

**No:** Perform the following:

- a. Determine the location of the cards in the group using the DSA. Record the DSA, which is word 7 of the reference code, from the user interface you are using.
- b. Locate the card(s) specified in the DSA by going to "MABIP53" on page 105. Return here after locating the card or cards and continue with the next step.

2. Were you able to identify a single card position by performing "MABIP53" on page 105?

**Yes:** This is the location of the failing item. Go to step 5 on page 461.

**No:** Continue with the next step.

3. Perform the following, referring to the removal and replacement procedures for each FRU location you determined (you can find links to the locations information, and from there to the removal and replacement procedures, in the table at the end of this procedure):

- a. Remove all of the adapter and/or IOP cards in the locations that are identified in the given range of card slots. Do not remove any FRUs with embedded adapters, only FRUs in PCI card slots.
- b. Replace each card one at a time.

**Note:** For i5/OS adapters controlled by IOPs, replace the IOP before any of the adapters.

Power on the unit (as instructed in the removal and replacement procedure indicated by following the link in the following table) after you replace each card until either the problem reappears or you have replaced each card.

- c. Did the problem reappear?

**Yes:** The last card that you replaced before the problem appeared again is the failing item. **This ends the procedure.**

**No:** Continue with the next step.

4. Did you identify a FRU with embedded adapters when performing "MABIP53" on page 105?

**Yes:** The problem is in the FRU with the embedded adapter. Continue with the next step and exchange that FRU.

**No:** The problem may be intermittent. Contact your next level of support. **This ends the procedure.**

5. Use the links in the following table to locate and replace the failing item(s).

Table 43. Failing item for symbolic FRU BRDGST1

System model, expansion unit, or machine type	Symbolic FRU to locate	FRU name	Link to locations
520	BRDGST1	PCI bridge set 1	Locations — model 520
550 and 9124-720	BRDGST1	PCI bridge set 1	Locations — 9124-720 and model 550
570	BRDGST1	PCI bridge set 1 (for correct system unit)	Locations — model 570
5074, 8079-002, 8093-002	BRDGST1	PCI bridge set 1	Locations — 5074, 8079-002, and 8093-002 expansion units
5079	BRDGST1	PCI bridge set 1	Locations — 5079 expansion unit
5088, 0588	BRDGST1	PCI bridge set 1	Locations — 5088 and 0588 expansion units
5094, 5294, 8094-002	BRDGST1	PCI bridge set 1	Locations — 5094, 5294, and 8094-002 expansion units
5095, 0595	BRDGST1	PCI bridge set 1	Locations — 5095 and 0595 expansion units
Type 1519 — external xSeries server	BRDGST1	Follow RIO/HSL cable	Locations — Integrated xSeries adapter card (IXA)
7311-D10, 7311-D11, and 5790	BRDGST1	PCI bridge set 1	Locations — 7311-D10, 7311-D11, and 5790 expansion units
7311-D20	BRDGST1	PCI bridge set 1	Locations — 7311-D20 expansion unit
5791, 5794, and 7040-61D	BRDGST1	PCI bridge set 1 on backplane 1 (left side)	Locations — 5791, 5794, and 7040-61D expansion units
	BRDGST1	PCI bridge set 1 on backplane 2 (right side)	

## BRDGST2

BRDGST2: PCI I/O card group in the second PCI bridge set (middle adapter card range when there are three PCI bridge sets and high adapter card range when there are two PCI bridge sets), IOAs and/or IOPs.

The multi-adapter bridge hardware is having a problem with one or more PCI cards or adapters in the second PCI bridge set in the enclosure, but the exact card or adapter cannot be identified. The problem can be with a card, a card slot, or an embedded adapter. The PCI bridge set is indicated by the Direct Select Address (DSA) in word 7 of the reference code.

1. Are you working from a serviceable event user interface of an operating system, service processor, or the HMC and there is a card position or list of card positions given for this FRU?

**Yes:** Then the position(s) given is the location of the failing component(s). When there is a list of locations in this FRU's location code, the card locations will be separated by commas. A range of card positions will show the starting card position, a colon, and the ending card position. Go to step 5 on page 462.

**No:** Perform the following:

- a. Determine the location of the cards in the group using the DSA. Record the DSA, which is word 7 of the reference code, from the user interface you are using.
  - b. Locate the card(s) specified in the DSA by going to “MABIP53” on page 105. Return here after locating the card or cards and continue with the next step.
2. Were you able to identify a single card position by performing “MABIP53” on page 105?
- Yes:** This is the location of the failing item. Go to step 5.
- No:** Continue with the next step.
3. Perform the following, referring to the remove and replace procedures for each FRU location you determined (you can find links to the locations information, and from there to the remove and replace procedures, in the table at the end of this procedure):
- a. Remove all of the adapter and/or IOP cards in the locations that are identified in the given range of card slots. Do not remove any FRUs with embedded adapters, only FRUs in PCI card slots.
  - b. Replace each card one at a time.
- Note:** For i5/OS adapters controlled by IOPs, replace the IOP before any of the adapters. Power on the unit (as instructed in the remove and replace procedure indicated by following the link in the following table) after you replace each card until either the problem reappears or you have replaced each card.
- c. Did the problem reappear?
- Yes:** The last card that you replaced before the problem appeared again is the failing item. **This ends the procedure.**
- No:** Continue with the next step.
4. Did you identify a FRU with embedded adapters when performing “MABIP53” on page 105?
- Yes:** The problem is in the FRU with the embedded adapter. Continue with the next step and exchange that FRU.
- No:** The problem may be intermittent. Contact your next level of support. **This ends the procedure.**
5. Use the links in the table below to locate and replace the failing item(s).

Table 44. Failing item for symbolic FRU BRDGST2

System model, expansion unit, or machine type	Symbolic FRU to locate	FRU location	Link to locations
520	BRDGST2	PCI bridge set 2	Locations — model 520
550 and 9124-720	BRDGST2	PCI bridge set 2	Locations — 9124-720 and model 550
570	BRDGST2	PCI bridge set 2 for correct system unit (primary or secondary)	Locations — model 570
5074, 8079-002, 8093-002	BRDGST2	PCI bridge set 2	Locations — 5074, 8079-002, and 8093-002 expansion units
5079	BRDGST2	PCI bridge set 2	Locations — 5079 expansion unit
5088, 0588	BRDGST2	PCI bridge set 2	Locations — 5088 and 0588 expansion units
5094, 5294, 8094-002	BRDGST2	PCI bridge set 2	Locations — 5094, 5294, and 8094-002 expansion units
5095, 0595	BRDGST2	PCI bridge set 2	Locations — 5095 and 0595 expansion units

Table 44. Failing item for symbolic FRU BRDGST2 (continued)

System model, expansion unit, or machine type	Symbolic FRU to locate	FRU location	Link to locations
Type 1519 — external xSeries server	BRDGST2	Follow RIO/HSL cable	Locations — Integrated xSeries adapter card (IXA)
7311-D10, 7311-D11, and 5790	BRDGST2	PCI bridge set 2	Locations — 7311-D10 7311-D11 and 5790 expansion unit
7311-D20	BRDGST2	PCI bridge set 2	Locations — 7311-D20 expansion unit
5791, 5794, and 7040-61D	BRDGST2	PCI bridge set 2 on backplane 1 (left side)	Locations — 5791, 5794, and 7040-61D expansion unit
	BRDGST2	PCI bridge set 2 on backplane 2 (right side)	

This ends the procedure.

### BRDGST3

PCI I/O card group in the third PCI bridge set (highest adapter card range), IOAs and/or IOPs.

The multi-adapter bridge hardware is having a problem with one or more PCI cards or adapters in the third PCI bridge set in the enclosure, but the exact card or adapter cannot be identified. The problem can be with a card, a card slot, or an embedded adapter. The PCI bridge set is indicated by the Direct Select Address (DSA) in word 7 of the reference code.

1. Are you working from a serviceable event user interface of an operating system, service processor, or the HMC, and there is a card position or list of card positions given for this FRU?

**Yes:** Then the position(s) given is the location of the failing component(s). When there is a list of locations in this FRU's location code, the card locations will be separated by commas. A range of card positions will show the starting card position, a colon, and the ending card position. Go to step 5 on page 464.

**No:** Perform the following:

- a. Determine the location of the cards in the group using the DSA. Record the DSA, which is word 7 of the reference code, from the user interface you are using.
- b. Locate the card(s) specified in the DSA by going to "MABIP53" on page 105. Return here after locating the card or cards and continue with the next step.

2. Were you able to identify a single card position by performing "MABIP53" on page 105?

**Yes:** This is the location of the failing item. Go to step 5 on page 464.

**No:** Continue with the next step.

3. Perform the following, referring to the remove and replace procedures for each FRU location you determined (you can find links to the locations information, and from there to the remove and replace procedures, in the table at the end of this procedure):

- a. Remove all of the adapter and/or IOP cards in the locations that are identified in the given range of card slots. Do not remove any FRUs with embedded adapters, only FRUs in PCI card slots.
- b. Replace each card one at a time.

**Note:** For i5/OS adapters controlled by IOPs, replace the IOP before any of the adapters. Power on the unit (as instructed in the remove and replace procedure indicated by following the link in the following table) after you replace each card until either the problem reappears or you have replaced each card.

- c. Did the problem reappear?

**Yes:** The last card that you replaced before the problem appeared again is the failing item. **This ends the procedure.**

**No:** Continue with the next step.

- Did you identify a FRU with embedded adapters when performing “MABIP53” on page 105?

**Yes:** The problem is in the FRU with the embedded adapter. Continue with the next step and exchange that FRU.

**No:** The problem may be intermittent. Contact your next level of support. **This ends the procedure.**

- Use the links in the following table below to locate and replace the failing item(s).

*Table 45. Failing item for symbolic FRU BRDGST3*

System model, expansion unit, or machine type	Symbolic FRU to locate	FRU name	Link to locations
570	BRDGST3	PCI bridge set 3 (on primary or secondary unit)	Locations — Model 570
5074, 8079-002, 8093-002	BRDGST3	PCI bridge set 3	Locations — 5074, 8079-002, and 8093-002 expansion I/O units
5079	BRDGST3	PCI bridge set 3	Locations — 5079 expansion I/O unit
5088, 0588	BRDGST3	PCI bridge set 3	Locations — 5088 and 0588 expansion I/O units
5094, 5294, 8094-002	BRDGST3	PCI bridge set 3	Locations — 5094, 5294, and 8094-002 expansion I/O units
Type 1519 — external xSeries server	BRDGST3	Follow RIO/HSL cable	Locations — Integrated xSeries adapter card (IXA)
5791, 5794, and 7040-61D	BRDGST3 (left side)	PCI bridge set 3 on backplane 1	Locations — 5791, 5794, and 7040-61D expansion unit
	BRDGST3 (right side)	PCI bridge set 3 on backplane 2	

**This ends the procedure.**

## BPC

Use the following table to perform the appropriate action for the SRC you are working with.

SRC	Replace this FRU	Link to locations information
1xxx8720 or 1xxx8740	BPC A (front)	Locations — model 590 and 595
1xxx8721 or 1xxx8741	BPC B (rear)	

## BSTWRPL

This symbolic FRU is no longer supported.

## BUSVPD

This is the VPD (vital product data) for a PCI bus at the multi-adapter bridge end of the primary PCI bus.

- Are you working from the serviceable event view and a card location is listed with this failing item?

**Yes:** Then the error is at that card location. Continue with the next step.

**No:** Perform the following:

- a. Record the bus number value (BBBB) from word 7 of the reference code (see “Breaking down a RIO/HSL or PCI bus reference code” on page 61 for help in determining the bus number).
- b. Search for the bus number in the HMC’s or operating system’s resource and configuration interfaces, or in the system configuration listing, to determine which unit contains the failing item. Record the frame or unit type and then continue with the next step.

2. Use the following table to determine the appropriate service action.

Frame or unit containing the failing item	Go to this symbolic FRU
520	“SYSBKPL” on page 547
570	“SYSBKPL” on page 547
5074, 8079-002, 8093-002	“TWRPLNR” on page 550
5079	“TWRPLNR” on page 550
5088, 0588	“TWRPLNR” on page 550
5094, 5294, 8094-002	“TWRPLNR” on page 550
5095, 0595	“TWRBKPL” on page 549
External xSeries server	“SIADPCD” on page 532
5791, 5794, and 7040-61D	“TWRPLNR” on page 550
7311-D10, 7311-D11, and 5790	“TWRPLNR” on page 550
7311-D20	“TWRPLNR” on page 550

**This ends the procedure.**

## CABLEH

### DANGER

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn everything OFF (unless instructed otherwise).
2. Remove power cords from the outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

To Connect:

1. Turn everything OFF (unless instructed otherwise)
2. Attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

(D005)

Use the following table to perform the appropriate action for the SRC you are working with.

**Attention:** Before replacing any cables, ensure that the cables are properly routed and securely plugged.

SRC	Action	Link to locations information
1xxx1D04	Replace the cables between the front light strip and the service processors.	Locations — model 590 and 595
1xxx1D05	Replace the cables between the rear light strip and the service processors.	
1xxx8720	Replace the cables between the front BPC and the service processors.	
1xxx8721	Replace the cables between the rear BPC and the service processors.	
1xxx8731 1xxx8732 1xxx8733 1xxx8734	Replace the cables between both BPCs and the service processors.	



## CACHBAT

The cache battery pack may be failing.

1. Use the cache battery pack location information in the service action log (SAL) if it is available. If the location is not available, use the address of the storage IOA (see System reference code (SRC) address formats) to find the location (see Finding part locations).
2. Using the type number of the storage IOA at the location you found, go to Part number catalog to determine the cache battery pack part number.
3. To exchange the cache battery pack, see Replacing the cache battery pack on type 2748, 2757, 2763, 2778, 2782, 5703, 5709 cards. **This ends the procedure.**

## CACHE

This symbolic FRU is no longer supported.

## CAPACTY

The failing component is the VPD card. After the part has been replaced and before powering on the system, make sure the system vital product data is restored (see Programming vital product data); otherwise, the system will fail to IPL.

Use this table to identify and replace the VPD card.

System model	Name of symbolic FRU to locate	FRU name	Link to locations information
520	CAPACTY	VPD card	Locations — Model 520
550 and 9124-720	CAPACTY	VPD card	Locations — 9124-720 and Model 550
570	CAPACTY	VPD card (on the primary unit or any of the secondary units)	Locations — Model 570
590 and 595	CAPACTY	VPD card	Locations — model 590 and 595

## CARDFLT

Use the following table to perform the appropriate action for the SRC you are working with.

SRC	Replace this FRU	Link to locations information
1xxx1D00	Service processor 0	Locations — model 590 and 595
1xxx1D01	Service processor 1	
1xxx1D04 or 1xxx1D05	Try replacing each service processor, one at a time, until the problem is resolved.	
1xxx1D02	Oscillator 1	
1xxx1D03	Oscillator 2	
1xxx1D10	Multiplexer card	
1xxx1D11 through 1xxx1D18	Bus adapter <i>x</i> , where <i>x</i> is the final digit in the SRC (1xxx 1D1 <i>x</i> )	

## CARDTMP

The cryptographic adapter has detected a voltage and/or temperature change in its physical operating environment.

Correct the voltage and/or temperature condition. Vary off the cryptographic device description associated with the device resource on the adapter resource and vary it back on.

## **CBLALL**

A power cable may be the failing item.

When there is a location and part number displayed on the control panel of a system or expansion tower, replace that FRU first.

Perform the following to determine the part number of the failing part.

1. Is the reference code 1xxx 1502, 1512, 1522, or 1532?

**No:** Continue with the next step.

**Yes:** Exchange the following one at a time (see Finding part locations):

For 5088, 0588:

- SPCN cable PWRC03
- SPCN cable PWRC02
- Power distribution card

For D10, 7311-D11, 7311-D20, and 5790:

- SPCN cable
- I/O unit backplane

For all other units:

- SPCN cable
- Power distribution card

**This ends the procedure.**

2. Is the reference code 1xxx 4410, 4411, 4412, 4413, 4414, 4415, or 4417?

**No:** Continue with the next step.

**Yes:** Exchange the following one at a time (see Finding part locations):

- Cable from charger A01 to batteries T01–T04
- Cable from charger to power supply 1, 2, or 3

**This ends the procedure.**

3. Is the reference code 1xxx 2612, 9012, 9013, 90F0, 90F2, 9135, 9231, 9232, 9233, 9235, 9236, 9280, 9281, 9282, or C62E?

**No:** Continue with the next step.

**Yes:** The failing item is the SPCN frame-to-frame cable or adapter. The following list shows the possible failing items, and the cable or adapter lengths when appropriate (see Part number catalog):

- 6.0 meters
- 15.0 meters
- 30.0 meters
- 60.0 meters
- SPCN optical cable (100.0 meters)
- SPCN optical adapter
- SPCN port cable (frame-to-node)
- Integrated xSeries server SPCN-Y cable assembly

**This ends the procedure.**

4. Is the reference code 1xxx 2613?

**No:** Continue with the next step.

**Yes:** This configuration requires 220 V ac. Go to Determine line cord, plug, and receptacle type in the Planning topic to determine the power cable part number for systems in your country or region. **This ends the procedure.**

5. Is the reference code 1xxx 8940, 8941, 8942, or 8943?

**Yes:** Continue with the next step.

**No:** Go to step 8.

6. Reseat the RS-485 cable.

**Note:** It may take up to one minute for the frame ID to stop blinking.

Does this correct the problem?

**Yes: This ends the procedure.**

**No:** Continue with the next step.

7. Exchange the RS-485 cable assembly (see Part number catalog).

**Note:** It may take up to one minute for the frame ID to stop blinking.

Does this correct the problem?

**Yes: This ends the procedure.**

**No:** Call your integrated xSeries server (IXS) service provider. **This ends the procedure.**

8. Is the reference code 1xxx 9133?

**No:** Go to step 12.

**Yes:** Continue with the next step.

9. If an expansion unit's MTS is displayed in the location field, then that expansion unit was not detected on any RIO/HSL loop. The location code of the expansion unit in question may be available in word 6 of the SRC. Is the location code present in word 6?

**Yes:** Go to step 11.

**No:** Continue with the next step.

10. Verify that the expansion units are cabled correctly with both RIO/HSL cables and power network connections (see Finding part locations) and that they are powered on and not indicating an error condition. Resolve any problems you discover. Does the SRC persist?

**No: This ends the procedure.**

**Yes:** Continue with the next step.

11. There may be a problem in the power network connection. Check the error log for another 1xxxxxxx SRC that surfaced around the same time as the 9133 SRC. Is such an SRC present?

**No:** Contact your next level of support. **This ends the procedure.**

**Yes:** Return to "Start of call procedure" on page 2 and service the 1xxxxxxx SRC to resolve this problem. **This ends the procedure.**

12. Is the reference code 1xxx 9137?

**No:** Go to step 15 on page 470.

**Yes:** Continue with the next step.

13. Check the error log for a B700698x SRC that surfaced around the same time as the 9137 SRC. Is such an SRC present?

**No:** Continue with the next step.

**Yes:** Return to "Start of call procedure" on page 2 and service the B700698x SRC to resolve this problem. **This ends the procedure.**

14. Verify that the RIO/HSL cables are connected and seated correctly, and also verify that all of the expansion units are powered on and not indicating an error condition. If a problem is found during either of these checks, resolve that problem. If the SRC still prevails, contact your next level of support. **This ends the procedure.**

15. Is the reference code 1xxx 9138?

**No:** Return to “Start of call procedure” on page 2. **This ends the procedure.**

**Yes:** You have a faulty location code or vital product data. Call your next level of support. **This ends the procedure.**

## **CBLCONT**

This symbolic FRU is used to show additional locations for the endpoints of cables. This FRU appears in the serviceable event user interface of an operating system, service processor, or the HMC, and is associated with the cable FRU that precedes it in the list. The location code associated with this FRU is the location of another end of the same cable. Cable FRUs are shown in the display by listing the cable’s part number or symbolic FRU first with the location code of one end of the cable. Each additional cable endpoint is represented as a “CBLCONT” FRU with a location code for another endpoint.

**Note:** If question marks (???) appear at the end of the location code, then the port could not be determined. Use the location code associated with the other end of the cable. If question marks appear for both port locations, use the isolation procedures suggested in the Description/Action column of the reference code table for this SRC.

## **CDAWKLD**

Too many communications lines are in use.

## **CDTRAY**

This symbolic FRU is not supported.

## **CHECK**

If the attached device is an external device, do the following before exchanging any parts:

1. Ensure that the device is powered on.

2. Is there a SCSI interface between the IOP/IOA and the device?

**No:** Continue with the next step.

**Yes:** Perform the following:

- If an interposer is required, make sure that it is connected between the I/O processor and the SCSI cable.
- Ensure that the SCSI cable is seated correctly, and that there are no bent or damaged pins on the SCSI cable.
- Ensure that a terminating plug is attached to the device end of the SCSI cable.
- Continue with the next step.

3. Is there a Fibre Channel interface between the IOP/IOA and the device?

**No:** Continue with the next step.

**Yes:** Perform the following:

- Verify that any hub or gateway devices are powered on.
- Verify that the Fibre Channel cable is correctly connected to the ports.
- If a cleaning kit is available, clean the Fibre Channel cable connectors.
- Continue with the next step.

4. Perform the Verification procedures to see if the problem was corrected. **This ends the procedure.**

## **CLCKMOD**

The logic oscillator is failing. Use the table below to determine which FRU to replace and how to replace it.

System model	Name of symbolic FRU to locate	FRU name	Link to locations information
520	CLCKMOD	System backplane	Locations — Model 520
550 and 9124-720	CLCKMOD	System backplane	Locations — 9124-720 and Model 550
570	CLCKMOD	I/O backplane (on primary unit or one of the secondary units)	Locations — Model 570
590 and 595	CLCKMOD	Oscillator 1 Oscillator 2	Locations — model 590 and 595

This ends the procedure.

## CMPRES1

The compressed device and the compression IOA are not compatible.

## CRYPBAT

The batteries for the cryptographic adapter need to be replaced. Refer to Part number catalog for battery replacement kit part number information. Then go to Replacing the battery on a type 4758 card or Replacing the battery on a type 4764 card to replace the batteries.

**Attention:** If you remove any of the batteries without first backing up the power with a fresh battery, the data in the card's protected memory could be lost, which would render the cryptographic adapter useless and require its replacement. Because the 4758-023 adapter contains 4 batteries, and the battery replacement kit contains only 2 batteries, *do not* attempt to remove or replace batteries unless you have two battery replacement kits. All other cryptographic adapters contain only 2 batteries, and therefore require only one battery replacement kit.

## CTLPNCD

This symbolic FRU is not supported on the system. Continue with the next FRU in the failing item list.

## CTLPNL

A control panel or display panel may be failing. Go to Finding part locations to locate and exchange the control or display panel on the system or expansion unit you are working with.

## DCA

A DCA needs to be replaced. Use the following table to determine which DCA to replace, and then follow the link to locations information to find the appropriate removal information.

SRC	FRU to replace	Link to locations information
1xxx8710	DCA 00 on Node 0	Locations — model 590 and 595
1xxx8711	DCA 01 on Node 0	

## DEVBPLN

A device backplane may be failing. Replace the device backplane, using the device backplane information in the Service Action Log. See Finding part locations for location, part number, and removal and replacement procedure information.

## DEVICE

The addressed storage device is the failing item. Perform the following.

1. Is the device location information available in the Service Action Log (SAL)?

**No:** Continue with the next step.

**Yes:** Exchange the failing item (see Starting disk service).

2. Find the IOP address and the device address (see System reference code (SRC) address formats).
3. To determine the location of the I/O processor card, see Finding part locations and find the diagram of the system unit or the expansion unit. Then, find:
  - The IOP card location identified by the direct select address.
  - The addressed storage device location identified by the device address.
4. Exchange the failing device. Use the device type to determine the part. **This ends the procedure.**

## DEVTERM

The device terminating plug may be failing.

Perform the following.

1. Find the IOA type:
  - a. Find the IOA location information in the Service Action Log if it is available. If the location is not available, find the address of the IOA (see System reference code (SRC) address formats). Use the address to find the location (see Finding part locations).
  - b. Find the IOA card in the system and read the type number of the card at that location.
2. Use the information in the following list to determine the failing terminating plug:

Storage IOA type	Action
2749	For device types 3490, 3570, 3590, 3995, and 7208, see FI00880 in the Failing Item (FI) code table. For all other devices, use part 85F7887.
5702	Use part 19P0874.
All others	The terminator is integrated into the backplane and not a separate failing item.

3. Exchange the failing item.

**Note:** If the terminating plug is located on a backplane, go to symbolic FRU “BACKPLN” on page 458. Follow the procedure until the terminating plug is accessible and then remove or exchange the plug.

**This ends the procedure.**

## DIMM 0

Use this page to view the locations of DIMM 0, DIMM 1, DIMM 2, and DIMM 3 on the 2890 and 2892 Integrated xSeries Server (IXS) cards.

In both figures, the first DIMM from the top of the IXS card (DIMM 0) is the failing item. To determine the part number, go to symbolic FRU "MEMORY" on page 514. **This ends the procedure.**

Figure 3. Locations of DIMM 0, DIMM 1, DIMM 2, and DIMM 3 on 2890 Integrated xSeries Server (IXS) card.

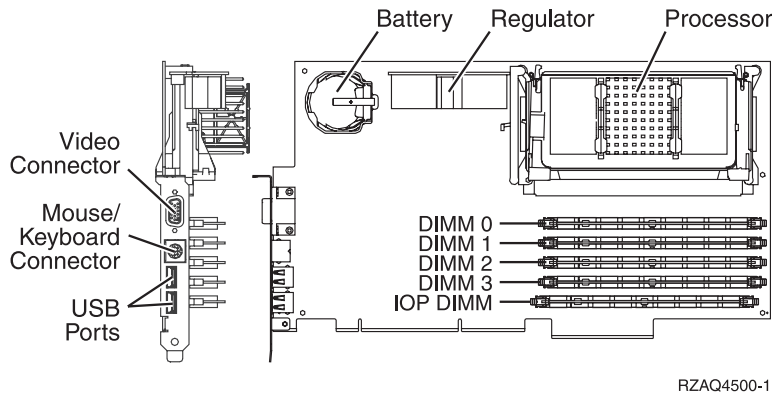
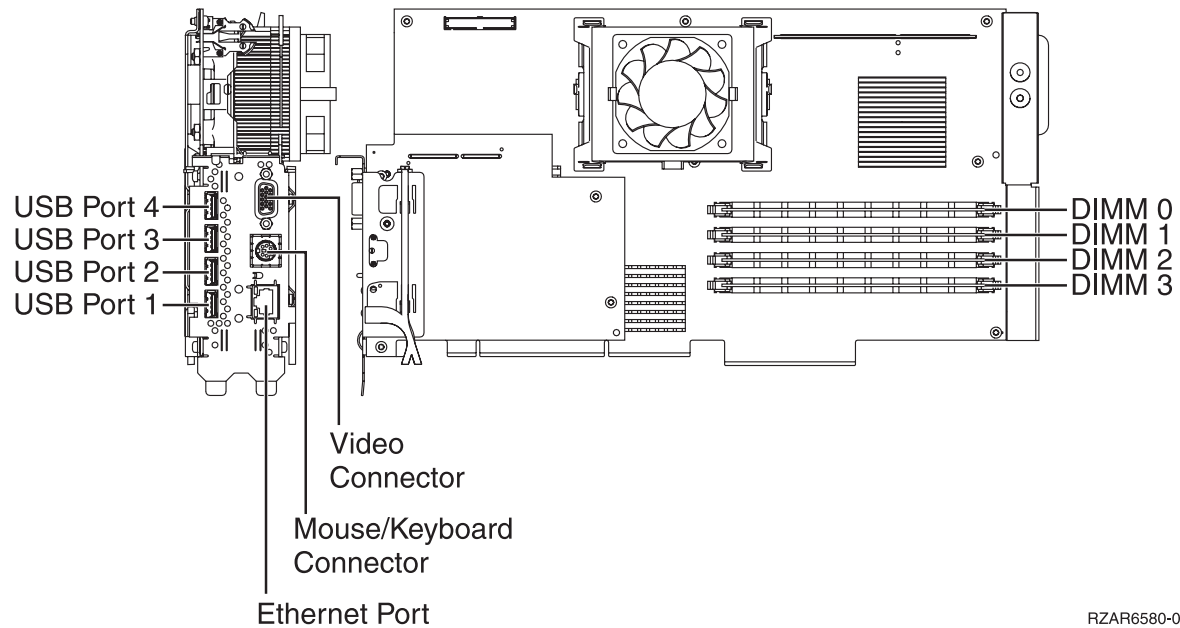


Figure 4. Locations of DIMM 0, DIMM 1, DIMM 2, and DIMM 3 on 2892 Integrated xSeries Server (IXS) card.

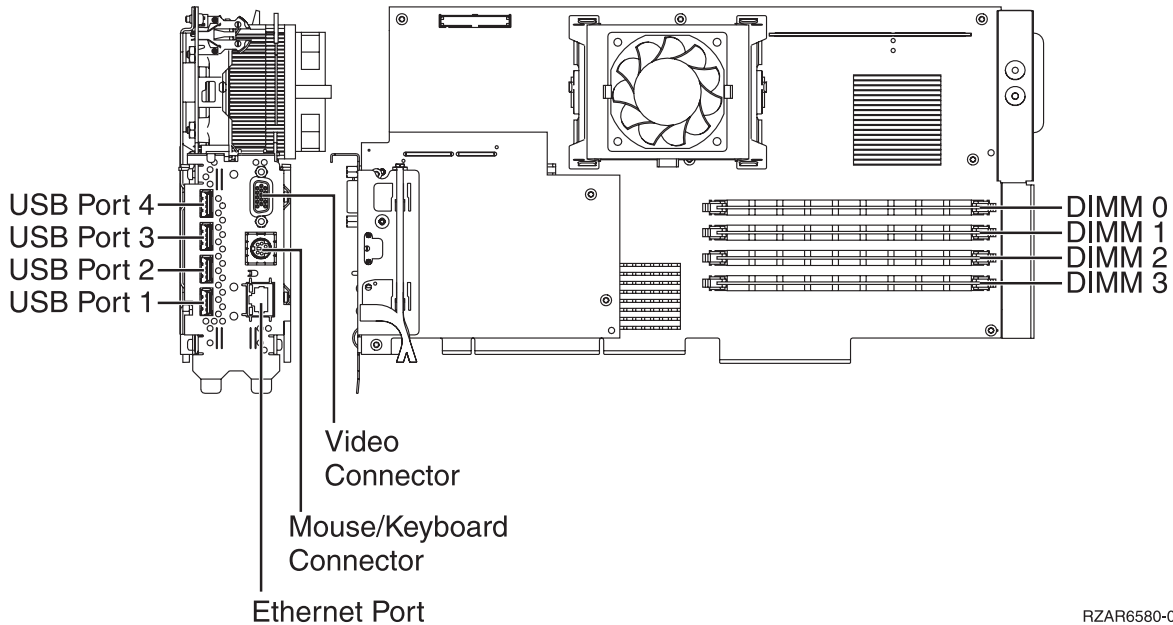


### DIMM0\_1

Use this page to view the locations of DIMM 0, DIMM 1, DIMM 2, and DIMM 3 on 2892 Integrated xSeries Server (IXS) card.

The first or second DIMM from the top (DIMM 0 or DIMM 1) of the IXS card is the failing item. To determine the part number, go to symbolic FRU "MEMORY" on page 514. **This ends the procedure.**

Figure 5. Locations of DIMM 0, DIMM 1, DIMM 2, and DIMM 3 on 2892 Integrated xSeries Server (IXS) card.



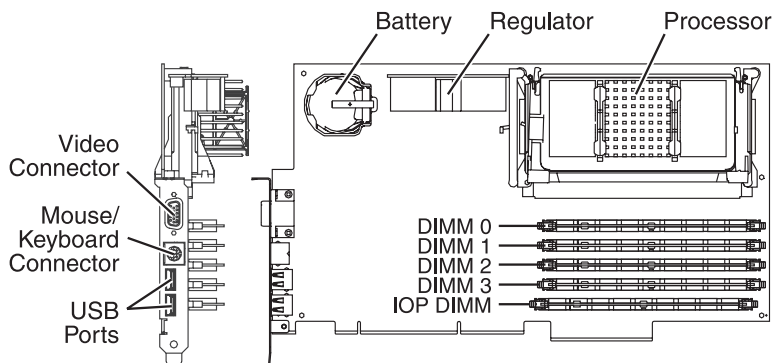
RZAR6580-0

## DIMM 1

Use this page to view the locations of DIMM 0, DIMM 1, DIMM 2, and DIMM 3 on the 2890 and 2892 Integrated xSeries Server (IXS) cards.

In both figures, the second DIMM from the top of the IXS card (DIMM 1) is the failing item. To determine the part number, go to symbolic FRU "MEMORY" on page 514. **This ends the procedure.**

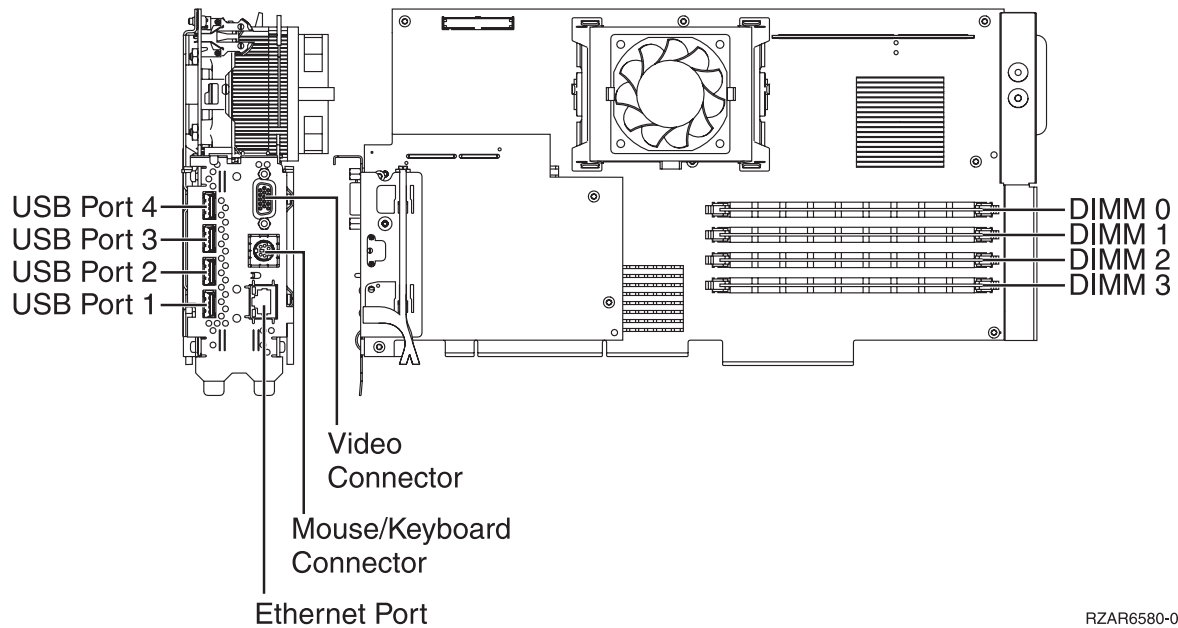
Figure 6. Locations of DIMM 0, DIMM 1, DIMM 2, and DIMM 3 on 2890 Integrated xSeries Server (IXS) card.



RZAQ4500-1



Figure 7. Locations of DIMM 0, DIMM 1, DIMM 2, and DIMM 3 on 2892 Integrated xSeries Server (IXS) card.



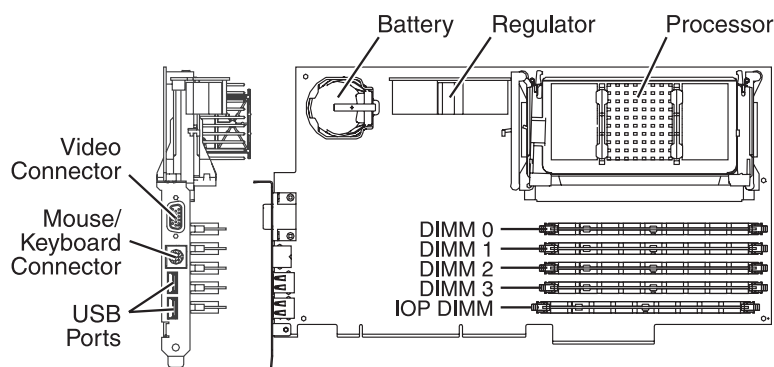
RZAR6580-0

## DIMM 2

Use this page to view the locations of DIMM 0, DIMM 1, DIMM 2 and DIMM 3 on the 2890 and 2892 Integrated xSeries Server (IXS) card.

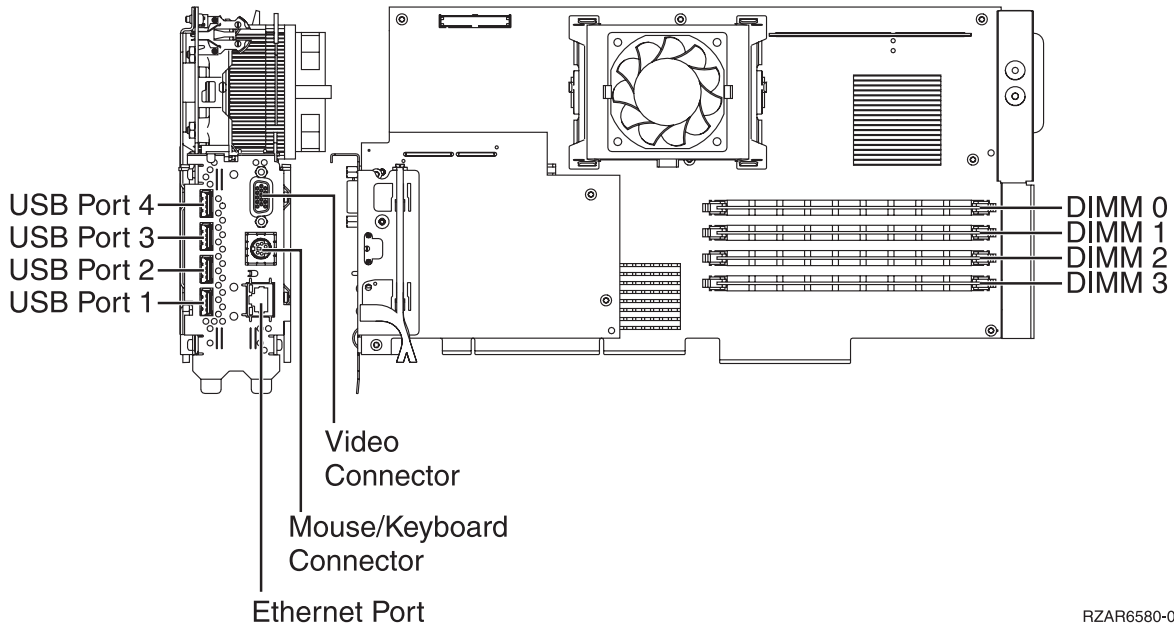
In both figures, the third DIMM from the top (DIMM 2) of the IXS card is the failing item. To determine the part number, go to symbolic FRU "MEMORY" on page 514. **This ends the procedure.**

Figure 8. Locations of DIMM 0, DIMM 1, DIMM 2, and DIMM 3 on 2890 Integrated xSeries Server (IXS) card.



RZAQ4500-1

Figure 9. Locations of DIMM 0, DIMM 1, DIMM 2, and DIMM 3 on 2892 Integrated xSeries Server (IXS) card.



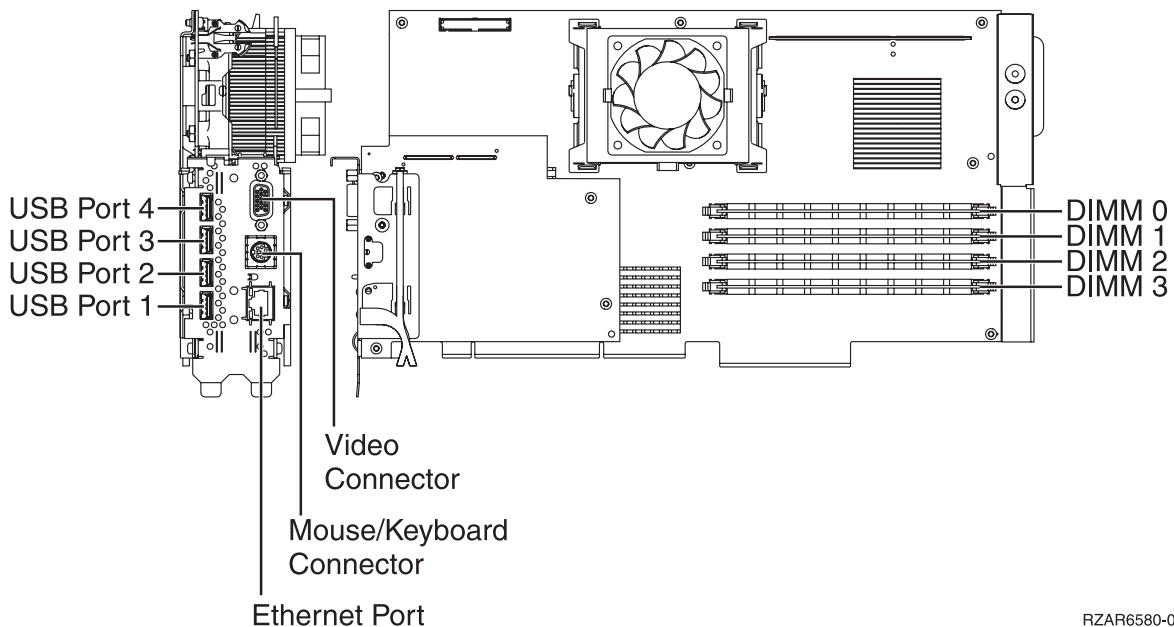
RZAR6580-0

### DIMM2\_3

Use this page to view the locations of DIMM 0, DIMM 1, DIMM 2 and DIMM 3 on 2892 Integrated xSeries Server (IXS) card.

The third or fourth DIMM from the top (DIMM 0 or DIMM 1) of the IXS card is the failing item. To determine the part number, go to symbolic FRU "MEMORY" on page 514. **This ends the procedure.**

Figure 10. Locations of DIMM 0, DIMM 1, DIMM 2 and DIMM 3 on 2892 Integrated xSeries Server (IXS) card.



RZAR6580-0

## DIMM 3

Use this page to view the locations of DIMM 0, DIMM 1, DIMM 2 and DIMM 3 on the 2890 and 2892 Integrated xSeries Server (IXS) cards.

In both figures, the **fourth** DIMM from the top (DIMM 3) of the IXS card is the failing item. To determine the part number, go to symbolic FRU "MEMORY" on page 514.

Figure 11. Locations of DIMM 0, DIMM 1, DIMM 2 and DIMM 3 on 2890 Integrated xSeries Server (IXS) card

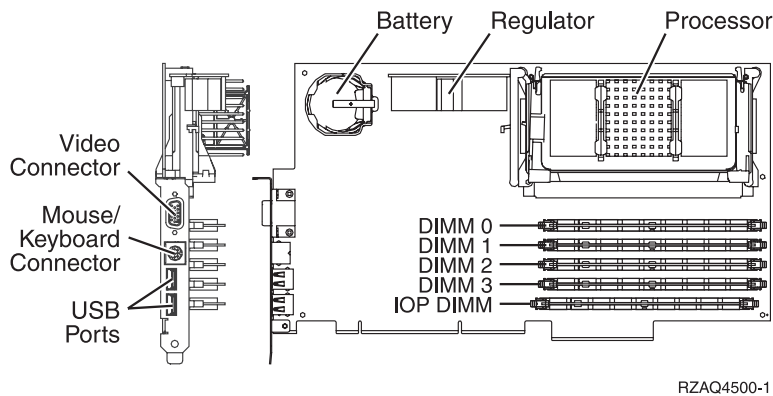
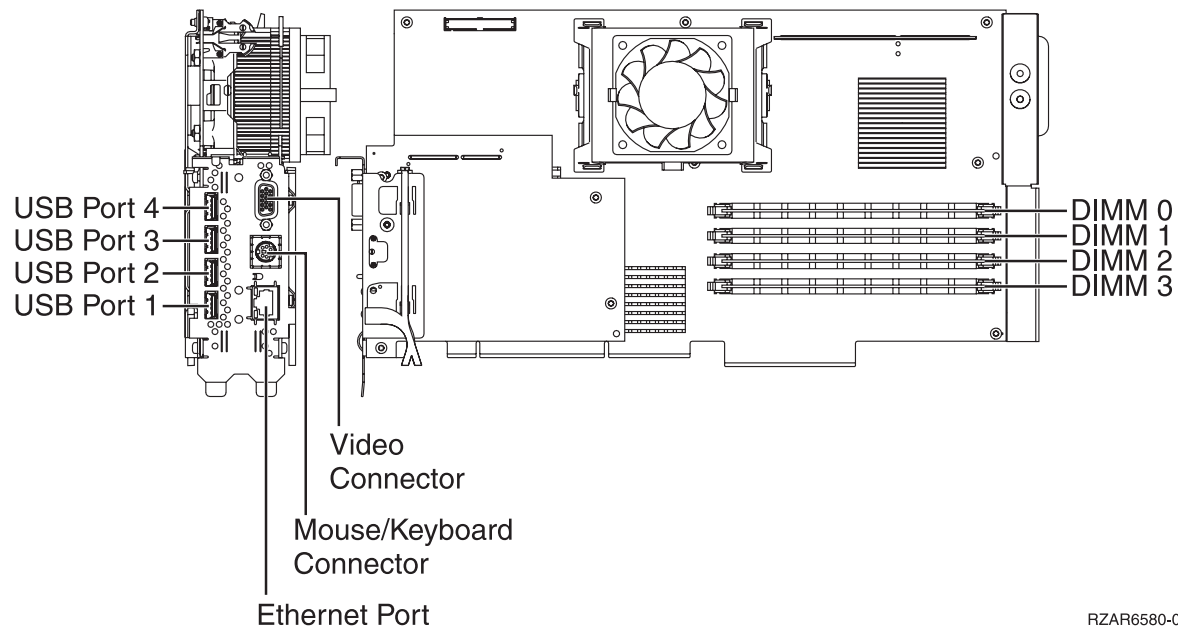


Figure 12. Locations of DIMM 0, DIMM 1, DIMM 2 and DIMM 3 on 2892 Integrated xSeries Server (IXS) card



## DISKDRV

The disk drive and logic card may be failing.

1. Is the device location information available in the Service Action Log?

**No:** Continue with the next step.

**Yes:** To exchange the failing item, see Disk unit recovery procedures. **This ends the procedure.**

2. Find the IOP address and the device address. See System reference code (SRC) address formats.
3. See Finding part locations and find the diagram of the system unit or expansion unit and find:

- The IOP card location that is identified by the direct select address.
  - The addressed disk location that is identified by the device address.
4. Is the SRC reported on the control panel?
- No:** Continue with the next step.
- Yes:** See Hardware SRC formats. The two rightmost characters of word 2 define the SRC format. Use the correct SRC format to locate the function that contains the characters *ttt lmmm*, where:
- *ttt* = Type number
  - *l* = Level
  - *mmm* = Model
- Then go to step 6.
5. Remove the disk unit to determine the part number. To exchange the disk drive and logic card, see Disk unit recovery procedures. **This ends the procedure.**
6. Using the type information, go to Part number catalog to determine the part number. If you do not know the type, remove the disk unit to determine the part number. To exchange the disk drive and logic card, see Disk unit recovery procedures. **This ends the procedure.**

## DISKIMG

There may be a problem with the Network Server Description (NWSD). First, vary off and then vary back on the NWSD. If this does not correct the problem, delete and re-create the NWSD, or call your next level of support.

## DPAC

The two-port adapter cable (part number 21F9345) is the failing item.

## DRVSWCH

The address switches on an optical disk drive in the optical library need to be checked and verified. Refer to the All 3995 Publications and Documentation Web site

(<http://snj1nt02.sanjose.ibm.com/tape/tapetec.nsf/pages/3995pub>)  for more information.

## DSKTRY

This symbolic FRU is no longer supported.

## DSKUNIT

See symbolic FRU “DISKDRV” on page 477.

## EACODE

An error occurred in the error analysis licensed internal code. Ask your next level of support for assistance.

## EXTREMD

An external removable media storage device may be failing.

1. Perform symbolic FRU “CHECK” on page 470 before removing or replacing parts. Return here if no problems are revealed.
2. Use the device type and refer to the appropriate service documentation for that device. This documentation will help you determine the part numbers and replacement procedures that you are to use during this repair action.
3. If you are unable to locate the documentation for your specific device, contact your next level of support for assistance. **This ends the procedure.**

## EXTSCSI

The external signal cable may be failing.

Perform the following:

1. Is more than one device attached?
  - No:** Continue with the next step.
  - Yes:** See the device documentation for information about setting the device address. **This ends the procedure.**
2. Is the attached device in the system unit?
  - No:** Continue with the next step.
  - Yes:** Use symbolic FRU “BACKPLN” on page 458 to determine which signal cables to replace. **This ends the procedure.**
3. Find the IOA type:
  - a. Find the IOA location.
  - b. Use the location information of the IOA in the Service Action Log if it is available. If the location is not available, find the address. See System reference code (SRC) address formats. Use the address to find the location. See Finding part locations.
  - c. Find the IOA card in the system and read the type number of the card at that location.
4. Find the IOA type, the attached device, the cable length, and the cable part number in the following list.
5. Verify that the part number in the list is the same as the part number on the cable.
6. For external devices that are not found in the following list, use the device type and refer to the appropriate service documentation for that device. The service documentation for that device will help you determine the FRU part numbers and replacement procedures you are to use during this repair action. If you are unable to locate the documentation for your specific device, then contact your next level of support for assistance.

Table 46. External device and part numbers

IOP or IOA Type	Device	Lengths	Part Number
2749	3490, 3490/Exx, 3590	2.8 meters	05H4647
2749	3490, 3490/Exx, 3590	4.5 meters	05H4648
2749	3490, 3490/Exx, 3590	12.0 meters	05H4649
2749	3490, 3490/Exx, 3590	18.0 meters	05H4650
2749	3490, 3490/Exx, 3590	25.0 meters	05H4651
2749	3490/Fxx, 3570, 358x, 9427, 7208/342	0.5 meters	49G6456 <b>Note:</b> For 9427 see the note following this table.
2749	3490/Fxx, 3570, 358x, 9427, 7208/342	4.5 meters	49G6457 <b>Note:</b> For 9427 see the note below this table.
2749	3490/Fxx, 3570, 358x, 9427, 7208/342	12.0 meters	49G6458 <b>Note:</b> For 9427 see the note below this table.
2749	3490/Fxx, 3570, 358x, 9427, 7208/342	18.0 meters	49G6459 <b>Note:</b> For 9427 see the note below this table.
2749	63A0		See device documentation to determine cable part numbers
2749	7208/012, 7208/222	1.5 meters	52G0174
2749	7208/012, 7208/222	4.0 meters	59H3462
2749	7208/012, 7208/222	12.0 meters	59H3463
2749	7208/232, 7208/234, 9348	0.5 meters	06H6037

Table 46. External device and part numbers (continued)

IOP or IOA Type	Device	Lengths	Part Number
2749	7208/232, 7208/234, 9348	4.0 meters	59H3460
2749	7208/232, 7208/234, 9348	12.0 meters	05H5543
2749	3995	12.0 meters	05H5543
2782, 5702, 5703	358x, 7206/VX2, 7207/122, 7208/345, 7210/020, 7210/025	1.5 meters	19P4508, or 19P4506 with 19P0482 interposer cable
2782, 5702, 5703	358x, 7206/VX2, 7207/122, 7208/345, 7210/020, 7210/025	2.5 meters	19P0279, or 35L1307 with 19P0482 interposer cable
2782, 5702, 5703	358x, 7206/VX2, 7208/345	4.5 meters	19P0050
2782, 5702, 5703	358x, 7206/VX2, 7208/345	10 meters	19P0048

**Note:** All cables for the 9427 tape library must include an interposer (part 05H3834) on the device end of the cable.

**This ends the procedure.**

## FCCABLE

The fibre channel cable may be failing. Use the part number on the cable to determine the part number to replace.

## FCCODE

An error has been detected in the fibre channel gateway device licensed internal code. See the gateway device service guide for possible corrective actions.

## FCDEV

The attached fibre channel device or fiber channel gateway device is the failing item.

Is there a fibre channel gateway device between the fiber channel I/O adapter and the device?

**No:** See the attached device maintenance information to determine the parts to replace. **This ends the procedure.**

**Yes:** See symbolic FRU "FCGATE." **This ends the procedure.**

## FCGATE

The fibre channel gateway device is the failing item. Use the gateway device service guide to determine the parts to replace.

## FCINTF

An error has been detected on the fibre channel interface. The failure may be any component between and including the fibre channel IOA and the storage device. To continue diagnosis, use existing fibre channel service procedures or contact your next level of support.

## FCIOA

The fibre channel I/O adapter is the failing item. Replace the fibre channel I/O adapter using the I/O adapter location information in the Service Action Log if it is available. If the location is not available, find the address of the I/O adapter (see SRC address formats. Use the address to find the location (see Finding part locations).

## FCPORT

The fibre channel IOA port may be the failing item.

Perform the following:

1. Is the SRC 2765/2766/2787/5704 3120 logged or been logged within 5 minutes of the SRC that sent you to this symbolic FRU?
  - Yes:** Continue with the next step.
  - No:** The fibre channel IOA port has not failed. See the next FRU in the SRC table. **This ends the procedure.**
2. Use the Service Action Log to get the resource name for the 3120 SRC. See "Using the Service Action Log" on page 24. Using the resource name, perform the following steps in DST/SST:
  - a. Select **Start a service tool > Hardware service manager > Locate resource by resource name.**
  - b. Enter the resource name.
  - c. Select the **Display detail** option for the storage IOA on the Logical Hardware Resources display.
  - d. Select the **Display additional port information** function key on the Auxiliary Storage Hardware Resource Detail display.

