

**Power775  
PCI Express Card Hotplug Procedure  
Last Modified 02/06/2013**



# Power775 PCI Express Card Hotplug Procedure

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# 1 GENERAL

## 1.1 Release / Revision History

Document Name	Date	PDF name	Description
Power775 PCI Express Card Hotplug Procedure	9/12/2012	“p775_pci_hotplug.pdf”	Initial Release
“	02/06/2013	“	Removed reference to xcat documentation.

Table 1 Release / Revision History

## 1.2 Where to find this document, and contents of the parent PDF

The current Power775 document is “p775\_pci\_hotplug.pdf” which is to be downloaded from:  
 InfoCenter Website: <http://publib.boulder.ibm.com/infocenter/powersys/v3r1m5/topic/p7ee2/p7ee2kickoff.htm>  
 Click “PDF files for the IBM Power 775 (9125-F2C) removing and replacing parts”  
 Under “CEC Drawer”, click “Power775 ” to download PDF “p775\_pci\_hotplug.pdf”

This is the only valid source for the latest Power775 PCI Express Card Hotplug Procedure..

## 1.3 Required Documents

Document	Doc Number	Location
Safety Notices <a href="http://publib.boulder.ibm.com/infocenter/powersys/v3r1m5/topic/p7hdx/G229-9054.pdf">http://publib.boulder.ibm.com/infocenter/powersys/v3r1m5/topic/p7hdx/G229-9054.pdf</a>	Doc# G229-9054	InfoCenter *

Table 2 Required Documents

\*InfoCenter Website: <http://publib.boulder.ibm.com/infocenter/powersys/v3r1m5/topic/p7ee2/p7ee2kickoff.htm>

## 1.4 Related Documents

Document	Doc Number	Location

Table 3 Related Documents

\*InfoCenter Website: <http://publib.boulder.ibm.com/infocenter/powersys/v3r1m5/topic/p7ee2/p7ee2kickoff.htm>

## 1.5 Abbreviations

Abbreviation	Definition	Details
CEC	Central Electronic Complex	Also referred to as the node.
DCCA	Distributed Conversion and Control Assembly	The power supplies for the CEC and DE are called the CEC DCCA and DE DCCA respectively.
DE	Disk Enclosure	
GPFS	Global Parallel File System	IBM's file system utilizing software RAID
HDD	Hard Disk Drive	This also means hard drive
LED	Light Emitting Diode	
PCB	Printed Circuit Board	
RAID	Redundant Array of Inexpensive Disks	
SAS	Serial Attached SCSI	Protocol used for direct attached storage
SSR	System Service Representative	IBM Service personnel
SSD	Solid State Drive	
UEPO	Unit Emergency Power Off	
UNVSA	Utility Non-Volatile Storage Assembly	Harddrive function in PCIe cassette

## 2 OVERVIEW

This section is an overview only. Do not start the service procedure until Section 3 which contains the detailed steps.

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### 2.1 Safety Notices

Read “Safety\_Notices “ available from InfoCenter at this link:  
<http://publib.boulder.ibm.com/infocenter/powersys/v3r1m5/topic/p7hdx/G229-9054.pdf>

The following cautions apply to all Power775 service procedures:

**CAUTION:**

**Energy hazard present. Shorting might result in system outage and possible physical injury. Remove all metallic jewelry before servicing. (C001)**

**CAUTION:**

**The doors and covers to the product are to be closed at all times except for service by trained service personnel. All covers must be replaced and doors locked at the conclusion of the service operation. (C013)**

**CAUTION:**

**Servicing of this product or unit is to be performed by trained service personnel only. (C032)**

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### 2.2 File System Risk Statement

The Global Parallel File System (GPFS) implementation of software RAID stripes data across all the Disk Enclosures in the cluster. **If the Utility Non-Volatile Storage Assembly and SAS Jumper Cable is powered off without a backup Utility Non-Volatile Storage Assembly and SAS Jumper Cable assembly or without all drawers being supported by the Service Node being reassigned to the backup Service Node, then all Disk Enclosures running off of this Service Node will go into panic and become unavailable.**

## **2.3 Required SSRs and Roles**

This service procedure requires 1 SSR.

This service procedure contains steps to be performed by a customer system administrator and an IBM System Service Representative (SSR)

- The customer system administrator and SSR tasks are separately called out in the procedure.

