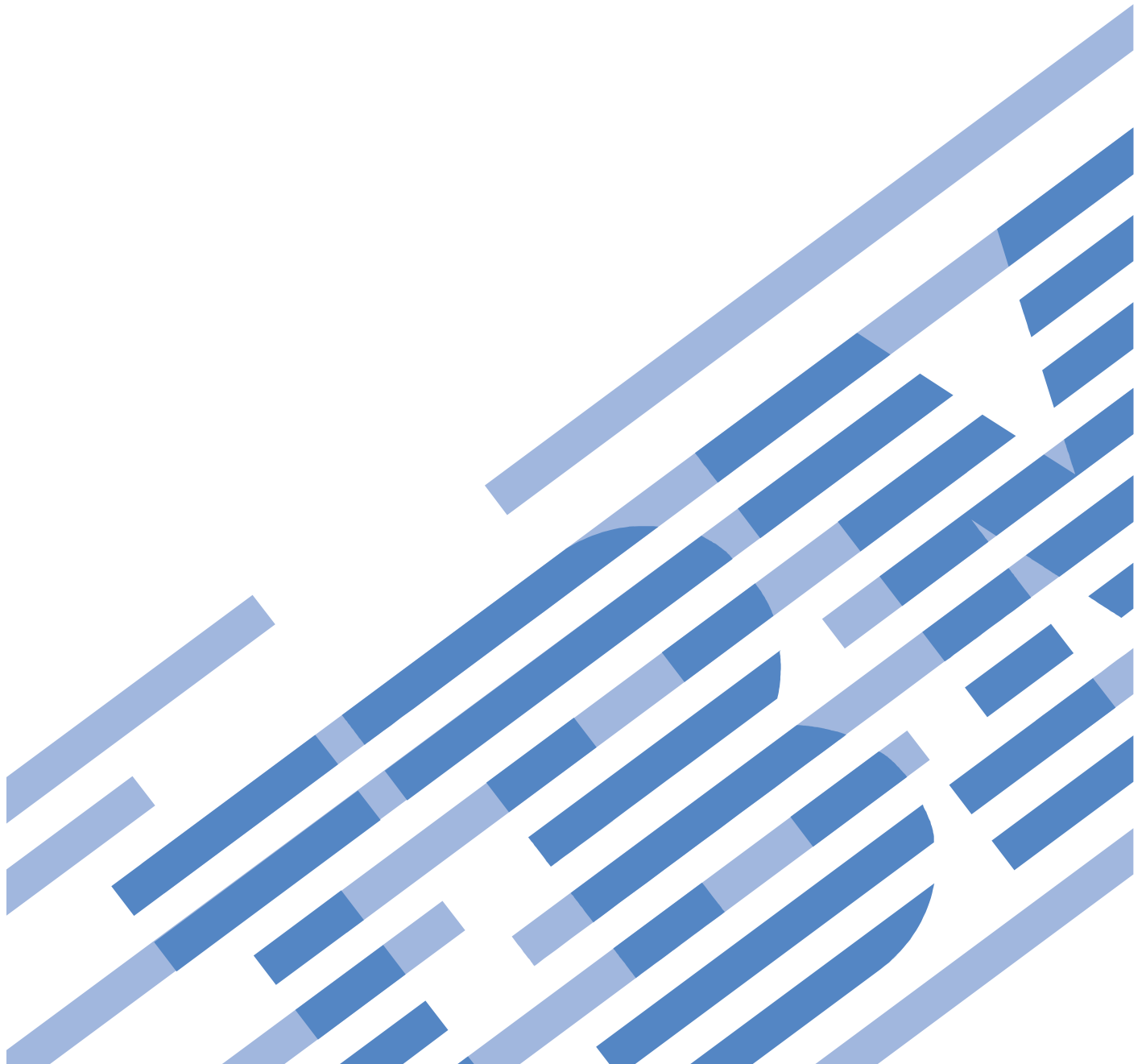


Power775
CEC Drawer Rails Service Procedure
Last Modified 2/27/2012



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1 GENERAL

1.1 Release / Revision History

Document Name	Date	PDF name	Description
Power775 CEC Drawer Rails Service Procedure	2/27/2012	"p775_cec_rails.pdf"	Initial Release

Table 1 Release / Revision History

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

The current Power775 CEC Drawer Rails Service Procedure document is "p775_cec_rails.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 CEC Drawer Rails Service Procedure" to download PDF "p775_cec_rails.pdf"

This is the only valid source for the latest Power775 CEC Drawer Rails Service Procedure.

1.3 Required Documents

Document	Doc Number	Location
Safety Notices http://publib.boulder.ibm.com/infocenter/powersys/v3r1m5/topic/p7hdx/G229-9054.pdf	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
"GPFS Native RAID Administration and Programming Reference"	SA23-1354	InfoCenter *

Table 3 Related Documents

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

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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
HPIC	High Power Interface Cable	DCCA Power Cable
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.

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:

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

The following notices specifically pertain to this Power775 service procedure.

CAUTION:

This part or unit is heavy but has a weight smaller than 18 kg (39.7 lb). Use care when lifting, removing, or installing this part or unit. (C008)

CAUTION: Do not remove or install this unit without using the provided lift tool. (C017)

CAUTION:

This product contains a Class 1M laser. Do not view directly with optical instruments. (C028)

CAUTION:

The water-based coolant solution may contain an additive intended to inhibit corrosion (or provide other functions). The solution may cause irritation to the skin or eyes. Avoid direct contact with the solution. Employ appropriate Personal Protective Equipment when performing operations involving the coolant or which may potentially expose you to the coolant. Refer to the MSDS for more information. (C037)

CAUTION:

Following the service procedure assures power is removed from 350 VDC power distribution connectors before they are unplugged. However, unplugging 350 VDC power distribution connectors while powered on, should not be done because it can cause connector damage and could result in burn and/or shock injury from electrical arcing. (C039)



DANGER: Rack-mounted devices are not to be used as shelves or work spaces. (L002)



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CAUTION: Hazardous energy present. Voltages with hazardous energy might cause heating when shorted with metal, which might result in splattered metal, burns, or both. (L005)



CAUTION: Hazardous moving parts nearby. (L008)



CAUTION: System or part is heavy. The label is accompanied by a specific weight range. (L009)



CAUTION: Protective eyewear is needed for the procedure. (L011)

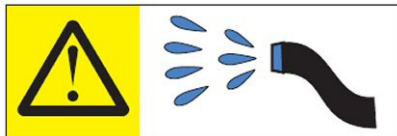


CAUTION: Pinch hazard. (L012)

ATTENTION: Small gaps exist that could pinch body parts if care is not exercised.



CAUTION: Chemical resistant gloves are needed for this procedure. (L014)



DANGER: Risk of electric shock due to water or a water solution which is present in this product. Avoid working on or near energized equipment with wet hands or when spilled water is present. (L016)



DANGER: Risk of injury due to heavy components falling from rack if the supplemental supports are not installed. (L019)

ATTENTION: The supplemental supports (Cam Followers) must be installed for the CEC or DE slide out service.

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CAUTION: Do not pull out more than one drawer at a time. The rack might become unstable if you pull out more than one drawer at a time. (L024)

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 servicing a CEC Drawer supporting a Service Node, then all Disk Enclosures running off of this service node will go into panic and become unavailable. If servicing a CEC Drawer supporting a GPFS node then the file system will go into panic and become unavailable. To avoid this situation you must migrate the drawers to be served by other nodes/CEC Drawers.**

2.3 Confirm how you got to this Power 775 CEC Drawer Slides/Rails Service Procedure

You should be performing this procedure if

An SRC directed you to complete a CEC Slide/Rail replacement

You should have downloaded this procedure from:

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

This is the only valid source for the latest Power775 CEC Drawer Slides/Rails Service Procedure

2.4 CEC Drawer Slides/Rails Description

Referring to Figure 1 below, the CEC Rails support the weight of each CEC Drawer. There is one set of CEC Rails per CEC Drawer. The CEC Rails are located along the left and right sides of the frame.

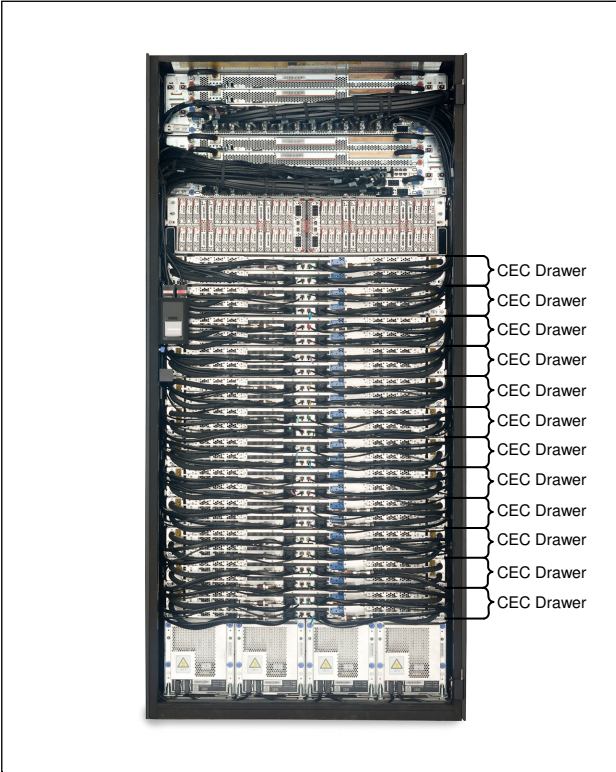


Figure 1 CEC Drawer locations

Figure 2 shows a CEC Drawer partially installed in the system. One CEC Slides/Rails is shown in the left portion of the image.



Figure 2 CEC Slides/Rails in rack

2.5 Background

The CEC Rails support and retain the CEC drawer in the frame. Figure 3 shows a photo of one CEC Rail, note that two are required per CEC Drawer. Note: the A and B designation in this image are not important for background understanding.

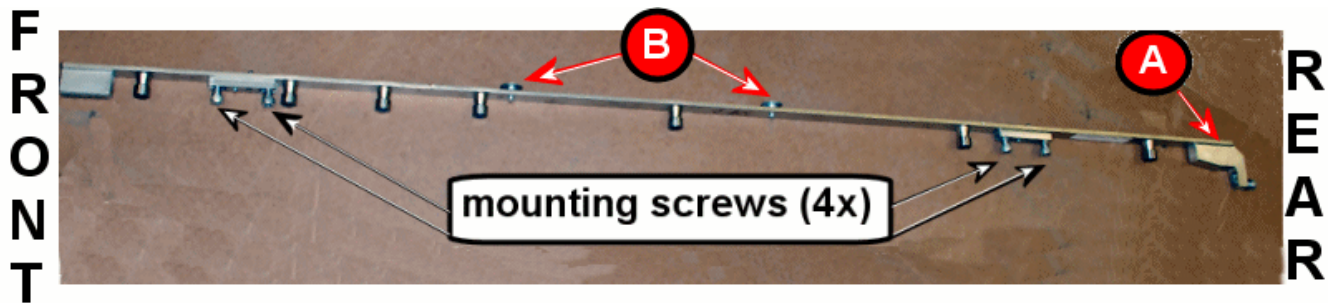


Figure 3 CEC Rail photo

2.6 Concurrency

The CEC Rails are not concurrently maintainable. The CEC drawer that is supported by the CEC Rails being serviced must be powered down completely and 350 volts should be off. The CEC drawer that is supported by the set of CEC Rails being serviced must be temporarily removed from the frame to a lift tool. All other Drawers in the system can remain powered on.

2.7 CEC Drawer Slides/Rails Weight

Each CEC Rail weighs 3.9 lbs (1.7 kg), a complete set weighs 7.8 lbs (3.4 kg). The CEC Drawer will also need to be serviced as part of this procedure, a CEC drawer can weigh up to 350 lbs (160 kg) depending on configuration.

2.8 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.

2.9 Estimated Service Time

3 hours

2.10 P7IH Hand Tool Kit Required Tools

- 2mm Hex Driver (0.07Nm Torque setting), PN 74Y0983, HPIC Jackscrews
- 4mm Hex Driver (41V1059)
- 3/8" Ratchet, PN 6428140, CEC Drawer Mounting
- 3/8" Torque Clutch - (23 - 31 Nm torque setting), PN 74Y0985, CEC Drawer Mounting
- 3/8" Extension - 18", PN 46K2707, CEC Drawer Mounting
- 3/8" Socket Bit, 5mm Hex, PN 74Y0986, CEC Drawer Mounting
- Flat Blade Screw Driver - 1/8" X 4", PN 73G5367, to remove CEC Drawer top cover

2.11 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

2.12 Overview of Procedure

This is an overview of the tasks to be performed. Read this overview but do not perform any of the tasks yet.

