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Educational Services



Upgrading the TX800 Series  
Magazine Tape Subsystem

EK-TF857-UP-002

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# Preface

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## Manual Structure

Chapter 1, Getting Started, describes the field replaceable units that you need to remove and replace for upgrading the TF837 and TZ857 subsystems. It provides a contents list of the TF857 and TZ867 upgrade kits. Chapter 1 also discusses guidelines to follow during the removal and replacement procedures.

Chapter 2, Removing and Replacing the Controller Module, describes how to remove the controller module from the each subsystem and replace it with a new controller module.

Chapter 3, Removing and Replacing the Drive, describes how to remove the tape drive and replace it with the new tape drive.

Chapter 4, Verifying the Upgrade, describes how to verify the TF857 or TZ867 upgrade.

For more information, see the applicable document:

- *TF837 Magazine Tape Subsystem Owner's Manual* (EK-TF837-OM)
- *TF857 Magazine Tape Subsystem Owner's Manual* (EK-TF857-OM)
- *TX867 Magazine Tape Subsystem Owner's Manual* (EK-TX867-OM)

## Intended Audience

**This manual is for Digital Services field engineers. If a customer performs this upgrade, and a problem occurs, it could interfere with the customer's warranty.**

## Conventions

The following are the product terms used in this manual:

- *TF837 subsystem* refers to the *TF837 magazine tape subsystem*
- *TF857 subsystem* refers to the *TF857 magazine tape subsystem*
- *TZ857 subsystem* refers to the *TZ857 magazine tape subsystem*
- *TZ867 subsystem* refers to the *TZ867 magazine tape subsystem*



# 1

## Getting Started

---

This chapter describes what you need to know before upgrading the:

- TF837 magazine tape subsystem to a TF857 magazine tape subsystem
- TZ857 magazine tape subsystem to a TZ867 magazine tape subsystem

### 1.1 Upgrade FRUs

To upgrade a TF837 subsystem, you must remove the following two field replaceable units (FRUs):

- TK71 tape drive
- TFK70 DSSI controller module

And replace them with:

- TK85 tape drive
- New DSSI controller module

To upgrade a TZ857 subsystem, you must remove the following two field replaceable units (FRUs):

- TK85 tape drive
- SCSI controller module

And replace them with:

- TK86 tape drive
- New SCSI controller module

#### NOTE

**Generic TZ867 subsystems have the drive and controller attached in the upgrade kit.**

### 1.2 TF857 Upgrade Kit

The following table lists the contents of your TF857 upgrade kit:

Description	Part Number
TF85 tape subsystem (2.6 Gbytes, formatted)	TF85-AA
TF857 Magazine Tape Subsystem Owner's Manual	EK-TF857-OM
Cartridge for TK85 tape drive	30-33075-07

<b>Description</b>	<b>Part Number</b>
Cartridge unit assembly cleaning cartridge	70-27644-01
Medallion, TF857	74-39761-02
Label, bar code .69 × 1.5	36-21711-09
Label, serial TF857, USA	36-35031-04 A
Upgrading the TF837 to a TF857 Magazine Tape Subsystem	EK-TF857-UP

### 1.3 TZ867 Upgrade Kit

The following table lists the contents of your TZ867 upgrade kit:

<b>Description</b>	<b>Part Number</b>
TZ86 tape subsystem (6.0 Gbytes, formatted)	TZ86-AA
TX867 Magazine Tape Subsystem Owner's Manual	EK-TX867-OM
Writer's Note: Cartridges part of kit?	
Cartridge for TK86 tape drive	30-33075-07
Cartridge unit assembly cleaning cartridge	70-27644-01
Medallion, TZ867	74-46124-01
Label, bar code 1.62 × 6.00	36-28231-08
Label, serial TZ867, USA	36-35031-15 A
Label, serial TZ867, Germany	36-35031-16 A
Upgrading the TX800 Series Magazine Tape Subsystem	EK-TF857-UP



## 1.4 Upgrade Guidelines

*Before* removing and replacing the drives and modules:

- Make sure no tape cassette is in the tape drive.
- Dismount the device by using a console command.

During removal and replacement:

- Do not disconnect the external DSSI or SCSI communications cable unless the system is shut down. Doing so while the system is running can cause a system failure and possibly cause customer data loss.
- Save the hardware; the metric screws are not readily available.
- Observe all electrostatic discharge (ESD) precautions.

## Removing and Replacing the Controller Module

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This chapter describes how to:

- Remove the TFK70 DSSI controller module and replace it with the new controller module
- Remove the old SCSI controller module and replace it with the new SCSI controller module

### CAUTIONS

**To maintain stability, slide only *one* TF837 or TZ857 subsystem from its enclosure at a time.**

**Do not disconnect the external DSSI or SCSI communications cable at the rear chassis. Doing so can cause an error on the DSSI or SCSI bus.**

## 2.1 Warm Swap Procedure

Writer's Note: Does this apply to a SCSI device?

By using the warm swap procedure, you can perform the upgrade without powering down the host system, or without taking all other devices off-line and disconnecting the DSSI or SCSI bus.

The warm swap procedure is the most efficient for customers because users can operate on the system while you do the procedure. The warm swap procedure lets you:

- Remove and replace the controller module while the host system is operating.
- Replace the new controller module parameters with the original controller module parameters, preventing multiple device names and images from being listed.

The rest of this section applies to the TF857 subsystem upgrade. If you are doing a TZ867 subsystem upgrade, go to Section 2.1.3.

### 2.1.1 Collecting and Recording Original Controller Module Parameters

Each TFK70 DSSI controller module comes from the manufacturer with a unique node name and system ID number. When you power up a TF837 subsystem with a newly installed controller module, the new parameters transfer to the host, and are added to the device list seen by the host.

You must set the DSSI node ID on the new controller module the same as the DSSI node ID on the old controller module. The new subsystem will have a new node name and new system ID; you can change both through PARAMS, if required.

The device list is updated only during a reboot. Therefore, you may see the “ghost name and ID” of a controller module that you have removed. The previous parameters remain, although no physical device is present.

## 2-2 Removing and Replacing the Controller Module

Before performing the warm swap procedure, you must collect and record the original controller module parameters. In particular, you must note the following information during the procedure:

- **Current node name** — This is the parameter known as NODENAME.
- **Unit number** — This is the parameter known as UNITNUM.
- **System ID number** — This is the parameter known as SYSTEMID.

You can obtain these parameters in one of three ways:

- Refer to the system site guide in which the parameters may have been recorded during installation.
- Use the **ANALYZE/SYSTEM** command to obtain information from the system.
- Use the **SET HOST/DUP** command to read the parameters from EEPROM (if the controller module is accessible).

You can use PARAMS to set your current parameter values into the new controller module. See the *TF857 Magazine Tape Subsystem Owner's Manual* for more information on using PARAMS.

### 2.1.1.1 Using the ANALYZE/SYSTEM Command

At the DCL prompt (\$), enter the following VMS command:

```
$ ANALYZE/SYSTEM
```

The system displays the system analyzer prompt:

```
SDA>
```

At this prompt, enter the command:

```
SDA> SHOW DEVICE MI
```

to list the node name, system ID number, and unit number.

