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MAINTENANCE AND SERVICE GUIDE
COMPAQ CONCERTO FAMILY OF PERSONAL COMPUTERS

First Edition (September 1993)
Part Number 144906-001

PREFACE

This Maintenance and Service Guide is a troubleshooting guide that can be used for reference when servicing the Compaq Concerto Personal Computer. Additional information is available in the Technical Reference Guide.

Compaq Computer Corporation reserves the right to make changes to the Compaq Concerto Personal Computer without notice.

Symbols

The following words and symbols mark special messages throughout this guide:

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> WARNING <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.

>>>

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of data.

>>>

IMPORTANT: Text set off in this manner presents clarifying information or specific instructions.

NOTE: Text set off in this manner represents commentary, sidelights, or interesting points of information.

Technician Notes

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> WARNING <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

Only authorized technicians trained by Compaq Computer Corporation should attempt to repair this equipment. All troubleshooting and repair procedures are detailed to allow only subassembly/module level repair. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard. Any indication of component replacement or printed wiring board modifications may void any warranty or exchange allowances.

>>>

Locating Additional Information

Outside the United States and Canada, contact your local CompaqCare Center or Compaq Sales Office. Within the United States and Canada, call the Compaq Customer Support Center at 1-800-345-1518.

For additional information, consult the following:

- ONLINE USER'S GUIDE
- BEYOND SETUP
- TECHNICAL REFERENCE GUIDE
- MAINTENANCE AND SERVICE GUIDE - OPTIONS AND PERIPHERALS
- COMPAQ SERVICE QUICK REFERENCE GUIDE
- Service Training Guides
- Compaq Service Advisories and Bulletins

Chapter 1 - Illustrated Parts Catalog

INTRODUCTION

This chapter provides illustrated parts breakdowns and identifies the spare parts for the standard features of the Compaq Concerto Family of Personal Computers, the FlexConnect, and accessories.

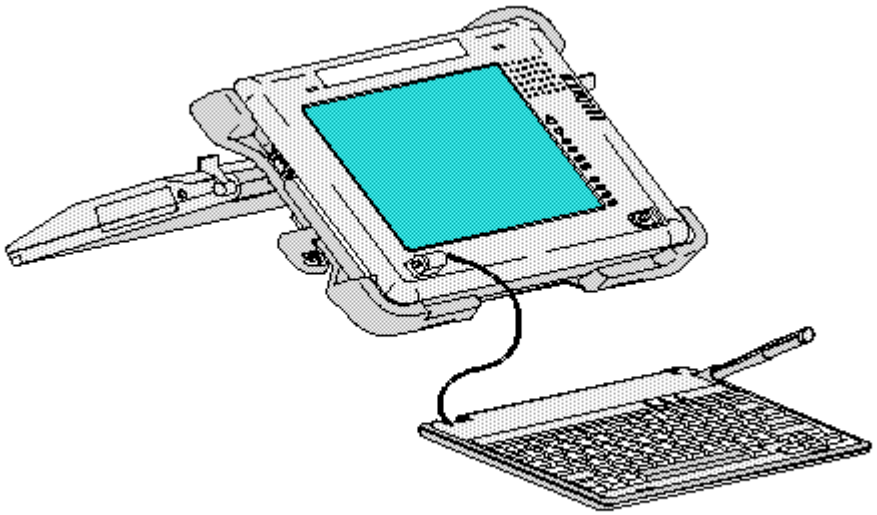

Figure 1-1. Compaq Concerto Personal Computer Connected to the FlexConnect

Chapter 1.1 ILLUSTRATED PARTS BREAKDOWN: COMPAQ CONCERTO FAMILY OF PERSONAL COMPUTERS

The Compaq Concerto Family of Personal Computers uses a sandwich construction (Figure 1-2). The display module and system module share a common chassis to form the display-chassis-system assembly. The front cover, display-chassis-system assembly, and rear cover are sandwiched together and secured by screws installed from the rear of the computer through the rear cover. For convenience, this manual considers all components mounted on the front side of the chassis as display module components. All components mounted on the rear of the chassis are system module components.

Display Module Description

The display module (Figure 1-3) includes the following replaceable parts:

- Front cover
- Display panel
- Digitizer
- Display inverter board
- Display inverter board insulator
- Display inverter board shield
- LED switch cable

o Speaker gasket

The display panel and digitizer are secured together with double-sided adhesive. A spacer installed in the cavity on the back of the display creates a flat registration surface between the digitizer and display panel. The digitizer is aligned with the display panel by locating pins on the display panel, which engage holes in the digitizer. The display panel and digitizer are seated in the display shield prior to being mounted to the chassis. The function of the display shield is to enhance digitizer functionality.

The digitizer is connected to the system board with a flat cable that is routed through openings in the display shield and the chassis. The display panel is connected to the system board with a flat cable that is routed around the edge of the chassis. The display-digitizer assembly is attached to the chassis with five mounting screws.

The display inverter board is mounted to the chassis below the display-digitizer assembly. An insulator, underneath the display inverter board, is attached to the chassis with an adhesive surface and is creased to fold over the top of the inverter board. A shield is mounted on top of the display inverter. One end of the shield has tabs that engage the chassis in a hinging motion; the other end is secured with one of the display inverter board mounting screws. The other display inverter board mounting screw attaches the board to the chassis and is installed prior to shield installation.

The LED switch cable is attached to the chassis by two nylon snap fasteners. The cable is routed around the edge of the chassis to the rear of the computer and connected to the system board. The cable includes a speaker that is fitted with a removable boot that directs sound up through the front cover.

The front cover provides half of the housing assembly for the display-chassis-system assembly. The digitizer pen park and keyboard pivots are incorporated into the front cover.

The keyboard is detachable. When in the closed position, the keyboard serves to protect the display panel. The keyboard contains a pen holder for temporary storage of the digitizer pen.

System Module Description

The system module (Figure 1-4) includes the following replaceable parts::

o Main battery
o Rear cover
o Auxiliary battery
o Hard drive
o Power supply
o Memory expansion board (optional)
o Diskette drive
o PCMCIA ejector rails
o System board

The system board is mounted directly to the chassis. All system module components connect to the system board and must be removed prior to

removing the system board. Since the auxiliary battery provides power to the system board and components, the auxiliary battery should be disconnected from the system board during maintenance.

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

The power supply can be damaged if it is removed while the auxiliary battery is installed.

>>>

The hard drive is connected directly to the system board with no intervening cables. It is mounted to the chassis with four screws. Different hard drives use two different mounting hole patterns. The mounting tabs on the chassis will accommodate both types.

The power supply board is held to the system board by four screws that engage screw locks that provide separation between the power supply board and the system board. These screw locks also help secure the system board to the chassis. There is no cable between the power supply board and system board; the power supply board connects directly to the system board.

The optional memory expansion board is attached to the system board by the two connectors. No mounting screws are required. System memory can be increased to a maximum of 20 Megabytes by adding a 16-Megabyte memory expansion board. Memory expansion boards are also available in 4- Megabyte and 8-Megabyte configurations.

The diskette drive is attached to the chassis in a manner similar to the hard drive. Four mounting screws attach the drive to the mounting tabs on the chassis. The diskette drive uses a short flat cable to connect to the system board.

There is an upper and a lower PCMCIA ejector rail. The upper rail is distinguished by a hex-shaped mounting hole for seating the screw head. The ejector rails slide into the PCMCIA connector and are secured to the chassis with two screws.

The rear cover provides the remaining half of the housing assembly. It houses the main battery and features a sliding door to protect the I/O panel.

Compaq Concerto Personal Computer Cover Components

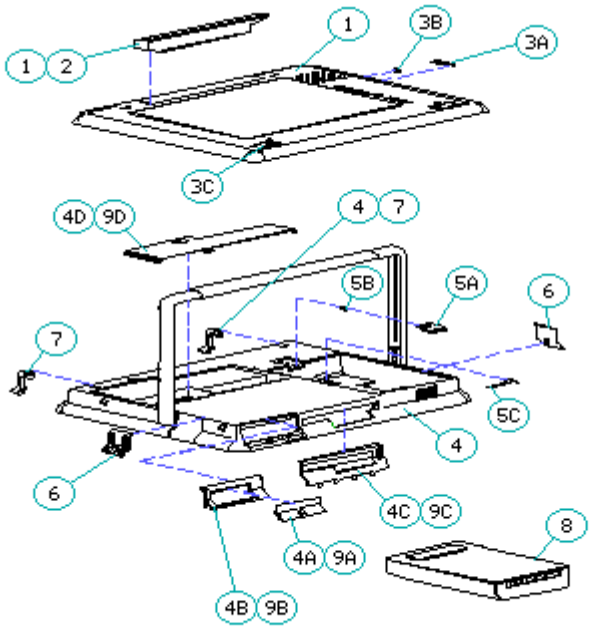

Figure 1-2. Compaq Concerto Personal Computer Cover Components

Table 1-1. Compaq Concerto Personal Computer Cover Components

Description	Spare Part Number	Notes
1. CPU Cover Kit	144849-001	Includes: a. CPU cover assembly b. Pen park
2. Pen Park	144951-001	
3. Hinge/Actuator	144954-001	Includes: a. 2 standby switch actuators b. 2 standby switch springs c. 4 keyboard hinges
4. CPU Base Kit	144850-001 *	Includes 1 rear cover with battery latch, foot latch, and anti-skid pads installed. Also includes: a. 1 PCMCIA hard drive bezel b. 1 PCMCIA door c. 1 diskette drive bezel d. 1/O door
5. Battery Leaf/ Latch Kit	142998-001	Includes: a. 5 battery latches b. 5 compression springs c. 5 battery eject springs
6. Foot latch	144655-001	Includes 2 foot latches
7. Anti-Skid Pads Kit	144955-001	Includes 10 pads
8. Nickel Metal	144823-001	Includes 1 battery

Hydride Battery Pack		
9. PCMCIA/Drive Doors Kit	144950-001	Includes: a. 2 PCMCIA hard drive bezels b. 2 PCMCIA doors c. 2 diskette drive bezels d. 2 I/O doors

* Part Number 144850-001 has been replaced by 144850-002 (Concerto 4/25) and 144850-003 (Concerto 4/33).

Display Module Components

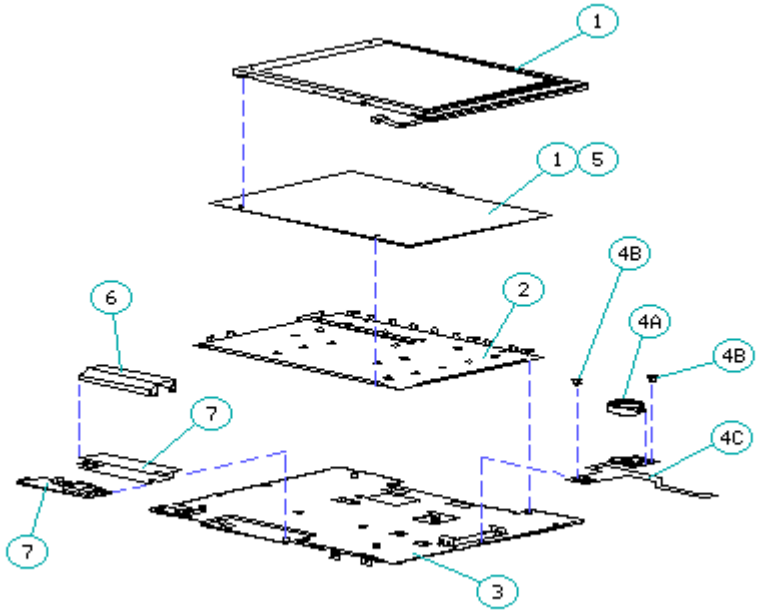

Figure 1-3. Display Module Components

Table 1-2. Display Module Components

Description	Spare Part Number	Notes
1. Display Kit	144856-001	Includes display panel with glass, digitizer, display spacer
2. Display Shield		Not available separately
3. Chassis		Not available separately
4. LED/Switch Cable	144855-001	Includes: a. 1 speaker gasket b. 4 nylon fasteners c. 1 LED/Switch cable
5. Digitizer	144857-001	

6. Display Inverter Board Shield	144812-001	
7. Display Inverter Board	144798-001	Includes inverter board insulator

System Module Components

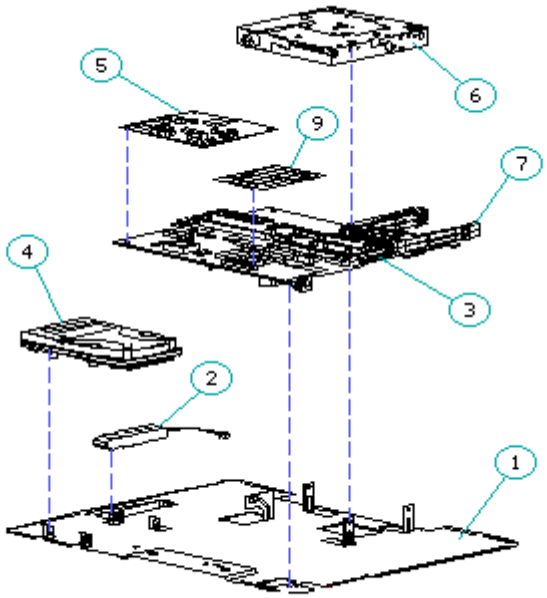

Figure 1-4. System Module Components

Table 1-3. System Module Components

Description	Spare Part Number	Notes
1. Chassis		Not available separately
2. Auxiliary Battery	144952-001	
3. System I/O Board/25	144815-001	Includes mounting hardware, I/O bulkhead. Does not include PCMCIA ejector rails.
3. System I/O Board/33	144904-001	Includes mounting hardware, I/O bulkhead. Does not include PCMCIA ejector rails.
4. 120-Megabyte Hard Drive	129981-001	
4. 250-Megabyte Hard Drive	144902-001	
5. Power Supply	144858-001	

6. 3 1/2-Inch, 1.44 Megabyte Diskette Drive	144851-001	
7. PCMCIA Ejector Rail Kit	196454-001	Includes a. 2 top rails b. 2 bottom rails c. 4 PCMCIA spacers
8. ZIF Slider Kit *	144953-001	Includes 10 ZIF connector sliders for each ZIF connector.
9. Memory Expansion Board (Option)		Available as described in Table 1-8

* Not shown

Cables Kit

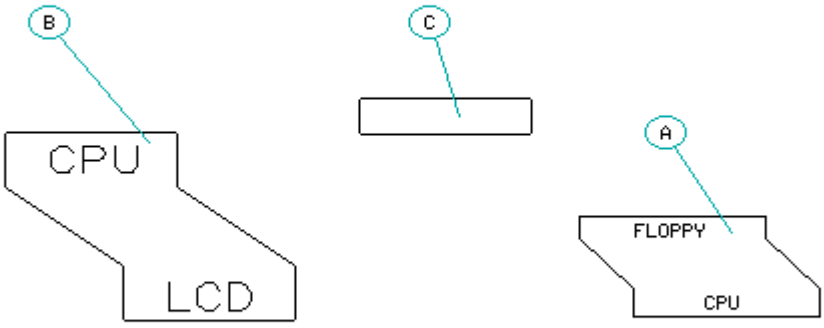

Figure 1-5. Cables Kit

Table 1-4. Cables Kit

Description	Spare Part Number	Notes
Cables Kit	144854-001	Includes: a. 2 diskette drive cables b. 2 display cables c. 2 ferrite bead (for display cable)

AC Adapter

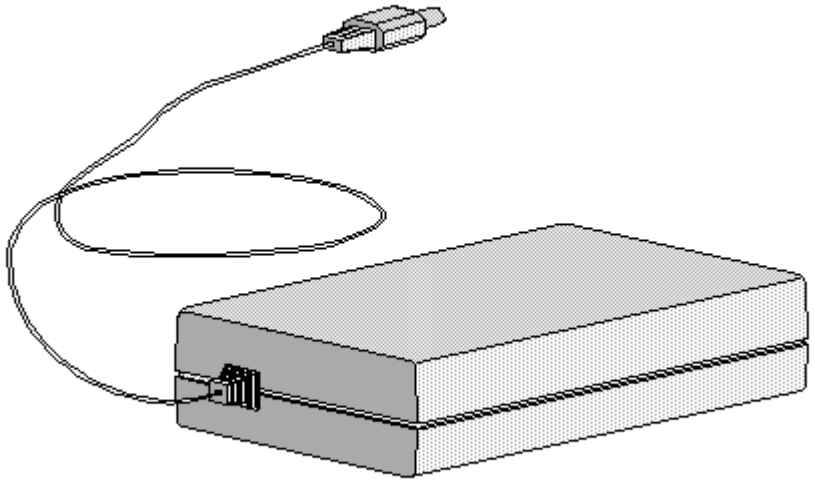

Figure 1-6. AC Adapter

Table 1-5. AC Adapter

Description	Spare Part Number
AC Adapter	144834-001

Keyboard

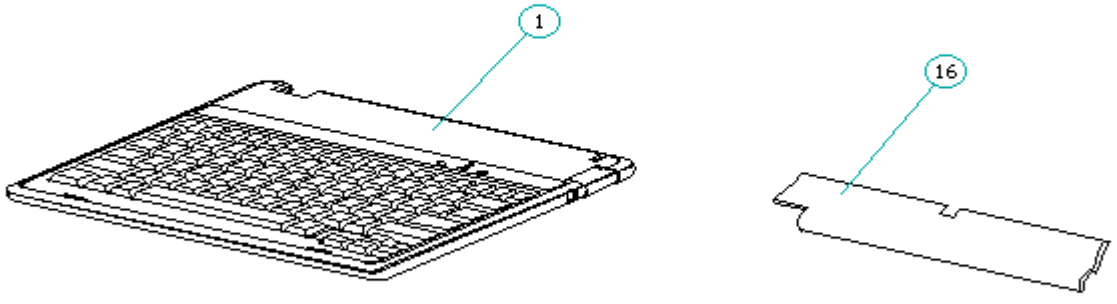

Figure 1-7. U.S. English Keyboard

Table 1-6. Keyboards

Description	Spare Part Number
1. U.S. English	144809-001
2. U.K. English	144809-003 *
3. German	144809-004 *
4. French	144809-005 *
5. Italian	144809-006 *
6. Spanish	144809-007 *
7. Danish	144809-008 *
8. Norwegian	144809-009 *
9. Swedish/Finnish	144809-010 *
10. Swiss	144809-011 *
11. French Canadian	144809-012 *
12. Portuguese	144809-013 *
13. Latin America	144809-016 *
14. Belgium	144809-018 *
15. Japanese	144809-019 *
16. Keyboard Foot Kit	144813-001 (Includes 2 cable compartment doors)

* Not shown

Memory Expansion Board (Optional)

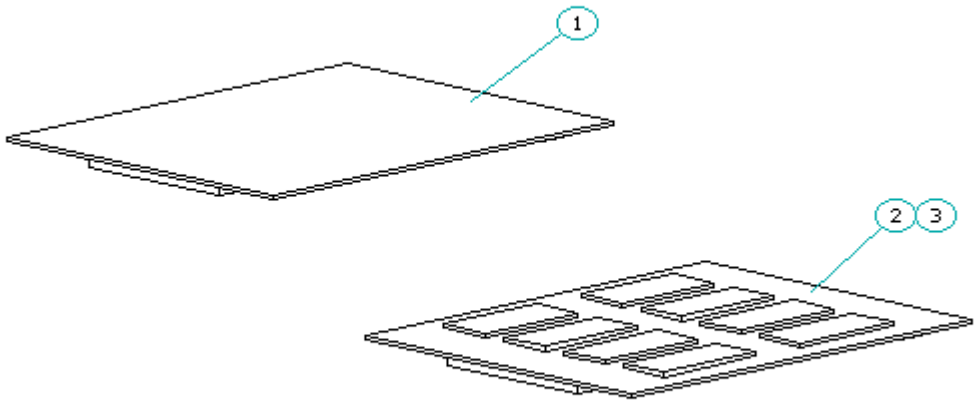

Figure 1-8. Memory Expansion Board (Optional)

Table 1-7. Memory Expansion Boards (Optional)

Description	Spare Part Number
1. 4-Megabyte, 32-Bit Memory Expansion Board	144859-001
2. 8-Megabyte, 32-Bit Memory Expansion Board	144860-001

3. 16-Megabyte, 32-Bit Memory Expansion Board 144861-001

Fastcharger

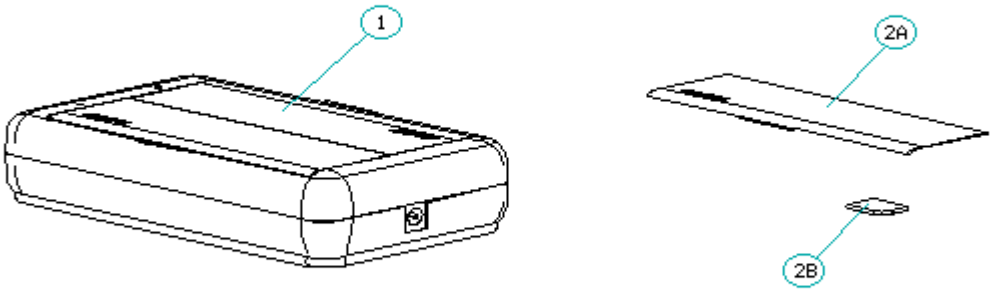

Figure 1-9. Fastcharger

Table 1-8. Fastcharger

Description	Spare Part Number	Notes
1. Fastcharger	144816-001	
2. Fastcharger Doors Kit	144959-001	Includes: a. 2 doors b. 4 anti-skid pads

Pen Components

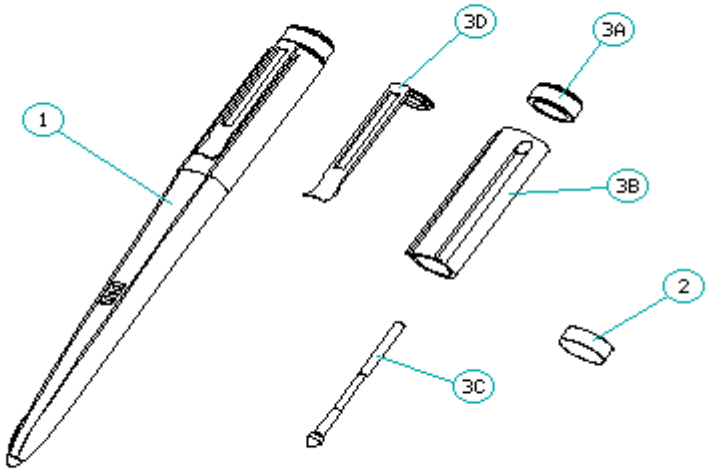

Figure 1-10. Pen Components

Table 1-9. Pen Components

Description	Spare Part Number	Notes
1. Pen	144852-001	1 each
2. Pen Battery *	144949-001	4 each
3. Kit, Miscellaneous Pen Parts	144948-001	Includes: a. 1 pen cap b. 1 pen battery cover c. 1 pen tip d. 1 pen clip

* Use Ray-O-Vac 1.5 Volt, Type 393 or equivalent.

Table 1-10. Documentation

Description	Spare Part Number
MAINTENANCE AND SERVICE GUIDE	196453-001
COMPAQ SERVICE QUICK REFERENCE GUIDE	106854-001
BEYOND SETUP GUIDE	196452-001
ONLINE USER'S GUIDE *	144957-001

* Includes Compaq Dictionary (preinstalled on hard drive).

Table 1-11. Accessories

Description	Spare Part Number
Auto Adapter	144835-001 *

Briefcase	129930-001 *
External Keypad (U.S., U.K., Swiss)	117263-001 *
Enhanced Keyboard (U.S. English)	140536-101 *
External Options Adapter	126752-001 *
Slip Cover	144915-001
CD-ROM Adapter (SII)	121467-002 *
CD-ROM Signal Cable (4 ft)	144916-001 *
Mouse, 2-Button	141189-201 *
External Trackball	142961-001 *
Microsoft Windows for Pen Computing	198818-001
Compaq Concerto ROMPaq Diskette	198819-001
Pen/Mouse Driver	198820-001
PCMCIA Support Software	198821-001

* Optional Accessory

Table 1-12. Mounting Hardware

Description	Spare Part Number	Notes
Kit, Screw lock, 440	142968-001	25 each #4-40 external screw locks
Kit, CPU Screws	144821-001	25 of each fastener in Table 1-13
Kit, Display Screws	144914-001	25 each M2.5 X 4 T8/slotted screws

Table 1-13. Fastener List

Description:	M2.0 X 12.0
Type:	Pan
Where Used:	PCMCIA to chassis
Part Number:	144762-001
Drive:	PH/1
Quantity:	4
Description:	M2.0 X 4.0
Type:	Truss
Where Used:	Power supply to screw locks
Part Number:	144863-001
Drive:	T8/SL
Quantity:	4
Description:	M2.0 X 2.0
Type:	Truss

Where Used: Diskette drive to chassis
Part Number: 144863-004
Drive: T8/SL
Quantity: 4

Description: M2.5 X 4.0
Type: Truss
Where Used: CPU I/O to chassis
Part Number: 144864-001
Drive: T8/SL
Quantity: 4

Description: M2.5 X 4.0
Type: Truss
Where Used: Inverter to chassis
Part Number: 144864-001
Drive: T8/SL
Quantity: 2

Description: #4-40 X 3/16
Type: Truss
Where Used: Keyboard/mouse connector
Part Number: 198795-001
Drive: T8/SL
Quantity: 1

Description: M2.5 X 4.0
Type: Truss
Where Used: Display to chassis
Part Number: 144864-001
Drive: T8/SL
Quantity: 5

Description: M2.5 X 10.0
Type: Truss
Where Used: Cover to base
Part Number: 144865-001
Drive: T8/SL
Quantity: 9

Description: M2.6 X 7.0
Type: Truss
Where Used: Keyboard front connector
Part Number: 144764-001
Drive: PH/1
Quantity: 1

Description: M3.0 X 3.0
Type: P/CAK
Where Used: Hard drive to chassis
Part Number: 139574-001
Drive: PH/1
Quantity: 4

Description: M2.0 X 2.5 *
Type: Hex
Where Used: Power supply to I/O
Part Number: 139576-001
Drive: 3/16
Quantity: 4

Description:	#4-40 *
Type:	Hex
Where Used:	Bulkhead connector
Part Number:	106902-004
Drive:	3/16
Quantity:	8

* Screw locks

Chapter 1.2 ILLUSTRATED PARTS BREAKDOWN: FLEXCONNECT

The FlexConnect (Figure 1-11) provides a convenient interface to peripherals for the Compaq Concerto Family of Personal Computers. The front module provides a secure mounting surface for the computer as well as the electronic connection to the interface. The rear module has provisions for connecting peripherals and houses the interface board. The front and rear modules are connected at the clutch assemblies where pivoting is allowed to occur for adjusting the viewing angle.

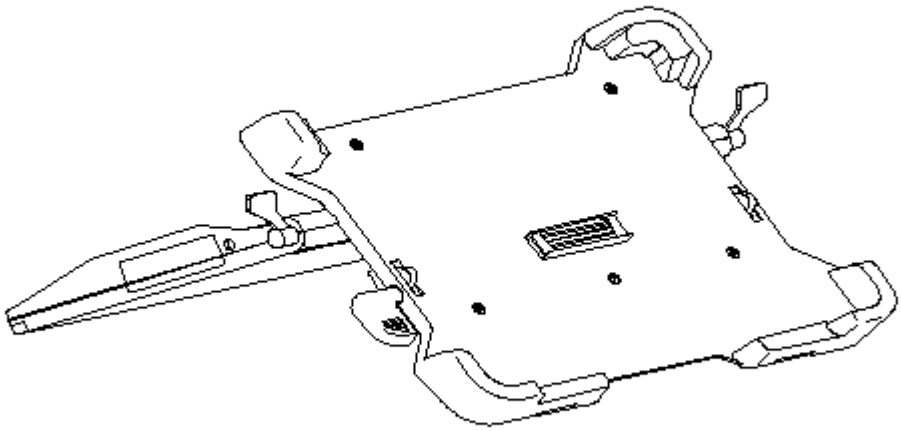

Figure 1-11. FlexConnect

Front Module Description

The front module (Figure 1-12) has the following replaceable parts:

- Front cover
- Feet
- Flex cable assembly
- Computer eject levers
- Front base

The function of the front module is to support the computer and accommodate

the connection of the computer to the interface board housed in the rear module. You must remove the cover from the front module to service the flex cable assembly and computer eject levers (Figure 1-12). The computer eject levers push the computer out of the FlexConnect.

The connector on the flex cable is mounted to the base of the front module. The connector is accessible to the computer through a cutout in the front module cover.

The feet prevent the FlexConnect from sliding on the tabletop; no adhesive or mounting hardware is required. The feet can be removed and replaced without removing the top cover.

Rear Module Description

The rear module (Figure 1-13) has the following replaceable parts:

- Rear cover
- Interface board
- Power switch
- Feet
- Rear base

There are three types of interface boards: pass-through, Ethernet and SCSI, and Token Ring and SCSI. The interface board is enclosed in a pan assembly, and the pan assembly is sandwiched between the cable tray and cover. The power switch is mounted to the interface board.

The feet are held in place by two of the rear module assembly screws and can be removed and replaced without having to remove any other part.

Clutch Assembly Description

The front and rear modules are joined at a pivot line to form an "A-frame" structure. The pivot points have clutches that allow the FlexConnect to be positioned at virtually any desired viewing angle. The clutch assembly is very durable; only the clutch actuator is replaceable. It is necessary to remove the rear module cover and release the clutch assembly bracket to replace the actuator.

FlexConnect Front Module Components

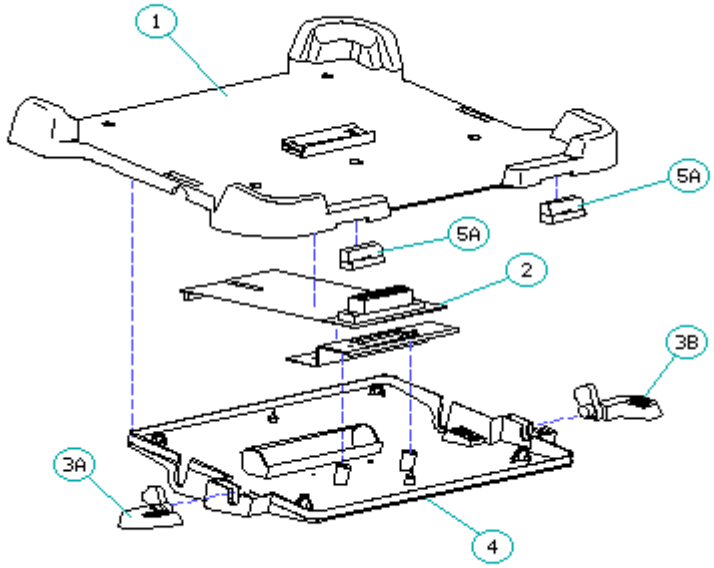

Figure 1-12. FlexConnect Front Module Components

Table 1-14. FlexConnect Front Module Components

Description	Spare Part Number	Notes
1. Front Cover Kit	196473-001	Includes cover and mounting hardware
2. Flex Cable	144929-001	
3. Computer Eject Lever	144960-001	Includes: a. 2 LH lever b. 2 RH lever
4. Front Base Kit	196472-001	Includes base and mounting hardware
5. Feet Kit	144962-001	Includes: a. 4 front feet b. 4 rear feet

FlexConnect Rear Module Components

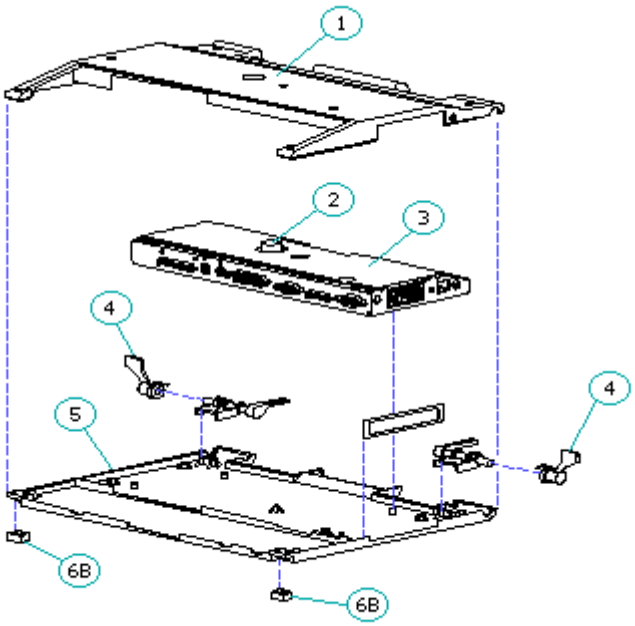

Figure 1-13. FlexConnect Rear Module Components

Table 1-15. FlexConnect Rear Module Components

Description	Spare Part Number	Notes
1. Rear Cover Kit	196475-001	Includes cover and mounting hardware
2. Power Switch	144964-001	
3. Interface Board Kit		Choose 144817-001, 144819-001, or 144820-001 (See Table 1-15 for details)
4. Clutch Actuator	144961-001	Includes: a. 2 actuators b. 6 clutch-mounting screws (not shown)
5 Rear Base Kit	196474-001	Includes base and mounting hardware
6. Feet Kit	144962-001	Includes: a. 4 front feet b. 4 rear feet

FlexConnect Interface Board

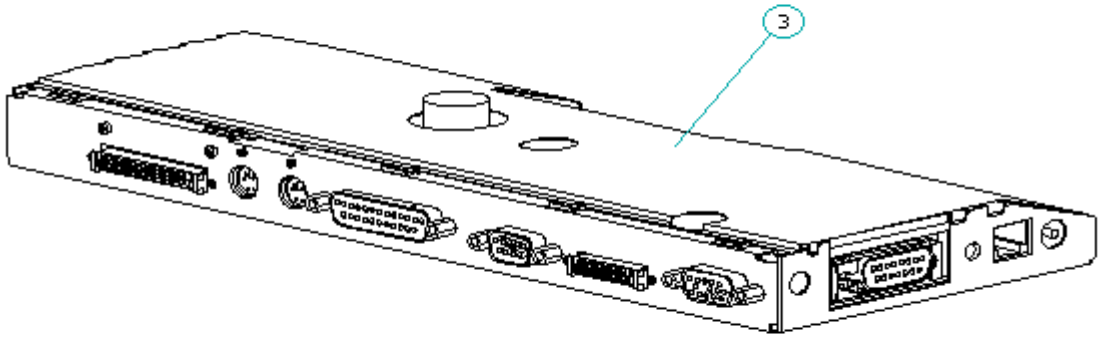

Figure 1-14. FlexConnect Interface Board

Table 1-16. FlexConnect Interface Boards

Description	Spare Part Number	Notes
1. Pass-Through Board *	144817-001	Includes PCA, bezel, power switch actuator, sheet metal pan, mounting hardware
2. Token Ring and SCSI Board *	144819-001	Includes PCA, bezel, power switch actuator, sheet metal pan, mounting hardware
3. Ethernet and SCSI Board	144820-001	Includes PCA, bezel, power switch actuator, sheet metal pan, mounting hardware

* Not Shown

FlexConnect AUI AC Adapter

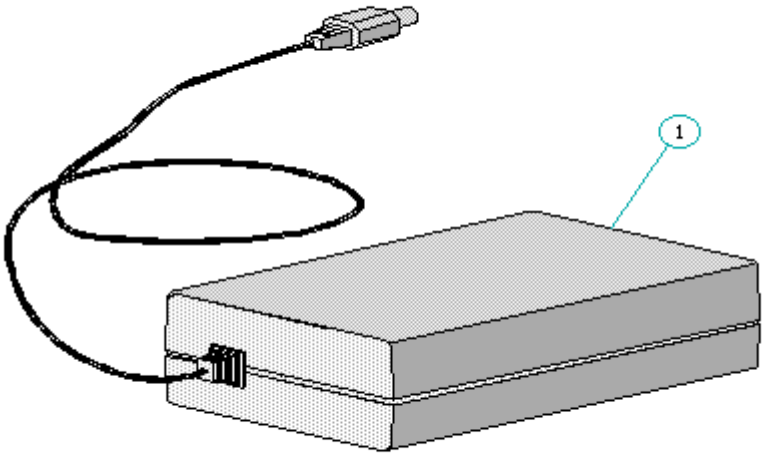

Figure 1-15. FlexConnect AUI AC Adapter

Table 1-17. FlexConnect AUI AC Adapter

Description	Spare Part Number	Notes
1. AUI AC Adapter	142534-001	
2. SCSI Extension Cable *	146953-001	CD-ROM Signal Cable; Length: 4ft

* Not shown

Table 1-18. FlexConnect Mounting Hardware

Description	Spare Part Number	Notes
Kit, Screws	144822-001	Includes 25 of each fastener in Table 1-19

Table 1-19. FlexConnect Fastener List

Description:	2-56 X 1/4
Type:	Pan
Where Used:	CD-ROM and SCSI connector
Part Number:	118292-001
Drive:	T8/SL
Quantity:	4
Description:	M2.0 X 0.4
Type:	Truss
Where Used:	Flex cable to ground
Part Number:	144863-002
Drive:	T8/SL
Quantity:	2

Description:	M2.6 X 2.41
Type:	Pan
Where Used:	Mouse and Keyboard connector
Part Number:	121188-001
Drive:	T8/SL
Quantity:	2

Description:	M2.5 X .45
Type:	Hex
Where Used:	PCA to basepan
Part Number:	139576-002
Drive:	Hex
Quantity:	2

Description:	M2.5 X .45 X 6
Type:	Truss
Where Used:	PCA to basepan
Part Number:	144865-003
Drive:	T8/SL
Quantity:	1

Description:	M2.5 X .45 X 6
Type:	Truss
Where Used:	Shroud to front base
Part Number:	144865-003
Drive:	T8/SL
Quantity:	2

Description:	M2.5 X .45 X 6
Type:	Truss
Where Used:	Front cover to front base
Part Number:	144865-003
Drive:	T8/SL
Quantity:	5

Description:	M2.5 X .45 X 6
Type:	Truss
Where Used:	Clutch to front base
Part Number:	144865-003
Drive:	T8/SL
Quantity:	4

Description:	M2.5 X .45 X 6
Type:	Truss
Where Used:	Clutch to rear base
Part Number:	144865-003
Drive:	T8/SL
Quantity:	4

Description:	M2.5 X .45 X 12
Type:	Truss
Where Used:	198-pin connector to front base
Part Number:	144865-004
Drive:	T8/SL
Quantity:	2

Description:	M2.5 X .45 X 19
Type:	Truss
Where Used:	Rear cover to rear base

Part Number: 144865-002
Drive: T8/SL
Quantity: 5

Description: M2.5 X .45 X 12
Type: Truss
Where Used: Rear feet
Part Number: 144865-004
Drive: T8/SL
Quantity: 2

Description: M2.5 X .45 X 12
Type: Truss
Where Used: Rear cover to rear base
Part Number: 144865-004
Drive: T8/SL
Quantity: 2

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Chapter 2 - Service Preliminaries

INTRODUCTION

This chapter provides general service information for the computer and FlexConnect.