Does the Port status field indicate that the port is "active"?

- Yes:** Continue with the next step.
  - No:** Go to step 5.
3. The port is now active. Has a 2105/2107 3002 SRC occurred around the time the problem was first reported?
    - Yes:** Continue with the next step.
    - No:** No further service actions are required. **This ends the procedure.**
  4. A 2105/2107 3002 has occurred, and the link has gone from not active to active. The fibre channel IOA port is functional. Choose from the following options:
    - If the disk units that reported the 2105/2107 3002 SRC are usable, then no further service actions are required. **This ends the procedure.**
    - If the disk units that reported the 2105/2107 3002 SRC are not usable, then go back to the 2105/2107 3002 FRU list and work with a FRU other than FCPORT. **This ends the procedure.**
  5. Clean the fibre channel IOA wrap plug using the cleaning kit. See the Part number catalog for the part number. Follow the instructions in the Fiber Optic Cleaning Procedures (SY27-2604). If the wrap plug has been lost, order and clean a new one. See the Part number catalog for part number.
  6. Perform the following steps:
    - a. Install the wrap plug on the fibre channel IOA.
    - b. After the wrap plug has been installed, wait 5 seconds.
    - c. Choose from the following options:
      - If you are on the Additional Port Information display, use the **Refresh** function key.
      - If you are not already on the Additional Port Information display, use the instructions from step 2 to check if the port has become active.

Is the port status now "active"?

- Yes:** Continue with the next step.
  - No:** Replace the fibre channel IOA. See symbolic FRU "FCIOA" on page 480 for further instructions. **This ends the procedure.**
7. Ask the customer whether the fibre channel IOA will attach devices now or whether the fibre channel IOA is to be used at a later time. Is the fibre channel IOA intended to attach devices at this time?
    - No:** The wrap plug must be left installed on the fibre channel IOA when it is not in use. No further service actions are required. **This ends the procedure.**
    - Yes:** Perform the following steps:

- a. Unplug the wrap plug from the fibre channel IOA and wait until the port status becomes "Not active" using the Refresh function key on the Additional Port Information display. The failure has been isolated to the first link, which includes any of the cables or junctions between the fibre channel IOA port and the first fibre channel hub, switch, gateway, or device.
- b. Use existing fibre channel service procedures to continue diagnosis of this first link until the port status becomes active, or contact your next level of support. **This ends the procedure.**

## FRPORT

The RIO/HSL node on one end of the link may be the failing item. If you were sent to this procedure as a result of a B700 6985 SRC, and this is the only FRU in the FRU list, then the system cannot see any I/O units on a RIO/HSL loop and there is at least one cable attached to a port on that loop. In this case, go to (A7xx, B7xx) Licensed Internal Code (LIC) Reference Codes and work from the full FRU list provided there.

**Note:** The other end of the link is given in the symbolic FRU "TOPORT" on page 548.

**Note:** For this procedure, the terms "HSL I/O bridge" and "RIO adapter" are interchangeable.

1. Record the bus number (BBBB) in word 7 of the reference code (see "Breaking down a RIO/HSL or PCI bus reference code" on page 61).
2. Find the failing RIO/HSL node using one of the following procedures, and then go to Completing the procedure:
  - Finding the failing RIO/HSL node using i5/OS
  - Finding the failing RIO/HSL node using AIX or Linux
  - Finding the failing RIO/HSL node using the HMC

### Finding the failing RIO/HSL node using i5/OS

1. Sign on to SST or DST if you have not already done so.
2. Select **Start a service tool > Hardware service manager > Logical hardware resources > High-speed link (HSL) resources**.
3. Select **Include non-reporting resources**. Move the cursor to the RIO/HSL loop that you want to examine and select **Display detail**. The loop number will be the number from word 7 of the reference code above.
4. The display that appears shows the port status of the Network Interface Controller (NIC) for the loop that you selected. Record the resource name, type-model, and serial number.
5. If the status of the "Leading port to next resource" is given as *operational*, then select **Follow Leading Port**. Do this until the status changes to *failed*. Does the resource name ever match the one recorded in the step above?
  - Yes:** You have traveled around the loop and did not find a failed link. **This ends the procedure.**
  - No:** Continue with the next step.
6. When the status is *failed*, you have found the from port. Go to Completing the procedure.

**Note:** This screen will be the starting point for symbolic FRU "TOPORT" on page 548.

### Finding the failing RIO/HSL node using AIX or Linux

1. Determine which RIO/HSL loop the failing node is on (see "Converting the loop number to NIC port location labels" on page 72).
2. Record, in order, each unit in the loop.
3. Power down the system and remove all expansion units in the loop that starts and ends at the ports given in the previous step. If there is a base I/O unit on that loop, leave only that unit connected to the system unit.
4. Power on the system to partition standby and check for the same SRC that sent you here. Did the SRC reoccur?



**No:** Power down the system and add the next unit in the original loop. Repeat step 3 on page 482.

**Yes:** The RIO/HSL node in the last I/O unit added is possibly the failing item. Use the RIO/HSL node information in the locations tables for the unit with the possible failing RIO/HSL node to, and go to Completing the procedure.

### Finding the failing RIO/HSL node using the HMC

Perform the following from Service Focal Point on the HMC:

1. Select **Service Utilities** from the tasks.
2. In the Service Utilities window, click once on the system you are working on. Then, from the selected drop down menu, select **View RIO Topology...**
3. In the Current Topology area, scroll down until you find data for the RIO/HSL loop number you are working with.
4. Each line in that RIO/HSL loop represents a RIO/HSL node. Find the first one with a leading port status of *failed*. Use that node information, and go to Completing the procedure.

### Completing the procedure

1. Record the following:
  - a. information of the first failing resource on the link
  - b. resource name, card type and model, and part number
  - c. link status of each port (record *internal* if the port is designated as internal)
2. Select **Cancel**, to return to the Work with High-speed link (HSL) resources display.
3. For the loop with the failure, select **Resources associated with loop**.
4. For the HSL I/O bridge with the resource name that you recorded, select **Associated packaging resources**.
5. Record the frame ID for this resource.
6. Select **Display detail** and record the card position for the first failing resource.
7. Now go to Finding part locations, select the model or expansion unit with this resource, and use the locations tables to find the replacement procedure and physical location of the FRU. **This ends the procedure.**

### FWADIPL

Perform the following.

1. Contact your network administrator to verify that the bootp server is correctly configured for this client.
2. Check the network connection. If the network connections are OK, retry the operation. If there is no network connection, contact the network administrator.
3. If there are no problems with the bootp server or the network connections, replace the adapter from which you are trying to boot.

**This ends the procedure.**

### FWCD1

Perform the following procedure.

1. If the problem persists, the CD in the USB CD-ROM drive might not be readable. Remove the CD and insert another CD.
2. If the problem persists after replacing the CD-ROM, replace the USB CD-ROM drive.
3. Replace the USB adapter the drive is attached to.

**This ends the procedure.**

## **FWCD2**

Perform the following procedure.

1. Check for server firmware updates. Apply if available.
2. If the problem persists, replace the USB CD-ROM drive.
3. Replace the USB adapter to which the drive is attached. **This ends the procedure.**

## **FWCONS**

Perform the following.

1. If your server has an attached console, but the console display is not working, go to one of the following:
  - All display problems in AIX server or AIX partition symptoms
  - All display problems in Linux server or Linux partition symptoms
2. If you can see selection screens on the terminals, press the appropriate key on the input device within 60 seconds. If the console does not respond to the keystroke:
  - a. If you are selecting the console with a keyboard attached to the system, replace the keyboard, then replace the service processor (see Finding part locations).
  - b. If you are selecting the console with an ASCII terminal, suspect the terminal. Use the problem determination procedures for the terminal.

**Note:** The ASCII terminal settings should be:

- 19,600 baud
- No parity
- 8 data bits
- 1 stop bit

**This ends the procedure.**

## **FWENET**

Perform the following.

1. Verify that the MAC address is properly programmed in the adapter's EPROM.
2. Replace the adapter specified by the location code.

**This ends the procedure.**

## **FWFLASH**

Perform the following.

1. Reboot the server or partition.
2. Reflash the server firmware (see Getting fixes).
3. Reboot the failing partition. **This ends the procedure.**

## **FWFWPBL**

Perform the following.

1. Check for platform firmware updates. Apply if available.
2. Contact service support.

**This ends the procedure.**

## **FWHANG**

Symbolic FRU FWHANG is not supported at this time.

## FWHOST

If the system is not connected to an active network or if the target server is inaccessible (this can also result from incorrect IP parameters being supplied), the system will still attempt to boot and, because timeout durations are necessarily long to accommodate retries, the system may appear to be hung.

Perform the following.

1. Restart the system and get to the SMS utilities. In the utilities menus, check the following:
  - Is the intended boot device correctly specified in the boot list?
  - Are the IP parameters correct?
  - Verify the network connection (the network could be down).
  - Have the network administrator verify the server configuration for this client.
  - Attempt to "ping" the target server using the SMS Ping utility.

**This ends the procedure.**

## FWIDE1

Perform the following.

1. Replace the media in the device specified by the location code.
2. Replace the device specified by the location code.

**This ends the procedure.**

## FWIDE2

Perform the following.

1. Verify that the signal and power cables are properly attached to the device specified by the location code. After they have been verified and repaired if necessary, retry the operation.
2. If the problem persists, the media in the device might not be readable. Remove the media and try another copy.
3. Replace the device specified by the location code.

**This ends the procedure.**

## FWIPIPL

Perform the following.

1. Contact your network administrator to verify that the network addresses on the server and gateway are correct.
2. Use the System Management Services menu to correct them on the server if necessary.

**This ends the procedure.**

## FWLPAR

Perform the following.

1. If a location code was reported with the error:
  - a. **Probing failed for the PCI slot connector.** Replace the PCI card in the connector specified by the location code. If this does not resolve the problem, replace the I/O planar on which the slot connector is located.
  - b. Check for adapter firmware updates if this error occurred during a hot plug operation. Apply if available. If there are no updates available, replace the adapter. If this does not resolve the problem, replace the I/O planar on which the slot connector is located.
  - c. Check for platform firmware updates. Apply the update if there is one available.
2. If no location code was reported with the error: The connector was not found.

- a. Check for platform firmware updates; apply if available.
- b. If no updates are available, replace the I/O planar specified by the location code. **This ends the procedure.**

## **FWMBOOT**

This checkpoint appears on the operator panel when partition firmware has entered the boot devices menu in the SMS because the multi-boot flag was turned on. The firmware is waiting for input from the user. If the firmware console is not open, the user cannot see the boot devices menu. In this case, the user might mistakenly assume that the system is hung. System firmware only progresses past this point when the user provides the required input.

## **FWNIM**

If this error occurs during the installation of AIX via a process called a NIM push, the **set\_bootlist** attribute may not have been set correctly on the NIM master. See the appropriate *AIX 5.x Installation Guide and Reference* for the level of AIX that is being installed for more information.

If this error occurs at any other time, perform the following:

1. Check for platform firmware updates. Apply if available.
2. Call service support.

**This ends the procedure.**

## **FWNVR1**

An error reported against the NVRAM can be caused by low battery voltage and (more rarely) power outages that occur during normal system usage. With the exception of the BA170000 error, these errors are warnings that the NVRAM data content had to be reestablished and do not require a FRU replacement unless the error is persistent. When one of these errors occurs, system customization information (the boot list, for example) has been lost, and the system may need to be re-configured.

If the error is persistent, replace the service processor (see symbolic FRU "SVCPROC" on page 547). **This ends the procedure.**

## **FWNVR2**

If the error is persistent, replace the service processor (see symbolic FRU "SVCPROC" on page 547). **This ends the procedure.**

## **FWNVR3**

Execution of a command line within the nvram configuration variable *nvramrc*(script) resulted in a "throw" being executed. This script can be modified by the system firmware SMS utilities, the operating system, PCI adapter ROM code or utility, or an operator (via the open firmware script editing command **nvedit**).

It may not be possible to resolve the problem without a detailed analysis of the NVRAM script, the current system configuration, and the device tree contents.

1. The problem can be caused by a SCSI adapter whose SCSI bus ID has been changed from the default setting no longer appearing in the system. This can be caused either by removing a SCSI adapter, or a problem with a SCSI adapter.
  - a. Select option 5, Change SCSI settings, on the SMS main menu. Then on the SCSI utilities menu, select option 2, Change SCSI ID.
    - 1) Verify the list of SCSI controllers/adapters. If the list is not correct, suspect a problem with the adapter(s) that are installed but not listed.
    - 2) Select the option to "Save" the configuration information.
    - 3) Restart the system.

- b. If the problem persists, boot the operating system and verify the SCSI bus IDs of the SCSI controllers, and correct if necessary.
  - c. Restart the system.
2. Contact your service support representative for further assistance.

**This ends the procedure.**

## **FWPCI1**

Perform the following procedure.

1. If the location code identifies a slot:
  - a. Check for adapter firmware updates. Apply the update if one is available.
  - b. Replace the adapter.
  - c. Check for platform firmware updates. Apply the update if one is available.
2. If the location code identifies an I/O planar:
  - a. Check for platform firmware updates. Apply the update if one is available.
  - b. Replace the I/O planar.
3. Call service support.

**This ends the procedure.**

## **FWPCI2**

Perform the following procedure.

1. If the location code identifies a slot:
  - a. Check for adapter firmware updates. Apply the update if one is available.
  - b. Check the cabling to the adapter (in particular, the adapters that have serial ports). Serial ports may require null modems or special cabling configurations to avoid connecting driver outputs together. This may create a PCI power problem and force the adapter to be de-configured.
  - c. Use the hop plug service aid to re-seat the adapter specified by the location code (see PCI adapter in the Installing features and replacing parts topic to exchange a PCI adapter while powered on). If re-seating the adapter fixes the problem, perform the repair checkout procedure. If the problem is not resolved, go to step 4.
  - d. Use the hot plug task to move the adapter to another slot (behind another PCI bridge). The "I/O Subsystem PCI and PCI-X PHB and PCI and PCI-X Slot Locations" identifies the PCI bridges and associated slots.
2. If the adapter is successfully re-configured in the new slot (behind another PCI bridge), the slot in which the adapter was originally plugged is bad:
  - a. Replace the I/O backplane assembly that contains the slot in which the adapter was plugged.
3. Replace the adapter if the adapter does not successfully re-configure into the new slot.

**This ends the procedure.**

## **FWPCI3**

Perform the following procedure.

1. If the location code identifies a slot:
  - a. Check the cabling to the adapter (in particular, the adapters that have serial ports). Serial ports may require null modems or special cabling configurations to avoid connecting driver outputs together. This may create a PCI power problem and force the adapter to be de-configured.
  - b. Move the adapter to another slot (behind another PCI bridge).
  - c. Check for adapter firmware updates. Apply the update if one is available.
  - d. Replace the adapter.

- e. Check for platform firmware updates. Apply the update if one is available.
  - f. Replace the I/O backplane.
2. If the location identifies an I/O backplane:
- a. Check for platform firmware updates. Apply the update if one is available.
  - b. Replace the I/O backplane.

**This ends the procedure.**

#### **FWPCI4**

Perform the following.

1. If a location code is associated with the checkpoint, replace the adapter identified by the location code.
2. If no location code is specified, see "" on page 317. **This ends the procedure.**

#### **FWPCI5**

Perform the following.

1. Is a location code associated with the checkpoint?

**No:** Go to "PFW1548: Memory and processor subsystem problem isolation procedure" on page 369. **This ends the procedure.**

**Yes:** Replace the following, one at a time, until the problem is resolved (see Finding part locations):

- a. FRU identified by the location code
- b. I/O backplane

**This ends the procedure.**

#### **FWPTR**

Values normally found in nonvolatile storage that point to the location of an operating system were not found. This can happen for two reasons: either your operating system doesn't support storing the values, or some events occurred that caused the system to lose non-volatile storage information (drainage or replacement of the battery). If you are running AIX, this information can be reconstructed by running the **bootlist** command specifying the device that the operating system is installed on. Please refer to your AIX documentation for the syntax and usage of the **bootlist** command.

In order to boot the operating system so that the above-mentioned values can be reconstructed, power the system down and power it back up again. This should cause the system to look for the operating system in the device contained in the custom boot list or in the default boot list, depending on the condition of the system. If this is not successful, modify the boot sequence (also known as the boot list) to include devices that are known to contain a copy of the operating system. This can be accomplished by using the System Management Services menus. For example, select a hard disk known to have a copy of the operating system as the first and only device in the boot sequence (boot list) and boot the system.

**This ends the procedure.**

#### **FWPWD**

You should be able to see the system prompt on the hardware console.

1. If your server has an attached console, but the console display is not working, go to *All display problems* in the Entry MAP.

**This ends the procedure.**

#### **FWRIPL**

Perform the following.

If a supported adapter is installed:

1. Replace the adapter.
2. Replace the I/O drawer backplane in the drawer in which the adapter is plugged.

If there are no supported LAN adapters installed in a full system partition, install one and reboot the system. If a supported LAN adapter is not assigned to the partition in a server running multiple partitions, deactivate the partition, assign one to the partition, then reactivate the partition.

**This ends the procedure.**

## **FWSCSI1**

Before replacing any system components:

1. Ensure that the controller and each device on the SCSI bus is assigned a unique SCSI ID.
2. Ensure that the SCSI bus is properly terminated.
3. Ensure that the SCSI signal and power cables are securely connected and are not damaged.

The location code information is required to identify the ID of SCSI device failures as well as to indicate the location of the controller to which the device is attached. Check the system error logs to determine the location code information associated with the error code.

1. Replace the SCSI device.
2. Replace the SCSI cable.
3. Replace the SCSI controller.

**This ends the procedure.**

## **FWSCSI2**

Before replacing any system components:

1. Ensure that the controller and each device on the SCSI bus is assigned a unique SCSI ID.
2. Ensure that the SCSI bus is properly terminated.
3. Ensure that the SCSI signal and power cables are securely connected and are not damaged.

The location code information is required to identify the ID of SCSI device failures as well as to indicate the location of the controller to which the device is attached. Check the system error logs to determine the location code information associated with the error code.

1. Replace the media (if it is a device with removable media).
2. Replace the SCSI device.

**This ends the procedure.**

## **FWSCSI3**

Before replacing any system components:

1. Ensure that the controller and each device on the SCSI bus is assigned a unique SCSI ID.
2. Ensure that the SCSI bus is properly terminated.
3. Ensure that the SCSI signal and power cables are securely connected and are not damaged.

The location code information is required to identify the ID of SCSI device failures as well as to indicate the location of the controller to which the device is attached. Check the system error logs to determine the location code information associated with the error code.

1. Replace the SCSI device.

**This ends the procedure.**

## **FWSCSI4**

Before replacing any system components:

1. Ensure that the controller and each device on the SCSI bus is assigned a unique SCSI ID.
2. Ensure that the SCSI bus is properly terminated.
3. Ensure that the SCSI signal and power cables are securely connected and are not damaged.

The location code information is required to identify the ID of SCSI device failures as well as to indicate the location of the controller to which the device is attached. Check the system error logs to determine the location code information associated with the error code.

1. Replace the media (if a device with removable media).
2. Replace the SCSI device.

**This ends the procedure.**

## **FWSCSI5**

Before replacing any system components:

1. Ensure that the controller and each device on the SCSI bus is assigned a unique SCSI ID.
2. Ensure that the SCSI bus is properly terminated.
3. Ensure that the SCSI signal and power cables are securely connected and are not damaged.

The location code information is required to identify the ID of SCSI device failures as well as to indicate the location of the controller to which the device is attached. Check the system error logs to determine the location code information associated with the error code.

1. Replace the SCSI device.
2. Replace the SCSI cable.
3. If the missing SCSI devices are connected to the same backplane, replace the SCSI backplane.
4. Replace the SCSI controller.

**This ends the procedure.**

## **FWSCSIH**

If a location code is available, follow the repair actions listed for error code BA090001 (see “FWSCSI1” on page 489).

If no location code is available, go to “PFW1548: Memory and processor subsystem problem isolation procedure” on page 369. **This ends the procedure.**

## **FWVTHMC**

1. The partition firmware is waiting for a virtual terminal to be opened on the HMC. Open a virtual terminal.
2. If a virtual terminal is open, the user might have entered a CTRL-S key sequence to stop the scrolling of data off the screen. If this is the case, enter a CTRL-Q key sequence to resume scrolling.
3. Check the ethernet connection between the HMC and the managed system.
4. Reboot the HMC.
5. There may be a hardware problem with the HMC. Refer to the HMC maintenance guide.
6. There may be a hardware problem with the service processor in the managed system. Check the service action event log in Service Focal Point for error codes that indicate a problem with the ethernet ports on the service processor. Take the appropriate actions based on the error codes that you find. **This ends the procedure.**



## **HMCLIC**

Firmware on the Hardware Management Console (HMC) must be replaced. See HMC fixes to obtain a new level of HMC firmware.

## **HSLH**

This is a hybrid HSL/RIO to HSL2/RIO-G copper cable where one end has an HSL/RIO yellow connector and the other end has an HSL2/RIO-G black connector. Diagnostic code cannot determine the length of the cable. Diagnostic code will attempt to determine the location codes of cable ports at each end of the cable. Go to "HSL\_LNK" on page 492 and follow the appropriate instructions.

**This ends the procedure.**

## **HSLH\_xx**

This is a hybrid HSL/RIO to HSL2/RIO-G copper cable where one end has an HSL/RIO yellow connector and the other end has an HSL2/RIO-G black connector. The "xx" value indicates the length of the cable in meters. Go to "HSL\_LNK" on page 492 and follow the appropriate instructions.

**This ends the procedure.**

## **HSLH\_06**

This is a hybrid HSL/RIO to HSL2/RIO-G copper cable where one end has an HSL/RIO yellow connector and the other end has an HSL2/RIO-G black connector. The "06" value indicates the length of the cable is 6 meters. Go to "HSL\_LNK" on page 492 and follow the appropriate instructions.

**This ends the procedure.**

## **HSLH\_15**

This is a hybrid HSL/RIO to HSL2/RIO-G copper cable where one end has an HSL/RIO yellow connector and the other end has an HSL2/RIO-G black connector. The "15" value indicates the length of the cable is 15 meters. Go to "HSL\_LNK" on page 492 and follow the appropriate instructions.

**This ends the procedure.**

## **HSL\_I**

This is an HSL/RIO interposer card for copper HSL2/RIO-G (black) connections or optical HSL/RIO connections. Diagnostic code cannot determine the type of interposer card. Go to "HSL\_LNK" on page 492 and follow the appropriate instructions.

**This ends the procedure.**

## **HSL\_Ix**

This is an HSL/RIO interposer card for copper HSL2/RIO-G (black) connections or optical HSL/RIO connections. The "x" value indicates the type of interposer card. Go to "HSL\_LNK" on page 492 and follow the appropriate instructions.

**This ends the procedure.**

## **HSL\_I2**

The failing item is an HSL2/RIO-G interposer card on machine type 9406 model 825. This interposer card is for copper HSL2/RIO-G cable connectors (black) on the system unit planar in location C08 or C09. Diagnostic code will attempt to include the card's location with the FRU in the serviceable event view. Go to "HSL\_LNK" on page 492 and follow the appropriate instructions.

**This ends the procedure.**

## HSL\_I3

The failing item is an HSL/RIO interposer card on machine type 9406 model 825. This interposer card is for optical HSL/RIO cable connectors on the system unit planar in location C08 or C09. Diagnostic code will attempt to include the card's location with the FRU in the serviceable event view. Go to "HSL\_LNK" and follow the appropriate instructions.

**This ends the procedure.**

## HSL\_I4

The failing item is an HSL2/RIO-G interposer card on a 61D expansion unit. This interposer card is for copper HSL2/RIO-G cable connectors (black) on the I/O unit planar in location -P1(riser) or -P2(riser). Diagnostic code will attempt to include the card's location with the FRU in the serviceable event view. Go to "HSL\_LNK" and follow the appropriate instructions.

**This ends the procedure.**

## HSL\_LNK

**Attention:** When a RIO/HSL cable is disconnected, it may result in a lost connection between the units even after the cable is reconnected. To fix this problem, you need to cycle power on the unit with the locked RIO/HSL connection (see Powering on and powering off an I/O expansion unit below).

**Note:** If question marks (???) appear at the end of the location code, then the port could not be determined. Use the location code associated with the other end of the cable. If question marks appear for both port locations, use the isolation procedures suggested in the Description/Action column of the reference code table for this SRC.

1. Choose from the following:

- If you were sent to this procedure from another symbolic FRU, locate that FRU in Table 47 to see the description of the RIO/HSL FRU. Then continue with the next step for more information about the FRU.
- If you are working with this symbolic FRU in the FRU list, the failing component is an RIO/HSL connection. Diagnostic code could not determine what kind of hardware was involved. The RIO/HSL hardware can be any of the following:
  - Cable
  - Embedded RIO/HSL link in a FRU (a planar, for example)
  - RIO/HSL interposer card

The RIO/HSL link is on or between the other FRU or FRUs listed for the reference code. Continue with the next step.

Table 47. RIO/HSL symbolic FRUs

RIO/HSL FRU	Description
HSL_OPT	This is an optical RIO/HSL cable.  When exchanging optical RIO/HSL cables, use the optical cleaning kit and procedures. See symbolic FRU "OPT_CLN" on page 521 for details.  If an interposer card is called for, be sure the interposer type matches the cable type (optical or copper).
HSL1	There is a standard copper RIO/HSL cable at both ends (yellow connectors).
HSL1_UN	There is a standard copper RIO/HSL cable (yellow connector) at the detecting end, and an unknown connector type at the other end.
HSL2	There is a copper HSL2/RIO-G cable at both ends (black connectors), but the length of the cable could not be sensed.

Table 47. RIO/HSL symbolic FRUs (continued)

RIO/HSL FRU	Description
HSL2_xx	There is a copper HSL2/RIO-G cable at both ends (black connectors). Use the xx value to determine the cable length from this list: <ul style="list-style-type: none"> <li>• HSL2_01 = 1 meter HSL2 cable</li> <li>• HSL2_03 = 3 meter HSL2 cable</li> <li>• HSL2_08 = 8 meter HSL2 cable</li> <li>• HSL2_10 = 10 meter HSL2 cable</li> <li>• HSL2_15 = 15 meter HSL2 cable</li> <li>• HSL2_17 = 1.75 meter HSL2 cable</li> <li>• HSL2_25 = 2.5 meter HSL2 cable</li> </ul>
HSLH	There is a hybrid RIO/HSL to HSL2/RIO-G cable (yellow connector at one end and black connector at the other end), but the length of the cable could not be sensed.
HSLH_xx	There is a hybrid RIO/HSL to HSL2/RIO-G cable (yellow connector at one end and black connector at the other end). Use the xx value to determine the cable length from this list: <ul style="list-style-type: none"> <li>• HSLH_06 = 6 meter HSL/RIO to HSL2/RIO-G cable</li> <li>• HSLH_15 = 15 meter HSL/RIO to HSL2/RIO-G cable</li> </ul>
HSL_I	There is a RIO/HSL interposer card for HSL/RIO cables (yellow connectors), HSL2/RIO-G cables (black connectors), or optical cables. The interposer card type could not be sensed.
HSL_Ix	There is a RIO/HSL interposer card for HSL/RIO cables (yellow connectors), HSL2/RIO-G cables (black connectors), or optical cables. Use the x value to determine the interposer card type from this list: <ul style="list-style-type: none"> <li>• HSL_I2 = Copper HSL2/RIO-G interposer card for HSL2/RIO-G cable connectors (black) in the system unit backplane position C08 or C09 of machine type 9406 model 825.</li> <li>• HSL_I3 = Optical HSL/RIO interposer card for optical RIO/HSL cables in system unit backplane position C08 or C09 of machine type 9406 model 825.</li> <li>• HSL_I4 = HSL2/RIO-G interposer/riser card on a 61D I/O unit in location -P1-riser or -P2-riser.</li> </ul>

2. Choose from the following options:

- If you are working from the serviceable event view, the location code or FRU description in the view will help determine the actual RIO/HSL hardware to exchange. Continue with the next step.
- If you are not working from the serviceable event view, or the view does not have a location code or better FRU description, then determine the location code of other FRUs in the FRU list for the error. Then continue with the next step.

3. Use the location code and the information from the preceding table, or other FRUs listed in the FRU list for this error, to determine the machine type, model, or unit feature involved in the error. Use Table 48 to find links to the locations information.

**Note:** If you exchange all of the FRUs in the FRU list, but the problem still exists, contact your next level of support. You may be directed to exchange additional RIO/HSL FRUs. Additional RIO/HSL FRUs have more information about RIO/HSL FRUs on specific models and I/O units. Use this section when you are directed by your next level of support.

Table 48. Location information

Machine type, model, or unit feature	Symbolic FRU to search for in the locations information	Link to location information
520	HSL_LNK	Locations — Model 520
550 and 9124-720	HSL_LNK	Locations — 9124-720 and Model 550
570	HSL_LNK	Locations — Model 570

Table 48. Location information (continued)

Machine type, model, or unit feature	Symbolic FRU to search for in the locations information	Link to location information
5074, 8079-002, 8093-002	HSL_LNK	Locations — 5074, 8079-002, and 8093-002 expansion I/O units
5079	HSL_LNK	Locations — 5079 expansion I/O unit
5088, 0588	HSL_LNK	Locations — 5088 and 0588 expansion I/O units
5094, 5294, 8094-002	HSL_LNK	Locations — 5094, 5294, and 8094-002 expansion I/O units
5095, 0595	HSL_LNK	Locations — 5095 and 0595 expansion I/O units
Type 1519 — external xSeries server	HSL_LNK	See table in card positions for xSeries
7311-D10, 7311-D11, and 5790	HSL_LNK	Locations — 7311-D10 7311-D11 and 5790 expansion unit
61D	HSL_LNK	Locations — 61D

### Additional RIO/HSL FRUs

The following are RIO/HSL FRUs by model and/or unit type. For the model or unit type you are working on, there may be additional RIO/HSL FRUs which were not listed in the FRU list of the error. Under the direction of your next level of support, you can try exchanging the additional FRUs.

1. In the following table, locate the unit type(s) on which you are working. Exchange the indicated RIO/HSL loop connections (external or embedded) or RIO/HSL interposer card.
2. Did the exchange correct the error?

**Yes:** The FRU you just replaced was the failing item. Go to Verifying the repair.

**This ends the procedure.**

**No:** Call your next level of support.

**This ends the procedure.**

Table 49. HSL/RIO cable or connections

System model or unit type	RIO/HSL cable or connections	Link to locations information
5074, 8079-002, 8093-002	External RIO/HSL ports on the HSL I/O bridge / RIO adapter card in location C08.	Locations — 5074, 8079-002, and 8093-002 expansion I/O units
5079	External RIO/HSL ports on the HSL I/O bridge / RIO adapter card in location C08.	Locations — 5079 expansion I/O unit
5088, 0588	External RIO/HSL ports on the HSL I/O bridge / RIO adapter card in location C10.	Locations — 5088 and 0588 expansion I/O units
5094, 8094-002	External RIO/HSL ports on the HSL I/O bridge / RIO adapter card in location C10.	Locations — 5094, 5294, and 8094-002 expansion I/O units
5095, 0595	External RIO/HSL ports on the HSL I/O bridge / RIO adapter card in location C05.	Locations — 5095 and 0595 expansion I/O units
5294	External RIO/HSL ports on the HSL I/O bridge / RIO adapter card in location C08.	Locations — 5094, 5294, and 8094-002 expansion I/O units

Table 49. HSL/RIO cable or connections (continued)

System model or unit type	RIO/HSL cable or connections	Link to locations information
Type 1519 — external xSeries server	External RIO/HSL ports on the Integrated xSeries Adapter.	See table in card positions for xSeries
7311-D10, 7311-D11, and 5790	External RIO/HSL ports on the HSL I/O bridge / RIO adapter card in location -P1.1.	Locations — 7311-D10 7311-D11 and 5790 expansion unit
61D	<p>External RIO/HSL ports on the HSL I/O bridge / RIO adapter interposer card in location -P1(-Riser)</p> <p>Embedded RIO/HSL ports in the I/O unit logic planar in position -P1(-Planar)</p> <p>External RIO/HSL ports on the HSL I/O bridge / RIO adapter interposer card in location -P2(-Riser)</p> <p>Embedded RIO/HSL ports in the I/O unit logic planar in position -P2(-Planar)</p>	Locations — 61D

### Powering on and powering off an I/O expansion unit

Follow these steps if you disconnected an RIO/HSL cable from an I/O expansion unit, and the RIO/HSL link on the unit did not recover when you reconnected the cable:

1. From the Hardware Service Manager screen, select **Packaging hardware resources**.
2. Select the frame that has just accidentally lost its RIO/HSL connection and select **Concurrent maintenance**. Then press **Enter**.
3. Select **Power off domain**.
4. After reconnecting the unit into the RIO/HSL loop, select **Power on domain**.

### HSL\_OPT

This is an optical HSL/RIO cable. When connecting or disconnecting these cables, use the optical cleaning kit described in “OPT\_CLN” on page 521. Go to “HSL\_LNK” on page 492 and follow the appropriate instructions.

**This ends the procedure.**

### HSL1

This is a standard copper HSL/RIO cable at both ends. Diagnostic code cannot determine the length of the cable. Go to “HSL\_LNK” on page 492 and follow the appropriate instructions.

**This ends the procedure.**

### HSL1\_UN

This is a standard copper HSL/RIO cable at the end where an error was detected. Diagnostic code cannot determine the length of the cable, or the type of connector at the other end. Go to “HSL\_LNK” on page 492 and follow the appropriate instructions.

**This ends the procedure.**

## **HSL2**

This is an HSL2/RIO-G copper HSL/RIO cable at both ends. Diagnostic code cannot determine the length of the cable. Go to “HSL\_LNK” on page 492 and follow the appropriate instructions.

**This ends the procedure.**

## **HSL2\_xx**

This is an HSL2/RIO-G copper HSL/RIO cable at both ends. The xx value indicates the cable length in meters. Go to “HSL\_LNK” on page 492 and follow the appropriate instructions. **This ends the procedure.**

## **HSL2\_01**

This is an HSL2/RIO-G copper HSL/RIO cable at both ends. The 01 value indicates the cable is 1 meter long. Go to “HSL\_LNK” on page 492 and follow the appropriate instructions.

**This ends the procedure.**

## **HSL2\_03**

This is an HSL2/RIO-G copper HSL/RIO cable at both ends. The 03 value indicates the cable is 3 meters long. Go to “HSL\_LNK” on page 492 and follow the appropriate instructions.

**This ends the procedure.**

## **HSL2\_08**

This is an HSL2/RIO-G copper HSL/RIO cable at both ends. The 08 value indicates the cable is 8 meters long. Go to “HSL\_LNK” on page 492 and follow the appropriate instructions.

**This ends the procedure.**

## **HSL2\_10**

This is an HSL2/RIO-G copper HSL/RIO cable at both ends. The 10 value indicates the cable is 10 meters long. Go to “HSL\_LNK” on page 492 and follow the appropriate instructions.

**This ends the procedure.**

## **HSL2\_15**

This is an HSL2/RIO-G copper HSL/RIO cable at both ends. The 15 value indicates the cable is 15 meters long. Go to “HSL\_LNK” on page 492 and follow the appropriate instructions.

**This ends the procedure.**

## **HSL2\_17**

This is an HSL2/RIO-G copper HSL/RIO cable at both ends. The 17 value indicates that the cable is 1.75 meters long. Go to “HSL\_LNK” on page 492 and follow the appropriate instructions.

## **HSL2\_25**

This is an HSL2/RIO-G copper HSL/RIO cable at both ends. The 25 value indicates that the cable is 2.5 meters long. Go to “HSL\_LNK” on page 492 and follow the appropriate instructions.

## **I2CBUS**

A fault was detected on the I2C bus.

Choose the model or I/O expansion unit you are working on:

- Instructions for Models 520, 9124-720, 550, and 570
- Instructions for 5095, 0595, 5790, 7311-D10, D11, and D20 I/O expansion units
- Instructions for all other I/O expansion units except 5095, 0595, 5790, 7311-D10, D11, and D20

### Instructions for Models 520, 9124-720, 550, and 570

1. Is the reference code 3114?

**No:** Continue with the next FRU in the list. **This ends the procedure.**

**Yes:** Replace the following (see Finding part locations for part numbers and a link to the exchange procedure):

- For models 520, 9124-720, and 550, replace the system backplane (SYSBKPL).
- For model 570 (4-way), replace the I/O backplane (SYSBKPL).
- For model 570 (8-way through 16-way), verify that the service processor cable is connected and seated properly on all units. If the reference code prevails, replace the following, one at a time, until the problem is resolved:
  - a. service processor cable (see Locations — model 570)
  - b. service processor (see Locations — model 570)
  - c. I/O backplane on the failing unit (see Locations — model 570)

**This ends the procedure.**

### Instructions for 5095, 0595, 5790, 7311-D10, D11, and D20 I/O expansion units

1. Is the reference code 3100, 3104, 3105, 3116, or 3118?

**No:** Continue with the next step.

**Yes:** Replace the backplane (TWRCARD). See Finding part locations for part numbers and a link to the exchange procedure. **This ends the procedure.**

2. Is the reference code 3101 or 3115?

**No:** Continue with the next step.

**Yes:** Replace the following FRUs one at a time (see Finding part locations for part numbers and a link to the exchange procedure):

- Display panel
- Backplane (TWRCARD)
- Signal cable SIGC01 (connecting the backplane to the display panel). **This ends the procedure.**

3. Is the reference code 3102, 3113, or 3114?

**No:** Continue with the next step.

**Yes:** Replace the following FRUs one at a time (see Finding part locations for part numbers and a link to the exchange procedure):

- Backplane (TWRCARD)
- Signal cable SIGC04 (connecting the SPCN card to the tower card). **This ends the procedure.**

4. Is the reference code 3103 or 3112?

**No:** Continue with the next step.

**Yes:** Replace the following FRUs one at a time:

- Device board (see Finding part locations)
- SPCN card (see “TWRCARD” on page 549). **This ends the procedure.**

5. Is the reference code 3121?

**No:** Return to “Start of call procedure” on page 2. **This ends the procedure.**

**Yes:** Replace device board 1 (see Finding part locations for part numbers and a link to the exchange procedure). **This ends the procedure.**

### Instructions for all I/O expansion units except 5095, 0595, 5790, 7311-D10, D11, and D20

1. Is the reference code 3101, 3105, 3115, or 3116?

**No:** Go to step 3 on page 498.

**Yes:** Continue with the next step.

2. Are you working on a 5088 or 0588?

**No:** Replace the following FRUs (see Finding part locations):

- Control panel NB1
- Tower card CB1
- Power cable PWR60 (connecting power distribution board PB1 to device board DB3).
- Signal cable SIG63 (connecting control panel NB1 to device board DB3). **This ends the procedure.**

**Yes:** Replace the following FRUs (see Locations — 5088 and 0588 expansion I/O units):

For reference code 3101 or 3115:

- Control panel NB1
- Tower card CB1

For reference code 3105 or 3116:

- Fan controller assembly BB1
- Tower card CB1

**This ends the procedure.**

3. Is the reference code 3102?

**No:** Continue with the next step.

**Yes:** Replace the following FRUs one at a time (see Finding part locations):

- HSL I/O bridge C08
- Tower card CB1

**This ends the procedure.**

4. Is the reference code 3103?

**No:** Continue with the next step.

**Yes:** Replace the following FRUs one at a time (see Finding part locations):

For 5088 and 0588:

- Tower card CB1

For 5074, 5079, 5094, and 5294:

- Device board DB1
- Device board DB2
- Device board DB3
- Tower card CB1

**This ends the procedure.**

5. Is the reference code 3104, 3114, or 3118?

**No:** Continue with the next step.

**Yes:** Replace the tower card CB1 (see Finding part locations). **This ends the procedure.**

6. Is the reference code 3106?

**No:** Continue with the next step.

**Yes:** Replace the network interface controller (NIC) card M41. (see Finding part locations). **This ends the procedure.**

7. Is the reference code 3110, 3111, or 3112?

**No:** Go to step 11 on page 499.

**Yes:** Continue with the next step.

8. Is the reference code 3110?

**No:** Continue with the next step.

**Yes:** Replace the following FRUs one at a time (see Finding part locations):



- Device board DB1
- Tower card CB1

**This ends the procedure.**

9. Is the reference code 3111?

**No:** Continue with the next step.

**Yes:** Replace the following FRUs one at a time (see Finding part locations):

- Device board DB2
- Tower card CB1

**This ends the procedure.**

10. Is the reference code 3112?

**No:** Continue with the next step.

**Yes:** Replace the following FRUs one at a time (see Finding part locations):

- Device board DB3
- Tower card CB1

**This ends the procedure.**

11. Is the reference code 3113?

**No:** Return to “Start of call procedure” on page 2. **This ends the procedure.**

**Yes:** Replace the HSL I/O bridge (see Finding part locations). **This ends the procedure.**

## IDPART

A system unit part is failing.

### Instructions for Models 520, 550, 9124-720, 570, 590, and 595

1. Is the reference code 1xxx 8430, 8431, or 8432?

**No:** Continue with the next step.

**Yes:** Go to step 4.

2. Is the reference code 1xxx 840D or 840E?

**Yes:** Continue with the next step.

**No:** Go to step 4.

3. Is the reference code for an xSeries server unit?

**No:** Perform “PWR1917” on page 189 for the correct configuration ID. **This ends the procedure.**

**Yes:** Exchange the Integrated xSeries Adapter (IXA) (see Locations — Integrated xSeries adapter card (IXA)). **This ends the procedure.**

4. Perform “PWR1917” on page 189 for the correct configuration ID, and then return here and continue with the next step.

5. Is the reference code 1xxx 8430?

**No:** Continue with the next step.

**Yes:** Verify that the FSP cable is connected and seated correctly. If the reference code prevails, replace the following, one at a time, until the problem is resolved:

- a. Service processor cable (see Model 570 cables for the part number and then Remove and replace the model 570 service processor cable)
- b. Service processor card (see Locations — model 570)
- c. I/O backplane (see Locations — model 570)

**This ends the procedure.**

6. Is the reference code 1xxx 8431?

**No:** Continue with the next step.

**Yes:** Replace the following, one at a time, until the problem is resolved:

- a. The cable that is not needed for system configuration
- b. Service processor card (see Locations — model 570)
- c. I/O backplane (see Locations — model 570)

**This ends the procedure.**

7. Is the reference code 1xxx 8432?

**No:** The reference code has changed. Return to the “Start of call procedure” on page 2. **This ends the procedure.**

**Yes:** Replace the service processor card (see Locations — model 570). **This ends the procedure.**

## IOA

See FI00719 to determine the field replaceable unit (FRU) part number.

**This ends the procedure.**

## IOACNFG

There is an IOA configuration problem.

Too many communications lines or IOAs are configured using the same IOP. See Hardware service manager in the Service functions for information about how to move an IOA to another IOP.

## IOADPTR

The hardware, firmware, microcode, or device driver of an adapter or card slot detected an error. The failing component is the adapter in the location specified in the SRC.

1. Are you working from the serviceable event view and is there a card location listed with this FRU?

**Yes:** Use Table 50 on page 501 to replace the adapter identified by this location code. **This ends the procedure.**

**No:** Determine the location of the adapter by working with the customer or your next level of support. If you cannot determine the location of the failing adapter by using SRC or resource information or the device tree, then determine the adapter type from the SRC, SRC description, failing resources, or error message you are working with. Make a list of all the adapter locations of that type assigned to the partition. Continue with the next step.

2. Have you identified a single FRU location?

**Yes:** Use Table 50 on page 501 to replace the FRU you have identified. **This ends the procedure.**

**No:** Continue with the next step.

3. Using the location codes you have identified, determine which system unit and expansion units have PCI adapters of this type assigned to the partition you are working with. Starting with the expansion units first, remove all of the PCI adapters of this type from one of the units (use Table 50 on page 501 to guide you to the correct locations information and removal procedure).

### Attention:

- Remove the PCI adapters from the system unit only after you have tried all of the expansion units first.
- Do **not** remove any FRUs with embedded adapters, only FRUs in PCI card slots.

Continue with the next step.

4. Reinstall one of the adapters (use Table 50 on page 501 to guide you to the correct removal procedure) and power on the unit. Continue with the next step.

5. Does the problem reoccur?

**Yes:** The adapter you just reinstalled is the failing item and needs to be replaced (use Table 50 on page 501 to guide you to the correct locations information and removal procedure). **This ends the procedure.**

**No:** Continue with the next step.

6. Have you reinstalled all of the adapters on the unit you're currently working with?  
**Yes:** Continue with the next step.  
**No:** Return to step 4 on page 500 and reinstall the next adapter on this unit.
7. Are there any units (including the system unit) on which you have not yet removed and reinstalled the PCI adapters?  
**No:** Continue with the next step.  
**Yes:** Return to step 3 on page 500 and work with another unit.
8. Go to "Card positions" on page 64 to determine if system unit or any of the expansion units has an embedded adapter of the type you are working with. Is there such an embedded adapter?  
**No:** The problem may be intermittent. Contact your next level of support. **This ends the procedure.**  
**Yes:** The FRU with the embedded adapter is the failing item and needs to be replaced. Use Table 50 to exchange the FRU at the location specified in the card position table. Repeat this step for each expansion unit with an embedded adapter assigned to the partition, and then for the system unit. **This ends the procedure.**

Table 50. Failing items for symbolic FRU IOADPTR

System model, expansion unit, or machine type	Symbolic FRU to locate	FRU location	Link to locations information
520	PCI IOA card in PCI bridge set 1	-P1-C1 -P1-C2 -P1-C4	Locations — model 520
	PCI IOA card in PCI bridge set 2	-P1-C3 -P1-C5 -P1-C6	
	Embedded adapters in system backplane, PCI bridge sets 1 and 2	-P1	
550 and 9124-720	PCI IOA card in PCI bridge set 1	-P1-C1 -P1-C2	Locations — 9124-720 and model 550
	PCI IOA card in PCI bridge set 2	-P1-C3 -P1-C4 -P1-C5	
	Embedded adapters in system backplane, PCI bridge sets 1 and 2	-P1	
570	PCI IOA card in PCI bridge set 2	-P1-C1 -P1-C2	Locations — model 570
	PCI IOA card in PCI bridge set 3	-P1-C3 -P1-C4 -P1-C5 -P1-C6	
	Embedded adapters in I/O backplane, PCI bridge sets 1, 2, and 3	-P1	

Table 50. Failing items for symbolic FRU IOADPTR (continued)

System model, expansion unit, or machine type	Symbolic FRU to locate	FRU location	Link to locations information
5074, 8079-002, 8093-002	PCI IOA in PCI bridge set 1	C01 C02 C03 C04	Locations — 5074, 8079-002, and 8093-002 expansion units
	PCI IOA in PCI bridge set 2	C05 C06 C07 C09 C10	
	PCI IOA in PCI bridge set 3	C11 C12 C13 C14 C15	
5079	PCI IOA in PCI bridge set 1	C01 C02 C03 C04	Locations — 5079 expansion unit
	PCI IOA in PCI bridge set 2	C05 C06 C07 C09 C10	
	PCI IOA in PCI bridge set 3	C11 C12 C13 C14 C15	
5088, 0588	PCI IOA in PCI bridge set 1	C01 C02 C03 C04	Locations — 5088 and 0588 expansion units
	PCI IOA in PCI bridge set 2	C05 C06 C07 C08 C09	
	PCI IOA in PCI bridge set 3	C11 C12 C13 C14 C15	

Table 50. Failing items for symbolic FRU IOADPTR (continued)

System model, expansion unit, or machine type	Symbolic FRU to locate	FRU location	Link to locations information
5094, 5294, 8094-002	PCI IOA in PCI bridge set 1	C01 C02 C03 C04	Locations — 5094, 5294, and 8094-002 expansion units
	PCI IOA in PCI bridge set 2	C05 C06 C07 C08 C09	
	PCI IOA in PCI bridge set 3	C11 C12 C13 C14 C15	
5095, 0595	PCI IOA in PCI bridge set 1	C01 C02 C03 C04	Locations — 5095 and 0595 expansion units
	PCI IOA in PCI bridge set 2	C06 C07 C08	
7311-D10, 7311-D11, and 5790	PCI IOA in PCI bridge set 1	-P1-I1 -P1-I2 -P1-I3	Locations — 7311-D10, 7311-D11, and 5790 expansion units
	PCI IOA in PCI bridge set 2	-P1-I4 -P1-I5 -P1-I6	
7311-D20	PCI IOA in PCI bridge set 1	C01 C02 C03 C04	Locations — 7311-D20 expansion unit
	PCI IOA in PCI bridge set 2	C06 C07 C08	

Table 50. Failing items for symbolic FRU IOADPTR (continued)

System model, expansion unit, or machine type	Symbolic FRU to locate	FRU location	Link to locations information
5791, 5794, and 7040-61D	PCI IOA in PCI bridge set 1	-P1-I1 -P1-I2 -P1-I3 -P1-I4	Locations — 5791, 5794, and 7040-61D expansion unit
	PCI IOA in PCI bridge set 2	-P1-I5 -P1-I6 -P1-I7	
	PCI IOA in PCI bridge set 3	-P1-I8 -P1-I9 -P1-I10	
	Embedded adapters in backplane 1 (left side), PCI bridge sets 2 and 3	-P1	
	PCI IOA in PCI bridge set 1	-P2-I1 -P2-I2 -P2-I3 -P2-I4	
	PCI IOA in PCI bridge set 2	-P2-I5 -P2-I6 -P2-I7	
	PCI IOA in PCI bridge set 3	-P2-I8 -P2-I9 -P2-I10	
	Embedded adapters in backplane 2 (right side), PCI bridge sets 2 and 3	-P2	

## IOBRDG

The failing component is the RIO/HSL I/O bridge on the IPL path. Use the table below to determine which FRU to replace and how to replace it.

Table 51. IOBRDG failing components

System model	Name of symbolic FRU to locate	FRU name (replace in order, one at a time)	Link to locations information
520	IOBRDG	System backplane	Locations — Model 520
550 and 9124-720	IOBRDG	System backplane	Locations — 9124-720 and Model 550
570	IOBRDG	I/O backplane (primary unit) I/O backplane (secondary units 1–3)	Locations — Model 570
590 and 595	IOBRDG	Service processor card 0 Service processor card 1	Locations — model 590 and 595

**This ends the procedure.**

## IO\_DEV

A storage device is the failing item. Perform the following:

1. Is device location information available in the serviceable event view for this FRU?

**Yes:** Continue with the next step.

**No:** If the adapter controlling this device is listed in the FRU list then use that location code and continue with the next step. Otherwise work with the customer or your next level of support to determine the location of the device or its adapter by using SRC information, failing resource information, device tree or error message information. Then continue with the next step.

2. Use the unit type information in the location code to identify the type of unit where the device or device adapter is located. Then use the following table to exchange the failing item. The link to locations information will guide you to the correct exchange procedure.

**Note:** The location listed may be a logical path instead of the physical device location. The known device logical location codes are handled in the locations information for each unit type.

Model or expansion unit	FRU to location	Link to locations information
520	Disk unit	Locations — model 520
550 and 9124-720	Disk unit	Locations — 9124-720 and model 550
570	Disk unit	Locations — model 570
5074, 8079-002, 8093-002	Disk unit	Locations — 5074, 8079-002, and 8093-002 expansion units
5079	Disk unit	Locations — 5079 expansion unit
5088, 0588	Disk unit	Locations — 5088 and 0588 expansion units
5094, 5294, 8094-002	Disk unit	Locations — 5094, 5294, and 8094-002 expansion units
5095, 0595	Disk unit	Locations — 5095 and 0595 expansion units
5791, 5794, and 7040-61D	Disk unit	Locations — 5791, 5794, and 7040-61D expansion unit
7311-D10, 7311-D11, and 5790	Disk unit	Locations — 7311-D10, 7311-D11, and 5790 expansion units
7311-D20	Disk unit	Locations — 7311-D20 expansion unit

## IO\_HUB

The failing component is the RIO/HSL NIC on the IPL Path. Use the table below to determine which FRU to replace and how to replace it.

**Note:** To simplify this information, secondary units on the 570 server are numbered 1 through 3-secondary unit 1 being nearest to the primary unit and secondary unit 3 being furthest.

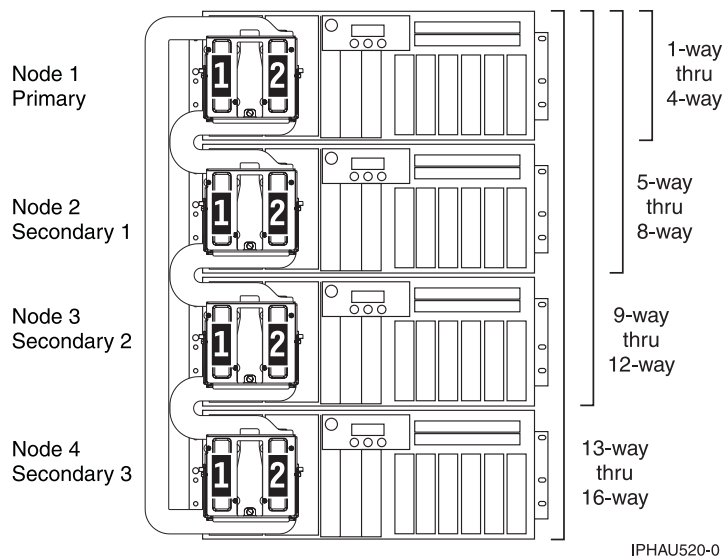


Table 52. IO\_HUB failing components

System model	Name of symbolic FRU to locate	FRU name (replace in order, one at a time)	Link to locations information
520	IO_HUB	System backplane	Locations — Model 520
550 and 9124-720	IO_HUB	System backplane	Locations — 9124-720 and Model 550
570	IO_HUB	I/O backplane (primary unit) I/O backplane (secondary units 1-3)	Locations — Model 570
590 and 595	IO_HUB	For each node, starting with node 0: Bus adapter card 1 Bus adapter card 2 Bus adapter card 3 Bus adapter card 4 Bus adapter card 5 Bus adapter card 6 Bus adapter card 7 Bus adapter card 8	Locations — model 590 and 595

This ends the procedure.

