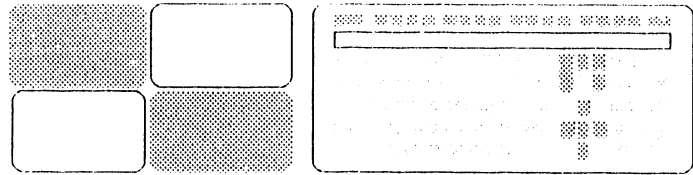


WANG

CUSTOMER SERVICE DOCUMENTATION



SCSI Storage Module

Models: SSM-C

COMPANY PROPRIETARY STATEMENT

This document is the property of Wang Laboratories, Inc. All information contained herein is considered Company Proprietary, and its use is restricted solely to assisting you in servicing Wang products. Neither this document nor its contents may be disclosed, copied, revealed, or used in whole or in part for any other purpose without the prior written permission of Wang Laboratories, Inc. This document must be returned upon request of Wang Laboratories, Inc.

Product Maintenance Manual

741-1874

COMPANY CONFIDENTIAL

PREFACE

This document is the Illustrated Product Maintenance manual for the Wang SCSI Storage Module. The manual is organized in accordance with Customer Engineering Technical Documentation's approved PMM outline. The scope of this manual reflects the type of maintenance philosophy selected for this product.

The purpose of this manual is to provide the Wang-Trained Customer Engineer (CE) with sufficient instructions to operate, troubleshoot, and repair the SCSI Storage Module. The manual will be updated on a regular schedule or as necessary. Such updates will be published either as Publication Update Bulletins (PUBs) or as full revisions.

This manual is divided into 12 sections numbered 1 through 12. Each section describes a separate maintenance subject and is arranged to minimize references to other sections. Referencing to other frames is made by means of an arrow followed by the section number(s) being referenced.

All information pertaining to a specific task is located either on a single frame or on multiple frames. Multiple frame tasks are arranged in a sequential order with the sheet number and total number of sheets stated in the title line.

First Edition (October 1988)

Use of the material in this document is authorized only for the purpose stated in the Preface, above.

© Copyright 1988 by Wang Laboratories, Inc.

SECTION 1
INTRODUCTION

	<u>Page</u>
1.1	SCSI STORAGE MODULE OVERVIEW 1-2
1.2	RELATED DOCUMENTATION 1-3
1.3	MEANING OF NON-STANDARD SYMBOLS 1-4
1.4	ABBREVIATIONS AND SYMBOLS USED IN THIS MANUAL 1-5

SECTION 2
SETTINGS

	<u>Page</u>
2.1	SCSI STORAGE MODULE 2-2

SECTION 3
CONTROLS AND INDICATORS

	<u>Page</u>
3.1	SCSI STORAGE MODULE FRONT VIEW 3-2
3.2	SCSI STORAGE MODULE REAR VIEW 3-3
3.3	145MB HALF-HEIGHT WINCHESTER DRIVE (2269V-4C) 3-5
3.4	326MB FULL-HEIGHT WINCHESTER DRIVE (2269V-5C) 3-6
3.5	150MB HALF-HEIGHT STREAMING CARTRIDGE TAPE DRIVE (2238V-3C) 3-7

TABLE OF CONTENTS

SECTION 4 OPERATION

		<u>Page</u>
4.1	POWER-ON PROCEDURE	4-2
4.2	POWER-DOWN PROCEDURE	4-5

SECTION 5 PREVENTIVE MAINTENANCE

		<u>Page</u>
5.1	TOOLS AND EQUIPMENT	5-2
5.2	PM SCHEDULES	5-3
5.3	OPERATIONAL CHECKS	5-4
5.4	CLEANING	5-5
5.5	INSPECTION	5-6
5.6	ADJUSTMENTS	5-7

SECTION 6 TROUBLESHOOTING

		<u>Page</u>
6.1	TOOLS AND EQUIPMENT	6-2
6.2	ON-LINE DIAGNOSTICS	6-3
6.3	POWER SUPPLY VOLTAGE MEASUREMENTS	6-4
6.4	TROUBLESHOOTING STRATEGY	6-5

SECTION 7
PARTS REPLACEMENT

	<u>Page</u>
7.1 TOOLS AND EQUIPMENT	7-2
7.2 TOP COVER REMOVAL	7-3
7.3 FRONT BEZEL REMOVAL	7-4
7.4 POWER ON/OFF SWITCH	7-5
7.5 DRIVE REMOVAL	7-7
7.5.1 326 MB Disk Drive (Model 2269V-5C)	7-7
7.5.2 145 MB Disk Drive (Model 2269V-4C)	7-10
7.5.3 150 MB Cartridge Tape (Model 2238V-3C)	7-13
7.6 POWER SUPPLY REMOVAL	7-16
7.7 DC FAN/POWER HARNESS ASSEMBLY	7-18
7.8 DUAL THUMBWHEEL SWITCH	7-19
7.9 SCSI INTERFACE CONNECTOR	7-20

SECTION 8
ADJUSTMENTS

	<u>Page</u>
8.1 ADJUSTMENTS	8-2

SECTION 9
INSTALLATION

	<u>Page</u>
9.1 TOOLS AND EQUIPMENT	9-2
9.2 UNPACKING PROCEDURES	9-3
9.2.1 Unpacking And Inspecting SCSI Storage Module	9-3
9.2.2 Claims Information	9-4
9.3 SWITCH SETTINGS	9-5
9.4 CONNECTIONS	9-6
9.4.1 Single SCSI Storage Module	9-7
9.4.2 Stacked SCSI Storage Modules	9-8
9.4.3 Side-By-Side SCSI Storage Modules	9-10
9.5 SYSTEM POWER-UP	9-12
9.6 ADDITIONAL DRIVE UPGRADES	9-15

SECTION 10
FUNCTIONAL DESCRIPTION

	<u>Page</u>
10.1 SCSI STORAGE MODULE DESCRIPTION	10-2

SECTION 11
SPECIFICATIONS

		<u>Page</u>
11.1	HARDWARE	11-2
11.1.1	SCSI Storage Module	11-2
11.1.2	145MB Disk Drive (2269V-4C)	11-3
11.1.3	326MB Disk Drive (2269V-5C)	11-4
11.1.4	150MB Streaming Cartridge Tape Drive (2238V-3C) ..	11-5

SECTION 12
ILLUSTRATED PARTS

		<u>Page</u>
12.1	SCSI STORAGE MODULE	12-2
12.2	CABLE ASSEMBLIES	12-4

SECTION 1
INTRODUCTION

**SECTION 1
CONTENTS**

1.1 SCSI STORAGE MODULE OVERVIEW 1-2
1.2 RELATED DOCUMENTATION 1-3
1.3 MEANING OF NON-STANDARD SYMBOLS 1-4
1.4 ABBREVIATIONS AND SYMBOLS USED IN THIS MANUAL 1-5

1.1 SCSI Storage Module Overview

The SCSI (Small Computer Systems Interface) Storage Module is a stand-alone device that provides external data storage via the SCSI bus. The SCSI Storage module can house one full height SCSI drive or two half-height SCSI drives. When only one half-height SCSI drive is installed, a blank panel is used to conceal the empty drive slot. This panel can be removed to accommodate another half-height SCSI drive.

Two types of fixed disk drives and one streaming cartridge tape drive can be installed in the module. These are:

- 145MB Half-Height Winchester Model 2269V-4C, 5-1/4" (part number 725-3822)
- 326MB Full-Height Winchester Model 2269V-5C, 5-1/4" (part number 725-3814)
- 150MB Half-Height Streaming Cartridge Tape Model 2238V-3C, 5-1/4" (part number 725-3820)

Depending on the system, multiple SCSI Modules and configurations can be used to provide up to the total number of SCSI devices (targets) supported by the SCSI Host. Each SCSI device must be assigned an unique target ID (0-6) with the last device having a terminator connector installed to terminate the SCSI bus signals.

⌘ END

1.2 Related Documentation

<i>Document</i>	<i>Part Number</i>
VS-5000 Series Computer	742-1840
VS-5000 Computer System Options	742-1841

xx END

1.3 Meaning Of Non-Standard Symbols

Non-standard symbols, examples, and meanings are as follows:

<i>Symbol</i>	<i>Meaning</i>
→ NEXT	Subsection continues on next page
⌘ END	End of subsection
→ 2.4	Refer to section 2, subsection 4
→ 741-1840, 7.2	Refer to manual 741-1840, section 7, subsection 2

⌘ END

1.4 Abbreviations And Symbols (Sheet 1 of 2)

<i>Abbreviation/ Symbol</i>	<i>Definition</i>
ac	Alternating Current
ANSI	American National Standards Institute
ASSY	Assembly
BIT	Built In Test
CBL	Cable
dc	Direct Current
DRAM	Data Random Access Memory
DVM	Digital Voltmeter
EIA	Electronic Industries Association
FCC	Federal Communications Commission
FRU	Field-Replaceable Unit
H	Hexadecimal Notation
ID	Identification
I/O	Input/Output
IPB	Illustrated Parts Breakdown

→ NEXT

1.4 Abbreviations And Symbols (Sheet 2 of 2)

<i>Abbreviation/ Symbol</i>	<i>Definition</i>
Kg	Kilogram
LED	Light-Emitting Diode
M	Mega, (Million)
MBPS	Megabits Per Second
NEMA	National Electrical Manufacturers Association
NRZI	Nonreturn to Zero
PCA	Printed Circuit Assembly
RAM	Random Access Memory
SCSI	Small Computer System Interface
SPS	Switching Power Supply
SW	Switch
Target ID	SCSI Device Address (SCSI Address)
TP	Test Point
V	Volts

x END

SECTION

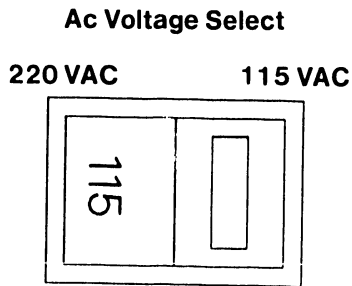
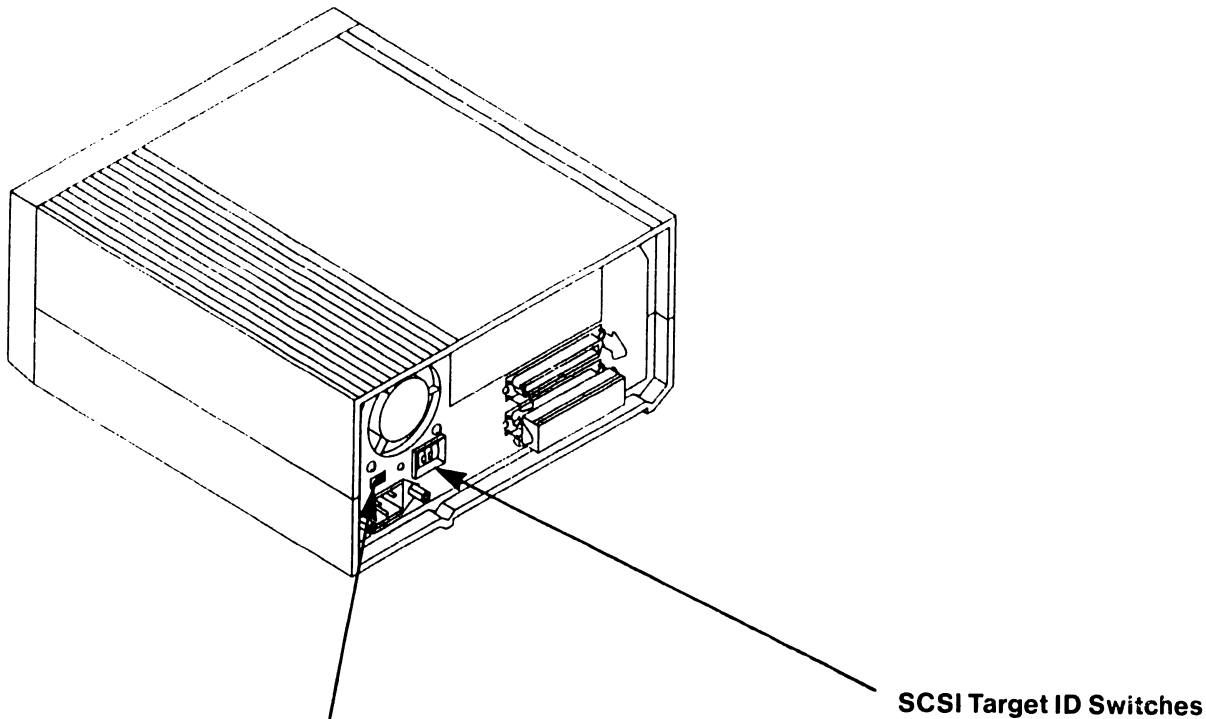
2

SETTINGS

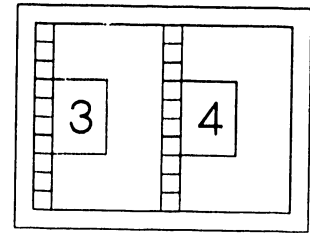
**SECTION 2
CONTENTS**

2.1 SCSI STORAGE MODULE 2-2

2.1 SCSI Storage Module



SCSI Target ID Switches



Target ID Switch
For Full-Height SCSI
or Bottom 1/2-Height
SCSI Drive

Target ID Switch
For Top 1/2-Height
SCSI Drive

⌘ END

SECTION

3

**CONTROLS AND
INDICATORS**

**SECTION 3
CONTENTS**

3.1 SCSI STORAGE MODULE FRONT VIEW 3-2

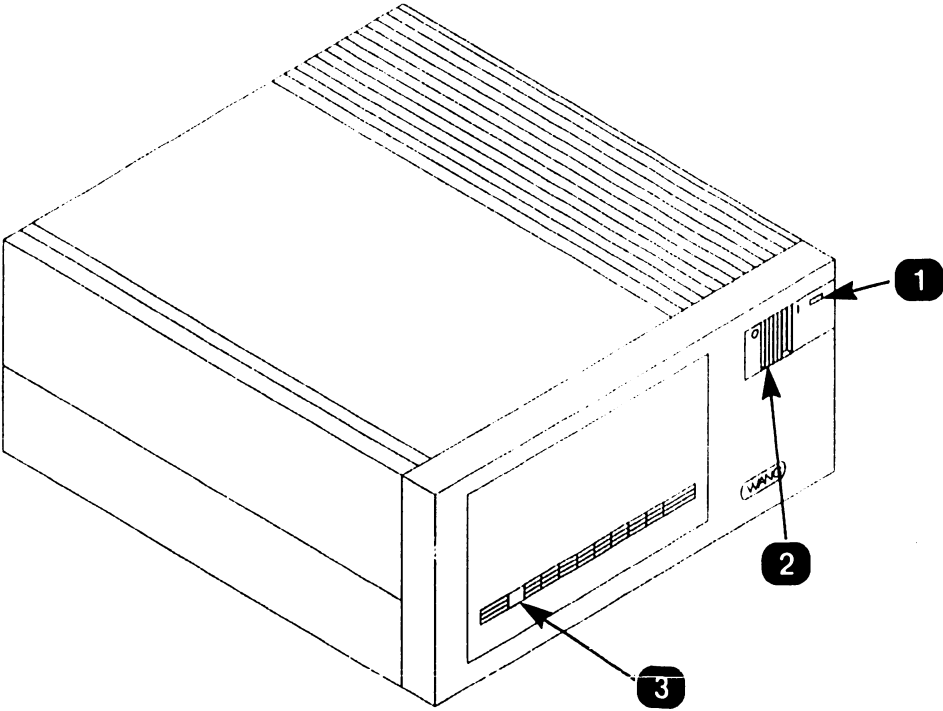
3.2 SCSI STORAGE MODULE REAR VIEW 3-3

3.3 145MB HALF-HEIGHT WINCHESTER DRIVE (2269V-4C) 3-5

3.4 326MB FULL-HEIGHT WINCHESTER DRIVE (2269V-5C) 3-6

3.5 150MB HALF-HEIGHT STREAMING CARTRIDGE
TAPE DRIVE (2238V-3C) 3-7

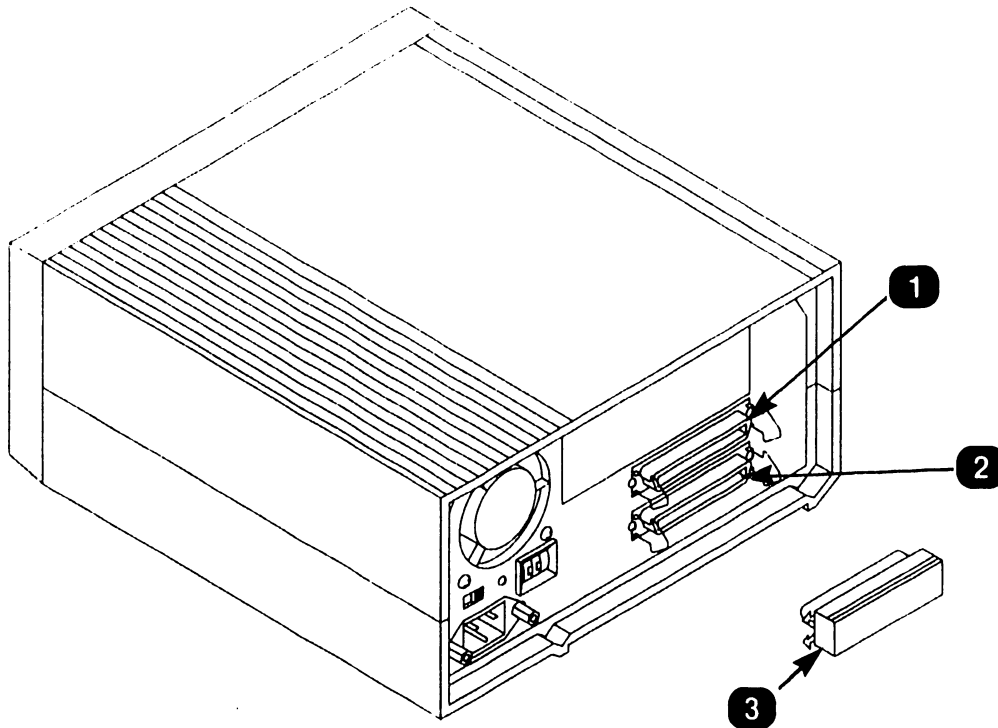
3.1 SCSI Storage Module Front View



<i>Item</i>	<i>Name</i>	<i>Type and Function</i>
1	Power-On LED	LED; green, illuminates when power is applied to the unit.
2	Power On/Off Switch	Switch; 2-position slide, applies ac power to power supply when switch is in the On position. Disconnects power when switch is in the Off position.
3	Diskette Drive Activity LED	LED; red, illuminates when drive is being accessed for read or write operations.

α END

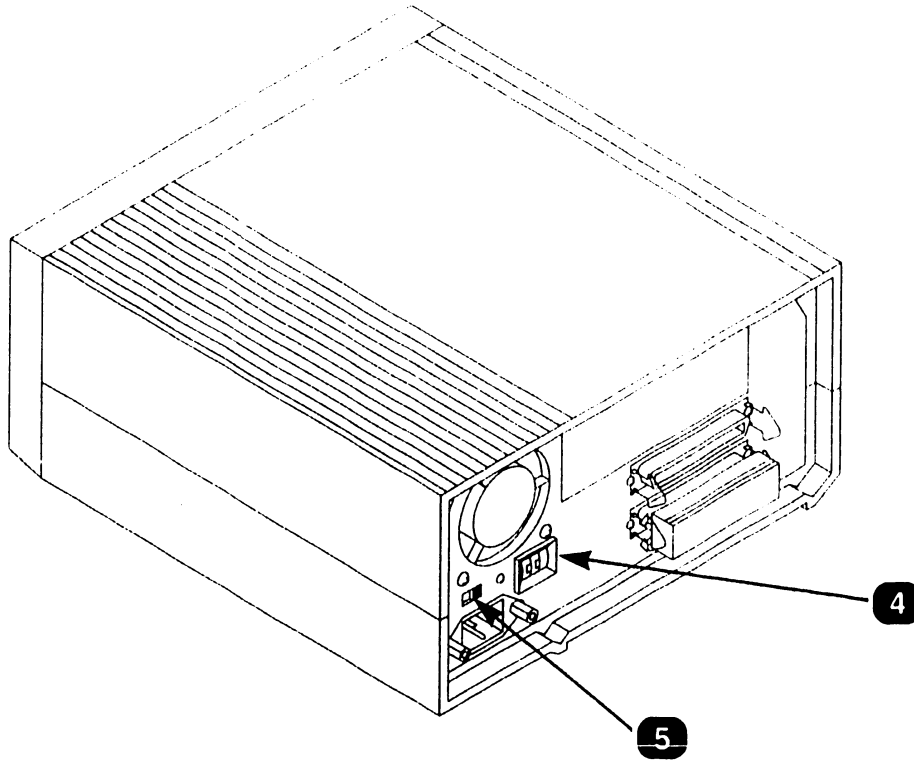
3.2 SCSI Storage Module Rear View (Sheet 1 of 2)



Item	Name	Type and Function
1	SCSI Bus Signal-In (Input) Connector	Connector; 50-pin D-shell, provides SCSI Bus input signals from host or previous SCSI Storage Module SCSI Bus Signal-Out connector.
2	SCSI Bus Signal-Out (Output) Connector	Connector; 50-pin D-shell, continues SCSI Bus to next SCSI Storage Module target or terminates bus (requires terminator).
3	Terminator	50-pin, terminates the SCSI bus signals. Must be installed on the last target device SCSI Signal-out connector.

