

Rear Door Heat eXchanger



Installation and Maintenance Guide

Rear Door Heat eXchanger



Installation and Maintenance Guide

Note:

Before using this information and the product it supports, read the general information in Appendix B, "IBM Statement of Limited Warranty Z125-4753-08 04/2004," on page 27 and Appendix C, "Notices," on page 45.

First Edition (May 2005)

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Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

Antes de instalar este produto, leia as Informações de Segurança.

在安装本产品之前，请仔细阅读 **Safety Information** (安全信息)。

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

Ennen kuin asennat tämän tuotteen, lue turvaohjeet kohdasta Safety Information.

Avant d'installer ce produit, lisez les consignes de sécurité.

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

Πριν εγκαταστήσετε το προϊόν αυτό, διαβάστε τις πληροφορίες ασφάλειας (safety information).

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

Prima di installare questo prodotto, leggere le Informazioni sulla Sicurezza.

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

Пред да се инсталира овој продукт, прочитајте информацијата за безбедност.

Les sikkerhetsinformasjonen (Safety Information) før du installerer dette produktet.

Przed zainstalowaniem tego produktu, należy zapoznać się z książką "Informacje dotyczące bezpieczeństwa" (Safety Information).

Antes de instalar este produto, leia as Informações sobre Segurança.

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

Antes de instalar este producto, lea la información de seguridad.

Läs säkerhetsinformationen innan du installerar den här produkten.

Important:

All caution and danger statements in this documentation begin with a number. This number is used to cross reference an English caution or danger statement with translated versions of the caution or danger statement in the *IBM NetBAY Rack Safety Information* document.

For example, if a caution statement begins with a number 1, translations for that caution statement appear in the *IBM NetBAY Rack Safety Information* book under statement 1.

Be sure to read all caution and danger statements in this documentation before performing the instructions. Read any additional safety information that comes with your server or optional device before you install the device.

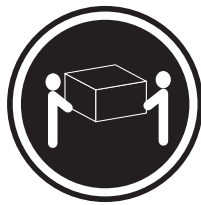
Statement 1:



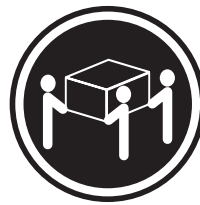
CAUTION:

To ensure safety, all configurations of the rack cabinet must be certified by a nationally recognized testing laboratory in order to verify compliance with country-specific safety regulations. This process ensures that the end product remains safe for the operator and service personnel under normal and foreseeable misuse conditions.

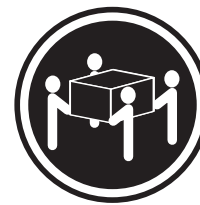
Statement 5:



≥ 18 kg (39.7 lb)



≥ 32 kg (70.5 lb)



≥ 55 kg (121.2 lb)

CAUTION:

Use safe practices when lifting.

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Chapter 1. Introduction

This *Installation and Maintenance Guide* contains instructions for installing and setting up the IBM® Rear Door Heat eXchanger.

The Rear Door Heat eXchanger is a water-cooled door that is mounted on the rear of an IBM NetBay42 Enterprise rack to cool the air that is heated and exhausted by devices inside the rack. Supply and return water hoses (not included with this product) deliver conditioned water to the heat exchanger in the door and remove warmed water from it. The rack on which you install this cooling feature can be on a raised floor or a non-raised floor.

This documentation might be updated occasionally to include information about new features, a translated version of the documentation might be available in your language, or technical updates might be available to provide additional information that is not included in this documentation. These updates are available from the IBM Web site. Complete the following steps to check for updated documentation and technical updates:

1. Go to <http://www.ibm.com/pc/support/>.
2. In the **Browse by topic** section, click **Publications**.
3. On the Publications page, in the **Brand** field, select **Servers**.
4. In the **Family** field, select **Rack/Storage Enclosures**.
5. In the **Type** field, select **9308**.
6. Click **Display documents**.

Record information about the Rear Door Heat eXchanger in the following table. You will need this information if you need to call for service.

Product name	IBM Rear Door Heat eXchanger
Serial number	_____

The IBM Documentation CD

The IBM *Documentation* CD contains documentation for your rack product in Portable Document Format (PDF) and includes the IBM Documentation Browser to help you find information quickly.

Hardware and software requirements

The IBM *Documentation* CD requires the following minimum hardware and software:

- Microsoft Windows NT 4.0 (with Service Pack 3 or later), Windows 2000, or Red Hat Linux.
- 100 MHz microprocessor.
- 32 MB of RAM.
- Adobe Acrobat Reader 3.0 (or later) or xpdf, which comes with Linux operating systems. Acrobat Reader software is included on the CD, and you can install it when you run the Documentation Browser.

Using the Documentation Browser

Use the Documentation Browser to browse the contents of the CD, read brief descriptions of the documents, and view documents using Adobe Acrobat Reader or xpdf. The Documentation Browser automatically detects the regional settings in use in your computer and displays the documents in the language for that region (if available). If a document is not available in the language for that region, the English-language version is displayed.

Use one of the following procedures to start the Documentation Browser:

- If Autostart is enabled, insert the CD into the CD drive. The Documentation Browser starts automatically.
- If Autostart is disabled or is not enabled for all users, use one of the following procedures:
 - If you are using a Windows operating system, insert the CD into the CD drive and click **Start --> Run**. In the **Open** field, type
`e:\win32.bat`

where *e* is the drive letter of the CD drive, and click **OK**.
 - If you are using Red Hat Linux, insert the CD into the CD drive; then, run the following command from the `/mnt/cdrom` directory:
`sh runlinux.sh`

Select your rack product from the **Product** menu. The **Available Topics** list displays all the documents for your rack product. Some documents might be in folders. A plus sign (+) indicates each folder or document that has additional documents under it. Click the plus sign to display the additional documents.

When you select a document, a description of the document appears under **Topic Description**. To select more than one document, press and hold the Ctrl key while you select the documents. Click **View Book** to view the selected document or documents in Acrobat Reader or xpdf. If you selected more than one document, all the selected documents are opened in Acrobat Reader or xpdf.

To search all the documents, type a word or word string in the **Search** field and click **Search**. The documents in which the word or word string appears are listed in order of the most occurrences. Click a document to view it, and press Ctrl+F to use the Acrobat search function or Alt+F to use the xpdf search function within the document.

Click **Help** for detailed information about using the Documentation Browser.

Related documentation

This *Installation and Maintenance Guide* provides general information about the Rear Door Heat eXchanger, including information about features and how to get help. In addition to this *Installation and Maintenance Guide*, the *IBM NetBAY Rack Safety Information* document comes with the Rear Door Heat eXchanger. The *Installation and Maintenance Guide* and the *NetBay Rack Safety Information* documents are on the *IBM Documentation CD*.

The *Rear Door Heat eXchanger Planning Guide* for water-cooled data centers is available from <http://www.ibm.com/pc/support/>.

Notices and statements in this document

The caution and danger statements that appear in this document are also in the multilingual *IBM NetBAY Rack Safety Information* document, which is on the IBM *Documentation* CD. Each statement is numbered for reference to the corresponding statement in the *IBM NetBAY Rack Safety Information* document.

The following notices and statements are used in this document:

- **Note:** These notices provide important tips, guidance, or advice
- **Important:** These notices provide information or advice that might help you avoid inconvenient or problem situations.
- **Attention:** These notices indicate potential damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.
- **Caution:** These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.
- **Danger:** These statements indicate situations that can be potentially lethal or extremely hazardous to you. A danger statement is placed just before the description of a potentially lethal or extremely hazardous procedure step or situation.

Specifications

The following information is a summary of the specifications of the Rear Door Heat eXchanger.

Table 1. Rear Door Heat eXchanger operating specifications

Door size <ul style="list-style-type: none">• Depth: 142.6 mm (5.6 in.)• Height: 1945.4 mm (76.6 in)• Width: 639 mm (25.2 in) Exchanger size <ul style="list-style-type: none">• Depth: 67 mm (2.6 in.)• Height: 1791.3 mm (70.5 in)• Width: 438.6 mm (17.3 in) Weight <ul style="list-style-type: none">• Empty: 29.9 kg (66 lbs)• Filled: 35.6 kg (78.5 lbs)	Air movement <ul style="list-style-type: none">• Provided by servers and other devices in the rack Water source <ul style="list-style-type: none">• User-supplied, compliant with specifications in the <i>Planning Guide</i> Pressure <ul style="list-style-type: none">• Maximum: 100 psi Required flow rate (as measured at the supply entrance to the heat exchanger) <ul style="list-style-type: none">• Minimum: 22.7 liters per minute (6.0 gallons per minute)• Maximum: 37.9 liters per minute (10.0 gallons per minute)	Water Volume <ul style="list-style-type: none">• Exchanger: Approximately 5.7 liters (1.5 gallons)• Exchanger plus supply and return hoses to the pump unit: Maximum of approximately 15.1 liters (4.0 gallons) excluding pump unit piping and reservoir Water temperature <ul style="list-style-type: none">• 18°C +/- 1°C (64.4°F +/- 1.8°F)
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Chapter 2. Installing the Rear Door Heat eXchanger

Before you can install the Rear Door Heat eXchanger, you must have prepared the facility according to the *Rear Door Heat eXchanger Planning Guide* for water-cooled data centers, which is available from <http://www.ibm.com/pc/support/>. The *Planning Guide* includes the water-quality and water-supply specifications.

You can install the Rear Door Heat eXchanger while devices in the rack cabinet are operating, but the optimum time for the installation is during a scheduled downtime or maintenance period.

Main tasks

Installing the Rear Door Heat eXchanger consists of the following major tasks:

1. Attaching the door assembly to the rack
2. Connecting the water-supply hose from the pump unit to the heat exchanger
3. Filling the heat exchanger with water (which includes purging air from the heat exchanger manifolds and connecting the return hose)
4. Securing the hoses and the door assembly

Note: Connecting the hoses from the pump unit to the heat exchanger (tasks 2 and 3) creates the required secondary loop in the water-circulation system. See the *Planning Guide* for information about primary and secondary loops in a water-circulation system.

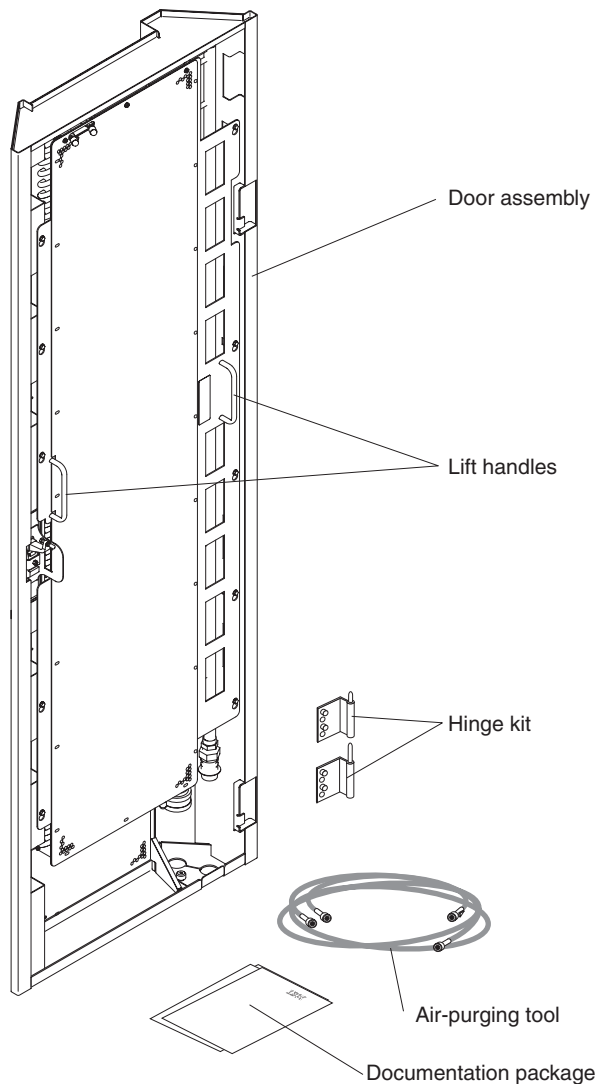
Review the information in “Required parts and tools”; then, go to “Installation procedures” on page 7 to begin the installation.

