

Power775 Filter Service Procedure

Last Modified 2/27/2013 2:01 PM



CONTENTS

1	GENERAL	4
1.1	RELEASE / REVISION HISTORY	4
1.2	WHERE TO FIND THIS DOCUMENT	4
1.3	REQUIRED DOCUMENTS	4
1.4	RELATED DOCUMENTS	4
1.5	ABBREVIATIONS.....	5
2	OVERVIEW	6
2.1	SAFETY NOTICES.....	6
2.2	CONFIRM HOW YOU GOT TO THIS POWER 775 FILTER SERVICE PROCEDURE.....	7
2.3	REQUIRED TOOLS.....	7
3	POWER775 FDT FILTER PROCEDURE.....	8
3.1	SAFETY NOTICES.....	8
3.2	BACKGROUND:.....	10
3.3	FDT FILTER PROCEDURE:.....	10
3.4	END OF SECTION 3: POWER775 FDT FILTER PROCEDURE.....	19
4	POWER 775 SYSTEM FILTER PROCEDURE	20
4.1	SAFETY NOTICES.....	20
4.2	BACKGROUND:.....	21
4.3	INSTALLING FILTER ON THE SYSTEM FRAME.....	22
4.4	END OF POWER 775 SYSTEM FILTER PROCEDURE	25
5	POWER775 FILTER DRAIN PROCEDURE.....	26
5.1	SAFETY NOTICES.....	26
5.2	BACKGROUND:.....	28
5.3	FILTER ASSEMBLY DRAIN PROCEDURE:.....	28
5.4	END OF POWER 775 FILTER ASSEMBLY DRAIN PROCEDURE.....	36
6	APPENDIX A: POWER775 FILL AND DRAIN TOOL (FDT) TANK DRAIN PROCEDURE	36
6.1	SAFETY NOTICES.....	36
6.2	BACKGROUND:.....	38
6.3	PROCEDURE:	38
6.4	END OF POWER775 FDT TANK DRAIN PROCEDURE.....	51
7	APPENDIX B: POWER775 FILL AND DRAIN TOOL (FDT) TANK FILL PROCEDURE ...	52
7.1	SAFETY NOTICES.....	52
7.2	BACKGROUND:.....	54
7.3	PROCEDURE:	54
7.4	END OF POWER775 FDT TANK FILL PROCEDURE	67
8	APPENDIX C: IBM POWER775 FDT VOLUME TABLES.....	68
8.1	IBM POWER 775 COMPONENT WATER VOLUMES.....	68
8.2	IBM POWER 775 SYSTEM WATER VOLUMES	68
8.3	IBM POWER 775 SYSTEM WATER CONTAINERS PER FRAME	69
8.4	END OF APPENDIX A: POWER775 FDT VOLUME TABLES	69

Figure List

Figure 1: Schematic of filter assembly connected to FDT.....	17
Figure 2: Filter assembly and HA1 connected to FDT	18
Figure 3: Filter assembly and HA2 connected to FDT	19
Figure 4 RDHX Open.....	22
Figure 5 RDHX Return Hose disconnected.....	23
Figure 6 Schematic of filter assembly connected to frame	23
Figure 7 Filter Assembly connected to the system	24
Figure 8 RDHX return hose connected to return manifold.....	25
Figure 9: Schematic of filter assembly connected to FDT.....	34
Figure 10: Filter assembly and HA1 connected to FDT	35

Table List

Table 1 Release / Revision History.....	4
Table 2 Required Documents	4
Table 3 Related Documents.....	4
Table 4 IBM Power 775 Component Water Volumes.....	68
Table 5 IBM Power 775 System Water Volume (Liters)	68
Table 6 IBM Power 775 System Water Volume (Gallons)	68
Table 7 IBM Power 775 Required Number of System Water Containers per Frame	69

1 GENERAL

1.1 Release / Revision History

File Name	Date	Description
"p775_Filter.pdf"	08/07/2012	Initial Release
"p775_Filter_Procedure.pdf"	03/01/2013	Updated for newly released Filter Assembly (FA1)

Table 1 Release / Revision History

1.2 Where to find this document

The current "Power775 Filter Service Procedure" document is "p775_Filter_Procedure.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 "Thermal components", click "FDT and System Filtering" to download PDF "p775_Filter_Procedure.pdf"

This is the only valid source for the latest Power775 Filter Service Procedure.

1.3 Required Documents

Document	PN	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	PN	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	Systems Services Representative	IBM Service personnel
SSD	Solid State Drive	
UEPO	Unit Emergency Power Off	
RDHX	Rear Door Heat Exchanger	Rear Door Heat Exchanger hose connections.
FDT	Fill and Drain Tool	Fill and Drain tool connections and operations.

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 – see Section 1.3.

<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 and 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)

The following notices specifically pertain to this Power775 service procedure.

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:

The weight of this part or unit is between 18 and 32 kg (39.7 and 70.5 lb). It takes two persons to safely lift this part or unit. (C009)



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



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

2.2 Confirm how you got to this Power 775 Filter Service Procedure

You should be performing this procedure if you have determined the FDT and or the system is contaminated and there is a need to filter the water.

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 Filter Service Procedure

2.3 Required Tools

The following list contains all of the tools required to complete this procedure:

- IBM Power 775 FDT P/N: 41T8667, 45D6928, or approved equivalent
- Filter Assembly 73Y9561 or approved equivalent

3 POWER775 FDT FILTER PROCEDURE

3.1 Safety Notices

Read “Safety Notices“ available from InfoCenter:

<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 and 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)

The following notices specifically pertain to this Power775 service procedure.

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: This unit must not be left running unattended, service personnel should always be overseeing the process. (C038)



DANGER: Hazardous voltage present. Voltages present constitute a shock hazard, which can cause severe injury or death. (L004)



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

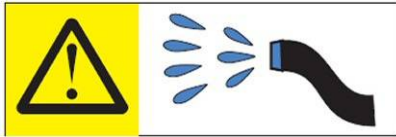
Power775 Filter Service Procedure



DANGER: Heavy equipment—personal injury or equipment damage might result if mishandled. (L013)



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)

3.2 Background:

This document contains the procedure for filtering the **IBM Power 775** system and the **IBM Power 775** Fill and Drain Tool (FDT). The successful execution of a **FDT Filter** procedure is required for the **IBM Power 775** Fill and Drain Tool (FDT) to be used once it has been exposed to contaminated water from the system.

This procedure should be used to filter the **IBM Power 775** Fill and Drain Tool (FDT) first to remove air from a new filter assembly prior to it being used for the Filter system procedure being performed on an **IBM Power 775** system. The filter assembly must be free of air and filled with water prior to it being attached to the system frame. If the filter assembly was attached to a frame prior to being filled, it could potentially cause the system to go down, do to low water levels in the WCUs caused by the air being introduced to the system.

Reference Information:

IBM Power 775 FDT P/N:	41T8667, 45D6928, or approved equivalent
Filter Assembly	73Y9561 or approved equivalent
Hose assemblies/adapters required:	HA1 (45D8561)
	HA2 (45D8562)

Approximate FDT water volume: 30 L

Expected time to fully filter **IBM Power 775** Fill and Drain Tool minimum of 2 hours

Expected time to fully filter **IBM Power 775** system minimum of 4 hours

NOTE: *Some steps in this procedure may be redundant due to other service operations being completed prior to this procedure. If a step has already been completed, verify that the step has been completed properly and proceed to the next step.*

NOTE: *It is recommended that the FDT is filtered for a minimum of 2 hours and the system frame for a minimum of 4 hours. Should the SSR filter either for more time that is at the discretion of the SSR.*

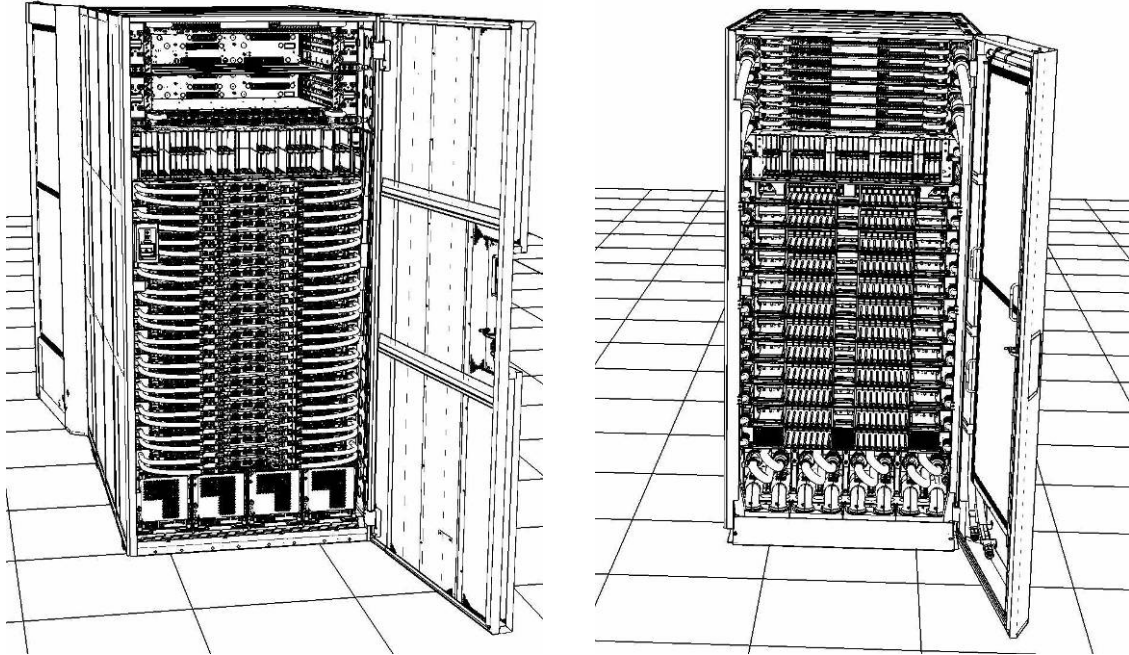
3.3 FDT Filter Procedure:

NOTE: If you already have the FDT powered on, proceed to **Step 14**. Otherwise, start procedure at **Step 1**.

1. Identify the **Power 775** frame that requires service.

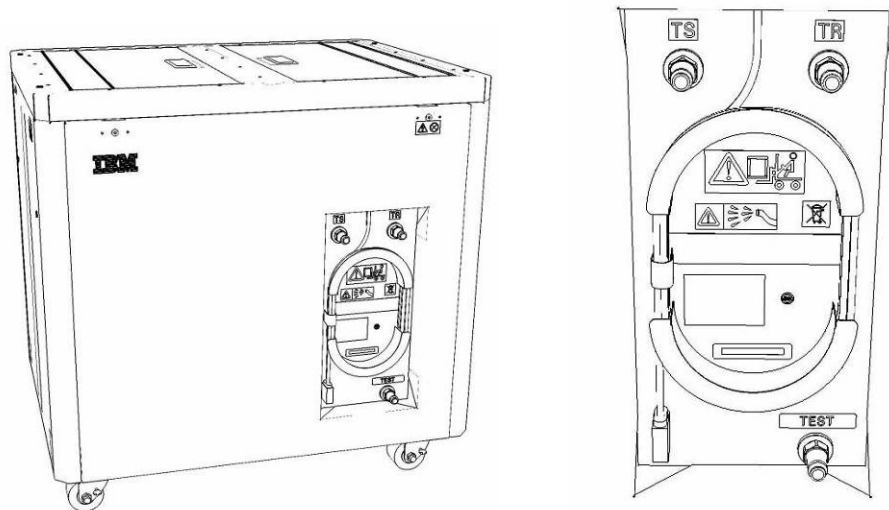
Verify that the system UEPO is set to **ON**, and the managing consoles (HMC and XCat) are powered on and communicating with the frame.

2. Open front and rear doors of the **Power 775** frame that requires service.



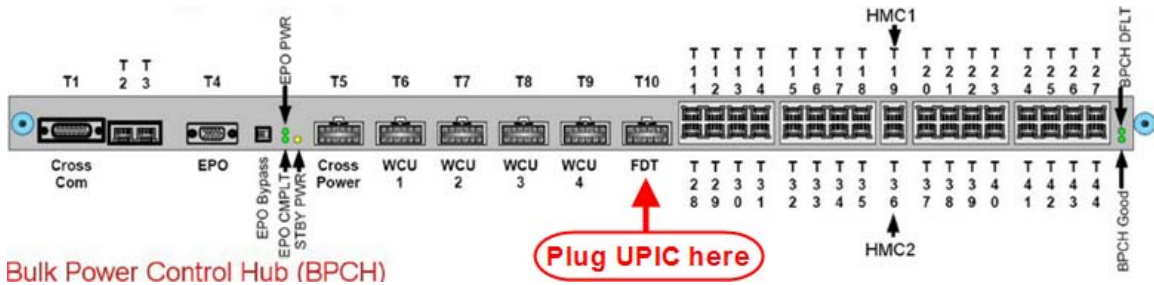
3. Bring the FDT to the front side of the **Power 775** frame that requires service.
4. Locate the panel of the FDT that contains the Universal Power and Information Cable (UPIC), as well as the **TS**, **TR**, and **TEST** water connections.

This side of the tool should be facing the front of the frame.

