7208 Model 345 External 8mm Tape Drive

7208 Model 345 8mm Tape Drive Service Guide

SY32-0411-00

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SY32-0411-00

Note!

Before using this information and the product it supports, be sure to read the general information under “Notices” on page v.

First Edition (November, 2000)

This edition, SY32–0411–00, applies to Model 345 of the 7208 8mm Tape Drive and to all subsequent releases and modifications until otherwise indicated in new editions. This edition applies only to the specified model of the device.

Contents

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Telephone: 1-919-543-2193

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About This Guide

This guide describes how to install and use the 7208 Model 345 8mm Tape Drive. It contains the following chapters:

Chapter 1, “Reference Information,” describes the 7208 Tape Drive, gives the system requirement, and lists hardware specifications.

Chapter 2, “Using the Media,” describes the media to use in the 7208 Tape Drive.

Chapter 3, “Maintenance Analysis Procedures,” describes a series of procedures designed to evaluate and correct a problem with the 7208 Tape Drive.

Chapter 4, “Removal and Replacement Procedures,” describes the procedures to follow when removing and replacing the field replaceable units (FRUs).

Chapter 5, “Parts Diagram and Parts List,” provides the parts diagram and parts list required to service the 7208 Model 345 Tape Drive.

Appendix A, “Power Cables,” provides power cable information for different countries.

Appendix B, “Fault Symptom Codes and Error Recovery Procedure Numbers,” provides information about the error codes reported by the drive.

Appendix C, “Error Recovery Procedures,” provides information and recovery procedures for resolving the error codes reported by the drive.

Store this guide with your system manuals.

Related Publications

- *7208 Model 345 8mm Tape Drive Setup and Operator Guide*, SA26–2008, provides installation and operating information for the 7208 Model 345 Tape Drive.
- *IBM Externally Attached Devices Safety Information*, SA26-2004, provides translations of danger notices.

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Chapter 1. Reference Information

The 7208 Model 345 8mm Tape Drive is an external storage device that connects to a host system and stores additional data.

The 7208 Tape Drive:

- Saves and restores system data files
- Archives important records
- Distributes upgrades to operating system software

The sections that follow describe the operator controls, indicator lights, and liquid crystal display (LCD) on the 7208 Tape Drive. This chapter also shows connector locations, lists hardware specifications, and describes how to clean the tape drive.

Front View

Figure 1 shows the front view of the 7208 Model 345 Tape Drive.

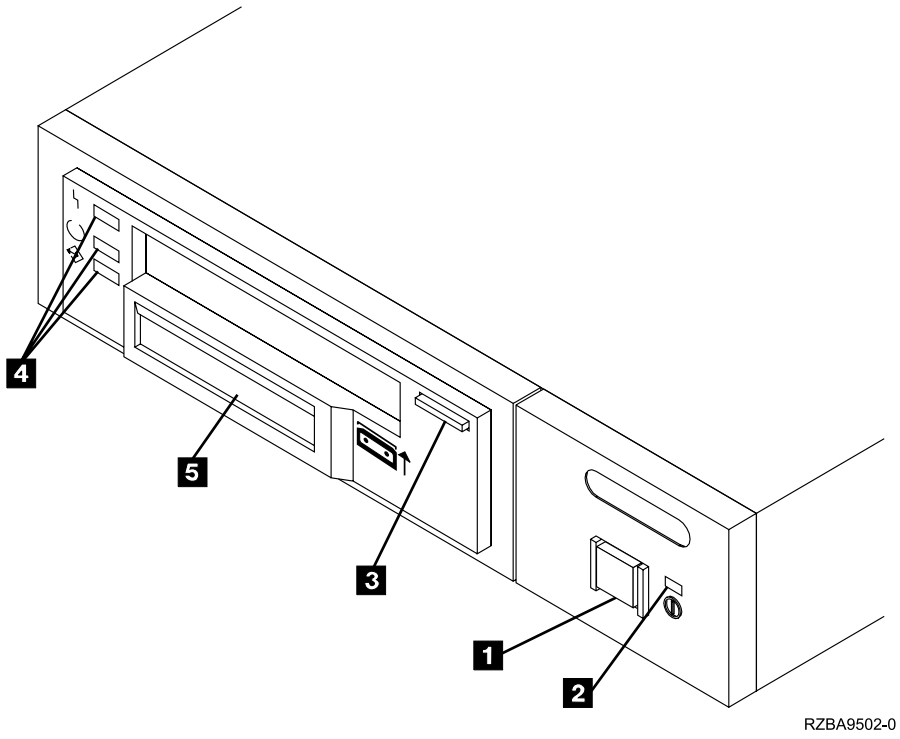


Figure 1. Front View of the 7208 Model 345 Tape Drive

Operator Controls

The 7208 Tape Drive has the following operator controls.

Power Switch

The power switch (**1** in Figure 1 on page 1) is a push button switch that enables the power to be turned on or off. When the 7208 Tape Drive is on, the power-on light **2** is on.

Note: The ⏻ symbol beside the power switch is an International Organization for Standardization (ISO) symbol for a push button switch.

Unload Button

The unload button **3** enables a tape cartridge to be ejected. The unload button operates only when the 7208 Tape Drive power is on. To remove a tape cartridge, press and hold the unload button for about one second.

Indicator Lights

The 7208 Model 345 Tape Drive has the following indicator lights.

Power-On Light

When the 7208 Tape Drive is turned on, the power-on light **2** comes on and stays on.

Status Lights

Three status lights **4** and their ISO symbols appear on the 7208 Tape Drive as follows:

- Fault (amber)
- Ready (green)
- Activity (green)

The combinations of the lights and their definitions are shown in Table 1.

Table 1. Status Lights on the 7208 Tape Drive

Status Lights	Status	Status of 7208 Tape Drive
Fault	On	The Power-On Self Test (POST) is running.
Ready	On	
Activity	On	
Fault	Off or On	One of the following conditions exists: • The power is off (Fault light is off). • The POST has completed successfully, but no tape cartridge has been inserted. If the Fault light is on, cleaning is required. See “Cleaning the Tape Drive” on page 8.
Ready	Off	
Activity	Off	

Table 1. Status Lights on the 7208 Tape Drive (continued)

Status Lights	Status	Status of 7208 Tape Drive
ϟ Fault	Off or On	A tape cartridge has been inserted: • The 7208 Tape Drive is ready to receive commands from the system (whether the Fault light is on or off). • If the Fault light is on, cleaning is required. See "Cleaning the Tape Drive" on page 8. • If the Activity light flashes, a tape cartridge is in the drive and tape movement is occurring. If the light is off, no tape movement is occurring.
○ Ready	Off	
⇳ Activity	Flashing or Off	
ϟ Fault	Flashing	The 7208 Tape Drive has detected an internal fault that requires corrective action: • Reset the error by turning the power off to the 7208 Tape Drive, then turning it back on, or by holding down the unload button for about 15 seconds. • If the Fault light still flashes after the reset, contact your service representative.
○ Ready	Off or On	
⇳ Activity	Off, On, or Flashing	
ϟ Fault	On	The tape drive requires cleaning. See "Cleaning the Tape Drive" on page 8. • If the Ready light is on, a tape cartridge is in the drive. If the light is off, a cartridge is not in the drive. • If the Activity light flashes, a tape cartridge is in the drive and tape movement is occurring. If the light is off, no tape movement is occurring.
○ Ready	Off or On	
⇳ Activity	Flashing or Off	

Liquid Crystal Display

The 7208 Tape Drive features a liquid crystal display (LCD) (**5** in Figure 1 on page 1). The LCD provides operating and error messages.

Table 2 shows a list of messages that display on the LCD.

Table 2. LCD Messages

Reset Messages	
RESET	The first message to appear during the power-on sequence.
MODEL:	Variable information about the tape drive, in this case IBM-60GB.
SUBMOD:	The submodel number of the tape drive.
SN:	The serial number of the tape drive.
CODE:	The level of the tape drive's firmware.
LAST CLN:	The number of hours since the last cleaning.
COMPRESSION:	Whether data compression is turned on (the default) or turned off.
SINGLE ENDED *or* DIFFERENTIAL	The type of SCSI input/output electrical interface.
WIDE	The width of the SCSI bus (measured in bits or bytes).
SCSI ID:	The SCSI address of the tape drive (0 through 15). The default is 0.
LANGUAGE:	The current language used on the LCD. To change the language, turn off the power to the tape drive. Press and hold the unload button immediately after turning the power back on. When the desired language displays, release the unload button.
Tape Drive Status Messages	
READY-NOTAPE	The tape drive is ready to accept a cartridge.
○¯○ LOADING....	The tape drive is loading the tape.
○¯○ READY-TAPE	The tape drive successfully loaded the tape and is ready for read or write operations.
○¯○ ILLEGAL TAPE	An unsuitable tape has been loaded and rejected.
<< EJECT======	The unload button was pressed. The tape drive will eject the cartridge as soon as it finishes the current operation.
○¯○ EJECT PREVNT	The unload button was pressed, and the system software has issued a command to prevent the eject function.
Tape Motion Messages	
○↑○ READ+▪▪▪▪▪=	The tape drive is reading data. The + sign appears when the data is compressed. The boxes (▪) represent the amount of tape processed (out of a total of six boxes). The = sign represents the amount of unprocessed tape.
○↓○ WRITE+▪▪▪▪=	The tape drive is writing data. The + sign appears when the data is compressed.
○/○ PROTECTED	The tape drive cannot write data because the data cartridge is write-protected.
○/○ ILLEGAL WRT	The tape drive cannot write to the type of data cartridge inserted. This message remains until a proper tape is inserted or a tape motion command is issued.

Table 2. LCD Messages (continued)

>> SEARCH▪▪==== << SEARCH▪▪====	A high-speed search is in progress.
<< REWIND▪▪▪===	The rewind function is in progress.
○×○ ERASE▪=====	The tape drive is erasing data on the tape. As the data is erased, the equal signs (=) change to boxes (▪).
Cleaning Messages	
○''○ CLEAN SOON	The tape drive needs to be cleaned.
○''○ MUST CLEAN	The tape drive must be cleaned when advanced metal-evaporated (AME) media is inserted after using metal particle (MP) media.
○''○ CLEANING	Cleaning is in progress.
○''○ DEPLETED	The cleaning tape in the cartridge is used up and the tape drive will eject it. Insert a new cleaning cartridge.
Error Conditions	
LAST 3 ERRORS ERR 1: xx yy zz ERR 2: xx yy zz ERR 3: xx yy zz	A hardware error has occurred. The LCD displays the last three error codes, with ERR 1: xx yy zz as the most recent. xx = the fault symptom code (FSC). yy and zz = additional information for product support personnel (the information may or may not be present). To resolve the error, refer to “Appendix B. Fault Symptom Codes and Error Recovery Procedure Numbers” on page 41.

