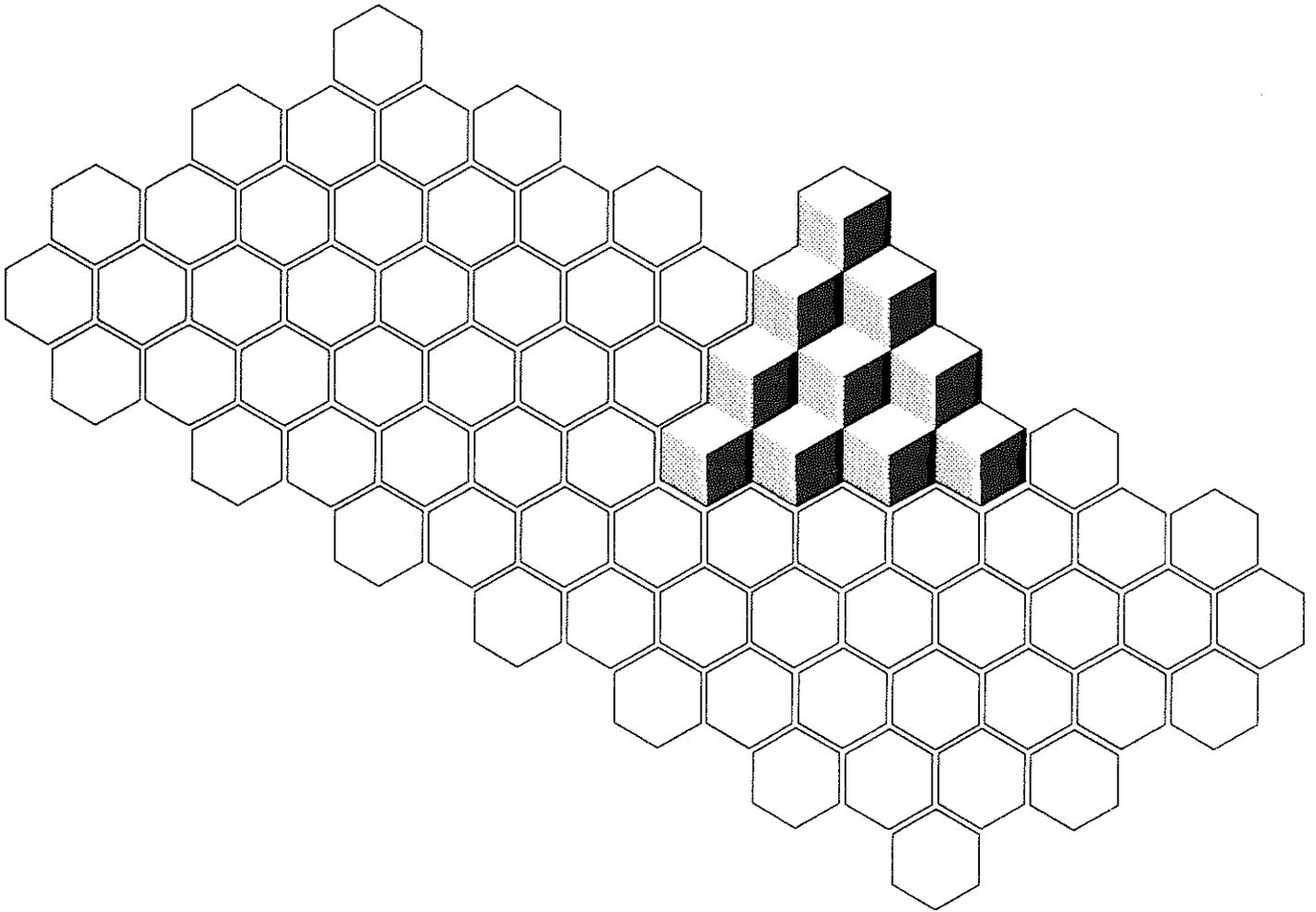


Service Guide



Federal Communications Commission (FCC) Statement

Warning: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

First Edition (June 1986)

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Information contained in this manual is subject to change from time to time. Any such change will be reported in subsequent revisions or Technical Newsletters.

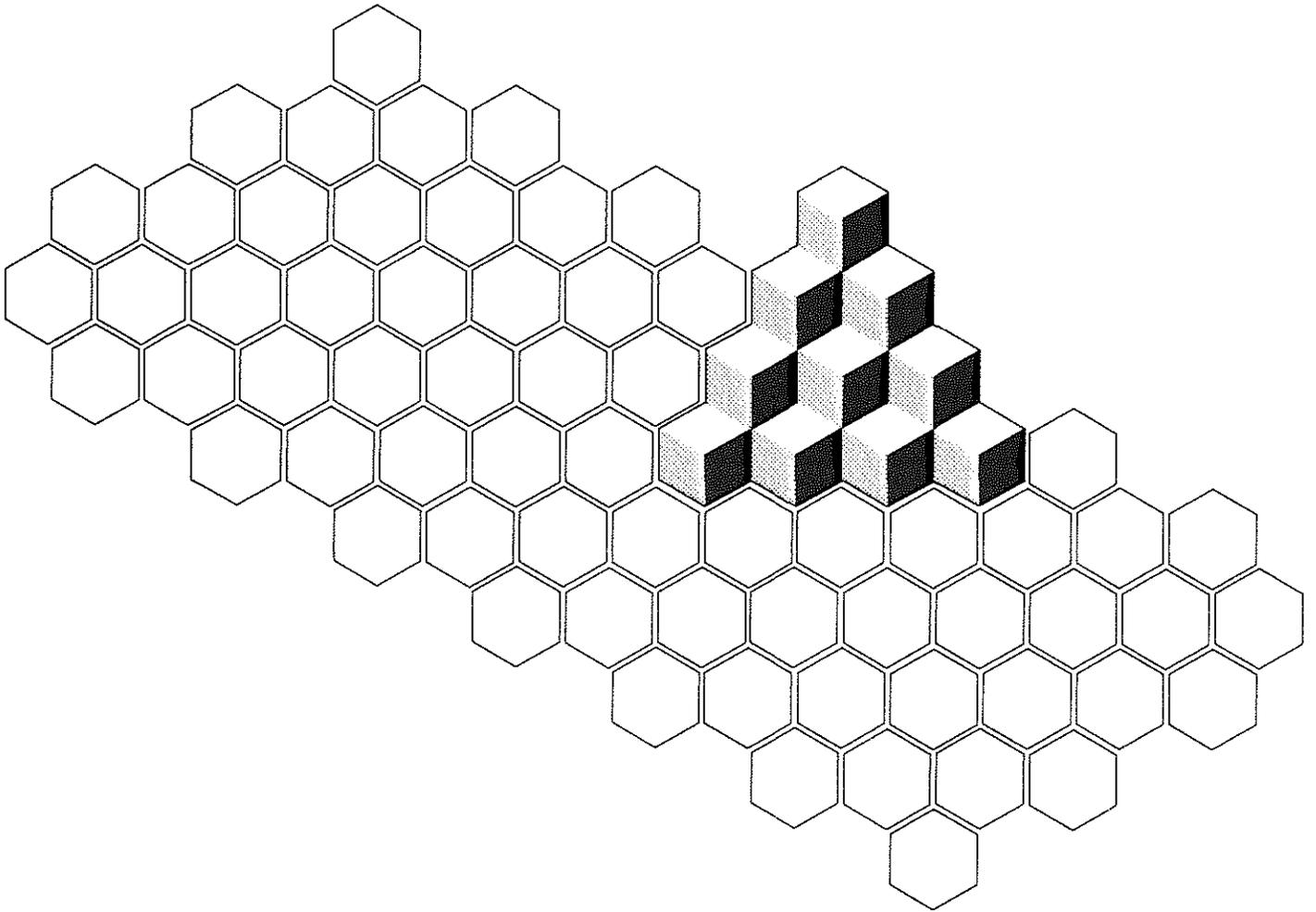
References in this publication to IBM products, programs, or services do not imply that IBM intends to make these available in all countries in which IBM operates.

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Service Guide



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Who should use this manual ...

This manual is for service representatives who service or repair the IBM 9332 Disk Unit.

This manual uses a specific range of words so that the text can be understood by service representatives in countries where English is not the normal language.

How this manual is arranged ...

This manual contains:

- A safety section with rules for safety and lists of safety notices
- A table of contents showing all the procedures in this manual and the page on which each procedure starts
- Five chapters with:
 - Information to locate field-replaceable units (FRUs) and to locate the 9332 model number and serial number
 - Procedures to remove and/or install any FRU and how to verify a good fix
 - Procedures to inspect the 9332 for safety conditions that can be of danger to the service representative
 - Information to order parts for the 9332
 - A service log to record each service event
- An appendix of wiring diagrams
- A glossary of terms and abbreviations used in this manual
- An index of part numbers
- An index of key words to procedures in this manual

If you need more information ...

See the following 9332 manuals for more information:

- *Installing*, SA21-9804, which contains procedures to install or remove the 9332 and prepare the 9332 for operation.
- *Analyzing Problems*, SA21-9837, which contains procedures to analyze 9332 problems.
- *Reference Code Guide*, SA21-9836, which contains descriptions of the 9332 reference codes and is used to identify field-replaceable units.

This product meets IBM safety standards.

The following information has been included in this publication for the use and safety of IBM personnel. For more information, see:

- *Electrical Safety for IBM Service Representatives, S229-8124*
- *Safety/Health Guidelines for IBM Service Representatives, S241-5493*

General Safety during Work

Use these rules to ensure general safety:

- Observe good housekeeping in the area of the machines during maintenance and after completing it.
- Use only field-supply items (such as adhesives, cleaning fluids, lubricants, paints, and solvents) that have been approved by IBM, that is, are supplied under an IBM part number.
- When lifting any heavy object:
 1. Ensure that you can stand safely without slipping.
 2. Balance the weight of the object between your two feet.
 3. Use a slow lifting force. Never move suddenly or twist when you attempt to lift.
 4. Lift by standing or by pushing up with your leg muscles; this action removes the strain from the muscles in your back. *Do not attempt to lift any objects that you think are too heavy for you.*
- Do not perform any action that causes hazards to the customer or that makes the equipment unsafe.
- Put removed covers and other parts in a safe place, away from all personnel, while you are servicing the machine.
- Always keep your tool case away from walk areas so that other persons will not trip over it; for example, put it under a desk or table.
- Do not wear loose clothing that can be trapped in the moving parts of a machine. Ensure that your sleeves are fastened or are rolled up above the elbows. If your hair is long, fasten it.
- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing.

Remember: A metal object lets more current flow if you touch a live conductor.
- Insert the ends of your necktie or scarf inside other clothing or fasten the necktie with a clip, preferably nonconductive, approximately 8 centimeters (3 inches) from the ends.
- Wear safety glasses when you are:
 - Using a hammer to drive pins or similar parts
 - Drilling with a power hand-drill
 - Using spring hooks or attaching springs
 - Soldering parts
 - Cutting wire or removing steel bands

General Safety during Work (Continued)

- Cleaning parts with solvents, chemicals, or cleaning fluids
 - Working in any other conditions that might be hazardous to your eyes.
 - Before you start the machine, ensure that other service representatives and the customer's personnel are not in a hazardous position.
 - After maintenance, reinstall all safety devices such as shields, guards, labels, and ground wires. Exchange any safety device that is worn or defective for a new one.
- Remember:* Safety devices protect personnel from hazards. You destroy the purpose of the devices if you do not reinstall them before completing your service call.
- Reinstall all covers correctly before returning the machine to the customer.

Safety with Electricity

Observe these additional rules when working on equipment powered by electricity:

- Find the room emergency power-off (EPO) switch or disconnecting switch. If an electrical accident occurs, you can then operate the switch quickly.
- Do not work alone under hazardous conditions or near equipment that has hazardous voltages. Always inform your manager of any possible problem or if you must work alone.
- Disconnect all power:

- Before removing or installing main units
- Before working near power supplies
- Before doing a mechanical inspection of power supplies
- Before installing changes in machine circuits.

- Before you start to work on the machine, unplug the machine's power cable. If you cannot unplug the cable easily, ask the customer to switch off the wall box switch that supplies power to the machine, and either:
 - Lock the wall box switch in the off position, or
 - Attach a DO NOT OPERATE tag, Z229-0237, to the wall box switch.

Note: A non-IBM attachment to an IBM machine can be powered possibly from another source and controlled by a different disconnecting switch or circuit breaker. If you determine that this condition is present, ensure that you remove (eliminate) this hazard before you start work.

- If you need to work on a machine that has *exposed* electrical circuits, observe the following precautions:
 - Ensure that another person, who is familiar with the power-off controls, is near you.

Remember: Another person must be there to switch off the power, if necessary.

- **CAUTION**
Some IBM hand tools have handles covered with a soft material that does not insulate you when working with live electrical circuits.

.....

Use only those tools and testers that are suitable for the job you are doing.

- Use only one hand when working with powered-on electrical equipment; keep the other hand in your pocket or behind your back.

Remember: There must be a complete circuit to cause electrical shock. By observing the above rule, you may prevent a current from passing through the vital parts of your body.

- When using testers, set the controls correctly and use the IBM-approved probe leads and accessories intended for that tester.

- **CAUTION**
Many customers have, near their equipment, rubber floor mats that contain small conductive fibers to decrease electrostatic discharges. Do not use this wrong type of

mat to protect yourself from electric shock.

.....

Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.

- Observe the special safety precautions when you work with very high voltages; these instructions are given in IBM safety service memorandums (SMs) and the safety sections of maintenance information. Use extreme care when measuring high voltages.
- Do not use tools or testers that have not been approved by IBM. Ensure that electrical hand tools, such as power drills and Wire-Wrap¹ tools, are inspected regularly.
- Do not use worn or broken tools and testers.
- *Never assume* that power has been disconnected from a circuit. First, *check* that it has been switched off.

¹ Trademark of the Gardner-Denver Co.

Safety with Electricity (Continued)

- Always look carefully for possible hazards in your work area. Examples of these hazards are: moist floors, nongrounded power extension cables, power surges, and missing safety grounds.
- Do not touch live electrical circuits with the glass surface of a plastic dental mirror. The surface is conductive; such touching can cause personal injury and machine damage.
- Unless the maintenance information specifically lets you, do not service the following parts *with power on them* when they are removed from their normal operating places in a machine:

- Power supply units
- Pumps
- Blowers and fans
- Motor generators

and similar units. (This rule ensures correct grounding of the units.)

- If an electrical accident occurs:
 - **Use caution; do not become a victim yourself.**
 - **Switch off power.**
 - **Send another person to get medical aid.**
 - **If the victim is not breathing, decide whether to give rescue breathing.**

These actions are described below.

Emergency First Aid

When giving rescue breathing after an electrical accident:

- *Use Caution.* If the victim is still in contact with the electrical-current source, remove the power; to do this, you may need to use the room emergency power-off (EPO) switch or disconnecting switch.