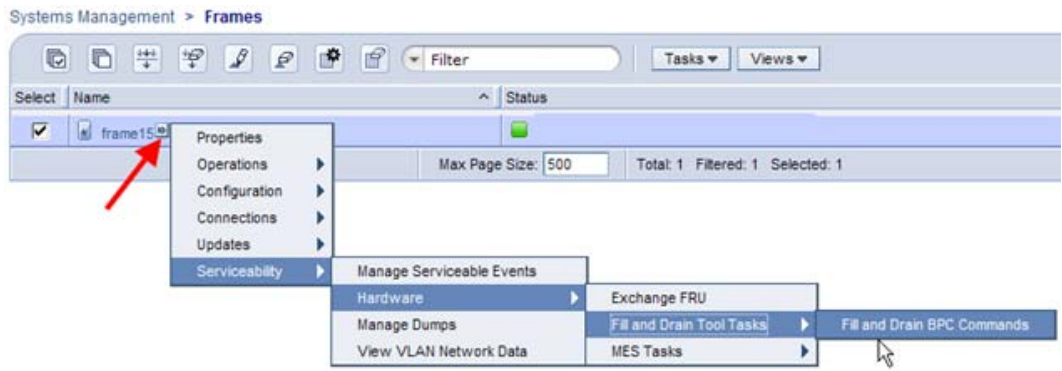


5. Unwrap the FDT UPIC cable from the storage loop on the FDT.
6. Select BPC port for FDT

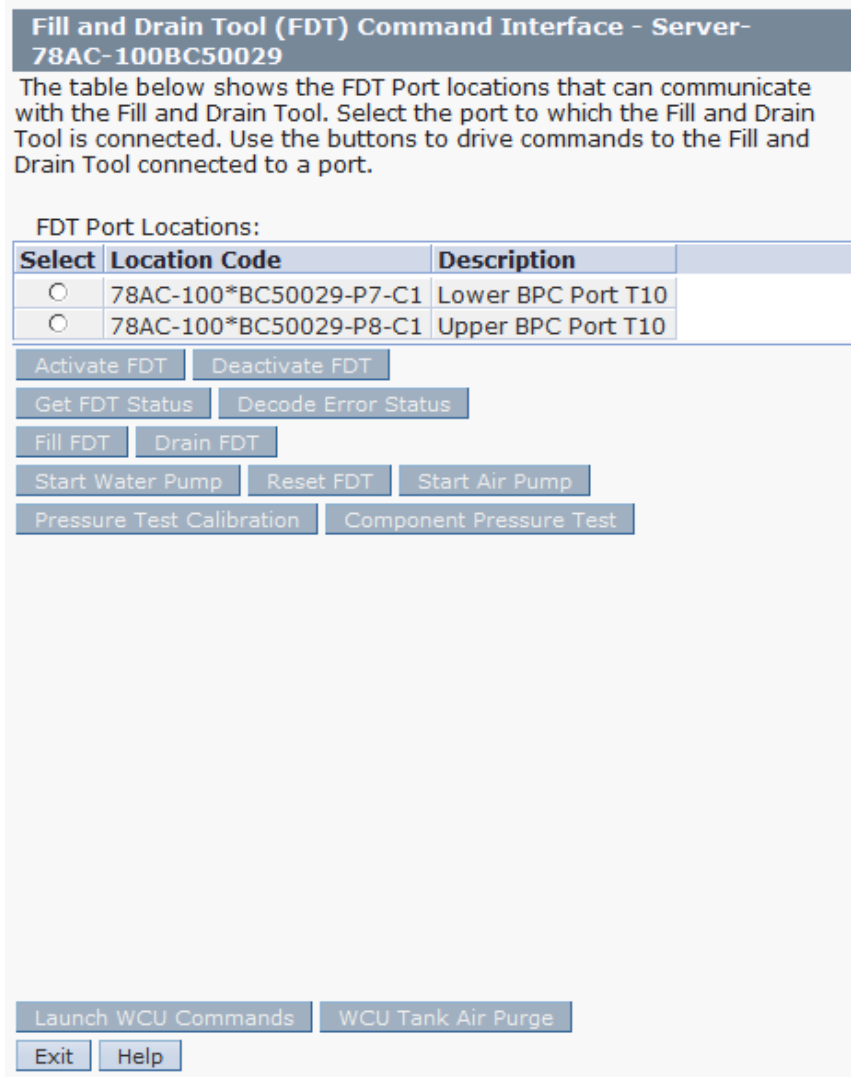
- If the lower BPA is not targeted for service, and is functional:
Plug the FDT UPIC cable into **port T10 of the lower BPC**.
- If the lower BPA is targeted for service, or is not functional:
Plug the FDT UPIC cable into **port T10 of the upper BPC**.



7. Login to the HMC with the User ID `hscroot`.
Use the HMC that is connected to the BPA where the FDT is plugged.
8. From the HMC left Navigation menu, expand **Systems Management** then select **Frames**.
Verify frame serial number for the frame to be serviced.
9. In the **Frames** view on the HMC, place a checkmark in the **Select** column for the frame to be serviced.
10. Verify that the frame **Status** is **Rack Standby/Rack Standby** or **Standby/Standby**.
 - If frame **Status** reads **Rack Standby/Rack Standby** or **Standby/Standby** – OK.
Continue to next step.
 - If frame **Status** does not read **Rack Standby/Rack Standby** or **Standby/Standby** – action required. Contact next level of support.
11. From the **Task** menu on the HMC, *select* **Serviceability > Hardware > Fill and Drain Tool Tasks > Fill and Drain Command Interface**



Fill and Drain Tool Command Interface will display. See below for a sample image of the interface (FDT deactivated).



12. Select the BPC port that the FDT was plugged into in **Step 6** from the **FDT Port Locations:** list.

13. *Click* the **Activate FDT** button.

- If the Activate FDT command is successful – OK. **Wait 30 seconds** and continue to next step.
- If the **Activate FDT** command fails – action required.
Click the **Deactivate FDT** button.

Wait 2 minutes and repeat **Step 13**. If the **Activate** command fails again, contact next level of support.

14. *Click* the **Get FDT Status** button.

- If the **Get FDT Status** command is successful – OK.
See below for a sample status (does not reflect expected state)
- If the **Get FDT Status** command fails – action required.
Repeat **Step 14**. If the **Get FDT Status** command fails again, contact next level of support.

Fill and Drain Tool (FDT) Command Interface - Server-78AC-100BC50029

The table below shows the FDT Port locations that can communicate with the Fill and Drain Tool. Select the port to which the Fill and Drain Tool is connected. Use the buttons to drive commands to the Fill and Drain Tool connected to a port.

FDT Port Locations:

Select	Location Code	Description
<input checked="" type="radio"/>	78AC-100*BC50029-P7-C1	Lower BPC Port T10
<input type="radio"/>	78AC-100*BC50029-P8-C1	Upper BPC Port T10

Activate FDT

Deactivate FDT

Get FDT Status

Decode Error Status

Fill FDT

Drain FDT

Start Water Pump

Reset FDT

Start Air Pump

Pressure Test Calibration

Component Pressure Test

FDT Power/Comm: GOOD

Frame Attached: IBM Power7 775

MDA-FD RL: 45D

Error Status: WARNING

Tank Level: Full

Air Pump: Off

Water Pump: DISABLED

Tool Mode: Ready

Pressure Test Calibration: Incomplete

Component Pressure Test: Incomplete

Launch WCU Commands

WCU Tank Air Purge

Exit

Help

Sample FDT Status

15. Click the Get FDT Status button and ensure the following status items are OK:

Status Item	State	Action
• Tool Mode:	Ready	– OK. Check next Status item.
• Error Status:	NONE	– OK. Check next Status item. WARNING – <i>click</i> the Decode Error Status button, record the information returned and check Tank Level. CRITICAL – <i>click</i> the Decode Error Status button, record the information returned and contact next level of support.
• Tank Level:	Full, Upper Half, Lower Half	– OK. Check next Status item. Empty – action required. Exit this procedure and perform a Fill and Drain Tool (FDT) Tank Fill Procedure adding one container of water. Once FDT tank level is Full, Upper Half or lower Half return to this step and continue with procedure.

16. Before proceeding, read required safety information:

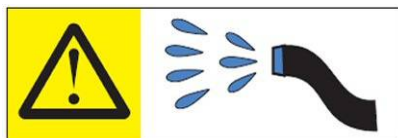
CAUTION: The water-based coolant solution may contain an additive intended to inhibit corrosion (or provide other functions). The solution may cause irritation to the skin or eyes. Avoid direct contact with the solution. Employ appropriate Personal Protective Equipment when performing operations involving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



CAUTION: 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)

17. Figure 1 is a schematic that shows how the filter assembly (FA1) can be attached to the tool source (TS) and tool return (TR) connections on the FDT using hose assemblies HA1 then HA2. The filter is used in this configuration to filter debris and contamination from the FDT and the hose assemblies.

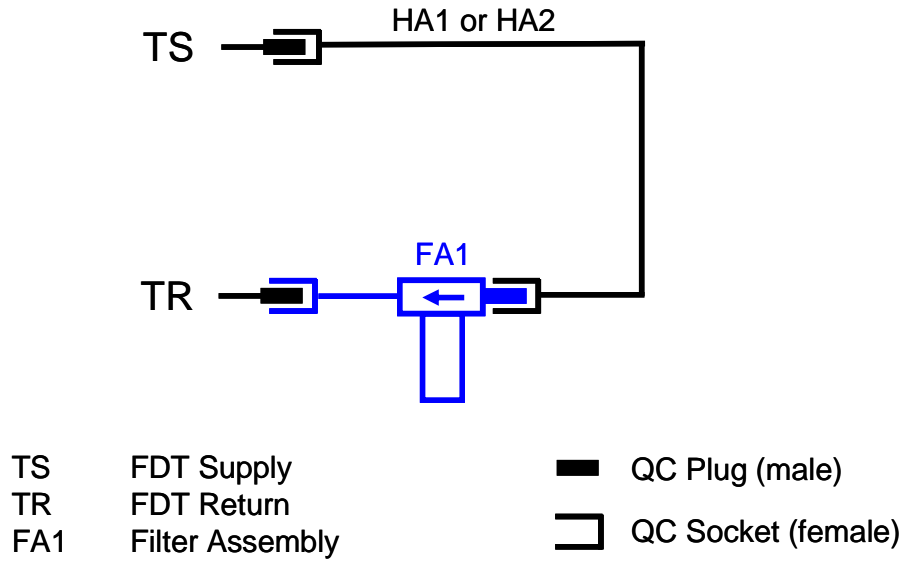


Figure 1: Schematic of filter assembly connected to FDT

18. Figure 2 shows the filter assembly FA1 connected to the FDT using hose assembly HA1. Connect one end of HA1 to the TS plug on the FDT and connect the other end of HA1 to the plug on the side of the filter housing on FA1. Connect the socket on the end of the hose on FA1 to the TR plug on the FDT.

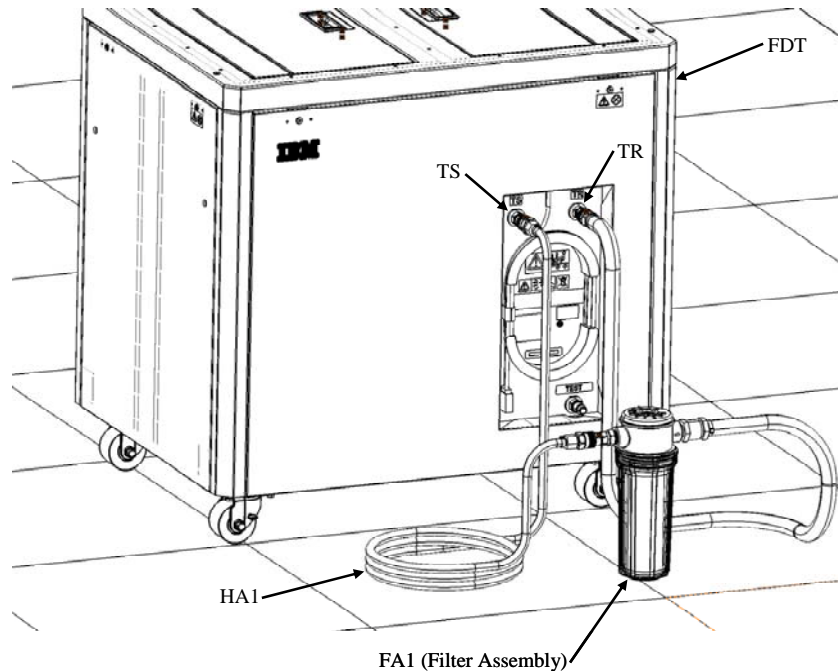


Figure 2: Filter assembly and HA1 connected to FDT

19. On the FDT panel, *click* the **Start Water Pump** button. This is a timed routine which will end after 30 minutes if unattended. The water pump will fill the filter assembly (FA1). While the water pump is running, the filter should be held upright to ensure all air is evacuated and the filter fills with water completely.
20. Let the **Start Water Pump** routine run until the pump stops, approximately 30 minutes. When this routine stops, restart the pump again so it runs for another 30 minutes. Proceed to the next step once the water pump stops.
21. Disconnect the ends of HA1 from TS and FA1. Connect the sight glass end of HA2 to TS and the non sight glass end of HA2 to FA1 as shown in figure 3.

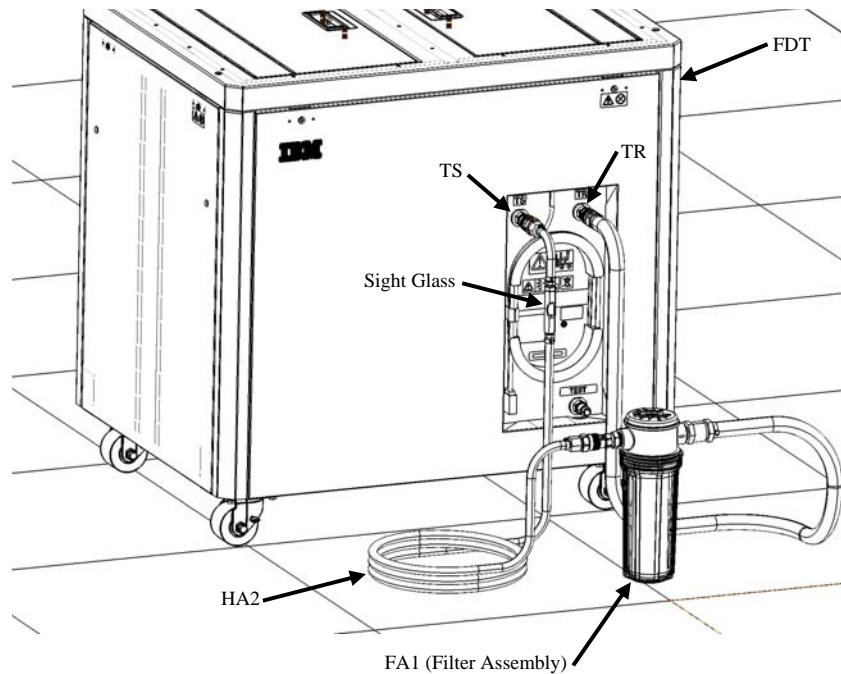


Figure 3: Filter assembly and HA2 connected to FDT

22. On the FDT panel, *click* the **Start Water Pump** button. This is a timed routine that will run for 30 minutes if left unattended. While the water pump is running, the filter should be held upright to ensure that the filter remains completely filled with water.
23. Let the **Start Water Pump** routine run until the pump stops, approximately 30 minutes. When this routine stops, restart the pump again so it runs for another 30 minutes.
24. Take notice of the color of the water. It will be dark or grey in color. Eventually the filter element will become dark as it removes particles from the water. 2 hours of filtering should be sufficient to remove the particles in the water and the water flowing in the filter assembly should appear clear.
25. Once the FDT has been filtered for a minimum of 4 cycles or 2 hours the filter assembly can be removed. Do not drain the filter assembly as it needs to be filled to be used in the System Filter Procedure.
26. Drain and deactivate the FDT in preparation for storage if it's not to be used.

3.4 End of Section 3: Power775 FDT Filter Procedure

4 POWER 775 SYSTEM FILTER PROCEDURE

4.1 Safety Notices

Read “Safety Notices“ available from InfoCenter:

<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 and 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: 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: This unit must not be left running unattended, service personnel should always be overseeing the process. (C038)



DANGER: Hazardous voltage present. Voltages present constitute a shock hazard, which can cause severe injury or death. (L004)



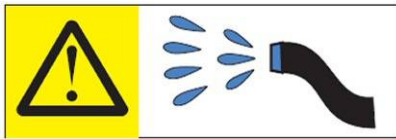
CAUTION: Protective eyewear is needed for the procedure. (L011)



DANGER: Heavy equipment—personal injury or equipment damage might result if mishandled. (L013)



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)

4.2 Background:

The Filter assembly will be installed in series with the RDHX attached to the frame water manifolds.