## IOP

Replace the I/O processor. Use the I/O processor location information in the Service Action Log if it is available. If the location is not available, find the address of the I/O Processor. See System reference code (SRC) address formats. Use the address to find the location. See Finding part locations.

## LBSADP1

This symbolic FRU is not supported on the system. Continue with the next FRU in the failing item list.

## LBSADP2

This symbolic FRU is not supported on the system. Continue with the next FRU in the failing item list.

## LBSADP3

This symbolic FRU is not supported on the system. Continue with the next FRU in the failing item list.

## LBSADP4

This symbolic FRU is not supported on the system. Continue with the next FRU in the failing item list.

## LBSADP5

This symbolic FRU is not supported on the system. Continue with the next FRU in the failing item list.

## LBUSADP

This symbolic FRU is not supported on the system. Continue with the next FRU in the failing item list.

## LICCODE

This procedure will determine the preferred method of updating platform LIC.

1. Is the system managed by an HMC?
  - No:** Continue with the next step.
  - Yes:** Go to step 5 on page 507.
2. Is the system IPL'd and is the operating system running?
  - No:** Continue with the next step.
  - Yes:** Go to step 9 on page 507.



3. Attempt to IPL the system from the present platform LIC side and start the operating system. Are you successful?
  - No:** Continue with the next step.
  - Yes:** Go to step 9.
4. Attempt to boot the system from the other side of the platform LIC, and start the operating system. Were you successful?
  - No:** Go to symbolic FRU "SVCPROC" on page 547 to update the platform LIC by replacing the service processor. **This ends the procedure.**
  - Yes:** Go to step 9.
5. Is the system at power-on standby mode or beyond?
  - Yes:** Continue with the next step.
  - No:** Go to symbolic FRU "SVCPROC" on page 547 to update the platform LIC by replacing the service processor. **This ends the procedure.**
6. Perform the following to determine how the system is currently set to receive firmware updates:
  - a. Access ASMI (see Accessing the Advanced System Management Interface).
  - b. On the ASMI Welcome pane, type in your authorized service provider User ID and Password, and click **Log In**.
  - c. In the navigation area, expand **System Configuration** and then click **Firmware Update Policy**.
  - d. The system is currently set to receive firmware updates from the resource (either the HMC or the operating system) displayed in the *Setting* field.

Choose from the following:

  - If the system is set to receive firmware updates from the operating system, continue with the next step.
  - If the system is set to receive firmware updates from the HMC, go to step 10.
7. Will the system IPL and run the service partition (from the current platform LIC side)?
  - No:** Continue with the next step.
  - Yes:** Go to step 9.
8. Attempt to boot the system from the other side of the platform LIC, and start the service partition. Were you successful?
  - No:** Go to step 10.
  - Yes:** Continue with the next step.
9. Determine what level of platform LIC is currently installed. Then go to Server firmware fixes and update the platform LIC from the operating system. If you are still unable to update the platform LIC, contact your next level of support.
 

**Attention:** Be aware that a newer level of platform LIC may already have been downloaded before this problem occurred or when the problem was reported.

**This ends the procedure.**
10. Go to Server firmware fixes and update the platform LIC from the HMC. If you are still unable to update the platform LIC, contact your next level of support. **This ends the procedure.**

## LITSTRP

Use the following table to perform the appropriate action for the SRC you are working with.

SRC	Replace this FRU	Link to locations information
1xxx1D04	Light strip (front)	Locations — model 590 and 595
1xxx1D05	Light strip (back)	

## LOC\_SYS

A problem has occurred on the local (this) system with i5/OS HSL OptiConnect. The i5/OS Service Action Log (SAL) code will attempt to identify the HSL/RIO loop number as a portion of the FRU's part description for this symbolic FRU. Search the SAL of this system for hardware and LIC problems. Correct any problems that you find with LIC or Network Interface Controller (NIC) / RIO controller hardware.

**This ends the procedure.**

## LPARCFG

There is a configuration problem with a logical partition. Perform any actions listed in the "Description/Action" column in the unit reference code table for the reference code.

Have the customer check processor and memory allocations to the partition. The customer must ensure that there are enough functioning processor and memory resources in the system for all the partitions. Processor or memory resources that failed during system IPL could have caused the IPL problem in the partition.

Have the customer check the bus and I/O processor allocations for the partition. The customer must ensure that the partition has load source and console I/O resources.

Have the customer check the IPL mode of the failing partition.

For further assistance, the customer should contact their software service provider, or see Partitioning the server for additional support.

**This ends the procedure.**

## LPARSUP

There is either an IPL problem, a main storage dump problem, or a software error with a partition. Perform any actions listed in the "Description/Action" column in the SRC table.

During the IPL or main storage dump of a partition, a complex problem was detected. The serviceable event view on the HMC has to be searched or the SRC history list on the HMC for the partition with the problem has to be analyzed in sequence. If the partition is a "Guest" partition, then the SRC history list of the "Hosting" partition must be analyzed.

Contact your next level of hardware support.

## LSERROR

There was an error when the platform LIC attempted to locate the i5/OS partition's load source. Choose from the following:

- If the load source is a tape or optical device, exchange the media. If replacing the media does not work, look in the serviceable event view for other errors.
- If the load source is a disk drive, perform a D-mode IPL. Correct any errors found.

**This ends the procedure.**

## MA\_BRDG

The problem is the multi-adapter bridge hardware on a system bus. Perform the following:

1. Is the location information for this failing component available in the problem view you are working with of the serviceable event user interface of an operating system, service processor, or Hardware Management Console (HMC)?

**No:** Continue with the next step.

**Yes:** Use this location information and go to step 3 on page 509.

2. Perform the following:

- a. Record the bus number, which is in word 7 of the reference code (see “Breaking down a RIO/HSL or PCI bus reference code” on page 61 for help in determining the bus number).
  - b. To determine which enclosure, frame, or I/O unit contains the failing component, search for the bus number using one of the following interfaces:
    - HMC system configuration user interface
    - i5/OS Hardware Service Manager (HSM)
    - System configuration listing
  - c. Record the enclosure or unit’s type/model or feature. Then continue with the next step.
3. The failing component is the FRU containing the multi-adapter bridge. Use the following table to identify the name of the FRU that is indicated by the location in the user interface you are working with, or by using the bus number you obtained previously in this procedure. Use the link to locations information to exchange the FRU.

*Table 53. FRU containing the multi-adapter bridge*

Model or expansion unit	Name of FRU to exchange	Symbolic FRU to look for	Link to locations information
520	System backplane	MA_BRDG	Locations — model 520
550 and 9124-720	System backplane	MA_BRDG	Locations — 9124-720 and model 550
570	I/O backplane on the primary unit or secondary unit	MA_BRDG	Locations — model 570
5074, 8079-002, 8093-002	Expansion unit backplane	MA_BRDG	Locations — 5074, 8079-002, and 8093-002 expansion I/O units
5079	Expansion unit backplane	MA_BRDG	Locations — 5079 expansion I/O unit
5088, 0588	Expansion unit backplane	MA_BRDG	Locations — 5088 and 0588 expansion I/O units
5094, 5294, 8094-002	Expansion unit backplane	MA_BRDG	Locations — 5094, 5294, and 8094-002 expansion I/O units
5095, 0595	Backplane	MA_BRDG	Locations — 5095 and 0595 expansion I/O units
Type 1519 external xSeries server	Integrated xSeries adapter (IXA) card	Follow the RIO/HSL cables	Locations — Integrated xSeries adapter card (IXA)
7311-D10, 7311-D11, and 5790	I/O unit backplane	MA_BRDG	Locations — 7311-D10, 7311-D11, and 5790 expansion units
7311-D20	Backplane	MA_BRDG	Locations — 7311-D20 expansion unit
5791, 5794, and 7040-61D	Backplane 1	MA_BRDG	Locations — 5791, 5794, and 7040-61D expansion unit
	Backplane 2	MA_BRDG	

**This ends procedure.**

## **MABRCFG**

The multi-adapter bridge hardware detected a configuration problem.

In some cases, the user interface view of the serviceable event will list more than one card position for this FRU's location. The problem may be with any one of the FRUs in those locations. When there is a list of locations in this FRU's location code, the card locations will be separated by commas. A range of card positions will show the starting card position, a colon, and the ending card position.

1. Are you working from the service event user interface from an operating system, service processor, or the HMC and there is a card position(s) listed with this failing item?

**Yes:** The listed card position(s) is where the error is located. Continue with the next step.

**No:** Go to "MABIP53" on page 105 to determine the card location where the multi-adapter bridge configuration error exists. Return here after locating the card, and continue with the next step.

2. Use the following table to determine the corrective action.

Table 54. Multi-adapter bridge errors

Problem or message (these appear in uppercase in the console)	Meaning or corrective action
Multi-adapter bridge has no IOP for the I/O adapters.	<ol style="list-style-type: none"> <li>1. System code detected one or more I/O adapters under the multi-adapter bridge specified in the DSA, but no I/O processor to control them. The I/O adapters are not available to the system. The problem view lists the card locations controlled by the multi-adapter bridge.  If you do not have the card locations listed in the problem view, find them by continuing with the next step. Otherwise, go to step 3.</li> <li>2. To locate the I/O adapters, search for the card locations controlled by the multi-adapter bridge. The multi-adapter bridge number is in the DSA (see "DSA translation" on page 62). See "Card positions" on page 64 to determine all the card locations controlled by the multi-adapter bridge.</li> <li>3. To make the I/O adapters available to the system, install an I/O processor in a card slot controlled by the multi-adapter bridge or move the I/O adapters to a multi-adapter bridge with an I/O processor. When adding an IOP, place it in a card position that is ahead of the IOAs according to the "IOA Assignment Rules" table located in Finding part locations for the frame type on which you are working.</li> </ol>
Card type not supported in this slot.	<p>System code detected a card type that is not supported in the multi-adapter bridge card location in which it is installed. Move the card to a location that will support that card type (check the installation instructions for the card to determine which card locations can support it).</p> <p>For reference codes where word 1 is B6006964 and word 4 is xxxx2015, if the SAL does not show a card position for this error, then the card position can be determined by creating a Direct Select Address (DSA) from information in the reference code. To create the DSA, use the first 5 digits of word 7 and the 6th digit of word 5 followed by two zeros. Using this DSA, perform "MABIP53" on page 105 to determine the position of the card that is not supported in that slot.</p>
I/O processor removed from multi-adapter bridge card slot.	System code detected that an I/O processor card was located in that card location on the previous IPL. The I/O processor is no longer installed in that location.
I/O adapter unavailable due to moved I/O processor card.	System code detected that the I/O processor which controlled the I/O adapter card specified in the DSA has been moved since the last IPL. The I/O adapter card is unavailable to the system.

Table 54. Multi-adapter bridge errors (continued)

Problem or message (these appear in uppercase in the console)	Meaning or corrective action
IOA removed from multi-adapter bridge slot.	System code detected that the card location specified in the DSA had an I/O adapter installed on the previous IPL. The I/O adapter is no longer installed in that card location.
I/O adapter replaced by I/O processor card.	System code detected that the card location specified in the DSA had an I/O adapter installed on the previous IPL. The I/O adapter has been replaced by an I/O processor.
Multi-adapter bridge configuration change or error.	System code has detected a change in the multi-adapter bridge configuration or a configuration error since the last IPL.
PCI I/O processor rejected assignment or removal of an IOA.	<p>The I/O processor's (IOP) Licensed Internal Code (LIC) has rejected the assignment of an I/O adapter (IOA) to that IOP, or the IOP's LIC has rejected the removal of an IOA that the IOP owns.</p> <p>Word 5 of the reference code is the Direct Select Address (DSA) of the IOP. Word 7 of is the DSA of the IOA. To find the IOP and IOA, go to "MABIP53" on page 105 using the DSA.</p> <p>Use Hardware Service Manager (HSM) concurrent maintenance functions to assign or remove the IOA. See Hardware Service Manager for details.</p> <p>Assignment failures can result from either of the following conditions:</p> <ul style="list-style-type: none"> <li>• The IOP is already at its capacity to accept IOA assignments.</li> <li>• The IOA is not a type supported by the IOP.</li> </ul> <p>Corrective action:</p> <ul style="list-style-type: none"> <li>• Add another IOP for LIC to assign the IOA to if necessary.</li> <li>• Reassign the IOA to another IOP using concurrent maintenance.</li> </ul> <p>Removal failures:</p> <ul style="list-style-type: none"> <li>• This is a LIC problem and should be reported.</li> <li>• Call your next level of support.</li> </ul>
Linux-owned slot - no IOP is allowed.	An IOP card was found in a PCI bridge set that is allocated to a Linux partition. The IOP will not be supported in this card position.

This ends the procedure.

## MASBUS

The multi-adapter bridge detected a problem with a connection to a PCI adapter that it controls either in a physical card location or embedded in a FRU. The problem is either in the bus between the multi-adapter bridge and the adapter, or with the card slot. The card location may or may not have an installed card.

- Are you working from the serviceable event view and a card location is listed with this FRU?

**Yes:** Then the listed card location is where the error is located. Continue with the next step.

**No:** Record the bus number value, BBBB, in word 7 of the reference code (see "Breaking down a RIO/HSL or PCI bus reference code" on page 61). Search for the bus number in the resource view available to you on the HMC or operating system, or in the System Configuration Listing, to determine which system unit or I/O unit contains the failing component. Record the unit's machine type, model, or feature and continue with the next step.

- The failing component is the FRU containing the physical or embedded card slot that is controlled by the multi-adapter bridge. Identify the system model, I/O unit, or machine type that is indicated by the location in the serviceable event view, or by using the bus number. Use the following table to find the appropriate service information.

Table 55. Failing component service information for MASBUS

Model or expansion unit	Name of FRU to exchange	FRU location	Link to locations information
Model 520	System unit logic planar	-P1	Locations — Model 520
550 and 9124-720	System unit logic planar	-P1	Locations — 9124-720 and Model 550
Model 570	Logic planar for system primary unit or secondary unit	-P1	Locations — Model 570
5074, 8079-002, 8093-002 expansion I/O tower	Tower card	CB1	Locations — 5074, 8079-002, and 8093-002 expansion I/O units
5079 expansion tower	Tower card	CB1	Locations — 5079 expansion I/O unit
5088, 0588 expansion unit	Tower card	CB1	Locations — 5088 and 0588 expansion I/O units
5094, 5294, 8094-002 expansion I/O unit	Tower card	CB1	Locations — 5094, 5294, and 8094-002 expansion I/O units
5095, 0595 expansion tower	Tower card	CB1	Locations — 5095 and 0595 expansion I/O units
Type 1519 — external xSeries server	Integrated xSeries adapter card	Follow the RIO/HSL cables	Locations — Integrated xSeries adapter card (IXA)
7311-D10, 7311-D11, and 5790	I/O unit logic planar	-P1	Locations — 7311-D10 7311-D11 and 5790 expansion unit
61D	I/O unit logic planar	-P1	Locations — 61D
		-P2	

**This ends the procedure.**

## MEDIA

The drive or media may be dirty, or the media may be defective.

- If it is an optical media, clean the drive (for 6330 DVD-RAM see the Part number catalog for the cleaning kit part number). If it is a tape media, clean the recording head in the tape unit.
- Attempt the failing operation again. Does the operation complete successfully?

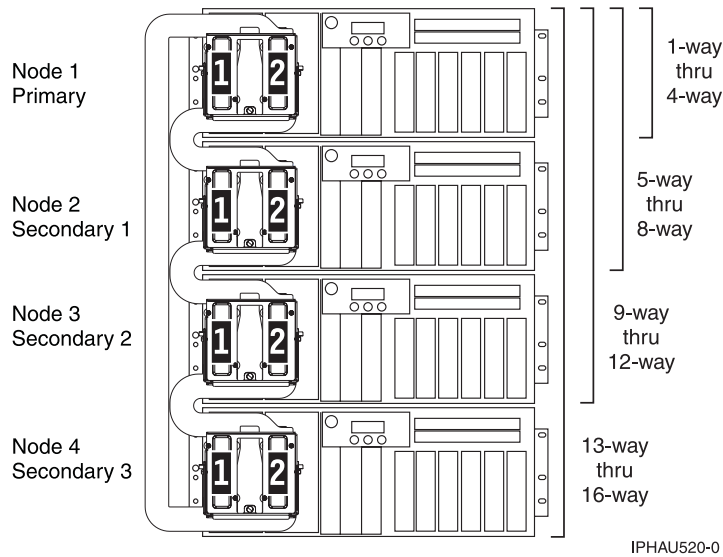
**No:** Replace the media. **This ends the procedure.**

**Yes:** The problem has been corrected. **This ends the procedure.**

## MEMBRD

The failing component is the board the memory DIMMs plug into. Use the following table to determine which FRU to replace and how to replace it.

**Note:** To simplify this information, secondary units on the 570 server are numbered 1 through 3-secondary unit 1 being nearest to the primary unit and secondary unit 3 being furthest.



System model	FRU name (replace one at a time, in order from top to bottom)	Link to locations information
520	system backplane	Locations — Model 520
550 and 9124-720	processor card 1 processor card 2	Locations — 9124-720 and Model 550
570	For each unit, starting with the primary unit and then the secondary units: processor card 1 processor card 2	Locations — Model 570
590 and 595	For each node starting with node 0: Memory card 1 Memory card 2 Memory card 3 Memory card 4 Memory card 5 Memory card 6 Memory card 7 Memory card 8 Memory card 9 Memory card 10 Memory card 11 Memory card 12 Memory card 13 Memory card 14 Memory card 15 Memory card 16	Locations — model 590 and 595

## MEMCTLR

The failing component is one of the memory controllers. Use the following table to determine what FRU to replace and how to replace it.

**Note:** To simplify this information, secondary units on the 570 server are numbered 1 through 3-secondary unit 1 being nearest to the primary unit and secondary unit 3 being furthest.

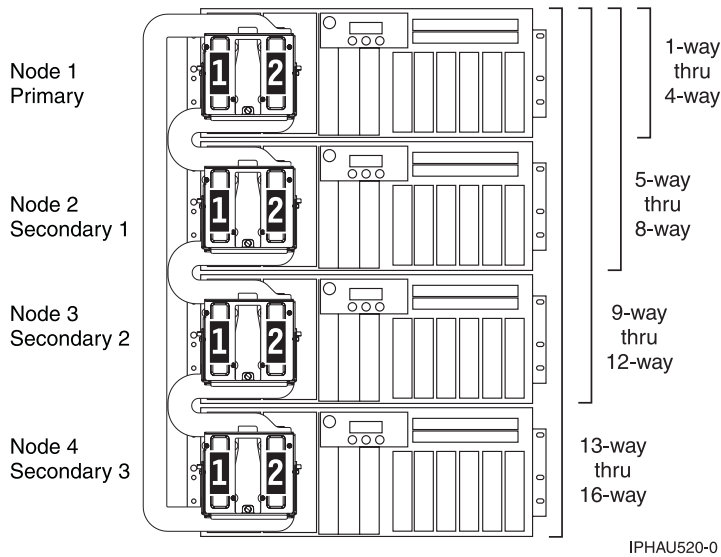


Table 56. MEMCTLR failing components

System model	Name of symbolic FRU to locate	FRU name (replace in order, one at a time)	Link to locations information
520	MEMCTLR	System backplane	Locations — Model 520
550 and 9124-720	MEMCTLR	Processor card 1 Processor card 2	Locations — 9124-720 and Model 550
570	MEMCTLR	For each unit, starting with the primary unit and then the secondary units: Processor card 1 Processor card 2	Locations — Model 570
590 and 595	MEMCTLR	For each node starting with node 0: MCM 0 MCM 1	Locations — model 590 and 595

**This ends the procedure.**

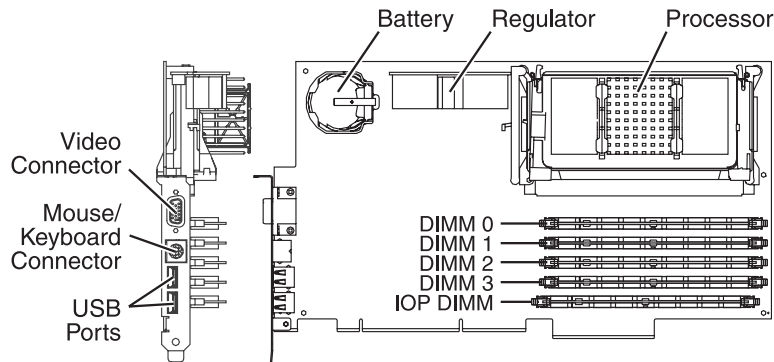
## MEMORY

Use this page to view memory and location information for the 2890 and 2892 Integrated xSeries Server (IXS) cards.



## Memory for 2890 Integrated xSeries Server (IXS) card

Figure 13. Locations of DIMM 0, DIMM 1, DIMM 2 and DIMM 3 on 2890 Integrated xSeries Server (IXS) card.



RZAQ4500-1

One of the Pentium® memory modules (DIMM 0, DIMM 1, DIMM 2, or DIMM 3) may be the failing item (see Finding part numbers).

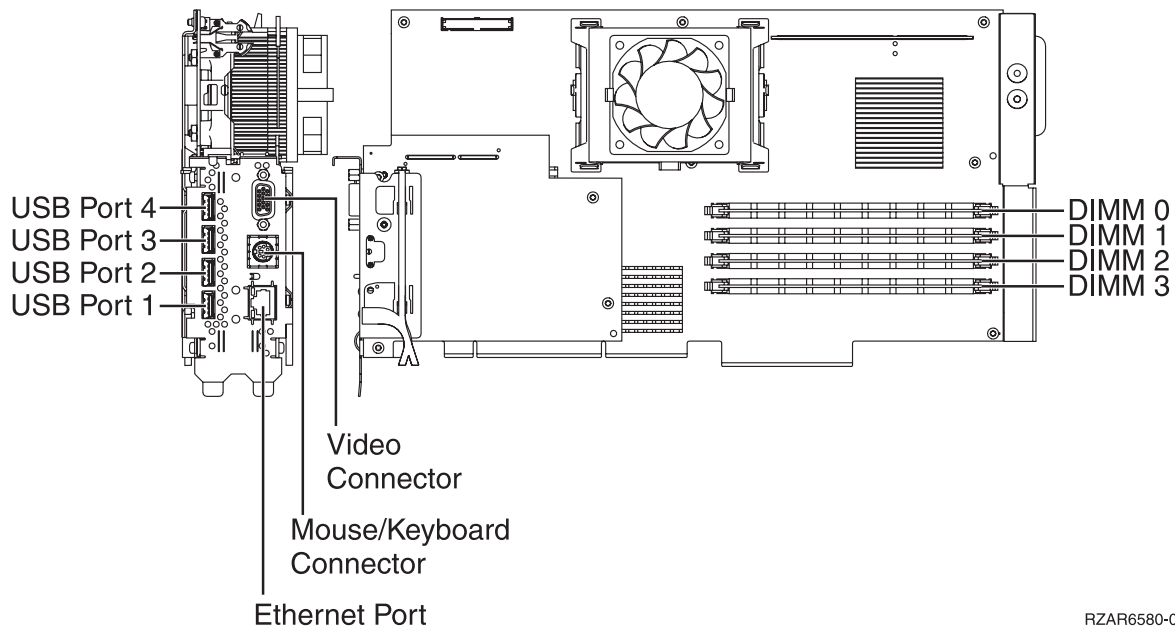
Feature	Size
2795/2895	128 MB
2796/2896	256 MB
2797/2897	1 GB

### Notes:

1. At least 1 Pentium memory module is required in positions DIMM 0, DIMM 1, DIMM 2 or DIMM 3.
2. An IXS adapter card IOP (see Finding part numbers) is required in the IOP DIMM position. This IOP memory module is NOT interchangeable with the Pentium memory module(s) in positions DIMM 0, DIMM 1, DIMM 2 or DIMM 3.

## Memory for 2892 Integrated xSeries Server (IXS) card

Figure 14. Locations of DIMM 0, DIMM 1, DIMM 2 and DIMM 3 on 2892 Integrated xSeries Server (IXS) card



One of the Pentium memory modules (DIMM 0, DIMM 1, DIMM 2, or DIMM 3) may be the failing item (see Finding part numbers).

Feature	Size
0426/0446	512 MB
0427/0447	1 GB

**Note:** At least **two** Pentium memory modules are required in positions DIMM 0 and DIMM 1, or positions DIMM 2 and DIMM 3.

### MEMDIMM

The failing component is one of the memory DIMMs. Use the following table to determine which FRUs to replace. The locations information will give the exact location codes as well as links to part numbers and exchange procedures.

**Note:** To simplify this information, secondary units on the 570 server are numbered 1 through 3-secondary unit 1 being nearest to the primary unit and secondary unit 3 being furthest.

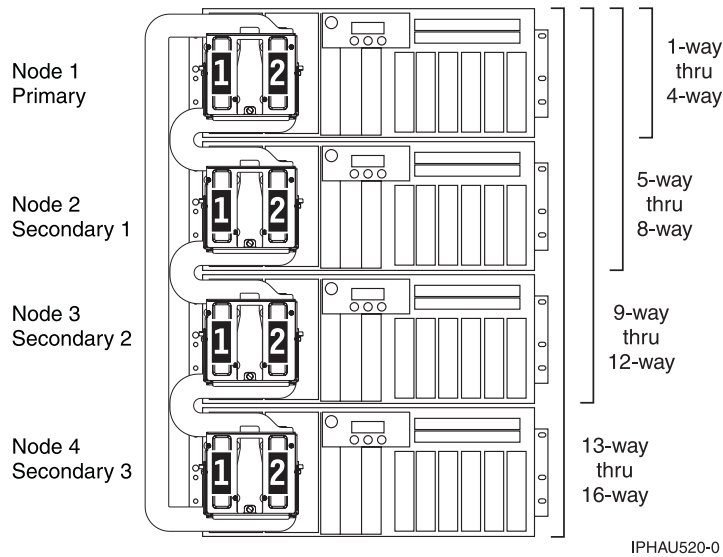


Table 57. MEMDIMM failing component

System model	Name of symbolic FRU to locate	FRU name (replace one at a time, top to bottom)	Link to locations information
520	MEMDIMM	Memory DIMM 1 Memory DIMM 2 Memory DIMM 3 Memory DIMM 4 Memory DIMM 5 Memory DIMM 6 Memory DIMM 7 Memory DIMM 8	Locations — Model 520
550 and 9124-720	MEMDIMM	For each processor card, starting with processor card 1: Memory DIMM 1 Memory DIMM 2 Memory DIMM 3 Memory DIMM 4 Memory DIMM 5 Memory DIMM 6 Memory DIMM 7 Memory DIMM 8	Locations — 9124-720 and Model 550
570	MEMDIMM	For each processor card (starting with processor card 1) on each unit (starting with the primary unit and then the secondary units): Memory DIMM 1 Memory DIMM 2 Memory DIMM 3 Memory DIMM 4 Memory DIMM 5 Memory DIMM 6 Memory DIMM 7 Memory DIMM 8	Locations — Model 570

Table 57. MEMDIMM failing component (continued)

System model	Name of symbolic FRU to locate	FRU name (replace one at a time, top to bottom)	Link to locations information
590 and 595	MEMDIMM	For each node starting with node 0: Memory card 1 Memory card 2 Memory card 3 Memory card 4 Memory card 5 Memory card 6 Memory card 7 Memory card 8 Memory card 9 Memory card 10 Memory card 11 Memory card 12 Memory card 13 Memory card 14 Memory card 15 Memory card 16	Locations — model 590 and 595

**This ends the procedure.**

## MESSAGE

Messages provided with this symbolic FRU's description appear in the i5/OS Service Action Log (SAL). If the word MESSAGE is listed in the i5/OS SAL as a part number, the description field provides information regarding proper handling of the error.

The following descriptions are used in MESSAGE FRUs. Follow the instructions provided when dealing with an error and the associated FRUs.

**Note:** The following messages are displayed in uppercase in the SAL. This list may not be complete if the level of service documentation does not match the level of LIC.

- Work all B600 6906 (or B700 6906) errors before this one.
- Cycle frame power before exchanging FRUS.
- Note: Replace FRUs one at a time.
- Linux-owned slots - no IOP is allowed.

**This ends the procedure.**

## MOVEIOA

An incorrect hardware configuration was detected.

The I/O adapter used by a guest partition is on the same PCI bridge set as an I/O processor in another partition. Guest partition data may be lost if any of the following occur:

- A primary partition type D IPL is performed.
- The I/O adapter is moved to an i5/OS partition.
- An error causes the logical partition (LPAR) configuration to not be used.

To correct the hardware configuration, either the I/O adapter or the I/O processor must be moved to a new card location. Use the LPAR Validation Tool (LVT) to create a valid configuration. For more information about the LPAR Validation Tool, see the Logical partitioning web site

([www.ibm.com/eserver/series/lpar/](http://www.ibm.com/eserver/series/lpar/)) 

## **MSGxxxx**

If you were sent here from a symbolic FRU with the format "MSGxxxx," use the following links to go to the message number's symbolic FRU.

**Note:** In i5/OS additional information about the FRU or problem may have been included as part of the description.

The following messages are displayed in uppercase in the i5/OS SAL view:

"MSG0001"

"MSG0002"

"MSG0003"

"MSG0005"

**This ends the procedure.**

### **MSG0001**

This symbolic FRU represents a specific message to the service provider relative to the reference code or FRU list for cases where it is needed.

MSG0001: Work all B600 6906 (or B700 6906) errors before this one.

### **MSG0002**

This symbolic FRU represents a specific message to the service provider relative to the reference code or FRU list for cases where it is needed.

MSG0002: Cycle frame power before exchanging FRUS.

### **MSG0003**

This symbolic FRU represents a specific message to the service provider relative to the reference code or FRU list for cases where it is needed.

MSG0003: Note: Replace FRUs one at a time.

### **MSG0005**

This symbolic FRU represents a specific message to the service provider relative to the reference code or FRU list for cases where it is needed.

MSG0005: Linux owned slots - no IOP is allowed.

### **NETSERV**

The Integrated xSeries Server (IXS) is the failing item. Call your Integrated xSeries Server (IXS) service provider.

### **NEXTLVL**

Contact your next level of support.

## NODEPL

The failing component is the node backplane. Use the table below to determine which FRU to replace and how to replace it.

**Note:** To simplify this information, secondary units on the 570 server are numbered 1 through 3-secondary unit 1 being nearest to the primary unit and secondary unit 3 being furthest.

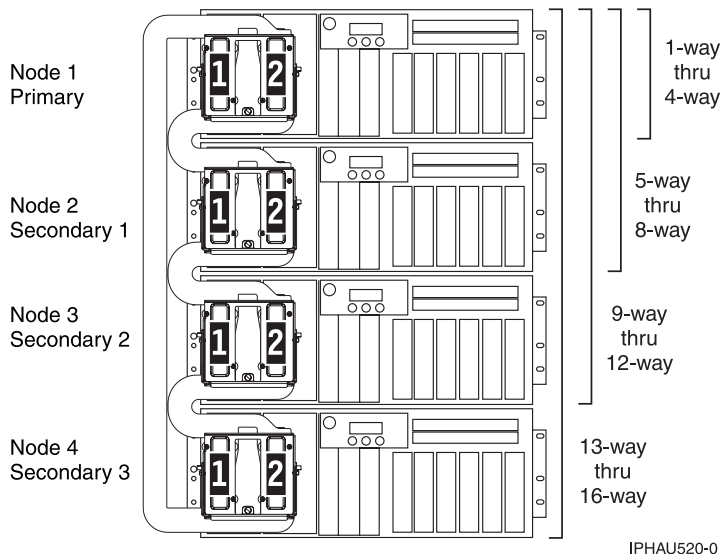


Table 58. NODEPL failing components

System model	Name of symbolic FRU to locate	FRU name (replace in order, one at a time)	Link to locations information
520	NODEPL	System backplane	Locations — Model 520
550 and 9124-720	NODEPL	System backplane	Locations — 9124-720 and Model 550
570	NODEPL	I/O backplane (primary unit) I/O backplane (secondary units 1-3)	Locations — Model 570
590 and 595	NODEPL	Processor assembly on each node, starting with node 0	Locations — model 590 and 595

This ends the procedure.

## NOFRUS

No failing items are identified for the reference code.

## NO\_PNUM

Diagnostic firmware could not determine a part number for the FRU. To determine the part number, exchange procedure, and other service information, record the location of the FRU from the user interface you are working with. Locate the machine type and model of the unit you are working with in the table below. Follow the link to the locations table for the machine type and model you are working with, and then match the location code you recorded to one in the locations table.

Model or expansion unit	Link to locations information
520	Locations — model 520
550 and 9124-720	Locations — 9124-720 and model 550

Model or expansion unit	Link to locations information
570	Locations — model 570
5074, 8079-002, 8093-002	Locations — 5074, 8079-002, and 8093-002 expansion units
5079	Locations — 5079 expansion unit
5088, 0588	Locations — 5088 and 0588 expansion units
5094, 5294, 8094-002	Locations — 5094, 5294, and 8094-002 expansion units
5095, 0595	Locations — 5095 and 0595 expansion units
Type 1519 — external xSeries server	Locations — Integrated xSeries adapter card (IXA)
5791, 5794, and 7040-61D	Locations — 5791, 5794, and 7040-61D expansion unit
7311-D10, 7311-D11, and 5790	Locations — 7311-D10, 7311-D11, and 5790 expansion units
7311-D20	Locations — 7311-D20 expansion unit

**This ends the procedure.**

### **NSCABLE**

The cable between the Integrated xSeries Adapter (IXA) card and the RS-485 port on the Integrated xSeries Server (IXS) is the failing item.

### **NTDEVDR**

The Windows NT server device driver may be causing the problem. Refer to Windows environment on iSeries, which is located in the iSeries Information Center, or contact your next level of support for assistance.

### **NTLANDD**

The Windows NT Server Virtual LAN device driver may be causing the problem. Refer to Windows environment on iSeries, which is located in the iSeries Information Center, or contact your next level of support for assistance.

### **NTOPSYS**

The Windows NT server operating system may be causing the problem. Refer to Windows environment on iSeries, which is located in the iSeries Information Center, or contact your next level of support for assistance.

### **NTUSER**

The Windows NT server user problem may be caused by:

- User-initiated action
- A Windows NT user application
- No keyboard or mouse attached to the Integrated xSeries Server (IXS)

Refer to Windows environment on iSeries, which is located in the iSeries Information Center, or contact your next level of support for assistance.

### **NTVSCSI**

The Windows NT server virtual SCSI device driver may be causing the problem. Refer to Windows environment on iSeries, which is located in the iSeries Information Center, or contact your next level of support for assistance.

### **OPT\_CLN**

Use the fiber optic cleaning kit (see Part number catalog) and the fiber optic cleaning procedures in "SY27-2604 Fiber Optic Cleaning Procedures" for all fiber channel connections such as those used in optical high speed link (HSL) connections or fibre channel attached devices.


**This ends the procedure.**

## **OPTLCBL**

The cabling for an optical disk drive in the optical library needs to be checked. The cabling may be incorrectly installed, or it may be defective.

Refer to the All 3995 Publications and Documentation  Web site for more information.

## **OPTLDRV**

An optical disk drive in the optical library is failing. Refer to the All 3995 Publications and Documentation  Web site for more information.

## **OPUSER**

The failing item indicates that the operator of the system console or the control panel performed an incorrect action.

Refer to the iSeries Information Center for more information.

## **OSLIC**

An operating system has experienced a fatal error.

If the SRC that sent you here is of the form B6xx xxxx, then check for an i5/OS PTF to correct the problem.

If the SRC that sent you here is of the form BAxx xxxx, then check for an AIX or Linux code patch to correct the problem.

If you need help finding the correct patches, or if this does not correct the problem, contact your next level of support.

## **OSTERM**

The operating system in a partition has terminated abnormally. Use the HMC to look for a partition that has failed. It should have the same SRC in the SRC display history for the failed partition. Use the SRC given in this error to resolve the problem.

**Note:** This error has not been automatically sent to IBM.

If problems continue, call your next level of support.

## **PGDPART**

1. Power off the frame.
2. Check that the tower card is connected and seated properly. See "TWRCARD" on page 549.
3. Check that the power supplies are connected and seated properly. See "PWRSPPLY" on page 529.
4. Power on the frame.
5. Is there a reference code 1xxx 2600, 2601, or 2603?

**No: This ends the procedure.**

**Yes:** Exchange the following FRUs one at a time (see Finding part locations):

- Tower card (TWRCARD)
- Power supplies (PWRSPPLY)
- Memory cards (if installed)
- Processor cards (if installed)
- Backplane (SYSBKPL)



**This ends the procedure.**

## **PIOCARD**

PIOCARD: PCI I/O adapter card, card slot, or embedded PCI I/O adapter, IOP, or IOA.

The multi-adapter bridge hardware that controls PCI adapters and PCI card slots detected an error. The failing component is the adapter in the location specified by the Direct Select Address (DSA) in the reference code. When possible, the diagnostic code will determine the FRU location for the serviceable event view.

1. Are you working from the serviceable event view and a card location is listed with this FRU?
  - Yes:** The error is located at the listed card location. Go to step 5.
  - No:** Perform the following:
    - a. Record the DSA, which is word 7 of the reference code.
    - b. Locate the card specified in the DSA by going to “MABIP53” on page 105. Return here after locating the FRU and continue with the next step.
2. Did you identify a single FRU location by using “MABIP53” on page 105?
  - Yes:** This is the location of the failing item. Go to step 5.
  - No:** Continue with the next step.
3. Perform the following, referring to the remove and replace procedures for each FRU location you determined (you can find links to the locations information, and from there to the remove and replace procedures, in the table at the end of this procedure):
  - a. Remove all of the adapter and/or IOP cards in the locations that are identified in the given range of card slots. Do not remove any FRUs with embedded adapters, only FRUs in PCI card slots.
  - b. Replace each card one at a time.
    - Note:** For i5/OS adapters controlled by IOPs, replace the IOP before any of the adapters. Power on the unit (as instructed in the remove and replace procedure indicated by following the link in the following table) after you replace each card until either the problem reappears or you have replaced each card.
  - c. Did the problem reappear?
    - Yes:** The last card that you replaced before the problem appeared again is the failing item. **This ends the procedure.**
    - No:** Continue with the next step.
4. Did you identify a FRU with embedded adapters when performing “MABIP53” on page 105?
  - Yes:** The problem is in the FRU with the embedded adapter. Continue with the next step and exchange that FRU.
  - No:** The problem may be intermittent. Contact your next level of support. **This ends the procedure.**
5. Use the links in the table below to locate and replace the failing item(s).

Table 59. Failing item for symbolic FRU PIOCARD

System model, expansion unit, or machine type	Symbolic FRU to locate	FRU location	Link to locations information
520	PCI IOP or IOA card in PCI bridge set 1	-P1-C1 -P1-C2 -P1-C4	Locations — model 520
	PCI IOP or IOA card in PCI bridge set 2	-P1-C3 -P1-C5 -P1-C6	
	Embedded adapters in system unit logic planar, PCI bridge sets 1 and 2	-P1	
550 and 9124-720	PCI IOP or IOA card in PCI bridge set 1	-P1-C1 -P1-C2	Locations — 9124-720 and model 550
	PCI IOP or IOA card in PCI bridge set 2	-P1-C3 -P1-C4 -P1-C5	
	Embedded adapters in system unit logic planar, PCI bridge sets 1 and 2	-P1	
570	PCI IOP or IOA card in PCI bridge set 2	-P1-C1 -P1-C2	Locations — model 570
	PCI IOP or IOA card in PCI bridge set 3	-P1-C3 -P1-C4 -P1-C5 -P1-C6	
	Embedded adapters in system unit logic planar, PCI bridge sets 1, 2, and 3	-P1	
5074, 8079-002, 8093-002	PCI IOP or IOA in PCI bridge set 1	C01 C02 C03 C04	Locations — 5074, 8079-002, and 8093-002 expansion units
	PCI IOP or IOA in PCI bridge set 2	C05 C06 C07 C09 C10	
	PCI IOP or IOA in PCI bridge set 3	C11 C12 C13 C14 C15	

Table 59. Failing item for symbolic FRU PIOCARD (continued)

System model, expansion unit, or machine type	Symbolic FRU to locate	FRU location	Link to locations information
5079	PCI IOP or IOA in PCI bridge set 1	C01 C02 C03 C04	Locations — 5079 expansion unit
	PCI IOP or IOA in PCI bridge set 2	C05 C06 C07 C09 C10	
	PCI IOP or IOA in PCI bridge set 3	C11 C12 C13 C14 C15	
5088, 0588	PCI IOP or IOA in PCI bridge set 1	C01 C02 C03 C04	Locations — 5088 and 0588 expansion units
	PCI IOP or IOA in PCI bridge set 2	C05 C06 C07 C08 C09	
	PCI IOP or IOA in PCI bridge set 3	C11 C12 C13 C14 C15	
5094, 5294, 8094-002	PCI IOP or IOA in PCI bridge set 1	C01 C02 C03 C04	Locations — 5094, 5294, and 8094-002 expansion units
	PCI IOP or IOA in PCI bridge set 2	C05 C06 C07 C08 C09	
	PCI IOP or IOA in PCI bridge set 3	C11 C12 C13 C14 C15	
5095, 0595	PCI IOP or IOA in PCI bridge set 1	C01 C02 C03 C04	Locations — 5095 and 0595 expansion units
	PCI IOP or IOA in PCI bridge set 2	C06 C07 C08	
Type 1519 — external xSeries server	Integrated xSeries adapter card	Follow RIO/HSL cable	Locations — Integrated xSeries adapter card (IXA)

Table 59. Failing item for symbolic FRU PIOCARD (continued)

System model, expansion unit, or machine type	Symbolic FRU to locate	FRU location	Link to locations information
7311-D10, 7311-D11, and 5790	PCI IOP or IOA in PCI bridge set 1	-P1-I1 -P1-I2 -P1-I3	Locations — 7311-D10, 7311-D11, and 5790 expansion units
	PCI IOP or IOA in PCI bridge set 2	-P1-I4 -P1-I5 -P1-I6	
5791, 5794, and 7040-61D	PCI IOP or IOA in PCI bridge set 1	-P1-I1 -P1-I2 -P1-I3 -P1-I4	Locations — 5791, 5794, and 7040-61D expansion unit
	PCI IOP or IOA in PCI bridge set 2	-P1-I5 -P1-I6 -P1-I7	
	PCI IOP or IOA in PCI bridge set 3	-P1-I8 -P1-I9 -P1-I10	
	Embedded adapters in I/O unit logic planar (left side), PCI bridge sets 2 and 3	-P1	
	PCI IOP or IOA in PCI bridge set 1	-P2-I1 -P2-I2 -P2-I3 -P2-I4	
	PCI IOP or IOA in PCI bridge set 2	-P2-I5 -P2-I6 -P2-I7	
	PCI IOP or IOA in PCI bridge set 3	-P2-I8 -P2-I9 -P2-I10	
	Embedded adapters in I/O unit logic planar (right side), PCI bridge sets 2 and 3	-P2	

This ends the procedure.

## PLDUMP

A platform dump occurred.

1. Find the SRC that occurred with the platform dump.
  - a. On the command line, enter the Start System Service Tools command STRSST. If you cannot get to SST, use function 21 to get to DST. Go to Dedicated Service Tools (DST) in the Service functions.
  - b. On the **Start Service Tools Sign On** display, type in a user ID with QSRV authority and password.
  - c. Select **Start a service tool > Main storage dump manager > Work with copies of main storage dumps**.
  - d. Display the platform dump summary for the time that the platform dump occurred.
  - e. The SRC is the value in the "SRC word 1" field of the Platform Dump Summary screen.
2. Use the SRC from the Platform Dump Summary screen and find the SRC in the Service action log (see "Using the Service Action Log" on page 24). The SRC occurred at or before the time that the platform dump occurred.

3. Did you find the SRC in the service action log?

**Yes:** Use the SRC to service the system. **This ends the procedure.**

**No:** The dump should be sent back to development for analysis, if it has not already been sent.  
**This ends the procedure.**

## PLUS

The list of possible failing items that are displayed online is not complete. There is not enough space to display all of the failing items. See the complete list of possible failing items in the appropriate unit reference code table in Reference codes.

## PPCIMIN

PPCIMIN: Primary PCI bus in an I/O unit.

Use symbolic FRU "PRI\_PCI" to determine the FRU(s) and service information.

**This ends the procedure.**

## PPCISYS

The failing component is the primary PCI bus in a system unit. Use symbolic FRU "PRI\_PCI" to determine the FRU(s) and service information.

**This ends the procedure.**

## PPCITWR

PPCITWR: Primary PCI bus in an I/O unit.

The failing component is the primary PCI bus under an HSL I/O bridge or RIO adapter in an I/O unit. Use symbolic FRU "PRI\_PCI" to determine the FRU(s) and service information.

**This ends the procedure.**

## PRI\_PCI

PRI\_PCI: Primary PCI bus.

This is a PCI bus generated under a RIO adapter/HSL I/O bridge. This bus can be in a system unit or I/O unit, and on some units this bus connects two FRUs.

1. Are you working from the serviceable event view and a card location is listed with this failing item?

**Yes:** Then the listed card location is where the error is located. Continue with the next step.

**No:** Record the bus number value, BBBB, in word 7 of the reference code (see "Breaking down a RIO/HSL or PCI bus reference code" on page 61). Search for the decimal bus number, using one of the following, to determine which frame or I/O unit contains the failing item.

- i5/OS Hardware Service Manager (HSM)
- System Configuration Listing

Record the unit type or feature and continue with the next step.

2. Use the table below to determine the appropriate service information.

*Table 60. Symbolic FRU to perform for PRI\_PCI*

Model or expansion unit containing the failing item	Action
520, 550, 9124-720, 570	Perform "SYSBKPL" on page 547.

Table 60. Symbolic FRU to perform for PRI\_PCI (continued)

Model or expansion unit containing the failing item	Action
5074, 5079, 8079-002, 8093-002	There are two potential failing items. Perform "SIADPCD" on page 532. If the problem persists after powering on the frame or unit, then perform "TWRPLNR" on page 550.  <b>Attention:</b> To prevent system VPD problems, do not replace both FRUs at the same time.
5088, 0588	There are two potential failing items. Perform "SIADPCD" on page 532. If the problem persists after powering on the frame or unit, then perform "TWRPLNR" on page 550.  <b>Attention:</b> To prevent system VPD problems, do not replace both FRUs at the same time.
5094, 5294, 8094-002	There are two potential failing items. Perform "SIADPCD" on page 532. If the problem persists after powering on the frame or unit, then perform "TWRPLNR" on page 550.  <b>Attention:</b> To prevent system VPD problems, do not replace both FRUs at the same time.
5095, 0595, 7311-D20	There are two potential failing items. Perform "SIADPCD" on page 532. If the problem persists after powering on the frame or unit, then perform "TWRPLNR" on page 550.  <b>Attention:</b> To prevent system VPD problems, do not replace both FRUs at the same time.
External xSeries server	Perform "SIADPCD" on page 532.
7311-D10, 7311-D11, and 5790	There are two potential failing items. Perform "SIADPCD" on page 532. If the problem persists after powering on the frame or unit, then perform "TWRPLNR" on page 550.  <b>Attention:</b> To prevent system VPD problems, do not replace both FRUs at the same time.
5791, 5794, and 7040-61D	Perform "TWRPLNR" on page 550.

**This ends the procedure.**

## PWRCBL

The failing item is the SPCN frame-to-frame cable or adapter. The following list shows the possible failing items, and the cable or adapter lengths when appropriate (see Part number catalog):

- 6.0 meters
- 15.0 meters
- 30.0 meters
- SPCN optical cable (100.0 meters)
- SPCN optical adapter
- SPCN port cable (frame-to-node)
- Integrated xSeries server SPCN-Y cable assembly

**This ends the procedure.**

## PWROC

A power supply is reporting a load fault.

1. Is the reference code 4414?

**No:** Go to “Start of call procedure” on page 2.

**This ends the procedure.**

**Yes:** Perform the first four steps of “PWR1906” on page 174 to isolate the failing item, then return here and continue with the next step.

2. Is the reference code 4414 still present?

**No:** Continue with the next step.

**Yes:** Replace the battery power unit charger (see Part number catalog).

**This ends the procedure.**

3. Power on the system. Does the failing expansion unit power on successfully?

**Yes:** Continue with the next step.

**No:** Go to “Start of call procedure” on page 2.

**This ends the procedure.**

4. Remove the ac line cord from the outlet. Does a battery power unit charger fault occur?

**Yes:** Replace the battery power unit charger (see Part number catalog).

**This ends the procedure.**

**No:** **This ends the procedure.**

## PWRSPLY

A power supply may be the failing item.

**Attention:** When replacing a redundant power supply, a 1xxx 1504, 1514, 1524, or 1534 reference code may surface in the error log. If you just removed and replaced the power supply in the location associated with this reference code, and the power supply came ready after the install, disregard this reference code. If you had not previously removed and replaced a power supply, the power supply did not come ready after installation, or there are repeated fan fault errors after the power supply replacement, continue to follow this procedure.

1. Is the reference code 1xxx-15xx?

**No:** Continue with the next step.

**Yes:** Perform the following:

- a. Find the unit reference code in the following tables to determine the failing power supply.
- b. Ensure that the power cables are properly connected and seated.
- c. On a failing unit with the dual line cord feature and a reference code of 1xxx-1500, 1510, 1520, or 1530, perform “PWR1911” on page 181 before replacing parts.
- d. Refer to Finding part locations to determine the location and part number of the failing item
- e. Replace the failing power supply (see the following tables to determine which power supply to replace).
- f. Perform the following if the new power supply does not fix the problem:
  - 1) Reinstall the original power supply.
  - 2) Try the new power supply in each of the other positions listed in the table.
  - 3) If the problem still is not fixed, reinstall the original power supply and go to the next FRU in the list.
  - 4) For reference codes 1xxx-1500, 1510, 1520, and 1530, exchange the power distribution backplane if a problem persists after replacing the power supply.

**Note:** If you are working on a Model 550 or 9124-720 and you have a reference code of 1xxx 1511 and/or 1521, but the system powered down or will not power up, you may have a

power/processor interlock failure. Ensure the system power supply(s), processor(s), and processor filler are properly seated. If the system still will not power on, replace the following FRUs one at a time:

- a. Power supply 1 (for single-power-supply system only)
- b. Processor 2 (or processor filler)
- c. Processor 1
- d. System backplane
- e. Power supply 1
- f. Power supply 2

Table 61. Models 520, 550, 9124-720, and 570

Unit reference code	Power supply
1510, 1511, 1512, 1513, 1514, 7110	E1
1520, 1521, 1522, 1523, 1524, 7120	E2

**Attention:** For reference codes 1500, 1510, 1520, and 1530, perform “PWR1911” on page 181 before replacing parts.

Table 62. 5088, 0588 expansion units

Unit reference code	Power supply
1510, 1511, 1512, 1513, 1514, 1516	P02
1520, 1521, 1522, 1523, 1524, 1526	P01

**Attention:** On a dual line cord system, for reference codes 1500, 1510, 1520, and 1530, perform “PWR1911” on page 181 before replacing parts. On a single line cord system, check the ac jumper to the power supply before replacing parts.

Table 63. 5074, 5079, 5094, 5294 I/O expansion units (single line cord)

Unit reference code	Power supply
1510, 1511, 1512, 1513, 1514, 1516	P01
1520, 1521, 1522, 1523, 1524, 1526	P02
1530, 1531, 1532, 1533, 1534, 1536	P03

**Attention:** On a dual line cord system, for reference codes 1500, 1510, 1520, and 1530, perform “PWR1911” on page 181 before replacing parts. On a single line cord system, check the ac jumper to the power supply before replacing parts.

**Attention:** For 5094, 5294 expansion units, do not install power supplies P00 and P01 ac jumper cables on the same ac input module.

Table 64. 5074, 5079, 5094, 5294 I/O expansion units (dual line cord)

Unit reference code	Power supply
1500, 1501, 1502, 1503	P00
1510, 1511, 1512, 1513, 1514, 1516	P01
1520, 1521, 1522, 1523, 1524, 1526	P02
1530, 1531, 1532, 1533	P03



Table 65. 5095, 0595, 5790, 7311-D10, 7311-D11, 7311-D20 expansion units

Unit reference code	Power supply
1510, 1511, 1512, 1513, 1514, 1516, 1517	P01/E1
1520, 1521, 1522, 1523, 1524, 1526, 1527	P02/E2

**This ends the procedure.**

2. Is the reference code 1xxx-2600, 2601, 2603, 2605, or 2606?

**No:** Continue with the next step.

**Yes:** Perform the following:

- a. Refer to Finding part locations to determine the location and part number of the failing item.
- b. Replace the failing power supply.
- c. Perform the following if the new power supply does not fix the problem:
  - 1) Reinstall the original power supply.
  - 2) Try the new power supply in each of the other positions listed in the table.
  - 3) If the problem still is not fixed, reinstall the original power supply and go to the next FRU in the list.

**Attention:** Do not install power supplies P00 and P01 ac jumper cables on the same ac input module.

Table 66. Failing power supplies

System or feature code	Failing power supply
Model 520, 550, 9124-720, and 570	Un-E1, Un-E2
5074, 5079, 5094, 5294 (single line cord)	P01, P02, P03
5074, 5079, 5094, 5294 (dual line cord)	P00, P01, P02, P03
5088, 0588	P02, P01
5095, 0595	P01, P02
5790, 7311-D10, 7311-D11, 7311-D20	E1, E2

**This ends the procedure.**

3. Is the reference code 1xxx 7300?

**No:** Continue with the next step.

**Yes:** Perform the following:

- a. The failing power supply is either E1 or E2.
- b. Refer to Finding part locations to determine the location and part number of the failing item.
- c. Replace the failing power supply.
- d. Perform the following if the new power supply does not fix the problem:
  - 1) Reinstall the original power supply.
  - 2) Try the new power supply in the other position.
  - 3) If the problem still is not fixed, reinstall the original power supply and go to the next FRU in the list.