If you cannot find the switch, use a dry wooden rod or some other nonconductive object to pull or push the victim away from contact with the electrical-current source.

- *Work Quickly.* If the victim is unconscious, he or she possibly needs rescue breathing. If the heart has stopped beating, the victim may also need external cardiac compression.

Only a trained and certified person² should perform external cardiac compressions.

- *Get Medical Aid.* Call a rescue group, an ambulance, or a hospital immediately.

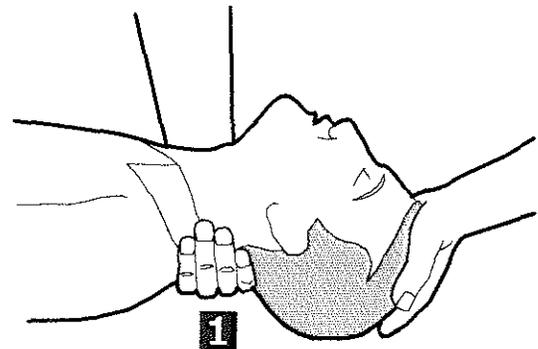
Rescue Breathing Procedures

Determine if the victim needs rescue breathing:

1. Prepare the victim:
 - a. Ensure that the victim's airway is open and not obstructed. Check the mouth for objects (such as chewing gum, food, dentures, or

the tongue) that can obstruct the flow of air.

- b. Place the victim on his or her back, then put one hand under the victim's neck and the other hand on the victim's forehead.
- c. Lift the neck with one hand **1** and press the forehead backward with the other hand.



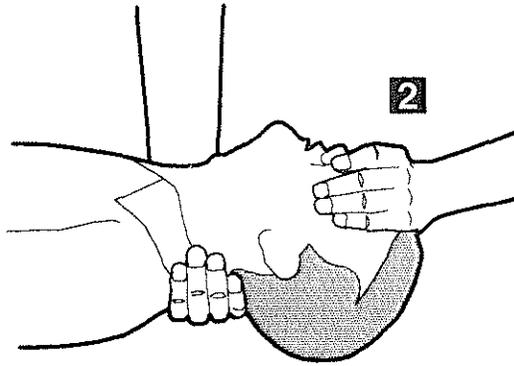
2. *Look, listen, and feel* to determine if the victim is breathing freely:
 - a. Put your cheek near the victim's mouth and nose.
 - b. Listen and feel for the breathing-out of air. At the same time, look at the victim's chest and upper abdomen to see if they move up and down.

If the victim is not breathing correctly and you decide that you want to give rescue breathing:

3. Continue to press on the victim's forehead with your hand and pinch together the victim's nostrils **2** with the thumb and finger.

² If you want to be trained in giving this aid, ask a suitable organization (such as the Red Cross) in your area.

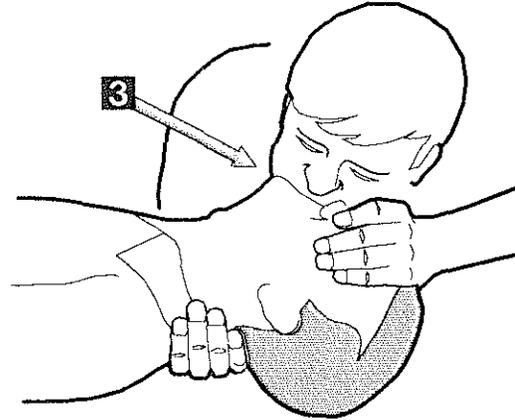
Rescue Breathing Procedures (Continued)



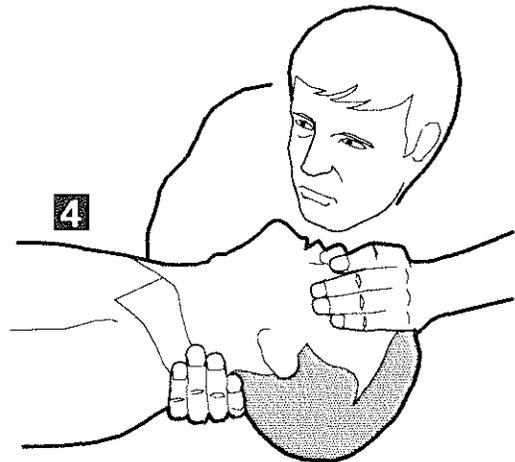
4. **CAUTION**
Use extreme care when giving rescue breathing to a victim who possibly has breathed-in toxic fumes. *Do not breathe-in air that the victim has breathed-out.*

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Open your mouth wide and take a deep breath. Make a tight seal with your mouth³ around the victim's mouth **3** and blow into it.



5. Remove your mouth and let the victim breathe out while you check that the victim's chest **4** moves down.



6. Repeat steps 4 and 5 once every 5 seconds until the victim breathes normally again or until medical aid comes.

³ A rescue-breathing face covering (mask) or similar unit can be used if you have been taught how to use it.

Reporting Accidents

Report to your manager or to your IBM site all accidents, possible hazards, and accidents that nearly occurred.

Remember: An accident that nearly occurred can be caused by a design problem. Quick reporting ensures quick solving of the problem.

Report also each small electric shock, because the conditions that caused it need only differ slightly to cause serious injury.

Safety Notices in This Manual

Danger Notices

Danger notices appear in the following procedures:

- “AC/DC Power Supply R/R” on page 2-12
- “Control Panel LED Assembly R/R” on page 2-56

Caution Notices

Caution notices appear on pages vii and x of this Safety section.

Caution notices also appear in the following procedures:

- “Placing the 9332 in the Service Position” on pages 2-7 and 2-8
- “Disk Enclosure R/R” on pages 2-19 and 2-20

Warning Notices

Warning notices appear in the following procedures:

- “Placing the 9332 in the Service Position” on pages 2-5, 2-6, and 2-8
- “Disk Enclosure R/R” on pages 2-18, 2-20, and 2-21
- “Driver Board R/R” on pages 2-24, 2-25, and 2-28
- “Servo Card(s) R/R” on pages 2-32 and 2-33
- “I/O Adapter Card R/R” on page 2-36
- “Driver/Receiver Card R/R” on page 2-40
- “Signal Cable Assembly R/R” on page 2-51
- “Verifying a Good Fix” on page 2-61

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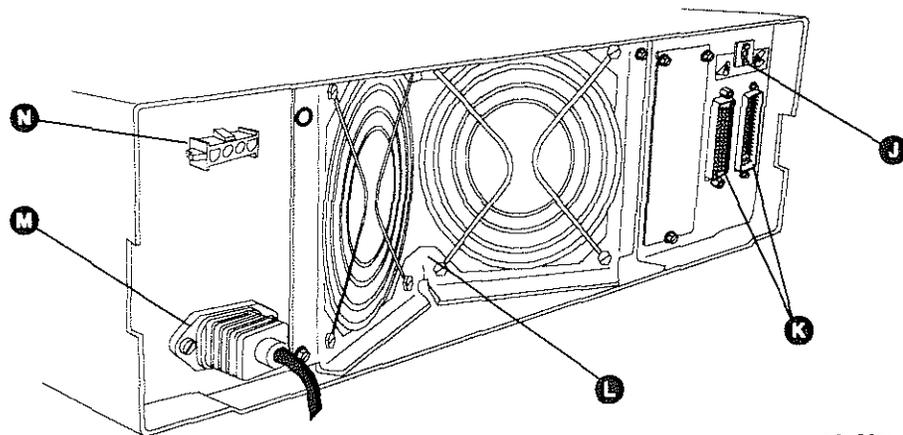
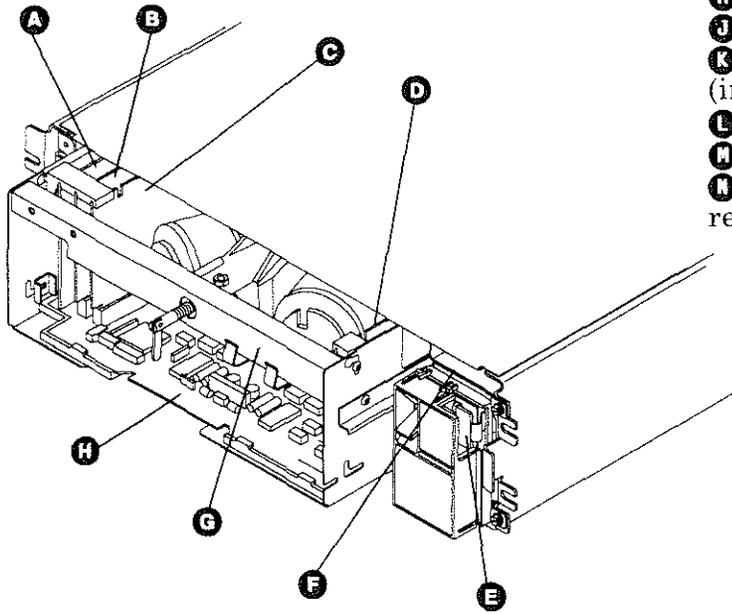
FRU Locations 1-2
Model and Serial Number Locations 1-3

FRU Locations

All FRUs that can be installed by field service representatives are shown in the following diagram.

For the specific removal/replacement (R/R) procedure for each FRU, see Chapter 2 of this manual.

- Ⓐ Driver/receiver card (A0A1)
- Ⓑ I/O adapter card (A0B1)
- Ⓒ Servo card 0 (A0C1)
- Ⓓ Servo card 1 (Model 400 only) (A0C2)
- Ⓔ Control panel LED assembly (A0OP)
- Ⓕ AC/DC power supply (A0P1)
- Ⓖ Disk enclosure (A0DE)
- Ⓗ Driver board (A0A0)
- Ⓙ Address switch assembly (A0S1)
- Ⓚ Signal cable assembly (internal) (A0I1)
- Ⓛ Fan assembly (A0F1)
- Ⓜ Power cord (A0L1)
- Ⓝ Fan connector (not a replaceable unit)

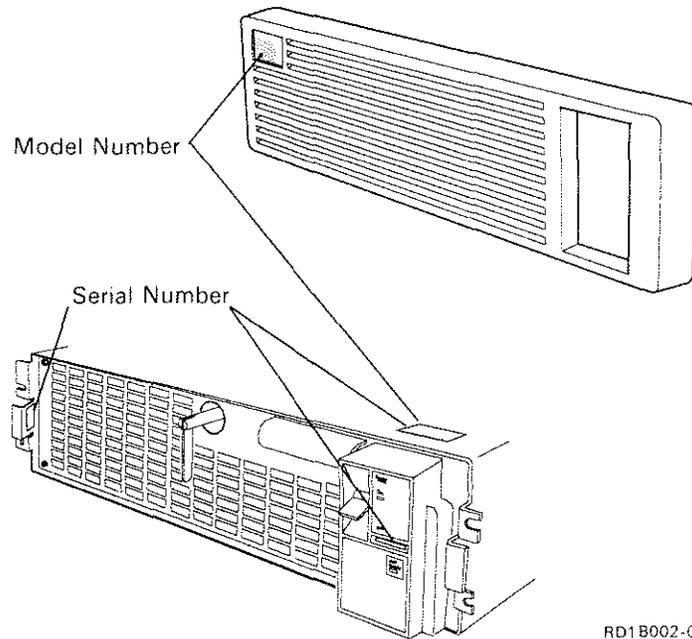


RD1B001-0

Model and Serial Number Locations

The 9332 model and serial numbers are in the following locations:

- **Model number**
 - Front cover
 - Information plate (top of disk unit)
- **Serial number**
 - Control panel
 - Disk drive (left side)
 - Information plate (top of disk unit)



RD1B002-0

1

1. Locations

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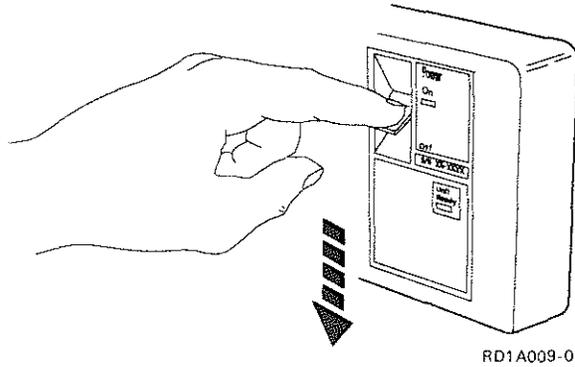
Working with ESD-Sensitive Parts

When holding or installing ESD-sensitive parts, use the ESD handling kit, IBM part 6428316 or similar. Read the instructions inside the top cover of the carrying case.

Placing the 9332 in the Service Position

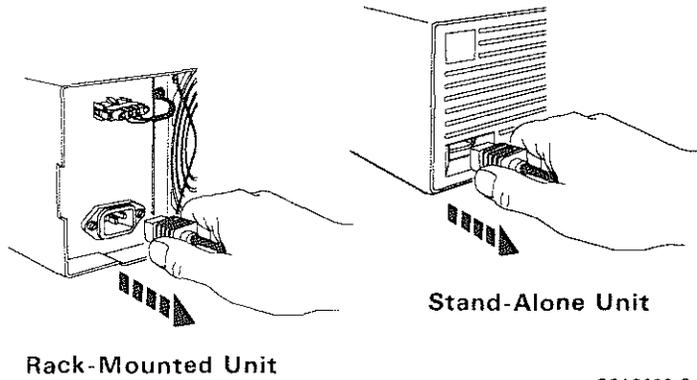
1

Power off the 9332.



2

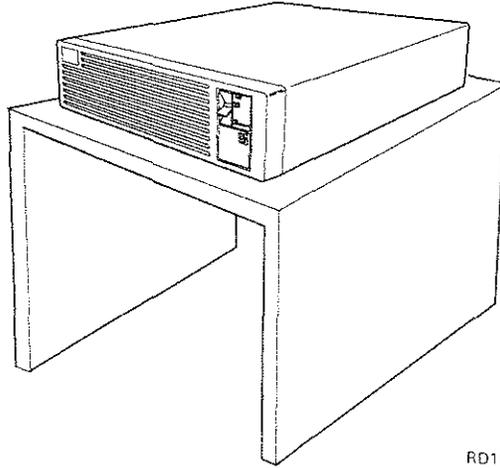
Disconnect the power cord from the rear of the power supply.



Placing the 9332 in the Service Position (Continued)

3

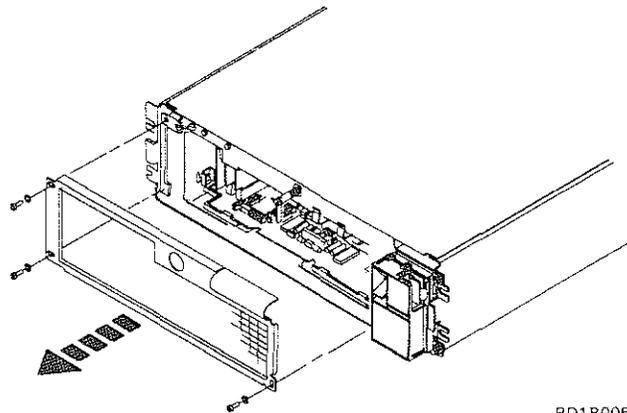
If you have a stand-alone unit that is placed on a table or shelf, ensure that the unit does not extend beyond the edge of the table or shelf.