The following example is an output screen example showing a node name, unit number, and system ID. The node name is TAPE1; the unit number is the final digit in the MIA0 portion of the node name. In this case, the unit number is 0. The system ID is 3C3643CABC35.

```
SDA> SHO DEV MI
```

```
I/O data structures
```

```
-----
```

```
DDB list
```

```
-----
```

Address	Controller	ACP	Driver	DPT	DPT size
-----	-----	---	-----	---	-----
804D8230	TAPE1\$MIA0	MTAACP	TUDRIVER	8030D330	4070

```
--- TAPE1 System Block (SB) 804DB170 ---
```

System ID	3C3643CABC35	Local software type	TFXX
Max message size	64	Local software vers.	T2.4
Max datagram size	64	Local software incarn.	00010000
Local hardware type	TF70		00010000
Local hardware vers.	202020202020	SCS poller timeout	001A
	303041202020	SCS poller enable mask	01

Press RETURN for more.

To exit the system analyzer, you must type the entire word EXIT at the SDA> prompt:

```
SDA> EXIT
```

Once you find the correct information, proceed with the warm swap procedure.

### 2.1.1.2 Using the SET HOST/DUP Command

Use the **SET HOST/DUP** command to read the parameters from EEPROM as well as access the **PARAMS>** prompt to set parameters.

#### NOTE

**Before running the SET HOST/DUP command, be sure to load the FYDRIVER local program by using this command:**

```
$ MCR SYSGEN CONN FYA0/NOADAP
```

The following is an example output screen showing the information collected with the **SET HOST/DUP** command. Be sure to use the parameters listed under **Current**.

```
$ SET HOST/DUP/SERVER=MSCP$DUP/TASK=PARAMS TAPE1
%HSCPAD-I-LOCPRGEXE, Local program executing - type ^\ to exit
      Copyright © 1990 Digital Equipment Corporation

PARAMS> SHOW /ALL
```

Parameter	Current	Default	Type	Radix
UNITNUM	0	0	Word	Dec
FORCEUNI	0	1	Boolean	0/1
NODENAME	TAPE1	T7D0J9	String	Ascii
FORCENAM	0	0	Boolean	0/1
SYSTEMID	3C3643CABC35	3C3643CABC35	Quadword	Hex

#### NOTE

**When using the SHOW /ALL command, be sure to leave a space after the word SHOW.**

To exit the PARAMS utility, type:

```
PARAMS> EXIT
```

Make a note of the current parameters and proceed with the warm swap procedure.

## 2.1.2 Removing the Controller Module Assembly from a TF837 Subsystem

To remove the TFK70 DSSI controller module:

1. Make sure a tape is not in use or mounted in the TK71 drive.
2. Press the Eject button on the operator control panel (Figure 2-1).
3. Open the receiver and remove the magazine.
4. Set the Mode Select key to Service Mode (Figure 2-1).
5. Open the rear door of the storage array.
6. Turn off subsystem power (Figure 2-2) and disconnect the ac power cord.
7. Release the two screws holding the controller module tray. Slide the tray out (Figure 2-2).

#### NOTE

**Be sure not to disconnect the external DSSI communications cable at the rear chassis bulkhead connector. Doing so can cause an error on the DSSI bus (Figure 2-2).**

8. Slowly pull the tray approximately three-fourths from the rear chassis. Be careful not to remove the tray completely from the rear chassis.

## 2-4 Removing and Replacing the Controller Module

9. Disconnect the internal DSSI communications cable from the controller module (Figure 2-3).
10. Disconnect the drive communications cable and the power harness from the controller module.
11. Release the four module clips, one in each corner of the module (Figure 2-2).
12. Lift and remove the TFK70 DSSI controller module. Note the DSSI node ID settings (Figure 2-4) on the module.
13. Disconnect the loader transfer assembly communications cable (Figure 2-3).

### 2.1.3 Removing the Controller Module Assembly from a TZ857 Subsystem

To remove the old SCSI controller module:

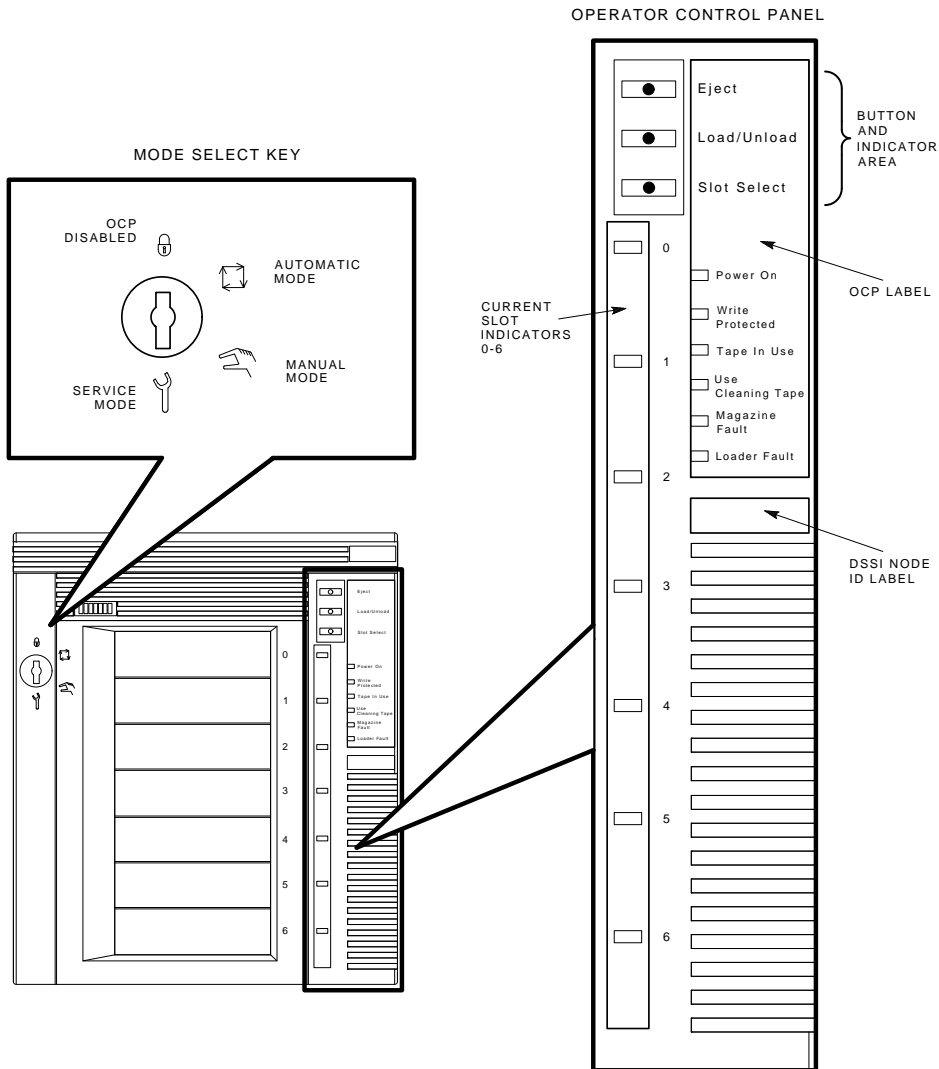
1. Ensure a tape is not in use or mounted in the TK85 drive.
2. Turn off subsystem power (Figure 2-2) and disconnect the ac power cord.
3. Release the two screws holding the controller module tray. Slide the tray out (Figure 2-2).