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## **2.4 P7IH Hand Tool Kit Required Tools**

None

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## **2.5 Prerequisites for this Procedure**

In order to perform this procedure, you will need the following information:

- 1) The location code of the FRU to be serviced
- 2) The cage location of the FRU to be serviced
- 3) The frame number of the FRU to be serviced

### 3 SERVICE PROCEDURE

#### 3.1 Set up RMC connections if not already done <= Customer Task

STEP 1 Check whether RMC connections are set up.

STEP 20 is one way to verify whether RMC is setup properly.

If set up, proceed to STEP 21.

If not set up, proceed to STEP 2.

STEP 2 Verify Service Networks are configured on Services nodes (possible for service node to ping HMC)

STEP 3 Verify Service nodes have IP Forwarding set

- a. Example (from EMS or Service Node) – “lsdef service -i setupipforward”
- b. Response: (should be set to 1)

```
Object name: f02c06sn6
             setupipforward=1
```

- c. If it is not set in xCat, issue “chdef service setupipforward=1” to set
- d. This can be set and verified on an AIX service node using the “no” command and on a Linux service node using the “sysctl” command without requiring the service node to be rebooted. (from service node)
  - i. AIX command to check ip forwarding setting
  - ii. AIX command to set ip forwarding
  - iii. Linux command to check ip forwarding – “sysctl net.ipv4.ip\_forward”
  - iv. Linux command to set ip forwarding – “sysctl -w net.ipv4.ip\_forward=1”

Note: changing the xCat setupipforward setting does not change the service node until it is rebooted. Setting ipforward using the commands in “d”, will set ipforwarding without requiring a reboot; however, this method does not last through a reboot.

STEP 4 Verify non-service nodes that control PCI slots have default routes to their service node (xCat database command)

- a. This is setup in xCAT in the networks table
- b. Example to check – “tabdump networks”
- c. Response example:

```
"hf0_net", "20.0.0.0", "255.0.0.0", "hf0", "<xcatmaster>",,,,,,,,,,
```

Here <xcatmaster> is setup as the default gateway. “xcatmaster” should be set to service node hfi IP address for all non-service nodes

- e. This can be set and verified using the “route” command without rebooting.

Note: changing the networks table will cause the default route to be set after all future reboots of the nodes. Setting the default route using the route command sets it without requiring a reboot, but will not remain through a reboot.



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- STEP 5 For Linux system, verify/install `rsct.core`, `rsct.core.utils`, `src`, `librtas.ppc`, `librtas.ppc64`, and `DynamicRM` are installed on all nodes that control PCI slots. For AIX systems, these rpms are installed as part of the OS; so nothing needs to be done. For Linux, gather and install the rpms (if not installed already).
- Note `DynamicRM` can be downloaded from <https://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/redhat/hmcmanaged/rhel6.html#>.
  - These rpms can be temporarily installed by copying the rpms to the node and using `rpm -ivh *.rpm` to install. However, they should be installed in the os image on the EMS; so they will be available after future reboots (for non-service nodes) and after a service node rebuild (for service nodes).

Note: by installing with the `rpm -ivh *.rpm` command, the RPMs can be loaded without requiring the nodes to be rebooted.

- STEP 6 Verify/install `xCat-rmc` on Management Node and Service Nodes (found in `xcat-core`)
- Example (on EMS and Service node) - `rpm -ivh xCAT-rmc-*.rpm`
- STEP 7 Verify that all the nodes that need RMC have "osi" in their "nodetype" table and each has the "mac" address set
- Example (on EMS) - `lsdef storage,util -i nodetype,mac`
  - Any node with a PCI adapter should have RMC
- STEP 8 Add the monserver entry to the noderes table for Non-Service Nodes that control PCI slots
- first IP address is the IP of the SN for the Service Network
  - second IP address is the IP of the SN for the HFI Network
  - Example (on EMS) - `chdef storage,util -i monserver=192.168.3.5,20.2.5.1`
  - Changing this does not require a reboot to take effect
- STEP 9 Add the monserver entry to noderes table for Service nodes
- One entry, IP address of EMS known by service node
  - Example (on EMS) - `chdef service monserver=172.0.0.3`
  - Changing this does not require a reboot to take effect
- STEP 10 Add `rmcmon` to the monitoring table
- Example (on EMS) - `monadd rmcmon -n`
- STEP 11 Start `rmc` monitoring
- Example (on EMS) - `monstart rmcmon`
- STEP 12 Verify `rmcmon` running
- Example (on EMS) - `lsdef -t monitoring`
  - Response (on EMS) - `rmcmon (monitoring)`
- STEP 13 Create `rmc` resources
- Example (on EMS) - `moncfg rmcmon storage,util`
- STEP 14 Add nodes into RMC domain
- Example (on EMS) - `moncfg rcmmon storage,util -r`
- STEP 15 On the EMS verify configuration (resource list should include all service nodes)
- Example (on EMS) - `lsrsrc -a IBM.Host Name`
  - Response:

```
Resource Persistent Attributes for IBM.Host
resource 1:
  Name = "f02c06sn6"
resource 2:
  Name = "f02c05sn5"
```