Rear View

Figure 2 shows the connector locations on the 7208 Model 345 Tape Drive:

1	SCSI address switch	3	Fan
2	SCSI bus cable connectors	4	Power cable connector

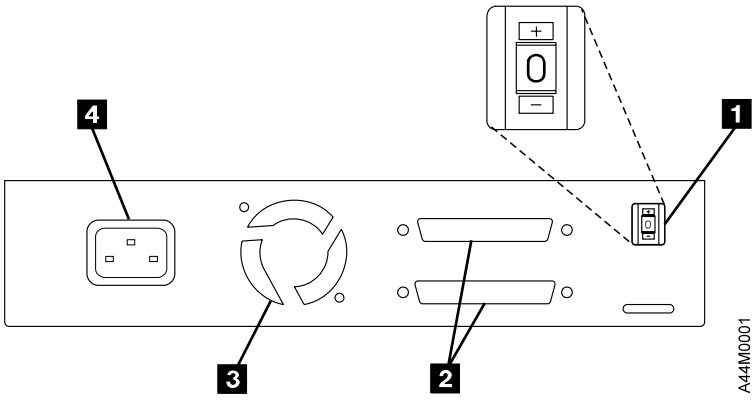


Figure 2. Rear View of the 7208 Model 345 Tape Drive

Rear View of the Drive

Figure 3 shows the connector locations on the drive:

1	Internal SCSI bus connector	3	Internal SCSI address connector
2	Power supply connector		

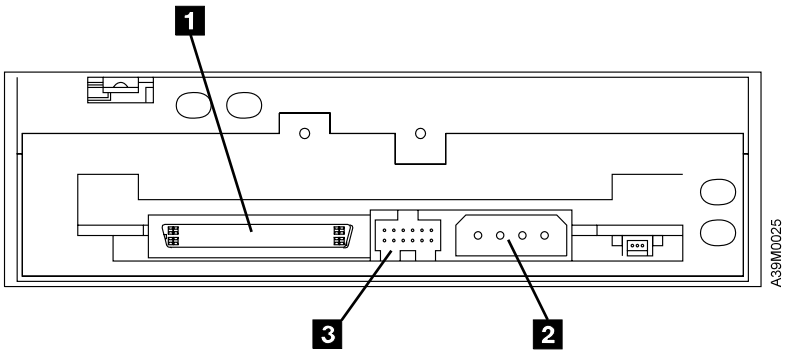


Figure 3. Connector Locations on the Drive

Internal View

Figure 4 shows the inside of the 7208 Model 345 Tape Drive:

1	Drive	4	Cooling fan
2	SCSI address cable	5	Power supply
3	SCSI bus connectors		

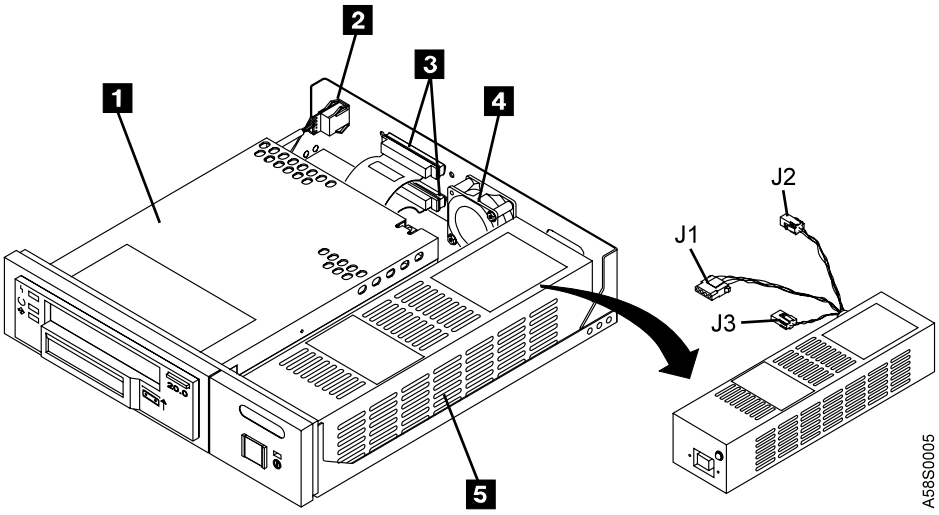


Figure 4. Internal View of the 7208 Model 345 Tape Drive

Specifications

Table 3. Specifications for the 7208 Model 345 Tape Drive

Physical Specifications		
Width	250 mm (9.8 in.)	
Depth	275 mm (10.8 in.)	
Height	55 mm (2.2 in.)	
Weight	3.2 kg (7.1 lb)	
Power Specifications		
kVA	0.023 @ 120 V ac	
V ac	100 to 125, or 200 to 240	
Hertz	50 to 60	
Btu Maximum (watts)	41.6 Btu/hr (12.2 watts) @ 240 V ac	
Power Factor	0.4 to 0.6	
Other Specifications		
Altitude	2135 m (7000 ft)	
Recommended Environment		
Environmental Factor	**Operating**	**Non-operating**
Temperature	16 to 32°C (60 to 90°F)	1 to 60°C (34 to 140°F)
Relative Humidity (noncondensing)	20 to 80%	20 to 95%
Maximum Wet Bulb	23°C (73°F)	27°C (81°F)
Note: The operating limits include media. The storage and shipping limits do not include media. For media storage and shipping limits, see “Storage and Shipping Environments” on page 13.		

Cleaning the Tape Drive

Clean the 7208 Tape Drive when the fault light comes on solid (see Table 1 on page 2), or when the LCD indicates cleaning is required (see Table 2 on page 4).

Note: If you use AME with SmartClean cartridges exclusively, the IBM M2 tape drive automatically performs the cleaning operation using the cleaning material in the cartridges. If you do not use SmartClean cartridges exclusively, the drive may require regular cleaning with an IBM AME 8mm cleaning cartridge.

The 7208 Tape Drive counts the number of hours of tape motion and indicates when it is time to clean the tape drive by displaying the message `CLEAN SOON` and turning on the Fault status light.

To clean the tape drive, use only the IBM AME 8mm Cleaning Cartridge (part number 35L1409). For uninterrupted operation, have one or more spare cleaning cartridges available.

Attention: Do not operate the 7208 Model 345 Tape Drive in a poor air-quality environment. If your environment contains an excessive amount of particulates, they may permanently damage the media, the drive, or both. Contact your service representative for more information.

To load the cleaning cartridge:

1. Make sure that the 7208 Tape Drive power is on and the Power-On Self Test has completed.
2. Grasp the cleaning cartridge (**1** in Figure 5) by the outer edges, with the window side up and the write-protect switch **2** facing you.

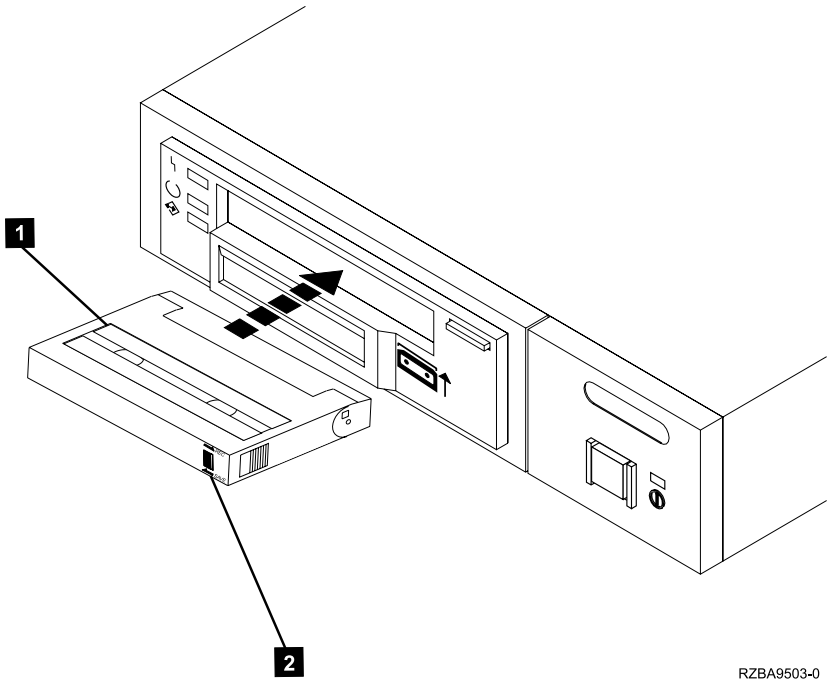


Figure 5. Loading the Cleaning Cartridge

3. Slide the cartridge into the opening on the front of the 7208 Tape Drive until the loading mechanism pulls the cartridge into the drive and the drive door closes.

After the cleaning cartridge has been fully inserted into the 7208 Tape Drive, the remainder of the cleaning process is automatic. The 7208 Tape Drive:

1. Loads the cleaning tape into the tape drive
2. Turns on the Fault status light (if the light is off)
3. Cleans the drive by moving the cleaning tape forward for approximately two minutes (the Fault status light comes on and the message `CLEANING` displays)
4. Unloads and ejects the cleaning tape when the cleaning operation is complete
5. Indicates a successful cleaning operation by turning off the Fault status light

The cleaning cartridge can be used for a maximum of 18 cleaning operations. If you attempt to use the depleted cartridge, the 7208 Tape Drive automatically detects the error, ejects the cartridge, and displays the message `DEPLETED`. The Fault status light remains on to indicate that cleaning is still required. Replace the depleted cartridge with a new cleaning cartridge.

Chapter 2. Using the Media

Use only IBM 8mm cartridges with the 7208 Tape Drive.

Types of 8mm Cartridges

The 7208 Model 345 Tape Drive is shipped with an advanced metal-evaporated (AME) SmartClean data cartridge, an AME test cartridge, and a cleaning cartridge.

The 7208 Tape Drive reads and writes to new Advanced Metal Evaporated (AME) data cartridges with SmartClean technology. SmartClean cartridges are designed to combine the extremely reliable AME recording media with a short segment of tape drive head cleaning material. The new SmartClean cartridges are easily identified by their cobalt-blue color and are available from in 75m, 150m, and 225m lengths.

Although extensive use is not recommended, M2 can write to AME cartridges designed for the first-generation MammothTape technology tape drives. When these cartridges are used, M2 requires regularly scheduled manual cleaning using a MammothTape cleaning cartridge. Such maintenance is greatly reduced by using only SmartClean media in M2.

Data Cartridge

Use the AME data cartridge for saving or restoring your programs or data.

Large and small labels are shipped with the data cartridge. To avoid problems with loading and unloading a tape, use only the small label on the tape cartridge and place the label in location **1** shown in Figure 6. Place the large label on the cartridge container.

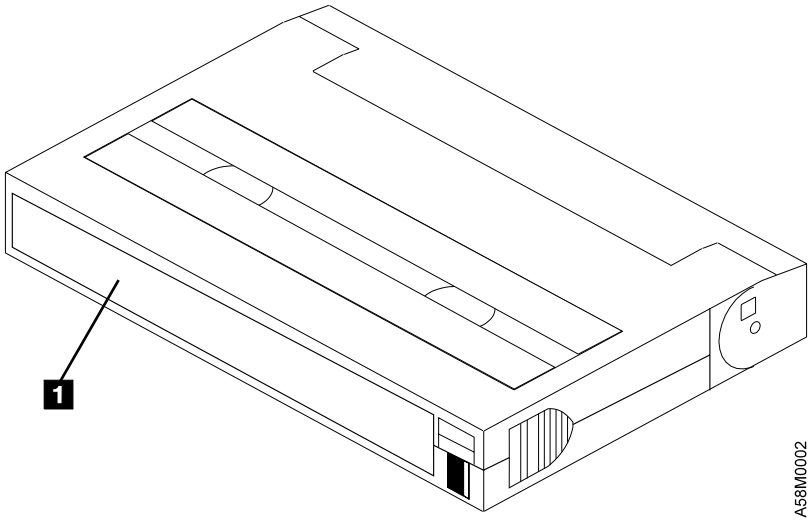


Figure 6. Placement of Label on an 8mm Data Cartridge

Test Cartridge

Use the specially labeled test cartridge to perform diagnostics on the drive. Do not use it to save or restore programs or data.

Cleaning Cartridge

Use the specially labeled cleaning cartridge to clean the tape drive (see “Cleaning the Tape Drive” on page 8).

To order additional cartridges, refer to “Ordering Tape Cartridges” on page 15.

Guidelines for Using Tape Cartridges

Observe the following guidelines for using media with the 7208 Model 345 Tape Drive:

Attention: Do not use video-grade cartridges, as they are hazardous to the 7208 Tape Drive and will void your warranty.

Before using a cartridge, let it acclimate to the operating environment for as long as it has been away from the environment or for 24 hours, whichever is less.

Use only IBM 8mm cartridges with the 7208 Model 345 Tape Drive. IBM only supports the use of IBM media. To order tape cartridges, see “Ordering Tape Cartridges” on page 15.

Attention: Clean the 7208 Tape Drive:
- Whenever you replace a worn tape
- Whenever you replace a defective tape
- Whenever the `CLEANING` message displays

For more information, see “Cleaning the Tape Drive” on page 8.

Do not write to previously written software distribution tapes. Often these tapes will not support being rewritten without modifications to the cartridge. If the cartridge is modified, it is possible to cause tape jams or tape misalignment.

Back up and then discard any tape that repeatedly produces error messages. (The error information is in the System Error Log.)

Do not open the door that covers the tape in the data cartridge. This door protects the magnetic tape from dirt, dust, and damage.

Do not touch the tape material. Any substance transferred to the tape by touching could cause loss of data.

Do not operate the 7208 Tape Drive in a dusty environment.

Do not store tape cartridges or the 7208 Tape Drive in a dusty environment.

Do not store tape cartridges flat. Store tape cartridges vertically on the long narrow spine in their protective case.

Storage and Shipping Environments

Before using an 8mm tape cartridge, let it acclimate by placing the cartridge in the operating environment for as long as it has been away from the environment, or for 24 hours, whichever is less.

Acclimation is necessary for any data cartridge that has been exposed to a different humidity environment or to temperature changes of 11°C (20°F) or more.