Required parts and tools

After you unpack the Rear Door Heat eXchanger, make sure that you have the following items that come in the option kit:

- Door assembly
- Hinge kit
- Air-purging tool
- Documentation package

Note: The illustrations in this document might differ slightly from your hardware.



In addition to the items that come in the option kit, you will need the following items:

- 7-mm wrench to remove and install the hinges.
- 8-mm wrench to adjust the latch mechanism.
- The hose assemblies that are described in the *Planning Guide*. The hose assemblies connect the heat exchanger to the pump unit, creating the secondary loop.

Note: For a non-raised floor, you must use the elbow-style hose assemblies that are described in the *Planning Guide*.

- An enclosed container with a capacity of at least 2 liters (approximately 2 quarts). You will use the container to catch water that escapes as you purge air from the heat exchanger while filling the heat exchanger with water.

Note: Although the likelihood of water exposure is small, you might prefer to place some water-absorbent material beneath the door assembly as a general practice when performing procedures on the heat exchanger.

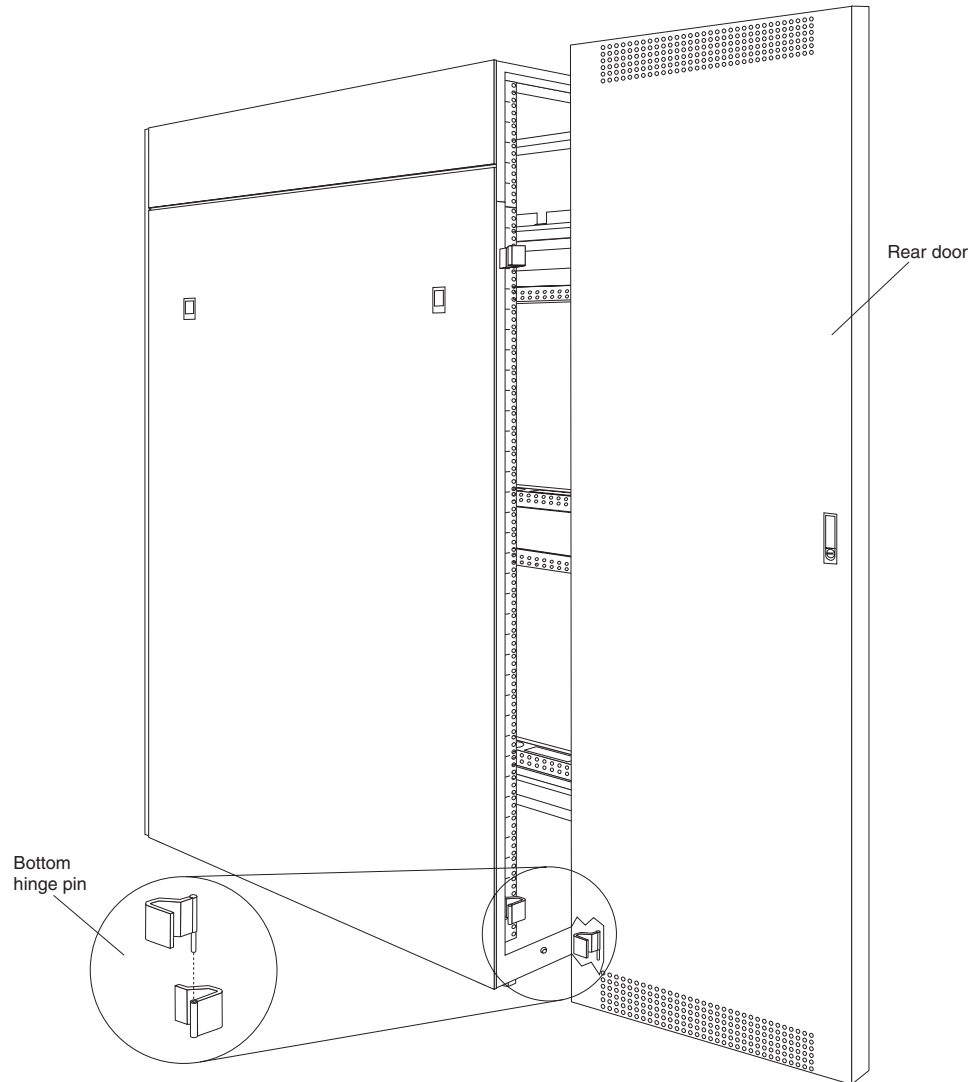
Installation procedures

Complete the procedures in this section to install the Rear Door Heat eXchanger.

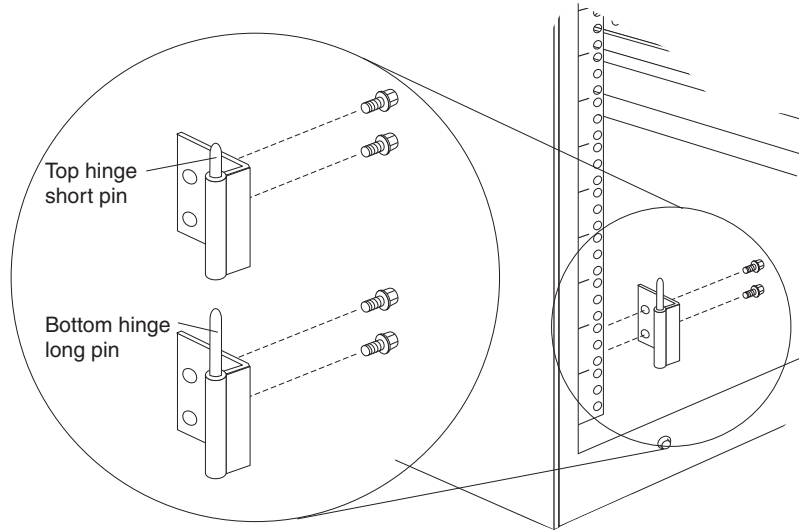
Attaching the door assembly to the rack

To install the Rear Door Heat eXchanger, complete the following steps:

1. Remove the Rear Door Heat eXchanger door assembly and all parts from the packaging.
2. Unlock and open the existing rear door on the rack cabinet; if a rear door is not present, go to step 4.

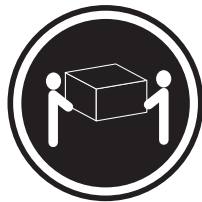


3. Grasp the door firmly with both hands and lift it upward and away from the hinges. Store the door in a safe place for possible future use.
4. Open the hinge kit that comes with the Rear Door Heat eXchanger. Note that one hinge has a long pin and one hinge has a shorter pin.

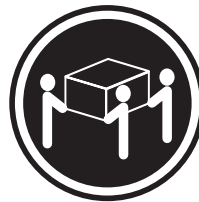


5. Remove the two screws that hold the top rear hinge in place on the rack cabinet and remove the hinge; then, install the new hinge with the short pin in the same location on the rack cabinet.
6. Remove the two screws that hold the bottom hinge in place on the rack cabinet and remove the hinge; then, install the new hinge with the long pin in the same location on the rack cabinet. Store both old hinges with the old rear door for possible future use.

Statement 5:



≥ 18 kg (39.7 lb)



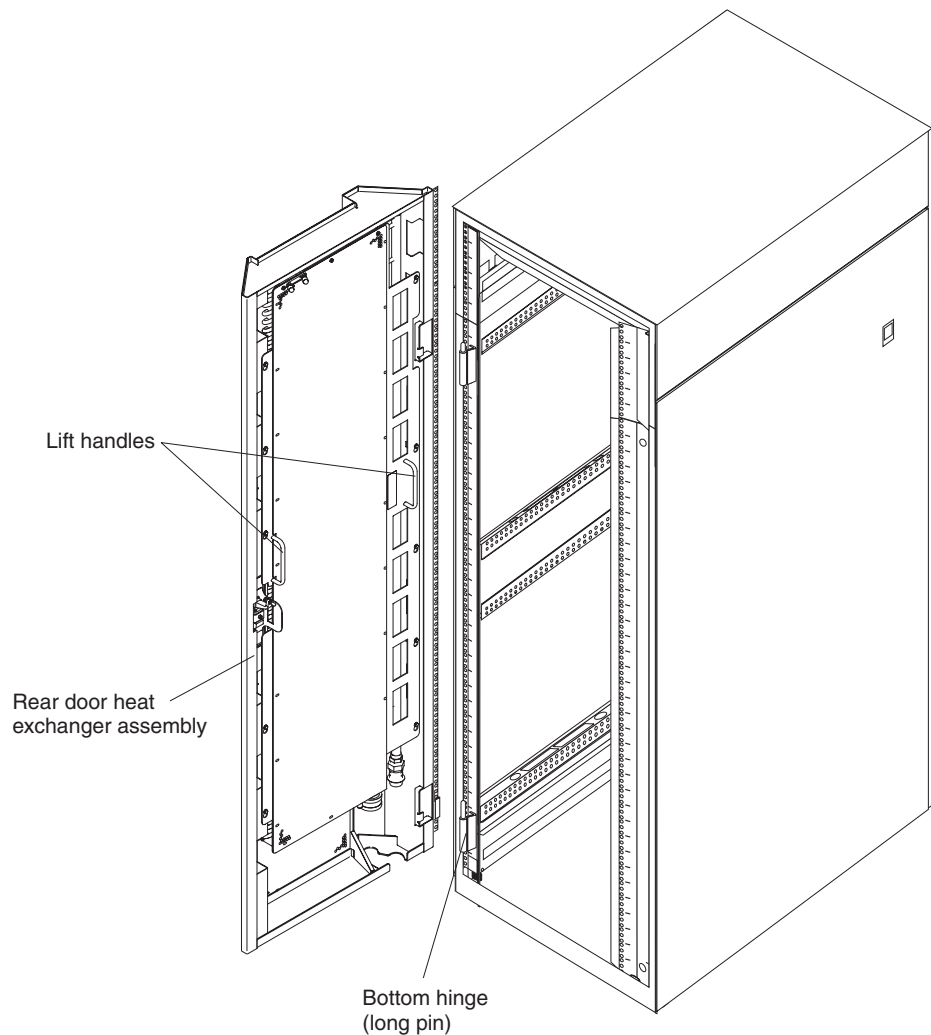
≥ 32 kg (70.5 lb)



≥ 55 kg (121.2 lb)

CAUTION:
Use safe practices when lifting.

7. Position the door at a 90° angle to the rack cabinet as shown in the following illustration.

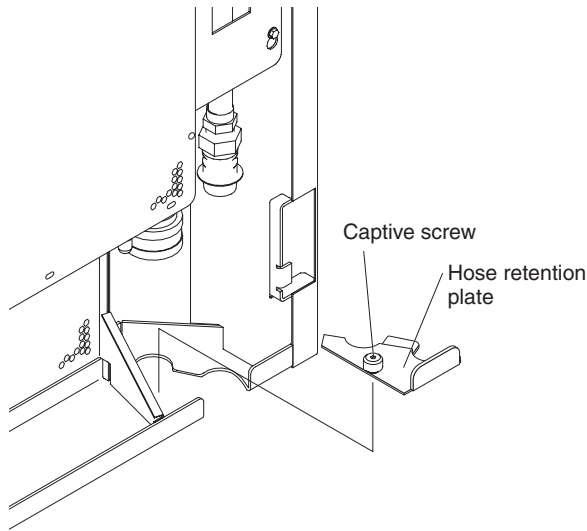


Attention: Make sure that you engage the bottom hinge pin first when you install a rear door on the rack cabinet.