**This ends the procedure.**

4. Is the reference code 1xxx 8455 or 8456?

**No:** Return to "Start of call procedure" on page 2. **This ends the procedure.**

**Yes:** One of the power supplies is missing, and must be installed. Use the following table to determine which power supply is missing, and the install the power supply (see Finding part locations to determine the part number and exchange procedure).

Reference code	Missing power supply
1xxx 8455	Un-E1
1xxx 8456	Un-E2

**This ends the procedure.**

## QDCCRLS

Licensed Internal Code is the failing item. Look for PTFs associated with the reference code and have the customer apply them.

## QSYSOPR

For more information, look in the System Operator message queue for a message with the same date and time. Perform any actions defined in the message.

## REFER

Consult the All 3995 Publications and Documentation  Web site to assist in analyzing the unit reference code (URC).

## REM\_NIC

One end of the failed link is a system unit other than the one reporting this error. In a cluster, all system units should send a warning to the other system units in the cluster when they are about to perform a controlled power down. This error could occur when a system unit leaves the cluster without issuing any warning to other system units. If the system unit is not reporting due to a failed cable or HSL hardware, replacing the FRUs in this error log entry will correct the problem.

However, the system unit may have been powered down immediately, or powered down because of an error. If this is the case, service any errors in the other system unit, or power the other system unit back on. When the other system unit reports in, the loop will be complete and this error can be closed.

**This ends the procedure.**

## REM\_SYS

A problem has occurred in a remote system that is in an i5/OS HSL OptiConnect loop. If the value of the first half of word 7 in the reference code is greater than or equal to 0680, then this value is the hexadecimal RIO/HSL loop number. The i5/OS Service Action Log (SAL) code will attempt to identify the RIO/HSL loop number of the local system and the serial number of the remote system as a portion of the part description for this symbolic FRU. If the SAL could not identify the serial number of the remote system, then check all the systems which are connected to the local RIO/HSL loop identified in the reference code or the SAL. Search the SAL of the remote system(s) for hardware and LIC problems. Correct any problems you find with LIC or Network Interface Controller (NIC) / RIO controller hardware.

**This ends the procedure.**

## SIADPCD

The failing component is the HSL I/O bridge card or RIO adapter card in an I/O unit, or the integrated xSeries adapter card in an xSeries server.

1. Are you working from the serviceable event view and do you know the type, model or feature, and serial number of the I/O unit where this failing component is located?

**Yes:** Continue with the next step.

**No:** Record the bus number value (BBBB) in word 7 of the reference code (see "Breaking down a RIO/HSL or PCI bus reference code" on page 61). Then search for the bus number in the system configuration listing to determine which frame or I/O unit contains the failing component. Then continue with the next step.

2. Use the following table to find the appropriate service information.

Table 67. SIADPCD service information

Unit containing the failing item	Name of FRU to exchange	Symbolic FRU	Link to locations information
5074, 8079-002, 8093-002	RIO/HSL adapter card	SIADPCD	Locations — 5074, 8079-002, and 8093-002 expansion units
5079	RIO/HSL adapter card	SIADPCD	Locations — 5079 expansion unit
5088, 0588	RIO/HSL adapter card	SIADPCD	Locations — 5088 and 0588 expansion units
5094, 5294, 8094-002	RIO/HSL adapter card	SIADPCD	Locations — 5094, 5294, and 8094-002 expansion units
5095, 0595	RIO/HSL adapter card	SIADPCD	Locations — 5095 and 0595 expansion units
Type 1519 — external xSeries server	Integrated xSeries adapter card	Follow RIO/HSL cable	Locations — Integrated xSeries adapter card (IXA)
7311-D10, 7311-D11, and 5790	RIO/HSL adapter card	SIADPCD	Locations — 7311-D10, 7311-D11, and 5790 expansion units
7311-D20	RIO/HSL adapter	SIADPCD	Locations — 7311-D20 expansion unit
5791, 5794, and 7040-61D	Backplane 1 (not the riser)	SIADPCD	Locations — 5791, 5794, and 7040-61D expansion unit
	Backplane 2 (not the riser)	SIADPCD	

**This ends the procedure.**

## SI\_CARD

The failing component is the RIO/HSL adapter card in the system unit.

Use this table to find the appropriate service information for the failing component.

System model	Name of FRU to exchange	Link to locations
520	System backplane	Locations — Model 520
550 and 9124-720	RIO/HSL adapter card	Locations — 9124-720 and Model 550
570	RIO/HSL adapter card (for the primary unit and each secondary unit)	Locations — Model 570
590 and 595	Bus adapter card 1 through bus adapter card 8 (for each node)	Locations — model 590 and 595

**This ends the procedure.**

## SICNTRL

The failing component is the network interface controller (NIC)/RIO controller.

1. Do you have a location code for this FRU in the serviceable event view?

**No:** Continue with the next step.

**Yes:** Go to step 4 on page 534.

2. Is the first half of word 7 of the reference code greater than or equal to 0680?
  - No:** Continue with the next step.
  - Yes:** This is a valid loop number and can be correlated to a position using “Converting the loop number to NIC port location labels” on page 72. Record the location code and go to step 4.
3. Since the first four characters of word 7 are less than 0680, they represent the system bus number. Do you have access to a system configuration listing?
  - No:** Contact your next level of support.
  - This ends the procedure.**
  - Yes:** Use the system configuration listing to determine which HSL/RIO loop number the system bus is connected to. Then, determine the FRU’s location using “Converting the loop number to NIC port location labels” on page 72. Once you have the FRU’s location, continue with the next step.
4. Use the table below to find the appropriate service information for this FRU.

*Table 68. FRU containing the NIC/RIO controller*

System model	Name of FRU to exchange	Symbolic FRU	Link to locations information
520	System backplane	SICNTRL	Locations — Model 520
570	I/O backplane	SICNTRL	Locations — Model 570
570 with secondary units	RIO/HSL adapter card	SICNTRL	Locations — Model 570
590 and 595	Logic planar for system node	SICNTRL	Locations — model 590 and 595

**This ends the procedure.**

## **SIIOADP**

SIIOADP: RIO adapter/HSL I/O bridge (in a system unit or I/O unit).

- Instructions for working the problem in i5/OS.
- Instructions for working the problem in AIX or Linux or from the HMC.

### **Instructions for working the problem in i5/OS**

1. Was the machine type, model, serial number, and card position listed in the serviceable event view?
  - No:** Continue with the next step.
  - Yes:** Use Table 69 on page 536 to locate and replace the failing item. **This ends the procedure.**
2. Was the machine type, model, and serial number listed in the serviceable event view, or do you know which unit had the failure?
  - No:** Continue with the next step.
  - Yes:** The failing component is the RIO adapter/HSL I/O bridge in that unit. Record the type and model of the unit and refer to Table 69 on page 536 to locate and replace the failing item. **This ends the procedure.**
3. Is there a RIO/HSL loop number listed for this FRU in the serviceable event view?
  - No:** Continue with the next step.
  - Yes:** Go to step 10 on page 535.
4. Use one of the following:
  - Direct Select Address (DSA) in word 7 of the reference code.
  - If word 7 is all zeros, use word 7 of the informational B700 6970 reference code, which should be logged around the same time.

Are the first four digits of word 7 (the bus number) greater than or equal to 0684?

**No:** Go to step 6.

**Yes:** Continue with the next step.

5. Convert the bus number (BBBB) in the DSA to decimal (see “DSA translation” on page 62). Then go to step 11.

6. Is the bus number greater than zero (0)?

**Yes:** Go to step 9.

**No:** Record the frame ID from the first 4 digits of word 5. This is the frame with the failing RIO adapter. Convert this value to decimal and continue with the next step.

7. Do you have a system configuration listing?

**Yes:** Locate the unit with the same decimal frame ID you identified earlier. Record the unit type and model or the unit feature and refer to Table 69 on page 536 to locate and replace the failing item. **This ends the procedure.**

**No:** Continue with the next step.

8. Perform the following:

- a. Sign on to SST or DST.

- b. Select **Start a service tool > Hardware service manager > Logical hardware resources > High-speed link (HSL) resources > Include non-reporting resources.**

- c. Record all the RIO/HSL loop numbers on the system.

- d. For each RIO/HSL loop you recorded, perform “RIOIP04” on page 90 until you have identified a unit with a failed link.

- e. Are all of the links that have I/O unit resources operational?

**Yes:** The problem is resolved; do not replace any parts. **This ends the procedure.**

**No:** If you identified a unit with a failed link, the SIIOADP failing item must be replaced. The failing SIIOADP is on the second unit (the unit with a failed trailing port) you recorded information for in “RIOIP04” on page 90. Using the second unit’s type and model information, refer to Table 69 on page 536 to locate and replace the failing item. **This ends the procedure.**

9. Record the bus number (BBBB) in the DSA. See “DSA translation” on page 62 for details. Then search for the bus number in the HSM or system configuration listing to determine which unit contains the failing item. Record the unit’s machine type and model or feature.
10. Have you already determined the machine type and model or the feature of the unit with this failing component using another procedure or symbolic FRU?

**Notes:**

- a. If the **system** is failing to IPL, then the machine type and model is the system unit’s machine type and model.

- b. If the **partition** is failing to IPL, then the machine type and model you are working with is the type and model, or feature, of the partition’s load source, which is defined in the LPAR configuration in HMC. Work with the customer to determine the type and model.

**No:** Continue with the next step.

**Yes:** The problem is in one of the HSL I/O bridges / RIO adapters within that loop. Use the machine type and model of the unit or the feature of the unit that you have already determined to exchange the failing component. Refer to Table 69 on page 536 for a link to locations information. **This ends the procedure.**

11. Perform “RIOIP04” on page 90 and then return here. Is the link operational after performing “RIOIP04” on page 90?

**Yes:** The problem has been resolved. **This ends the procedure.**

**No:** If you identified a unit with a failed link, the SIIOADP failing item must be replaced. The failing SIIOADP is on the second unit (the unit with a failed trailing port) you recorded

information for in “RIOIP04” on page 90. Using the second unit’s type and model information, refer to Table 69 to locate and replace the failing item. **This ends the procedure.**

**Instructions for working the problem in AIX or Linux or from the HMC**

1. Is a location for this FRU given in the serviceable event view?
  - No:** Continue with the next step.
  - Yes:** Use that location and Table 69 to find and replace the failing part. **This ends the procedure.**
2. Is a frame number given in word 5 of the SRC?
  - No:** Continue with the next step.
  - Yes:** Try to match it to a frame using the frame’s control panel. Use Table 69 to find and replace the failing part. **This ends the procedure.**

**Note:** If you cannot determine the frame, continue with the next step.
3. Record the RIO loop number (BBBB) from word 7 of the reference code (see “Breaking down a RIO/HSL or PCI bus reference code” on page 61).
4. Choose from the following:
  - **If you are working from an HMC,** continue with the next step.
  - **If you are working in AIX or Linux,** determine which RIO loop the failing SIIOADP is on (see “Converting the loop number to NIC port location labels” on page 72). Record, in order, each unit in the loop, and then go to step 6.
5. Perform the following from Service Focal Point on the HMC:
  - a. Select the Service Utilities GUI.
  - b. Select the system you are working on.
  - c. From the *Selected* drop down menu, select **View RIO Topology**.
  - d. In the *Current Topology* area of the RIO Topology GUI, scroll down until you find data for the RIO loop number you obtained in step 3.
  - e. Each line under this RIO loop represents a link in the loop. Record the location code information for each unit in the loop and then continue with the next step.
6. Power down the system and remove all towers in the loop that starts and ends at the ports given in the previous step. If there is a base I/O unit on that loop, leave only that unit connected to the system unit.
7. Power on the system to partition standby and check for the same SRC that sent you here. Did the SRC reoccur?
  - No:** The SIIOADP in the last I/O unit added is the failing item. If there is a system unit and base I/O unit, the failing SIIOADP may be in either, and you should replace them one at a time. Use Table 69 to find and replace the failing part. **This ends the procedure.**
  - Yes:** Power down the system and add the next unit in the original loop. Then repeat step 7.

**Note:** If all the units have been added and the SRC does not reoccur, go to “Verifying a high-speed link, system PCI bus, or a multi-adapter bridge repair” on page 76. **This ends the procedure.**

Table 69. SIIOADP service information

Unit containing the failing item	Name of FRU to exchange	Symbolic FRU	Link to locations information
520	System backplane	SIIOADP	Locations — model 520
550 and 9124-720	System backplane	SIIOADP	Locations — 9124-720 and model 550
570	I/O backplane on system primary unit or a secondary unit	SIIOADP	Locations — model 570

Table 69. SIIOADP service information (continued)

Unit containing the failing item	Name of FRU to exchange	Symbolic FRU	Link to locations information
590 and 595	Logic planar for the system node	SIIOADP	Locations — model 590 and 595
5074, 8079-002, 8093-002	RIO/HSL adapter card	SIIOADP	Locations — 5074, 8079-002, and 8093-002 expansion units
5079	RIO/HSL adapter card	SIIOADP	Locations — 5079 expansion unit
5088, 0588	RIO/HSL adapter card	SIIOADP	Locations — 5088 and 0588 expansion units
5094, 5294, 8094-002	RIO/HSL adapter card	SIIOADP	Locations — 5094, 5294, and 8094-002 expansion units
5095, 0595	RIO/HSL adapter card	SIIOADP	Locations — 5095 and 0595 expansion units
Type 1519 — external xSeries server	Integrated xSeries adapter card	Follow RIO/HSL cable	Locations — Integrated xSeries adapter card (IXA)
7311-D10, 7311-D11, and 5790	RIO/HSL adapter card	SIIOADP	Locations — 7311-D10, 7311-D11, and 5790 expansion units
7311-D20	RIO/HSL adapter card	SIIOADP	Locations — 7311-D20 expansion unit
5791, 5794, 7040-61D	Backplane 1 (not the riser)	SIIOADP	Locations — 5791, 5794, and 7040-61D expansion units
	Backplane 2 (not the riser)	SIIOADP	

## SI\_PHB

The HSL I/O bridge/RIO adapter hardware in a system or I/O unit is failing. Follow this procedure to identify the failing component to exchange.

1. Are you working from the serviceable event view and a card location is listed with this FRU?

**Yes:** Then the listed card location is where the error is located. Continue with the next step.

**No:** Record the bus number value, BBBB, in word 7 of the reference code (see “Breaking down a RIO/HSL or PCI bus reference code” on page 61). Search for the decimal bus number, using one of the following, to determine which frame or I/O unit contains the failing item.

- the HMC’s system configuration user interface (if an HMC is controlling the system)
- i5/OS Hardware Service Manager (HSM)
- or the System Configuration Listing

Record the unit type or feature and continue with the next step.

2. Use the table below to determine the appropriate service information.

Table 70. SI\_PHB service information

Unit containing the failing item	Name of FRU to exchange	Symbolic FRU	Link to locations information
520	System backplane	SI_PHB	Locations — model 520
550 and 9124-720	System backplane	SI_PHB	Locations — 9124-720 and model 550

Table 70. SI\_PHB service information (continued)

Unit containing the failing item	Name of FRU to exchange	Symbolic FRU	Link to locations information
570	I/O backplane on system primary unit or a secondary unit	SI_PHB	Locations — Model 570
590 and 595	Logic planar on the system unit node	SI_PHB	Locations — model 590 and 595
5074, 8079-002, 8093-002	RIO/HSL adapter card	SI_PHB	Locations — 5074, 8079-002, and 8093-002 expansion units
5079	RIO/HSL adapter card	SI_PHB	Locations — 5079 expansion unit
5088, 0588	RIO/HSL adapter card	SI_PHB	Locations — 5088 and 0588 expansion units
5094, 5294, 8094-002	RIO/HSL adapter card	SI_PHB	Locations — 5094, 5294, and 8094-002 expansion units
5095, 0595	RIO/HSL adapter card	SI_PHB	Locations — 5095 and 0595 expansion units
Type 1519 — external xSeries server	Integrated xSeries adapter card	Follow RIO/HSL cable	Locations — Integrated xSeries adapter card (IXA)
7311-D10, 7311-D11, and 5790	RIO/HSL adapter card	SI_PHB	Locations — 7311-D10, 7311-D11, and 5790 expansion units
7311-D20	RIO/HSL adapter card	SI_PHB	Locations — 7311-D20 expansion unit
5791, 5794, 7040-61D	Backplane 1 (not the riser)	SI_PHB	Locations — 5791, 5794, and 7040-61D expansion unit
	Backplane 2 (not the riser)	SI_PHB	

**This ends the procedure.**

### SIRGCBL

This symbolic FRU is not supported on the system. Continue with the next FRU in the failing item list.

### SIRGCFG

An invalid configuration was detected on an HSL/RIO loop during IPL.

The four rightmost characters of word 4 in the reference code represent the Program Return Code (PRC), which describes the problem detected. The four leftmost digits of word 7 represent the loop number in hexadecimal format. Convert the loop number to decimal format before comparing it to loop numbers shown in serviceable event views and service tools.

To determine the problem, find the PRC in the table below.

**Note:** The FRU description in the serviceable event view may already contain a message that identifies the problem.



Table 71. Correcting an invalid configuration on an HSL/RIO loop

PRC	Problem identified	Corrective action
xxxx 0008	System serial number not set	Set the serial number on the system unit. See Accessing the Advanced System Management Interface in the Installing hardware topic. If the problem persists contact your next level of support.
xxxx 3200	Clustered system(s) on loop with SPD migrated tower	Migration towers are not supported; remove them.
xxxx 3201	Clustered systems on multiple HSL/RIO loops	Ensure all clustered systems are on the same HSL/RIO loop.
xxxx 3202	Multiple SPD migrated towers detected	Migration towers are not supported; remove them.
xxxx 3207	SPD migrated tower not on first HSL/RIO loop	Migration towers are not supported; remove them.
xxxx 3212	NIC/RIO controller level does not support OptiConnect	The NIC/RIO controller hardware component does not support i5/OS HSL OptiConnect. The FRU containing the NIC/RIO controller component must be upgraded to a level that supports HSL OptiConnect. Examine the Service Action Log (SAL) of the IBM eServer i5 system on this loop for the same error. The SAL will call out the correct FRU to replace. Use the service tools and information for that system to correct the problem and close the problem on this system.

This ends the procedure.

## SIRSTAT

A status indication for a RIO/HSL loop is identified in the reference code. Use the table below to determine if the status indication requires a service action. Record the rightmost four characters of word 4 of the reference code. These characters are the program return code (PRC), which indicates the RIO/HSL status. The leftmost four characters of word 7 indicate the RIO/HSL loop number (in hexadecimal format).

Table 72. Status indicated by the PRC

PRC	Indicated status
3205	<p>During IPL, LIC determined that the loop was not complete.</p> <ul style="list-style-type: none"> <li>This is expected if there are no I/O units on the loop.</li> <li>This error can also occur when an I/O unit, shared I/O unit, or another system on the loop did not complete powering on by the time this system's LIC checked the loop for completeness. As a result, you may see this error in the serviceable event view you are working with.</li> <li>When you find the same reference code logged from the same IPL against the same resource with a PRC of 3206 or 3208, the problem no longer exists. This can happen because the error was recovered when RIO/HSL hardware came on line, was properly configured, or the diagnostic code determined that there was not a problem based on the combination of machine types, features, configuration, and topology. In this case, you may close the problem entry.</li> <li>In i5/OS, this error may also appear in the serviceable event view if any I/O units were removed from the loop without deleting the RIO/HSL I/O bridge resources of those units from Hardware Service Manager (HSM). The service procedure identified with the reference code that sent you here will help you determine if the loop is functioning correctly or if service is required.</li> <li>This error may also be caused by a problem in a rack, frame, or unit connected to the RIO/HSL loop if the problem prevents the unit from powering on or being detected by LIC. Follow the service procedures for this reference code. When necessary, you may be directed to work on other reference codes before returning to this procedure.</li> </ul>

Table 72. Status indicated by the PRC (continued)

PRC	Indicated status
3206	During normal operation an RIO/HSL loop recovered its redundant path. The loop is now complete.
3208	During normal operation an RIO/HSL I/O bridge recovered a failed link on the loop.
3209	See Indicated status for PRC 3209 below.
3210	An RIO/HSL link switched to a slower speed. The link is designed to run at a faster speed based on the link's hardware and LIC levels at both ends. If there is a FRU list in the serviceable event view, use it to complete the repair action. If not, perform the following sections of this procedure below: <ol style="list-style-type: none"> <li>1. Determining the RIO/HSL port label</li> <li>2. Replacing the link's failing end point FRUs (replace only the "From Frame ID" end point FRU)</li> </ol>

### Indicated status for PRC 3209

Recoverable CRC (cyclical redundancy check) errors have occurred on the loop. This error requires service action. An RIO/HSL cable or connection must be exchanged. Exchange only the cable that appears in the FRU list of this reference code in this document. If you are working from the serviceable event view, then only the FRU(s) required for this error will be displayed.

Choose from the following scenarios:

- If there is a serviceable event view entry with a cable FRU listed with a loop number, enclosure/unit ID, and port label identified with the cable FRU, then perform one of the following:
  - If the cable is optical, it is possible the optical connections need cleaning. You can choose either to clean the cable connections at each end without exchanging the cable, or to exchange the cable. Use symbolic FRU "OPT\_CLN" on page 521 for information on cleaning the connections. See Exchanging RIO/HSL cables to exchange the cable.
  - If the cable is copper, examine the screws that hold the connector at the end of the cable identified in the reference code or the first cable location listed in the serviceable event view entry. It is possible to get CRC errors when the connector screws are not tight. You can choose to tighten the cable connector screws without exchanging the cable only if they are loose. Otherwise, you must exchange the cable (see Exchanging RIO/HSL cables).
  - If neither of these actions resolves the problem, replace the FRUs in the serviceable event view one at a time. See Finding part locations for the model or unit you are working on.

#### This ends the procedure.

- If the serviceable event view entry does not list any cable FRUs, then exchange the failing items listed in the serviceable event view entry by following the normal service procedures for those FRUs. This will be the case when the RIO/HSL connection is embedded. See Finding part locations for the model or unit you're working on.

#### This ends the procedure.

- If the serviceable event view entry has cable FRU(s) listed, but the loop number, enclosure/unit ID, and port label are not all listed with the cable FRU, go to Determining the RIO/HSL port label below.

### Determining the RIO/HSL port label

Retrieve and record the following information:

- **Loop number.** The loop number is displayed in hexadecimal format as the four leftmost digits of word 7 in the reference code. Convert the loop number to decimal format using "DSA translation" on page 62. Record both the hexadecimal and decimal formats of the loop number. If the loop is an internal loop on an 520 or 570 (loops 0680, 0683, 0686, 0689 hexadecimal or 1664, 1667, 1670, 1673 decimal), then record "Internal".
- **Frame ID.** The frame ID is displayed in hexadecimal format as the four leftmost digits of word 5 of the reference code. You must convert the frame ID to decimal format to match what is displayed in user

interfaces and problem views. Record both the hexadecimal and decimal formats of the frame ID. If the frame ID is not zero, then translate the frame ID into the correct machine type, model, and serial number by performing the following:

1. Log on to SST/DST.  
**Attention:** Do not IPL to DST.
2. Select **Hardware Service Manager**.
3. Select **Packaging resources**.
4. Selecting **Display details** for each unit listed until the frame ID matches the ID you are working with. Once you find the matching frame ID, record the unit's machine type, model, and serial number.

**Note:** A frame ID of 0000 is valid at this point in the procedure. A frame ID of zero is indicating the NIC/RIO controller in a system unit.

- **Port number indicator.** The port number indicator is the four rightmost digits of word 5 of the reference code.

Use the frame ID and port number indicator in the following table to determine the RIO/HSL port label. If you are referred to "Converting the loop number to NIC port location labels" on page 72, the failing item is in a system unit. You will need the RIO/HSL loop number to determine the FRU.

*Table 73. Determining which RIO/HSL port label to use*

Loop number (hexadecimal / decimal)	Frame ID	Port number indicator	Use this RIO/HSL port label
0680 / 1664	0000	0000	"Internal"
0680 / 1664	0000	0001	"Internal"
0681 / 1665	0000	0000	For 520, "-P1-T3" For 570, "-P1-T8"
0681 / 1665	0000	0001	For 520, "-P1-T4" For 570, "-P1-T9"
0682 / 1666	0000	0000	For 570, "-P1-C7-T1"
0682 / 1666	0000	0001	For 570, "-P1-C7-T2"
0683 / 1667	0000	0000	For 570, "Internal" (see note below)
0683 / 1667	0000	0001	For 570, "Internal" (see note below)
0684 / 1668	0000	0000	For 550 and 9124-720, -P1-T11 For 570, -P1-T8 (see note below) For 590 and 595, "Internal"
0684 / 1668	0000	0001	For 550 and 9124-720, -P1-T12 For 570, -P1-T9 (see note below) For 590 and 595, "Internal"
0685 / 1669	0000	0000	For 570, -P1-C7-T1 (see note below) For 590 and 595, -P2-T1
0685 / 1669	0000	0001	For 570, -P1-C7-T2 (see note below) For 590 and 595, -P2-T2
0686 / 1670	0000	0000	For 570, "Internal" (see note below) For 590 and 595, -P2-T1
0686 / 1670	0000	0001	For 570, "Internal" (see note below) For 590 and 595, -P2-T2
0687 / 1671	0000	0000	For 570, -P1-T8 (see note below) For 590 and 595, -P2-T1

Table 73. Determining which RIO/HSL port label to use (continued)

Loop number (hexadecimal / decimal)	Frame ID	Port number indicator	Use this RIO/HSL port label
0687 / 1671	0000	0001	For 570, -P1-T9 (see note below) For 590 and 595, -P2-T2
0688 / 1672	0000	0000	For 570, -P1-C7-T1 (see note below) For 590 and 595, -P2-T1
0688 / 1672	0000	0001	For 570, -P1-C7-T2 (see note below) For 590 and 595, -P2-T2
0689 / 1673	0000	0000	For 570, "Internal" (see note below) For 590 and 595, "Internal"
0689 / 1673	0000	0001	For 570, "Internal" (see note below) For 590 and 595, "Internal"
068A / 1674	0000	0000	For 570, -P1-T8 (see note below) For 590 and 595, -P2-T1
068A / 1674	0000	0001	For 570, -P1-T9 (see note below) For 590 and 595, -P2-T2
068B / 1675	0000	0000	For 570, -P1-C7-T1 (see note below)
068B / 1675	0000	0001	For 570, -P1-C7-T2 (see note below)
068C / 1676	0000	0000	For 590 and 595, -P2-T1
068C / 1676	0000	0001	For 590 and 595, -P2-T2
068E / 1678	0000	0000	For 590 and 595, -P2-T1
068E / 1678	0000	0001	For 590 and 595, -P2-T2
0690 / 1680	0000	0000	For 590 and 595, -P2-T1
0690 / 1680	0000	0001	For 590 and 595, -P2-T2
0692 / 1682	0000	0000	For 590 and 595, -P2-T1
0692 / 1682	0000	0001	For 590 and 595, -P2-T2
0694 / 1684	0000	0000	For 590 and 595, "Internal"
0694 / 1684	0000	0001	For 590 and 595, "Internal"
0695 / 1685	0000	0000	For 590 and 595, -P3-T1
0695 / 1685	0000	0001	For 590 and 595, -P3-T2
0696 / 1686	0000	0000	For 590 and 595, "Internal"
0696 / 1686	0000	0001	For 590 and 595, "Internal"
0697 / 1687	0000	0000	For 590 and 595, -P3-T1
0697 / 1687	0000	0001	For 590 and 595, -P3-T2
0698 / 1688	0000	0000	For 590 and 595, -P3-T1
0698 / 1688	0000	0001	For 590 and 595, -P3-T2
069A / 1690	0000	0000	For 590 and 595, -P3-T1
069A / 1690	0000	0001	For 590 and 595, -P3-T2
069C / 1692	0000	0000	For 590 and 595, -P3-T1
069C / 1692	0000	0001	For 590 and 595, -P3-T2
069E / 1694	0000	0000	For 590 and 595, -P3-T1
069E / 1694	0000	0001	For 590 and 595, -P3-T2
06A0 / 1696	0000	0000	For 590 and 595, -P3-T1

Table 73. Determining which RIO/HSL port label to use (continued)

Loop number (hexadecimal / decimal)	Frame ID	Port number indicator	Use this RIO/HSL port label
06A0 / 1696	0000	0001	For 590 and 595, -P3-T2
06A2 / 1698	0000	0000	For 590 and 595, -P3-T1
06A2 / 1698	0000	0001	For 590 and 595, -P3-T2
06A4 / 1700	0000	0000	For 590 and 595, -P4-T1
06A4 / 1700	0000	0001	For 590 and 595, -P4-T2
06A6 / 1702	0000	0000	For 590 and 595, -P4-T1
06A6 / 1702	0000	0001	For 590 and 595, -P4-T2
06A7 / 1703	0000	0000	For 590 and 595, -P4-T1
06A7 / 1703	0000	0001	For 590 and 595, -P4-T2
06A8 / 1704	0000	0000	For 590 and 595, -P4-T1
06A8 / 1704	0000	0001	For 590 and 595, -P4-T2
06AA / 1706	0000	0000	For 590 and 595, -P4-T1
06AA / 1706	0000	0001	For 590 and 595, -P4-T2
06AC / 1708	0000	0000	For 590 and 595, -P4-T1
06AC / 1708	0000	0001	For 590 and 595, -P4-T2
06AE / 1710	0000	0000	For 590 and 595, -P4-T1
06AE / 1710	0000	0001	For 590 and 595, -P4-T2
06B0 / 1712	0000	0000	For 590 and 595, -P4-T1
06B0 / 1712	0000	0001	For 590 and 595, -P4-T2
06B2 / 1714	0000	0000	For 590 and 595, -P4-T1
06B2 / 1714	0000	0001	For 590 and 595, -P4-T2
06B4 / 1716	0000	0000	For 590 and 595, -P5-T1
06B4 / 1716	0000	0001	For 590 and 595, -P5-T2
06B6 / 1718	0000	0000	For 590 and 595, -P5-T1
06B6 / 1718	0000	0001	For 590 and 595, -P5-T2
06B8 / 1720	0000	0000	For 590 and 595, -P5-T1
06B8 / 1720	0000	0001	For 590 and 595, -P5-T2
06BA / 1722	0000	0000	For 590 and 595, -P5-T1
06BA / 1722	0000	0001	For 590 and 595, -P5-T2
06BC / 1724	0000	0000	For 590 and 595, -P5-T1
06BC / 1724	0000	0001	For 590 and 595, -P5-T2
06BE / 1726	0000	0000	For 590 and 595, -P5-T1
06BE / 1726	0000	0001	For 590 and 595, -P5-T2
06C0 / 1728	0000	0000	For 590 and 595, -P5-T1
06C0 / 1728	0000	0001	For 590 and 595, -P5-T2
06C2 / 1730	0000	0000	For 590 and 595, -P5-T1
06C2 / 1730	0000	0001	For 590 and 595, -P5-T2
	other than 0000 or 0001	0000	"0"

Table 73. Determining which RIO/HSL port label to use (continued)

Loop number (hexadecimal / decimal)	Frame ID	Port number indicator	Use this RIO/HSL port label
	other than 0000 or 0001	0001	"1"

**Note:** For 570, exchange the FRU on the correct unit (primary or secondary) by matching the serial number (if available in the FRU list on the serviceable event view) or by matching the loop number to the correct unit using "Converting the loop number to NIC port location labels" on page 72.

### Determining if the cable is the cause of the problem

If there is a cable attached to the failing port:

- If the cable is optical, it is possible the optical connections need cleaning. You can choose either to clean the cable connections at each end without exchanging the cable, or to exchange the cable. Use symbolic FRU "OPT\_CLN" on page 521 for information on cleaning the connections. See Exchanging RIO/HSL cables to exchange the cable.
- If the cable is copper, examine the screws that hold the connector at the end of the cable identified in the reference code or the first cable location listed in the serviceable event view entry. It is possible to get CRC errors when the connector screws are not tight. You can choose to tighten the cable connector screws without exchanging the cable only if they are loose. Otherwise, you must exchange the cable (see Exchanging RIO/HSL cables).
- If neither of these actions resolves the problem, replace the cable. Perform "RIOIP08" on page 93 to determine the frame ID and RIO/HSL port label of the other end of the cable you will be exchanging (if you do not already know). Does this correct the problem?

**Yes: This ends the procedure.**

**No:** Continue with replacing the FRUs that the cable is connected to, starting with the FRU listed first.

### Replacing the link's failing end point FRUs

Use the following table to determine the end point FRUs on the "From Frame ID" port. Replace the FRUs one at a time.

If replacing the end point FRUs for the "From Frame ID" port does not resolve the error, use the table below to replace the end point FRUs at the other end of the cable. Perform "RIOIP08" on page 93 to determine the system or I/O unit frame ID and RIO/HSL port label of the other end of the cable (if you do not already know).

Table 74. End point FRUs

Model	Loop number (hexadecimal / decimal)	End point FRUs
520, 570	0680 / 1664	The loop is embedded in the system unit planar. Exchange the system unit planar using symbolic FRU "SYSBKPL" on page 547.
520, 570	0681 / 1665	For all port number values, the loop's NIC/RIO controller is embedded in the system unit planar. Exchange the system unit planar using symbolic FRU "SYSBKPL" on page 547.
570	0682 / 1666	For all port number values, the loop's NIC/RIO controller is in the NIC/RIO controller card. Exchange the NIC/RIO controller using symbolic FRU "SICNTRL" on page 533.

Table 74. End point FRUs (continued)

Model	Loop number (hexadecimal / decimal)	End point FRUs
570	0683 / 1667 0686 / 1670 0689 / 1673	The loop is embedded in the system unit planar. Exchange the system unit planar using symbolic FRU "SYSBKPL" on page 547. <b>Note:</b> Exchange the FRU on the correct unit (primary or secondary) by matching the serial number (if available in the FRU list on the serviceable event view) or by matching the loop number to the correct unit using "Converting the loop number to NIC port location labels" on page 72.

**This ends the procedure.**

## SLOTERR

The multi-adapter bridge detected a problem with a card location that it controls. The problem is in the controls for the card slot. The card location may or may not have an installed card. If there is a card installed in that location, it may be the source of the problem. In some cases, the user interface view of the serviceable event will list more than one card position for this FRU's location. The problem may be with any one of the FRU's in those locations. When there is a list of locations in this FRU's location code, the card locations will be separated by commas. A range of card positions will show the starting card position, a colon, and the ending card position.

**Note:** Any IOPs plugged into slots owned by a Linux partition will not power on. This error will be logged. Correct the situation by removing the IOP cards.

- Is there a single card position listed in the serviceable event user interface of an operating system, service processor, or the HMC for this failing item?  
**No:** Continue with the next step.  
**Yes:** Go to step 5.
- Is there a range of card positions (PCI bridge set) listed in the problem view for this failing item?  
**No:** Continue with the next step.  
**Yes:** LIC could not identify the slot with the error. Perform "MABIP03" on page 113 to determine the card position with the failure.  
**This ends the procedure.**
- Record the Direct Select Address (DSA), which is word 7 of the reference code from the problem view display.
- Examine the multi-adapter bridge function number in the DSA (see "DSA translation" on page 62). Is the multi-adapter bridge function number less than or equal to 7?  
**Yes:** Go to "MABIP53" on page 105 to locate the card, and then continue with the next step.  
**No:** LIC could not identify the slot with the error. Perform "MABIP03" on page 113 to determine the card position with the failure.  
**This ends the procedure.**
- Does the reference code that sent you here appear more than once, or does another reference code with this symbolic FRU appear from the same IPL and against the same resource?  
**Yes:** The failure is at the multi-adapter bridge. Do not use this symbolic FRU; instead, go to the next failing item in the list.  
**This ends the procedure.**  
**No:** Locate the message in the following table to determine the problem and necessary corrective action.

Table 75. Card slot errors

Problem or message	Meaning or corrective action
Slot unavailable due to 64-bit card in adjacent slot.	<p>The card location specified in the DSA is unavailable for the card installed there. Do not use that card location.</p> <p>The card location with a multi-adapter bridge function number one less than the multi-adapter bridge function number in the DSA has a 64-bit card installed. The 64-bit card is using the 32-bit PCI bus of the card location specified in the DSA.</p> <p>To determine the multi-adapter bridge function numbers and the card locations they specify, see "DSA translation" on page 62.</p>
LED control failure, do not use slot.	System code has detected a problem with the controls for the LED at the card location specified by the DSA. Do not use that card location.
Power control failure, do not use slot.	System code has detected a problem with the power controls at the card location specified by the DSA. Do not use that card location.
Multi-adapter bridge card slot error, do not use card slot.	System code has detected a problem with the controls at the card location specified by the DSA. Do not use that card location.

**This ends the procedure.**

## SLOTUSE

The card in the given slot is not available for use.

1. Is the unit reference code 2250 or 2300?

**No:** Continue with step 3.

**Yes:** The first two characters in word 4 of the reference code will identify the platform LIC component that has control of the slot. Continue with the next step.

2. What is the value of the first two characters of word 4 of the reference code?

- **81:** The component that has control of the slot is concurrent maintenance. The concurrent maintenance procedure must complete before the partition will IPL. **This ends the procedure.**
- **02 or 03:** The component that has control of the slot is HMC service or HMC configuration. Make sure that HMC functions are not using the slot. **This ends the procedure.**
- **Other:** Contact your next level of support. **This ends the procedure.**

3. Is the unit reference code 2475?

**No:** Contact your next level of support. **This ends the procedure.**

**Yes:** Continue with the next step.

4. Look in the serviceable event view for part numbers and location codes associated with the card slot.

**Note:** There will not be a part number if the card slot is empty.

If the reference code is on the control panel, look in the FRU callout section of the reference code for the location of the card slot. Use the location information to see if a card is physically present in the card slot. Is a card physically present?

**Yes:** Exchange the failing card. **This ends the procedure.**

**No:** Use symbolic FRU "LPARCFG" on page 508 to reconfigure the card slot so that it is not a required resource to IPL the partition. **This ends the procedure.**



## SPBUS

The path to the service processor may be the failing item.

Look in the serviceable event view. Fix all B700 697x errors that occurred at approximately the same time. One of them will implicate the hardware that communicates with the service processor.

**This ends the procedure.**

## SPNLCRD

This symbolic FRU is no longer supported.

## SRCTB1X

There is a failure detected by the power subsystem. The complete FRU part number, procedure ID, or symbolic FRU could not be determined by the power subsystem firmware. This FRU in the serviceable event view may have a partial or complete location code that will assist you in the repair action. Go to (1xxx) System power control network (SPCN) reference codes and locate the SRC you are working on to service this problem.

## STORIOA

Replace the storage I/O adapter. Use the I/O adapter location information in the Service Action Log if it is available. If the location is not available, find the address of the I/O adapter (see System reference code (SRC) address formats). Use the address to find the location (see Finding part locations).

## SVCDPCS

See the *Description/Action* column in the List of system reference codes for the SRC you have.

## SVCPROC

The service processor is failing. After the part has been replaced and before powering on the system, make sure the SPCN configuration ID is set (see Changing system configuration); otherwise, the system will not IPL.

Use the table below to determine which FRU to replace and how to replace it.

System model	Name of symbolic FRU to locate	FRU name	Link to locations information
520	SVCPROC	service processor card	Locations — Model 520
550 and 9124-720	SVCPROC	system backplane	Locations — 9124-720 and Model 550
570	SVCPROC	service processor card (primary unit)	Locations — Model 570
590 and 595	SVCPROC	service processor card 0 service processor card 1	Locations — model 590 and 595

**This ends the procedure.**

## SYSBKPL

The failing component is in the system unit backplane. After the part has been replaced, make sure the enclosure serial number is set before powering up (see Setting the system identifiers); otherwise, the machine will fail to IPL.

Use the appropriate link to the locations information to find the FRU's position, part number, and exchange procedure.

Table 76. Backplane service information

System model	FRU to exchange	Link to locations information
520	system backplane	Locations — Model 520
550 and 9124-720	system backplane	Locations — 9124-720 and Model 550
570	I/O backplane (primary unit)	Locations — Model 570
590 and 595	system backplane	Locations — model 590 and 595

## TAPCLN

Clean the tape unit.

## TAPCNFG

One of the following configuration problems was detected:

- Tape and disk devices are attached to an I/O processor or IOA that does not support tape and disk devices at the same time.
- An unsupported device type or model is attached.

Correct the configuration problem before exchanging any parts.

## TOD

This symbolic FRU is no longer supported. See symbolic FRU "TOD\_BAT" instead.

## TOD\_BAT

The battery for the time-of-day battery is low or failing. Use the table below to determine which FRU to replace and how to replace it.

System model	Name of symbolic FRU to locate	FRU name	Link to locations information
520	TOD_BAT	Time-of-day (TOD) battery	Locations — Model 520
550 and 9124-720	TOD_BAT	Time-of-day (TOD) battery	Locations — 9124-720 and Model 550
570	TOD_BAT	Time-of-day (TOD) battery (primary unit)	Locations — Model 570
590 and 595	TOD_BAT	Time-of-day (TOD) battery	Locations — model 590 and 595

**This ends the procedure.**

## TOPORT

The HSL/RIO node on one end of the link may be the failing item. If you were sent to this procedure as a result of a B700 6985 SRC, and this is the only FRU in the FRU list, then the system cannot see any I/O units on a HSL/RIO loop and there is at least one cable attached to a port on that loop. In this case, go to (A7xx, B7xx) Licensed Internal Code (LIC) Reference Codes and work from the full FRU list provided there.

**Note:** The other end of the link is given in the symbolic FRU "FRPORT" on page 482.

**Note:** For this procedure, the terms "HSL I/O bridge" and "RIO adapter" are interchangeable.

1. Starting from the failed port you isolated in symbolic FRU "FRPORT" on page 482, select **Follow Leading Port** to move to the other side of the failed link.
2. Record the following:
  - a. information of the first failing resource on the link

- b. resource name, card type and model, and part number
- c. link status of each port (record *internal* if the port is designated as internal)
3. Select **Cancel**, to return to the Work with High-speed link (HSL) resources display.
4. For the loop with the failure, select **Resources associated with loop**.
5. For the HSL I/O bridge with the resource name that you recorded, select **Associated packaging resources**.
6. Record the frame ID for this resource.
7. Select **Display detail** and record the card position for the first failing resource.
8. Now go to Finding part locations, select the model or expansion unit with this resource, and use the locations tables to find the replacement procedure and physical location of the FRU. **This ends the procedure.**

## TWRBKPL

TWRBKPL: I/O unit PCI card planar.

The failing item is the tower card in an I/O unit.

1. Are you working from the serviceable event view and a card location is listed with this failing item?
  - Yes:** Then the listed card location is where the error is located. Continue with the next step.
  - No:** Record the bus number value, BBBB, in word 7 of the reference code (see “DSA translation” on page 62). Search for the bus number in the HMC’s or operating system’s resource and configuration interfaces or the System Configuration Listing to determine which unit contains the failing item. Continue with the next step.
2. The failing item is built into the backplane PCI card planar of the I/O unit. Use the table below to determine the appropriate service information.

I/O unit	FRU to exchange	Symbolic FRU	Link to locations information
5095, 0595	Backplane	TWRBKPL	Locations — 5095 and 0595 expansion units

**This ends the procedure.**

## TWRCARD

An SPCN card may be failing. The SPCN card may be on a card or embedded in the backplane. Perform the following to service this FRU.

Examine the location code of this FRU in the serviceable event view you are working with to determine the unit’s type and model (see Location codes). Locate the unit’s type and model in the table below to determine the correct service action.

1. Verify that all cables are seated correctly.
2. Examine the location code of this FRU in the serviceable event view you are working with to determine the unit’s type and model (see Location codes). Is the failing SPCN card in the system unit?
  - No:** Go to step 4 on page 550.
  - Yes:** Choose from the following:
    - If you are working on a Model 550 or 9124-720, replace the system backplane (see “SYSBKPL” on page 547). **This ends the procedure.**
    - If you are working on a Model 520, 570, 590, or 595, replace the service processor card (see Finding part locations to locate and replace the card) and then continue with the next step.
3. Does the same reference code still occur?
  - No:** **This ends the procedure.**
  - Yes:** Replace the backplane (see “SYSBKPL” on page 547). **This ends the procedure.**

4. The failing SPCN card is in a secondary expansion unit or base I/O unit. Find the failing unit in the following table, and use the link to locations information to locate and replace the failing item.

**Attention:** For SRC 1xxx 8910 or 8920, ac removal is required to reset the flashing (frame-indicating) LEDs that are located on the TWRCARD.

Expansion unit	Failing unit description	Symbolic FRU in locations table	Link to locations information
5074, 8079-002, 8093-002	The SPCN card is part of the tower backplane assembly.	TWRCARD	Locations — 5074, 8079-002, and 8093-002 expansion I/O units
5079	The SPCN card is part of the tower backplane assembly.	TWRCARD	Locations — 5079 expansion I/O unit
5088, 0588 (If the last 4 characters of word 1 are 7610, 7611, 7620, 7621, 7630, 7631, 7640, or 7641.)	Replace the following one at a time: 1. AMD controller card 2. Tower backplane	1. AMDCTRL 2. TWRCARD	Locations — 5088 and 0588 expansion I/O units
5088, 0588 (If the last 4 characters of word 1 are not 7610, 7611, 7620, 7621, 7630, 7631, 7640, or 7641.)	The SPCN card is part of the tower backplane assembly.	TWRCARD	Locations — 5088 and 0588 expansion I/O units
5094, 5294, 8094-002	The SPCN card is part of the tower backplane assembly.	TWRCARD	Locations — 5094, 5294, and 8094-002 expansion I/O units
5095, 0595	The SPCN card is part of the tower backplane assembly.	TWRCARD	Locations — 5095 and 0595 expansion I/O units
7311-D10, 7311-D11, and 5790	The SPCN card is part of the I/O backplane.	TWRCARD	Locations — 7311-D10, 7311-D11, and 5790 expansion units
7311-D20	The SPCN card is part of the I/O backplane.	TWRCARD	Locations — D20 expansion unit
Type 1519 xSeries server	Integrated xSeries adapter card (IXA)		Locations — Integrated xSeries adapter card (IXA)

**This ends the procedure.**

## TWRPLNR

The failing component is in the PCI planar board of an I/O unit.

1. Are you working from the serviceable event view and a card location is listed with this failing item?

**Yes:** Then the listed card location is where the error is located. Continue with the next step.

**No:** Record the bus number value, BBBB, in word 7 of the reference code (see “DSA translation” on page 62). Search for the bus number in the HMC’s or operating system’s resource and configuration interfaces or the System Configuration Listing to determine which unit contains the failing item. Record the unit type and model. Continue with the next step.

2. Use the table below to determine the appropriate service information.

*Table 77. Failing component service information for TWRPLNR*

Unit type	Symbolic FRU to locate	FRU name	Link to locations information
5074, 8079-002, 8093-002	TWRPLNR	Expansion unit backplane	Locations — 5074, 8079-002, and 8093-002 expansion units

Table 77. Failing component service information for TWRPLNR (continued)

Unit type	Symbolic FRU to locate	FRU name	Link to locations information
5079	TWRPLNR	Expansion unit backplane	Locations — 5079 expansion unit
5088, 0588	TWRPLNR	Expansion unit backplane	Locations — 0588 and 5088 expansion units
5094, 5294, 8094-002	TWRPLNR	Expansion unit backplane	Locations — 5094, 5294, and 8094-002 expansion units
5791, 5794, and 7040-61D	TWRPLNR	Backplane 1 (not the riser)	Locations — 5791, 5794, and 7040-61D expansion units
		Backplane 2 (not the riser)	
7311-D10, 7311-D11, and 5790	TWRPLNR	I/O backplane	Locations — 7311-D10, 7311-D11, and 5790 expansion units
7311-D20	TWRPLNR	Backplane	Locations — 7311-D20 expansion unit

This ends the procedure.

### UC235

The problem may be that the card (a resource) was removed from the card enclosure without updating the system configuration records.

**Note:** If the system has OptiConnect, verify that the remote system was powered on at the time of the failure.

To update the system configuration records select **Hardware System Manager > Logical Hardware Resources > System Bus Resources > Non-reporting Resources > Remove**. This ends the procedure.

### UC236

The problem may be that the card (a resource) is not correctly plugged into the card enclosure. Use the location information associated with this failing component in the Service Action Log entry and verify that the card is installed properly.

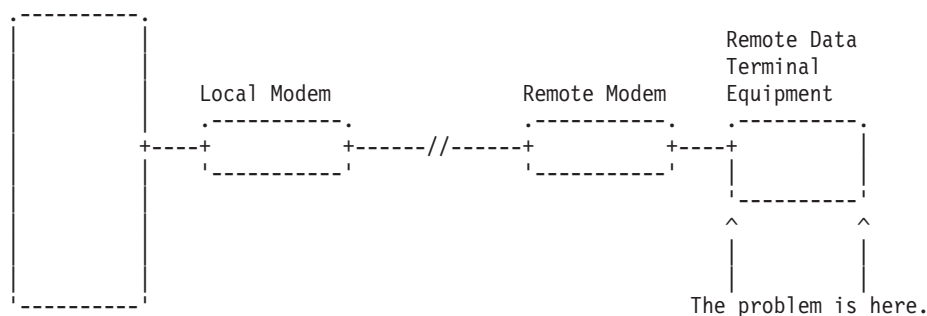
### UG3AS

An error has been detected in the licensed internal code. Contact your next level of support for possible corrective actions.

### UJ0E2

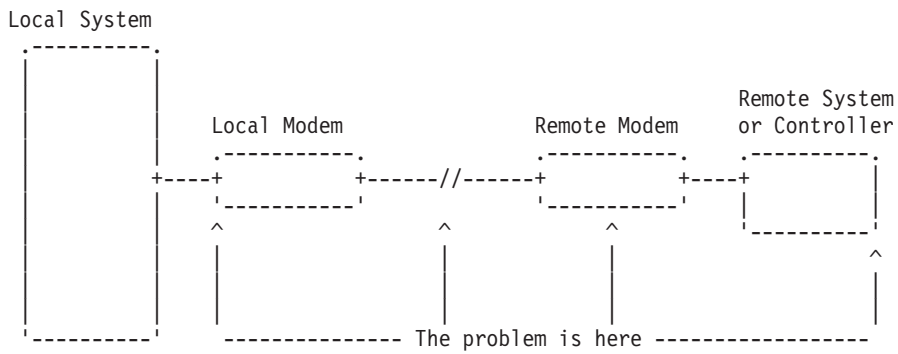
The problem has been isolated to the remote data terminal equipment.

Local System



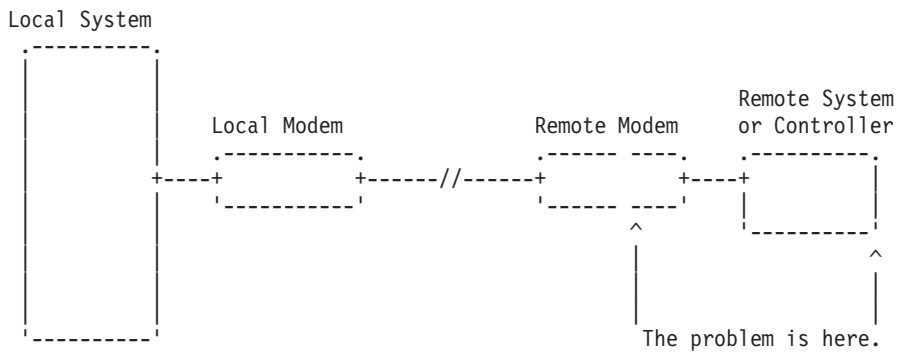
### UJ0E3

The problem has been isolated to the local modem or the hardware that links to the remote end.



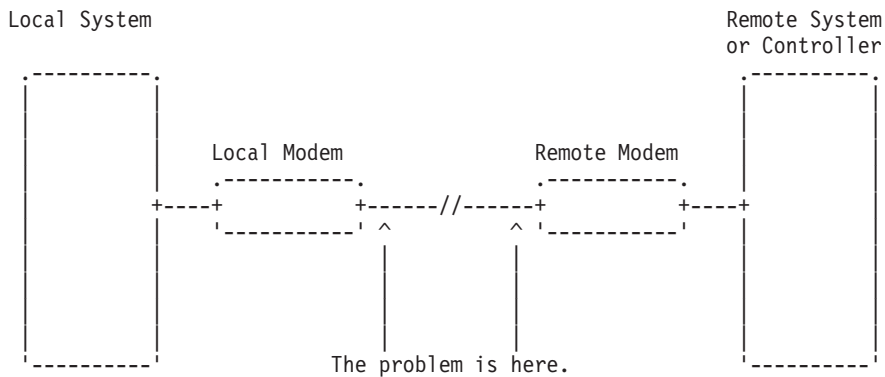
### UJ0E6

The problem has been isolated to the remote modem, or the remote system or controller.



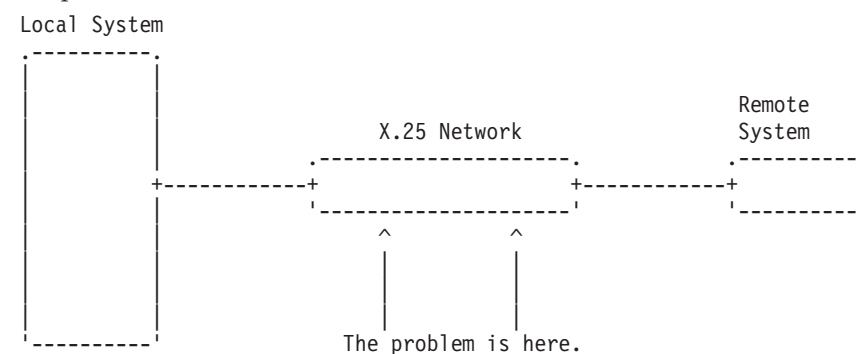
### UJ0E7

The problem has been isolated to the telephone line equipment that links the local and the remote equipment.



