processor installation

hp workstation i2000

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⚠ WARNING!

Please read all warnings and instructions BEFORE operating the system. Avoid Injury: To avoid personal injury when unpacking the system, use only a mechanical assist unit to lift it off the shipping pallet. The system weighs approximately 84 lbs.

WARNINGS

The following cautionary notices apply whenever you remove the access cover to access components inside the system. Before you proceed, please read the following Warning section carefully.

⚡	The power supply in this product contains no user-serviceable parts. Refer servicing only to qualified personnel.
✋	Do not attempt to modify or use the supplied AC power cord if it is not the exact type required.
⏻	The DC push-button on/off switch on the system does not turn off system AC power. To remove AC power from the system, you must unplug each AC power cord from the wall outlet or power supply.
⚠	**SAFETY STEPS:** Whenever you remove the chassis covers to access the inside of the system, follow these steps: 1. Turn off all peripheral devices connected to the system. 2. Turn off the system by using the push-button on/off power switch on the system. 3. Unplug all AC power cords from the system or from wall outlets. 4. Label and disconnect all cables connected to the I/O connectors or ports on the rear of the system. 5. Provide some electrostatic discharge (ESD) protection by wearing an anti-static wrist strap attached to chassis ground of the system—any unpainted metal surface—when handling components. 6. Do not operate the system with the chassis covers removed.
	After you have completed the six SAFETY steps above, you can remove the system covers. To do this: 1. Unlock the system from the side using the keys provided. 2. Remove the thumbscrews to remove the side cover.

Continued

WARNINGS (continued)

	For proper cooling and airflow, always reinstall the chassis covers before turning on the system. Operating the system without the covers in place can damage system parts. To install the covers: 1. Check first to make sure you have not left loose tools or parts inside the system. 2. Check that cables, add-in boards, and other components are properly installed. 3. Attach the covers to the chassis with the screws removed earlier, and tighten them firmly. 4. Lock the system to prevent unauthorized access inside the system. 5. Connect all external cables and the AC power cord to the system.
	The microprocessor, heat sink and Power Pod may be hot if the system has been running. Also, there may be sharp pins and edges on some board and chassis parts. Contact should be made with care. Consider wearing protective gloves.
	Danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.
	The system is designed to operate in a typical office environment. Choose a site that is: 1. Clean and free of airborne particles (other than normal room dust). 2. Well ventilated and away from sources of heat including direct sunlight. 3. Away from sources of vibration or physical shock. 4. Isolated from strong electromagnetic fields produced by electrical devices. 5. In regions that are susceptible to electrical storms, we recommend you plug your system into a surge suppresser and disconnect telecommunication lines to your system during an electrical storm. 6. Provided with a properly grounded wall outlet. 7. Provided with sufficient space to access the power supply cords, because they serve as the product's main power disconnect.
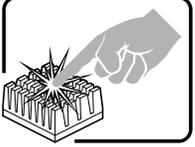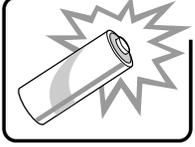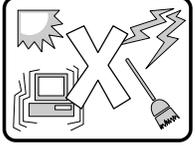
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⚠ **WARNING**

Do not open the power supply. Risk of electric shock. Refer servicing of the power supply to qualified service personnel.

⚠ **CAUTION**

Before removing the access cover for any reason, observe these cautionary guidelines.

- Turn off all peripheral devices.
- Turn off the system by pressing the power button on the front of the chassis. Then unplug the AC power cord from the chassis or wall outlet.
- Label and disconnect all peripheral cables connected to the I/O connectors or ports on the back of the chassis.
- Provide some electrostatic discharge (ESD) protection by wearing an anti-static wrist strap attached to chassis ground—any unpainted metal surface—when handling components.

⚠ **CAUTION**

The power button on the front panel does not disconnect the AC power. To remove power from the system, you must unplug the AC power cord from the AC supply or from the computer chassis.

⚠ **CAUTION**

ESD can damage disk drives, boards, and other parts. Perform all procedures in this chapter only at an ESD workstation. If one is not available, provide some ESD protection by wearing an anti-static wrist strap attached to chassis ground—any unpainted metal surface—on your system when handling parts.

Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges. Do not touch the connector contacts. After removing a board from its protective wrapper or from the system, place the board component side up on a grounded, static free

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surface. If you place the board on a conductive surface, the battery leads may short out. If they do, this will result in a loss of CMOS data and will drain the battery. Use a conductive foam pad if available but not the board wrapper. Do not slide the board over any surface. For proper cooling and airflow, always install the chassis side cover before turning on the system. Operating it without the cover in place can damage system parts.

safety and regulatory requirements

Read all instructions before using the system. Save all the safety and regulatory instructions. The Federal Communications Commission at the time of distribution has not approved this workstation.

This product is not, and may not be, offered for sale or lease, or sold until the written approval of the FCC and *Product Safety Certification* have been obtained.

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purpose of this guide

The purpose of this guide is to provide detailed instructions on installing an Itanium™ processor (for replacement or adding a second processor) in an hp workstation i2000. Each section is intended to build on the previous section and should be preformed in the order listed. If this kit is used in conjunction with another upgrade kit, the instructions following the Removing the Processor section may overlap. Please read all instructions prior to beginning any upgrade.

This processor kit contains:

- One- (1) Itanium™ processor

- One- (1) heat sink (attached to processor)

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1. workstation instructions

1.1 accessing the system

NOTE

Due to the weight of the workstation system (approximately 84 lbs.), care must be taken when maneuvering the system during assembly and disassembly.