PREPARE CEC DRAWER FOR SERVICE TO SLIDES/RAILS
HAVE CUSTOMER CHECK FOR GPFS NODE AND SHUTDOWN CEC DRAWER
START FRU REPLACEMENT PROCEDURE
FRONT MECHANICAL PREPARATIONS FOR CEC SLIDES/RAILS SERVICE
ATTACH LIFT TOOL TO RACK
REAR MECHANICAL PREPARATIONS FOR CEC SLIDES/RAILS SERVICE
TEMPORARILY REMOVE CEC DRAWER
RE-INSTALL CEC DRAWER TO ORIGINAL POSITION
VERIFY ALL D-LINKS AND L-LINKS ARE OPERATIONAL
CONFIRM WITH CUSTOMER THAT CEC IS OPERATIONAL

3 SERVICE PROCEDURE

STOP – Do not proceed unless you have read “G229-9054.pdf” which is available from InfoCenter; see Section 1.3.

3.1 Prepare CEC Drawer for Service to Slides/Rails <= SSR TASK

STEP 1 The HMC can be accessed via the keyboard/display that resides in the management rack or by plugging a laptop into the BPCH of the rack where the service will be performed.

STEP 2 Logon to the HMC.

STEP 3 Determine if the CEC Drawer contains the Service node, see Figure 4 . If it does, have the system administrator reassign the nodes supported by the Service Node to the backup service node. (A CEC Drawer with a Service node will have a UNVSA card (usually 2 as shown below) and a 2 port SAS card plugged its PCI slot(s) (the UNVSAs are normally plugged into PCI slots 14 & 16, the SAS card in slot 15, but may be in any 3 locations in the CEC Drawer) . If the CEC Drawer has one of its octants functioning as a Service node, all the CEC Drawers being supported by the Service node must be reassigned to the backup Service node in the building block before powering the CEC off.)

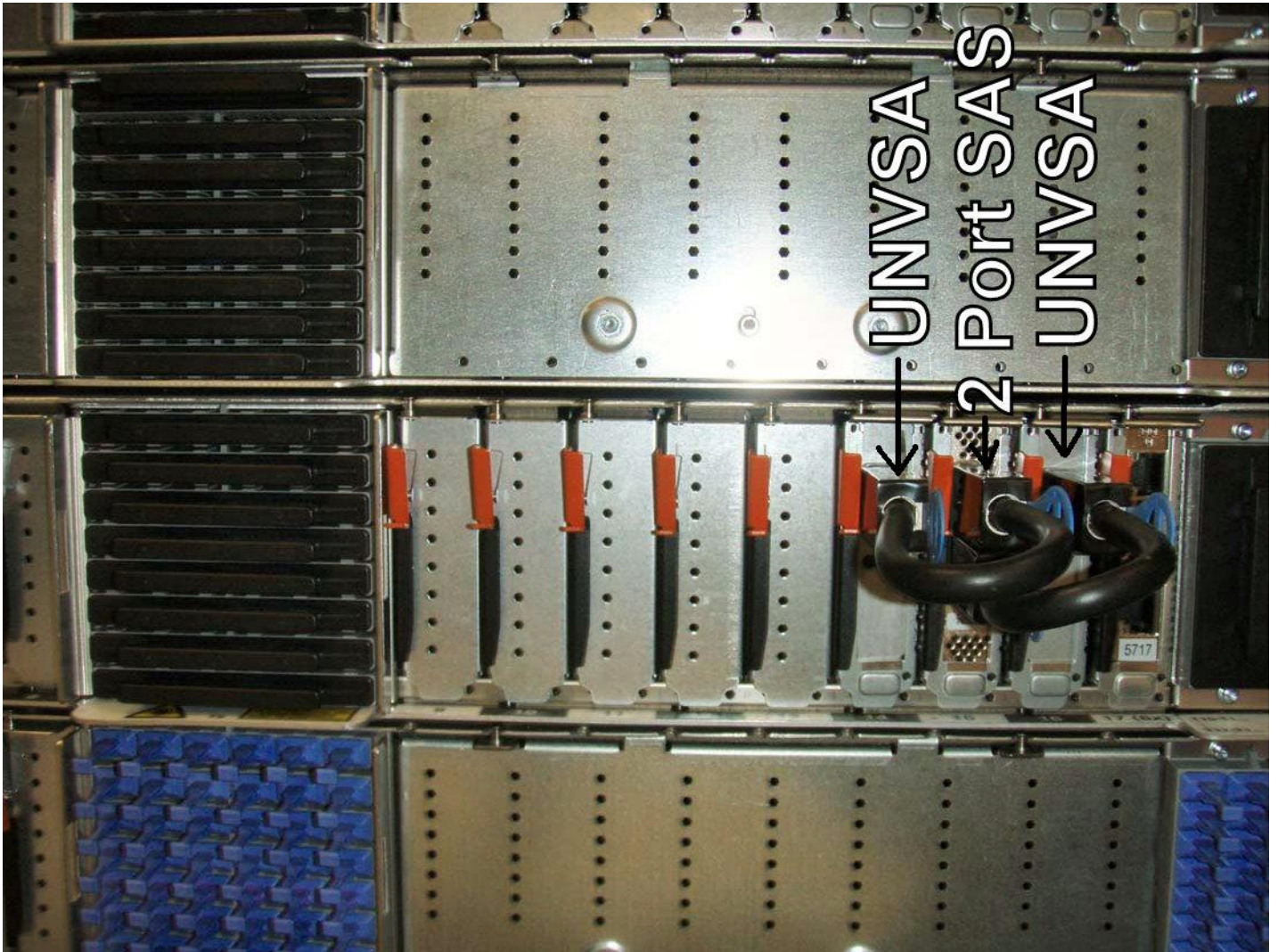


Figure 4 Service Node configuration

3.2 Have customer check for GPFS node and shutdown CEC Drawer <= CUSTOMER TASK

STEP 4 Check for GPFS node in CEC Drawer to be serviced

- Have the customer determine if there is a GPFS node in the CEC drawer to be shut down.
- If the CEC drawer contains a GPFS node, verify that there is an active backup GPFS node for the GPFS node that will be shut down during this service action. **If there is no active backup, the filesystem will go down when this CEC drawer is shut down.**
- If there is an active backup GPFS node, proceed to STEP 5.
- If there is no active backup GPFS node, perform the following:
 - If you can activate the backup GPFS node, activate it before proceeding with this service action. After the backup GPFS is active, you may proceed to STEP 5.
 - If you cannot activate the backup GPFS node because it requires service, service the backup GPFS node first. Then activate it, and confirm that it is acting as a backup for the GPFS node that is in this CEC drawer. After the backup GPFS is active, you may proceed to STEP 5.
 - If you cannot activate the backup GPFS node and you cannot service it before proceeding, prepare the cluster for the filesystem to come down before proceeding. After the filesystem has come down gracefully, you may proceed to STEP 5.

STEP 5 Have the system administrator to ensure that the CEC Drawer has no active partitions running. (This procedure is not a concurrent process from the point of view of the CEC Drawer whose Rails are being serviced. It should be noted that this procedure is concurrent from the point of view of the other CEC Drawers in the rack. The procedure does not affect the other CEC Drawers in the rack from continuing to be used.)

STEP 6 Have customer shutdown the CEC Drawer being serviced.

3.3 Start FRU Replacement Procedure <= SSR TASK

- STEP 7 Initiate the procedure by using CEC Drawer FRU exchange as described below:
- STEP 8 In the HMC left Navigation pane, expand **Systems Management** then click **Servers**.
- STEP 9 Place a checkmark in the **Select** column for the Server with the CEC Drawer to be serviced.
See Figure 5 .

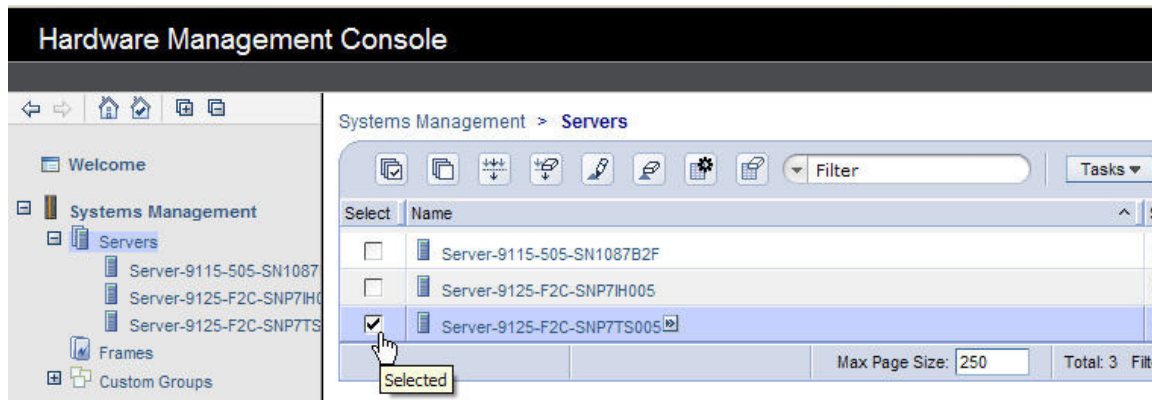


Figure 5 HMC CEC Drawer Selection

- STEP 10 From the **Tasks** menu *select* **Serviceability -> Hardware -> Exchange FRU**. See Figure 6.

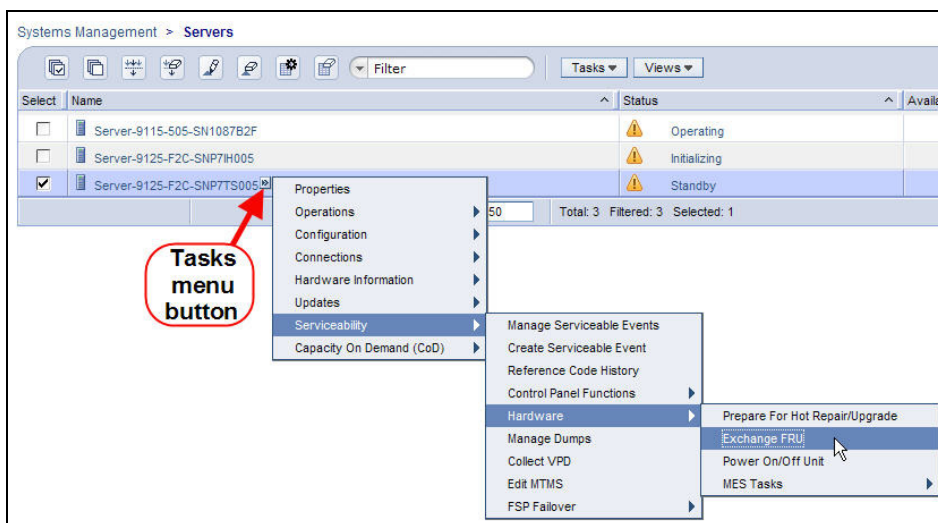


Figure 6 Exchange FRU Panel

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STEP 11 In the Replace **Hardware – Replace FRU, Select FRU Type** window *select CEC Drawer* then *click the Next* button. See Figure 7 . Note: This CEC Drawer procedure is being used to Power off the CEC Drawer being serviced(removing 350V)

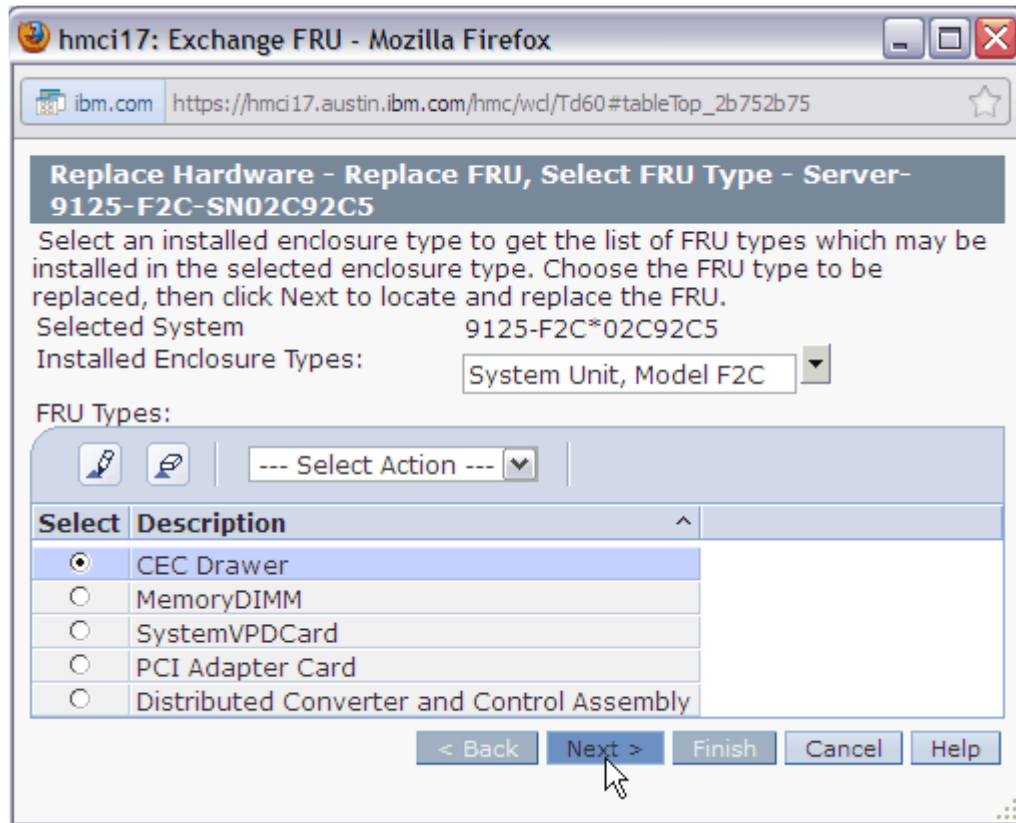


Figure 7 CEC Drawer Selection

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STEP 12 In the Replace **Hardware – Replace FRU, Select Location** window *select* the FRU Location code (**CEC Drawer**) to be serviced then *click* the **Add** button. See Figure 8.