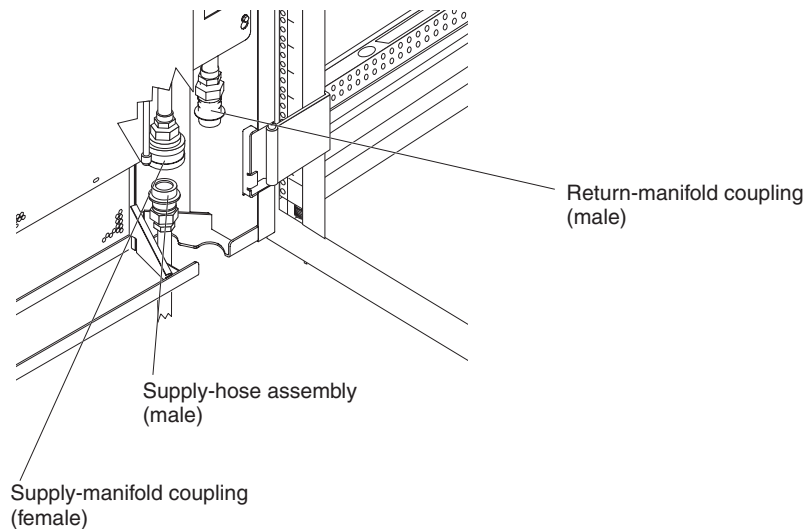
8. Place the door so that the bottom hinge pin on the rack cabinet goes into the locator hole in the bottom hinge area of the door. While keeping the door on the bottom hinge pin, lift the door slightly and place the top hinge area of the door on the top hinge pin on the rack cabinet; then, lower the door onto the hinge pins.
9. Close and adjust the latch mechanism so that all the door gaskets touch the rack members and compress to a gap of approximately 7 mm (0.25 in.) on all four sides of the door.

Connecting the water supply

To connect the secondary-loop water supply to the heat exchanger, complete the following steps.



1. Open the door to 90° and remove the hose-retention plate.
2. If the rack cabinet is on a raised floor, remove the floor tile that the hoses will pass through and pull the hoses up to provide slack.



3. Attach the water-supply hose to the female coupling (on the supply manifold) on the heat exchanger. To attach the supply hose, complete the following steps:
 - a. Align the male hose coupling with the female supply-manifold coupling.

Note: If you misalign the couplings, it will be difficult to connect the hose.

- b. Move the female collar upward.
- c. Insert the male hose coupling. Exert upward pressure until the female collar moves downward and locks in place with an audible click.

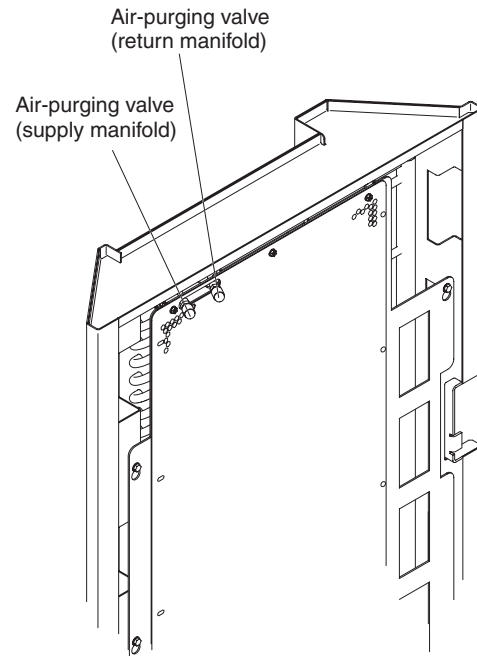
Note: After the couplings are engaged but before the collar has locked into place, you can let go of the collar and use both hands to push the hose upward to lock the couplings.

Important: Do not connect the return hose until instructed to do so in “Filling the heat exchanger with water.”

Filling the heat exchanger with water

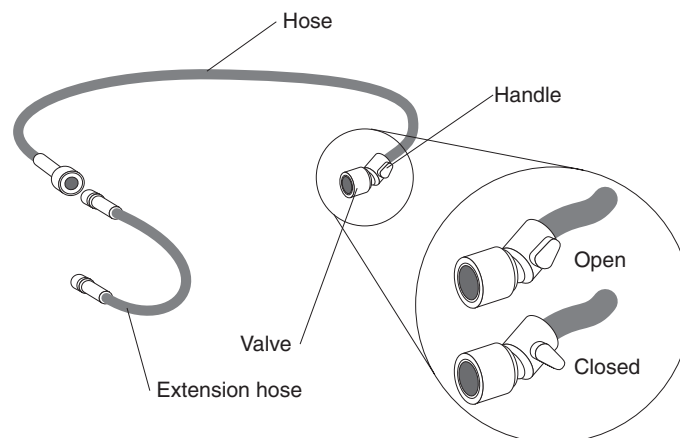
To fill the heat exchanger with water for the first time, complete the following steps.

Attention: Wear safety goggles or other eye protection whenever filling, draining, or purging air from the Rear Door Heat eXchanger.



1. Unscrew and retain the caps from both air-purging valves.

Note: The valves are similar to the valves on bicycle or automobile tires. The following illustration shows the air-purging tool.



2. Attach the air-purging tool to the leftmost (supply) air-purging valve. Make sure that the air-purging tool handle is in the closed position (perpendicular to the hose).

Note: The 6-inch extension hose for the air-purging tool is not required for this procedure. You can attach the extension hose to the tool, or you can set the extension hose aside.

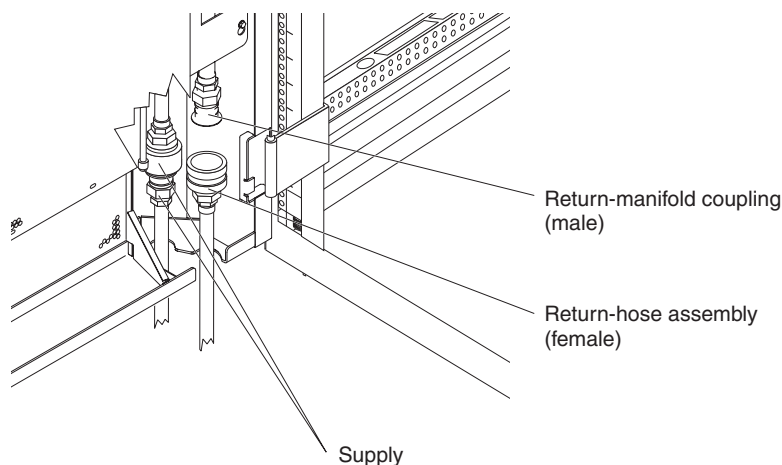
3. Place the other end of the air-purging tool into the 2-liter container to catch the water and air bubbles that escape during the filling procedure.
4. Turn on the flow of water to the heat exchanger.

Note: Depending on your facility, this might mean turning on the pump unit, opening a valve at the pump unit, or a similar action.

5. Turn the air-purging tool handle to the open position (parallel to the hose). Water that is mixed with air will begin to spit into the container when the manifold is almost full.
6. When there is a steady stream of water from the air-purging tool into the container, turn the tool handle to the closed position; then, disconnect the tool and move it and the container to the rightmost (return) air-purging valve.

Attention: If water drips from an air-purging valve after you remove the air-purging tool, reattach the tool and disconnect it again to exercise and reseal the seal.

7. Turn the air-purging tool handle to the open position. When there is a steady stream of water from the air-purging tool, turn the tool handle to the closed position; then, disconnect the tool and set it aside temporarily.



8. Attach the return hose to the male coupling (on the return manifold) on the heat exchanger. To attach the return hose, complete the following steps.

Note: To make it easier to attach the return hose, turn off the water supply temporarily to remove water pressure. After attaching the return hose, turn on the water supply again.

- a. Align the female hose coupling with the male return-manifold coupling.

Note: If you misalign the couplings, it will be difficult to connect the hose.

- b. Move the female collar downward and raise the coupling to the male coupling.
- c. Exert upward pressure until the female collar moves upward and locks in place with an audible click.

Note: After the couplings are engaged but before the collar has locked into place, you can let go of the collar and use both hands to push the hose upward to lock the couplings.

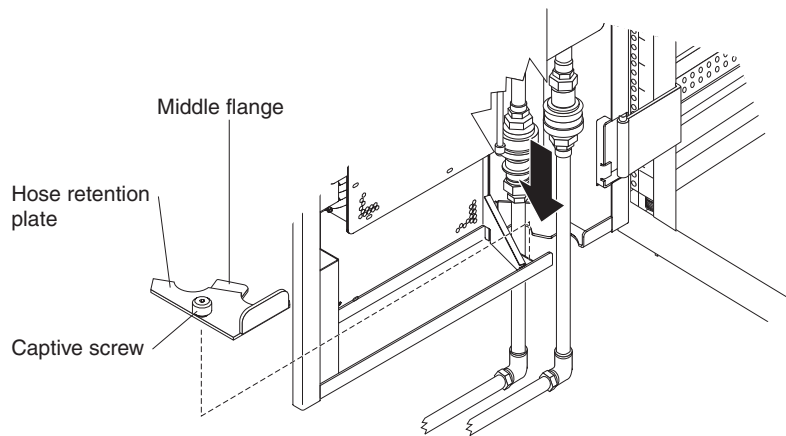
9. Attach the air-purging tool to the leftmost air-purging valve again and purge the air from the valve again (repeat steps 3, 5, and 6 on page 12). Purge the air from the rightmost valve again.

Notes:

- a. Water will spray or spit into the container immediately at this point.
 - b. Air in a manifold causes a splashing or gurgling sound. Repeat the air-purging procedure on both valves if this sound is present.
10. Feel the tops and bottoms of the manifolds (the vertical copper supply and return pipes on the heat exchanger). If they are cool to the touch, the chilled water is flowing correctly through the heat exchanger.
 11. Screw the valve caps onto the air-purging valves and hand-tighten them to provide a secondary seal.

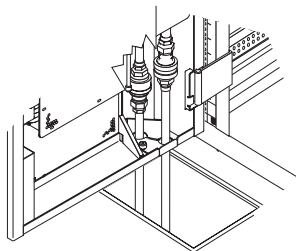
Completing the installation

Complete the following steps.

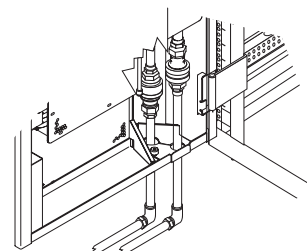


1. Reinstall the hose-retention plate. To reinstall the hose-retention plate, complete the following steps:
 - a. Slide the middle flange of the hose-retention plate below the matching lip of the corresponding plate and wiggle the plate into place.
 - b. Fasten the captive screw.

Raised floor



Non-raised floor



2. Install the floor tile (on a raised floor) or route the hoses away from the rack cabinet (on a non-raised floor).

3. Close and latch the door.

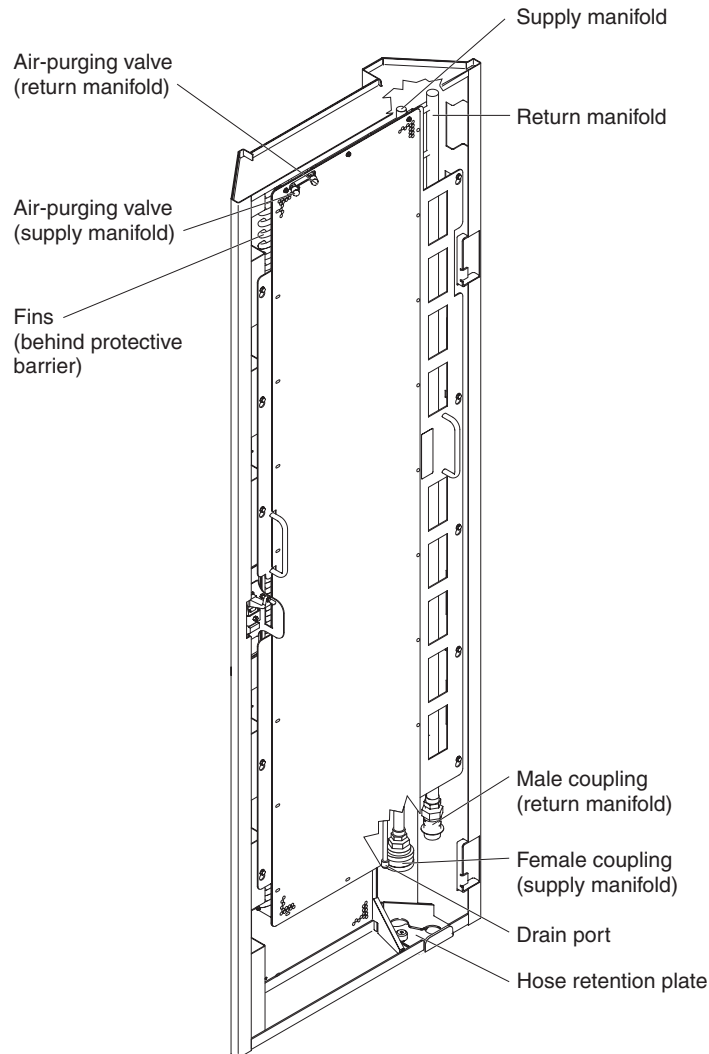
Note: If the rack cabinet is on a non-raised floor, you might have to manually keep the hoses parallel and move them back into position as you close the door.