#### NOTE

**Be sure not to disconnect the external SCSI communications cable at the rear chassis bulkhead connector. Doing so can cause an error on the SCSI bus (Figure 2-2).**

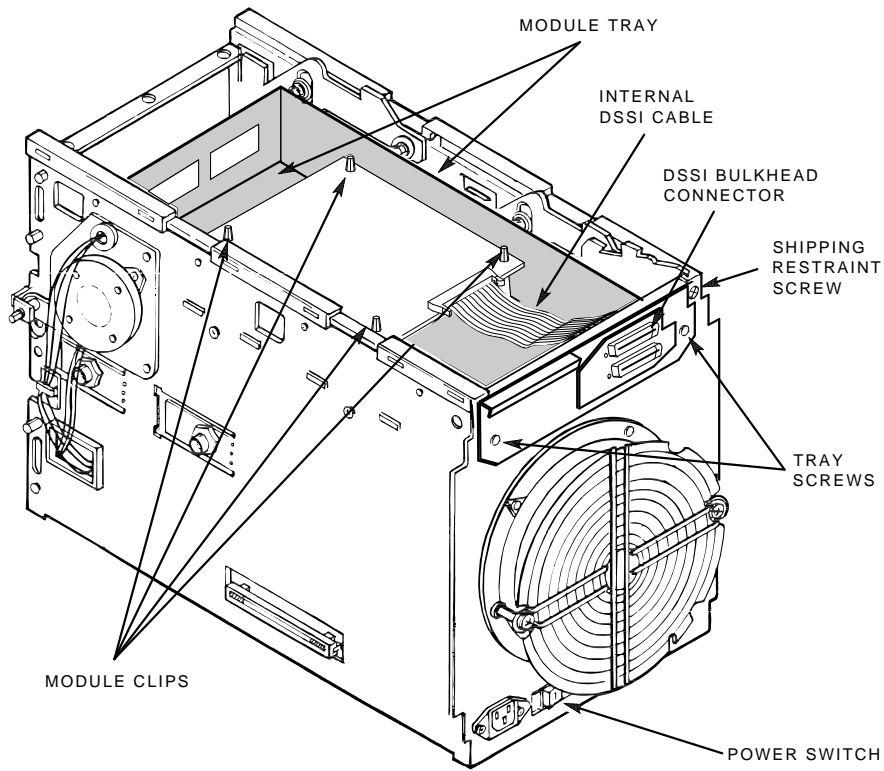
4. Slowly pull the tray approximately three-fourths from the rear chassis. Be careful not to remove the tray completely from the rear chassis.
5. Disconnect the internal SCSI communications cable from the controller module (Figure 2-3).
6. Disconnect the drive communications cable and the power harness from the controller module.
7. Release the two metal tabs under the rear of the controller module (Figure 2-2).
8. Lift and remove the controller module.
9. Disconnect the loader transfer assembly communications cable (Figure 2-3).