### UJ0E9

The problem has been isolated to the X.25 network.



### **UJ6P3**

An error occurred in the IBM Facsimile Support/400 Licensed Program. Please contact your next level of support for possible corrective actions.

Find additional information on Facsimile Support for OS/400 in the Application System Facsimile Support for OS/400 User's Guide.

### **UJ9GC**

The configuration for the wireless network has been identified as a cause of the problem.

The following parameters must be the same for the entire network:

- Frequency
- Data rate
- Radio system identifier

The configuration for one or more of the following will need to be changed:

- i5/OS line description
- Access points
- Remote devices

### **UJA32, UJC38**

The communication line or the automatic call unit is already being used.

Perform the following:

1. Use the documentation that came with your automatic call unit to verify that the unit is configured correctly.
2. Make sure that the telephone line attached to your automatic call unit is not being used by another job. **This ends the procedure.**

### **UJA33, UJP37**

The problem can be caused by one of the following:

- There are too many active lines using the same input/output processor (IOP) card.
- The line speeds are set too high.

Perform the following to find which active lines use the same IOP, and to correct the problem:

1. Vary off the failing line using the VRYCFG command.
2. Vary the line on again, with the reset option of the VRYCFG command set to **Yes**. The active lines using that IOP will be displayed with their line speeds.
3. Determine if there are too many lines using the IOP, or if the line speeds are too high.
4. Correct the configuration as needed. **This ends the procedure.**

### **UJA34**

A configuration parameter may be incorrect.

To determine the configuration parameter that was identified as a possible problem, search for the error in the Service Action Log (see "Using the Service Action Log" on page 24) and display the failing item information for the error. The failing item description associated with this symbolic FRU identifies the parameter that may be the problem.

The line configuration parameter that was identified as a possible problem can be changed by using the WRKLIND command. Determine if the suspected configuration parameter is wrong and change if necessary. For more information about commands related to communications, see CL command finder in the iSeries Information Center.

Some software problems can be temporarily solved by changing the configuration parameter, even if the original value was correct. Report this problem to your service representative if you use this temporary change.

### **UJA35**

A configuration parameter may be incorrect.

To determine the configuration parameter that was identified as a possible problem, search for the error in the Service Action Log (see "Using the Service Action Log" on page 24) and display the failing item information for the error. The failing item description associated with this symbolic FRU identifies the parameter that may be the problem.

The configuration parameter that was identified as a possible problem can be verified by displaying the synchronous data link control (SDLC) controller description with the DSPCTLD command.

The controller description was created by the CRTCTLAPPC, CRTCTLFNC, CRTCTLHOST, or CRTCTLRWS command. You may need to review the appropriate command information to determine if the configuration parameter is wrong.

For more information about commands related to communications, see the CL command finder in the iSeries Information Center.

Some software problems can be temporarily solved by changing the configuration parameter, even if the original value was correct. Report this problem to your service representative if you use this temporary change.

### **UJA36**

A configuration parameter may be incorrect.

To determine the configuration parameter that was identified as a possible problem, search for the error in the Service Action Log (see "Using the Service Action Log" on page 24) and display the failing item information for the error. The failing item description associated with this symbolic FRU identifies the parameter that may be the problem.

The configuration parameter that was identified as a possible problem can be verified by displaying the X.25 line description with the DSPLIND command.

The line description was created by the CRTLINX25 command. You may need to review the appropriate command information to determine if the configuration parameter is wrong.

For more information about commands related to communications, see the CL command finder in the iSeries Information Center.

Some software problems can be temporarily solved by changing the configuration parameter, even if the original value was correct. Report this problem to your service representative if you use this temporary change.

### **UJB35**

A configuration parameter may be incorrect.

To determine the configuration parameter that was identified as a possible problem, search for the error in the Service Action Log (see "Using the Service Action Log" on page 24) and display the failing item information for the error. The failing item description associated with this symbolic FRU identifies the parameter that may be the problem.



The configuration parameter that was identified as a possible problem can be verified by displaying the binary synchronous line description with the DSPLIND command.

The line description was created by the CRTLINBSC command. You may need to review the appropriate command information to determine if the configuration parameter is wrong.

For more information about commands related to communications, see the CL command finder in the iSeries Information Center.

Some software problems can be temporarily solved by changing the configuration parameter, even if the original value was correct. Report this problem to your service representative if you use this temporary change.

### **UJB36**

A configuration parameter may be incorrect.

To determine the configuration parameter that was identified as a possible problem, search for the error in the Service Action Log (see "Using the Service Action Log" on page 24) and display the failing item information for the error. The failing item description associated with this symbolic FRU identifies the parameter that may be the problem.

The configuration parameter that was identified as a possible problem can be verified by displaying the binary synchronous control unit description with the DSPCTLD command.

The controller description was created by the CRTCTLBSC command. You may need to review the appropriate command information to determine if the configuration parameter is wrong.

For more information about commands related to communications, see the CL command finder in the iSeries Information Center.

Some software problems can be temporarily solved by changing the configuration parameter, even if the original value was correct. Report this problem to your service representative if you use this temporary change.

### **UJC35**

A configuration parameter may be incorrect.

To determine the configuration parameter that was identified as a possible problem, search for the error in the Service Action Log (see "Using the Service Action Log" on page 24) and display the failing item information for the error. The failing item description associated with this symbolic FRU identifies the parameter that may be the problem.

The configuration parameter that was identified as a possible problem can be verified by displaying the IDLC line description with the DSPLINID command.

The line description was created by the CRTLINASC command. You may need to review the CRTLINASC command information to determine if the configuration parameter is wrong.

Information about commands related to communications can be found in the following manuals:

- CL Programming, SC41-5721-03
- Communications Configuration, SC41-5401-00

Some software problems can be temporarily solved by changing the configuration parameter, even if the original value was correct. Report this problem to your service representative if you see this temporary change.

## **UJC36**

A configuration parameter may be incorrect.

To determine the configuration parameter that was identified as a possible problem, search for the error in the Service Action Log (see “Using the Service Action Log” on page 24) and display the failing item information for the error. The failing item description associated with this symbolic FRU identifies the parameter that may be the problem.

The configuration parameter that was identified as a possible problem can be verified by displaying the asynchronous control unit description with the DSPCTLD command.

The control unit description was created by the CRTCTLASC command. You may need to review the CRTCTLASC command information to determine if the suspected configuration parameter is wrong.

Information about commands related to communications can be found in the following manuals:

- CL Programming, SC41-5721-03
- Communications Configuration, SC41-5401-00

Some software problems can be temporarily solved by changing the configuration parameter, even if the original value was correct. Report this problem to your service representative if you see this temporary change.

## **UJE31**

There could be a problem with the Token-Ring Network Manager program. Contact the token-ring administrator responsible for your network.

## **UJE32**

There could be a problem with the Token-Ring Network Management function. Contact the token-ring administrator responsible for your network.

## **UJE33**

The token-ring adapter returned status information because it has received a beacon frame from the token-ring network. The line is still operational; however, if this problem occurs often, you may want to refer to Physical site planning for information about the electrical requirements and noise problem considerations.

## **UJE34**

The error message may have been logged from a temporary error that is not caused by equipment failure. This type of error message sometimes contains information about system performance. See the original system message for cause and recovery information about the error.

## **UJE35**

A configuration parameter may be incorrect.

To determine the configuration parameter that was identified as a possible problem, search for the error in the Service Action Log (see “Using the Service Action Log” on page 24) and display the failing item information for the error. The failing item description associated with this symbolic FRU identifies the parameter that may be the problem.

The configuration parameter that was identified as a possible problem can be verified by displaying the local area network line description with the DSPLIND command.

The line description was created by the CRTLINTRN, CRTLINETH, or CRTLINDDI command. You may need to review the appropriate command information to determine if the configuration parameter is wrong.

For more information about commands related to communications, see the CL command finder in the iSeries Information Center.

Some software problems can be temporarily solved by changing the configuration parameter, even if the original value was correct. Report this problem to your service representative if you use this temporary change.

### **UJE36**

A configuration parameter may be incorrect.

To determine the configuration parameter that was identified as a possible problem, search for the error in the Service Action Log (see "Using the Service Action Log" on page 24) and display the failing item information for the error. The failing item description associated with this symbolic FRU identifies the parameter that may be the problem.

The configuration parameter that was identified as a possible problem can be verified by displaying the local area network control unit description with the DSPCTLD command.

The controller description was created by the CRTCTLAPPC, CRTCTLHOST, or CRTCLRWS command. You may need to review the appropriate command information to determine if the configuration parameter is wrong.

For more information about commands related to communications, see the CL command finder in the iSeries Information Center.

Some software problems can be temporarily solved by changing the configuration parameter, even if the original value was correct. Report this problem to your service representative if you use this temporary change.

### **UJE37**

The problem may be at the remote site.

Perform the following:

1. Ask the remote site operator to verify the following:
  - The remote equipment is powered on and ready.
  - The configuration values are correct.
  - The local area network cables are securely connected and are not damaged.
2. If the problem continues, run all available diagnostic tests on the remote equipment and perform the repair action specified. **This ends the procedure.**

### **UJE38**

Too many jobs are running that use the communications controller.

Before you can run your communications job, you must do one or more of the following:

- End any diagnostic program that may be running, such as the Communications Trace Program.
- Vary off a line that is using the controller.
- Lower the speed of a line that uses the controller.

Perform the following to find which lines are using the controller:

1. Vary off the failing line using the VRYCFG command.
2. Vary the line on again, with the reset option of the VRYCFG command set to **Yes**. The names of the lines using the controller will be displayed. **This ends the procedure.**

### **UJE39**

The problem may be at the remote site.

Perform the following:

1. Ask the remote site operator to verify the following:
  - The remote equipment is powered on and ready.
  - The configuration values are correct.
2. If the problem continues, run all available diagnostic tests on the remote equipment and perform the repair action specified. **This ends the procedure.**

### **UJE40**

The problem may be at the remote site or on the network media.

Perform the following:

1. Ask the remote site operator to verify the following:
  - The remote equipment is powered on and ready.
  - The configuration values are correct.
  - The local area network cables are securely connected and are not damaged.
2. If the problem continues, run all available diagnostic tests on the remote equipment and perform the repair action specified. **This ends the procedure.**

### **UJJ35**

A configuration parameter may be incorrect.

To determine the configuration parameter that was identified as a possible problem, search for the error in the Service Action Log (see "Using the Service Action Log" on page 24) and display the failing item information for the error. The failing item description associated with this symbolic FRU identifies the parameter that may be the problem.

The configuration parameter that was identified as a possible problem can be verified by displaying the X.25 line description with the DSPLIND command.

The line description was created by the CRTLINX25 command. You may need to review the appropriate command information to determine if the configuration parameter is wrong.

For more information about commands related to communications, see the CL command finder in the iSeries Information Center.

Some software problems can be temporarily solved by changing the configuration parameter, even if the original value was correct. Report this problem to your service representative if you use this temporary change.

### **UJJ36**

A configuration parameter may be incorrect.

To determine the configuration parameter that was identified as a possible problem, search for the error in the Service Action Log (see "Using the Service Action Log" on page 24) and display the failing item information for the error. The failing item description associated with this symbolic FRU identifies the parameter that may be the problem.

The configuration parameter that was identified as a possible problem can be verified by displaying the X.25 control unit description with the DSPCTLD command.

The controller description was created by the CRTCTLAPPC, CRTCTLFNC, CRTCTLHOST, CRTCTLRWS, or CRTCTLASC command. You may need to review the appropriate command information to determine if the configuration parameter is wrong.

For more information about commands related to communications, see the CL command finder in the iSeries Information Center.

Some software problems can be temporarily solved by changing the configuration parameter, even if the original value was correct. Report this problem to your service representative if you use this temporary change.

### **UJJ37**

The error message may have been logged from a temporary error that is not caused by equipment failure. This type of error message sometimes contains information about system performance. See the original system message for cause and recovery information about the error.

### **UJJ38**

A user specified X.25 facility, such as packet size, window size, reverse charging, or closed user group, may not have been correctly assigned.

### **UJJ39**

Refer to Configure your iSeries server for communications in the IBM eServer iSeries Information Center.

### **ULNZ3**

The problem may be a communications line problem.

When a workstation is attached to the system through modems, it may fail or lose communication with the system for various lengths of time. This is due to a communications line problem. Refer to the modem service information to determine how to test the modems and verify that the communications line between the modems is working correctly.

### **ULNZ4**

Independent workstation and SDLC support.

The system considers an independent workstation to be an attached remote system when it is attached using PC Support asynchronous communications on an ASCII workstation controller.

Perform the following:

- See the *ASCII Work Station Reference*, SA41-3130-00 information for instructions on how to verify that the remote system (independent workstation) that is attached to the failing port is a supported device.
- See the device hardware maintenance and service information for instructions on how to verify that the device is working correctly.

### **UNM31**

A configuration parameter may be incorrect.

To determine the configuration parameter that was identified as a possible problem, search for the error in the Service Action Log (see "Using the Service Action Log" on page 24) and display the failing item information for the error. The failing item description associated with this symbolic FRU identifies the parameter that may be the problem.

The configuration parameter that was identified as a possible problem can be verified by displaying the ISDN network interface description with the DSPNWIISDN command.

The line description was created by the CRTNWIISDN command. You may need to review the appropriate command information to determine if the configuration parameter is wrong.

For more information about commands related to communications, see the CL command finder in the iSeries Information Center.

Some software problems can be temporarily solved by changing the configuration parameter, even if the original value was correct. Report this problem to your service representative if you use this temporary change.

### **UNM32**

The licensed internal code of the communications I/O card cannot obtain a necessary resource because of a heavy workload. This can be caused by too many configured stations, too many users, maximum inbound or outbound data sizes, as well as other considerations.

Try to reduce the total workload on the communications I/O controller card by performing one of the following:

- Change the communications configuration
- Vary off any unused lines
- End any service functions that are not needed

### **UNM35**

There could be a problem at the remote U interface, between the NT1 node and the Integrated Services Digital Network (ISDN). This interface is a 2-wire connection between the NT1 node and the ISDN. Contact your ISDN provider and have them verify the proper operation of the interface.

### **UNM36**

There may be a problem in the Integrated Services Digital Network (ISDN). Contact your ISDN service provider and report the problem.

### **UNM38**

The required program temporary fix (PTF) is not installed.

To use the specified network type, you must first install a PTF. If the PTF has not been previously installed, install it and try the operation again.

### **UNP20**

The internal code of the I/O card that detected the error may be defective.

Perform the following:

1. Replace the suspected card.
2. If the failure occurs again, contact your next level of support and report the problem. **This ends the procedure.**

### **UNU01**

Electrical noise in the local environment can cause performance degradation or loss of an ISDN communications link. Motors, electrical devices, power cables, communications cables, radio transmitters, and magnetic devices can cause noise or electrical interference.

Perform the following:

1. Inspect ISDN cables or wiring located near a source of possible noise or electrical interference.
2. Inspect ISDN cables for damage, incorrect connections, or loose connections.
3. Consult your local ISDN network provider or service representative for assistance in correcting the problem. **This ends the procedure.**

## UNU02

The problem may be at the remote location.

Perform the following:

1. Have the remote site operator verify that the remote equipment is powered on and ready, and that the remote configuration values are correct and compatible with the local configuration.
2. If the problem continues, determine if data is being transferred over the remote ISDN interface. This can be done by either using a communications trace (STRSST), or attaching a protocol analyzer to the line.
  - If a line trace reveals that no data is being transferred, then run hardware and diagnostic tests on the remote equipment.
  - If data is crossing the ISDN interface, analyze the failing protocol procedures to determine which configuration parameters to change. Consult your service representative for help with this analysis.  
**This ends the procedure.**

## UNU31

A configuration parameter may be incorrect.

To determine the configuration parameter that was identified as a possible problem, search for the error in the Service Action Log (see "Using the Service Action Log" on page 24) and display the failing item information for the error. The failing item description associated with this symbolic FRU identifies the parameter that may be the problem.

The configuration parameter that was identified as a possible problem can be verified by displaying the IDLC line description with the DSPLINIDLC command.

The line description was created by the CRTLINIDLC command. You may need to review the appropriate command information to determine if the configuration parameter is wrong.

For more information about commands related to communications, see the CL command finder in the iSeries Information Center.

Some software problems can be temporarily solved by changing the configuration parameter, even if the original value was correct. Report this problem to your service representative if you use this temporary change.

## UNU32

A configuration parameter may be incorrect.

To determine the configuration parameter that was identified as a possible problem, search for the error in the Service Action Log (see "Using the Service Action Log" on page 24) and display the failing item information for the error. The failing item description associated with this symbolic FRU identifies the parameter that may be the problem.

The configuration parameter that was identified as a possible problem can be verified by displaying the IDLC controller description with the DSPCTLD command.

The controller description was created by the CRTCTLHOST, CRTCTLAPPC, or CRTCLRWS command. You may need to review the appropriate command information to determine if the configuration parameter is wrong.

For more information about commands related to communications, see the CL command finder in the iSeries Information Center.

Some software problems can be temporarily solved by changing the configuration parameter, even if the original value was correct. Report this problem to your service representative if you use this temporary change.

## **UPLF1**

The system may not have been able to complete the APPN session initiation due to the number of jobs that were active when the timeout occurred.

The timeout condition could have been caused by a system performance problem. System performance could be impacted by the capacity of the system. System performance can also be impacted by processing requests from other systems in the network.

For capacity planning and system performance information, refer to *eServer™ iSeries Performance Tools for iSeries* (SC41–5340).

## **UPSUNIT**

The uninterruptible power supply (UPS) may be the failing component.

Perform the following:

1. Is the problem that the system has a UPS reference code, but the UPS does not have a fault code?
  - Yes:** Continue with the next step.
  - No:** Go to step 3.
2. Remove the UPS signal cable from the system connector. Does the system report a UPS reference code now?
  - No:** Continue with the next step.
  - Yes:** Replace the following, one at a time, until the problem is resolved:
    - a. Tower card (see "TWRCARD" on page 549)
    - b. Remote power controller (RPC)**This ends the procedure.**
3. Perform the following:
  - a. Verify the UPS signal cable, between the UPS and the system, is connected and seated properly.
  - b. Have the customer call the UPS provider for service if a problem is found.
  - c. Call service support if the problem prevails after the UPS is verified as working correctly.**This ends the procedure.**

## **USER**

There has been a system operator error or user error. See the system operator information.

## **UX201**

The printer definition table may be causing the problem. See the original system message for cause and recovery information about the error.

## **UX202**

A problem was detected while downloading a device licensed internal code change to the device. See the original system message for cause and recovery information about the error.

## **UY1Z1**

Cable problems:

See the *IBM Technical Information Manual* for information on how to correct cabling problems. Problems that are associated with noise can cause a workstation to fail or lose communication with the system for various lengths of time. A motor or any device that is a source of electrical radiation can cause noise or electrical interference. The following are common causes for noise problems:



- Cables that are located near a source of electrical interference.
- Cables that are loose, damaged, or not correctly connected

### **UY1Z2**

This error occurs if you attempted to activate more workstations than the amount allowed.

Perform one of the following to correct the problem:

- Turn off the power for the workstation that caused the error, or connect the workstation to a different controller.
- Turn off the power for a different workstation that is connected to the same workstation controller.

See the local workstation diagrams for the physical location of workstations. **This ends the procedure.**

### **UY1Z3**

This error is caused by a workstation that is connected to the port.

1. Perform the following:
  - a. Turn off the power for one workstation on the port
  - b. Check if the other workstations operate correctly.
  - c. Repeat this for each workstation on the port.
  - d. The workstation that causes the problem is the one that is turned off when the others are working correctly.
  - e. If you did not find the problem, continue with the next step.
2. Perform the following:
  - a. Turn off the power for all workstations on the port.
  - b. Then, turn on one workstation to check if it works when all other workstations are turned off.
  - c. Repeat this for each workstation on the port. The workstation that causes the problem is the one that works when all other workstations are turned off. **This ends the procedure.**

### **UY1Z4**

An error occurred with the pass-through command between the workstation controller and the workstation. A failure in the licensed internal code (LIC) in either the workstation or the workstation controller causes this type of error.

### **UY1Z5**

The communication between the workstation controller and a workstation was interrupted during an active session.

Possible causes include:

- The power for the workstation was turned off, then on.
- A temporary loss of power to the workstation occurred.

### **VPDPART**

1. Is the reference code 1xxx 8402?

**No:** Continue with the next step.

**Yes:** Prior to exchanging any parts, verify that the processors are installed. If you are in test mode and have removed all of the processors, disregard this reference code. Otherwise, correct the processors. If the processors are installed correctly, then exchange the service processor card (see "SVCPROC" on page 547). **This ends the procedure.**

2. Is the reference code 1xxx 8404, 8405, or 8406?

**No:** Continue with the next step.

**Yes:** Use the table below to find the correct action to take. See Finding part locations for part number and exchange information.

Reference code	Action
1xxx 8404	Processor card mismatch. Exchange processor card 2 in the primary unit.
1xxx 8405	Processor card mismatch. Exchange processor card 1 in a secondary unit.
1xxx 8406	Processor card mismatch. Exchange processor card 2 in a secondary unit.

**This ends the procedure.**

3. Is the reference code 1xxx 8409?

**No:** Continue with the next step.

**Yes:** No processors are installed. If you are in test mode and have removed all of the processors, disregard this reference code. Otherwise, correct the processors. If the processors are installed correctly, exchange all processors. See Finding part locations for part number and exchange information. **This ends the procedure.**

4. Is the reference code 1xxx 8413 or 8414?

**No:** Continue with the next step.

**Yes:** Perform the following:

**Note:** See Finding part locations for part and location information.

- For a model 520, replace the system unit backplane (see “SYSBKPL” on page 547).
- For a model 570, use the reference code in the table below to find the FRU.

Reference code	Action
1xxx 8413	Exchange processor 1.
1xxx 8414	Exchange processor 2.

**This ends the procedure.**

5. Are you working on a model 590 or 595?

**No:** Continue with the next step.

**Yes:** Go to step 7.

6. Is the reference code 1xxx 8423 or 8424?

**No:** Go to step 8 on page 565.

**Yes:** Perform the following:

**Note:** See Finding part locations for part and location information.

- For a model 520, replace the system unit backplane (see “SYSBKPL” on page 547).
- For a model 550, 9124-720, and 570, use the reference code in the table below to find the FRU.

Reference code	Action
1xxx 8423	Exchange processor 1.
1xxx 8424	Exchange processor 2.

**This ends the procedure.**

7. Is the 1xxx reference code in one of the following ranges?

- 8410 through 8417
- 8420 through 8427
- 8470 through 8477

**No:** Go to step 8 on page 565.

**Yes:** Use the following table to replace the appropriate FRU. **This ends the procedure.**

SRC	FRU to replace	Link to locations
8410, 8420, 8470	MCM 0 on node 0	Locations — model 590 and 595
8411, 8421, 8471	MCM 1 on node 0	
8412, 8422, 8472	MCM 0 on node 1	
8413, 8423, 8473	MCM 1 on node 1	
8414, 8424, 8474	MCM 0 on node 2	
8415, 8425, 8475	MCM 1 on node 2	
8416, 8426, 8476	MCM 0 on node 3	
8417, 8427, 8477	MCM 1 on node 3	

8. Is the reference code 1xxx 911C?

**Yes:** Two nodes have the same VPD. See System unique identifier in the Service functions to resolve the problem. **This ends the procedure.**

**No:** Return to “Start of call procedure” on page 2. **This ends the procedure.**

## Failing Function Codes (FFCs)

Failing function codes represent functions within the system unit.

**Note:** When replacing a FRU, use MAP 0410: Repair checkout to verify the fix.

The failing function codes are listed in numerical sequence.

A function may not be physically packaged on the same FRU in various system units. When this condition exists, the FRU part number for each type of system unit is listed.

### Column Heading Term Definitions

The columns in the failing function code list are as follows:

#### Failing function code

The failing function code number from the SRN list in MAP 0260: System hangs during resource configuration.

#### Machine type/model

This column is used when the failing function is on a FRU which differs by machine type and model. Use the part number for the type of system unit you are servicing.

See “Machine Types” on page 566 for the names of the machine types.

**Note:** Although the machine cover logo may depict the model number as four digits, the service and parts ordering system requires three-digit numbers. For example, if the cover logo depicts model number *xxxx*, service and parts documentation may refer to that model as *xxx*.

#### Part number

This column contains the part number of the FRU that contains the failing function. Use the part number for the type of system unit you are servicing.

#### Description and notes

This column contains the description of the FRU and any usage notes. The FRU description may be different in different system units. Use the one for the type of system unit you are servicing.

Select failing function codes to access the failing function code listing.

## Machine Types

Machine Type	Description
3151	Display Terminal
3161	Display Terminal
3163	Display Terminal
3514	External Disk Array, Models 212 and 213
3812	Pageprinter
3852	Printer
4201	Proprinter II
4202	Proprinter XL
4207	Proprinter X24
4208	Proprinter XL24
4216	Personal Pageprinter
4224	Printer
4234	Printer
4869	5.25-Inch External Diskette Drive
5081	Color Display
5083	Tablet
5085	Graphics Processor
5086	Graphics Processor
5088	Communications Controller
5202	Quietwriter Printer
5204	Quickwriter Printer
6094	Model 10, Dials
6094	Model 20, Lighted Program Function Keyboard (LPFK)
6094	Model 30, Spaceball™
6180	M1 color plotter
6182	Color Plotter
6184	Color Plotter
6185	Model 1 Color Plotter
6186	Color Plotter
6187	Plotter
7372	Plotter
7017	System Unit (Rack Mount), I/O Rack (with up to 4 I/O drawers)
7024	System Unit (Floor Standing)
7025	System Unit (Floor Standing)
7026	System Unit (Rack Mount)
7027	Disk Drive Drawer
7028	System Unit (Model 6C1, 6C4, 6E1, 6E4)
7029	System Unit (Model 6C3, 6E3)
7038	System Unit (Model 6M2)
7039	System Unit (Model 651)
7040	System Unit (Model 670, 690)
7043	System Unit (Models 140, 150, 240, 260)
7044	System Unit (Models 170, 270) Floor Standing
7046	System Unit (Model B50) Rack Mount
7131	Model 105 SCSI Multi-Storage Tower
7134	High Density SCSI Disk Subsystem, Model 010.
7137	Disk Array Subsystem Models 412, 413, and 414
7135	RAIDiant Array SCSI Disk Drive Subsystem, Models 010 and 110
7203	External Portable Disk Drive
7204	External Disk Drive Model 320
7206	2.0 GB or 4.0 GB External 4 mm Tape Drive 24/48 GB DDS-2 4 mm Autotape Loader

Machine Type	Description
7207	150 MB, 525 MB or 1.2 GB External 1/4-Inch Cartridge Tape Drive
7208	2.3 GB or 5.0 GB External 8 mm Tape Drive
7210	External CD-ROM Drive
7235	POWERgraphics GTO graphics subsystem
7250	POWERgraphics Accelerator
7311	I/O Drawer (Models D10, D20)
7317	System Unit, (Telco Rack Mounted)
7331	Model 205 8 mm Tape Library
7332	Model 005 4 mm Tape Library
8508	Monochrome Display
9076	SMP Thin/Wide Node
9076	Power3 SMP Thin/Wide Node
9076	Power3 SMP High Node
9111	520
9112	System Unit (Model 265)
9114	System Unit (Model 275)
9117	570
9333	High-Performance Disk Drive Subsystem Models 010 and 011
9333	High-Performance Disk Drive Subsystem Models 500 and 501
9334	SCSI Expansion Unit Model 010 (Single-Ended), Model 011 (Differential)
9334	SCSI Expansion Unit Model 500 (Single-Ended), Model 501 (Differential)
9348	1/2-Inch 9-Track Tape Drive

## Failing Function Code List

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
11A		09J8199	Battery kit, Cryptographic Coprocessor
132			The program that just loaded may be damaged.
141		4569502	857 MB Disk Enclosure Assembly
151		33F8354	Battery, time-of-day, NVRAM, etc. <b>Note:</b> After replacement of this FRU the following must be done by you or the customer: <ol style="list-style-type: none"> <li>1. Time and date must be set.</li> <li>2. Network IP addresses should be set (for machines that IPL from a network).</li> <li>3. The bootlist should be set to reflect the customers preference for the IPL devices (when it is different from the default list).</li> </ol>
151	520 550 570	Battery For the latest part numbers, go to the Part Number Catalog.	
151	7017/S70 7017/S7A 7017/S80 7017/S85	03N3523 03N3523 11K0301 16G8095	Service Processor Card Service Processor Card Service Processor Card Battery
151	7025/6F0 7025/6F1	16G8095 43L5269	Battery System board

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
151	7025/F80	16G8095 43L5269	Battery System board
151	7026/6H0 7026/6H1 7026/6M1 7026/H80 7026/M80	16G8095 41L5560	Battery Primary I/O backplane
151	7028/6C4 7028/6E4	15F8409 00P4488 00P5830	Battery System Board (with RIO capability) System Board (with RIO-2 capability)
151	7029/6C3 7029/6E3 9114/275	16G8095 80P2388	Battery Service Processor
151	7038/6M2	00P4062 00P5604  16G8095	Service Processor/PCI Adapter Backplane Service Processor/PCI Adapter Backplane (RIO-2 capability) Battery
151	7039/651	16G8095 00P4811	Battery Service Processor/VPD Card
151	7040/61R 7040/W42	44H2790	Integrated Battery Feature
151	7040/671 7040/681	16G8095 09P2435	Battery Primary I/O Book
151	7043/150 7044/170 7046/B50	15F8409	Battery
151	9076 SMP Thin/Wide Node	41L6138	I/O Planar (Check NVRAM jumper)
151	9076/ Power3 SMP Thin/Wide Node	03N2866 03N3368	I/O planar (200 MHz) I/O planar (375 MHz) (Check NVRAM jumper)
151	9076/ Power3 SMP High Node	11K0571	NIO Planar <b>Note:</b> There is no battery for this model.
152	520 550 570	Power Supply  For the latest part numbers, go to the Part Number Catalog.	
152	7017/S70	21H7030 21H6961 21H7763 21H7100 93H3753 93H3734 93H3682 07L6658 07L6656	System Power Supply problem AC Bulk Power Supply SPCN card Programmable regulator assembly Memory regulator assembly AC box, Domestic (U.S.) single phase AC box, World Trade, single phase AC box, World Trade, two phase Bulk Power Supply (-48 Vdc) DC box (-48 Vdc)

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
152	7017/S7A	21H7030 21H6961 21H7763 21H7100 93H3753 93H3734 93H3682 97H9465 08L1336	AC Bulk Power Supply SPCN card Programmable regulator assembly Memory regulator assembly AC box, Domestic (U.S.) single phase AC box, World Trade, single phase AC box, World Trade, two phase Power distribution board I/O Drawer Power Supply
152	7017/S80 7017/S85	21H7719 21H6961 21H7763 21H3603 93H3753 93H3734 93H3682  21H7000 04N6092  97H9465 08L1336	System Rack AC Bulk Power Supply SPCN Card Programmable Regulator assembly CPM Regulator assembly AC Box, Domestic (U.S.) Single Phase AC Box, World Trade, Single Phase AC Box, World Trade, Two Phase With dual line cord feature: AC Box, Single phase Concurrent maintenance card I/O Rack Power Distribution Board I/O Drawer Power Supply
152	7024	93H3504	Power Supply
152	7025/6F0 7025/6F1	24L1400	Power supply
152	7025/F30	40H5428	Power Supply (474 watts)
152	7025/F30 7025/F40	12J5701	Optional Power Supply <b>Note:</b> If your are replacing the power supply because of receiving SRNs 950-700 thru 950-998, replace the optional power supply first.
152	7025/F40	07L7476	Power Supply (575 watts)
152	7025/F50	93H9789	Power Supply
152	7025/F80	24L1400	Power supply
152	7026/6H0 7026/6H1	11K0802 41L5404 11K0812 41L5413 03N2829	CEC drawer ac power supply CEC drawer dc power supply I/O drawer ac power supply I/O drawer dc power supply Cooling unit (filler)
152	7026/6M1	24L0728 44L0045 11K0812 03N2829	CEC drawer ac power supply CEC drawer dc power supply I/O drawer ac power supply Cooling unit (filler)
152	7026/B80	00P2342 00P2344	Power supply, ac Power supply, dc
152	7026/H10	93H8714	System Power Supply problem Power Supply

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
152	7026/H50	93H9551 08L1336 97H9464	Power Distribution Board Power Supply Power Supply (-48 Vdc) <b>Note:</b> Replace the Power Distribution Board before replacing the power supply.
152	7026/H70	08L0388 94H1041 41L4881	Power Distribution Board Power Supply Power Supply(-48 Vdc) <b>Note:</b> Replace the Power Distribution Board before replacing the power supply.
152	7026/H80	11K0802 41L5404 11K0812 41L5413 03N2829	CEC drawer ac power supply CEC drawer dc power supply I/O drawer ac power supply I/O drawer dc power supply Cooling unit (filler)
152	7026/M80	24L0728 44L0045 11K0812 03N2829	CEC drawer ac power supply CEC drawer dc power supply I/O drawer ac power supply Cooling unit (filler)
152	7028/6C1 7028/6E1	24P6867	Power supply
152	7028/6C4 7028/6E4	09P5894	AC Power Supply
152	7029/6C3 7029/6E3 9114/275	53P5617	AC Power Supply
152	7038/6M2	21P4437	AC Power Supply
152	7039/651	44P3110 00P4811	Distributed Converter Assembly (DCA) Service Processor/VPD Card
152	7040/671 7040/681	11P1543 11P1544 11P1545 11P1546 11P1547 11P1548 11P1549 11P1550 11P1551 11P1552 11P1540	Distributed Converter Assembly (DCA1) P00 Distributed Converter Assembly (DCA1) P01 Distributed Converter Assembly (DCA2) P00 Distributed Converter Assembly (DCA2) P01 Distributed Converter Assembly (DCA3) P00 Distributed Converter Assembly (DCA3) P01 Distributed Converter Assembly (DCA4) P00 Distributed Converter Assembly (DCA4) P01 Distributed Converter Assembly (DCA5) P00 Distributed Converter Assembly (DCA5) P01 Capacitor Card
152	7040/61D	11P3582	Distributed Converter Assembly
152	7040/61R 7040/W42	31L8609 11P1598 12K0981 11P4205 44H2790	Bulk Power Regulator (BPR) Bulk Power Controller (BPC) Bulk Power Distribution (BPD) Bulk Power Enclosure (BPE) Integrated Battery Feature (IBF)
152	7043/140 7043/150 7043/240	40H7566 40H7563	PFC Power Supply (Japan Only) Non-PFC Power Supply (Other Countries)
152	7043/260	97H9337	Power supply



Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
152	7043/270	24L1968	Power Supply
152	7044/170	41L5215	Power Supply
152	7044/270	24L1968	Power Supply
152	7046/B50	24L2659	Power supply
152	7203	00G2960	Bridge Box Power Supply
152	7204/001	46G3934	Bridge Box Power Supply
152	7204 Models, 112, 113, 114, 139, 317, 325, 339	59H3760	Bridge Box Power Supply
152	7204 Models 010, 215, 315	8191380	Bridge Box Power Supply
152	7206/001	46G3934	Bridge Box Power Supply
152	7206/002	8191380	Bridge Box Power Supply
152	7207 Models 001, 011	00G2960	Bridge Box Power Supply
152	7207/012	46G3934	Bridge Box Power Supply
152	7207/315	59H3760	Bridge Box Power Supply
152	7208/001	00G2960	Bridge Box Power Supply
152	7208/011 7208/034 7208/341 7208/342	46G3934 59H3760 59H2835 59H2836	Bridge Box Power Supply
152	7209	46G3934	Bridge Box Power Supply
152	7210/001	00G2960	Bridge Box Power Supply
152	7210/005	65G7585	Power supply/enclosure
152	7210/010	59H3760	Power supply
152	7236 MediaStreamer	40H7566	Power Supply
152	7311/D10	09P3354	AC Power Supply
152	7311/D20	53P4832	Power Supply
152	7317/F3L	93H2232	Power Supply
152	16-Port RAN	93H7091	Power Supply for Remote Async Node, FRU Part Numbers 51G8139, 93H6549, or 93H6563
152	9076 SMP Thin/Wide Node	11J6523 11J6524	CPU Power Supply I/O power supply
152	9076/ Power3 SMP Thin/Wide Node	31L7865 11J6524	CPU Power Supply I/O Power Supply
152	9076/ Power3 SMP High Node	12K0447 12K0448 12K0449 12K0450 12K0452	2.5V DC/DC Regulator Card 3.3V DC/DC Regulator Card +5V standby/+12V DC/DC regulator card -5V/-12V DC/DC regulator card Power distribution board
152	9076/ Power3 RIO Drawer	11J6495	Power card (2)
152	9112/265	24P6867	Power supply

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
153	7017/S70	07L7178 93H8714 93H7539 93H7542	Device drawer, exp unit pwr sup 1/4 Power Supply (AC) 3/4 Power Supply (AC) 1/4 Power Supply (-48 Vdc) 3/4 Power Supply (-48 Vdc)
153	7017/S7A	08L1336	I/O Drawer Power Supply
153	7017/S80 7017/S85	08L1336	I/O Drawer Power Supply
153	7040/61D	11P3582	Distributed Converter Assembly
153	7040/61R 7040/W42	31L8609 11P1598 12K0981 11P4205 44H2790	Bulk Power Regulator (BPR) Bulk Power Controller (BPC) Bulk Power Distribution (BPD) Bulk Power Enclosure (BPE) Integrated Battery Feature (IBF)
159		6247455	Tablet Puck problem Tablet cursor, Models 21, 22
159		74F3131	Tablet cursor, 4-button, 6093 Models 11, 12
159		74F3132	Tablet cursor, 6-button, 6093 Models 11, 12
165	520 550 570	Control Panel For the latest part numbers, go to the Part Number Catalog.	
165	7017/S70	91H1381 03N3523	Indicator Card Service Processor Card
165	7017/S7A	91H1381 07L9514 03N3523	Indicator Card Drawer Indicator Panel Card Service Processor Card <b>Note:</b> See the location codes in the system unit service guide to determine if the operator panel or the drawer indicator panel is the failing FRU.
165	7017/S80 7017/S85	91H1381 07L9514 11K0301	Indicator Card Drawer Indicator Panel Card Service Processor Card <b>Note:</b> See the location codes in the system unit service guide to determine if the operator panel or the drawer indicator panel is the failing FRU.
165	7024	93H4859 40H5434	Display panel Display cable
165	7025/6F0 7025/6F1	24L1593	Operator panel
165	7025/F30	82G3614 71G6290 93H5911	Display panel Display cable Operator panel control assembly
165	7025/F40	82G3614 93H1816 07L7600	Display panel Display cable Operator panel control assembly
165	7025/F50	06H7082 93H1816 93H2922	Display panel Display cable Operator panel control assembly
165	7025/F80	24L1593	Operator panel

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
165	7026/6H0 7026/6H1 7026/6M1	24L1089	Primary I/O drawer operator panel
165	7026/B80	04N5108 04N6150	Operator panel signal cable Operator panel assembly
165	7026/H10	82G3614 93H1816 93H7439	Display panel Display cable Operator panel control assembly
165	7026/H50	06H7082 93H1816 93H2922	Display panel Display cable Operator panel control assembly
165	7026/H70	06H7082 93H1816 41L6006	Display panel Display cable Operator panel control assembly
165	7026/H80 7026/M80	24L1089	Primary I/O drawer operator panel
165	7028/6C1 7028/6E1	21P6650 21P7166	Operator panel cable Operator panel assembly
165	7028/6C4 7028/6E4	00P3210	Operator Panel
165	7029/6C3 7029/6E3 9114/275	53P6230 97P2342	Operator Panel Operator Panel Cable
165	7038/6M2	97P2908	Operator Panel
165	7040/671 7040/681	24L1089	Operator Panel
165	7043/140 7043/150 7043/240	73H3766	Operator Panel problem Operator panel circuit assembly
165	7043/260 7043/270	97H9328 97H9442 07L7234	Operator panel signal cable Operator panel audio cable Operator panel assembly
165	7044/170	41L6173	Operator Panel
165	7044/270	97H9328 97H9442 07L7234	Operator panel signal cable Operator panel audio cable Operator panel assembly
165	7046/B50	07L9101	Operator panel
165	7317/F3L	82G3614 71G6290 73H0895	Display panel Display cable Operator panel control assembly
165	9076 SMP Thin/Wide Node	11J4000	Supervisor Card
165	9076/ Power3 SMP Thin/Wide Node	11J4000	Supervisor Card
165	9112/265	21P6650 21P7166	Operator panel cable Operator panel assembly

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
166	520 550 570	Fan Assembly or Blower  For the latest part numbers, go to the Part Number Catalog.	
166	7017/S70	21H6959 40H4878	Fan Assembly or Blower problem System rack blower 3-Fan assembly
166	7017/S7A	21H6959 41L6269 93H8868	System rack blower I/O drawer blower DASD Fan Assembly
166	7017/S80 7017/S85	21H6959  41L6269 93H8868	System Rack System rack blower I/O Rack I/O drawer blower DASD Fan Assembly
166	7024	06H2647	Fan
166	7025/6F0 7025/6F1	24L1730	Fan
166	7025/F30	39H9898	Fan
166	7025/F40	40H1424 40H1423 40H1433	Fan 1 and 3 Fan 2 Fan 4
166	7025/F50	40H1424 40H1433 73H3577	Fan 3 Fan 2 and 4 Fan 1 CPU
166	7025/F80	24L1730	Fan
166	7026/6H0 7026/6H1	41L5315 41L5448 03N2829 41L5448	CEC drawer fan CEC drawer fan Cooling unit (filler) I/O drawer fan
166	7026/6M1	04N3345 03N2829 41L5448	CEC drawer fan Cooling unit (filler) I/O drawer fan
166	7026/B80	04N5124 04N5121	Front fans 1 and 2 Rear fans 3 and 4
166	7026/H10	40H4878	3-Fan hot-plug assembly
166	7026/H50	93H8868 41L6269 93H8570	Fan 1, 2, 3, 4 Blower Fan 5, 6 Fan 7 CPU
166	7026/H70	93H8868 41L6269 41L5329 08L0530	Fan 1, 2, 3, 4 Blower Fan 5, 6 Fan 7 CPU I/O Blower 8
166	7026/H80	41L5315 41L5448 03N2829 41L5448	CEC drawer fan CEC drawer fan Cooling unit (filler) I/O drawer fan
166	7026/M80	04N3345 03N2829 41L5448	CEC drawer fan Cooling unit (filler) I/O drawer fan

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
166	7028/6C1 7028/6E1	21P6798 09N7515 21P6811	Processor Fan Blower Assembly Rear Fan Assembly
166	7028/6C4 7028/6E4	09P5865 09P5866	Processor Fan 1 and 2 PCI Fan 3 and 4
166	7029/6C3 7029/6E3 9114/275	53P4612	Fan Assembly
166	7039/651	44P2255	Fan Assembly
166	7040/61R 7040/W42	11P1787	Bulk Power Fan
166	7038/6M2	21P4491 21P4490	Drawer Fan Processor Fan
166	7039/651	44P2255	Fan Assembly
166	7040/61D	11P4624	Fan Assembly
166	7040/671 7040/681	07H5349	Blower
166	7043/140 7043/150	40H7584	Fan Assembly or Blower problem Fan assembly
166	7043/240	93H1820	Fan assembly
166	7043/260 7043/270	74G6361 97H9425	Fan 1, CEC Fan 2, I/O
166	7044/170	41L6172 10L5575 10L5574	Bottom front fan assembly Top front fan Rear fan
166	7044/270	74G6361 97H9425	Fan 1, CEC Fan 2, I/O
166	7046/B50	11H9744	Fan assembly
166	7236 MediaStreamer	94H0620	Fan assembly
166	7311/D10	09P3354	Drawer Fan
166	7311/D11	Drawer Fan For the latest part numbers, go to the Part Number Catalog	
166	9076 SMP Thin/Wide Node	11J6513 11J6514 11J6513	CPU Fan 1 CPU Fan 2 (High Speed) I/O Fan 3 and 4
166	9076/ Power3 SMP Thin/Wide Node	11J6513 11J6514	Fan (Medium Speed) Fan (High Speed)
166	9076/ Power3 SMP High Node	07L8594	Fan assembly
166	9112/265	21P6798 09N7515 53P1990	Processor Fan Blower Assembly Rear Fan Assembly
166	9076/ Power3 RIO Drawer	11J5275	Fan (2)

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
167	520 550 570	Power Supply (Fan)  For the latest part numbers, go to the Part Number Catalog.	
167	7024	93H3504	Power Supply Fan problem Power supply
167	7025	12J5701 40H5428 07L7476 93H9789	Power supply
167	7025/6F0 7025/6F1	24L1400	Power supply
167	7025/F30 7025/F40 7025/F50	12J5701 40H5428 07L7476 93H9789	Power supply
167	7025/F80	24L1400	Power supply
167	7026/H50	93H8868	Power supply
167	7028/6C4 7028/6E4	09P5692	AC Power Supply
167	7029/6C3 7029/6E3 9114/275	53P5617	AC Power Supply
167	7040/61R 7040/W42	11P1787	Bulk Power Fan
167	7043/140 7043/150 7043/240	40H7566 40H7563	PFC Power Supply (Japan Only) Non-PFC Power Supply (All Other Countries)
167	7043/260	97H9337	Power supply
167	7043/270	24L1968	Power Supply
167	7044/170	41L5215	Power Supply
167	7044/270	24L1968	Power Supply
167	7046/B50	24L2659	Power supply
167	9076 SMP Thin/Wide Node	11J6513 11J6514 11J6513	CPU Fan 1 CPU Fan 2 (High Speed) I/O Fan 3 and 4
167	9076/ Power3 SMP Thin/Wide Node	11J6513 11J6514	Fan (Medium Speed) Fan (High Speed)
169			Operator Panel Logic problem <b>Note:</b> If the type/model and FRU information is not listed here, refer to FFC 221.
181	520 550 570	Diskette drive cable  For the latest part numbers, go to the Part Number Catalog.	
181	7024	11H8073	Diskette drive cable problem Cable, diskette drive signal
181	7025/6F0 7025/6F1	24L1771 23L2922	Cable, diskette drive signal Cable, diskette drive power

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
181	7025/F30	11H8162	Cable, diskette drive signal
181	7025/F40 7025/F50	73H1894	Cable, diskette drive signal
181	7025/F80	24L1771 23L2922	Cable, diskette drive signal Cable, diskette drive power
181	7026/H10	73H1894	Cable, diskette drive signal
181	7026/H50	73H1894	Cable, diskette drive signal
181	7026/H70	73H1894	Cable, diskette drive signal
181	7028/6C4 7028/6E4	09P5863 09P5864	Cable, Diskette 34-pin Cable, Diskette Power 4-pin
181	7040/671 7040/681	11P2353	Cable, diskette drive signal
181	7043/140 7043/240	93H1821	Cable, diskette drive signal
181	7043/150	93H1821	Cable, diskette drive signal
181	7043/260 7043/270	97H9320	Cable, diskette drive signal
181	7044/170	24L2668	Cable, diskette drive signal
181	7044/270	97H9320	Cable, diskette drive signal
181	7046/B50	76H4091 24L2668	Diskette drive Cable, diskette drive
181	7317/F3L	73H4937	Cable, diskette drive
185		71G6458	X.25 Interface Co-Processor Adapter
186		33F8967 84F7540 53F2662	Co-Processor Multiport Adapter, Model 2 Daughter Card 1 MB Memory Module
188		6247454	Tablet stylus, Models 21, 22
188		74F3133	Tablet stylus, 6093 Models 11, 12
190	520 550 570		Internal Disk Signal Cable For the latest part numbers, go to the Part Number Catalog.
190	7017/S70	93H2455 93H2456 07L7005 93H2485 52G4291  06H6036  52G4233  73H3142	Internal Disk Signal Cable problem SCSI Cable Media Bay to SCSI slot 2 I35 SCSI Cable, slot 9 to Redrive Card I35 SCSI Cable, slot 9 to Redrive Card SCSI Cable, I35 SCSI Card to Card SCSI Cable, SCSI-2 to SE/SE SCSI Redrive Card (0.6 m) SCSI Cable, SCSI-2 to SE/SE SCSI Redrive Card (1.0 m) SCSI Cable, SCSI-2 to SE/SE SCSI Redrive Card (2.5 m) SCSI Cable, SCSI-2 to Bulkhead <b>Note:</b> Consult the 7017/S70 Service Guide before ordering replacement cables.