→ NEXT

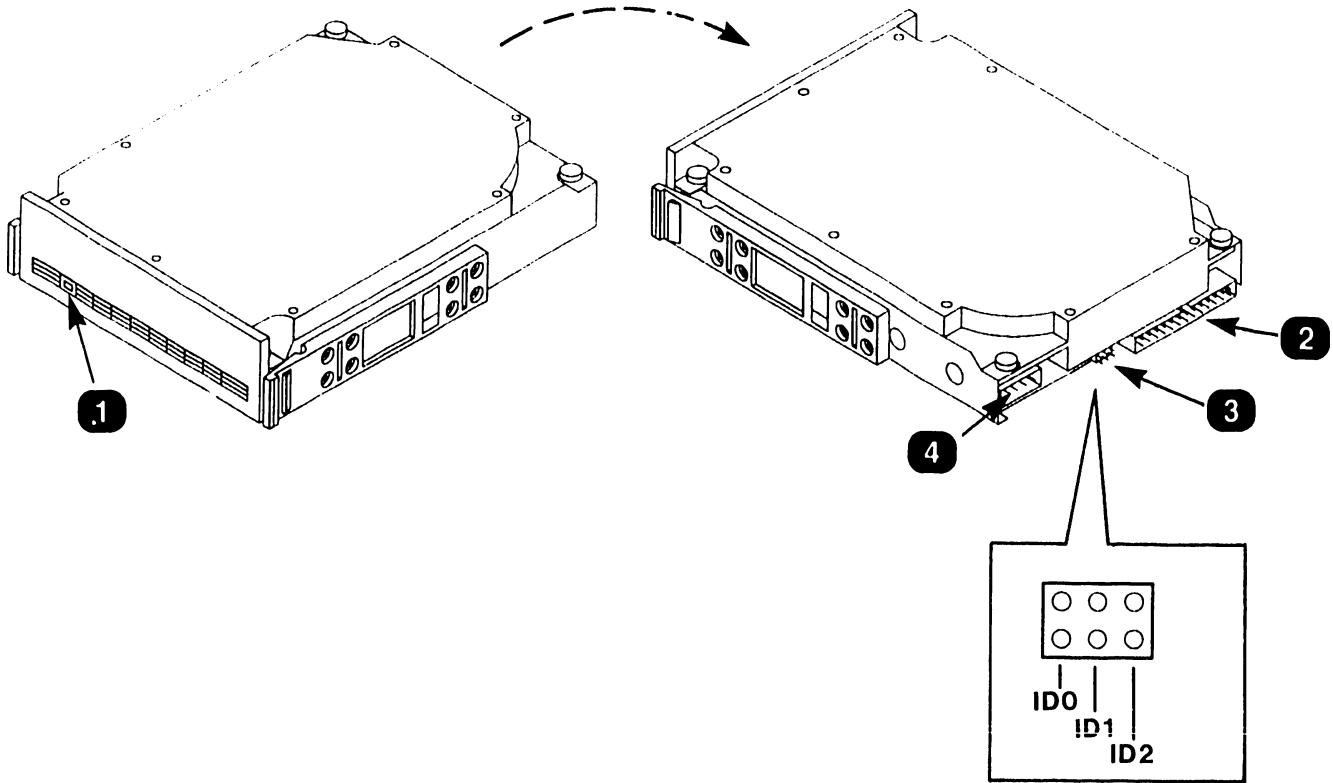
3.2 SCSI Storage Module Rear View (Sheet 2 of 2)



Item	Name	Type and Function
4	Target ID Select Switches	Switches; two roller 10-position (0-9), sets SCSI drive target ID. Positions 0-6 select the respective target ID, position 7 is invalid, and positions 8 and 9 select target ID 0 and 1 respectively. Configure targets so left-most switch selects full-height drive or bottom half-height drive and right switch selects top half-height drive.
5	AC Voltage Select Switch	Slide-type switch; selects ac operating voltage of 115V or 220V, determined by available line voltage.

⌘ END

3.3 145MB Half-Height Winchester Drive (2269V-4C)

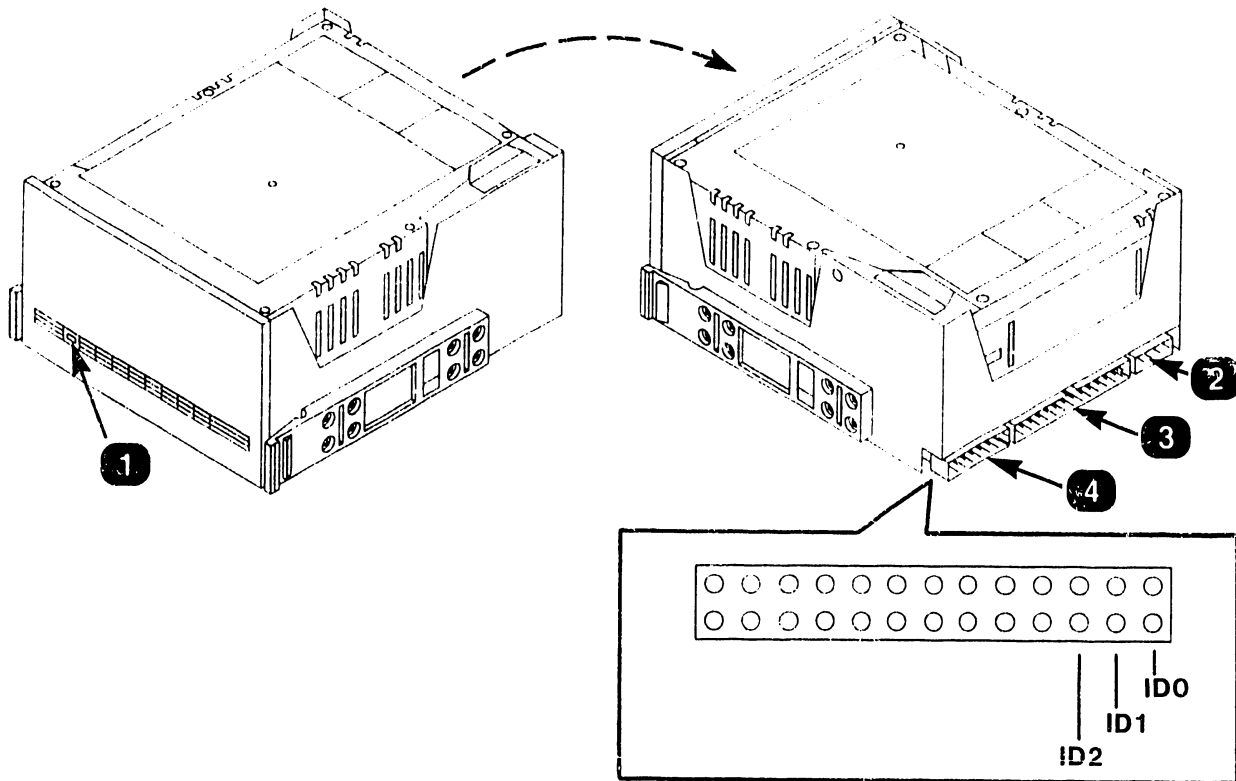


Item	Name	Type and Function
1	Drive Activity LED	LED; red, illuminates when drive is being accessed for read or write operations.
2	SCSI Bus Connector	Connector; 50-pin keyed, connects SCSI Bus interface cable to drive PCA.
3	SCSI Target ID Connector	Header, connects Target ID Select switch cable to drive PCA for drive (target) ID (address).
4	Power Connector	Connector; 4-pin mate and lock, provides required drive voltages (Ground, +5, +12).

α END

CONTROLS AND INDICATORS

3.4 326MB Full-Height Winchester Drive (2269V-5C)

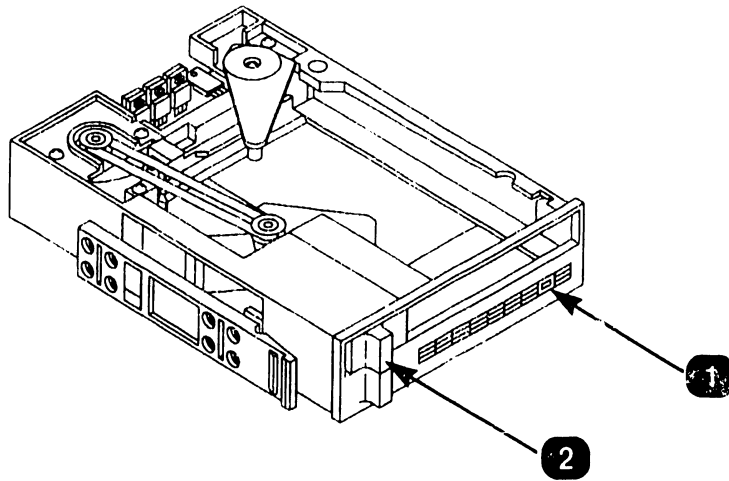


Item	Name	Type and Function
1	Drive Activity LED	LED; red, illuminates when drive is being accessed for read or write operations.
2	Power Connector	Connector; 4-pin mate and lock, provides required drive voltages (Ground, +5, +12).
3	SCSI Bus Connector	Connector; 50-pin keyed, connects SCSI Bus interface cable to drive PCA.
4	SCSI Target ID Connector	Header; 26-pin, connects Target ID Select switch cable to drive PCA for drive (target) ID (address).

⌘ END

CONTROLS AND INDICATORS

3.5 150MB Half-Height Streaming Cartridge Tape Drive (2238V-3C) (Sheet 1 of 2)

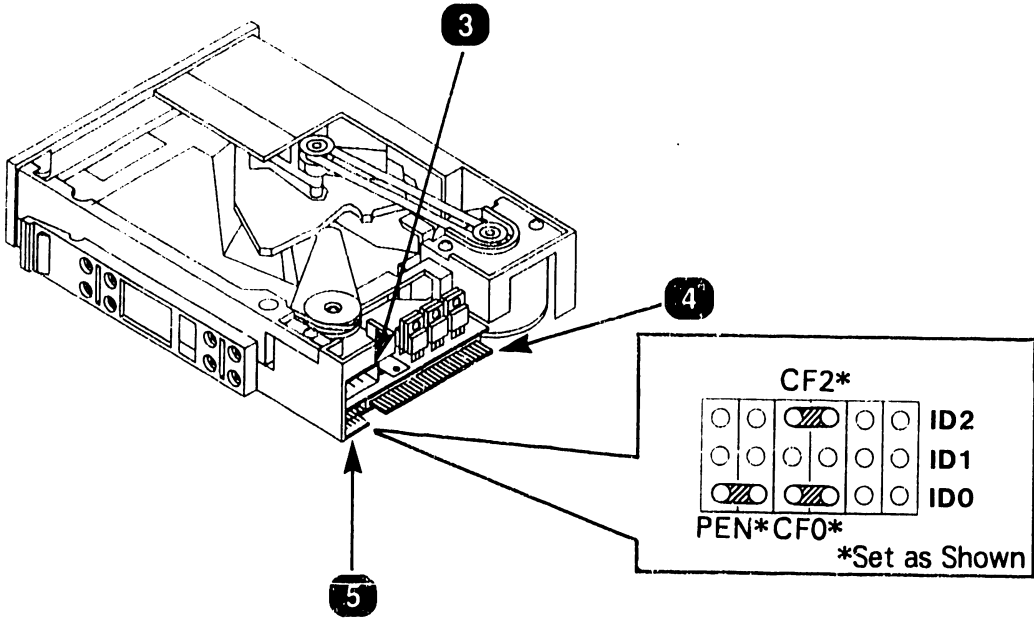


<i>Item</i>	<i>Name</i>	<i>Type and Function</i>
1	Drive Activity LED	LED; green, illuminates when drive is accessed for read or write operations.
2	Door Latch	Slide-type, loads and releases cartridge tape head.

→ NEXT

CONTROLS AND INDICATORS

3.5 150MB Half-Height Streaming Cartridge Tape Drive (2238V-3C) (Sheet 2 of 2)



Item	Name	Type and Function
3	Power Connector	Connector; 4-pin mate and lock, provides required drive voltages (Ground, +5, +12).
4	SCSI Bus Connector	Connector; 50-pin keyed, connects SCSI Bus interface cable to drive PCA.
5	SCSI Target ID Connector	Header; 18-pin, connects Target ID Select switch cable to drive PCA for drive (target) ID (address).

❏ END

SECTION

4

OPERATION

**SECTION 4
CONTENTS**

4.1 POWER-ON PROCEDURE 4-2
4.2 POWER-DOWN PROCEDURE 4-5

4.1 Power-On Procedure (Sheet 1 of 3)

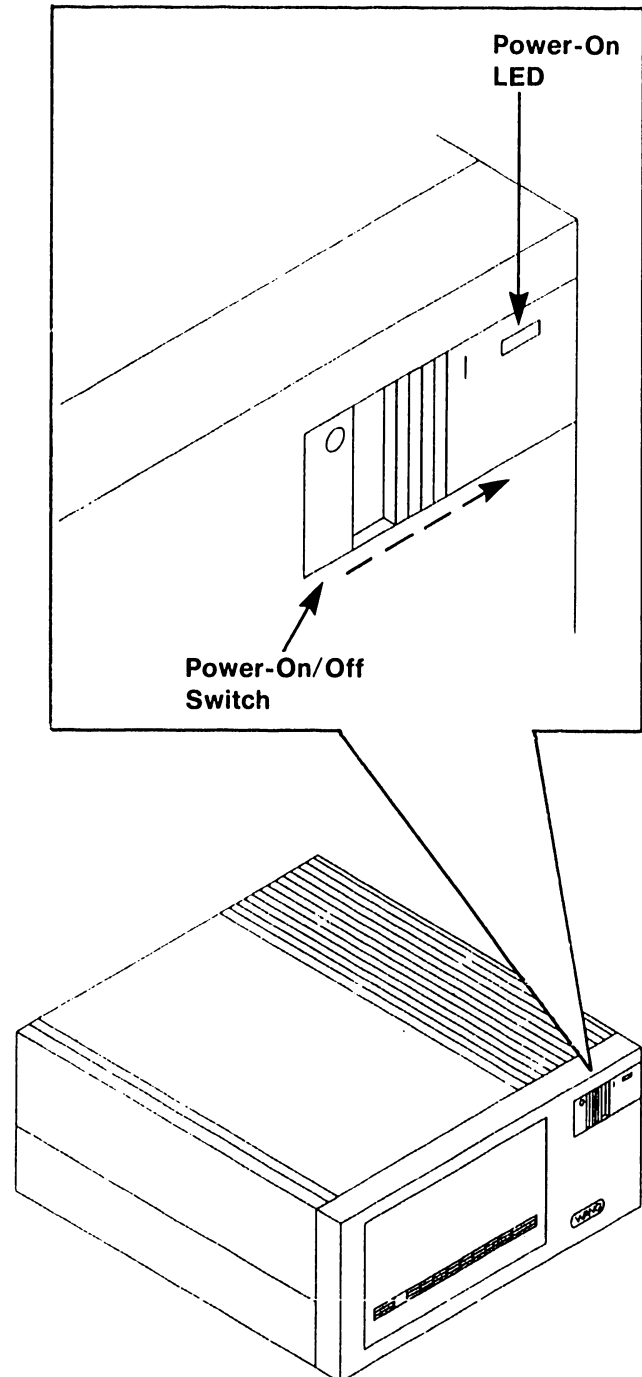
NOTE

SCSI Storage Module Power-On and Power Down procedures use the VS-5000 Computer System as the mainframe (Host). Other mainframe procedures will be similar, refer to appropriate mainframe manual for power-on procedures.

Before applying power to the SCSI Storage Modules ensure that:

- SCSI Storage Modules target IDs do not conflict with other SCSI devices installed on the bus.
- Cables are securely attached.
- The last Storage Module target has the terminator installed.
- Storage Module AC Select Switch is set to match the incoming power source.
- SCSI Storage Module ac power cord is connected to ac receptacle.

- 1) Power ON SCSI Storage Module(s) by sliding the power-on switch to the On position. Power-On LED should be illuminated.
- 2) Power ON VS-5000 mainframe. (Refer to VS-5000 Computer Manual.)



→ NEXT

4.1 Power-On Procedure (Sheet 2 of 3)

-
- 3 The VS-5000 Computer runs its Resource Control Unit (RCU) BIT diagnostics and upon successful completion displays the IPL Drive Selection Screen on Workstation 0 (WS0).
-

VS 5000 Revision 8861
 (c) Copr. Wang Laboratories, Inc. 1988
 (Initial message) Building IPL device table, please wait.
 (then replaced by) Default action is to xx in xx seconds.

Device	Capacity	Type	Volume	VSID	Status
2270V7	1.2 MB	Dsket			
α 2269V5	326 MB	Fixed	SYSTEM	0	Bootstrap Device
2269V4	145 MB	Rem	BACKUP	0	Media Tolerant
2269V4	145 MB	Rem	KAKRED	0	Media Tolerant
2269V5	326 MB	Fixed	AMKTAP	0	Media Tolerant

(1) IPL	(9) Set Date & Time
12) Test & IPL	
(3) Test/Continuous	(16) Stop Auto Seq

NOTE

Streaming Cartridge Tape drives are not reported on this screen.

→ NEXT

4.1 Power-On Procedure (Sheet 3 of 3)

- 4 Verify all SCSI devices (except Streaming Cartridge Tape) on the bus are correctly identified. Devices are listed in descending order according to their respective target IDs, with target ID 6 (if used) being the first SCSI device listed following the diskette drive.
- 5 If all SCSI devices are properly declared, the SCSI devices powered-up correctly. If some SCSI devices are not declared, refer to the troubleshooting section.

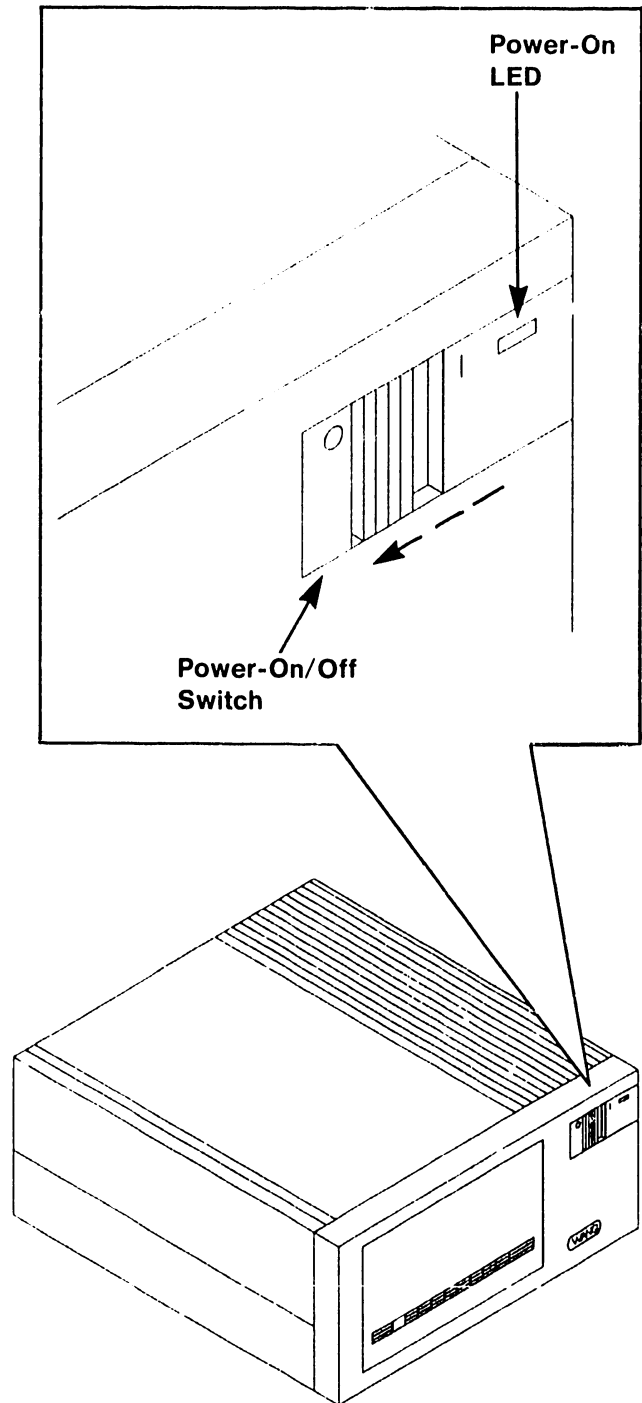
□ END

4.2 Power-Down Procedures

CAUTION

Powering off system and/or any external disk drive improperly may result in damage to Volume Table Of Contents (VTOC).