Figure 2-1 Operator Control Panel



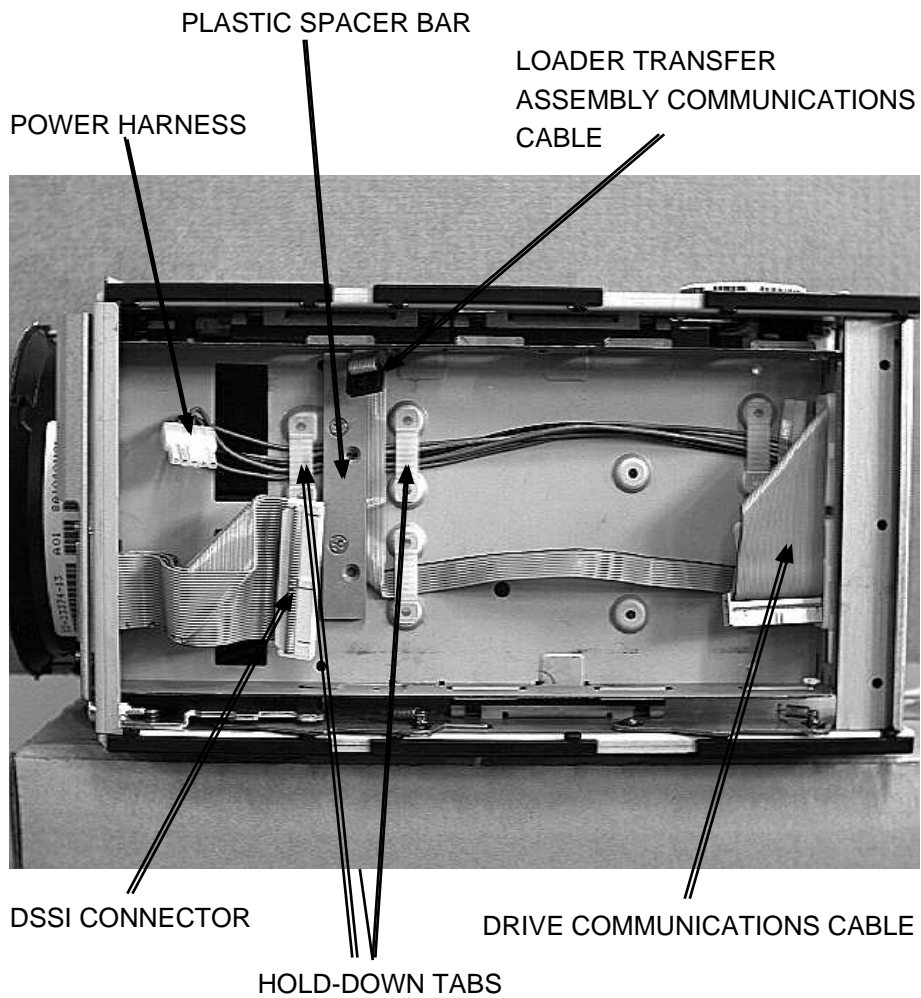
SHR\_X1025B\_89

**Figure 2-2 TFK70 DSSI Bus Controller Module Tray**



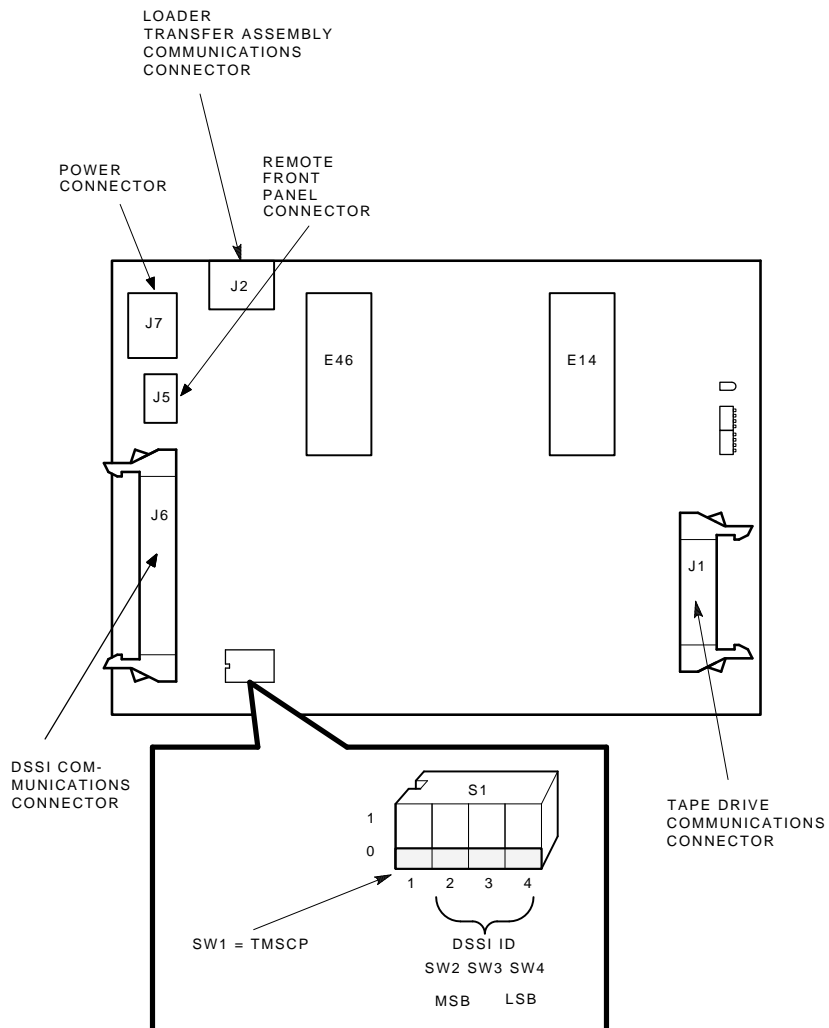
SHR-0002-90  
SHR-X0141A-90-CPG

**Figure 2-3 Identifying the Cables of the Subsystem**



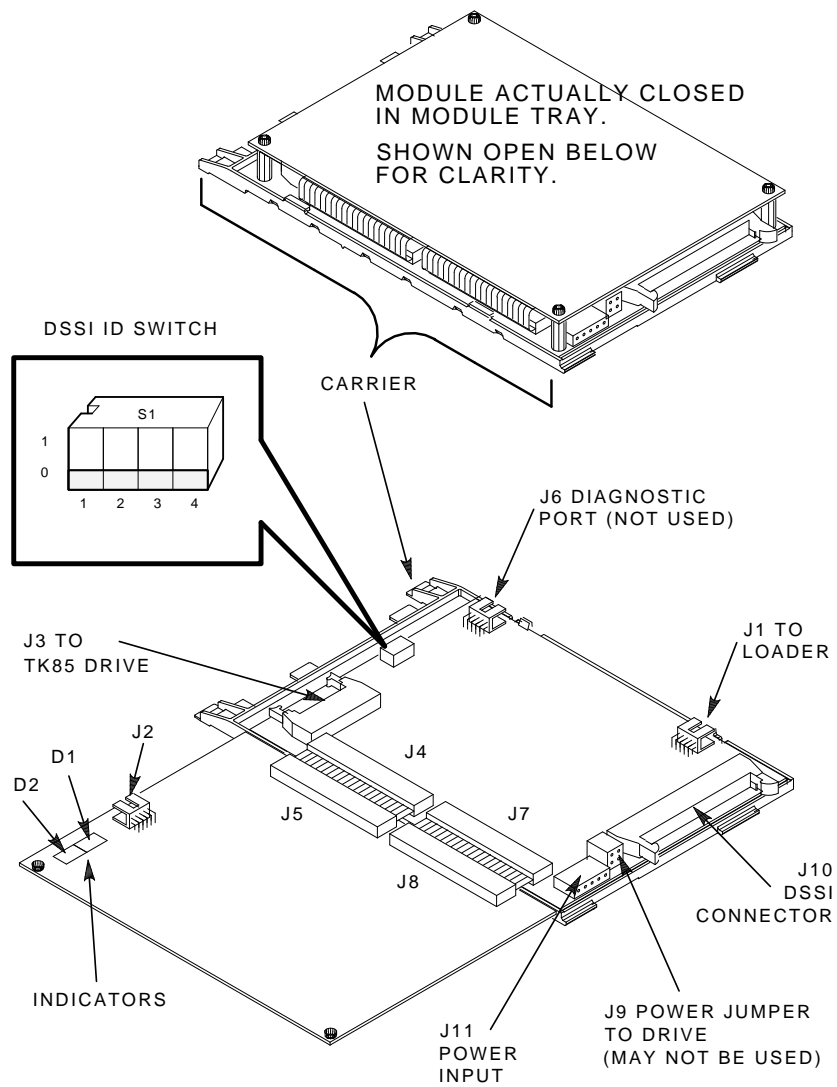


**Figure 2-4 Locating the DSSI ID Switch on the TFK70 DSSI Controller Module**



SHR-X0055A-90

**Figure 2-5 Locating the DSSI ID Switch on the New Controller Module**



SHR-X0035-91

### 2.1.4 Preparing the Module Tray for the TF857 Subsystem

To prepare the module tray for the new controller module:

1. Pull the module tray forward and push out the drive communications cable.
2. Open the metal clamp at the left front of the module tray. Press the clamp tips down to the tray bottom to prevent cable damage (Figure 2-6).
3. Locate, in the tray, the plastic spacer bar containing four countersunk holes. Remove the two screws. **SAVE THESE SCREWS.** You will reuse them when you install the new module.
4. Relocate the loader transfer assembly communications cable to the opposite side of the tray. To do this, release with pliers or a screwdriver, one of two plastic, hold-down tabs for the power harness (Figures 2-3 and 2-6). It does not matter which one of the two hold-down tabs you release.
5. Slip the loader transfer assembly communications cable out from under the power harness. Unfold the cable until it is straight. Slide the cable forward until 3-1/2 inches of cable are remaining beyond the hold-down tab. Fold the cable 90 degrees to the right, just beyond the hold-down tab. (Be sure to rotate the cable with the cable's red side on the forward side. Then it will correctly connect to the new controller module.)

### 2.1.5 Unpacking the TF857 Subsystem

To unpack the upgrade kit:

1. Take the TF85 tape subsystem out of the upgrade kit.
2. Disconnect the power cable (PN 17-02614-01) from the new controller module and the TK85 drive. This power cable is not used for this application.
3. Unsnap the controller module from the metal tabs of the drive.
4. Disconnect the drive communications cable from the new controller module.
5. Put aside the new controller module.
6. Unscrew the noncaptive screws of the metal module clip with hold-down tabs on the TK85 drive and put aside the drive.

### 2.1.6 Installing the New Controller Module for the TF857 Subsystem

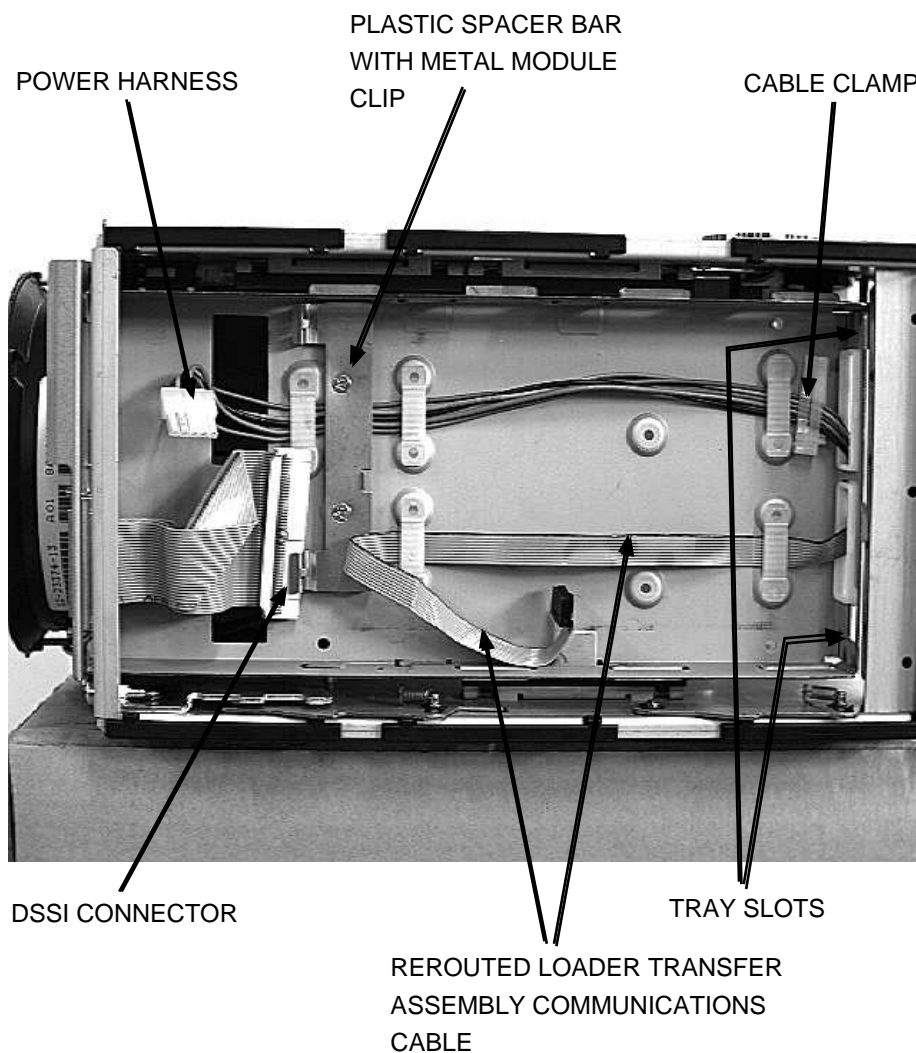
To install the new controller module:

#### NOTE

**Before installing the new controller module, make sure the node ID of the new controller module matches the node ID of the TFK70 DSSI controller module (Figures 2-4 and 2-5).**

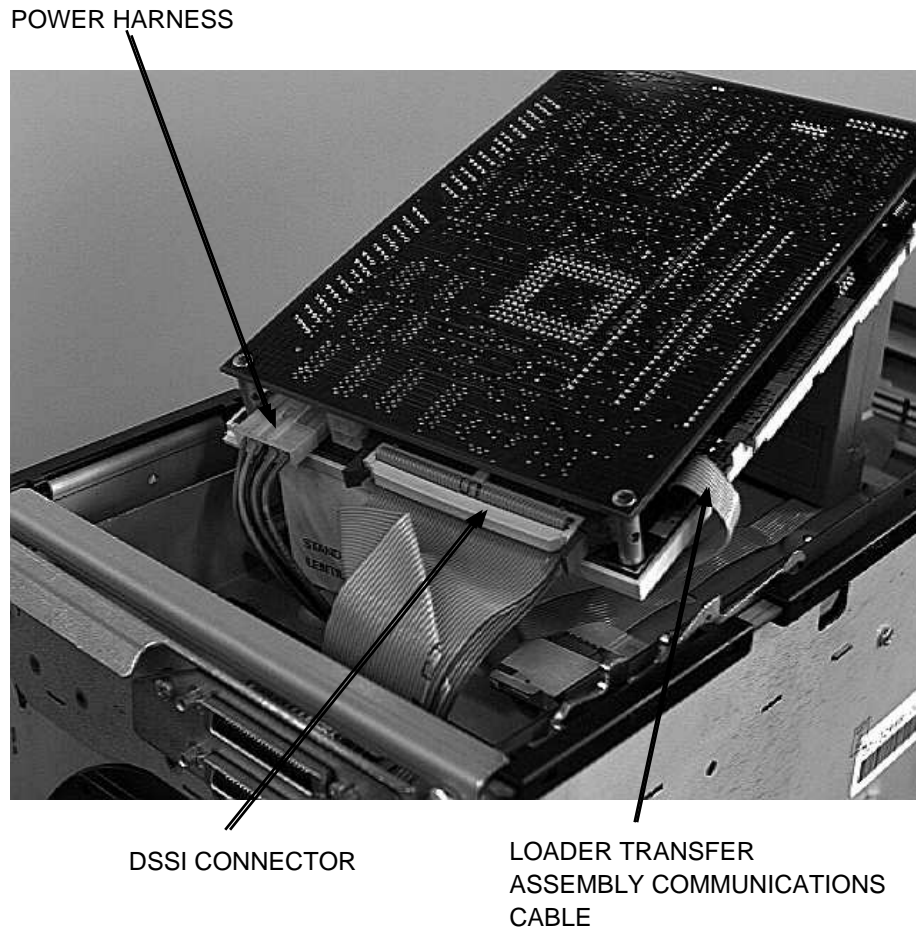
1. Position the plastic spacer bar with the threaded holes of the module tray (Figure 2-6). Make sure the holes are in front of where the screws are going.
2. On top of the spacer bar, fasten the metal module clip (from the TK85 drive) with the metal module clip tabs in the rear (Figure 2-6). The ends of the plastic spacer bar and the ends of the metal module clip should be even. Use the two screws you saved.
3. Seat the new controller module carrier with the prongs in the horizontal tray slots at the front of the tray (Figure 2-6).

**Figure 2-6 The Loader Transfer Assembly Communications Cable Rerouted**

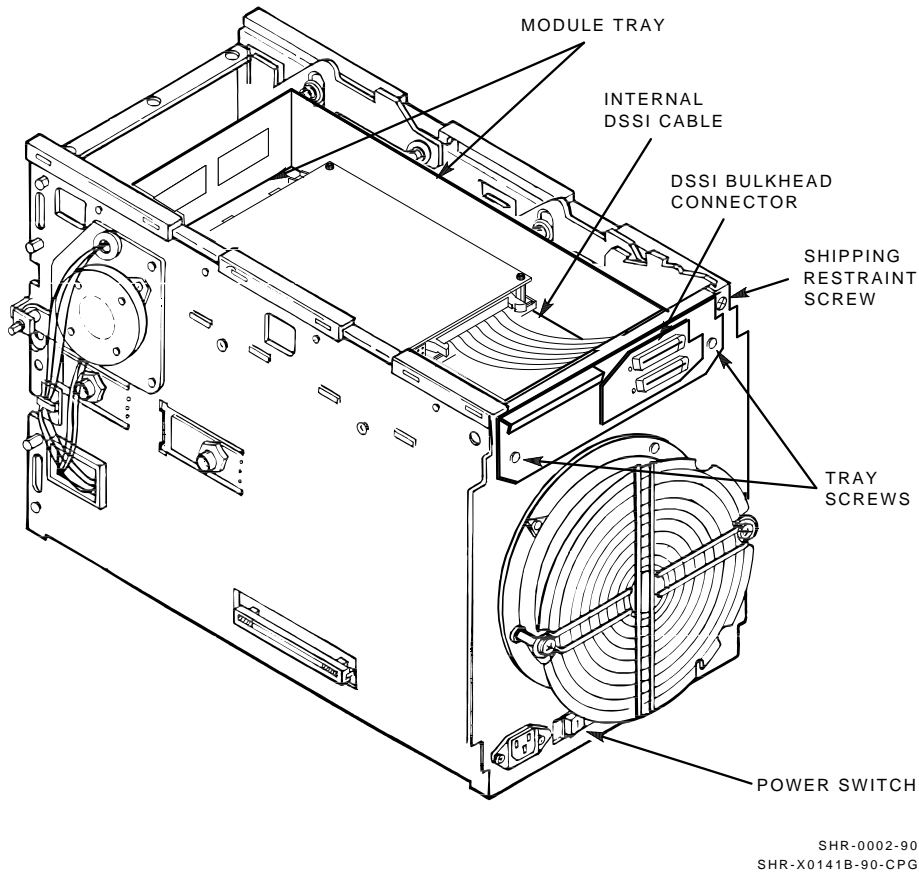


4. With the new controller module tilted up, attach the loader transfer assembly communications cable to the module (Figure 2-7).
5. Gently lower the controller module into the tray to avoid damaging the loader transfer assembly communications cable. Push on the two outer controller module screws, one in each corner, to avoid damaging the etch.
6. While snapping in the tabs of the metal module clip, press into the clip tabs, the plastic tabs in the rear of the controller module.
7. Attach the power harness and attach the DSSI cable to the controller module.
8. Slide the controller module tray gently into the rear chassis to avoid damaging cables (Figure 2-8).