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
190	7017/S7A	93H2455 06H6876	SCSI Cable Media Bay to SCSI Adapter SCSI Card to Backplane <b>Note:</b> Consult the 7017/S7A Service Guide before ordering replacement cables.
190	7017/S80 7017/S85	93H2455 06H6876	SCSI Cable Media Bay to SCSI Adapter SCSI Card to Backplane <b>Note:</b> Consult the 7017/S80 or 7017/S85 Service Guide before ordering replacement cables.
190	7024	12H1169	Cable, Internal SCSI, 4-drop
190	7025/6F0 7025/6F1	04N4265 00P2358 04N2273 04N4555 04N5589	Internal SCSI cable, 4-drop SCSI cable, short (8 inches) SCSI cable, long (44 inches) SCSI two-pack backplane SCSI six-pack backplane
190	7025/F30	73H3596	Cable, Internal SCSI, 4-drop
190	7025/F40	93H3490	Cable, Internal SCSI, 4-drop
190	7025/F50	73H3596	Cable, Internal SCSI, 4-drop
190	7025/F80	04N4265 00P2358 04N2273 04N4555 04N5589	Internal SCSI cable, 4-drop SCSI cable, short (8 inches) SCSI cable, long (44 inches) SCSI two-pack backplane SCSI six-pack backplane
190	7026/6H0 7026/6H1 7026/6M1	41L5519	I/O drawer internal SCSI cable
190	7026/B80	21P3951	Cable, internal SCSI
190	7026/H10	73H3596	Cable, Internal SCSI, 4-drop
190	7026/H50	93H9613 52G4291 52G4233 06H6876	Cable, Internal SCSI, 4-drop Cable, SCSI-2 Cable, SCSI Cable, SCSI
190	7026/H80 7026/M80	41L5519	I/O drawer internal SCSI cable
190	7026/H70	93H9613 52G4291 52G4233	Cable, Internal SCSI, 4-drop Cable, SCSI-2 Cable, SCSI
190	7028/6C1 7028/6E1	21P6655	Cable, internal SCSI
190	7028/6C4 7028/6E4	09P5889 09P5895 09P5888	Cable, SCSI 68-pin Cable, SCSI 50-pin Cable, DASD Power 5-pin
190	7038/6M2	21P5205	SCSI Cable, media/DASD
190	7039/651	44P3988	Processor Subsystem Chassis (with Backplane and DASD Ribbon Cable)
190	7040/671 7040/681	11P2349  11P2350	SCSI Cable for Media Subsystem Rear Component SCSI Cable for Media Subsystem Front Component



Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
190	7043/140 7043/150	73H0435	Internal Disk Signal Cable problem Cable, Internal SCSI, 4-drop
190	7043/240	40H7572	Cable, Internal SCSI, 4-drop
190	7043/240	93H6151	Ultra SCSI Cable assembly (optional)
190	7043/260 7043/270	97H9322 01K6497	Cable, Internal SCSI, 4-drop Cable, Internal SCSI Pigtail
190	7044/170	41L6178	Cable, Internal SCSI, 7-drop
190	7044/270	97H9322 01K6497	Cable, Internal SCSI, 4-drop Cable, Internal SCSI Pigtail
190	7046/B50	24L2667	Cable, internal SCSI
190	7236 MediaStreamer	93H6435 93H6629	SCSI Cable SCSI ID Cable
190	7317/F3L	93H8972	Cable, Internal SCSI, 3-drop
190	9076 SMP Thin/Wide Node	08J6105 11J5177 08J6111	Cable, Internal SCSI, 2-drop Cable, Internal SCSI, 4-drop Alternate DASD Cabling
190	9076/ Power3 SMP Thin/Wide Node	08J6105 11J5177 08J6111	Cable, Internal SCSI, 2-drop Cable, Internal SCSI, 4-drop Alternate DASD cabling
190	9076/ Power3 SMP High Node	08L1353 41L6350 41L5044 03N3667	Docking card, processor Docking card, I/O Cable, SCSI to docking card Cable, DASD
190	9076/ Power3 RIO Drawer	05N4972 11J5276	DASD docking card Cable, SCSI
190	9112/265	21P6655	Cable, internal SCSI
190	2104	09L3111 09L3307 09L3305 09L3303 09L3301 09L3299 09L3309	JBOD card 20 m cable, adapter to JBOD 10 m cable, adapter to JBOD 5 m cable, adapter to JBOD 3 m cable, adapter to JBOD 1 m cable, adapter to JBOD 3 m non-LVD cable, adapter to JBOD
192	7203	00G2960	Power Supply, portable disk drive
199	520 550 570	SCSI Enclosure Service (SES)  For the latest part numbers, go to the Part Number Catalog.	
199			SCSI Enclosure Service (SES) <b>Note:</b> If the system or enclosure type does not appear in the list below, refer to it's service guide.
199	7025/6F0 7025/6F1 7025/F80	04N5589	SCSI six-pack backplane
199	7029/6C3 7029/6E3 9114/275	00P5684	Disk Drive Backplane

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
199	7040/61D	11P2395	DASD 4-Pack Cage Assembly
199	9076/ Power3 RIO Drawer	12K0503	DASD Controller
199	2104	09L3111	JBOD card
201			<b>Note:</b> Content moved to FFC 190.
203			<b>Note:</b> Content moved to FFC 152.
210	520 550 570		Fixed point processor problem For the latest part numbers, go to the Part Number Catalog.
210	7017/S70	90H9694 90H9662	Fixed Point Processor problem Processor Card (4x) (Type 2) (120 MHz) Processor Card (4x) (Type 1) (120 MHz)
210	7017/S7A	08L1474 08L1473	Processor Card (Type 2) (262 MHz) Processor Card (Type 1) (262 MHz)
210	7017/S80	23L7434 23L7447	Processor Card (Type 1 RH) Processor Card (Type 2 LH)
210	7017/S85	21P4511 21P4517	Processor Card (Type 1 RH) Processor Card (Type 2 LH)
210	7024/E20	40H6616 03N3989	CPU card (100 MHz) CPU card (233 MHz)
210	7024/E30	73H3614 93H2431 03N3989	CPU card (133 MHz) CPU card (166 MHz) CPU card (233 MHz)
210	7025/6F0	04N5353 09P6524 23L7785 09P6525 23L7794 53P1301	1-way processor card (600 MHz) 1-way processor card (750 MHz) 2-way processor card (600 MHz) 2-way processor card (750 MHz) 4-way processor card (600 MHz) 4-way processor card (750 MHz)
210	7025/6F1	04N5353 09P6524 23L7785 09P6525 23L7794 53P1301 23L7799 53P1334	1-way processor card (600 MHz) 1-way processor card (750 MHz) 2-way processor card (600 MHz) 2-way processor card (750 MHz) 4-way processor card (600 MHz) 4-way processor card (750 MHz) 6-way processor card (668 MHz) 6-way processor card (750 MHz)
210	7025/F30	73H3614 93H2431 03N3989	CPU card (133 MHz) CPU card (166 MHz) CPU card (233 MHz)
210	7025/F40	11H7517 41L6111	CPU card (166 MHz) CPU card (233 MHz)
210	7025/F50	93H2679 73H4768 93H9018 93H8945	166 MHz CPU card (1-way) 166 MHz CPU card (2-way) 332 MHz CPU card (1-way) 332 MHz CPU card (2-way)

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
210	7025/F80	04N4765 21P4751 21P4760 21P4774	1-way processor card (450 MHz) 2-way processor card (450 MHz) 4-way processor card (450 MHz) 6-way processor card (500 MHz)
210	7026/6H0	04N5353 09P6524 23L7785 09P6525 23L7794 53P1301	1-way processor card (600 MHz) 1-way processor card (750 MHz) 2-way processor card (600 MHz) 2-way processor card (750 MHz) 4-way processor card (600 MHz) 4-way processor card (750 MHz)
210	7026/6H1	04N5353 09P6524 23L7785 09P6525 23L7794 53P1301 23L7799 53P1334	1-way processor card (600 MHz) 1-way processor card (750 MHz) 2-way processor card (600 MHz) 2-way processor card (750 MHz) 4-way processor card (600 MHz) 4-way processor card (750 MHz) 6-way processor card (668 MHz) 6-way processor card (750 MHz)
210	7026/6M1	04N6698 21P6381 21P6383	2-way processor card (500 MHz) 2-way processor card (750 MHz) 4-way processor card (750 MHz)
210	7026/B80	09P0399 09P0143  09P0406  09P4478	Processor card (375 MHz, one-way) Processor card (375 MHz, two-way, 8 M L2)  Processor card (375 MHz, two-way, 4 M L2)  Processor Card (450 MHz, two-way)
210	7026/H10 7026/H10	11H7517	CPU card (166 MHz)
210	7026/H50	93H9018 93H8945	CPU card (332 MHz one-way) CPU card (332 MHz two-way)
210	7026/H70	94H1013 94H1008	Fixed Point Processor problem CPU card (332 MHz one-way) CPU card (332 MHz two-way)
210	7026/H80	04N4765 21P4751 21P4760 21P4774	1-way processor card (450 MHz) 2-way processor card (450 MHz) 4-way processor card (450 MHz) 6-way processor card (500 MHz)
210	7026/M80	04N6930 04N6931	2-way processor card 4-way processor card
210	7028/6C1 7028/6E1	09P5495 09P3666 09P3669	333 MHz Processor card 375 MHz Processor card 450 MHz Processor Card
210	7028/6C4 7028/6E4	00P2974 00P2977 00P2728 00P2731 00P2733 00P2736	Processor Card, 1.0 GHz 1-way Processor Card, 1.0 GHz 2-way Processor Card, 1.2 GHz 1-way Processor Card, 1.2 GHz 2-way Processor Card, 1.45 GHz 1-way Processor Card, 1.45 GHz 2-way

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
210	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 80P4966 80P4970	1.2 GHz Processor (1-way) 1.2 GHz Processor (2-way) 1.45 GHz Processor (1-way) 1.45 GHz Processor (2-way)
210	7038/6M2	53P4953	4-way Processor Board
210	7039/651	44P3706 44P3705 60G7598 60G7592	1.1 GHz 8-way MCM with VPD Card 1.3 GHz 4-way MCM with VPD Card 1.5 GHz 8-way MCM with VPD Card 1.7 GHz 4-way MCM with VPD Card
210	7040/671	03N3229 09P3217	1.1 GHz 4-way MCM with VPD Card 1.1 GHz 8-way MCM with VPD Card
210	7040/681	00p5153 00p4629 03N3223 03N3228 03N3229 09P3217	1.7 GHz 8-way MCM (GQ) 1.5 GHz 8-way MCM (GQ) 1.3 GHz 4-way MCM with VPD Card 1.3 GHz 8-way MCM with VPD Card 1.1 GHz 4-way MCM with VPD Card 1.1 GHz 8-way MCM with VPD Card
210	7043/140	93H7142 93H7143 93H6023 93H9334	166 MHz System board 200 MHz System board 233 MHz System board 332 MHz System board
210	7043/150	41L5912	375 MHz System board
210	7043/240	11H7517 41L6111	166 MHz Processor and Cache Card 233 MHz Processor and Cache Card
210	7043/260	03N2403	200 MHz CPU card
210	7043/270	11K0171 11K0218	CPU card (375 MHz one-way) CPU card (375 MHz two-way)
210	7044/170	09P0277 09P0272 09P0943	Processor card (333 MHz) Processor card (400 MHz) Processor card (450 MHz)
210	7044/270	11K0171 11K0218 09P4478	CPU card (375 MHz one-way) CPU card (375 MHz two-way) CPU card (450 MHz two-way)
210	7046/B50	41L5912	375 MHz System board
210	7317/F3L	73H3614 93H2431 03N3989	CPU card (133 MHz) CPU card (166 MHz) CPU card (233 MHz)
210	9076 SMP Thin/Wide Node	93H9716	CPU card (332 MHz)
210	9076/ Power3 SMP Thin/Wide Node	03N2403 11K0232	CPU card (200 MHz) CPU card (375 MHz)
210	9076/ Power3 SMP High Node	11K0198	CPU card
210	9112/265	09P5856	450 MHz Processor Card
212			Cache problem <b>Note:</b> For type/model and FRU information refer to FFC 210.

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
214	520 550 570		Memory Control Unit problem  For the latest part numbers, go to the Part Number Catalog.
214	7017/S70 7017/S7A	97H7696	Memory Control Unit problem System backplane assembly
214	7017/S80 7017/S85	23L7598	System backplane assembly
214	7024/E20	40H6616 03N3989	CPU card (100 MHz) CPU card (233 MHz)
214	7024/E30	73H3614 93H2431 03N3989	CPU card (133 MHz) CPU card (166 MHz) CPU card (233 MHz)
214	7025/6F0	04N5353 09P6524 23L7785 09P6525 23L7794 53P1301	1-way processor card (600 MHz) 1-way processor card (750 MHz) 2-way processor card (600 MHz) 2-way processor card (750 MHz) 4-way processor card (600 MHz) 4-way processor card (750 MHz)
214	7025/6F1	04N5353 09P6524 23L7785 09P6525 23L7794 53P1301 23L7799 53P1334	1-way processor card (600 MHz) 1-way processor card (750 MHz) 2-way processor card (600 MHz) 2-way processor card (750 MHz) 4-way processor card (600 MHz) 4-way processor card (750 MHz) 6-way processor card (668 MHz) 6-way processor card (750 MHz)
214	7025/F30	73H3614 93H2431 03N3989	CPU card (133 MHz) CPU card (166 MHz) CPU card (233 MHz)
214	7025/F40	11H7517 93H5163	CPU card (166 MHz) CPU card (233 MHz)
214	7025/F50	07L9718	System board
214	7025/F80	04N4765 21P4751 21P4760 21P4774	1-way processor card (450 MHz) 2-way processor card (450 MHz) 4-way processor card (450 MHz) 6-way processor card (500 MHz)
214	7026/6H0	04N5353 09P6524 23L7785 09P6525 23L7794 53P1301	1-way processor card (600 MHz) 1-way processor card (750 MHz) 2-way processor card (600 MHz) 2-way processor card (750 MHz) 4-way processor card (600 MHz) 4-way processor card (750 MHz)
214	7026/6H1	04N5353 09P6524 23L7785 09P6525 23L7794 53P1301 23L7799 53P1334	1-way processor card (600 MHz) 1-way processor card (750 MHz) 2-way processor card (600 MHz) 2-way processor card (750 MHz) 4-way processor card (600 MHz) 4-way processor card (750 MHz) 6-way processor card (668 MHz) 6-way processor card (750 MHz)

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
214	7026/6M1	04N3524	CEC drawer backplane
214	7026/B80	08L0988	System board
214	7026/H10	11H7517	CPU card (166 MHz)
214	7026/H50	07L9718	System board
214	7026/H70	08L0988	System board
214	7026/H80	04N4765 21P4751 21P4760 21P4774	1-way processor card (450 MHz) 2-way processor card (450 MHz) 4-way processor card (450 MHz) 6-way processor card (500 MHz)
214	7026/M80	04N3023	CEC drawer backplane
214	7028/6C1 7028/6E1	09P2420	System board
214	7028/6C4 7028/6E4	00P2974 00P2977 00P2728 00P2731 00P2733 00P2736	Processor Card, 1.0 GHz 1-way Processor Card, 1.0 GHz 2-way Processor Card, 1.2 GHz 1-way Processor Card, 1.2 GHz 2-way Processor Card, 1.45 GHz 1-way Processor Card, 1.45 GHz 2-way
214	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)
214	7038/6M2	09P3876	System Backplane Assembly
214	7039/651	44P3988	Processor Subsystem Chassis (with Backplane and DASD Ribbon Cable)
214	7040/671 7040/681	11P3046	System Backplane
214	7043/140	93H7142 93H7143 93H6023 93H9334	166 MHz System board 200 MHz System board 233 MHz System board 332 MHz System board
214	7043/150	41L5912	375 MHz System board
214	7043/240	11H7517 41L6111	166 MHz Processor and Cache Card 233 MHz Processor and Cache Card
214	7043/260	08L1303	Memory Control Unit Problem System board
214	7043/270	08L0988	System board
214	7044/170	41L572 09P0037	System board, class A System board, class B
214	7044/270	08L0988	System board
214	7046/B50	41L5912	375 MHz System board
214	7317/F3L	73H3614 93H2431 03N3989	Memory Control Unit problem CPU card (133 MHz) CPU card (166 MHz) CPU card (233 MHz)

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
214	9076 SMP Thin/Wide Node	07L9718 41L6138 93H3316	CPU chassis system board CPU chassis I/O planar I/O chassis connection card
214	9076/ Power3 SMP Thin/Wide Node	08L1303 08L0988 03N2866 03N3368 07L8531	CPU chassis, system board (200 MHz) CPU chassis, system board (375 MHz) CPU chassis, I/O planar (200 MHz) CPU chassis, I/O planar (375 MHz) I/O expansion card
214	9076/ Power3 SMP High Node	03N4184	System Planar
214	9112/265	09P2420	System board
217	520 550 570	System ROS/EEPROM problem For the latest part numbers, go to the Part Number Catalog.	
217	7024/E20	40H6616 03N3989	System ROS/EEPROM problem CPU card (100 MHz) CPU card (233 MHz)
217	7024/E30	73H3614 93H2431 03N3989	CPU card (133 MHz) CPU card (166 MHz) CPU card (233 MHz)
217	7025/6F0 7025/6F1	43L5269	System board
217	7025/F30	73H3614 93H2431 03N3989	CPU card (133 MHz) CPU card (166 MHz) CPU card (233 MHz)
217	7025/F40	11H7517 93H5163	CPU card (166 MHz) CPU card (233 MHz)
217	7025/F50	41L5106	I/O board
217	7025/F80	43L5269	System board
217	7026/B80	00P1859	I/O board
217	7026/H10	11H7517	CPU card (166 MHz)
217	7026/H50	41L5106	I/O board
217	7026/H70	08L0617	I/O board
217	7028/6C1 7028/6E1	09P2420	System Board
217	7028/6C4 7028/6E4	00P4488 00P5830	System Board (with RIO capability) System Board (with RIO-2 capability)
217	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)
217	7043/140	93H7142 93H7143 93H6023 93H9334	System ROS/EEPROM problem 166 MHz System board 200 MHz System board 233 MHz System board 332 MHz System board
217	7043/150	41L5912	375 MHz System board

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
217	7043/240	11H7517 41L6111	166 MHz Processor and Cache Card 233 MHz Processor and Cache Card
217	7043/260	41L5511	I/O board
217	7043/270	41L6013	I/O board
217	7044/170	41L5721 09P0037	System board, class A System board, class B
217	7044/270	41L6013	I/O board
217	7046/B50	41L5912	375 MHz System board
217	7317/F3L	73H3614 93H2431 03N3989	CPU card (133 MHz) CPU card (166 MHz) CPU card (233 MHz)
217	9076 SMP Thin/Wide Node	41L6138	I/O planar
217	9076/ Power3 SMP Thin/Wide Node	03N2866 03N3368	I/O planar (200 MHz) I/O planar (375 MHz)
217	9112/265	09P2420	System Board
219			Common Memory Logic problem. Refer to Part Number Catalog <b>Note:</b> If more than a pair of memory modules from the same memory card are reported missing, replace the FRU that the memory modules plug into first. Otherwise, replace the memory module at the physical location code that is reported.
221	520 550 570		System I/O Control Logic problem For the latest part numbers, go to the Part Number Catalog.
	7017/S70	94H1268	System I/O Control Logic problem I/O planar
221	7017/S7A	08L0103	I/O planar
221	7017/S80 7017/S85	08L1438	I/O planar
221	7024	93H4808	System board
221	7025/6F0 7025/6F1	43L5269	System board
221	7025/F30	93H8371	System board
221	7025/F40	93H8652	System board
221	7025/F50	41L5106	I/O board
221	7025/F80	43L5269	System board
221	7026/6H0 7026/6H1 7026/6M1	41L5560 41L5661	Primary I/O drawer backplane Secondary I/O drawer backplane
221	7026/B80	00P1859	I/O board
221	7026/H10	93H8652	System board
221	7026/H50	41L5106	I/O board



Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
221	7026/H70	03N2797	I/O board
221	7026/H80 7026/M80	41L5560 41L5661	Primary I/O drawer backplane Secondary I/O drawer backplane
221	7028/6C1 7028/6E1	09P2420	System Board
221	7028/6C4 7028/6E4	00P3166 00P4488 00P5830 00P5290 00P4483	CEC Backplane (GP processor) CEC Backplane (GQ processor) CEC Backplane (RIO-G capability) PCI Riser Card (6 slot) PCI Riser Card (4 slot)
221	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)
221	7038/6M2	00P4062 00P5604	Service Processor/PCI Adapter Backplane Service Processor/PCI Adapter Backplane (RIO-2 capability)
221	7039/651	44P3988	Processor Subsystem Chassis (with Backplane and DASD Ribbon Cable)
221	7040/61D	44P0199	I/O Planar
221	7043/140	93H7142 93H7143 93H6023 93H9334	System I/O control logic problem 166 MHz System board 200 MHz System board 233 MHz System board 332 MHz System board
221	7043/150	41L5912	375 MHz System board
221	7043/240	11H7516	System board
221	7043/260	41L5511	I/O board
221	7043/270	41L6013	I/O board
221	7044/170	41L5721 09P0037	System board, class A System board, class B
221	7044/270	41L6013	I/O board
221	7046/B50	41L5912	375 MHz System board
221	7311/D10	09P5921	I/O Drawer Backplane
221	7311/D20	53P3472	PCI Planar
221	7317/F3L	93H8371	System board
221	9076 SMP Thin/Wide Node	41L6138	I/O planar
221	9076/ Power3 SMP Thin/Wide Node	03N2866 03N3368	I/O planar (200 MHz) I/O planar (375 MHz)
221	9076/ Power3 SMP High Node	11K0571	NIO planar
221	9076/ Power3 RIO Drawer	05N5005	RIO planar (expansion unit)
221	9112/265	09P2420	System Board

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
226			System Status Logic problem <b>Note:</b> If the type/model and FRU information is not listed here, refer to FFC 221.
227	520 550 570	ISA/PCI Bus Logic problem  For the latest part numbers, go to the Part Number Catalog.	
227	7017/S70	94H1268 93H8502	ISA/PCI Bus Logic problem I/O board Indicator Panel card
227	7017/S7A	08L0103	I/O planar
227	7017/S80 7017/S85	08L1438	I/O planar
227	7024	93H4808	System board
227	7025/6F0 7025/6F1	43L5269	System board
227	7025/F30	93H8371	System board
227	7025/F40	93H8652	System board
227	7025/F50	41L5106	I/O board
227	7025/F80	43L5269	System board
227	7026/6H0 7026/6H1 7026/6M1	41L5660 41L5661	Primary I/O drawer backplane Secondary I/O drawer backplane
227	7026/B80	00P1859	I/O board
227	7026/H10	93H8652	System board
227	7026/H50	41L5106	I/O board
227	7026/H70	08L0617	I/O board
227	7026/H80 7026/M80	41L5660 41L5661	Primary I/O drawer backplane Secondary I/O drawer backplane
227	7028/6C1 7028/6E1	09P2420	System Board
227	7028/6C4 7028/6E4	00P4488 00P5830	System Board (with RIO capability) System Board (with RIO-2 capability)
227	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)
227	7038/6M2	00P4062 00P5604	Service Processor/PCI Adapter Backplane Service Processor/PCI Adapter Backplane (RIO-2 capability)
227	7039/651	00P4603	System Backplane
227	7040/61D	44P0199	I/O Planar
227	7043/140	93H7142 93H7143 93H6023 93H9334	166 MHz System board 200 MHz System board 233 MHz System board 332 MHz System board
227	7043/150	07L8446	375 MHz System board

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
227	7043/240	11H7516	System board
227	7043/260	08L0633	I/O board
227	7043/270	41L6013	I/O board
227	7044/170	41L5721 09P0037	System board, class A System board, class B
227	7044/270	41L6013	I/O board
227	7046/B50	41L5912	375 MHz System board
227	7311/D10	09P5921	I/O Drawer Backplane
227	7311/D20	53P3472	PCI Planar
227	7317/F3L	93H8371	System board
227	9076 SMP Thin/Wide Node	41L6138	I/O planar
227	9076/ Power3 SMP Thin/Wide Node	03N2866 03N3368	I/O planar (200 MHz) I/O planar (375 MHz)
227	9076/ Power3 SMP High Node	11K0571	NIO Planar
227	9076/ Power3 RIO Drawer	05N5005	RIO Planar (expansion unit)
227	9112/265	09P2420	System Board
240			Token-ring network problem
241			Ethernet network problem
251		8529214 8185219	Cables, parallel printer
252		40H6328	Standard 9-pin to 25-pin converter cable
253			Cable, Multiprotocol, EIA-422A, (customer-provided)
254		71F0165	Cable, 4-Port Multiprotocol EIA-232, V.24
256		6339098	Cable, token-ring, 10 ft. (3.04 m)
257		71F0162	Cable, 4-Port Multiprotocol, V.35
258		40F9897	4-Port Multiprotocol cable
259		6323741	Cable, async EIA-232D, V.24
260		71F0164	Cable, 4-Port Multiprotocol, X.21
261		1749352	RS/232 Interposer
262		00F5524	8-Port Multiport Interface Cable
263		12H1204	Terminal cable, EIA-232
266		59F3432	RJ-45 to DB-25 Converter Cable
267		81F8570	Cable assembly, 4-port Multiprotocol jumper
271		07F3151 53F3926	Cable, X.25 attachment cable, X.21 (3 m) Cable, X.25 attachment cable, X.21 (6 m)
272		07F3160 53F3927	Cable, X.25 attachment cable, V.24 (3 m) Cable, X.25 attachment cable, V.24 (6 m)

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
273		07F3171 53F3928	Cable, X.25 attachment cable, V.35 (3 m) Cable, X.25 attachment cable, V.35 (6 m)
276		31F4221	Cable, SCSI controller cable
277	520 550 570		Internal SCSI Signal Cable problem For the latest part numbers, go to the Part Number Catalog.
277	7017/S70	93H2455 07L7005 93H2485 52G4291  06H6036  52G4233  73H3142	Internal SCSI Signal Cable problem SCSI Cable Media Bay to SCSI slot 2 I35 SCSI Cable, slot 9 to Redrive Card SCSI Cable, I35 SCSI Card to Card SCSI Cable, SCSI-2 to SE/SE SCSI Redrive Card (0.6 m) SCSI Cable, SCSI-2 to SE/SE SCSI Redrive Card (1.0 m) SCSI Cable, SCSI-2 to SE/SE SCSI Redrive Card (2.5 m) SCSI Cable, SCSI-2 to Bulkhead <b>Note:</b> Consult the 7017/S70 Service Guide before ordering replacement cables.
277	7017/S7A	93H2455 06H6876	SCSI Cable Media Bay to SCSI Adapter SCSI Card to Backplane <b>Note:</b> Consult the 7017/S7A Service Guide before ordering replacement cables.
277	7017/S80 7017/S85	93H2455 06H6876	SCSI Cable Media Bay to SCSI Adapter SCSI Card to Backplane <b>Note:</b> Consult the 7017/S80 or 7017/S85 Service Guide before ordering replacement cables.
277	7024	12H1169	Cable, Internal SCSI, 7-drop
277	7025/6F0 7025/6F1	04N4265	Internal SCSI cable
277	7025/F30	73H3596	Cable, Internal SCSI, 7-drop
277	7025/F40	93H3490	Cable, Internal SCSI, 7-drop
277	7025/F50	73H3596	Cable, Internal SCSI, 7-drop
277	7025/F80	04N4265	Internal SCSI cable
277	7026/6H0 7026/6H1	41L5519	I/O drawer internal SCSI cable
277	7026/6M1	31F4223	I/O drawer internal SCSI cable
277	7026/B80	21P3951	Cable, internal SCSI
277	7026/H10	73H3596	Cable, Internal SCSI, 7-drop
277	7026/H50	93H9613 52G4291 52G4233 06H6876	Cable, Internal SCSI, 4-drop Cable, SCSI-2 Cable, SCSI Cable, SCSI
277	7026/H70	93H9613 52G4291 52G4233 06H6876	Internal SCSI Signal Cable problem Cable, Internal SCSI, 4-drop Cable, SCSI-2 Cable, SCSI Cable, SCSI
277	7026/H80	41L5519	I/O drawer internal SCSI cable

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
277	7026/M80	31F4223	I/O drawer internal SCSI cable
277	7028/6C1 7028/6E1	21P6655	SCSI Cable
277	7028/6C4 7028/6E4	09P5889 09P5895 09P5888 09P5869 09P2808	Cable, SCSI 68-pin Cable, SCSI 50-pin Cable, DASD Power 5-pin Cable, External SCSI 68-pin Cable, Internal SCSI Port (SCSI Cable Media Bay to SCSI Adapter)
277	7029/6C3 7029/6E3 9114/275	00P5684	Disk Drive Backplane
277	7038/6M2	09P3876	System Backplane Assembly
277	7039/651	44P2165	SCSI cable, media/DASD
277	7040/61D	11P2349  11P2350	SCSI Cable for Media Subsystems Front Component SCSI Cable for Media Subsystems Rear Component
277	7043/140 7043/150	73H0435	Cable, Internal SCSI, 4-drop
277	7043/240	40H7572	Cable, Internal SCSI, 4-drop
277	7043/240	93H6151	Ultra SCSI Cable assembly (optional)
277	7043/260 7043/270	97H9322 01K6497	Cable, Internal SCSI, 4-drop Cable, Internal SCSI Pigtail
277	7044/170	41L6178	Cable, Internal SCSI, 7-drop
277	7044/270	97H9322 01K6497	Cable, Internal SCSI, 4-drop Cable, Internal SCSI Pigtail
277	7046/B50	24L2667	Cable, internal SCSI
277	7236 MediaStreamer	93H6435 93H6629	SCSI Cable SCSI ID Cable
277	7317/F3L	93H8972	Cable Internal SCSI, 3-drop
277			Generic SCSI Cable (external) <b>Note:</b> For FRU part number refer to the system unit's service guide. If the cable is after market refer to it's service documentation.
277	9076 SMP Thin/Wide Node	08J6105 11J5177 08J6111	Cable, Internal SCSI, 2-drop Cable, Internal SCSI, 4-drop Alternate DASD Cabling
277	9076/ Power3 SMP Thin/Wide Node	08J6105 11J5177 08J6111	Cable, Internal SCSI, 2-drop Cable, Internal SCSI, 4-drop Alternate DASD Cabling
277	9112/265	21P6655	SCSI Cable
279			PTC resistor has been tripped <b>Note:</b> Refer to SCSI-2 Single-Ended Adapter PTC Failure Isolation Procedure.

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
282	520 550 570	System Backplane Assembly For the latest part numbers, go to the Part Number Catalog.	
282	7017/S70	97H7696	System Backplane Assembly
282	7017/S7A	97H7696	System Backplane Assembly
282	7017/S80 7017/S85	23L7598	System Backplane Assembly
282	7025/6F0 7025/6F1 7025/F80	04N4555	SCSI backplane
282	7026/6H0 7026/6H1 7026/H80	43L5274	CEC drawer backplane
282	7026/M80	04N3023	CEC drawer backplane
282	7026/6M1	04N3524	CEC drawer backplane
282	7028/6C4 7028/6E4	00P3166 00P4488 00P5830	CEC Backplane (GP processor) CEC Backplane (GQ processor) CEC Backplane (RIO-G capability)
282	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)
282	7038/6M2	00P3876	System Backplane
282	7039/651	00P4603	System Backplane
282	7040/671 7040/681	11P3046	System Backplane
287	520 550 570	I/O Drawer power supply For the latest part numbers, go to the Part Number Catalog.	
287	7017/S70	93H8714	I/O Drawer 3/4 Power Supply
287	7017/S7A	08L1336	I/O Drawer power supply
287	7017/S80 7017/S85	08L1336	I/O Drawer power supply
287	7026/6H0 7026/6H1 7026/6M1 7026/H80 7026/M80	11K0812	I/O drawer power supply
287	7029/6C3 7029/6E3 9114/275	53P5617	AC Power Supply
287	7040/61D	11P3582	I/O Drawer DCA
287	7311/D10	09P3354	AC Power Supply
287	7311/D20	53P4832	Power Supply
287	9076/ Power3 RIO Drawer	12K0446 31L8752	Power Supply Supervisor Card

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
289	520 550 570	I/O Drawer Power Supply For the latest part numbers, go to the Part Number Catalog.	
289	7017/S70	07L7178	I/O Drawer 1/4 Power Supply
289	7017/S7A	08L1336	I/O Drawer Power supply
289	7017/S80 7017/S85	08L1336	I/O Drawer Power supply
289	7026/6H0 7026/6H1 7026/6M1 7026/H80 7026/M80	11K0812	I/O drawer power supply
289	7029/6C3 7029/6E3 9114/275	53P5617	AC Power Supply
289	7040/61D	11P3582	I/O Drawer DCA
289	7311/D10	09P3354	AC Power Supply
289	7311/D20	53P4832	Power Supply
289	9076/ Power3 RIO Drawer	12K0446 31L8752	Power Card Supervisor Card
292	520 550 570	Host - PCI Bridge problem For the latest part numbers, go to the Part Number Catalog.	
292	7017/S70	94H1268	Host - PCI Bridge problem I/O planar
292	7017/S7A	08L0103	I/O planar
292	7017/S80 7017/S85	08L1438	I/O planar
292	7024/E20	40H6616 03N3989	CPU card (100 MHz) CPU card (233 MHz)
292	7024/E30	73H3614 93H2431 03N3989	CPU card (133 MHz) CPU card (166 MHz) CPU card (233 MHz)
292	7025/6F0 7025/6F1	43L5269	System board
292	7025/F30	73H3614 93H2431 03N3989	CPU card (133 MHz) CPU card (166 MHz) CPU card (233 MHz)
292	7025/F40	11H7517 41L6111	CPU card (166 MHz) CPU card (233 MHz)
292	7025/F50	41L5106	I/O board
292	7025/F80	43L5269	System board
292	7026/6H0 7026/6H1 7026/6M1	04N6228	RIO adapter
292	7026/B80	00P1859	I/O board

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
292	7026/H10	11H7517	CPU card (166 MHz)
292	7026/H50	41L5106	I/O board
292	7026/H70	08L0617	Host - PCI Bridge problem I/O planar
292	7026/H80	04N6228	RIO adapter
292	7026/M80	04N3687	CEC RIO adapter
292	7028/6C4 7028/6E4	00P3166 00P4488 00P5830	CEC Backplane (GP processor) CEC Backplane (GQ processor) CEC Backplane (RIO-G capability)
292	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)
292	7038/6M2	00P4062 00P5604	Service Processor/PCI Adapter Backplane Service Processor/PCI Adapter Backplane (RIO-2 capability)
292	7039/651	00P4603	System Backplane
292	7040/61D	44P0199	!/O Planar
292	7028/6C1 7028/6E1	09P2420	System Board
292	7043/140	93H7142 93H7143 93H6023 93H9334	166 MHz System board 200 MHz System board 233 MHz System board 332 MHz System board
292	7043/150	41L5912	375 MHz System board
292	7043/240	11H7517 41L6111	166 MHz Processor and Cache Card 233 MHz Processor and Cache Card
292	7043/260	41L5511	I/O board
292	7043/270	41L6013	I/O board
292	7044/170	41L5721 09P0037	System board, class A System board, class B
292	7044/270	41L6013	I/O board
292	7046/B50	41L5912	375 MHz System board
292	7311/D10	09P5912	I/O Drawer Backplane
292	7311/D20	53P3472	PCI Planar
292	7317/F3L	73H3614 93H2431 03N3989	CPU card (133 MHz) CPU card (166 MHz) CPU card (233 MHz)
292	9076 SMP Thin/Wide Node	07L9718 41L6138 93H3316	CPU chassis system board CPU chassis I/O planar I/O chassis connection card
292	9076/ Power3 SMP Thin/Wide Node	08L1303 08L0988 03N2866 03N3368	CPU chassis, system board (200 MHz) CPU chassis, system board (375 MHz) CPU chassis, I/O planar (200 MHz) CPU chassis, I/O planar (375 MHz)
292	9112/265	09P2420	System Board



Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
293			PCI - PCI Bridge problem <b>Note:</b> If the type/model and FRU information is not listed here, refer to FFC 221.
294			MPIC Interrupt Controller problem <b>Note:</b> If the type/model and FRU information is not listed here, refer to FFC 221.
295			PCI - ISA Bridge problem <b>Note:</b> If the type/model and FRU information is not listed here, refer to FFC 221.
296			PCI Device or Adapter problem The FRU can only be identified by it's location code reported by diagnostics.
297		93H6055	Texture memory module for the GXT800P Graphics Adapter
298		93H6057	Base memory module for the GXT800P Graphics Adapter
2C3		93H5263 93H5264 93H5265 93H5267	2-Port Multiprotocol adapter cable V.24 2-Port Multiprotocol adapter cable V.35 2-Port Multiprotocol adapter cable V.36 2-Port Multiprotocol adapter cable X.21
2C4	520 550 570	System Bus Connector problem System Backplane Assembly  For the latest part numbers, go to the Part Number Catalog.	
2C4	7017/S70	97H7696	System Bus Connector problem System Backplane Assembly
2C4	7017/S7A	97H7696	System Backplane Assembly
2C4	7017/S80 7017/S85	23L7598	System Backplane Assembly
2C4	7025/6F0 7025/6F1	43L5269	System board
2C4	7025/F50	07L9718	System board
2C4	7025/F80	43L5269	System board
2C4	7026/6H0 7026/6H1	43L5274	CEC drawer backplane
2C4	7026/6M1	04N3524	CEC drawer backplane
2C4	7026/B80	08L988	System board
2C4	7026/H50	07L9718	System board
2C4	7026/H70	08L0988	System board
2C4	7026/H80	43L5274	CEC drawer backplane
2C4	7026/M80	04N3023	CEC drawer backplane
2C4	7028/6C1 7028/6E1	09P2420	System Board
2C4	7028/6C4 7028/6E4	00P3166 00P4488 00P5830	CEC Backplane (GP processor) CEC Backplane (GQ processor) CEC Backplane (RIO-G capability)

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
2C4	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)
2C4	7038/6M2	09P3876	System Backplane Assembly
2C4	7039/651	00P4603	System Backplane
2C4	7040/671 7040/681	11P3046	System Backplane
2C4	7043/260	08L1303	System board
2C4	7043/270	08L0988	System board
2C4	7044/170	41L5721 09P0037	System board, class A System board, class B
2C4	7044/270	08L0988	System board
2C4	9076 SMP Thin/Wide Node	07L9718	CPU chassis system board
2C4	9076/ Power3 SMP Thin/Wide Node	08L1303 08L0988	CPU chassis, system board (200 MHz) CPU chassis, system board (375 MHz)
2C4	9112/265	09P2420	System Board
2C5	7017/S70	19H0289	32 MB Memory Module problem 32 MB Memory Module
2C5	7025/F50	07L7729	32 MB Memory Module
2C5	7026/H50	07L7729	32 MB Memory Module
2C5	7026/H70	07L7729	32 MB Memory Module
2C5	7043/260	42H2773	32 MB Memory Module
2C6	520 550 570		Memory module problem For the latest part numbers, go to the Part Number Catalog.
2C6	7025/6F0 7025/6F1	07L7729 93H4702 07L9030 10L5417  07L9758  09P0335	32 MB memory module 128 MB memory module 256 MB memory module 512 MB memory module F/C 4131 (Cannot be mixed with F/C 4100 in a quad or in a pair if memory DIMMs are installed on a 1-way CPU card) 512 MB memory module F/C 4100 (Cannot be mixed with F/C 4131 in a quad or in a pair if memory DIMMs are installed on a 1-way CPU card) 1 GB memory module
2C6	7025/F50	93H4702	128 MB Memory Module problem 128 MB Memory Module

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
2C6	7025/F80	07L7729 93H4702 07L9030 10L5417  07L9758	32 MB memory module 128 MB memory module 256 MB memory module 512 MB memory module F/C 4131 (Cannot be mixed with F/C 4100 in a quad or in a pair if memory DIMMs are installed on a 1-way CPU card) 512 MB memory module F/C 4100 (Cannot be mixed with F/C 4131 in a quad or in a pair if memory DIMMs are installed on a 1-way CPU card)
2C6	7026/6H0 7026/6H1	07L7729 93H4702 07L9030 10L5417  07L9758  09P0335	32 MB memory module 128 MB memory module 256 MB memory module 512 MB memory module F/C 4131 (Cannot be mixed with F/C 4100 in a quad or in a pair if memory DIMMs are installed in a 1-way CPU card) 512 MB memory module F/C 4100 (Cannot be mixed with F/C 4131 in a quad or in a pair if memory DIMMs are installed in a 1-way CPU card) 1 GB memory module
2C6	7026/6M1	07L7729 93H4702 07L9030 10L5417  07L9758  09P0466	32 MB memory module 128 MB memory module 256 MB memory module 512 MB memory module F/C 4131 (Cannot be mixed with F/C 4100 in an octal) 512 MB memory module F/C 4100 (Cannot be mixed with F/C 4131 in an octal) 1 GB Memory module
2C6	7026/B80	93H4702	128 MB Memory Module
2C6	7026/H50	93H4702	128 MB Memory Module
2C6	7026/H70	93H4702	128 MB Memory Module
2C6	7026/H80	07L7729 93H4702 07L9030 10L5417  07L9758  09P0335	32 MB memory module 128 MB memory module 256 MB memory module 512 MB memory module F/C 4131 (Cannot be mixed with F/C 4100 in a quad or in a pair if memory DIMMs are installed in a 1-way CPU card) 512 MB memory module F/C 4100 (Cannot be mixed with F/C 4131 in a quad or in a pair if memory DIMMs are installed in a 1-way CPU card) 1 GB memory module

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
2C6	7026/M80	07L7729 93H4702 07L9030 10L5417  07L9758	32 MB memory module 128 MB memory module 256 MB memory module 512 MB memory module F/C 4131 (Cannot be mixed with F/C 4100 in an octal) 512 MB memory module F/C 4100 (Cannot be mixed with F/C 4131 in an octal)
2C6	7028/6C1 7028/6E1	93H4702 09P0550 09P0491	128 MB DIMM 256 MB DIMM 512 MB DIMM
2C6	7028/6C4 7028/6E4	53P3224 53P3226 53P3230 53P3232	256 MB DIMM 512 MB DIMM 1 GB DIMM 2 GB DIMM
2C6	7029/6C3 7029/6E3 9114/275	00P5765 00P5767 00P5769 00P5771 00P5773	256 MB DIMM 512 MB DIMM 1024 MB DIMM 1 GB DIMM 2 GB DIMM
2C6	7038/6M2	53P3226 53P3230 53P3232 53P1636 53P1643	512 MB Memory Module 1 GB Memory Module 2 GB Memory Module 4 GB CUoD DIMM Card 8 GB CUoD DIMM Card
2C6	7043/260 7043/270	93H4702	128 MB Memory Module
2C6	7044/170	93H4702 07L9030 09P0550 07L9758 09P0491	128 MB Memory Module 256 MB Memory Module 256 MB Memory Module 512 MB Memory Module 512 MB Memory Module
2C6	7044/270	93H4702	128 MB Memory Module
2C6	9076/ Power3 SMP High Node	93H4702	128 MB Memory Module
2C6	9112/265	09P0550 09P0491	256 MB DIMM 512 MB DIMM
2C7	7017/S70	93H7689 93H7688	Base Memory Card problem Base Memory Card (LH) Base Memory Card (RH)
2C7	7025/6F0 7025/6F1	04N4808 44H8167	Base memory card Memory card filler
2C7	7025/F50	93H2641	Base Memory Card
2C7	7025/F80	04N4808 44H8167	Base memory card Memory card filler
2C7	7026/6H0 7026/6H1	04N4808 44H8167	Memory riser card Memory card filler
2C7	7026/6M1	04N3033	Memory riser card
2C7	7026/B80	07L7065	Base Memory Card

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
2C7	7026/H50	93H2641	Base Memory Card
2C7	7026/H70	07L7065	Base Memory Card
2C7	7026/H80	04N4808 44H8167	Memory riser card Memory card filler
2C7	7026/M80	04N3033	Memory riser card
2C7	7038/6M2	97P3186 00P4050 00P4045	Processor Board (1.2 GHz) Processor Board (1.45 GHz) CUoD Processor Board (1.45 GHz)
2C7	7043/260 7043/270	07L7065	Base Memory Card
2C7	7044/270	07L7065	Base Memory Card
2C7	9076 SMP Thin/Wide Node	93H2641	Base Memory Card
2C7	9076/ Power3 SMP Thin/Wide Node	07L7065	Base Memory Card
2C7	9076/ Power3 SMP High Node	07L6608	Base Memory Card
2C8	520 550 570	Mezzanine Bus problem System backplane  For the latest part numbers, go to the Part Number Catalog.	
2C8	7017/S70	94H1268	Mezzanine Bus problem I/O planar
2C8	7017/S7A	08L0103	I/O planar
2C8	7017/S80 7017/S85	08L1438	I/O planar
2C8	7025/6F0 7025/6F1	43L5269	System board
2C8	7025/F50	07L9718 41L5106	System board I/O board
2C8	7025/F80	43L5269	System board
2C8	7026/6H0 7026/6H1 7026/6M1	04N6228 41L5560 41L5561	RIO adapter Primary I/O backplane Secondary I/O backplane
2C8	7026/B80	08L0988 00P1859	System board I/O board
2C8	7026/H50	07L9718 1L5106	System board I/O board
2C8	7026/H70	08L0988 03N2797	System board I/O board
2C8	7026/H80	04N6228 41L5560 41L5561	RIO adapter Primary I/O backplane Secondary I/O backplane
2C8	7026/M80	04N6228 41L5560 41L5561	RIO adapter Primary I/O backplane Secondary I/O backplane

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
2C8	7028/6C1 7028/6E1	09P2420	System Board
2C8	7028/6C4 7028/6E4	00P3166 00P4488 00P5830 00P5290 00P4483	CEC Backplane (GP processor) CEC Backplane (GQ processor) CEC Backplane (RIO-G capability) PCI Riser Card (6 slot) PCI Riser Card (4 slot)
2C8	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)
2C8	7038/6M2	00P4062 00P5604	Service Processor/PCI Adapter Backplane Service Processor/PCI Adapter Backplane (RIO-2 capability)
2C8	7039/651	00P4603	System Backplane
2C8	7040/61D	11P2623	I/O Planar
2C8	7043/260	08L1303 03N2443	System board I/O board
2C8	7043/270	08L0988 41L6013	System board I/O board
2C8	7044/270	08L0988 41L6013	System board I/O board
2C8	7311/D10	09P5921	I/O Drawer Backplane
2C8	7311/D20	53P3472	PCI Planar
2C8	9076 SMP Thin/Wide Node	07L9718 41L6138 93H3316 31L7766	CPU chassis system board CPU chassis I/O planar I/O Chassis connection card SP Switch MX
2C8	9076/ Power3 SMP Thin/Wide Node	08L1303 08L0988 03N2866 03N3368 07L8531 31L7766	CPU chassis, system board (200 MHz) CPU chassis, system board (375 MHz) CPU chassis, I/O planar (200 MHz) CPU chassis, I/O planar (375 MHz) I/O Expansion Card SP Switch MX
2C8	9112/265	09P2420	System Board
2C9	520 550 570	PCI Bus problem I/O planar  For the latest part numbers, go to the Part Number Catalog.	
2C9	7017/S70	94H1268	PCI Bus problem I/O planar
2C9	7017/S7A	08L0103	I/O planar
2C9	7017/S80 7017/S85	08L1438	I/O planar
2C9	7024/E20 7024/E30	93H4808	System board
2C9	7025/6F0 7025/6F1	43L5269	System board

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
2C9	7025/F30	93H8371	System board
2C9	7025/F40	93H8652	System board
2C9	7025/F50	41L5106	I/O board
2C9	7025/F80	43L5269	System board
2C9	7026/6H0 7026/6H1 7026/6M1	04N6228 41L5560 41L5561	RIO adapter Primary I/O backplane Secondary I/O backplane
2C9	7026/B80	00P1859	I/O board
2C9	7026/H10	93H8652	System board
2C9	7026/H50	41L5106	I/O board
2C9	7026/H70	03N2797	PCI Bus problem I/O board
2C9	7026/H80	04N6228 41L5560 41L5561	RIO adapter Primary I/O backplane Secondary I/O backplane
2C9	7026/M80	04N6228 41L5560 41L5561	RIO adapter Primary I/O backplane Secondary I/O backplane
2C9	7028/6C1 7028/6E1	09P2420	System Board
2C9	7028/6C4 7028/6E4	00P5290 00P4483	PCI Riser Card (6 slot) PCI Riser Card (4 slot)
2C9	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)
2C9	7038/6M2	00P4062 00P5604	Service Processor/PCI Adapter Backplane Service Processor/PCI Adapter Backplane (RIO-2 capability)
2C9	7039/651	00P4603	System Backplane
2C9	7040/61D	11P2623	I/O Planar
2C9	7043/140	93H7142 93H7143 93H6023 93H9334	166 MHz System board 200 MHz System board 233 MHz System board 332 MHz System board
2C9	7043/150	41L5912	375 MHz System board
2C9	7043/240	11H7516	166 MHz System board
2C9	7043/260	03N2443	I/O board
2C9	7043/270	41L6013	I/O board
2C9	7044/170	41L5721 09P0037	System board, class A System board, class B
2C9	7044/270	41L6013	I/O board
2C9	7046/B50	41L5912	375 MHz System board
2C9	7311/D10	09P592	I/O Drawer Backplane
2C9	7311/D20	53P3472	PCI Planar

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
2C9	7317/F3L	93H8371	System board
2C9	9076 SMP Thin/Wide Node	41L6138 93H3316 93H3202	I/O planar Expansion I/O connection card PCI Expansion I/O planar <b>Note:</b> Suspect planar associated with the failing device.
2C9	9076/ Power3 SMP Thin/Wide Node	08L1303 08L0988 03N2866 03N3368 07L8531 31L7766	CPU chassis, system board (200 MHz) CPU chassis, system board (375 MHz) CPU chassis, I/O planar (200 MHz) CPU chassis, I/O planar (375 MHz) I/O Expansion Card SP Switch MX
2C9	9076/ Power3 SMP High Node	11K0571	NIO Planar
2C9	9076/ Power3 RIO Drawer	05N5005	RIO Planar
2C9	9112/265	09P2420	System Board
2CC		09P0335	1 GB Memory Module
2CD		07L9030 09P0550	256 MB Memory Module 256 MB Memory Module
2CE		11K9758 09P0491	512 MB Memory Module 512 MB Memory Module
2D0			ISA adapter or integrated device
2D1	520 550 570	ISA Bus problem I/O board  For the latest part numbers, go to the Part Number Catalog.	
2D1	7025/F50	41L5106	ISA Bus problem I/O board
2D1	7026/B80	00P1859	I/O board
2D1	7026/H50	41L5106	I/O board
2D1	7026/H70	30N2797	I/O board
2D1	7028/6C1 7028/6E1	09P2420	System Board
2D1	7028/6C4 7028/6E4	00P3166 00P4488 00P5830	CEC Backplane (GP processor) CEC Backplane (GQ processor) CEC Backplane (RIO-G capability)
2D1	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)
2D1	7043/260	03N2443	I/O board
2D1	7043/270	41L6013	I/O board
2D1	7044/170	41L5721 09P0037	System board, class A System board, class B
2D1	7044/270	41L6013	I/O board
2D1	9112/265	09P2420	System Board



Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
2D2	520 550 570	Mezzanine Bus Arbiter problem I/O planar  For the latest part numbers, go to the Part Number Catalog.	
2D2	7017/S70	94H1268	Mezzanine Bus Arbiter problem I/O planar
2D2	7017/S7A	08L0103	I/O planar
2D2	7017/S80 7017/S85	08L1438	I/O planar
2D2	7025/6F0 7025/6F1	43L5269	System board
2D2	7025/F50	41L5106	I/O board
2D2	7025/F80	43L5269	System board
2D2	7026/6H0 7026/6H1 7026/6M1	04N6228 41L5560 41L5561	RIO adapter Primary I/O backplane Secondary I/O backplane
2D2	7026/B80	00P1859	I/O board
2D2	7026/H50	41L5106	I/O board
2D2	7026/H70	03N2797	I/O board
2D2	7026/H80	04N6228 41L5560 41L5561	RIO adapter Primary I/O backplane Secondary I/O backplane
2D2	7026/M80	04N6228 41L5560 41L5561	RIO adapter Primary I/O backplane Secondary I/O backplane
2D2	7028/6C1 7028/6E1	09P2420	System Board
2D2	7028/6C4 7028/6E4	00P5290 00P4483	PCI Riser Card (6 slot) PCI Riser Card (4 slot)
2D2	7029/6C3 7029/6E3 9114/275	80P2388	Service Processor
2D2	7038/6M2	00P4062 00P5604	Service Processor/PCI Adapter Backplane Service Processor/PCI Adapter Backplane (RIO-2 capability)
2D2	7039/651	00P4603	System Backplane
2D2	7040/61D	11P2623	I/O Planar
2D2	7043/260	03N2443	I/O board
2D2	7043/270	41L6013	I/O board
2D2	7044/170	41L5721 09P0037	System board, class A System board, class B
2D2	7044/270	41L6013	I/O board
2D2	7311/D10	09P5921	I/O Drawer Backplane
2D2	7311/D20	53P3472	PCI Planar
2D2	9076 SMP Thin/Wide Node	07L9718	CPU chassis system board

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
2D2	9076/ Power3 SMP Thin/Wide Node	08L1303 08L0988	System board (200 MHz) System board (375 MHz)
2D2	9076/ Power3 SMP High Node	11K0571	NIO planar
2D2	9076/ Power3 RIO Drawer	05N5005	RIO planar
2D2	9112/265	09P2420	System Board
2D3	520 550 570	Service Processor Card For the latest part numbers, go to the Part Number Catalog.	
2D3	7017/S70	03N3523	Service Processor Card
2D3	7017/S7A	03N3523	Service Processor Card
2D3	7017/S80 7017/S85	11K0301	Service Processor Card
2D3	7025/6F0 7025/6F1	43L5269	System board
2D3	7025/F50	08L0442	Service Processor <b>Note:</b> The service processor can fail diagnostics if the firmware levels between the system and service processor are not compatible. Check the levels of the system and service processor firmware. Compatible levels are listed in update package documentation and in RETAIN. If the firmware levels are compatible and the problem persists, then replace the service processor card.
2D3	7025/F80	43L5269	System board
2D3	7026/6H0 7026/6H1 7026/6M1	41L5560	Primary I/O drawer backplane
2D3	7026/B80	00P1859	I/O board
2D3	7026/H50	08L0449	Service processor <b>Note:</b> The service processor can fail diagnostics if the firmware levels between the system and service processor are not compatible. Check the levels of the system and service processor firmware. Compatible levels are listed in update package documentation and in RETAIN. If the firmware levels are compatible and the problem persists, then replace the service processor card.
2D3	7026/H70	03N2797	I/O board
2D3	7026/H80 7026/M80	41L5560	Primary I/O drawer backplane
2D3	7028/6C1 7028/6E1	09P2420	System Board
2D3	7028/6C4 7028/6E4	00P3166 00P4488 00P5830	CEC Backplane (GP processor) CEC Backplane (GQ processor) CEC Backplane (RIO-G capability)

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
2D3	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970 80P2388	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way) Service Processor Card
2D3	7038/6M2	00P4062 00P5604	Service Processor/PCI Adapter Backplane Service Processor/PCI Adapter Backplane (RIO-2 capability)
2D3	7039/651	09P6222	Service Processor Card
2D3	7039/651	00P4603	System Backplane
2D3	7040/671 7040/681	09P2435	Primary I/O Book
2D3	7043/260	03N2443	I/O board
2D3	7043/270	41L6013	I/O board
2D3	7044/170	41L5721 09P0037	System board, class A System board, class B
2D3	7044/270	41L6013	I/O board
2D3	9076 SMP Thin/Wide Node	08L0442	Service processor <b>Note:</b> The service processor can fail diagnostics if the firmware levels between the system and service processor are not compatible. Check the levels of the system and service processor firmware. Compatible levels are listed in update package documentation and in RETAIN. If the firmware levels are compatible and the problem persists, then replace the service processor card.
2D3	9076/ Power3 SMP Thin/Wide Node	03N2866 03N3368	I/O planar (200 MHz) I/O planar (375 MHz)
2D3	9076/ Power3 SMP High Node	11K0571	NIO planar
2D3	9112/265	09P2420	System Board
2D4	520 550 570		System/SP Interface Logic problem I/O planar  For the latest part numbers, go to the Part Number Catalog.
2D4	7017/S70	94H1268	System/SP Interface Logic problem I/O planar
2D4	7017/S7A	08L0103	I/O planar
2D4	7017/S80 7017/S85	08L1438	I/O planar
2D4	7025/6F0 7025/6F1	43L5269	System board
2D4	7025/F50	41L5106	I/O board
2D4	7025/F80	43L5269	System board
2D4	7026/6H0 7026/6H1 7026/6M1	41L5560	Primary I/O drawer backplane

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
2D4	7026/B80	00P1859	I/O board
2D4	7026/H50	41L5106	I/O board
2D4	7026/H70	03N2797	I/O board
2D4	7026/H80 7026/M80	41L5560	Primary I/O drawer backplane
2D4	7028/6C1 7028/6E1	09P2420	System Board
2D4	7028/6C4 7028/6E4	00P3166 00P4488 00P5830	CEC Backplane (GP processor) CEC Backplane (GQ processor) CEC Backplane (RIO-G capability)
2D4	7029/6C3 7029/6E3 9114/275	53P6230	Operator Panel
2D4	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970 80P2388	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way) Service Processor
2D4	7038/6M2	00P4062 00P5604	Service Processor/PCI Adapter Backplane Service Processor/PCI Adapter Backplane (RIO-2 capability)
2D4	7039/651	09P6222	Service Processor Card
2D4	7039/651	09P6222	Service Processor Card
2D4	7040/671 7040/681	09P2435	Primary I/O Book
2D4	7043/260	08L0633	I/O board
2D4	7043/270	41L6013	I/O board
2D4	7044/170	41L5721 09P0037	System board, class A System board, class B
2D4	7044/270	41L6013	I/O board
2D4	9076 SMP Thin/Wide Node	41L6138	I/O planar
2D4	9076/ Power3 SMP Thin/Wide Node	03N2866 03N3368	I/O planar (200 MHz) /O planar (375 MHz)
2D4	9076/ Power3 SMP High Node	11K0571	NIO planar
2D4	9112/265	09P2420	System Board
2D5	520 550 570	SP Primary I/O bus problem Service Processor Card I/O planar  For the latest part numbers, go to the Part Number Catalog.	
2D5	7017/S70	03N3523 94H1268	SP Primary I/O bus problem Service Processor Card I/O planar
2D5	7017/S7A	03N3523 08L0103	Service Processor Card I/O planar