- 1) Perform system power-off procedures to verify all users have logged off system.
- 2) Press VS-5000 Computer System CONTROL MODE switch.
- 3) Power down SCSI Storage Modules by positioning the Power On/Off switch to the Off Position. Note the Power-On LED goes out.



□ END

SECTION

5

**PREVENTIVE
MAINTENANCE**

**SECTION 5
CONTENTS**

5.1	TOOLS AND EQUIPMENT	5-2
5.2	PM SCHEDULES	5-3
5.3	OPERATIONAL CHECKS	5-4
5.4	CLEANING	5-5
5.5	INSPECTION	5-6
5.6	ADJUSTMENTS	5-7

5.1 Tools and Equipment

No special tools or equipment are required for preventive maintenance (PM) on the SCSI Storage Module.

α END

5.2 PM Schedules

SCSI Storage Module does not require any preventive maintenance. However, the service technician should perform the following while at the site during service calls.

<u>Action</u>	<u>Section</u>
Operational Check	5.3
Clean Exterior	5.4
Clean Interior	5.4
Inspect	5.5

❧ END

5.3 Operational Check

An equipment operational check is recommended after every service call. This check consists of powering-on the SCSI Storage Modules and verifying the drives are declared.

Performing a file copy operation to the drive(s) or running on-line diagnostics can be done to verify the drives operational status.

✕ END

5.4 Cleaning

Exterior:

- 1 Remove dust from exterior with cloth and vacuum.
- 2 Wipe case clean with soft cloth.

Interior:

- 1 Power down system (→ 4.2) and remove top cover (→ 7.2.1). Vacuum interior.
- 2 Clean fan blades with a clean cloth.

Streaming Tape Drive Heads:

Streaming Tape Drive heads should be cleaned periodically using a cotton swab and denatured alcohol.

α END

5.5 Inspection

- 1 Check for loose or damaged parts.
- 2 Check PCA and cabling circuitry.
- 3 Check fan operation.

α END

5.6 Adjustments

Mechanical:

① None Required

Electrical:

① None Required

⌘ END

SECTION

6

TROUBLESHOOTING

**SECTION 6
CONTENTS**

6.1	TOOLS AND EQUIPMENT	6-2
6.2	ON-LINE DIAGNOSTICS	6-3
6.3	POWER SUPPLY VOLTAGE MEASUREMENTS	6-4
6.4	TROUBLESHOOTING STRATEGY	6-5

6.1 Tools and Equipment

No special tools or equipment are required to troubleshoot the SCSI Storage Module or associated drives.

α END

6.2 On-Line Diagnostics

On-line diagnostics allow diagnostic testing of equipment while the mainframe is running customer applications. On-line diagnostics, along with a monitor program, are part of a VS test package called 'VSTEST'. VSTEST contains diagnostic routines that provide testing and exercising routines for the SCSI Storage Module drives. VSTEST is available under part number 195-4788-0, which includes documentation and media.

⌘ END

6.3 Power Supply Voltage Measurements

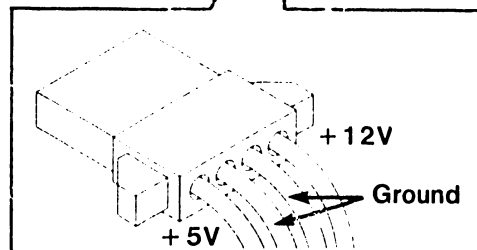
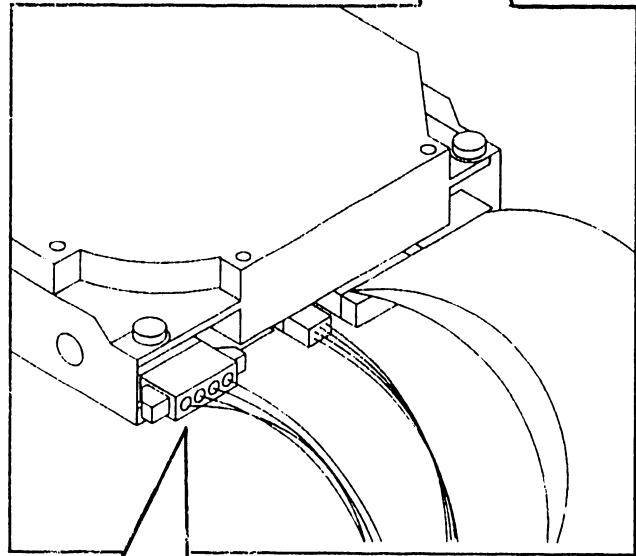
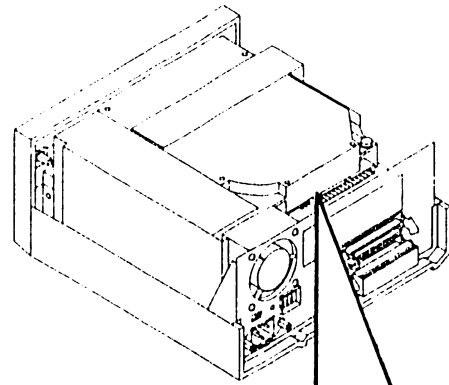
Power supply voltage measurements must be made from inside the SCSI Storage Module cabinet. Power supply voltages are not adjustable. If the voltages are missing or out of tolerance, the power supply must be replaced. Perform the following voltage measurements:

- 1) Power-Off the SCSI Storage Module and disconnect the ac power cord. (-4.2)
- 2) Remove cabinet top cover. (-7.2)
- 3) Power-On SCSI Storage Module.
- 4) Connect Common lead of DVM to one of the ground test points on the drive power cable connector.
- 5) Connect Positive lead of DVM to +5V test point and verify dc voltage limits.
- 6) Connect Positive lead of DVM to +12V test point and verify dc voltage limits.

Voltage	Limits
+5V	+4.75 - 5.25V
+12V	+11.4 - 12.6V

NOTE

Voltage measurements should be taken (under load) with drive(s) power cable connected.



α END

6.4 Troubleshooting Strategy (Sheet 1 of 2)

Troubleshooting strategy procedures are contained in the format: Fault Condition and Troubleshooting Actions.

<i>Fault Condition</i>	<i>Troubleshooting Actions</i>
SCSI Storage Module Power-on LED does not light, drive(s) activity LEDs do not light	<ul style="list-style-type: none"> • Check source voltage at electrical outlet. • Source voltage OK, check ac power cord continuity, check ac voltage select switch is set to match incoming voltage. • Source voltage OK at unit, check power-on switch and replace if faulty. If functional, replace power supply. (→ 7.6)
SCSI Storage Module Power-On LED is lit, fan attempts to run, and drive activity LEDs do not light	<ul style="list-style-type: none"> • Check voltages. (→ 6.3) • Voltages missing or out of tolerance, disconnect drive power cable and remeasure voltages. If voltages are correct and present, drive is defective. If voltages are wrong, replace power supply. (→ 7.6)
SCSI Storage Module Drives are not declared on IPL Device Selection screen, system BIT test passed	<ul style="list-style-type: none"> • Check SCSI cable connections, ensure terminator is installed on last target. Verify SCSI Storage Modules are powered-on and re-initialize system.

→ NEXT

6.4 Troubleshooting Strategy (Sheet 2 of 2)

*Fault Condition**Troubleshooting Actions*

IPL Device Selection screen displays device model number with message 'Device Not Accessible' in status field, system BIT test passed

- SCSI Target ID conflict. Verify Target ID of non-accessible device. If ID conflict exists, change Target ID to valid, nonconflicting address and re-initialize system. (Note: ID 7 is an invalid ID.) If message still appears, verify Target ID Thumbwheel switch is functional. Replace if faulty. (- 7.8)

SCSI Devices display read, write, or seek errors, system BIT test passed

- Drive may be defective, run VSTEST on suspect drive and interpret results.
- Verify SCSI host (RCU or 1-Port SCSI) successfully completes diagnostic testing. Replace defective drive. (- 7.5)

⌘ END

SECTION

7

PARTS

REPLACEMENT

**SECTION 7
CONTENTS**

7.1 TOOLS AND EQUIPMENT 7-2

7.2 TOP COVER REMOVAL 7-3

7.3 FRONT BEZEL REMOVAL 7-4

7.4 POWER ON/OFF SWITCH 7-5

7.5 DRIVE REMOVAL 7-7

7.5.1 326 MB Disk Drive (Model 2269V-5C) 7-7

7.5.2 145 MB Disk Drive (Model 2269V-4C) 7-10

7.5.3 150 MB Cartridge Tape (Model 2238V-3C) 7-13

7.6 POWER SUPPLY REMOVAL 7-16

7.7 DC FAN/POWER HARNESS ASSEMBLY 7-18

7.8 DUAL THUMBWHEEL SWITCH 7-19

7.9 SCSI INTERFACE CONNECTOR 7-20

7.1 Tools and Equipment

No special tools or equipment are required to perform parts replacement for the SCSI Storage Module or associated drives.

⌘ END

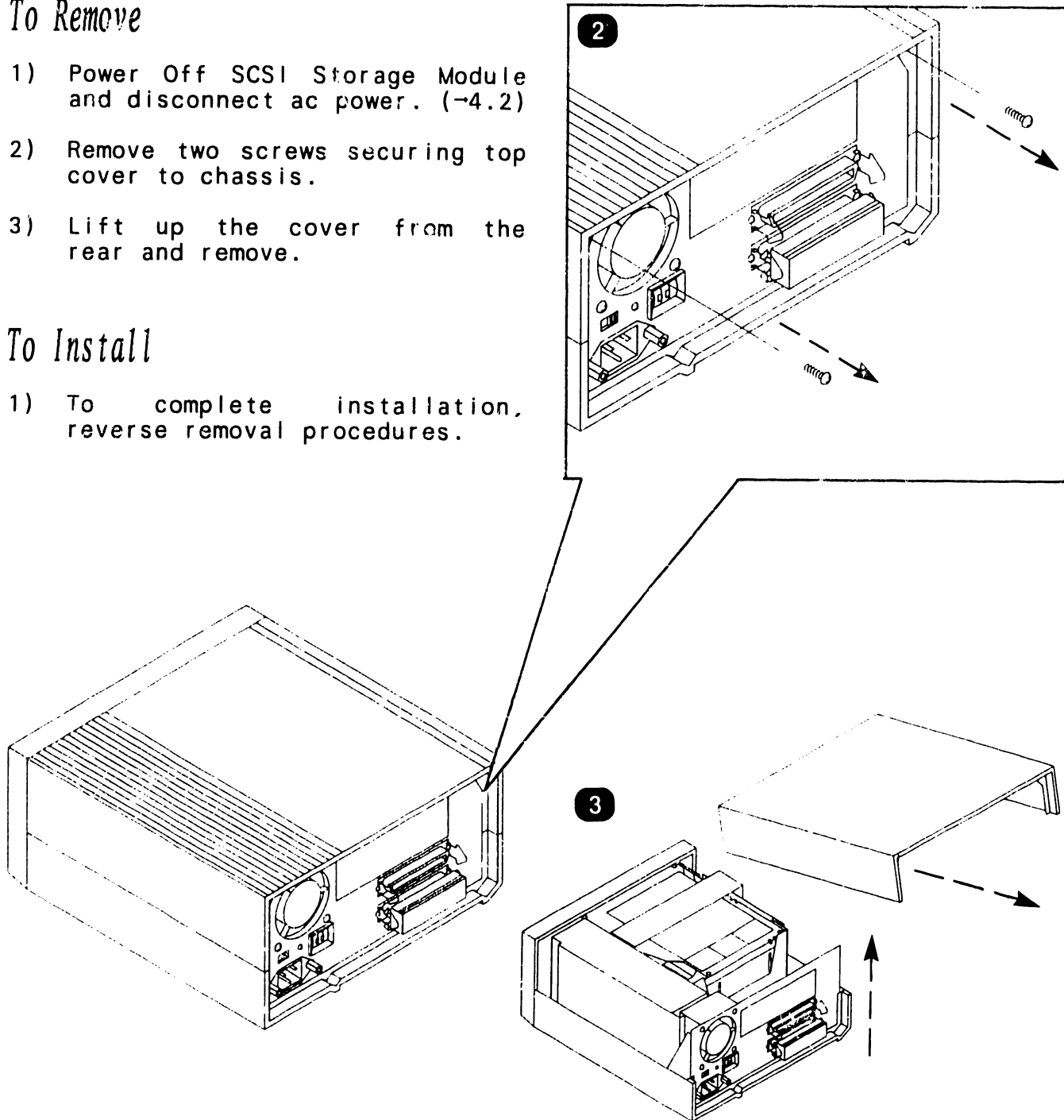
7.2 Top Cover Removal

To Remove

- 1) Power Off SCSI Storage Module and disconnect ac power. (-4.2)
- 2) Remove two screws securing top cover to chassis.
- 3) Lift up the cover from the rear and remove.

To Install

- 1) To complete installation, reverse removal procedures.



α END

7.3 Front Bezel Removal

To Remove

- 1) Power Off SCSI Storage Module and disconnect ac power. (-4.2)
- 2) Remove top cover. (-7.2)

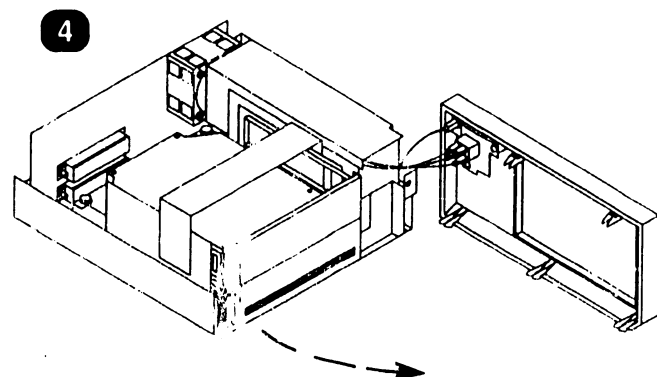
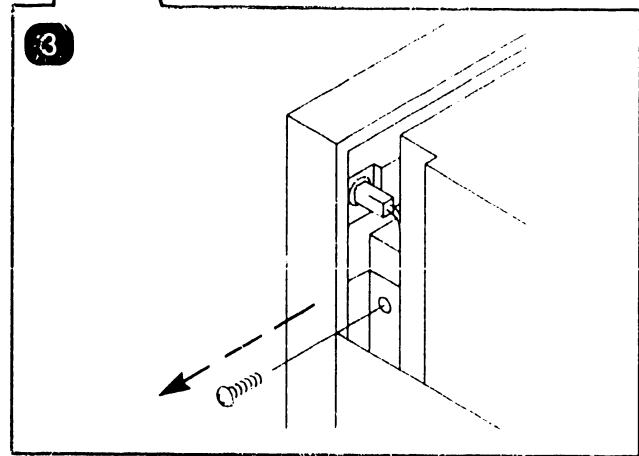
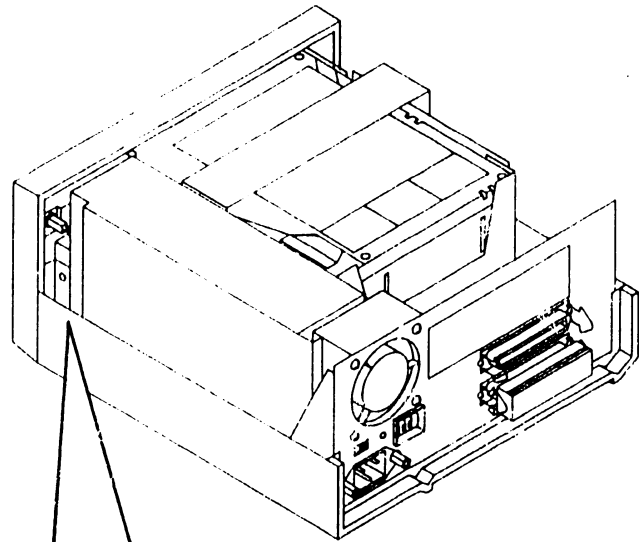
NOTE

Some SCSI Storage Modules front bezel retaining screw is located perpendicular to the front cover.

- 3) Remove screw securing front bezel to chassis.
- 4) Open front cover to the right being careful not to over tension power on/off switch cable and power-on LED cable.

To Install

- 1) To complete installation, reverse removal procedures.

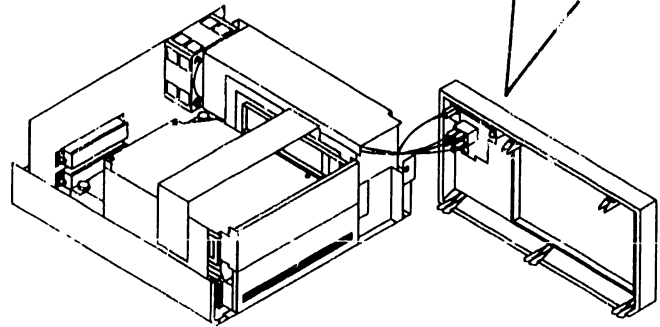
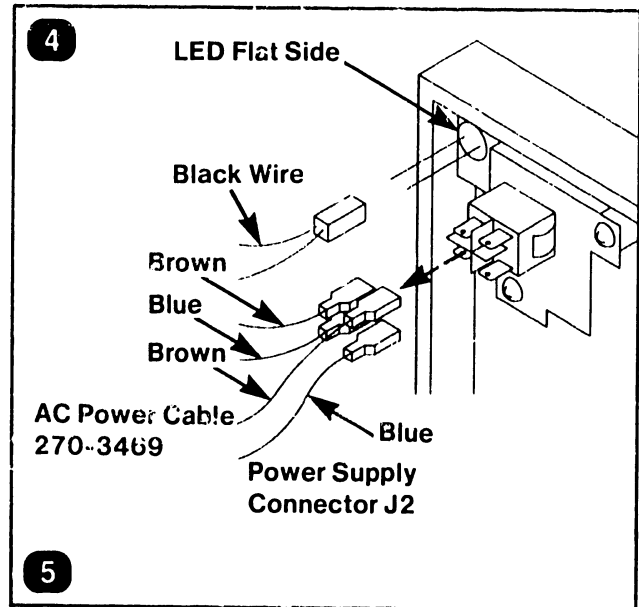


⌘ END

7.4 Power On/Off Switch Removal (Sheet 1 of 2)

To Remove

- 1) Power Off SCSI Storage Module and disconnect ac power. (-4.2)
- 2) Remove top cover. (-7.2)
- 3) Remove front bezel. (-7.3)
- 4) Note wire positions and disconnect two wire Power-On LED cable from LED (black wire to flat side of LED).
- 5) Note wire positions and disconnect the four (wires) spade connectors from rear of power-on switch.