**Figure 2-7 Installing the New Controller Module**



**Figure 2-8 Rear of the TF857 Subsystem**



### 2.1.7 Preparing the Module Tray for the TZ867 Subsystem

To prepare the module tray for the new controller module:

1. Pull the module tray forward and push out the drive communications cable.
2. Open the plastic cable clamp at the left front of the module tray.

### 2.1.8 Unpacking the TZ867 Subsystem

To unpack the upgrade kit:

1. Take the TZ867 subsystem out of the upgrade kit.
2. Unsnap the controller module from the metal tabs of the drive.
3. Disconnect the drive communications cable from the new controller module.
4. Put aside the new controller module.
5. Unscrew the noncaptive screws of the metal module clip with hold-down tabs on the TK86 drive and put aside the drive.

### 2.1.9 Installing the New Controller Module for the TZ867 Subsystem

To install the new controller module:

1. Seat the new controller module carrier with the prongs in the horizontal tray slots at the front of the tray (Figure 2-6).
2. With the new controller module tilted up, attach the loader transfer assembly communications cable to the module (Figure 2-7).
3. Gently lower the controller module into the tray to avoid damaging the loader transfer assembly communications cable. Push on the two rear corners of the controller module to avoid damaging the module.
4. While snapping in the tabs of the metal module clip, press into the clip tabs, the plastic tabs in the rear of the controller module.
5. Attach the power harness and attach the SCSI cable to the controller module.
6. Connect the remote ID cable to the remote ID connector on the module. The connector is labeled "Remote ID".

Writer's Note: Does this step apply?

7. Slide the controller module tray gently into the rear chassis to avoid damaging cables (Figure 2-8).

# 3

## Removing and Replacing the Drive

---

This chapter describes how to:

- Remove the TK71 tape drive and replace it with the TK85 tape drive
- Remove the TK85 tape drive and replace it with the TK86 tape drive

### 3.1 Removing the TK71 or TK85 Tape Drive

To remove the TK71 or TK85 tape drive:

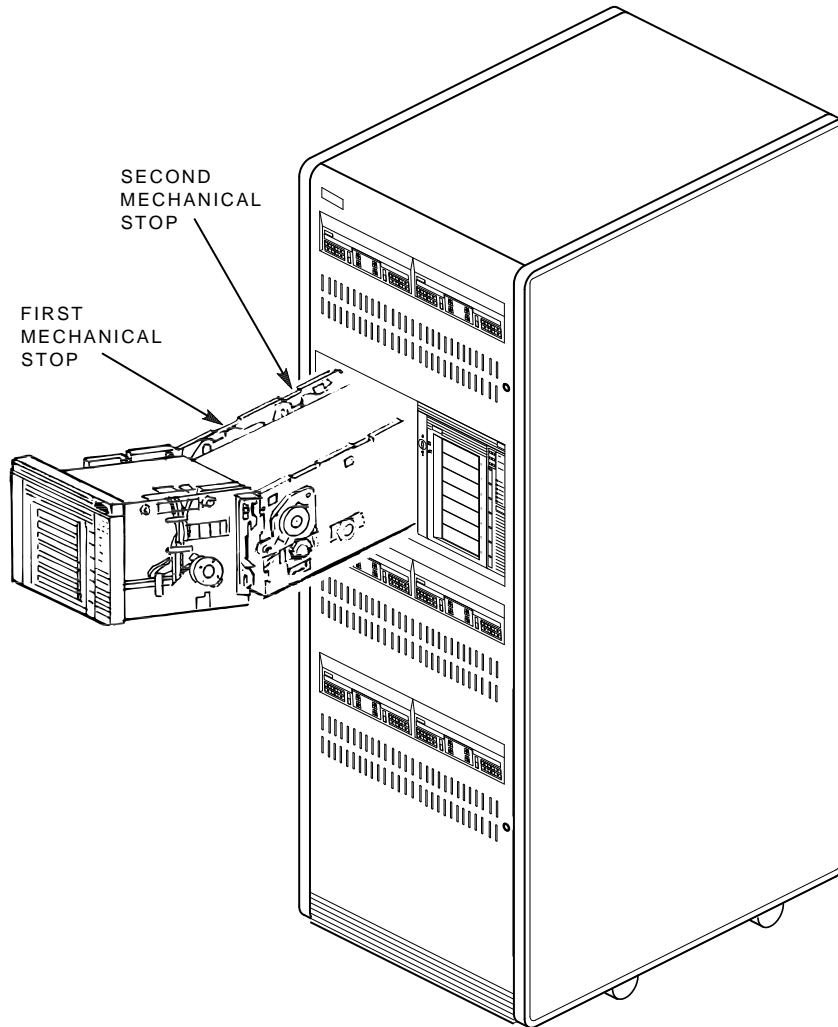
1. Set the Mode Select key to Service mode (Figure 2–1).
2. Close the receiver.
3. Loosen the shipping screw in the upper right corner of the subsystem rear panel. (This step does not apply to generic loaders.)



