

# DECsystem 5100

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## Maintenance Guide Addendum: RZ24L-EF and TLZ06-FG Drives

Order Number: EK-422AA-AD. A01

**November 1992**

This document is an addendum to the DECsystem 5100 Maintenance Guide (EK-422AA-MG). It provides general information about the RZ24L-EF disk drive and the TLZ06-FG tape drive.

**Digital Equipment Corporation  
Maynard, Massachusetts**

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**First Edition, November 1992**

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# About This Addendum

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## About This Addendum

This document is an addendum to the *DECsystem 5100 Maintenance Guide* (EK-422AA-MG). It provides general information about the RZ24L-EF disk drive and the TLZ06-FG tape drive.

### Intended Audience

This document is intended for Digital Services personnel and self-maintenance customers only. Readers should be familiar with the options.

Contact your Digital Services representative if you want the RZ24L-EF or the TLZ06-FG drives installed in your system. If you attempt to install these drives, then you may invalidate the warranty.

### Organization

This document contains two chapters and one appendix:

- Chapter 1 provides general information about the RZ24L-EF hard disk drive.
- Chapter 2 provides general information about the TLZ06-FG cartridge tape drive.
- Appendix A provides a list of related documentation.

### Related Documentation

See Appendix A for a list of related documentation.

### Conventions

The following conventions are used in this addendum:

Convention	Meaning
<b>Caution</b>	Provides information to prevent damage to equipment or software.
<b>Note</b>	Provides general information about the current topic.
P/N	Part number



---

## RZ24L-EF Hard Disk Drive

This chapter provides general information about the RZ24L-EF hard disk drive.

---

### Description

#### Physical Description

The RZ24L-EF hard disk drive is a 3.5-inch high density drive capable of storing 245 MB of (formatted) information. It is a Winchester-type drive using a SCSI interface and is designed for use on low-end desktop and workstation systems to provide random access data storage capability.

The RZ24L-EF drive conforms to the common command set (CCS). The medium contained within the drive is a non-removable head/disk assembly. The entire drive assembly (HDA and module) is considered one field replaceable unit (FRU).

#### Parts List

Table 1–1 lists the contents of the RZ24L-EF kit with its corresponding part numbers.

**Table 1–1 RZ24L-EF Kit Parts**

P/N	Description	Qty
RZ24L-E	245MB 3 1/2" disk drive	1
90-09984-07	Screw 6-32 pan	4
EK-424AA-AD	Microvax 3100 and VAXserver 3100 Options Installation Guide Addendum: RZ24L Drive	1
EK-422AA-AD	DECsystem 5100 Maintenance Guide Addendum: RZ24L-EF and TLZ06-FG Drives	1
90-08318-00	Washer, shoulder	2

Description

### **Software Requirements**

To operate the RZ24L-EF hard disk drive, software must be installed on the disk. Use a diskette drive, tape drive, or CDROM drive to load the software on the RZ24L-EF. The RZ24L-EF hard disk drive is formatted (ready to receive information) when it is shipped from the factory.

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## **Configuration**

### **Termination**

The RZ24L-EF hard disk drive should not be terminated internally. The SCSI bus must be terminated; therefore, termination must occur within the host system or the expansion boxes.

If your drive or drive module has the terminator resistor packs already installed, then use needlenose pliers to remove the packs. The terminator resistor packs are located just behind the SCSI port connector.

Refer to the *DECsystem 5100 Maintenance Guide, EK-422AA-MG* for procedures on the termination of the SCSI bus.

### **Assigning the SCSI ID**

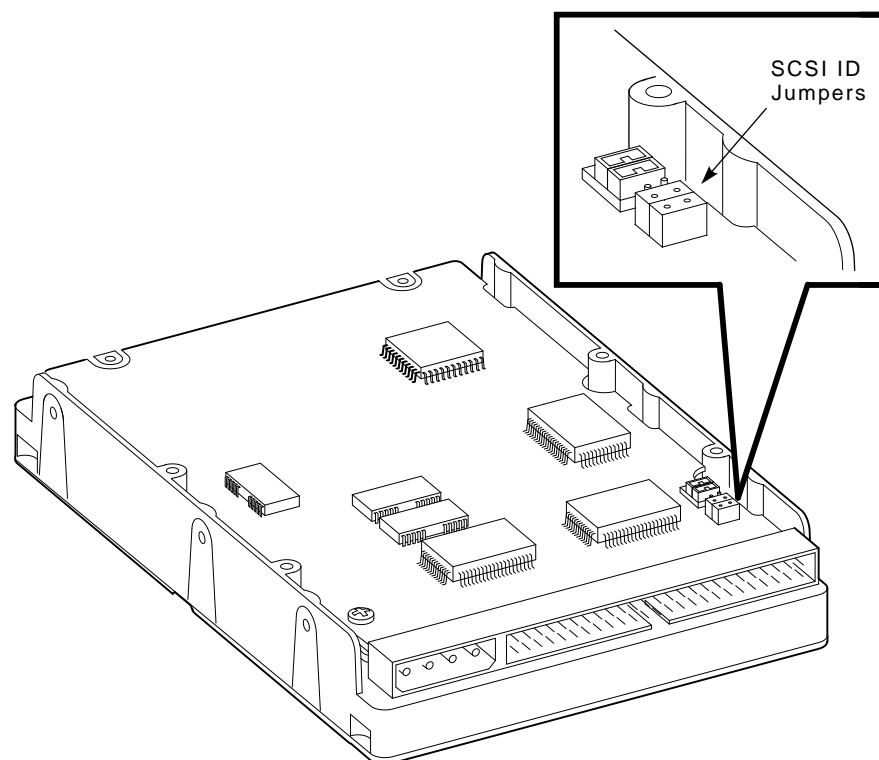
Follow these guidelines for assigning the SCSI ID:

- Assign the SCSI ID number for each drive using the ID select jumper.
- Be sure to assign a unique ID number to each SCSI device.



Figure 1–1 shows the SCSI ID jumper locations.

Figure 1–1 RZ24L SCSI ID Jumper Location



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All SCSI devices are set to a default SCSI ID before the devices leave the factory. Default settings should only be changed when a system is configured with more than one particular device.

Table 1–2 shows the SCSI ID jumper settings.

Table 1–2 SCSI ID Jumper Settings

SCSI ID	A	A1	A2
0	Out	Out	Out
1	In	Out	Out
2	Out	In	Out
3	In	In	Out
4	Out	Out	In
5	In	Out	In
6	Out	In	In
7	In	In	In

---

## Mounting the Drive

### Upper and/or Lower Shelf

The RZ24L-EF drive can be installed on the upper or lower shelf of the DECsystem 5100; however, it is recommended that all slots in the upper shelf be filled first. The upper shelf can accommodate three RZ-type devices.

If you are mounting the RZ24L-EF on the lower shelf, then you can mount it on either the left or right side; however, the left side (side facing the front of the system) is recommended.

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## Disassembling the System

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### Note

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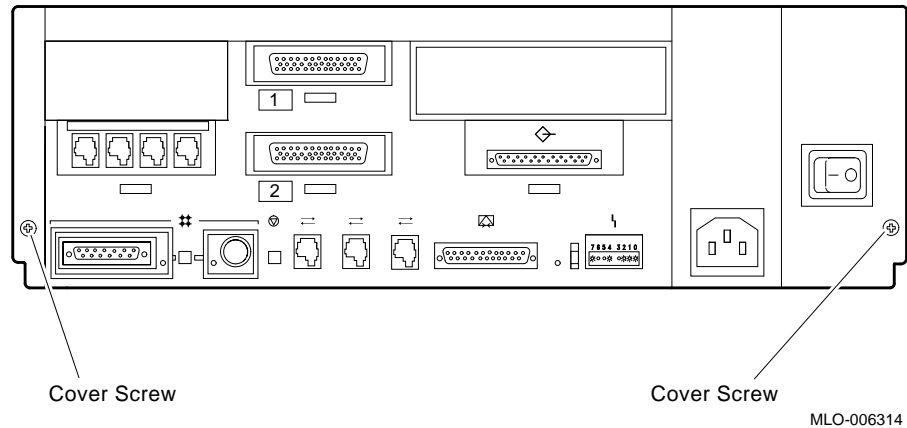
Contact your Digital Services representative if you want the RZ24L-EF drive installed in your system. Only qualified Digital Services engineers should perform system repair. If you attempt to install this drive, then you may invalidate the warranty.