RD1B004-0

4

Remove three screws and remove the front shield.



RD1B005-0

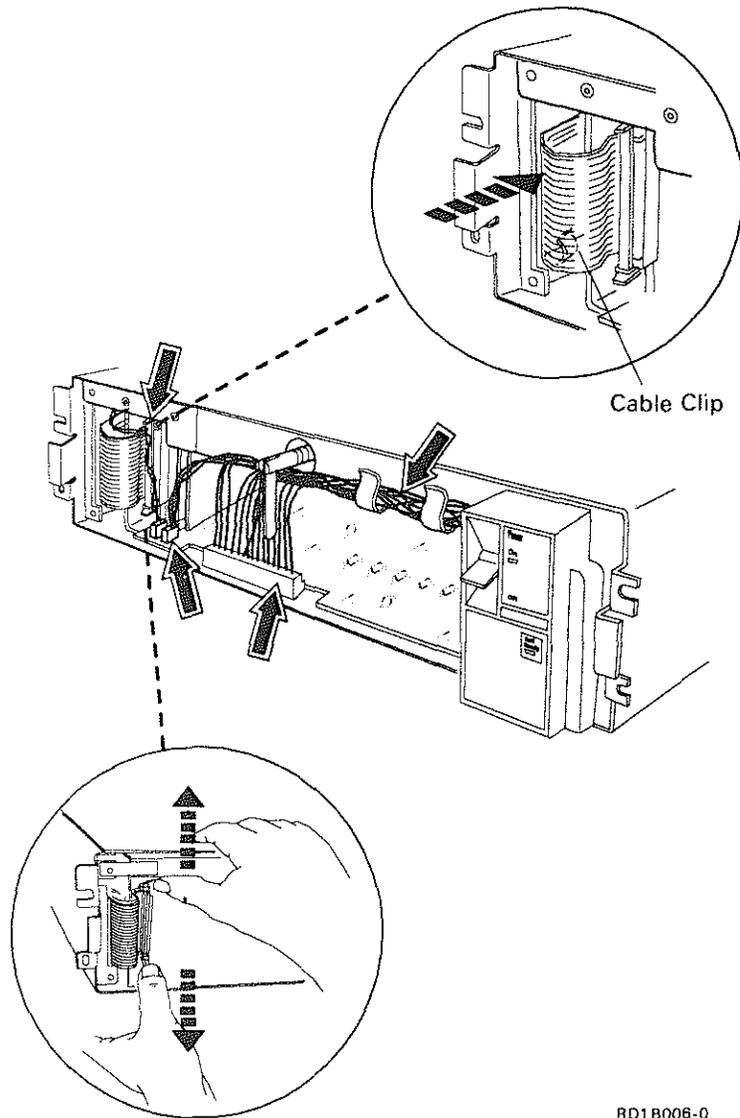
5

Warning: When connecting the signal cable to the driver/receiver card, ensure that the cable is put in position as shown. Airflow to the logic cards could become restricted if the signal cable is not installed correctly.

Disconnect the following cables:

- Power cable from the driver board (two connectors)
- Power cable from the retainers
- Address cable from the driver board
- Signal cable from the driver/receiver card connector

Note: To disconnect the signal cable, unlock the cable connector latches as shown.



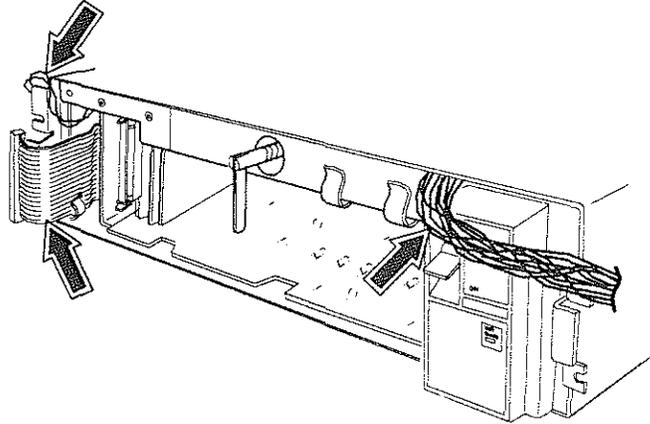
RD1B006-0

Placing the 9332 in the Service Position (Continued)

6

Warning: When sliding the disk enclosure into or out of the disk unit, ensure that the power cable, signal cable, and address cable do not get damaged.

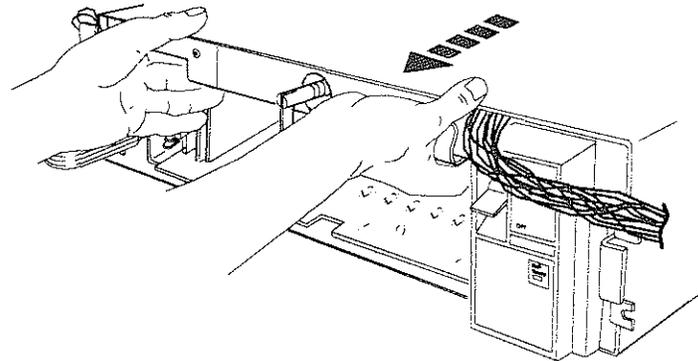
Position all cables in a safe area. Attach the cables with tape or other suitable material to hold them in place.



RD1B028-0

7

Pull the disk enclosure out of the disk unit as shown.



RD1B029-0

8

**Do you have a
stand-alone unit?**

Yes No

**For a
rack-mounted
unit, go to step
12.**

**9**

CAUTION
**The disk enclosure
weighs 13.6 kilograms
(30 pounds).**

Placing the 9332 in the Service Position (Continued)

10

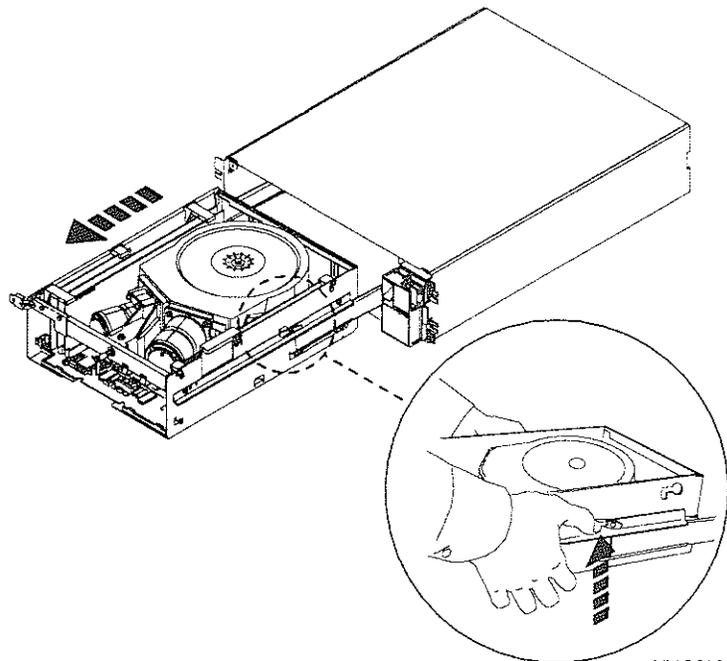
CAUTION
Attach the ESD grounding strap to the disk enclosure to prevent a static discharge when moving the disk enclosure.

Attach the ESD grounding strap to the disk enclosure.

11

Warning: If the disk enclosure is dropped, the heads or disk can be damaged. A drop of a few inches is enough to cause damage.

Remove the disk enclosure.



RD1B010-0

12

End of procedure.

Restore the 9332 to the operating position by the reverse order of this procedure.

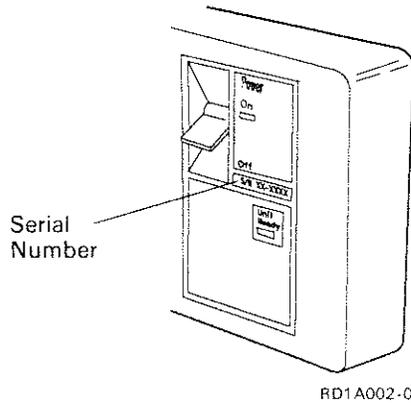
- **For a rack-mounted unit, start the restore at step 7.**
- **For a stand-alone unit, start the restore at step 11.**

AC/DC Power Supply R/R

1

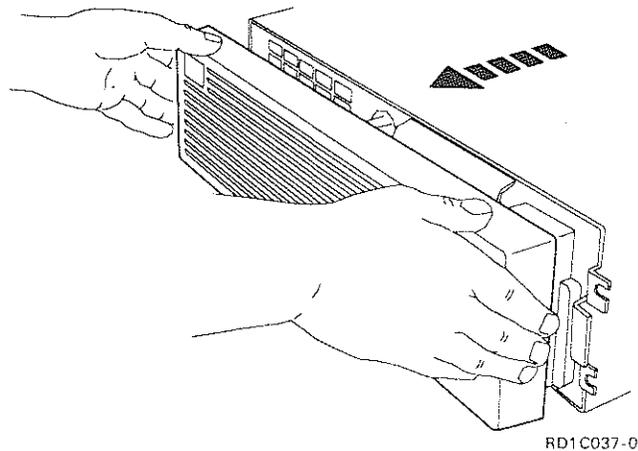
Verify the serial number of the 9332 that is installed.

- Look at the serial number on the front of the control panel.



2

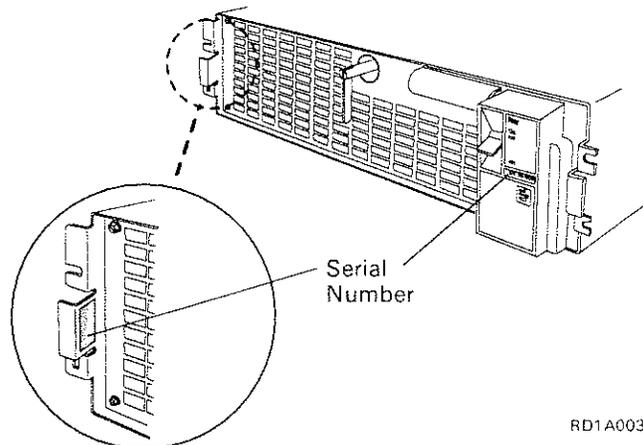
Remove the front cover.



3

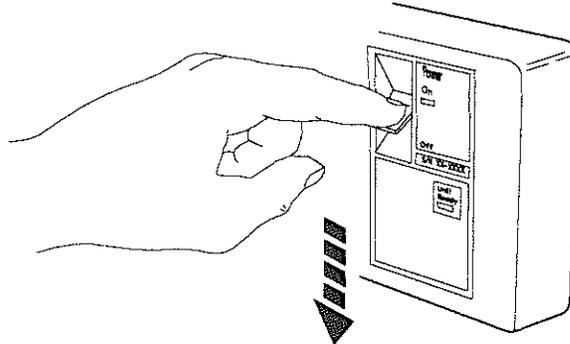
Verify that all serial numbers match.

- Control panel serial number
- Disk drive serial number



4

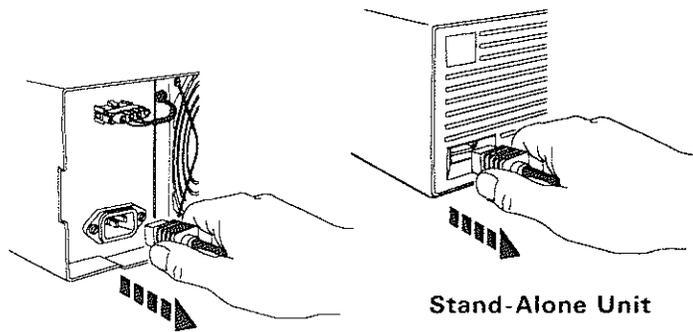
Power off the 9332.



RD1A009-0

5

Disconnect the power cord from the rear of the power supply.



Rack-Mounted Unit

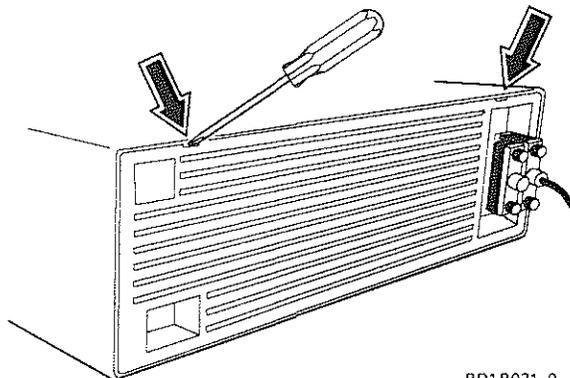
Stand-Alone Unit

RD1B003-0

6

If you have stand-alone covers installed on the 9332, remove the rear cover.

Note: Slide the rear cover back on the signal cables.

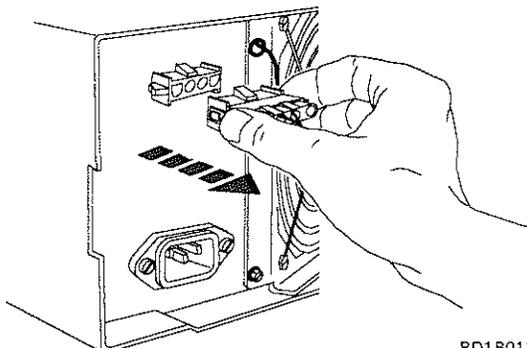


RD1B031-0

AC/DC Power Supply R/R (Continued)

7

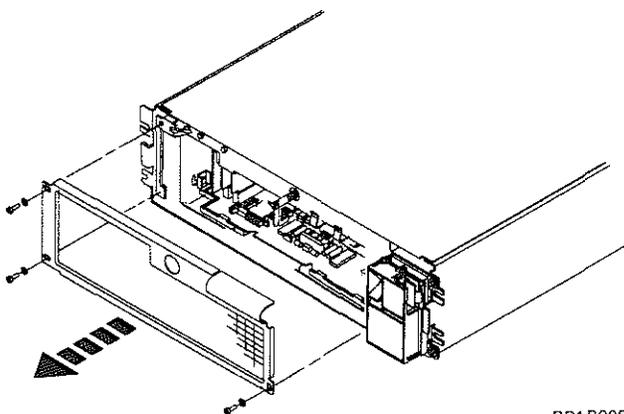
Disconnect the fan power cable from the power supply connector.



RD1B012-0

8

Remove three screws and remove the front shield.