Check the heat exchanger after several hours of operation. If there is a splashing or gurgling sound, repeat the air-purging procedure on both valves (trapped air from the hoses might have migrated to the heat exchanger).

Check the heat exchanger for air in the manifolds again after one month of operation, to ensure that the exchanger is filled correctly.

Chapter 3. Maintenance procedures

The following illustration shows the locations of components on the Rear Door Heat eXchanger.



Note: Although the likelihood of water exposure is small, you might prefer to place some water-absorbent material beneath the door assembly as a general practice when performing procedures on the heat exchanger.

Purging air from the heat exchanger

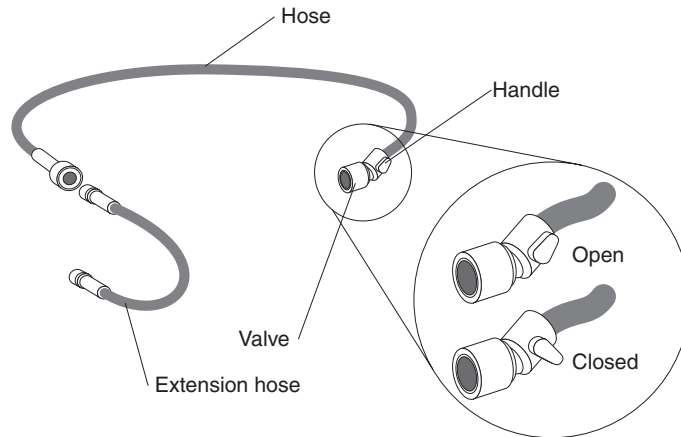
Perform this procedure as part of regular maintenance and when you hear a splashing or gurgling sound from the manifolds.

Attention: Wear safety goggles or other eye protection whenever filling, draining, or purging air from the Rear Door Heat eXchanger.

1. Unscrew and retain the caps from both air-purging valves.

Note: The valves are similar to the valves on bicycle or automobile tires.

The following illustration shows the air-purging tool.



2. Attach the air-purging tool to the leftmost (supply) air-purging valve. Make sure that the air-purging tool handle is in the closed position (perpendicular to the hose).

Note: The 6-inch extension hose for the air-purging tool is not required for this procedure. You can attach the extension hose to the tool if you want to, or you can set the extension hose aside.

3. Place the other end of the air-purging tool in the 2-liter container to catch the water and air bubbles that escape during the purging procedure.
4. Turn the air-purging tool handle to the open position (parallel to the hose). Water that is mixed with air will begin to spit into the container.
5. When there is a steady stream of water from the air-purging tool into the container, turn the tool handle to the closed position; then, disconnect the tool and move it and the container to the rightmost (return) air-purging valve.

Attention: If water drips from an air-purging valve after you remove the air-purging tool, reattach the tool and disconnect it again to exercise and reseal the seal.

6. Turn the air-purging tool handle to the open position. When there is a steady stream of water from the air-purging tool, turn the tool handle to the closed position; then, disconnect the tool and set it aside.

Note: Air in a manifold causes a splashing or gurgling sound. Repeat the air-purging procedure on both valves if this sound is present.

7. Screw the valve caps onto the air-purging valves and hand-tighten them to provide a secondary seal.

Draining the heat exchanger

Perform this procedure before having the Rear Door Heat eXchanger removed from the rack cabinet or when directed to do so by IBM Service. The drain port is at the bottom of the heat exchanger, near the supply and return couplings.

Attention: Wear safety goggles or other eye protection whenever filling, draining, or purging air from the Rear Door Heat eXchanger.

Note: Although the likelihood of water exposure is small, you might prefer to place some water-absorbent material beneath the door assembly as a general practice when draining the heat exchanger.

To drain water from the heat exchanger, complete the following steps.

1. Shut off the flow of water at the source.

Note: Depending on your facility, this might mean turning off the pump unit, closing a valve at the pump unit, or a similar action.

2. Open the door assembly to 90°.
3. Unscrew the captive screw on the hose-retention plate.
4. Lift the plate out of the door assembly.
5. Disconnect the return hose and the supply hose from the heat exchanger and move them out of the way.
6. Remove the valve caps from the air-purging valves and from the drain port.
7. Remove the extension hose from the air-purging tool, if it is connected. Make sure that the air-purging tool handle is in the closed position.
8. Attach the hose and valve portion of the tool to the drain port, and place the hose end into a container capable of holding at least 5.7 liters (1.5 gallons) of water.
9. Open the handle on the air-purging tool.
10. Attach the extension hose to one of the air-purging valves at the top of the heat exchanger to allow air to enter the manifolds.

Note: Instead of using the extension hose, if filtered and oil-free compressed air is available, you can attach the compressed-air hose to the air-purging valve to force water out of the exchanger. Keep the air pressure at 50 pounds per square inch gage (psig) or less to avoid excessive spray at the drain port.

11. When the water flow at the drain port stops, move the extension hose or compressed-air hose to the other air-purging valve and repeat the process.
12. When the water has drained completely from the manifolds, complete the following steps:
 - a. Remove the air-purging-tool extension hose or compressed-air hose from the air-purging valve.
 - b. Remove the air-purging tool hose and valve from the drain port.
 - c. Screw the valve caps onto the air-purging valves and drain valve and hand-tighten them to provide a secondary seal.

Refilling after a leak in the system

The action that you take depends on where the leak occurs.

Leak in the water-supply circuit

If the leak occurs in the user-supplied secondary loop of the water-circulation system, other than in the heat exchanger, repair the leak; then, complete the following steps:

1. Reconnect the return and supply hoses, if they are disconnected.
 - To attach the supply hose, complete the following steps:
 - a. Align the male hose coupling with the female supply-manifold coupling.

Note: If you misalign the couplings, it will be difficult to connect the hose.

- b. Move the female collar upward.
- c. Insert the male hose coupling. Exert upward pressure until the female collar moves downward and locks in place with an audible click.

Note: After the couplings are engaged but before the collar has locked into place, you can let go of the collar and use both hands to push the hose upward to lock the couplings.

- To attach the return hose, complete the following steps.
 - a. Align the female hose coupling with the male return-manifold coupling.

Note: If you misalign the couplings, it will be difficult to connect the hose.

- b. Move the female collar downward and raise the coupling to the male coupling.
- c. Exert upward pressure until the female collar moves upward and locks in place with an audible click.

Note: After the couplings are engaged but before the collar has locked into place, you can let go of the collar and use both hands to push the hose upward to lock the couplings.

2. Turn on the flow of water from the pump unit to the heat exchanger.
3. Perform the air-purging procedure to remove any air that enters the heat exchanger from the hoses. (See “Purging air from the heat exchanger” on page 15 for instructions.)

Leak in the heat exchanger

Although a leak in the heat exchanger is unlikely, if it does occur, you must replace the door assembly. To replace the door assembly, complete the following steps.

Note: Call for service to obtain a replacement Rear Door Heat eXchanger. See Appendix A, “Getting help and technical assistance,” on page 25 for service or assistance information.

1. Drain the water from the heat exchanger. (See “Draining the heat exchanger” on page 16 for instructions.)
2. Have trained service personnel replace the door assembly. (See “Replacing the door assembly” for instructions.)
3. Fill the replacement Rear Door Heat eXchanger with water. (See “Connecting the water supply” on page 10 through “Completing the installation” on page 13 for instructions.)

Replacing the door assembly

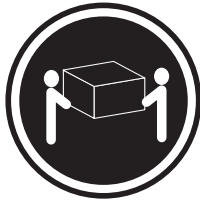
Note: This procedure is performed by trained service personnel.

Important: Before you remove the door assembly, make sure that the water has been drained from the heat exchanger and the hoses have been detached. (See “Draining the heat exchanger” on page 16 and “Attaching and detaching the hoses” on page 21 for instructions.)

To replace the door assembly from the rack cabinet, complete the following steps.

1. Open the door assembly 90°.

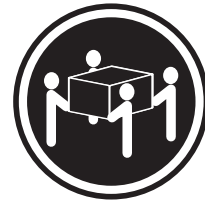
Statement 5:



≥ 18 kg (39.7 lb)



≥ 32 kg (70.5 lb)

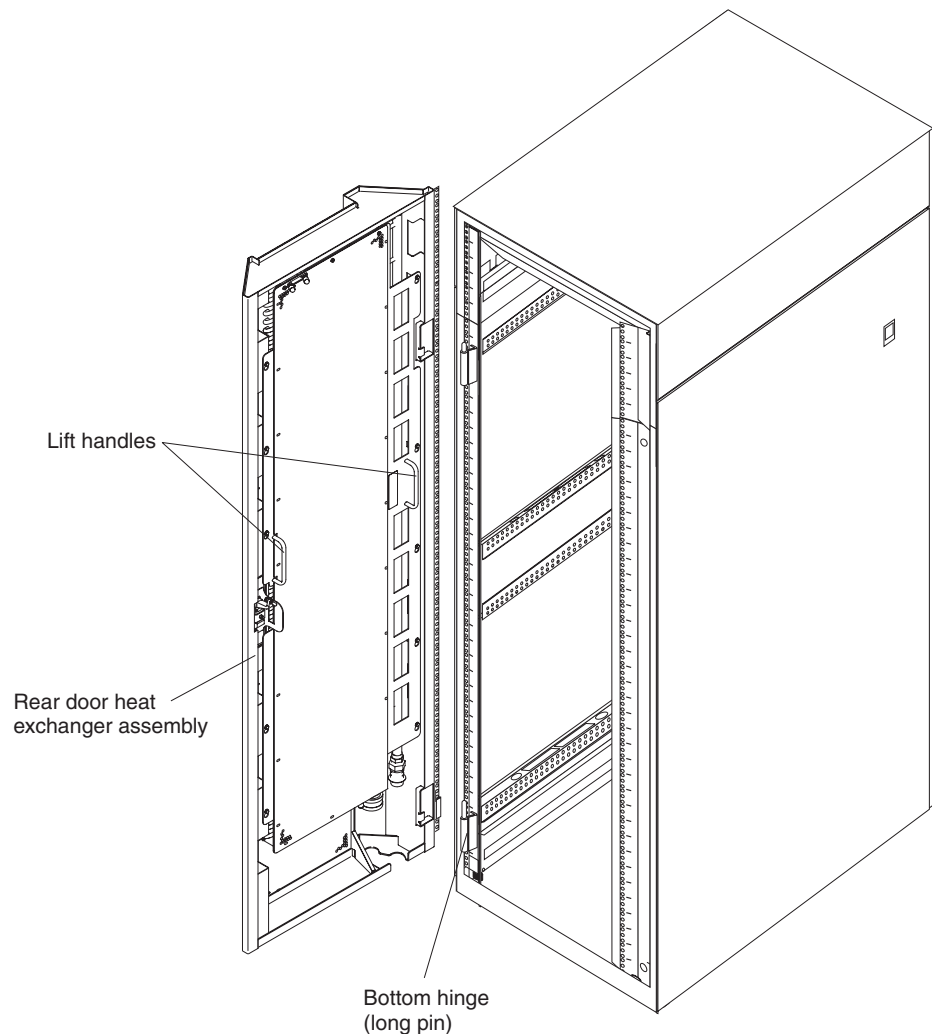


≥ 55 kg (121.2 lb)

CAUTION:

Use safe practices when lifting.

2. Grasp the door assembly firmly with both hands and lift it upward and away from the hinges.
3. Position the replacement door assembly at a 90° angle to the rack cabinet as shown in the following illustration.



Attention: Make sure that you engage the bottom hinge pin first when you install a rear door on the rack cabinet.

4. Place the door so that the bottom hinge pin on the rack cabinet goes into the locator hole in the bottom hinge area of the door. While keeping the door on the bottom hinge pin, lift the door slightly and place the top hinge area of the door on the top hinge pin on the rack cabinet; then, lower the door onto the hinge pins.
5. Close and adjust the latch mechanism so that all the door gaskets touch the rack members and compress to a gap of approximately 7 mm (0.25 in.) on all four sides of the door.