---

### System Shutdown

To shut down the system:

1. Be sure the customer performs a system backup.
2. Set the power switch to off (0) on the DECsystem 5100 and all expansion boxes.
3. Mark and disconnect all cables to the DECsystem 5100.
4. Loosen the two Phillips screws holding the cover. From the rear of the DECsystem 5100, slide the cover forward and lift it away from the system. See Figure 1-2.

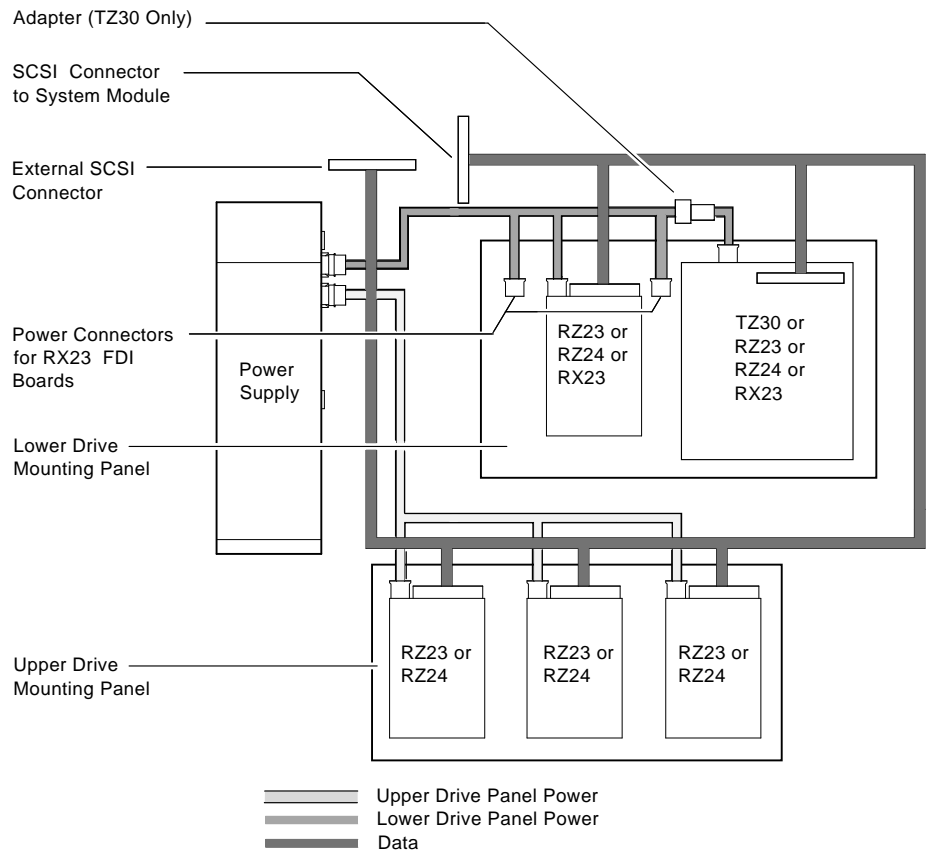
**Figure 1–2 Cover Screw Location**

### Removing the Upper Drive Shelf

To remove the upper drive shelf:

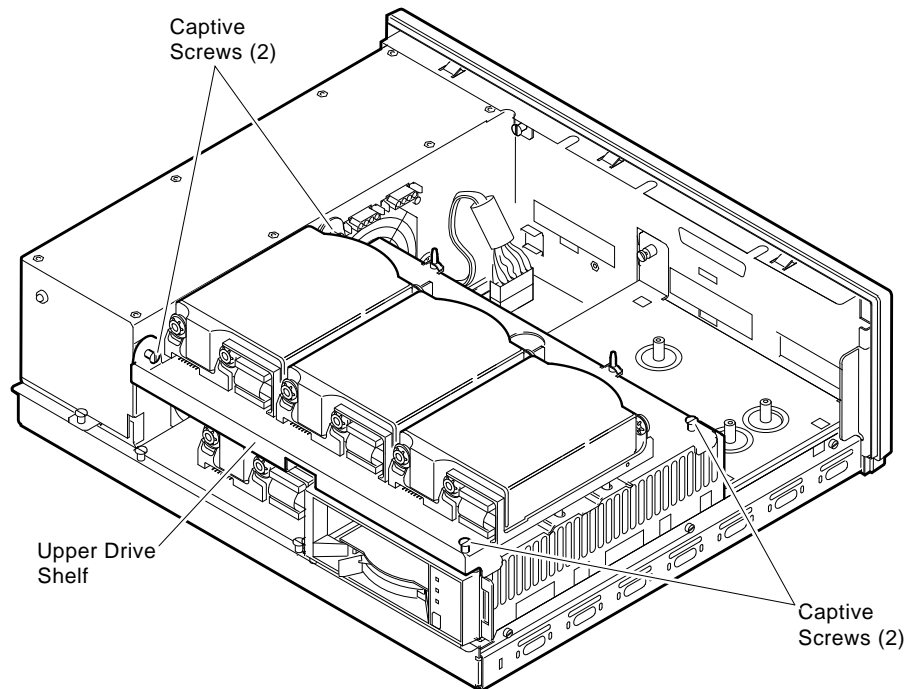
1. If you are mounting the device on the upper shelf, then remove any device that may be attached to the upper shelf (DSH80 option, for example).
2. Note the position of the mass storage drives and mark the cables accordingly.
3. Disconnect the power cables and SCSI bus cables from the drives on the upper drive shelf. See Figure 1–3 for the cable disconnection locations.

**Figure 1-3 Cable Disconnections**



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4. Loosen the four captive screws as shown in Figure 1-4.

**Figure 1-4 Removing Upper Drive Shelf**

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5. Lift the upper drive shelf away from the lower drive shelf and carefully set it aside.

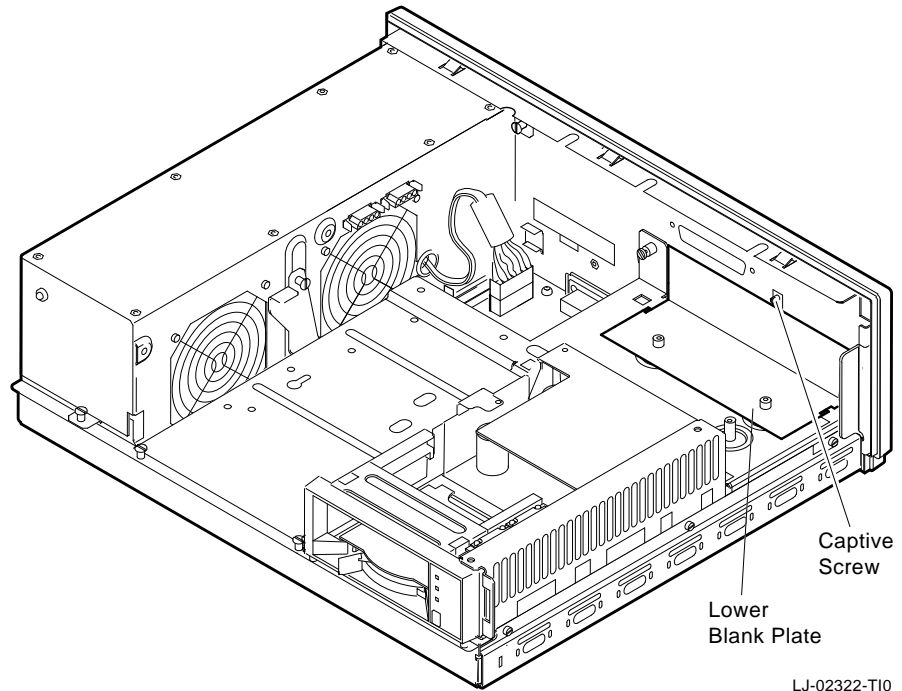
If the device is being mounted on the upper shelf, then skip the section Removing the Lower Drive Shelf.