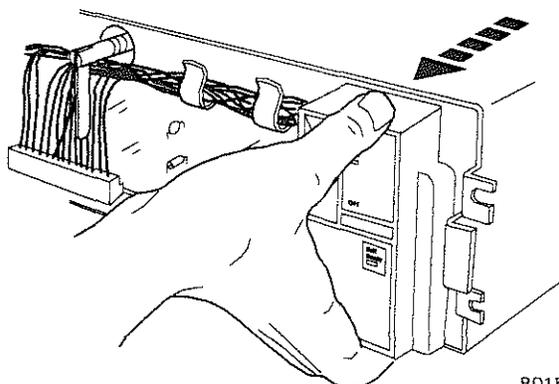


RD1B005-0

9

DANGER
Line voltage is present if the power cord is not disconnected.

Remove the control panel bezel by using finger pressure on the bezel and pulling straight out.

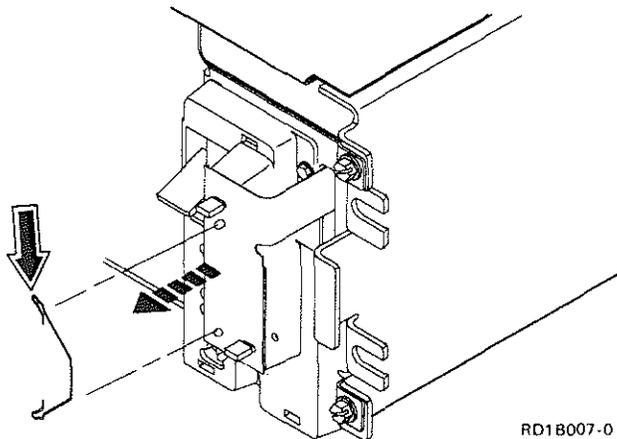


RD1B027-0

Note: The bezel is attached to the power supply by three tab latches.

10

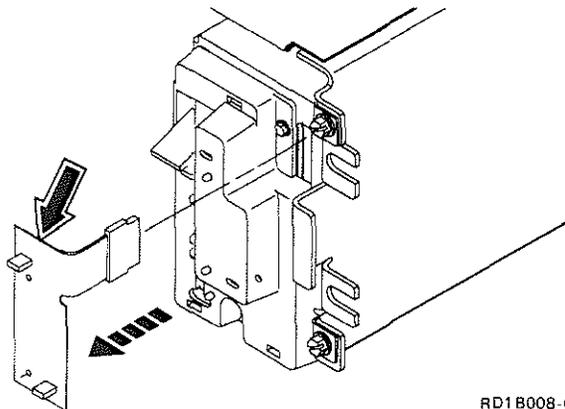
**Remove the wire cable
retainer.**



RD1B007-0

11

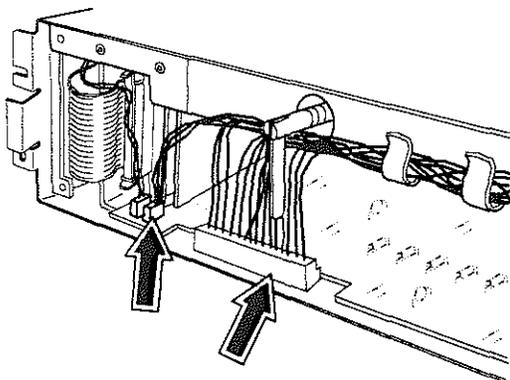
**Remove the control
panel LED assembly by
pulling out on the
assembly.**



RD1B008-0

12

**Disconnect the power
cable from the driver
board (two connectors).**



RD1B009-0

16

**Install the power supply
in the reverse order of
removal.**

17

Verify the fix.

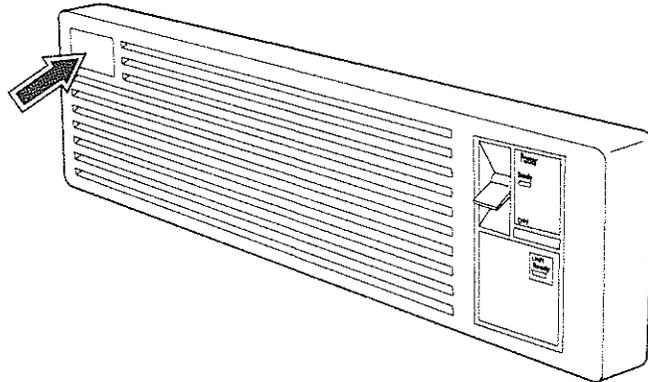
**See “Verifying a Good
Fix” on page 2-61.**

Disk Enclosure R/R

1

Verify the model number of the 9332 that is installed.

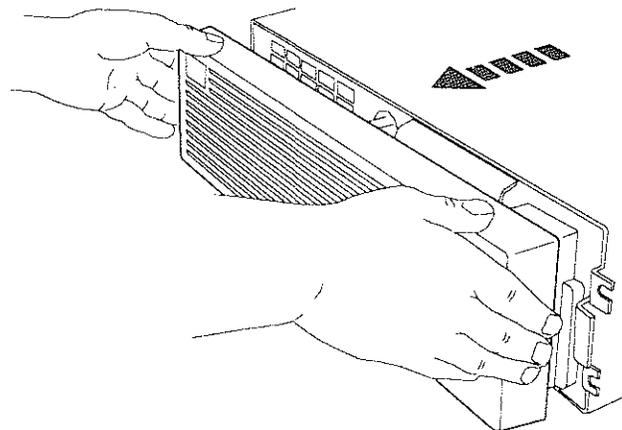
- Look at the nameplate on the front cover.
 - Model 200
 - Model 400



RD1B013-0

2

Remove the front cover.

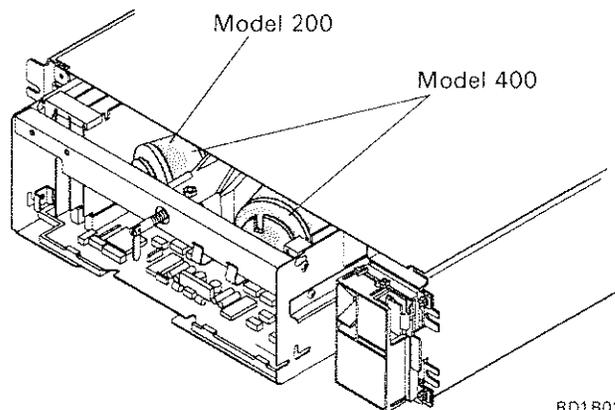


RD1C037-0

3

Observe the number of actuators present.

- Model 200 = one actuator
- Model 400 = two actuators

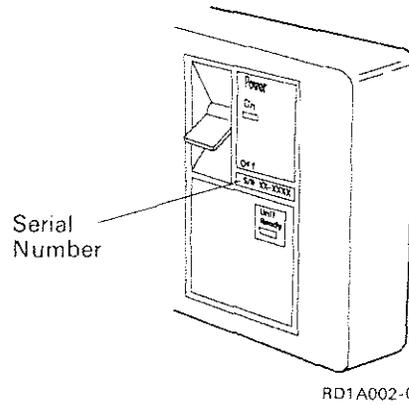


RD1B014-0

4

Verify the serial number of the 9332 that is installed.

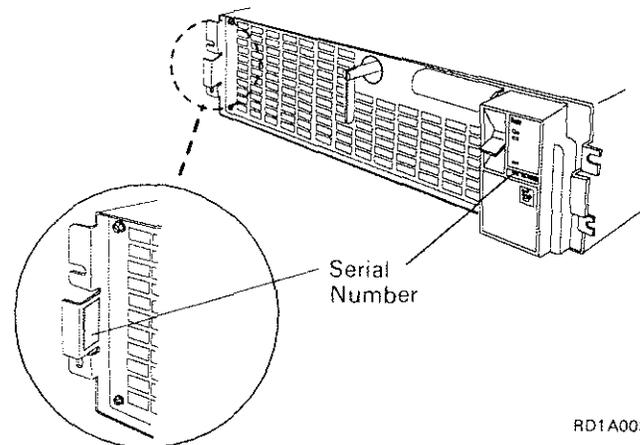
- Look at the serial number on the front of the control panel.



5

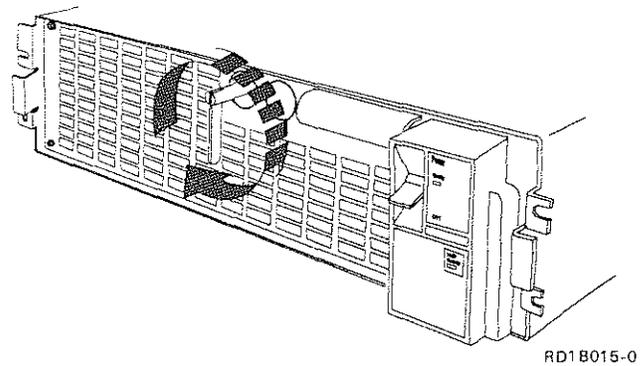
Verify that all serial numbers match.

- Control panel serial number
- Disk drive serial number



6

Lock the shock mounts by turning the locking lever clockwise until it stops.



Disk Enclosure R/R (Continued)

7

Place the 9332 in the service position.

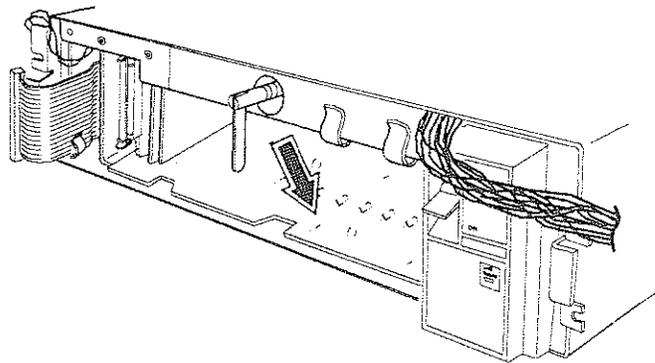
See "Placing the 9332 in the Service Position" on page 2-3.

8

Warning: The logic circuits could be damaged by electrostatic discharge when servicing this unit.

Remove all electronic card and board assemblies.

See "Driver Board R/R" on page 2-22.



RD1B016-0

9

Is the 9332 mounted in a rack?

Yes No



Go to step 13.

10**CAUTION**

The disk enclosure weighs 13.6 kilograms (30 pounds).

Disk Enclosure R/R (Continued)

11

CAUTION

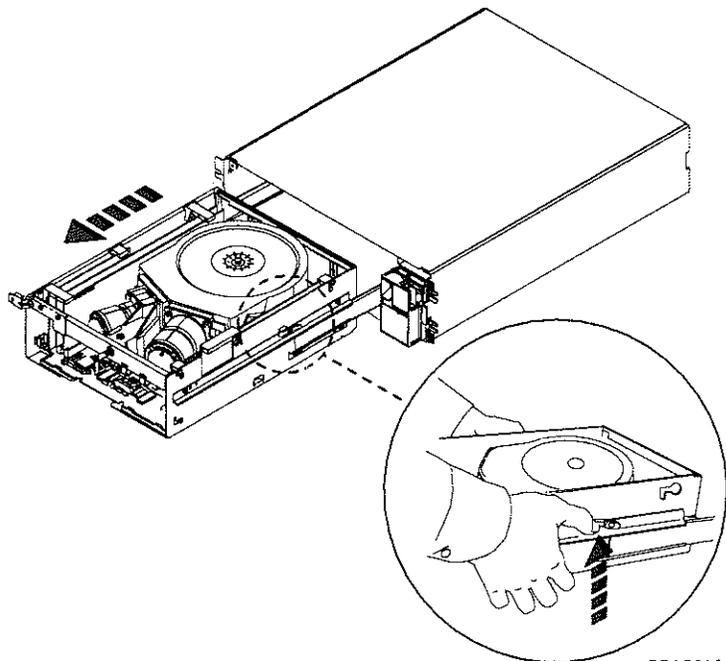
Attach the ESD grounding strap to the disk enclosure to prevent a static discharge when moving the disk enclosure.

Attach the ESD grounding strap to the disk enclosure.

12

Warning: If the disk enclosure is dropped, the heads or disk can be damaged. A drop of a few inches is enough to cause damage.

Remove the disk enclosure.



RD1B010-0

13

End of procedure.

Warning: When sliding the disk enclosure into the 9332, ensure that the power cable, signal cable, and address cable do not get damaged.

Install the disk enclosure in the reverse order of removal.

Note: When installing the disk enclosure, ensure that the carrier slides are moved to the rear of the 9332 before placing the disk enclosure on the carrier slides.

14

Verify the fix.

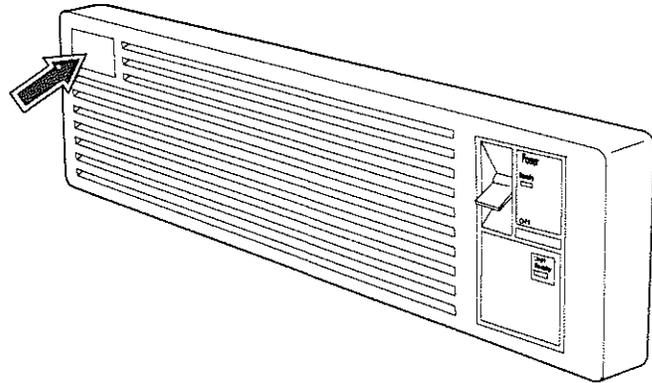
See “Verifying a Good Fix” on page 2-61.

Driver Board R/R

1

Verify the model number of the 9332 that is installed.

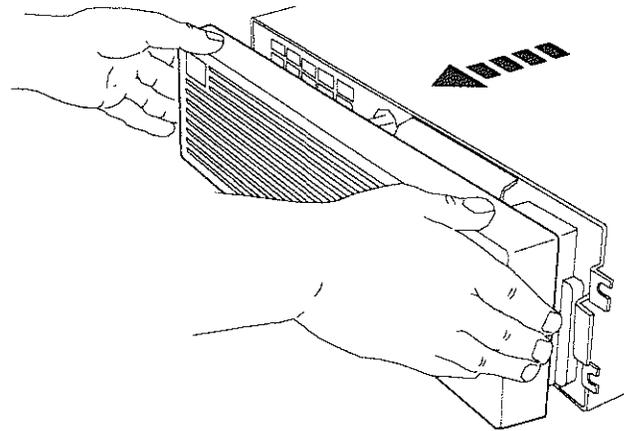
- Look at the nameplate on the front cover.
 - Model 200
 - Model 400



RD1B013-0

2

Remove the front cover.

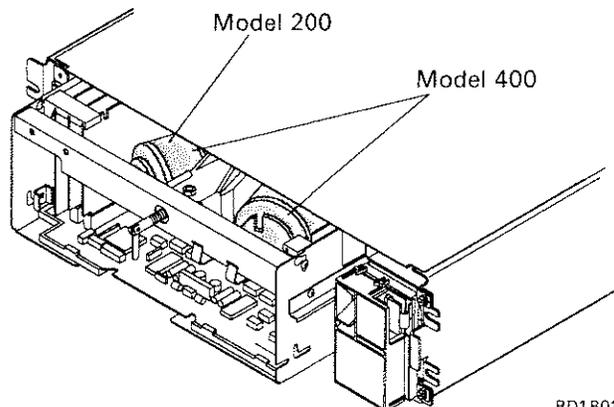


RD1C037-0

3

Observe the number of actuators present.