The 8mm data cartridge can be stored and shipped in a wide variety of environments. Table 4 provides a description of these environments.

Table 4. Recommended Environment for 8mm Data Cartridges

Environmental Factor	Storage	Shipping
Temperature	5 to 32°C (41 to 90°F)	−40 to 45°C (−40 to 113°F)
Relative Humidity (noncondensing)	20 to 80%	20 to 80%
Maximum Wet Bulb	26°C (79°F)	26°C (79°F)

Operating in Harsh Environments

The 7208 Tape Drive is ideally suited to streaming operations, as opposed to multiple stop-and-start, random-search tape operations. When the tape is used for frequent stop-and-start operations, it is beneficial to still have as much streaming movement as possible. This can be accomplished by ensuring that any save or restore operation is the only active operation being performed.

Do not use as an archival tape any tape that has been used outside of the ranges specified in Table 4 for an extended period of time. The magnetic and physical strength of the tape will have deteriorated as a result of its exposure to the environment. Do not store important data on such a tape; transfer the data to a newer tape for reliable archiving.

Setting the Write-Protect Switch

The position of the write-protect switch on the 8mm tape cartridge determines when you can write to the tape.

- When the switch is set to the left in the SAVE position **1**, data cannot be written to or read from the tape (data is saved).
- When the switch is set to the right in the REC (Record) position **2**, data can be written to and read from the tape.

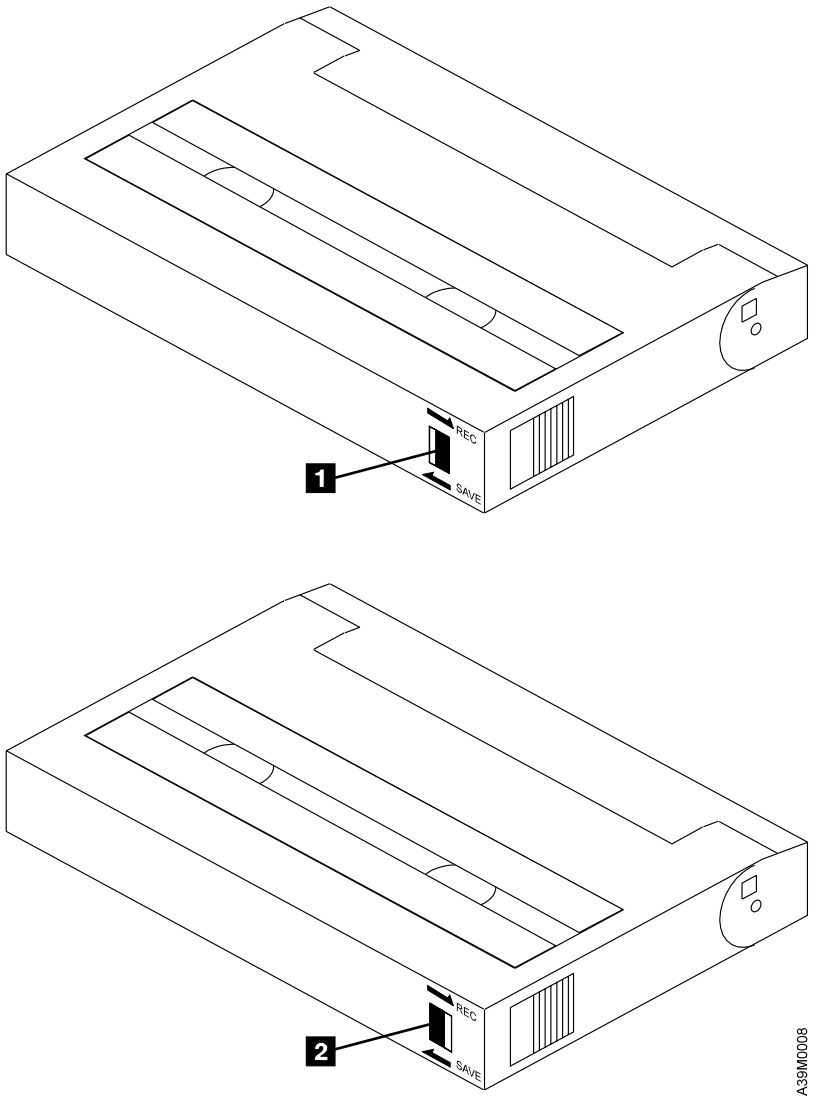


Figure 7. Setting the Write-Protect Switch

Ordering Tape Cartridges

Table 5 lists the tape cartridges that you can order for the 7208 Model 345 Tape Drive. To order cartridges in the United States and Canada, call 1-888-IBM-MEDIA. To order cartridges in other locations, contact your local provider of IBM storage products.

Table 5. Tape Cartridges for the 7208 Model 345 Tape Drive

IBM Part Number	Type of Cartridge	Length
35L1044	20 GB 8mm AME with SmartClean Data Cartridge	75 m (246 ft)
09L5323	40 GB 8mm AME with SmartClean Data Cartridge	150 m (492 ft)
09L5322	60 GB 8mm AME with SmartClean Data Cartridge	225 m (738 ft)
35L1409	8mm Cleaning Cartridge	– –

Chapter 3. Maintenance Analysis Procedures

DANGER

To prevent a possible electrical shock from touching two surfaces with different electrical grounds, use one hand, when possible, to connect or disconnect signal cables. (RSFTD004)

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the products that attach to the system. It is the customer's responsibility to ensure that the outlet is correctly wired and grounded to prevent an electrical shock. (RSFTD201)

Purpose of the MAPs

Maintenance analysis procedures (MAPs) are used to check the:

Power cable	Configuration	SCSI bus (signal) cable
Power supply	Drive	SCSI address
Terminator	Fan	
Media	Drive head	

If a problem is detected, the procedure isolates the problem to the failing field replaceable unit (FRU), such as the 7208 Tape Drive cover, drive, power supply, or cooling fan.

For instructions about removing or replacing a FRU, refer to "Chapter 4. Removal and Replacement Procedures" on page 25.

Figure 8 on page 18 provides a flowchart to be used as a guide to the MAPs. For detailed instructions on how to perform each procedure safely and correctly, refer to the steps in this chapter.

Flowchart of the MAPs

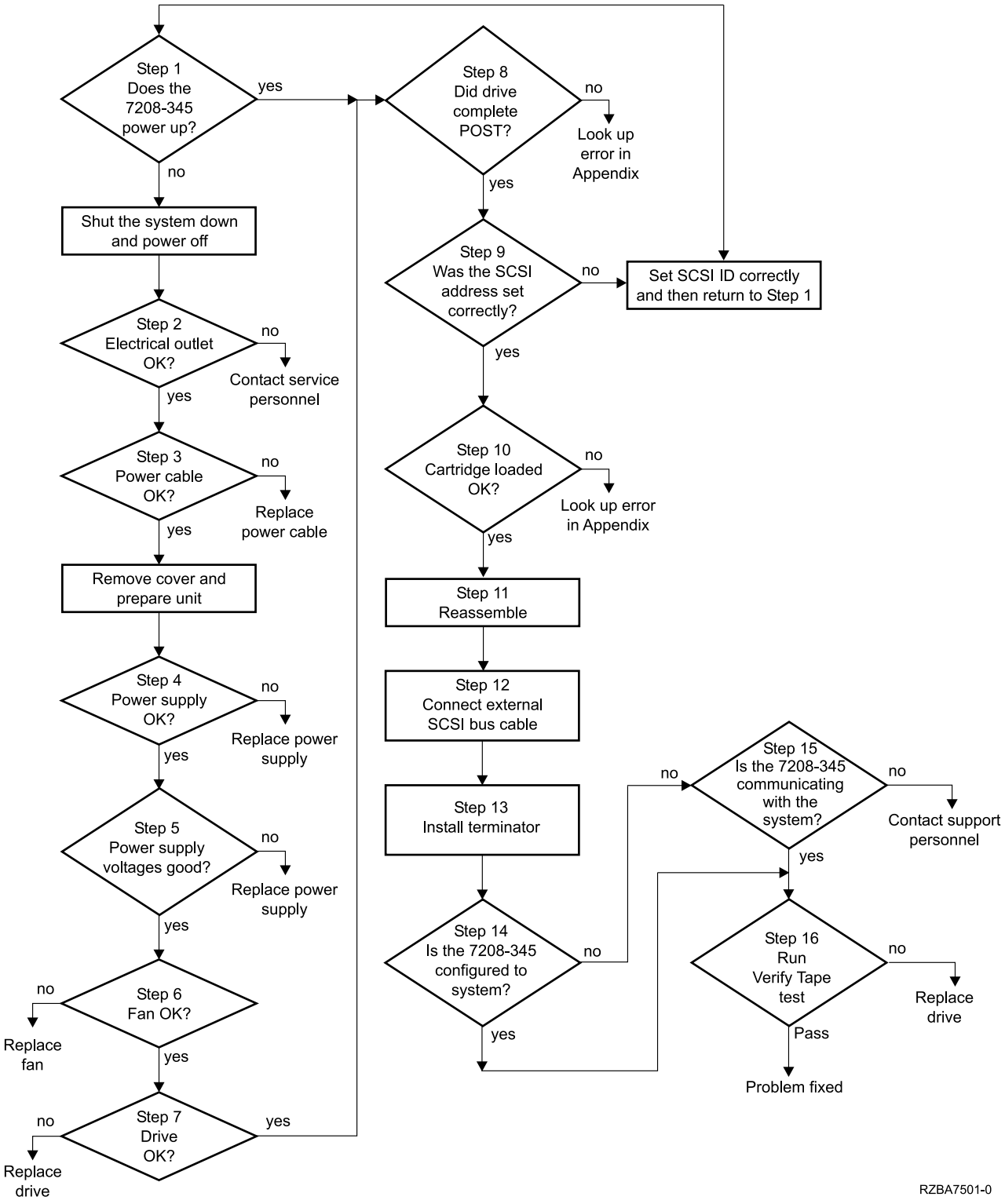


Figure 8. Flowchart of the Maintenance Analysis Procedures (MAPs)

Step 1

This step verifies whether the 7208 Tape Drive is receiving electrical power and the fan is operating properly.

1. Make sure that the 7208 Tape Drive power cable is plugged into an electrical outlet.
2. Make sure that the 7208 Tape Drive power is on by checking that:
   - The power-on light is on.
   - There is airflow from the fan at the rear of the unit.

Is the power-on light on and is there airflow from the fan?

NO While watching for the power-on light to come on, press the power switch again. Repeat this procedure several times. If the power-on light fails to come on or if there is no airflow from the fan, go to Step 2.

YES Go to Step 8.

Step 2

This step tests the voltage at the electrical outlet.

1. Do a controlled system shutdown (refer to the instructions in Chapter 2, "Setting Up the 7208 Tape Drive," in the *7208 Model 345 8mm Tape Drive Setup and Operator Guide*).
2. Ensure that the power to the host system is off.
3. Press the 7208 Tape Drive power switch to turn off the power.
4. Unplug the 7208 Tape Drive power cable from the electrical outlet and from the 7208 Tape Drive.
5. Measure the voltage at the electrical outlet.

Is the voltage from the electrical outlet correct?

NO Contact your service personnel for further instructions.

YES Go to Step 3.

Step 3

This step determines whether the power cable is functional.

Make sure that all of the conductors in the power cable have continuity, and that there are no short circuits.

Does the power cable have continuity and are there no short circuits?

NO Replace the power cable, then go to Step 1.

YES Go to Step 4.

Step 4

This step prepares the 7208 Tape Drive to determine whether the power supply, fan, or tape drive is the cause of the problem.

1. Remove the cover of the 7208 Tape Drive. Refer to “Removing and Replacing the Cover” on page 26.
2. Disconnect the power supply connector (J1) from the drive.
3. Disconnect the power supply connector (J2) between the power supply and the cooling fan.
4. Plug the 7208 Tape Drive power cable into the 7208 Tape Drive and into a grounded electrical outlet.
5. Press the 7208 Tape Drive power switch to turn on the power.

Does the power-on light come on and stay on?

NO Replace the power supply, then go to Step 5. Refer to “Removing and Replacing the Power Supply” on page 28.

YES Go to Step 5.

Step 5

This step checks the power supply voltage levels as the possible source of the problem.