⚠ CAUTION

*The DC push-button on/off switch on the system **does not completely** turn off system AC power. To remove AC power from the system, **you must unplug each AC power cord from the wall outlet or power supply.***

Before servicing, first identify the component(s) that must be added or removed from the system. If replacing components, such as hard drives, CD-ROMs, or the LS-120 floppy drive, the front bezel (large plastic section on the front of the system) must be removed for access to the bays, as well as side access within the system. In cases not involving the peripherals or front panel ports, the bezel can remain in place. Use the following steps to access or open the system:

1. Starting with the system in an upright (normal) position, and resting on an anti-static surface, loosen the four- (4) Phillips-head screws from the rear (as shown in Figure 1).
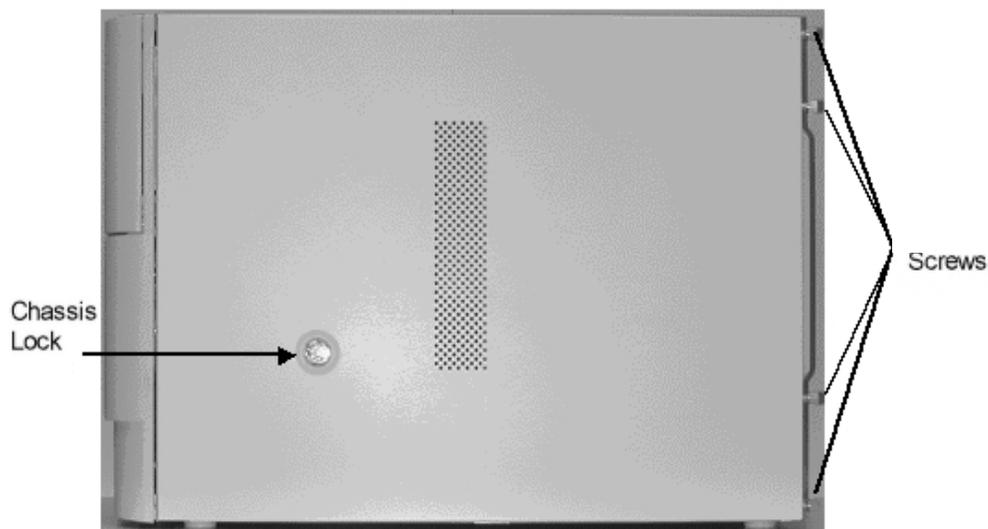
Figure 1. Removing the Four- (4) Chassis Screws

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2. Carefully place the system on its side. The side containing the lock in the center should be facing upwards.

3. Pull the system out from the work area and grasp the bottom inside of the bezel. Locate the two- (2) bezel clips (as show in Figure 2) near the bottom of the system and press in to disengage the bezel from the chassis sheet metal. Once disengaged, gently pull the front bezel away from the system. There are four- (4) interlock clips that disengage from the slots within the system chassis.

Bezel Interlock Clips
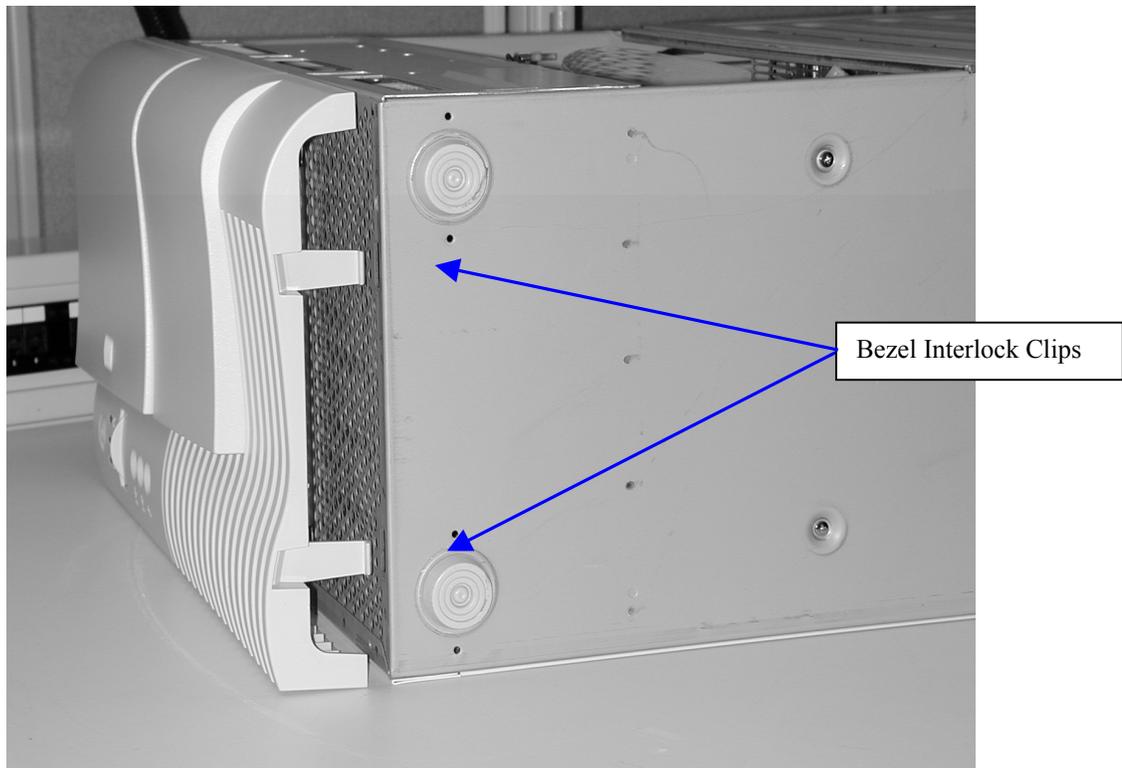
Figure 2. Bezel Interlock Clips

4. Remove the side cover by firmly pressing on the center of the panel and pushing, forcing the panel to slide backwards toward the rear of the unit.