- a. *Select* the **FRU Location Code** that contains the **Serial Number** of the **CEC Drawer** to be serviced.
Only one location code should be displayed similar to: U78A9.001.[CEC Serial Number] – P1
- b. Click the **Add** button.

STEP 13 The selected **Location Code** will be added to the **Pending Actions** list.

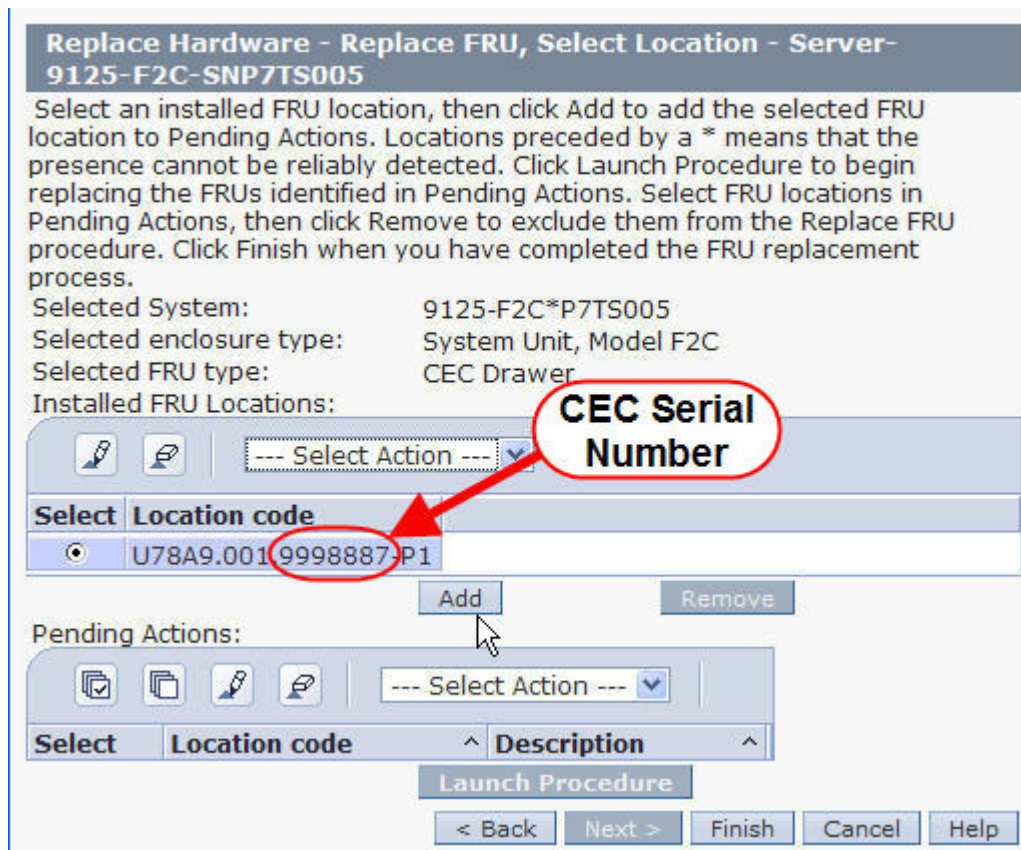


Figure 8 FRU Location Code selection

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STEP 14 In the **Pending Actions** list, place a checkmark in the **Select** column for the CEC Drawer to be serviced then *click* the **Launch Procedure** button. See Figure 9.

Replace Hardware - Replace FRU, Select Location - Server-9125-F2C-SNP7TS005

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*P7TS005
Selected enclosure type: System Unit, Model F2C
Selected FRU type: CEC Drawer
Installed FRU Locations:

Select	Location code
<input type="radio"/>	U78A9.001.9998887-P1

Add Remove

Pending Actions:

Select	Location code	Description
<input checked="" type="checkbox"/>	U78A9.001.9998887-P1	CEC Drawer

Launch Procedure

< Back Next > Finish Cancel Help

Figure 9 Pending Actions Panel

STEP 15 Follow the R&V Panels until you arrive at the panel instructing you to open the rear door. Before opening the rear door you must return to this paper procedure and follow the instructions in the paper procedure. The paper procedure will take you through removal of the CEC Drawer using the lift tool, replacing the CEC Rails and then reinstalling the CEC Drawer. After these steps are complete you will return to the R&V panels as directed in STEP 71 to complete the final steps in the CEC Drawer reinstallation.

3.4 Front Mechanical Preparations for CEC Slides/Rails Service <= SSR TASK

CAUTION:

This part or unit is heavy but has a weight smaller than 18 kg (39.7 lb). Use care when lifting, removing, or installing this part or unit. (C008)

STEP 16 Open and remove the front door, See Figure 10. The front door weights 37lbs (16.8 kg)

- Push in the door lock latch to release and open the door.
- Face the inside of the door and place hands on the cross bars.
- Lift upwards.

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Figure 10 Removal of Front Door

STEP 17 If servicing the CEC Drawer Slides/Rails of the lowest CEC Drawer in the rack, locate and remove the CAM Followers from their storage location as they are shipped in the lowest slot in the frame. The CAM Followers can be removed by pulling out the plunger and sliding the CAM Follower up to remove it from its storage location. See Figure 11.

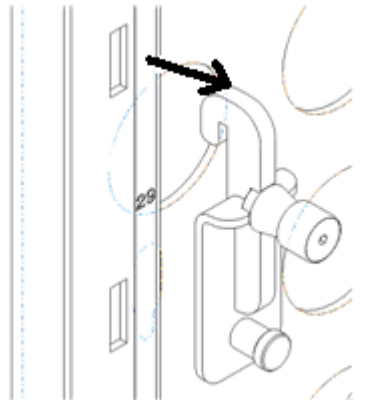


Figure 11 CAM Follower Removal

3.5 Attach Lift Tool to rack <= SSR TASK



CAUTION: System or part is heavy. The label is accompanied by a specific weight range. (L009)

CAUTION: Do not remove or install this unit without using the provided lift tool. (C017)

Lift tool 74Y1087 is required for this service procedure due to the high weight of the CEC Drawer.

STEP 18 Position the Lift Tool to the front side of the rack as shown in Figure 12.

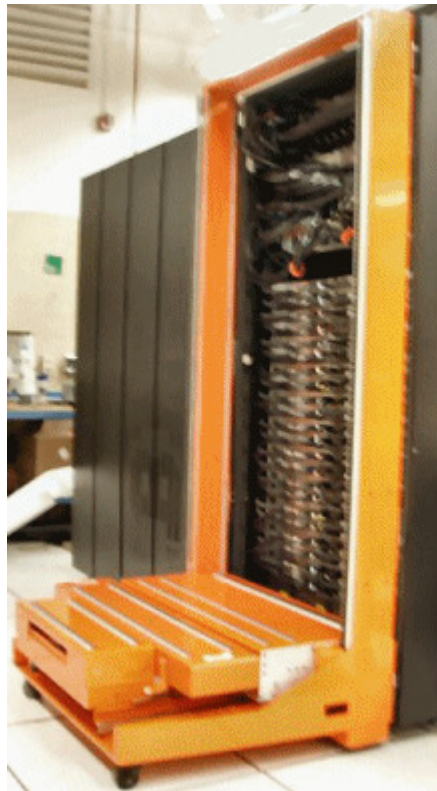


Figure 12 Position Lift Tool at front side of rack

STEP 19 Attach Lift Tool via the two “Frame Front Mounting Brackets”.

Tool-set: [3/8in-ratchet handle, 230in-lb torque clutch (PN 74Y0985), 30cm (12in) socket extension, 5mm hex socket bit (PN 74Y0986)]

STEP 20 Flip the two Rack mounting brackets out (A) towards the slots on the Rack. See Figure 13.

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STEP 21 Fasten the mounting brackets to the Rack using the 5mm hex bit 74Y0986 and ratchet 6428140 (B). See Figure 13.

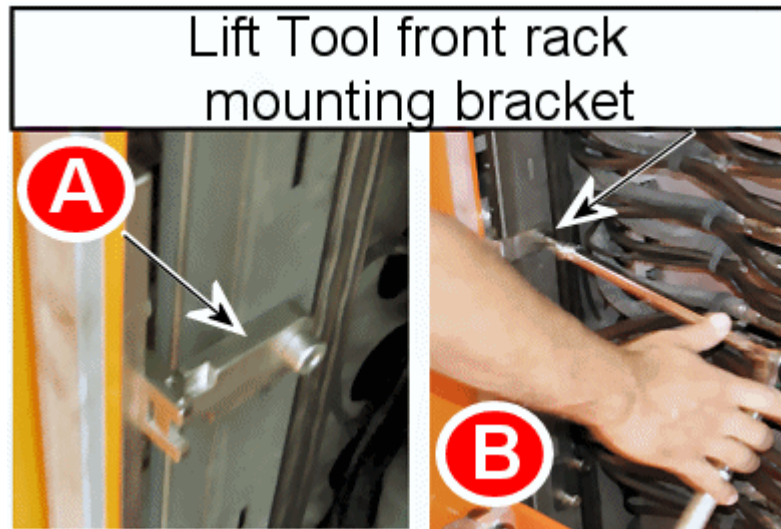


Figure 13 Lift Tool front mounting bracket

STEP 22 Pull out the rear safety gate and flip it up to the vertical position, see Figure 14.

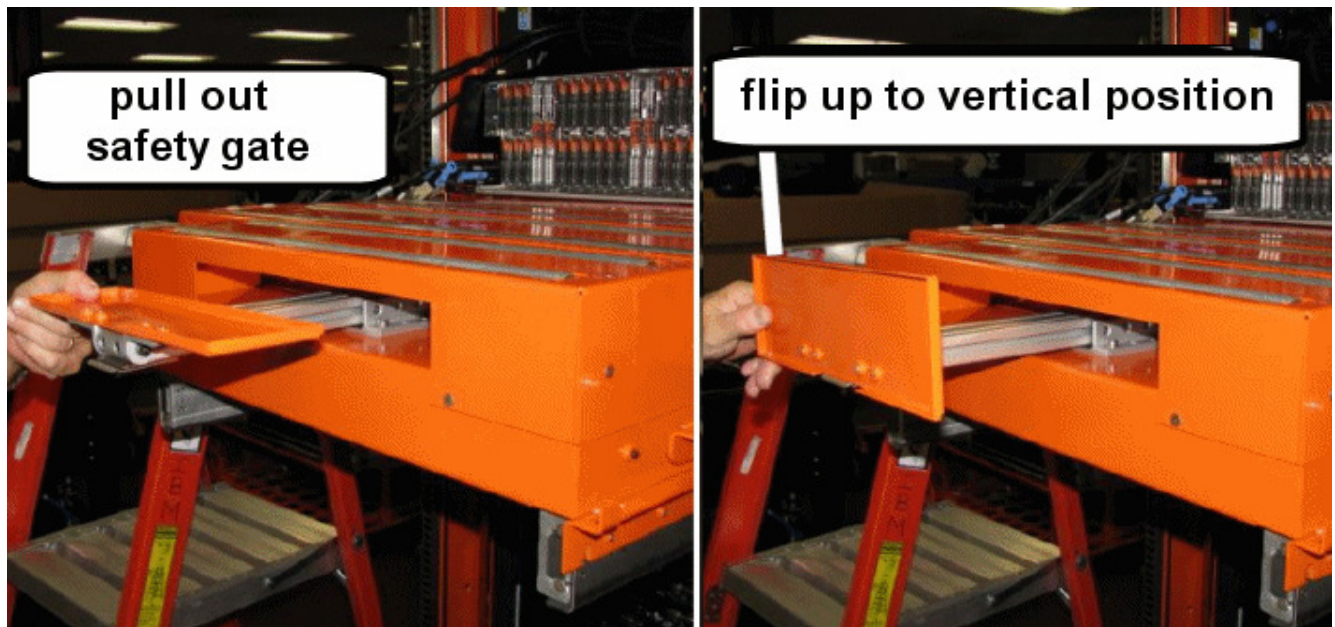


Figure 14 Safety gate positioning

STEP 23 Push stage two release and slide rear table out until it locks into place, see Figure 15 for latch and see Figure 16 for final/open position of table.