The filter has a defined flow direction and it's important the assembly is attached to the RDHX return hose and the rack return manifold RDHX connection. Please make note of the hoses in the pictures and the markings indicating which end of the hose is connected to the manifold in the frame and which is connected to the RDHX hose.

The flow will be coming from the supply manifold through, the RDHX supply hose, and into RDHX. The water will leave the RDHX through the RDHX return hose and into the filter assembly which will be connected to the return manifold. The RDHX and filter are in parallel with the frame cooling loop such that should the flow through the door become reduced as the filter removes particles from the water, the result will be a slight increase of warm air coming from the frame as the RDHX won't remove the heat effectively with reduced flow. System cooling flow will not be affected.

NOTE: *It is recommended that the system frame is filtered for a minimum of 4 hours. Should the SSR filter the system for more time that is at the discretion of the SSR.*

4.3 Installing Filter on the System frame

WARNING !!!

ONLY CONTINUE IF THE FILTER ASSEMBLY IS FILLED WITH WATER !!

Prior to connecting the filter assembly to the system frame the filter assembly must be filled with water. This can be accomplished by running the FDT Filter Procedure from SECTION 3. **If the filter is attached without being filled there is potential to cause the frame to come down due to low water on the WCUs.**

1. Open the RDHX using the rear door latch (see Figure 4 RDHX Open).

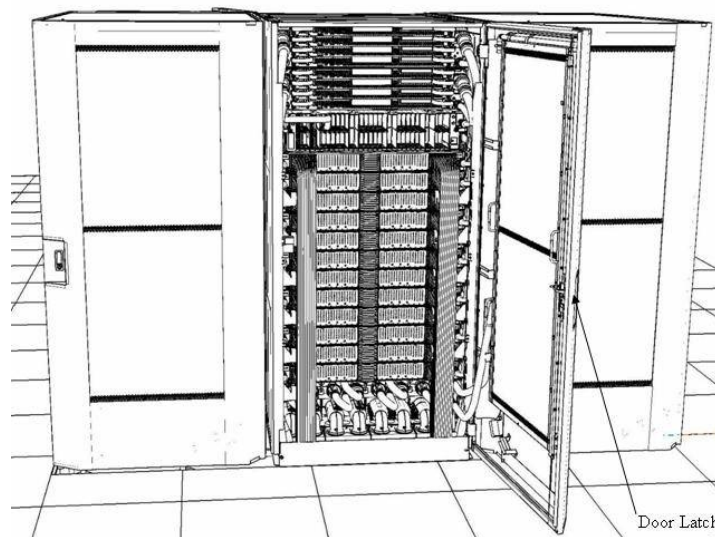


Figure 4 RDHX Open

2. From the rear side of the system, disconnect the RDHX return hose (see Figure 5 RDHX Return Hose). Pull back on the ribbed collar on the quick connect to disconnect the hose.

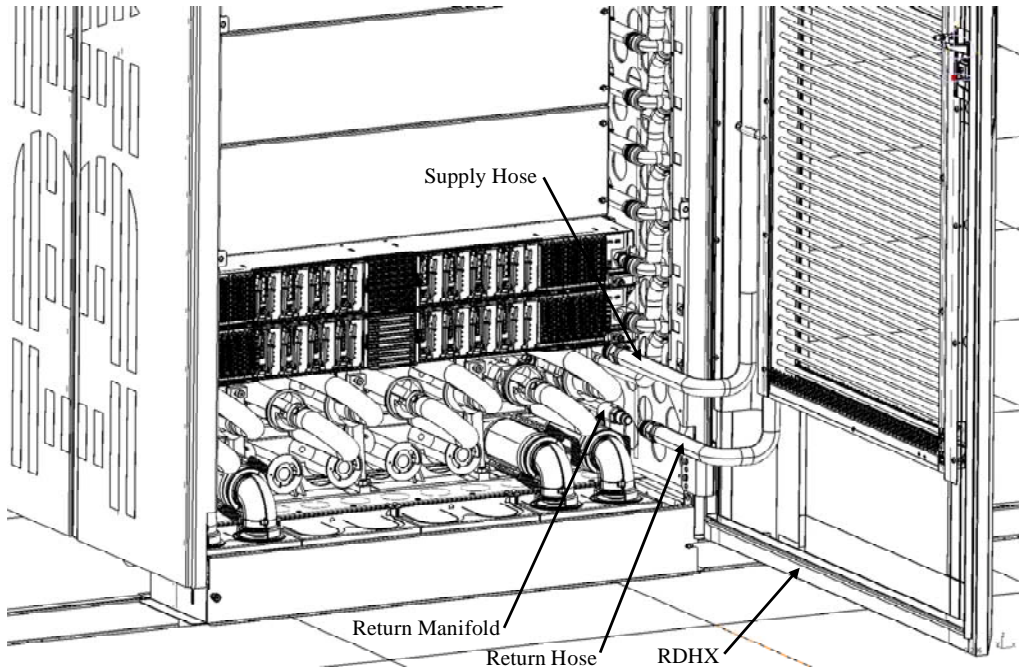


Figure 5 RDHX Return Hose disconnected

3. Figure 6 is a schematic that shows how the filter assembly (FA1) can be attached to the return hose on the RDHX and the return manifold connections. The filter is used in this configuration to filter debris and contamination from the water circulating through components in the frame.

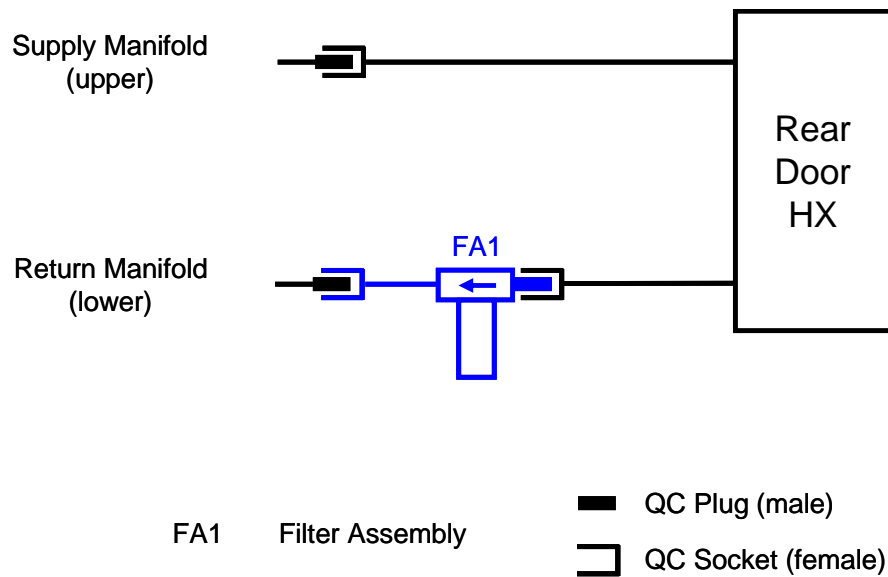


Figure 6 Schematic of filter assembly connected to frame

Power775 Filter Service Procedure

4. Connect the return hose from the RDHX to the plug on the filter assembly. Then connect the filter assembly hose to the return manifold (lower manifold) (see Figure 7).

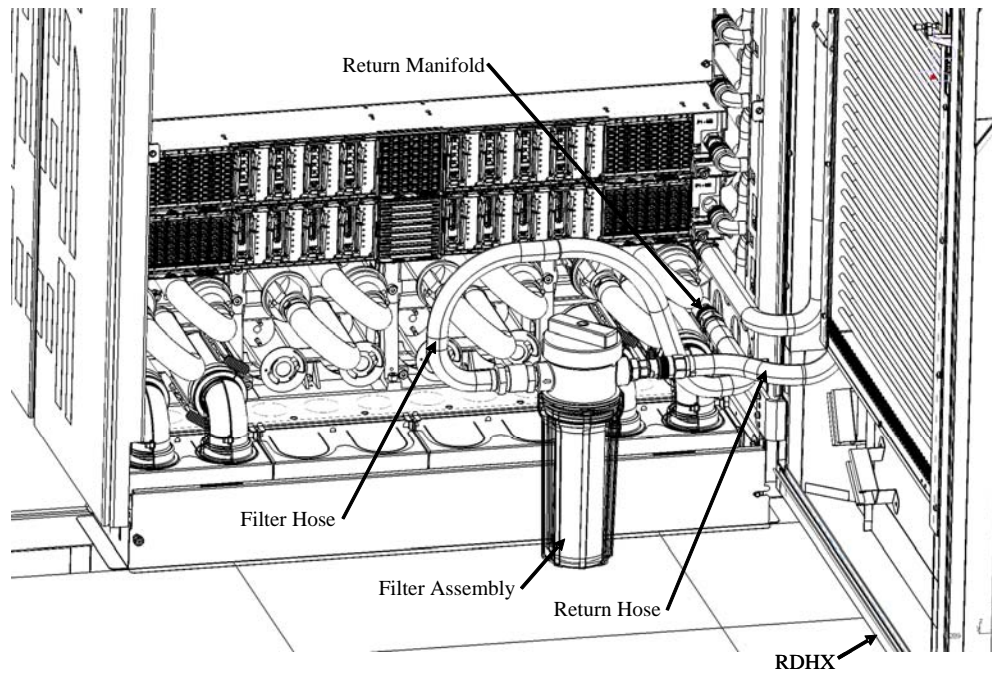


Figure 7 Filter Assembly connected to the system

5. After a minimum of 4 hours or when the water being filtered appears to be clear, the filter assembly can be removed. First disconnect the RDHX return hose from the filter assembly then disconnect the filter hose from the return manifold. Reconnect the RDHX return hose to the return manifold (see figure 8).

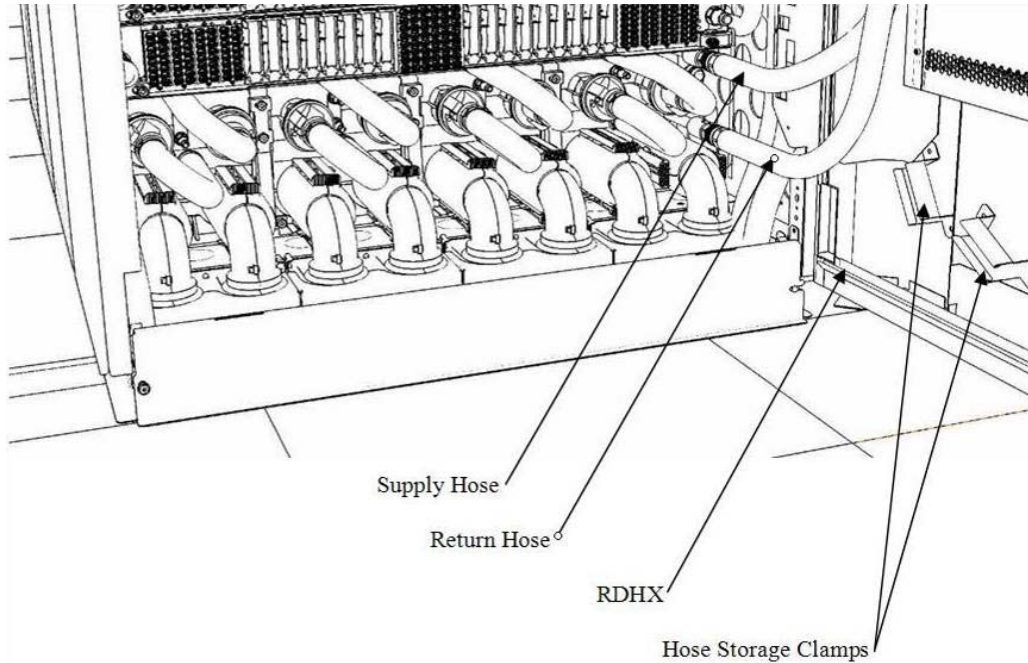


Figure 8 RDHX return hose connected to return manifold

6. If additional frames do not need to be filtered, then the filter assembly should be drained and stored in the FDT. The filter assembly can be drained by following the steps in the Filter Drain Procedure.

4.4 End of power 775 system filter Procedure

5 POWER775 FILTER DRAIN PROCEDURE

5.1 Safety Notices

Read “Safety Notices“ available from InfoCenter:

<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 and 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)

The following notices specifically pertain to this Power775 service procedure.

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: This unit must not be left running unattended, service personnel should always be overseeing the process. (C038)



DANGER: Hazardous voltage present. Voltages present constitute a shock hazard, which can cause severe injury or death. (L004)



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

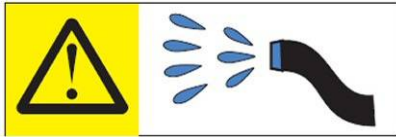
Power775 Filter Service Procedure



DANGER: Heavy equipment—personal injury or equipment damage might result if mishandled. (L013)



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)

5.2 Background:

This section should be used to drain the Filter Assembly.

Reference Information:

IBM Power 775 FDT P/N:

41T8667, 45D6928, or approved equivalent

Filter Assembly

73Y9561 or approved equivalent

Hose assemblies/adapters required:

HA1 (45D8561)

HA2 (45D8562)

NOTE: Some steps in this procedure may be redundant due to other service operations being completed prior to this procedure. If a step has already been completed, verify that the step has been completed properly and proceed to the next step.

NOTE: The filter assembly should be drained prior to long term storage to avoid leaks due to possible damage to the assembly.

5.3 Filter Assembly Drain Procedure:

NOTE: The Fill and Drain Tool (FDT) can not be full at the start of this procedure since water is being moved from the filter assembly to the FDT's tank. If the FDT is completely full, the commands will not function. See **APPENDIX A: POWER775 FILL AND DRAIN TOOL (FDT) TANK DRAIN PROCEDURES**, if necessary.

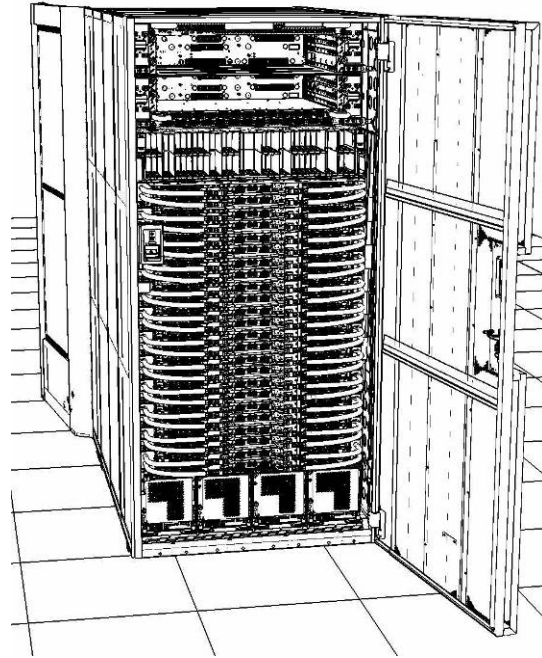
NOTE: If you already have the FDT powered on, proceed to **Step 14**. Otherwise, start procedure at **Step 1**.