→ NEXT

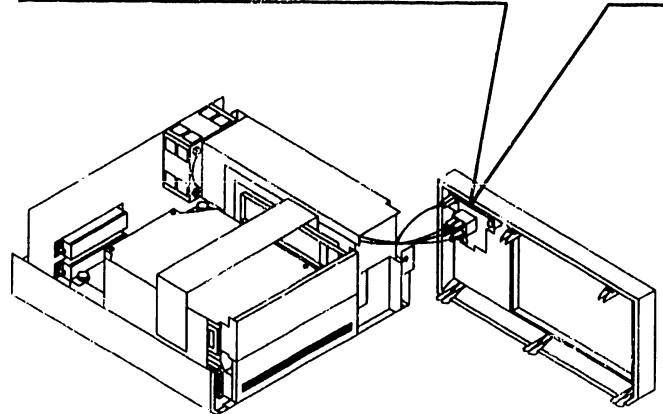
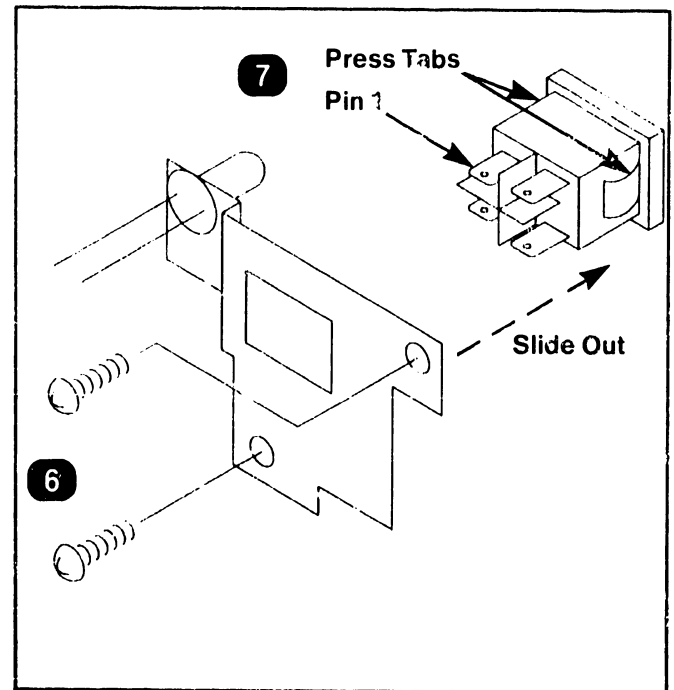
7.4 Power On/Off Switch Removal (Sheet 2 of 2)

- 6) Remove two screws securing Power On/Off switch/LED bracket to front cover.
- 7) Press tabs on each side of switch and slide switch out through switch/LED bracket.

*To Install***NOTE**

For replacement, position switch with Pin 1 in the upper left hand corner (closest to Power-On LED).

- 1) To complete installation, reverse removal procedures.



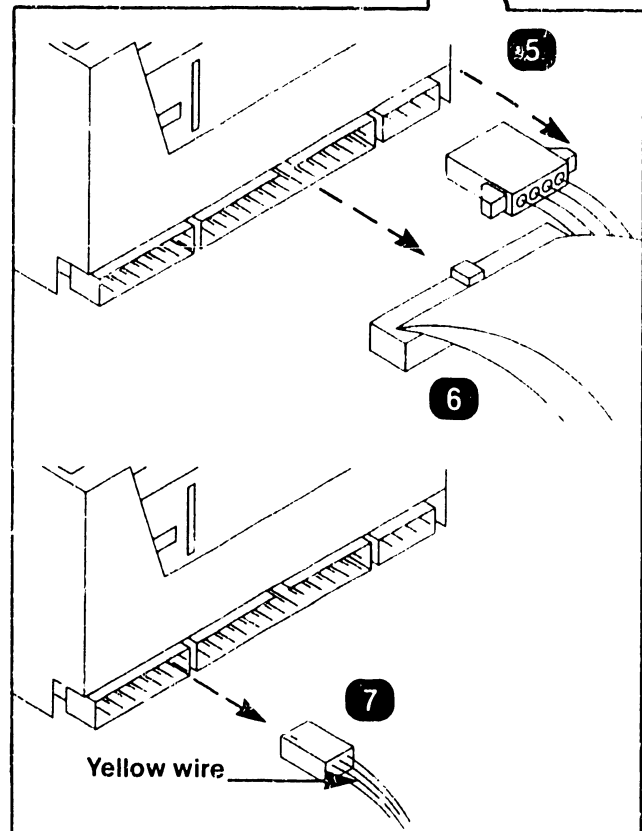
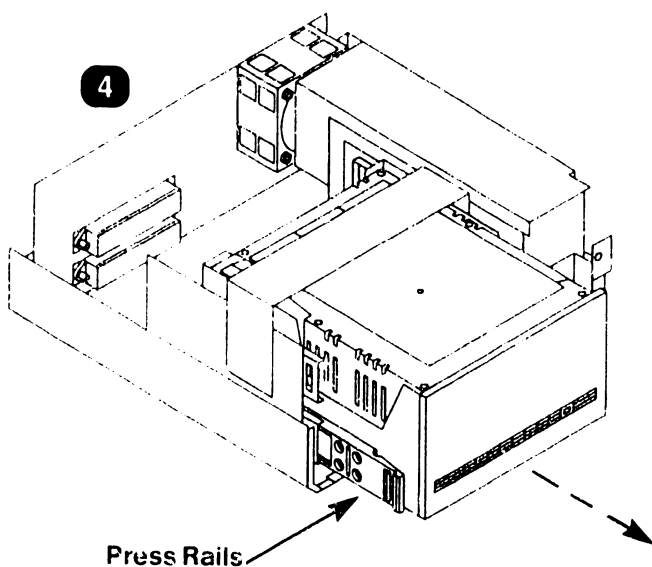
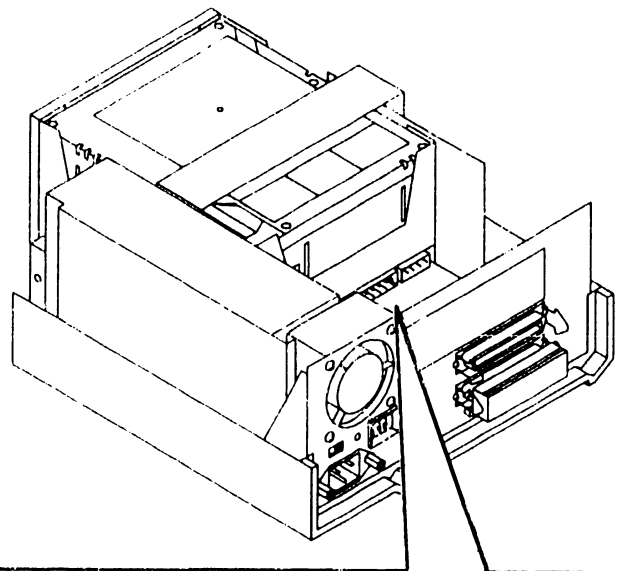
⌘ END

7.5 Drive Removal

7.5.1 326MB Disk Drive (Model 2269V-5C) (Sheet 1 of 3)

To Remove

- 1) Power Off SCSI Storage Module and disconnect ac power. (-4.2)
- 2) Remove top cover. (-7.2)
- 3) Remove front bezel. (-7.3)
- 4) Press drive slide rails and pull drive out about 3 inches.
- 5) Note cable position and remove power cable from power connector.
- 6) Note cable position and remove 50-pin SCSI cable from SCSI connector.
- 7) Note cable position and remove 6-pin Target ID cable from target connector.
- 8) Remove drive from chassis.



→ NEXT

7.5 Drive Removal

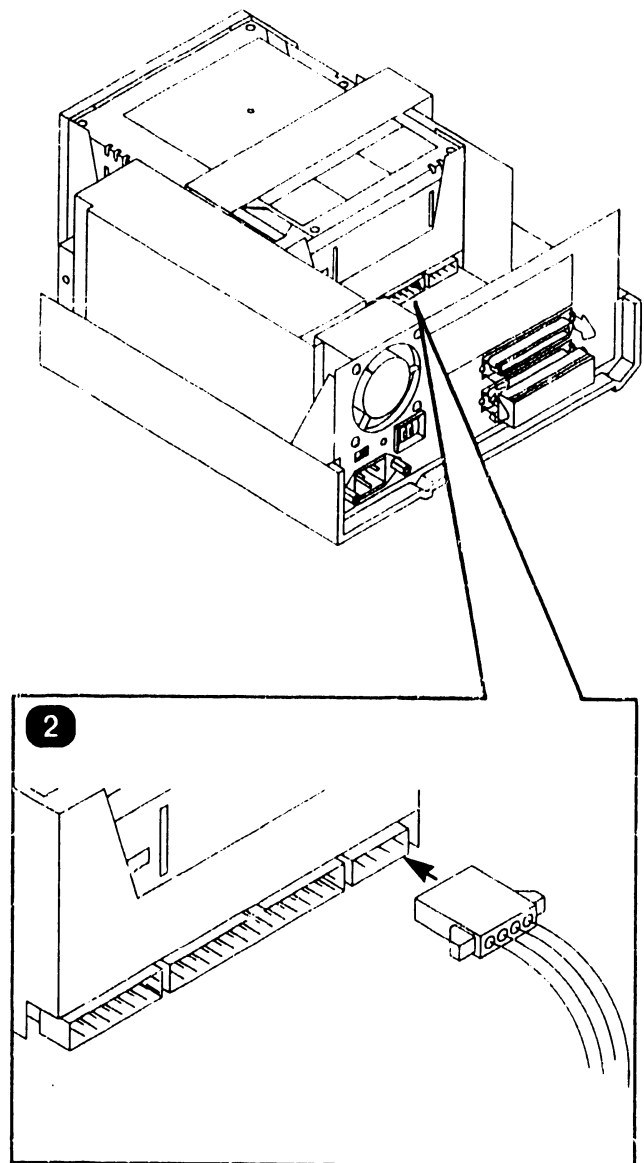
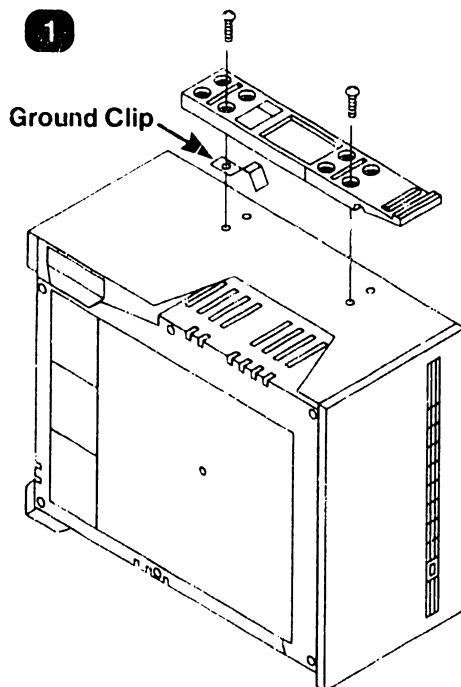
7.5.1 326MB Disk Drive (Model 2269V-5C) (Sheet 2 of 3)

To Install

NOTE

For drive replacement, the nylon rails on the drives must be positioned in the rear-most settings. Ensure drive ground clip is making good electrical contact.

- 1) Remove two screws securing nylon rail to drive and install rails in rear most position. Be sure drive ground clip is making good electrical contact with drive.
- 2) Install drive part way into bottom chassis rail and connect power cable to power connector.



→ NEXT

7.5 Drive Removal

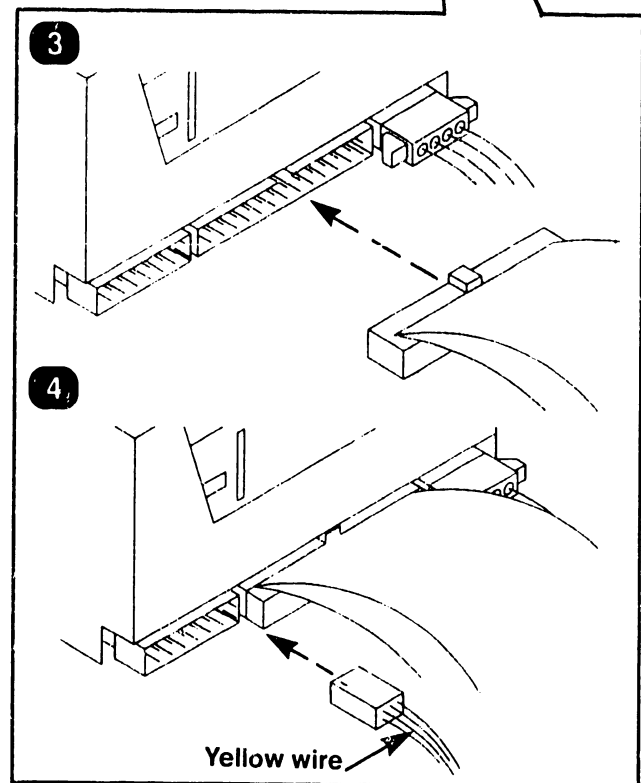
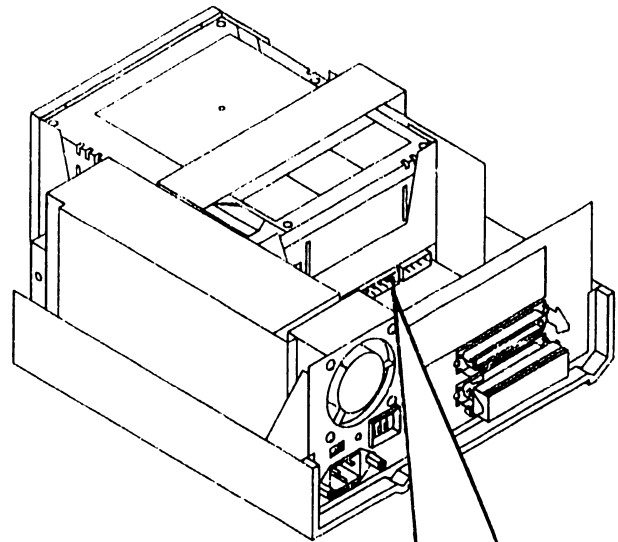
7.5.1 326MB Disk Drive (Model 2269V-5C) (Sheet 3 of 3)

- 3) Note SCSI cable key and connect SCSI cable to SCSI connector.

NOTE

For drives installed in bottom rail, use target ID switch cable closest to the fan (leftmost switch when viewed from rear of unit). For drives mounted in top rail, use target ID switch cable furthest from the fan (rightmost switch when viewed from rear of unit).

- 4) Note Target ID Connector pin 1 (yellow wire) and position connector with pin 1 towards the top left as viewed from the rear, and connect Target ID Cable to Target ID connector (six pins closest to the 50-pin SCSI housing).
- 5) Slide drive into chassis being careful not to pinch cables until rails lock into place.
- 6) Replace front bezel (-7.3) and top cover (-7.2).



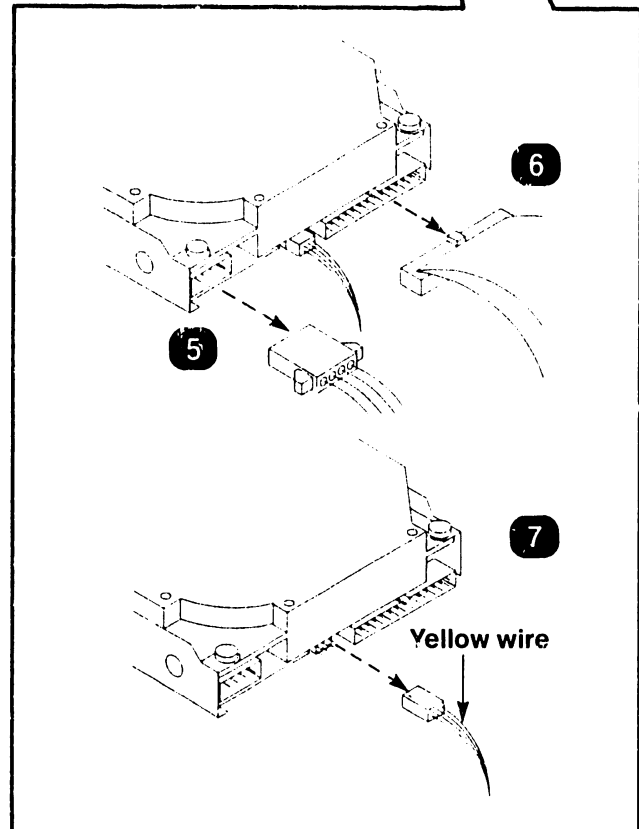
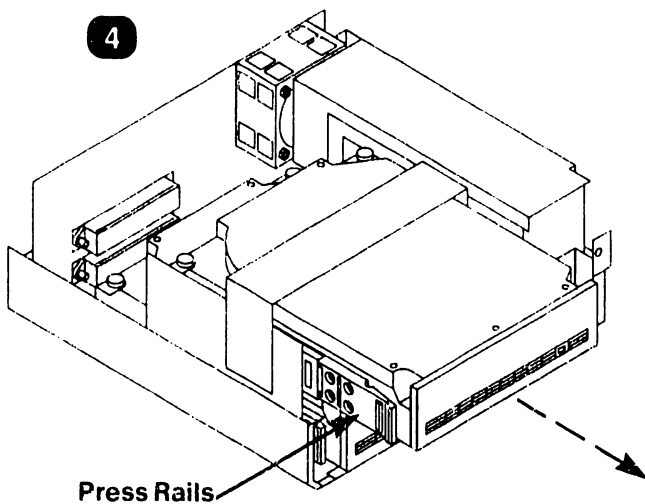
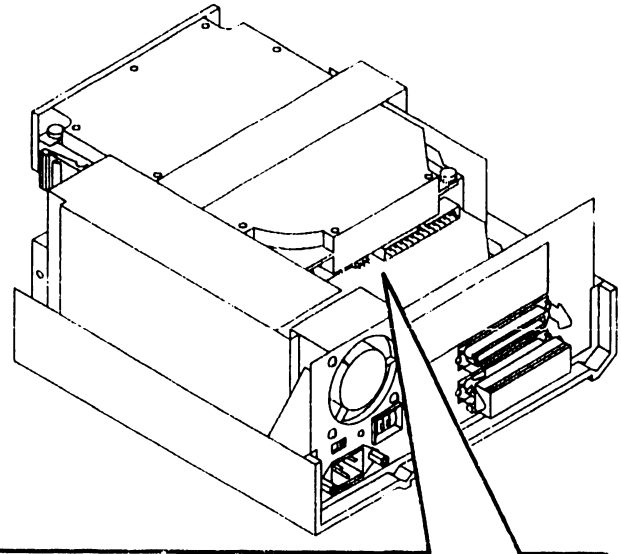
α END

7.5 Drive Removal

7.5.2 145MB Disk Drive (Model 2269V-4C) (Sheet 1 of 3)

To Remove

- 1) Power Off SCSI Storage Module and disconnect ac power. (-4.2)
- 2) Remove top cover. (-7.2)
- 3) Remove front bezel. (-7.3)
- 4) Press drive slide rails and pull drive out about 3 inches.
- 5) Note cable position and remove power cable from power connector.
- 6) Note cable position and remove 50-pin SCSI cable from SCSI connector.
- 7) Note cable position and remove 6-pin Target ID cable from target connector.
- 8) Remove drive from chassis.