- Model 200 = one actuator
- Model 400 = two actuators

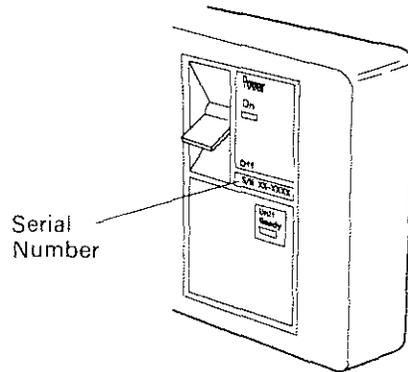


RD1B014-0

4

Verify the serial number of the 9332 that is installed.

- Look at the serial number on the front of the control panel.

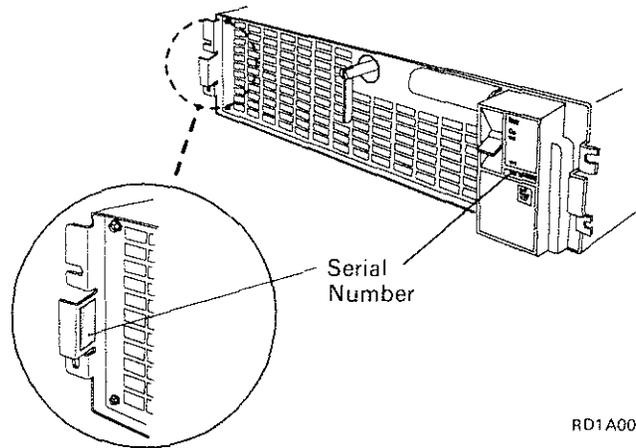


RD1 A002-0

5

Verify that all serial numbers match.

- Control panel serial number
- Disk drive serial number



RD1 A003-1

Driver Board R/R (Continued)

6

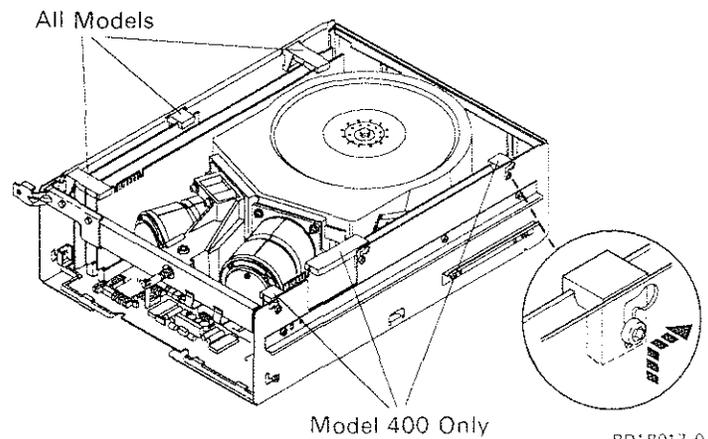
Warning: The logic circuits could be damaged by electrostatic discharge when servicing this unit.

Place the 9332 in the service position.

See "Placing the 9332 in the Service Position" on page 2-3.

7

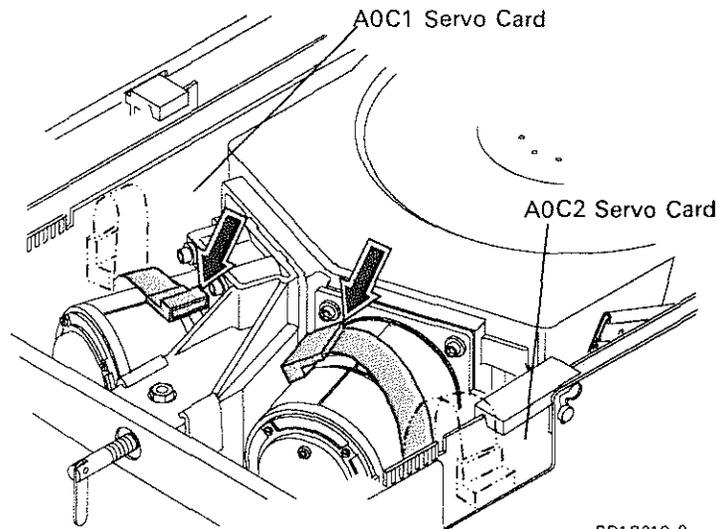
Loosen the screws and remove the card retainers that hold the logic cards to the disk enclosure assembly.



8

Warning: Any pull on the cable assembly can cause the cable to become loose or come off. If the cable assembly is damaged, the disk enclosure assembly must be replaced.

Disconnect the cable(s) from the servo card(s) and place the cable(s) over the actuator(s) as shown.



RD1B018-0

Driver Board R/R (Continued)

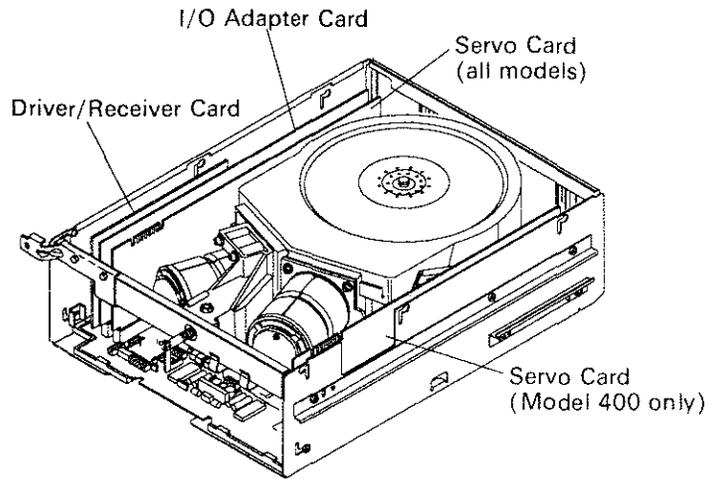
9

Remove the logic cards from the driver board.

- Driver/receiver card
- I/O adapter card
- Servo card(s)

Notes:

1. *To loosen and remove each card, pull up about 2 centimeters (0.8 inch) on the rear of the card, then pull up on the front of the card.*
2. *To install each card, insert the front of the card into the connector, then push down on the rear of the card.*

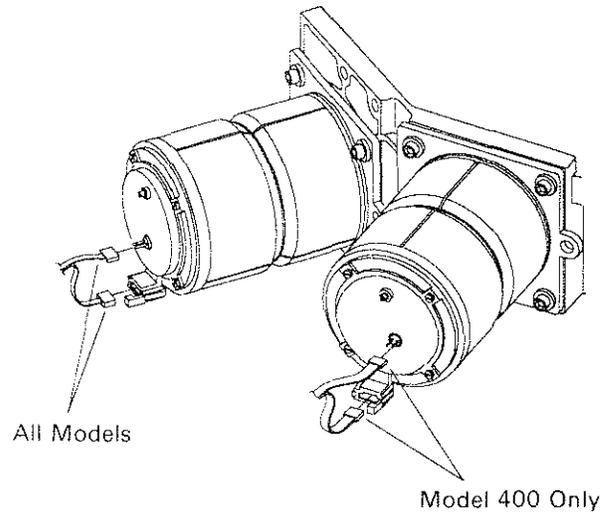


RD1B019-0

10

Disconnect the VCM cable from each servo actuator.

Observe how each VCM cable has two connectors that connect to the servo actuator.

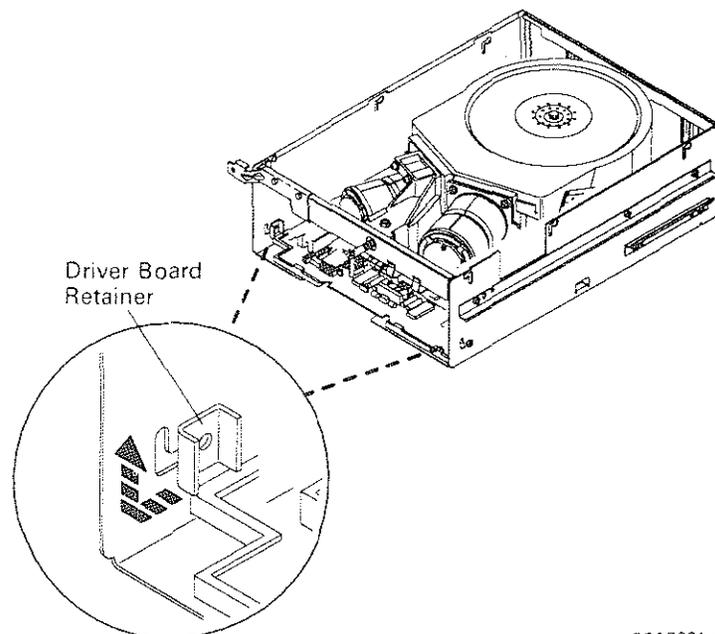


RD1B020-0

11

Loosen the two screws and board retainers that hold the driver board to the disk enclosure assembly.

Position the board retainers to the upper end of the slot and tighten the screw.



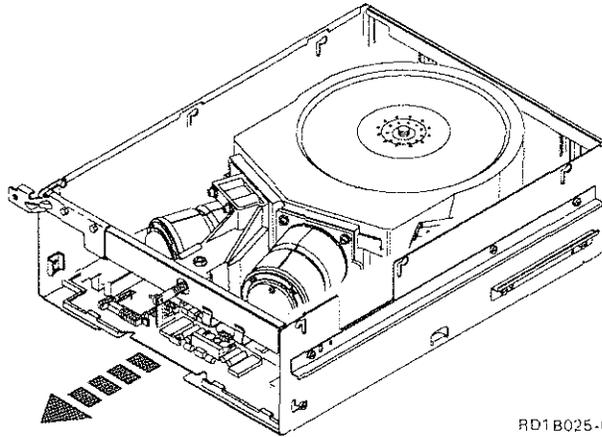
RD1B021-0

Driver Board R/R (Continued)

12

Warning: Be careful when removing the driver board because the disk enclosure cable(s) may contact and be damaged by parts on the driver board. If the cable(s) is damaged, the disk enclosure assembly must be replaced.

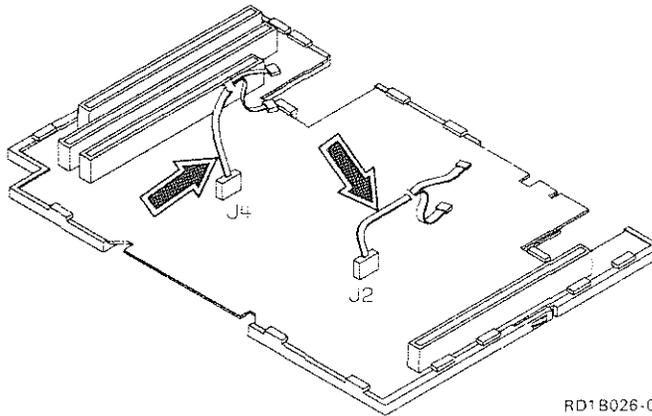
Remove the driver board from the disk enclosure assembly.



RD1B025-0

13

Move the VCM cable(s) from the driver board that was removed to the driver board to be installed.

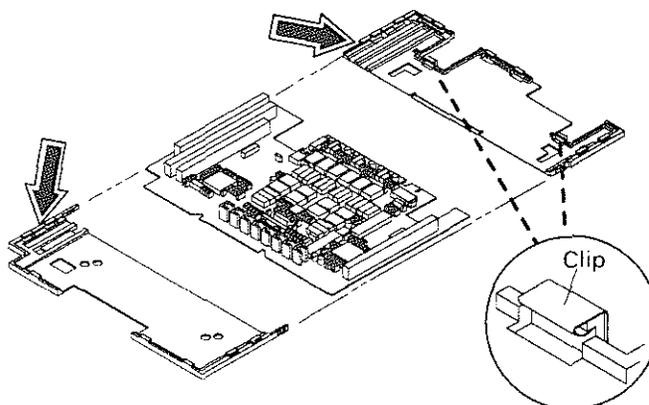


RD1B026-0

14

Move the shrouds from the driver board that was removed to the driver board to be installed.

Note: Ensure that the two clips are installed on the driver board.



RD1B024-0

15

Install the driver board in the reverse order of removal.

16

Verify the fix.

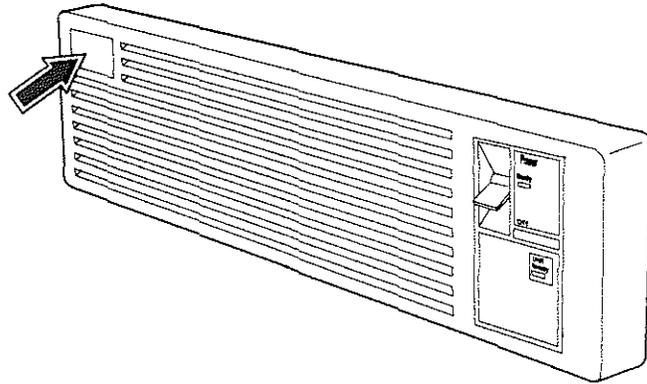
See "Verifying a Good Fix" on page 2-61.

Servo Card(s) R/R

1

Verify the model number of the 9332 that is installed.

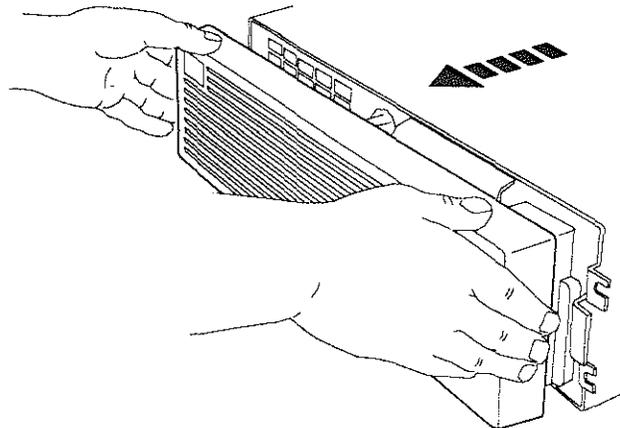
- Look at the nameplate on the front cover.
 - Model 200
 - Model 400



RD1B013-0

2

Remove the front cover.

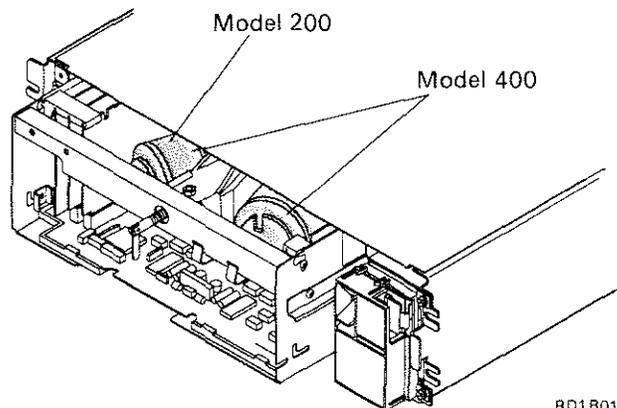


RD1C037-0

3

Observe the number of actuators present.