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- STEP 16 On the Service nodes verify configuration (resource list should include all nodes serviced through that service node)
- Example (on EMS) – “xdsh f02c06sn6 lsrsrc -a IBM.Host Name”
  - Response:

```
f02c06sn6: Resource Persistent Attributes for IBM.Host
f02c06sn6: resource 1:
f02c06sn6: Name = "f02c06n13-hf0"
f02c06sn6: resource 2:
f02c06sn6: Name = "f02c06n29-hf0"
```

- STEP 17 If all the nodes are not listed you may need to refresh
- Example (on EMS) – “xdsh storage,util refrsrc IBM.MCP”

- STEP 18 Set route on HMC for HFI network to a service node

- From HMC GUI
  - > HMC Management
  - > Change Network Settings
  - > Routing
  - > New
    - Net
    - Destination: <HFI Network>
      - Like 20.0.0.0
    - Gateway: <Service Node IP>
      - Like 10.1.255.15
    - Subnet: <HFI Netmask>
      - Like 255.0.0.0
    - Adapter: <HMC adapter>
      - Like eth1
  - “OK”

- STEP 19 Verify adding route worked by running “route” on HMC window

- Login to HMC and run route command
- Login example

```
ssh hscpe@<hmc IP> ### pw = abc1234
```

- Example – “route”

- Expect line like “20.0.0.0 ....” line below (when 20.x.x.x is the HFI IP address range)

```
hscpe@bulab80:~> route
Kernel IP routing table
Destination      Gateway          Genmask         Flags Metric Ref    Use Iface
9-114-28-192net *                255.255.255.192 U        0      0      0 eth0
10.2.0.0         *                255.255.0.0    U        0      0      0 eth2
10.1.0.0         *                255.255.0.0    U        0      0      0 eth1
10.253.0.0       *                255.255.0.0    U        0      0      0 s10
link-local      *                255.255.0.0    U        0      0      0 eth0
20.0.0.0         10.1.255.15     255.0.0.0      UG       0      0      0 eth1
loopback        *                255.0.0.0      U        0      0      0 lo
default         28gate.ppd.pok. 0.0.0.0         UG       0      0      0 eth0
```

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- STEP 20 Check RMC connections
- Logon to HMC and run lspartition
  - Example

```
ssh hscpe@<hmc IP> ### pw = abc1234
lspartition -dlpar
```

- Verify lspartition results

```
# lspartition -dlpar
<#4 Partition:<1*9125-F2C*02DE2C5, bulab99.ppd.pok.ibm.com, 9.114.28.239>
    Active:<1>, OS:<AIX, 7.1, 7100-01-03-1207>, DCaps:<0x2c4f>,
CmdCaps:<0x1b, 0x1b>, PinnedMem:<12544>
<#5> Partition:<13*9125-F2C*02ACDB5, , 20.2.5.13>
    Active:<1>, OS:<Linux/Red Hat, 2.6.32-220.7.1.el6.2012046.2, 6.2>,
DCaps:<0x2c7f>, CmdCaps:<0x19, 0x19>, PinnedMem:<0>
```

- Verify that all LPAR IP addresses are listed (HFI address for all but Service node used to setup HMC route)
- Verify all nodes that are running have "Active:<1>". If Active is not <1>, then something is not setup correctly in that LPAR. This usually means one of the rpms listed in STEP 6 is not installed or it was not listed in STEPs 16 and 17 as being monitored.