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5. Once the side cover has been removed the system should appear (as shown in Figure 3).
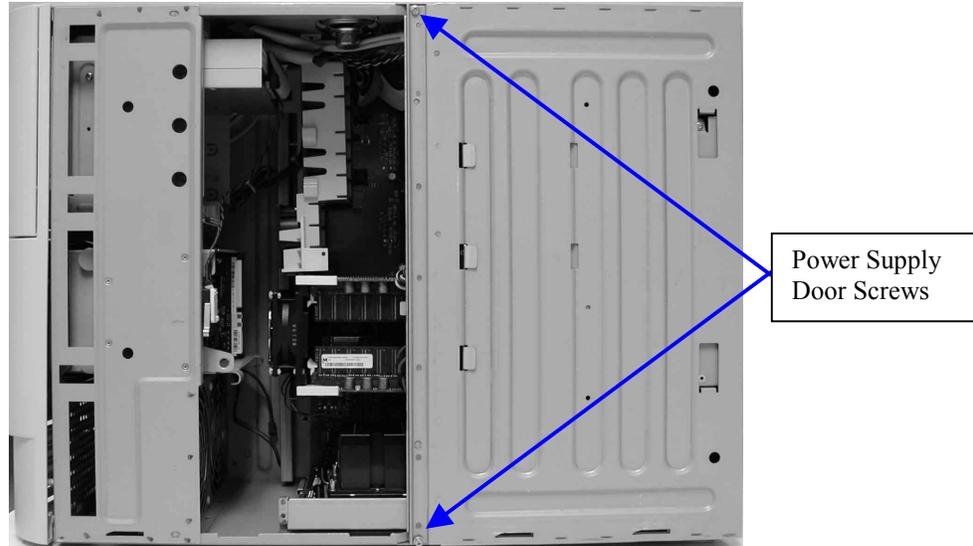
Figure 3. Internal System View after Side Door Removal

6. Remove the two- (2) Phillips-head screws from the power supply door and set aside for later reinstallation.

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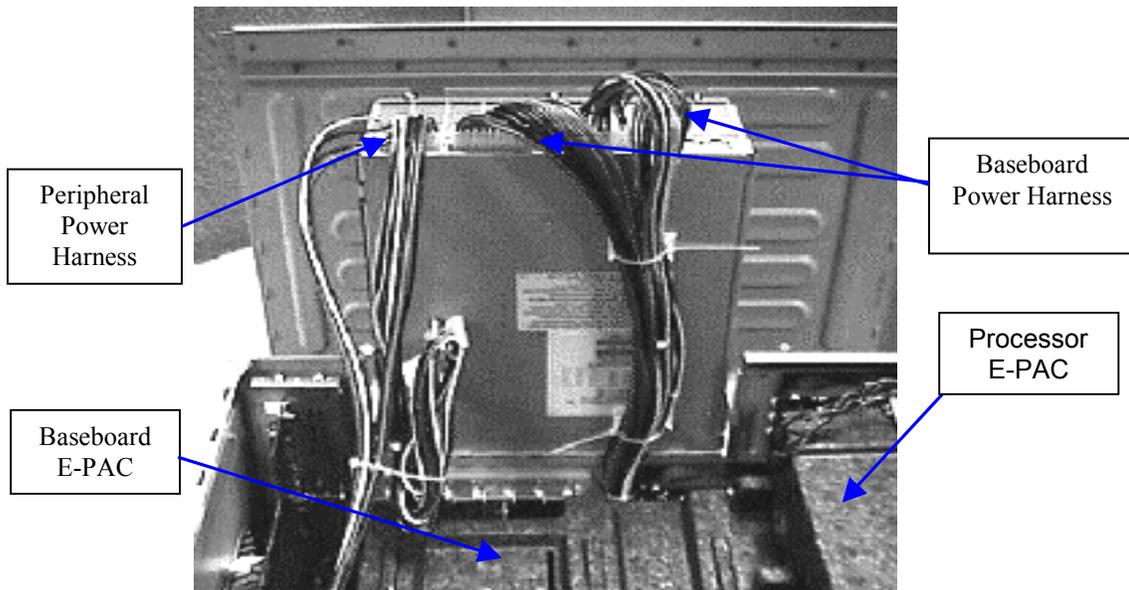
Figure 4. Power Supply Door in Opened Position

7. Open the power supply door (as shown in Figure 4) by pulling upwards and allowing the door to swing outwards until the metal clip (near the top of the system) is engaged with a "click". The power supply door is now locked into an open position for system access.

8. Remove the baseboard E-PAC (black Styrofoam protective material as shown in Figure 4).

📫 **NOTE**

This E-PAC material is required for proper operation of the system and must be replaced in the same position before closing the system after servicing.