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STEP 24 Pull the stage one release and slide the Lift Tool mid table out until it locks into place, see Figure 15 for latch and see Figure 16 for final/open position of table.

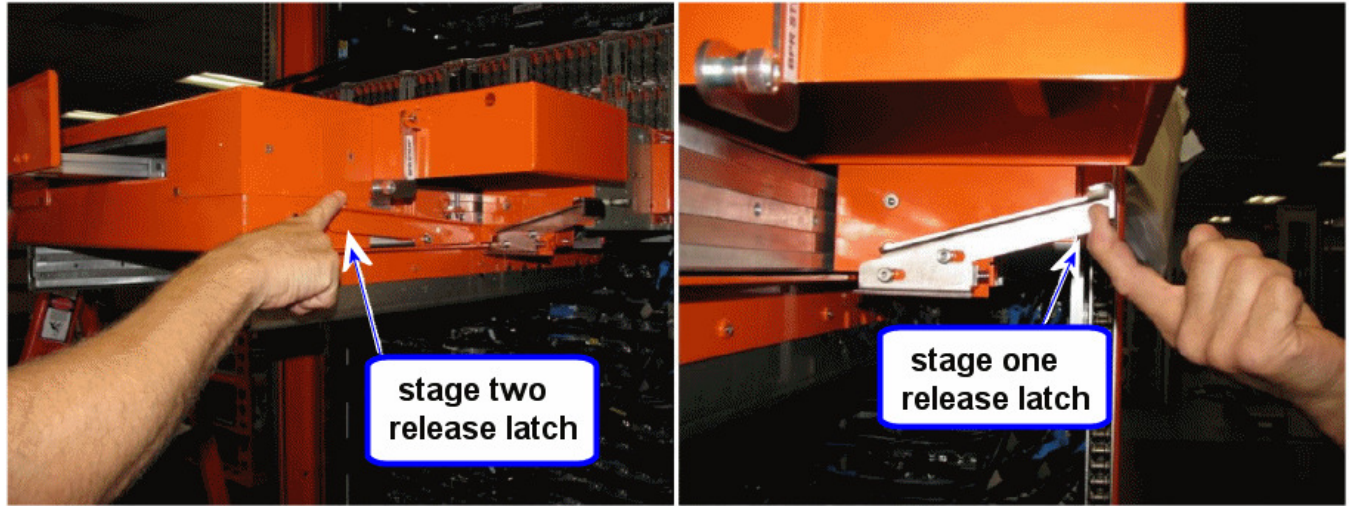


Figure 15 Slide mid and rear tables out by pressing the release latches

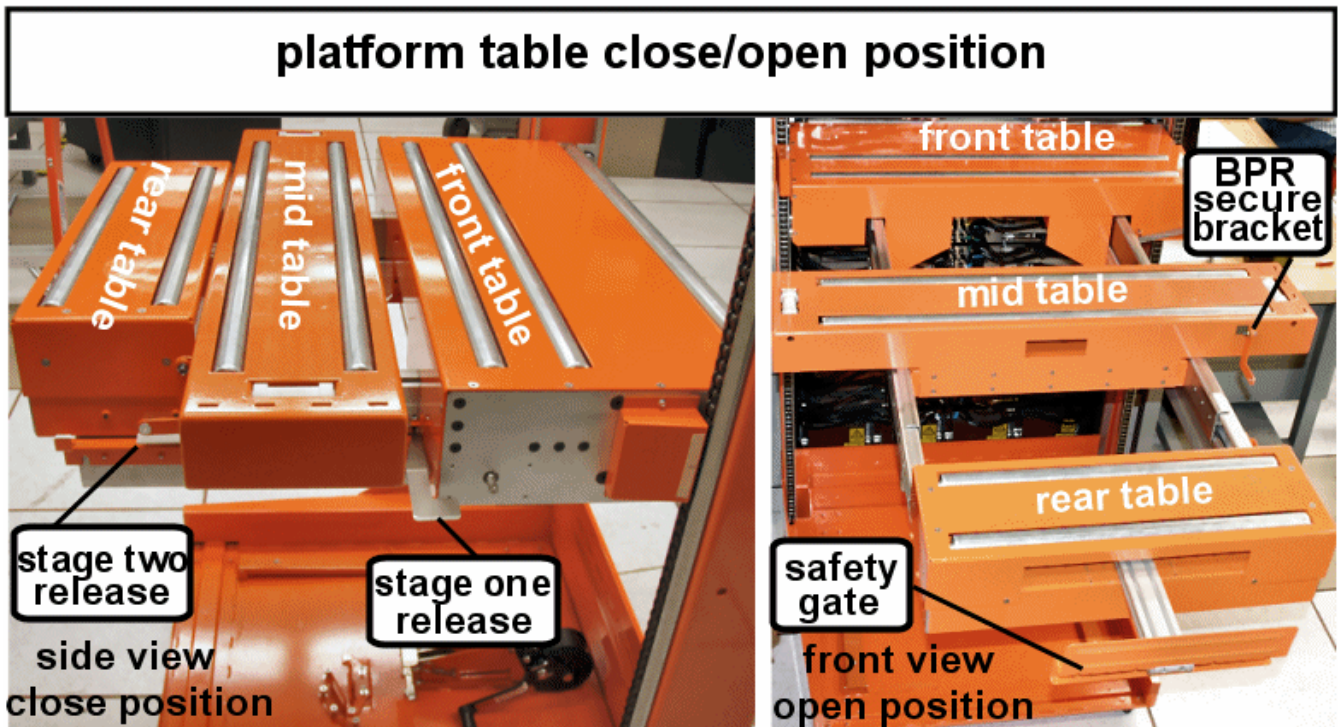


Figure 16 Lift Tool Platform Position

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STEP 25 Ensure that all the cables of the rack are dressed such that the lift table will not catch on cables as it is moved up and down across the face of the rack. See Figure 17 and Figure 18.

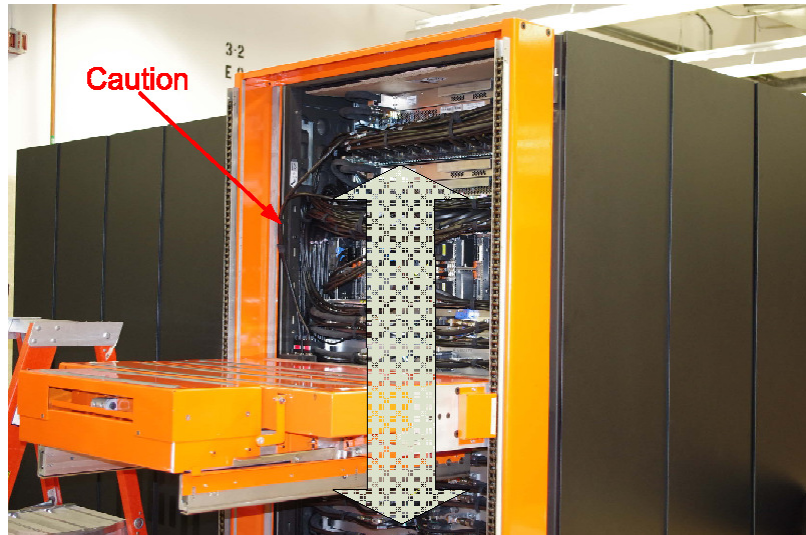


Figure 17 Lift table movement path

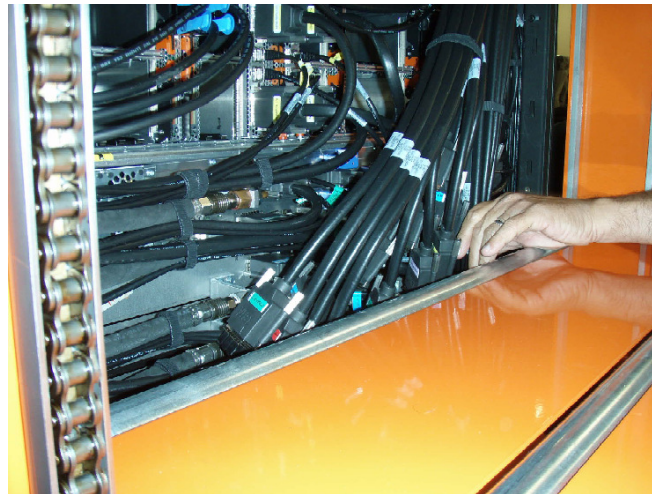


Figure 18 Secure cables

STEP 26 Ensure that the UEPO will not be hit by the table as it moves up and down. Also ensure that the UEPO is secured to the frame so it does not move during the service procedure.

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STEP 27 Raise the lift tool table just below the CEC Drawer to be removed. The platform is raised via the Table Lift Drive, using the battery powered drill shipped with the Lift Tool. Note: Fully extend the platform table to the open position during CEC Rail service

ATTENTION:

- Use two hands to operate the battery powered drill as it is a high torque tool (see Figure 19).
- Use the “Drill” setting on speed “LOW (1)” (Figure 20).
- Be aware that when lowering the tool, as you approach the bottom of the lift table range, reduce the speed of the drill to avoid high torque to the hands and drill slippage from the tool.

Required Tools:

Milwaukee Cordless Drill 2602-20 & Milwaukee 18V Lithium-ION Battery 48-11-1828

Power Drill Operation – Correct Technique

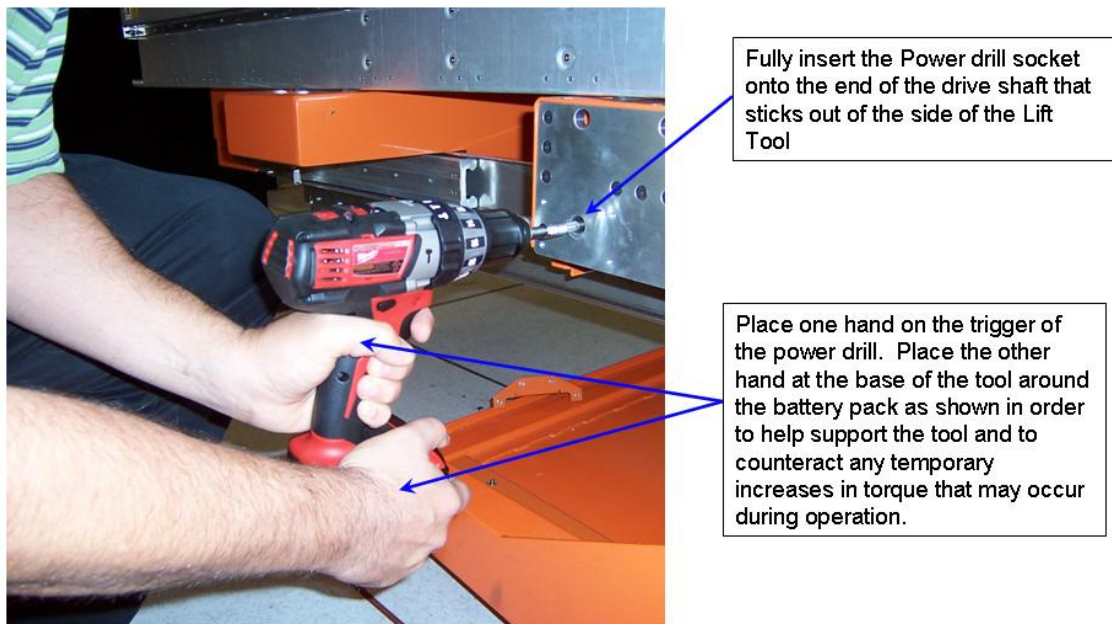


Figure 19 Power Drill Operation – Correct Technique

Power Drill Operation – Correct Settings For Use

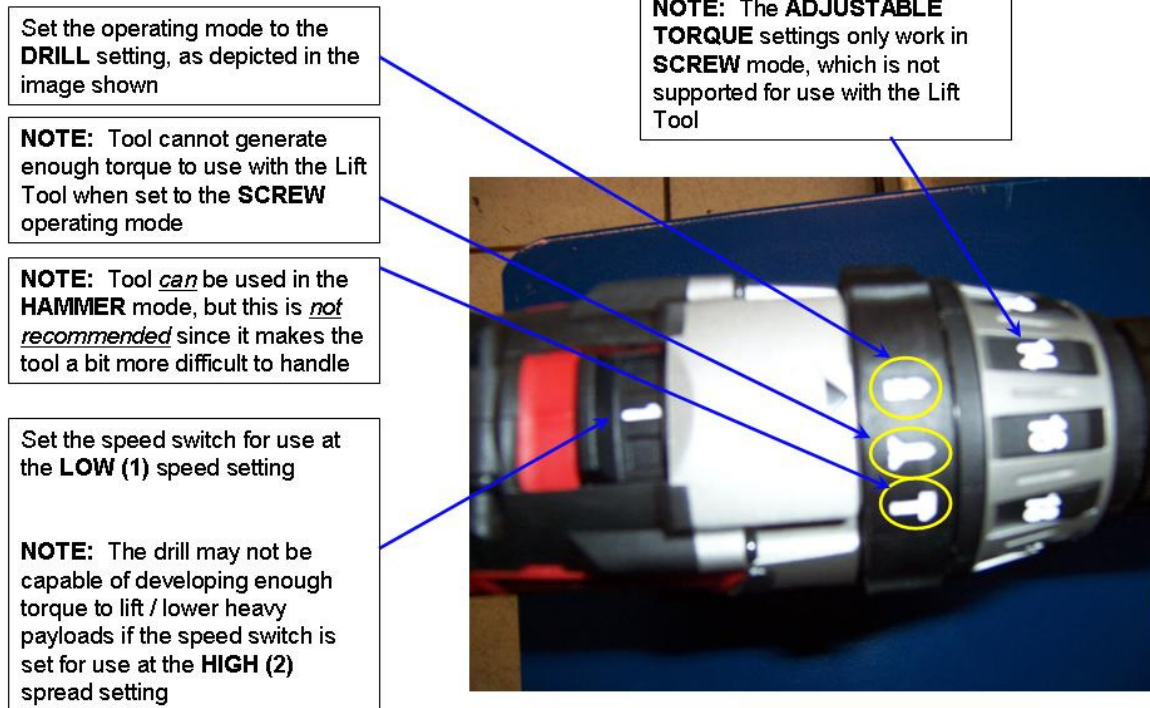


Figure 20 Power Drill Operation – Correct Settings for Use

3.6 Rear Mechanical Preparations for CEC Slides/Rails Service <= SSR TASK

STEP 28 Go to the back of the rack and open the rear door.

STEP 29 Locate the CEC Drawer being serviced.
 (Figure 21 is a photo of a CEC Drawer for the purposes of identifying the D-Link, the L-Link, the PCI cables, and the water connection locations)

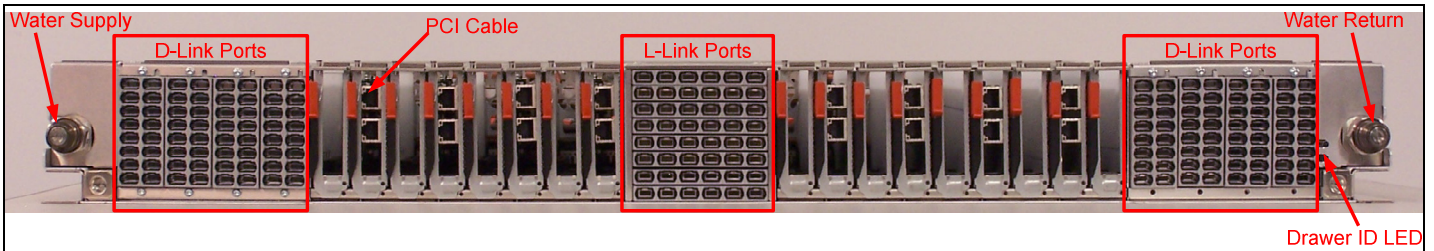


Figure 21 CEC Drawer rear view

(See Figure 22 for the location codes for the D-Links and the L-Link backplane assembly)

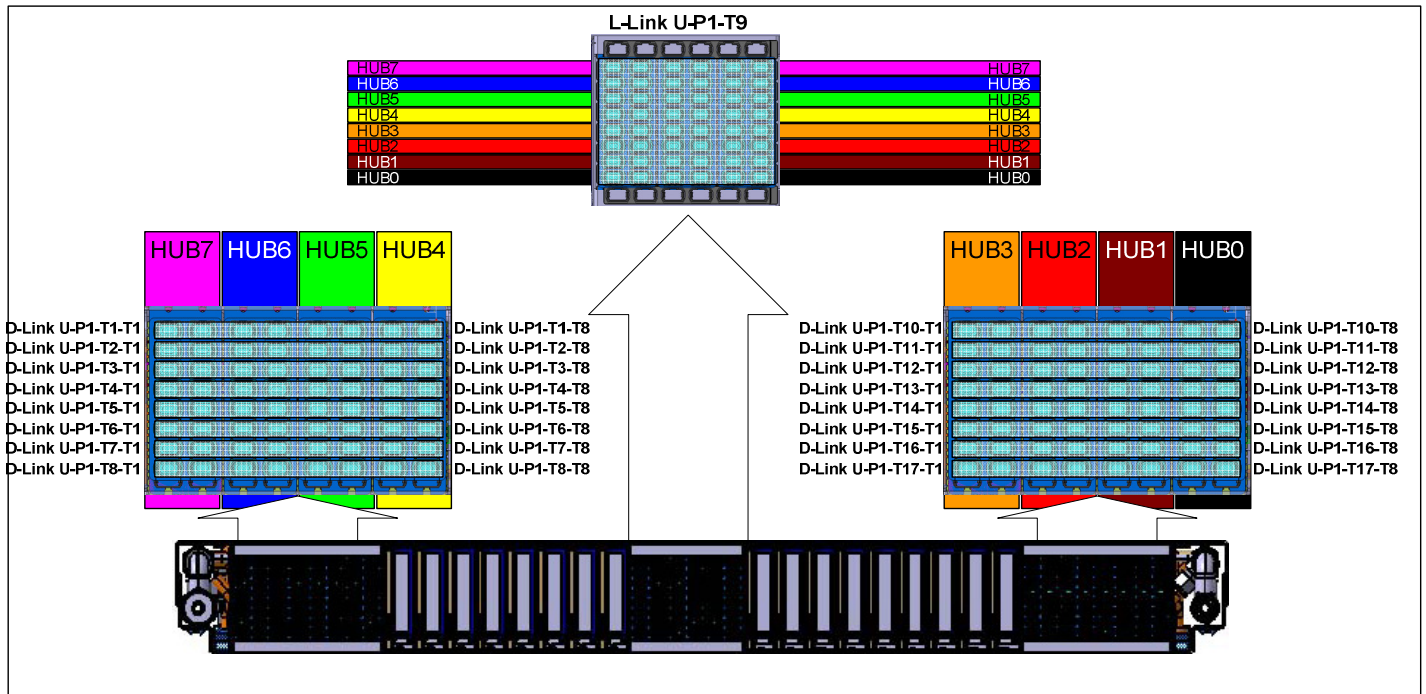


Figure 22 Location Codes for D-Link and L-Link assemblies

STEP 30 Label and disconnect any PCIe card cables

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CAUTION:

This product contains a Class 1M laser. Do not view directly with optical instruments. (C028)

STEP 31 Disconnect the L-Links from the CEC Drawer being serviced if present. (some CEC Drawer will not have L-Links). Refer to Figure 22 above. (It is important to note that we must take every precaution to ensure that the L link do not get dirt, dust or other debris on them)

Are you are servicing a CEC Drawer that has L-Links?

If Yes, then continue to STEP 32

If No, then skip to STEP 37

STEP 32 Ensure that all 8 spring clips holding the OBE (Optical Backplane Enclosure) to the CEC drawer are properly latched. Identify the 4 handles in the OBE that plug into the CEC Drawer whose CEC Rails are being serviced.



CAUTION: Sharp edges, corners, or joints nearby. (L006)

STEP 33 Pull out each of the 4 actuation handles until the connectors are unplugged. It is not necessary to pull the handle out more than 1/2 inch. Figure 23 shows a method for pulling out the handles. The photo also shows the spring clips on the right side of the OBE, holding the 4 sections of the OBE to the CEC drawers.

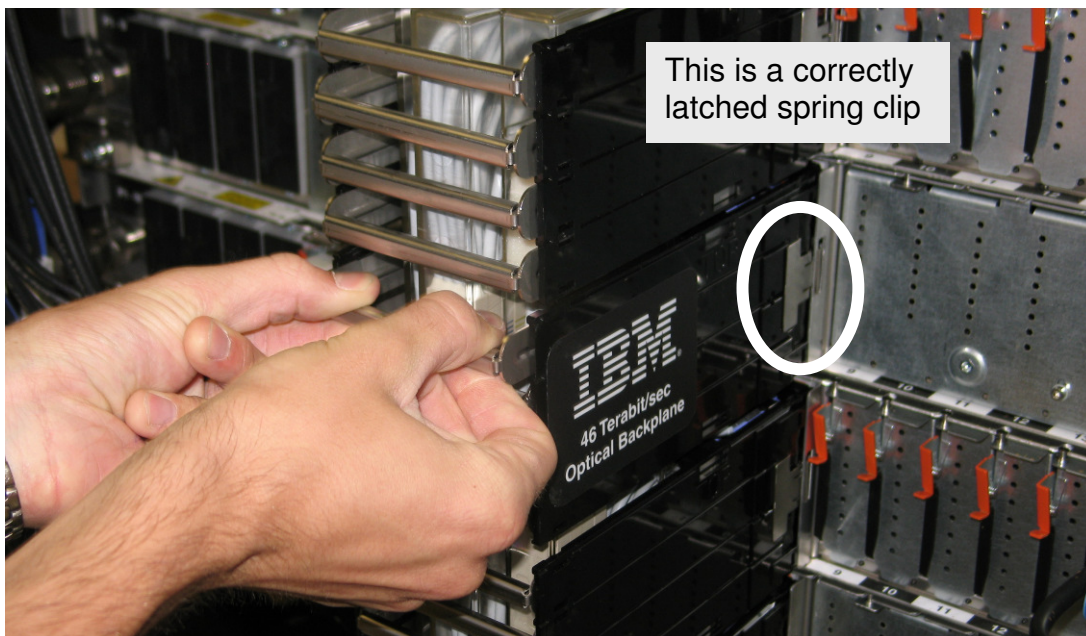


Figure 23 Optical Backplane Enclosure

STEP 34 Detach the OBE section of the CEC drawer being service as follows.

STEP 35 Press in the 2 spring clips on each side of the optical backplane enclosures, to de-latch the OBE from the CEC Drawer being serviced.

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STEP 36 Pull the OBE handle/sidewall assembly slightly outward to separate it from the CEC drawer. See Figure 24. Take care not to bump the frame faces of the fiber optic connectors against any surface, including body parts, to prevent contamination or damage on the fiber endfaces. **NOTE:** Do not remove more than one CEC drawer per OBE at a time - the OBE must be supported by at least 3 CEC drawers while it is installed in the system.

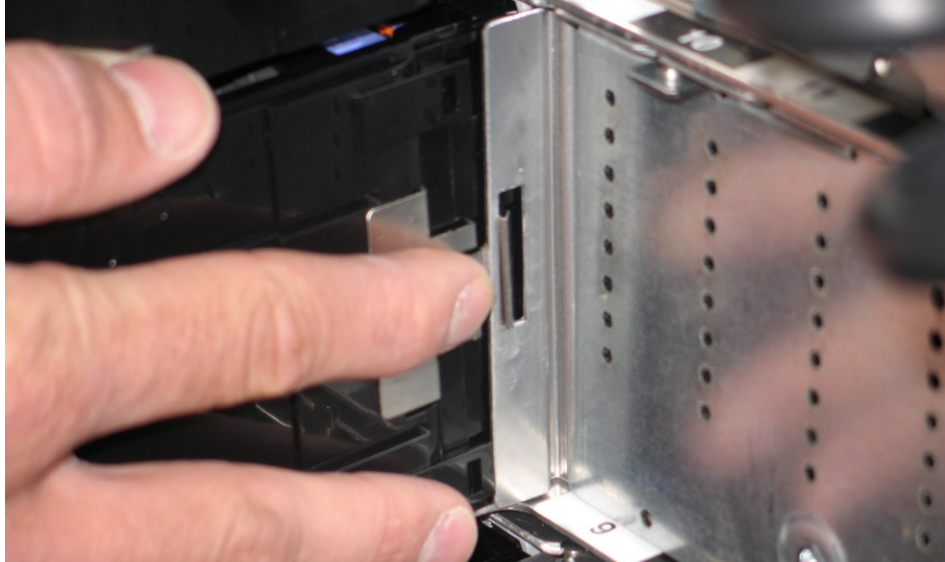


Figure 24 OBE Sidewall Assembly

STEP 37 Remove the CEC Drawer D-Links from both the left and right rear of the CEC Drawer (Right side of CEC shown in Figure 25) being serviced by pulling on the blue tabs of each D-Link. Take care not to bump the fiber optic connectors against any surface including body parts. (The row of D-Links are contained within the D-Link Grouper and will remain in the housing. It is worth noting that the housing has a label on it with its location and each cable has a label – see Figure 26.) Must remove cable support brackets.