## 3.2 Perform FRU Exchange procedure <= SSR Task

The hotplug of the PCI Express Card is done by performing a FRU Exchange procedure on the HMC.

STEP 21 Start FRU Exchange procedure

There are 2 ways to start the PCI Express Card FRU Exchange procedure.

The first is from the SRC listed in the HMC. Perform the Repair and Verify procedure from the HMC as normal.

The second option is to select the cage in the HMC and select *select Serviceability -> Hardware -> Exchange FRU*.

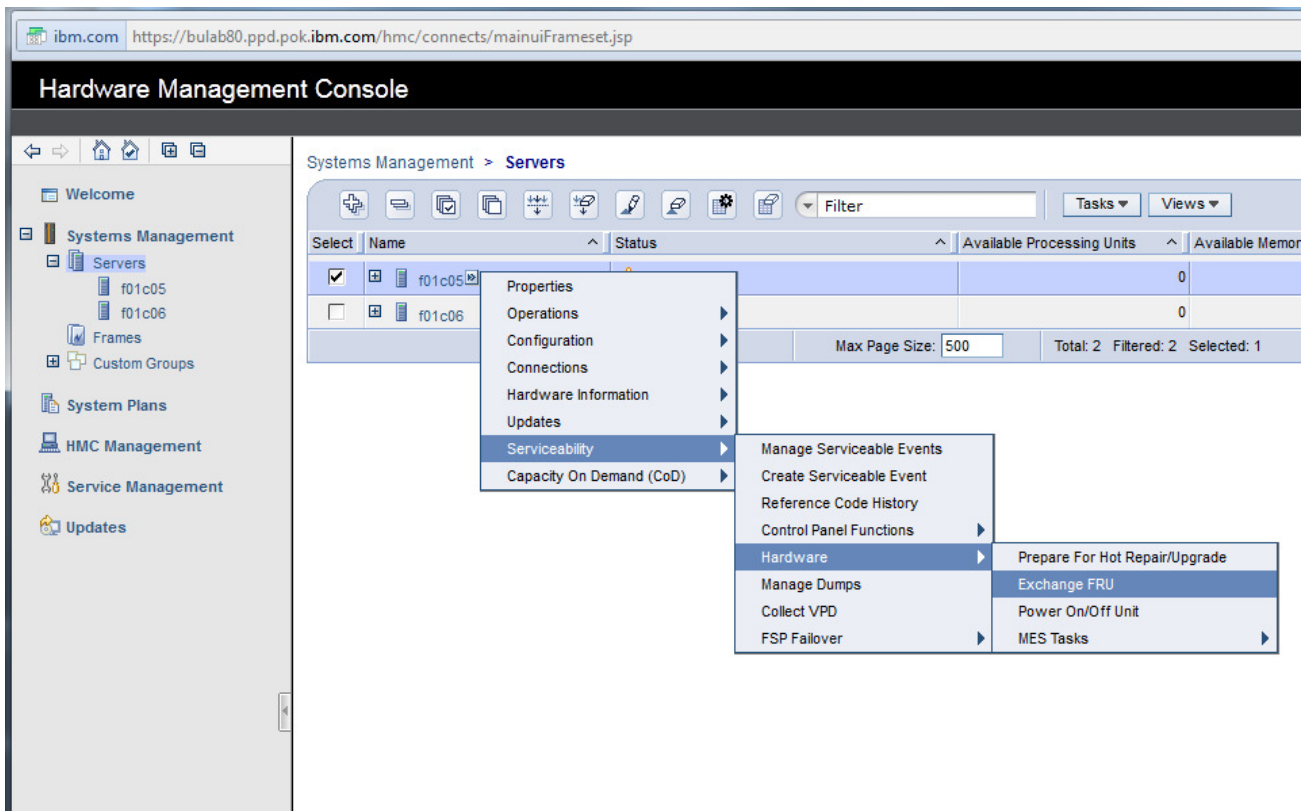


Figure 1 Selecting Exchange FRU

Then from the window titled **Replace Hardware – Replace FRU**, **Select FRU Type** *select* PCI Adapter Card, then *click* Next >.