### Removing the Lower Drive Shelf

To remove the lower drive shelf:

1. Providing an option is present (for example, DHT80), disconnect the 100-way cable (P/N 17-02295-02) attached to the option. Do not take the option completely off the shelf.  
If the system does not have an option present, then it has a blank cover plate. Loosen the captive screw on the blank cover plate (P/N 74-41590-01) and remove the plate (Figure 1-5).

Figure 1-5 Removing the Blank Cover Plate



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**Caution**

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When removing the EMI shield, grab the middle of the shield with both hands and gently pull forward. Removing the shield in any other way could cause damage to the shield.

---

2. Carefully remove the EMI shield (P/N 74-42127-01) that is connected to the upper and lower shelves by carefully pulling the shield forward towards the front of the enclosure, as instructed in the **Caution** above.

Pulling forward releases the two tabs that hold the shield in place. Once the tabs are released, the shield should come out easily. Note the way in which it is mounted, because it will need to be reinstalled the same way.

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**Note**

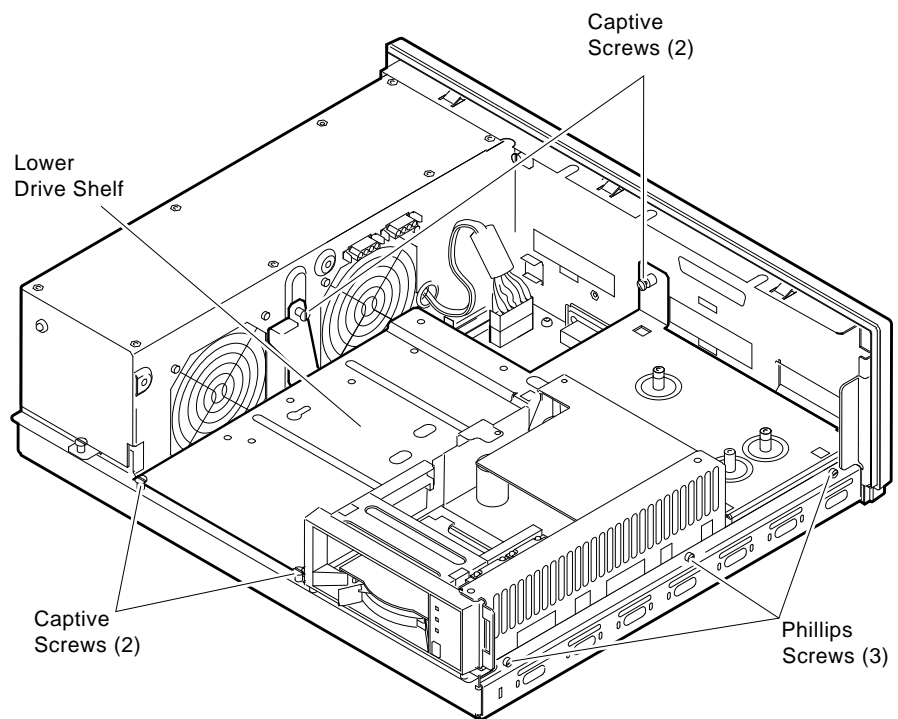
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Notice how the SCSI cable and power cables are routed through the slots in the EMI shield to the devices mounted on the lower drive shelf. These cables need to be routed the same way for reassembly.

---

3. Remove the SCSI cable from the slots in the EMI shield to remove the shield completely from the enclosure.
4. Set the shield aside.
5. Mark and disconnect the SCSI cables and power cables connected to the drives on the lower shelf. See Figure 1-3.
6. Loosen the four captive screws, and remove the three Phillips screws and set them aside. See Figure 1-6.
7. Slide the lower drive shelf toward the front of the chassis and lift it from the unit.

**Figure 1-6 Removing the Lower Drive Shelf**



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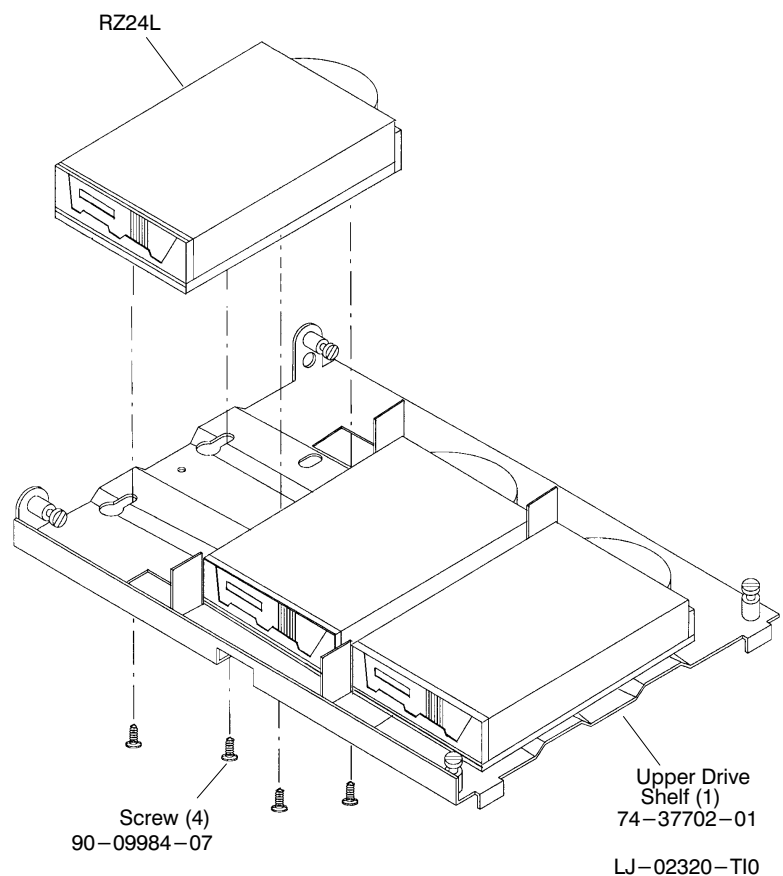
## Installing the Drive

### Mounting the Device on the Upper Shelf

If the drive is being mounted on the upper drive shelf, then use the four Phillips head screws (P/N 90-09984-07). The step washers (P/N 90-08318-00) are not used for mounting the drive on the upper shelf. To mount the device on the upper shelf:

1. Place the drive over the holes where it will mount onto the drive shelf. The back of the drive (the side with the connectors) should face the back of the drive shelf.
2. Insert the four Phillips head screws through the bottom of the drive shelf and tighten to secure the drive in place. See Figure 1-7.