→ NEXT

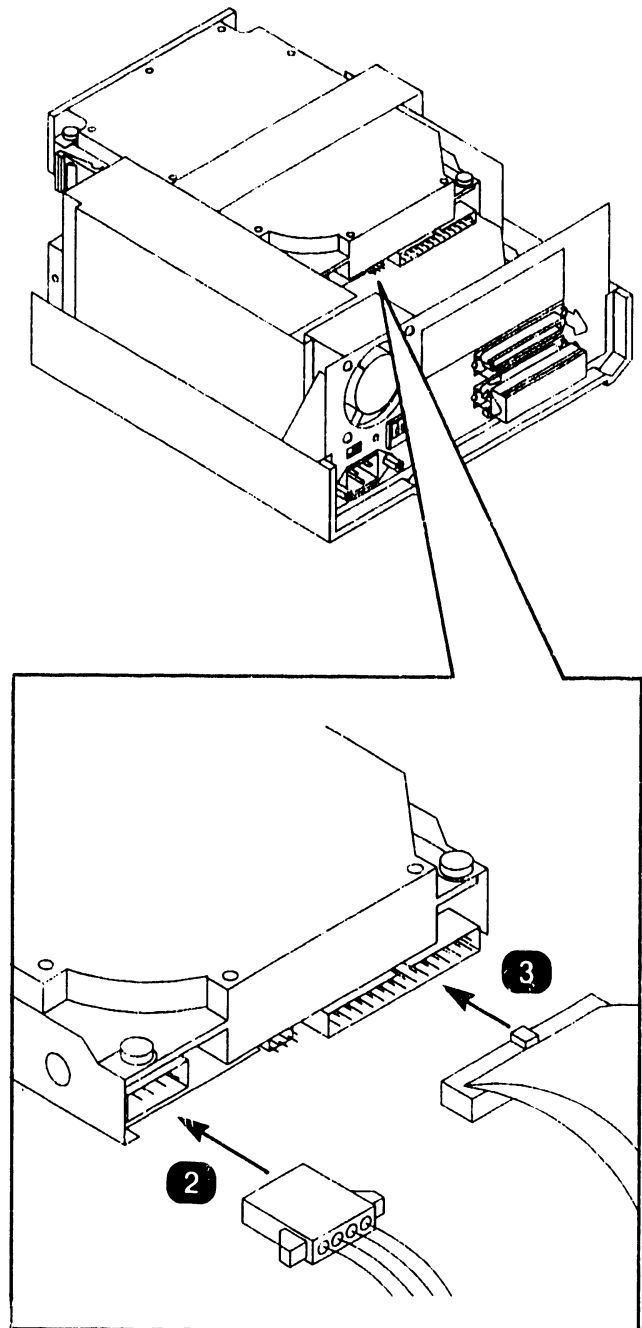
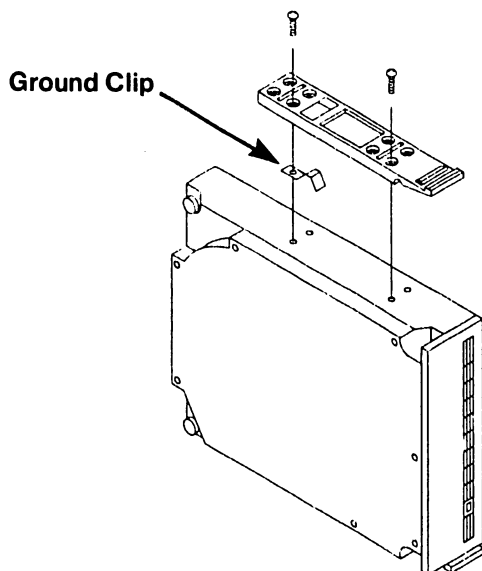
7.5 Drive Removal

7.5.2 145MB Disk Drive (Model 2269V-4C) (Sheet 2 of 3)

*To Install***NOTE**

For drive replacement, nylon rails on the drives must be positioned in the rearmost settings. Ensure drive ground clip is making good electrical contact.

- 1) Remove two screws securing drive nylon rail to drive and install rails in the rearmost position. Be sure drive ground clip is making good electrical contact with drive.
- 2) Install drive part way into bottom chassis rail and connect power cable to drive power connector.
- 3) Note SCSI cable key and connect SCSI cable to SCSI connector.



→ NEXT

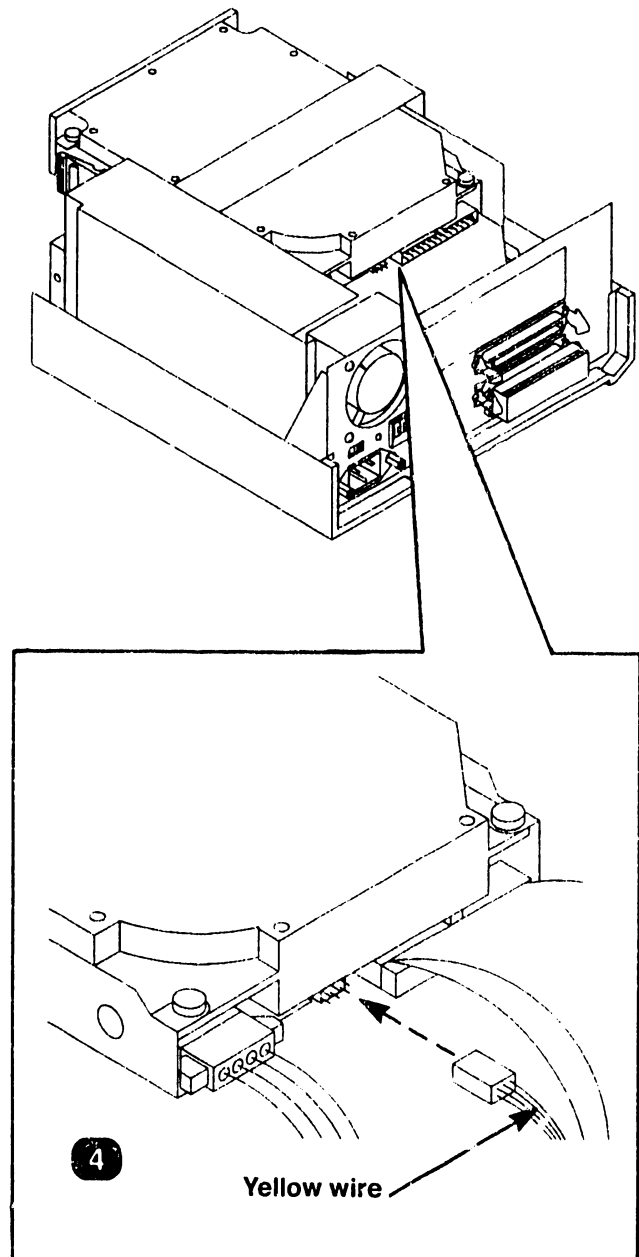
7.5 Drive Removal

7.5.2 145MB Disk Drive (Model 2269V-4C) (Sheet 3 of 3)

NOTE

For drives installed in bottom rail, use target ID switch cable closest to the fan (leftmost switch when viewed from rear of unit). For drives mounted in top rail, use target ID switch cable furthest from the fan (rightmost switch when viewed from rear of unit).

- 4) Note Target ID Connector pin 1 (yellow wire) and position connector with pin 1 towards the bottom right as viewed from the rear, and connect Target ID Cable to Target ID connector.
- 5) Slide drive into chassis being careful not to pinch cables until rails lock into place.
- 6) Replace front bezel (-7.3) and top cover (-7.2).



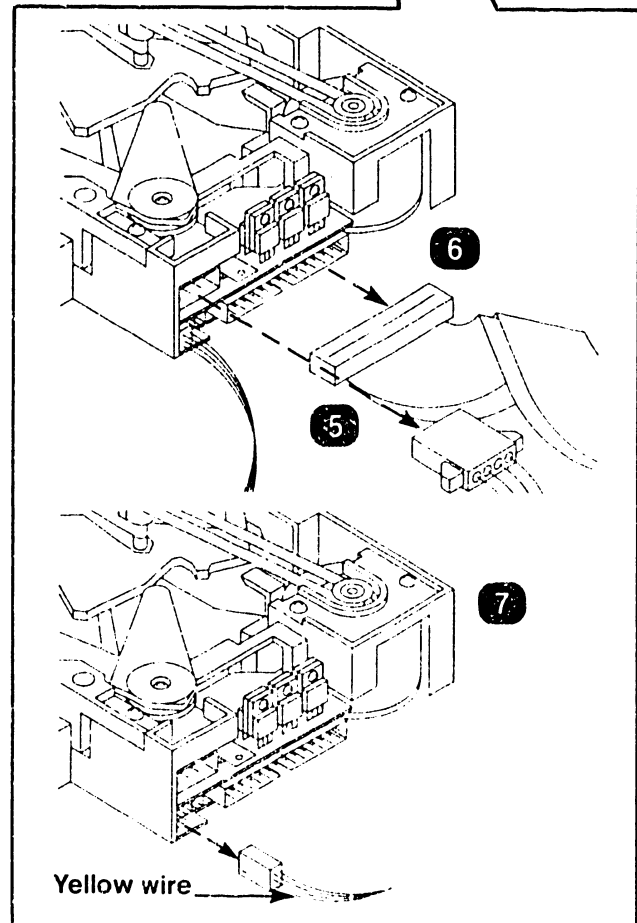
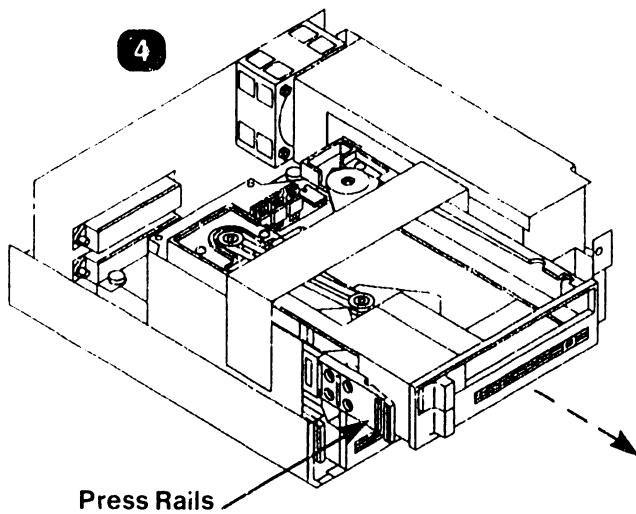
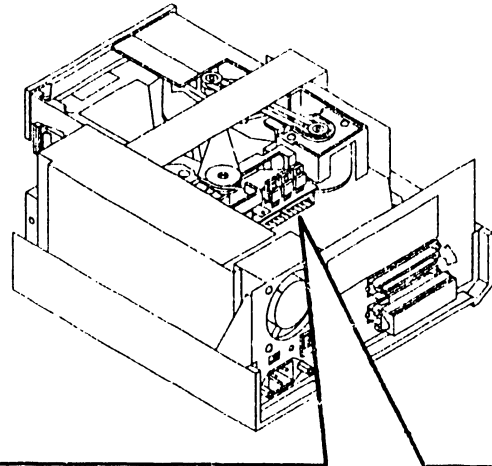
x END

7.5 Drive Removal

7.5.3 150MB Cartridge Tape (Model 2238V-3C) (Sheet 1 of 3)

To Remove

- 1) Power Off SCSI Storage Module and disconnect ac power. (-4.2)
- 2) Remove top cover. (-7.2)
- 3) Remove front bezel. (-7.3)
- 4) Press drive slide rails and pull drive out about 3 inches.
- 5) Note cable position and remove power cable from power connector.
- 6) Note cable position and remove 50-pin SCSI cable from SCSI connector.
- 7) Note cable position and remove 6-pin Target ID cable from target connector.
- 8) Remove drive from chassis.



→ NEXT

7.5 Drive Removal

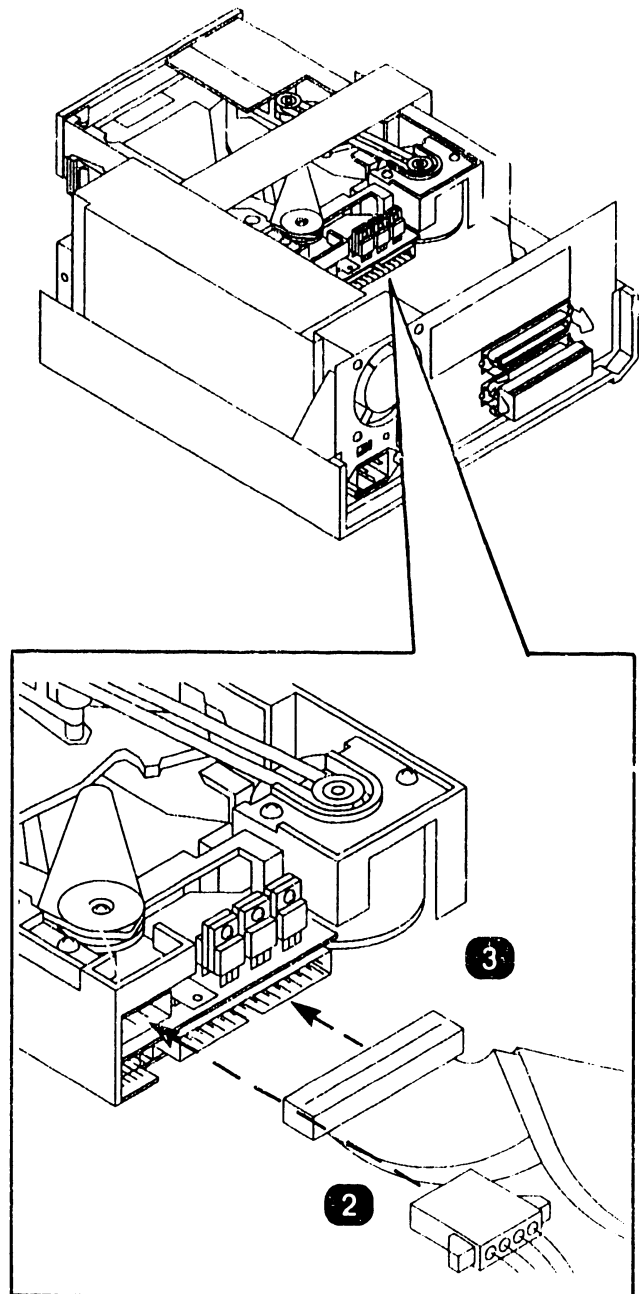
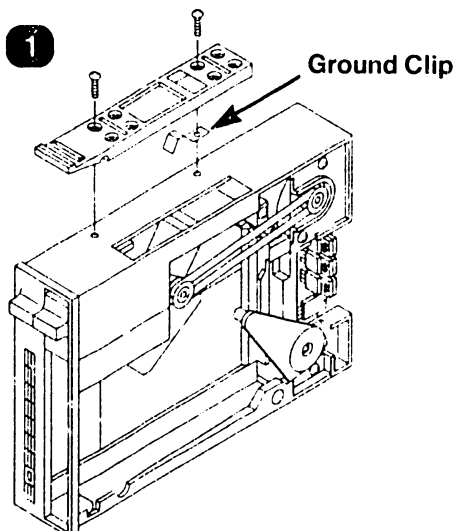
7.5.3 150MB Cartridge Tape (Model 2238V-3C) (Sheet 2 of 3)

To Install

NOTE

For drive replacement, nylon rails on the drives must be positioned in the rearmost settings. Ensure drive ground clip is making good electrical contact.

- 1) Remove two screws securing each drive nylon rail to drive and install rails in the rearmost position. Be sure drive ground clip is making good electrical contact with drive.
- 2) Install drive part way into bottom rail and connect power cable to drive power connector.
- 3) Note SCSI cable key and twist cable 180 degrees so key is facing down and connect SCSI cable to SCSI connector.



→ NEXT

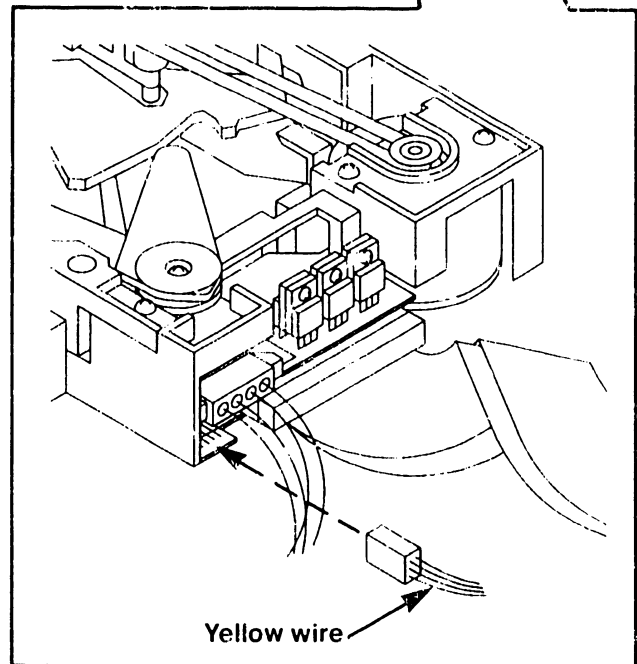
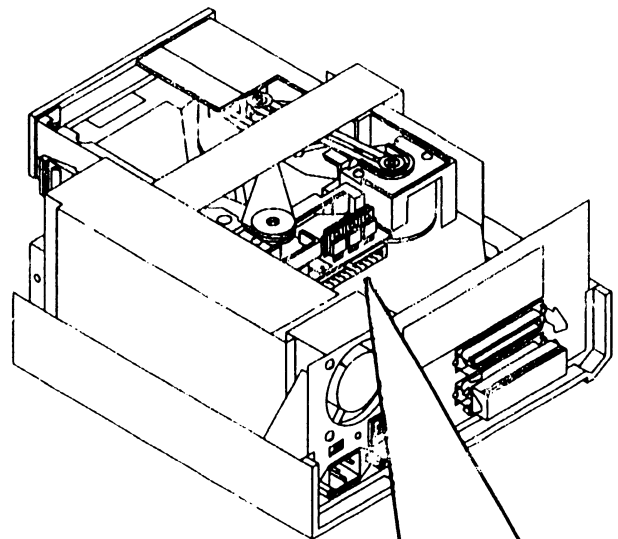
7.5 Drive Removal

7.5.3 150MB Cartridge Tape (Model 2238V-3C) (Sheet 3 of 3)

NOTE

For drives installed in bottom rail, use target ID switch cable closest to the fan (leftmost switch when viewed from rear of unit). For drives mounted in top rail, use target ID switch cable furthest from the fan (rightmost switch when viewed from rear of unit).

- 4) Note Target ID Connector pin 1 (yellow wire) and position connector with pin 1 (yellow wire) towards the bottom left as viewed from the rear), and connect Target ID Cable to Target ID connector.
- 5) Slide drive into chassis being careful not to pinch cables until rails lock into place.
- 6) Replace front bezel (→ 7.3) and top cover (→ 7.2).

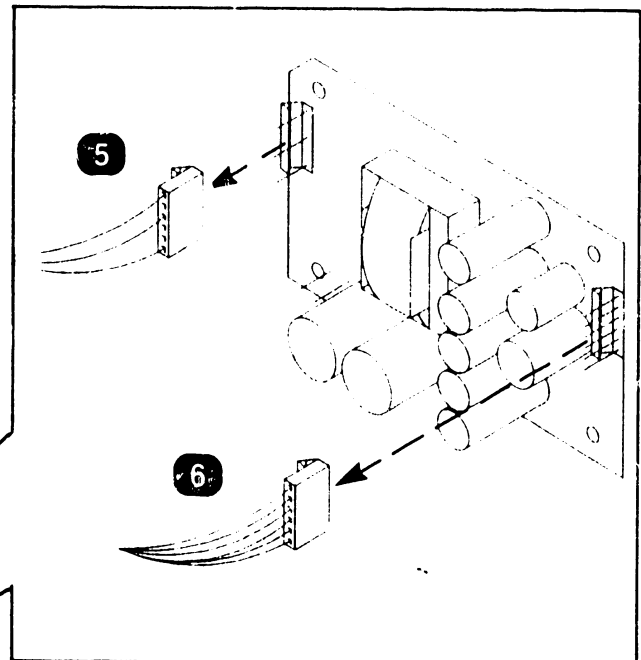
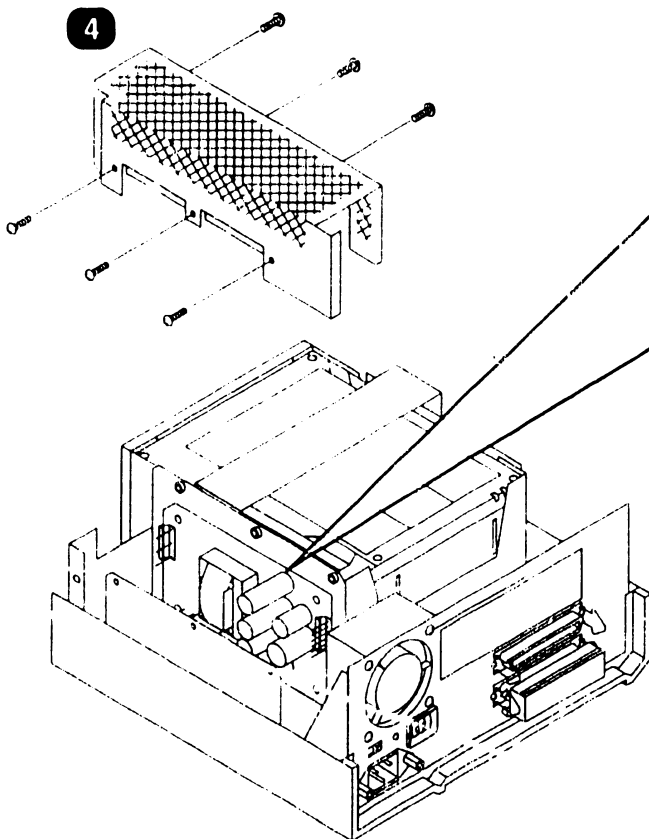


α END

7.6 Power Supply Removal (Sheet 1 of 2)

To Remove

- 1) Power Off SCSI Storage Module and disconnect ac power. (-4.2)
- 2) Remove top cover. (-7.2)
- 3) Remove front bezel. (-7.3)
- 4) Remove six power supply cover mounting screws. Remove cover.
- 5) Remove 5-position cable from power supply connector J1. (Green/yellow wire to pin 1.)
- 6) Remove 6-position cable from power supply connector J2. (Red wire to pin 1.)