9. Locate and remove the processor Power Pod's power harness from the main power supply (shown in Figure 5)
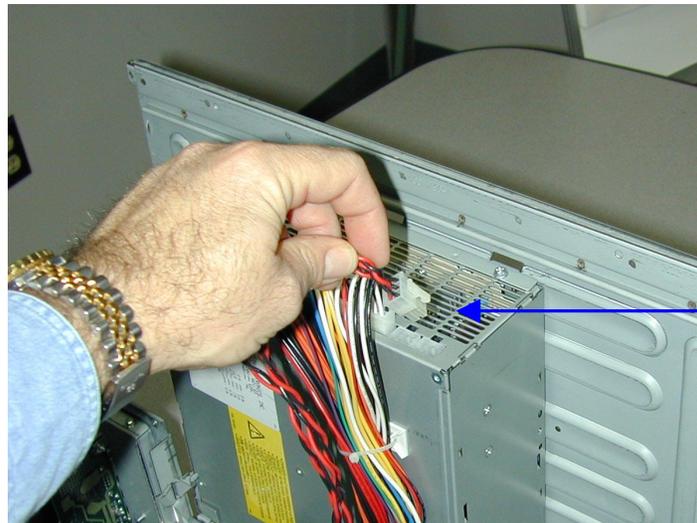
Processor Assembly Power Harness

Figure 5. Processor Power Harness

10. Locate and remove the two- (2) screws securing the processor assembly to the system chassis and set aside for later reinstallation. Remove the processor assembly from the system chassis. Refer to Figure 6.
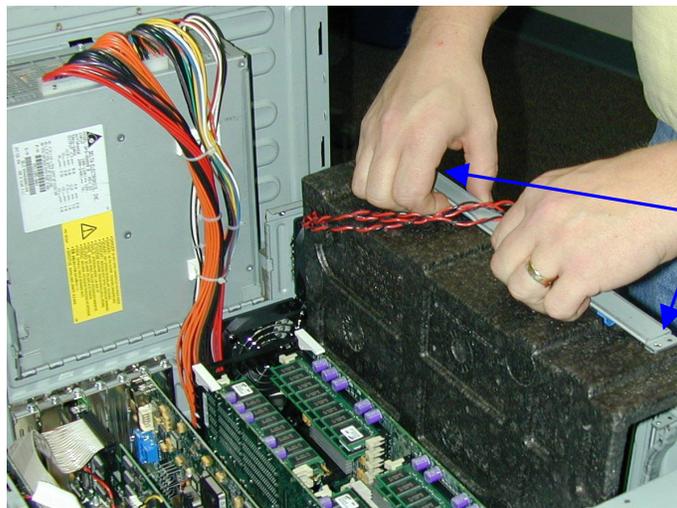
Processor Assembly Screws

Figure 6. Processor Assembly Removal

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1.2   installing an Itanium™ processor in an hp workstation i2000

📬 **NOTE**

Due to differences, such as stepping core speed and internal cache processor part numbers must match in a dual processor configuration. Attempting to operate with mixed part numbers may cause system failure or unstable operation.

1.2.1   removing the processor

1. Remove the processor E-PAC from the processor assembly.

2. Remove the four- (4) Phillips-head screws securing the processor Power Pod to the retention device. Refer to Figure 7.
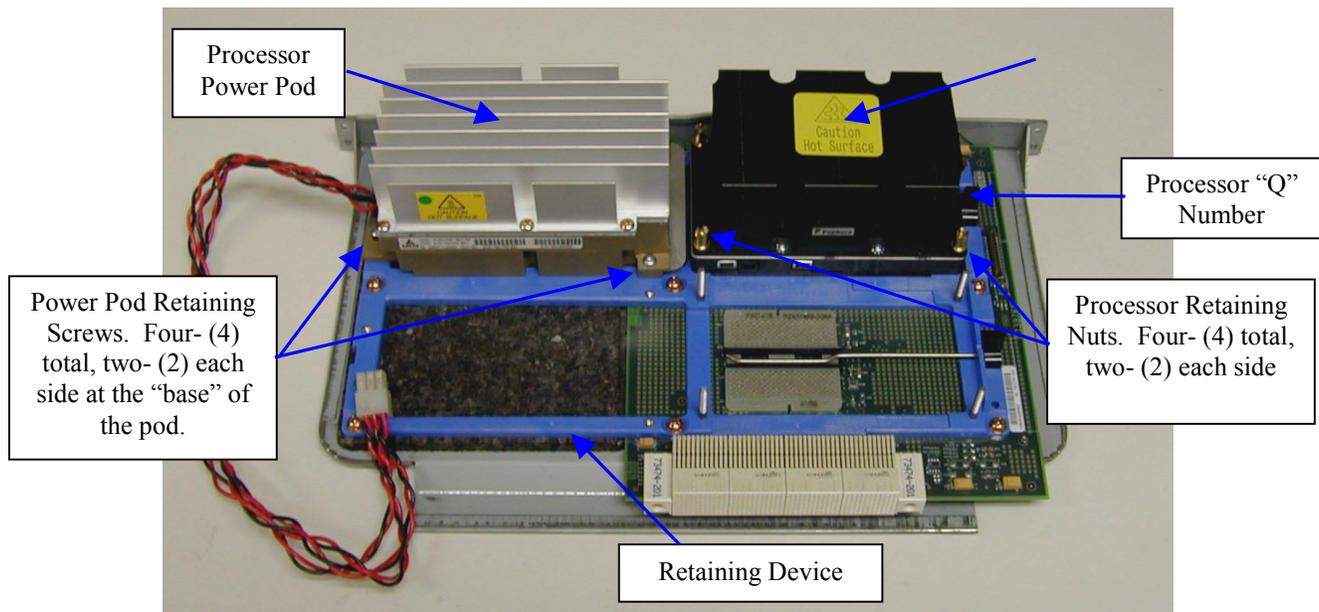
Figure 7. Processor Assembly

1. After removing the four- (4) retaining screws from the base of the Power Pod, set the screws safely aside.

2. Disengage the Power Pod from the processor by sliding it outward and away from the processor (as shown in Figure 8).

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Slide the Pod in this direction to remove.