**Figure 1-7 Upper Drive Shelf Mounting**



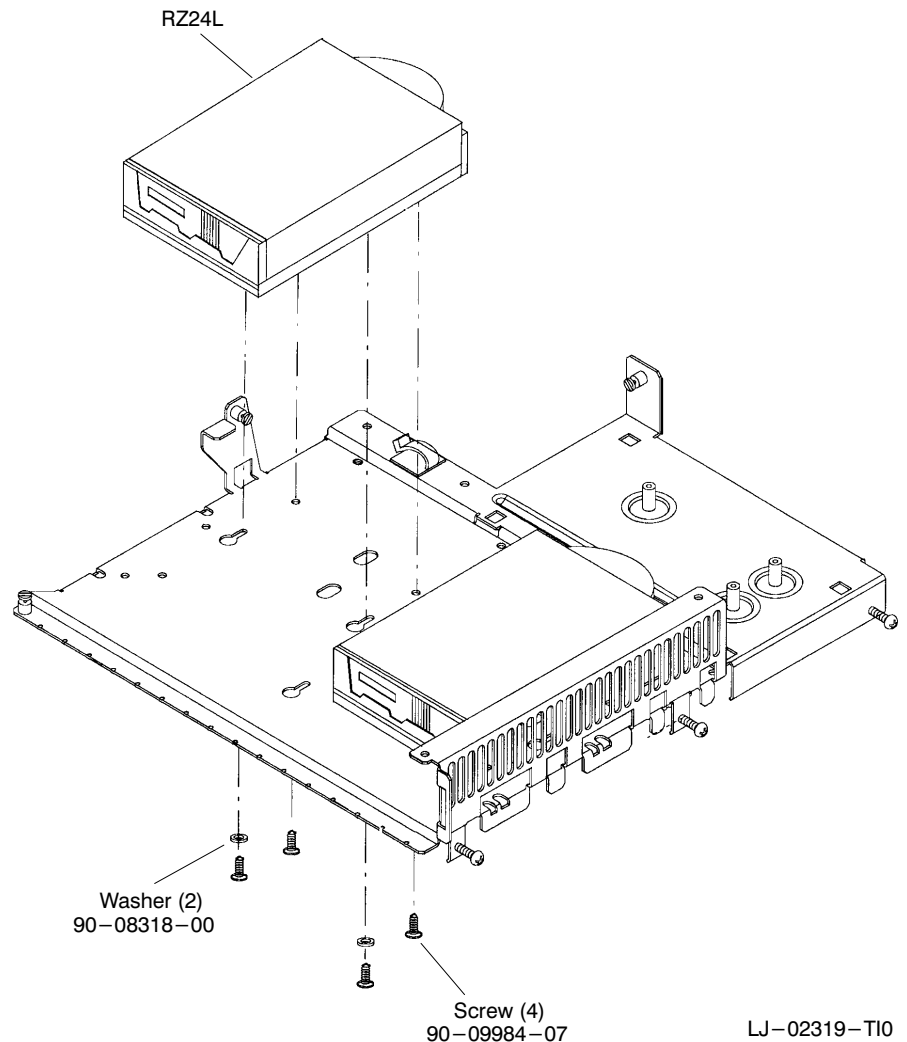


## Mounting the Drive on the Lower Shelf

If the drive is being mounted on the lower drive shelf, then use the four Phillips head screws (P/N 90-09984-07) and the step washers (P/N 90-08318-00). To mount the device on the lower shelf:

1. Place the drive over the holes where it will mount onto the drive shelf. The back of the drive (the side with the connectors) should face the back of the drive shelf. See Figure 1-8.

Figure 1-8 Lower Drive Shelf Mounting



2. Insert the two step washers into the key-shaped holes.
3. Insert the screws through the step washers and through the shelf. Do not tighten the screws.
4. Insert the two remaining screws that do not go through the step washers.
5. Tighten the screws to secure the drive in place.

---

## Reassembling the System

### Shelf Replacement

To reassemble the system:

1. If the lower shelf is not removed, then go to step 8.
2. Replace the lower shelf and tighten the screws.
3. Reconnect the SCSI and power cables to the devices on the lower shelf.
4. Connect the SCSI cable to the RZ24L-EF.

---

**Note**

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The EMI shield must be reinstalled to comply with FCC regulations.

---

5. Route the SCSI cable through the curved slots in the EMI shield as it was previously routed before the disassembly.
6. Reconnect the 100-way cable to the option if an option is present, or replace the blank plate (Figure 1–5).
7. Replace the SCSI and power cables to the devices on the lower shelf, including the RZ24L-EF.
8. Install the upper shelf by tightening the four captive screws to secure the upper shelf in place.
9. Replace the SCSI and power cables to the devices on the upper shelf. If the new RZ24L-EF was installed on the upper shelf, then connect the SCSI cable to the drive.
10. Replace the system cover and secure it with the two Phillips head screws.

---

## TLZ06-FG Cartridge Tape Drive

This chapter provides general information about the TLZ06-FG cartridge tape drive.

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### Description

#### Physical Description

The TLZ06-FG cartridge tape drive is a half-height, 5¼-inch, streaming tape drive that uses DAT DOS tapes. The TLZ06 tape drive provides archival storage and retrieval and data collection activities. It uses the Small Computer System Interface (SCSI).

The TLZ06-FG drive consists of the drive and built-in controller logic.

#### Parts List

Table 2–1 lists the contents of the TLZ06-FG kit with their corresponding part numbers.

**Table 2–1 TLZ06-FG Kit Parts**

P/N	Description	Qty
TLZ06-BA	DAT drive (Note: The minimum revision of this part is .A02.)	1
TLZ06-CA	4GB DAT data cartridge	1
TLZ04-HA	4MM DAT drive cleaning cartridge	1
EK-422AA-AD	DECsystem 5100 Maintenance Guide Addendum: RZ24L-EF and TLZ06-FG drives	1
12-27886-02	Shoulder screws	4
90-00018-02	Rubber grommets	4
74-44536-01	Bezel	1

## Description

### Software Requirements

The TLZ06-FG drive is supported under ULTRIX Version 4.3. In order to operate the TLZ06-FG drive, the SCSI/CAM driver for RISC ULTRIX Version 4.3 must be installed.

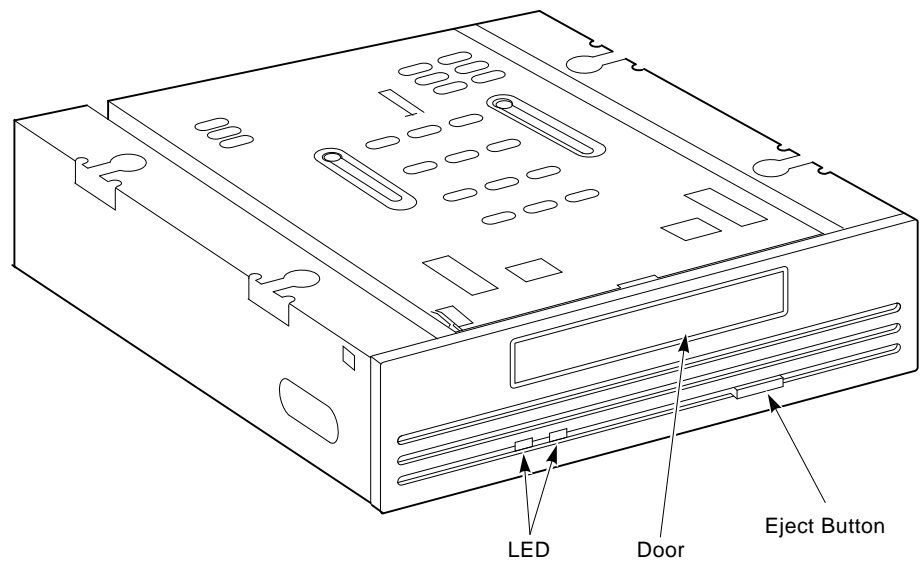
The TLZ06-FG has the following features:

- Functions in vertical and horizontal positions
- Uses status LED protocol

### Controls and Indicators

The front of the TLZ06 tape drive contains two LEDs and an eject button (Figure 2-1).