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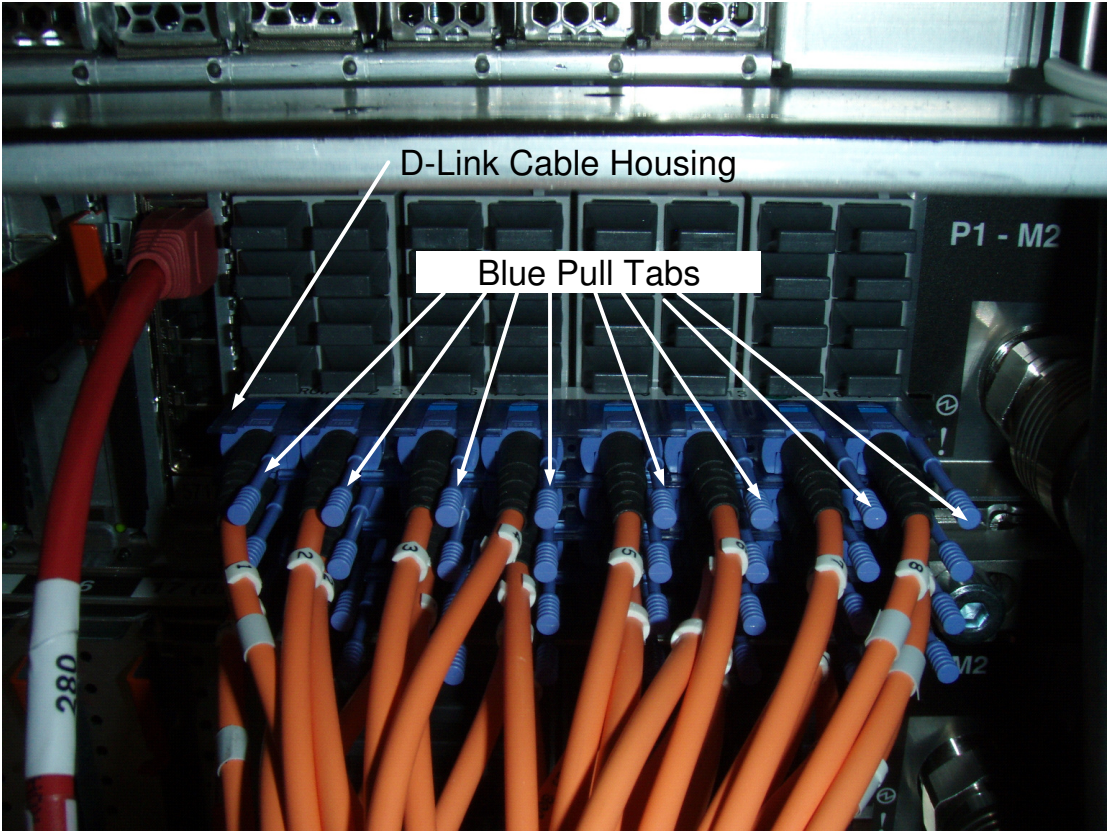


Figure 25 D-Link Grouper

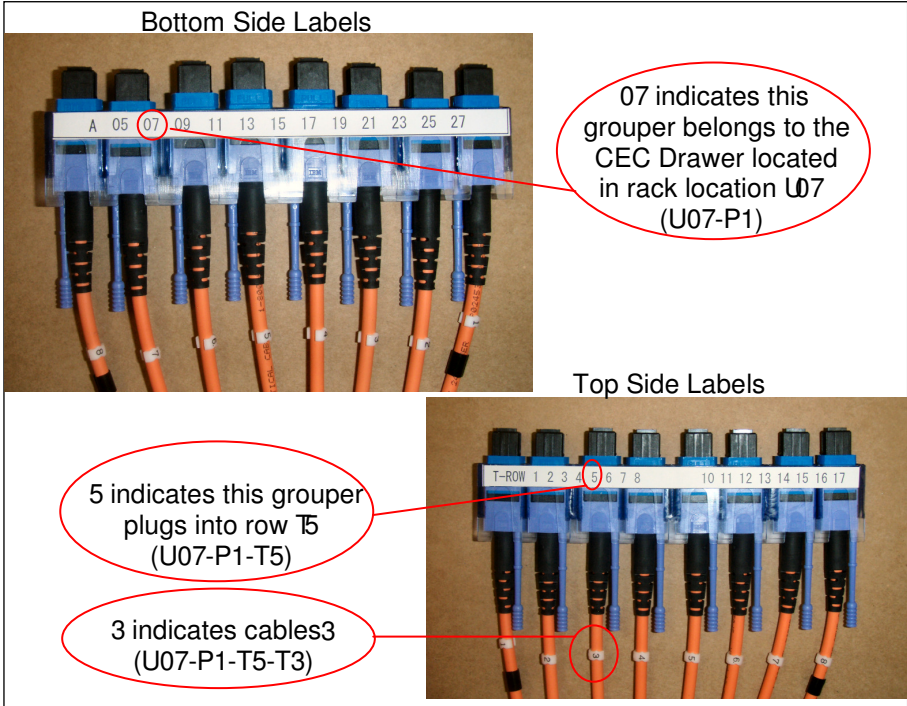


Figure 26 D-Link Grouper assembly detail

Power775 CEC Drawer Rails Service Procedure

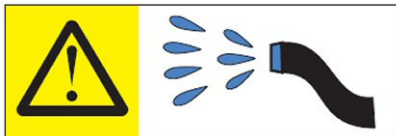
PN: 41U8495, EC N44172



CAUTION: Protective eyewear is needed for the procedure. (L011)



CAUTION: Chemical resistant gloves are needed for this procedure. (L014)



DANGER: Risk of electric shock due to water or a water solution which is present in this product. Avoid working on or near energized equipment with wet hands or when spilled water is present. (L016)

CAUTION:

The water-based coolant solution may contain an additive intended to inhibit corrosion (or provide other functions). The solution may cause irritation to the skin or eyes. Avoid direct contact with the solution. Employ appropriate Personal Protective Equipment when performing operations involving the coolant or which may potentially expose you to the coolant. Refer to the MSDS for more information. (C037)

STEP 38 Disconnect the two water hoses from the left and right rear(see Figure 27) of the CEC Drawer. Disconnect the hoses by pulling the retaining ring on the hose, see Figure 28.

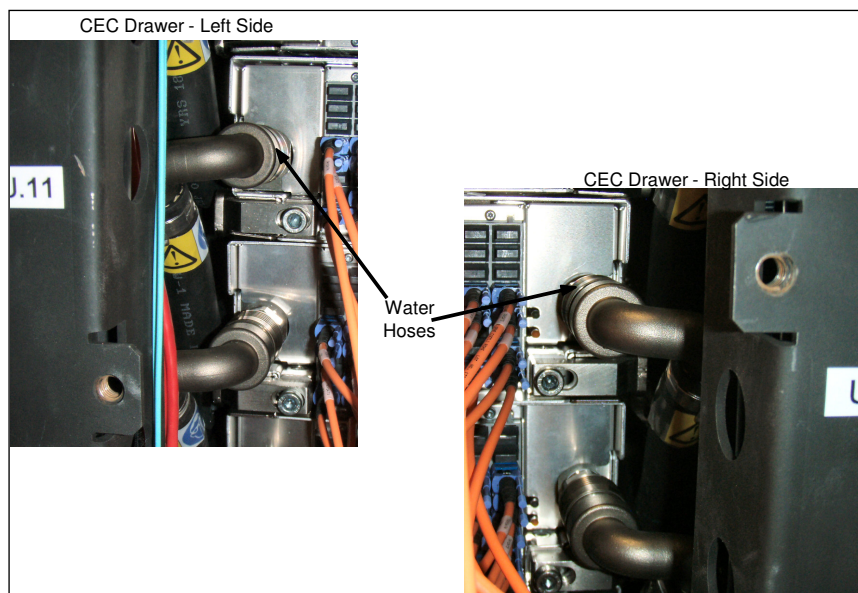


Figure 27 CEC Drawer rear water connections

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Figure 28 CEC Drawer retaining ring image

STEP 39 Ensure that everything has been disconnected from the rear of the CEC Drawer and properly labeled.

Check List:

- 4 L-Link Actuation Handles
- All D-Links to CEC
- PCI Cables
- Both water connections

STEP 40 Loosen the rear CEC Rail mounting bracket captive screws using the tools listed below(see Figure 29):

3/8" Ratchet, PN 6428140

3/8" Extension - 18", PN 46K2707

3/8" Socket Bit, 5mm Hex, PN 74Y0986

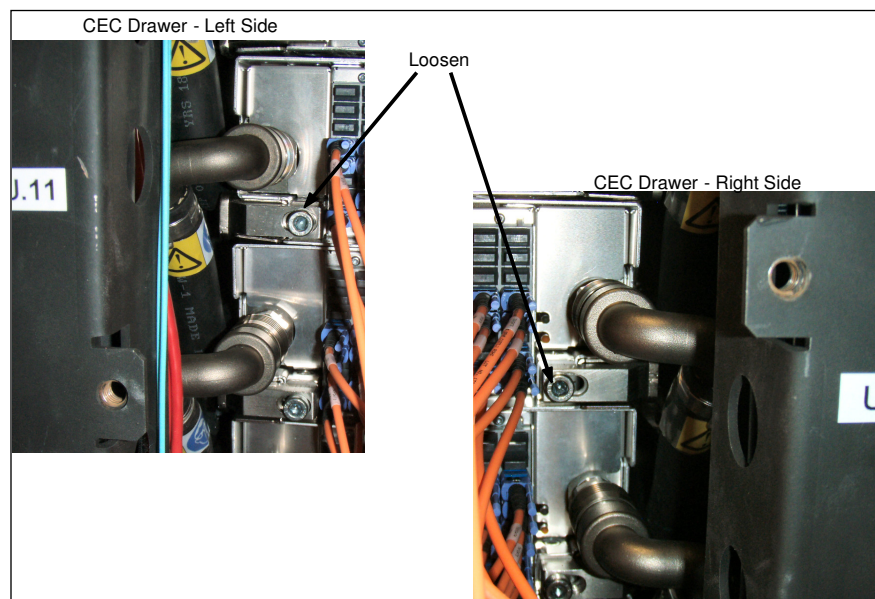


Figure 29 Rear CEC Rail mounting bracket

3.7 Temporarily remove CEC Drawer <= SSR TASK



DANGER: Rack-mounted devices are not to be used as shelves or work spaces. (L002)



CAUTION: System or part is heavy. The label is accompanied by a specific weight range. (L009)

CAUTION: Do not remove or install this unit without using the provided lift tool. (C017)

STEP 41 As necessary, place the ladder on the right side of the Lift Tool to allow access to CEC Drawer Safety Latch.

STEP 42 Slide the CEC Drawer out until the safety stop is reached. Note that the CEC drawer should slide ~2/3 of the way out and then stop on the right side Safety Latch.

STEP 43 Raise the Lift Tool Table so it contacts the bottom of the CEC Drawer and then slightly further to transfer the CEC Drawer weight to the Lift Tool Table. *Important, do not raise too high which will result in the CEC Drawer being driven into the mechanical device above. This can cause damage.*

STEP 44 After the CEC Drawer stops on the Safety Latch, carefully slide the CEC Drawer back ¼-½ inch into the Rack.

STEP 45 On the right-hand side, insert the 4mm Hex Driver (41V1059) into the gap between CEC Drawer and Rack so that the 4mm Hex Driver rests on the bottom side of the Safety Latch Lift Pin. See Figure 30.