CAUTION: DO NOT LIFT the Pod until completely disengaged from the processor, or damage to the processor power connector may result.
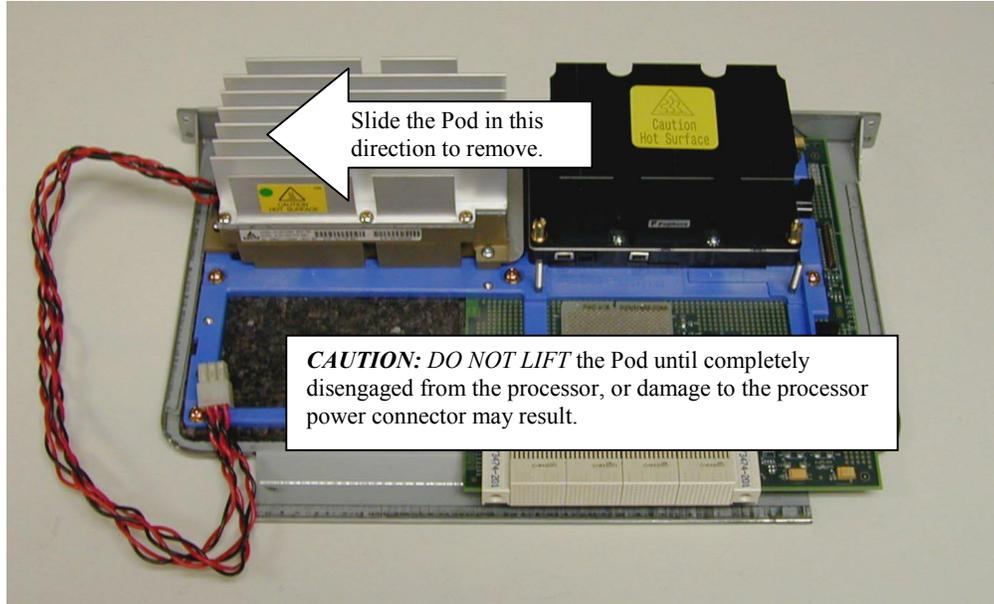
Figure 8. Removing the Power Pod

3.   After the Power Pod has been completely removed, remove the four- (4) processor retaining nuts from the retaining studs at the base of the Intel® Itanium™ processor. Set them safely aside.

4. Grasping the heat sink on the processor, while depressing firmly on the black processor ejector tab, gently rock the processor side-to-side until freed from the LIF socket. Refer to Figure 9.

Rock gently side to side until free

Press down on the processor ejector tab.
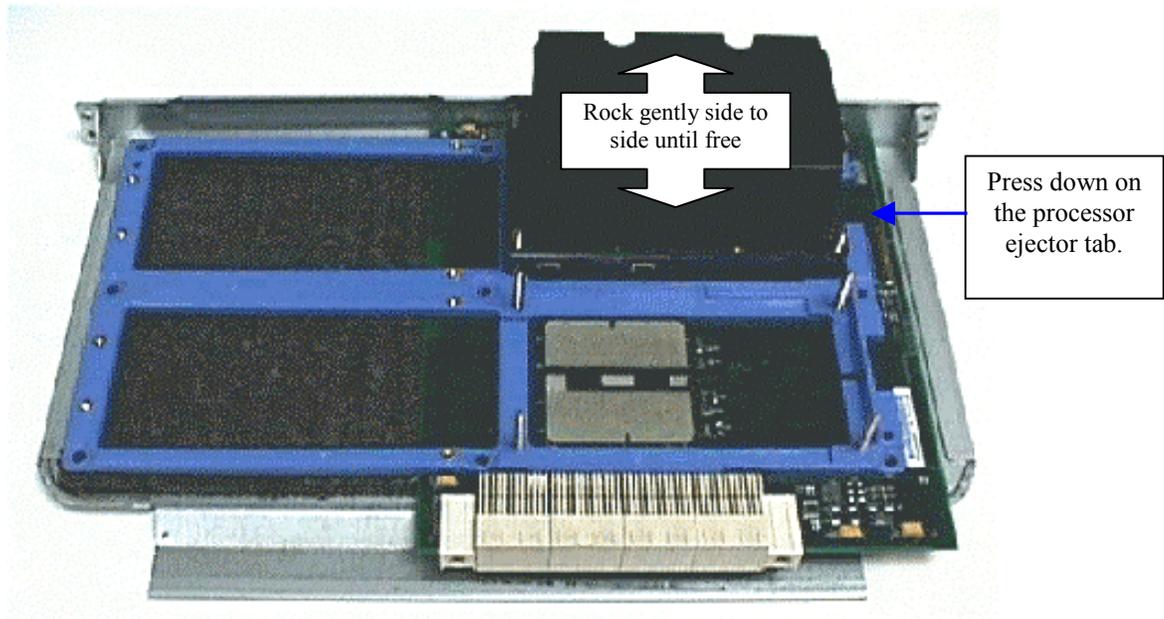
Figure 9. Removing the Processor

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1.2.2   installing the processor

1.   Position the replacement processor over the four- (4) processor retention studs.

2.   Gently lower into place onto the LIF socket #1. Refer to Figure 10

Position the processor power connector facing towards the Power Pod when mounting the processor to the retention device.