1. Press the power switch to turn off the power.
2. Disconnect the power supply connector (J1) from the drive.
3. Disconnect the power supply connector (J2) between the power supply and the cooling fan.
4. Connect the power cable to both the 7208 Tape Drive and to the electrical outlet.
5. Press the power switch to turn on the power.
6. On the power supply connector J1 (see Figure 9), check the following:
   - The +12V signal falls between a minimum of +11.5 volts and a maximum of +12.6 volts
   - The +5V signal falls between a minimum of +4.8 volts and a maximum of +5.25 volts

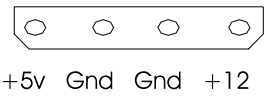


Figure 9. Power Supply Connector J1

7. On the power supply connector J2 (see Figure 10), check that the +12V signal falls between a minimum of +11.5 volts and a maximum of +12.6 volts.

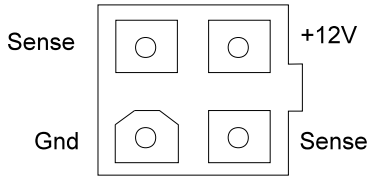


Figure 10. Power Supply Connector J2

Are the voltages good, and does the power-on light come on and stay on?

NO Replace the power supply, and then return to Step 4. Refer to “Removing and Replacing the Power Supply” on page 28.

YES Go to Step 6.

Step 6

This step examines the cooling fan as the possible source of the problem.

1. Press the power switch to turn off the power.
2. Reconnect the power supply connector (J2) to the cooling fan.
3. Press the power switch to turn on the power.

Does the power-on light come on and stay on, and is there airflow from the fan?

NO Replace the cooling fan, then return to Step 6. Refer to “Removing and Replacing the Cooling Fan” on page 30.

YES Go to Step 7.

Step 7

This step examines the drive as the possible source of the problem.

1. Press the power switch to turn off the power.
2. Reconnect the power supply connector (J2) to the drive.
3. Press the power switch to turn on the power.

Does the power-on light come on and stay on, and is there airflow from the fan?

NO Replace the drive, then return to Step 7. Refer to “Removing and Replacing the Drive” on page 27.

YES Go to Step 8.

Step 8

This step examines the drive as the possible source of the problem.

While pressing the power switch to turn on the power, watch for the following:

- The three status lights come on for approximately 10 seconds, then go out.
- The LCD displays the message READY-NOTAPE or READY-TAPE.

Did the three status lights come on and go out, and did the message READY-NOTAPE or READY-TAPE display?

NO Refer to "Appendix B. Fault Symptom Codes and Error Recovery Procedure Numbers" on page 41 and follow the problem determination steps.

YES Go to Step 9.

Step 9

This step checks whether the SCSI address switch setting is correct.

Is the SCSI address set correctly?

NO Set the SCSI address to the correct setting, then return to Step 1. Refer to the instructions for setting the SCSI address in the *7208 Model 345 8mm Tape Drive Setup and Operator Guide*.

YES Go to Step 10.

Step 10

This step examines the tape cartridge as the possible source of the problem.

1. If there is a tape cartridge currently in the drive, press the unload button to eject it. If the cartridge fails to eject, refer to "Manually Removing a Tape Cartridge" on page 31.
2. With the power turned on to the 7208 Tape Drive, insert a blank IBM AME data cartridge.
3. Check that after approximately 20 seconds, the Ready light comes on and stays on, and the LCD displays the message READY-TAPE.

Did the cartridge load correctly?

NO Refer to "Appendix B. Fault Symptom Codes and Error Recovery Procedure Numbers" on page 41 and follow the problem determination steps.

YES Go to Step 11.

Step 11

This step describes the reassembly process.

1. Press the power switch to turn off the power.
2. Unplug the power cable from the electrical outlet.
3. Make sure that the power supply connector (J1) is plugged into the drive.
4. Make sure that the power supply connector (J2) is plugged into the cooling fan.

5. Make sure that all other cables are properly connected, and that the wires are routed away from the cooling fan.
6. Perform the cover replacement procedure. Refer to “Removing and Replacing the Cover” on page 26.
7. Plug the power cable into the electrical outlet.
8. Press the power switch to turn on the power.

Does the power-on light come and stay on, and is there airflow from the fan?

NO Verify that the 7208 Tape Drive was reassembled correctly. If the power-on light still does not come on and there is no airflow from the fan, go to Step 1.

YES Go to Step 12.

Step 12

This step ensures that the external SCSI bus cable connection is proper.

Ensure that the SCSI bus cable is properly connected to both the host system and to the 7208 Tape Drive.

Is the SCSI bus cable properly connected to the host system and to the 7208 Tape Drive?

NO Plug the SCSI bus cable into both the host system and the 7208 Tape Drive, then go to Step 13.

YES Go to Step 13.

Step 13

This step ensures that the terminator is properly connected.

Ensure that the correct LVD terminator is used and properly connected to the last device on the SCSI bus.

Is the correct LVD terminator properly connected to the last device on the SCSI bus?

NO Ensure that the terminator is properly connected to the last device on the SCSI bus, then go to Step 14.

YES Go to Step 14.

Step 14

This step verifies that the 7208 Tape Drive is properly configured to the host system. Refer to your system manuals and the *7208 Model 345 8mm Tape Drive Setup and Operator Guide* to determine whether the 7208 Tape Drive is properly configured.

Does the 7208 Tape Drive that you are configuring appear under the Description column, and can it be powered off and on successfully?

NO Go to Step 15.

YES Go to Step 16.

Step 15

This step verifies whether the 7208 Tape Drive can communicate with the host system. Refer to your system manuals for instructions about determining if the host system is communicating with the 7208 Tape Drive.

Are the 7208 Tape Drive and the host system communicating?

NO Contact your service personnel for further instructions.

YES Go to Step 16.

Step 16

This step runs the AIX diagnostics.

Run the diagnostics on the 7208 Tape Drive. Have the test cartridge available for when the diagnostics prompt you to load the cartridge. From the AIX command prompt, type:

```
diag
```

and then press Enter. For additional instructions on running diagnostics, refer to your AIX manuals.

Do all of the diagnostics routines pass?

NO Replace the FRU isolated by the diagnostics and identified by the service request number.

> **Note:** If the drive is the FRU isolated by the diagnostics, check that the J1 connector is properly seated. If the drive has recently been replaced because of a similar problem, contact your service personnel.

YES If no problem was identified, the problem may be intermittent, related to the tape quality, or relating to the environment. If a FRU was replaced or changed and no more errors occur, the problem is fixed.

This completes the MAPs.

Chapter 4. Removal and Replacement Procedures

This chapter describes the procedures to follow when removing and replacing the field replaceable units (FRUs), such as the 7208 Tape Drive cover, drive, power supply, and cooling fan. It also describes how to manually remove a tape cartridge.

DANGER

To prevent a possible electrical shock from touching two surfaces with different electrical grounds, use one hand, when possible, to connect or disconnect signal cables. (RSFTD004)

DANGER

To prevent a possible electrical shock when adding or removing any devices to or from the system, ensure that the power cords for those devices are unplugged before the signal cables are connected or disconnected. If possible, disconnect all power cords from the existing system before you add or remove a device. (RSFTD203)

Before installing any FRU, let it acclimate to the operating environment for as long as it has been away from the environment or for 12 hours, whichever is less.

Handling Static-Sensitive Devices

Attention: Tape drives are sensitive to static electricity discharge. When handling a tape drive, wrap it in an antistatic bag to prevent damage.

Take the following precautions:

- Do not remove the drive from the antistatic bag until you are ready to install it.
- With the drive still in its antistatic bag, touch it to the metal frame of an electrically grounded surface.
- Hold the drive by the frame. Avoid touching the solder joints or pins.
- Handle the drive carefully to prevent permanent damage.

Removing and Replacing the Cover

To remove the cover from the 7208 Tape Drive:

1. If a tape cartridge is loaded in the drive, eject it.
2. Do a controlled system shutdown (refer to the instructions in Chapter 2, "Setting up the 7208 Tape Drive," in the *7208 Model 345 8mm Tape Drive Setup and Operator Guide*).
3. If it is on, turn off the power to the 7208 Tape Drive.
4. Unplug the 7208 Tape Drive power cable from the electrical outlet.
5. Disconnect the power cable from the 7208 Tape Drive.
6. Disconnect the SCSI bus (signal) cable from the 7208 Tape Drive.
7. Tilt the 7208 Tape Drive on its side and remove the four cover mounting screws from the bottom (see Figure 11).
8. Remove the cover by sliding it to the rear (see the directional arrow in Figure 11).

To replace the cover, reverse the removal procedure.

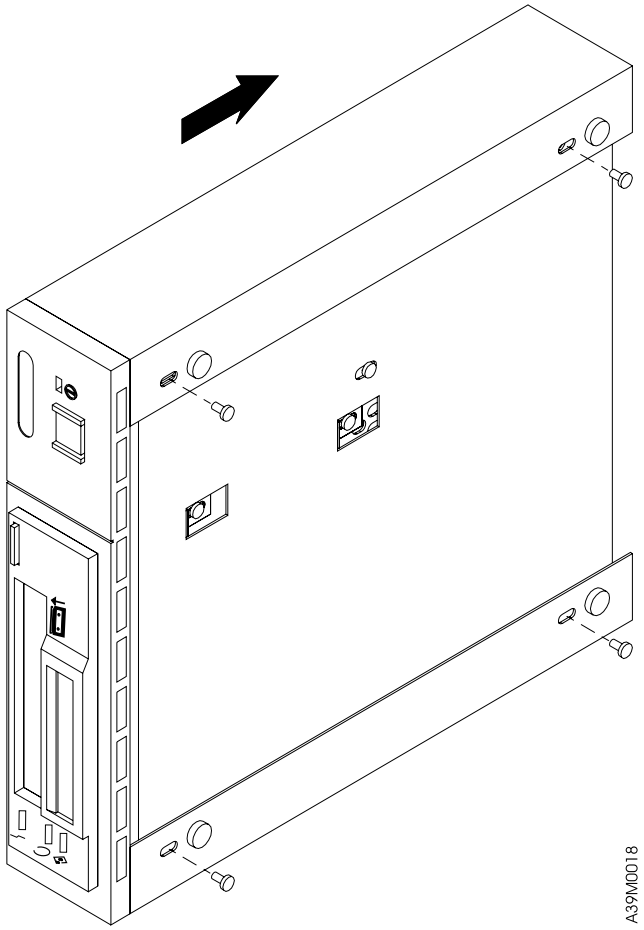


Figure 11. Removing and Replacing the Cover

Removing and Replacing the Drive

To remove the drive from the 7208 Tape Drive:

1. Perform the cover removal procedure. Refer to “Removing and Replacing the Cover” on page 26.
2. Tilt the 7208 Tape Drive on its side. Support the drive (**1** in Figure 12) while removing the four screws **2** that secure the drive to the chassis.
3. Support the drive while returning the 7208 Tape Drive to its original position.
4. Disconnect the power supply connector (J1) **3** from the drive.
5. Disconnect the internal SCSI bus cable **4** from the drive.

   Note: To remove the cable, grasp the connector and pull it towards you. Do not pull on the cable.
6. Disconnect the internal SCSI address cable **5** from the drive.
7. Slide the drive forward and out of the chassis.