1. Identify the **Power 775** frame you will use.

Verify the system UEPO is set to **ON**, and the managing consoles (HMC and XCat) are powered on and communicating with the frame.

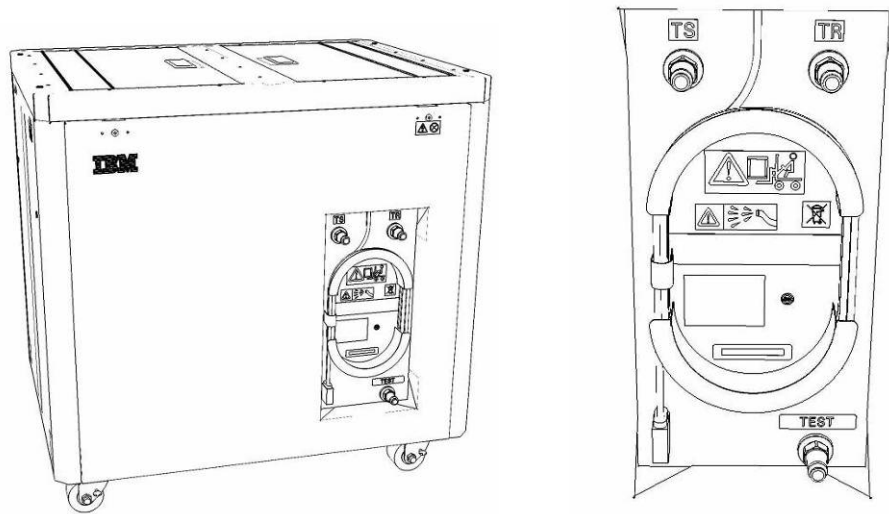
2. Open front door of the **Power 775** frame. You will need only the power connection.

Power775 Filter Service Procedure



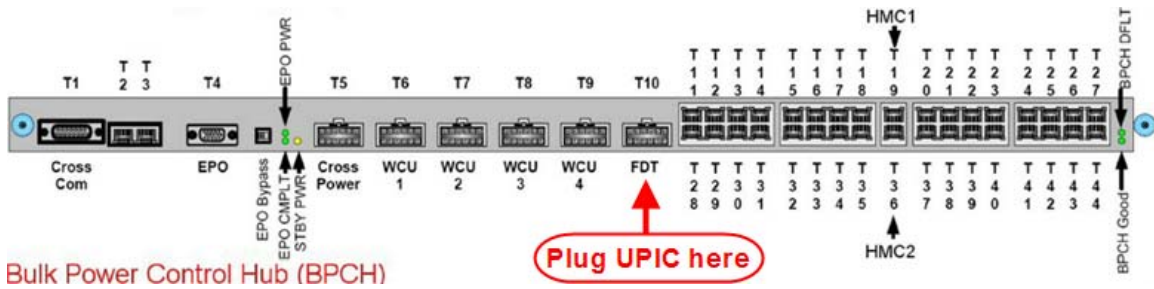
3. Bring the FDT to the front side of the **Power 775** frame.
4. Locate the panel of the FDT that contains the Universal Power and Information Cable (UPIC), as well as the **TS**, **TR**, and **TEST** water connections.

This side of the tool should be facing the front of the frame.

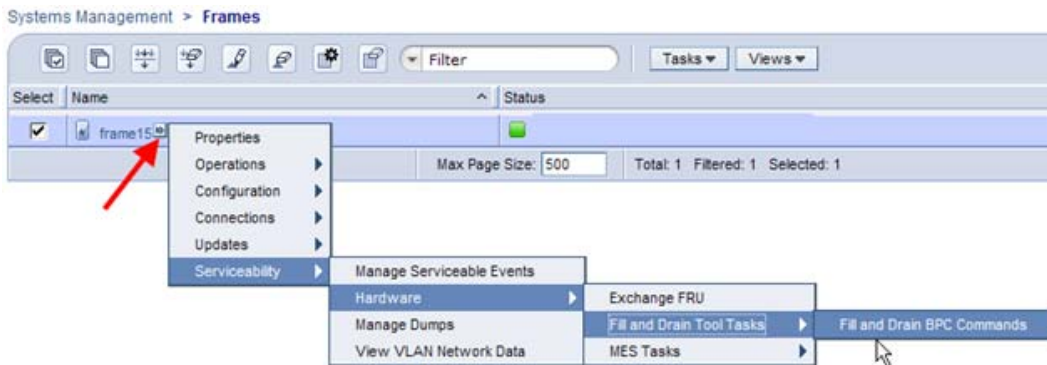


5. Unwrap the FDT UPIC cable from the storage loop on the FDT.
6. Select BPC port for FDT
 - If the lower BPA is not targeted for service, and is functional:
Plug the FDT UPIC cable into **port T10 of the lower BPC**.

- If the lower BPA is targeted for service, or is not functional:
Plug the FDT UPIC cable into **port T10 of the upper BPC**.



7. Login to the HMC with the User ID `hscroot`.
Use the HMC that is connected to the BPA where the FDT is plugged.
8. From the HMC left Navigation menu, expand **Systems Management** then select **Frames**.
Verify frame serial number for the frame to be used or serviced.
9. In the **Frames** view on the HMC, place a checkmark in the **Select** column for the frame to be used or serviced.
10. Verify that the frame **Status** is **Rack Standby/Rack Standby** or **Standby/Standby**.
 - If frame **Status** reads **Rack Standby/Rack Standby** or **Standby/Standby** – OK.
Continue to next step.
 - If frame **Status** does not read **Rack Standby/Rack Standby** or **Standby/Standby** – action required. Contact next level of support.
11. From the **Task** menu on the HMC, *select* **Serviceability** > **Hardware** > **Fill and Drain Tool Tasks** > **Fill and Drain Command Interface**



Fill and Drain Tool Command Interface will display. See below for a sample image of the interface (FDT deactivated).

Fill and Drain Tool (FDT) Command Interface - Server-78AC-100BC50029

The table below shows the FDT Port locations that can communicate with the Fill and Drain Tool. Select the port to which the Fill and Drain Tool is connected. Use the buttons to drive commands to the Fill and Drain Tool connected to a port.

FDT Port Locations:

Select	Location Code	Description
<input type="radio"/>	78AC-100*BC50029-P7-C1	Lower BPC Port T10
<input type="radio"/>	78AC-100*BC50029-P8-C1	Upper BPC Port T10

12. Select the BPC port that the FDT was plugged into in **Step 6** from the **FDT Port Locations:** list.

13. *Click* the **Activate FDT** button.

- If the Activate FDT command is successful – OK. **Wait 30 seconds** and continue to next step.
- If the **Activate FDT** command fails – action required.

Click the **Deactivate FDT** button.

Wait 2 minutes and repeat **Step 13**. If the **Activate** command fails again, contact the next level of support.

14. Click the **Get FDT Status** button.

- If the **Get FDT Status** command is successful – OK.
See below for a sample status (does not reflect expected state)
- If the **Get FDT Status** command fails – action required.
Repeat **Step 14**. If the **Get FDT Status** command fails again, contact next level of support.

Fill and Drain Tool (FDT) Command Interface - Server-78AC-100BC50029

The table below shows the FDT Port locations that can communicate with the Fill and Drain Tool. Select the port to which the Fill and Drain Tool is connected. Use the buttons to drive commands to the Fill and Drain Tool connected to a port.

FDT Port Locations:

Select	Location Code	Description
<input checked="" type="radio"/>	78AC-100*BC50029-P7-C1	Lower BPC Port T10
<input type="radio"/>	78AC-100*BC50029-P8-C1	Upper BPC Port T10

FDT Power/Comm: GOOD
 Frame Attached: IBM Power7 775
 MDA-FD RL: 45D
 Error Status: WARNING
 Tank Level: Full
 Air Pump: Off
 Water Pump: DISABLED
 Tool Mode: Ready
 Pressure Test Calibration: Incomplete
 Component Pressure Test: Incomplete

Sample FDT Status

15. Click the Get FDT Status button and ensure the following status items are OK:

Status Item	State	Action
• Tool Mode:	Ready	– OK. Check next Status item.
• Error Status:	NONE	– OK. Check next Status item. WARNING – <i>click</i> the Decode Error Status button, record the information returned and check Tank Level. CRITICAL – <i>click</i> the Decode Error Status button, record the information returned and contact next level of support.
• Tank Level:	Empty, Upper Half, Lower Half	– OK. Check next Status item. FULL – action required. Exit this procedure and perform a Fill and Drain Tool (FDT) Tank Drain Procedure removing one container of water. Once FDT tank level is Upper Half or lower Half, or Empty return to this step and continue with procedure.

16. Before proceeding, read required safety information:

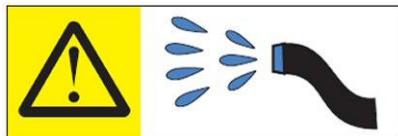
CAUTION: The water-based coolant solution may contain an additive intended to inhibit corrosion (or provide other functions). The solution may cause irritation to the skin or eyes. Avoid direct contact with the solution. Employ appropriate Personal Protective Equipment when performing operations involving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



CAUTION: 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)

17. Figure 9 is a schematic that shows how the filter assembly (FA1) can be attached to the tool source (TS) and tool return (TR) connections on the FDT using hose assemblies HA1 or HA2.

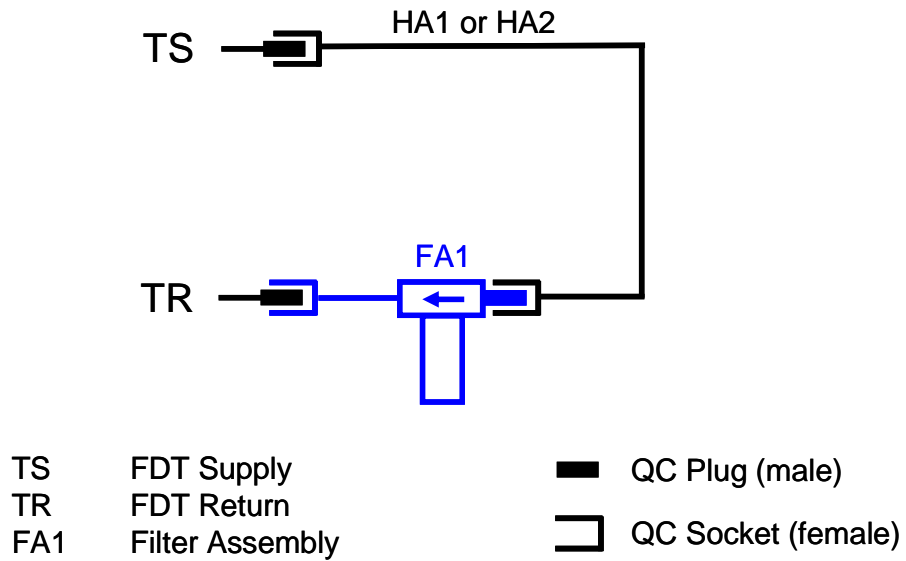


Figure 9: Schematic of filter assembly connected to FDT

18. Figure 10 shows the filter assembly FA1 connected to the FDT using hose assembly HA1. Connect one end of HA1 to the TS plug on the FDT and connect the other end of HA1 to the plug on the side of the filter housing on FA1. Connect the socket on the end of the hose on FA1 to the TR plug on the FDT.

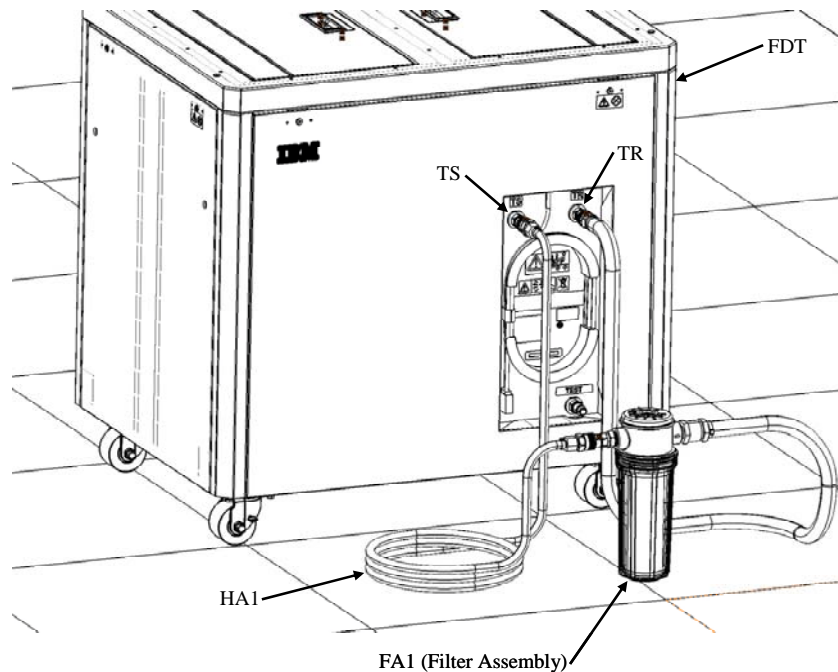


Figure 10: Filter assembly and HA1 connected to FDT

19. On the FDT panel, *click* the **Start Air Pump** button. This is a timed routine which will end after 1 minute 40 seconds if unattended. While the air pump is running, the filter (FA1) should be held in a way to ensure all water is evacuated. **CAUTION: this must not be left running unattended, service personnel should always oversee this process.**
20. Let the **Start Air Pump** routine run until the motor stops. If the Filter Assembly still contains water, run the Start Air Pump routine again and repeat as necessary.
- NOTE:** The filter assembly's position may need to be changed to ensure all water is removed. Hold the filter assembly upside down if needed.
21. Disconnect the ends of HA1 from TS and FA1. Disconnect the FA1 hose from TR.
22. Drain and deactivate the FDT in preparation for storage if it's not to be used.

5.4 End of Power 775 Filter Assembly Drain Procedure

6 APPENDIX A: POWER775 FILL AND DRAIN TOOL (FDT) TANK DRAIN PROCEDURE

6.1 Safety Notices

Read “Safety Notices“ available from InfoCenter:

<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 and 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)

The following notices specifically pertain to this Power775 service procedure.

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: This unit must not be left running unattended, service personnel should always be overseeing the process. (C038)



DANGER: Hazardous voltage present. Voltages present constitute a shock hazard, which can cause severe injury or death. (L004)



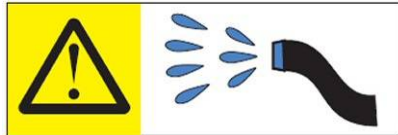
CAUTION: Protective eyewear is needed for the procedure. (L011)



DANGER: Heavy equipment—personal injury or equipment damage might result if mishandled. (L013)



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)

6.2 Background:

This document contains the procedure for draining the water out of the internal reservoir of an **IBM Power 775** Fill and Drain Tool (FDT).