→ NEXT

7.6 Power Supply Removal (Sheet 2 of 2)

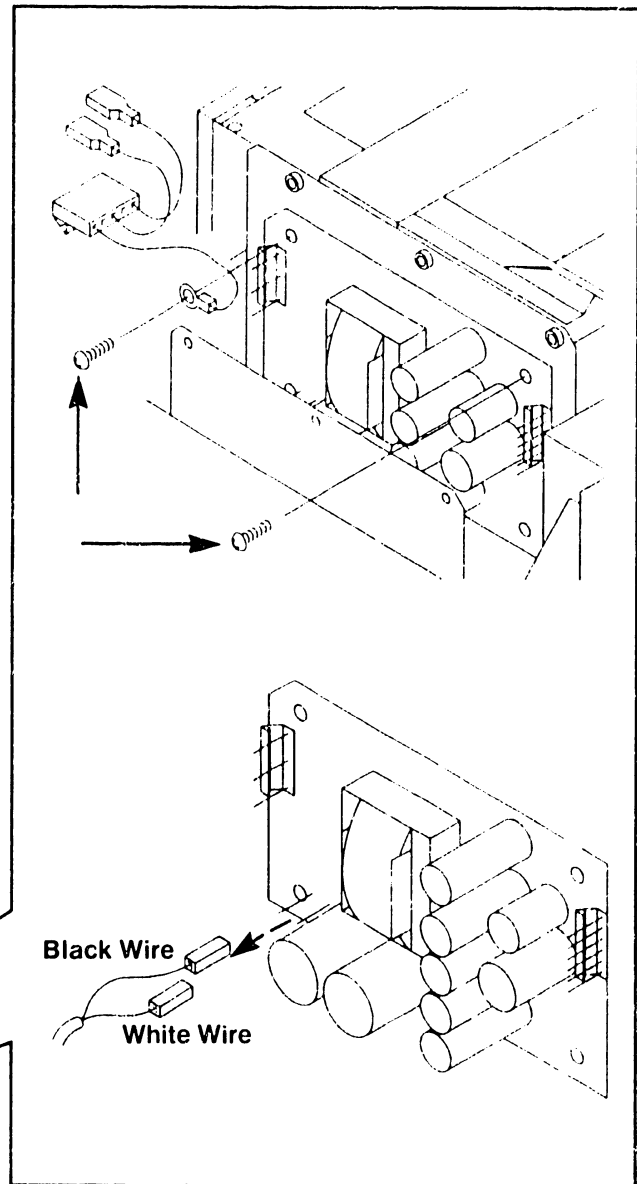
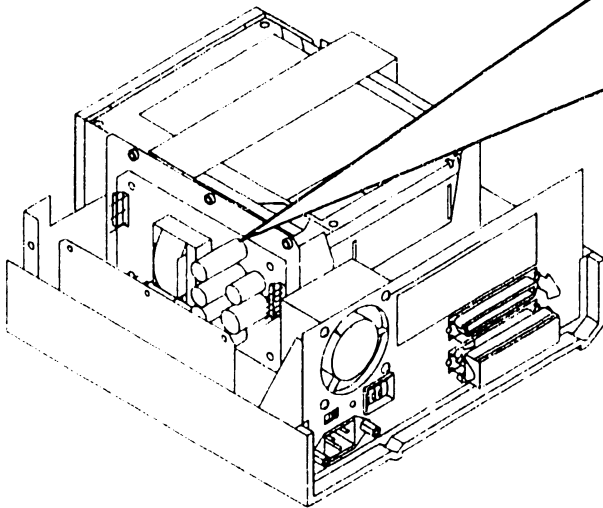
- 7) Remove two power supply mounting screws. Remove power supply.
- 8) Note 110/220V switcher cable connections and remove black wire from pin 2 (220V) and white wire from pin 1 (115V). (Blue wire is not used.)

*To Install***NOTE**

Bottom of the power supply must be inserted in the nylon card guide.

Ensure connector J1 ground wire (green/yellow) is positioned under the left mounting screw and is making good electrical contact with the power supply.

- 1) To complete installation, reverse removal procedures.

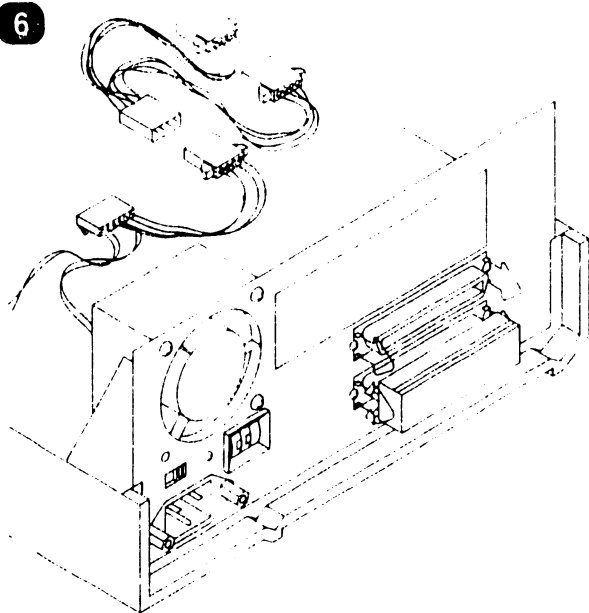


✕ END

7.7 DC Fan/Power Harness Assembly

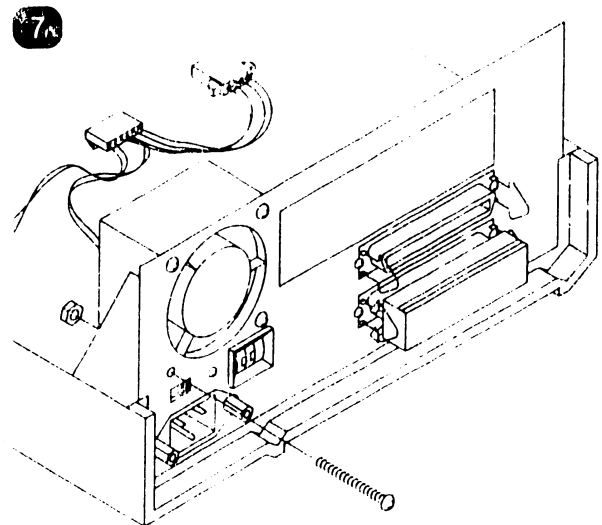
To Remove

- 1) Power Off SCSI Storage Module and disconnect ac power. (-4.2)
- 2) Remove top cover. (-7.2)
- 3) Disconnect Power-On LED cable. (-7.4, step 4)
- 4) Remove power supply cover. (-7.6, step 4)
- 5) Disconnect 6-position cable from power supply connector J2. (-7.6, step 6)
- 6) Disconnect power 'Y' cable.
- 7) Remove four screws and nuts securing DC fan to chassis.
- 8) Remove fan/power harness assembly.

*To Install***NOTE**

Position replacement fan/power harness assembly with two wires from the fan in the bottom left hand corner (as viewed from rear) and airflow arrow on the bottom of the fan pointing towards the rear of chassis.

- 1) To complete installation, reverse removal procedures.

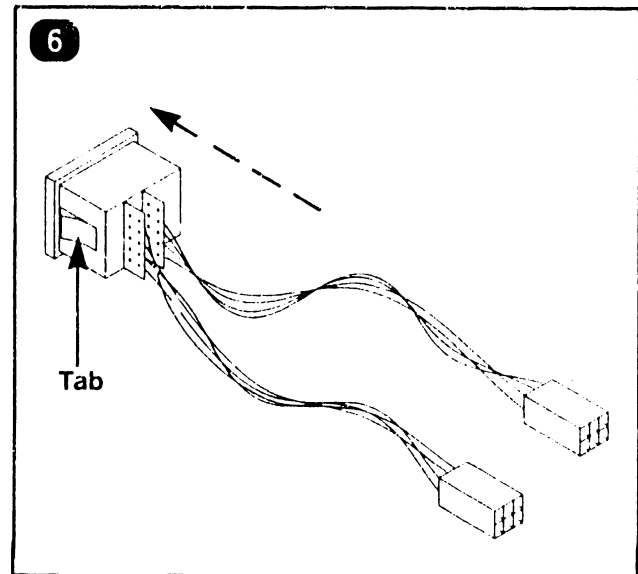


α END

7.8 Dual Thumbwheel Switch

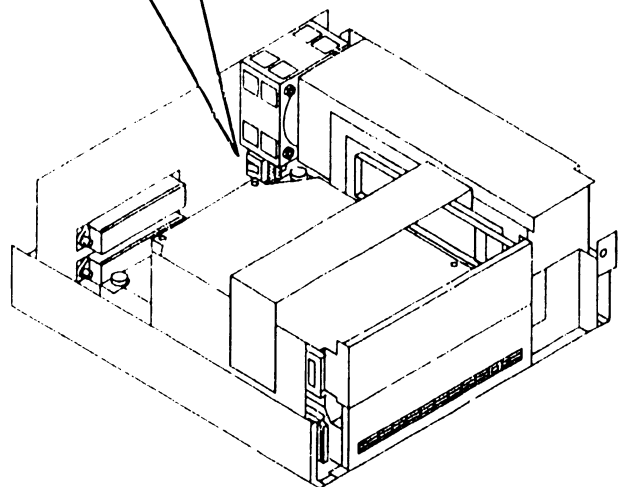
To Remove

- 1) Power Off SCSI Storage Module and disconnect ac power. (-4.2)
- 2) Remove top cover. (-7.2)
- 3) Remove power supply cover. (-7.6, step 4)
- 4) Remove fan/power harness assembly. (-7.7)
- 5) Disconnect Target ID connector from drives. (-7.5)
- 6) Press tabs on both side of thumbwheel switch and slide switch out through rear of chassis.

*To Install***NOTE**

For replacement, position switch with number designation in upright position.

- 1) To complete installation, reverse removal procedures.



α END

7.9 SCSI Interface Cable

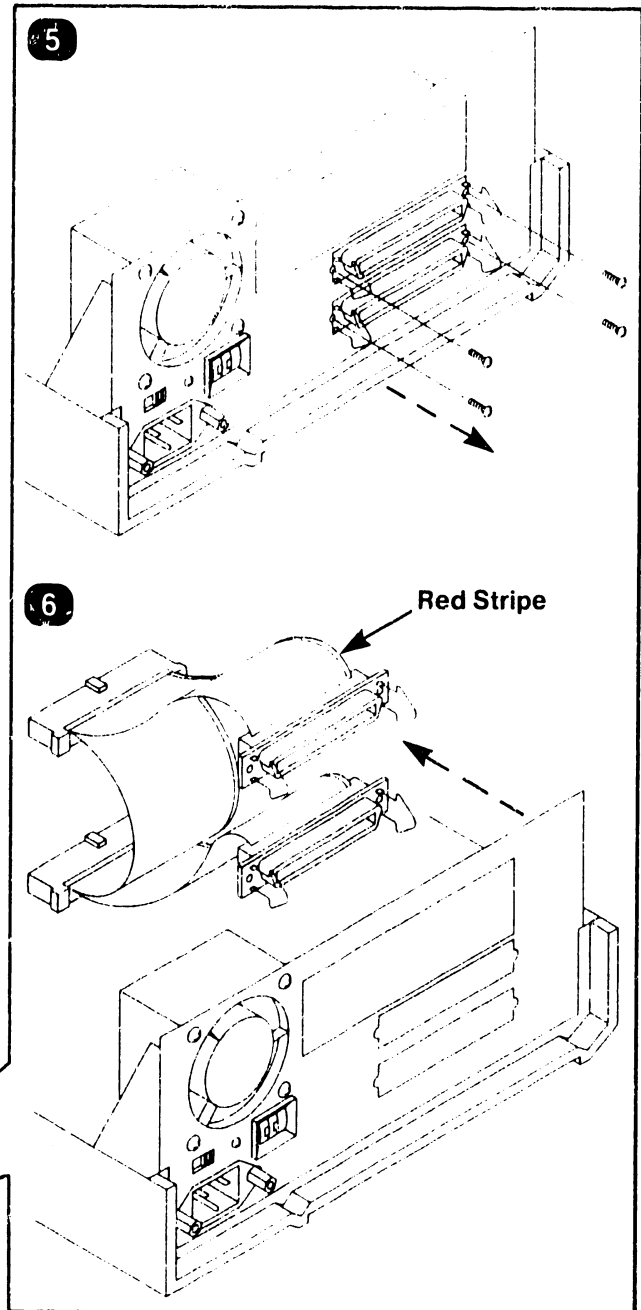
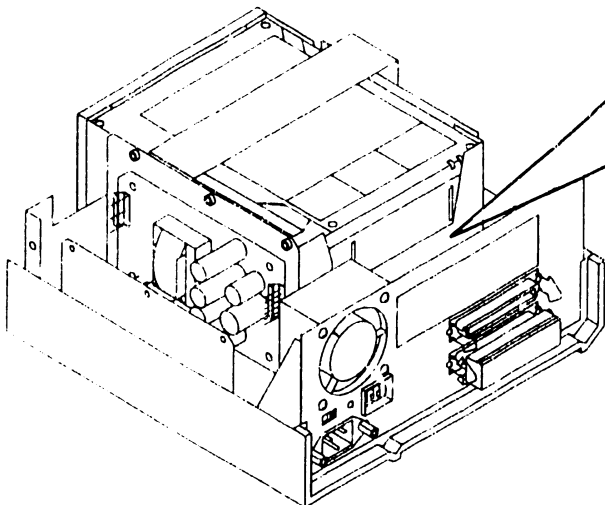
To Remove

- 1) Power Off SCSI Storage Module and disconnect ac power. (-4.2)
- 2) Remove top cover. (-7.2)
- 3) Remove front bezel. (-7.3)
- 4) Remove drives. (-7.5)
- 5) Remove two screws per connector that secure SCSI connectors to chassis.
- 6) Remove SCSI Interface cable.

*To Install***NOTE**

Position replacement SCSI cable with pin 1 (red stripe) towards the right hand side of chassis as viewed from the rear.

- 1) To complete installation, reverse removal procedures.



□ END

SECTION

8

ADJUSTMENTS

**SECTION 8
CONTENTS**

8.1 ADJUSTMENTS 8-2

8.1 Adjustments

No electrical or mechanical adjustments are required for the SCSI Storage Module and associated drives.

⌘ END

SECTION

9

INSTALLATION

**SECTION 9
CONTENTS**

9.1 TOOLS AND EQUIPMENT 9-2

9.2 UNPACKING PROCEDURES 9-3

9.2.1 Unpacking And Inspecting SCSI Storage Module 9-3

9.2.2 Claims Information 9-4

9.3 SWITCH SETTINGS 9-5

9.4 CONNECTIONS 9-6

9.4.1 Single SCSI Storage Module 9-7

9.4.2 Stacked SCSI Storage Modules 9-8

9.4.3 Side-By-Side SCSI Storage Modules 9-10

9.5 SYSTEM POWER-UP 9-12

9.6 ADDITIONAL DRIVE UPGRADES 9-15

9.1 Tools And Equipment

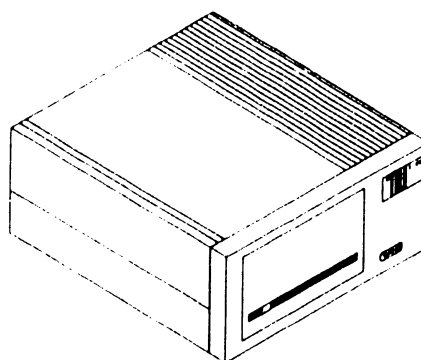
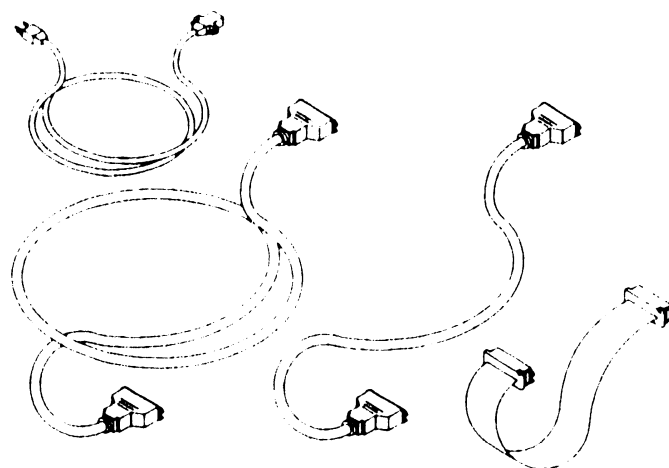
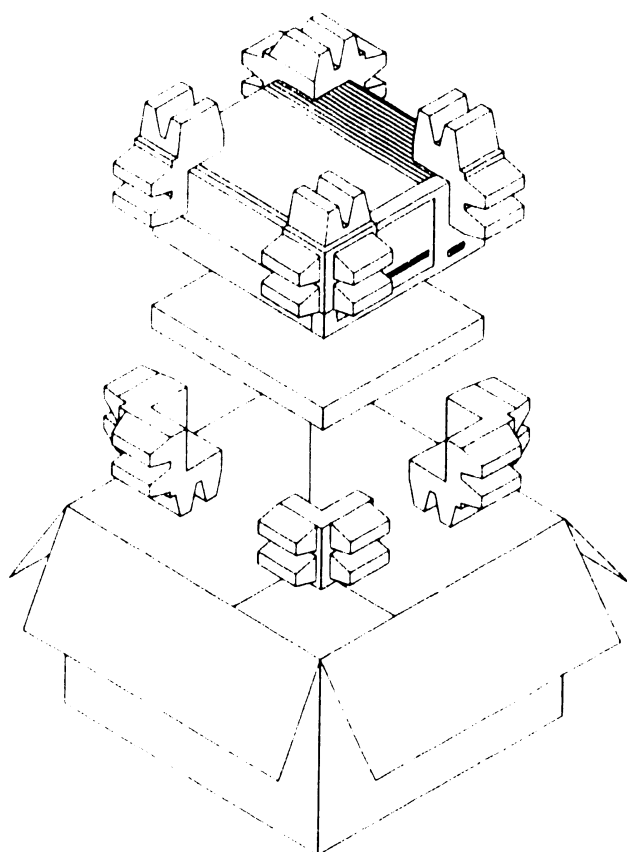
No special tools or equipment are required for installing the SCSI Storage Module and associated drives.

□ END

9.2 Unpacking Procedures

9.2.1 Unpacking And Inspecting SCSI Storage Module

- 1) Remove SCSI Storage Module from shipping carton. (Cables are shipped in a separate box.)
- 2) Verify the following items have been received:
 - SCSI Storage Module
 - 8 foot SCSI cable (421-0066)
 - 1 foot SCSI cable (220-3621)
 - 2 foot SCSI cable (421-0084)
- 3) Visually inspect unit for external damage.