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
2D5	7017/S80 7017/S85	11K0301 08L1438	Service Processor Card I/O planar
2D5	7025/6F0 7025/6F1	43L5269	System board
2D5	7025/F50	41L5106 08L0442	I/O board Service Processor
2D5	7025/F80	43L5269	System board
2D5	7026/6H0 7026/6H1 7026/6M1	41L5560	Primary I/O drawer backplane
2D5	7026/B80	00P1859	I/O board
2D5	7026/H50	41L5106 08L0449	I/O board Service Processor
2D5	7026/H70	03N2797	I/O board
2D5	7026/H80 7026/M80	41L5560	Primary I/O drawer backplane
2D5	7028/6C1 7028/6E1	09P2420	System Board
2D5	7028/6C4 7028/6E4	00P3166 00P4488 00P5830	CEC Backplane (GP processor) CEC Backplane (GQ processor) CEC Backplane (RIO-G capability)
2D5	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)
2D5	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)
2D5	7038/6M2	00P4062 00P5604	Service Processor/PCI Adapter Backplane Service Processor/PCI Adapter Backplane (RIO-2 capability)
2D5	7039/651	09P6222	Service Processor Card
2D5	7039/651	09P6222	Service Processor Card
2D5	7040/671 7040/681	09P2435	Primary I/O Book
2D5	7043/260	03N2443	I/O board
2D5	7043/270	41L6013	I/O board
2D5	7044/170	41L5721 09P0037	System board, class A System board, class B
2D5	7044/270	41L6013	I/O board
2D5	9076 SMP Thin/Wide Node	41L6138	I/O planar
2D5	9076/ Power3 SMP Thin/Wide Node	03N2866 03N3368	I/O planar (200 MHz) I/O planar (375 MHz)

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
2D5	9076/ Power3 SMP High Node	11K0571 03N4184 07L6608	NIO planar System planar Base memory card
2D5	9112/265	09P2420	System Board
2D6	520 550 570	Service Processor Card For the latest part numbers, go to the Part Number Catalog.	
2D6	7017/S70	03N3523	Service Processor Card
2D6	7017/S7A	03N3523	Service Processor Card
2D6	7017/S80 7017/S85	11K0301	Service Processor Card
2D6	7025/6F0 7025/6F1	43L5269	System board
2D6	7025/F80	43L5269	System board
2D6	7026/6H0 7026/6H1 7026/6M1 7026/H80 7026/M80	41L5560	Primary I/O drawer backplane
2D6	7028/6C4 7028/6E4	00P4488 00P5830	System Board (with RIO capability) System Board (with RIO-2 capability)
2D6	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970 80P2388	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)
2D6	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)
2D6	7039/651	09P6222	Service Processor Card
2D6	7040/671 7040/681	09P2435	Primary I/O Book
2D6	9076/ Power3 SMP High Node	11K0571	NIO planar
2D7	520 550 570	System board For the latest part numbers, go to the Part Number Catalog.	
2D7	7025/6F0 7025/6F1	43L5269	System board
2D7	7026/6M1	24L1089	Primary I/O Operator Panel
2D7	7025/F50	93H2922	VPD Module problem Operator Panel
2D7	7025/F80	43L5269	System board
2D7	7026/B80	00P1859	I/O board
2D7	7026/H50	93H2922	Operator Panel
2D7	7026/H70	41L6006	Operator Panel

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
2D7	7026/H70 7026/M80	24L1089	Primary I/O Operator Panel
2D7	7028/6C1 7028/6E1	09P2420	System Board
2D7	7028/6C4 7028/6E4	00P3210	Operator Panel
2D7	7029/6C3 7029/6E3 9114/275	53P6230	Operator Panel
2D7	7038/6M2	97P2908	Operator Panel
2D7	7040/671 7040/681	24L1089	Operator Panel
2D7	7043/260	03N2443	I/O board
2D7	7043/270	41L6013	I/O board
2D7	7044/170	41L5721 09P0037	System board, class A System board, class B
2D7	7044/270	41L6013	I/O board
2D7	9076 SMP Thin/Wide Node	41L6138	I/O planar
2D7	9076/ Power3 SMP Thin/Wide Node	03N2866 03N3368	I/O planar (200 MHz) I/O planar (375 MHz)
2D7	9076/ Power3 SMP High Node	11K0571	NIO planar (VPD module)
2D7	9112/265	09P2420	System Board
2D9	520 550 570	Power Controller problem I/O planar  For the latest part numbers, go to the Part Number Catalog.	
2D9	7017/S70	94H1268	Power Controller problem I/O planar
2D9	7017/S7A	08L0103	I/O planar
2D9	7017/S80 7017/S85	08L1438	I/O planar
2D9	7025/6F0 7025/6F1	43L5269	System board
2D9	7025/F50	41L5106	I/O board
2D9	7025/F80	43L5269	System board
2D9	7026/6H0 7026/6H1 7026/6M1	41L5560 41L5561	Primary I/O drawer backplane Secondary I/O drawer backplane
2D9	7026/B80	00P1859	I/O board
2D9	7026/H50	41L5106	I/O board
2D9	7026/H70	03N2797	I/O board
2D9	7026/H80 7026/M80	41L5560 41L5561	Primary I/O drawer backplane Secondary I/O drawer backplane

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
2D9	7028/6C1 7028/6E1	09P2420	System Board
2D9	7028/6C4 7028/6E4	09P2702	PCI Riser Card
2D9	7029/6C3 7029/6E3 9114/275	53P6230	Operator Panel
2D9	7029/6C3 7029/6E3 9114/275	53P6230	Operator Panel
2D9	7029/6C3 7029/6E3 9114/275	53P6230	Operator Panel
2D9	7029/6C3 7029/6E3 9114/275	53P6230	Operator Panel
2D9	7029/6C3 7029/6E3 9114/275	80P2408 90P2401 00P4966 00P4970 80P2388	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way) Service Processor
2D9	7038/6M2	00P4062 00P5604	Service Processor/PCI Adapter Backplane Service Processor/PCI Adapter Backplane (RIO-2 capability)
2D9	7040/61R 7040/W42	11P1598	Bulk Power Controller (BPC)
2D9	7043/260	03N2443	I/O board
2D9	7043/270	41L6013	I/O board
2D9	7044/170	41L5721 09P0037	System board, class A System board, class B
2D9	7044/270	41L6013	I/O board
2D9	7311/D10	09P5921	I/O Drawer Backplane
2D9	7311/D20	53P3472	PCI Planar
2D9	9076 SMP Thin/Wide Node	41L6138	I/O planar
2D9	9076/ Power3 SMP Thin/Wide Node	03N2866 03N3368	I/O planar (200 MHz) I/O planar (375 MHz)
2D9	9076/ Power3 SMP High Node	11K0571 05N5775	NIO planar Supervisor card
2D9	9112/265	09P2420	System Board
2E0	520 550 570		Fan Sensor problem I/O planar  For the latest part numbers, go to the Part Number Catalog.
2E0	7017/S70	94H1268	Fan Sensor problem I/O planar



Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
2E0	7017/S7A	93H8686	Fan monitoring control card
2E0	7017/S80 7017/S85	93H8686 97H9465	Fan monitoring control card Power Distribution Board
2E0	7025/6F0 7025/6F1	43L5269	System board
2E0	7025/F50	41L5106	I/O board
2E0	7025/F80	43L5269	System board
2E0	7026/6H0 7026/6H1 7026/6M1	11K1107 41L5415 41L5560	SPCN fan control card Power distribution board Primary I/O backplane
2E0	7026/B80	00P1859	I/O board
2E0	7026/H50	93H8686	Fan Monitoring Control Card
2E0	7026/H70	93H8686	Fan Monitoring Control Card
2E0	7026/H80 7026/M80	11K1107 41L5415 41L5560	SPCN fan control card Power distribution board Primary I/O backplane
2E0	7028/6C1 7028/6E1	09P2420	System Board
2E0	7028/6C4 7028/6E4	00P3166 00P4488 00P5830	CEC Backplane (GP processor) CEC Backplane (GQ processor) CEC Backplane (RIO-G capability)
2E0	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970 80P2388	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way) Service Processor
2E0	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970 80P2388	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way) Service Processor
2E0	7038/6M2	00P4062 00P5604	Service Processor/PCI Adapter Backplane Service Processor/PCI Adapter Backplane (RIO-2 capability)
2E0	7039/651	09P6222	Service Processor Card
2E0	7040/61R 7040/W42	11P1598	Bulk Power Controller (BPC)
2E0	7040/671 7040/681	09P2435	Primary I/O Book
2E0	7043/260	03N0633	I/O board
2E0	7043/270	41L6013	I/O board
2E0	7044/170	41L5721 09P0037	System board, class A System board, class B
2E0	7044/270	41L6013	I/O board
2E0	7311/D10	09P5921	I/O Drawer Backplane
2E0	7311/D20	53P3472	PCI Planar

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
2E0	9076 SMP Thin/Wide Node	41L6138	I/O planar
2E0	9076/ Power3 SMP Thin/Wide Node	03N2866 03N3368	I/O planar (200 MHz) I/O planar (375 MHz)
2E0	9076/ Power3 SMP High Node	12K0451	Fan control card
2E0	9076/ Power3 RIO Drawer	31L8752 05N5005	Supervisor card RIO planar
2E0	9112/265	09P2420	System Board
2E1	520 550 570	Thermal Sensor problem I/O planar  For the latest part numbers, go to the Part Number Catalog.	
2E1	7017/S70	94H1268	Thermal Sensor problem I/O planar
2E1	7017/S7A	08L0103	I/O planar
2E1	7017/S80 7017/S85	08L1438	I/O planar
2E1	7024	93H4808	System board
2E1	7025/6F0 7025/6F1	43L5269	System board
2E1	7025/F30	93H8371	System board
2E1	7025/F40	93H8652	System board
2E1	7025/F50	41L5106	I/O board
2E1	7025/F80	43L5269	System board
2E1	7026/6H0 7026/6H1 7026/6M1	41L5560 41L5561 24L1089 24L0955	Primary I/O backplane Secondary I/O backplane Primary I/O drawer operator panel Secondary I/O drawer operator panel
2E1	7026/B80	00P1859	I/O board
2E1	7026/H10	93H8652	System board
2E1	7026/H50	41L5106	I/O board
2E1	7026/H70	03N2797	I/O board
2E1	7026/H80 7026/M80	41L5560 41L5561 24L1089 24L0955	Primary I/O backplane Secondary I/O backplane Primary I/O drawer operator panel Secondary I/O drawer operator panel
2E1	7028/6C1 7028/6E1	09P2420	System Board
2E1	7028/6C4 7028/6E4	00P3210	Operator Panel
2E1	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
2E1	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)
2E1	7029/6C3 7029/6E3 9114/275	53P6230	Operator Panel
2E1	7038/6M2	97P2908	Operator Panel
2E1	7039/651	00P4603	System Backplane
2E1	7040/61D	11P2623	I/O Planar
2E1	7043/140	93H7142 93H7143 93H6023 93H9334	Thermal Sensor problem 166 MHz System board 200 MHz System board 233 MHz System board 332 MHz System board
2E1	7043/150	41L5912	375 MHz system board
2E1	7043/240	11H7516	System board
2E1	7043/260	03N2443	I/O board
2E1	7043/270	41L6013	I/O board
2E1	7044/170	41L5721 09P0037	System board, class A System board, class B
2E1	7044/270	41L6013	I/O board
2E1	7046/B50	41L5912	375 MHz System board
2E1	7311/D10	09P5921	I/O Drawer Backplane
2E1	7311/D20	53P3472	PCI Planar
2E1	7317/F3L	93H8371	System board
2E1	9076 SMP Thin/Wide Node	41L6138	I/O planar
2E1	9076/ Power3 SMP Thin/Wide Node	03N2866 03N3368	I/O planar (200 MHz) I/O planar (375 MHz)
2E1	9076/ Power3 SMP High Node	03N4184 11K0571	System planar (inlet) NIO planar (outlet)
2E1	9076/ Power3 RIO Drawer	12K0446 05N5005 31L8752	Power Supply RIO planar (midrange) Supervisor card
2E1	9112/265	09P2420	System Board
2E2	520 550 570	Voltage Sensor problem I/O planar  For the latest part numbers, go to the Part Number Catalog.	
2E2	7017/S70	94H1268	Voltage Sensor problem I/O planar
2E2	7017/S7A	08L0103	I/O planar
2E2	7017/S80 7017/S85	08L1438	I/O planar

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
2E2	7025/6F0 7025/6F1	43L5269	System board
2E2	7025/F50	41L5106	I/O board
2E2	7025/F80	43L5269	System board
2E2	7026/6H0 7026/6H1 7026/6M1	41L5415	Power distribution board
2E2	7026/B80	00P1859	I/O board
2E2	7026/H50	41L5106	I/O board
2E2	7026/H70	03N2797	I/O board
2E2	7026/H80 7026/M80	41L5415	Power distribution board
2E2	7028/6C1 7028/6E1	09P2420	System Board
2E2	7028/6C4 7028/6E4	00P3166 00P4488 00P5830	CEC Backplane (GP processor) CEC Backplane (GQ processor) CEC Backplane (RIO-G capability)
2E2	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970 00P5245	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way) Service Processor
2E2	7039/651	00P4603	Service Processor Card
2E2	7040/61D	11P2623	I/O Planar
2E2	7043/260	03N2443	I/O board
2E2	7043/270	41L6013	I/O board
2E2	7044/170	41L5721 09P0037	System board, class A System board, class B
2E2	7044/270	41L6013	I/O board
2E2	7311/D10	09P5921	I/O Drawer Backplane
2E2	7311/D20	53P3472	PCI Planar
2E2	9076 SMP Thin/Wide Node	41L6138 46H9165	I/O planar I/O Expansion Interposer Card
2E2	9076/ Power3 SMP Thin/Wide Node	03N2866 03N3368 46H9165	I/O planar (200 MHz) I/O planar (375 MHz) I/O Expansion Interposer Card
2E2	9076/ Power3 SMP High Node	11K0571 03N4184 11K0198	NIO Planar 3.3V, +5V, 5SB, +12V, -12V System Planar 2.5V, 3.3V CPU Card 1.8V, 2.5V
2E2	9076/ Power3 RIO Drawer	05N5005	RIO planar
2E2	9112/265	09P2420	System Board
2E3	520 550 570	Serial Port Controller problem Service Processor Card  For the latest part numbers, go to the Part Number Catalog.	

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
2E3	7017/S70	03N3523	Serial Port Controller problem Service Processor Card
2E3	7017/S7A	03N3523	Service Processor Card
2E3	7017/S80 7017/S85	11K0301	Service Processor Card
2E3	7025/6F0 7025/6F1	43L5269	System board
2E3	7025/F50	41L5106	I/O board
2E3	7025/F80	43L5269	System board
2E3	7026/6H0 7026/6H1 7026/6M1	41L5560	Primary I/O drawer backplane
2E3	7026/B80	00P1859	I/O board
2E3	7026/H50	41L5106	I/O board
2E3	7026/H70	03N2797	I/O board
2E3	7026/H80 7026/M80	41L5560	Primary I/O drawer backplane
2E3	7028/6C1 7028/6E1	09P2420	System Board
2E3	7028/6C4 7028/6E4	00P3166 00P4488 00P5830	CEC Backplane (GP processor) CEC Backplane (GQ processor) CEC Backplane (RIO-G capability)
2E3	7038/6M2	00P4062 00P5604	Service Processor/PCI Adapter Backplane Service Processor/PCI Adapter Backplane (RIO-2 capability)
2E3	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970 00P5245	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way) Service Processor
2E3	7038/6M2	00P4062 00P5604	Service Processor/PCI Adapter Backplane Service Processor/PCI Adapter Backplane (RIO-2 capability)
2E3	7039/651	09P6222	Service Processor Card
2E3	7040/671 7040/681	09P2435	Primary I/O Book
2E3	7043/260	03N2443	I/O board
2E3	7043/270	41L6013	I/O board
2E3	7044/170	41L5721 09P0037	System board, class A System board, class B
2E3	7044/270	41L6013	I/O board
2E3	9076 SMP Thin/Wide Node	41L6138 11J4000 11J5197	I/O planar Supervisor card Power/supervisor interposer cable

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
2E3	9076/ Power3 SMP Thin/Wide Node	03N2866 03N3368 11J4000 11J5197	I/O planar (200 MHz) I/O planar (375 MHz) Supervisor card Power/supervisor interposer cable
2E3	9076/ Power3 SMP High Node	11K0571	NIO planar
2E3	9112/265	09P2420	System Board
2E4	520 550 570	JTAG/COP Controller problem Service Processor Card  For the latest part numbers, go to the Part Number Catalog.	
2E4	7017/S70	03N3523	JTAG/COP Controller problem Service Processor Card
2E4	7017/S7A	03N3523	Service Processor Card
2E4	7017/S80 7017/S85	11K0301	Service Processor Card
2E4	7025/6F0 7025/6F1	43L5269	System board
2E4	7025/F50	41L5106	I/O board
2E4	7025/F80	43L5269	System board
2E4	7026/6H0 7026/6H1 7026/6M1	41L5560	Primary I/O drawer backplane
2E4	7026/B80	00P1859	I/O board
2E4	7026/H50	41L5106	I/O board
2E4	7026/H70	03N2797	I/O board
2E4	7026/H80 7026/M80	41L5560	Primary I/O drawer backplane
2E4	7028/6C1 7028/6E1	09P2420	System Board
2E4	7028/6C4 7028/6E4	00P3166 00P4488 00P5830	CEC Backplane (GP processor) CEC Backplane (GQ processor) CEC Backplane (RIO-G capability)
2E4	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970 80P2388	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way) Service Processor
2E4	7038/6M2	00P4062 00P5604	Service Processor/PCI Adapter Backplane Service Processor/PCI Adapter Backplane (RIO-2 capability)
2E4	7039/651	09P6222	Service Processor Card
2E4	7040/671 7040/681	09P2435	Primary I/O Book
2E4	7043/260	03N2443	I/O board
2E4	7043/270	41L6013	I/O board

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
2E4	7044/170	41L5721 09P0037	System board, class A System board, class B
2E4	7044/270	41L6013	I/O board
2E4	9076 SMP Thin/Wide Node	41L6138	I/O planar
2E4	9076/ Power3 SMP Thin/Wide Node	03N2866 03N3368	I/O planar (200 MHz) I/O planar (375 MHz)
2E4	9076/ Power3 SMP High Node	11K0571 03N4184	NIO Planar (JTAG) System Planar
2E4	9112/265	09P2420	System Board
2E6		40H6595	PCI Differential Ultra SCSI Adapter (4-L)
2E6	7017/S80 7017/S85 7028/6C1 7028/6E1 7028/6C4 7028/6E4 7040/61D 7043/270 7044/170 7044/270 7046/B50	11K0671	PCI Universal Differential Ultra SCSI Adapter (4-U)
2E6	7311/D10	09P5921	I/O Drawer Backplane
2E6	7311/D20	53P3472	PCI Planar
2E7			Generic PCI SCSI Adapter
2E8	520 550 570	Processor card  For the latest part numbers, go to the Part Number Catalog.	
2E8	7025/6F0	04N5353 23L7785 23L7794	1-way processor card (600 MHz) 2-way processor card (667 MHz) 4-way processor card (667 MHz)
2E8	7025/6F1	04N5353 23L7785 23L7794 23L7799	1-way processor card (600 MHz) 2-way processor card (667 MHz) 4-way processor card (667 MHz) 6-way processor card (667 MHz)
2E8	7025/F40	11H7517	166 MHz Processor and Cache card
2E8	7025/F80	04N4765 03P0062 03P0070 03P0085	1-way processor card 2-way processor card 4-way processor card 6-way processor card
2E8	7026/6M1	04N6698 21P6381 21P6383	2-way processor card (500 MHz) 2-way processor card (750 MHz) 4-way processor card (750 MHz)

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
2E8	7026/B80	09P0399 09P0143  09P0406  09P4478	Processor card (375 MHz, one-way) Processor card (375 MHz, two-way, 8 M L2) Processor card (375 MHz, two-way, 4 M L2)  Processor Card (450 MHz, two-way)
2E8	7026/H10	11H7517	166 MHz Processor and Cache card
2E8	7026/M80	04N6930 04N6931	2-way processor card 4-way processor card
2E8	7028/6C1 7028/6E1	09P2420	System Board
2E8	7028/6C4 7028/6E4	00P2974 00P2977 00P2728 00P2731 00P2733 00P2736	Processor Card, 1.0 GHz 1-way Processor Card, 1.0 GHz 2-way Processor Card, 1.2 GHz 1-way Processor Card, 1.2 GHz 2-way Processor Card, 1.45 GHz 1-way Processor Card, 1.45 GHz 2-way
2E8	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)
2E8	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)
2E8	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)
2E8	7038/6M2	97P3186 00P4050 00P4045	Processor Board (1.2 GHz) Processor Board (1.45 GHz) CUoD Processor Board (1.45 GHz)
2E8	7039/651	44P3706 44P3705 60G7598 60G7592	1.1 GHz 8-way MCM with VPD Card 1.3 GHz 4-way MCM with VPD Card 1.5 GHz 8-way MCM with VPD Card 1.7 GHz 4-way MCM with VPD Card
2E8	7040/671	00P4688 03N3229 09P3217	1.5 GHz 4-way MCM with L3 1.1 GHz 4-way MCM with VPD Card 1.1 GHz 8-way MCM with VPD Card
2E8	7040/681	00P4629 00P4687 03N3223 03N3228 03N3229 09P3217	1.5 GHz 8-way MCM - GQ 1.7 GHz 8-way MCM- GQ 1.3 GHz 4-way MCM with VPD Card 1.3 GHz 8-way MCM with VPD Card 1.1 GHz 4-way MCM with VPD Card 1.1 GHz 8-way MCM with VPD Card
2E8	7043/240	11H7517 41L6111	166 MHz Processor and Cache card 233 MHz Processor and Cache card
2E8	7043/270 7044/270	11K0171 11K0218	CPU card (375 MHz one-way) CPU card (375 MHz two-way)



Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
2E8	9112/265	09P2420	System Board
301	7017/S70	90H9831	Memory 128 MB Card
301	7017/S7A	90H9831	Memory 128 MB Card
302	550	Memory 256 MB Card For the latest part numbers, go to the Part Number Catalog.	
302	7017/S70	90H9834	Memory 256 MB Card
302	7017/S7A	90H9834	Memory 256 MB Card
302	7017/S80 7017/S85	23L7566	Memory 256 MB Card
302	7028/6C4 7028/6E4	09P2705	Memory Module 256 MB
303	550	512 MB Memory Card For the latest part numbers, go to the Part Number Catalog.	
303	7017/S70	90H9837	512 MB Memory Card
303	7017/S7A	90H9837	512 MB Memory Card
303	7017/S80 7017/S85	23L7570	512 MB Memory Card
303	7028/6C4 7028/6E4	09P2706	Memory Module 512 MB
304	7017/S70	97H6226	1 GB Memory Card
304	7017/S7A	97H6226	1 GB Memory Card
304	7017/S80 7017/S85	23L7577 04N4994	1 GB Memory Card <b>Note:</b> 23Lxxxx and 04Nxxxx memory cards cannot be mixed. Replace bad FRUs with FRUs that have the same part number.
304	7028/6C4 7028/6E4	09P2707	Memory Module 1GB
305	550	2 GB Memory Card For the latest part numbers, go to the Part Number Catalog.	
305	7017/S7A	97H6244	2 GB Memory Card
305	7017/S80 7017/S85	23L7589 04N5004	2 GB Memory Card <b>Note:</b> 23Lxxxx and 04Nxxxx memory cards cannot be mixed. Replace bad FRUs with FRUs that have the same part number.
305	7028/6C4 7028/6E4	53P3232	Memory Module 2 GB
306	520 550 570	RIO I/O Cable For the latest part numbers, go to the Part Number Catalog.	
306	7017/S70	90H9795 21H7643 21H7377	Remote I/O cable (2 meter) Remote I/O cable (6 meter) Remote I/O cable (15 meter)

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
306	7017/S7A	90H9795 21H7643 21H7377	Remote I/O cable (2 meter) Remote I/O cable (6 meter) Remote I/O cable (15 meter)
306	7017/S80 7017/S85	90H9795 21H7643 21H7377	Remote I/O cable (2 meter) Remote I/O cable (6 meter) Remote I/O cable (15 meter)
306	7026/6H0 7026/6H1 7026/6M1 7026/H80 7026/M80	44L0005 97H7490 04N7014	
306	7028/6C4 7028/6E4	53P2676 21P5456	Remote I/O-G cable (3.5 meter) Remote I/O-G cable (10 meter)
306	7038/6M2	09P2631 09P2632 09P2633	Remote I/O-G Cable (1 meter) Remote I/O-G Cable (4 meter) Remote I/O-G Cable (10 meter)
306	7039/651	09P2631 09P2632 09P2633	Remote I/O-G Cable (1 meter) Remote I/O-G Cable (4 meter) Remote I/O-G Cable (10 meter)
306	7039/651 7040/671 7040/681	23L3080 44H8873 44H9137	Remote I/O Cable 3-Meter Remote I/O Cable 6-Meter Remote I/O Cable 15-Meter
306	9076/ Power3 SMP High Node	90H9795 21H7377	Remote I/O cable (2 meter) Remote I/O cable (15 meter)
307	520 550 570	Expansion Unit Logic problem I/O planar  For the latest part numbers, go to the Part Number Catalog.	
307	7017/S70	94H1268	Expansion Unit Logic problem I/O planar
307	7017/S7A	08L0103	I/O planar
307	7017/S80 7017/S85	08L1438	I/O planar
307	7026/6H0 7026/6H1 7026/6M1 7026/H80 7026/M80	41L5560 41L5561	Primary I/O backplane Secondary I/O backplane
307	7028/6C4 7028/6E4	00P3166 00P4488 00P5830	CEC Backplane (GP processor) CEC Backplane (GQ processor) CEC Backplane (RIO-G capability)
307	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)
307	7040/61D	11P2623	I/O Planar
307	7311/D10	09P5921	I/O Drawer Backplane
307	7311/D20	53P3472	PCI Planar

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
308	520 550 570	I/O Bridge problem System backplane Assembly  For the latest part numbers, go to the Part Number Catalog.	
308	7017/S70	97H7696	I/O Bridge problem System backplane Assembly
308	7017/S7A	97H7696	System Backplane Assembly
308	7017/S80 7017/S85	23L7598	System Backplane Assembly
308	7025/6F0 7025/6F1	43L5269	System board
308	7025/F80	43L5269	System board
308	7026/6H0 7026/6H1	43L5274	CEC backplane
308	7026/6M1	04N3867	CEC RIO adapter card
308	7026/H80	43L5274	CEC backplane
308	7026/M80	04N3867	CEC RIO adapter card
308	7028/6C4 7028/6E4	00P3166 00P4488 00P5830	CEC Backplane (GP processor) CEC Backplane (GQ processor) CEC Backplane (RIO-G capability)
308	7029/6C3 7029/6E3 9114/275	80P2388	Service Processor
308	7038/6M2	00P4062 00P5604	Service Processor/PCI Adapter Backplane Service Processor/PCI Adapter Backplane (RIO-2 capability)
308	7039/651	09P6222	Service Processor Card
308	7040/671 7040/681	11P2623	Primary I/O Book
30A		23L7595 04N5011	4 GB Memory Card <b>Note:</b> 23Lxxxx and 04Nxxxx memory cards cannot be mixed. Replace bad FRUs with FRUs that have the same part number.
30B		04N5531	8 GB Memory Card
440		25L3101	9.1 GB Ultra SCSI Disk Drive only
440	7046/B50	03N3873	9.1 GB Ultra SCSI Disk Drive and Carrier
441		25L3100	18.2 GB Ultra SCSI Disk Drive only
441	7046/B50	03N3874	18.2 GB Ultra SCSI Disk Drive and Carrier
442		09L3117	9.1 GB Ultra LVD SCSI Disk Drive
443		09L3118	18.2 GB Ultra LVD SCSI Disk Drive
444		41L5235	2-Port Multiprotocol PCI Adapter (ASIC)
447		80P33	PCI 64-Bit Fibre Channel Adapter

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
451	7028/6C1 7028/6C4 7028/6E1 7028/6E4 7029/6C3 7029/6E3 7038/6M2 7039/651 7040/61D 7311/D20 9112/275 9114/275	00P2685	73.4 GB 15K RPM Ultra3 SCSI Disk Drive/Carrier
451	2104-DU3/TU3 7040/681	55P4103	73 GB SCSI Disk Drive
453	7028/6C4 7028/6E4 7040/61D 7039/651	00P3835 00P2665	146.8 GB 10K RPM SCSI Disk Drive/Carrier <b>Note:</b> The FRU part numbers are interchangeable. Order the FRU part number that matches the FRU part number you are replacing.
453	7028/6C1 7028/6E1  9112/265	00P3837 00P2669	146.8 GB 10K RPM SCSI Disk Drive/Carrier <b>Note:</b> The FRU part numbers are interchangeable. Order the FRU part number that matches the FRU part number you are replacing.
453	7029/6C3 7029/6E3 9114/275	00P2665	146.5 GB 10K RPM Ultra3 SCSI Disk Drive/Carrier
458		71P9163	36 GB DAT Tape Drive
459		18P8779	36 GB DAT Tape Drive
541		19P2042 19P1629	7205-440 40 GB Tape Drive 7337-360 40 GB Tape Drive
542		19P0708 19P0207	7208-345 60 GB Tape Drive 7334-410 60 GB Tape Drive
56B		07N6777	36.4 GB 15K RPM Disk Drive
56D	7025/F80 7025/6F0 7025/6F1 7026/B80 7028/6C4 7028/6E4 7029/6C3 7029/6E3 7038/6M2 7039/651 7040/61D 7311/D20 9112/275 9114/275	00P2693	36.5 GB 15K RPM Ultra3 SCSI Disk Drive/Carrier
56D	7028/6C1 7028/6E1 9112/265	00P2697	36.5 GB 15K RPM Ultra3 SCSI Disk Drive/Carrier

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
56D	7029/6C3 7029/6E3 9114/275	00P2693	36.5 GB 15K RPM Ultra3 SCSI Disk Drive/Carrier
56D	2104-DU3/TU3	55P4098	36.5 GB 15K RPM Ultra3 SCSI Disk Drive/Carrier
57D		07N4798 09P4882 07N3172 00P3069	73.4 GB 10K RPM, 68-pin Ultra LVD SCSI Disk Drive <b>Note:</b> The FRU part numbers are interchangeable. Order the FRU part number that matches the FRU part number you are replacing.
57D	7043 7044	07N4799 09P4886 07N3176 00P3071	73.4 GB 10K RPM, 80-pin SCSI Disk Drive <b>Note:</b> The FRU part numbers are interchangeable. Order the FRU part number that matches the FRU part number you are replacing.
57D	7025/F80 7025/6F0 7025/6F1 7026/B80 7028/6C4 7028/6E4 7039/651 7040/61D 7046/B50	09P3924 09P4888 00P3833 00P3072	73.4 GB 10K RPM SCSI Disk Drive/Carrier <b>Note:</b> The FRU part numbers are interchangeable. Order the FRU part number that matches the FRU part number you are replacing.
57D	7028/6C1 7028/6E1 9112/265	09P3928 09P4890	73.4 GB 10K RPM SCSI Disk Drive/Carrier <b>Note:</b> The FRU part numbers are interchangeable. Order the FRU part number that matches the FRU part number you are replacing.
57D	7311/D20	00P3833 00P3072	73.4 GB 10K RPM SCSI Disk Drive/Carrier <b>Note:</b> The FRU part numbers are interchangeable. Order the FRU part number that matches the FRU part number you are replacing.
58B		09P3921 09P4874	9.1 GB 10K RPM SCSI Disk Drive/Carrier <b>Note:</b> The FRU part numbers are interchangeable. Order the FRU part number that matches the FRU part number you are replacing.
58D	7025/F80 7025/6F0 7025/6F1 7026/B80 7028/6C4 7028/6E4 7040/61D 7046/B50 7039/651	09P3922 09P4435 00P3829 00P3064	18.2 GB 10K RPM SCSI Disk Drive/Carrier <b>Note:</b> The FRU part numbers are interchangeable. Order the FRU part number that matches the FRU part number you are replacing.

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
58D	2104 7028/6C1 7028/6E1 7028/6C47028/6E4 9112/265	09P3823 09P4437	18.2 GB 10K RPM SCSI Disk Drive/Carrier <b>Note:</b> The FRU part numbers are interchangeable. Order the FRU part number that matches the FRU part number you are replacing.
58D	7311/D20	00P3829 00P3064	18.2 GB 10K RPM SCSI Disk Drive/Carrier <b>Note:</b> The FRU part numbers are interchangeable. Order the FRU part number that matches the FRU part number you are replacing.
59B	7025/F80 7025/6F0 7025/6F1 7026/B80 7039/651 7040/61D 7046/B50	09P3923 09P4445 00P3831 00P3068	36.4 GB 10K RPM SCSI Disk Drive/Carrier <b>Note:</b> The FRU part numbers are interchangeable. Order the FRU part number that matches the FRU part number you are replacing.
59B	2104 7028/6C1 7028/6C4 7028/6E1 9112/265	09P3826 09P4447	36.4 GB 10K RPM SCSI Disk Drive/Carrier <b>Note:</b> The FRU part numbers are interchangeable. Order the FRU part number that matches the FRU part number you are replacing.
59B	7311/D20	00P3831 00P3068	36.4 GB 10K RPM SCSI Disk Drive/Carrier <b>Note:</b> The FRU part numbers are interchangeable. Order the FRU part number that matches the FRU part number you are replacing.
601		07N3675 03N3873 31L8768	9.1 GB LVD 68-pin SCSI Disk Drive 9.1 GB LVD 68-pin Drive/Carrier (U2) 9.1 GB LVD 68-pin Drive/Carrier (SP)
60B	7043 7044	07N4813 09P4429 07P3174 00P3061	18.2 GB LVD 10K RPM, 68-pin SCSI Disk Drive <b>Note:</b> The FRU part numbers are interchangeable. Order the FRU part number that matches the FRU part number you are replacing.
613		19P4898	8-mm 80-GB VXA-2 tape device
61B		07N4833 09P4443 07N3177 00P3067	36.4 GB 10K RPM, 80-pin SCSI Disk Drive <b>Note:</b> The FRU part numbers are interchangeable. Order the FRU part number that matches the FRU part number you are replacing.
61B	7028/6C1 7028/6E1 7028/6C47028/6E4 9112/265	09P3826	36.4 GB 10K RPM, SCSI Disk Drive/Carrier
61D		00P1519	36.4 GB 10K RPM Drive/Carrier
61E		00P1511	18.2 GB 10K RPM Drive/Carrier
621		03N3301	9.1 GB LVD 80-pin Drive/Carrier (U2)
623		07N3674 03N3874 31L8770	18.2 GB LVD 68-pin SCSI Disk Drive 18.2 GB LVD 68-pin Drive/Carrier (U2) 18.2 GB LVD 68-pin Drive/Carrier (SP)

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
624		03N3302	18.2 GB LVD 80-pin Drive/Carrier (U2)
62D		07N4823 09P4868	9.1 GB 10K RPM, 68-pin SCSI Disk Drive <b>Note:</b> The FRU part numbers are interchangeable. Order the FRU part number that matches the FRU part number you are replacing.
62E		00P1508	9.1 GB 10K RPM Drive/Carrier
636		97H7782	TURBOWAYS 622 Mbps PCI MMF ATM Adapter
637		03N3606	Dual Channel PCI-2 Ultra2 SCSI Adapter
638		22L0027	4.5 GB 16-bit Ultra SCSI SE Disk Drive
639		34L2232 08L1155 06H9389 06H7691 1147429	9.1 GB Ultra SCSI Disk Drive (68-pin) Spacer Tray ID cable Screw
63A			See 62D.
63B		07N4853	9.1 GB 10K RPM, 80-pin SCSI Disk Drive
63C			See 60B.
63D	7043 7044	07N4843 09P4433 07N3178 00P3063	18.2 GB 10K RPM, 80-pin SCSI Disk Drive <b>Note:</b> The FRU part numbers are interchangeable. Order the FRU part number that matches the FRU part number you are replacing.
63D	7028/6C1 7028/6E1 9112/265	09P3823	18.2 GB 10K RPM, SCSI Disk Drive/Carrier
63E		07N4803 09P4439 07N3173 00P3065	36.4 GB 10K RPM, 68-pin SCSI Disk Drive <b>Note:</b> The FRU part numbers are interchangeable. Order the FRU part number that matches the FRU part number you are replacing.
63F			See 61B.
640		34L2233 44H4644 44H4266	9.1 GB Ultra SCSI Disk Drive (80-pin) Tray Screw
643		09L3116	18.2 GB Ultra LVD SCSI Disk Drive
644		09L3339	36.2 GB Ultra LVD SCSI Disk Drive
646		03N3554	High-Speed Token-Ring PCI Adapter
64A			See 62E.
64B		00P1517	9.1 GB LVD 80-pin Drive/Carrier
64C			See 61E.
64D		00P1520	18.2 GB LVD 80-pin Drive/Carrier
64E		00P1514	36.4 GB 10K RPM Drive/Carrier
64F			See 61D.

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
650			Unknown disk drive. <b>Note:</b> This FFC indicates that the disk drive could not properly configure. Refer to the disk drive FRU part number.
653		59H6923	18.2 GB Ultra-SCSI 16-bit disk drive
655		11K0313	GXT130P PCI Graphics Adapter
657		07L7495	GXT2000P 3D Graphics Adapter PCI
662	520 550 570	System board  For the latest part numbers, go to the Part Number Catalog.	
662	7025/6F0 7025/6F1	43L5269	System board
662	7025/F80	43L5269	System board
662	7026/B80	00P1859	I/O board
662	7026/H50	41L5106	I/O board, Integrated Ultra2 SCSI
662	7026/H70	03N2797	I/O board, Integrated Ultra2 SCSI
662	7028/6C1 7028/6E1	09P2420	System Board
662	7028/6C4 7028/6E4	00P3166 00P4488 00P5830	CEC Backplane (GP processor) CEC Backplane (GQ processor) CEC Backplane (RIO-G capability)
662	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)
662	7043/260	08L0633	I/O board, Integrated Ultra2 SCSI
662	7043/270	41L6013	I/O board
662	7044/170	41L5721 09P0037	System board, class A System board, class B
662	7044/270	41L6013	I/O board
662	9112/265	09P2420	System Board
663		87H3734  47L8851 09J8829	IBM ARTIC960RxD PCI Adapter (base card) IBM ARTIC960RxF Adapter IBM ARTIC960 Quad T1/E1 Adapter (daughter card)
664		04N2967	SCSI-2 CD-ROM Drive
667		01K7396	PCI 3-Channel Ultra2 SCSI RAID Adapter
669		41L6396	PCI Gigabit Ethernet Adapter
66A		09P2470	Keyboard/Mouse USB PCI Attachment Card
66C		00P1690	10/100/1000 Base-T Ethernet PCI Adapter
66D		37L6892	PCI 4-Channel Ultra3 SCSI RAID Adapter (Base card only)
66E		04N5967	4.7 GB DVD-RAM drive, Black Bezel
66E		04N5968	4.7 GB DVD-RAM drive, White Bezel



Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
673		59H6925	18.2 GB Differential SCSI Disk Drive
674		31L7567 39H8084	ESCON Channel PCI Adapter Assembly IBM ARTIC960Rx PCI Base Adapter
675		87H3427	IBM ARTIC960Hx PCI Base Adapter
677		09P1173	PCI 32-Bit Fibre Channel Adapter
678		59H3879	12 GB 4 mm SCSI Tape Drive
679		83H7105	4.5 GB SCSI Disk Drive
67B		10J0593	PCI Cryptographic Coprocessor Card
67E		00P5758	GXT135P PCI Graphics Adapter
681		59H6926	9.1 GB Ultra-SCSI 16-bit drive
682		93H8055	20X (MAX) SCSI-2 CD-ROM Drive
683			2105 - All Models
684		93H6563 93H7091	Enhanced Remote Asynchronous Node, 16-Port RS-422 Power supply, remote async node
685		93H2534	GXT120P 2D Video Accelerator Adapter PCI
686		93H6541	8-Port Asynchronous EIA-232/RS-422 Adapter
687		93H6545	128-Port Asynchronous Controller
689	7317/F3L	83H7105 93H9005	4.5 GB 16-bit Ultra SCSI SE Disk Drive 4.5 GB 16-bit Ultra SCSI SE Disk Drive assembly
68C		19P0802	20 GB 4-mm Tape Drive
68E		00P2368	POWER GXT6000P Graphics Adapter
690		76H2698	9.1 GB 16-bit Ultra SCSI SE Disk Drive
691		93H5513	TURBOWAYS 25 ATM PCI Adapter
692		59H3121 59H3569 59H3569 59H3570 59H3570	7205-311 35 GB DLT Tape Drive 3447-105 35 GB DLT Tape Drive 3447-106 35 GB DLT Tape Drive 7337-305 35 GB DLT Tape Drive 7337-306 35 GB DLT Tape Drive
693		93H5839	Eicon ISDN DIVA PRO 2.0 PCI S/T Adapter for PowerPC System
697		21H3890	TURBOWAYS 155 PCI MMF ATM Adapter (1 MB)
698		21H7977	TURBOWAYS 155 PCI UTP ATM Adapter (1 MB)
699		94H0385	3Com Fast EtherLink XL PCI 10/100 Ethernet for PowerPC Microprocessor-based Systems
69B		21P4106	64-bit/66 MHz PCI ATM MMF Adapter
69D		21P4112	64-bit/66 MHz PCI ATM 155 UTP Adapter
6C9		53P2799	SCSI DVD-ROM Drive

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
6CC		59H6259 21H8734 05J6446	4.5 GB SSA drive (DCHC/DGHC) in a blue-handled carrier 9.1 GB 1.6-inch SSA drive (DCHC) in a blue-handled carrier 9.1 GB 1.0-inch SSA drive (DGHC) in a blue-handled carrier
6CC	7025/F40 7025/F50 7026/H50 7026/H70	03N2837 09P0618	9.1 GB SSA Drive 10K RPM in a Blue Handle Carrier
6CC	7025/F80 7025/6F0 7025/6F1	03N4139 09P0620	9.1 GB SSA 10KRPM drive in a F80 carrier 18.2 GB SSA 10K RPM drive in a F80 carrier
6CC	7025/F80 7025/6F0 7025/6F1	09P4943 09P4944 09P4946	9.1 GB SSA 10K RPM drive in a U3 carrier 18.2 GB SSA 10K RPM drive in a U3 carrier 36.4 GB SSA 10K RPM drive in a U3 carrier
6CC	9076 System	12K0576 09P0622 09P0624	9.1 GB SSA 10K RPM drive in an SP carrier 18.2 GB SSA 10K drive in an SP carrier 36.4 GB SSA 10K RPM drive in an SP carrier
700		74G6995	1.1 GB 8-bit SE Disk Drive Assembly
701		74G7006 06H8631 06H7691 27H0380	1.1 GB 16-bit SE Disk Drive Assembly Tray Assembly 4 Position ID Cable Electronics Card Assembly
702		74G7009 74G7015	1.1 GB 16-bit DE Disk Drive Assembly Electronics Card Assembly
703		74G6996 74G6998	2.2 GB 8-bit SE Disk Drive Electronics card assembly
704		74G8824 74G7007 06H8631 06H7691 27H0380	2.2 GB 16-bit SE Disk Drive Assembly 2.2 GB 16-bit SE Disk Drive Unit Tray Assembly 4 Position ID Cable Electronics Card Assembly
705		74G7010 74G7015	2.2 GB 16-bit DE Disk Drive Assembly Electronics Card Assembly
706		74G7008 74G8825 06H8631 06H7691 27H0380	4.5 GB 16-bit SE Disk Drive 4.5 GB 16-bit SE Disk Drive Assembly Tray Assembly 4 Position ID Cable Electronics Card Assembly
707		74G7011 74G7015	4.5 GB 16-bit DE Disk Drive Assembly Electronics Card Assembly

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
709	7024 7025 7026/B80 7026/H50 7043/140 7043/240 7043/270 7044/270 7317/F3L	73H3384	128-Port ISA Adapter
711			Unknown adapter
713		87H3427	IBM ARTIC960Hx PCI Base Adapter
721			Unknown SCSI device
722			Unknown disk drive
723			Unknown CD-ROM drive
724			Unknown tape drive
725	Model P50	96G2130 96G2699	Display, 15", Northern Hemisphere Display, 15", Southern Hemisphere
725	Model P70	96G3020 96G2150	Display, 17", Northern Hemisphere Display, 17", Southern Hemisphere
725	Model P72	21L4570 21L4571 61H0215 61H0216	Display, 17", Northern (White) Display, 17", Northern (Black) Display, 17", Southern (White) Display, 17", Southern (Black)
725	Model P92	61H0412 61H0223 61H0224 61H0225	Display, 19", Northern (White) Display, 19", Northern (Black) Display, 19", Southern (White) Display, 19", Southern (Black)
725	Model P200	96G2701 96G3049	Display, 20", Northern Hemisphere Display, 20", Southern Hemisphere
725	Model P202	60H0233 60H0234 60H0235 60H0236	Display, 21", Northern (White) Display, 21", Northern (Black) Display, 21", Southern (White) Display, 21", Southern (Black)
725			Unknown display adapter type
726			Unknown input device
727			Unknown async device
728			Unknown parallel device
730			Unknown diskette drive
733		59H3161	140 GB 8 mm Tape Library
734		73H1513	Quad Speed SCSI-2 600 MB CD-ROM Drive
736			Quiet Touch Keyboard and Speaker cable <b>Note:</b> The part number is printed on the underside of the keyboard.
741		52G0124 06H8631	1.08 GB SCSI-2 Disk Drive (1-inch high) 8-bit Tray Assembly
742		11H8128	T2 PCI Ethernet Adapter

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
745	7332/005 7332/110		16 GB DDS-2 Tape Cartridge Auto Loader 48 GB DDS-3 Tape Cartridge Auto Loader <b>Note:</b> Service documentation for this device supply the FRU part numbers.
746	7017/S70 7017/S7A 7017/S80 7017/S85	73H3562	PCI SCSI SE Adapter problem SCSI-2 Fast/Wide PCI Adapter
746	7024	73H3562 93H4808	SCSI-2 Fast/Wide PCI Adapter System board, Integrated SCSI
746	7025/F30	73H3562 93H8371	SCSI-2 Fast/Wide PCI Adapter System board, Integrated SCSI
746	7025/F40	73H3562 93H8652	SCSI-2 Fast/Wide PCI Adapter System board, Integrated SCSI
746	7025/F50	73H3562 07L6594	SCSI-2 Fast/Wide PCI Adapter I/O board, Integrated SCSI
746	7026/B80 7026/H10	73H3562 93H8652	SCSI-2 Fast/Wide PCI Adapter System board, Integrated SCSI
746	7026/H50	73H3562 07L6594	SCSI-2 Fast/Wide PCI Adapter I/O board, Integrated SCSI
746	7043/140	73H3562 93H7142 93H7143 93H6023 93H9334	PCI SCSI SE Adapter problem SCSI-2 Fast/Wide PCI Adapter System board 166 MHz, Integrated SCSI System board 200 MHz, Integrated SCSI System board 233 MHz, Integrated SCSI System board 332 MHz, Integrated SCSI
746	7043/150	07L8446	375 MHz System board
746	7043/240	73H3562 11H7516	SCSI-2 Fast/Wide PCI Adapter System board, Integrated SCSI
746	7043/260	73H3562 08L0633	SCSI-2 Fast/Wide PCI Adapter I/O board
746	7043/270	41L6013 73H3562	I/O board SCSI-2 Fast/Wide PCI Adapter
746	7044/170	41L5721 09P0037 73H3562	System board, class A, Integrated SCSI System board, class B, Integrated SCSI SCSI-2 Fast/Wide PCI Adapter
746	7044/270	41L6013 73H3562	I/O board SCSI-2 Fast/Wide PCI Adapter
746	7046/B50	41L5912	375 MHz System board
746	9076 SMP Thin/Wide Node	73H3562 41L6138	SCSI-2 Fast/Wide PCI Adapter I/O board, Integrated SCSI
746	9076/ Power3 SMP Thin/Wide Node	73H3562 03N2866 03N3368	SCSI-2 Fast/Wide PCI Adapter I/O planar (200 MHz), integrated SCSI I/O planar (375 MHz), integrated SCSI
747		93H8407	SCSI-2 Differential Fast/Wide PCI Adapter

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
749	7331/205		7331 Model 205 8 mm Tape Library <b>Note:</b> For FRU numbers, refer to the service documentation for this device.
74A	7024	93H4808	Integrated SCSI-2 F/W SE problem System board, Integrated SCSI
74A	7025/F30	93H8371	System board, Integrated SCSI
74A	7025/F40	93H8652	System board, Integrated SCSI
74A	7025/F50	41L5106	I/O board, Integrated SCSI
74A	7026/B80	00P1859 73H3384	I/O board SCSI-2 Fast/Wide PCI Adapter
74A	7026/H10	93H8652	System board, Integrated SCSI
74A	7026/H50	41L5106	I/O board, Integrated SCSI
74A	7026/H70	03N2797	I/O board, Integrated SCSI
74A	7043/140	73H3562 93H7142 93H7143 93H6023 93H9334	PCI SCSI SE Adapter problem SCSI-2 Fast/Wide PCI Adapter System board 166 MHz, Integrated SCSI System board 200 MHz, Integrated SCSI System board 233 MHz, Integrated SCSI System board 332 MHz, Integrated SCSI
74A	7043/150	07L8446	375 MHz System board
74A	7043/240	73H3562 11H7516	SCSI-2 Fast/Wide PCI Adapter System board, Integrated SCSI
74A	7043/260	73H3562 08L0633	SCSI-2 Fast/Wide PCI Adapter I/O board
74A	7043/270	41L6013 73H3562	I/O board SCSI-2 Fast/Wide PCI Adapter
74A	7044/170	41L5721 00P1859 73H3562	System board, class A, Integrated SCSI System board, class B, Integrated SCSI SCSI-2 Fast/Wide PCI Adapter
74A	7044/270	41L6013 73H3562	I/O board SCSI-2 Fast/Wide PCI Adapter
74A	7046/B50	41L5912	375 MHz System board
74A	9076 SMP Thin/Wide Node	73H3562 41L6138	SCSI-2 Fast/Wide PCI Adapter I/O board, Integrated SCSI
74A	9076/ Power3 SMP Thin/Wide Node	73H3562 03N2866 03N3368	SCSI-2 Fast/Wide PCI Adapter I/O planar (200 MHz), integrated SCSI I/O planar (375 MHz), integrated SCSI
750		04H8098	Auto LANStreamer® Token-Ring PCI Adapter
751		08L1319 06H6036 52G4233 40H7351	SCSI 32-bit SE F/W RAID Adapter SCSI RAID Cable (1.0 m) SCSI RAID Cable (2.5 m) SCSI RAID Cable (6.0 m)
757		87G4858	SCSI 13 GB 1/4-Inch Tape Drive
759		87G8976	1080 MB Disk Drive

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
763		31L7847 46H9688 77G0818	SP Switch MX Adapter Wrap Plug Terminator
764		08L0398 46H9688 77G0818	SP System Attachment Adapter Wrap Plug Terminator
772		83H7105	4.5 GB 16-bit SCSI F/W Disk Drive
773		76H2698	9.1 GB 16-bit SCSI F/W Disk Drive
774	7204/339	27H1677	9.1 GB External SCSI DE Disk Drive
775		93H5107	MVP Power Graphics Adapter
776		93H6594	PCI Token-Ring Adapter
777		94H0823	10/100 Base-TX Ethernet PCI Adapter
778		24L0030	POWER GXT3000P 3D Graphics Adapter PCI
77B		03N3952 09P1421	4-Port 10/100 Ethernet Tx PCI Adapter 4-Port 10/100 Ethernet Tx PCI Adapter (new chip)
780		40H1937	X.25 Interface Co-Processor Adapter
781		84F7540 33F8967	Co-Processor Multiport Adapter, Model 2 Daughter Co-Processor Multiport Adapter, Model 2 (Base) <b>Note:</b> Replace the daughter card before replacing the base card.
783		76H0473 76H0474 41H8714	24/48 GB DDS-2 4 mm Tape Autoloader (vertical orientation) 24/48 GB DDS-2 4 mm Tape Autoloader (horizontal orientation) Tape Magazine
784		93H7151 93H7152	2.1 GB 8-bit SCSI-2 Disk Drive 2.1 GB 16-bit SCSI-2 Disk Drive
785		40H6632	8-port ISA Async EIA-232/RS-422 Adapter
786		93H6264	GXT250P High Performance Graphics Adapter
786		93H6267	GXT255P High Performance Graphics Adapter
787		94H0028	GXT500P Graphics Adapter
788		07L9009	Ultimedia® Video Capture Adapter
789	7209/003	50G0212	External 2.6 GB Rewritable Optical Disk Drive
78B		00P2429	POWER GXT4000P Graphics Adapter
78D		03N4169	GXT300P 2D Graphics Adapter
790			Multi-bus Integrated Ethernet Adapter problem <b>Note:</b> If the type/model and FRU information is not listed here, refer to FFC 221.
791		74G8824 74G7007 06H8631 06H7691 27H0380	2.2 GB 16-bit SE Disk Drive Assembly 2.2 GB 16-bit SE Disk Drive unit Tray Assembly 4 Position ID Cable Electronics card Assembly

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
792		83H7105	4.5 GB 16-bit SE Disk Drive Assembly
793		76H2698	9.1 GB 16-bit SE Disk Drive Assembly
795		73H3405 73H3401 73H3413	FDDI LPSAS Adapter (single fiber) FDDI LPDAS Adapter (dual fiber) FDDI UPSAS Adapter (single copper)
799		93H6086 93H3662	2-Port Multiprotocol PCI Adapter 2-Port Multiprotocol PCI Wrap Plug
7C0	520 550 570	System board For the latest part numbers, go to the Part Number Catalog.	
7C0	7024	93H4808	CPU/System Interface System board
7C0	7025/F30	93H8371	System board
7C0	7025/F40	93H8652	System board
7C0	7025/F50	07L9718	System board
7C0	7026/B80	08L0988	System board
7C0	7026/H10	93H8652	System board
7C0	7026/H50	07L9718	System board
7C0	7026/H70	08L0988	System board
7C0	7028/6C1 7028/6E1	09P2420	System Board
7C0	7028/6C4 7028/6E4	00P3166 00P4488 00P5830	CEC Backplane (GP processor) CEC Backplane (GQ processor) CEC Backplane (RIO-G capability)
7C0	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)
7C0	7043/140	93H7142 93H7143 93H6023 93H9334	166 MHz System board 200 MHz System board 233 MHz System board 332 MHz System board
7C0	7043/150	41L5912	375 MHz System board
7C0	7043/240	11H7516	166 MHz System board
7C0	7043/260	08L1303	CPU/System Interface System board
7C0	7043/270	08L0988	System board
7C0	7044/170	41L5721 09P0037	System board, class A System board, class B
7C0	7044/270	08L0988	System board
7C0	7046/B50	41L5912	375 MHz System board
7C0	7317/F3L	93H8371	System board
7C0	9076 SMP Thin/Wide Node	07L9718	System board