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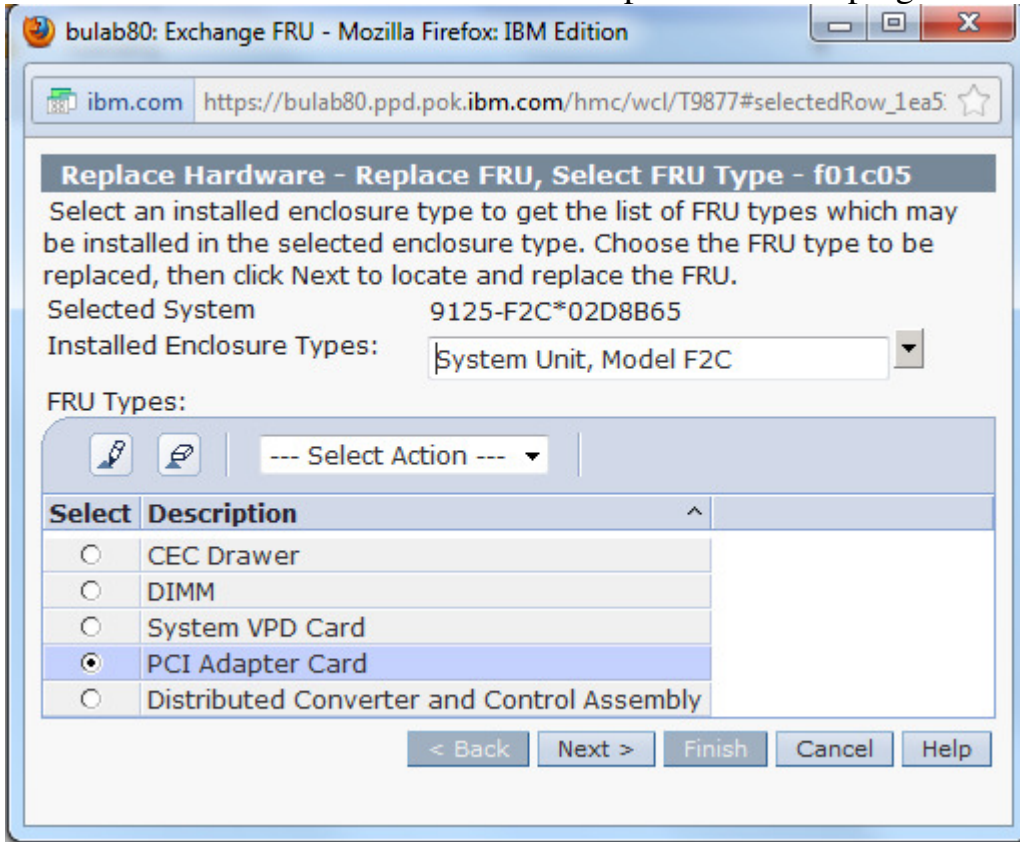


Figure 2 Select PCI Adapter

Then in the window titled **Replace Hardware – Replace FRU, Select Location** *select* correct PCI Adapter Card location, then *click* ADD.