Processor retention studs

LIF socket #1 (Single processor must be mounted here)
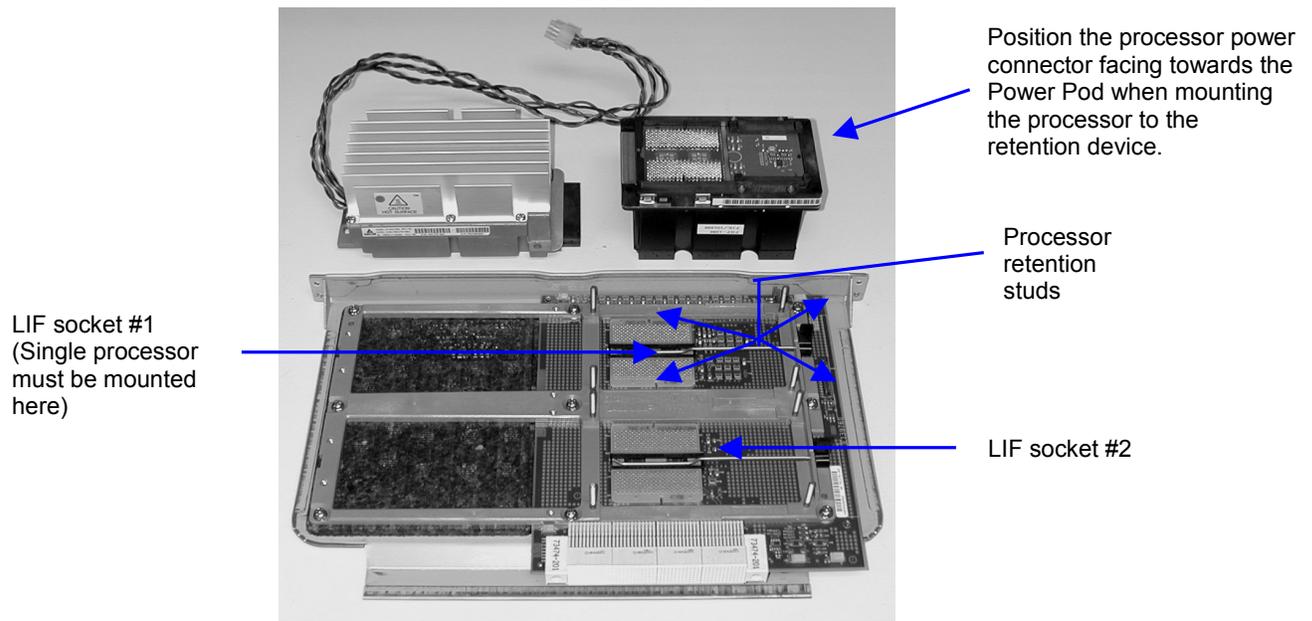
LIF socket #2

Figure 10. Replacing the Processor

3.   Once the Itanium™ processor has been lowered into position onto the retention studs, there remains a slight amount of play, which enables the installer to line up the processor pins in the LIF socket correctly seating the processor.

4.   Ensure that the processor case aligns properly and seats flush within the retention mechanism.

5.   Place the processor assembly on a sturdy surface such as a bench or desktop, with the processor backing plate facing down.

6.   Using the heel of the hand apply firm pressure to the heat sink to seat the processor into the LIF socket. Refer to Figure 11.
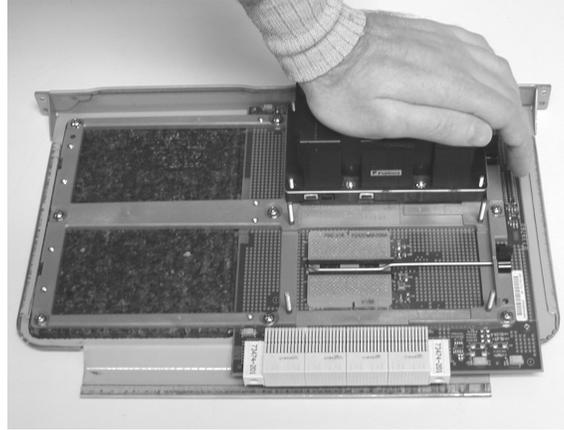
Figure 11. Properly Seating the Processor

7. Locate the four- (4) brass, Castle-head nuts and fasten the nuts to the four- (4) threaded retention studs. Utilize the cross-torque pattern referenced in Figure 12.

8. Use a torque driver and tighten the screws to 10 inch-pounds.
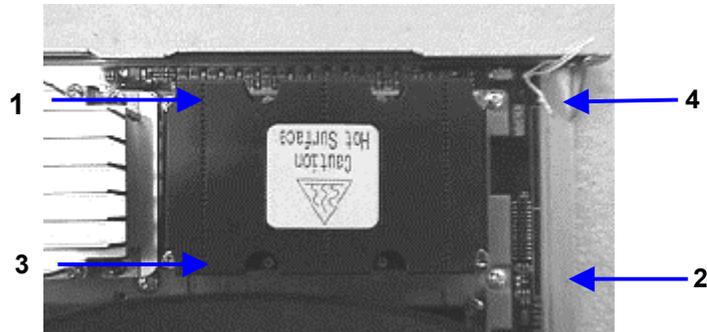
Figure 12. Top View of Processor and Cross-Torque Pattern

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1.2.3   replacing the power pod

1. Locate the processor Power Pod and four- (4), (6-32 .5 inch) Phillips-head screws.

2. Place the processor Power Pod onto the retention device.

3. Next, firmly mate the Itanium™ processor card edge power connector to the Power Pod's card edge socket.
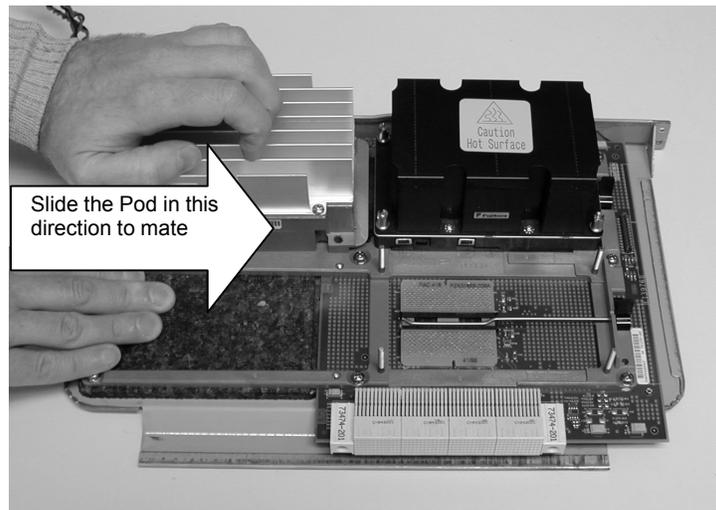
Figure 13. Installing the Power Pod

4. Fasten the Power Pod to the retention device with four - (4) Phillips-head screws. A second processor can be installed in a similar manner if required.