Adherence to the procedures and precautions described in this chapter is essential for proper service.

Chapter 2.1 ELECTROSTATIC DISCHARGE INFORMATION

A sudden discharge of static electricity from a finger or other conductor can destroy static-sensitive devices or micro circuitry. Often the spark is neither felt nor heard, but damage occurs. An electronic device exposed to electrostatic discharge (ESD) may not be affected at all and will work perfectly throughout a normal cycle. Or it may function normally for a while, then degrade in the internal layers, reducing its life expectancy.

Networks built into many integrated circuits provide some protection, but in many cases, the discharge contains enough power to alter device parameters or melt silicon junctions.

Generating Static

Table 2-1 shows how different activities generate static electricity and at different electrostatic voltage levels.

Table 2-1. Typical Electrostatic Voltages

	Relative Humidity		
Event	10%	40%	55%
Walking across carpet	35,000V	15,000V	7,500V
Walking across vinyl floor	12,000V	5,000V	3,000V
Motions of bench worker	6,000V	800V	400V
Removing DIPS from plastic tubes	2,000V	700V	400V
Removing DIPS from vinyl trays	11,500V	4,000V	2,000V
Removing DIPS from Styrofoam	14,500V	5,000V	3,500V
Removing bubble pack from PCBs	26,000V	20,000V	7,000V
Packing PCBs in foam-lined box	21,000V	11,000V	5,000V

NOTE: 700 volts can degrade a product.

Preventing Electrostatic Damage to Equipment

Many electronic components are sensitive to ESD. Circuitry design and structure determine the degree of sensitivity. The following proper

packaging and grounding precautions are necessary to prevent damage:

- To avoid hand contact, transport products in static-safe containers such as tubes, bags, or boxes.
- Protect all electrostatic parts and assemblies with conductive or approved containers or packaging.
- Keep electrostatic sensitive parts in their containers until they arrive at static-free stations.
- Place items on a grounded surface before removing them from their container.
- Always be properly grounded when touching a sensitive component or assembly.
- Place reusable electrostatic-sensitive parts from assemblies in protective packaging or conductive foam.

Use transporters and conveyors made of antistatic belts and metal roller bushings. Mechanized equipment used for moving materials must be wired to ground and proper materials selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.

Preventing Damage to Drives

To prevent static damage to diskette drives and hard drives, use the following precautions:

- Handle drives gently, using static-guarding techniques.
- Store drives in the original shipping containers.
- Avoid dropping drives from any height onto any surface.
- Handle drives on surfaces that have at lease one inch of shock-proof foam.
- Always place drives PCB assembly side down on the foam.

Grounding Methods

The method for grounding must include either a wrist strap or a foot strap at a grounded workstation. When seated, wear a wrist strap connected to a grounded system. When standing, use footstraps and a grounded floor mat.

Table 2-2. Static-Shielding Protection Levels

Method	Voltages
Antistatic plastic	1,500
Carbon-loaded plastic	7,500

Metallized laminate	15,000

Grounding Workstations

To prevent static damage at the workstation, use the following precautions:

- Cover the workstation with approved static-dissipative material. Provide a wrist strap connected to the work surface and properly grounded tools and equipment.
- Use static-dissipative mats, heel straps, or air ionizers to give added protection.
- Handle electrostatic sensitive components, parts, and assemblies by the case or PCB laminate. Handle them only at static-free workstations.
- Avoid contact with pins, leads, or circuitry.
- Turn off power and input signals before inserting and removing connectors or test equipment.
- Use fixtures made of static-safe materials when fixtures must directly contact dissipative surfaces.
- Keep work area free of nonconductive materials such as ordinary plastic assembly aids and Styrofoam.
- Use field service tools, such as cutters, screwdrivers, vacuums, that are conductive.
- Use a portable field service kit with a static dissipative vinyl pouch that folds out of a work mat. Also use a wrist strap and a ground cord for the work surface. Ground the cord to the chassis of the equipment undergoing test or repair.

Grounding Equipment

Use the following equipment to prevent static electricity damage to equipment:

Wrist Straps are flexible straps with a minimum of 1 megohm +/- 10% resistance in the ground cords. To provide proper ground, a strap must be worn snug against the skin. On grounded mats without banana-plug connectors, connect a wrist strap with alligator clips.

Heelstraps/Toestraps/Bootstraps can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use them on both feet with a minimum of 1 megohm resistance between operator and ground. To be effective, the conductive strips must be worn in contact with the skin.

Recommended Materials and Equipment

Other materials and equipment that are recommended for use in preventing static electricity include:

o Antistatic tape

o Antistatic smocks, aprons, or sleeve protectors

o Conductive bins and other assembly or soldering aids

o Conductive foam

o Conductive table-top workstations with ground cord of 1 megohm resistance

o Static dissipative table or floor mats with hard tie to ground

o Field service kits

o Static awareness labels

o Wrist straps and footwear straps providing 1 megohm +/-10% resistance

o Material handling packages

o Conductive plastic bags

o Conductive plastic tubes

o Conductive tote boxes

o Metal tote boxes

o Opaque shielding bags

o Transparent metallized shielding bags

o Transparent shielding tubes

Chapter 2.2 SERVICE CONSIDERATIONS

Listed below are some of the considerations that should be kept in mind during the disassembly and assembly of the computer and the FlexConnect.

Tools and Software Requirements

To service the computer and the FlexConnect, you need the following:

o Phillips screwdriver, size P-1
o Torx screwdriver, size T-8
o Flat-bladed screwdriver
o Hex socket driver (3/16)
o Diagnostics software
o Formatted scratch diskettes
o Spudger (DESCO #618 or #621)
o PCMCIA rail spacer

Screws

The screws used in these products are not interchangeable. If an incorrect

screw is used during the reassembly process, it could cause damage to the unit. Compaq strongly recommends that all screws removed during disassembly be kept with the part that was removed, then returned to their proper locations.

IMPORTANT: As each subassembly is removed from the computer, it should be placed away from the work area to prevent damage.

Cables and Connectors

Most cables used throughout the unit are flat flexible cables (Figure 2-1 through Figure 2-3). These cables must be handled with extreme care to avoid damage. Apply only the tension required to seat or unseat the cables during insertion or removal from the connector. Handle cables by the connector or pull tabs whenever possible. In all cases, avoid bending, twisting, or tearing the cables, and ensure that cables are placed in such a way that they cannot be caught or snagged by parts being removed or replaced.

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

When servicing these units, ensure that cables are placed in their proper location during the reassembly process. Improper cable placement may damage the unit.

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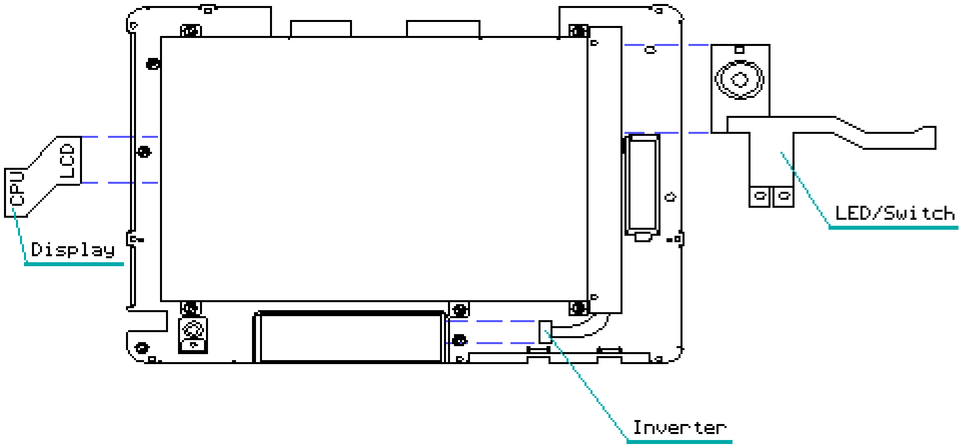

Figure 2-1. Display Module Cables

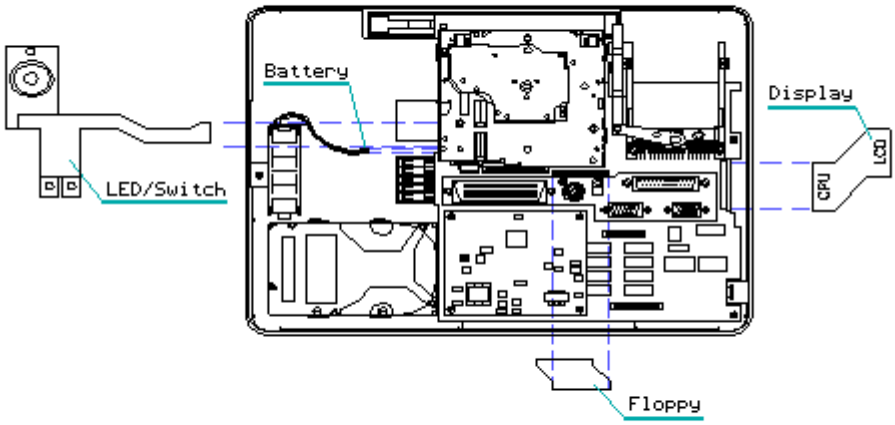

Figure 2-2. System Module Cables

NOTE: The digitizer cable is connected to the back side of the system board and is hidden from view during disassembly.

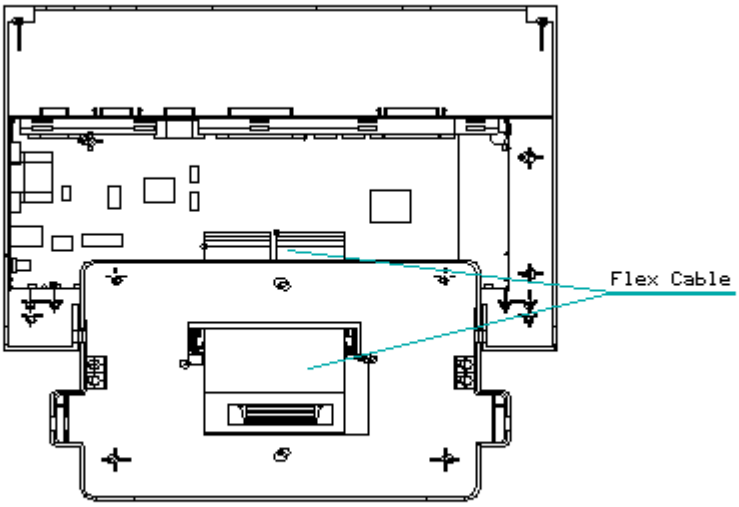

Figure 2-3. FlexConnect Flex Cable

Plastics

The plastics can be damaged by the use of excessive force during disassembly and reassembly. When handling the plastic cases and housing assemblies, use care. Do not use screwdrivers or similar tools to pry apart the plastics.

Disposal of a Used Battery Pack

Battery components are considered environmentally harmful. Disposal of the Compaq Concerto main battery, a Nickel Metal Hydride (NiMH) Battery Pack, and the Compaq Concerto auxiliary battery, a Nickel Cadmium (NiCad) Battery Pack, should comply with country, state, province, or local regulations. Whenever possible, battery components should be recycled.

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

Never attempt to open or service a battery pack. Opening a battery pack not only damages the pack and makes it unusable, but also exposes potentially harmful battery components.

>>>

In the interest of our customers and the protection of our environment, Compaq has initiated a disposal/recycling program for these batteries. Further, because Compaq is funding all costs associated with the program, it is offered at no cost to the Compaq laptop and notebook customers.

IMPORTANT: Toll-Free Number 1-800-524-9859

Customers in North America can take advantage of this program immediately. If you want to safely dispose of a depleted Compaq rechargeable battery pack, call the Compaq toll-free telephone number. A recorded message will ask you to provide your name, mailing address, and information about the battery pack. Within approximately two to three weeks, Compaq will send to the recorded address a postage paid "battery mailer" envelope preaddressed to the reclamation facility. Place the Compaq rechargeable battery pack into the battery mailer and mail it to the Compaq address shown on the mailer. Do not return Compaq rechargeable battery packs to Authorized Compaq Resellers or Authorized Compaq Service Providers (except in the case of service or in warranty exchanges) nor to any Compaq address other than the permitted address on the preaddressed battery mailer envelope.

Chapter 3 - Removal and Replacement Procedures

INTRODUCTION

This chapter provides subassembly/module level removal and replacement procedures for the computer.

After completing all necessary removal and replacement procedures, run the diagnostics program to verify that all components operate properly.

Chapter 3.1 DISASSEMBLY/ASSEMBLY SEQUENCE

Only the preparation procedures and removal of the system board require a specific disassembly/assembly sequence. After completing the preparation procedures, all other components, except the system board, are immediately accessible for service.

Preparing the Computer for Service

The preparation procedures must be completed before any other service activity. Prepare the computer for service by completing the following steps in the sequence presented:

1. Remove the computer from the FlexConnect (if applicable).
2. Remove the keyboard.
3. Disconnect all peripherals.
4. Disconnect the AC power.

After completing the preparation procedures, you can service the external components or proceed with removing the covers.

Servicing the External Components

The external components described in this section can be serviced without removing the covers from the computer, and they can be serviced in any sequence. The external components are:

- Pen park
- Keyboard hinges
- PCMCIA hard drive bezel
- PCMCIA hard drive door
- I/O door
- Feet

Preparing for Service of Internal Components

Internal components include all components that require removal of the covers for service. This includes serviceable items on the covers. To prepare the computer for servicing of the internal components, complete the following steps in the sequence presented:

1. Remove the battery pack.
2. Remove the covers.
3. Disconnect the auxiliary battery.

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

Always disconnect the auxiliary battery after removing the back cover to prevent damage to the electronics.

>>>

You can now proceed in any sequence to service any of the internal components. These components are categorized as:

- Internal front cover components
- Internal rear cover components
- System module components
- Display module components

NOTE: Rest the computer in one of the covers during service. The covers provide a stable work platform and protect the computer from damage.

Servicing the Internal Front Cover Components

The only serviceable internal front cover component is the standby switch. After preparing the computer for service and removing the front cover, you can service the standby switch. Leave the computer resting in the rear cover while servicing the front cover.

Servicing the Internal Rear Cover Components

After preparing the computer for service and removing the rear cover, you can service the internal rear cover components. Service these components in any sequence:

- Battery latch
- Battery eject spring
- Diskette drive bezel
- Foot latch

Servicing the System Module Components

After preparing the computer for service and removing the rear cover, you can service the system module components. All system module components, except for the system board, can be serviced in any sequence. All system module components, except the auxiliary battery, must be removed prior to removing the system board. The system module includes:

- Hard drive
- Power supply
- Memory board (optional)
- Diskette drive
- PCMCIA ejector rails
- System board

o Auxiliary battery

Leave the computer resting in the front cover while performing service on the system module.

Servicing the Display Module Components

After preparing the computer for service and removing the front cover, you can service the display module components. All display module components can be serviced in any sequence. The display module includes:

o Display/digitizer assembly
o Digitizer
o Inverter board
o LED/switch cable

Chapter 3.2 REMOVING THE COMPUTER FROM FLEXCONNECT

If the computer is installed on a FlexConnect, you must remove it from the FlexConnect before attempting to perform any of the service procedures. To separate the computer from the FlexConnect, perform the following steps:

1. Actuate the standby switch on the computer to place it in Standby.

2. Turn off the FlexConnect and any external equipment.

3. Using the clutch levers, lower the FlexConnect to a horizontal position.

4. Disconnect the computer from the FlexConnect by gently pressing on the computer eject levers located on each side of the FlexConnect (Figure 3-1).

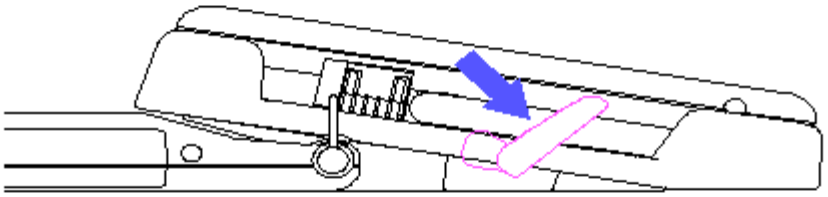

Figure 3-1. Seperating the Computer from the FlexConnect

Chapter 3.3 COMPUTER PREPARATION

Before beginning the removal and replacement procedures, follow these steps to prepare the computer for service:

1. Remove the computer from the FlexConnect, if applicable (Section 3.2). If the computer is not installed in a FlexConnect, go to step 2.

2. Turn off the computer and disconnect all external peripherals.

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

The computer power should be turned off before any cables are connected or disconnected.

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3. Disconnect the AC adapter from the computer (Figure 3-2).

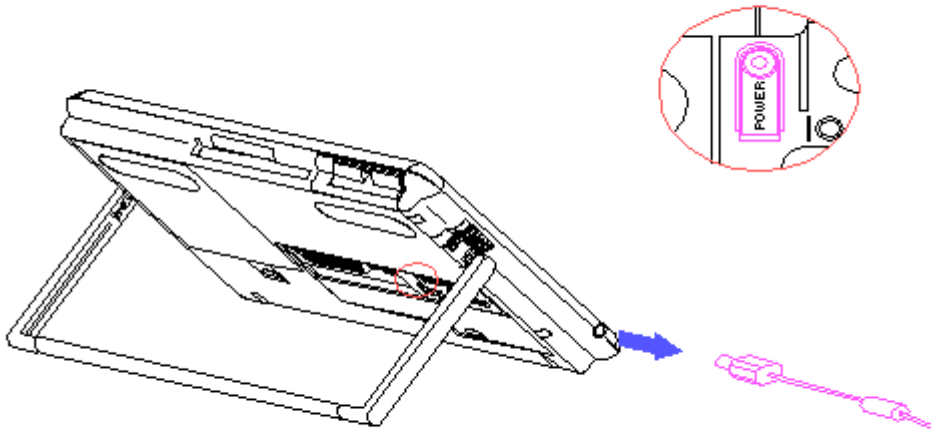

Figure 3-2. Disconnecting the AC Power Cord

4. Follow these steps to separate the keyboard from the computer:

   a. Open the keyboard foot by pulling it up from the bottom (Figure 3-3).

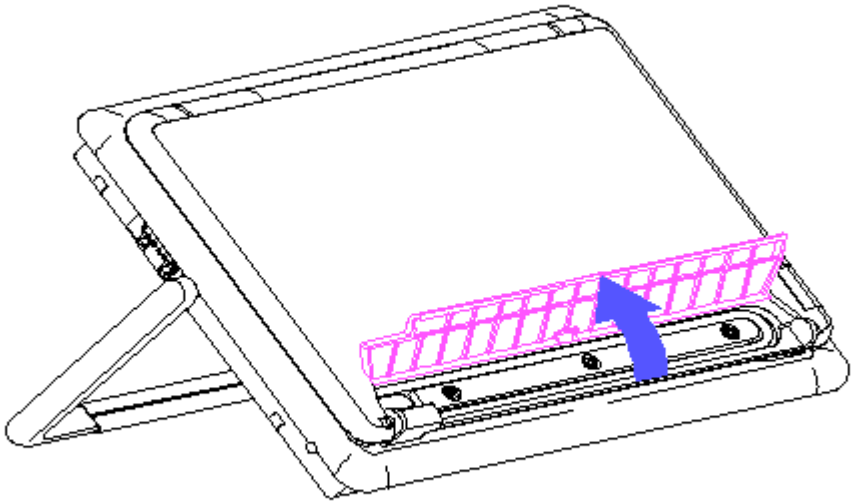

Figure 3-3. Opening the Keyboard Foot

   b. Remove the keyboard cable from the tray (Figure 3-4).

   c. Release the keyboard by sliding the two latches toward the center of the keyboard (Figure 3-4).

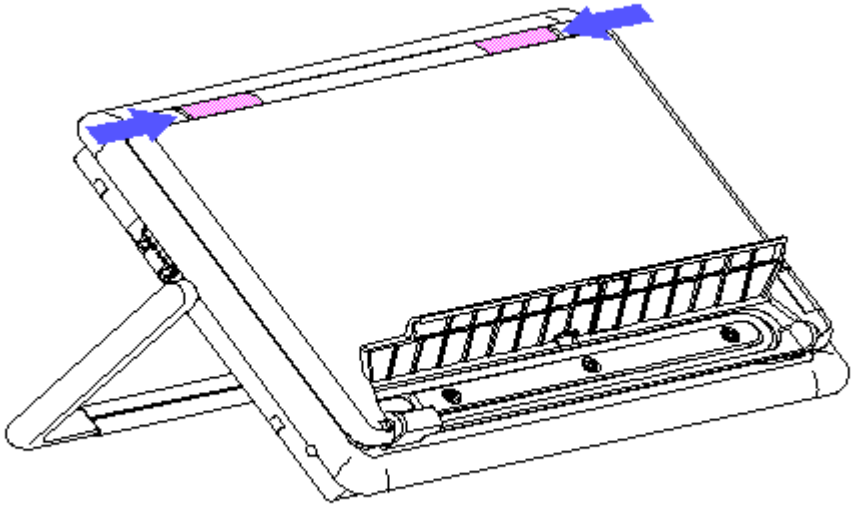

Figure 3-4. Unlatching the Keyboard

d. Pivot the keyboard on its hinges to a position that is perpendicular to the display (Figure 3-5).

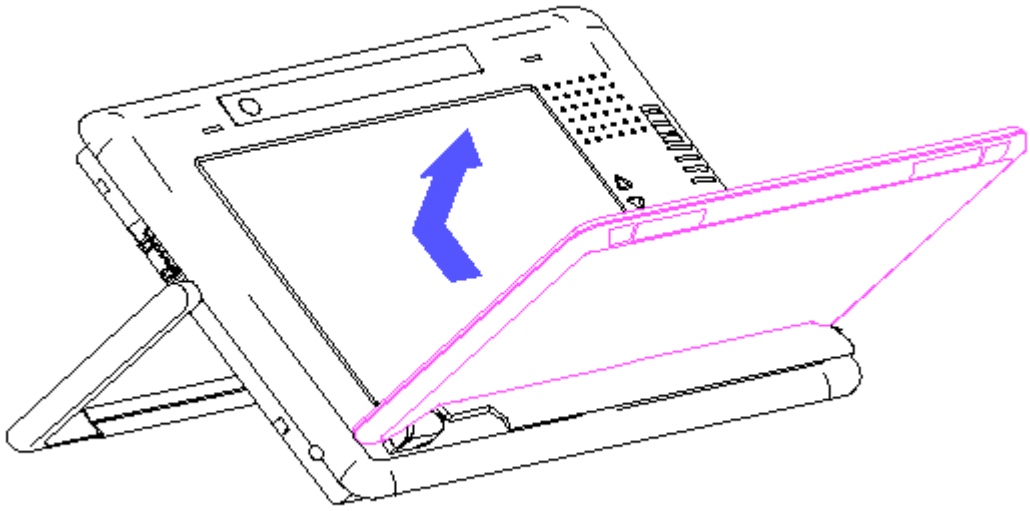

Figure 3-5. Releasing the Keyboard

e. While maintaining the perpendicular orientation, slide the keyboard toward the top of the display and pull it away from the computer (Figure 3-5).

f. Disconnect the keyboard cable from the computer (Figure 3-6).

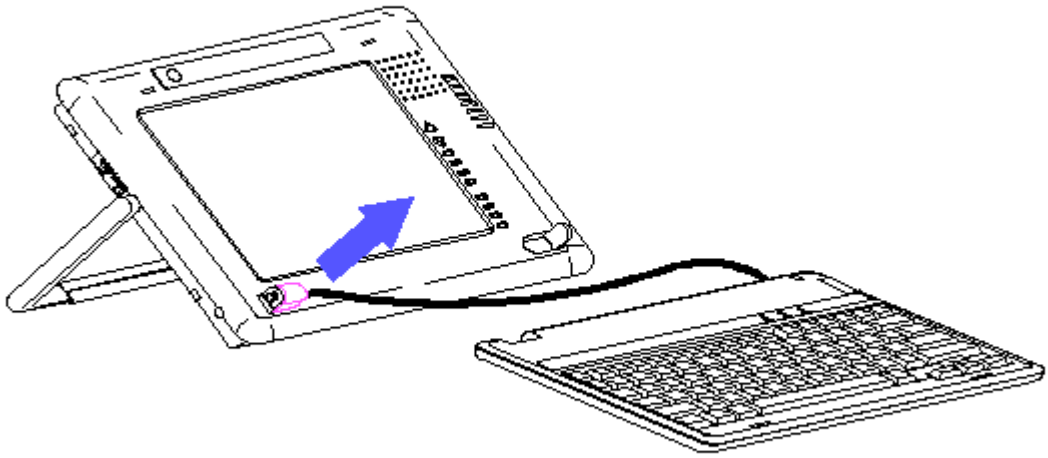

Figure 3-6. Disconnecting the Keyboard

5. Follow these steps to remove the battery pack from the computer:

   a. Place the computer, display side down, on a smooth surface.

   b. Slide the battery release latch away from the battery pack (Figure 3-7). The ejector spring located under the battery pack will push the battery pack up for removal.

   c. Remove the battery pack by lifting it out of the battery compartment.

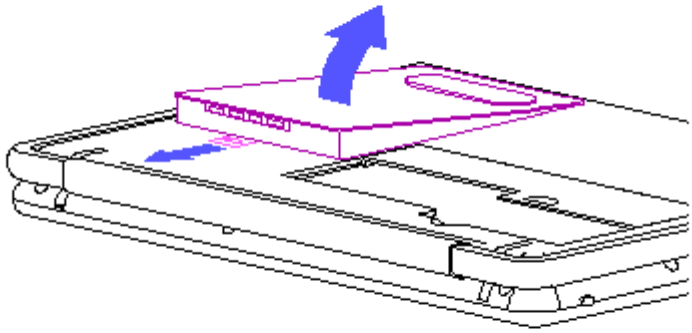

Figure 3-7. Removing the Battery Pack

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

Metal objects can damage the battery pack and the connectors in the battery compartment. To prevent damage, do not let metal objects touch any of the connectors. Do not place any objects other than the battery pack or battery replica in the battery compartment.

>>

6. The computer is now ready for service.

Chapter 3.4 REMOVING AND REPLACING THE COVERS

The computer consists of a display unit and a system unit that share a common chassis. This display-chassis-system subassembly is enclosed between the plastic covers. Access to any of the display or system components begins with the removal of the covers.

IMPORTANT: Before removing the covers, maker certain that there is no diskette in the diskette drive and no PCMCIA card in the PCMCIA slot.

To remove the covers, follow these steps:

1. If applicable, remove the computer from the FlexConnect (Section 3.2).

2. Complete the steps in the preparation procedure (Section 3.3).

3. Remove the ten screws from the back cover in the following sequence:

a. Remove the screw from the PCMCIA hard drive bezel (Figure 3-8).

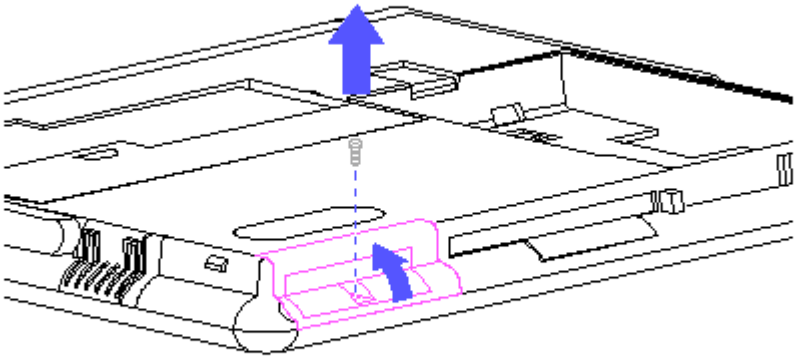

Figure 3-8. Removing the Screw from the PCMCIA Door

b. Open the PCMCIA door and remove the screw located behind the door (Figure 3-9).

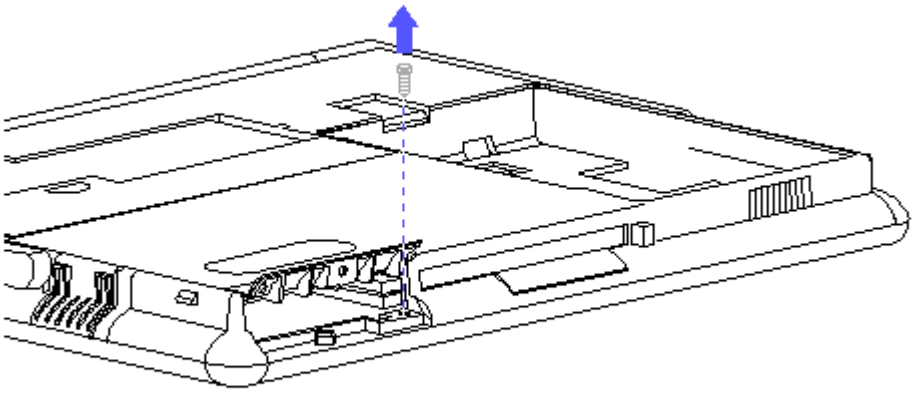

Figure 3-9. Removing the Screw Behind the PCMCIA Door

c. Open the I/O door and remove the screw adjacent to the keyboard connector (Figure 3-10).

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

This is a size 4-40 screw and is a different size than all the other rear cover screws. Take the necessary precautions to ensure that the proper screw is installed at reassembly.

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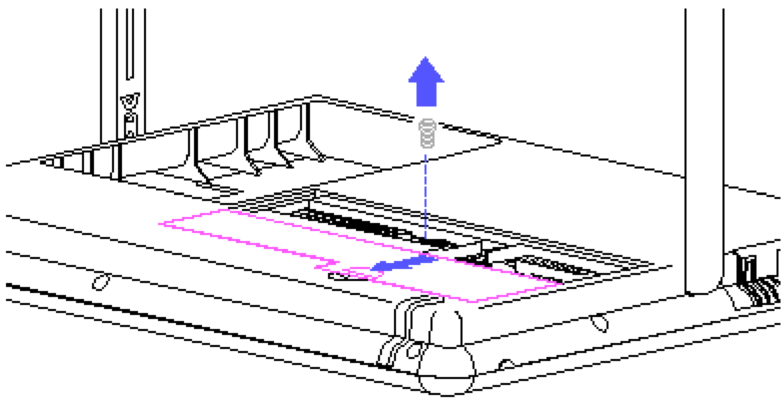

Figure 3-10. Removing the Screw Behind the I/O Door

d. Remove the remaining seven screws around the periphery of the cover (Figure 3-11).

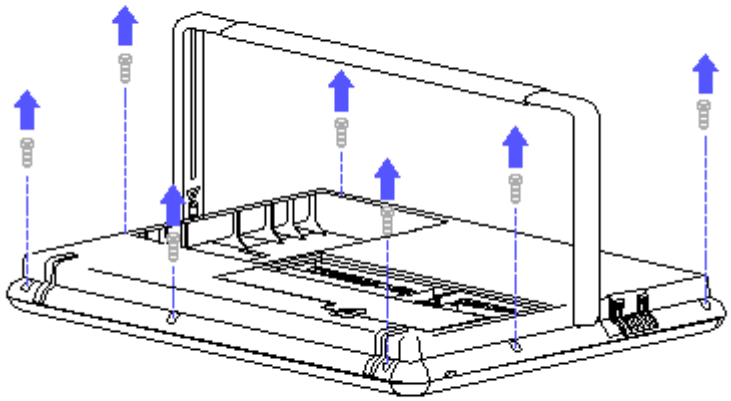

Figure 3-11. Removing the Remaining Seven Screws

4. Lift the back cover off the computer (Figure 3-12).

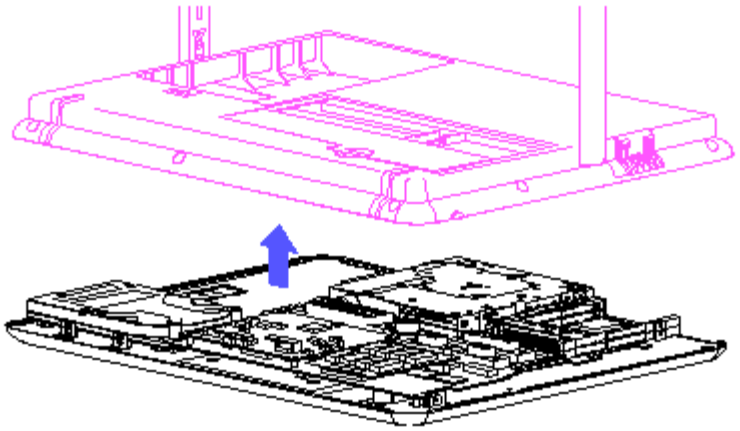

Figure 3-12. Removing the Back Cover

5. Disconnect the auxiliary battery from the system board (Figure 3-13).

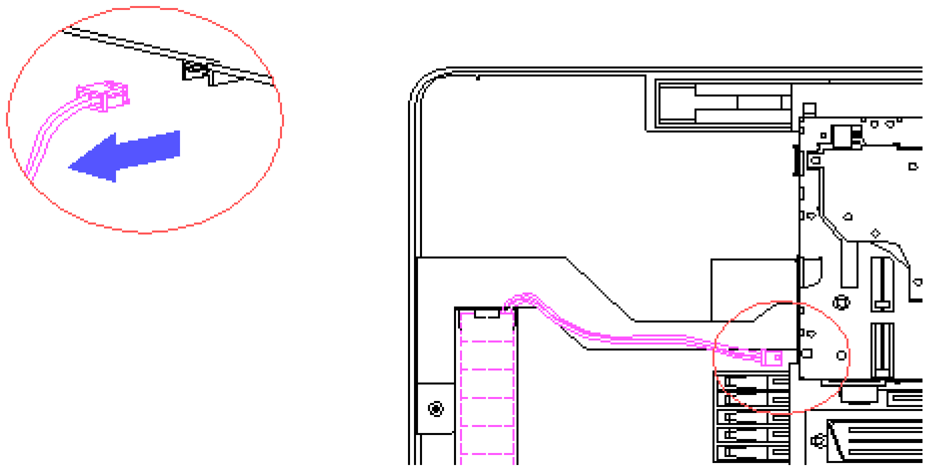

Figure 3-13. Disconnecting the Auxiliary Battery

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

To prevent damage to electronic components, always disconnect the auxiliary battery after removing the back cover.

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>><<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

6. The display-chassis-system subassembly can now be separated from the front cover (Figure 3-14). However, it is recommended that you use the front cover to support the assembly when servicing the system components.

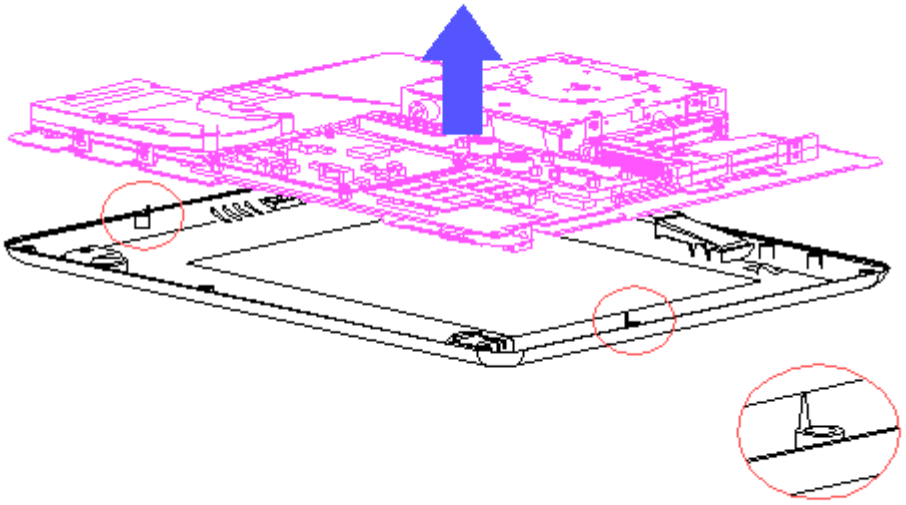

Figure 3-14. Separating the Display-Chassis-System Assembly from the Front Cover

7. Reverse steps 3 through 6 to replace the covers.

NOTE: There are two locating pins on the inside of the front cover for proper alignment of the display-chassis-system subassembly. Make certain that these locating pins are seated in the holes provided in the chassis (Figure 3-14).

NOTE: Check that the covers are seated along all edges before installing the screws. You may have to snap the covers together in the vicinity of the diskette drive.

Chapter 3.5 REMOVING FRONT COVER COMPONENTS

The serviceable components on the front cover are:

- Pen park
- Keyboard pivots
- Switch actuator

Pen Park

The pen park snaps into place at the top of the CPU cover. It is not necessary to remove the CPU cover to remove or install the pen park. To remove and install a pen park, complete the following steps:

1. Remove the computer from the FlexConnect, if applicable (Section 3.2). If the computer is not mounted on a FlexConnect, go to step 2.