The FDT is used to transfer water into and out of various components of the **IBM Power 775** system. When a system component or the entire system is drained, the water will be transferred into the tank (internal reservoir) within the FDT. During drain operations, the FDT tank may become full, and if so, will need to be periodically emptied into the supplied system water containers. The FDT Tank Drain Procedure instructs the user to properly transfer water out of the FDT Tank and into an empty system water container.

During system or component drain operations, if the FDT senses that the internal reservoir has become full, it will terminate any running drain routine, as well as prevent any further drain routines from being executed. This may occur during a system or component drain procedure; if so, the system or component drain procedure must be paused, and this FDT Tank Drain Procedure must be completed before system/component draining can resume. Individual system water containers treated with a corrosion inhibitor are shipped with the system and after the initial system fill, the empty containers must be stored to be available for the FDT Tank Drain operation.

The system water is treated and must not be poured down a sink or on the ground.

Reference Information:

IBM Power 775 FDT P/N:	41T8667, 45D6928 or approved equivalent
IBM System Water Container P/N:	45D2124 (U.S.), 45D2129 (non-U.S.)
Hose assemblies/adapters required:	THA (45D8563)

Approximate FDT internal water volume: 32 L

Expected drainage time for one (1) system water container: 1 min, 40 s

NOTE: *Some steps in this procedure may be redundant due to other service operations being completed prior to this procedure. If a step has already been completed, verify that the step has been completed properly and proceed to the next step.*

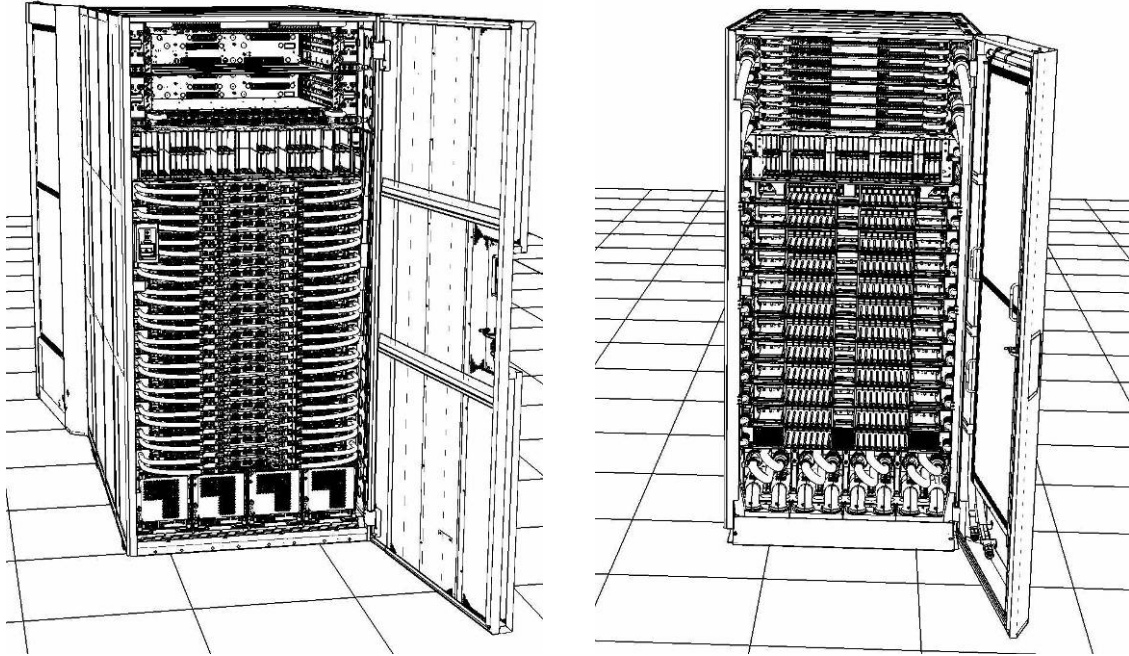
6.3 Procedure:

NOTE: If you already have the FDT powered on, proceed to **Step 14**. Otherwise, start procedure at **Step 1**.

1. Identify the **Power 775** frame that requires service.

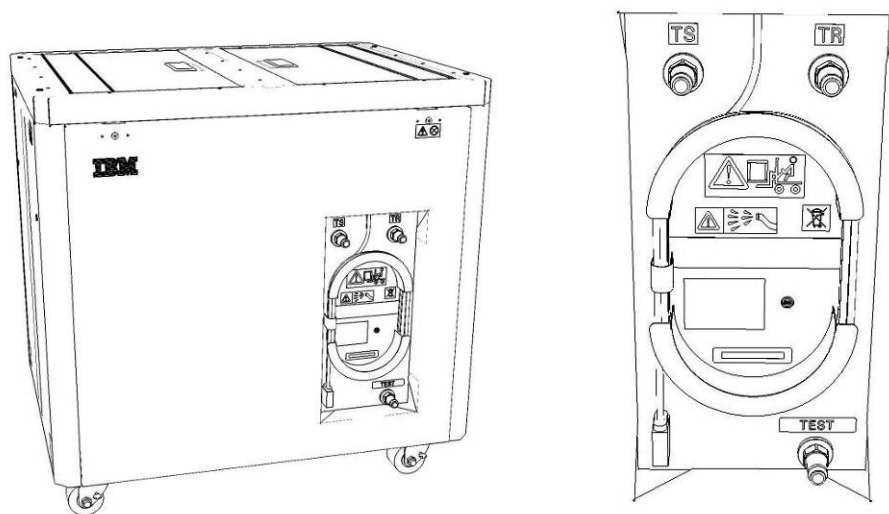
Verify that the system UEPO is set to **ON**, and the managing consoles (HMC and XCat) are powered on and communicating with the frame.

2. Open front and rear doors of the **Power 775** frame that requires service.



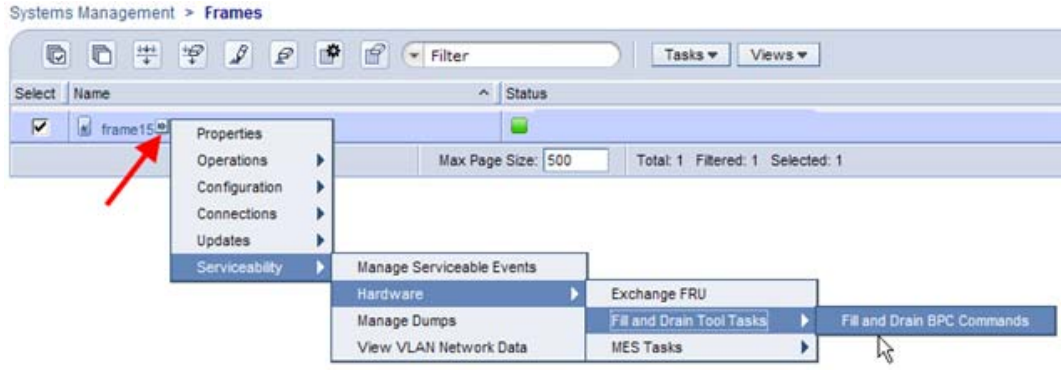
3. Bring the FDT to the front side of the **Power 775** frame that requires service.
4. Locate the panel of the FDT that contains the Universal Power and Information Cable (UPIC), as well as the **TS**, **TR**, and **TEST** water connections.

This side of the tool should be facing the front of the frame.



5. Unwrap the FDT UPIC cable from the storage loop on the FDT.

Power775 Filter Service Procedure



Fill and Drain Tool Command Interface will display. See below for a sample image of the interface (FDT deactivated).

Fill and Drain Tool (FDT) Command Interface - Server-78AC-100BC50029

The table below shows the FDT Port locations that can communicate with the Fill and Drain Tool. Select the port to which the Fill and Drain Tool is connected. Use the buttons to drive commands to the Fill and Drain Tool connected to a port.

FDT Port Locations:

Select	Location Code	Description
<input type="radio"/>	78AC-100*BC50029-P7-C1	Lower BPC Port T10
<input type="radio"/>	78AC-100*BC50029-P8-C1	Upper BPC Port T10

Activate FDT Deactivate FDT

Get FDT Status Decode Error Status

Fill FDT Drain FDT

Start Water Pump Reset FDT Start Air Pump

Pressure Test Calibration Component Pressure Test

Launch WCU Commands WCU Tank Air Purge

Exit Help

12. Select the BPC port that the FDT was plugged into in **Step 6** from the **FDT Port Locations:** list.

13. *Click* the **Activate FDT** button.

- If the Activate FDT command is successful – OK. **Wait 30 seconds and continue to next step.**
- If the **Activate FDT** command fails – action required.

Click the **Deactivate FDT** button.

Wait 2 minutes and repeat **Step 13**. If the **Activate** command fails again, contact next level of support.

14. *Click* the **Get FDT Status** button.

- If the **Get FDT Status** command is successful – OK.

See below for a sample status (does not reflect expected state)

- If the **Get FDT Status** command fails – action required.

Repeat **Step 14**. If the **Get FDT Status** command fails again, contact next level of support.

Fill and Drain Tool (FDT) Command Interface - Server-78AC-100BC50029

The table below shows the FDT Port locations that can communicate with the Fill and Drain Tool. Select the port to which the Fill and Drain Tool is connected. Use the buttons to drive commands to the Fill and Drain Tool connected to a port.

FDT Port Locations:

Select	Location Code	Description
<input checked="" type="radio"/>	78AC-100*BC50029-P7-C1	Lower BPC Port T10
<input type="radio"/>	78AC-100*BC50029-P8-C1	Upper BPC Port T10

FDT Power/Comm: GOOD
 Frame Attached: IBM Power7 775
 MDA-FD RL: 45D
 Error Status: WARNING
 Tank Level: Full
 Air Pump: Off
 Water Pump: DISABLED
 Tool Mode: Ready
 Pressure Test Calibration: Incomplete
 Component Pressure Test: Incomplete

Sample FDT Status

15. Click the Get FDT Status button and ensure the following status items are OK:

Status Item	State	Action
-------------	-------	--------

- **Tool Mode:** **Ready** – OK. Check next Status item.
- **Error Status:** **NONE** – OK. Check next Status item.

WARNING – *click* the **Decode Error Status** button, record the information returned and check Tank Level.

CRITICAL – *click* the **Decode Error Status** button, record the information returned and contact next level of support.

- **Tank Level:** **Full, Upper Half, or Lower Half** – OK.
Note tank level, and proceed to next step.
Empty – FDT cannot be drained.
Exit procedure.

16. Locate an empty system water container.

Transport the container to the location of the FDT.

Do not place the container between the FDT and the open frame.

NOTE: Use an empty system water container **only**. If a non-empty system water container is used, water will overflow out of the container.

IBM PN **45D2124** (U.S.), **45D2129** (non-U.S.).

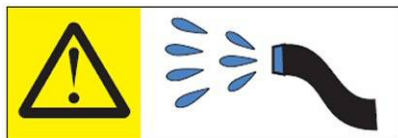
CAUTION: The water-based coolant solution may contain an additive intended to inhibit corrosion (or provide other functions). The solution may cause irritation to the skin or eyes. Avoid direct contact with the solution. Employ appropriate Personal Protective Equipment when performing operations involving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



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



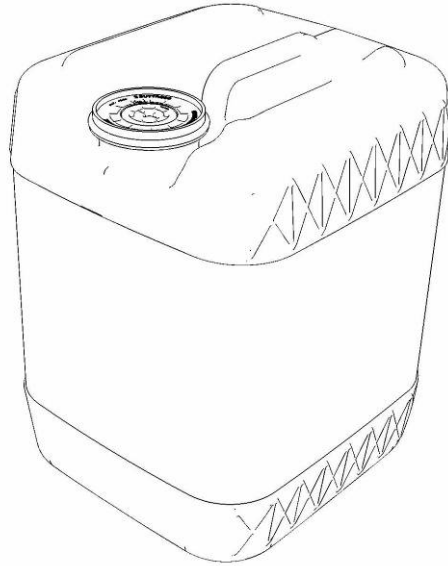
CAUTION: Chemical resistant gloves are needed for this procedure. (L014)



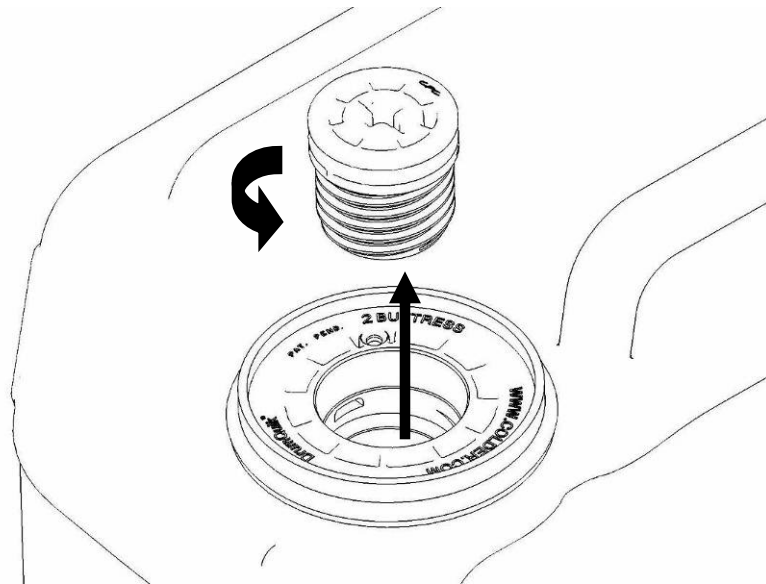
DANGER: Risk of electric shock due to water or a water solution which is present in this product. Avoid working on or near energized equipment with wet hands or when spilled water is present. (L016)

The system water is treated and must not be poured down a sink or on the ground.

Power775 Filter Service Procedure

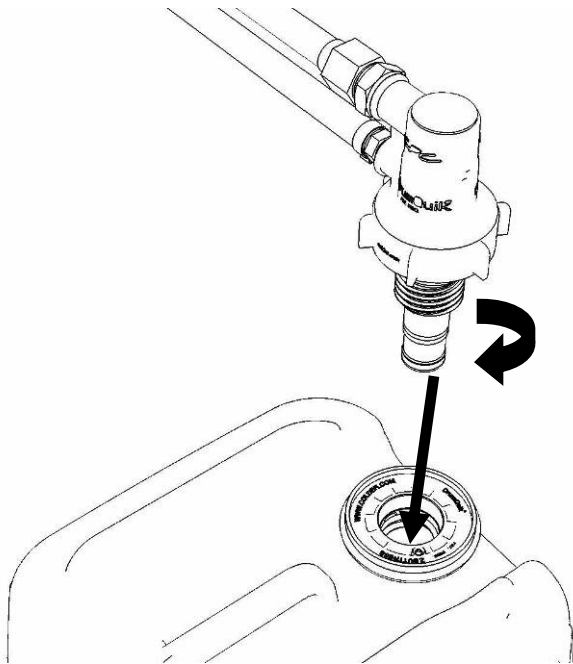


17. Remove the inner cap from the white system water container insert.
Unthread inner cap counter-clockwise with a large screwdriver.