1.3 installing a second Itanium™ processor in a workstation

Follow the procedure above (Installing an Itanium™ Processor) to replace a secondary processor.

☞ **NOTE**
Due to differences in the processor abstraction layer, multi-processor systems must use the same "Q" number processors. Attempting to operate with mixed "Q" numbers may cause system failure or unstable operation.

1.4 reassembling your workstation

1.4.1 reinstalling the processor board

1. Replace the processor E-PAC, previously removed in Step 1 of the Removing the Processor section, and route the Power Pod's power cable(s) through the opening in the E-PAC.

2. Grasping the processor board by the backing plate, align the edges of the backing plate with the processor's guide plate and firmly insert this assembly into the chassis.

3. Secure the processor board backing plate to the chassis by replacing the two- (2) Phillips-head screws previously removed in Step 10 of the *Removing the Processor* section.

4. Attach the Power Pod's power cables to the main power supply.

5. Ensure that the processor assembly is properly seated into the baseboard assembly and that the E-PAC is reinstalled over the processors. Refer to Figure 14.

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Processor E-PAC
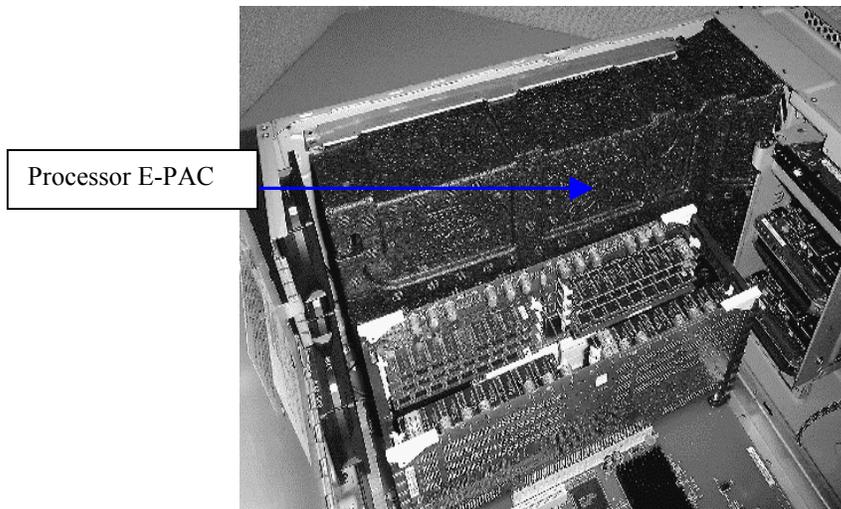
Figure 14. Correct Reinstallation of E-PAC

6. Verify that the memory cards are properly seated into the baseboard assembly.

7. Check that all cables are properly plugged in and not blocking fans or interfering with fan movement.

8. Verify that the Baseboard E-PAC is in place over the memory cards as shown in Figure 15. the center tab should align with the E-PAC of the processor assembly. If necessary position your fingers over the E-PAC as shown in Figure 16 and push down. The E-PAC should "pop" into place.

Baseboard E-PAC

E-PAC Channel
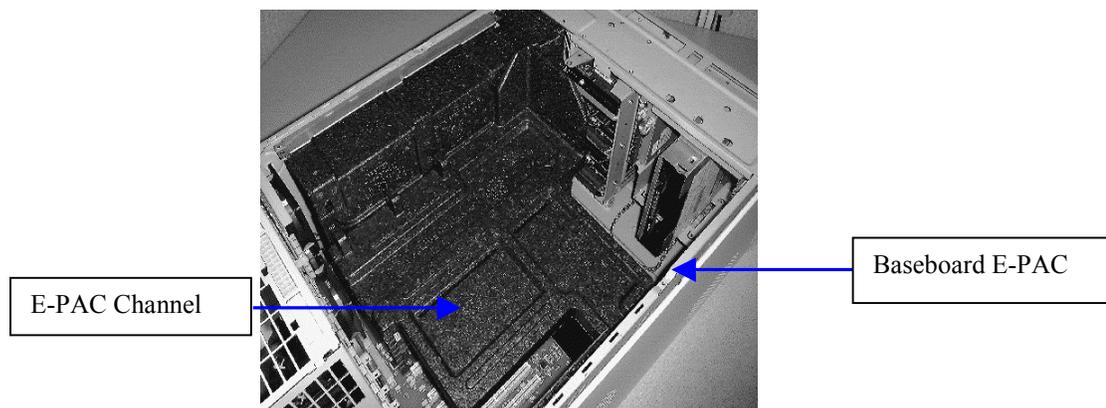
Figure 15. E-PAC Inserted over Memory Cards