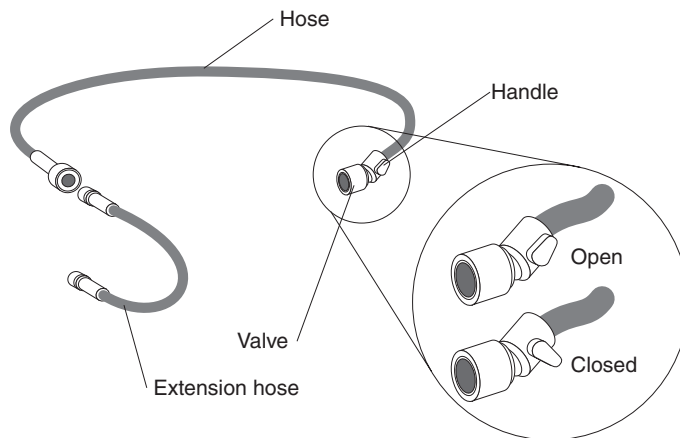
Sub-tasks

The following actions are used frequently throughout the installation and maintenance procedures. Refer to these actions as necessary as you perform the installation and maintenance procedures.

Opening and closing the air-purging valves

The air-purging valves are similar to bicycle or automobile tire valves. You must use the air-purging tool to open and close an air-purging valve.

The following illustration shows the air-purging tool.



When the air-purging tool handle is parallel to the tool hose, the tool is open, and air flows through the tool. When the tool handle is perpendicular to the tool hose, the tool is closed, and air does not flow.

To open an air-purging valve, complete the following steps:

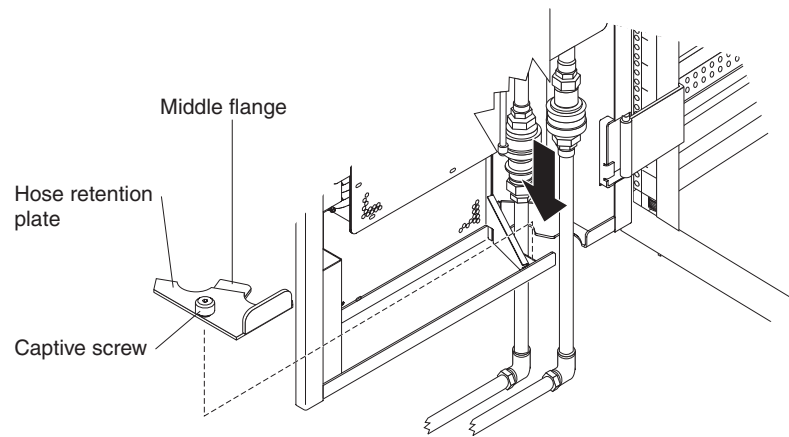
1. Unscrew the valve cap.
2. Screw the valve of the air-purging tool onto the air-purging valve. The tool presses the valve pin inside the valve stem and allows air to flow.
3. Open the air-purging tool (turn the handle parallel to the tool hose).

To close an air-purging valve, complete the following steps:

1. Close the air-purging tool (turn the handle perpendicular to the tool hose).
2. Unscrew the valve of the air-purging tool from the air-purging valve.
3. When you have completed the task that you are performing, such as draining the heat exchanger or purging air from it, screw the valve cap onto the air-purging valve. The valve cap provides a secondary seal.

Removing and replacing the hose-retention plate

You must remove the hose-retention plate before you connect the hose assemblies to or disconnect the hose assemblies from the manifold couplings.



To remove the hose-retention plate, complete the following steps:

1. Open the door assembly to 90°.
2. Unscrew the captive screw on the hose-retention plate.
3. Lift the plate out of the door assembly.

To replace the hose-retention plate, complete the following steps:

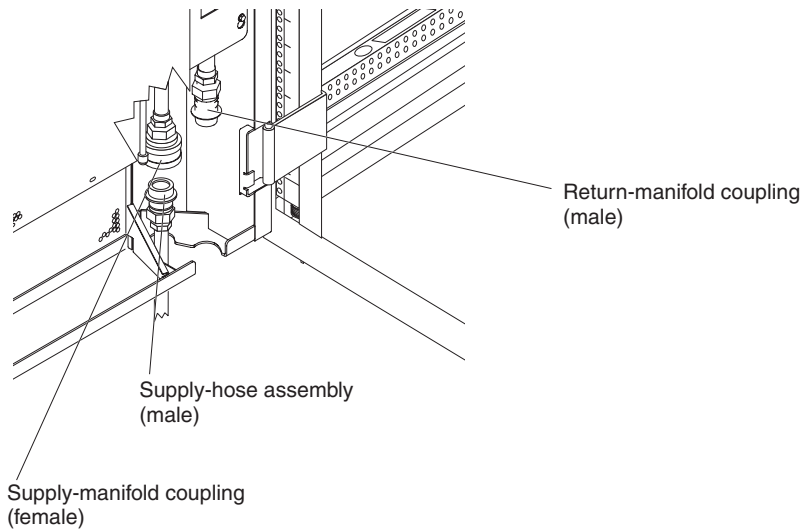
1. Slide the middle flange of the hose-retention plate below the matching lip of the corresponding plate and wiggle the plate into place.
2. Fasten the captive screw.

Attaching and detaching the hoses

Note: It is easier to attach and detach the hose assemblies when there is no water pressure in the hoses.

Remove the hose-retention plate before attaching or detaching the hoses. (See "Removing and replacing the hose-retention plate" for instructions.)

Supply hose



Attach the water-supply hose to the female coupling (on the supply manifold) on the heat exchanger. To attach the supply hose, complete the following steps:

1. Align the male hose coupling with the female supply-manifold coupling.

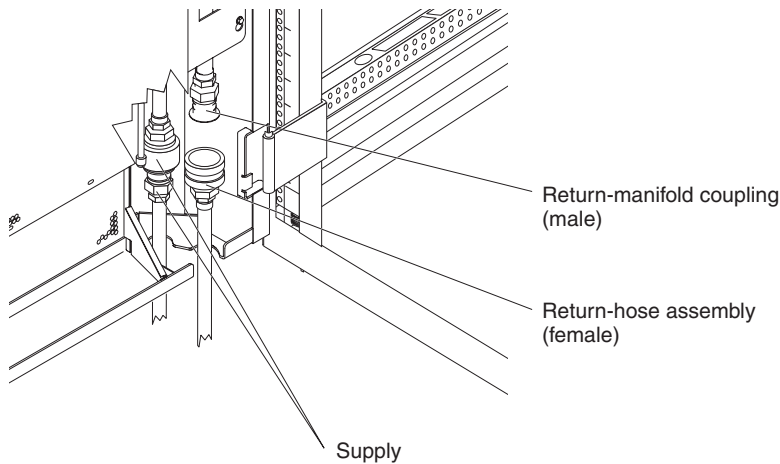
Note: If you misalign the couplings, it will be difficult to connect the hose.

2. Move the female collar upward.
3. Insert the male hose coupling. Exert upward pressure until the female collar moves downward and locks in place with an audible click.

Note: After the couplings are engaged but before the collar has locked into place, you can let go of the collar and use both hands to push the hose upward to lock the couplings.

To detach the supply hose, move the female supply-manifold coupling collar upward and pull the male hose coupling from the female coupling.

Return hose



Attach the water-return hose to the male coupling (on the return manifold) on the heat exchanger. To attach the return hose, complete the following steps.

Note: To make it easier to attach the return hose, turn off the water supply temporarily to remove water pressure. After attaching the return hose, turn on the water supply again.

1. Align the female hose coupling with the male return-manifold coupling.

Note: If you misalign the couplings, it will be difficult to connect the hose.

2. Move the female collar downward and raise the coupling to the male coupling.
3. Exert upward pressure until the female collar moves upward and locks in place with an audible click.

Note: After the couplings are engaged but before the collar has locked into place, you can let go of the collar and use both hands to push the hose upward to lock the couplings.

To detach the return hose, move the female collar downward and pull the female hose coupling from the male coupling.

Maintenance schedule

Perform the following maintenance tasks at the indicated time intervals.

Table 2. Maintenance schedule

Task	When to perform
Inspect the heat-exchanger fins for air blockage at the fins (from dust, dirt, debris, and so on)	Annually
Check the manifolds for temperature (make sure that the top of the manifolds are cool) and sounds of air in the system, to ensure that the exchanger is correctly filled.	One month after installation Annually
Inspect the entire length of the supply hose and return hose for damage, age cracks, and kinks. Be sure to inspect at the door and outside of the rack.	Annually

Field-replaceable unit part numbers

IBM field-replaceable unit (FRU) part numbers are subject to change without notice. The following table contains a listing of the FRU part numbers that are available as of the date of this printing.

FRU part number	Description
32R0743	Rear Door Heat eXchanger assembly
32R0718	Hinge kit

Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This appendix contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your @server or IntelliStation® system, and whom to call for service, if it is necessary.

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that they are connected.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system. Information about diagnostic tools is in the *Hardware Maintenance Manual and Troubleshooting Guide* or *Problem Determination and Service Guide* on the IBM Documentation CD that comes with your system.

Note: For some IntelliStation models, the *Hardware Maintenance Manual and Troubleshooting Guide* is available only from the IBM support Web site.

- Go to the IBM support Web site at <http://www.ibm.com/pc/support/> to check for technical information, hints, tips, and new device drivers or to submit a request for information.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the publications that are provided with your system and software. The information that comes with your system also describes the diagnostic tests that you can perform. Most @server and IntelliStation systems, operating systems, and programs come with information that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the information for the operating system or program.

Using the documentation

Information about your IBM @server or IntelliStation system and preinstalled software, if any, is available in the documentation that comes with your system. That documentation includes printed books, online books, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to <http://www.ibm.com/pc/support/> and follow the instructions. Also, some publications are available through the IBM Publications Ordering System at <http://www.elink.ibm.com/public/applications/publications/cgibin/pbi.cgi>.

Getting help and information from the World Wide Web

On the World Wide Web, the IBM Web site has up-to-date information about IBM eServer and IntelliStation products, services, and support. The address for IBM xSeries® and BladeCenter™ information is <http://www.ibm.com/eserver/xseries/>. The address for IBM IntelliStation information is <http://www.ibm.com/pc/us/intellistation/>.

You can find service information for your IBM products, including supported options, at <http://www.ibm.com/pc/support/>.

Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with xSeries servers, BladeCenter products, IntelliStation workstations, and appliances. For information about which products are supported by Support Line in your country or region, see <http://www.ibm.com/services/sl/products/>.

For more information about Support Line and other IBM services, see <http://www.ibm.com/services/>, or see <http://www.ibm.com/planetwide/> for support telephone numbers. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

Hardware service and support

You can receive hardware service through IBM Services or through your IBM reseller, if your reseller is authorized by IBM to provide warranty service. See <http://www.ibm.com/planetwide/> for support telephone numbers, or in the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

In the U.S. and Canada, hardware service and support is available 24 hours a day, 7 days a week. In the U.K., these services are available Monday through Friday, from 9 a.m. to 6 p.m.

Appendix B. IBM Statement of Limited Warranty Z125-4753-08 04/2004

Part 1 - General Terms

Part 1 - General Terms

*This Statement of Limited Warranty includes Part 1 - General Terms, Part 2 - Country-unique Terms, and Part 3 - Warranty Information. The terms of Part 2 replace or modify those of Part 1. The warranties provided by IBM in this Statement of Limited Warranty apply only to Machines you purchase for your use, and not for resale. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them. The term "Machine" does not include any software programs, whether pre-loaded with the Machine, installed subsequently or otherwise. **Nothing in this Statement of Limited Warranty affects any statutory rights of consumers that cannot be waived or limited by contract.***

What this Warranty Covers

IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications ("Specifications") which are available on request. The warranty period for the Machine starts on the original Date of Installation and is specified in Part 3 - Warranty Information. The date on your invoice or sales receipt is the Date of Installation unless IBM or your reseller informs you otherwise. Many features, conversions, or upgrades involve the removal of parts and their return to IBM. A part that replaces a removed part will assume the warranty service status of the removed part. Unless IBM specifies otherwise, these warranties apply only in the country or region in which you purchased the Machine.