2. Open the pen park, and using a twisting action, (Figure 3-15), remove the pen park.

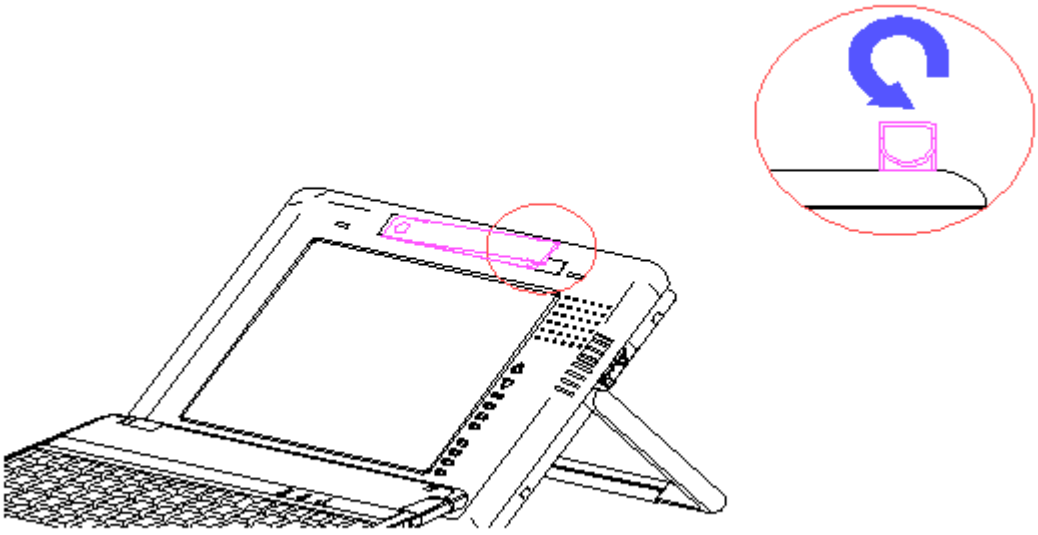

Figure 3-15. Removing the Pen Park

3. Use the same technique described in step 2 to install a new pen park.

Keyboard Hinges

The keyboard hinges are not designed to be removed. However, if a keyboard hinge should break, a replacement hinge can be installed without removing the CPU cover. Follow these steps to install a replacement hinge:

1. Remove the computer from the FlexConnect, if applicable (Section 3.2). If the computer is not mounted on a FlexConnect, proceed directly to step 2.

2. Complete the preparation steps included in Section 3.3.

3. To install the hinge, engage one side of the hinge in its seat and snap the hinge into place (Figure 3-16). This is a fairly tight fit so you may have to exert considerable pressure.

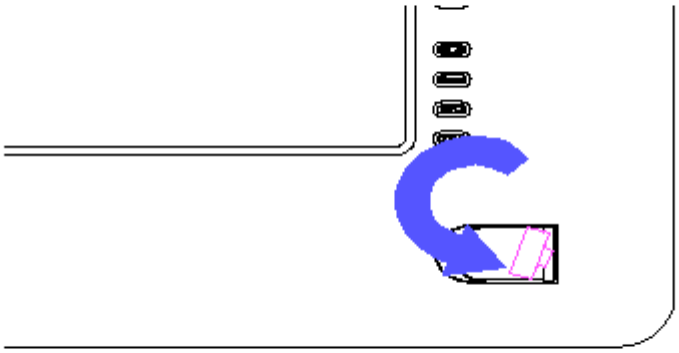

Figure 3-16. Installing the Keyboard Pivot

Standby Switch Actuator

The standby switch actuator is snap fit and is held in place by two tabs on the back side of the actuator that engage the CPU cover. To remove and install a switch actuator, follow these steps:

1. Remove the computer from the FlexConnect, if applicable (Section 3.2). If the computer is not mounted on a FlexConnect, proceed directly to step 2.

2. Complete the preparation steps included in Section 3.3.

3. Remove the covers (Section 3.4).

4. From the rear of the CPU cover, disengage the switch actuator tabs to release the actuator from the cover (Figure 3-17), and free the actuator spring (Figure 3-18).

   NOTE: The actuator spring is secured in its seat on the front of the CPU cover by the standby switch actuator. When you release the actuator, the spring is loose in its seat. Take care not to lose the spring.

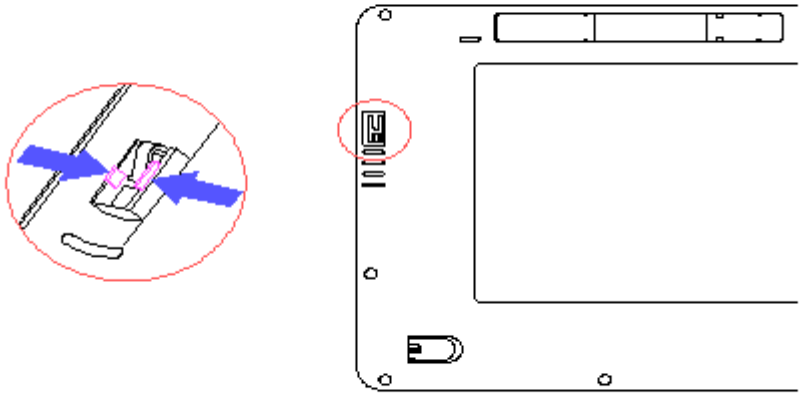

Figure 3-17. Releasing the Switch Actuator

5. To install a standby switch actuator, follow these steps:

   a. Install the actuator spring (Figure 3-18).

   b. Beginning at the top of the opening in the cover for the switch actuator, slide the switch actuator into position and then snap it into place (Figure 3-18).

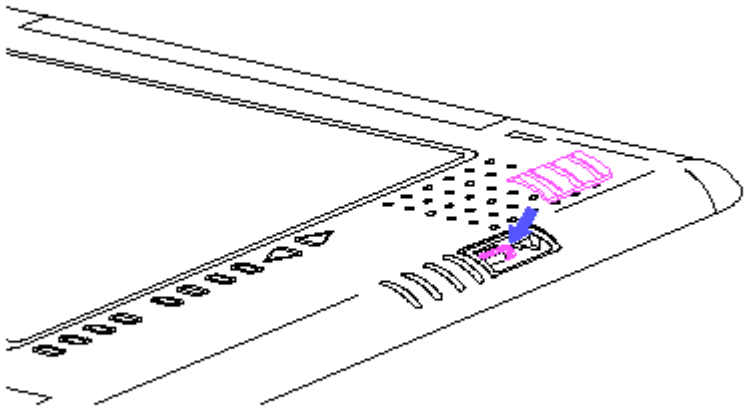

Figure 3-18. Installing the Actuator Spring and Actuator

Chapter 3.6 REMOVING REAR COVER COMPONENTS

The serviceable components on the rear cover are:

- Feet
- I/O door
- PCMCIA door
- PCMCIA hard drive bezel
- Diskette drive bezel
- Battery latch
- Battery eject spring
- Foot latch

Feet

The feet are located at the bottom of the rear cover and are held in place by a snap fit. No adhesives or mechanical fasteners are used. It is not necessary to remove the cover to remove or install a foot.

1. To remove a foot, pull out at the top of the foot (Figure 3-19) and then slide it out at the bottom.

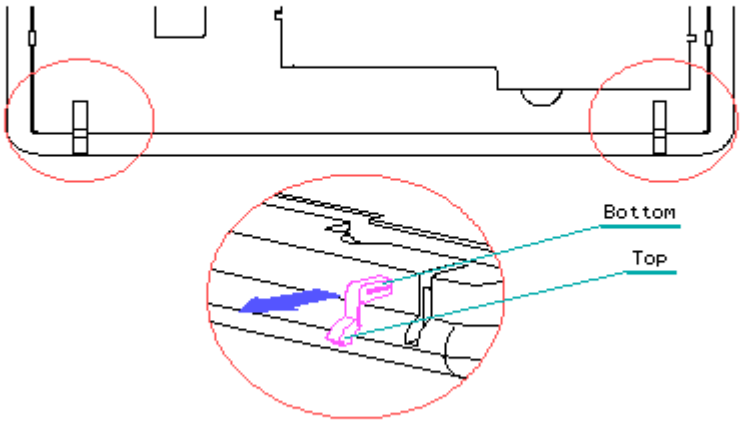

Figure 3-19. Removing a Foot

2. To install a foot, reverse the removal procedure. Insert the foot at the bottom and push it in as far as it will go. Then press the top of the foot into place (Figure 3-19).

I/O Door

The I/O door can be removed and replaced without removing the rear cover.

The door is made of a flexible plastic which rides in tracks provided in the rear cover. To remove the I/O door, follow these steps:

1. Slide the door to the center of its travel to disengage the retaining hooks that secure the door in a closed position (Figure 3-20).

2. Lift the door near its center and flex it enough to allow the ends to slip out of the tracks (Figure 3-20). Reverse this process to install a new I/O door.

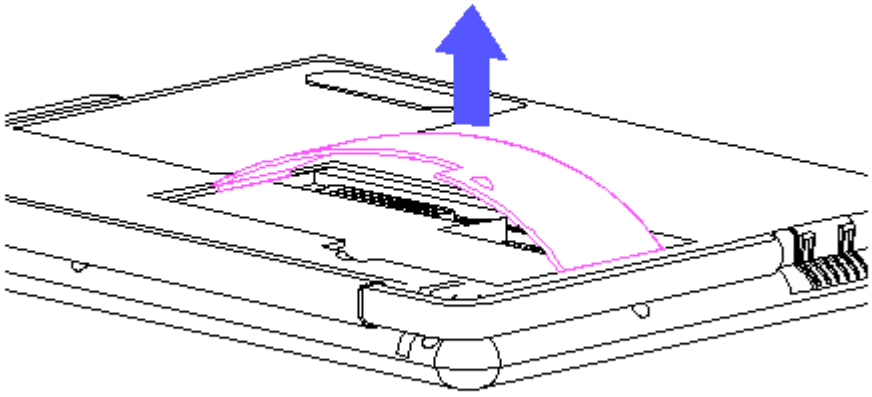

Figure 3-20. Removing the I/O Door

PCMCIA Door

The PCMCIA door is not designed to be removed and it is advised that it not be removed unless absolutely necessary. In the event that you do have to remove the door, it can be removed and replaced without removing the rear cover. The door is snapped into place. To remove and replace the PCMCIA door, complete the following steps:

1. Open the PCMCIA door. If the bezel is in place, it will be necessary to remove the screw from the door so you can open the door.

2. The PCMCIA door pivots on two pivot posts on the back cover. Sockets across the rear edge of the PCMCIA door engage these pivot posts. There is an opening on one side of the sockets to allow the door to snap off of the pivot posts. With the computer resting display side down, orient the open PCMCIA door so the openings in the sockets are on top.

3. Flex the door slightly while pushing down to snap the door out (Figure 3-21).

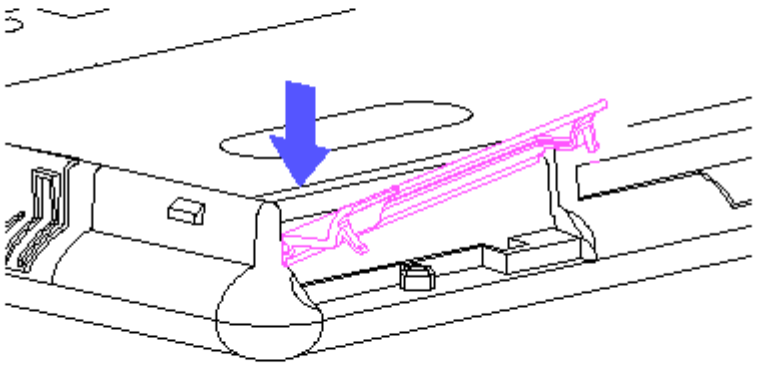

Figure 3-21. Removing the PCMCIA Door

4. To install the PCMCIA door, engage one end on its pivot post and snap the other end into place (Figure 3-22). Replace the screw in the door if applicable.

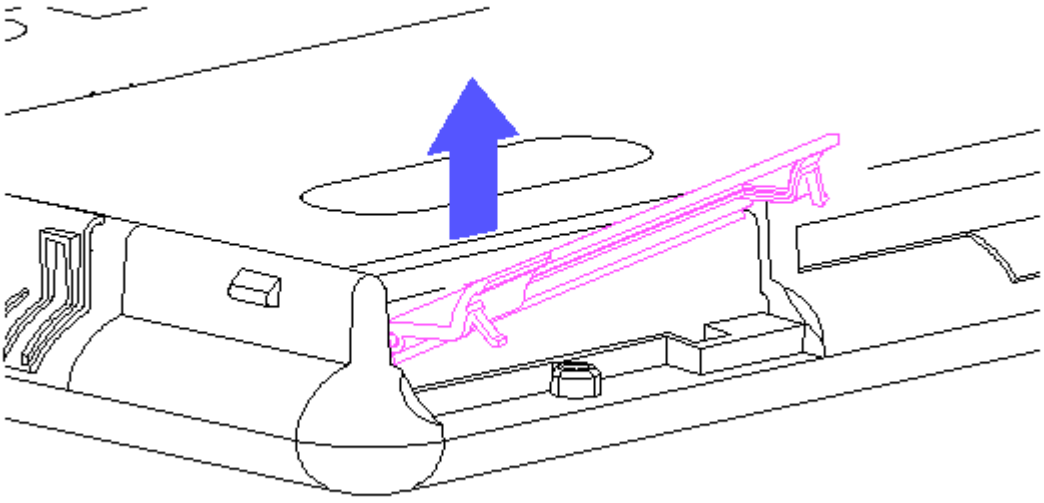

Figure 3-22. Installing the PCMCIA Door

PCMCIA Hard Drive Bezel

NOTE: The PCMCIA hard drive bezel serves to secure PCMCIA hard drives or other PCMCIA cards without external connections into place. It is removable for use with cards that do have external connections.

The PCMCIA hard drive bezel snaps into place from the outside of the PCMCIA door. To remove and replace the bezel, complete the following steps:

1. Remove the computer from the FlexConnect, if applicable (Section 3.2). If the computer is not mounted on a FlexConnect, proceed directly to step 2.

2. Remove the screw from the PCMCIA bezel.

3. Open the PCMCIA door.

4. Remove the bezel by applying pressure along the edge where the screw hole is located, pushing the bezel toward the outside of the PCMCIA door. (Figure 3-23).

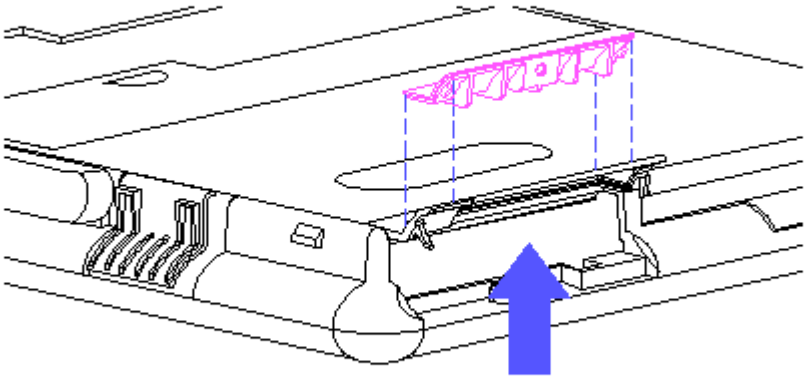

Figure 3-23. Removing the PCMCIA Hard Drive Bezel

5. Replace the bezel by snapping it into place from the outside of the PCMCIA door. You can do this with the PCMCIA door closed. Engage the edge closest to the pivot points, then snap the other side into place (Figure 3-24).

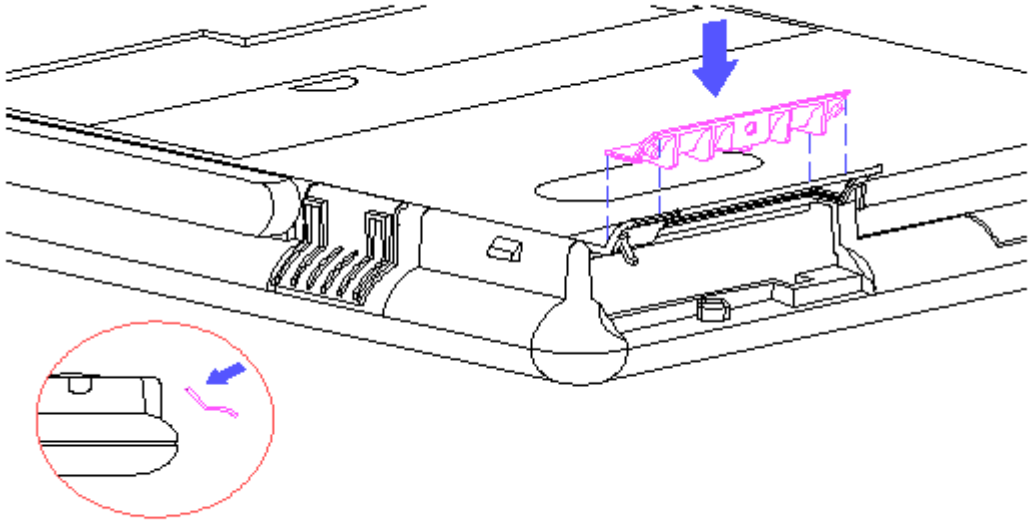

Figure 3-24. Installing the PCMCIA Hard Drive Bezel

Diskette Drive Bezel

The diskette drive bezel snaps into place from the inside of the back cover. Therefore, the back cover must be removed for this procedure. To remove and replace the bezel, complete the following steps:

1. Remove the computer from the FlexConnect, if applicable (Section 3.2). If the computer is not installed in a FlexConnect, go to step 2.

2. Complete the preparation steps included in Section 3.3.

3. Remove the back cover (Section 3.4).

4. Remove the diskette drive bezel by pushing it toward the inside of the back cover and then sliding it up and out of the cover (Figure 3-25).

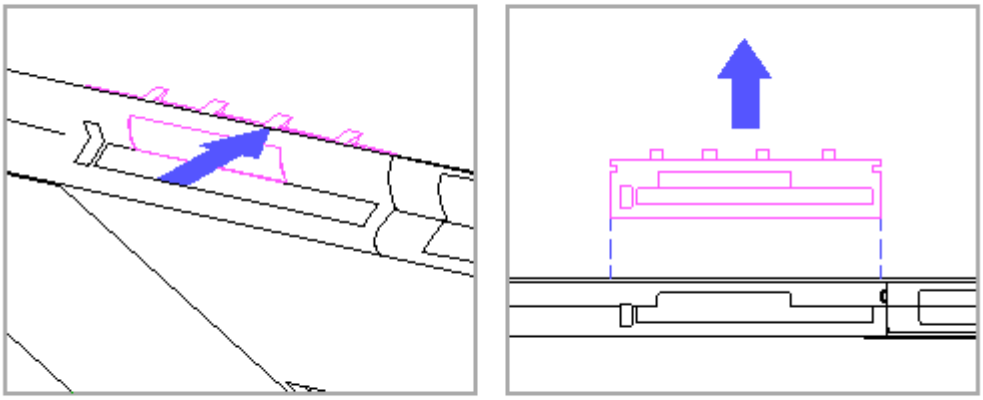

Figure 3-25. Removing the Diskette Drive Bezel

5. Install a diskette drive bezel by sliding it down into place, engaging its mounting tracks, and applying pressure toward the outside of the cover to snap it into place (Figure 3-26).

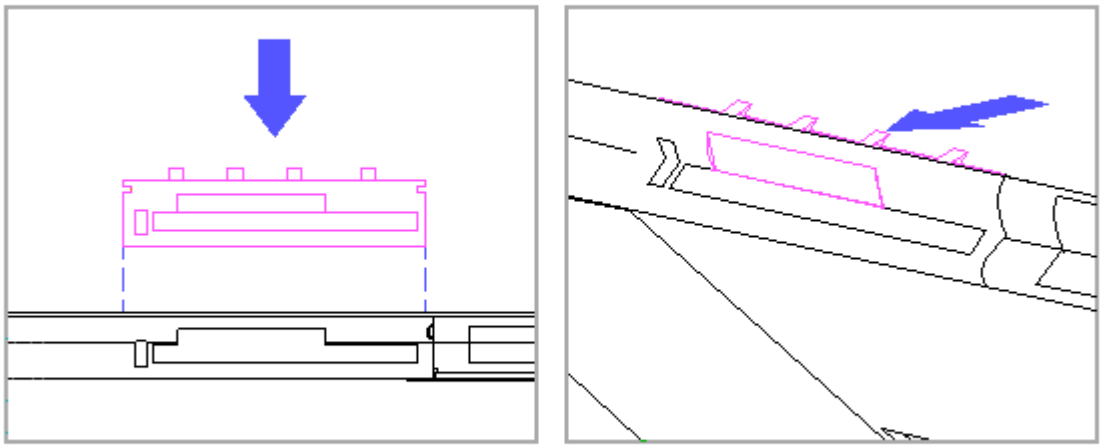

Figure 3-26. Installing the Diskette Drive Bezel

6. Replace the back cover.

Battery Latch

The back cover must be removed to allow removal of the battery latch. To remove and replace the battery latch, complete the following steps:

1. Remove the computer from the FlexConnect, if applicable (Section 3.2). If the computer is not installed in a FlexConnect, go to step 2.

2. Complete the preparation steps included in Section 3.3.

3. Remove the back cover (Section 3.4).

4. Working from the inside of the back cover, gently lift the tab that holds the battery latch in place (Figure 3-27). The latch spring should provide enough force to push the latch out from under the tab.

NOTE: The battery latch spring is secured in its seat by the latch. When the latch is released, the spring is loose in its seat. Take care not to lose the spring.

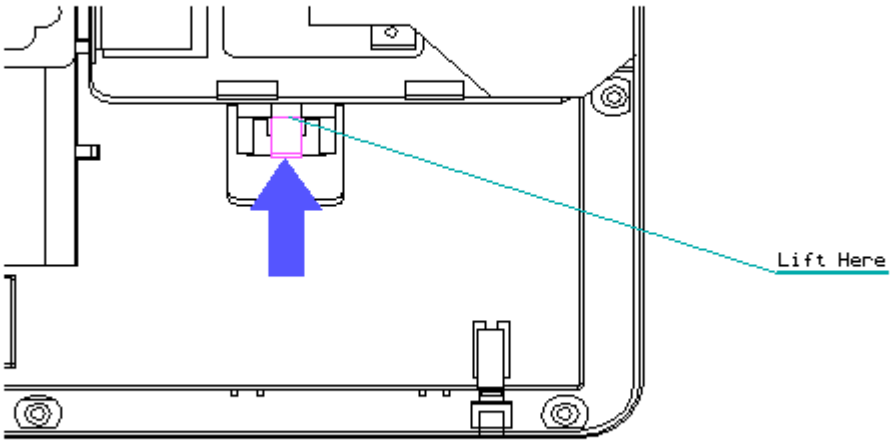

Figure 3-27. Releasing the Battery Latch

5. Turn the back cover over and remove the latch and spring (Figure 3-28).

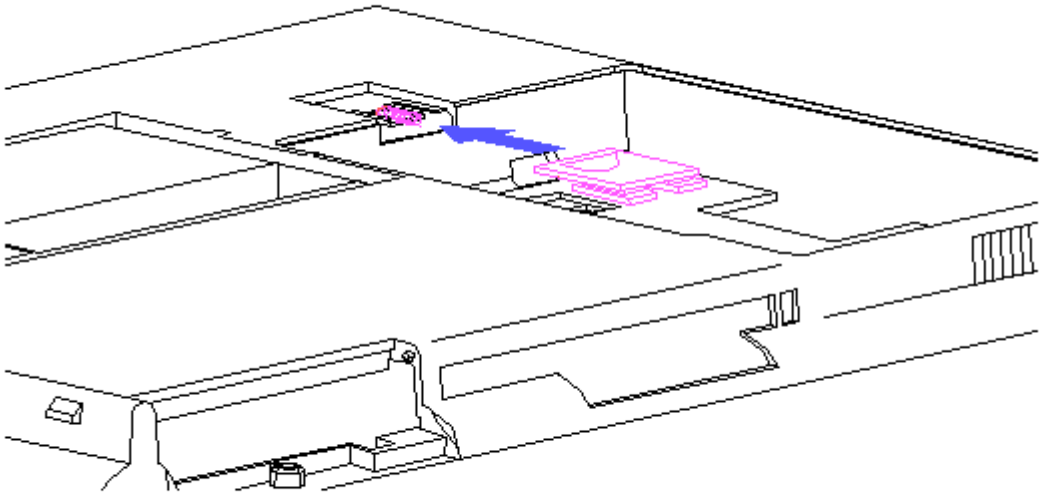

Figure 3-28. Removing and Replacing the Latch and Spring

6. To install the latch and spring, position the spring in its seat and snap the latch into place (Figure 3-28).

Battery Eject Spring

The rear cover must be removed to remove and install the battery eject spring. To remove and replace the battery eject spring, complete the following steps:

1. Remove the computer from the FlexConnect, if applicable (Section 3.2). If the computer is not installed in a FlexConnect, go to step 2.

2. Complete the preparation steps included in Section 3.3.

3. Remove the back cover (Section 3.4).

4. Working from inside the back cover and taking care not to disturb the battery shield, use a small, flat-blade screwdriver to lift the eject spring tab off of the boss on the back cover (Figure 3-29).

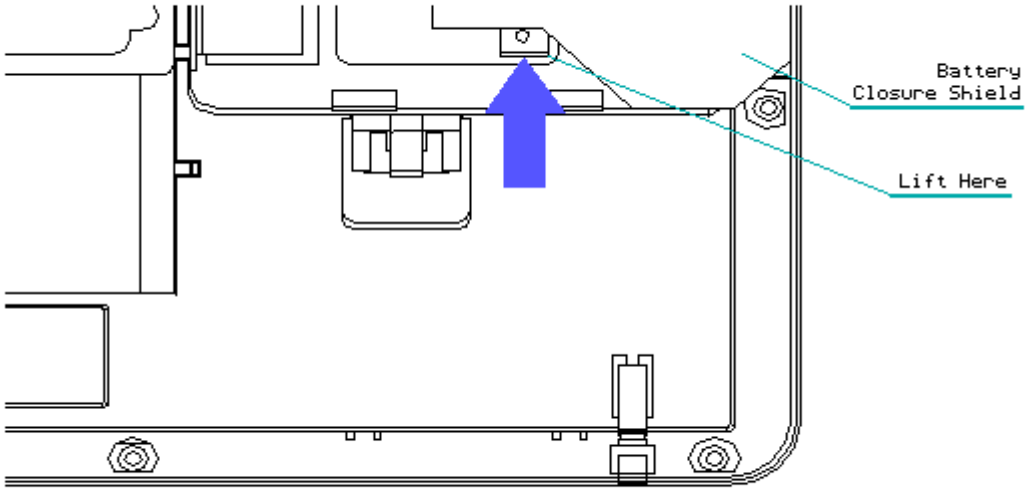

Figure 3-29. Releasing the Battery Eject Spring

5. Turn the back cover over and slide the eject spring out (Figure 3-30).

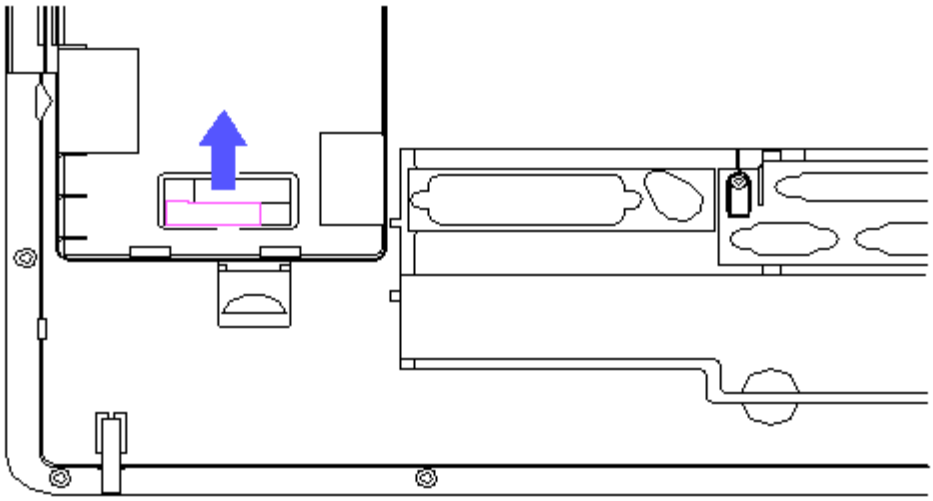

Figure 3-30. Removing the Battery Eject Spring

6. Reverse steps 4 and 5 to install a new spring, making certain the hole in the spring is seated over the boss on the inside of the cover.

7. Replace the back cover.

Foot Latch

The back cover must be removed to allow removal of the foot latch. To remove and replace the foot latch, complete the following steps:

1. Remove the computer from the FlexConnect, if applicable (Section 3.2). If the computer is not installed in a FlexConnect, go to step 2.

2. Complete the preparation steps included in Section 3.3.

3. Remove the back cover (Section 3.4).

4. Working from the inside of the back cover, release the tab that holds the foot latch in place (Figure 3-31).

NOTE: One of the foot latch tabs is hidden from view by the battery closure shield. The shield can be lifted sufficiently to release the tab.

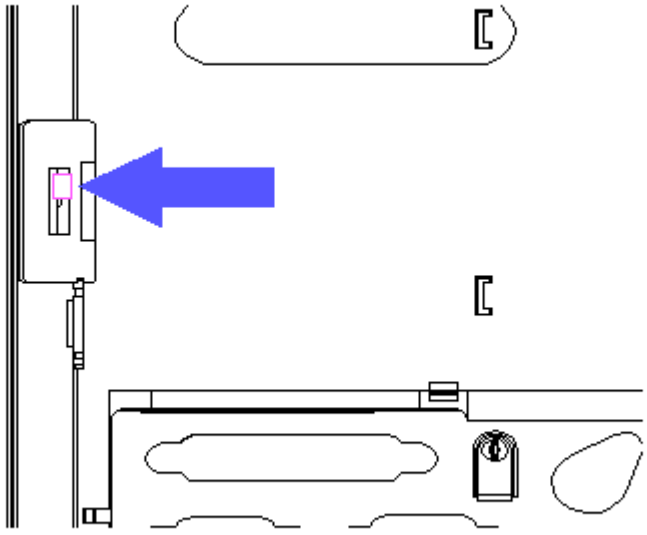

Figure 3-31. Releasing the Foot Latch Tab

5. To install a new foot latch, insert the latch from the outside of the cover and snap it into place (Figure 3-32).

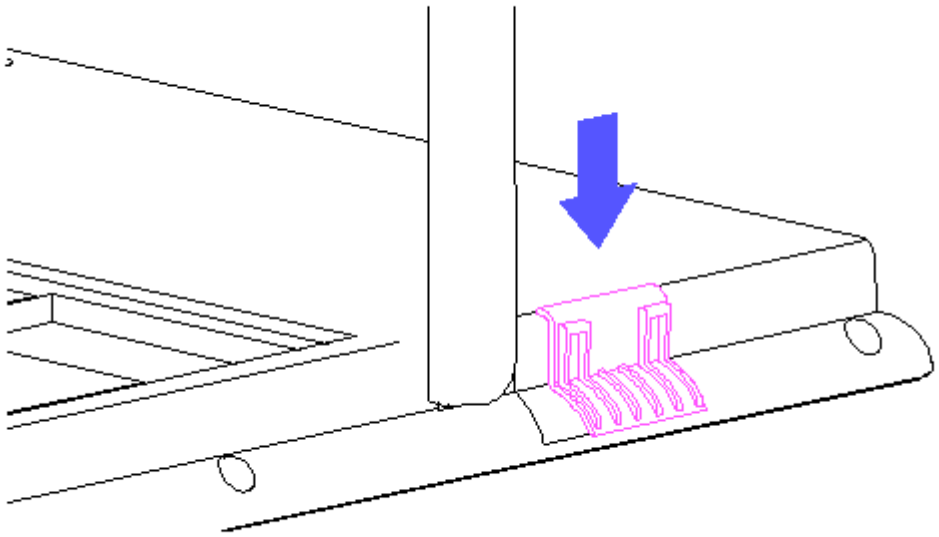

Figure 3-32. Installing a Foot Latch

Chapter 3.7 REMOVING THE DISPLAY MODULE COMPONENTS

The following components are located in the display module:

- Display/Digitizer assembly
- Inverter board
- LED/Speaker cable

These components are mounted independent of each other and can be removed or replaced in any sequence.

Removing the Display/Digitizer

The display/digitizer consists of the display panel, display spacer, digitizer panel, and display shield. The display spacer rests in the cavity on the back of the display panel to provide a flat contact surface for the digitizer panel. The spacer is held to the display panel with a strip of tape along each side. The display panel and digitizer panel are fastened together with double-sided adhesive tape and a metal pan. This display-spacer-digitizer subassembly rests in the display shield. The entire subassembly is mounted to the chassis as a unit. To remove the subassembly, complete the following steps:

1. Remove the computer from the FlexConnect, if applicable (Section 3.2). If the computer is not mounted on a FlexConnect, proceed directly to step 2.

2. Complete the preparation steps included in Section 3.3.

3. Remove the covers (Section 3.4).

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

To prevent damage to electronic components, always disconnect the auxiliary battery after removing the back cover.

>><<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

4. Place the display-chassis-system subassembly, display side up, in the back cover of the computer. This will protect the system module components during service.

5. Disconnect the display cable from the system and disconnect the inverter cable at the inverter (Figure 3-33). Retain the ferrite bead for reassembly.

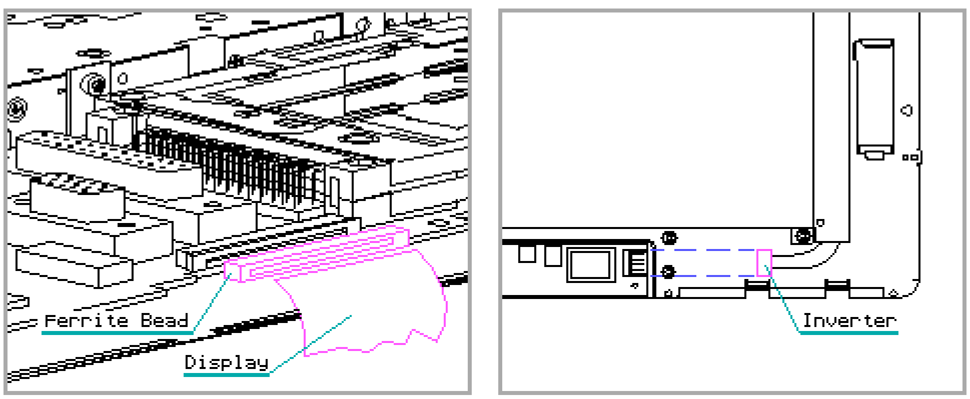

Figure 3-33. Disconnect the Display and Inverter Cables

NOTE: Removal of the inverter board shield will make it easier to disconnect the inverter cable. See the "Display Inverter Board" section later in this chapter.

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

The display/digitizer unit is attached to the system board by a hidden cable routed through the chassis. Take care not to damage this cable when lifting the display from the chassis.

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6. Remove the five T-8 slotted Torx screws that attach the display to the chassis (Figure 3-34).

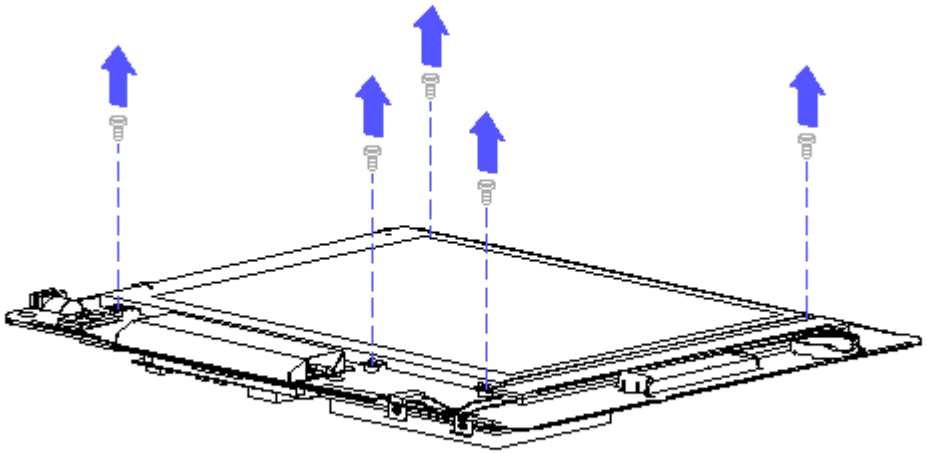

Figure 3-34. Removing the Display/Digitizer Mounting Screws

7. Carefully lift the display assembly (digitizer/spacer/display), with display shield attached, away from the chassis and disconnect the digitizer cable ZIF connector (accessible through a cutout in the chassis) from the system board (Figure 3-35).

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

Take care not to disturb the hard drive shield that is taped to the display side of the chassis. The computer cannot function properly if this shield is removed or damaged.

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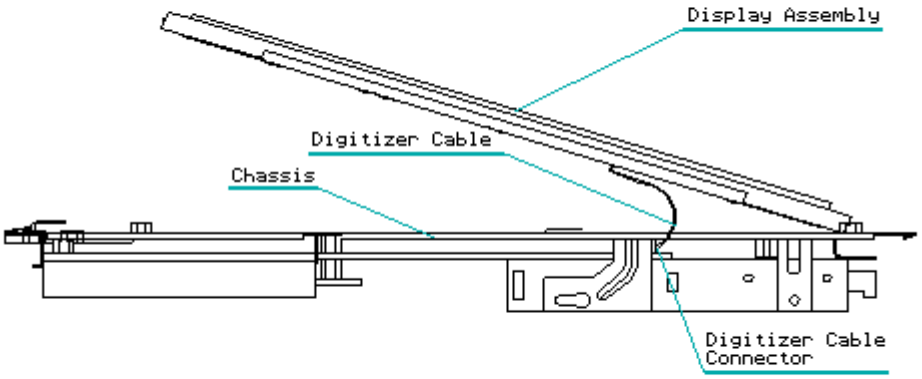

Figure 3-35. Disconnecting the Digitizer Cable

8. Separate the display assembly from the display shield, allowing the digitizer cable to pass through the cutout provided in the shield (Figure 3-36).

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

Use extreme caution when handling the digitizer cable. Avoid contacting the display shield with the cable. If the silver signal traces on the cable are scratched or damaged, the digitizer will not function.

>>

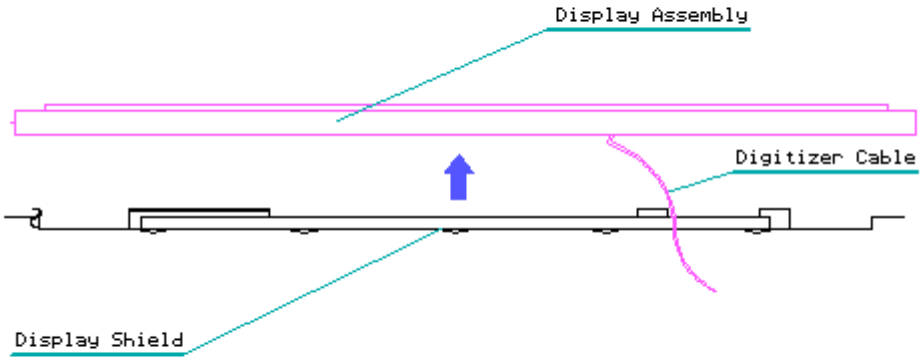

Figure 3-36. Separating the Display Assembly from the Display Shield

9. You can replace the display, spacer, and digitizer as a unit or replace the digitizer only. To replace the display, spacer, and digitizer as a unit, reverse the procedure in steps 1 through 7 above. To replace the digitizer only, complete the following procedure.