Figure 2-1 TLZ06 Cartridge Tape Drive (Front View)



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### LED Indicator

Table 2-2 describes the LED activity during operation.

Table 2-2 LED Activity

Drive Status	LED
Tape not loaded	Off
Tape loaded <sup>1</sup>	Solid green
Tape in motion	Blinking green
Tape faulted	Solid amber

<sup>1</sup>Tape is automatically loaded upon insertion of the cartridge tape.

**Eject Button**      The eject button ejects the cartridge tape from the drive.

---

## Using the Cartridge Tape

**Overview**      This section explains how to perform the following procedures when using the cartridge tape:

- Set the write-protect switch
- Insert a cartridge tape into the drive
- Remove a cartridge tape from the drive

### Setting the Write-Protect Switch

Observe the following guidelines when setting the write-protect switch:

- If you are reading data or copying data from a tape, then close the write-protect switch on the top of the tape.
- If you are writing data, then open the write-protect switch on the top of the tape.

### Inserting the Cartridge Tape into the Drive

To insert the cartridge tape into the drive:

1. Insert the cartridge tape into the drive, making sure the cartridge's write-protect switch is in the upper right corner.
2. Slide the cartridge straight into the cartridge area until you feel resistance.

When the tape is properly inserted, the LED glows solid green and the drive is ready to accept operating system commands.

### Removing the Cartridge Tape from the Drive

After the tape is dismounted by the software, the tape is ejected from the drive.

To remove the cartridge tape from the drive, press the eject button. The door will open and the cartridge tape will eject slightly.

---

## Configurations

### SCSI ID Settings

The TLZ06-FG cartridge tape drive is set to a default SCSI ID of 5 before the devices leave the factory. Default settings should only be changed when a TLZ06-FG cartridge tape drive is being added to a host system that already has a TLZ06 installed.

---

**Note**

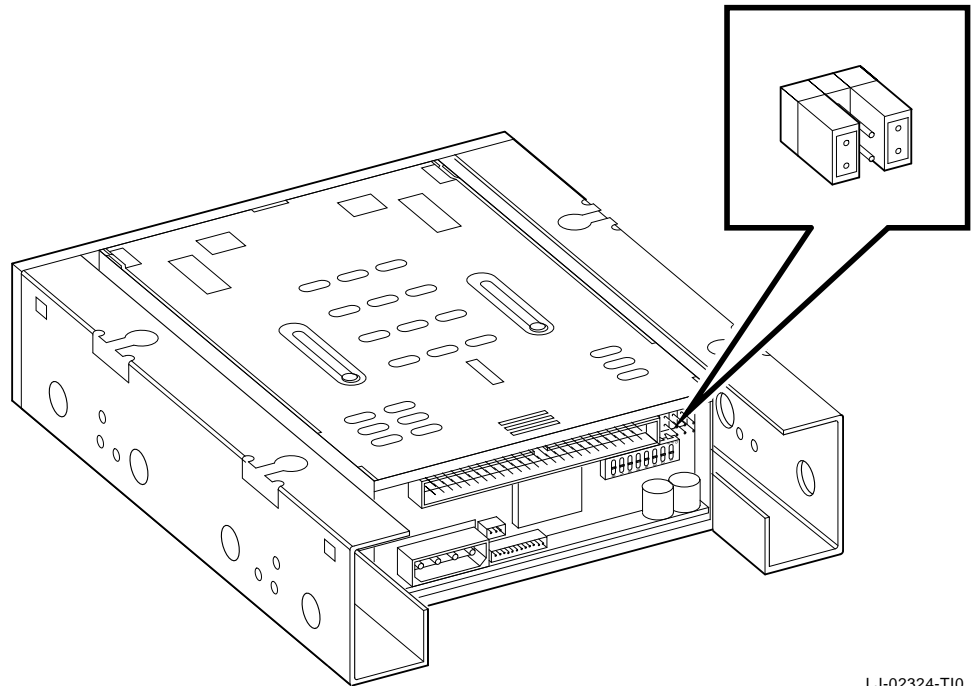
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Each SCSI device must have its own SCSI ID.

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The SCSI ID is set or changed by adding jumpers to, or removing jumpers from, a connector at the rear of the tape drive. Figure 2–2 shows the SCSI ID jumper location.

**Figure 2–2 TLZ06-FG SCSI ID Jumper Location**



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Table 2-3 lists the jumper settings necessary to configure the TLZ06-FG cartridge tape drive for a particular SCSI ID.

**Table 2-3 TLZ06-FG SCSI ID Jumper Settings**

SCSI ID	2	1	0
0	Out	Out	Out
1	Out	Out	In
2	Out	In	Out
3	Out	In	In
4	In	Out	Out
5*	In	Out	In
6†	In	In	Out
7	In	In	In

\*Default ID for the TLZ06 tape drive.

†Reserved address ID - do not use.

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## Disassembling the System

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### Note

Contact your Digital Services representative if you want the TLZ06-FG drive installed in your system. Only qualified Digital Services technicians should perform system repair. If you attempt to install this drive, then you may invalidate the warranty.

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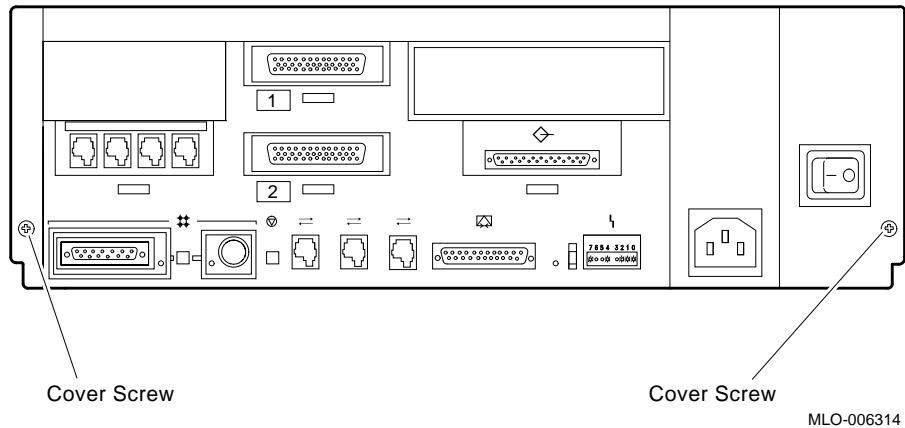
### System Shutdown

To shut down the system:

1. Be sure the customer performs a system backup.
2. Set the power switch to off (O) on the DECsystem 5100 and all expansion boxes.
3. Mark and disconnect all cables to the DECsystem 5100.

4. Loosen the two Phillips screws holding the cover. From the rear of the DECsystem 5100, slide the cover forward and lift it away from the system. See Figure 2-3.