### 3-2 Removing and Replacing the Drive

4. Use a screwdriver to press the first mechanical stop; slide the subsystem to the second mechanical stop (Figure 3-1).

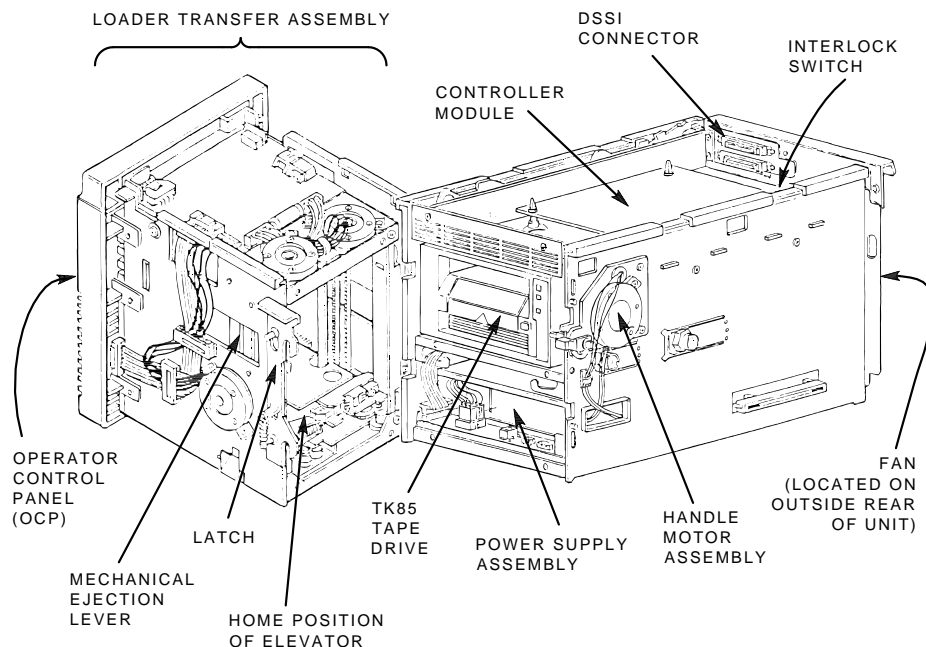
**Figure 3-1 Mechanical Stops**



CXO-2461B  
SHR\_X1106D\_89

5. Lift the latch (Figure 3-2) and swing open the loader transfer assembly.

**Figure 3-2 Loader Open Latch**



SHR-X0147F-90-CPG

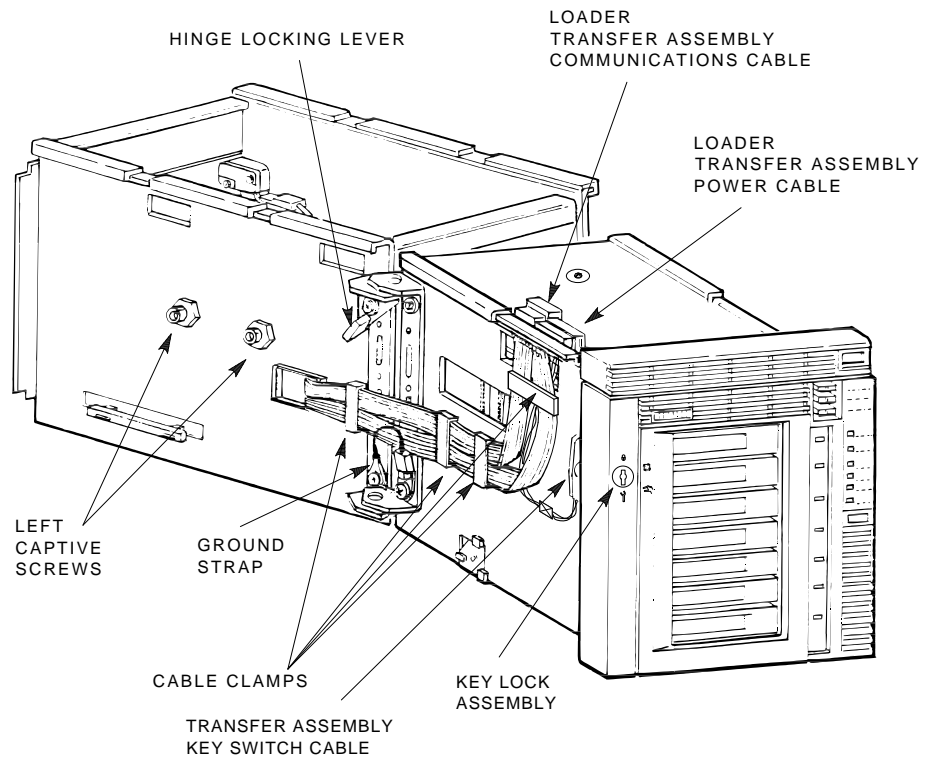
6. Use a screwdriver to disengage the four captive screws that secure the drive at the right (Figure 3-2) and left (Figure 3-3) sides of the rear chassis. Each screw is recessed inside a nut. Do not attempt to loosen these nuts.

**NOTE**

**Remember the position of the old drive handle. The drive handle of the new drive needs to be in the same position as that of the old drive handle when you install the new drive.**

### 3-4 Removing and Replacing the Drive

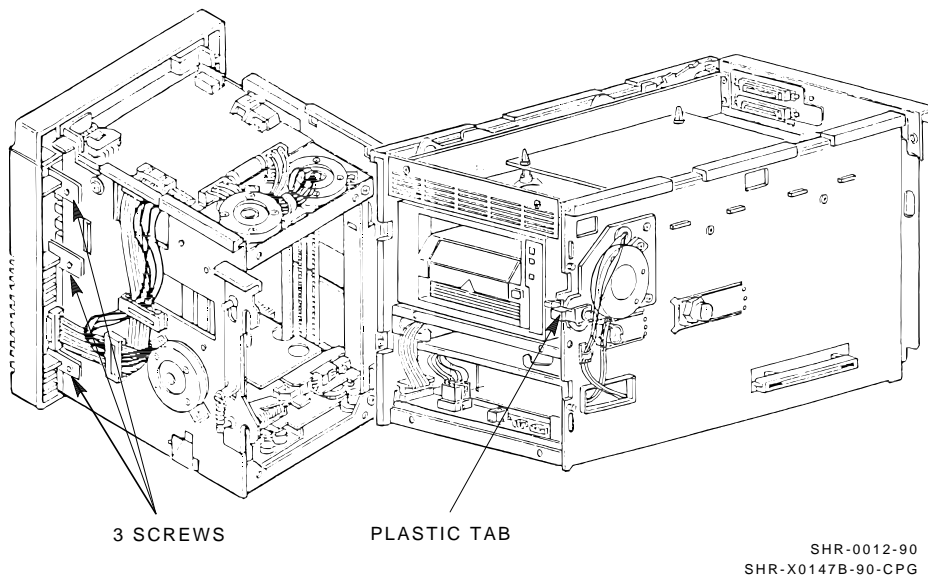
**Figure 3-3 Captive Screws for Drive**



SHR-X0143-90-CPG

7. Disengage the handle motor assembly from the drive handle by pushing or pulling the plastic tab on the handle motor assembly about one inch to the right (Figure 3-4). (You may have to move the drive slightly to release the plastic tab.) Rotate the black plastic tab toward the handle motor assembly.

**Figure 3-4 Plastic Tab**



8. Slide the drive toward you, almost fully out of the rear chassis.
9. Disconnect the 4-pin power supply cable and drive communications cable (flat ribbon cable) from the rear of the drive, and remove the drive from the rear chassis. (Can this step apply to TF857 and TZ867? If so, then delete next step.)
10. Disconnect the 4-pin power supply cable from the rear of the drive, and remove the drive from the rear chassis.

## 3.2 Installing the TK85 or TK86 Tape Drive

To install the TK85 or TK86 tape drive:

1. Insert the tape drive halfway into the rear chassis, and for the TK85 drive, keep the controller communications cable on top of the drive.
2. Attach the 4-pin power cable to the TK85 drive.
3. Attach the 4-pin power cable and connect the drive communications cable to the TK86 drive. (Can the last two steps be combined? or does each drive have a separate step?)

### CAUTION

**Carefully position the cables when sliding the drive into the chassis, ensuring no damage occurs from snagging.**

4. Slide the drive into the rear chassis; align the drive handle shaft with the handle motor coupling shaft (Figure 3-5).

You can see the drive handle shaft by looking down on the drive from the top. A half-moon cutout in the drive bezel accommodates the shaft and coupling assembly.

5. Make sure the new drive handle is in the same position as that of the old drive handle when you removed the old drive. Engage the drive handle shaft with the handle motor coupling shaft:
  - a. Rotate the plastic tab into the horizontal position and push the handle motor coupling shaft toward the drive; it will slip partially onto the drive handle shaft.