Separating the Digitizer from the Display Panel

The digitizer is attached to the display with double-sided adhesive tape. To separate the digitizer from the display panel, grasp the digitizer at one corner and peel it away from the display (Figure 3-37). Remove any remaining tape residue from the display.

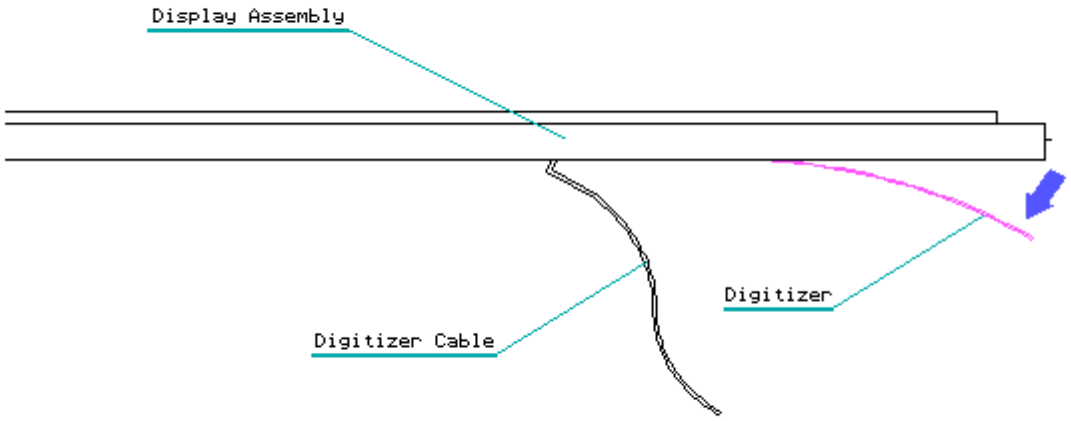

Figure 3-37. Separating the Digitizer from the Display Panel

Installing the Digitizer

Two strips of double-adhesive tape are installed on the digitizer. There is a hole and a slot on the digitizer that mate with pins on the rear of the display for alignment. To install the digitizer onto the display panel, complete the following steps:

1. Lay the display panel face down on a clean work surface.
2. Remove the protective backing from the double-adhesive tape on the digitizer.
3. Align the round hole on the digitizer with its pin on the display panel and then align the slot with the other pin (Figure 3-38). Affix the digitizer to the display panel with the double-adhesive tape.

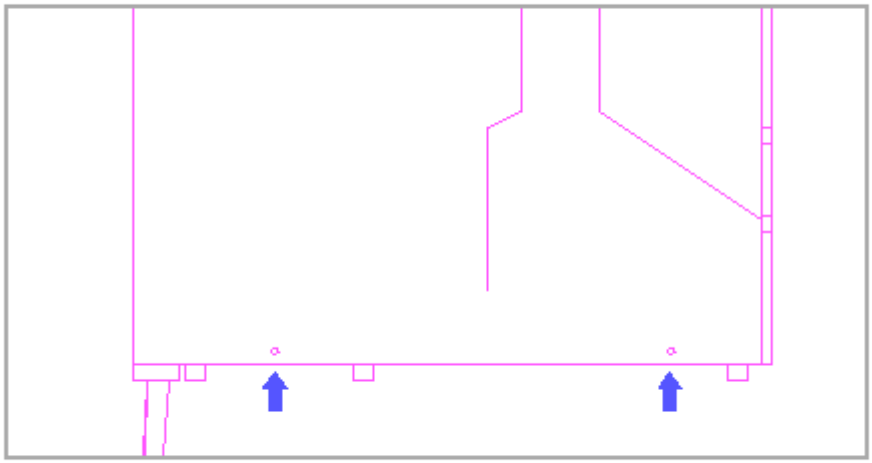

Figure 3-38. Installing the Digitizer

4. Place the display/digitizer assembly in the display shield, routing the digitizer cable through the cutout provided in the shield (Figure 3-39).

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

Use extreme caution when handling the digitizer cable. Avoid contacting the display shield with the cable. If the silver signal traces on the cable are scratched or damaged, the digitizer will not function.

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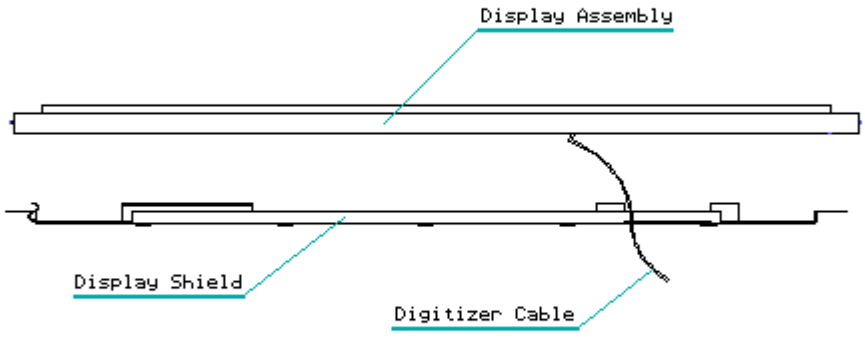

Figure 3-39. Placing the Display/Digitizer into the Display Shield

Installing the Display/Digitizer

To install the display assembly into the computer, complete the following steps:

1. Position the chassis, system side down, on a flat, clean surface.

2. Position the display assembly (display/spacer/digitizer/shield) with the display side away from the chassis and the bottom edge of the display assembly touching the bottom edge of the chassis (Figure 3-40).

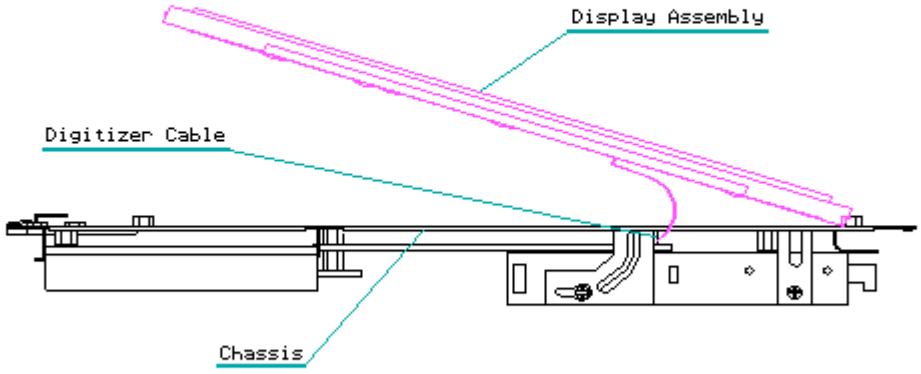

Figure 3-40. Installing the Display/Digitizer

3. Feed the digitizer cable connector through the opening in the chassis and plug it into its ZIF connector on the system board (if the system board is currently installed).

NOTE: If the system board is not currently installed, the digitizer cable can be connected from the system side of the chassis prior to diskette drive installation.

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

Take care not to disturb the hard drive shield that is taped to the display side of the chassis. The computer cannot function properly if this shield is removed or damaged.

>>>

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

Use extreme caution when handling the digitizer cable. Avoid contacting the chassis with the cable. If the silver signal traces on the cable are

scratched or damaged, the digitizer will not function.

>>>

4. Rotate the display/digitizer unit into position on the chassis and install the five T-8 slotted Torx screws.

5. Install the ferrite bead on the display cable and connect the display cable to the system board (Figure 3-41).

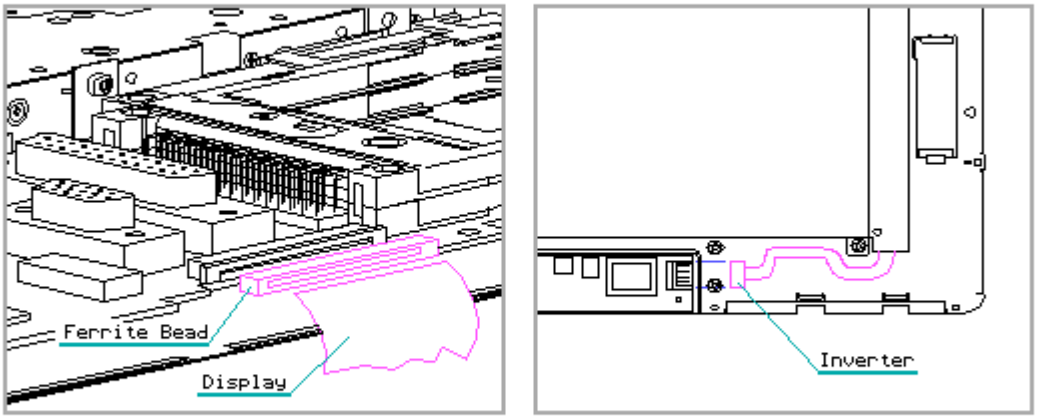

Figure 3-41. Connecting the Display Cable and Inverter Cable

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

The inverter cable must be routed close to the bottom edge of the display to avoid crimping of the cable by the well in the front cover for the keyboard hinge (Figure 3-41).

>>>

6. Connect the inverter cable to the inverter board (Figure 3-41).

7. Ensure that the speaker gasket is in place.

8. Connect the auxiliary battery to the system board and replace the covers.

Removing and Replacing the Display Inverter Board

To remove the display inverter board, complete the following steps:

1. Remove the computer from the FlexConnect, if applicable (Section 3.2). If the computer is not mounted on a FlexConnect, proceed directly to step 2.

2. Complete the steps included in Section 3.3.

3. Remove the covers (Section 3.4).

4. Place the display-chassis-system subassembly, display side up, on a clean work surface.

5. Remove the Torx T-8 slotted screw from the inverter shield (Figure 3-42) and remove the shield by lifting it at the end where the screw was installed. The opposite end of the shield is secured by tabs that engage cutouts in the chassis.

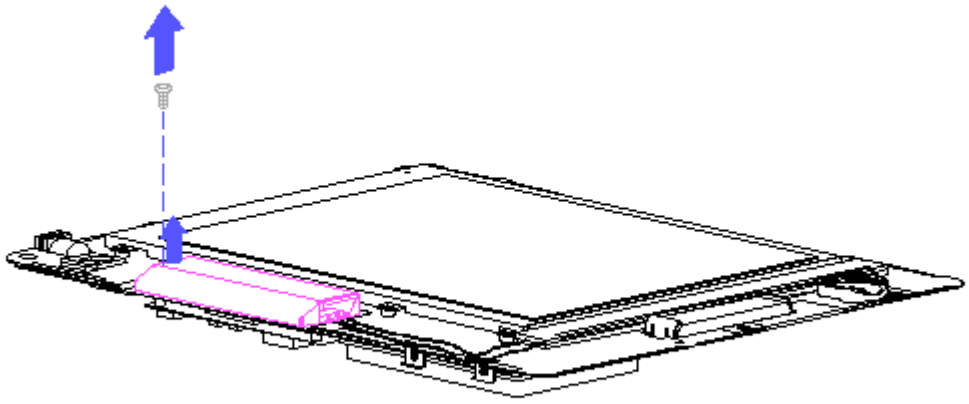

Figure 3-42. Removing the Inverter Shield

6. Disconnect the inverter cable at the inverter.

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

Do not pull on the cables to disconnect the inverter cable. Pull on the connector to disconnect.

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>><<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

7. Fold the inverter insulator out of the way and remove the T8 slotted Torx screw from the inverter board (Figure 3-43).

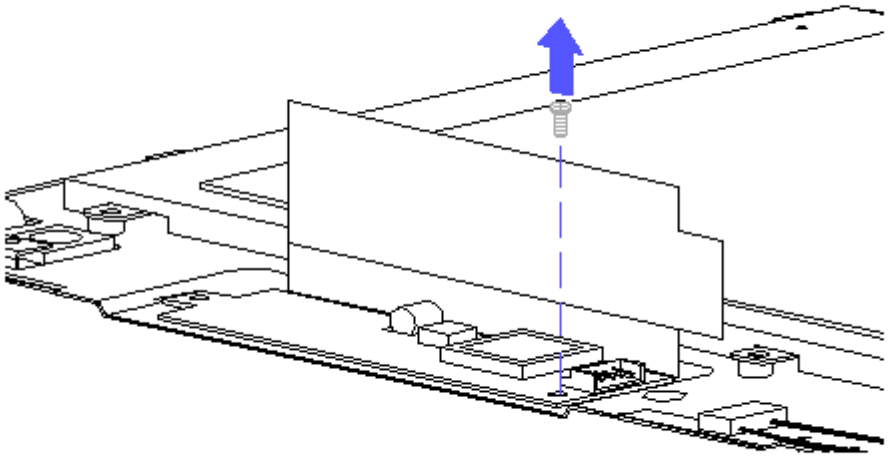

Figure 3-43. Removing the Inverter Board Mounting Screw

8. The inverter board connects directly to the system board with a connector on the back side of the board which accesses the system board through a cutout in the chassis. You will feel the resistance from this connector as you remove the inverter board. Remove the inverter board.

   NOTE: The inverter insulator has an adhesive backing that holds it to the chassis. Peel off and replace if necessary.

9. Reverse steps 1 through 8 to install the inverter board.

Removing and Replacing the LED/Switch Cable

The LED/Switch Cable is held to the chassis with two nylon snap fasteners. To remove an replace the LED/Switch Cable, complete the following steps:

1. Remove the computer from the FlexConnect, if applicable (Section 3.2). If the computer is not mounted on a FlexConnect, proceed directly to step 2.

2. Complete the steps included in Section 3.3.

3. Remove the covers (Section 3.4).

4. Place the display-chassis-system subassembly, display side up, on a clean work surface.

5. If the speaker gasket is damaged, remove it (Figure 3-44).

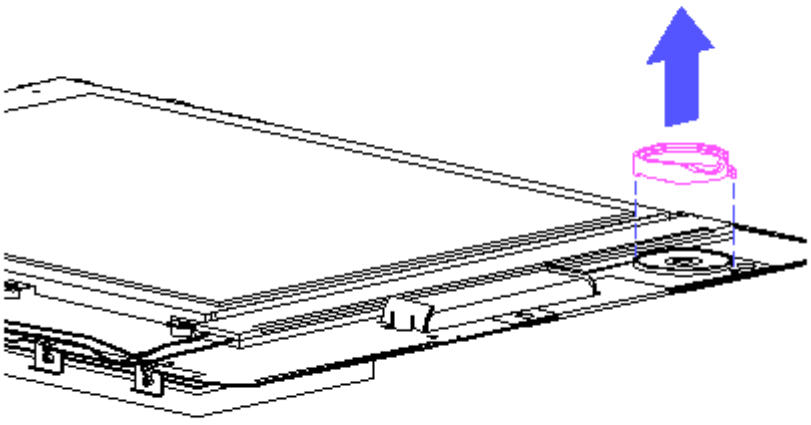

Figure 3-44. Removing the Speaker Gasket

6. Remove the two nylon snap fasteners that secure the speaker cable to the chassis (Figure 3-45).

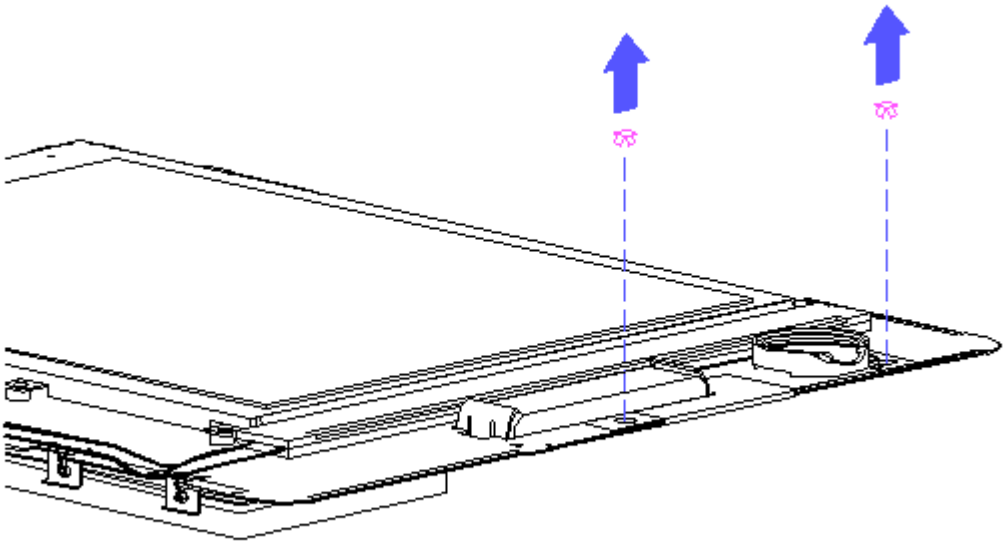

Figure 3-45. Removing the Snap Fasteners

7. Disconnect the LED/Switch Cable from its ZIF connector on the system board and remove the cable (Figure 3-46).

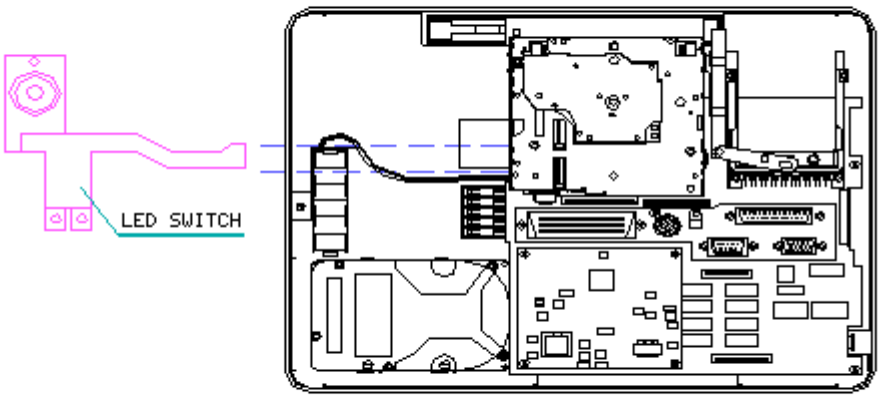

Figure 3-46. Disconnecting the LED/Switch Cable

8. Reverse the above procedure to replace the cable. The snap fasteners are mounted from the display side of the chassis.

Chapter 3.8 REMOVING THE SYSTEM MODULE COMPONENTS

Most system module components are readily accessible by removing only the rear cover. It is recommended that the auxiliary battery be disconnected from the system board during any maintenance inside the computer.

Removing the Hard Drive

The hard drive is mounted directly to the chassis and is located on the system side of the chassis. Therefore, to gain access to the hard drive for removal and installation, only the rear cover has to be removed.

NOTE: Your replacement hard drive may be either of two interchangeable types. The locations of the mounting holes for the two drives are slightly different but this difference is accommodated in the hard drive mounting brackets.

To remove the hard drive from the computer, complete the following steps:

1. Remove the computer from the FlexConnect, if applicable (Section 3.2). If the computer is not installed in a FlexConnect, go to step 2.

2. Complete the preparation steps included (Section 3.3).

3. Place the computer face down on a flat, clean surface and remove the rear cover (Section 3.4). Leave the system-chassis-display subassembly resting in the front cover.

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

To prevent damage to electronic components, always disconnect the auxiliary battery after removing the back cover.

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>><<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

4. Remove the four Phillips head screws securing the hard drive to its mounting brackets (Figure 3-47).

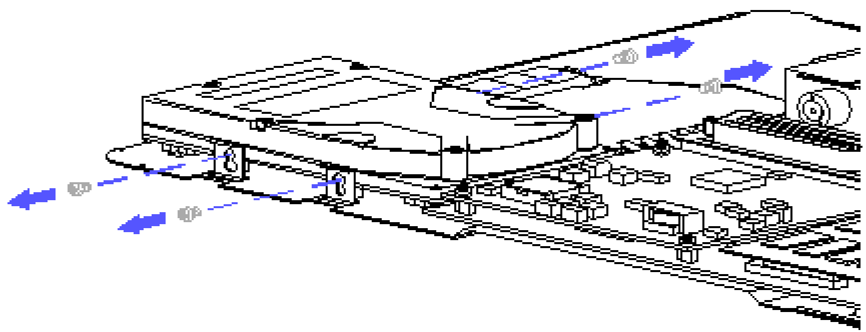

Figure 3-47. Removing the Hard Drive Mounting Screws

5. The hard drive is connected directly to the system board. Slide the hard drive off of its connector on the system board and lift the hard drive out of the computer (Figure 3-48).

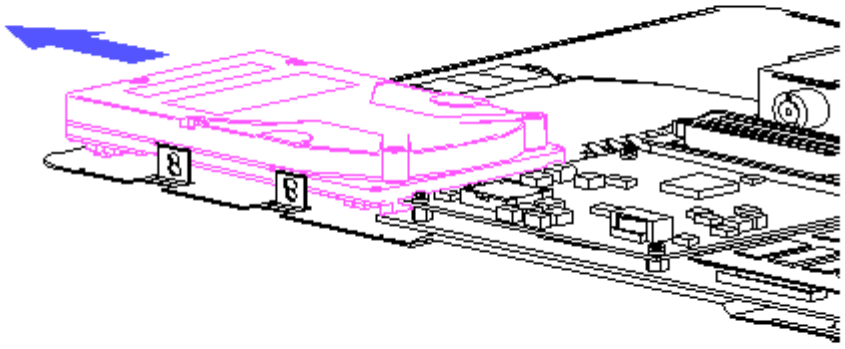

Figure 3-48. Disconnecting the Hard Drive

Installing the Hard Drive

To install a hard drive into the computer, complete the following steps:

1. The hard drive is connected directly to the system board (Figure 3-49). Position the hard drive, component side down, inside of its mounting brackets, and slide it onto the connector on the system board.

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

The hard drive connector has two rows of pins that mate with the connector on the system board. Make certain that the connectors are properly aligned before engaging the connectors.

>>>

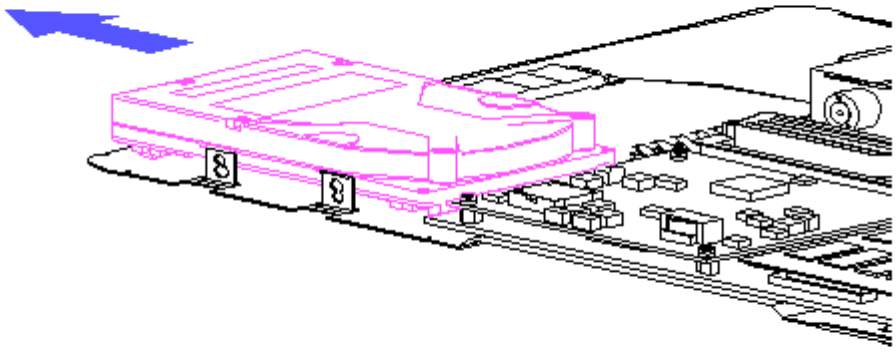

Figure 3-49. Connecting the Hard Drive

2. The mounting holes in the mounting brackets are in the shape of a "snowman." This hole configuration was designed to accommodate both types of hard drives. The configuration provides a mounting hole and a mounting slot on each side of the hard drive. Your hard drive will align with either the upper or lower mounting holes/slots. Install the mounting screws in the round holes first, then in the slotted holes (Figure 3-50).

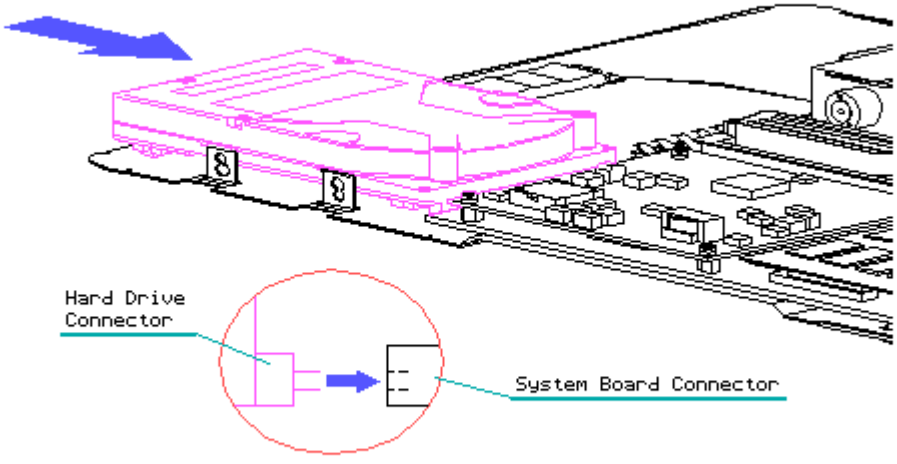

Figure 3-50. Installing the Hard Drive Mounting Screws

3. Connect the auxiliary battery and replace the back cover.

Removing the Power Supply

The power supply is mounted on the system board on the system side of the chassis. Therefore, you need to remove the back cover only to remove and replace the power supply.

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

The auxiliary battery must be disconnected before attempting to install or remove the power supply. Failure to disconnect the auxiliary battery can damage the components on the power supply.

>>>

To remove the power supply from the computer, follow these steps:

1. Remove the computer from the FlexConnect, if applicable (Section 3.2). If the computer is not mounted on a FlexConnect, proceed directly to step 2.

2. Complete the steps included in Section 3.3.

3. Place the computer face down on a flat, clean surface and remove the rear cover (Section 3.4). Leave the system-chassis-display subassembly resting in the front cover.

4. Disconnect the auxiliary battery from the system board.

5. Remove the four Torx T-8 slotted screws securing the power supply to its screw locks on the system board (Figure 3-51).

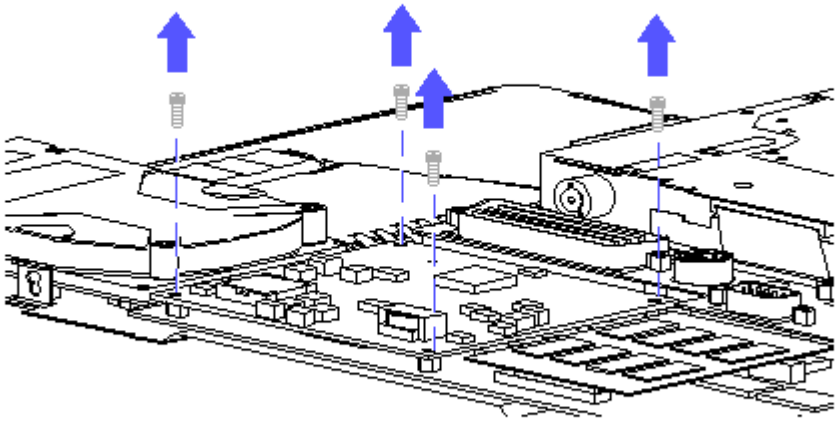

Figure 3-51. Removing the Power Supply Mounting Screws

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

The power supply must be removed in the manner prescribed below to prevent damage to the power supply connector.

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>><<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

6. The power supply is connected directly to the system board by a connector on its bottom side. Begin lifting the power supply along the edge away from the hard drive. Slide the power supply off of its connector on the system board and lift it out of the computer (Figure 3-52).

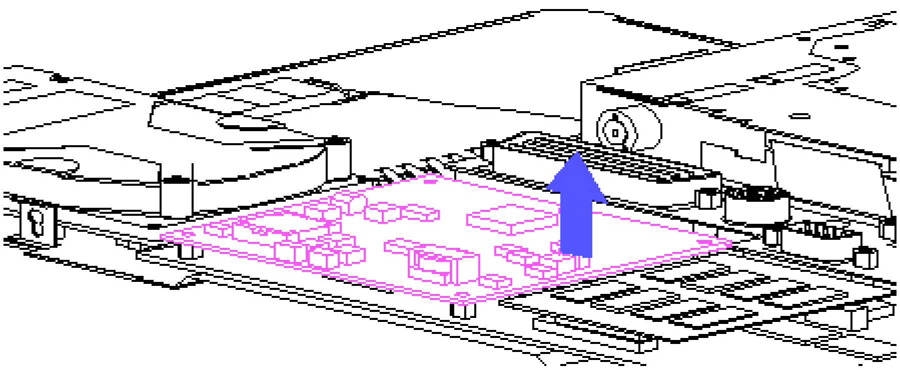

Figure 3-52. Removing the Power Supply

Installing the Power Supply

To install the power supply in the computer, follow these steps:

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

The auxiliary battery must be disconnected before attempting to install or remove the power supply. Failure to disconnect the auxiliary battery can damage the components on the power supply.

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>><<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

1. Ensure that the auxiliary battery is disconnected.

2. Align the power supply with its connector on the system board and apply slight pressure to mate the connectors (Figure 3-52).

3. Install the four Torx T-8 slotted screws (Figure 3-51).

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

Take care not to over tighten the mounting screws.

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>><<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

4. Connect the auxiliary battery.

5. Replace the back cover.

Removing the Memory Board

The memory board is attached to the system board by its two connectors and is secured in place by structural features in the back cover. To gain access to the memory board for removal and replacement, only the rear cover has to be removed. It is recommended that the auxiliary battery be disconnected from the system board before removing the memory board.

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

The memory board must be removed in the manner prescribed below to prevent damage to the memory board connectors.

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>><<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

To remove the memory board from the computer, follow these steps:

1. Remove the computer from the FlexConnect, if applicable (Section 3.2). If the computer is not mounted on a FlexConnect, proceed directly to step 2.

2. Complete the preparation steps included in Section 3.3.

3. Place the computer face down on a flat, clean surface and remove the rear cover (Section 3.4). Leave the system-chassis-display assembly resting in the front cover.

4. The memory board is connected directly to the system board. Remove the memory board from the system board by lifting the edge of the board opposite the hard drive (Figure 3-53).

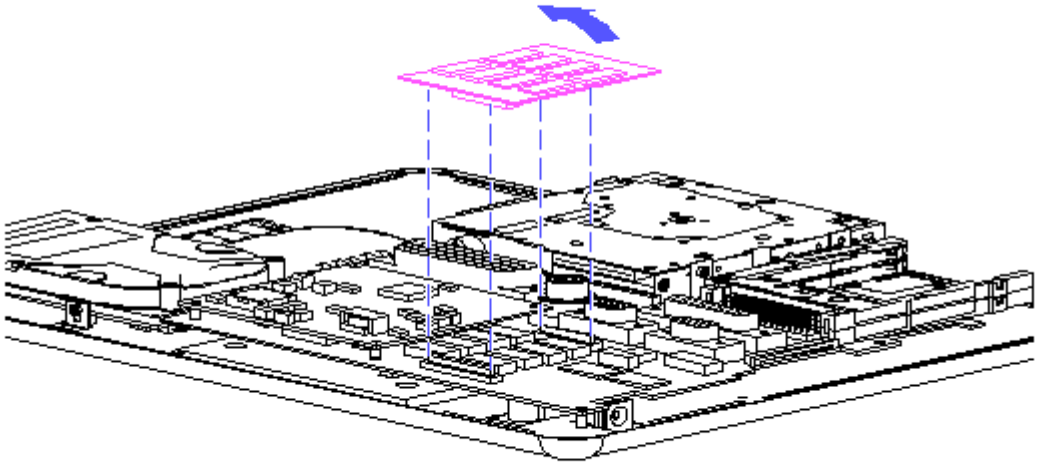

Figure 3-53. Removing the Memory Baord

Installing the Memory Board

To install a memory board into the computer, complete the following steps:

1. Align the memory board with its connectors on the system board. Make certain the long connector on the memory board is aligned with the long connector on the system board.

2. Apply slight pressure to mate the connectors and position the memory board in place (Figure 3-53).

   IMPORTANT: Check that the memory board is level. If it is not level, it is probably not installed properly.

3. Connect the auxiliary battery.

4. Replace the back cover.

Removing the Diskette Drive

The diskette drive is mounted directly to the chassis and is located on the system side of the chassis. To gain access to the diskette drive for removal and installation, only the rear cover has to be removed.

To remove the diskette drive from the computer, complete the following steps:

1. Remove the computer from the FlexConnect, if applicable (Section 3.2). If the computer is not mounted on a FlexConnect, proceed directly to step 2.

2. Complete the computer preparation procedures (Section 3.3).

IMPORTANT: Make certain that there is no diskette inserted in the drive before continuing with this procedure.

3. Place the computer face down on a flat, clean surface and remove the rear cover (Section 3.4). Leave the system-chassis-display subassembly resting in the front cover.

4. Remove the four Torx T-8 slotted screws securing the diskette drive to its mounting brackets (Figure 3-54).

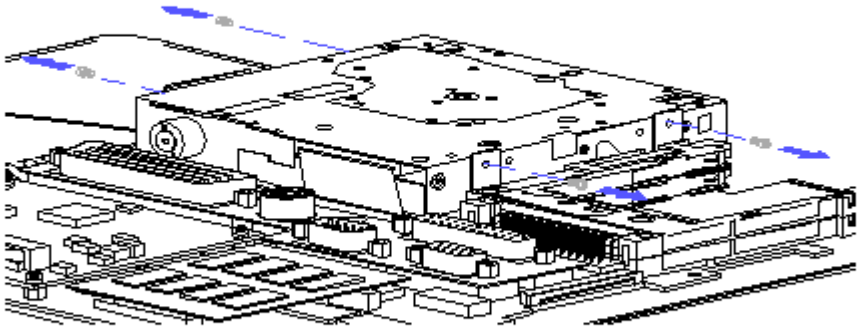

Figure 3-54. Removing the Diskette Drive Mounting Screws

5. Rotate the diskette drive out of its mounting brackets (Figure 3-55).

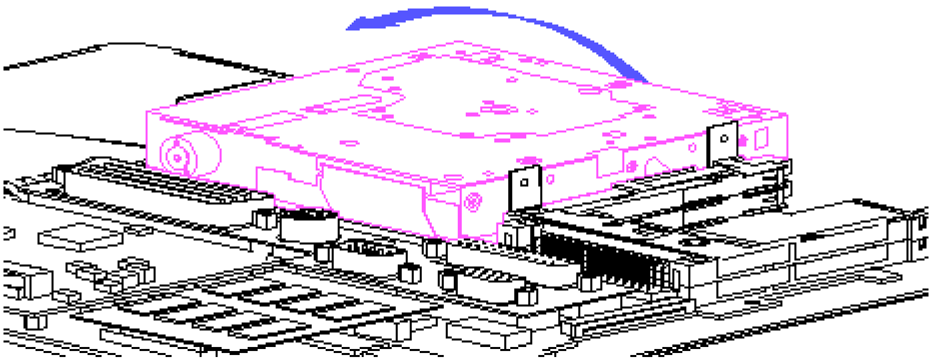

Figure 3-55. Removing the Diskette Drive

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

To avoid damage to the diskette drive cable, determine if the diskette drive connector on the system board is a ZIF or LIF connector. If it is a ZIF connector, be sure to release the slide on the connector before attempting to release or connect the cable.

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>><<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

6. The diskette drive cable is connected to a LIF or ZIF connector on the system board. If the system board has a ZIF connector, use a Spudger to release the slide on the ZIF connector. Release the diskette drive cable from its connector on the system board (Figure 3-56).

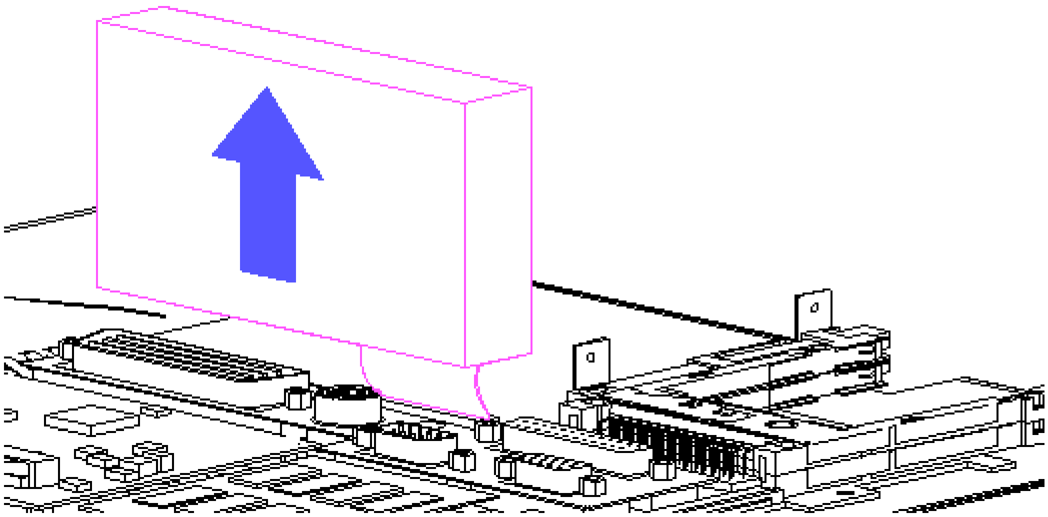

Figure 3-56. Disconnecting the Diskette Drive Cable

7. Remove the cable from the LIF connector on the diskette drive and retain for use in the new drive.

Installing the Diskette Drive

To install a diskette drive into the computer, complete the following steps:

1. The diskette drive is connected to the system board with a short ribbon cable. The ends of the cable are labeled for "FLOPPY" and "CPU". Connect the "FLOPPY" end of the cable to the diskette drive first. Then, connect the "CPU" end of the cable to the connector on the system board (Figure 3-57).

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

To avoid damage to the diskette drive cable, determine if the diskette drive connector on the system board is a ZIF or LIF connector. If it is a ZIF connector, be sure to release the slide on the connector before attempting to release or connect the cable.