⌘ END

9.2 Unpacking Procedures

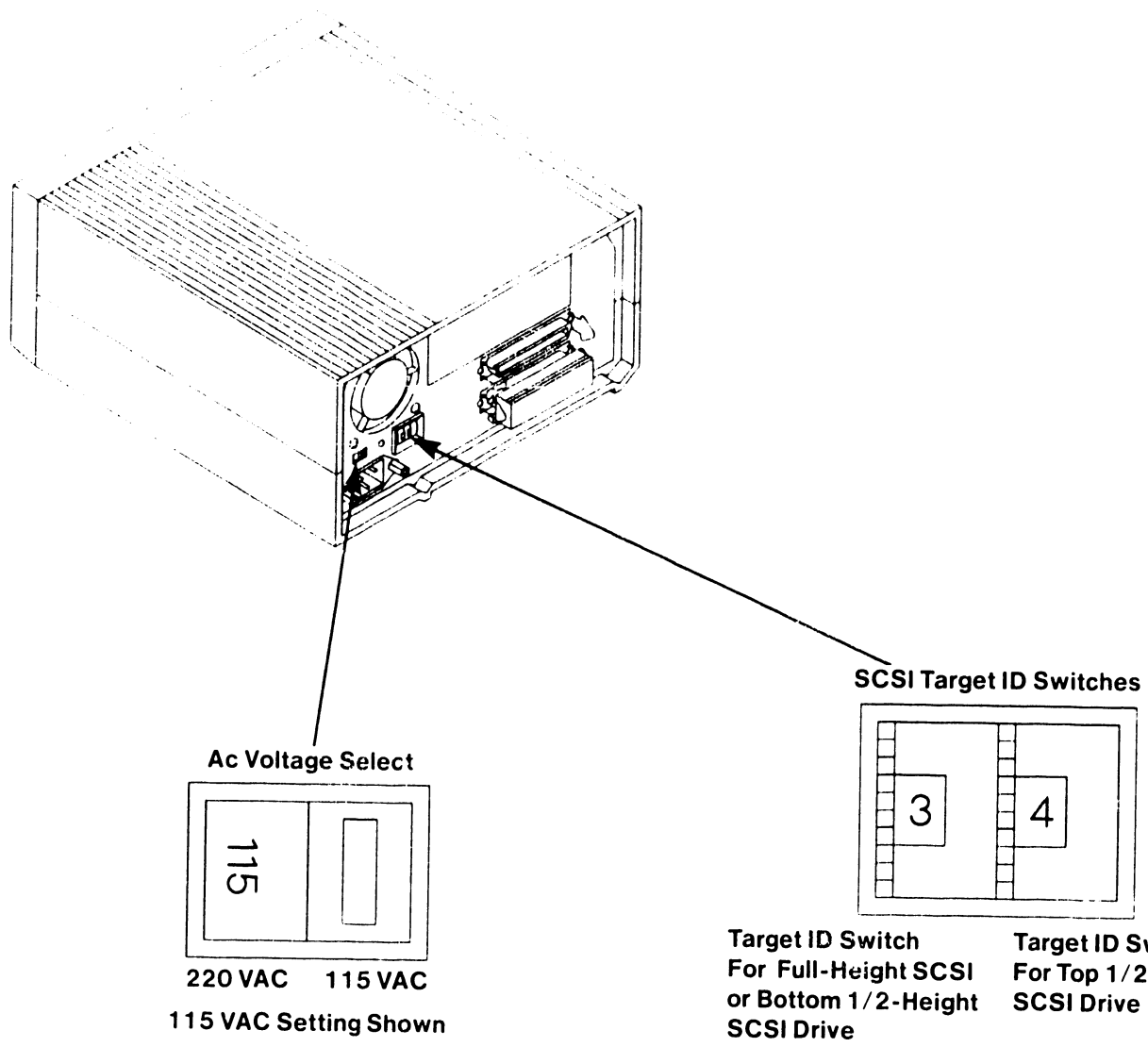
9.2.2 Claims Information

If damage is discovered during unpacking or inspection, notify your manager.

⌘ END

9.3 Switch Settings

- 1) Set 115V/230V Ac Voltage Select switch to match the incoming voltage.
- 2) Set Target(s) ID address to a valid, unused address.



□ END

9.4 Connections

NOTE

VS-5000 Series RCU board supports a total of seven SCSI devices (system mounted and SCSI Storage Module). Be sure to not exceed this limit.

VS-5000 Series SCSI Controller supports a total of seven SCSI devices. Be sure to not exceed this limit.

The last SCSI target on the bus must be terminated using the SCSI Bus terminator.

SCSI Storage Modules configurations can either be:

- Single SCSI Storage Module
- Stacked SCSI Storage Modules
- Side-By-Side Storage Modules

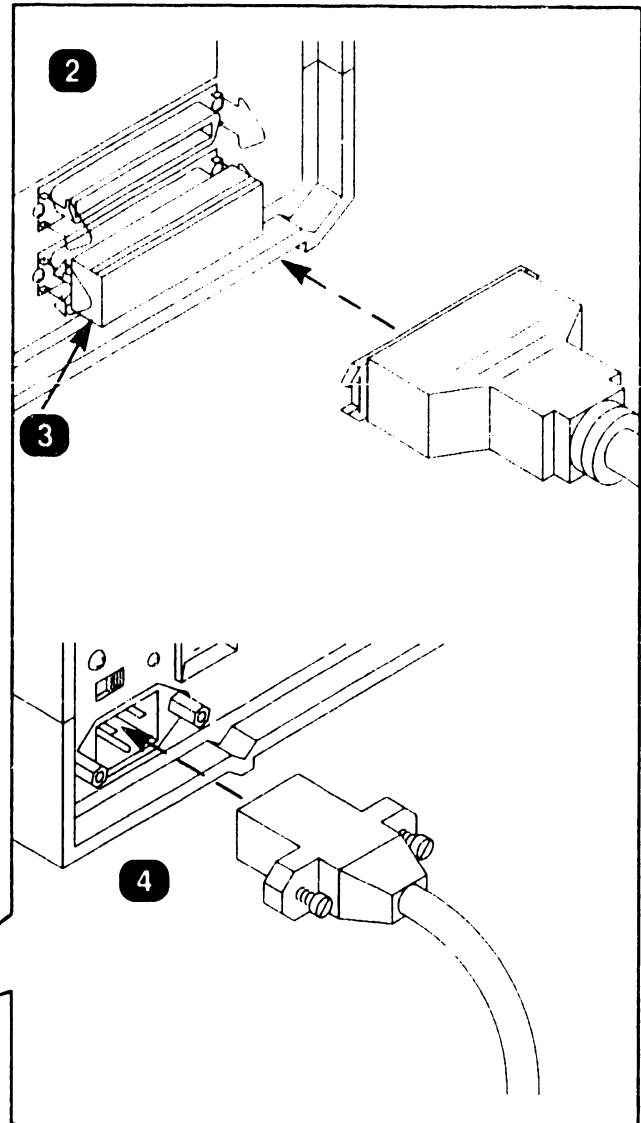
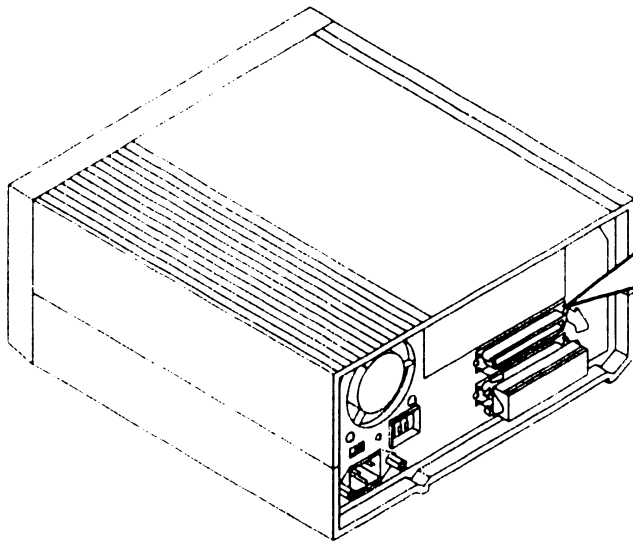
SCSI Storage Modules can contain either one 326MB full-height drive, one 145MB half-height drive, one 150MB half-height cartridge tape drive, or a combination of two half-height drives.

→ NEXT

9.4 Connections

9.4.1 Single SCSI Storage Module

- 1) Verify target ID address and ac voltage select setting. (→ 9.3)
- 2) Connect 8 foot SCSI interface cable (421-0066) between SCSI Host connector (RCU or 1-Port SCSI) and the top connector (SCSI Bus Signal-In). Secure cable using the snap locks.
- 3) Ensure the SCSI Bus terminator is installed on the SCSI Bus Signal-out connector and secured with the snap locks.
- 4) Connect ac power cord to ac power input connector.



α END

9.4 Connections

9.4.2 Stacked SCSI Storage Modules (Sheet 1 of 2)

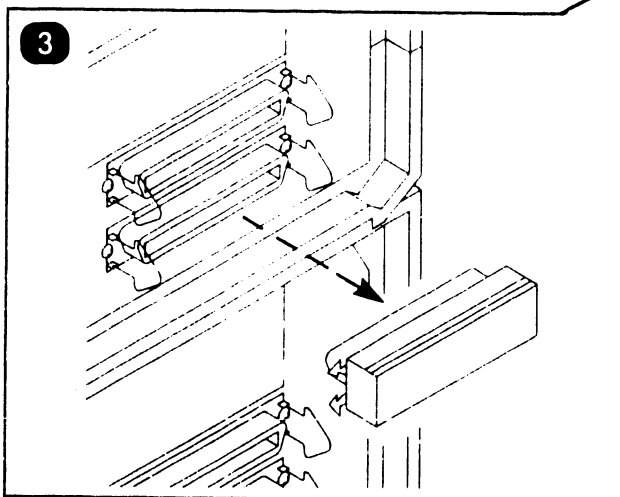
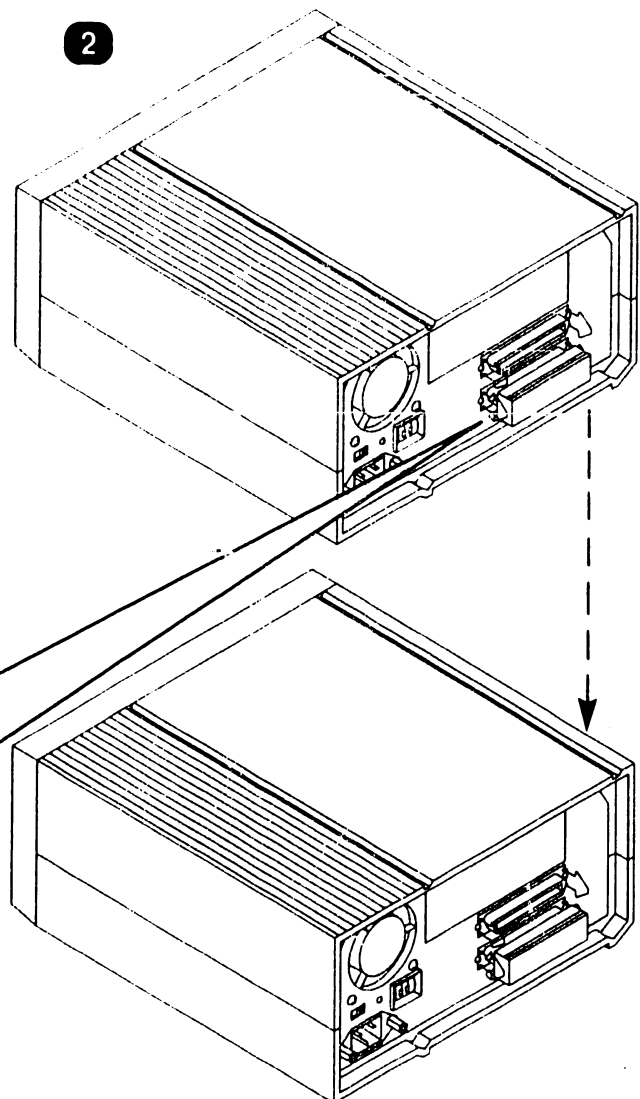
- 1) Verify target ID address and ac voltage select setting for each SCSI Storage Module target (drive). (→ 9.3)

NOTE

Do Not exceed the maximum accumulated SCSI cable length of 6 meters (18.75 feet). Include the 1.6 foot internal SCSI Storage Module SCSI cable in the calculations.

Do Not exceed the maximum number of SCSI devices (targets) supported by the SCSI Host.

- 2) Stack the SCSI Storage Modules by placing the legs of the upper module into the top cover grooves of the lower module.
- 3) Remove the terminator from the upper SCSI Storage module SCSI bus Signal-Out connector.

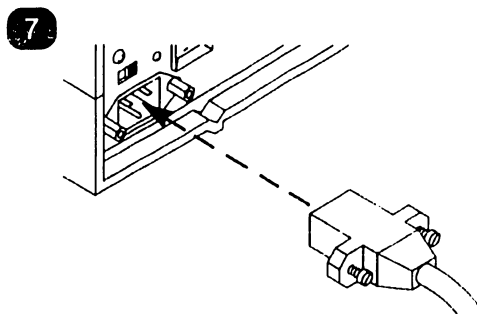
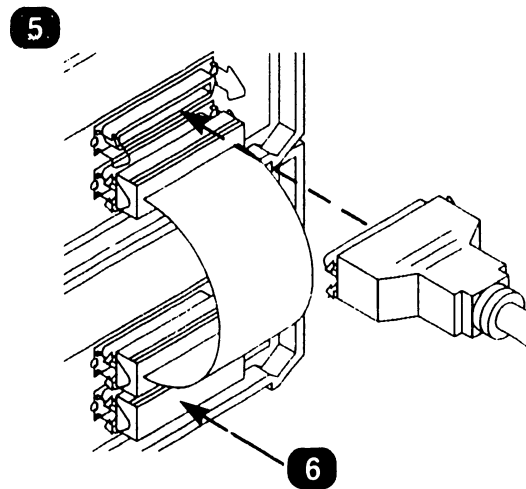
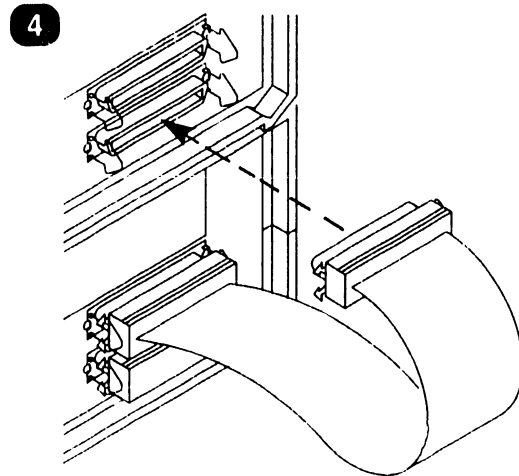
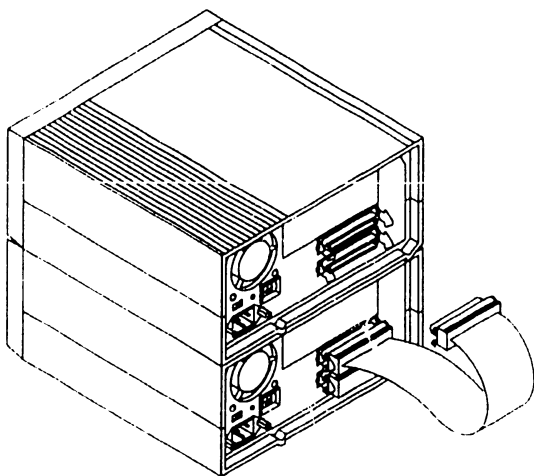


→ NEXT

9.4 Connections

9.4.2 Stacked SCSI Storage Modules (Sheet 2 of 2)

- 4) Connect the one foot SCSI interface cable (220-3621) between the upper module SCSI Signal-Out connector and lower module Signal-In connector. Secure cable using the snap locks.
- 5) Connect 8 foot SCSI interface cable (421-0066) between SCSI Host connector (RCU or 1-Port SCSI) and the top connector (SCSI Bus Signal-In) of the upper module. Secure cable using the snap locks.
- 6) Ensure the SCSI Bus terminator is installed on the lower module SCSI Bus Signal-out connector and secured in place with the snap locks.
- 7) Connect ac power cord to modules' ac power input connector.



⌘ END

9.4 Connections

9.4.3 Side-By-Side SCSI Storage Modules (Sheet 1 of 2)

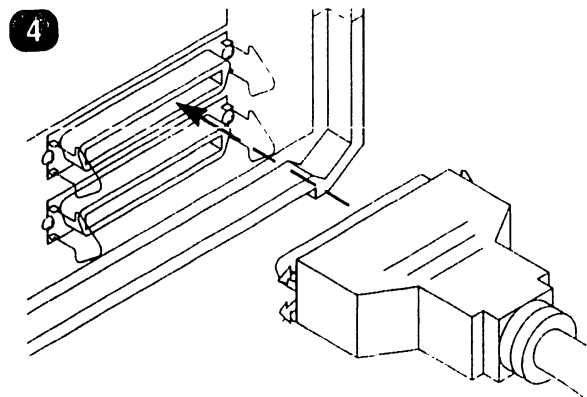
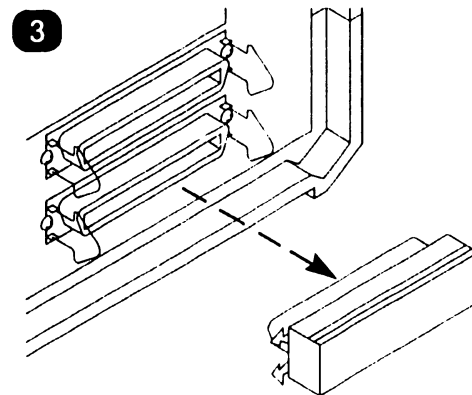
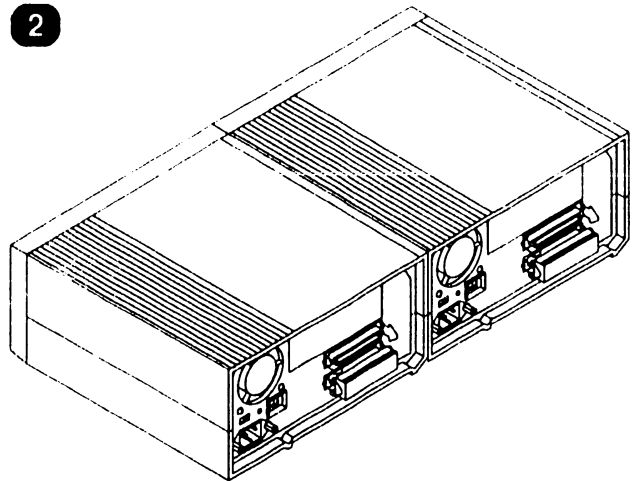
- 1) Verify target ID address and ac voltage select setting for each SCSI Storage Module target (drive). (→ 9.3)

NOTE

Do Not exceed maximum accumulated SCSI cable length of 6 meters (18.75 feet). Include the 1.6 foot internal SCSI Storage Module SCSI cable in the calculations.

Do Not exceed the maximum number of SCSI devices (targets) supported by the SCSI Host.

- 2) Position SCSI Storage Modules side-by-side within the two foot cable length.
- 3) Remove the terminator from the SCSI Storage module being connected to the Host.
- 4) Connect 8 foot SCSI interface cable (421-0066) between the SCSI Host connector (RCU or 1-Port SCSI) and the top connector (SCSI Bus Signal-In) of the first module. Secure cable using the snap locks.