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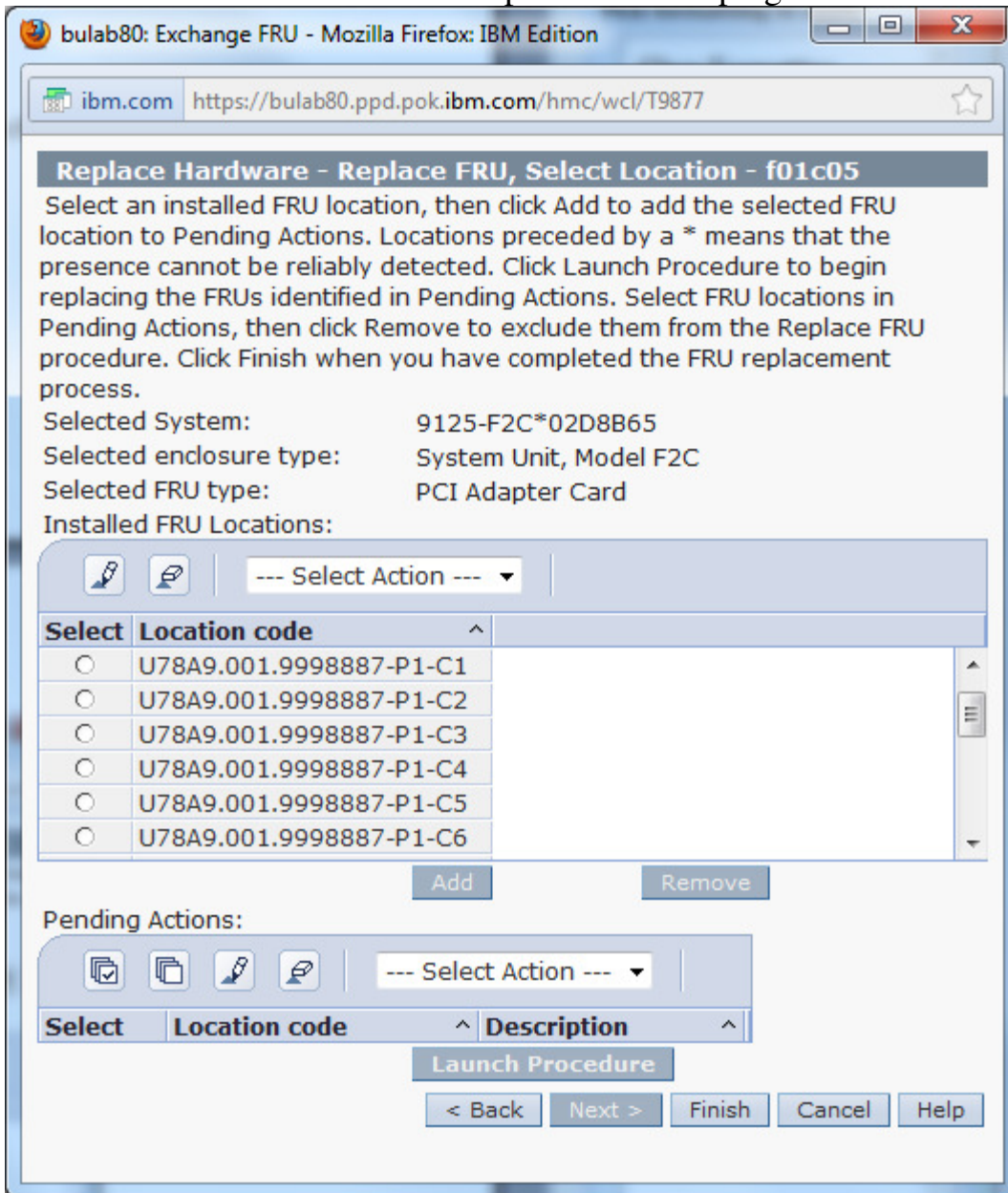


Figure 3 Select PCI Adapter Location

Finally, in window titled **Replace Hardware – Replace FRU, Select Location** place check mark in selection box then click Launch Procedure. In following example figure, P1-C1 of CEC U78A9.001.9998887 was selected.

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**Replace Hardware - Replace FRU, Select Location - f01c05**

Select an installed FRU location, then click Add to add the selected FRU location to Pending Actions. Locations preceded by a \* means that the presence cannot be reliably detected. Click Launch Procedure to begin replacing the FRUs identified in Pending Actions. Select FRU locations in Pending Actions, then click Remove to exclude them from the Replace FRU procedure. Click Finish when you have completed the FRU replacement process.

Selected System: 9125-F2C\*02D8B65  
Selected enclosure type: System Unit, Model F2C  
Selected FRU type: PCI Adapter Card  
Installed FRU Locations:

Select	Location code
<input type="radio"/>	U78A9.001.9998887-P1-C1
<input type="radio"/>	U78A9.001.9998887-P1-C2
<input type="radio"/>	U78A9.001.9998887-P1-C3
<input type="radio"/>	U78A9.001.9998887-P1-C4
<input type="radio"/>	U78A9.001.9998887-P1-C5
<input type="radio"/>	U78A9.001.9998887-P1-C6

Add Remove

Pending Actions:

Select	Location code	Description
<input checked="" type="checkbox"/>	U78A9.001.9998887-P1-C1	PCI Adapter Card

Launch Procedure

< Back Next > Finish Cancel Help

Figure 4 Launch procedure to replace PCI Adapter

At this point, the HMC repair and verify procedure will provide the instructions on how to replace the PCI adapter.