THESE WARRANTIES ARE YOUR EXCLUSIVE WARRANTIES AND REPLACE ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. SOME STATES OR JURISDICTIONS DO NOT ALLOW THE EXCLUSION OF EXPRESS OR IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION MAY NOT APPLY TO YOU. IN THAT EVENT, SUCH WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD. SOME STATES OR JURISDICTIONS DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

What this Warranty Does not Cover

This warranty does not cover the following:

- any software programs, whether pre-loaded or shipped with the Machine, or installed subsequently;
- failure resulting from misuse (including but not limited to use of any Machine capacity or capability, other than that authorized by IBM in writing), accident, modification, unsuitable physical or operating environment, or improper maintenance by you;
- failure caused by a product for which IBM is not responsible; and
- any non-IBM products, including those that IBM may procure and provide with or integrate into an IBM Machine at your request.

The warranty is voided by removal or alteration of identification labels on the Machine or its parts.

IBM does not warrant uninterrupted or error-free operation of a Machine.

Any technical or other support provided for a Machine under warranty, such as assistance with “how-to” questions and those regarding Machine set-up and installation, is provided **WITHOUT WARRANTIES OF ANY KIND**.

How to Obtain Warranty Service

If the Machine does not function as warranted during the warranty period, contact IBM or your reseller to obtain warranty service. If you do not register the Machine with IBM, you may be required to present proof of purchase as evidence of your entitlement to warranty service.

What IBM Will Do to Correct Problems

When you contact IBM for service, you must follow the problem determination and resolution procedures that IBM specifies. An initial diagnosis of your problem can be made either by a technician over the telephone or electronically by access to an IBM website.

The type of warranty service applicable to your Machine is specified in Part 3 - Warranty Information.

You are responsible for downloading and installing designated Machine Code (microcode, basic input/output system code (called “BIOS”), utility programs, device drivers, and diagnostics delivered with an IBM Machine) and other software updates from an IBM Internet Web site or from other electronic media, and following the instructions that IBM provides.

If your problem can be resolved with a Customer Replaceable Unit (“CRU”) (e.g., keyboard, mouse, speaker, memory, hard disk drive), IBM will ship the CRU to you for you to install.

If the Machine does not function as warranted during the warranty period and your problem cannot be resolved over the telephone or electronically, through your application of Machine Code or software updates, or with a CRU, IBM or your reseller, if approved by IBM to provide warranty service, will either, at its discretion, 1) repair it to make it function as warranted, or 2) replace it with one that is at least functionally equivalent. If IBM is unable to do either, you may return the Machine to your place of purchase and your money will be refunded.

IBM or your reseller will also manage and install selected engineering changes that apply to the Machine.

Exchange of a Machine or Part

When the warranty service involves the exchange of a Machine or part, the item IBM or your reseller replaces becomes its property and the replacement becomes yours. You represent that all removed items are genuine and unaltered. The replacement may not be new, but will be in good working order and at least functionally equivalent to the item replaced. The replacement assumes the warranty service status of the replaced item.

Your Additional Responsibilities

Before IBM or your reseller exchanges a Machine or part, you agree to remove all features, parts, options, alterations, and attachments not under warranty service.

You also agree to:

1. ensure that the Machine is free of any legal obligations or restrictions that prevent its exchange;
2. obtain authorization from the owner to have IBM or your reseller service a Machine that you do not own; and
3. where applicable, before service is provided:
 - a. follow the service request procedures that IBM or your reseller provides;
 - b. backup or secure all programs, data, and funds contained in the Machine;
 - c. provide IBM or your reseller with sufficient, free, and safe access to your facilities to permit IBM to fulfill its obligations; and
 - d. inform IBM or your reseller of changes in the Machine's location.
4. (a) ensure all information about identified or identifiable individuals (Personal Data) is deleted from the Machine (to the extent technically possible), (b) allow IBM, your reseller or an IBM supplier to process on your behalf any remaining Personal Data as IBM or your reseller considers necessary to fulfill its obligations under this Statement of Limited Warranty (which may include shipping the Machine for such processing to other IBM service locations around the world), and (c) ensure that such processing complies with any laws applicable to such Personal Data.

Limitation of Liability

IBM is responsible for loss of, or damage to, your Machine only while it is 1) in IBM's possession or 2) in transit in those cases where IBM is responsible for the transportation charges.

Neither IBM nor your reseller are responsible for any of your confidential, proprietary or personal information contained in a Machine which you return to IBM for any reason. You should remove all such information from the Machine prior to its return.

Circumstances may arise where, because of a default on IBM's part or other liability, you are entitled to recover damages from IBM. In each such instance, regardless of the basis on which you are entitled to claim damages from IBM (including fundamental breach, negligence, misrepresentation, or other contract or tort claim), except for any liability that cannot be waived or limited by applicable laws, IBM is liable for no more than

1. damages for bodily injury (including death) and damage to real property and tangible personal property; and
2. the amount of any other actual direct damages, up to the charges (if recurring, 12 months' charges apply) for the Machine that is subject of the claim. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code ("LIC").

This limit also applies to IBM's suppliers and your reseller. It is the maximum for which IBM, its suppliers, and your reseller are collectively responsible.

UNDER NO CIRCUMSTANCES IS IBM, ITS SUPPLIERS OR RESELLERS LIABLE FOR ANY OF THE FOLLOWING EVEN IF INFORMED OF THEIR POSSIBILITY: 1) THIRD PARTY CLAIMS AGAINST YOU FOR DAMAGES (OTHER THAN THOSE UNDER THE FIRST ITEM LISTED ABOVE); 2) LOSS OF,

OR DAMAGE TO, DATA; 3) SPECIAL, INCIDENTAL, OR INDIRECT DAMAGES OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES; OR 4) LOST PROFITS, BUSINESS REVENUE, GOODWILL OR ANTICIPATED SAVINGS. SOME STATES OR JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU. SOME STATES OR JURISDICTIONS DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

Governing Law

Both you and IBM consent to the application of the laws of the country in which you acquired the Machine to govern, interpret, and enforce all of your and IBM's rights, duties, and obligations arising from, or relating in any manner to, the subject matter of this Statement of Limited Warranty, without regard to conflict of law principles.

THESE WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE OR JURISDICTION TO JURISDICTION.

Jurisdiction

All of our rights, duties, and obligations are subject to the courts of the country in which you acquired the Machine.

Part 2 - Country-unique Terms

AMERICAS

ARGENTINA

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the Ordinary Commercial Court of the city of Buenos Aires.

BOLIVIA

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the courts of the city of La Paz.

BRAZIL

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the court of Rio de Janeiro, RJ.

CHILE

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the Civil Courts of Justice of Santiago.

COLOMBIA

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the Judges of the Republic of Colombia.

EQUADOR

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the Judges of Quito.

MEXICO

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the Federal Courts of Mexico City, Federal District.

PARAGUAY

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the courts of the city of Asuncion.

PERU

Limitation of Liability: *The following is added at the end of this section:*

In accordance with Article 1328 of the Peruvian Civil Code the limitations and exclusions specified in this section will not apply to damages caused by IBM's willful misconduct ("dolo") or gross negligence ("culpa inexcusable").

URUGUAY

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the City of Montevideo Court's Jurisdiction.

VENEZUELA

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the Courts of the Metropolitan Area Of the City of Caracas.

NORTH AMERICA

How to Obtain Warranty Service: *The following is added to this Section:*

To obtain warranty service from IBM in Canada or the United States, call 1-800-IBM-SERV (426-7378).

CANADA

Limitation of Liability: *The following replaces item 1 of this section:*

1. damages for bodily injury (including death) or physical harm to real property and tangible personal property caused by IBM's negligence; and

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*

laws in the Province of Ontario.

UNITED STATES

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*

laws of the State of New York.

ASIA PACIFIC

AUSTRALIA

What this Warranty Covers: *The following paragraph is added to this section:*

The warranties specified in this Section are in addition to any rights you may have under the Trade Practices Act 1974 or other similar legislation and are only limited to the extent permitted by the applicable legislation.

Limitation of Liability: *The following is added to this section:*

Where IBM is in breach of a condition or warranty implied by the Trade Practices Act 1974 or other similar legislation, IBM's liability is limited to the repair or replacement of the goods or the supply of equivalent goods. Where that condition or warranty relates to right to sell, quiet possession or clear title, or the goods are of a kind ordinarily acquired for personal, domestic or household use or consumption, then none of the limitations in this paragraph apply.

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*

laws of the State or Territory.

CAMBODIA AND LAOS

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*

laws of the State of New York, United States of America.

CAMBODIA, INDONESIA, AND LAOS

Arbitration: *The following is added under this heading:*

Disputes arising out of or in connection with this Statement of Limited Warranty shall be finally settled by arbitration which shall be held in Singapore in accordance with the Arbitration Rules of Singapore International Arbitration Center ("SIAC Rules") then in effect. The arbitration award shall be final and binding for the parties without appeal and shall be in writing and set forth the findings of fact and the conclusions of law.

The number of arbitrators shall be three, with each side to the dispute being entitled to appoint one arbitrator. The two arbitrators appointed by the parties shall appoint a third arbitrator who shall act as chairman of the proceedings. Vacancies in the

post of chairman shall be filled by the president of the SIAC. Other vacancies shall be filled by the respective nominating party. Proceedings shall continue from the stage they were at when the vacancy occurred.

If one of the parties refuses or otherwise fails to appoint an arbitrator within 30 days of the date the other party appoints its, the first appointed arbitrator shall be the sole arbitrator, provided that the arbitrator was validly and properly appointed.

All proceedings shall be conducted, including all documents presented in such proceedings, in the English language. The English language version of this Statement of Limited Warranty prevails over any other language version.

HONG KONG S.A.R. OF CHINA AND MACAU S.A.R. OF CHINA

Governing Law: *The following replaces “laws of the country in which you acquired the Machine” in the first sentence:*
laws of Hong Kong Special Administrative Region of China.

INDIA

Limitation of Liability: *The following replaces items 1 and 2 of this section:*

1. liability for bodily injury (including death) or damage to real property and tangible personal property will be limited to that caused by IBM's negligence; and
2. as to any other actual damage arising in any situation involving nonperformance by IBM pursuant to, or in any way related to the subject of this Statement of Limited Warranty, the charge paid by you for the individual Machine that is the subject of the claim. For purposes of this item, the term “Machine” includes Machine Code and Licensed Internal Code (“LIC”).

Arbitration: *The following is added under this heading:*

Disputes arising out of or in connection with this Statement of Limited Warranty shall be finally settled by arbitration which shall be held in Bangalore, India in accordance with the laws of India then in effect. The arbitration award shall be final and binding for the parties without appeal and shall be in writing and set forth the findings of fact and the conclusions of law.

The number of arbitrators shall be three, with each side to the dispute being entitled to appoint one arbitrator. The two arbitrators appointed by the parties shall appoint a third arbitrator who shall act as chairman of the proceedings. Vacancies in the post of chairman shall be filled by the president of the Bar Council of India. Other vacancies shall be filled by the respective nominating party. Proceedings shall continue from the stage they were at when the vacancy occurred.

If one of the parties refuses or otherwise fails to appoint an arbitrator within 30 days of the date the other party appoints its, the first appointed arbitrator shall be the sole arbitrator, provided that the arbitrator was validly and properly appointed.

All proceedings shall be conducted, including all documents presented in such proceedings, in the English language. The English language version of this Statement of Limited Warranty prevails over any other language version.

JAPAN

Governing Law: *The following sentence is added to this section:*

Any doubts concerning this Statement of Limited Warranty will be initially resolved between us in good faith and in accordance with the principle of mutual trust.

MALAYSIA

Limitation of Liability: *The word “SPECIAL” in item 3 of the fifth paragraph is deleted.*

NEW ZEALAND

What this Warranty Covers: *The following paragraph is added to this section:*

The warranties specified in this section are in addition to any rights you may have under the Consumer Guarantees Act 1993 or other legislation which cannot be excluded or limited. The Consumer Guarantees Act 1993 will not apply in respect of any goods which IBM provides, if you require the goods for the purposes of a business as defined in that Act.

Limitation of Liability: *The following is added to this section:*

Where Machines are not acquired for the purposes of a business as defined in the Consumer Guarantees Act 1993, the limitations in this section are subject to the limitations in that Act.