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>><<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

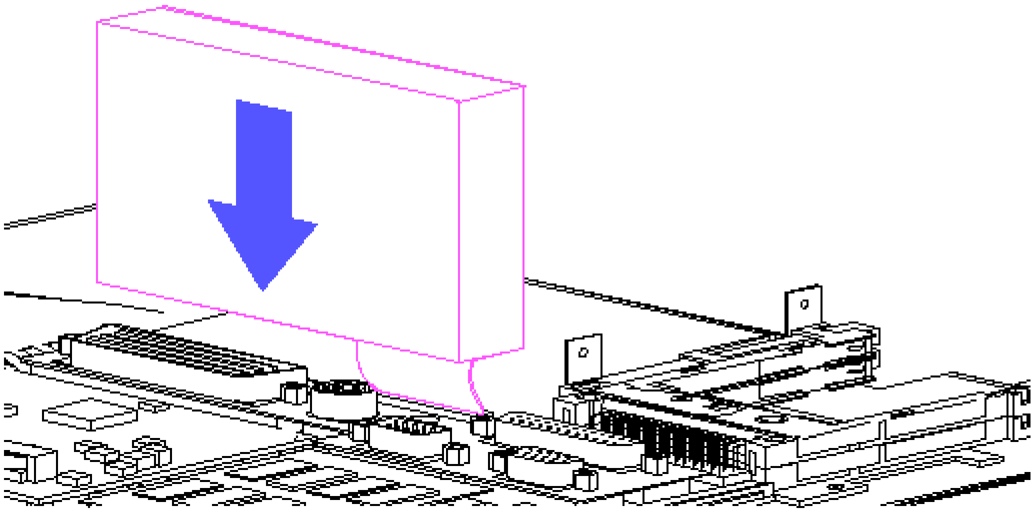

Figure 3-57. Connecting the Diskette Drive

2. Position the diskette drive inside of the mounting brackets and align the mounting holes (Figure 3-58).

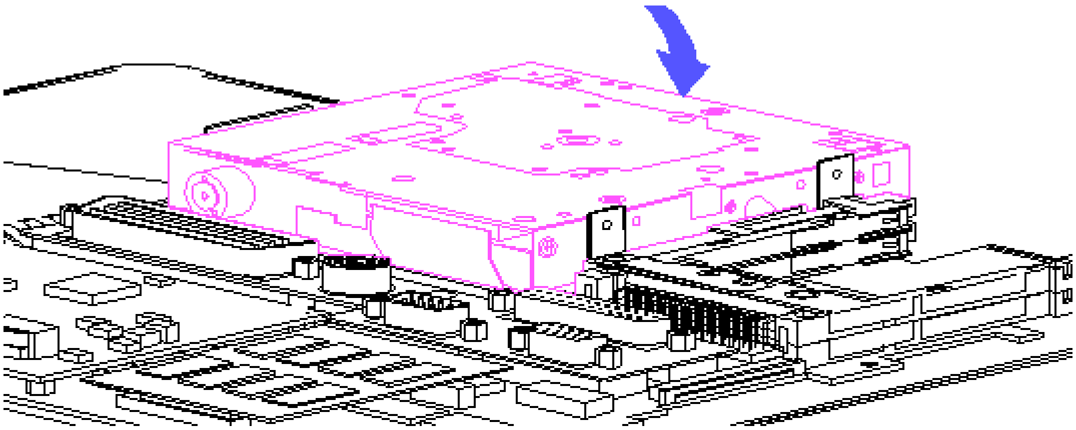

Figure 3-58. Mounting the Diskette Drive

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

A long screwdriver (6" long bit) is recommended for installing the diskette drive mounting screws on the side toward the PCMCIA slot. Also, take care not to over tighten the mounting screws.

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>><<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

3. Install the four T-8 Torx slotted mounting screws (Figure 3-59).

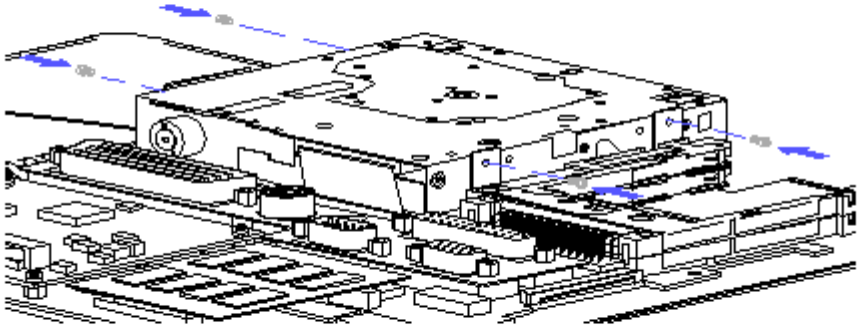

Figure 3-59. Installing the Diskette Drive Mounting Screws

Removing the PCMCIA Ejector Rails

The PCMCIA ejector rails are mounted directly to the chassis and are located on the system side of the chassis. Therefore, to gain access to the ejector rails, only the rear cover has to be removed.

IMPORTANT: Make certain that no card or PCMCIA spacer is inserted in the PCMCIA rail before starting this procedure.

IMPORTANT: The upper PCMCIA ejector rail has hex-shaped screw holes on the top that allow the screw heads to seat below the top surface of the rails. It is essential that the proper ejector rail is installed on the top.

To remove the PCMCIA ejector rails, complete the following steps:

1. Remove the computer from the FlexConnect, if applicable (Section 3.2). If the computer is not mounted on a FlexConnect, proceed directly to step 2.

2. Complete the steps in Section 3.3.

3. Place the computer face down on a flat, clean surface and remove the rear cover (Section 3.4). Leave the assembly resting in the front cover.

4. Remove the two screws holding the rails in place (Figure 3-60).

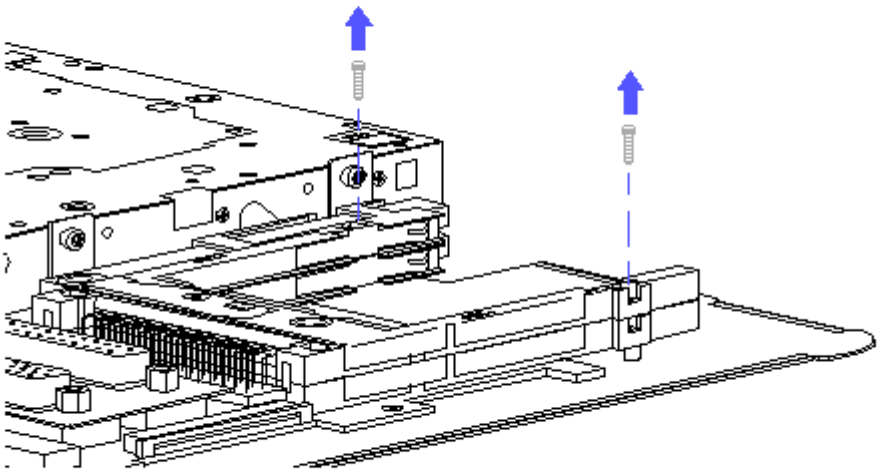

Figure 3-60. Removing the Ejector Rail Mounting Screws

5. Slide the ejector rail out (Figure 3-61).

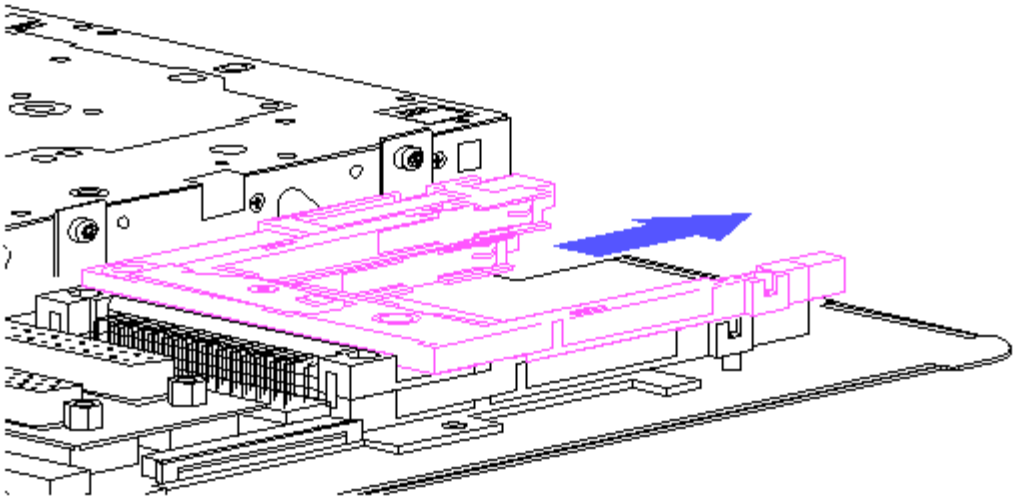

Figure 3-61. Removing the PCMCIA Ejector Rail

Installing the PCMCIA Ejector Rails

1. Install the new ejector rails (Figure 3-62).

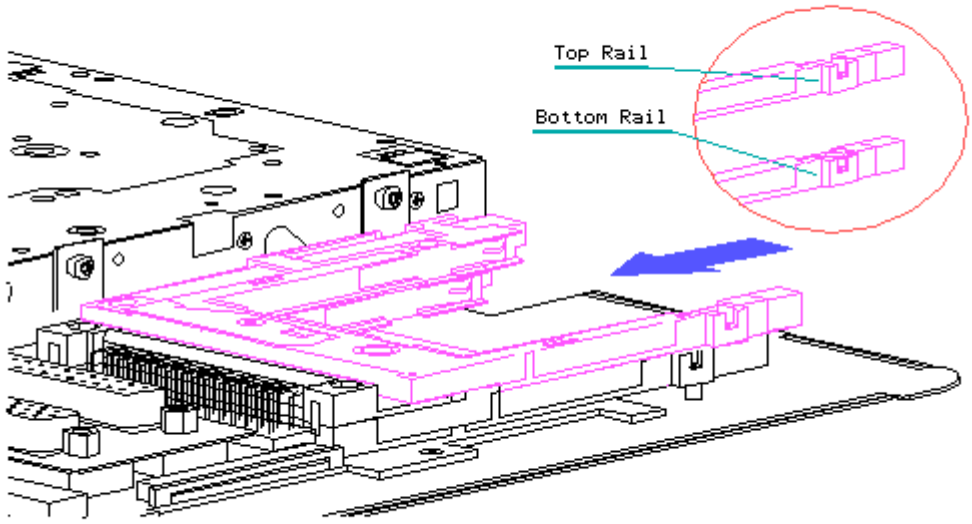

Figure 3-62. Installing the PCMCIA Ejector Rails

2. Insert the PCMCIA spacer into the rails to assist with rail alignment (Figure 3-63).

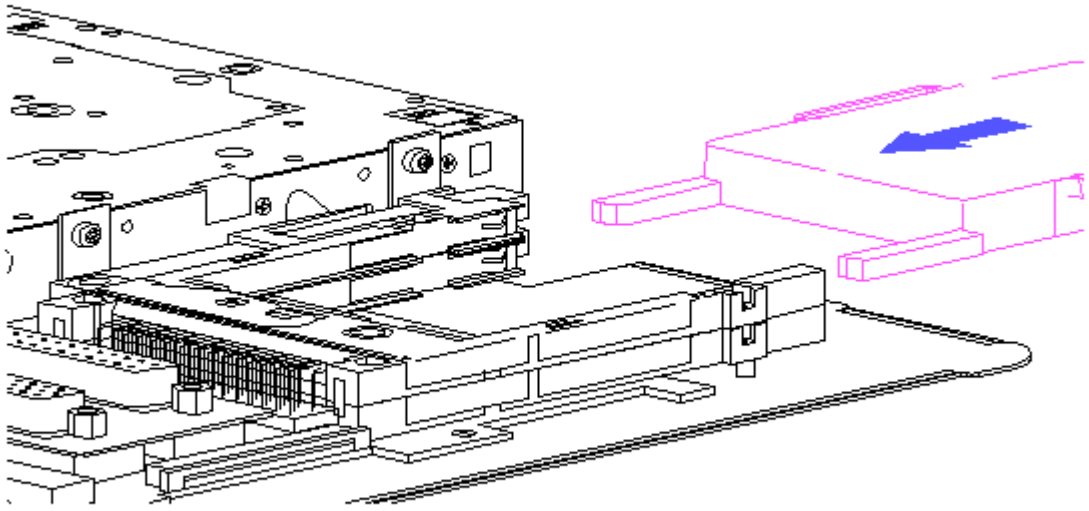

Figure 3-63. Using the PCMCIA Spacer

3. Install the two mounting screws (Figure 3-60).

4. After installing the two mounting screws, you can either remove the PCMCIA spacer or leave it stored in the slot.

5. Replace the rear cover.

Removing the System Board

The system board is mounted to the chassis in the system module. Removal and replacement of system board requires removal of all components in the system module.

To remove the system board, complete the following steps:

1. If applicable, remove the computer from the FlexConnect (see section 2.4). If the computer is not mounted on a FlexConnect, proceed directly to step 2.

2. Complete the preparation steps described in Section 3.3.

3. Remove the covers (Section 3.4).

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

To prevent damage to the electronic components, always disconnect the auxiliary battery after removing the back cover.

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4. Remove the Phillips head screw from the keyboard connector (Figure 3-64).

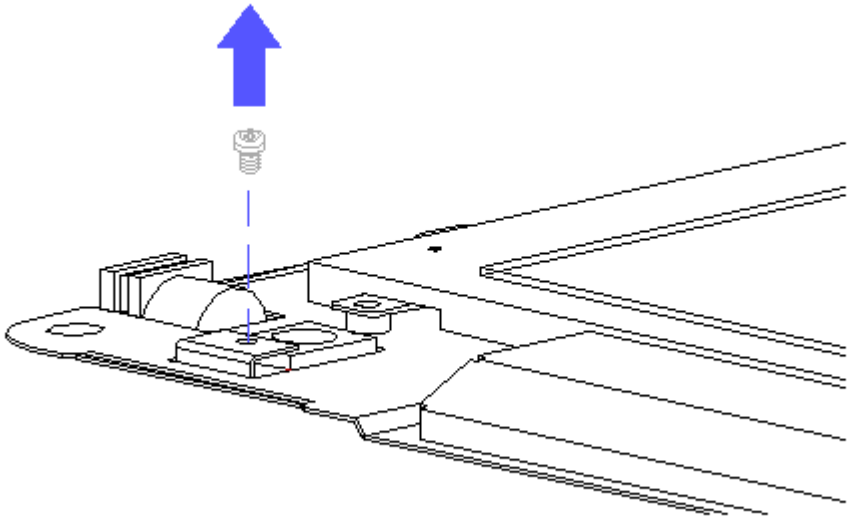


Figure 3-64. Removing the Screw from the Keyboard Connector

5. Remove or disconnect the following components from the system module:

   a. Disconnect the LED/Switch cable from the system board (Figure 3-65).

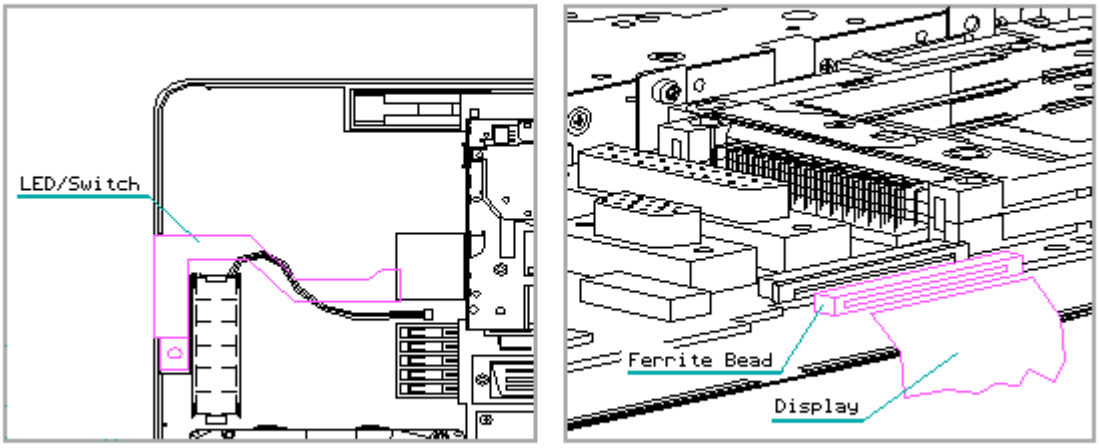


Figure 3-65. Disconnecting the LED/Switch Cable from the System Board

b. Disconnect the display cable from the system board (Figure 3-65). Retain the ferrite ring for reuse.

c. Remove the hard drive (Section 3.8).

d. Remove the power supply (Section 3.8).

e. Remove the four power supply screw locks (Figure 3-66).

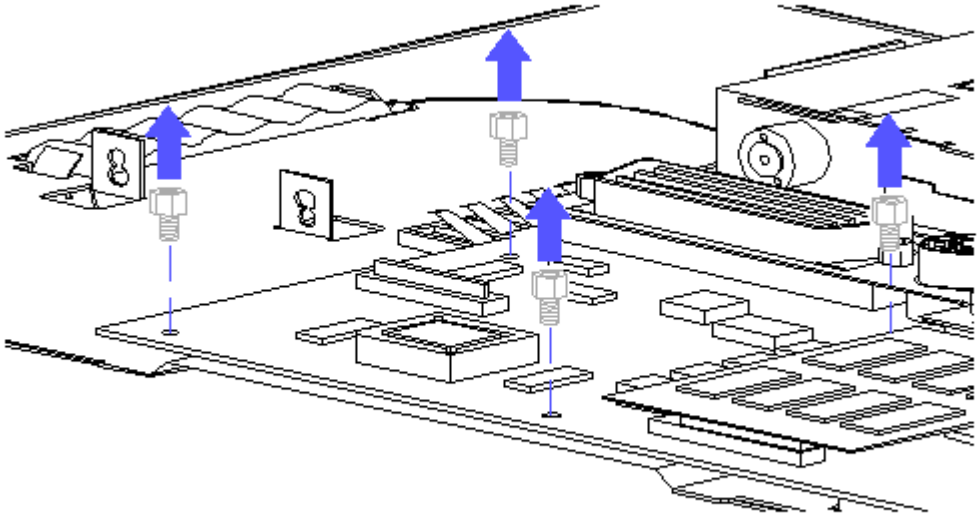


Figure 3-66. Removing the Power Supply Screw Locks

f. Remove the memory board (Section 3.8).

g. Remove the diskette drive (Section 3.8).

h. Remove the PCMCIA ejector rails and retain for future use (Section 3.8).

NOTE: The ejector rails are not supplied with the replacement system board. Always remove the ejector rails and retain them for future use when removing a system board.

6. Disconnect the digitizer cable from its ZIF connector on the system board (Figure 3-67).

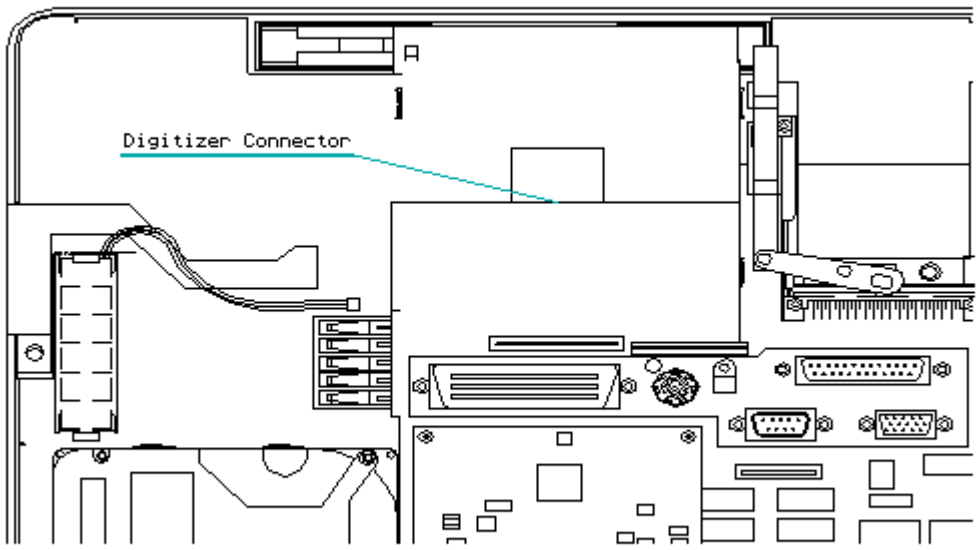


Figure 3-67. Disconnecting the Digitzer from the System Board

7. Remove the screws from the system board and remove the system board (Figure 3-68).

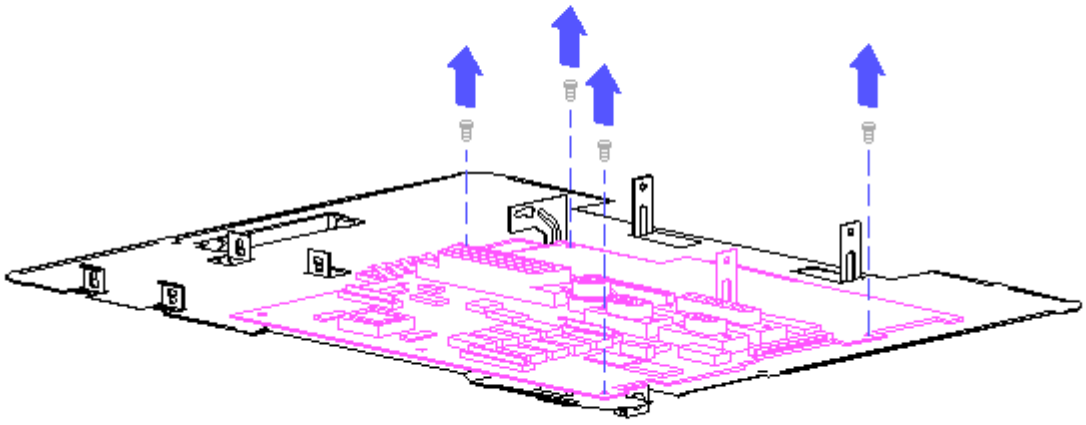


Figure 3-68. Removing the System Board

Replacing the System Board

To replace the system board, complete the following steps:

1. Position the system board on the chassis, align the inverter connector with the connector on the inverter board, and install the mounting screws in the following sequence:

   a. Install a screw in the #1 position and then install one in the #2 position (Figure 3 69).

      IMPORTANT: The #1 and #2 screw positions precisely locate the system board on the chassis. These screws must be installed first. These hole positions are labeled on the system board.

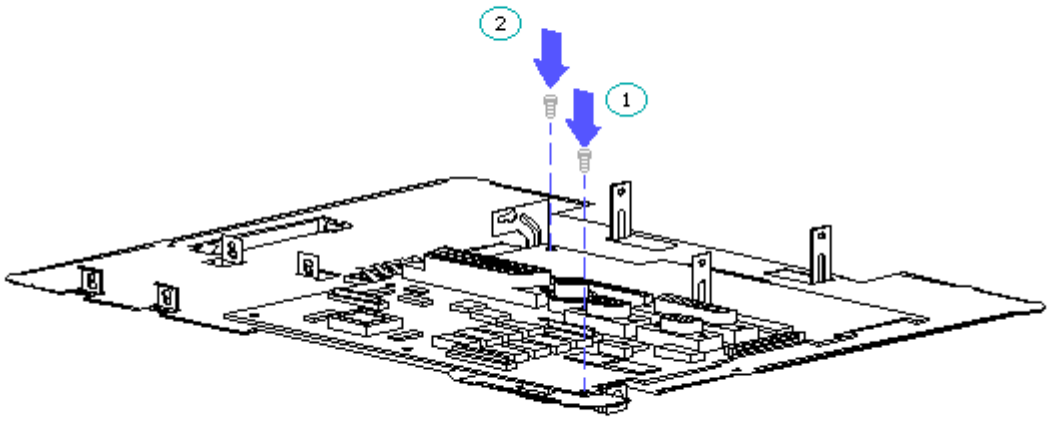


Figure 3-69. Installing Screws in the #1 and #2 Positions

2. Reference section 3.6 and install the following:

   a. Hard drive
   b. Power supply
   c. Memory board
   d. Diskette drive
   e. PCMCIA ejector rails

3. Connect the display cable, with ferrite bead, to the system board (Figure 3-70).

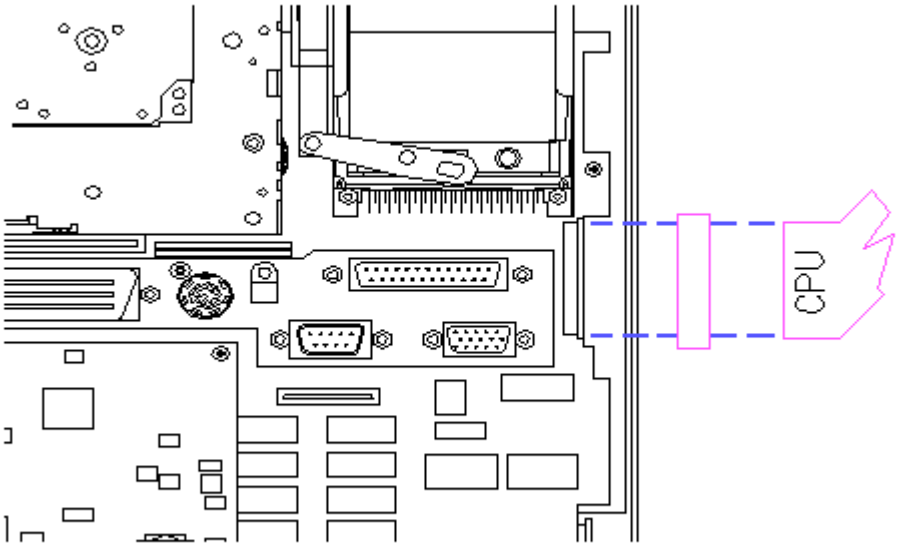


Figure 3-70. Connecting the Display Cable to the System Board

4. Connect the LED/Switch cable to the system board (Figure 3-71).

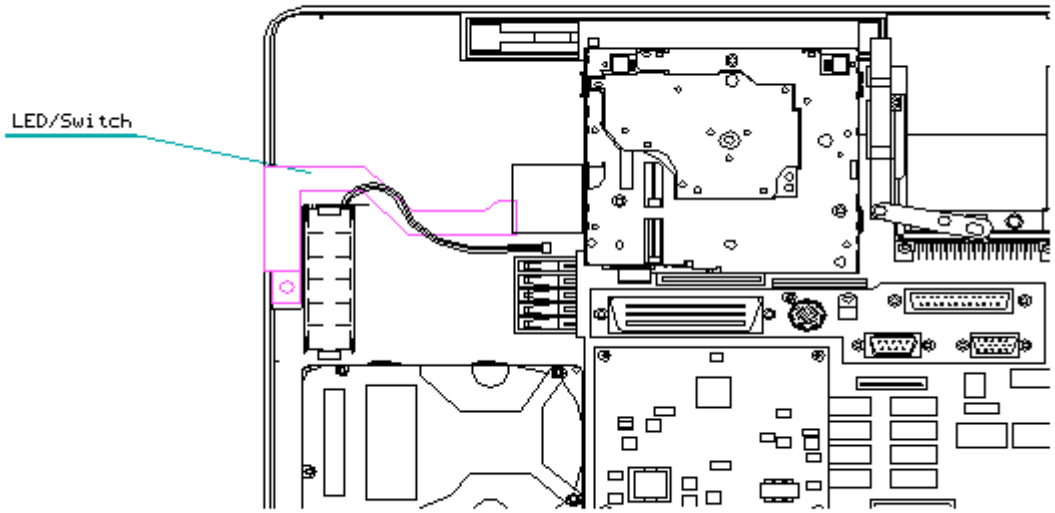


Figure 3-71. Connecting the LED/Switch Cable to the System Board

5. Turn the assembly over, system side down, and reference section 3.5 to install the following:

   a. Display/digitizer assembly
   b. Inverter board

6. Install the keyboard connector screw (Figure 3-72).

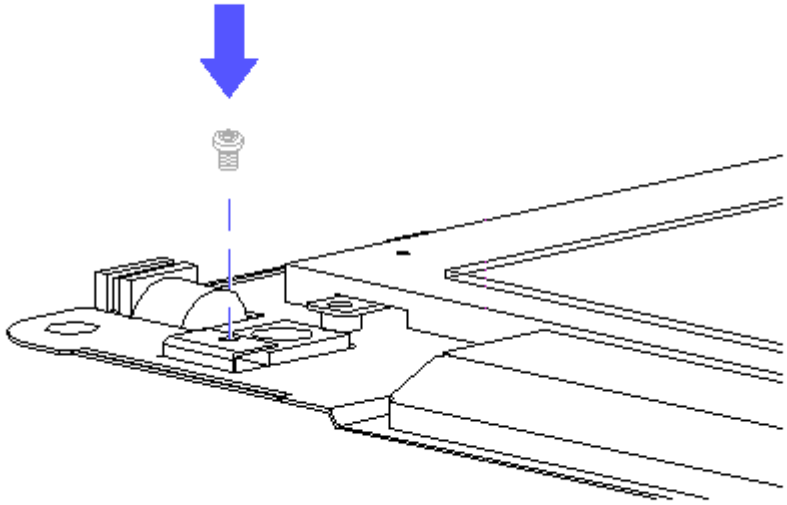


Figure 3-72. Installing the Keyboard Connector Screw

7. Replace the speaker gasket on the LED/Switch cable.

8. Connect the auxiliary battery cable to the system board (Figure 3-73).

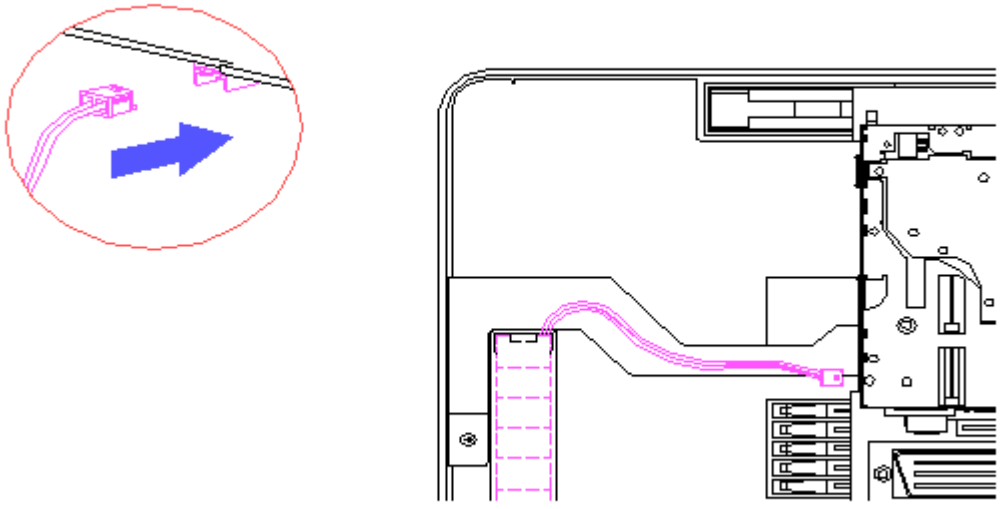


Figure 3-73. Connecting the Auxiliary Battery

9. Reference Section 3.4 and replace the covers.

10. Reference Section 3.3 to install the main battery and connect peripherals.

Removing and Replacing the Auxiliary Battery

The auxiliary battery is mounted in a cutout on the system side of the chassis and is secured in place by structural features in the chassis. To gain access to the memory board for removal and replacement, only the rear cover has to be removed.

To remove the auxiliary battery, follow these steps:

1. Remove the computer from the FlexConnect, if applicable (Section 3.2). If the computer is not mounted on a FlexConnect, proceed directly to step 2.

2. Complete the preparation steps included in Section 3.3.

3. Place the computer face down on a flat, clean surface and remove the rear cover (Section 3.4). Leave the system-chassis-display subassembly resting in the front cover.

4. Disconnect the auxiliary battery from the system board (Figure 3-74).

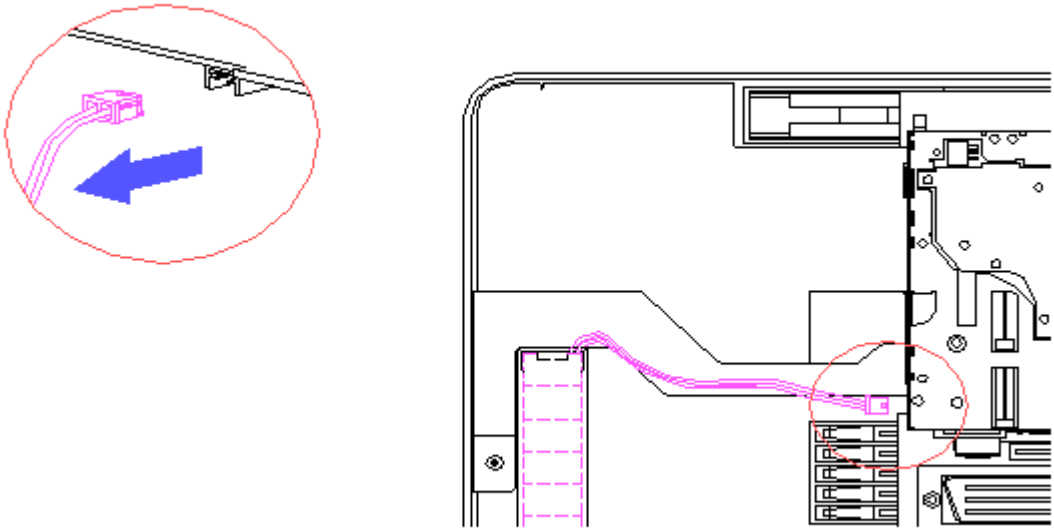


Figure 3-74. Disconnecting the Auxiliary Battery

5. To remove the auxiliary battery, reach underneath the chassis and push the end without the cable out of the cutout in the chassis (Figure 3-75).

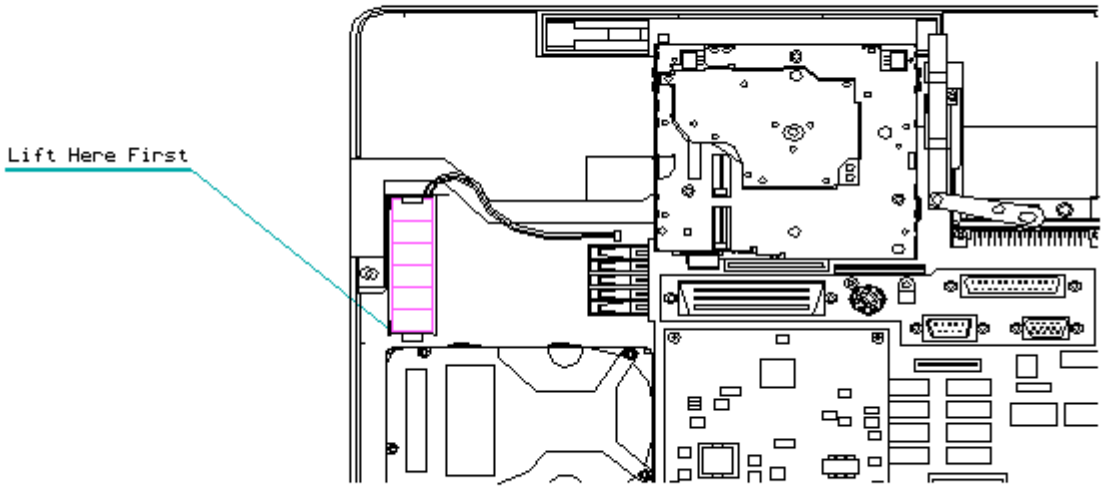


Figure 3-75. Releasing the Auxiliary Battery

6. Lift the end of the battery opposite the cable and pull the battery out of the cutout in the chassis (Figure 3-75).

7. Reverse steps 5 and 6 to install a new battery. Be sure to place the cable end of the battery first.

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> CAUTION <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

Make certain that the battery is oriented as shown in Figure 3-74 with the battery cable routed as shown.

>>>

Chapter 4 - Removal and Replacement Procedures

INTRODUCTION

This chapter provides subassembly/module level removal and replacement procedures for the FlexConnect.

Chapter 4.1 DISASSEMBLY/ASSEMBLY SEQUENCE

This section provides an outline of the disassembly for the FlexConnect. Disassembly to replace subassemblies/assemblies should be performed in the following sequence:

Preparing the FlexConnect for Service

Preparation of the FlexConnect for service includes removing the computer (if applicable), disconnecting external equipment, and disconnecting AC power.

Servicing the External Components

The external components can be serviced without removing the covers from the FlexConnect, and they can be serviced in any sequence. The external components are:

- Front feet
- Rear feet

Preparing for Service of Internal Components

Internal components include all components that require removal of the covers for service. To prepare the FlexConnect for servicing of the internal components, complete the following in any sequence:

- Remove the front cover.
- Remove the rear cover.

Servicing the Front Module Internal Components

After preparing the FlexConnect for service and removing the front cover, you can service the internal front module components. Service these components in any sequence:

- Eject levers
- Flex cable connector

Servicing the Rear Module Internal Components

After preparing the FlexConnect for service and removing the rear cover, you can service the internal rear module components. The clutch actuator

can be serviced at any time; the remaining components must be serviced in the sequence presented. These components include:

- Clutch actuator (any sequence)
- Metal pan cover
- Flex cable
- Interface card
- Power button

Servicing the Bases

Replacement of the front and rear bases of the FlexConnect requires a complete disassembly.

Chapter 4.2 FLEXCONNECT PREPARATION

Before beginning the removal and replacement procedures, complete the following steps to prepare the FlexConnect for service:

1. Remove the computer from the FlexConnect, if applicable (Section 3.2). If the computer is not mounted on the FlexConnect, proceed directly to step 2.
2. Turn off any external equipment attached to the FlexConnect.
3. Disconnect all external equipment (Figure 4-1).
4. Disconnect the AC Adapter from the wall outlet and then from the FlexConnect.
5. The FlexConnect is now prepared for removal and replacement procedures.