- Model 200 = one actuator
- Model 400 = two actuators

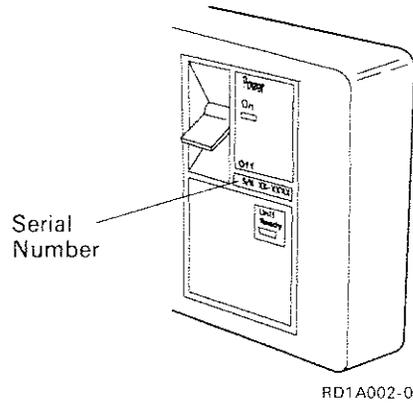


RD1B014-0

4

Verify the serial number of the 9332 that is installed.

- Look at the serial number on the front of the control panel.

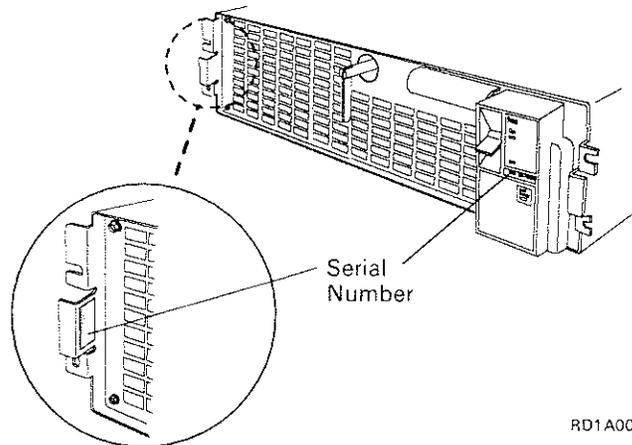


RD1A002-0

5

Verify that all serial numbers match.

- Control panel serial number
- Disk drive serial number



RD1A003-1

Servo Card(s) R/R (Continued)

6

Warning: The logic circuits could be damaged by electrostatic discharge when servicing this unit.

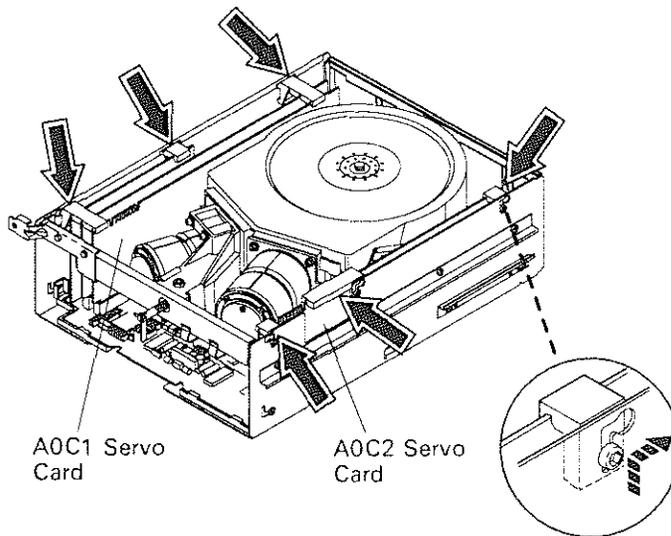
Place the 9332 in the service position.

See "Placing the 9332 in the Service Position" on page 2-3.

7

Loosen the screws and remove the card retainers that hold the logic card to the disk enclosure assembly.

Note: The unit reference code identifies the specific location of the servo card to be installed.

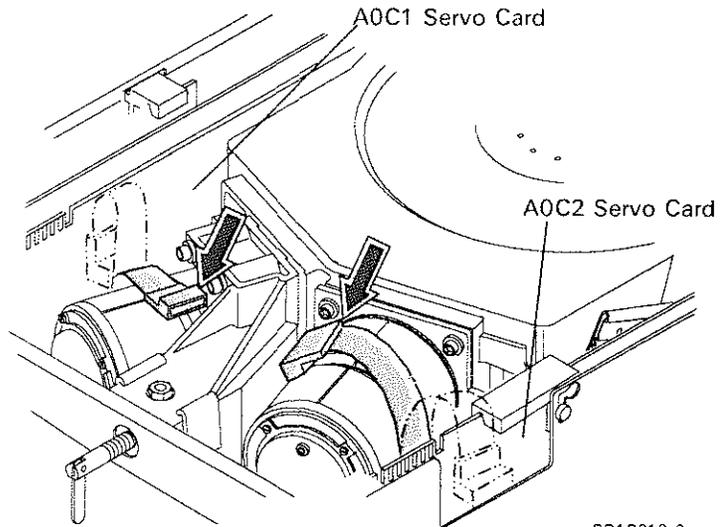


RD1B034-0

8

Warning: Any pull on the cable assembly can cause the cable to become loose or come off. If the cable assembly is damaged, the disk enclosure assembly must be replaced.

Disconnect the cable from the servo card and place the cable over the actuator as shown.



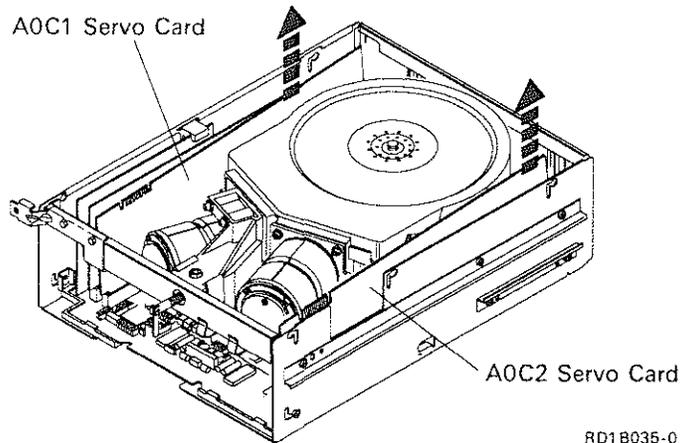
RD1B018-0

9

Remove the specified servo card from the driver board.

Notes:

1. *The unit reference code identifies the specific location of the servo card to be installed.*
2. *To loosen and remove the servo card, pull up about 2 centimeters (0.8 inch) on the rear of the card, then pull up on the front of the card.*



RD1B035-0

Servo Card(s) R/R (Continued)**10**

Install the servo card in the reverse order of removal.

Ensure that the servo card and card retainers are seated correctly.

Note: To install the servo card, insert the front of the card into the connector first, then push down on the rear of the card.

11

Verify the fix.

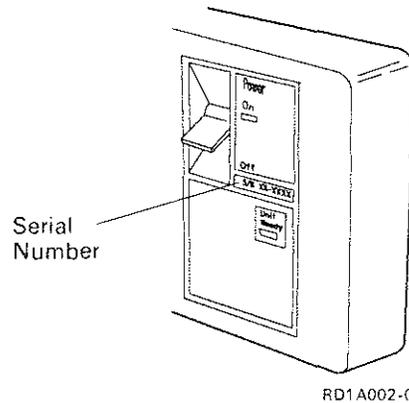
See “Verifying a Good Fix” on page 2-61.

I/O Adapter Card R/R

1

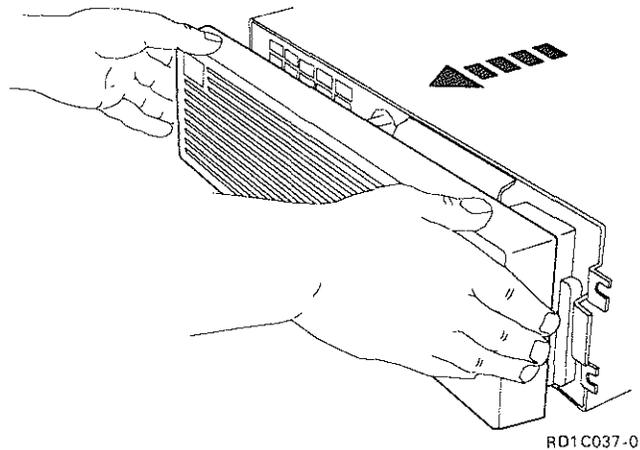
Verify the serial number of the 9332 that is installed.

- Look at the serial number on the front of the control panel.



2

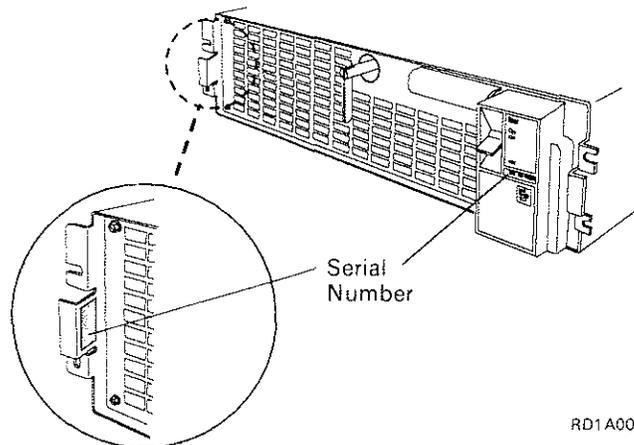
Remove the front cover.



3

Verify that all serial numbers match.

- Control panel serial number
- Disk drive serial number



I/O Adapter Card R/R (Continued)

4

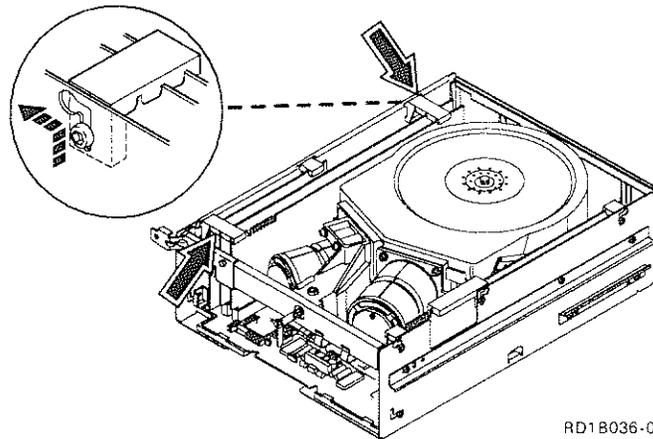
Warning: The logic circuits could be damaged by electrostatic discharge when servicing this unit.

Place the 9332 in the service position.

See "Placing the 9332 in the Service Position" on page 2-3.

5

Loosen the screws and remove the two card retainers that hold the logic cards to the disk enclosure assembly.

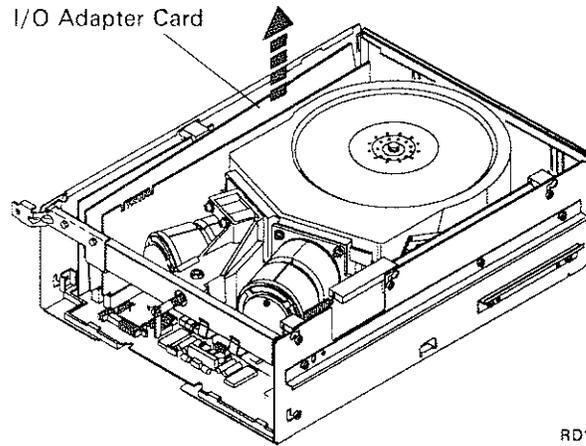


RD1 B036-0

6

Remove the I/O adapter card from the driver board.

Note: To loosen and remove the I/O adapter card, pull up about 2 centimeters (0.8 inch) on the rear of the card, then pull up on the front of the card.



RD1B037-0

7

Install the I/O adapter card in the reverse order of removal.

Ensure that the I/O adapter card and card retainers are seated correctly.

Note: To install the I/O adapter card, insert the front of the card into the connector first, then push down on the rear of the card.

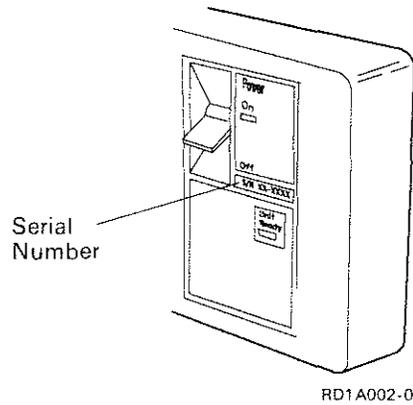
I/O Adapter Card R/R (Continued)**8****Verify the fix.****See “Verifying a Good Fix” on page 2-61.**

Driver/Receiver Card R/R

1

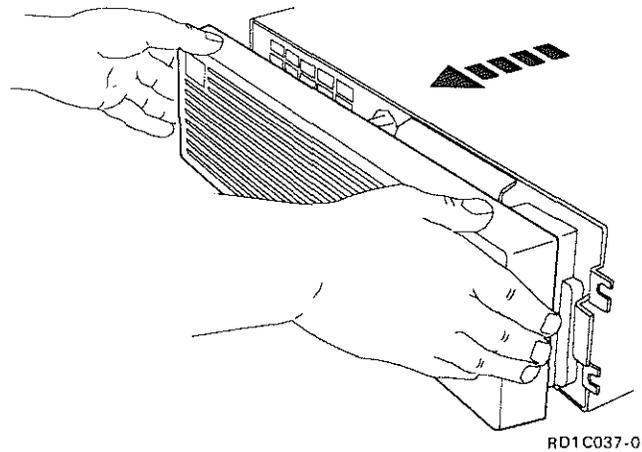
Verify the serial number of the 9332 that is installed.

- Look at the serial number on the front of the control panel.



2

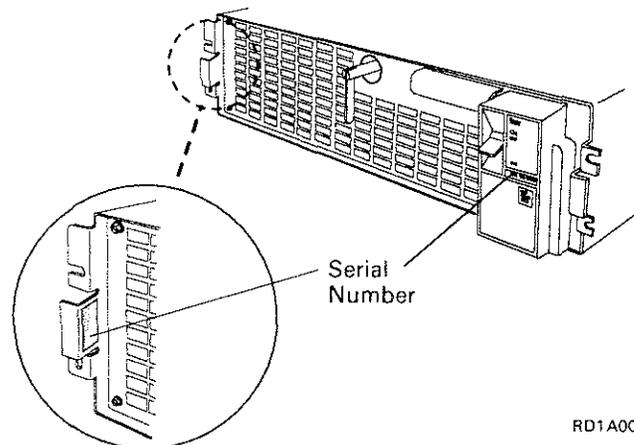
Remove the front cover.



3

Verify that all serial numbers match.