### NOTE

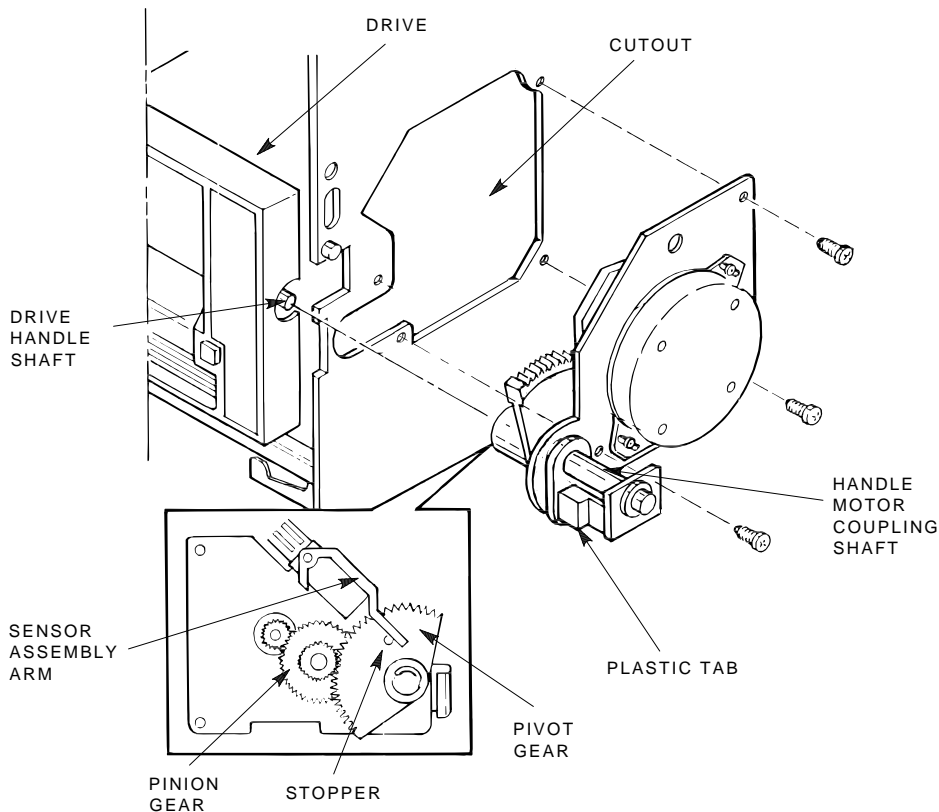
**Locate the plastic tab on the drive. This tab, along with a small metal tab (write-protect switch), is inside the cartridge opening adjacent to the Tape In Use indicator on the bezel. This assembly locks the drive handle and must be pushed to the right to lift the handle.**

### CAUTION

**Failure to release the plastic tab before lifting the handle could cause damage; do not force the handle against the locking mechanism.**

- b. With the handle in the correct position, apply pressure to the handle motor coupling shaft until it is fully engaged. You may need to wiggle the drive slightly to seat the shaft firmly.
6. Engage the four captive screws on the rear chassis with the threaded holes on the drive. You may have to pull up the drive slightly to engage the captive screws. Do not completely tighten the screws; use the following sequence:
    - Left front
    - Left rear
    - Right front
    - Right rear
  7. Then tighten screws in the following order:
    - Left front
    - Left rear
    - Right front
    - Right rear

**Figure 3-5 Handle Motor Assembly**



SHR-0067-89  
SHR-X0146-90-CPG

8. Do this step for the TF837 to TF857 subsystem upgrade only. Pull the module tray forward and pass the drive communications cable through the opening in front of the connector on the controller module. Connect the drive communications cable to the controller module. Carefully lead the cables through so the cables do not interfere with the mechanisms.
9. Close the loader transfer assembly.

**CAUTION**

**If the handle motor coupling shaft is seated correctly, the loader transfer assembly closes and latches without difficulty. Use caution in closing the loader transfer assembly and push the black plastic tab farther toward the drive, if necessary, to seat it fully. Be careful not to damage the heads on the drive mounting screws.**

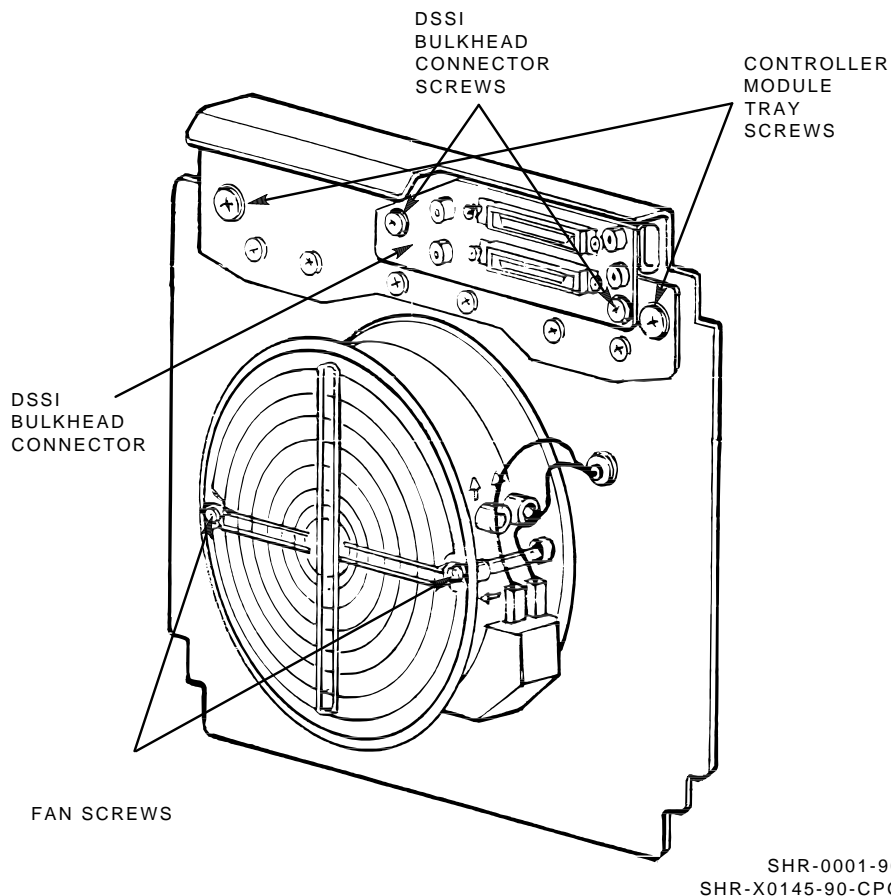
10. Slide the subsystem fully into the enclosure.

**CAUTION**

**Carefully guide the cables while sliding the tray in or out. Because the cables are loose, they could interfere with the handle down optic sensor.**

11. At the rear of the unit, slide in the controller module tray and tighten the one-quarter turn captive screws that secure the controller module tray (Figure 3-6).

**Figure 3-6 Captive Screws for Controller Module Tray**



12. Redress the external DSSI or SCSI communications cable(s) into the rear chassis' cable restraints.
13. For the TF837 to TF857 subsystem upgrade only, redress the subsystem's ac power cable into the cable restraints.
14. Verify a secure power connection at both ends of the power cable.
15. Release the medallion at the top right. Above the operator control panel, insert a screwdriver into the louver next to the medallion center and pry out the medallion. Insert the new medallion into the medallion opening.
16. Remove the old subsystem serial number label at the back of the rear chassis. Add the new subsystem serial number label in the same spot as that of the old serial number.
17. Remove the old bar code label and add the new bar code label.

The subsystem is now upgraded. Ensure the host system is rebooted to recognize the new subsystem.

# 4

## Verifying the Upgrade

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To verify the upgrade is operating correctly:

1. Set the TF857 or TZ867 subsystem power switch to 1 (on). If the Power On indicator does not light, verify that the subsystem is placed as far into the enclosure as possible.
2. Secure the rear door of the storage array.
3. Install a scratch tape in slot 0 of the magazine.
4. Install the magazine into the receiver.
5. For reading and writing purposes, load CompacTape III cartridges into the magazine. Up to seven cartridges can be loaded. (Writer's Note: Not sure about this next sentence for the TZ867.) CompacTape and CompacTape II cartridges can only be read by the TK85 drive.
6. Execute LDRTST for the TF857 subsystem. (See the *TF857 Magazine Tape Subsystem Owner's Manual* for information on running local diagnostic programs and utilities.)