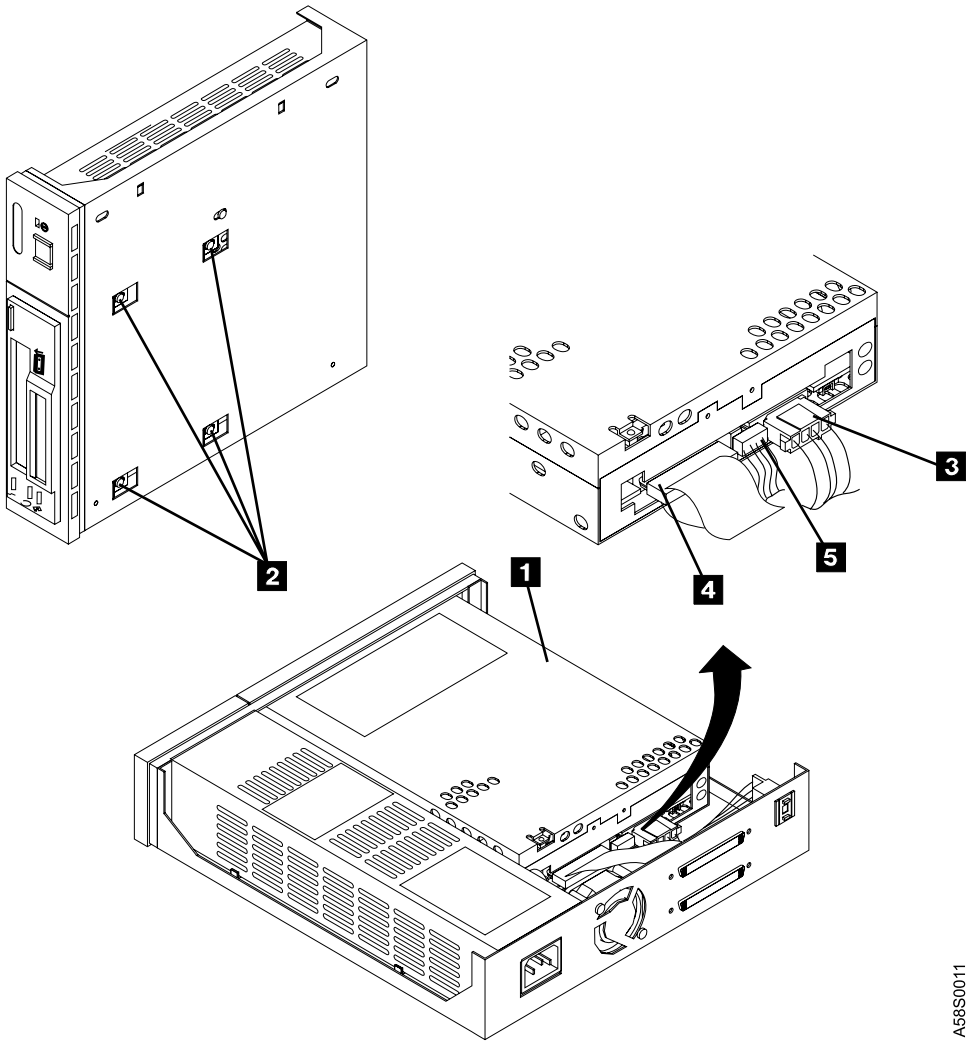


Figure 12. Removing and Replacing the Drive

To replace the drive, reverse the removal procedure. Make sure to:

- Correctly insert and engage each cable to its proper connector.
- Arrange the cables so that they do not interfere with the cooling fan blades or the replacement of the cover.
- After installing the cover, align the drive with the front of the cover, then tighten the four screws (2 in Figure 12 on page 27) that secure the drive to the chassis.

Note: The power supply connector J3 is not used in the 7208 Model 345 Tape Drive.

Removing and Replacing the Power Supply

DANGER

Do not attempt to open the covers of the power supply. Power supplies are not serviceable and are to be replaced as a unit. (RSFTD217)

To remove the power supply from the 7208 Tape Drive:

1. Perform the cover removal procedure. Refer to “Removing and Replacing the Cover” on page 26.
2. Tilt the 7208 Tape Drive (1 in Figure 13 on page 29) on its side. Support the power supply while removing the power supply mounting screw 2 from the bottom.
3. Support the power supply while returning the 7208 Tape Drive to its original position.
4. Disconnect the power supply connector (J1) 3 from the drive.
5. Disconnect the power supply connector (J2) 4 between the power supply and the cooling fan.
6. Grasp the rear of the power supply 5 and while pressing it toward the front panel, lift the rear of the power supply, then remove it from the chassis.
7. Push the power switch push button 6 out of the front panel and set it aside.
8. Remove the electromagnetic interference (EMI) gasket 7 and save it for installation with the replacement power supply.

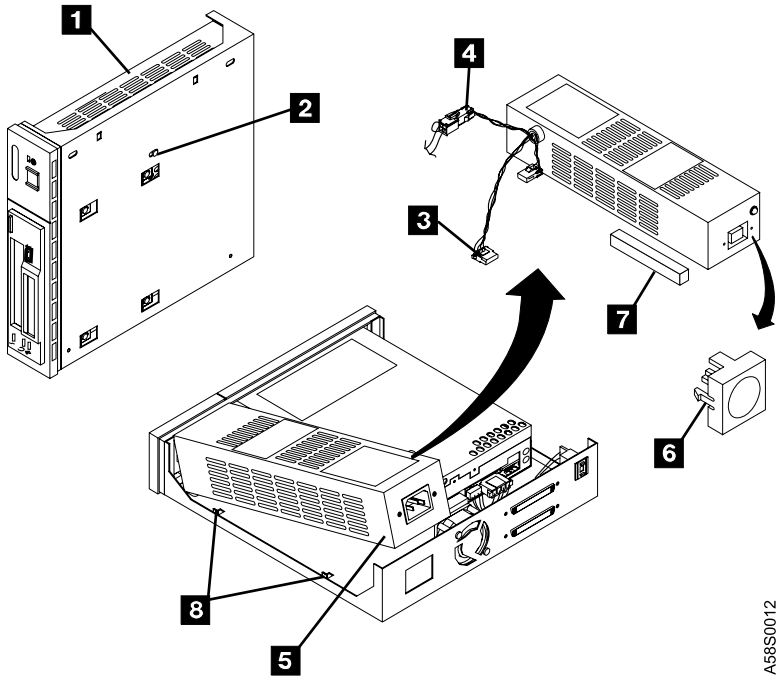


Figure 13. Removing and Replacing the Power Supply

To replace the power supply, reverse the removal procedure. Make sure to:

- Align the power supply on the base of the chassis and inside the two tabs (8 in Figure 13).
- Insert the EMI gasket 7 between the power supply and the drive.
- To reduce radiated noise, perform five full (360°) twists of the J1 power cable 3 .
- With its locking features in a horizontal position, insert the power switch push button 6 into the front panel and press until it locks in place.

  Note: If the power switch does not work properly, loosen the power supply mounting screw 2 , slide the power supply to the rear of the chassis, and retighten the mounting screw.
- Arrange the cables so that they do not interfere with the cooling fan blades or the replacement of the cover. Ensure that they do not obstruct airflow through the fan.

Note: The power supply connector J3 is not used in the 7208 Tape Drive.

Removing and Replacing the Cooling Fan

To remove the cooling fan:

1. Perform the cover removal procedure. Refer to “Removing and Replacing the Cover” on page 26.
2. Disconnect the power supply connector (J2) (**1** in Figure 14) between the power supply and the cooling fan.
3. Remove the two screws, lockwashers, and nuts **2** that secure the cooling fan to the rear of the 7208 Tape Drive.
4. Lift the cooling fan out of the 7208 Tape Drive.

To replace the cooling fan, reverse the removal procedure. Make sure that the cooling fan is oriented so that air flows out from the rear of the 7208 Tape Drive.

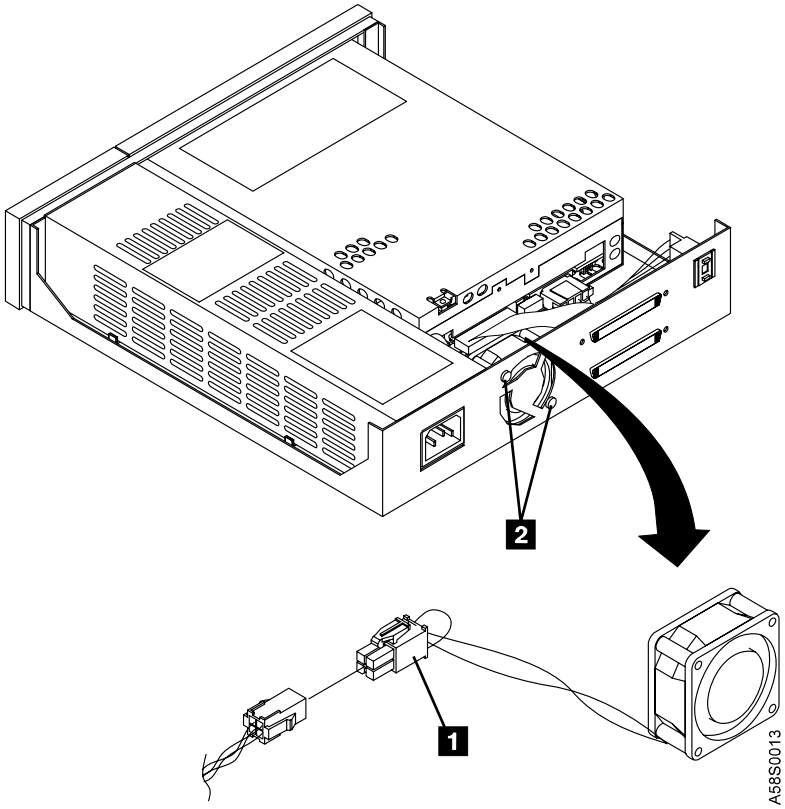


Figure 14. Removing and Replacing the Cooling Fan

Manually Removing a Tape Cartridge

If a power failure or a drive failure prevents the tape cartridge from ejecting, the cartridge can be removed manually.

Before manually removing the tape cartridge, turn off the 7208 Tape Drive, then turn it on again to clear potential error conditions. Press the unload button. If the tape does not eject, proceed with the manual removal.

Attention: The procedure that follows may result in damage to your tape cartridge. If you use this procedure, you must replace the drive. If you choose to return the drive and the stuck tape to IBM for maintenance, the tape will be scrapped.

To manually remove a tape cartridge:

1. Perform the cover removal procedure. Refer to “Removing and Replacing the Cover” on page 26.
2. Perform the drive removal procedure. Refer to “Removing and Replacing the Drive” on page 27.
3. Using a Torx screwdriver, remove the three T-6 screws that secure the top cover of the drive (one on the rear and two sides of the drive). See Figure 15.

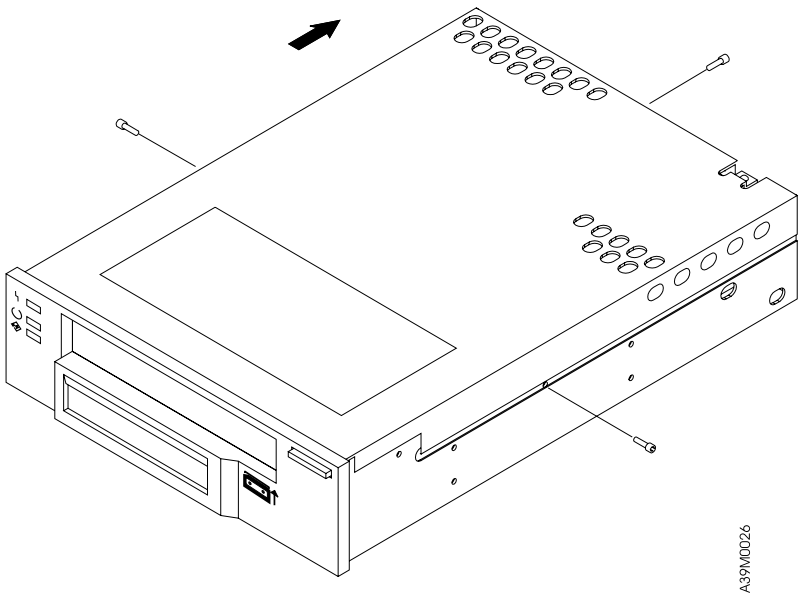


Figure 15. Removing the Top Cover of the Drive

4. Slide the cover to the rear of the drive and remove it completely.
5. If it obvious that the tape must be destroyed before it can be removed, perform the following procedure. Otherwise, go to step 6 on page 32.

   Attention: **This procedure will destroy the tape cartridge and its data.** Use the following procedure only if the loaded tape is known to be damaged or cannot be unloaded by another method.

   a. Cut the tape at a convenient location.
   b. Manually unload the tape cartridge (see step 9 on page 34).

6. Position the drive so that it faces you.
7. Take up slack in the tape by using the following instructions to move the drive's trolleys and the supply reel motor.

   Attention: To avoid damaging the tape, do not touch it.

   - To move the drive's trolleys:
     a. On the left side panel of the drive (toward the rear) locate the hole marked UNLOAD (**1** in Figure 16).
     b. Insert a 2.5-mm L-Hex (allen) wrench approximately 43 mm (2 in.) into the UNLOAD hole. Position it so that it seats securely into the inner socket.
     c. Turn the wrench in the direction marked on the drive (clockwise).
     d. Rotate the wrench until the trolleys **2** stop moving. This may take more than 120 turns of the wrench.