- Control panel serial number
- Disk drive serial number



Driver/Receiver Card R/R (Continued)

4

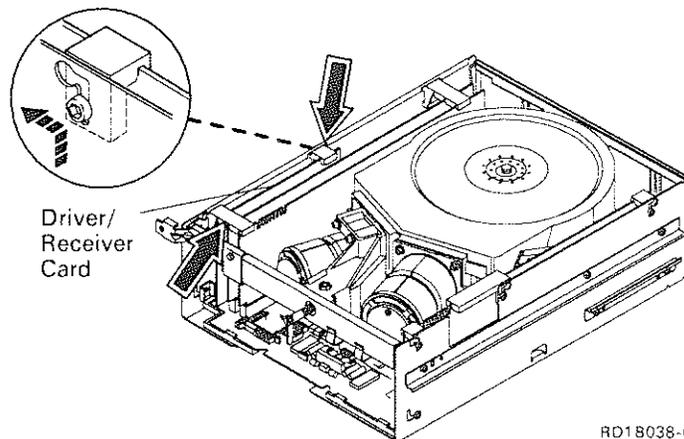
Warning: The logic circuits could be damaged by electrostatic discharge when servicing this unit.

Place the 9332 in the service position.

See "Placing the 9332 in the Service Position" on page 2-3.

5

Loosen the screws and remove the two card retainers that hold the logic cards to the disk enclosure assembly.



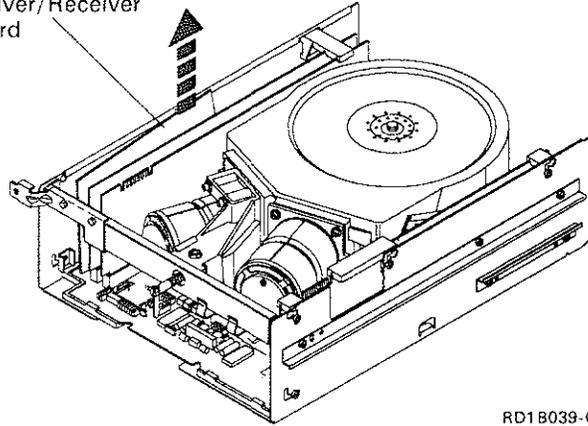
RD18038-0

6

Remove the driver/receiver card from the driver board.

Note: To loosen and remove the driver/receiver card, pull up about 2 centimeters (0.8 inch) on the rear of the card, then pull up on the front of the card.

Driver/Receiver
Card



RD1B039-0

Driver/Receiver Card R/R (Continued)

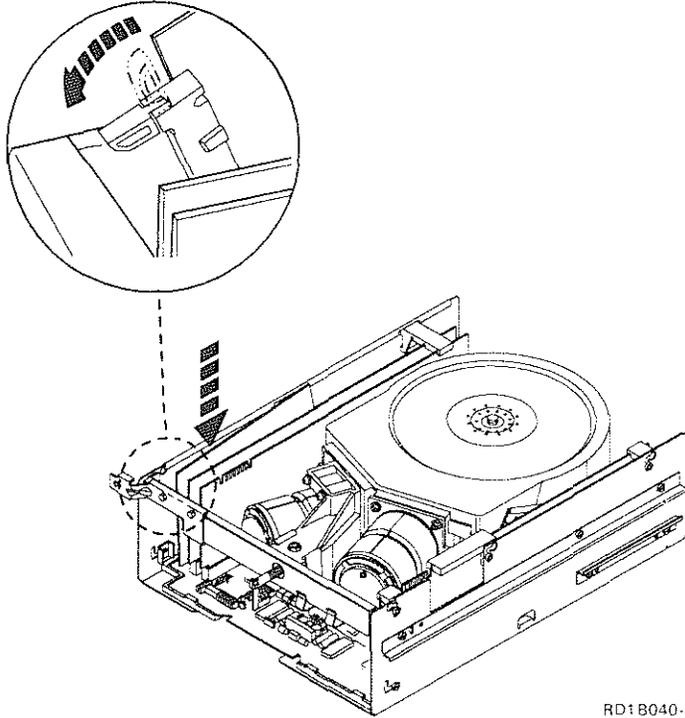
7

Install the driver/receiver card in the reverse order of removal.

Ensure that the driver/receiver card and card retainers are seated correctly.

Notes:

1. *The signal cable connector latches must be in the closed position when installing the card.*
2. *To install the driver/receiver card, insert the front of the card into the connector first, then push down on the rear of the card.*



RD1 B040-0

8

Verify the fix.

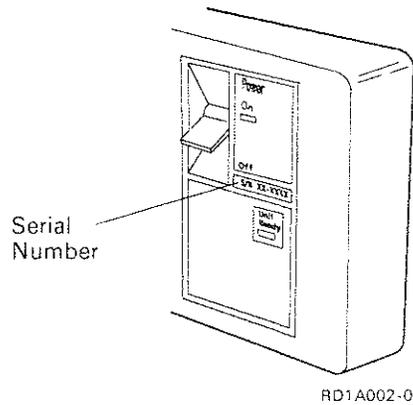
See "Verifying a Good Fix" on page 2-61.

Fan Assembly R/R

1

Verify the serial number of the 9332 that is installed.

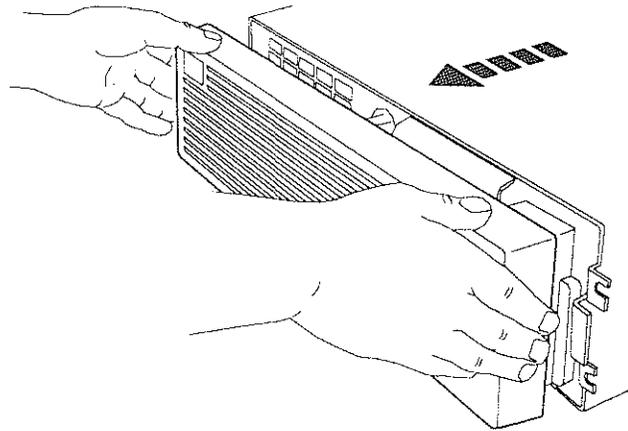
- Look at the serial number on the front of the control panel.



RD1A002-0

2

Remove the front cover.

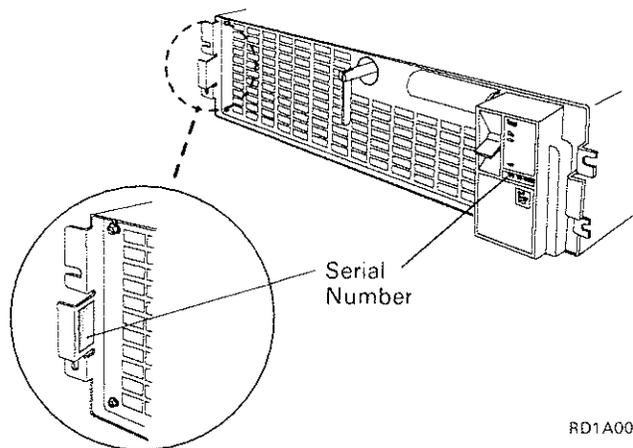


RD1C037-0

3

Verify that all serial numbers match.

- Control panel serial number
- Disk drive serial number

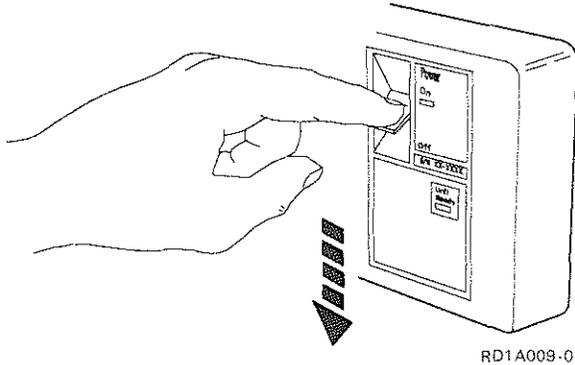


RD1A003-1

Fan Assembly R/R (Continued)

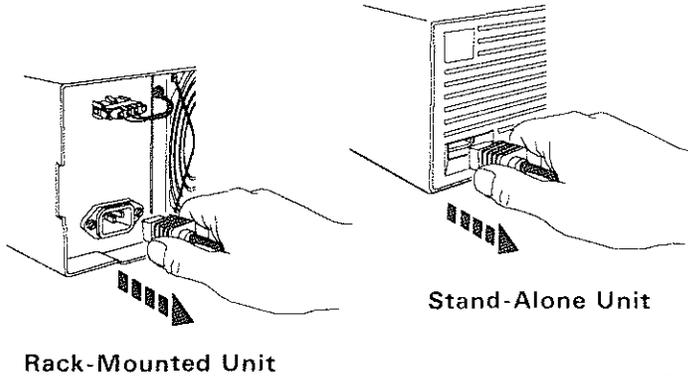
4

Power off the 9332.



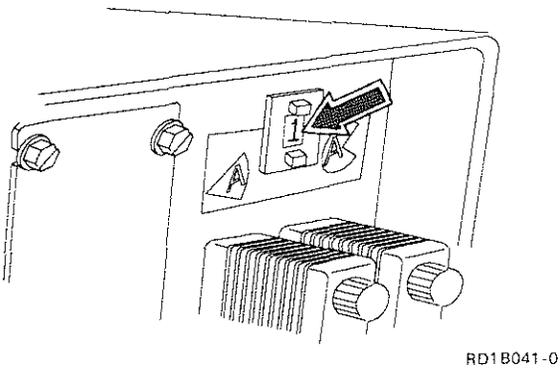
5

Disconnect the power cord from the rear of the power supply.



6

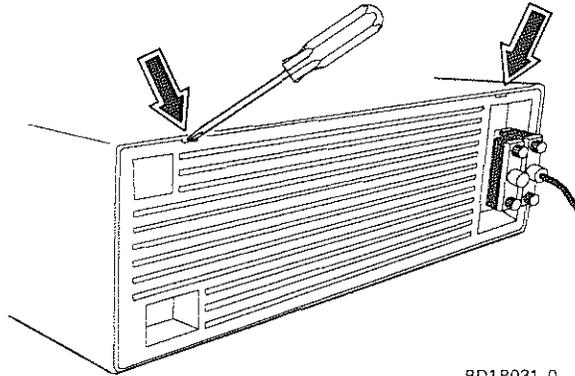
Record the setting of the address switch.



7

If this is a stand-alone unit, remove the rear cover from the cover assembly.

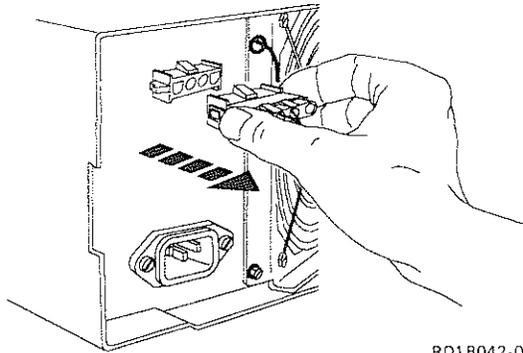
Note: Slide the rear cover back on the signal cable(s).



RD1B031-0

8

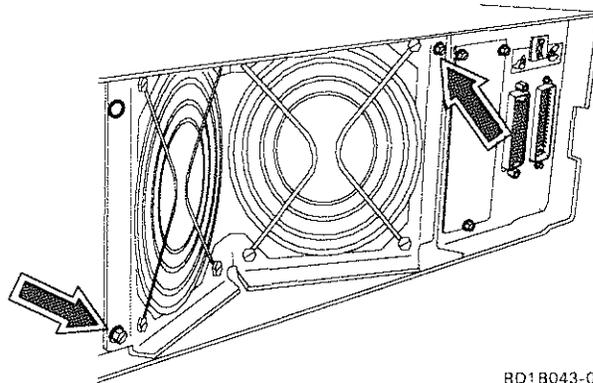
Disconnect the fan power cable from the power supply connector.



RD1B042-0

9

Remove the two screws that hold the fan assembly to the unit.

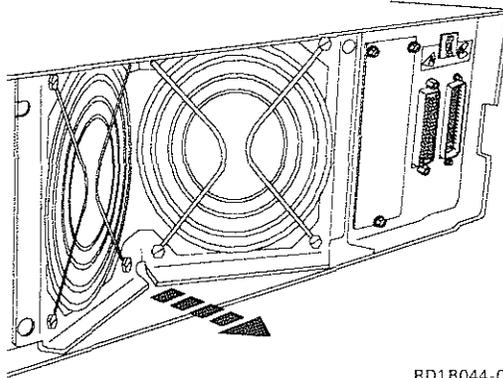


RD1B043-0

Fan Assembly R/R (Continued)

10

Remove the fan assembly.



RD1B044-0

11

Install the fan assembly in the reverse order of removal.

12

Ensure that the address switch is at the same setting as recorded in step 6.

13

Verify the fix.

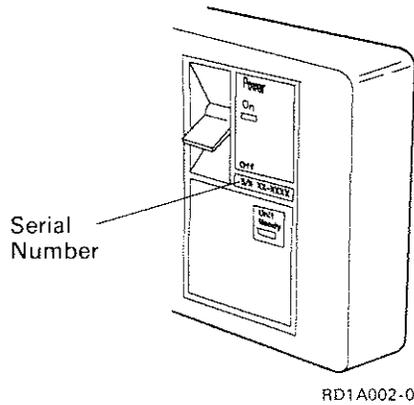
See “Verifying a Good Fix” on page 2-61.

Signal Cable Assembly R/R

1

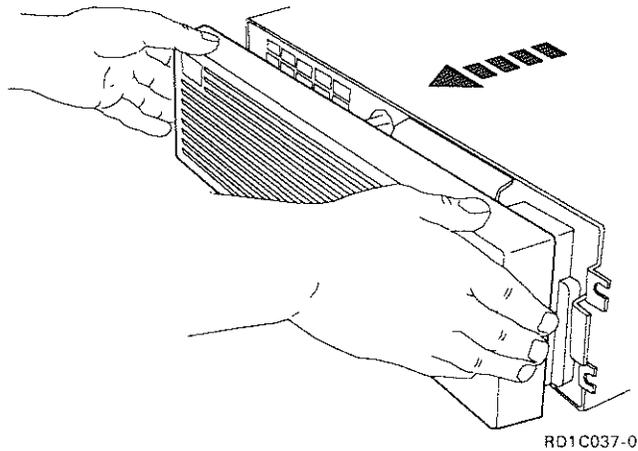
Verify the serial number of the 9332 that is installed.

- Look at the serial number on the front of the control panel.



2

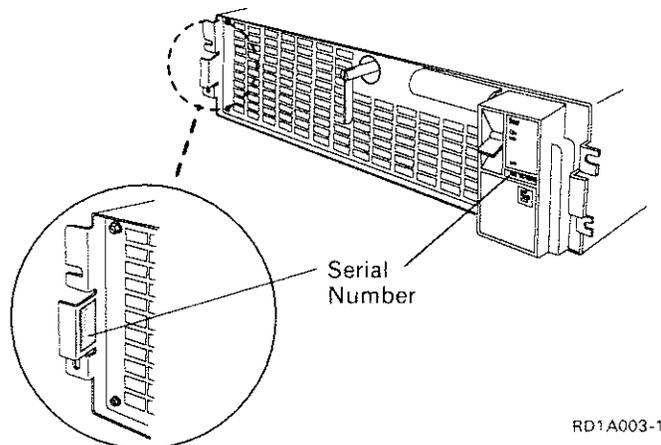
Remove the front cover.