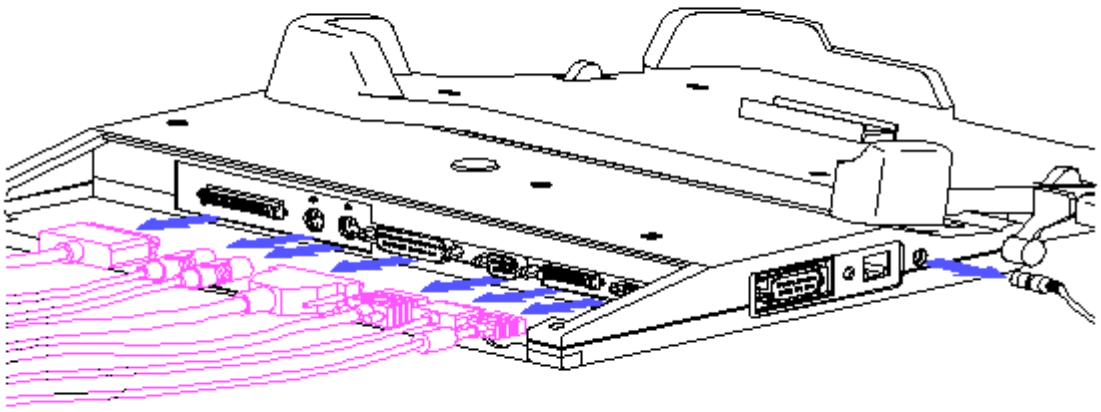


Figure 4-1. FlexConnect Connectors and Power Button

Chapter 4.3 REMOVING AND REPLACING THE RUBBER FEET

The front and rear feet can be removed and replaced without disassembly of the unit. However, it is recommended that the computer and all external equipment and power be removed before performing any service procedures on the unit.

Removing and Replacing the Front Feet

The front feet on the FlexConnect snap into place and require no adhesive or additional mechanical means of retention. Complete the following steps to remove and replace the front feet:

1. Prepare the FlexConnect for service by completing the steps in Section 4.2.

2. Remove a foot by pushing down on the front edge of the foot, causing it to roll out of its socket.

3. Install a replacement foot by sliding it into place (Figure 4-2).

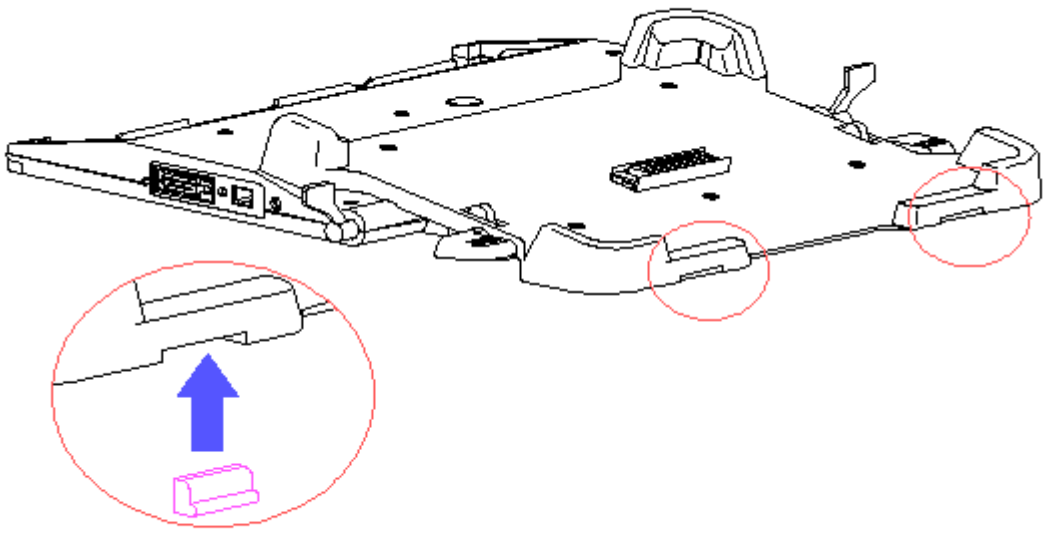


Figure 4-2. Front Feet Replacement

Removing and Replacing the Rear Feet

The rear feet are held in place by two of the rear cover screws. Complete the following steps to remove and replace the rear feet:

1. Prepare the FlexConnect for service by completing the steps in Section 4.2.

2. Remove a foot by removing the rear cover screw directly above the foot.

3. Install a replacement foot by sliding it into place and installing the rear cover screw (Figure 4-3).

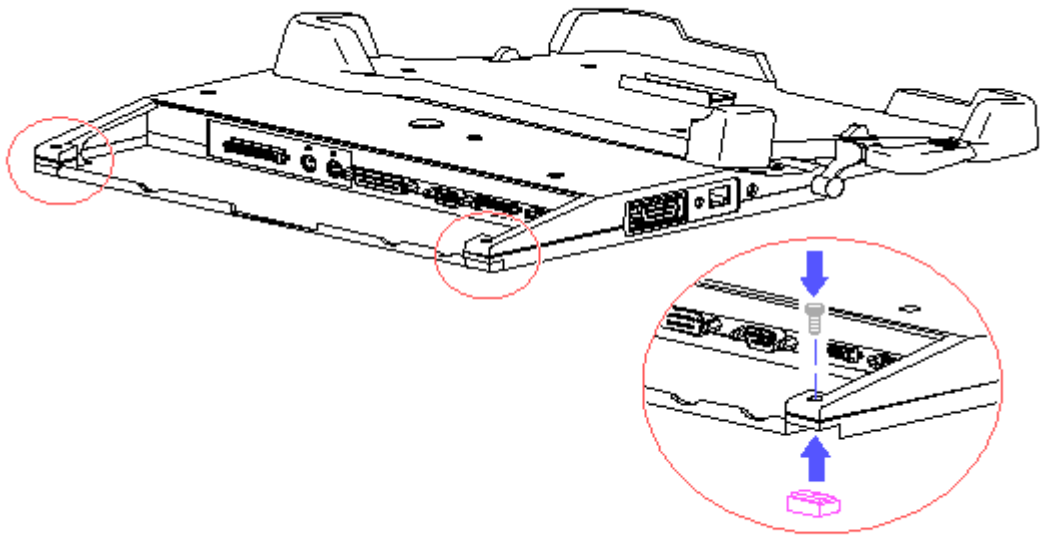


Figure 4-3. Rear Foot Replacement

Chapter 4.4 REMOVING THE COVERS

Only the front and rear top covers have to be removed to perform maintenance on the FlexConnect. Removal of the front and rear bases is necessary only to replace the bases or the clutches.

Removing the Front Cover

The front cover must be removed for the following maintenance procedures:

- Removal and replacement of the eject levers
- Removal and replacement of the flex cable assembly

Complete the following steps to remove and replace the front cover:

1. Prepare the FlexConnect for service by completing the steps in Section 4.2.

2. Remove the five screws holding the front cover in place and remove the front cover (Figure 4-4).

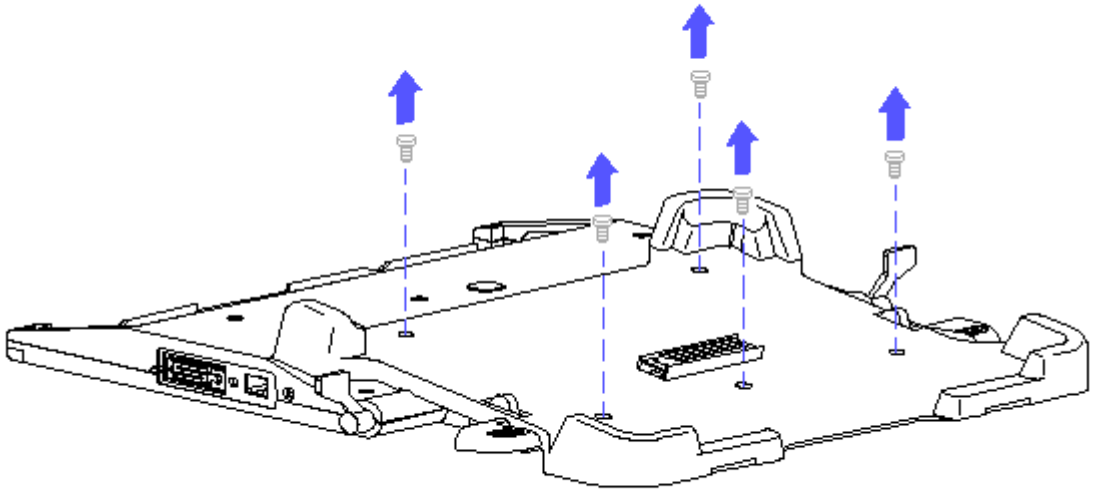


Figure 4-4. Front Cover Removal and Replacement

3. Position the cover and insert the five screws to reinstall.

Removing the Rear Cover

The rear cover must be removed for the following replacement procedures:

- Clutch actuator replacement
- Interface board replacement
- Power button replacement
- Ribbon cable replacement

Complete the following steps to remove and replace the rear cover:

1. Prepare the FlexConnect for service by completing the steps in Section 4.2.

2. With the FlexConnect in the raised position, remove the nine screws holding the rear cover in place and remove the rear cover (Figure 4-5).

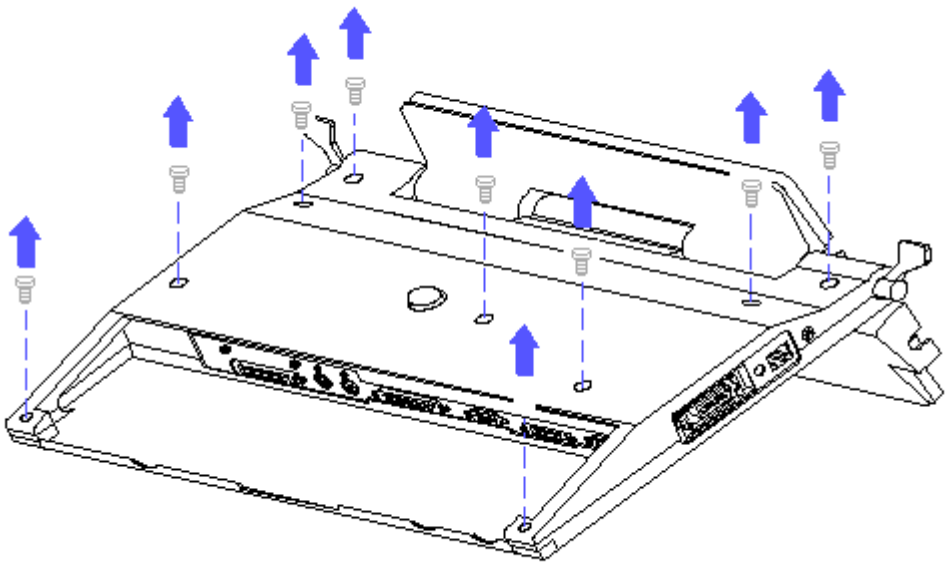


Figure 4-5. Rear Cover Removal and Replacement

3. Position the cover and insert the nine screws to reinstall.

Chapter 4.5 REMOVING THE FRONT MODULE COMPONENTS

The following components are located in the front module and are accessible by removing the front cover:

- Eject levers
- Flex cable connector

Removing the Eject Levers

Complete the following steps to remove and replace the eject levers:

1. Prepare the FlexConnect for service by completing the steps in Section 4.2.
2. Remove the front cover as described in Section 4.4.
3. Remove and replace the eject levers as shown in Figure 4-6.

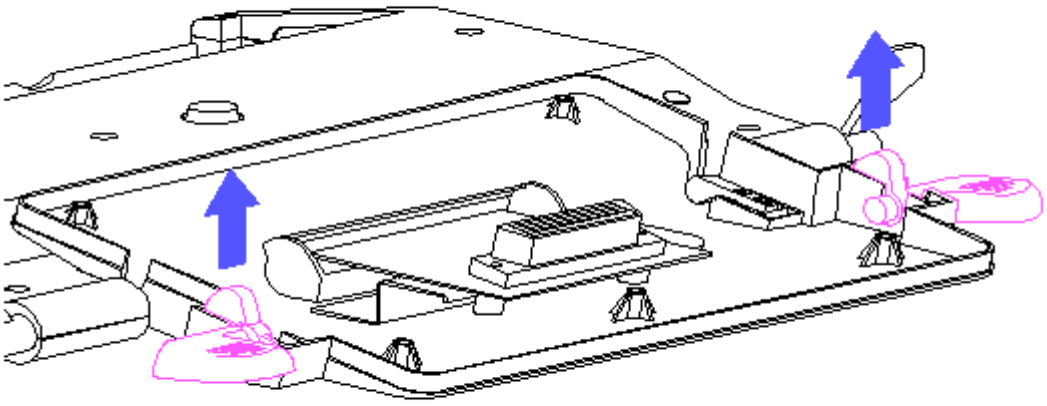


Figure 4-6. Removal and Replacement of Eject Levers

Removing the Flex Cable

Removal of the flex cable requires access to the front and rear modules of the FlexConnect. This procedure is presented in Section 4.6.

Chapter 4.6 REMOVING THE REAR MODULE COMPONENTS

The following components are located in the rear module:

- Clutch actuator
- Interface board
- Power button
- Flex cable

Removing and Replacing the Flex Cable

The front cover and the rear cover must be removed to remove and replace the flex cable. Complete the following steps to remove and replace the flex cable:

1. Prepare the FlexConnect for service by completing the steps in Section 4.2.

2. Remove the front cover (Section 4.4).

3. Remove the rear cover (Section 4.4).

4. With the FlexConnect in the raised position, remove the metal pan cover from the interface board assembly (Figure 4-7).

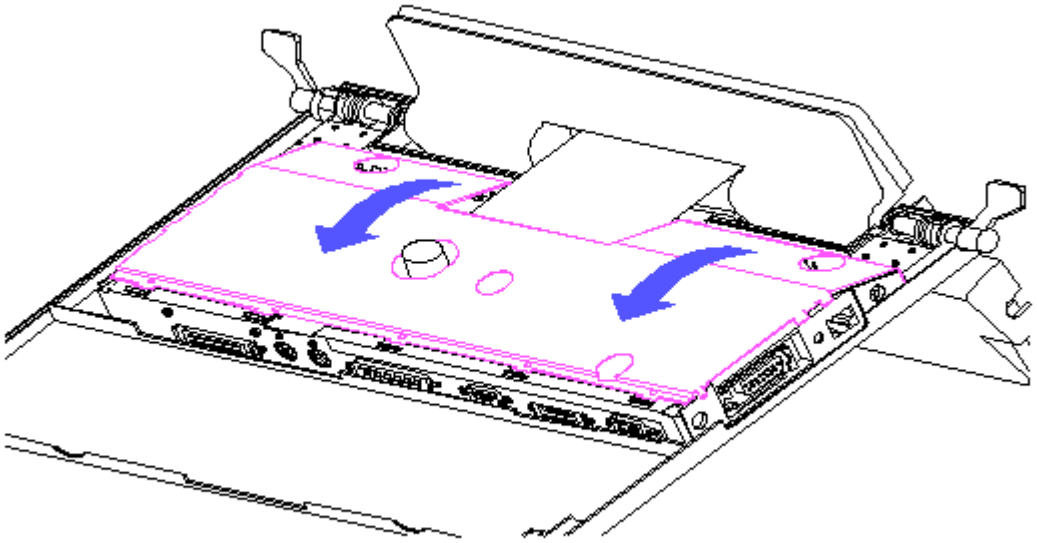


Figure 4-7. Metal Pan Cover Removal

5. Remove the two screws securing the flex cable to the interface board and disconnect the flex cable from the interface board (Figure 4-8).

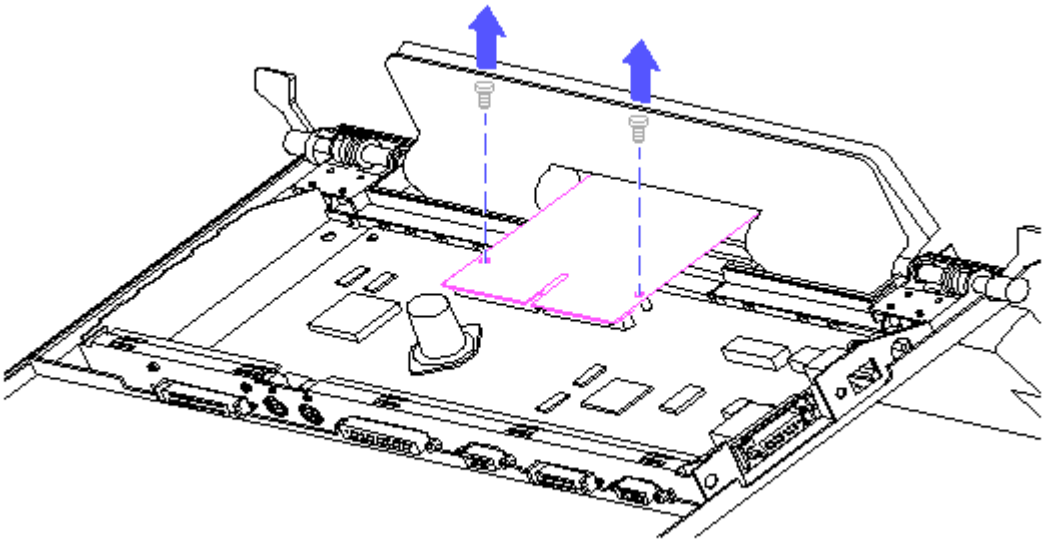


Figure 4-8. Disconnecting the Flex Cable from the Interface Board

6. Remove the two screws securing the flex cable connector to the front pan assembly (Figure 4-9).

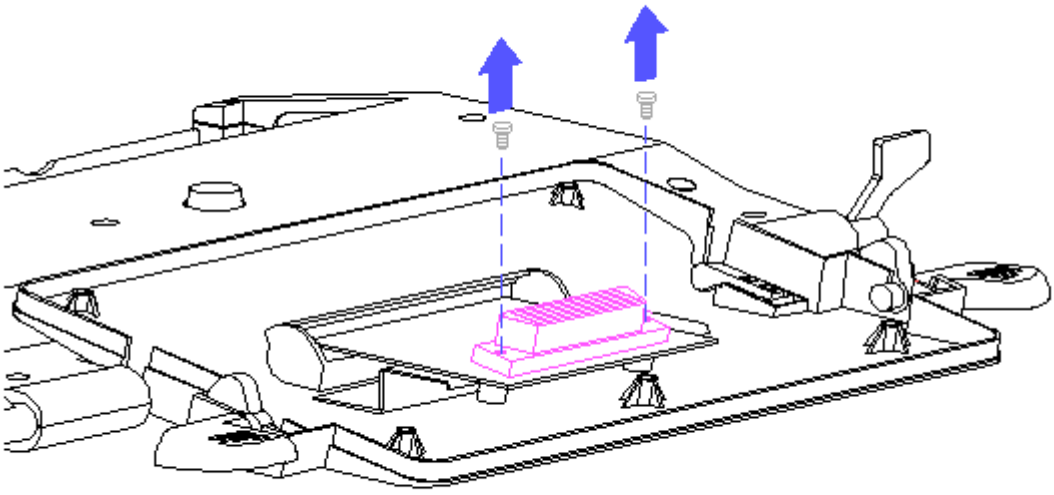


Figure 4-9. Removing the Flex Cable Connector

7. Slide the cable out toward the front module.

8. Reverse the above procedure to install a new flex cable.

Removing and Replacing the Power Button

This procedure requires removal of the rear cover, the metal pan cover, and the interface board. Complete the following to replace the button:

1. Prepare the FlexConnect for maintenance (Section 4.2).

2. Remove the rear cover (Section 4.4).

3. Remove the metal pan cover (Figure 4-7).

4. Remove bezel from side of the FlexConnect (Figure 4-10). The Ethernet version is illustrated but Token Ring and pass-through bezels are installed in the same manner.

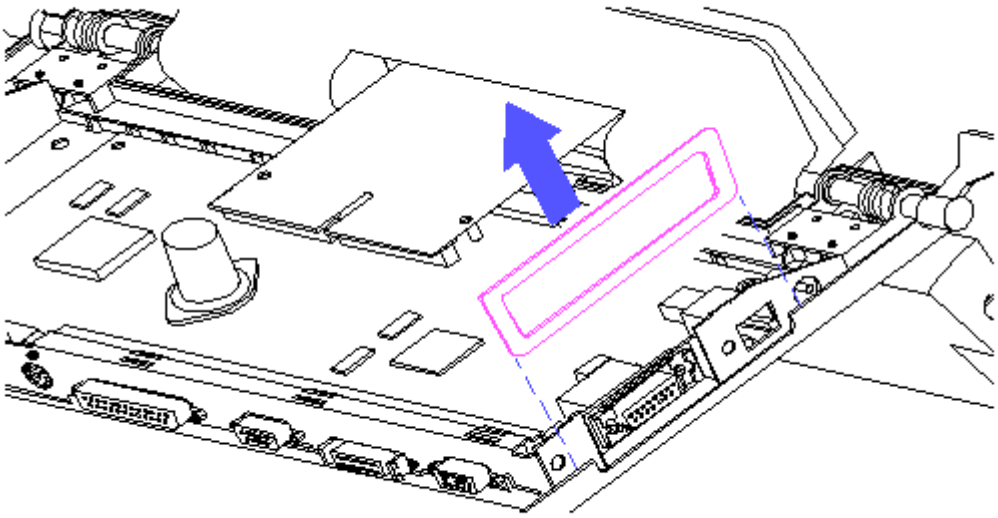


Figure 4-10. Removing the Bezel

5. Remove the screw locks and screws from I/O bulkhead (Figure 4-11).

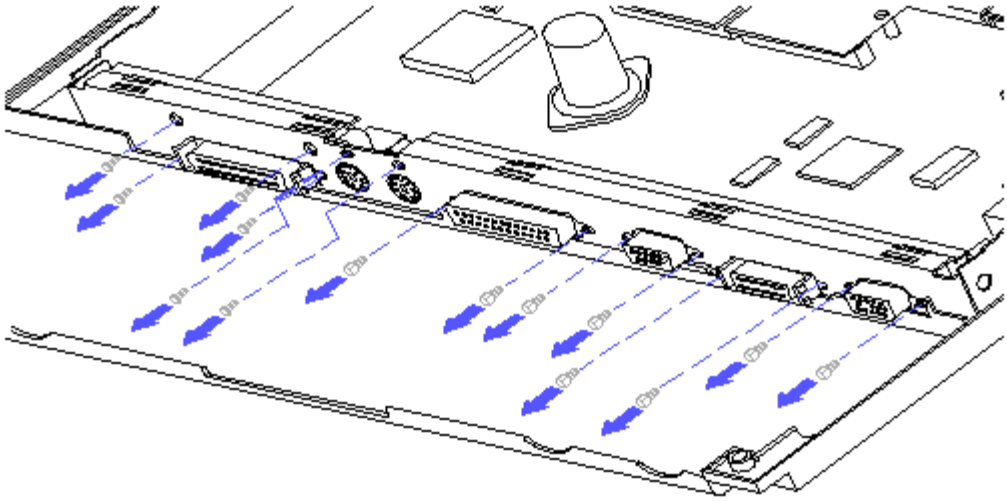


Figure 4-11. Removing the Screw Locks and Screws

6. Remove the two screws securing the flex cable to the interface board and disconnect the flex cable from the interface board (Figure 4-12).

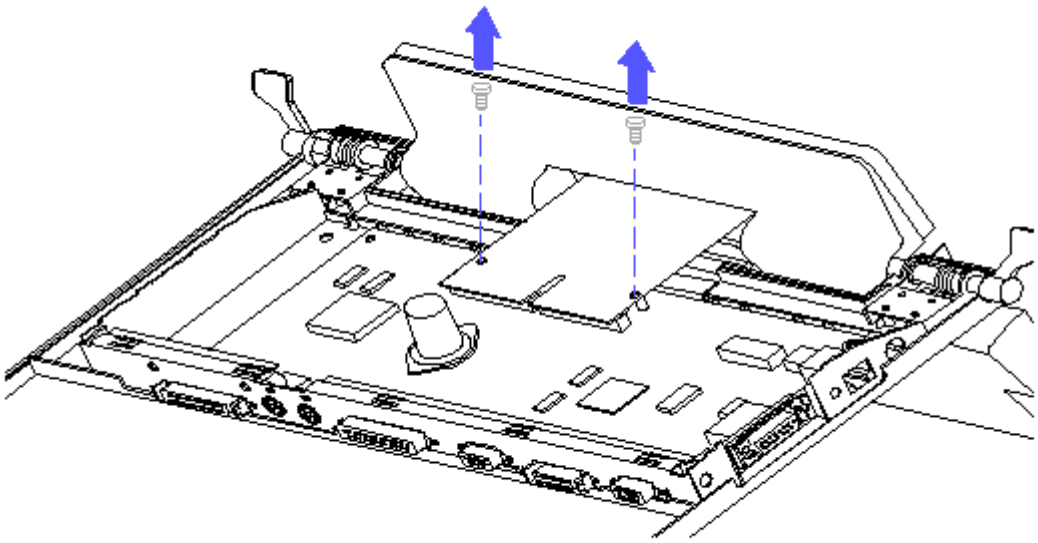


Figure 4-12. Disconnecting the Flex Cable from the Interface Board

7. Remove the screw and two screw locks that secure the board to the sheet metal pan (Figure 4-13).

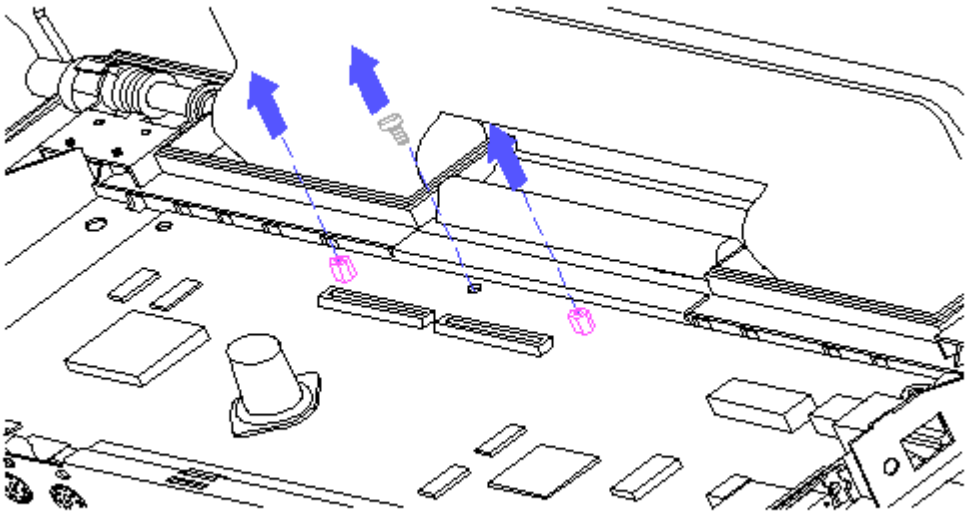


Figure 4-13. Removing the Flex Cable Screw Locks

8. Rotate the interface board out of the sheet metal pan (Figure 4-14).

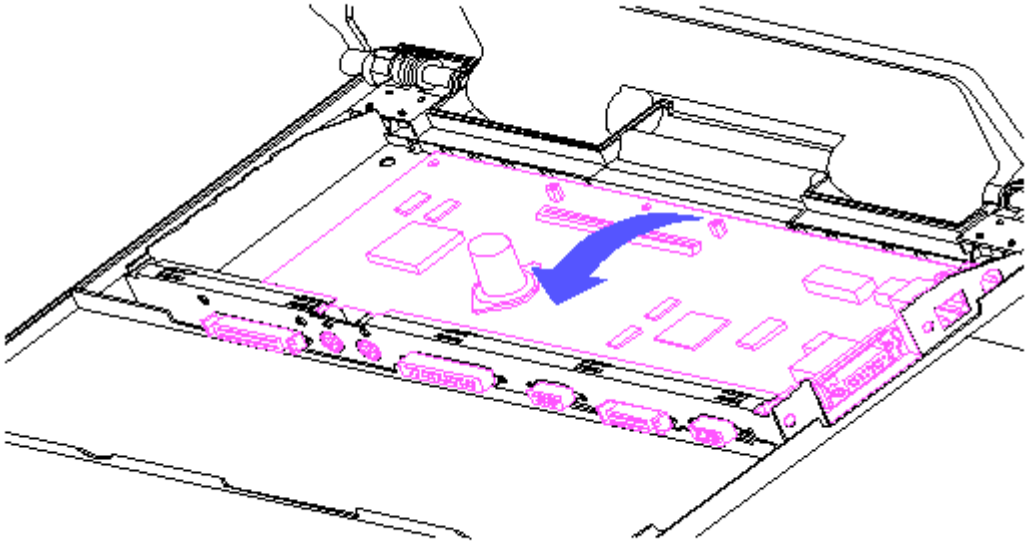


Figure 4-14. Removing the Interface Board

9. Snip the tethers that are securing the power button to board (Figure 4-15).

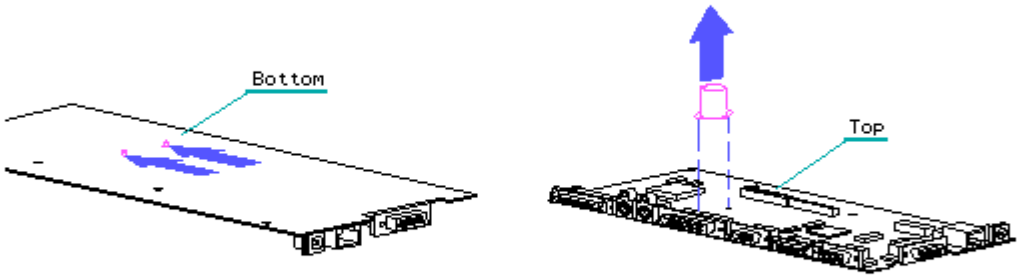


Figure 4-15. Releasing the Button from the Interface Board

10. Install the new power button by feeding the tethers through the hole in the interface board, pulling on the tethers to pull the enlarged area through the hole, and then snip off the excess from the tethers on the under side of the interface board (Figure 4-16).

    IMPORTANT: Do NOT cut the tethers between the enlarged area and the

interface board. Make certain that you trim the excess from between the enlarged area and the free end of the tether.

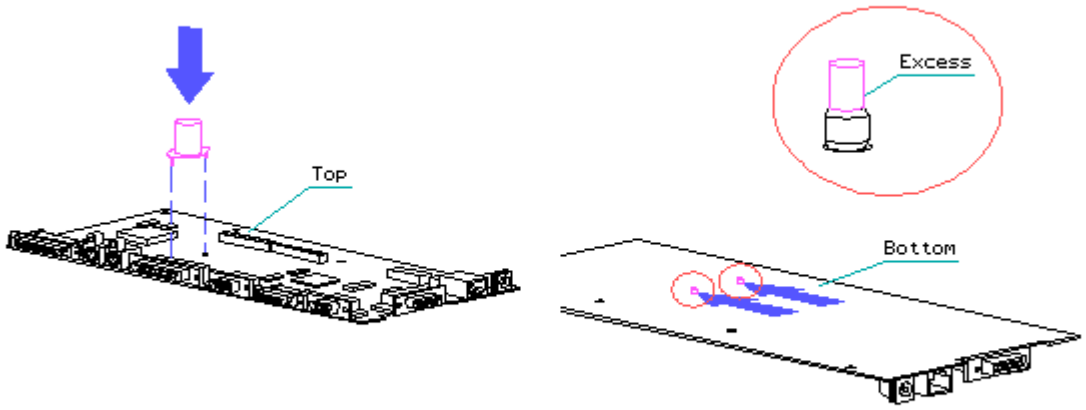


Figure 4-16. Installing the Power Button

11. Reverse the previous steps to reassemble the interface board.

Removing and Replacing the Interface Board

This procedure requires removal of the rear cover and the metal pan cover. Complete the following steps to replace the interface board:

1. Prepare the FlexConnect for maintenance (Section 4.2)

2. Remove the rear cover (Section 4.4).

3. Remove the metal pan cover (Figure 4-17).

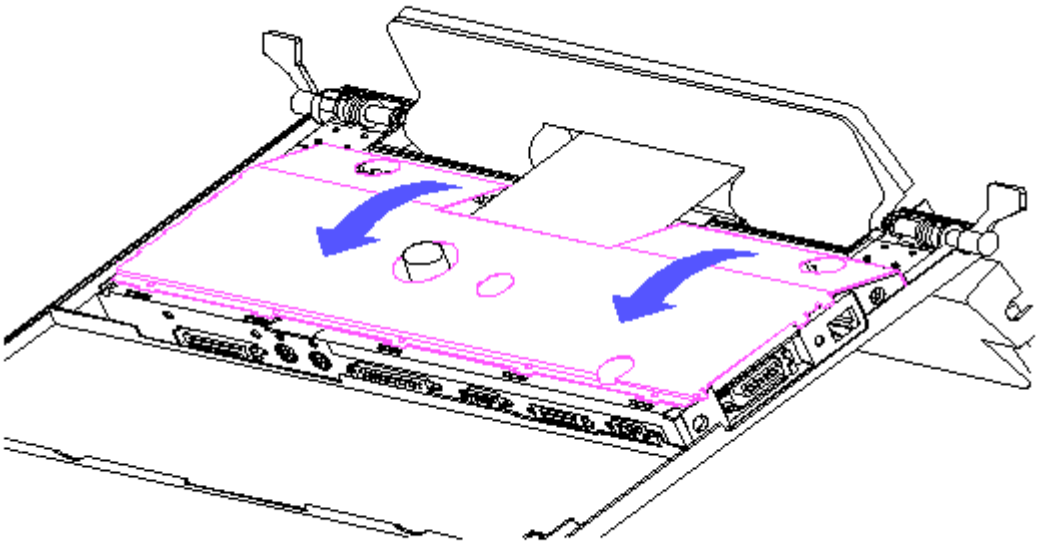


Figure 4-17. Removing the Pan Cover

4. Remove the bezel from side of the FlexConnect (Figure 4-18).

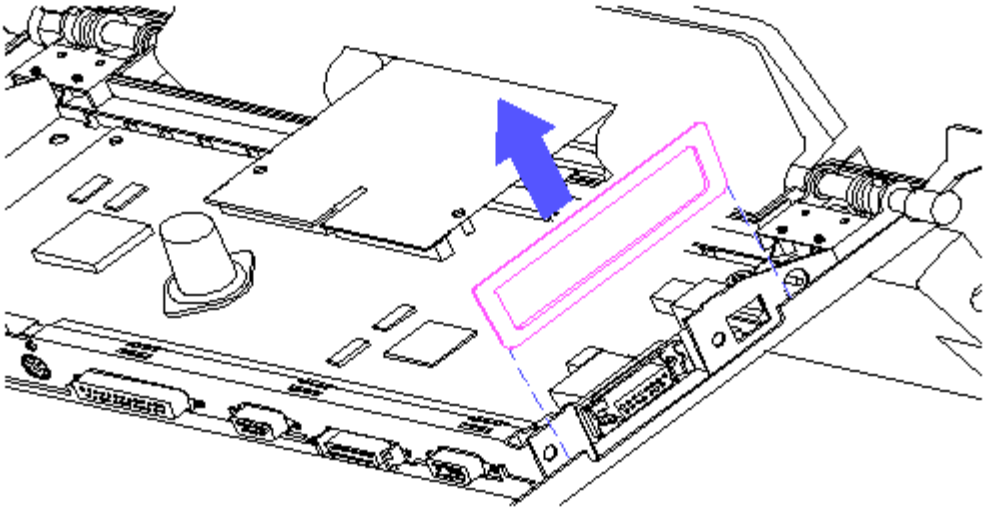


Figure 4-18. Removing the Bezel

5. Remove the two screws securing the flex cable to the interface board and disconnect the flex cable from the interface board (Figure 4-19).

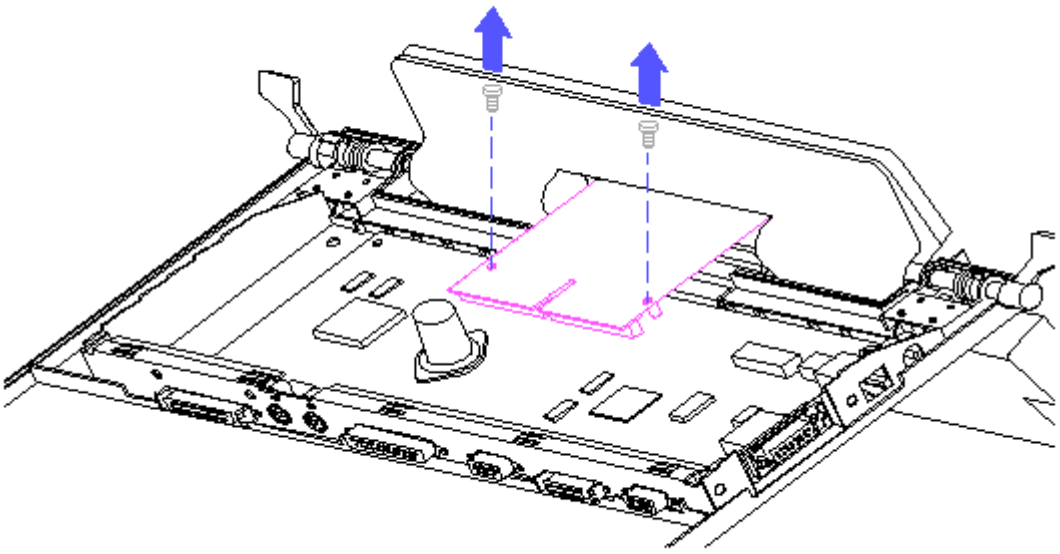


Figure 4-19. Disconnecting the Flex Cable

6. Lift the interface board, with pan attached, out of base (Figure 4-20).

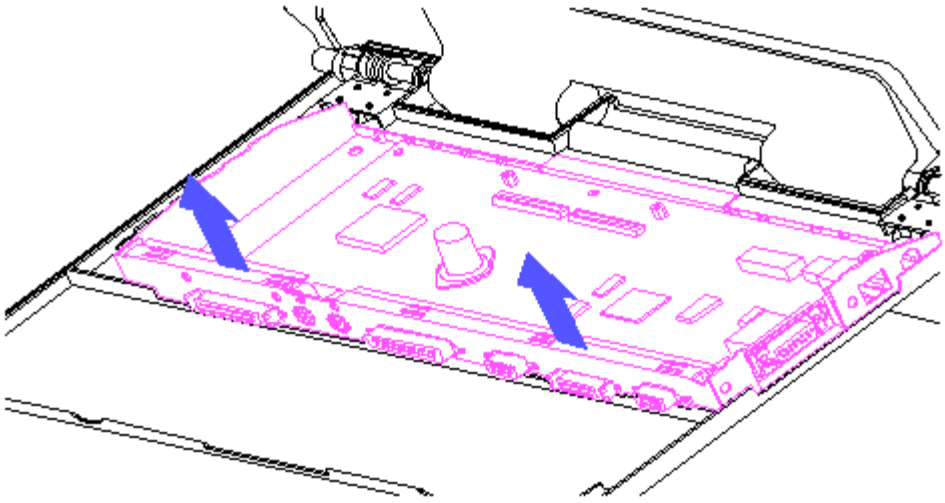


Figure 4-20. Removing the Interface Board

7. Reverse the previous steps to install a new card and reassemble the unit.

Removing and Replacing the Clutch Actuator

This procedure requires removal of the rear cover only.