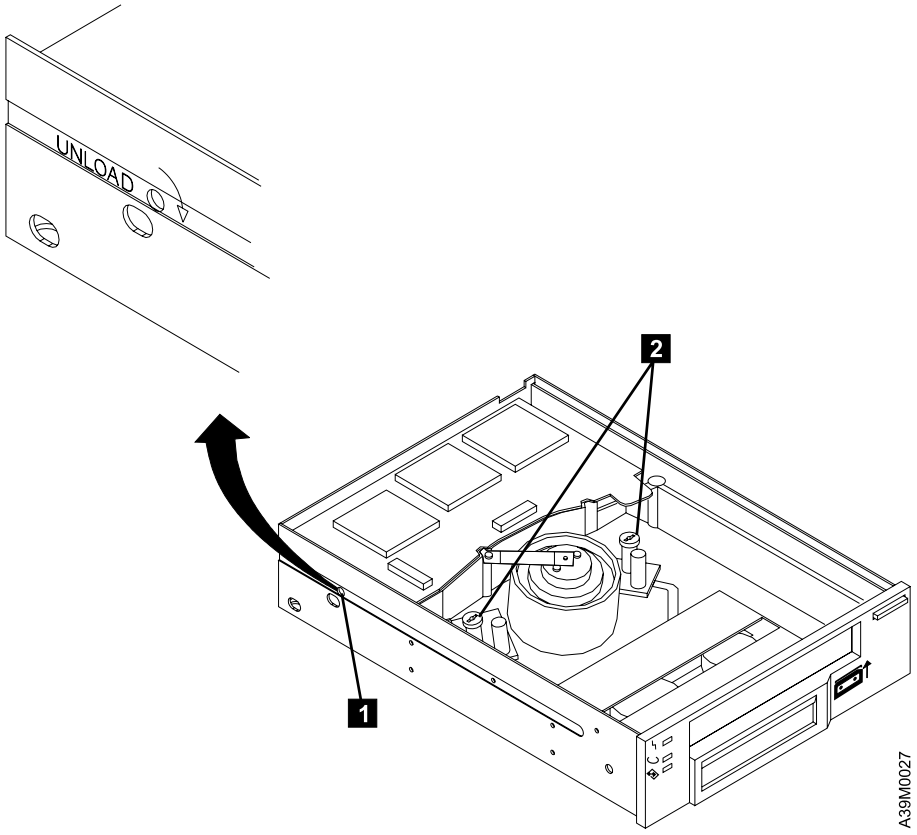


Figure 16. Moving the Trolleys

- To move the supply reel motor:
  a. On the bottom of the drive, locate the hole marked UNLOAD (**1** in Figure 17) and cut the seal above the hole.
  b. Insert a non-metallic probe (such as the wooden end of a swab) approximately 0.64 cm (0.25 in.) into the UNLOAD hole and position it so that it rests on the inner flange **2** .
  c. Gently push the flange with the probe in the direction marked on the drive (clockwise).
  d. Repeat the preceding step until there is no slack in the tape. This may take many motions to retract all of the tape. Perform this motion until you feel a definite tightening in the flange tension.

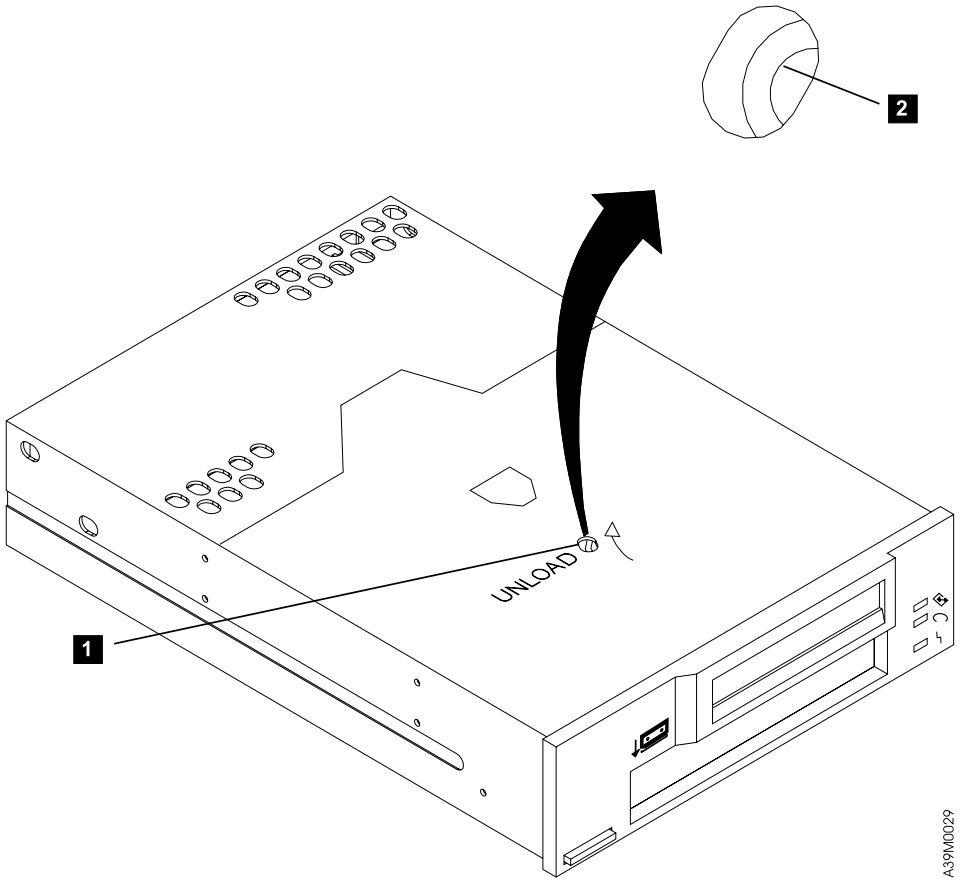


Figure 17. Moving the Supply Reel Motor. The drive is turned upside down.

8. Ensure that the tape is fully retracted into the cartridge.

9. Unload the tape cartridge by doing the following:
   a. At the left front of the drive, insert a 2.5-mm L-Hex wrench into the hole marked UNLOAD (**1** in Figure 18).
   b. Turn the wrench in the direction marked on the drive (counterclockwise) until the tape ejects.

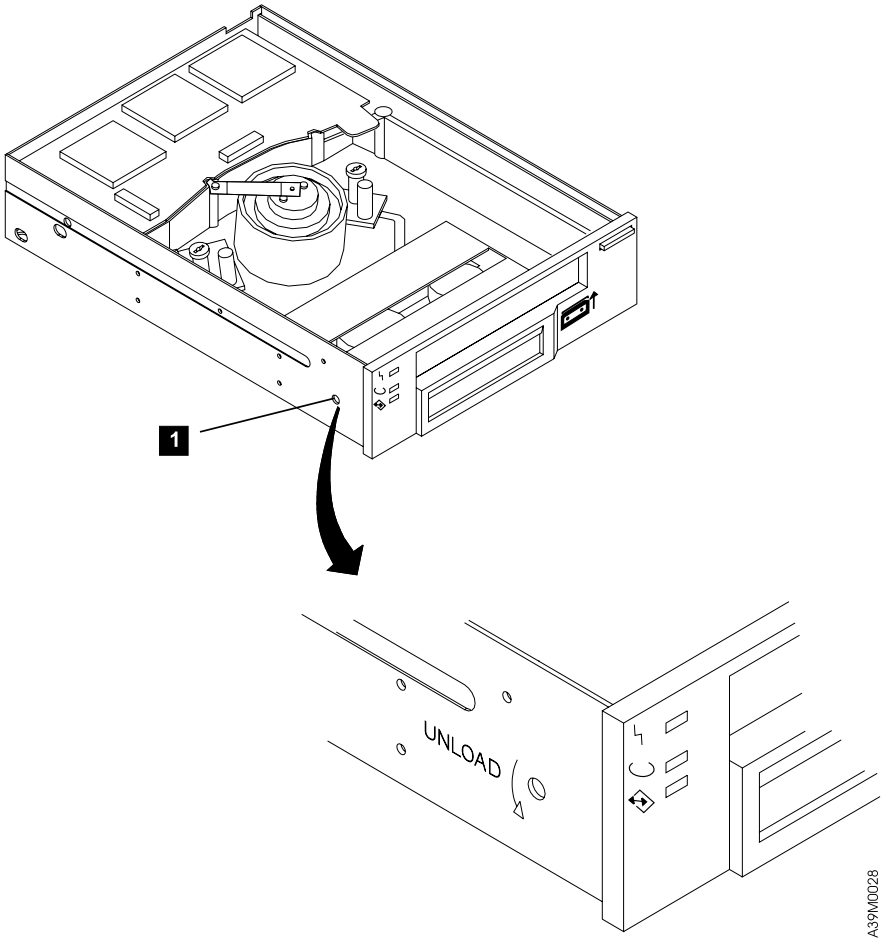


Figure 18. Unloading the Tape Cartridge

10. Replace the cover of the drive (reverse the removal procedure).
11. Replace the drive (refer to "Removing and Replacing the Drive" on page 27).

Note: Service personnel should record on the service action report the error message that displayed on the LCD and the fact that the tape cartridge had to be manually removed.

Chapter 5. Parts Diagram and Parts List

This chapter provides the parts diagram and parts list required to service the 7208 Model 345 Tape Drive.

How To Use This Parts List

AR (As Required) in the *Units* column indicates that the quantity is not the same for all machines.

NP (Non-Procurable) in the *Part Number* column indicates that the part is non-procurable and that the individual parts or the next higher assembly should be ordered.

NR (Not Recommended) in the *Units* column indicates that the part is procurable but not recommended for field replacement, and that the next higher assembly should be ordered.

00 (Not Shown) in the *Asm- Index* column indicates that the part is either not shown or not referenced in the illustration.

R (Restricted) in the *Units* column indicates that the part has a restricted availability.

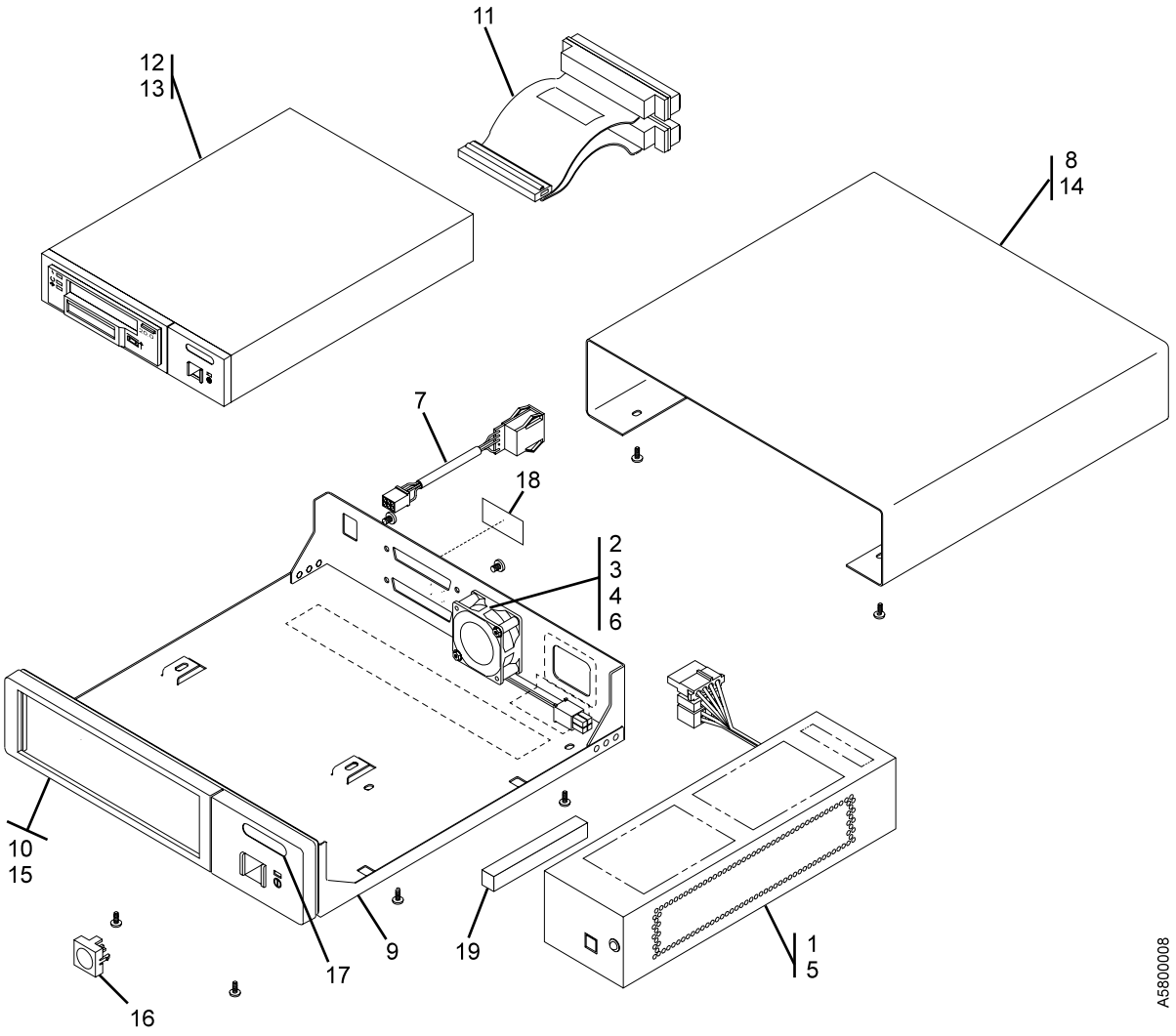
Indenture The indenture is marked by a series of dots located before the parts description. The indenture indicates the relationship of a part to the next higher assembly. For example:

Indenture	**Relationship of Parts**
(No dot)	MAIN ASSEMBLY
(One dot)	• Detail parts of a main assembly
(One dot)	• Sub assembly of the main assembly
(Two dots)	• • Detail part of a one-dot sub assembly
(Two dots)	• • Sub assembly of a one-dot sub assembly
(Three dots)	• • • Detail part of a two-dot sub assembly

Example of Parts Listing

Asm-Index	**Part Number**	**Units**	**Description**
3-	2512667	1	Cover Asm, Rear, Red
	2513714	1	Cover Asm, Rear, White
			For Next Higher Asm, see Assembly 1-2.
-1	5373637	1	•Seal, Top
-2	5356429	2	•Clip, Retaining
-3	1847630	1	•Finger Stock Asm
-4	1847602	NR	••Channel, Finger Stock
-5	5373639	AR	•Seal, Bottom
-6	NP	1	•Cover, Rear, Without Paint

Assembly 1: Parts Diagram



Assembly 1: (continued)

Asm–Index	Part Number	Units	Description
1–1	59H3759	1	Power supply
–2	1622401	2	Nut, cooling fan, M3 hex
–3	1622344	2	Washer, cooling fan
–4	42F7300	1	Cooling fan
–5	46G2677	1	Screw, power supply, M3 x 6mm
–6	46G2676	2	Screw, cooling fan, M3 x 25mm
–7	59H2694	1	Cable, SCSI address
–8	46G2677	4	Screw, cover, M3 x 6mm
–9	59H2689	1	Chassis
–10	59H3771	1	Bezel assembly
–11	59H2690	1	Cable, SCSI-2 internal
–12	19P0708	1	Drive (60GB LVD IBM M2)
–13	46G2677	4	Screw, drive
–14	59H3846	1	Cover, includes feet
–15	1622673	2	Screw, bezel
–16	74G8497	1	Push button, power supply
–17	19P0694	1	Logo
–18	19P1434	1	Label, SCSI LVD
–19	71F0734	1	EMI gasket
–00	09L5322	1	Data cartridge, 225 m
–00	09L5323	1	Data cartridge, 150 m
–00	35L1044	1	Data cartridge, 75 m
–00	59H2677	1	Test cartridge (short length for customer engineer use)
–00	35L1409	1	Cleaning cartridge
–00	19P0051	1	Device-to-device SCSI bus cable, 0.5 meter (1.75 feet) HD68 to HD68
–00	19P0279	1	VHDCI/HD68 SCSI cable, 2.5 meter
–00	19P0050	1	VHDCI/HD68 SCSI cable, 4.5 meter
–00	19P0048	1	VHDCI/HD68 SCSI cable, 10 meter
–00	35L0145	1	Terminator, SCSI LVD

Appendix A. Power Cables

To avoid electrical shock, a power cable with a grounded attachment plug has been provided. Use only properly grounded outlets.

Power cables used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA). The power cables consist of:

- Electrical cables, type SVT or SJT.
- Attachment plugs complying with National Electrical Manufacturers Association (NEMA) 5-15P, that is:

  "For 115 V operation use a UL Listed Cable Set consisting of a minimum 18 AWG, Type SVT or SJT three conductor cable a maximum of 15 feet in length and a parallel blade, grounding type attachment plug rated at 15 A, 125 V."

  "For 230 V operation in the United States use a UL Listed Cable Set consisting of a minimum 18 AWG, Type SVT or SJT three conductor cable a maximum of 15 feet in length, and a tandem blade, grounding type attachment plug rated at 15 A, 250 V."
- Appliance couplers complying with International Electrotechnical Commission (IEC) Standard 320, Sheet C13.

Power cables used in other countries consist of:

- Electrical cables, type HD21.
- Attachment plugs approved by the appropriate testing organization for the specific countries where they are used.

  "For units set at 230 V (outside of U. S.): Use a Cable Set consisting of a minimum 18 AWG cable and grounding type attachment plug rated 15 A, 250 V. The Cable Set should have the appropriate safety approvals for the country in which the equipment is to be installed and marked 'HAR'."

Table 6 lists the power cable part number, the country where the power cable can be used, and an index number to be matched with the receptacles shown in Figure 19 on page 40. If your power cable does not match this information, contact your local dealer.

Table 6. Power Cable Information

Part Number	Country	Index
1838574 Japan	Bahamas, Barbados, Bolivia, Brazil, Canada, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Netherlands Antilles, Panama, Peru, Philippines, Taiwan, Thailand, Tobago, Trinidad, U.S.A. (except Chicago), Venezuela	1
6952300 US/Canada	Bahamas, Barbados, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Korea (South), Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Puerto Rico, Saudi Arabia, Suriname, Taiwan, Trinidad, U.S.A. (except Chicago), Venezuela	2
6952301 6 ft Chicago	Chicago, U.S.A.	2
13F9940 Australia	Argentina, Australia, New Zealand, Uruguay	3

Table 6. Power Cable Information (continued)

Part Number	Country	Index
13F9979 France	Abu Dhabi, Austria, Belgium, Bulgaria, Botswana, Egypt, Finland, France, Germany, Greece, Iceland, Indonesia, Korea (South), Lebanon, Luxembourg, Macau, Netherlands, Norway, Portugal, Saudi Arabia, Spain, Sudan, Sweden, Turkey, Yugoslavia	4
13F9997 Denmark	Denmark	5
14F0015 South Africa	Bangladesh, Burma, Pakistan, South Africa, Sri Lanka	6
14F0033 United Kingdom	Bahrain, Bermuda, Brunei, Channel Islands, Cyprus, Ghana, Hong Kong, India, Iraq, Ireland, Jordan, Kenya, Kuwait, Malawi, Malaysia, Nigeria, Oman, People's Republic of China, Qatar, Sierra Leone, Singapore, Tanzania, Uganda, United Arab Emirates (Dubai), United Kingdom, Zambia	7
14F0051 Switzerland	Liechtenstein, Switzerland	8
14F0069 Italy	Chile, Ethiopia, Italy	9
14F0087 Israel	Israel	10
6952291 Colombia	Colombia, Paraguay	11

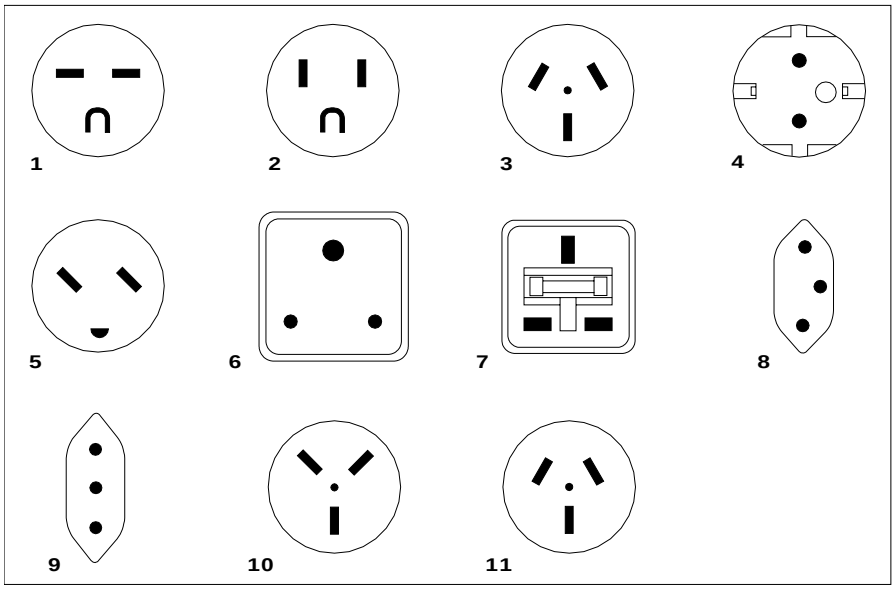


Figure 19. Types of Receptacles

Appendix B. Fault Symptom Codes and Error Recovery Procedure Numbers

Use Table 7 to resolve error messages that appear on the LCD of the 7208 Model 345 Tape Drive:

1. Determine the fault symptom code (FSC) in the error message (the first two digits in the message). For example, in error message `ERR 1: AD 58 C0`, the FSC is `AD`.
2. Locate the FSC in Table 7 and identify the error recovery procedure (ERP) number for that FSC.
3. Locate the ERP number in Table 8 on page 49, and identify the recommended error recovery procedure.

Note: Abbreviations in the Description column are defined as follows:

EOD End Of Data

EOT End Of Tape

LBOP Logical Beginning Of Partition

LBOT Logical Beginning Of Tape

LEOP Logical End Of Partition

LEOT Logical End Of Tape

PBOP Physical Beginning Of Partition

PBOT Physical Beginning Of Tape

PEOT Physical End Of Tape

PEOP Physical End Of Partition

Note: Items in the Cause column are defined as follows:

A = Application software
B = Bus (SCSI)
D = Drive
I = Informational message
O = Operator
S = System
T = Tape

Table 7. Fault Symptom Codes (FSC) and Error Recovery Procedure (ERP) Numbers

FSC	Description	ERP Number	Cause
02	The tape is at an incorrect position to perform a WRITE operation.	2	O = 50% S = 50%
03	Tape is write protected for the requested WRITE operation.	5	D = 5% O = 90% T = 5%
04	An LEOT or LEOP was encountered on the current WRITE operation.	10	I

Table 7. Fault Symptom Codes (FSC) and Error Recovery Procedure (ERP) Numbers (continued)

FSC	Description	ERP Number	Cause
05	The operation has aborted (as requested).	11	D = 50% O = 50%
06	An LEOT or LEOP was encountered on the last WRITE operation.	10	I
08	The compression data integrity check failed.	12	D = 100%
09	An LEOT or LEOP was detected during a READ operation.	10	I
0A	A length mismatch was encountered on a READ operation.	15	I
0B	An uncorrectable block was encountered on a READ operation.	8,6	D = 10% T = 90%
0C	An EOD mark was encountered on a READ operation.	13	I
0D	A filemark was encountered during a READ or VERIFY operation.	10	I
0E	An illegal condition exists that prohibits a READ or VERIFY operation.	2	D = 50% S = 50%
0F	A READ operation was issued to blank tape.	4	I
10	The READ operation has aborted (as requested).	11	D = 50% O = 50%
11	Too many permanent READ errors occurred. The drive cannot synchronize the data.	8,6	D = 10% T = 90%
14	PEOT or PEOP was encountered on a READ or VERIFY operation.	2,8,6	D = 50% O = 50%
15	An incorrect filemark was encountered during a READ operation.	8,6	T = 100%
16	A media error was detected during a READ operation.	8,6	D = 10% T = 90%
17	A hardware error occurred during a READ operation.	12	D = 100%
18	READ decompression failed — HW error.	12	D = 100%
19	Cyclic Redundancy Check (CRC) failed during the read operation after decompression	12	D = 100%
1C	The tape is in an unknown or incompatible format.	14	T = 100%
1D	A setmark was encountered during a READ or VERIFY operation. A setmark is a location finding mark that is set on the tape.	10	I
26	A WRITE FILEMARKS (WFM) command was received when the tape was not at a legal position to write.	2	O = 50% S = 50%
27	The tape is write-protected for WRITE FILEMARKS (WFM).	5	I
28	An LEOT or LEOP was encountered during a WRITE FILEMARKS (WFM).	10	I