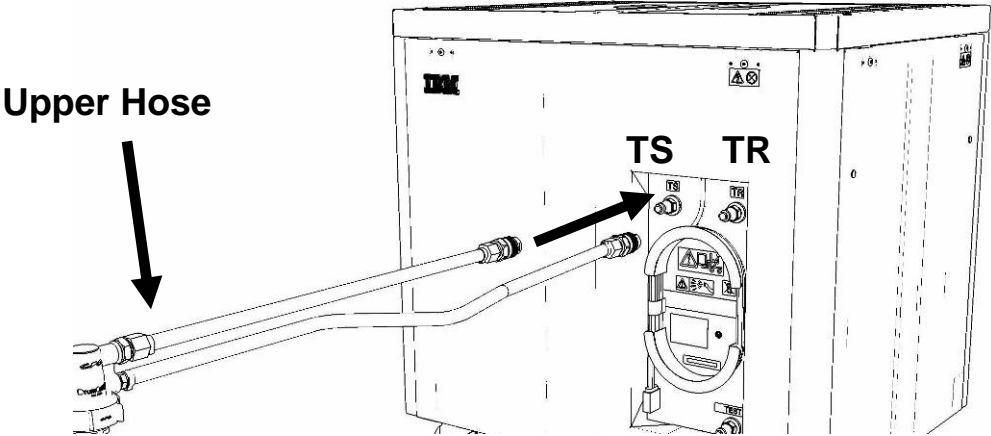


18. Remove transfer hose assembly **THA** from the upper tool storage compartment.
19. Insert large white threaded insert of **THA** into the system water container.
Turn clockwise until hand tight.

Power775 Filter Service Procedure

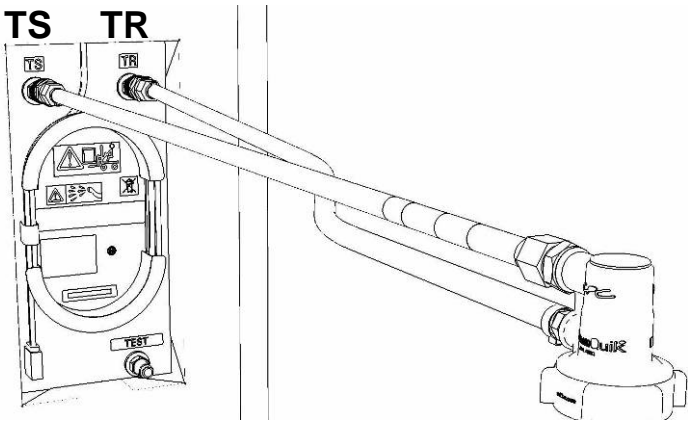
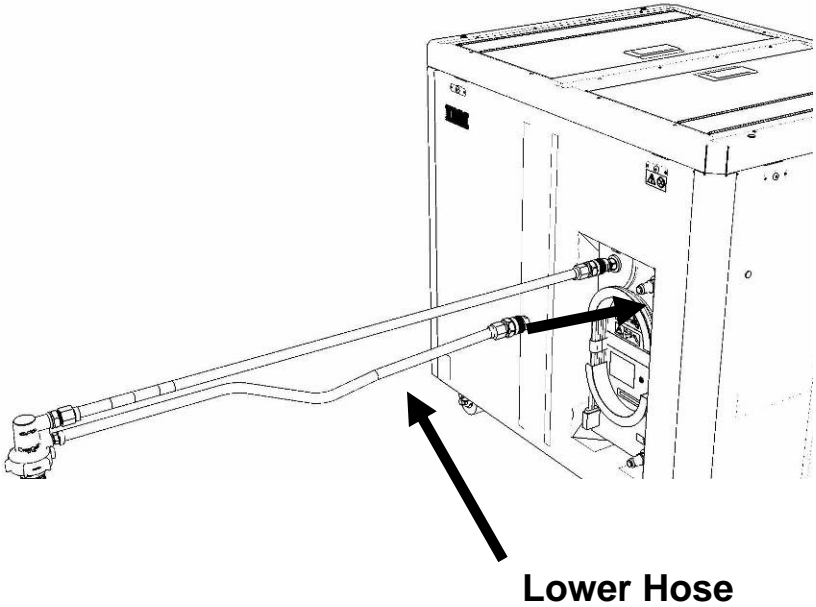


20. Connect the **Upper THA Hose** to the **TS** connection on the front panel of the FDT.

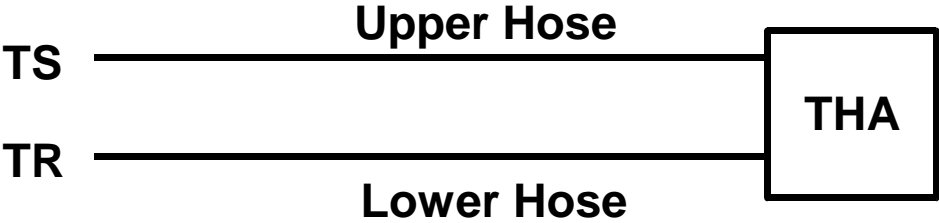


21. Connect the **Lower THA Hose** to the **TR** connection on the front panel of the FDT.

Power775 Filter Service Procedure



22. Ensure all water connections are made properly and securely.



23. On the FDT panel, *click* the **Drain FDT** button.

The **Get FDT Status** button may be *clicked* to examine FDT status.

NOTE: *The water pump will shut off after 1 minute, 40 seconds of run time.*

CAUTION: **This unit must not be left running unattended, service personnel should always be overseeing the process. (C038)**

24. Verify that the container feels full of water after FDT drain.

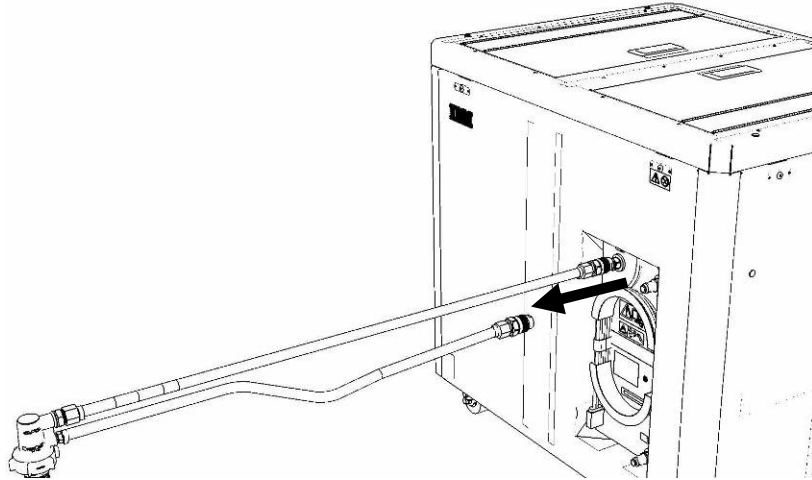
Container will weigh approximately 35 lbs. (16 kg) when full.

- If container feels full, proceed to **Step 25**.
- If container feels empty, repeat **Step 20** and continue with procedure.
To prevent overflow, only repeat if the system water container is **still empty**.

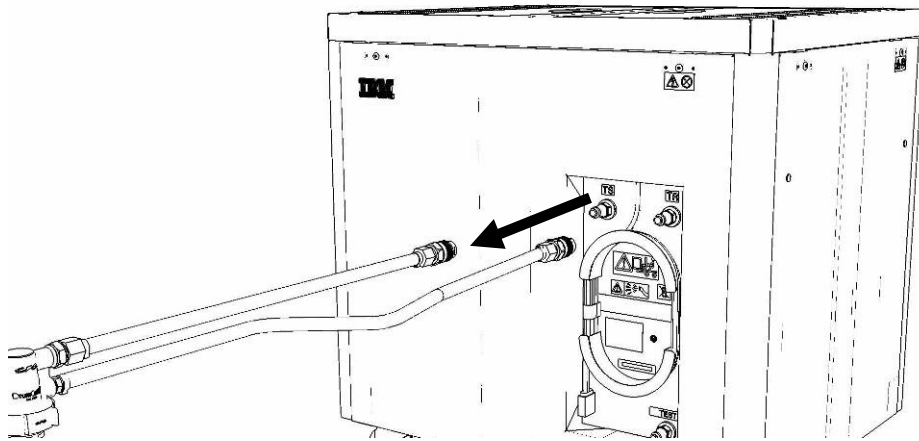
25. Click the Get FDT Status button and ensure the following status items are OK:

Status Item	State	Action
• Tool mode:	Ready – OK.	Check next Status item. FDT Drain Mode – water pump still running. Wait 30 seconds and repeat Step 25 .
• Error Status:	NONE – OK.	Check next Status item. WARNING – <i>click</i> the Decode Error Status button, record information returned and proceed to next step. CRITICAL – <i>click</i> the Decode Error Status button, record information returned and contact next level of support.
• Tank Level:	Repeat Step 16 to Step 25 (with additional empty container) until desired level is reached.	If tank level does not fall, repeat Step 16 through Step 25 . If tank level does not decrease after repeat, contact next level of support. To prevent overflow, only repeat if the system water container is still empty .

26. Disconnect the **Lower THA Hose** from the **TR** connection on the front panel of the FDT.



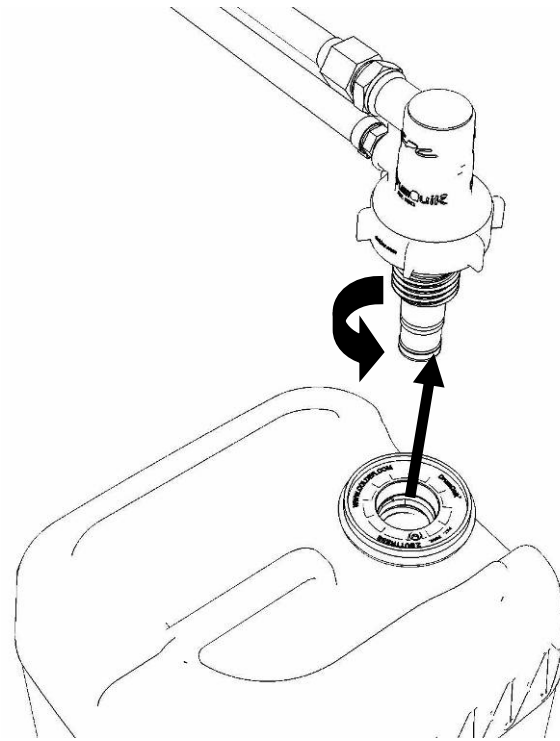
27. Disconnect the **Upper THA Hose** from the **TS** connection on the front panel of the FDT.



28. Remove large white threaded insert of **THA** from the system water container.

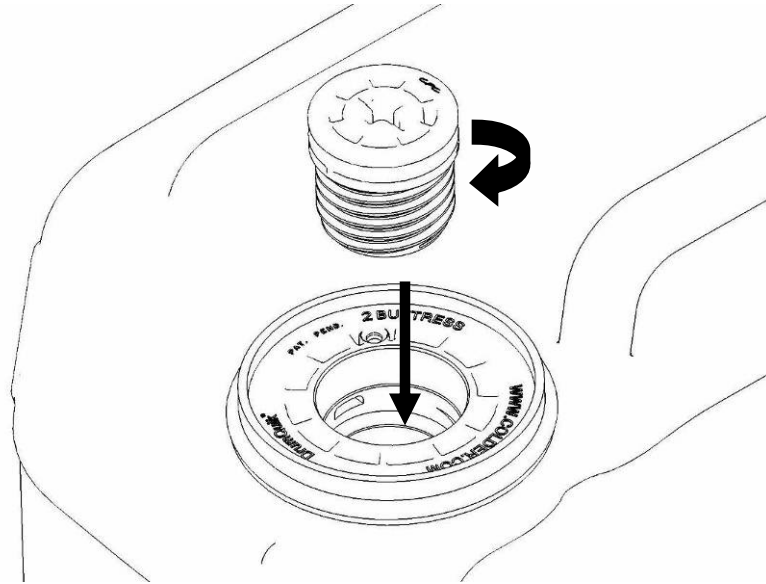
Turn **slowly** counterclockwise until removed.

Some residual pressure may remain on the system water container



29. Replace the inner cap into the white system water container insert.

Turn inner cap clockwise with a large screwdriver.



30. Place all hose assemblies and adapters in their appropriate locations within the FDT storage enclosure.

31. Determine whether the FDT will be used for another procedure:

- If the FDT will be used for another procedure, leave tool activated and go to that procedure now; skip the remaining steps of this procedure.
- If the FDT requires no further use - proceed to the next step.

32. Click the **Deactivate FDT** button.

- If the **Deactivate FDT** command is successful – OK. Proceed to next step.
- If the **Deactivate FDT** command fails– action required.

Repeat **Deactivate FDT**. If the **Deactivate FDT** command fails again, contact next level of support.

33. Disconnect FDT UPIC power cable from port T10 of BPC used.

Wrap the UPIC cable in appropriate cable storage location on FDT.

34. If this procedure was referenced from another procedure, return to parent procedure.

6.4 End of Power775 FDT Tank Drain Procedure

7 APPENDIX B: POWER775 FILL AND DRAIN TOOL (FDT) TANK FILL PROCEDURE

7.1 Safety Notices

Read "Safety Notices" available from InfoCenter:

<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 and 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)

The following notices specifically pertain to this Power775 service procedure.

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: This unit must not be left running unattended, service personnel should always be overseeing the process. (C038)



DANGER: Hazardous voltage present. Voltages present constitute a shock hazard, which can cause severe injury or death. (L004)



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

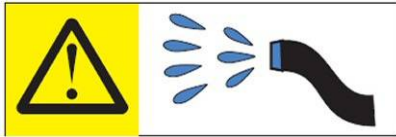
Power775 Filter Service Procedure
---- Appendix F: FDT Pressure Test Calibration Procedure ----



DANGER: Heavy equipment—personal injury or equipment damage might result if mishandled.
(L013)



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)

7.2 Background:

This document contains the procedure for filling an **IBM Power 775** Fill and Drain Tool (FDT) tank (internal reservoir).

The FDT is used to transfer water into and out of various components of the **IBM Power 775** system. When a system component or the entire system is filled, the water will be transferred from the tank (internal reservoir) within the FDT to the component or system. During fill operations, the FDT tank may become empty, and if so, will need to be periodically filled using the supplied system water containers. Individual system water containers treated with a corrosion inhibitor are shipped with the system. The FDT Tank Fill Procedure instructs the user to properly transfer water out of a full system water container into the FDT Tank.