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
7C0	9076/ Power3 SMP Thin/Wide Node	08L1303 08L0988	System board (200 MHz) System board (375 MHz)
7C0	9112/265	09P2420	System Board
7C1	520 550 570	Business Audio Subsystem problem System board  For the latest part numbers, go to the Part Number Catalog.	
7C1	7024	93H4808	Business Audio Subsystem problem System board
7C1	7025/F30	93H8371	System board
7C1	7025/F40	93H8652	System board
7C1	7025/F50	07L9718	System board
7C1	7026/B80	00P1859 04N6150	I/O board Operator panel assembly
7C1	7026/H10	93H8652	System board
7C1	7026/H50	07L9718	System board
7C1	7026/H70	08L0988	System board
7C1	7028/6C1 7028/6E1	15F8409 21P7166	System Board Operator Panel
7C1	7028/6C4 7028/6E4	00P4488 00P5830 21P7166	System Board (with RIO capability) System Board (with RIO-2 capability) Operator Panel
7C1	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970 53P6230	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way) Operator Panel
7C1	7043/140	93H7142 93H7143 93H6023 93H9334	166 MHz System board 200 MHz System board 233 MHz System board 332 MHz System board
7C1	7043/150	41L5912	375 MHz System board
7C1	7043/240	11H7516	166 MHz System board
7C1	7043/260	08L1303	System board
7C1	7043/270	41L6013 07L7234	I/O board Operator panel
7C1	7044/170	41L5721 09P0037	System board, class A System board, class B
7C1	7044/270	41L6013 07L7234	I/O board Operator panel
7C1	7046/B50	41L5912	375 MHz System board
7C1	7317/F3L	93H8371	System board
7C1	9112/265	09P2420 21P7166	System Board Operator Panel
804		73H2601	8X Speed SCSI-2 CD-ROM Drive
806		07L7113	GXT800P Graphics Adapter



Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
807			SCSI Device Enclosure <b>Note:</b> If the resource description on the screen displays: <ul style="list-style-type: none"> <li>• "ses" or "SCSI Enclosure Services Device," use FFC 199.</li> <li>• "saft" or "SCSI Accessed Fault-Tolerant Enclosure Device," use FFC 2580.</li> </ul>
80c			SSA Adapter problem refer to the <i>SSA Adapters: User's Guide and Maintenance Information</i> .
811			Processor Complex being identified.
812			Common Standard Adapter Logic problem <b>Note:</b> For type/model and FRU information refer to FFC 227.
814	520 550 570	System board For the latest part numbers, go to the Part Number Catalog.	
814	7025/6F0 7025/6F1	43L5269	System board
814	7025/F80	43L5269	System board
814	7026/6H0 7026/6H1 7026/6M1 7026/H80 7026/M80	41L5560	Primary drawer I/O backplane
814	7017/S70	03N3523	Service Processor Card problem <b>Note:</b> Unless listed, refer to FFC 221 for type/model and FRU information.
814	7017/S7A	03N3523	Service Processor Card <b>Note:</b> Unless listed, refer to FFC 221 for type/model and FRU information.
814	7017/S80 7017/S85	11K0301	Service Processor Card <b>Note:</b> Unless listed, refer to FFC 221 for type/model and FRU information.
814	7028/6C4 7028/6E4	00P3166 00P4488 00P5830	CEC Backplane (GP processor) CEC Backplane (GQ processor) CEC Backplane (RIO-G capability)
814	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970 80P2388	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way) Service Processor
814	7038/6M2	00P4062 00P5604	Service Processor/PCI Adapter Backplane Service Processor/PCI Adapter Backplane (RIO-2 capability)
814	7039/651	09P6222	Service Processor Card
814	7040/671 7040/681	09P2435	Primary I/O Book
814	9076/ Power3 SMP High Node	11K0571	NIO Planar

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
815			Floating Point Processor problem <b>Note:</b> For type/model and FRU information refer to FFC 210.
815	9076/ Power3 SMP High Node		<b>Note:</b> If the type/model and FRU information is not listed here, refer to FFC 221.
816			Operator Panel Logic problem <b>Note:</b> If the type/model and FRU information is not listed here, refer to FFC 221.
816	7038/6M2	00P4062 00P5604	Service Processor/PCI Adapter Backplane Service Processor/PCI Adapter Backplane (RIO-2 capability)
816	7039/651	09P6222	Service Processor Card
816	7040/671 7040/681	09P2435	Primary I/O Book
817	520 550 570	System board For the latest part numbers, go to the Part Number Catalog.	
817	7025/6F0 7025/6F1	43L5269	System board
817	7025/F80	43L5269	System board
817	7026/6H0 7026/6H1 7026/6M1 7026/H80 7026/M80	41L5560	Primary drawer I/O backplane
817	7017/S70	03N3523	Time of Day Logic problem Service Processor Card <b>Note:</b> Unless listed refer to FFC 221 for type/model and FRU information.
817	7017/S7A	03N3523	Service Processor Card <b>Note:</b> Unless listed refer to FFC 221 for type/model and FRU information.
817	7017/S80 7017/S85	11K0301	Service Processor Card <b>Note:</b> Unless listed refer to FFC 221 for type/model and FRU information.
817	7028/6C4 7028/6E4	00P3166 00P4488 00P5830	CEC Backplane (GP processor) CEC Backplane (GQ processor) CEC Backplane (RIO-G capability)
817	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970 80P2388	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way) Service Processor
817	7038/6M2	00P4062 00P5604	Service Processor/PCI Adapter Backplane Service Processor/PCI Adapter Backplane (RIO-2 capability)
817	7039/651	09P6222	Service Processor Card
817	7040/671 7040/681	09P2435	Primary I/O Book

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
817	9076/ Power3 SMP High Node	11K0571	NIO Planar
820			Interprocessor related testing problem <b>Note:</b> For type/model and FRU information, if not listed here, refer to FFC 221.
821			Standard Keyboard Adapter problem <b>Note:</b> If the type/model and FRU information is not listed here, refer to FFC 221.
823			Standard Mouse Adapter problem <b>Note:</b> For type/model and FRU information, if not listed here, refer to FFC 221.
823	9076/ Power3 SMP High Node	11K0571	NIO Planar
824			Standard Tablet Adapter problem <b>Note:</b> For type/model and FRU information, if not listed here, refer to FFC 221.
824	9076/ Power3 SMP High Node	11K0571	NIO Planar
825	9076/ Power3 SMP High Node	11K0571	NIO Planar
826			Serial Port 1 Adapter problem <b>Note:</b> For type/model and FRU information, if not listed here, refer to FFC 221.
826	7038/6M2	00P4062 00P5604	Service Processor/PCI Adapter Backplane Service Processor/PCI Adapter Backplane (RIO-2 capability)
826	7039/651	09P6222	Service Processor Card
826	7040/671 7040/681	09P2435	Primary I/O Book
826	9076 SMP Thin/Wide Node	11J4000 11J5197 41L6138	Supervisor Card Power/supervisor interposer cable I/O planar
826	9076/ Power3 SMP Thin/Wide Node	11J4000 11J6147 03N2866 03N3368	Supervisor Card Power/supervisor interposer cable I/O planar (200 MHz) I/O planar (375 MHz)
826	9076/ Power3 SMP High Node	11K0571	NIO Planar
827			Built-in Parallel Port Adapter problem <b>Note:</b> For type/model and FRU information, if not listed here, refer to FFC 221.
827	9076/ Power3 SMP High Node	11K0571	NIO Planar
828			Standard Diskette Adapter problem <b>Note:</b> For type/model and FRU information, if not listed here, refer to FFC 221.
828	7038/6M2	00P4062 00P5604	Service Processor/PCI Adapter Backplane Service Processor/PCI Adapter Backplane (RIO-2 capability)

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
828	7039/651	09P6222	Service Processor Card
828	7040/671 7040/681	09P2435	Primary I/O Book
828	9076/ Power3 SMP High Node	11K0571	NIO Planar
82C		11H6095	S15 Graphics PCI Adapter
830		11H5969	8-Port ISA adapter
831			Serial Port 2 Adapter problem <b>Note:</b> If the type/model and FRU information is not listed here, refer to FFC 221.
831	9076/ Power3 SMP High Node	11K0571	NIO Planar
836		73H3384	128-Port Async Controller
837		88G3842 93H6549 40H2589 93H7091	Remote Async Node, 16-port EIA-232 Enhanced Remote Async Node, 16-port EIA-232 Rack Mounted Node, 16-port EIA-232 Power Supply, Remote Async Node
840		93H3809	PCI Single-Ended Ultra SCSI Adapter <b>Note:</b> If you receive this FFC but are working with Integrated Ultra SCSI, see FFC 84A.
844	7135		RAIDiant Array SCSI Subsystem Controller <b>Note:</b> Refer to the 7135 documentation.
845	7135		RAIDiant Array SCSI 2.0 GB Disk Drive <b>Note:</b> Refer to the 7135 documentation.
846	7135		RAIDiant Array SCSI 1.3 GB Disk Drive <b>Note:</b> Refer to the 7135 documentation.
84A	520 550 570	I/O board For the latest part numbers, go to the Part Number Catalog.	
84A	7026/B80	00P1859	I/O board
84A	7026/H10	93H8652	Integrated Ultra SCSI problem System board, Integrated Ultra SCSI
84A	7026/H50	41L5106	I/O board, Integrated Ultra SCSI
84A	7026/H70	03N3484	I/O board, Integrated Ultra SCSI
84A	7028/6C1 7028/6E1	09P2420	System Board
84A	7028/6C4 7028/6E4	00P3166 00P4488 00P5830	CEC Backplane (GP processor) CEC Backplane (GQ processor) CEC Backplane (RIO-G capability)
84A	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
84A	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)
84A	7043/140	93H7142 93H7143 93H6023 93H9334	System board 166 MHz, Integrated Ultra SCSI System board 200 MHz, Integrated Ultra SCSI System board 233 MHz, Integrated Ultra SCSI System board 332 MHz, Integrated Ultra SCSI
84A	7043/150	41L5912	375 MHz System board
84A	7043/240	11H7516	System board, Integrated Ultra SCSI
84A	7043/260	03N2443	I/O board
84A	7043/270	41L6013	I/O board
84A	7044/170	41L5721 09P0037	System board, class A System board, class B
84A	7044/270	41L6013	I/O board
84A	7046/B50	41L5912	375 MHz System board
84A	7317/F3L	93H8371	System board, Integrated Ultra SCSI
84A	9076/ Power3 SMP High Node	11K0571	NIO Planar
84A	9112/265	09P2420	System Board
868			Integrated SCSI I/O Controller problem <b>Note:</b> If the type/model and FRU information is not listed here, refer to FFC 221.
868	9076/ Power3 SMP High Node	11K0571	NIO Planar
887	520 550 570	Integrated Ethernet Adapter problem System board, Integrated Ethernet Adapter  For the latest part numbers, go to the Part Number Catalog.	
887	7025/F40	93H8652	Integrated Ethernet Adapter problem System board, Integrated Ethernet Adapter
887	7025/F50	41L5106	I/O board, Integrated Ethernet Adapter
887	7026/B80	00P1859	I/O board
887	7026/H10	93H8652	System board, Integrated Ethernet Adapter
887	7026/H50	41L5106	I/O board, Integrated Ethernet Adapter
887	7026/H70	03N3484	I/O board, Integrated Ethernet Adapter
887	7028/6C1 7028/6E1	09P2420	System Board
887	7028/6C4 7028/6E4	00P3166 00P4488 00P5830	CEC Backplane (GP processor) CEC Backplane (GQ processor) CEC Backplane (RIO-G capability)

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
887	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)
887	7043/140	93H7142  93H7143  93H6023  93H9334	System board 166 MHz, Integrated Ethernet Adapter System board 200 MHz, Integrated Ethernet Adapter System board 233 MHz, Integrated Ethernet Adapter System board 332 MHz, Integrated Ethernet Adapter
887	7043/150	41L5912	375 MHz System board
887	7043/240	11H7516	System board, Integrated Ethernet Adapter
887	7043/260	03N2443	I/O board
887	7043/270	41L6013	I/O board
887	7044/170	41L5721 09P0037	System board, class A System board, class B
887	7044/270	41L6013	I/O board
887	7046/B50	41L5912	375 MHz System board
887	9076 SMP Thin/Wide Node	41L6138	I/O planar
887	9076/ Power3 SMP Thin/Wide Node	03N2866 03N3368	I/O planar (200 MHz) I/O planar (375 MHz)
887	9076/ Power3 SMP High Node	11K0571	NIO Planar
887	9112/265	09P2420	System Board
891			Vendor SCSI Adapter
892			Vendor Display Adapter
893			Vendor LAN Adapter
894			Vendor Async Communications Adapter
899			Atape
89c		73H1513	600 MB Double Speed Tray-Loading CD-ROM <b>Note:</b> The 2x CD-ROM drive is no longer available. A 4x CD-ROM drive will be shipped as a replacement.
900		93H7983	GXT110P Graphics Adapter
901			Vendor SCSI device
902			Vendor Display
903			Vendor Async device
904			Vendor Parallel device
905			Other Vendor device

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
908	7025/F40 7025/F50 7043/140 7043/150 7043/240 7043/260 7043/270 7044/170 7044/270	93H2399	POWER GXT1000 Graphics Accelerator Attachment Adapter
912		86F0119 86F0125	2.0 GB SCSI-2 DE Disk Drive Differential frame electronics <b>Note:</b> Check RETAIN for frame electronics availability. Exchange the complete drive assembly whenever possible. Exchange the logic card only when the data on the disk must be saved.
913		6374682 6374683	1 GB DE Disk Drive, half-height Differential frame electronics <b>Note:</b> Check RETAIN for frame electronics availability. Exchange the complete drive assembly whenever possible. Exchange the logic card only when the data on the disk must be saved.
914		16G8492	5 GB 8 mm SCSI DE Tape Drive
915		59H3481	4/8 GB 4 mm Tape Drive
917		86F0767	2.0 GB DE F/W Disk Drive <b>Note:</b> If the disk drive is in a 7134 drawer replace with FRU P/N 67G3022.
918		86F0766	2.0 GB 16-bit SCSI SE F/W Disk Drive
921		82G3278 1392090 1394609	101 Key Keyboard problem Keyboard U.S. English Keyboard Cost Reduced English Keyboard cable
921	7040	93H8120	101 Keyboard U.S. English
922		8131596	102 Key Keyboard problem Keyboard, Arabic
922	7040	93H8125	Keyboard, Arabic (ID 238)
922	7040	93H8127	Keyboard, Belgium-French (ID 120)
922		1391414	Keyboard, Belgium-Dutch
922		1391526	Keyboard, Belgium-French
922	7040	93H8126	Keyboard, Belgium-French (ID 120)
922		64F7707	Keyboard, Brazilian Portuguese
922	7040	93H8124	Keyboard, Brazilian Portuguese (ID 275)
922		1399583	Keyboard, Bulgarian
922	7040	93H8128	Keyboard, Bulgarian (ID 442)
922	7040	93H8155	Keyboard, Chinese/US (ID 467)
922		1399570	Keyboard, Czechoslovakian

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
922	7040	93H8129	Keyboard, Czechoslovakian (ID 243)
922		1391407	Keyboard, Danish
922	7040	93H8130	Keyboard, Danish (ID 159)
922	7040	93H8130	Keyboard, Danish (ID 159)
922	7040	93H8131	Keyboard, Dutch (ID 143)
922		1391511	Keyboard, Dutch/Netherlands
922		1391411	Keyboard, Finnish/Swedish
922		1391402	Keyboard, French
922	7040	93H8132	Keyboard, French(ID 189)
922		82G3279	Keyboard, French-Canadian
922	7040	93H8121 93H8122	Keyboard, French-Canadian (ID 058) Keyboard, French-Canadian (ID 445)
922	7040	93H8133	Keyboard, German (ID 129)
922		1391403	Keyboard, German/Austrian
922		1399046	Keyboard, Greek
922	7040	93H8134	Keyboard, Greek (ID 129)
922		1391408	Keyboard, Hebrew
922	7040	93H8135	Keyboard, Hebrew (ID 212)
922		1399581	Keyboard, Hungarian
922	7040	93H8136	Keyboard, Hungarian (ID 208)
922		1391407	102 Key Keyboard problem Keyboard, Icelandic
922	7040	93H8137	Keyboard, Icelandic (ID 197)
922		1393395	Keyboard, Italian
922	7040	93H8138	Keyboard, Italian (ID 142)
922	7040	93H8156	Keyboard, Korea (ID 413)
922		82G3292	Keyboard, Latin American (Spanish)
922	7040	93H8152	Keyboard, Latvia (ID 234)
922		1391409	Keyboard, Norwegian
922	7040	93H8139	Keyboard, Norwegian (ID 155)
922		1391410	Keyboard, Portuguese
922		1399580	Keyboard, Polish
922	7040	93H8140	Keyboard, Polish (ID 214)
922	7040	93H8141	Keyboard, Portuguese (ID 163)
922		1399582	Keyboard, Romania
922	7040	93H8142	Keyboard, Romania (ID 446)
922		1399579	Russian
922	7040	93H8143	Keyboard, Russian (ID 443)
922	7040	93H8144	Keyboard, Serbian (ID 118)
922		1399571	Keyboard, Slovak
922	7040	93H8145	Keyboard, Slovak (ID 245)



Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
922		1391405	Keyboard, Spanish
922	7040	93H8123 93H8146	Keyboard, Spanish (ID 171) Keyboard, Spanish (ID 172)
922	7040	93H8147	Keyboard, Sweden/Finland (ID 153)
922		1395881	Keyboard, Swiss-French
922	7040	93H8148	Keyboard, Swiss French/German (ID 150)
922		1395882	Keyboard, Swiss-German
922	7040	93H8157	Keyboard, Thailand (ID 191)
922		1393286	Keyboard, Turkish (ID 179)
922	7040	93H8149	Keyboard, Turkish (ID 179)
922		8125409	Keyboard, Turkish (ID 440)
922	7040	93H8150	Keyboard, Turkish (ID 440)
922		1391406	Keyboard, U.K. English
922	7040	93H8151	Keyboard, Turkish (ID 166)
922	7040	93H8153	Keyboard, US English ISO9995 (ID 103P)
922		06H3048	Keyboard, U.S. OEM
922	7040	93H8154	Keyboard, 106 Japan (ID 194)
922		1394609	Keyboard cable
923		1392090 79F0167 66G0507 06H5286 02G7353	106 keys International Keyboard problem Keyboard, Chinese Keyboard, Japanese-Kanji Japanese, Enhanced Keyboard, Korean Keyboard, Taiwanese
925		93H9113	3-Button Mouse
925	7040	76H5084	3-Button Mouse
926		6247450 74F3130	Tablet, 5083 Model 21 Tablet, 6093 Model 11
927		6247452 74F3140 93H7714	Tablet, 5083 Model 22 Tablet, 6093 Model 12 Tablet, 6093 Model 21
929		39F8227 39F8302	Dials, 6094 Model 10 Cable, Serial Attachment, Power
930		39F8226 39F8302	Lighted Program Function Keyboard (LPFK), 6094 Model 20 Cable, Serial Attachment, Power

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
935	7024 7025 7043 7317 7026 7040/671 7040/681 7044 7017/S70 7017/S7A 7017/S80 7017/S85	93F2361 76H4091 07L7814	1.44 MB 3.5-inch White Diskette Drive 1.44 MB 3.5-inch Black Diskette Drive 1.44 MB 3.5-inch Diskette Drive
938			Serial HIPPI PCI Adapter <b>Notes:</b> 1. Use the number printed above the bar code to order this part. 2. The FRU part number of the wrap plug used with this adapter is 21H3547.
946	570	Standard Serial Port 3 Adapter problem For the latest part numbers, go to the Part Number Catalog.	
946			Standard Serial Port 3 Adapter problem <b>Note:</b> For type/model and FRU information, if not listed here, refer to FFC 221.
946	7039/651	09P6222	Service Processor Card
946	7040/671 7040/681	09P2435	Primary I/O Book
946	9076/ Power3 SMP High Node	11K0571	NIO Planar
947		84G3491	1000 MB, 16-bit Disk Drive
950			Unknown SCSI device is missing.
951		53F3429 6373521	670 MB SCSI Disk Drive Logic Card <b>Note:</b> Exchange the complete drive whenever possible. If extreme data saving measures are necessary, exchange the logic card.
952		53F3427 6373521	355 MB SCSI Disk Drive Logic Card <b>Note:</b> Exchange the complete drive whenever possible. If extreme data saving measures are necessary, exchange the logic card.
953		93X0961 93X0901	320 MB SCSI Disk Drive Logic Card and Frame assembly <b>Note:</b> Exchange the complete drive whenever possible. Exchange the logic card only when the data on the disk must be saved.

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
954		00G1948 73F8994	400 MB SCSI Disk Drive Logic Card and Frame assembly <b>Note:</b> Exchange the complete drive whenever possible. Exchange the logic card only when the data on the disk must be saved.
955		45G9502	857 MB SCSI Disk Drive
956		6373521	355/670 MB Logic Card.
959		81F8085	160MB SCSI Disk Drive
960		52G0061 31G9756	1.37 GB SCSI Disk Drive Assembly Logic card <b>Note:</b> Logic card stocking is limited; special ordering is required. Check RETAIN for logic card availability. Exchange the complete drive assembly when possible. Exchange the logic card when the data on the disk must be saved.
962	3161		Use device documentation.
963	3163		Use device documentation.
964		59H2839 59H4120 59H2835 59H2842	20 GB 8 mm SE SCSI Tape Drive (internal,white) 20 GB 8 mm SE SCSI Tape Drive (internal, black) 20 GB 8 mm Diff SCSI Tape Drive (external/white) 400 GB 8 mm Diff Tape Autoloader (No LCD in Bezel/white)
966		93H2136	Media Streamer Audio/Video Decoder Adapter
968		55F9902 55F9909	1 GB SCSI SE Disk Drive Single-Ended Frame Electronics <b>Note:</b> Check RETAIN for frame electronics availability. Exchange the complete drive assembly when possible. Exchange the logic card when the data on the disk must be saved.
970	9348		1/2-inch 9-Track Tape Drive Use device documentation
971		16G8423	150 MB 1/4-Inch Tape Drive
972		16G8421	2.3 GB 8 mm Tape Drive
973			Other SCSI Tape Drive
974		88G3929	CD-ROM Drive (Type A or Type B bezel)
980	4216		Use the device documentation
981		51G8237	540 MB SCSI-2 Single-Ended Disk Drive
982	3852		Use the device documentation
983	4201		Use the device documentation
984		45G9467	1 GB 8-bit Disk Drive
986		36G0454	2.4 GB SCSI Disk Drive
987		73H1513	600 MB CD-ROM-2 Disk Drive
989		43G1842	200 MB SCSI Disk Drive

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
990		86F0118	2.0 GB SCSI-2 SE Disk Drive
991		46G2700	525 MB 1/4-Inch SCSI Tape Drive
992	5202		Use the device documentation
993	5204		Use the device documentation
994		59H3159	5/10 GB 8 mm Internal Tape Drive
995		21H5155	1.2 GB 1/4-inch Cartridge Tape Drive
998		8191193	2.0 GB 4 mm SCSI Tape Drive
999	3514 7137		Disk Array Subsystems <b>Note:</b> Refer to the 3514 or 7137 documentation
B08		02G7431	Ethernet 10 Base Twisted-pair Transceiver
B09		02G7437	Ethernet/ISO 8802.3 Transceiver (formerly IEEE 802.3)
B10			System board PTC (thermal fuse) <b>Note:</b> If a thermal fuse has opened, it should reset within ten minutes after turning the power off. If the thermal fuse does not reset, a faulty device may be drawing excessive power through the fuse.
B31			Unknown keyboard type
B3A			Unidentifiable backplane tied to a SCSI RAID adapter
B54		43G0936 43G0937	128-Port Async Controller Cable, 0.2 m (9 in.) 128-Port Async Controller Cable, 4.6 m (15 ft.)
B69		33F8967	Co-Processor Multiport Adapter, Model 2 (0 MB)
B71		53F2612	8-Port EIA-232-D Multiport, Model 2 Interface Card
B72		53F2615	8-Port EIA-422-A Multiport, Model 2 Interface Card
B73		72F0164	6-Port V.35 Multiport, Model 2 Interface Card
B74		04G5500	6-Port V.21 Multiport, Model 2 Interface Card
B77		53F2662	Co-Processor 1 MB Memory Module
B81		40F9897	Co-Processor Multiport Interface Cable
B82		71F0162	Co-Processor Multiport V.35 Cable
B83		71F0164	Co-Processor Multiport X.21 Cable

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
B88			<p>Generic SCSI I/O Controller</p> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1. If the failing FRU for this FFC is PCI(x), where x is the PCI bus number, 0, 1, ..., refer to FFC 221.</li> <li>2. Use the location code to identify the failing FRU. Determine if the failing FRU is integrated on the system board. If the failing FRU is integrated use FFC 221. If the failing FRU is not integrated replace the FRU identified by its description that is shown with the location code for SCSI and SCSI-2 adapter. Choose the FFC for the appropriate SCSI I/O controller.</li> <li>3. Check the SCSI controller fuse or PTC resistor before exchanging the system board. Refer to Service Hints in 398.</li> <li>4. Check that the SCSI disable jumper is in the enabled position.</li> <li>5. Check the FRU number of the installed external terminator: Low density - 51G7736 High density - 51G7737</li> </ol>
C11		36G4280	<p>2.4 GB SCSI Disk Drive Field Repair Assembly</p> <p><b>Note:</b> The field repair assembly includes one disk drive, the electronics planar, and the 5-1/4 inch form factor "cage." The remaining "good" drive is removed from the failed disk drive assembly and installed in the field repair assembly to create a complete dual-disk drive assembly. If saving data is critical, as a last resort try installing the "bad" drive in place of one of the two "good" drives in the now-complete field repair assembly. If the "bad" drive operates satisfactorily, the problem was probably in the electronics planar.</p>
C22		94H0779	RJ-45 to DB25 Converter Cable Kit
C24		54G3384 55G3384	<p>Fiber Optic Cables for PCI Fibre Channel Adapter</p> <p>6.7 m</p> <p>12.8 m</p>
C33	7025/F40 7250/002	73H4034	GPSS Card
C34	7025/F40 7250/002	11H8490	RSS Card (without memory sockets)
C35	7025/F40 7250/002	65G4887	VOO Card
C36	7025/F40 7250/002	65G4892	Attachment Adapter Cable
C44	7025/F40 7250/002	65G4894	VOO/RSS Crossover Cable

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
C45	7025/F40 (Base and AG memory) 7250/002	65G4889	12M VRAM Memory Module
C46	7025/F40 (Base and AG memory) 7250/002	65G4890	16M VRAM Memory Module
C47	7025/F40 (TX Memory) 7250/002	65G4891	16M DRAM Memory Module
C48	7025/F40 7250/002	65G4893	RSS/GPSS Crossover Card
C94		68X6356 87H3621	IBM ARTIC960 4 MB Memory Module IBM ARTIC960 8 MB Memory Module
C95		87H3413 87H3428 87H3701 09J8829 51H8702	IBM ARTIC960 4-Port Selectable interface Board IBM ARTIC960 4-Port T1/E1 interface Card IBM ARTIC960Hx DSP interface card IBM ARTIC960 Quad T1/E1 interface card IBM ARITC960 PCI Adapter interface Board
C97		87H3502 87H3311 5605670	IBM ARTIC960 4-Port T1/E1 Interface Card Wrap Plug IBM ARTIC960 4-Port Selectable Interface Board Wrap Plug ESCON Wrap Plug <b>Note:</b> A wrap plug is shipped with each adapter and cable.
C98		87H3405 87H3396 87H3408 87H3399 87H3402 87H3518 87H3515	IBM ARTIC960 4-Port Selectable EIA-232 Cable IBM ARTIC960 4-Port Selectable RS-449 Cable IBM ARTIC960 4-Port Selectable X.21 Cable IBM ARTIC960 4-Port Selectable V.35 Cable IBM ARTIC960 4-Port Selectable EIA-530 Cable IBM ARTIC960 4-Port T1 RJ-45 Cable IBM ARTIC960 4-Port E1 RJ-45 Cable <b>Note:</b> A wrap plug is shipped with each adapter and cable.
D01	520 550 570	Generic L2 Cache problem For the latest part numbers, go to the Part Number Catalog.	
D01	7017/S70	90H9694 90H9662	Generic L2 Cache problem Processor Card (4x) (Type 2) Processor Card (4x) (Type 1)

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
D01	7017/S7A	08L1474 08L1473	Processor Card (type 2) (262 MHz) Processor Card (type 1) (262 MHz)
D01	7017/S80	23L7434 23L7447	Processor Card (Type 1 RH) Processor Card (Type 2 LH)
D01	7017/S85	21P4511 21P4517	Processor Card (Type 1 RH) Processor Card (Type 2 LH)
D01	7024/E20	40H6616 03N3989	CPU Card (100 MHz) CPU Card (233 MHz)
D01	7024/E30	73H3614 93H2431 03N3989	CPU Card (133 MHz) CPU Card (166 MHz) CPU Card (233 MHz)
D01	7025/6F0	04N5353 09P6524 23L7785 09P6525 23L7794 53P1301	1-way processor card (600 MHz) 1-way processor card (750 MHz) 2-way processor card (600 MHz) 2-way processor card (750 MHz) 4-way processor card (600 MHz) 4-way processor card (750 MHz)
D01	7025/6F1	04N5353 09P6524 23L7785 09P6525 23L7794 53P1301 23L7799 53P1334	1-way processor card (600 MHz) 1-way processor card (750 MHz) 2-way processor card (600 MHz) 2-way processor card (750 MHz) 4-way processor card (600 MHz) 4-way processor card (750 MHz) 6-way processor card (668 MHz) 6-way processor card (750 MHz)
D01	7025/F30	73H3614 93H2431 03N3989	CPU Card (133 MHz) CPU Card (166 MHz) CPU Card (233 MHz)
D01	7025/F40	11H7517 93H5163	CPU Card (166 MHz) CPU Card (233 MHz)
D01	7025/F50	93H2679 73H4768 93H9018 93H8945	166 MHz CPU Card (1-way) 166 MHz CPU Card (2-way) 332 MHz CPU Card (1-way) 332 MHz CPU Card (2-way)
D01	7025/F80	04N4765 21P4751 21P4760 21P4774	1-way processor card (450 MHz) 2-way processor card (450 MHz) 4-way processor card (450 MHz) 6-way processor card (500 MHz)
D01	7026/6H0	04N5353 09P6524 23L7785 09P6525 23L7794 53P1301	1-way processor card (600 MHz) 1-way processor card (750 MHz) 2-way processor card (600 MHz) 2-way processor card (750 MHz) 4-way processor card (600 MHz) 4-way processor card (750 MHz)

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
D01	7026/6H1	04N5353 09P6524 23L7785 09P6525 23L7794 53P1301 23L7799 53P1334	1-way processor card (600 MHz) 1-way processor card (750 MHz) 2-way processor card (600 MHz) 2-way processor card (750 MHz) 4-way processor card (600 MHz) 4-way processor card (750 MHz) 6-way processor card (688 MHz) 6-way processor card (750 MHz)
D01	7026/6M1	04N6698 21P6381 21P6383	2-way processor card (500 MHz) 2-way processor card (750 MHz) 4-way processor card (750 MHz)
D01	7026/B80	09P0399 09P0143  09P0406  09P4478	Processor card (375 MHz, one-way) Processor card (375 MHz, two-way, 8 M L2) Processor card (375 MHz, two-way, 4 M L2)  Processor Card (450 MHz, two-way)
D01	7026/H10	11H7517	166 MHz Processor and Cache Card
D01	7026/H50	93H9018 93H8945	CPU Card (1-way) CPU Card (2-way)
D01	7026/H70	94H1013 94H1008	Generic L2 Cache problem CPU Card (1-way) CPU Card (2-way)
D01	7026/H80	04N4765 21P4751 21P4760 21P4774	1-way 450 MHz processor card 2-way 450 MHz processor card 4-way 450 MHz processor card 6-way 500 MHz processor card
D01	7026/M80	04N6930 04N6931	2-way processor card 4-way processor card
D01	7028/6C4 7028/6E4	00P2974 00P2977 00P2728 00P2731 00P2733 00P2736	Processor Card, 1.0 GHz 1-way Processor Card, 1.0 GHz 2-way Processor Card, 1.2 GHz 1-way Processor Card, 1.2 GHz 2-way Processor Card, 1.45 GHz 1-way Processor Card, 1.45 GHz 2-way
D01	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)
D01	7038/6M2	97P3186 00P4050 00P4045	Processor Board (1.2 GHz) Processor Board (1.45 GHz) CUoD Processor Board (1.45 GHz)
D01	7039/651	44P3706 44P3705 60G7598 60G7592	1.1 GHz 8-way MCM with VPD Card 1.3 GHz 4-way MCM with VPD Card 1.5 GHz 8-way MCM with VPD Card 1.7 GHz 4-way MCM with VPD Card
D01	7039/651	44P3706 44P3705 60G7598 60G7592	1.1 GHz 8-way MCM with VPD Card 1.3 GHz 4-way MCM with VPD Card 1.5 GHz 8-way MCM with VPD Card 1.7 GHz 4-way MCM with VPD Card



Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
D01	7040/671	03N3229 09P3217	1.1 GHz 4-way MCM with VPD Card 1.1 GHz 8-way MCM with VPD Card
D01	7040/681	03N3223 03N3228 03N3229 09P3217	1.3 GHz 4-way MCM with VPD Card 1.3 GHz 8-way MCM with VPD Card 1.1 GHz 4-way MCM with VPD Card 1.1 GHz 8-way MCM with VPD Card
D01	7043/140	75H5462 75H5463	512KB L2 Cache 1 MB L2 Cache
D01	7043/150	07L8446	System Board
D01	7043/240	11H7517 93H5163	166 MHz Processor and Cache Card 233 MHz Processor and Cache Card
D01	7043/260	08L1013	200 MHz CPU Card
D01	7043/270	11K0171 11K0218	CPU card (375 MHz one-way) CPU card (375 MHz two-way)
D01	7044/170	09P0277 09P0272 09P0943	Processor card (333 MHz) Processor card (400 MHz) Processor card (450 MHz)
D01	7044/270	11K0171 11K0218 09P4478	CPU card (375 MHz one-way) CPU card (375 MHz two-way) CPU card (450 MHz two-way)
D01	7046/B50	41L5912	375 MHz System board
D01	7317/F3L	73H3614 93H2431 03N3989	CPU Card (133 MHz) CPU Card (166 MHz) CPU Card (233 MHz)
D01	9076 SMP Thin/Wide Node	93H9716	CPU card (332 MHz)
D01	9076/ Power3 SMP Thin/Wide Node	03N2403 11K0232	CPU card (200 MHz) CPU card (375 MHz)
D01	9076/ Power3 SMP High Node	11K0198	CPU card
D06		88G3650	64 Port to 128 Port Converter Kit (four to a pack) <b>Note:</b> Converter part number is 88G3651
D07	7044/170	09P0277 09P0272 09P0943	Processor card (333 MHz) Processor card (400 MHz) Processor card (450 MHz)
D08	7134	88G5722	DC Fan assembly
D46		6339098	Token-Ring 9-pin D-Shell cable, 3m (10 ft.)
D46		60G1063	Token-Ring RJ-45 STP cable, 3m (10 ft.) <b>Note:</b> Not used with the High-Speed Token-Ring PCI adapter
D46		93H8894	RJ-45 to 9-pin D-Shell Token-Ring Conversion cable <b>Note:</b> Not used with the High-Speed Token-Ring PCI adapter
D46		OEM Cable	Standard UTP RJ-45 cable
D50			Content moved to FFC 190.

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
D56		12H1204	EIA-232E Printer/ Terminal Serial Cable
D57		07L9822	8-Port Multiport Interface Cable ISA Async Adapter
D59		93H7766	TP PCI Ethernet Adapter
D60		93H1902	T2 PCI Ethernet Adapter
D60		93H7766	TP PCI Ethernet Adapter
D66	7250	11H4436	RSS Card (with memory sockets)
D67			8 MB, ECC, 50 nsec Memory Module
D68			16 MB, ECC, 50 nsec Memory Module
D69			32 MB, ECC, 50 nsec Memory Module
D70			64 MB, ECC, 50 nsec Memory Module
D71		42H2771	8 MB, ECC, 60 nsec Memory Module
D72		42H2772	16 MB, ECC, 60 nsec Memory Module
D73		42H2773	32 MB, ECC, 60 nsec Memory Module
D74	7025/F40 7043/140 7043/240	42H2774	64 MB, ECC, 60 nsec Memory Module
D74	7043/140	93H6823	128 MB, ECC, 60 nsec Memory Module
D74	7043/240	93H6822	128 MB, ECC, 60 nsec Memory Module
D74	7043/150	07L9302 07L9304 07L9306	64 MB, ECC Memory Module 128 MB, ECC Memory Module 256 MB, ECC Memory Module
D74	7046/B50	19L1809 29L3302	128 MB, ECC Memory Module 256 MB, ECC Memory Module
D75		65G4615	8 MB, ECC, 70 nsec Memory Module
D76			16 MB, ECC, 70 nsec Memory Module
D77			32 MB, ECC, 70 nsec Memory Module
D78		39H9837	64 MB, ECC, 70 nsec Memory Module
D83			8 MB, Parity, 50 nsec Memory Module
D84			16 MB, Parity, 50 nsec Memory Module
D85			32 MB, Parity, 50 nsec Memory Module
D86			64 MB, Parity, 50 nsec Memory Module
D87			8 MB, Parity, 60 nsec Memory Module
D88			16 MB, Parity, 60 nsec Memory Module
D89			32 MB, Parity, 60 nsec Memory Module
D90			64 MB, Parity, 60 nsec Memory Module
D91			8 MB, Parity, 70 nsec Memory Module
D92			16 MB, Parity, 70 nsec Memory Module
D93		65G4617	32 MB, Parity, 70 nsec Memory Module
D94		39H9837	64 MB, ECC, 70 nsec Memory Module

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
D95	7043/140 7043/150 7025/F40 7043/240	94H0029	GXT550P Graphics Adapter
D96		93H6267	GXT255P High Performance PCI Graphics Adapter
D97		93H7439	Operator Panel/Speaker Assembly
E10	7043/140 7043/150	73H4532	Riser Card
E10	7043/240	73H3712	Riser Card
E10	7046/B50	23L8117	Riser Card
E10	Models not listed		Refer to FFC 227
E11			128 MB, ECC, 50 nsec Memory Module
E12	7025/F40 7025/F50 7026/H10 7026/H50 7317/F3L	93H6821	128 MB, ECC, 60 nsec Memory Module
E12	7043/140	93H6823	128 MB, ECC, 60 nsec Memory Module
E12	7043/240	93H6822	128 MB, ECC, 60 nsec Memory Module
E12	9076 SMP Thin/Wide Node	93H4702	128 MB, ECC, 60 nsec Memory Module
E12	9076/ Power3 SMP Thin/Wide Node	93H4702	128 MB, ECC, 60 nsec Memory Module
E13			128 MB, ECC, 70 nsec Memory Module
E14			128 MB, Parity, 50 nsec Memory Module
E15			128 MB, Parity, 60 nsec Memory Module
E16			128 MB, Parity, 70 nsec Memory Module
E17	7017/S70	19H0288	Memory 16 MB Memory Module
E18	7017/S70	35H8751	Memory 64 MB Memory Module
E19	520 550 570	Power Supply Sensor Failed I/O planar  For the latest part numbers, go to the Part Number Catalog.	
E19	7026/H50	07L6594	Power Supply Sensor Failed I/O planar
E19	7026/H70	08L0617	I/O planar
E19	7028/6C4 7028/6E4	00P5892 09P5859 00P3166 00P4488 00P5830	AC Power Supply DC Power Supply CEC Backplane (GP processor) CEC Backplane (GQ processor) CEC Backplane (RIO-G capability)
E19	7029/6C3 7029/6E3 9114/275	53P5617 80P2408 80P2401 00P4966 00P4970	AC Power Supply System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
E19	9076 SMP Thin/Wide Node	41L6138	I/O planar
E19	9076/ Power3 SMP Thin/Wide Node	03N2866 03N3368	I/O planar (200 MHz) I/O planar (375 MHz)
E19	9076/ Power3 SMP High Node	11K0198 03N4184 11K0571	CPU Card System Planar NIO Planar
E19	9076/ Power3 RIO Drawer	31L8752 12K0446 05N5005	Supervisor Card Power Supply RIO planar
E1A	7017/S80 7017/S85	23L7595 04N5011	4 GB Memory Card
E22			Video Cable (generic)
E23			Audio Cable (generic)
E24	7236	94H0623	Resistor Assembly
E26	7026/H50	93H9551	Power Distribution Card
E26	7026/H70	08L0388	Power Distribution Card
E29		21H8979	32 MB Cache (Located on the LVD SCSI RAID Adapter) (includes battery)
E2A		37L6902 19K0561	128 MB Cache, U.S. (includes battery) 128 MB Cache, Japan (includes battery)
E30		44H8429	32 MB Cache Battery (Located on the LVD SCSI RAID Adapter)
E3A		37L6903 00N9561	128 MB Cache battery, U.S. 128 MB Cache battery, Japan
Exx	9076/ Power3 SMP Thin/Wide Node		(xx represents any character) Refer to the Firmware Checkpoint Three-Digit Error Code section of the service manual.
Fxx	7024 7025		(xx represents any character) Refer to the Firmware Checkpoint Three-Digit Error Code section of the service manual.
2520		09P2544	Dual-Channel Ultra3 SCSI PCI Adapter
2521	7039/651	44P3988	Processor Subsystem Chassis (with Backplane and DASD Ribbon Cable)
2522		97P2686	PCI-X Dual Channel U320 SCSI Adapter <b>Note:</b> Use the location code to identify the failing FRU. Determine if the failing FRU is integrated on the system board. If the failing FRU is integrated use FFC 221. If the failing FRU is not integrated replace the FRU identified here.

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
2523		97P3960 PCI-X Dual Channel U320 SCSI RAID Adapter or enablement card. <b>Note:</b> <b>Notes:</b> 1. Use the location code to identify if the failing FRU is a RAID enablement card plugged into a special slot on the I/O planar or if it is a PCI-X adapter. If the failing FRU is a PCI-X adapter, replace the FRU identified here. If the failing FRU is a RAID enablement card use FFC 2525. 2. If the problem persists after replacing the RAID enablement card, use FFC 2522 to replace the integrated SCSI adapter.	
2524			Missing options resolution for integrated PCI-X Dual Channel U320 SCSI adapter. <b>Note:</b> For type/model and FRU information, if not listed here, refer to FFC 586.
2525		80P2868	Missing options resolution for integrated PCI-X Dual Channel U320 SCSI RAID enablement card.
2526		44L0313	PCI-X Ultra320 SCSI RAID Battery Pack
2527		97P6094	Quad Channel Ultra320 SCSI Raid adapter
2530		09P3196	10/100 Mbps Ethernet PCI Adapter II
2531		80P4066	10 Gigabit-LR Ethernet PCI-X Adapter
2532		16R0599	10 Gigabit-SR Ethernet PCI-X Adapter
2547			Generic AS400 SCSI JBOD (Not OS Disk) Disk Drive
254E		13N2056	Fibre Channel Expansion Card
2550		09P3425	POWER GXT4500P Graphics Adapter
2551		09P3391	POWER GXT6500P Graphics Adapter
2562		09P2470	Keyboard/Mouse USB PCI Attachment Card
2564		80P2994	Keyboard/Mouse USB PCI Attachment Card
2566		33P3339	USB 3.5 inch micro diskette drive
2568			Generic USB CD-ROM
2570		11P1856	IBM Cryptographic Accelerator PCI Adapter
2571		80P4353	2-Port PCI Asynchronous EIA-232 Adapter
2580	7028/6C1 7028/6E1	21P7165	SCSI Accessed Fault-Tolerant Enclosure (SAF-TE) Device
2590		24P3605	48x IDE CDROM Drive Black Bezel
2591		53P2735	IDE 16/48X DVD-ROM Black Bezel
2592		00P4775	Slimline IDE 8X/24X DVD-ROM
2593		97P3693	IDE DVD-RAM Drive
25A0	520 550 570	System Board  For the latest part numbers, go to the Part Number Catalog.	

Failing Function Code	Machine Type/- Model	FRU Part Number	Description and Notes
25A0	7028/6C1 7028/6E1	09P2420	System Board
25A0	7028/6C4 7028/6E4	00P3166 00P4488 00P5830	CEC Backplane (GP processor) CEC Backplane (GQ processor) CEC Backplane (RIO-G capability)
25A0	7029/6C3 7029/6E3 9114/275	80P2408 80P2401 00P4966 00P4970	System Backplane (1.2 GHz, 1-way) System Backplane (1.2 GHz, 2-way) System Backplane (1.45 GHz, 1-way) System Backplane (1.45 GHz, 2-way)
25B9		80P4094	1 GB PCI-X iSCSI TOE Ethernet Adapter (Fiber)
		11P3847	Wrap Plug
25C0		00P3055	IBM Gigabit-SX Ethernet PCI-X Adapter
25C1		00P3056	IBM 10/100/1000 Base-TX PCI-X Adapter
25C2		00P4290	IBM Dual-Port Gigabit SX Ethernet PCI-X Adapter
25C3		00P4289	IBM 10/100/1000 Base-TX Dual-Port PCI-X Adapter
25C4		13N0504	Broadcom Dual-Port Gpbs Ethernet PCI-X Adapter
		73P9031	Broadcom Dual-Port Gpbs Ethernet PCI-X Daughter Card
25D0		00P4648	PCI Audio Adapter
25F8		80P4092	1 GB PCI-X iSCSI TOE Ethernet Adapter (Copper)
2600		00P4297	PCI 64-Bit Fibre Channel Adapter
2601		80P4544	PCI 64-Bit Fibre Channel Adapter (cost reduced)
2631			Integrated IDE controller
2640			2.5 inch IDE Disk Drive
2D00			SES/SAF-TE LED Problem <b>Note:</b> If type/model and FRU information is not listed here, refer to FFC 199.
2D00	7028/6C4 7028/6E4	09P5895 00P2983	Cable, DASD 50 pins DASD backplane
2D01		97P4846	PCI-X Quad Channel U320 SCSI RAID Battery Pack
2D02			Generic USB Reference to Controller/Adapter

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## Appendix. Notices

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The manufacturer has prepared this information for use with the specific machines indicated. The manufacturer makes no representations that it is suitable for any other purpose.

The manufacturer's computer systems contain mechanisms designed to reduce the possibility of undetected data corruption or loss. This risk, however, cannot be eliminated. Users who experience unplanned outages, system failures, power fluctuations or outages, or component failures must verify the accuracy of operations performed and data saved or transmitted by the system at or near the time of the outage or failure. In addition, users must establish procedures to ensure that there is independent data verification before relying on such data in sensitive or critical operations. Users should periodically check the manufacturer's support websites for updated information and fixes applicable to the system and related software.

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## Communications statements

The following Class A statements apply to these models:

5790  
5791  
5794  
7311-D10  
7311-D11  
7311-D20  
9111-520 (rack-mounted version)  
9113-550  
9117-570  
9119-590  
9119-595  
9124-720  
9405-520  
9406-520  
9406-550  
9406-570  
9406-595  
9411-100

The following Class B statements apply to model 9111-520 (stand-alone version).

### Federal Communications Commission (FCC) statement

**Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible Party:

International Business Machines Corporation  
New Orchard Road  
Armonk, NY 10504

Telephone: 1-919-543-2193

### Industry Canada Compliance Statement

This Class A digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations.

## Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

## European Community Compliance Statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

## Australia and New Zealand Class A statement

**Attention:** This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

## VCCI Statement - Japan

この装置は、クラス A 情報技術装置です。この装置を家庭環境で使用する  
と電波妨害を引き起こすことがあります。この場合には使用者が適切な対策  
を講ずるよう要求されることがあります。 V C C I - A

The following is a summary of the VCCI Japanese statement in the box above.

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

## Electromagnetic Interference (EMI) Statement - People's Republic of China

Per GB 9254-1998, the user manual for a Class A product must carry the following warning message (English translation from the Chinese standard) about use in a residential environment in Chinese (*Simplified Chinese*):

### 声 明

此为 A 级产品,在生活环境  
中,该产品可能会造成无线电干  
扰。在这种情况下,可能需要用  
户对其干扰采取切实可行的措  
施。

Declaration: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may need to perform practical action.

## Electromagnetic Interference (EMI) Statement - Taiwan

### 警告使用者：

這是甲類的資訊產品，在  
居住的環境中使用時，可  
能會造成射頻干擾，在  
這種情況下，使用者會被  
要求採取某些適當的對策。

The following is a summary of the EMI Taiwan statement above.

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user will be required to take adequate measures.

### **Radio Protection for Germany**

Dieses Gerät ist berechtigt in Übereinstimmung mit Dem deutschen EMVG vom 9.Nov.92 das EG-Konformitätszeichen zu führen.

Der Aussteller der Konformitätserklärung ist die IBM Germany.

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse A. Für diese von Geräten gilt folgende Bestimmung nach dem EMVG:

Geräte dürfen an Orten, für die sie nicht ausreichend entstört sind, nur mit besonderer Genehmigung des Bundesministers für Post und Telekommunikation oder des Bundesamtes für Post und Telekommunikation betrieben werden. Die Genehmigung wird erteilt, wenn keine elektromagnetischen Störungen zu erwarten sind.

(Auszug aus dem EMVG vom 9.Nov.92, Para.3, Abs.4)

### Hinweis

Dieses Genehmigungsverfahren ist von der Deutschen Bundespost noch nicht veröffentlicht worden.

The following Statement applies to this IBM product. The statement for other IBM products intended for use with this product will appear in their accompanying manuals.

### **Federal Communications Commission (FCC) statement**

**Note:** This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an IBM authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from IBM authorized dealers. IBM is not responsible for any radio or television interference caused by using other than recommended cables or connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interferences, and (2) this device must accept any interferences received, including interference that may cause undesired operation.

Responsible Party:

International Business Machines Corporation  
New Orchard Road  
Armonk, NY 10504

Telephone: 1-919-543-2193

### **Industry Canada Compliance Statement**

This Class B digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations.

### **Avis de conformité à la réglementation d'Industrie Canada**

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

### **European Community Compliance Statement**

This product is in conformity with the protection requirements of EC Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class B Information Technology Equipment according to CISPR 22 / European Standard EN 55022. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication devices.

Properly shielded and grounded cables and connectors (IBM part number 75G5958 or its equivalent) must be used in order to reduce the potential for causing interference to radio and TV communications and to other electrical or electronic equipment. Such cables and connectors are available from IBM authorized dealers. IBM cannot accept responsibility for an interference caused by using other than recommended cables and connectors.

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## **Product recycling and disposal**

This unit contains materials such as circuit boards, cables, electromagnetic compatibility gaskets and connectors which may contain lead and copper/beryllium alloys that require special handling and disposal at end of life. Before this unit is disposed of, these materials must be removed and recycled or discarded according to applicable regulations. IBM offers product-return programs in several countries. Information on product recycling offerings can be found on IBM's Internet site at <http://www.ibm.com/ibm/environment/products/prp.shtml>.

IBM encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. IBM offers a variety of programs and services to assist equipment owners in recycling their IT products. Information on product recycling offerings can be found on IBM's Internet site at <http://www.ibm.com/ibm/environment/products/prp.shtml>.

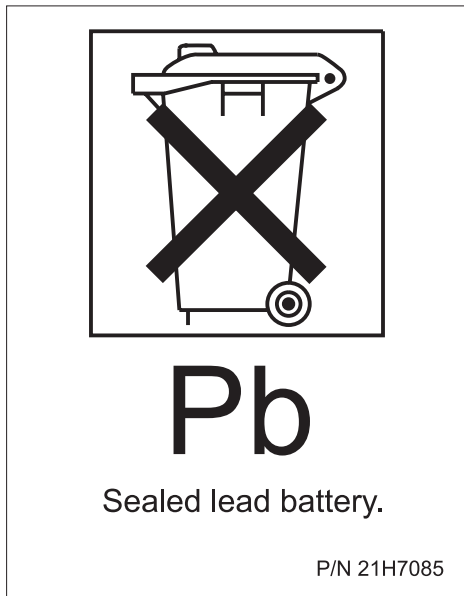
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## **Battery return program**

This product may contain sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area. For information on disposal of batteries outside the United States, go to <http://www.ibm.com/ibm/environment/products/batteryrecycle.shtml> or contact your local waste disposal facility.

In the United States, IBM has established a return process for reuse, recycling, or proper disposal of used IBM sealed lead acid, nickel cadmium, nickel metal hydride, and other battery packs from IBM Equipment. For information on proper disposal of these batteries, contact IBM at 1-800-426-4333. Please have the IBM part number listed on the battery available prior to your call.

In the Netherlands, the following applies:



In Taiwan, the following applies. Please recycle batteries.



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## IBM Cryptographic Adapter Card Return Program

This machine may contain an optional feature, the cryptographic coprocessor card, which includes a polyurethane material that contains mercury. Follow local ordinances or regulations for disposal of this card. IBM has established a return program for certain IBM Cryptographic Adapter Cards. More information can be found at: <http://www.ibm.com/ibm/environment/products/prp.shtml>





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