**Figure 2-3 Cover Screw Location**



### Removing the Upper Drive Shelf

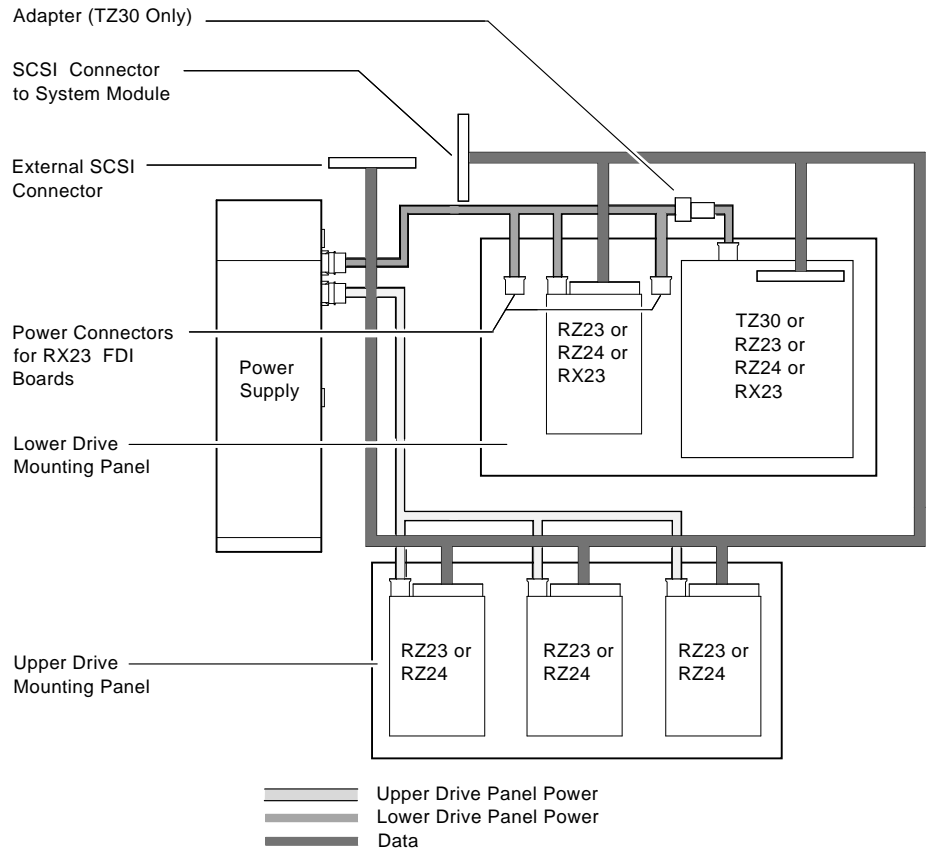
To remove the upper drive shelf:

1. Remove any device that may be attached to the upper drive shelf (DSH80 option, for example).
2. Note the position of the mass storage drives and mark the cables accordingly.



3. Disconnect the power cables and SCSI bus cables from the drives on the upper drive shelf. See Figure 2-4 for the cable disconnection locations.

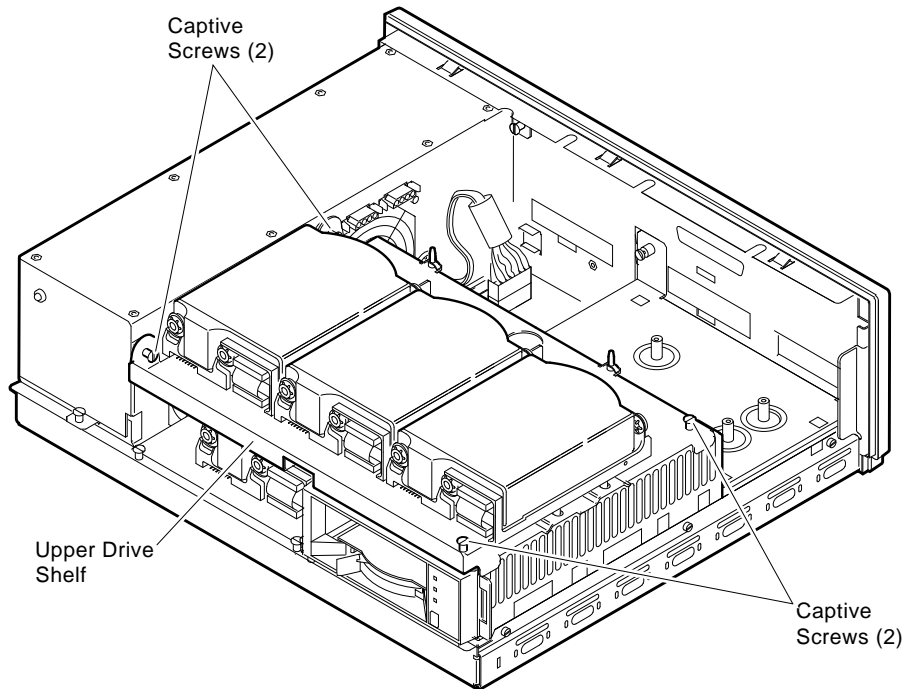
**Figure 2-4 Cable Disconnections**



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4. Loosen the four captive screws as shown in Figure 2-5.

**Figure 2-5 Removing the Upper Drive Shelf**



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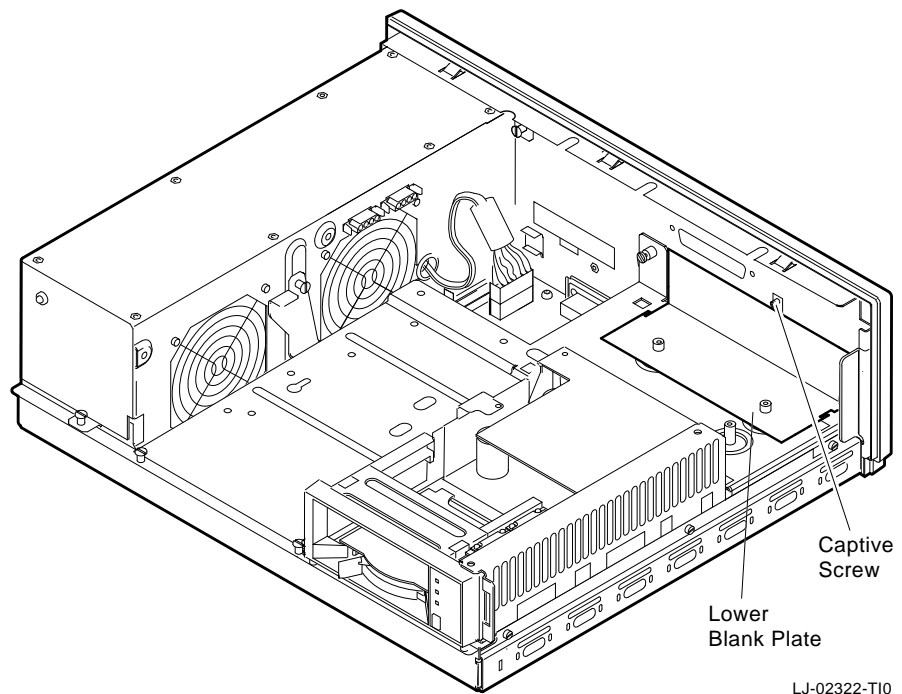
5. Lift the upper drive shelf away from the lower drive shelf and carefully set it aside.

## Removing the Lower Drive Shelf

To remove the lower drive shelf:

1. Providing an option is present (for example, DHT80), disconnect the 100-way cable (P/N 17-02295-02) attached to the option. Do not take the option completely off the shelf.  
If the system does not have an option present, then it has a blank cover plate. Loosen the captive screw on the lower blank plate (P/N 74-41590-01) and remove the plate (Figure 2–6).

Figure 2–6 Removing the Blank Cover Plate



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### Caution

When removing the EMI shield, grab the middle of the shield with both hands and gently pull forward. Removing the shield in any other way could cause damage to the shield.

2. Carefully remove the EMI shield (P/N 74-42127-01) that is connected to the upper and lower drive shelves by carefully pulling the shield forward towards the front of the enclosure as instructed in the **Caution** above. Pulling forward releases two tabs that hold the shield in place. Once the tabs are released, the shield should come out easily. Note the way in which it is mounted, because it will need to be reinstalled the same way.