During system or component filling operations, if the FDT senses that the internal reservoir has become empty, it will terminate any running fill routine, as well as prevent any further fill routines from being executed. This may occur during a system or component fill procedure; if so, the system or component fill procedure must be paused, and this FDT Tank Fill Procedure must be completed before system/component filling can resume.

The system water is treated and must not be poured down a sink or on the ground.

Reference Information:

IBM Power 775 FDT P/N:	41T8667, 45D6928, or approved equivalent
IBM System Water Container P/N:	45D2124 (U.S.), 45D2129 (non-U.S.)
Hose assemblies/adapters required:	THA (45D8563)

Approximate FDT internal water volume: 32 L

Expected filling time for one (1) system water container: 1 min, 30 s

NOTE: *Some steps in this procedure may be redundant due to other service operations being completed prior to this procedure. If a step has already been completed, verify that the step has been completed properly and proceed to the next step.*

7.3 Procedure:

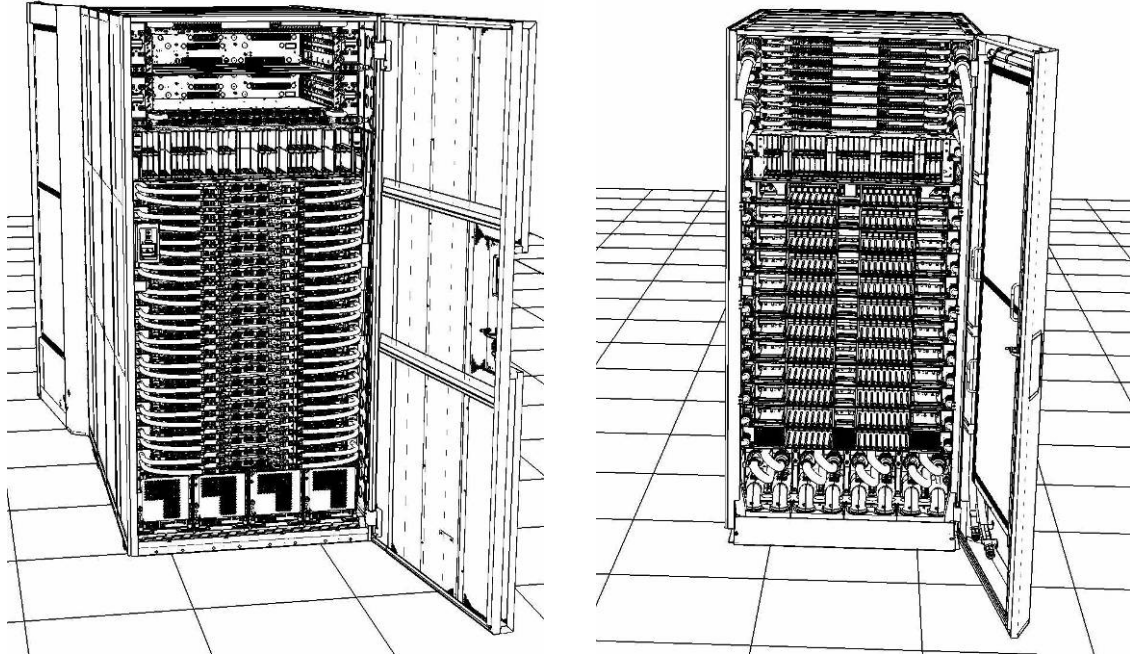
NOTE: If you already have the FDT powered on, proceed to **Step 14**. Otherwise, start procedure at **Step 1**.

Power775 Filter Service Procedure
---- Appendix F: FDT Pressure Test Calibration Procedure ----

1. Identify the **Power 775** frame that requires service.

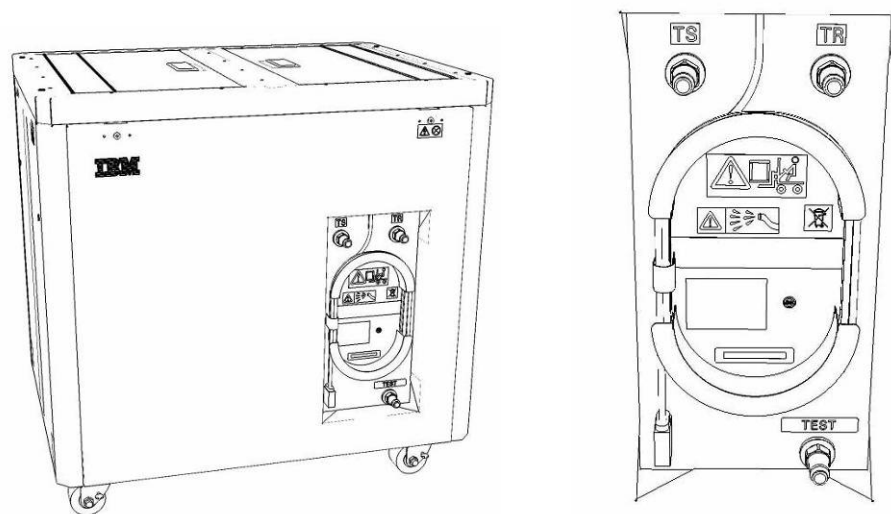
Verify that the system UEPO is set to **ON**, and the managing consoles (HMC and XCat) are powered on and communicating with the frame.

2. Open front and rear doors of the **Power 775** frame that requires service.



3. Bring the FDT to the front side of the **Power 775** frame that requires service.
4. Locate the panel of the FDT that contains the Universal Power and Information Cable (UPIC), as well as the **TS**, **TR**, and **TEST** water connections.

This side of the tool should be facing the front of the frame.

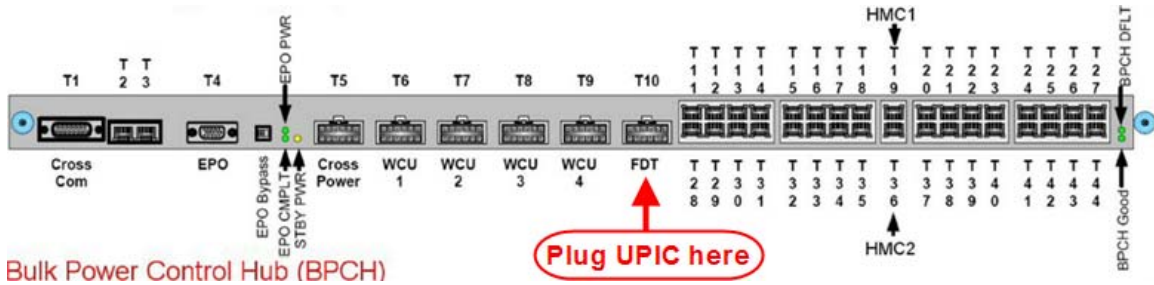


5. Unwrap the FDT UPIC cable from the storage loop on the FDT.

Power775 Filter Service Procedure
 ---- Appendix F: FDT Pressure Test Calibration Procedure ----

6. Select BPC port for FDT

- If the lower BPA is not targeted for service, and is functional:
 Plug the FDT UPIC cable into **port T10 of the lower BPC.**
- If the lower BPA is targeted for service, or is not functional:
 Plug the FDT UPIC cable into **port T10 of the upper BPC.**



7. Login to the HMC with the User ID `hscroot`.

Use the HMC that is connected to the BPA where the FDT is plugged.

8. From the HMC left Navigation menu, expand **Systems Management** then select **Frames**.

Verify frame serial number for the frame to be serviced.

9. In the **Frames** view on the HMC, place a checkmark in the **Select** column for the frame to be serviced.

10. Verify that the frame **Status** is **Rack Standby/Rack Standby** or **Standby/Standby**.

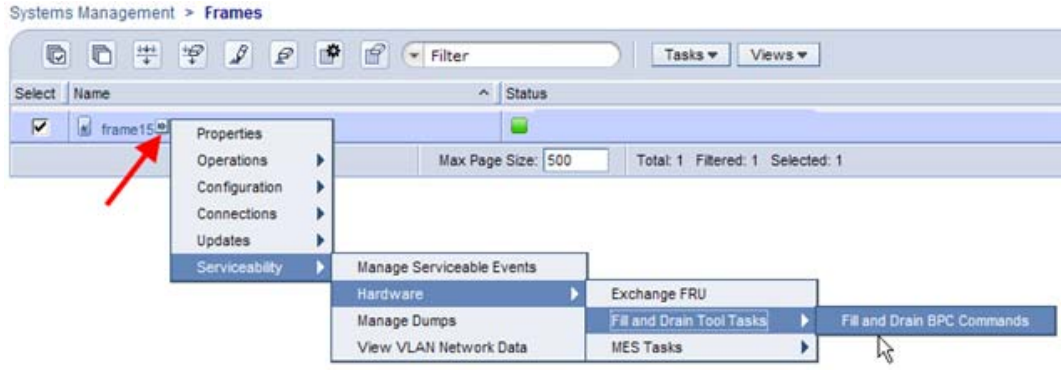
- If frame **Status** reads **Rack Standby/Rack Standby** or **Standby/Standby** – OK.

Continue to next step.

- If frame **Status** does not read **Rack Standby/Rack Standby** or **Standby/Standby** – action required. Contact next level of support.

11. From the **Task** menu on the HMC, *select* **Serviceability** > **Hardware** > **Fill and Drain Tool Tasks** > **Fill and Drain Command Interface**

Power775 Filter Service Procedure
 ---- Appendix F: FDT Pressure Test Calibration Procedure ----



Fill and Drain Tool Command Interface will display. See below for a sample image of the interface (FDT deactivated).

Fill and Drain Tool (FDT) Command Interface - Server-78AC-100BC50029

The table below shows the FDT Port locations that can communicate with the Fill and Drain Tool. Select the port to which the Fill and Drain Tool is connected. Use the buttons to drive commands to the Fill and Drain Tool connected to a port.

FDT Port Locations:

Select	Location Code	Description
<input type="radio"/>	78AC-100*BC50029-P7-C1	Lower BPC Port T10
<input type="radio"/>	78AC-100*BC50029-P8-C1	Upper BPC Port T10

Power775 Filter Service Procedure
---- Appendix F: FDT Pressure Test Calibration Procedure ----

12. Select the BPC port that the FDT was plugged into in **Step 6** from the **FDT Port Locations:** list.

13. *Click* the **Activate FDT** button.

- If the Activate FDT command is successful – OK. **Wait 30 seconds and continue to next step.**
- If the **Activate FDT** command fails – action required.

Click the **Deactivate FDT** button.

Wait 2 minutes and repeat **Step 13**. If the **Activate** command fails again, contact next level of support.

14. *Click* the **Get FDT Status** button.

- If the **Get FDT Status** command is successful – OK.
See below for a sample status (does not reflect expected state)

- If the **Get FDT Status** command fails – action required.

Repeat **Step 14**. If the **Get FDT Status** command fails again, contact next level of support.

Power775 Filter Service Procedure
 ---- Appendix F: FDT Pressure Test Calibration Procedure ----

Fill and Drain Tool (FDT) Command Interface - Server-78AC-100BC50029

The table below shows the FDT Port locations that can communicate with the Fill and Drain Tool. Select the port to which the Fill and Drain Tool is connected. Use the buttons to drive commands to the Fill and Drain Tool connected to a port.

FDT Port Locations:

Select	Location Code	Description
<input checked="" type="radio"/>	78AC-100*BC50029-P7-C1	Lower BPC Port T10
<input type="radio"/>	78AC-100*BC50029-P8-C1	Upper BPC Port T10

FDT Power/Comm: GOOD
 Frame Attached: IBM Power7 775
 MDA-FD RL: 45D
 Error Status: WARNING
 Tank Level: Full
 Air Pump: Off
 Water Pump: DISABLED
 Tool Mode: Ready
 Pressure Test Calibration: Incomplete
 Component Pressure Test: Incomplete

Sample FDT Status

15. Click the Get FDT Status button and ensure the following status items are OK:

Status Item	State	Action
-------------	-------	--------

- **Tool Mode:** **Ready** – OK. Check next Status item.
- **Error Status:** **NONE** – OK. Check next Status item.

WARNING – *click* the **Decode Error Status** button, record the information returned and check Tank Level.

CRITICAL – *click* the **Decode Error Status** button, record the information returned and contact next level of support.

- **Tank Level: Lower Half or Empty** – OK.

Note tank level, and proceed to next step.

Upper Half or Full – FDT should not be filled.

Exit procedure.

16. Locate a full system water container.

Transport the container to the location of the FDT.

Do not place the container between the FDT and the open frame.

NOTE: Use of a non-full system water container will result in repeated FDT filling operations.

IBM PN 45D2124 (U.S.), 45D2129 (non-U.S.).

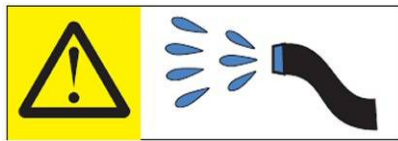
CAUTION: The water-based coolant solution may contain an additive intended to inhibit corrosion (or provide other functions). The solution may cause irritation to the skin or eyes. Avoid direct contact with the solution. Employ appropriate Personal Protective Equipment when performing operations involving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



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



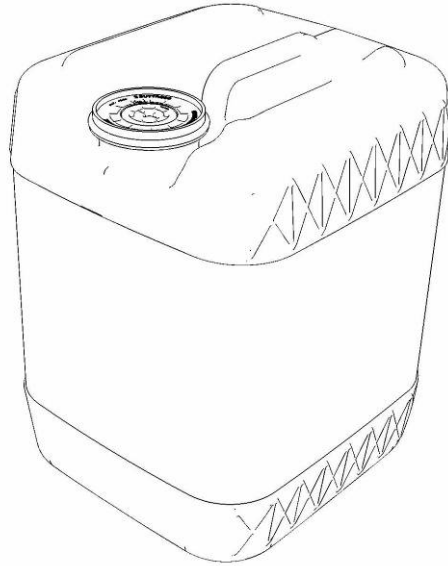
CAUTION: Chemical resistant gloves are needed for this procedure. (L014)



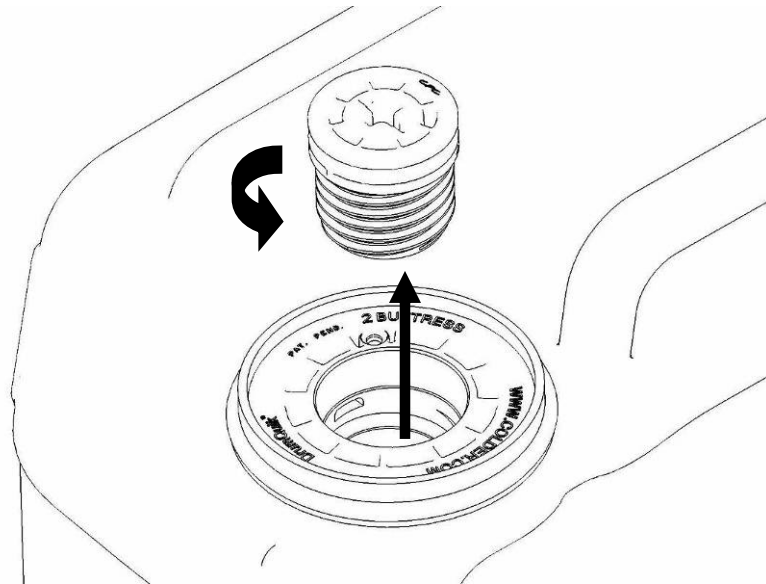
DANGER: Risk of electric shock due to water or a water solution which is present in this product. Avoid working on or near energized equipment with wet hands or when spilled water is present. (L016)

The system water is treated and must not be poured down a sink or on the ground.