PEOPLE’S REPUBLIC OF CHINA (PRC)

Governing Law: *The following replaces “laws of the country in which you acquired the Machine” in the first sentence:*

laws of the State of New York, United States of America (except when local law requires otherwise).

PHILIPPINES

Limitation of Liability: *Item 3 in the fifth paragraph is replaced by the following:*

SPECIAL (INCLUDING NOMINAL AND EXEMPLARY DAMAGES), MORAL, INCIDENTAL, OR INDIRECT DAMAGES FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES; OR

Arbitration: *The following is added under this heading:*

Disputes arising out of or in connection with this Statement of Limited Warranty shall be finally settled by arbitration which shall be held in Metro Manila, Philippines in accordance with the laws of the Philippines then in effect. The arbitration award shall be final and binding for the parties without appeal and shall be in writing and set forth the findings of fact and the conclusions of law.

The number of arbitrators shall be three, with each side to the dispute being entitled to appoint one arbitrator. The two arbitrators appointed by the parties shall appoint a third arbitrator who shall act as chairman of the proceedings. Vacancies in the post of chairman shall be filled by the president of the Philippine Dispute Resolution Center, Inc. Other vacancies shall be filled by the respective nominating party. Proceedings shall continue from the stage they were at when the vacancy occurred.

If one of the parties refuses or otherwise fails to appoint an arbitrator within 30 days of the date the other party appoints its, the first appointed arbitrator shall be the sole arbitrator, provided that the arbitrator was validly and properly appointed.

All proceedings shall be conducted, including all documents presented in such proceedings, in the English language. The English language version of this Statement of Limited Warranty prevails over any other language version.

SINGAPORE

Limitation of Liability: *The words “SPECIAL” and “ECONOMIC” in item 3 in the fifth paragraph are deleted.*

EUROPE, MIDDLE EAST, AFRICA (EMEA)

THE FOLLOWING TERMS APPLY TO ALL EMEA COUNTRIES:

The terms of this Statement of Limited Warranty apply to Machines purchased from IBM or an IBM reseller.

How to Obtain Warranty Service:

*Add the following paragraph in **Western Europe** (Andorra, Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, Netherlands, Norway, Poland, Portugal, San Marino, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom, Vatican State, and any country subsequently added to the European Union, as from the date of accession):*

The warranty for Machines acquired in Western Europe shall be valid and applicable in all Western Europe countries provided the Machines have been announced and made available in such countries.

If you purchase a Machine in one of the Western European countries, as defined above, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM, provided the Machine has been announced and made available by IBM in the country in which you wish to obtain service.

If you purchased a Personal Computer Machine in Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Federal Republic of Yugoslavia, Former Yugoslav Republic of Macedonia (FYROM), Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, or Ukraine, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM.

If you purchase a Machine in a Middle Eastern or African country, you may obtain warranty service for that Machine from the IBM entity within the country of purchase, if that IBM entity provides warranty service in that country, or from an IBM reseller, approved by IBM to perform warranty service on that Machine in that country. Warranty service in Africa is available within 50 kilometers of an IBM approved service provider. You are responsible for transportation costs for Machines located outside 50 kilometers of an IBM approved service provider.

Governing Law:

The phrase “the laws of the country in which you acquired the Machine” is replaced by:

1) “the laws of Austria” in **Albania, Armenia, Azerbaijan, Belarus, Bosnia-Herzegovina, Bulgaria, Croatia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, FYR Macedonia, Moldova, Poland, Romania, Russia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, and FR Yugoslavia**; 2) “the laws of France” in **Algeria, Benin, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo Republic, Djibouti, Democratic Republic of Congo, Equatorial Guinea, French Guiana, French Polynesia, Gabon, Gambia, Guinea, Guinea-Bissau, Ivory Coast, Lebanon, Madagascar, Mali, Mauritania, Mauritius, Mayotte, Morocco, New Caledonia, Niger, Reunion, Senegal, Seychelles, Togo, Tunisia, Vanuatu, and Wallis & Futuna**; 3) “the laws of Finland” in **Estonia, Latvia, and Lithuania**; 4) “the laws of England” in **Angola, Bahrain, Botswana, Burundi, Egypt, Eritrea, Ethiopia, Ghana, Jordan, Kenya, Kuwait, Liberia, Malawi, Malta, Mozambique, Nigeria, Oman, Pakistan, Qatar, Rwanda, Sao Tome, Saudi Arabia, Sierra Leone, Somalia, Tanzania, Uganda, United Arab Emirates, the United Kingdom, West Bank/Gaza, Yemen, Zambia, and Zimbabwe**; and 5) “the laws of South Africa” in **South Africa, Namibia, Lesotho and Swaziland**.

Jurisdiction: *The following exceptions are added to this section:*

1) **In Austria** the choice of jurisdiction for all disputes arising out of this Statement of Limited Warranty and relating thereto, including its existence, will be the competent court of law in Vienna, Austria (Inner-City); 2) **in Angola, Bahrain, Botswana, Burundi, Egypt, Eritrea, Ethiopia, Ghana, Jordan, Kenya, Kuwait, Liberia, Malawi, Malta, Mozambique, Nigeria, Oman, Pakistan, Qatar, Rwanda, Sao Tome, Saudi Arabia, Sierra Leone, Somalia, Tanzania, Uganda, United Arab Emirates, West Bank/Gaza, Yemen, Zambia, and Zimbabwe** all disputes arising out of this Statement of Limited Warranty or related to its execution, including summary proceedings, will be submitted to the exclusive jurisdiction of the English courts; 3) **in Belgium and Luxembourg**, all disputes arising out of this Statement of Limited Warranty or related to its interpretation or its execution, the law, and the courts of the capital city, of the country of your registered office and/or commercial site location only are competent; 4) **in France, Algeria, Benin, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo Republic, Djibouti, Democratic Republic of Congo, Equatorial Guinea, French Guiana, French Polynesia, Gabon, Gambia, Guinea, Guinea-Bissau, Ivory Coast, Lebanon, Madagascar, Mali, Mauritania, Mauritius, Mayotte, Morocco, New Caledonia, Niger, Reunion, Senegal, Seychelles, Togo, Tunisia, Vanuatu, and Wallis & Futuna** all disputes arising out of this Statement of Limited Warranty or related to its violation or execution, including summary proceedings, will be settled exclusively by the Commercial Court of Paris; 5) **in Russia**, all disputes arising out of or in relation to the interpretation, the violation, the termination, the nullity of the execution of this Statement of Limited Warranty shall be settled by Arbitration Court of Moscow; 6) **in South Africa, Namibia, Lesotho and Swaziland**, both of us agree to submit all disputes relating to this Statement of Limited Warranty to the jurisdiction of the High Court in Johannesburg; 7) **in Turkey** all disputes arising out of or in connection with this Statement of Limited Warranty shall be resolved by the Istanbul Central (Sultanahmet) Courts and Execution Directorates of Istanbul, the Republic of Turkey; 8) in each of the following specified countries, any legal claim arising out of this Statement of Limited Warranty will be brought before, and settled exclusively by, the competent court of a) Athens for **Greece**, b) Tel Aviv-Jaffa for **Israel**, c) Milan for **Italy**, d) Lisbon for **Portugal**, and e)

Madrid for **Spain**; and 9) **in the United Kingdom**, both of us agree to submit all disputes relating to this Statement of Limited Warranty to the jurisdiction of the English courts.

Arbitration: *The following is added under this heading:*

In Albania, Armenia, Azerbaijan, Belarus, Bosnia-Herzegovina, Bulgaria, Croatia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, FYR Macedonia, Moldova, Poland, Romania, Russia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, and FR Yugoslavia all disputes arising out of this Statement of Limited Warranty or related to its violation, termination or nullity will be finally settled under the Rules of Arbitration and Conciliation of the International Arbitral Center of the Federal Economic Chamber in Vienna (Vienna Rules) by three arbitrators appointed in accordance with these rules. The arbitration will be held in Vienna, Austria, and the official language of the proceedings will be English. The decision of the arbitrators will be final and binding upon both parties. Therefore, pursuant to paragraph 598 (2) of the Austrian Code of Civil Procedure, the parties expressly waive the application of paragraph 595 (1) figure 7 of the Code. IBM may, however, institute proceedings in a competent court in the country of installation.

In Estonia, Latvia and Lithuania all disputes arising in connection with this Statement of Limited Warranty will be finally settled in arbitration that will be held in Helsinki, Finland in accordance with the arbitration laws of Finland then in effect. Each party will appoint one arbitrator. The arbitrators will then jointly appoint the chairman. If arbitrators cannot agree on the chairman, then the Central Chamber of Commerce in Helsinki will appoint the chairman.

EUROPEAN UNION (EU)

THE FOLLOWING TERMS APPLY TO ALL EU COUNTRIES:

The warranty for Machines acquired in EU countries is valid and applicable in all EU countries provided the Machines have been announced and made available in such countries.

How to Obtain Warranty Service: *The following is added to this section:*

To obtain warranty service from IBM in EU countries, see the telephone listing in Part 3 - Warranty Information.

You may contact IBM at the following address:

IBM Warranty & Service Quality Dept.
PO Box 30
Spango Valley
Greenock
Scotland PA16 0AH

CONSUMERS

Consumers have legal rights under applicable national legislation governing the sale of consumer goods. Such rights are not affected by the warranties provided in this Statement of Limited Warranty.

AUSTRIA, DENMARK, FINLAND, GREECE, ITALY, NETHERLANDS, NORWAY, PORTUGAL, SPAIN, SWEDEN AND SWITZERLAND

Limitation of Liability: *The following replaces the terms of this section in its entirety:*

Except as otherwise provided by mandatory law:

1. IBM's liability for any damages and losses that may arise as a consequence of the fulfillment of its obligations under or in connection with this Statement of Limited Warranty or due to any other cause related to this Statement of Limited Warranty is limited to the compensation of only those damages and losses proved and actually arising as an immediate and direct consequence of the non-fulfillment of such obligations (if IBM is at fault) or of such cause, for a maximum amount equal to the charges you paid for the Machine. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code ("LIC").

The above limitation shall not apply to damages for bodily injuries (including death) and damages to real property and tangible personal property for which IBM is legally liable.

2. **UNDER NO CIRCUMSTANCES IS IBM, ITS SUPPLIERS OR RESELLERS LIABLE FOR ANY OF THE FOLLOWING, EVEN IF INFORMED OF THEIR POSSIBILITY: 1) LOSS OF, OR DAMAGE TO, DATA; 2) INCIDENTAL OR INDIRECT DAMAGES, OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES; 3) LOST PROFITS, EVEN IF THEY ARISE AS AN IMMEDIATE CONSEQUENCE OF THE EVENT THAT GENERATED THE DAMAGES; OR 4) LOSS OF BUSINESS, REVENUE, GOODWILL, OR ANTICIPATED SAVINGS.**

FRANCE AND BELGIUM

Limitation of Liability: *The following replaces the terms of this section in its entirety:*

Except as otherwise provided by mandatory law:

1. IBM's liability for any damages and losses that may arise as a consequence of the fulfillment of its obligations under or in connection with this Statement of Limited Warranty is limited to the compensation of only those damages and losses proved and actually arising as an immediate and direct consequence of the non-fulfillment of such obligations (if IBM is at fault), for a maximum amount equal to the charges you paid for the Machine that has caused the damages. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code ("LIC").

The above limitation shall not apply to damages for bodily injuries (including death) and damages to real property and tangible personal property for which IBM is legally liable.

2. **UNDER NO CIRCUMSTANCES IS IBM, ITS SUPPLIERS OR RESELLERS LIABLE FOR ANY OF THE FOLLOWING, EVEN IF INFORMED OF THEIR POSSIBILITY: 1) LOSS OF, OR DAMAGE TO, DATA; 2) INCIDENTAL OR INDIRECT DAMAGES, OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES; 3) LOST PROFITS, EVEN IF THEY ARISE AS AN IMMEDIATE CONSEQUENCE OF THE EVENT THAT GENERATED THE DAMAGES; OR 4) LOSS OF BUSINESS, REVENUE, GOODWILL, OR ANTICIPATED SAVINGS.**

THE FOLLOWING TERMS APPLY TO THE COUNTRY SPECIFIED:

AUSTRIA

The provisions of this Statement of Limited Warranty replace any applicable statutory warranties.