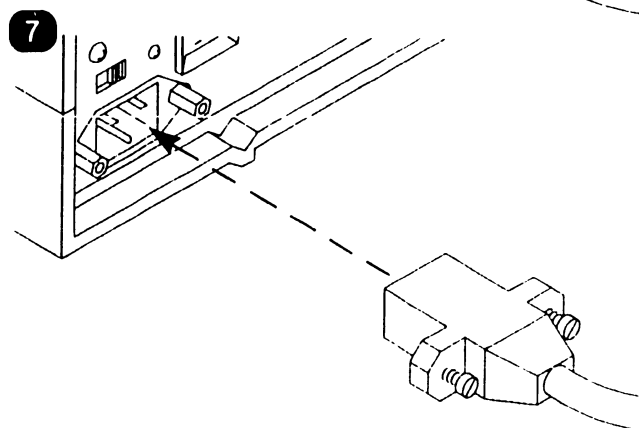
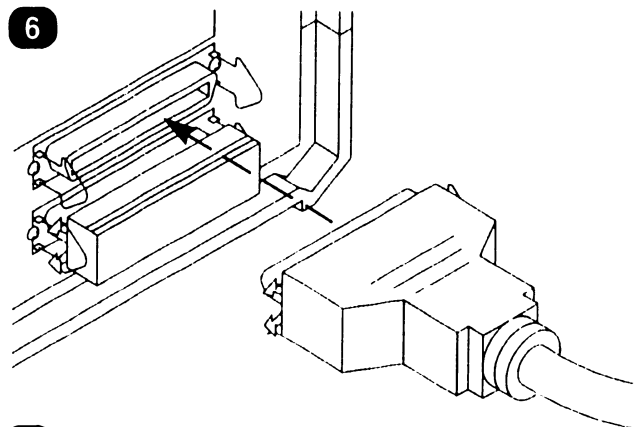
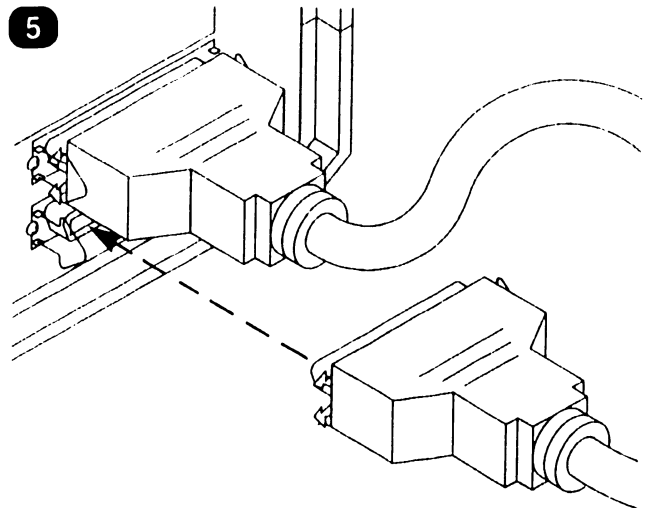
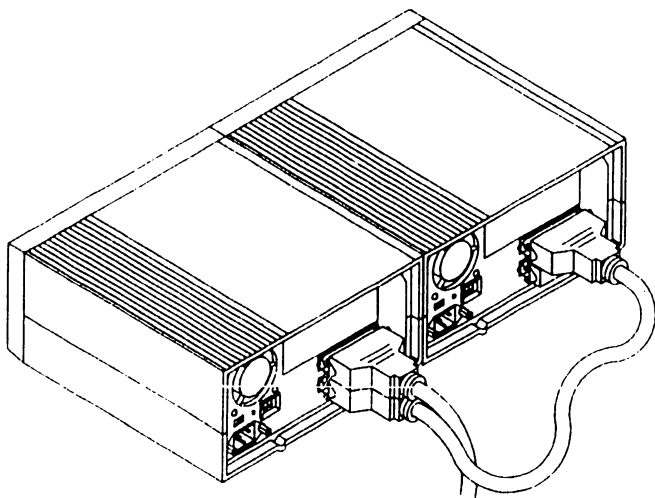


→ NEXT

9.4 Connections

9.4.3 Side-By-Side SCSI Storage Modules (Sheet 2 of 2)

- 5) Connect the two foot SCSI interface cable (421-0084) between the first module SCSI Signal-Out connector and the adjacent module Signal-In connector. Secure cable using the snap locks.
- 6) Ensure the SCSI Bus terminator is installed on the last module SCSI Bus Signal-Out connector and secured in place with the snap locks.
- 7) Connect ac power cords to module's ac power input connector.



⌘ END

9.5 System Power-Up (Sheet 1 of 3)

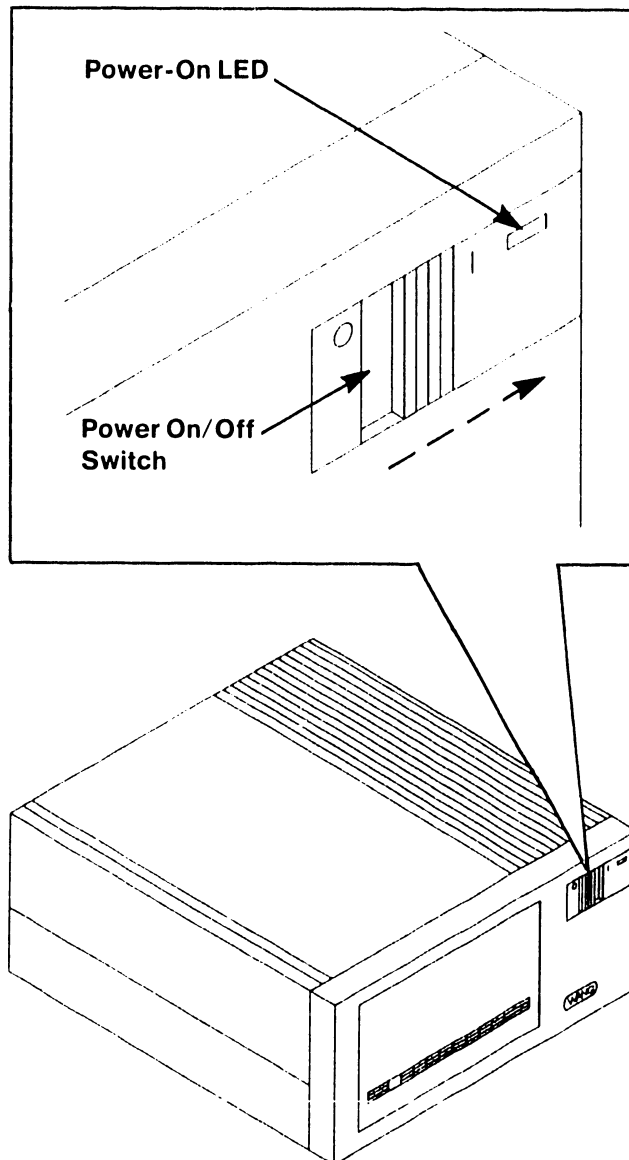
NOTE

SCSI Storage Module Power-On procedures use the VS-5000 Computer System as the mainframe (Host). Other mainframe procedures will be similar; refer to the appropriate mainframe manual for power-on procedures.

Before applying power to the SCSI Storage Modules ensure that:

- SCSI Storage Modules target IDs do not conflict with other SCSI devices installed on the bus.
- Cables are securely attached.
- The last SCSI Storage Module target has the terminator installed.
- Storage Module Ac Select Switch is set to match incoming power source.
- SCSI Storage Module ac power cord is connected to an ac receptacle.

- 1) Power ON SCSI Storage Modules by sliding the power-on switch to the On position. Power-On LED should be illuminated.
- 2) Power ON VS-5000 mainframe. (Refer to VS-5000 Computer Manual.)



→ NEXT

9.5 System Power-Up (Sheet 2 of 3)

3 The VS-5000 Computer runs its Resource Control Unit (RCU) BIT diagnostics and upon successful completion displays the IPL Drive Selection Screen on Workstation 0 (WS0).

VS 5000 Revision 8861
 (c) Copr. Wang Laboratories, Inc. 1988
 (Initial message) Building IPL device table, please wait.
 (replaced by) Default action is to xx in xx seconds.

Device	Capacity	Type	Volume	VSID	Status
2270V7	1.2 MB	Dsket			
x 2269V5	326 MB	Fixed	SYSTEM	0	Bootstrap Device
2269V4	145 MB	Rem	BACKUP	0	Media Tolerant
2269V4	145 MB	Rem	KAKRED	0	Media Tolerant
2269V5	326 MB	Fixed	AMKTAP	0	Media Tolerant

- | | |
|---------------------|---------------------|
| (1) IPL | (9) Set Date & Time |
| (2) Test & IPL | |
| (3) Test/Continuous | (16) Stop Auto Seq |

NOTE

Streaming Cartridge Tape drives are not reported on this screen.

→ NEXT

9.5 System Power-Up (Sheet 3 of 3)

- 4 Verify all SCSI devices (except Streaming Cartridge Tape) on the bus are correctly identified. Devices are listed in descending order according to their target ID, with target ID 6 (if used) being the first SCSI device listed following the diskette drive.
- 5 If SCSI devices are properly declared, the SCSI devices have power-on properly. If some SCSI devices are not declared, refer to Section 6, Troubleshooting.
- 6 Run system 'GENEDIT' and declare all SCSI devices installed on the system.
- 7 Initialize all new disk drives using DISKINT.

x END

9.6 Additional Drives Upgrades

Additional drives configurations can be installed in the SCSI Storage Module. Five configurations are available:

- One 145MB Disk
- One 326MB Disk
- One 150MB Cartridge Tape
- One 150MB Cartridge Tape and one 145 MB Disk
- Two 145MB Disk

Refer to section 7.5, Drive Removal for drive removal and replacement procedures.

α END

SECTION

10

**FUNCTIONAL
DESCRIPTION**

**SECTION 10
CONTENTS**

10.1 SCSI STORAGE MODULE DESCRIPTION 10-2

10.1 SCSI Storage Module Description (Sheet 1 of 2)

The SCSI Storage Module provides external disk and/or cartridge tape storage for up to two half-height SCSI embedded drives or one full-height SCSI embedded drive. SCSI Storage Modules can be added to provide up to 7 target devices on the SCSI bus.

The SCSI Storage Module contains an internal power supply that converts the source voltage (115 Vac or 230 Vac) into output voltages required for drive operation; +5 Vdc, +12 Vdc, and ground (± 0 V). The power supply is self-adjusting with no voltage adjustments required.

The SCSI Bus is under control of the initiator that provides the control signals, arbitration signals, and address/data signals required for the SCSI Bus. SCSI Bus signals and descriptions are as follows:

→ NEXT

FUNCTIONAL DESCRIPTION

10.1 SCSI Storage Module Description (Sheet 2 of 2)

<i>Signal</i>	<i>Mnemonic</i>	<i>Description</i>
BUSY	-BSY	Signal that indicates the bus is presently being used.
SELECT	-SEL	Signal used by the initiator to select a target or by a target to reselect the initiator.
COMMAND/ DATA	-C/D	Signal driven by the target indicating whether command (C) or data (D) information is on the bus.
INPUT/ OUTPUT	-I/O	Signal driven by the target that controls the direction of data movement on the data bus with respect to the initiator. 1 denotes input to target, 0 denotes input to initiator.
MESSAGE	-MSG	Signal driven by the target indicating message phase.
REQUEST	-REQ	Signal driven by the target indicating a request for a data byte transfer.
ACKNOWLEDGE	-ACK	Signal driven by the initiator indicating acknowledgement of a Request/Acknowledge transfer.
ATTENTION	-ATN	Signal driven by the Initiator to indicate an Attention condition, where the Initiator wants to transfer a message byte to a target.
RESET	-RES	Signal that indicates a bus reset condition.
DATA BITS 0 - 7	-DB0-7	Command information or data information on the bus depending on the state of -C/D signal.
PARITY BIT	-DBP	Parity bit assigned to the Command or Data information byte of data bits 0 - 7.

xx END

SECTION

11

SPECIFICATIONS

SECTION 11
CONTENTS

11.1	HARDWARE	11-2
11.1.1	SCSI Storage Module	11-2
11.1.2	145MB Disk Drive (2269V-4C)	11-3
11.1.3	326MB Disk Drive (2269V-5C)	11-4
11.1.4	150MB Streaming Cartridge Tape Drive (2238V-3C) ..	11-5

11.1 Hardware

11.1.1 SCSI Storage Module

Dimensions:

Depth: 11.0 inches (28.0 cm)
Width: 10.0 inches (25.4 cm)
Height: 5.0 inches (12.7 cm)
Weight: 12 - 14 lbs (5.5 - 6.4 kg)
(configuration dependent)

Power Requirement:

90 - 132 Vac (115 Vac nominal)
60 Hz +/- 0.5 (60 Hz nominal)
180 - 264 Vac (230 Vac nominal)
50 Hz +/- 0.5 (50 Hz nominal)

Power Supply Output Voltages:

+5 Vdc:
Output Range: 4.75 to 5.25 volts
Output Current:
Full Height drive - 0.5 to 2.5 Amps
Half Height drive - 0.25 to 1.25 Amps

+12 Vdc:
Output Range: 11.40 to 12.60 volts
Output Current:
Full Height drive - 1.2 to 3.0 Amps
(6.0 Amps Peak at 3% duty cycle)
Half Height drive - 0.6 to 1.5 Amps
(3.0 Amps Peak at 3% duty cycle)

Power Dissipation:

48 Watts (163 BTU/Hr)

Maximum SCSI Cable Length:

18.75 feet (6 meters) Accumulative

α END

11.1 Hardware

11.1.2 145MB Disk Drive (2269V-4C)

Drive Dimensions:

Depth: 8.0 inches (203 mm)
Width: 5.75 inches (146 mm)
Height: 1.63 inches (41.3 mm)
Weight: 3.6 lb (1.6 kg)

Drive Performance:

Capacity: 145 MB Formatted
Number of Data Heads: 7
Transfer Rate: 1.25 MB/Second
Seek Time (average): 23 Msec
Rotational Latency (average): 8.33 Msec
Rotational Speed: 3600 RPM

Environmental:

Temperature: 50 to 122°F
(10 to 50°C)
Humidity: 10 to 85% non-condensing
Altitude: 0 to 10,000 feet
(0 to 3050 meters)

⌘ END

11.1 Hardware

11.1.3 326MB Disk Drive (2269V-5C)

Drive Dimensions:

Depth: 8.0 inches (203 mm)
Width: 5.75 inches (146 mm)
Height: 3.25 inches (82.6 mm)
Weight: 6.0 lb (2.7 kg)

Drive Performance:

Capacity: 326 MB Formatted
Number of Data Heads: 15
Transfer Rate: 1.25 MB/Second
Seek Time (average): 18 Msec
Rotational Latency (average): 8.33 Msec
Rotational Speed: 3600 RPM

Environmental:

Temperature: 50 to 122°F
(10 to 50°C)
Humidity: 10 to 90% non-condensing
Altitude: -200 to 10,000 feet
(-61 to 3050 meters)

⌘ END

11.1 Hardware

11.1.4 150MB Streaming Cartridge Tape Drive (2238V-3C)

Drive Dimensions:

Depth: 8.0 inches (203 mm)
Width: 5.75 inches (146 mm)
Height: 1.63 inches (41.3 mm)
Weight: 3.0 lb (1.36 kg)

Drive Performance:

Capacity (maximum): 150 MB
Tape Speed: 90.0 Inches Per Second
Tape Length (maximum): 600 feet
Track Format: 18 Track Serpentine
Transfer Rate: 112.5 KB/Second
Start/Stop Time: 300.0 usecond maximum

Environmental:

Temperature: 50 to 104°F
(10 to 40°C)
Humidity: 20 to 80% non-condensing
Altitude: -983 to 9840 feet
(-299.82 to 3001 meters)

✕ END

SECTION 12
ILLUSTRATED
PARTS

SECTION 12
CONTENTS

12.1 SCSI STORAGE MODULE 12-2

12.2 CABLE ASSEMBLIES 12-4

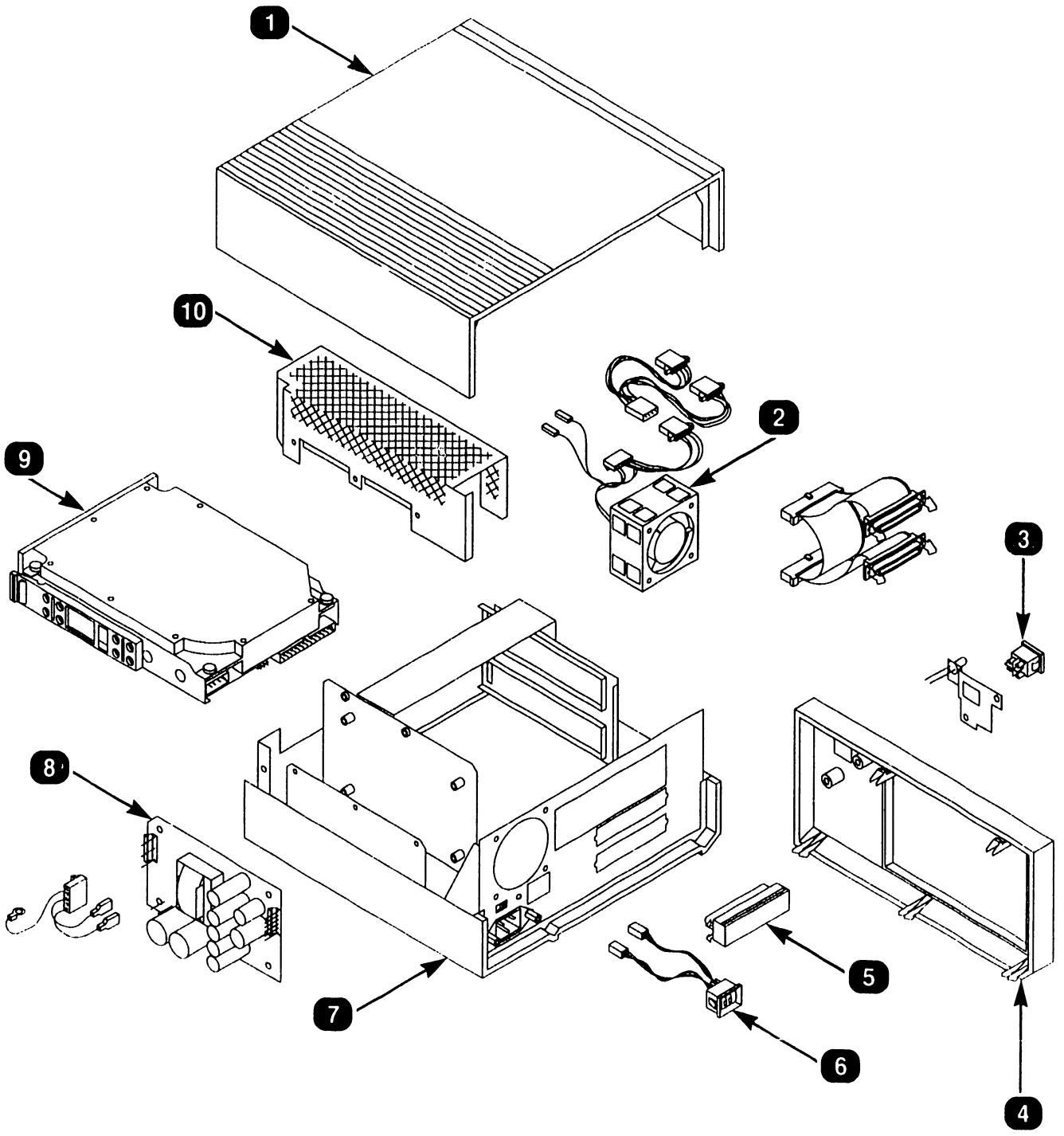
12.1 SCSI Storage Module (Sheet 1 of 2)

<i>Item</i>	<i>Part Number</i>	<i>Description</i>
1	449-1212	Cover, Top
2*	270-3469	Fan/Power Harness Assembly
3*	325-0091	Power On/Off Switch
4	449-1214	Bezel, Case Front
5	725-3334	Terminator, 50-pin
6*	220-2747	Thumbwheel Switch/Cable Assembly, 10-Position
7	449-1211	Base, Bottom
8*	725-4113	Power Supply
9*	725-3822	145 MB Half-Height Winchester Disk Drive (2269V-4C)
	725-3814	326 MB Full-Height Winchester Disk Drive (2269V-5C)
	725-3820	150 MB Streaming Cartridge Tape Drive (2238V-3C)
	725-1294	Tape, 600 foot
10	451-9016	Power Supply Cover

* = Field Replaceable Item

→ NEXT

12.1 SCSI Storage Module (Sheet 2 of 2)



⌘ END

12.2 Cable Assemblies

<i>Part Number</i>	<i>Description</i>
220-2749	Drive power cable, 4-pos. to dual 4-pos. connectors
220-2746	110/230V switcher cable
220-2748	Power supply Ac cable, dual spade lugs to 5-position connector (Power-On switch to Power Supply J1)
220-3691	SCSI interface cable, internal 18 inch
220-0220	Power cable, Ac filter to power on switch
421-0066	External SCSI interface cable, 8 foot
421-0084	External SCSI jumper cable, 2 foot (side-by-side installation)
220-3621	External SCSI jumper cable, 1 foot (stack installation)

x END

WANG

WANG LABORATORIES, INC., ONE INDUSTRIAL AVENUE, LOWELL, MA 01851 ● TELEPHONE (508)459-5000, TELEX 172108

COMPANY CONFIDENTIAL

PRINTED IN U.S.A.

END