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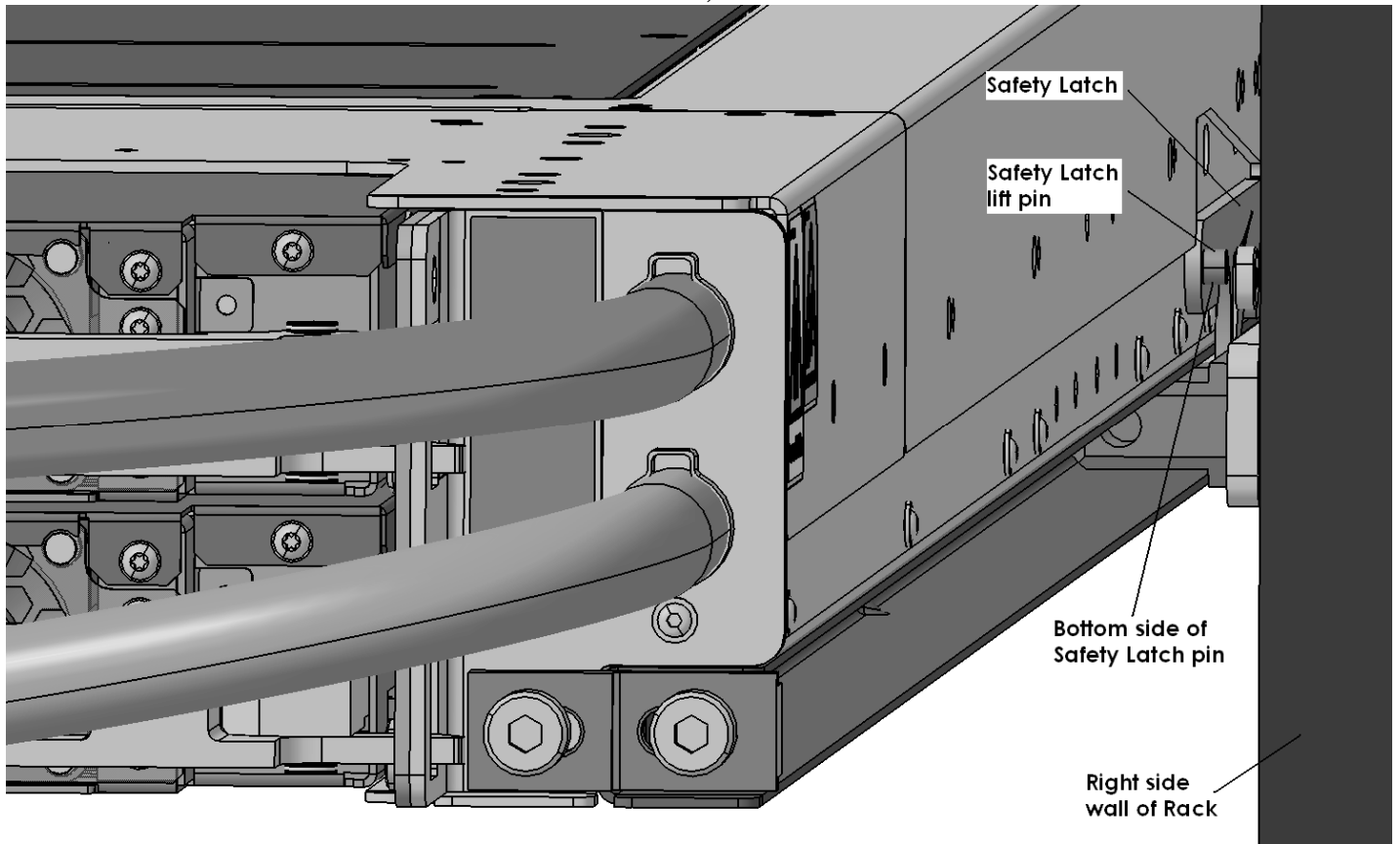


Figure 30 Safety Latch actuation

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- STEP 46 Push up on the Safety Latch pin to make the Safety Latch pivot upward. Slide CEC Drawer forward while continuing to push the Safety Latch pin up.
- CEC Drawer should slide out ~1 inch before stopping on the left side Safety Latch.
- STEP 47 Once CEC Drawer stops on left Safety Latch, carefully slide the CEC Drawer back ¼-½ inch.
- Be careful not to slide CEC Drawer back any further, or else the right side Safety Latch will re-engage.
 - If this happens, go back to STEP 42.
- STEP 48 As necessary, place the ladder on the left side of the Lift Tool to allow access to left/second CEC Drawer Safety Latch.
- STEP 49 On the left-hand side, stick the 4mm Hex Driver (41V1059) into gap between CEC Drawer and Rack so that the Driver rests on the bottom side of the Safety Latch Lift Pin.
- STEP 50 Push up on the Safety Latch pin to make the Safety Latch pivot upward. Slide CEC Drawer forward while continuing to push Safety Latch pin up.
- CEC Drawer can now completely slide out and will no longer be supported by the Rack rails.
 - Therefore, be sure that Lift Tool is installed correctly before sliding CEC Drawer completely out of Rack
- STEP 51 Move the CEC Drawer completely onto the lift tool platform.
- ATTENTION: Do not go under the CEC Drawer while it is partially or fully out of the frame**
- STEP 52 Lower the lift tool platform as needed to service the CEC Rails that this CEC Drawer was removed from. The platform is lowered via the “Table Lift Drive”. The platform may be lowered with either the manual tool provided or a battery powered drill. (Note: when using a drill once the platform bottoms out the drill will rotate in your hand. You may wish to reduce the torque on the drill before using it.
- STEP 53 Loosen the four (4) rail mounting captive screws from the CEC Rail
- Loosen and disengage the rail mounting captive screws using Tool-set: [3/8in-ratchet handle, 230in-lb torque clutch (PN 74Y0985), 30cm (12in) socket extension, 5mm hex socket bit (PN 74Y0986)]. Note: the captive screws will stay attached to the CEC Rail.
- STEP 54 Slide the rail assembly gently towards the front of the Rack to disengage the “mushroom” pins. The CEC Rail will now be free to move. Finally, remove the entire CEC Rail from the front or rear of the EIA rack space – use whichever side is easiest for removal.
- STEP 55 Complete the above two steps for both the left and right CEC Rail

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STEP 56 Locate the replacement CEC Drawer right and left side rails **PN 45D9467** from the ship group.

STEP 57 Verify the rails are properly oriented for Rack installation(see Figure 31).

- The rail end with the thumbscrew (**A**) is installed at rear of the Rack.
- The two guide pins (**B**) face in toward the Rack key holes.

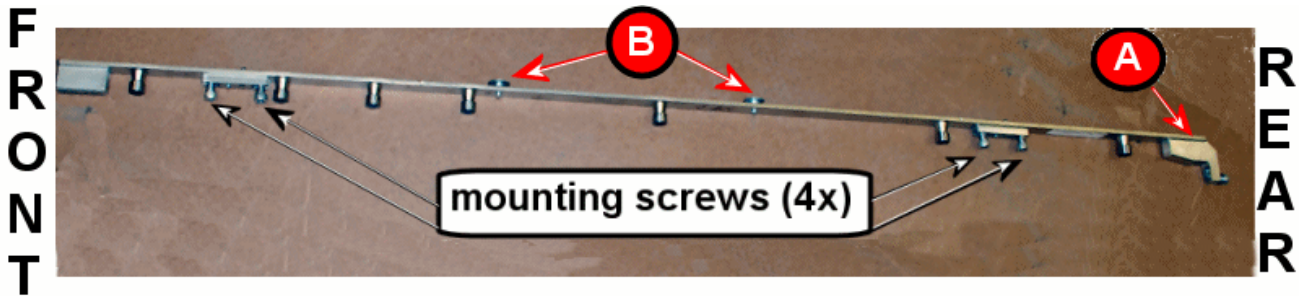


Figure 31 CEC Rail Details

STEP 58 Install the rails into the Rack.

- a) Facing the front of the Rack, position the left side rail guide pins with the appropriate key slots (**A**) and (**B**) on the Rack. See Figure 32.

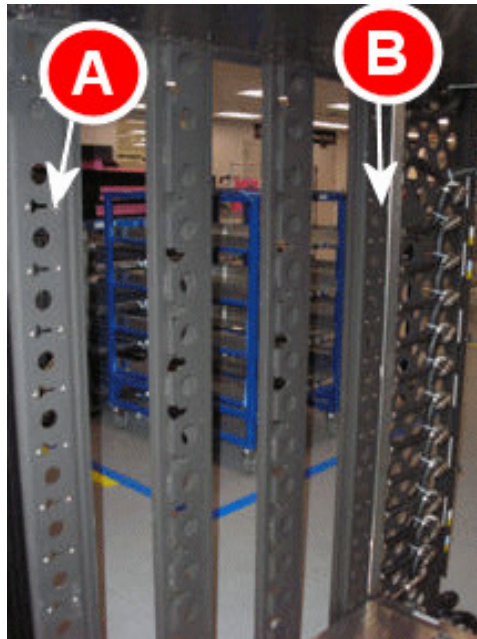


Figure 32 Rack features for Slide/Rail installation

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- b) Align and insert the two guide pins on the back of the rail into the key holes in the Rack. See Figure 33.

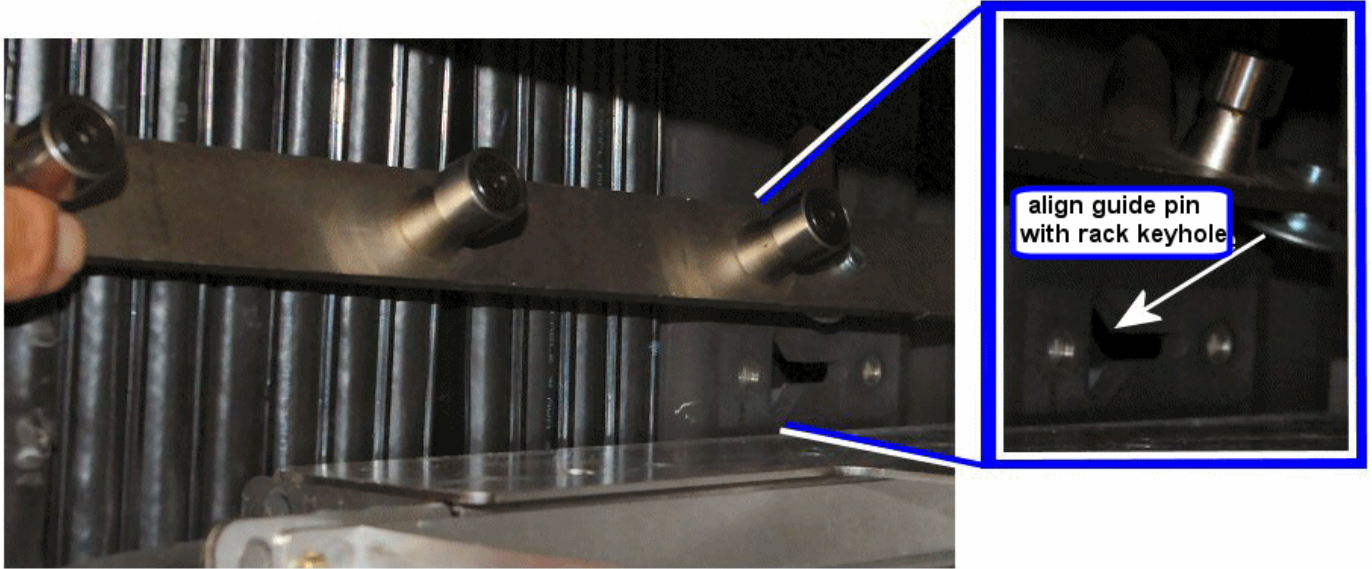


Figure 33 Guide pin vs rack keyhole alignment

Note the rail guide pin will sit in the Rack key hole as shown in Figure 34. You will only be able to see this if the rack side cover is not installed.

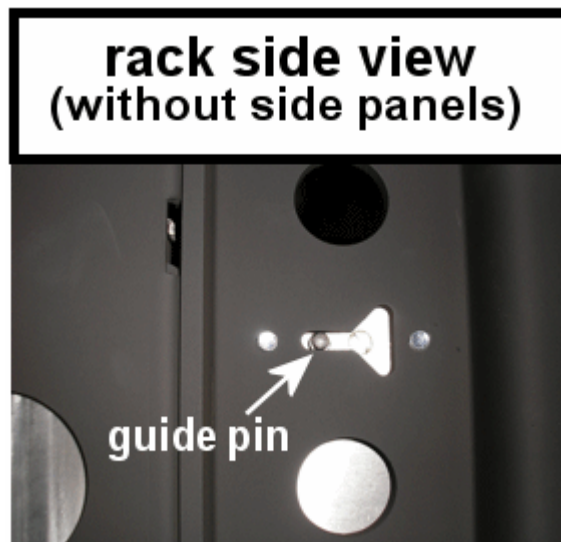


Figure 34 Guidepin location in rack after installation.