What this Warranty Covers: *The following replaces the first sentence of the first paragraph of this section:*

The warranty for an IBM Machine covers the functionality of the Machine for its normal use and the Machine's conformity to its Specifications.

The following paragraphs are added to this section:

The limitation period for consumers in action for breach of warranty is the statutory period as a minimum. In case IBM or your reseller is unable to repair an IBM Machine, you can alternatively ask for a partial refund as far as justified by the reduced value of the unrepaired Machine or ask for a cancellation of the respective agreement for such Machine and get your money refunded.

The second paragraph does not apply.

What IBM Will Do to Correct Problems: *The following is added to this section:*

During the warranty period, IBM will reimburse you for the transportation charges for the delivery of the failing Machine to IBM.

Limitation of Liability: *The following paragraph is added to this section:*

The limitations and exclusions specified in the Statement of Limited Warranty will not apply to damages caused by IBM with fraud or gross negligence and for express warranty.

The following sentence is added to the end of item 2:

IBM's liability under this item is limited to the violation of essential contractual terms in cases of ordinary negligence.

EGYPT

Limitation of Liability: *The following replaces item 2 in this section:*

as to any other actual direct damages, IBM's liability will be limited to the total amount you paid for the Machine that is the subject of the claim. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code ("LIC").

Applicability of suppliers and resellers (unchanged).

FRANCE

Limitation of Liability: *The following replaces the second sentence of the first paragraph of this section:*

In such instances, regardless of the basis on which you are entitled to claim damages from IBM, IBM is liable for no more than: (items 1 and 2 unchanged).

GERMANY

What this Warranty Covers: *The following replaces the first sentence of the first paragraph of this section:*

The warranty for an IBM Machine covers the functionality of the Machine for its normal use and the Machine's conformity to its Specifications.

The following paragraphs are added to this section:

The minimum warranty period for Machines is twelve months. In case IBM or your reseller is unable to repair an IBM Machine, you can alternatively ask for a partial refund as far as justified by the reduced value of the unrepaired Machine or ask for a cancellation of the respective agreement for such Machine and get your money refunded.

The second paragraph does not apply.

What IBM Will Do to Correct Problems: *The following is added to this section:*

During the warranty period, transportation for delivery of the failing Machine to IBM will be at IBM's expense.

Limitation of Liability: *The following paragraph is added to this section:*

The limitations and exclusions specified in the Statement of Limited Warranty will not apply to damages caused by IBM with fraud or gross negligence and for express warranty.

The following sentence is added to the end of item 2:

IBM's liability under this item is limited to the violation of essential contractual terms in cases of ordinary negligence.

HUNGARY

Limitation of Liability: *The following is added at the end of this section:*

The limitation and exclusion specified herein shall not apply to liability for a breach of contract damaging life, physical well-being, or health that has been caused intentionally, by gross negligence, or by a criminal act.

The parties accept the limitations of liability as valid provisions and state that the Section 314.(2) of the Hungarian Civil Code applies as the acquisition price as well as other advantages arising out of the present Statement of Limited Warranty balance this limitation of liability.

IRELAND

What this Warranty Covers: *The following is added to this section:*

Except as expressly provided in these terms and conditions, all statutory conditions, including all warranties implied, but without prejudice to the generality of the foregoing all warranties implied by the Sale of Goods Act 1893 or the Sale of Goods and Supply of Services Act 1980 are hereby excluded.

Limitation of Liability: *The following replaces the terms of this section in its entirety:*

For the purposes of this section, a "Default" means any act, statement, omission, or negligence on the part of IBM in connection with, or in relation to, the subject matter of this Statement of Limited Warranty in respect of which IBM is legally liable to

you, whether in contract or tort. A number of Defaults which together result in, or contribute to, substantially the same loss or damage will be treated as one Default occurring on the date of occurrence of the last such Default.

Circumstances may arise where, because of a Default, you are entitled to recover damages from IBM.

This section sets out the extent of IBM's liability and your sole remedy.

1. IBM will accept unlimited liability for death or personal injury caused by the negligence of IBM.
2. Subject always to the **Items for Which IBM is Not Liable** below, IBM will accept unlimited liability for physical damage to your tangible property resulting from the negligence of IBM.
3. Except as provided in items 1 and 2 above, IBM's entire liability for actual damages for any one Default will not in any event exceed the greater of 1) EUR 125,000, or 2) 125% of the amount you paid for the Machine directly relating to the Default.

Items for Which IBM is Not Liable

Save with respect to any liability referred to in item 1 above, under no circumstances is IBM, its suppliers or resellers liable for any of the following, even if IBM or they were informed of the possibility of such losses:

1. loss of, or damage to, data;
2. special, indirect, or consequential loss; or
3. loss of profits, business, revenue, goodwill, or anticipated savings.

SLOVAKIA

Limitation of Liability: *The following is added to the end of the last paragraph:*

The limitations apply to the extent they are not prohibited under §§ 373-386 of the Slovak Commercial Code.

SOUTH AFRICA, NAMIBIA, BOTSWANA, LESOTHO AND SWAZILAND

Limitation of Liability: *The following is added to this section:*

IBM's entire liability to you for actual damages arising in all situations involving nonperformance by IBM in respect of the subject matter of this Statement of Warranty will be limited to the charge paid by you for the individual Machine that is the subject of your claim from IBM.

UNITED KINGDOM

Limitation of Liability: *The following replaces the terms of this section in its entirety:*

For the purposes of this section, a "Default" means any act, statement, omission, or negligence on the part of IBM in connection with, or in relation to, the subject matter of this Statement of Limited Warranty in respect of which IBM is legally liable to you, whether in contract or tort. A number of Defaults which together result in, or contribute to, substantially the same loss or damage will be treated as one Default.

Circumstances may arise where, because of a Default, you are entitled to recover damages from IBM.

This section sets out the extent of IBM's liability and your sole remedy.

1. IBM will accept unlimited liability for:
 - a. death or personal injury caused by the negligence of IBM; and
 - b. any breach of its obligations implied by Section 12 of the Sale of Goods Act 1979 or Section 2 of the Supply of Goods and Services Act 1982, or any statutory modification or re-enactment of either such Section.
2. IBM will accept unlimited liability, subject always to the **Items for Which IBM is Not Liable** below, for physical damage to your tangible property resulting from the negligence of IBM.
3. IBM's entire liability for actual damages for any one Default will not in any event, except as provided in items 1 and 2 above, exceed the greater of 1) Pounds Sterling 75,000, or 2) 125% of the total purchase price payable or the charges for the Machine directly relating to the Default.

These limits also apply to IBM's suppliers and resellers. They state the maximum for which IBM and such suppliers and resellers are collectively responsible.

Items for Which IBM is Not Liable

Save with respect to any liability referred to in item 1 above, under no circumstances is IBM or any of its suppliers or resellers liable for any of the following, even if IBM or they were informed of the possibility of such losses:

1. loss of, or damage to, data;
2. special, indirect, or consequential loss; or
3. loss of profits, business, revenue, goodwill, or anticipated savings.

Part 3 - Warranty Information

This Part 3 provides information regarding the warranty applicable to your Machine, including the warranty period and type of warranty service IBM provides.

Warranty Period

The warranty period may vary by country or region and is specified in the table below.

Note: "Region" means either Hong Kong or Macau Special Administrative Region of China.

A warranty period of 3 years on parts and 1 year on labor means that IBM provides warranty service without charge for:

1. parts and labor during the first year of the warranty period; and
2. parts only, on an exchange basis, in the second and third years of the warranty period. IBM will charge you for any labor provided in performance of the repair or replacement(s) in the second and third year of the warranty period.

IBM Rear Door Heat eXchanger

Country or Region of Purchase	Warranty Period	Type of Warranty Service*
Worldwide	1 year	2
* See " <u>Types of Warranty Service</u> " for the legend and explanations of warranty-service types.		

Types of Warranty Service

If required, IBM provides repair or exchange service depending on the type of warranty service specified for your Machine in the above table and as described below. Warranty service may be provided by your reseller if approved by IBM to perform warranty service. Scheduling of service will depend upon the time of your call and is subject to parts availability. Service levels are response time objectives and are not guaranteed. The specified level of warranty service may not be available in all worldwide locations, additional charges may apply outside IBM's normal service area, contact your local IBM representative or your reseller for country and location specific information.

1. Customer Replaceable Unit ("CRU") Service

IBM provides replacement CRUs to you for you to install. CRU information and replacement instructions are shipped with your Machine and are available from IBM at any time on your request. Installation of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation. You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service designated for your Machine. IBM specifies in the materials shipped with a replacement CRU whether a defective CRU must be returned to IBM. When return is required, 1) return instructions and a container are shipped with the replacement CRU, and 2) you may be charged for the replacement CRU if IBM does not receive the defective CRU within 30 days of your receipt of the replacement.

2. On-site Service

IBM or your reseller will either repair or exchange the failing Machine at your location and verify its operation. You must provide suitable working area to allow disassembly and reassembly of the IBM Machine. The area must be clean, well lit and suitable for the purpose. For some Machines, certain repairs may require sending the Machine to an IBM service center.

3. Courier or Depot Service*

You will disconnect the failing Machine for collection arranged by IBM. IBM will provide you with a shipping container for you to return your Machine to a designated service center. A courier will pick up your Machine and deliver it to the designated service center. Following its repair or exchange, IBM will arrange the return delivery of the Machine to your location. You are responsible for its installation and verification.

4. Customer Carry-In or Mail-In Service

You will deliver or mail as IBM specifies (prepaid unless IBM specifies otherwise) the failing Machine suitably packaged to a location IBM designates. After IBM has repaired or exchanged the Machine, IBM will make it available for your collection or, for Mail-in Service, IBM will return it to you at IBM's expense, unless IBM specifies otherwise. You are responsible for the subsequent installation and verification of the Machine.

5. CRU and On-site Service

This type of Warranty Service is a combination of Type 1 and Type 2 (see above).

6. CRU and Courier or Depot Service

This type of Warranty Service is a combination of Type 1 and Type 3 (see above).

7. CRU and Customer Carry-In or Mail-In Service

This type of Warranty Service is a combination of Type 1 and Type 4 (see above).

When a 5, 6 or 7 type of warranty service is listed, IBM will determine which type of warranty service is appropriate for the repair.

* This type of service is called ThinkPad® EasyServ or EasyServ in some countries.

The IBM Machine Warranty World Wide Web site at http://www.ibm.com/servers/support/machine_warranties/ provides a worldwide overview of IBM's Limited Warranty for Machines, a Glossary of IBM definitions, Frequently Asked Questions (FAQs) and Support by Product (Machine) with links to Product Support pages. **The IBM Statement of Limited Warranty is also available on this site in 29 languages.**

To obtain warranty service contact IBM or your IBM reseller. In Canada or the United States, call 1-800-IBM-SERV (426-7378). In the EU countries, see the telephone numbers below.

EU Country Telephone List

Phone numbers are subject to change without notice. For the warranty service contact telephone number in a country subsequently added to the EU and not yet reflected in the list below, contact IBM in that country or visit the website above for a current telephone listing.

Austria -- +43-1-24592-5901	Latvia -- +386-61-1796-699
Belgium -- +32-70-23-3392	Lithuania -- +386-61-1796-699
Cyprus -- +357-22-841100	Luxembourg -- +352-298-977-5063
Czech Republic -- +420-2-7213-1316	Malta -- +356-23-4175
Denmark -- +45-4520-8200	Netherlands -- +31-20-514-5770
Estonia -- +386-61-1796-699	Poland -- +48-22-878-6999
Finland -- +358-8001-4260	Portugal -- +351-21-892-7147
France -- +33-238-557-450	Slovakia -- +421-2-4954-1217
Germany -- +49-1805-253553	Slovenia -- +386-1-4796-699
Greece -- +30-210-680-1700	Spain -- +34-91-714-7983
Hungary -- +36-1-382-5720	Sweden -- +46-8-477-4420
Ireland -- +353-1-815-4000	United Kingdom -- +44-0870-550-0900
Italy -- +39-800-820-094	

Appendix C. Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

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EtherJet	Tivoli
e-business logo	Tivoli Enterprise
@server	Update Connector
FlashCopy	Wake on LAN
IBM	XA-32
IBM (logo)	XA-64
IntelliStation	X-Architecture
NetBAY	Xcel4
Netfinity	XpandOnDemand
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