1. Prepare the FlexConnect for maintenance (Section 4.2)

2. Remove the rear cover (Section 4.4).

3. Remove the two screws securing the clutch bracket to the base (Figure 4-21).

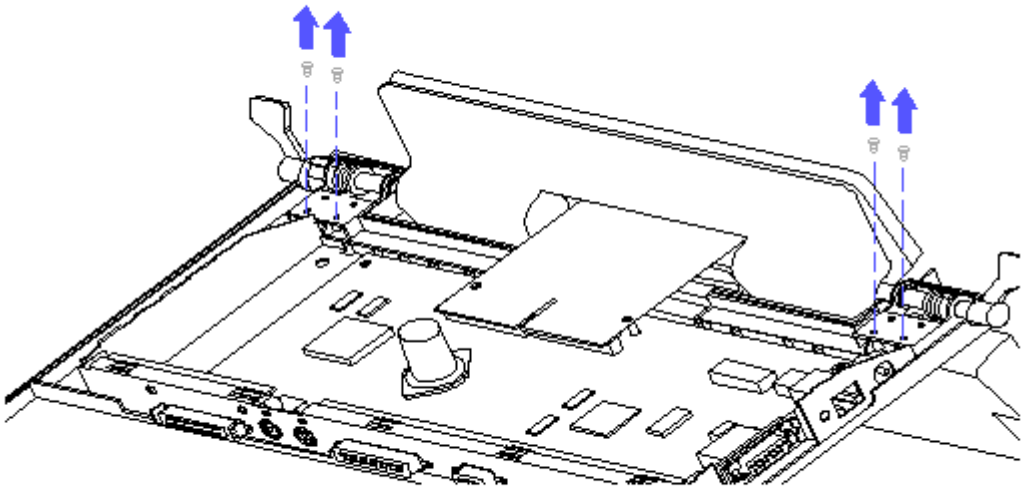


Figure 4-21. Clutch Mounting Bracket

4. Remove the clutch actuator. Lift the clutch a sufficient height away from the plastic to allow removal of the actuator (Figure 4-22).

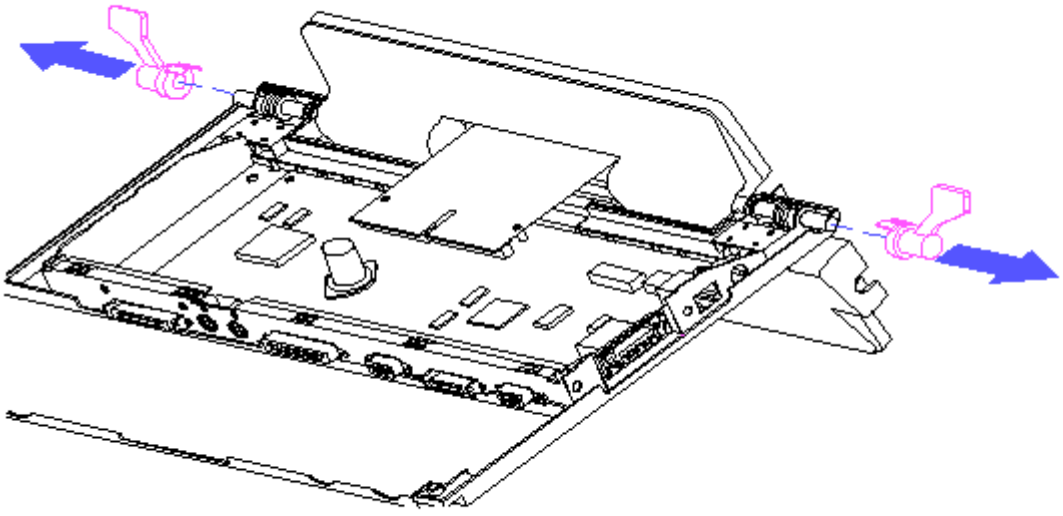


Figure 4-22. Clutch Actuator Replacement

5. Reverse the previous steps to replace the clutch actuator and to reassemble the unit.

Chapter 4.7 REMOVING THE BASES

Disassembly of the FlexConnect to release the front base also releases the rear base. Therefore, removal of both bases is included in the one procedure.

Complete the following steps to remove the front and rear bases:

1. Remove the front cover (Section 4.4).
2. Remove the eject levers and set them aside for reassembly (Section 4.5).
3. Remove the rear cover (Section 4.4).
4. Remove the flex cable (Section 4.5).
5. The interface board is now free. Lift the interface board and pan out of the rear base.
6. Remove the metal shroud mounting screws and remove the shroud (Figure 4-23).

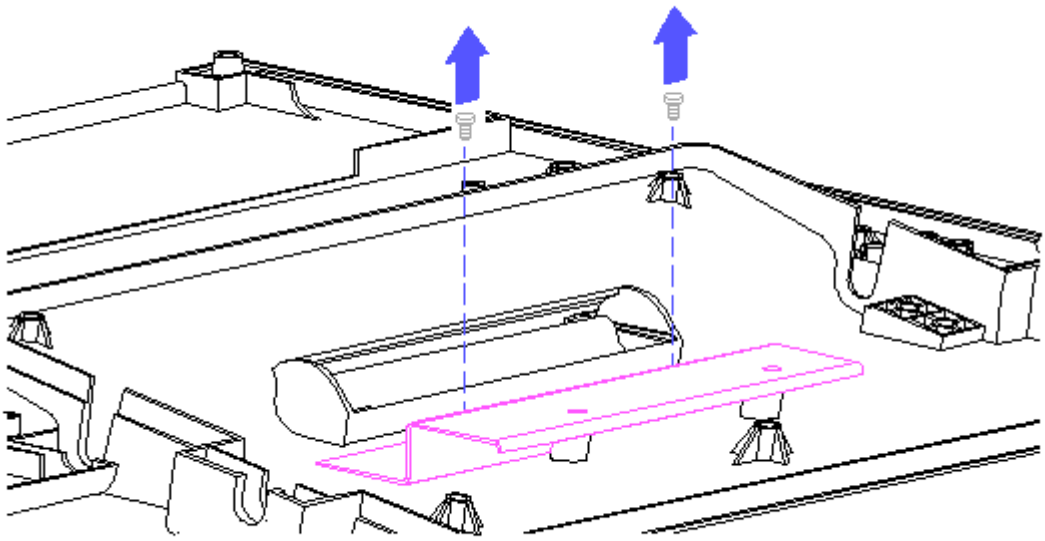


Figure 4-23. Removing the Shroud Mounting Screws

7. Remove the clutch mounting screws from the front and rear bases and remove the clutch assemblies (Figure 4-24). This releases the front and rear bases.

   NOTE: Releasing the clutch assembly from the base also frees the clutch actuator. Set the clutch actuators aside for reassembly.

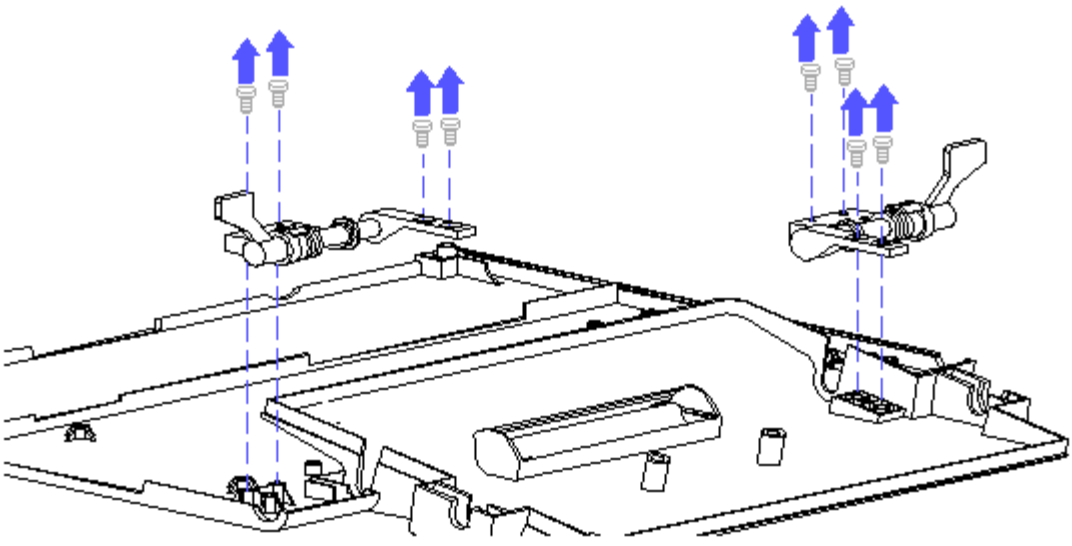


Figure 4-24. Removing the Clutch Mounting Screws

8. Reverse steps 1 through 8 to replace the clutches and the front and rear bases.

Chapter 5 - Power-On Self-Test (POST)

INTRODUCTION

This chapter lists the assemblies checked by the Power-On Self-Test (POST) and briefly describes the types of error codes that can occur. The chapter also includes problem isolation procedures and a flowchart for quick reference.

Chapter 5.1 POST

POST is a series of diagnostic tests that runs automatically on the Compaq Concerto Personal Computers when the system is turned on.

POST checks the following assemblies to ensure that the computer system is functioning properly:

- System Board
- Memory Expansion Board
- Keyboard
- Video Controller Circuitry
- Hard Drive
- Diskette Drive
- Digitizer Controller

POST also serves to detect the presence of the following:

- Hard Drive
- Diskette Drive
- Serial Port
- Parallel Port
- External Display
- Mouse
- External Keyboard
- Memory Expansion Board

If POST finds an error in the system, an error condition is indicated by an audible and/or visual message. See Chapter 4, "Error Messages and Codes," for an explanation of the error codes and a recommended course of action.

Chapter 5.2 PRELIMINARY STEPS

If you encounter an error condition, complete the following steps before starting problem isolation procedures:

1. Turn off the computer. Do not remove the battery pack.

2. Disconnect any external devices (leave the AC adapter attached). Do not disconnect the printer if you want to test it or use it to log error messages.

3. Install all appropriate loopback plugs and terminating plugs for complete testing.

4. Clear the power-on-password, if it is preset by the user.

   You will know that the power-on password is set when a Personal Identification Number (PIN) tablet appears on the screen when POST completes (Figure 5-1). If this occurs, you must enter the password to continue. You must clear the password during SETUP.

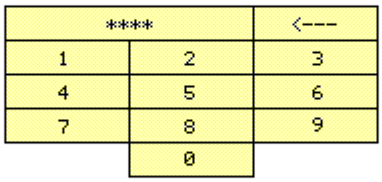


Figure 5-1. PIN Tablet

   When the PIN tablet appears, enter the 4-digit password. You cannot use the numeric keypad for this entry. Either use the pen or the numeric keys across the top of the keyboard.

   If you do not have access to the password, you must disable the power-on password. Refer to Section 5.3, "Clearing Power-on Password," for information on how to disable the power-on password.

5. The brightness and contrast should be set approximately at the center of their ranges. Since these are controlled by hotkeys and hot buttons, you will have to adjust this after power on.

   NOTE: Diagnostics are available by selecting the Computer Checkup (TEST) utility on the Configuration and Diagnostics Menu. This menu is displayed when the F10 key is pressed during POST, after restarting the computer.

6. Turn on the computer.

7. Press the F10 key as soon as the cursor moves to the upper right corner of the screen or you are prompted to enter F10 SETUP. This happens almost immediately. The Power-On Self-Test (POST) runs, you hear two

beeps, and the cursor moves.

8. If prompted, select the desired language. The Configuration and Diagnostics Menu will be displayed.

Follow the procedures of the Problem Isolation Flowchart, Section 5.4, and refer to Chapter 6, "Error Messages and Codes," for detailed information on problem isolation.

Chapter 5.3 CLEARING POWER-ON PASSWORD

To clear the power-on password feature, you must disable the power-on password by relocating a jumper on the system board. To do so, complete the following steps:

1. Complete the preparation procedures in Section 3.3.

2. Remove the rear cover (Section 3.4).

3. Remove the Power-On Password jumper (Figure 5-2). Retain the jumper for replacement later.

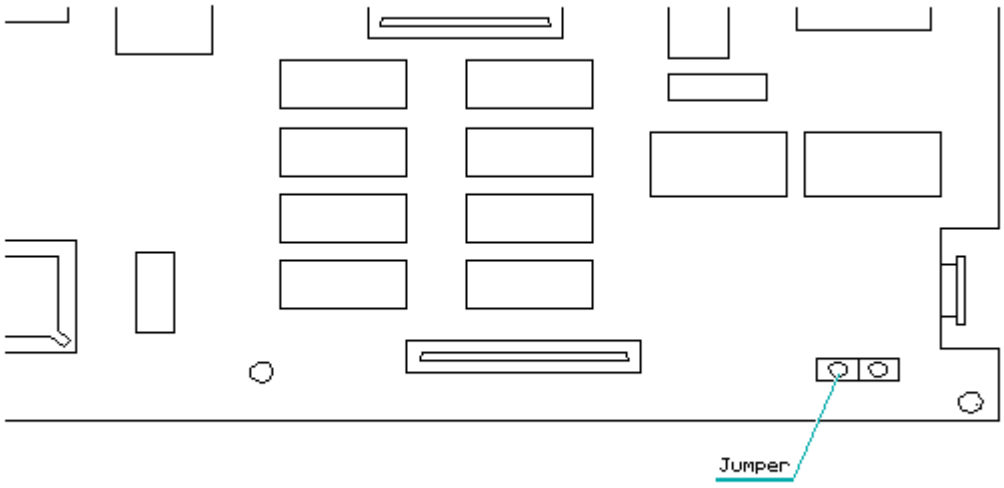


Figure 5-2. Power-On Password Jumper

4. Replace the rear cover.

5. Turn on computer until POST is complete.

6. Turn off computer and replace the jumper.

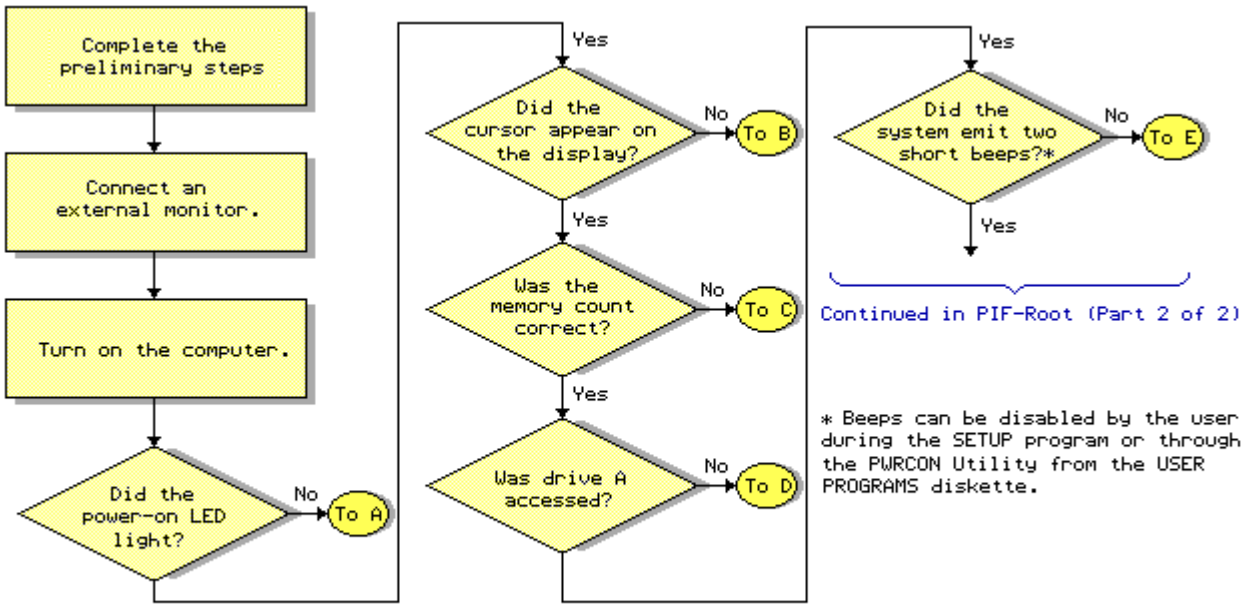
7. Reassemble the computer (refer to Chapter 3, "Removal and Replacement

Procedures") then reconnect the AC power.

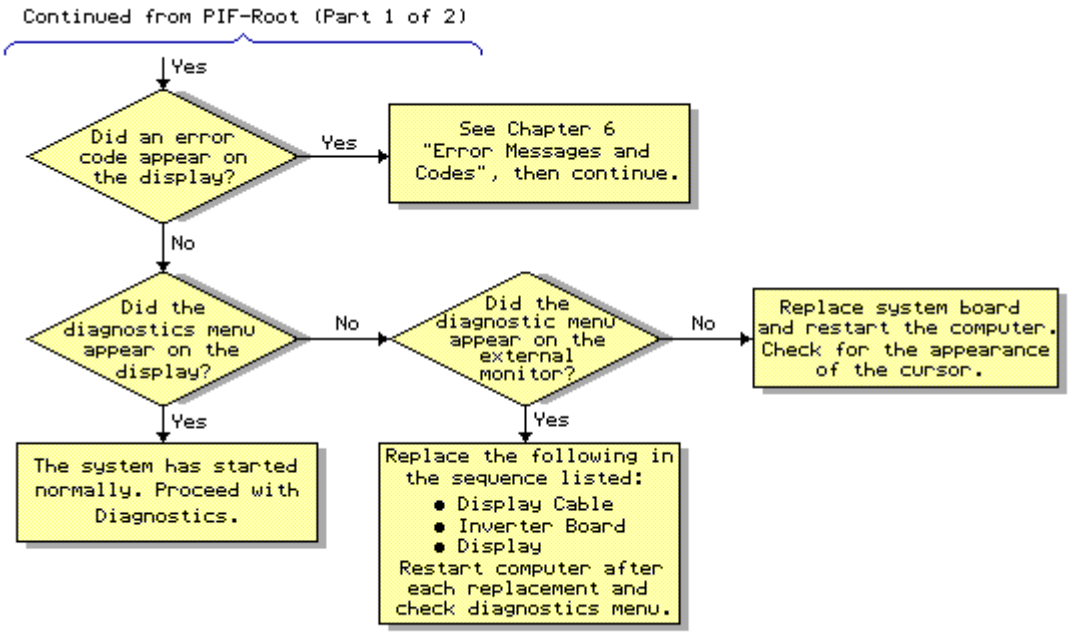
8. Turn on the computer and allow it to complete POST. If the PIN tablet does not appear when POST completes, the power-on password was erased.

Chapter 5.4 PROBLEM ISOLATION FLOWCHART

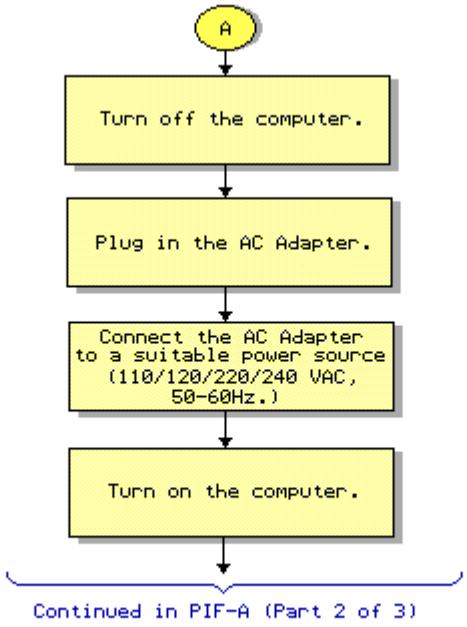
The problem isolation flowchart provides a quick reference for identifying and correcting problems that may occur during POST. The flowchart gives troubleshooting procedures for identifying malfunctions. It also directs you to Chapter 6, "Error Messages and Codes," for more detailed troubleshooting information.



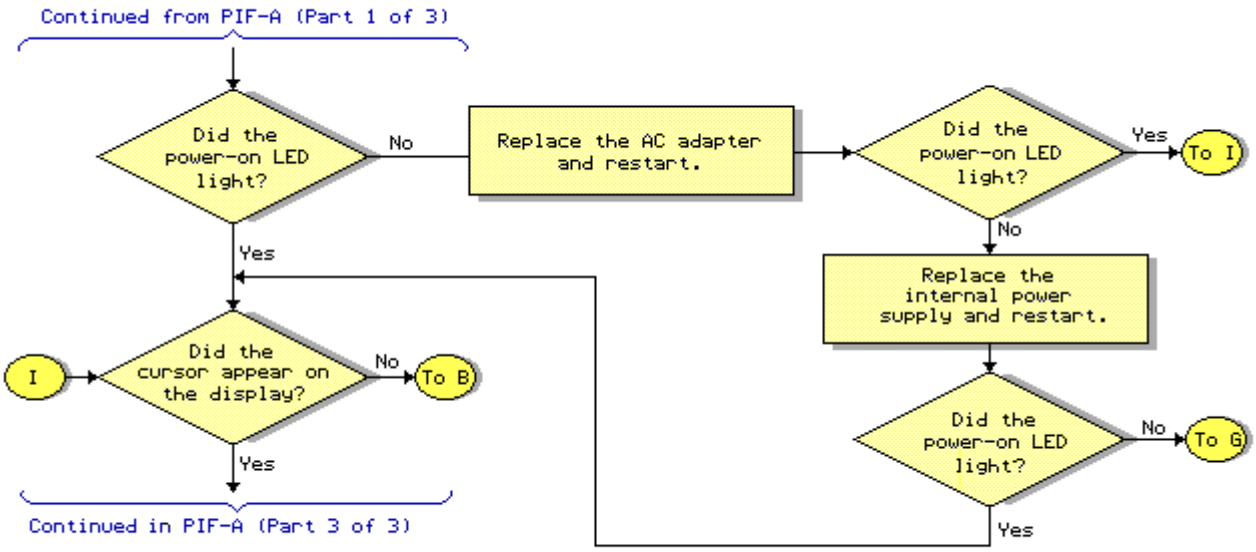
Problem Isolation Flowchart - Root (Part 1 of 2)



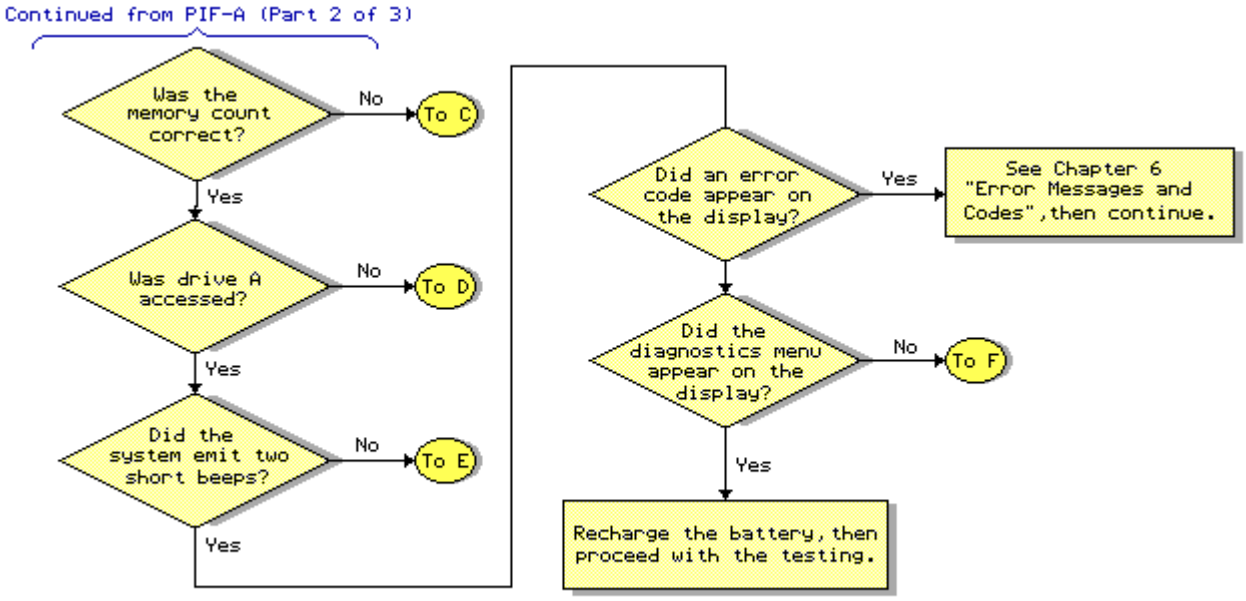
Problem Isolation Flowchart - Root (Part 2 of 2)



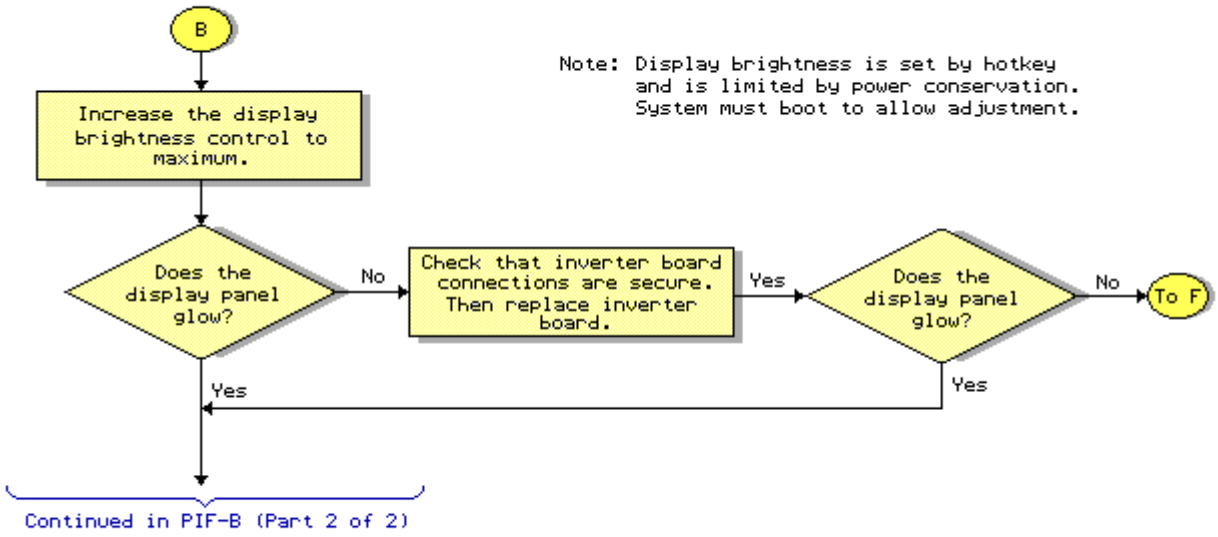
Problem Isolation Flowchart - A (Part 1 of 3)



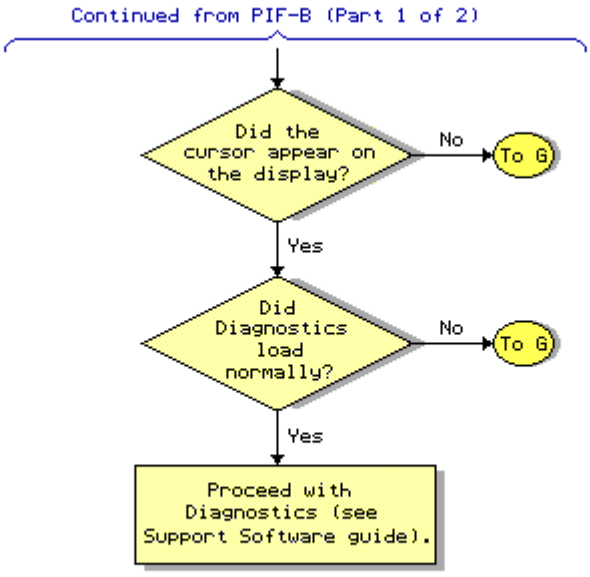
Problem Isolation Flowchart - A (Part 2 of 3)



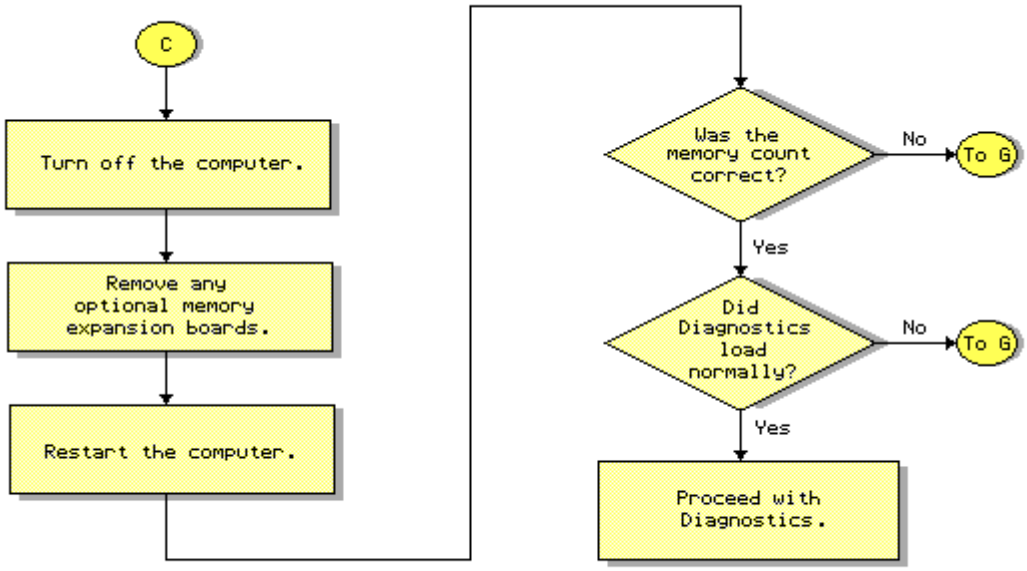
Problem Isolation Flowchart - A (Part 3 of 3)



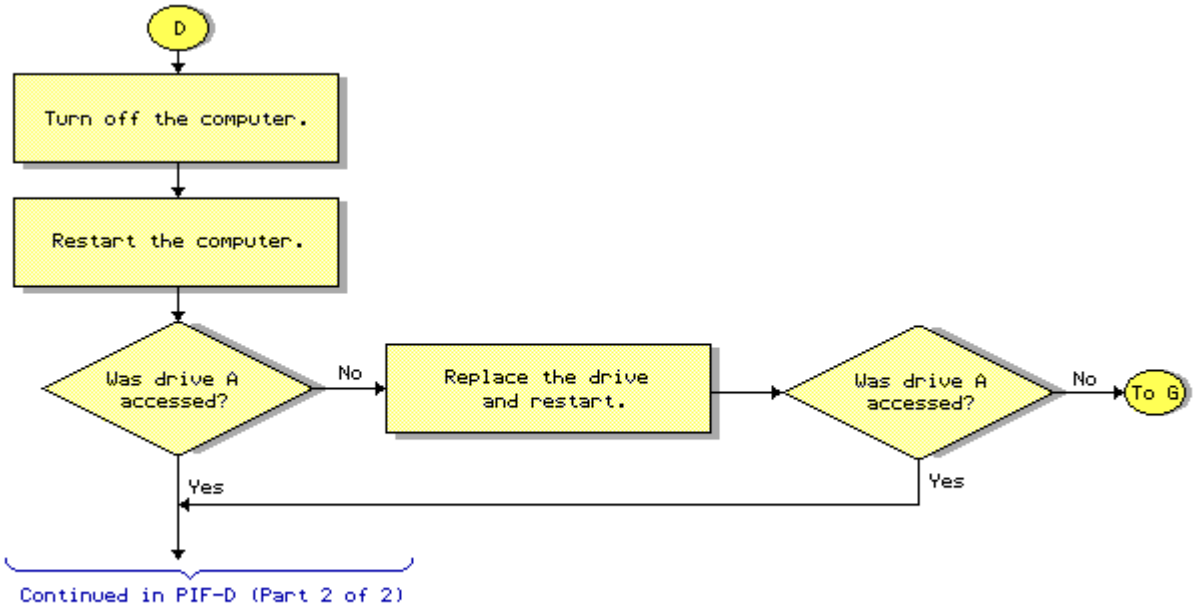
Problem Isolation Flowchart - B (Part 1 of 2)



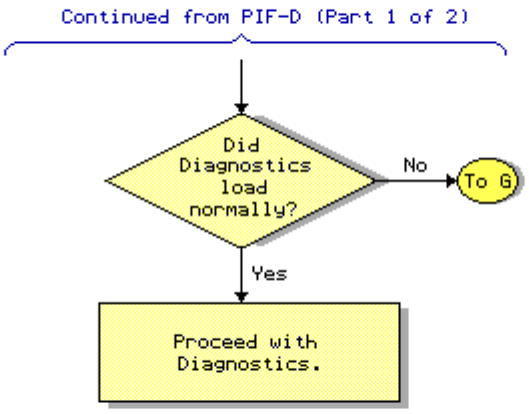
Problem Isolation Flowchart - B (Part 2 of 2)



Problem Isolation Flowchart - C



Problem Isolation Flowchart - D (Part 1 of 2)



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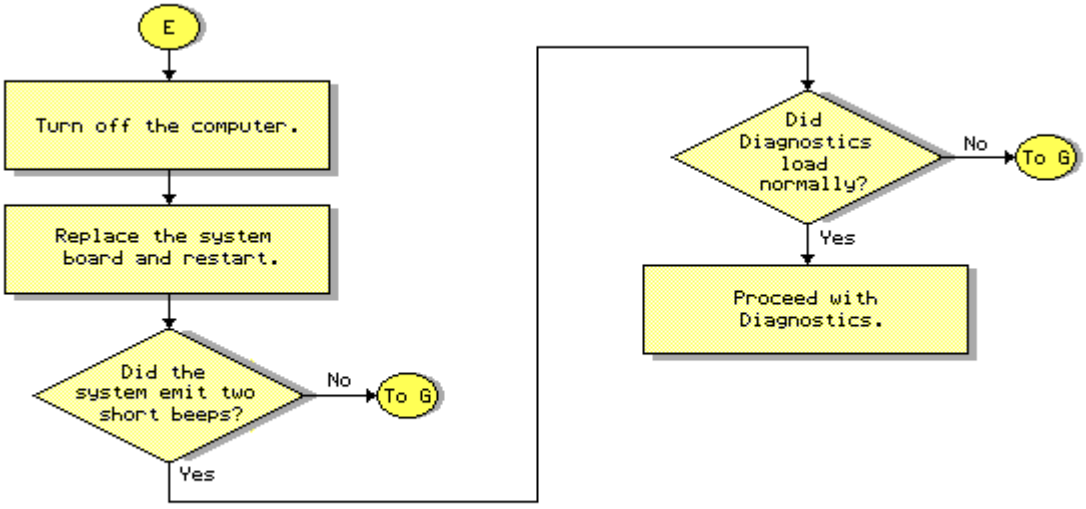
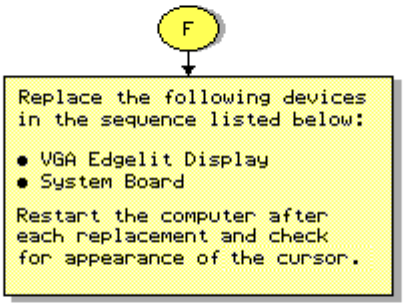
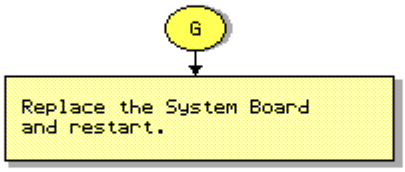


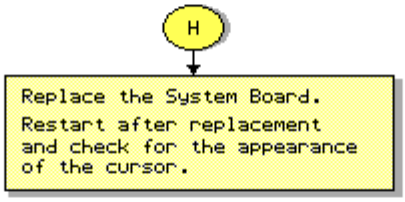
Problem Isolation Flowchart - E



Problem Isolation Flowchart - F



Problem Isolation Flowchart - G



Problem Isolation Flowchart - H

Chapter 6 - Error Messages and Codes

INTRODUCTION

This chapter contains Power-On Self-Test (POST) messages, diagnostic error codes, and memory error codes.

The messages and codes appear in tables that include a description of the error, the probable cause, and the recommended action that should be taken to resolve the error condition.

Chapter 6.1 POWER-ON SELF-TEST MESSAGES

An error message results if a problem is encountered during the Power-On Self-Test Utility. This Power-On Self-Test Utility runs automatically when the system is turned on.

Table 6-1 lists the messages for POST, the audible (beep) message, probable cause, and recommended action.

Table 6-1. Power-On Self-Test Messages

Message	Beeps	Probable Cause	Recommended Action
101-ROM Error	1 Long, 1 Short	ROM checksum option	1. Inspect the ROM placement. 2. Verify the correct ROM. 3. Replace the ROM.
101-I/O ROM Error	1 Long, 1 Short	System ROM	1. Inspect the ROM placement. 2. Verify the correct ROM. 3. Replace the ROM.
102-System Board or System Memory Failure	None	System Board	Replace the system board.
162-System Options Error	2 Short	Configuration error	Run SETUP.
162-System Options Not Set	2 Short	Configuration incorrect	Run SETUP.
163-Time & Date Not Set	2 Short	Invalid time or date configuration memory	Run SETUP.
164-Memory Size Error	2 Short	Configuration memory incorrect	Run SETUP. RAM will update automatically.
167-RTC Lost Power	2 Short	Battery pack discharged	1. Fully charge battery pack. 2. Run SETUP.

XX000Y ZZ * 201-Memory Error	None	RAM failure	1. Replace the memory card. 2. Replace the system board.
XX000Y ZZ *	None	RAM failure	Replace the system board.
205-Memory Error	None	Cache memory error	Run diagnostics to help identify error.
301-Keyboard Error	None	Keyboard	Replace the keyboard.

* Beeps can be disabled by the user during the SETUP program.