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- STEP 59 Fasten the four (4) rail mounting captive screws, see Figure 35
- Start to fasten the captive screws by hand first, to prevent cross threading of the screw and threaded hole.
 - Fasten the rail mounting captive screws using Tool-set: [3/8in-ratchet handle, 230in-lb torque clutch (PN 74Y0985), 30cm (12in) socket extension, 5mm hex socket bit (PN 74Y0986)].



Figure 35 Rail mounting screw location

- STEP 60 Repeat STEP 57 to STEP 59 for the right side rail installation.

3.8 Re-install CEC Drawer to original position <= SSR TASK



DANGER: Rack-mounted devices are not to be used as shelves or work spaces. (L002)



CAUTION: System or part is heavy. The label is accompanied by a specific weight range. (L009)

CAUTION: Do not remove or install this unit without using the provided lift tool. (C017)

- STEP 61 Raise the lift tool back to the appropriate EIA location of the rack if previously lowered. Position the lift tool height such that CEC drawer channels will roll off of the lift tool platform and onto the CEC Rails. Line up the sides of the CEC Drawer (A) with the slide mechanism on the rail as shown in Figure 36.

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rack rear view of CEC Drawer

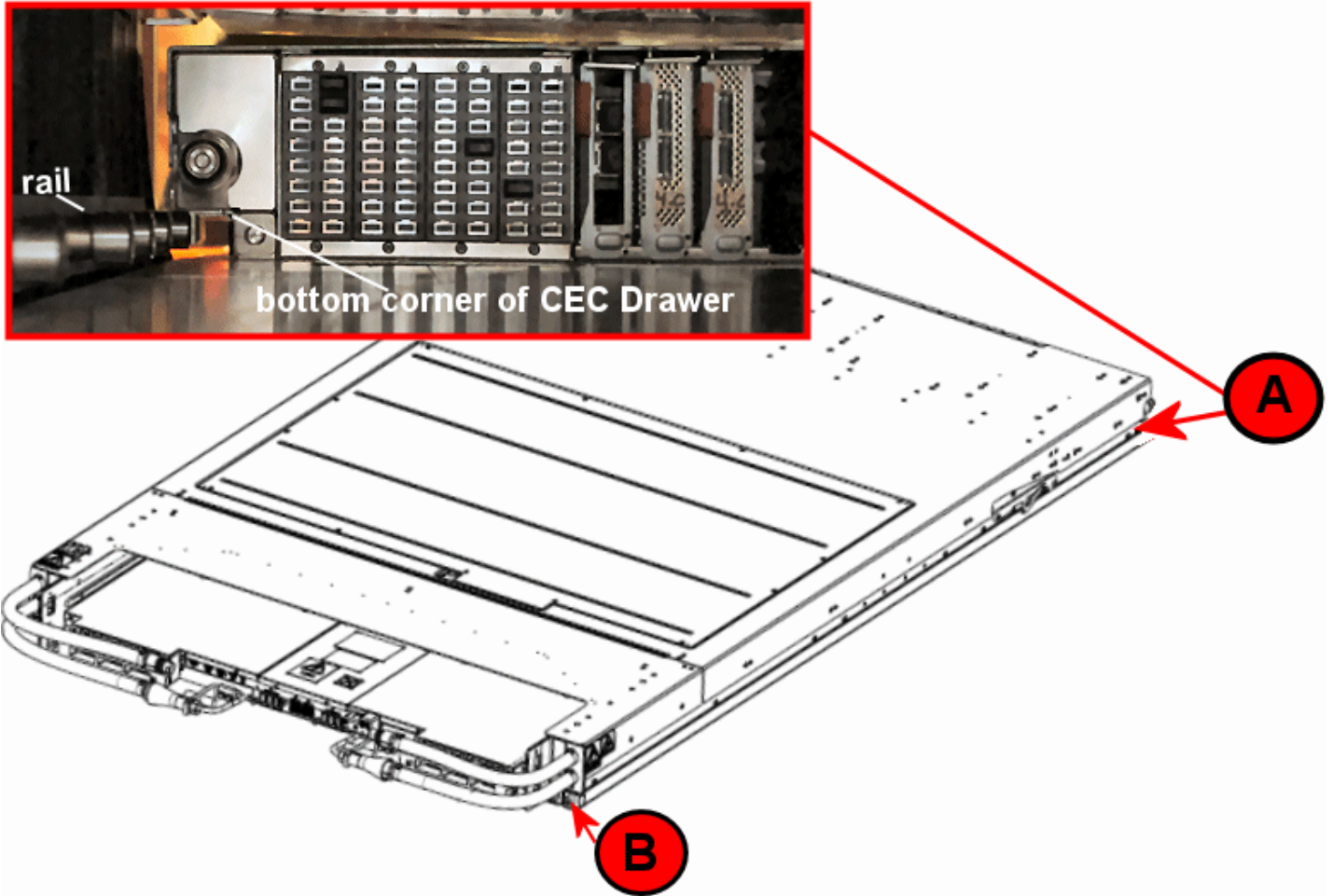


Figure 36 CEC Drawer lined up with Slide/Rail

STEP 62 Slide the CEC Drawer back into the frame. Note, there are staggered latches in the CEC Drawer one on the left and one on the right. One or both need to be disengaged, one at a time to return the CEC drawer to its operating position in the rack. Use P/N 41V1059 to lift the latches. Do not use screw driver to lift the latches as this may damage cables.

STEP 63 Go to the rear of the rack.

STEP 64 Tighten the CEC mounting bracket screws using the following tools:
3/8" Ratchet, PN 6428140
3/8" Torque Clutch - (23 - 31 Nm torque setting), PN 74Y0985
3/8" Extension - 18", PN 46K2707
3/8" Socket Bit, 5mm Hex, PN 74Y0986

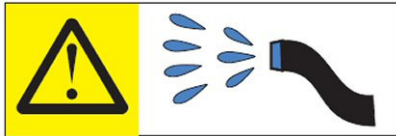
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CAUTION: Protective eyewear is needed for the procedure. (L011)



CAUTION: Chemical resistant gloves are needed for this procedure. (L014)



DANGER: Risk of electric shock due to water or a water solution which is present in this product. Avoid working on or near energized equipment with wet hands or when spilled water is present. (L016)

CAUTION:

The water-based coolant solution may contain an additive intended to inhibit corrosion (or provide other functions). The solution may cause irritation to the skin or eyes. Avoid direct contact with the solution. Employ appropriate Personal Protective Equipment when performing operations involving the coolant or which may potentially expose you to the coolant. Refer to the MSDS for more information. (C037)

STEP 65 Reconnect the 2 water hoses

CAUTION:

This product contains a Class 1M laser. Do not view directly with optical instruments. (C028)

STEP 66 Plug the L-Links:

- With the Optical Backplane Enclosure retracted, partially insert the top row of connector into the L-Link ports, then second, the third and the fourth, so that all connectors are partially inserted into the L-Link Ports in the CEC drawer.
- Press inward on the 2 spring clips on each of the OBE handle/sidewall assembly, slide the OBE handle/sidewall assembly forward toward, and release the spring clips, to attach it to the CEC Drawer.
- Ensure that the spring clips are properly inserted on the insides of the slotted latching plates of the CEC drawer.
- Gently push the 4 OBE actuation handles forward, to slide the optical connectors into the L-ports in the CEC drawer. This step takes some care, since each handle actuates 12 connectors, and there may be some misalignment between one or more of the 12 individual connectors and the L-Ports in the CEC drawer. It may be necessary to rotate slightly the handle/sidewall assembly to align the connectors with the L-Ports. When all 12 connectors of a handle are aligned with the L-Ports, the handle will slide forward by ~1/2" to insert the connectors into the L-Ports.

NOTE: All 4 handles must be slid forward to prevent damage to the L-Port adapters before proceeding.

- Using the upper of the 4 actuation handles, press in the connector. When the actuator is connected a audible click will be heard for each of the 4 MPO connectors. (Approximately 20 lbs of force will be required for each of the handles to fully actuate all 12 connectors during insertion.)

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- Once all 4 handles are slid forward with the L-Link connectors in the L-Ports of the adapters, do the final actuation of the handles, see Figure 37. This requires pushing the handle forward forcefully, hard enough to simultaneously seat the 12 connectors. It requires approximately 20 lbs of force for each handle to fully actuate all 12 connectors during insertion. When the connectors are fully actuated, an audible "click" will be heard, as all 12 connectors click into place.

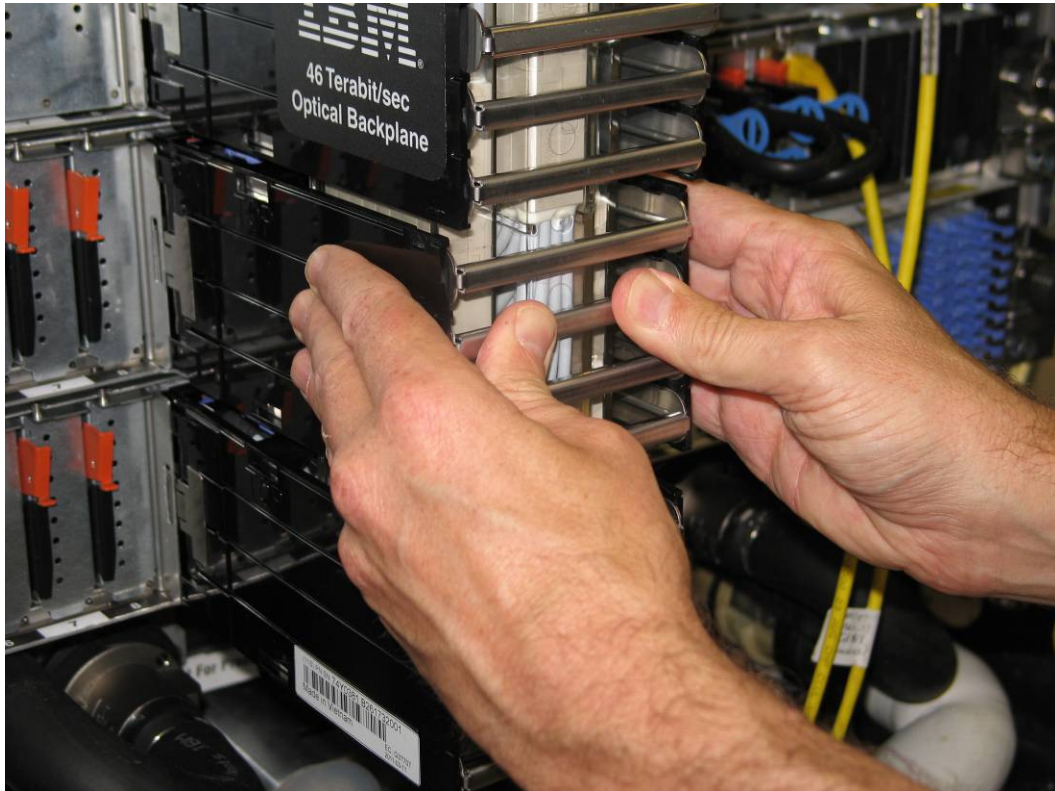


Figure 37 OBE Installation

STEP 67 Re-install the D-Links and cable support brackets starting from the bottom most position, refer to Figure 38

- Position the grouper for the D-Link optical connectors at the proper row.
- Insert the grouper into their respective D-Port adapter receptacles.
- Insert each connector into its port by pushing on the push/pull tab, or by pushing on the strain relief boot at the rear of the connector.
- Re-install the cable support brackets

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Figure 38 D-Link Grouper Installation

STEP 68 If required, re-plug all of the PCIe cables.

STEP 69 Detach and Store the Lift Tool, see Figure 15 and Figure 16.

- a. Retract the platform table.
- b. Lower the platform table to the lowest position.
- c. Detach the Rack mounting bracket fasteners from the Rack by loosening the fasteners, then fold brackets in towards the Lift Tool.

STEP 70 Return the CAM Followers to the original Rack storage location at the bottom of the Rack rails and secure using the retention screws which were removed in earlier step.

CAUTION:

This part or unit is heavy but has a weight smaller than 18 kg (39.7 lb). Use care when lifting, removing, or installing this part or unit. (C008)

STEP 71 Return to the HMC and the Exchange FRU R&V procedure. Click “Next” on the R&V panels until you get to the close the rear door panel. After you get to the close rear door panel, please follow the R&V panel instructions. The remaining R&V screens will direct you on reconnecting brackets, power, etc at the front of the CEC Drawer.

GO BACK to use the R&V procedures at this point.

3.9 Verify all D-Links and L-Links are operational <= Customer TASK

STEP 72 Verify that the D-Links and L-Links are all operational.

3.10 Confirm with customer that CEC is operational <= SSR TASK

STEP 73 Confirm with the customer that the CEC is operational, including all the D-Links and L-Links.

4 END OF POWER775 CEC DRAWER RAILS SERVICE PROCEDURE