Table 7. Fault Symptom Codes (FSC) and Error Recovery Procedure (ERP) Numbers (continued)

FSC	Description	ERP Number	Cause
31	A setmark was encountered during a SPACE or LOCATE operation.	10	I
32	A filemark was detected during SPACE or LOCATE operation.	10	I
33	An EOD was encountered on a SPACE or LOCATE operation.	10	I
34	A PEOT or PEOP was encountered on a SPACE or LOCATE operation.	8,6	T = 100%
35	A PBOT or PBOP was encountered on a SPACE or LOCATE operation.	2	I
36	A format error occurred during a SPACE or LOCATE operation.	8,6	D = 20% T = 80%
37	An uncorrectable block was encountered during a SPACE or LOCATE operation.	8,6	D = 10% T = 90%
38	A media error occurred during a SPACE or LOCATE operation.	8,6	D = 20% T = 80%
3A	An incorrect filemark was encountered during a SPACE operation.	3	T = 100%
3B	The SPACE/LOCATE operation has aborted (as requested).	11	D = 50% O = 50%
3D	There is no information at this position on tape. The tape drive cannot perform a space operation.	8,6	D = 20% T = 80%
47	An incompatible media cartridge was rejected after loading.	14	O = 90% T = 10%
4B	The tape is at an illegal position for an ERASE operation.	2	O = 50% S = 50%
4C	The tape is write-protected for an ERASE operation.	5	D = 5% O = 90% T = 5%
4E	The ERASE operation has aborted (as requested).	11	D = 5% O = 90% S = 5%
58	A hardware error occurred during the SEND DIAGNOSTIC operation.	12	D = 100%
61	The microcode header was not valid when loading firmware.	8,6	T = 100%
63	The CONTROL LOAD image is not valid.	8,6	T = 100%
65	The EEPROM load image is not valid.	8,6	T = 100%
66	The Boot microcode is downlevel.	8,6	T = 100%

Table 7. Fault Symptom Codes (FSC) and Error Recovery Procedure (ERP) Numbers (continued)

FSC	Description	ERP Number	Cause
67	The drive cannot program one of the memory areas.	12	D = 100%
69	Cyclic Redundancy Check (CRC) in the LOAD IMAGE operation was not correct.	8,6	T = 100%
6D	The READ BUFFER command failed.	12	D = 100%
71	The tape is at an illegal position to format the partition.	2	D = 50% O = 50%
72	The partitions are too big for the tape.	2	O = 100%
74	The partition format of the tape failed.	8,6	T = 100%
75	The partition format was aborted.	8,6	D = 5% O = 90% S = 5%
79	The drive failed to position the tape to a new partition.	8,6	T = 100%
7A	The partition switch operation was aborted.	11	D = 5% O = 90% S = 5%
8C	A controller firmware logic error occurred.	12	D = 100%
8D	The software detected a hardware problem.	12	D = 100%
93	A PEOP was detected.	10	A = 100%
94	The drive failed to perform the WRITE SETMARK operation.	6	T = 100%
95	A WRITE failure occurred after the retry limit was exceeded.	8,6	D = 30% T = 70%
96	A WFM failure occurred after the retry limit was exceeded.	8,6	D = 30% T = 70%
97	A WRITE EOD failure occurred after the retry limit was exceeded.	8,6	D = 30% T = 70%
98	The Buffer Record Table (BRT), which is a list of block addresses, contains an incorrect value.	12	D = 100%
99	The buffer is empty, which caused a fill error.	12	D = 100%
9A	A timeout occurred during the search function because the data interpreter did not encounter the required text.	12	D = 100%
9B	The read-back-check operation detected a different block type from what was written (old data is not being fully overwritten).	8,6	D = 50% T = 50%
9C	A formatter interrupt timeout occurred during a WRITE operation.	12	D = 100%
9D	A permanent write error was encountered, causing the write recovery to fail. [1]	8,6	D = 30% T = 70%

Table 7. Fault Symptom Codes (FSC) and Error Recovery Procedure (ERP) Numbers (continued)

FSC	Description	ERP Number	Cause
9E	The permanent write error rewrite threshold has been reached. [1]	8,6	D = 30% T = 70%
9F	Servo zone read-back-check failure on a write. The servo zone is a written section on the tape that verifies that the tape is correctly aligned with the drive head.	8,6	D = 30% T = 70%
A1	A tape drive head synchronization error occurred during a WRITE operation.	8,6	D = 90% T = 10%
A2	An underrun error occurred during a WRITE operation.	12	D = 100%
A3	An Logical Port write buffer CRC error occurred.	12	D = 100%
A4	A Physical Port WRITE buffer CRC error occurred.	12	D = 100%
A5	Buffer positioning was lost during a WRITE about process.	12	D = 100%
A6	An Logical Port READ buffer CRC error occurred.	12	D = 100%
A7	A Physical Port READ buffer CRC error occurred.	12	D = 100%
A8	A Physical Port parity error occurred.	12	D = 100%
AC	A servo software error occurred.	12	D = 100%
AD	A servo hardware error occurred.	8,6	D = 10% T = 90%
AE	The drive is not tracking correctly.	8,6	D = 40% T = 60%
AF	An PEOT or PEOP was encountered during a motion command	2	D = 100%
B0	The drive is not tracking — the tape is damaged.	8,6	D = 40% T = 60%
B3	A LBOT or LBOP WRITE failure occurred	8,6	D = 30% T = 70%
B4	A LBOT failure occurred.	8,6	D = 30% T = 70%
B5	The read manager could not read the LBOT or LBOP.	8,6	D = 30% T = 70%
B6	And End Of Tape (EOT) mark was encountered when the buffer was being emptied.	2	I
C0	A power-on reset occurred.	3	I
C1	The tape may have been changed.	3	I
C2	The MODE SELECT parameters have changed.	3	I
C3	New microcode was loaded.	3	I
C4	The operator requested media removal.	11	I
C5	An incompatible media that was inserted was rejected.	14	I
C6	The drive is not ready, the cause is not known.	7,3	I

Table 7. Fault Symptom Codes (FSC) and Error Recovery Procedure (ERP) Numbers (continued)

FSC	Description	ERP Number	Cause
C7	The drive is not ready, but it is in process of becoming ready.	3	I
C8	A backup positioning command is required.	2	I
C9	The specified command requires a tape and none is loaded.	7,3	I
CA	The log threshold was met.	3	I
CB	The log Parameter was changed.	3	I
CC	The length of the parameter has caused an error in Command Descriptor Block (CDB).	2	D = 50% S = 50%
CD	An illegal Operation Code was used.	2	D = 50% S = 50%
CE	An incorrect field or reserved bits were set in the CDB.	2	D = 50% S = 50%
CF	This Logical Unit (LUN) is not supported.	2	D = 50% S = 50%
D0	An incorrect field exists in the Parameter List (Mode Data).	2	D = 50% S = 50%
D1	An illegal bit is set in the identify message.	2	D = 50% S = 50%
D2	Media removal is prevented.	2	D = 50% S = 50%
D3	The command issued has a mode mismatch (variable/fixed).	2	D = 50% S = 50%
D4	An illegal Transfer Length in was encountered in the CDB.	2	D = 50% S = 50%
D6	Could not change the MODE SELECT parameters since the tape was not at Logical Beginning Of Tape (LBOT) (or Logical Beginning Of Partition (LBOP)).	2	D = 50% S = 50%
D7	The drive cannot read the media because it is in an incompatible format.	14	D = 50% S = 50%
D8	The commands overlapped and caused a bad Initiator-Target-Logical Unit (ITL) connection.	2	D = 50% S = 50%
DA	Illegal bits were set in an ID message.	2	D = 50% S = 50%
DB	The drive cannot write to tape because the cartridge is not AME format.	14	I

Table 7. Fault Symptom Codes (FSC) and Error Recovery Procedure (ERP) Numbers (continued)

FSC	Description	ERP Number	Cause
DC	A parameter was out of range in the last LOG SELECT or MODE SELECT command. The parameter was rounded to a valid value and the operation was completed.	7	T = 100%
DD	The drive is not ready. The head cannot locate the file marks on the tape.	2	D = 50% S = 50%
DF	A host error exists in the message system.	10	I
DE	The density specified is not supported.	2	D = 50% S = 50%
E0	The command was aborted in the Command Descriptor Block (CDB) phase (because of a parity or other error), or a reconnect attempt failed after the allowed number of retries.	12	B = 100%
E1	The operation was aborted prior to the Data phase because of an incorrect message.	12	B = 100%
E2	The operation was aborted in the Data phase because of an initialize error was detected.	12	B = 100%
E3	The operation was aborted in the Data phase because of an incorrect message.	12	B = 100%
E4	The operation was aborted after the Data phase because of an incorrect message.	12	B = 100%
E5	The operation was aborted after the Data phase because of an unspecified error.	12	B = 100%
E6	An ABORT operation occurred which was caused by a SCSI Bus Parity Error.	12	B = 100%
E7	An ABORT operation sent by the initiator has been completed.	12	B = 100%
E8	The drive needs cleaning.	1	I
E9	Cleaning has occurred.	10	I
EA	An incorrect mode was specified for data compression.	2	D = 50% S = 50%
EB	Download in progress.	3	D = 50% S = 50%
EC	Log parameter overflow (recovered error).	10	I
ED	The tape history log indicates a worn tape; replace the tape.	6	T=100%
EE	Service may be required.	12	D = 90% T = 10%
F0	Tape alert async notification test.	10	I
F1	Tape alert async notification.	10	I
FA	The serial number is incorrect or blank.	12	D = 100%
FC	The head synchronization value in the EEPROM is out of range.	12	D = 100%

Table 7. Fault Symptom Codes (FSC) and Error Recovery Procedure (ERP) Numbers (continued)

FSC	Description	ERP Number	Cause
FD	The EEPROM contains meaningless information.	12	D = 100%

[1] If the read-back-check criteria are not met for a data or short filemark block (that is, if the block is not perfect), the block is rewritten. If rewrite activity is excessive, the tape drive moves the tape backward, reads the tape to verify that blocks are written, and then moves the tape backward again. It then performs a write splice operation and rewrites the blocks. If the rewrite threshold is exceeded for any block, the tape drive returns Check Condition status with the sense key set to Medium Error (3h) and the FSC set to 9Eh. If the recovery splice operation cannot be completed, the FSC is 9Dh.

Appendix C. Error Recovery Procedures

Use Table 8 to resolve error messages that appear on the LCD of the 7208 Model 345 Tape Drive:

1. Determine the fault symptom code (FSC) in the error message (the first two digits in the message). For example, in error message `ERR 1: AD 58 C0`, the FSC is `AD`.
2. Locate the FSC in Table 7 on page 41 and identify the error recovery procedure (ERP) number for that FSC.
3. Locate the ERP number in Table 8, and identify the recommended error recovery procedure. If two or more ERP codes are listed for the fault symptom code in Table 7 on page 41, perform the action for the first code, then perform the action for the second code, and so on.

Table 8. Error Recovery Procedures

ERP Number	Recommended Error Recovery Procedure
1	Warning Message, clean drive.
2	Application program error or user error using application. Retry operation. If this problem continues, notify application provider.
3	Reissue the failed command or command sequence.
4	Application attempted to read a blank tape. Either write to the tape or replace the tape with a tape containing data.
5	Tape is write protected and a write or erase was attempted. Either write-enable the tape or insert a write-enabled tape.
6	Perform the following until the operation can be completed: 1. Clean the drive 2. Retry the operation 3. Clean the drive 4. Replace the tape cartridge 5. If the error persists and there is an error in the system error log, call your service representative
7	Insert a data cartridge into the tape drive.
8	Perform one of the following actions: • Reset the tape drive by holding down the unload button until the `RESET` message appears; then release the button. • Send a SCSI bus reset (a hard reset).
9	Clean the tape drive and repeat the operation.
10	No action is necessary.
11	User has pushed the unload button. No action is required; the tape drive performed the requested operation.
12	The tape drive requires maintenance.
13	The tape drive has encountered the end of the media on a read or write operation. Mount the next tape and continue the tape operation.
14	The media type is not supported. Clean the drive and retry the operation with supported media.
15	The block size requested on the read operation does not match the block size that the tape was written at. Change the application's block size.

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7208 Model 345 External 8mm Tape Drive
7208 Model 345 8mm Tape Drive
Service Guide

Publication No. SY32-0411-00

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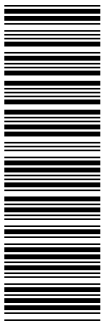

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