Message	Beeps	Probable Cause	Recommended Action
301-Keyboard Error or Test Fixture Installed	None	Keyboard	Replace the keyboard.
303-Keyboard Controller Error	None	System board keyboard controller	Replace the system board.
304-Keyboard or system Unit Error	None	Keyboard	1. Replace the keyboard. 2. Replace the system board.
601-Diskette Controller Error	None	Diskette controller circuitry or no drive attached or, if attached, drive is defective	1. Check and/or replace diskette drive cable. 2. Run diagnostics. 3. Replace the system board.
605-Diskette Drive Error	None	Mismatch in drive type	Run SETUP; Autosetup update.
702-Coprocessor Detection Error	None	Indicates a bad processor since the coprocessor is integrated	1. Run SETUP. 2. Check processor installation. 3. Replace processor. ROM should auto-update configuration.
1125-Internal Serial Port Failure	None	Defective internal port	Replace the system board.
1150-Comm Port Configuration Error	2 Short	Added or removed modem or second serial interface board	Run SETUP. ROM should auto-update configuration.
1780-Disk 0 Failure	None	Hard drive/format error	1. Run diagnostics. 2. Replace the drive.

1781-Disk 1 Failure	None	Hard drive/format error	1. Run diagnostics. 2. Replace the drive.
1782-Disk Controller Failure	None	Hard drive controller error	1. Run diagnostics. 2. Replace the drive.
1790-Disk 0 Error	None	Hard drive error	1. Run diagnostics. 2. Replace the drive.
1791-Disk 1 Error	None	Hard drive 1 error	1. Run diagnostics. 2. Replace the drive.
XX000Y ZZ Parity Check 2	None	Parity RAM failure	Run diagnostics.
Audible	1 Short	Power-on successful	None
Audible	2 Short	Power-on successful	None
(RESUME = F1 key)	None	As indicated to continue	Press F1 key.

Chapter 6.2 DIAGNOSTIC ERROR CODES

Diagnostic error codes occur if the system recognizes a problem while running the diagnostics program. These error codes help identify possible defective subassemblies. Table 6-2 through Table 6-12 list possible error codes, a description of the error condition, and the action required to resolve the error condition.

In each case, the Recommended Action column lists steps necessary to correct the problem. After completing each step, run the diagnostics program to verify whether the condition has been corrected. If the error code reappears, perform the next step, then run the diagnostics program again. Follow this procedure until the diagnostics program no longer detects an error condition.

The error code appear in an AYY-XX or AAYY-XX format.

A or AA = number that represents faulty assembly
YY = test or action that failed
XX = a specific problem

For assistance in the removal and replacement of a particular subassembly, refer to the removal and replacement procedures in Chapter 3.

Table 6-2. System Board Test Error Codes

Error Code	Description	Recommended Action
101-01	CPU test failed	Replace the system board and retest for error code 101-01.

102-01	Coprocessor initial status word incorrect	The following steps apply to error codes 102-XX:
102-02	Coprocessor initial control word incorrect	1. Run SETUP. 2. Replace system board and retest.
102-03	Coprocessor tag word not all ones	
102-04	Coprocessor tag word not all zeros	
102-05	Coprocessor exchange command failed	
102-06	Coprocessor masked exception incorrectly handled	
102-07	Coprocessor unmasked exception incorrectly handled	
102-08	Coprocessor wrong mask bit set in status register	
102-09	Coprocessor unable to store real number	
102-10	Coprocessor real number calculation test failed	The following steps apply to error codes 102-XX:
102-11	Coprocessor speed test failed	1. Run SETUP. 2. Replace system board and retest.
102-12	Coprocessor pattern test failed	
102-15	Coprocessor is inoperative or socket is unoccupied	
103-01	DMA page registers test failed	Replace the system board and retest for error codes 103-XX through 114-XX.
103-02	DMA byte controller test failed	
103-03	DMA word controller test failed	

Error Code	Description	Recommended Action
104-01	Interrupt controller master test failed	Replace the system board and retest for error codes 103-XX through 114-XX.
104-02	Interrupt controller slave test failed	

104-03	Interrupt controller software RTC is inoperative	
105-01	Port 61 bit 6 not at zero	
105-02	Port 61 bit 5 not at zero	
105-03	Port 61 bit 3 not at zero	
105-04	Port 61 bit 1 not at zero	
105-05	Port 61 bit 0 not at zero	
105-06	Port 61 bit 5 not at one	
105-07	Port 61 bit 3 not at one	
105-08	Port 61 bit 1 not at one	
105-09	Port 61 bit 0 not at one	
105-10	Port 61 I/O test failed	
105-11	Port 61 bit 7 not at zero	
105-12	Port 61 bit 2 not at zero	
106-01	Keyboard controller self-test failed	
107-01	CMOS RAM test failed	
108-02	CMOS interrupt test failed	
108-03	CMOS interrupt test, CMOS not properly initialized	
109-01	CMOS clock load data test failed	
109-02	CMOS clock rollover test failed	
109-03	CMOS clock test, CMOS not properly initialized	

Error Code	Description	Recommended Action
110-01	Programmable timer load data test failed	Replace the system board and retest for error codes 103-XX through 114-XX.
110-02	Programmable timer dynamic test failed	
111-01	Refresh detect test failed	
112-01	Speed test slow mode out of range	

112-02	Speed test mixed mode out of range
112-03	Speed test fast mode out of range
112-04	Speed test unable to enter slow mode
112-05	Speed test unable to enter mixed mode
112-06	Speed test unable to enter fast mode
112-07	Speed test system error
112-08	Speed test unable to enter auto mode
112-09	Speed test unable to enter high mode
112-10	Speed test high mode out of range
112-11	Speed test auto mode out of range
113-01	Protected mode test failed
114-01	Speaker test failed

Table 6-3. Memory Test Error Codes

Error Code	Description	Recommended Action
201-01	Memory machine ID test failed	Replace the system board and retest; applies to error codes 201-XX through 202-XX.
202-01	Memory system ROM checksum failed	
202-02	Failed RAM/ROM map test	
202-03	Failed RAM/ROM protect test	
203-01	Memory write/read test	The following steps apply to error codes 203-XX through 211-XX.
203-02	Error during saving program memory in write/read test	1. Replace the memory card and retest.
203-03	Error during restore of program memory in write/read test	2. Replace the system board and retest.
204-01	Memory address test failed	

204-02	Error during saving program memory in address test
204-03	Error during restore of program memory in address test
204-04	A20 address test failed
204-05	Page hit address test failed
205-01	Walking I/O test failed
205-02	Error during saving program memory in walking I/O test
205-03	Error during restore of program memory in walking I/O test
210-XX	Increment Pattern Test
211-XX	Random Pattern Test

Table 6-4. Keyboard Test Error Codes

Error Code	Description	Recommended Action
301-01	Keyboard short test, 8042 self-test failed	The following steps apply to error codes 301-XX through 304-XX:
301-02	Keyboard short test, interface test failed	1. Check the keyboard connection. If disconnected, turn off the computer and connect the keyboard.
301-03	Keyboard short test, echo test failed	2. Replace the keyboard and retest.
301-04	Keyboard short test failed	3. Replace the system board and retest.
302-01	Keyboard long test failed	
303-01	Keyboard LED test, 8042 self-test failed	
303-02	Keyboard LED test, reset test failed	
303-03	Keyboard LED test, reset test failed	
303-04	Keyboard LED test, LED command test failed	
303-05	Keyboard LED test, LED command test failed	
303-06	Keyboard LED test, LED command test	

303-07	Keyboard LED test, LED command test failed
303-08	Keyboard LED test, command byte restore test failed
303-09	Keyboard LED test, LEDs failed to light
304-01	Keyboard typematic test failed
304-02	Unable to enter mode 3
304-03	Incorrect scan code from keyboard
304-04	No make code observed
304-05	Unable to disable typematic feature
304-06	Unable to return to normal mode

Table 6-5. Parallel Printer Test Error Codes

Error Code	Description	Recommended Action
401-01	Printer failed or not connected	The following steps apply to error codes 401-XX through 498-XX:
402-01	Printer data register	1. Connect the printer.
402-02	Printer control register failed	2. Check power to the printer and retest.
402-03	Printer data and control register failed	3. Disconnect printer. Install the loopback connector and retest.
402-04	Printer loopback failed	4. Replace the system board and retest.
402-05	Printer loopback and data failed	
402-06	Printer loopback and control register failed	
402-07	Printer loopback, data, and control register failed	
402-08	Printer interrupt test failed	
402-09	Printer interrupt and data register failed	

402-10	Printer interrupt and control register failed
402-11	Printer interrupt and loopback failed
402-13	Printer interrupt, loopback, and data register failed
402-14	Printer interrupt, loopback, and control register failed
402-15	Printer interrupt, loopback, data, and control register failed
402-16	Printer unexpected interrupt received
403-01	Printer pattern test failed
498-00	Printer failed or not connected

Table 6-6. Diskette Drive Test

Error Code	Description	Recommended Action
600-XX	Diskette ID drive types test failed	The following steps apply to error codes 600-XX through 610-XX:
601-XX	Diskette format failed	1. Replace the diskette and retest.
602-XX	Diskette read test failed	2. Check and/or replace the diskette signal cable and retest.
603-XX	Diskette write, read, compare test failed	3. Replace the diskette drive and retest.
604-XX	Diskette random seek test failed	4. Replace the system board and retest.
605-XX	Diskette ID media failed	
606-XX	Diskette speed test failed	
607-XX	Diskette wrap test failed	
608-XX	Diskette write-protect test failed	
609-XX	Diskette reset controller test failed	
610-XX	Diskette change line test failed	
610-01	Exceeded maximum soft error	

	limit	
610-02	Exceeded maximum hard error limit	
710-03	Previously exceeded maximum soft error limit	
610-04	Previously exceeded maximum hard error limit	
610-05	Failed to reset controller	
610-06	Fatal error while reading	
610-07	Fatal error while writing	
610-08	Failed compare of write/read buffers	
610-09	Failed to format a track	

Error Code	Description	Recommended Action
610-10	Failed sector wrap test	The following steps apply to error codes 600-XX through 610-XX: 1. Replace the diskette and retest. 2. Check and/or replace the diskette signal cable and retest. 3. Replace the diskette drive and retest. 4. Replace the system board and retest.
610-20	Failed to get drive type	
610-21	Failed to get change line status	
610-22	Failed to clear change line status	
610-23	Failed to set drive type in ID media	
610-24	Failed to read diskette media	
610-25	Failed to verify diskette media	
610-26	Failed to read media in speed test	
610-27	Failed speed limits	
610-28	Failed write protect test	
697-00	Diskette type error	The following steps apply to error codes 697-XX through 698-XX: 1. Replace the diskette and retest. 2. Check and/or replace the diskette drive cable and retest. 3. Replace the diskette drive and retest. 4. Replace the system board and retest.
698-00	Diskette drive speed not within limits	

699-00	Diskette drive/media ID error	1. Replace media. 2. Run SETUP.

Table 6-7. Serial Test Error Codes

Error Code	Description	Recommended Action
1101-01	Serial Port Test; UART DLAB bit failure	The following steps apply to error codes 1101-XX through 1109-XX:
1101-02	Serial Port Test; line input or UART fault	1. Check the switch settings on the serial/parallel interface board, if applicable.
1101-03	Serial Port Test; address line fault	2. Replace the serial/parallel interface board, if applicable.
1101-04	Serial Port Test; data line fault	3. Replace the system board and retest.
1101-05	Serial Port Test; UART control signal failure	
1101-06	Serial Port Test; UART THRE bit failure	
1101-07	Serial Port Test; UART DATA READY bit failure	
1101-08	Serial Port Test; UART TX/RX buffer failure	
1101-09	Serial Port Test; INTERRUPT circuit failure	
1101-10	Serial Port Test; COM1 set to invalid interrupt	
1101-11	Serial Port Test; COM2 set to invalid interrupt	
1101-12	Serial Port Test; DRIVER/RECEIVER control signal failure	
1101-13	Serial Port Test; UART control signal interrupt failure	
1101-14	Serial Port Test; DRIVER/RECEIVER data failure	
1109-01	Clock register initialization failure	
1109-02	Clock register rollover failure	

1109-03	Clock reset failure
1109-04	Input line or clock failure
1109-05	Address line fault
1109-06	Data line fault; Clock Register Test

Table 6-8. Modem Communications Test Error Codes

Error Code	Description	Recommended Action
1201-XX	Modem internal loopback test	The following steps apply to error codes 1201-XX through 1210-XX: 1. Refer to modem documentation for correct setup procedures. 2. Check the modem line. 3. Replace the modem and retest.
1201-01	UART DLAB bit failure	
1201-02	Line input or UART failure	
1201-03	Address line fault	
1201-04	Data line fault	
1201-05	UART control signal failure	
1201-06	UART THRE bit failure	
1201-07	UART DATA READY bit failure	
1201-08	UART TX/RX buffer failure	
1201-09	INTERRUPT circuit failure	
1201-10	COM1 set to invalid interrupt	
1201-11	COM2 set to invalid interrupt	
1201-12	DRIVER/RECEIVER control signal failure	
1201-13	UART control signal interrupt failure	
1201-14	DRIVER/RECEIVER data failure	
1201-15	Modem detection failure	
1201-16	Modem ROM; checksum failure	
1201-17	Tone detection failure	
1202-XX	Internal Modem Text	

Error Code	Description	Recommended Action
1202-01	Modem timed out waiting for SYNC (local loopback mode)	
1202-02	Modem timed out waiting for response (local loopback mode)	
1202-03	Modem exceed data block retry limit (local loopback mode)	The following steps apply to error codes 1201-XX through 1210-XX: 1. Refer to modem documentation for correct setup procedures. 2. Check the modem line. 3. Replace the modem and retest.
1202-11	Modem timed out waiting for SYNC (analog loopback originate mode)	
1202-12	Modem timed out waiting for modem response (analog loopback originate mode)	
1202-13	Modem exceeded data block retry limit (analog loopback originate mode)	
1202-21	Modem timed out waiting for SYNC (analog loopback answer mode)	
1202-22	Modem timed out waiting for modem response (analog loopback answer mode)	
1202-23	Modem exceeded data block retry limit (analog loopback answer mode)	
1203-XX	Modem external termination test	
1203-01	Modem external TIP/RING failure	
1203-02	Modem external DATA TIP/RING failure	
1203-03	Modem line termination failure	
1204-XX	Modem auto originate test	
1206-XX	Dial multifrequency tone test	
1210-XX	Modem direct connect test	
1210-01	Modem timed out waiting for SYNC	

Error Code	Description	Recommended Action
1210-02	Modem timed out waiting for response	The following steps apply to error codes 1201-XX through 1210-XX: 1. Refer to modem documentation for correct setup procedures. 2. Check the modem line. 3. Replace the modem and retest.
1210-03	Modem exceeded data block retry limit	
1210-04	RCV exceeded carrier lost limit	
1210-05	XMIT exceeded carrier lost limit	
1210-06	Timed out waiting for dial tone	
1210-07	Dial number string too long	
1210-08	Modem timed out waiting for remote response	
1210-09	Modem exceeded maximum redial limit	
1210-10	Line quality prevented remote connection	
1210-11	Modem timed out waiting for remote connection	
1210-17	Tone detection failure	

Table 6-9. Hard Drive Test Error Codes

Error Code	Description	Recommended Action
1700-XX	Hard drive ID drive types test failed	The following steps apply to error codes 1700-XX through 1799-XX: 1. Run SETUP and verify drive type. 2. Replace the hard drive signal cable and retest. 3. Replace the hard drive and retest. 4. Replace the system board and retest.
1701-XX	Hard drive format test failed	
1702-XX	Hard drive read test failed	
1703-XX	Hard drive write/read/ compare test failed	
1704-XX	Hard drive controller test	
1705-XX	Hard drive controller test failed	
1706-XX	Hard drive ready test failed	
1707-XX	Hard drive recalibration test failed	

1708-XX	Hard drive format bad track test failed
1709-XX	Hard drive reset controller test failed
1710-XX	Hard drive park head test failed
1714-XX	Hard drive file write test failed
1715-XX	Hard head select test failed
1716-XX	Hard drive conditional format test failed
1717-XX	Hard drive ECC * test failed
1719-XX	Hard drive power mode test failed
1719-01	Exceeded maximum soft error limit
1719-02	Exceed maximum hard error limit

Error Code	Description	Recommended Action
1719-03	Previously exceeded maximum soft error limit	The following steps apply to error codes 1700-XX through 1799-XX: 1. Run SETUP and verify drive type. 2. Replace the hard drive signal cable and retest. 3. Replace the hard drive and retest. 4. Replace the system board and retest.
1719-04	Previously exceeded maximum hard error limit	
1719-05	Failed to reset controller	
1719-06	Fatal error while reading	
1719-07	Fatal error while writing	
1719-08	Failed compare of write/ read/compare	
1719-09	Failed to format a track	
1719-10	Failed sector wrap test	
1719-19	Controller failed to deallocate bad sector	
1719-40	Failed cylinder 0	
1719-41	Drive not ready	
1719-42	Recalibrate failed	

Error Code	Description	Recommended Action
1719-43	Failed to format bad track	
1719-44	Failed disk controller diagnostics	
1719-45	Failed to get drive parameters from ROM	
1719-46	Invalid drive parameters found in ROM	
1719-47	Failed to park heads	The following steps apply to error codes 1700-XX through 1799-XX: 1. Run SETUP and verify drive type. 2. Replace the hard drive signal cable and retest. 3. Replace the hard drive and retest. 4. Replace the system board and retest.
1719-48	Failed to move disk table to RAM	
1719-49	Failed to read media in file write test	
1719-50	Failed file I/O write test	
1719-51	Failed file I/O read test	
1719-52	Failed file I/O compare test	
1719-53	Failed drive/head register test	
1719-54	Failed digital input register test	
1719-55	Failed cylinder 1	
1719-56	Hard drive controller RAM diagnostics failed	
1719-57	Hard drive controller to drive test failed	
1719-58	Failed to write sector buffer	
1719-59	Failed to read sector buffer	
1719-60	Failed to compare sector buffer	
1719-61	Failed uncorrectable ECC * error	
1719-62	Failed correctable ECC * error	
1719-63	Failed soft error rate	
1719-65	Exceeded maximum bad sector per track	

1719-66	Failed initial drive parameter
1719-67	Failed to write long
1719-68	Failed to read long
1719-69	Failed to read drive size from controller
1719-70	Failed translate mode
1719-71	Failed nontranslated mode
1719-72	Bad track limit exceeded
1719-73	Previously exceeded bad track limit
1719-74	Failed sleep mode
1719-75	Failed idle mode
1719-76	Failed standby mode
1719-77	Failed to change mode
1719-78	Exceeded spinup time limit
1799-XX	Invalid hard drive type failed

* Error Correction Code

Table 6-10. Video Test Error Codes

Error Code	Description	Recommended Action
2402-XX	Video memory test failed	The following steps apply to error codes 2402-XX through 2456-XX: 1. Run SETUP. 2. Replace the monitor and retest. 3. Replace the system board and retest.
2403-XX	Video attribute test failed	
2404-XX	Video character set test failed	
2405-XX	Video 80 x 25 mode 9 x 14 character cell test failed	
2406-XX	Video 80 x 25 mode 8 x 8 character cell test failed	
2407-XX	Video 40 x 25 mode test failed	
2408-XX	Video 320 x 200 mode color set 0 test failed	

2409-XX	Video 320 x 200 mode color set 1 test failed	
2410-XX	Video 640 x 200 mode test failed	
2411-XX	Video screen memory page test failed	
2412-XX	Video gray scale test failed	
2414-XX	Video white screen test failed	
2416-XX	Video noise pattern test failed	
2418-XX	ECG/VGC memory test failed	
2419-XX	ECG/VGC ROM checksum test failed	
2420-XX	ECG/VGC attribute test failed	The following steps apply to error codes 2402-XX through 2456-XX: 1. Run SETUP. 2. Replace the monitor and retest. 3. Replace the system board and retest.
2421-XX	ECG/VGC 640 x 200 graphics mode	
2422-XX	ECG/VGC 640 x 350, 16 color set test failed	
2423-XX	ECG/VGC 640 x 350, 64 color set test failed	The following steps apply to error codes 2402-XX through 2456-XX: 1. Run SETUP. 2. Replace the monitor and retest. 3. Replace the system board and retest.
2424-XX	ECG/VGC monochrome text mode test failed	
2425-XX	ECG/VGC monochrome graphics mode test failed	
2431-XX	640 x 480 graphics test failure	
2432-XX	320 x 200 graphics (256 color mode) test failure	
2448-XX	Advanced VGA controller test failed	
2451-XX	132-column advanced VGA test failed	
2456-XX	Advanced VGA 256 color test failed	

Error Code	Description	Recommended Action

2458-XX	Advanced VGA BitBLT test	The following steps apply to error codes 2458-XX through 2480-XX: 1. Run SETUP. 2. Replace the system board and retest.
2468-XX	Advanced VGA DAC test	
2477-XX	Advanced VGA data path test	
2480-XX	Advanced VGA DAC test	

Table 6-11. Audio Test Error Codes

Error Code	Description	Recommended Action
3206-XX	Audio System Internal Error	Replace the system board and retest.

Table 6-12. Pointing Device Interface Test Error Codes

Error Code	Description	Recommended Action
8601-XX	Pointing Device Interface test failed	The following steps apply to error code 8601-XX: 1. Replace with a working pointing device and retest. 2. Replace pointing device interface board, if applicable, and retest. 3. Replace the system board and retest.

Chapter 7 - Specifications

INTRODUCTION

This chapter provides physical, environmental, and performance specifications for the Compaq Concerto Personal Computer and the following subsystems:

- Liquid Crystal Display
- 3 1/2-inch, 1.44-Megabyte Diskette Drive
- Hard Drive
- Internal Power Supply
- Battery Pack
- FlexConnect

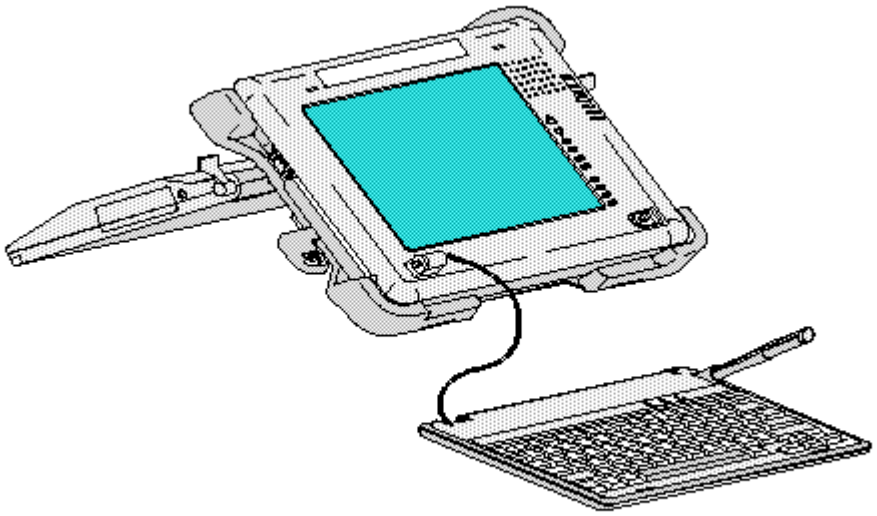


Figure 7-1. Compaq Concerto Personal Computer with FlexConnect

Chapter 7.1 SYSTEM UNIT

System Unit		
Dimensions:		
Height	9.5 in	24.1 cm
Width	12.0 in	30.5 cm
Depth	2.0 in	05.2 cm
Weight	Approx 6.8 lb	Approx 3.1 kg
Environmental Requirements		
Temperature:		
Standalone Operating	50oF to 104oF	10oC to 40oC
With FlexConnect:		
Operating	50oF to 95oF	10oC to 35oC

Nonoperating	-4oF to 140oF	-20oC to 60oC
Relative Humidity (Noncondensing):		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Shock and Vibrations		
Shock:		
Operating	10G, 11 ms, half sine	
Nonoperating	60G, 11 ms, half sine	
Vibration:		
Operating	0.25G, 5-500 Hz/octave/min sweep	
Nonoperating	1.00G, 5-500 Hz/octave/min sweep	
Maximum Unpressurized Altitude:		
Operating	10,000 ft	3,658 m
Nonoperating	30,000 ft	12,192 m
Heat Output	20.5 BTU/Hr (calculated maximum)	

Chapter 7.2 LIQUID CRYSTAL DISPLAY

Liquid Crystal Display			
Dimensions (Image Area):			
Height	5.67 in		14.30 cm
Width	7.56 in		19.20 cm
Diagonal Size	9.5 in		
Mounting	Internal		
Display	STN		
Gray Scales	16 (640 X 480)		
	64 (320 X 240)		
Brightness/Contrast	Adjustable		
Maximum Pixel Resolution	640 X 480		
Character Display	80/40 X 25		
Horizontal Frequency	31.2 KHz		
Vertical Frequency	70 Hz (CGA/EGA), 60 Hz (VGA)		
Display Inverter Board - Output Current (Amps)			
	Typical	Min	Max
-28 Volts	.024	.01	.027

Chapter 7.3 DISKETTE DRIVE

Diskette Drive	
	1.44 MB
Diskette Size	3-1/2 in
Light Indicators:	
Read/Write (high density)	Green
Read/Write (low density)	Green
Capacity Per Diskette (high/low)	1.44MB/720KB
Drives Supported	1
Drive Height	0.6 in (1.55 cm)
Drive Rotation (rpm)	300
Transfer Rate (bps) (high/low)	500K/250K
Bytes Per Sector	512
Sectors Per Track (high/low)	18/9
Tracks Per Side (high/low)	80/80
Access Times:	
Track-to-Track (ms)	3/3
Average (ms)	94/94
Settling Time (ms)	94/94
Latency Average (ms)	100
Cylinders (high/low)	80/80
Read/Write Heads	2

Chapter 7.4 HARD DRIVES

Hard Drives		
	120 MB	250 MB
Standard Configurations	Model 120	Model 250
Formatted Capacity Per Drive:		
Physical	121.79 MBytes	252.7 MBytes
Logical	121.41 MBytes	250.3 MBytes
Drives Supported	1	1
Drive Height	.75 in	.75 in

	1.9 cm	1.9 cm	
Drive Width	2.75 in 6.98 cm	2.75 in 6.98 cm	
Drive Depth	4.00 in 10.16 cm	4.00 in 10.16 cm	
Drive Type	50	20	
Transfer Rate (Mbits/sec):			
Head	18	(Zone 1) (Zone 2) (Zone 3) (Zone 4) (Zone 5)	28.28 26.09 24.77 22.15 19.56
Interface	6.5	8.0	
Sector Interleave	1:1	1:1	
Bytes Per Sector	512	512	
Sectors Per Track:			
Physical	54	48 - 72 (5 Zones)	
Logical	39	63	
Number of Surfaces:			
Physical	4	6	
Logical	8	16	
Access Times (Including Settling):			
Track-to-Track (ms)	8	3	
Average (ms)	19	15	
Maximum (ms)	40	30	
Physical Cylinders	1122	1339	
Physical Read/Write Heads	4	6	
Logical Cylinders	760	485	
Logical Read/Write Heads	8	16	

Chapter 7.5 INTERNAL POWER SUPPLY

Internal Power Supply	
Input Requirements:	
Input Voltage	10 - 20 VDC
Standby	6.5 - 8.5 VDC
Input Fuse	5.0A (Battery connection only)
Power Output:	
Steady State	18W
Peak	21W

Cooling	Convection
VDC Output:	
Nominal Voltage	+5.075 VDC
Nominal Continuous Current Maximum	2.2A
Maximum Peak Current	4.0A
Regulation Tolerance	+/- 0.15

Output Current (Amps)

Voltage	Normal Operation			Standby	
	Typical	Min	Max	Typical	Max
3.3 Volts	.864	.2	1.2	.007	.010
5.075 Volts	.164	.15	2.6	.010	.350
12.0 Volts	.010	.0	.050	.0	.001

Chapter 7.6 NICKEL METAL HYDRIDE (NIMH) BATTERY PACK

Nickel Metal Hydride (NIMH) Battery Pack

Dimensions:		
Height	0.87 in	22.1 mm
Length	5.67 in	144.0 mm
Width	3.80 in	96.5 mm
Weight	1.26 lb	.57 kgr
Power Supply:		
Nominal Open Circuit Voltage	12.0 VDC	
Capacity	2.2Ah	
Environmental Requirements:		
Operating Temperature	50oF to 104oF	10oC to 40oC
Nonoperating Temperature	-4oF to 86oF	-20oC to 30oC (no time limit)
	4oF to 104oF	-20oC to 40oC (< 3 months)
	-4oF to 122oF	-20oC to 50oC (< 1 month)

Chapter 7.7 AC ADAPTER

AC Adapter

Model No.	Series 2842 (Only)	
Dimensions:		
Height	1.4 in	4.97 cm
Depth	3.3 in	8.38 cm
Width	5.3 in	13.46 cm
Weight	0.8 lb	0.36 kg

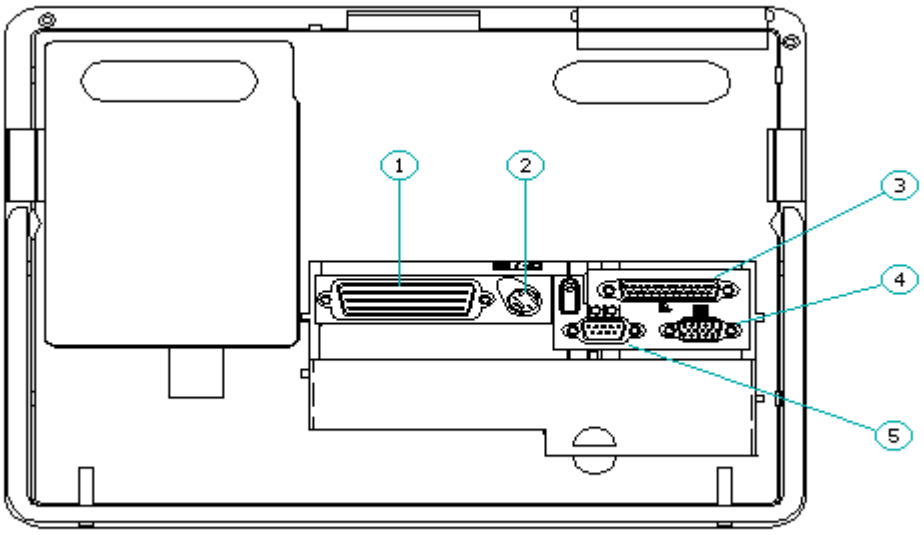
Power Supply:		
Operating voltage	100 - 120/220 - 240 VAC	
Maximum output voltage	18.5V	
Maximum output current	3.1A	
Maximum output power	37W	
Operating current	1.0/0.5A	
Frequency	50 - 60 Hz	

Chapter 7.8 FLEXCONNECT

FlexConnect		
Dimensions:		
Height	3.25 in - 10.25 in	8.25 cm - 26.0 cm
Width	16.0 in	40.64 cm
Depth	17.25 in - 11.0 in	43.82 cm - 27.9 cm
Weight	Approx 2.6 lb	Approx 1.17 kg
Environmental Requirements:		
Temperature	50oF to 104oF	10oC to 40oC
Nonoperating	-22oF to 140oF	-30oC to 60oC
Relative Humidity (Noncondensing):		
Operating	10% to 90%, noncondensing	
Nonoperating	5% to 95%, noncondensing	
Shock and Vibrations		
Shock:		
Operating	10G, 11 ms, half sine	
Nonoperating	60G, 11 ms, half sine	
Vibration:		
Operating	0.25G, 5-500 Hz/octave/min sweep	
Nonoperating	1.00G, 5-500 Hz/octave/min sweep	
Maximum Unpressurized Altitude:		
Operating	10,000 ft	3,658 m
Nonoperating	40,000 ft	15,750 m

Appendix A - External Connectors

Compaq Concerto External Connectors

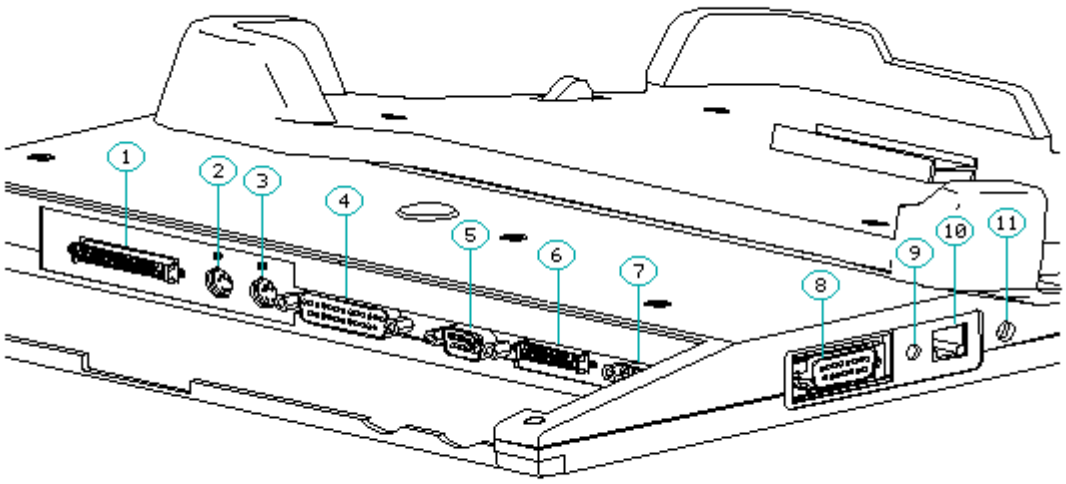


Compaq Concerto External Connectors

Table A-1. Compaq Concerto External Connectors

Index	Description
1	FlexConnect connector
2	Mouse/Keyboard
3	Enhanced parallel connector
4	Serial connector
5	External Monitor connector

Enhanced FlexConnect with Ethernet Connectors

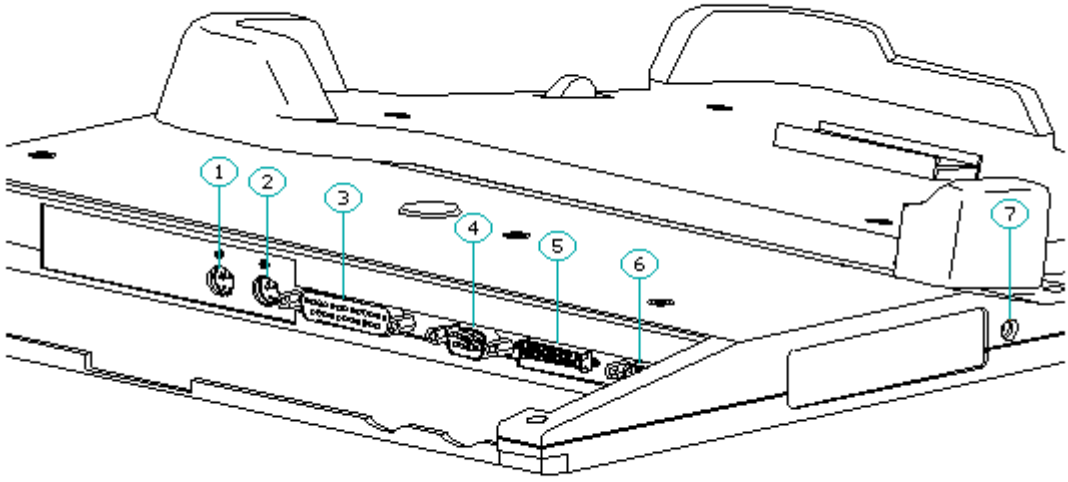


Enhanced FlexConnect with Ethernet Connectors

Table A-2. Enhanced FlexConnect with Ethernet Connectors

Index	Description
1	SCSI
2	PS/2 Pointing Device (6-pin)
3	Keyboard
4	Parallel Connector (25-pin)
5	Serial Connector (9-pin)
6	External Storage (28-pin)
7	Video Connector (15-pin)
8	AUI Connector (15-pin)
9	AUI AC Adapter
10	RJ-45 Connector (8-pin)
11	AC Adapter

FlexConnect Pass-Through Connectors

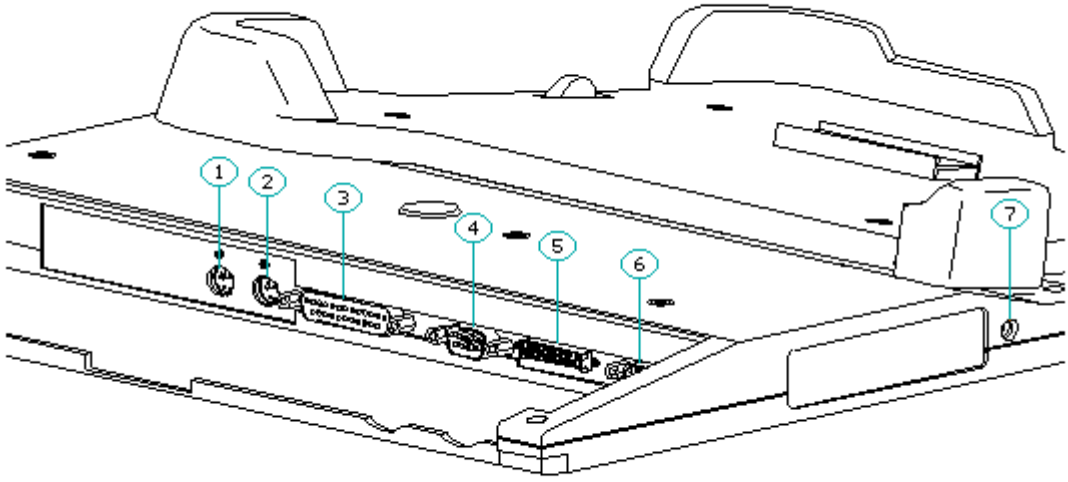


FlexConnect Pass-Through Connectors

Table A-3. FlexConnect Pass-Through Connectors

Index	Description
1	PS/2 Pointing Device (6-pin)
2	Keyboard
3	Parallel Connector (25-pin)
4	Serial Connector (9-pin)
5	External Storage (28-pin)
6	Video Connector (15-pin)
7	AC Adapter

Enhanced FlexConnect with Token Ring Connectors



FlexConnect Pass-Through Connectors

Table A-4. Enhanced FlexConnect with Token Ring Connectors

Index	Description
1	SCSI
2	PS/2 Pointing Device (6-pin)
3	Keyboard
4	Parallel Connector (25-pin)
5	Serial Connector (9-pin)
6	External Storage (28-pin)
7	Video Connector (15-pin)
8	DB-9 Connector (9--pin)
9	RJ-45 Connector (8-pin)
10	AC Adapter