---

**Note**

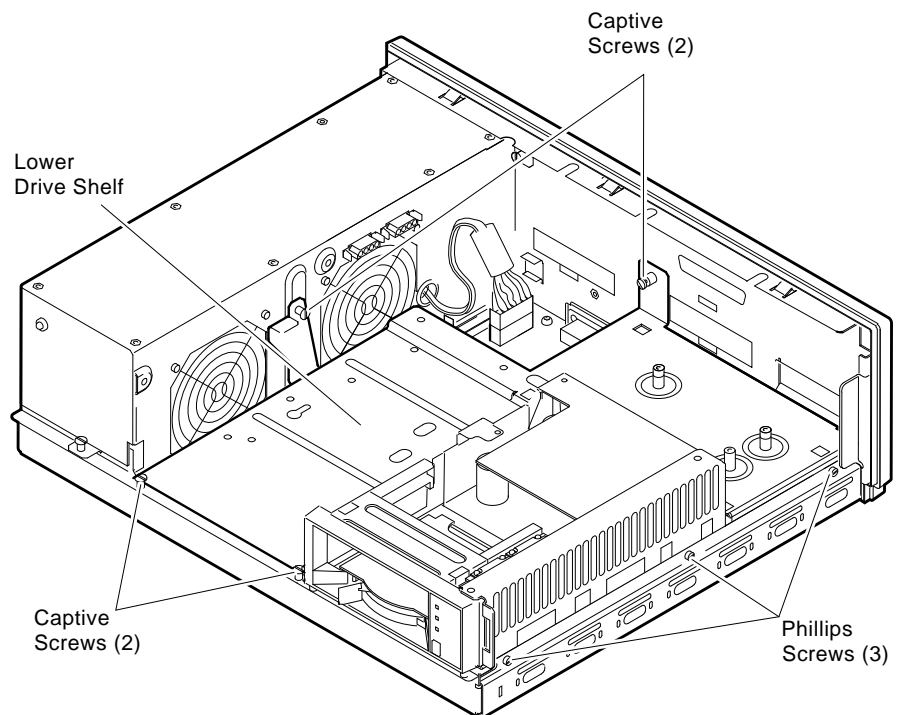
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Notice how the SCSI cable and power cables are routed through the slots in the EMI shield to the devices mounted on the lower drive shelf. These cables need to be routed the same way for reassembly.

---

3. Remove the SCSI cable from the slots in the EMI shield to remove the EMI shield completely from the enclosure.
4. Set the shield aside.
5. Mark and disconnect the SCSI cables and the power cable connected to the drives on the lower shelf. See Figure 2-4.
6. Loosen the four captive screws and remove the three Phillips screws and set them aside. See Figure 2-7.
7. Slide the lower drive shelf toward the front of the chassis and lift it from the unit.

**Figure 2-7 Removing the Lower Drive Shelf**



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# Installing the Drive

## Mounting the Tape Drive on the Lower Shelf

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### Note

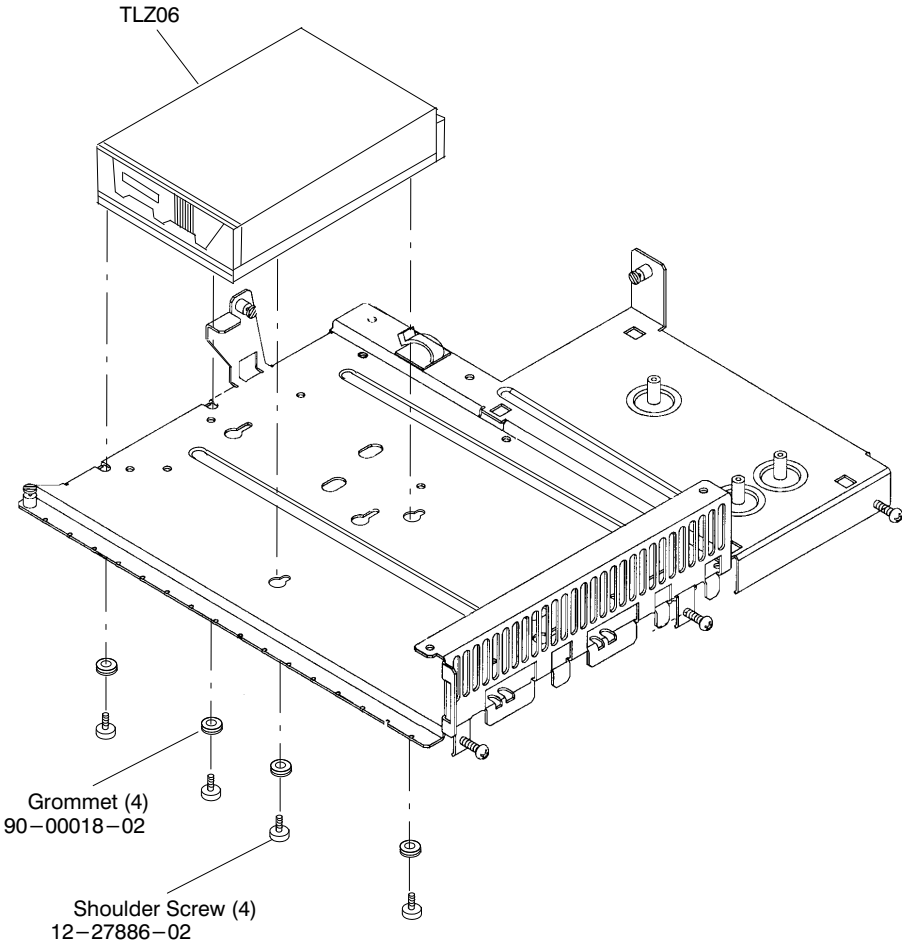
The TLZ06-FG can only be installed on the front left-hand side of the lower drive tray.

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To mount the TLZ06-FG device to the lower drive shelf:

1. Facing the front of the drive, loosely install two shoulder screws (P/N 12-27886-02) through two rubber grommets (P/N 90-00018-02) into the threaded holes located on the right side of the drive (Figure 2-8.)

Figure 2-8 TLZ06-FG Mounting Drive



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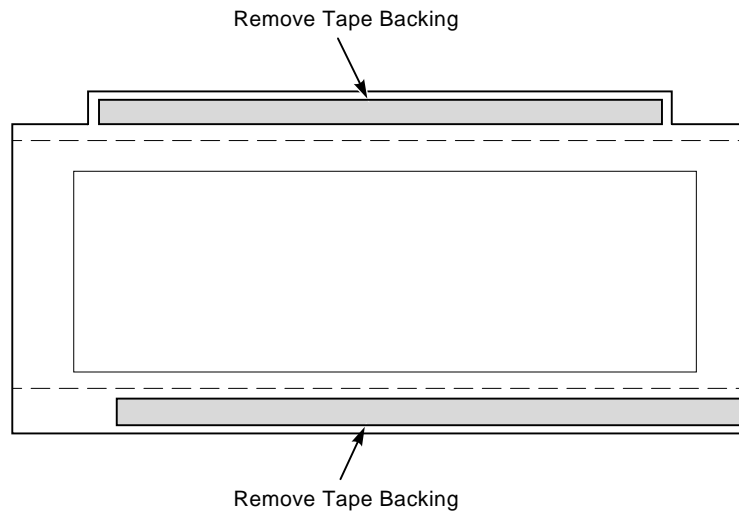
2. Place the drive on the lower drive tray and position the two screws that were just installed on the right side of the drive over the drive tray slotted mounting holes (shaped like keyholes). See Figure 2–8.
3. Lower the drive so that the grommets align with the holes, and slide the drive towards the back of the tray.
4. Find the drive mounting slots located on the side of the shelf.
5. Slide one grommet into each of the slots. Install the two remaining shoulder screws through the grommets and tighten the screws.
6. Tighten all the screws in the drive tray mounting holes to secure the drive.

## Inserting the Bezel

The bezel should be inserted into the cover. To insert the bezel:

1. Remove the backing from the double-sided tape on the bezel (P/N 74-44536-01) in two places as shown in Figure 2–9. Be sure to remove just the backing on the tape and not the tape itself.