Power775 Filter Service Procedure
---- Appendix F: FDT Pressure Test Calibration Procedure ----



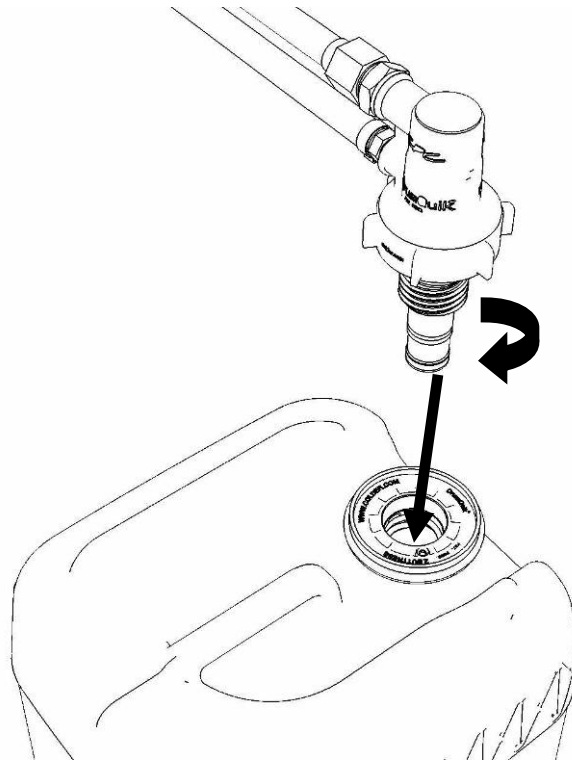
17. Remove the inner cap from the white system water container insert.
Unthread inner cap counter-clockwise with a large screwdriver.



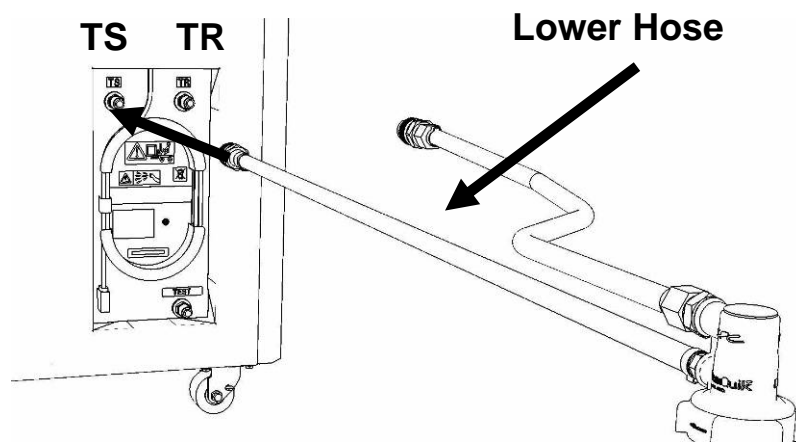
18. Remove transfer hose assembly **THA** from the upper tool storage compartment.

Power775 Filter Service Procedure
---- Appendix F: FDT Pressure Test Calibration Procedure ----

19. Insert large white threaded insert of **THA** into the system water container.
Turn clockwise until hand tight.

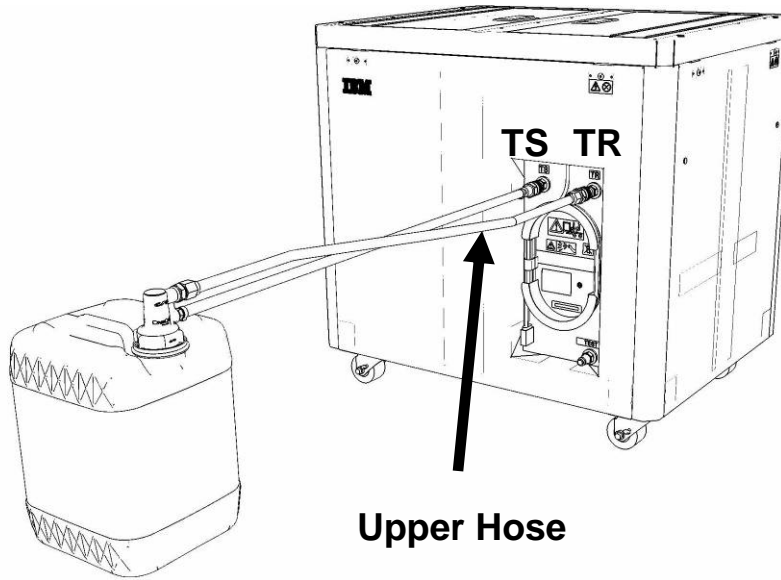


20. Connect the **Lower THA Hose** to the **TS** connection on the front panel of the FDT.



Power775 Filter Service Procedure
---- Appendix F: FDT Pressure Test Calibration Procedure ----

21. Connect the **Upper THA Hose** to the **TR** connection on the front panel of the FDT.



22. Ensure all water connections are made properly and securely.



23. On the FDT panel, *click* the **Fill FDT** button.

The **Get FDT Status** button may be *clicked* to examine FDT status.

NOTE: *The air pump will shut off after 1 minute, 40 seconds of run time.*

CAUTION: **This unit must not be left running unattended, service personnel should always be overseeing the process. (C038)**

24. Verify that the container feels empty after FDT fill.

Container will weigh approximately 5 lbs. (2 kg) when empty.

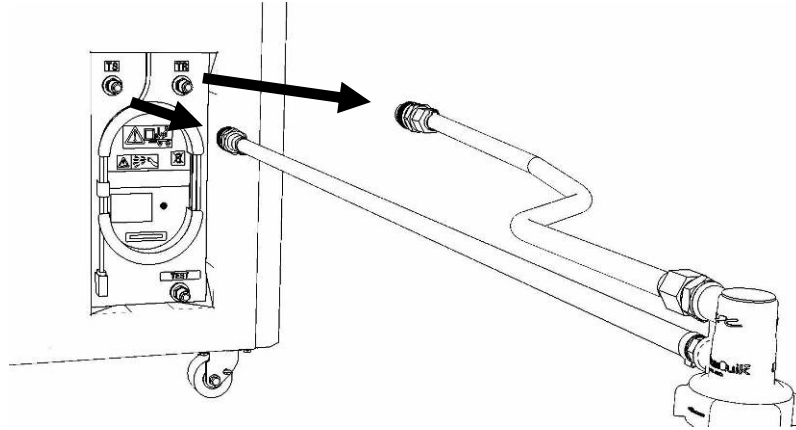
- If container feels empty, proceed to **Step 25**.
- If container does not feel empty, repeat **Step 20** and continue with procedure.

25. Click the **Get FDT Status** button and ensure the following status items are OK:

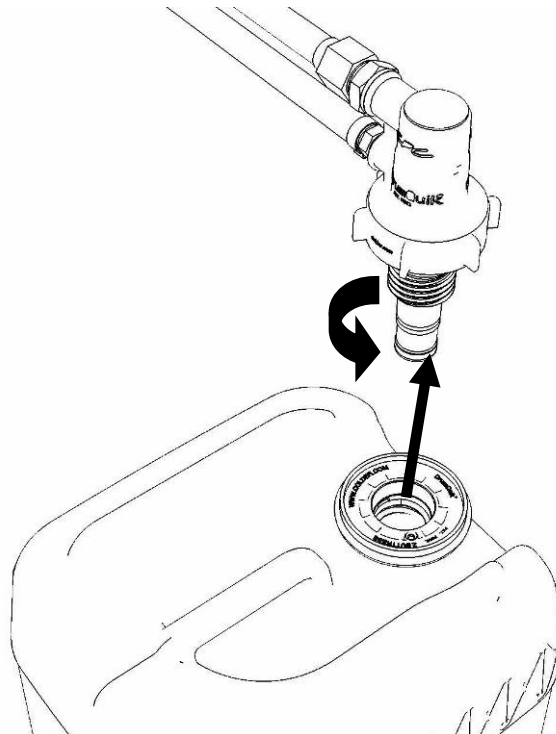
Status Item	State	Action
• Tool mode:	Ready – OK. Check next Status item. FDT Fill Mode – air pump still running. Wait 30 seconds and repeat Step 25 .	
• Error Status:	NONE – OK. Check next Status item. WARNING – <i>click</i> the Decode Error Status button, record information returned and proceed to next step. CRITICAL – <i>click</i> the Decode Error Status button, record information returned and contact next level of support.	
• Tank Level:	Repeat Step 16 to Step 25 (with additional full container) until desired level is reached. If tank level does not rise, repeat Step 16 through Step 25 . If tank level does not increase after repeat, contact next level of support.	

Power775 Filter Service Procedure
---- Appendix F: FDT Pressure Test Calibration Procedure ----

26. Disconnect the **Lower THA Hose** from the **TS** connection on the front panel of the FDT.
27. Disconnect the **Upper THA Hose** from the **TR** connection on the front panel of the FDT.

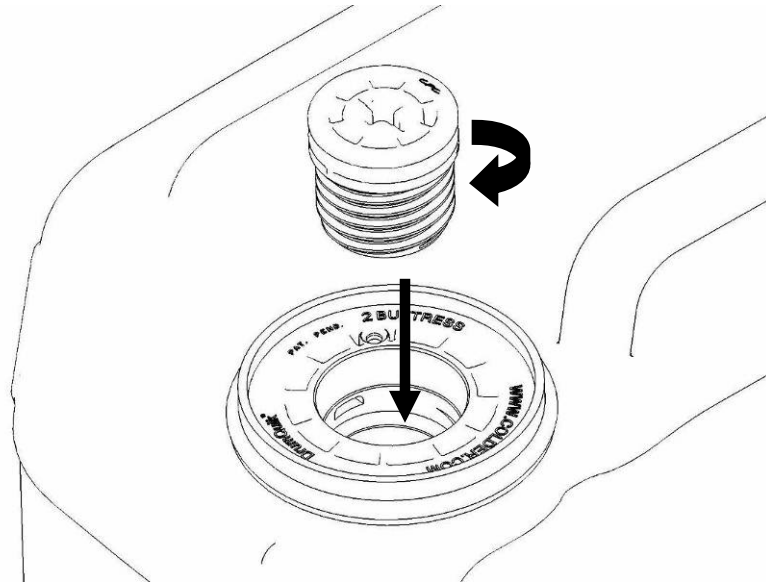


28. Remove large white threaded insert of **THA** from the system water container.
Turn **slowly** counterclockwise until removed.
Some residual pressure may remain on the system water container



Power775 Filter Service Procedure
---- Appendix F: FDT Pressure Test Calibration Procedure ----

29. Replace the inner cap into the white system water container insert.
Turn inner cap clockwise with a large screwdriver.



30. Place all hose assemblies and adapters in their appropriate locations within the FDT storage enclosure.
31. Determine whether the FDT will be used for another procedure:
- If the FDT will be used for another procedure, leave tool activated and go to that procedure now; skip the remaining steps of this procedure.
 - If the FDT requires no further use - proceed to the next step.
32. Click the **Deactivate FDT** button.
- If the **Deactivate FDT** command is successful – OK. Proceed to next step.
 - If the **Deactivate FDT** command fails– action required.
Repeat **Deactivate FDT**. If the **Deactivate FDT** command fails again, contact next level of support.
33. Disconnect FDT UPIC power cable from port T10 of BPC used.
Wrap the UPIC cable in appropriate cable storage location on FDT.
34. If this procedure was referenced from another procedure, return to parent procedure.

7.4 End of Power775 FDT Tank Fill Procedure

8 APPENDIX C: IBM POWER775 FDT VOLUME TABLES

8.1 IBM Power 775 Component Water Volumes

	Liters	Gallons
WCU	10.75	2.84
Supply Manifold	5.64	1.49
Return Manifold	5.64	1.49
CEC	1.74	0.46
CEC DCCA	0.07	0.02
CEC + 2 DCCAs	1.87	0.49
BPE	0.97	0.26
BPR	0.12	0.03
BPD	0.18	0.05
Disk Enclosure	0.90	0.24
RDHX	7.50	1.98
System Water Container	15.00	3.96
FDT Tank (Internal Reservoir)	32.00	8.45

Table 4 IBM Power 775 Component Water Volumes

8.2 IBM Power 775 System Water Volumes

		Number of CEC Drawers										
		2	3	4	5	6	7	8	9	10	11	12
Number of Disk Enclosures	0	46.8	48.6	50.5	63.6	65.4	67.3	69.2	82.3	84.1	86.0	87.9
	1	47.7	49.5	51.4	64.5	66.3	68.2	70.1	83.2	85.0	86.9	88.8
	2	48.6	50.4	52.3	65.4	67.2	69.1	71.0	84.1	85.9		
	3	49.5	51.3	53.2	66.3	68.1	70.0	71.9				
	4	50.4	52.2	54.1	67.2	69.0						
	5	51.3	53.1	55.0								
	6	52.2										

(Volumes in Liters)

Table 5 IBM Power 775 System Water Volume (Liters)

		Number of CEC Drawers										
		2	3	4	5	6	7	8	9	10	11	12
Number of Disk Enclosures	0	12.4	12.8	13.3	16.8	17.3	17.8	18.3	21.7	22.2	22.7	23.2
	1	12.6	13.1	13.6	17.0	17.5	18.0	18.5	22.0	22.5	23.0	23.5
	2	12.8	13.3	13.8	17.3	17.8	18.3	18.8	22.2	22.7		
	3	13.1	13.6	14.1	17.5	18.0	18.5	19.0				
	4	13.3	13.8	14.3	17.7	18.2						
	5	13.5	14.0	14.5								
	6	13.8										

(Volumes in Gallons)

Table 6 IBM Power 775 System Water Volume (Gallons)

8.3 IBM Power 775 System Water Containers per Frame

		Number of CEC Drawers										
		2	3	4	5	6	7	8	9	10	11	12
Number of Disk Enclosures	0	4	4	4	5	5	5	5	6	6	6	6
	1	4	4	4	5	5	5	5	6	6	6	6
	2	4	4	4	5	5	5	5	6	6		
	3	4	4	4	5	5	5	5				
	4	4	4	4	5	5						
	5	4	4	4								
	6	4										

Table 7 IBM Power 775 Required Number of System Water Containers per Frame

8.4 End of Appendix A: Power775 FDT Volume Tables