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Center Tab
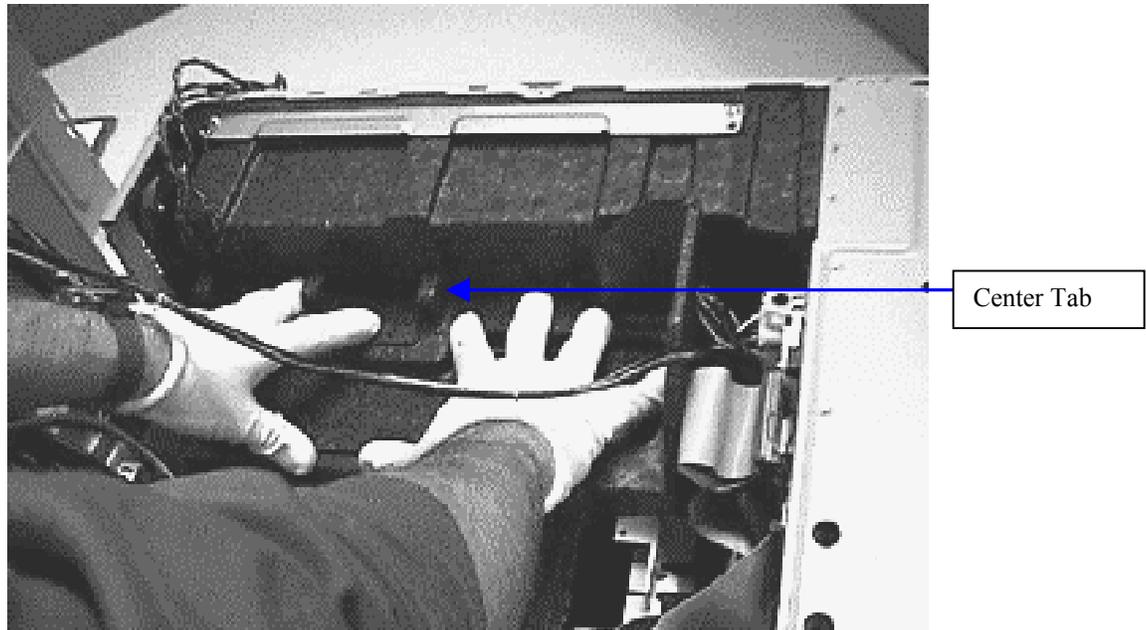
Figure 16. E-PAC Installation

9. Once the E-PAC is in place, close the power supply door by disengaging the power supply door-locking tab located near the I/O board. The supply closes in a downward motion into the system. While closing, keep the cables of the power supply in channel of the E-PAC as much as possible. Be sure that no power cables are being cut or pinched and DO NOT FORCE the door closed. If the system will not close easily, then the cables of the power supply need to be routed back into the E-PAC channel.

10. Reattach the two- (2) power supply door screws.

11. Reattach the side panel by placing the tabs of the sheet metal into the slots of the system at the top. Then slide the side panel towards the front of the system. When properly in place, the lock can be depressed into the system and secured.

12. Reattach the bezel by aligning the top of the bezel to the top of the system. Then by aligning the interlock clips with their respective slots push the clips into the slots starting with the top two down to the bottom clips.

13. Reattach all external devices such as the keyboard, mouse, video monitor and AC power into their respective ports.

14. The system is now ready to power on.

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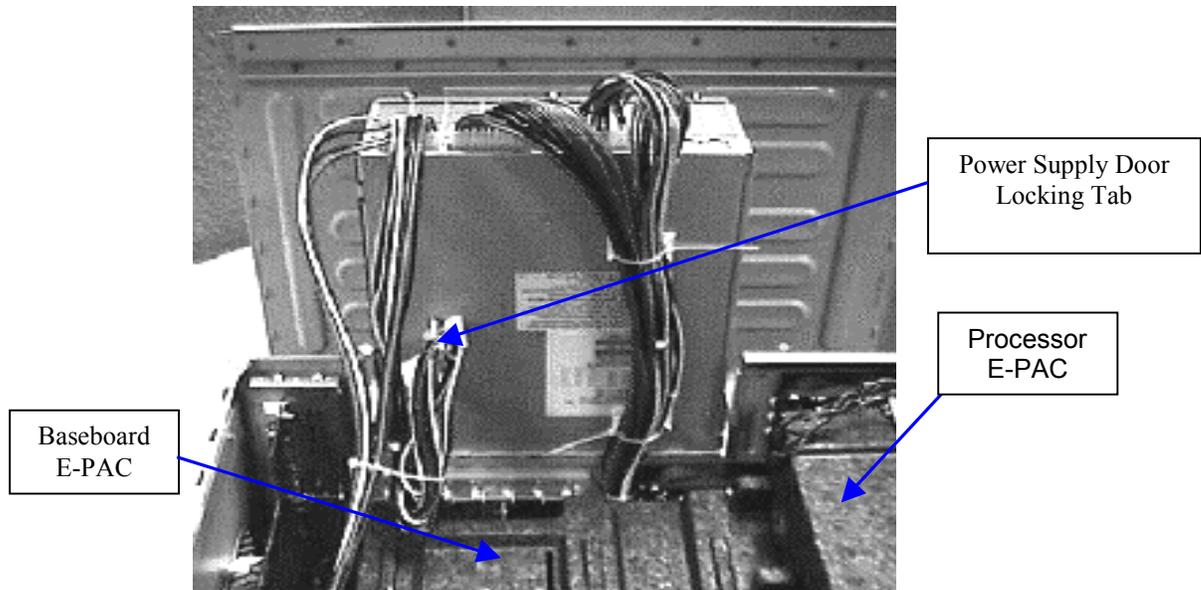
Figure 17. Power Supply Door Locking Tab

1.5   workstation support

For more information on the hp workstation i2000 and the latest updates for this product, you can visit the following pages on HP's web sites:

- For the latest drivers, FAQs, and support information:
  http://www.hp.com/workstations/support/

- For HP Itanium™ information: http://www.hp.com/go/itanium

- For documentation: http://docs.hp.com

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