**Figure 2–9 Double-sided Tape Removal**



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### Note

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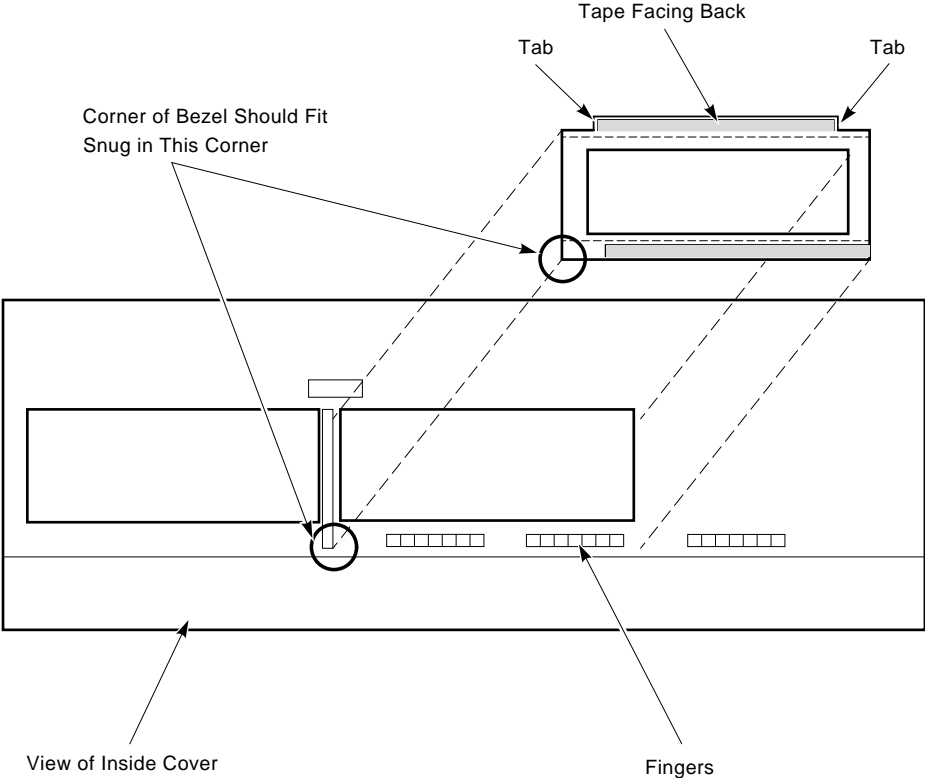
The double-sided tape on the bezel adheres to the inside of the cover.

---

2. Fit the bezel into the inside of the cover. The bezel fits over the slot on the right-hand side (if looking at the inside of the cover). The corners on the bezel that have tabs should be facing up.

Slide the bezel between the fingers located on the cover and the face of the cover until it is seated against the left corner and bottom edge of the cover. See Figure 2-10.

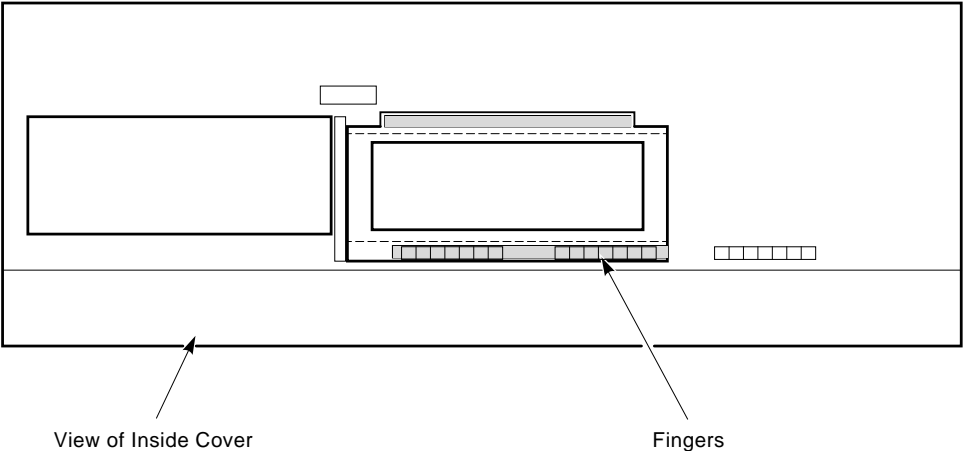
Figure 2-10 Inserting the Bezel



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Figure 2-11 shows the view of the inside of the cover with the bezel in place.

Figure 2-11 Bezel Location Inside Cover



LJ-01650-T10

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## Reassembling the System

### Shelf Replacement

To reassemble the system:

1. If the lower shelf is not removed, go to step 8.
2. Replace the lower shelf and tighten the screws.
3. Reconnect the SCSI and power cables to the devices on the lower shelf.
4. Connect the SCSI cable to the TLZ06-FG.

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**Note**

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The EMI shield must be reinstalled to comply with FCC regulations.

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5. Route the SCSI cable through the curved slots in the EMI shield as it was previously routed before the disassembly.
6. Reconnect the 100-way cable to the option if an option is present, or replace the blank plate (Figure 2-6).
7. Replace the SCSI and power cables to the devices on the lower shelf, including the TLZ06-FG.
8. Install the upper shelf by tightening the four captive screws to secure the upper shelf in place.
9. Replace the SCSI and power cables to the devices on the upper shelf. If the new TLZ06-FG was installed on the upper shelf, then connect the SCSI cable the drive.
10. Replace the system cover and secure it with the two Phillips head screws.



## Testing the TLZ06

To test the TLZ06 drive, perform the following power-up diagnostics:

1. Power up the system.
2. At the console prompt (>>>), enter the `conf -f` command to verify that the system can see the TLZ06 at the assigned SCSI ID and the other installed drives. The following is an example of the system configuration display.

```
>> conf -f
hardware: revision 1
firmware: revision 4
cpu: revision 2.32
fpu: revision 3.32
security switch: secure mode
password: clear
eeprom: valid
ethernet hardre address: 09-00-2b-19-28-1d
option board: DHT80 - Async Comm, 8 ports
memory: total size 8MBs
      bank0  4MB SIMMs  size  8MBs      0 bad pages
scsi peripherals
  unit  type  product          removeable/fixed  capacity
  ---  ---  ---
  0    disk  RZ24 (C) DEC    fixed              200 MBs
  3    disk  RZ24 (C) DEC    fixed              200 MBs
  5    tape  TLZ06(C) DEC    removeable
```

3. Test the TLZ06-FG drive by invoking either the canned tape test (CT) or the level 2 internal drive diagnostics (S2). The following procedures and examples show how to use the two test commands:

- a. Load a write-enabled scratch tape into the TLZ06.
- b. At the console prompt, enter SCSI, the test type (CT or S2), and the SCSI ID number as shown in the following examples:

```
>>SCSI CT 5
Are you ready?
Y/N? Y

- self test completed OK
```

```
>>SCSI S2 5
invoking self test 2 ...
If testing a tape drive, insert a scratch tape.
Are you ready?
Y/N? Y

- self test completed OK
```

- c. Using the help screen provided, determine whether or not your system ROM supports the CT or S2 test.

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**Note**

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The CT is a short read/write test that runs for only 30 seconds. The S2 is a comprehensive read/write test that runs for 6 minutes.

The number 5 in the examples denote the SCSI ID number.

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# A

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## Related Documentation

Table A-1 provides a list of documentation related to the options described in this addendum.

**Table A-1 Related Documentation**

<b>Documentation</b>	<b>Part Number</b>
RZXX Disk Drive Subsystem Pocket Service Guide	EK-RZXX-PS
TLZ06 Cartridge Tape Drive Owner's Guide	EK-TLZ06-OG