3

Verify that all serial numbers match.

- Control panel serial number
- Disk drive serial number



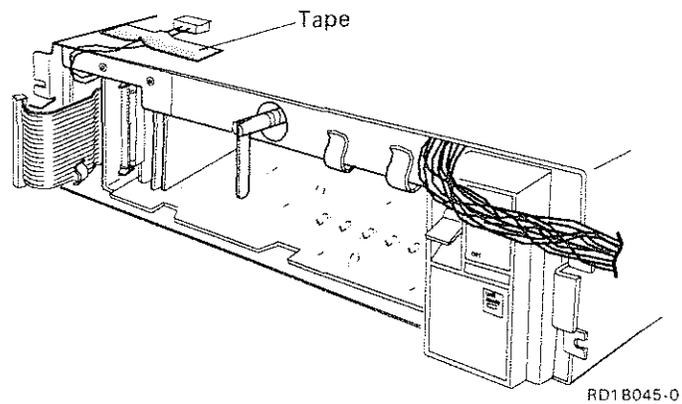
4

Place the 9332 in the service position.

See “Placing the 9332 in the Service Position” on page 2-3.

5

Position the address switch cable and attach with tape as shown.

**6**

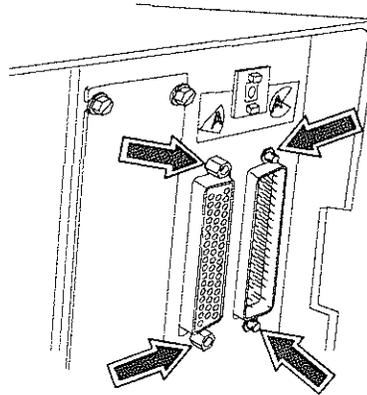
Remove the fan assembly.

See “Fan Assembly R/R” on page 2-43.

Signal Cable Assembly R/R (Continued)

7

Remove the four screws and lock washers that hold the signal cable assembly to the unit.

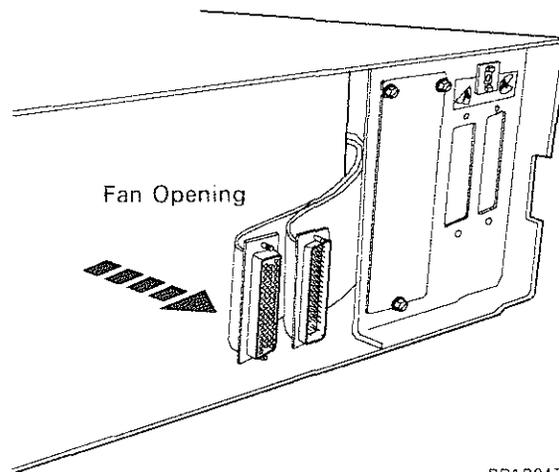


RD1B046-0

8

Remove the signal cable assembly.

Note: The signal cable assembly is removed through the opening left by the fan assembly.

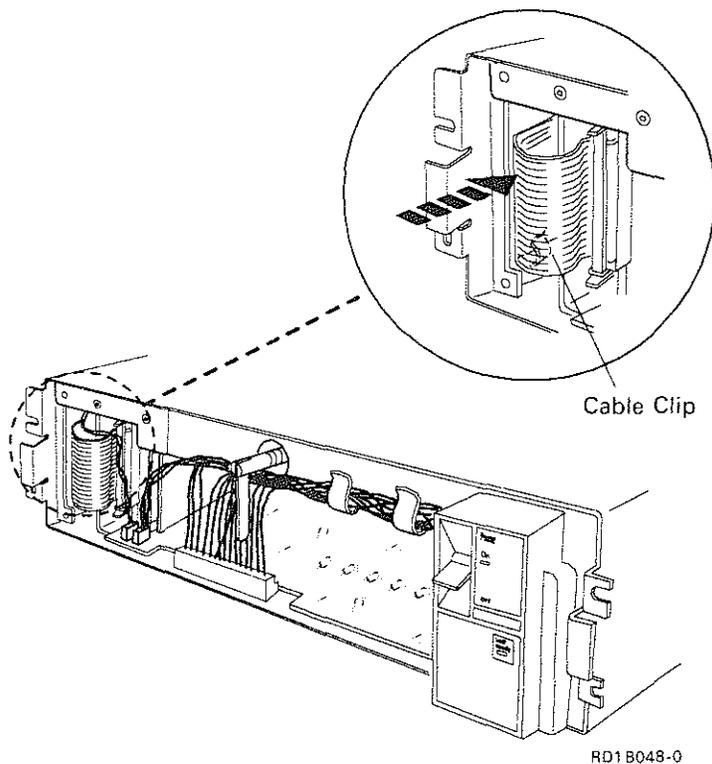


RD1B047-0

9

Warning: When connecting the signal cable to the driver/receiver card, ensure that the cable is put in position as shown. Airflow to the electronic cards could become restricted if the signal cable is not installed correctly.

Install the signal cable assembly in the reverse order of removal.



10

Verify the fix.

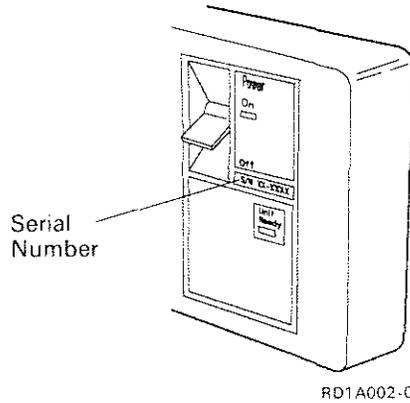
See “Verifying a Good Fix” on page 2-61.

Address Switch Assembly R/R

1

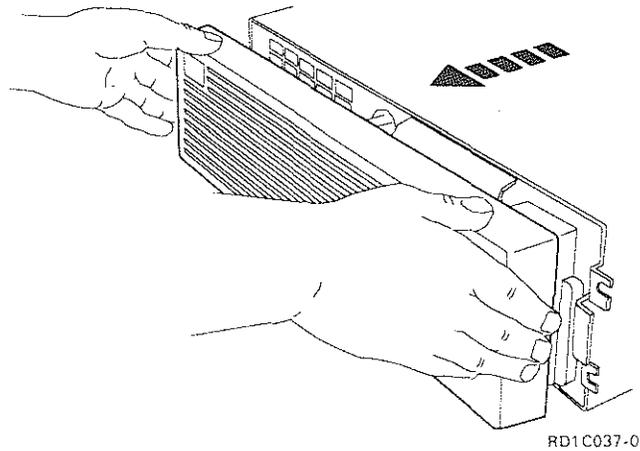
Verify the serial number of the 9332 that is installed.

- Look at the serial number on the front of the control panel.



2

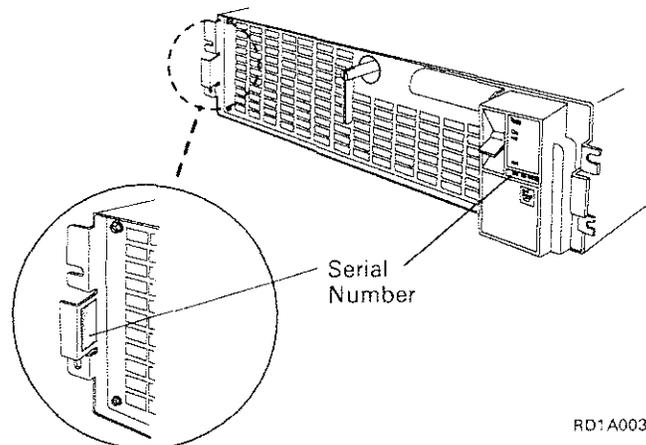
Remove the front cover.



3

Verify that all serial numbers match.

- Control panel serial number
- Disk drive serial number



4

Place the 9332 in the service position.

See "Placing the 9332 in the Service Position" on page 2-3.

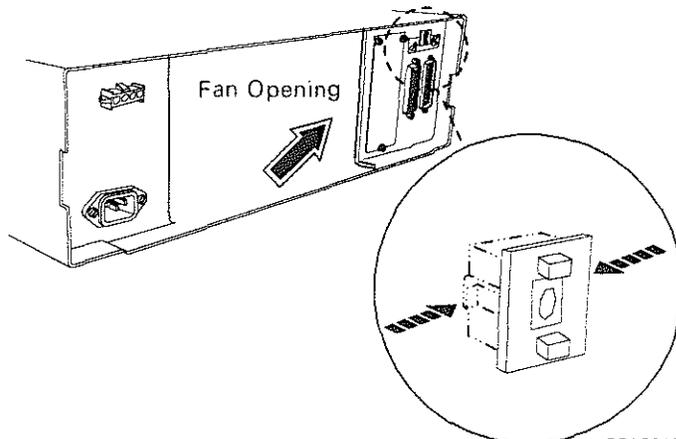
5

Remove the fan assembly.

See "Fan Assembly R/R" on page 2-43.

6

Disconnect the address switch assembly from the rear of the unit by reaching through the fan opening and pressing on the tabs that hold the switch to the rear panel.

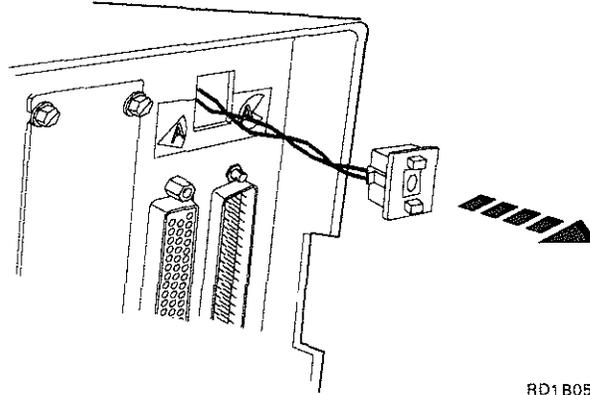


RD1 B049-0

Address Switch Assembly R/R (Continued)

7

Remove the address switch assembly through the mounting hole.



RD1B050-0

8

Install the address switch assembly in the reverse order of removal.

9

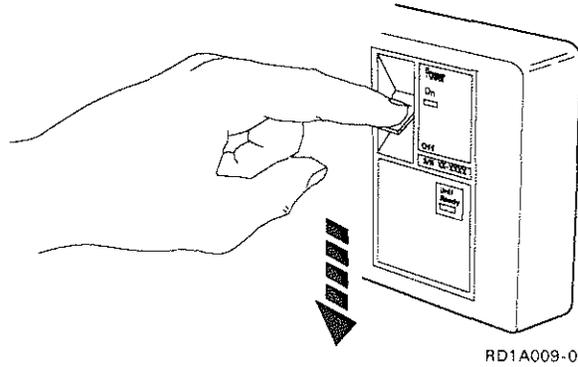
Verify the fix.

See "Verifying a Good Fix" on page 2-61.

Control Panel LED Assembly R/R

1

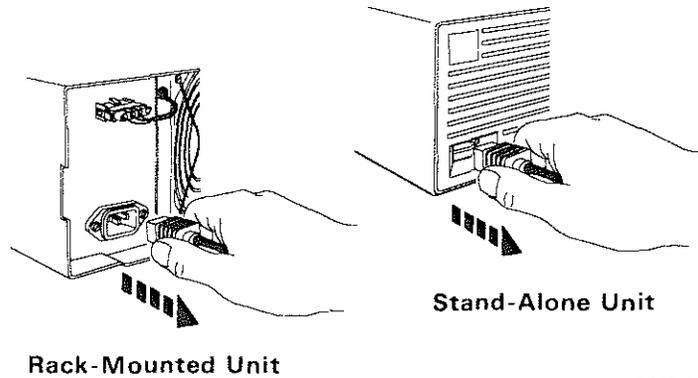
Power off the 9332.



RD1A009-0

2

Disconnect the power cord from the rear of the power supply.



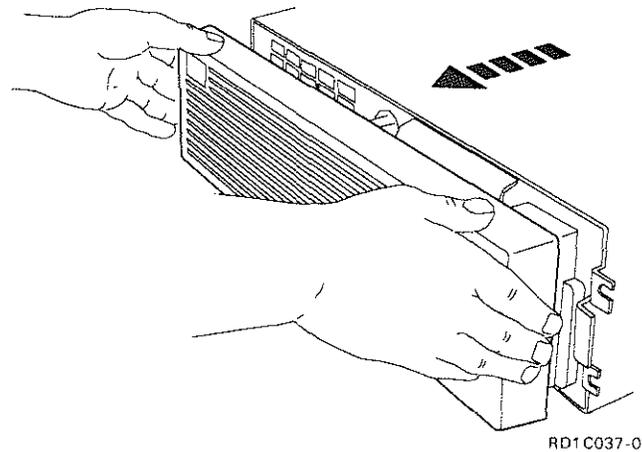
Rack-Mounted Unit

Stand-Alone Unit

RD1B003-0

3

Remove the front cover.



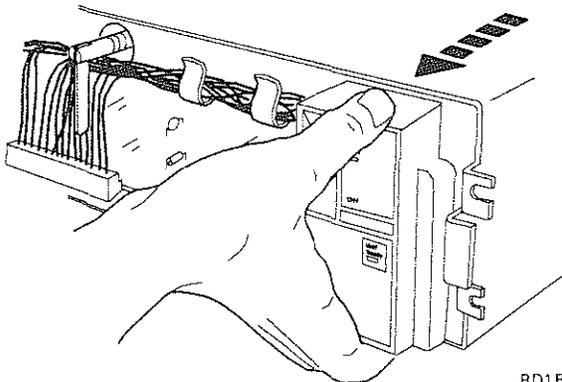
RD1C037-0

Control Panel LED Assembly R/R (Continued)

4

DANGER
Line voltage is present if the power cord is not disconnected.

Remove the control panel bezel by using finger pressure on the bezel and pulling straight out.

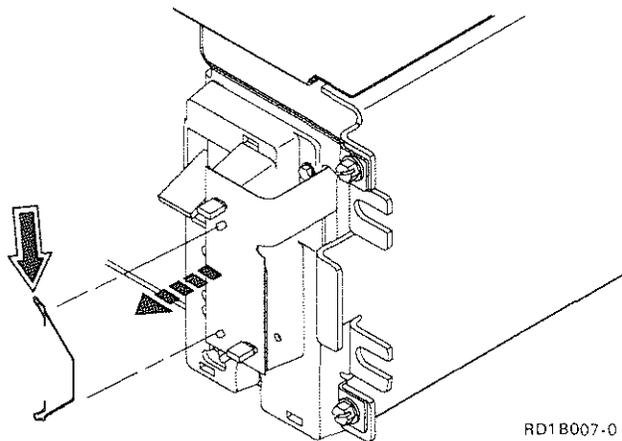


RD1B027-0

Note: The bezel is attached to the power supply by three tab latches.

5

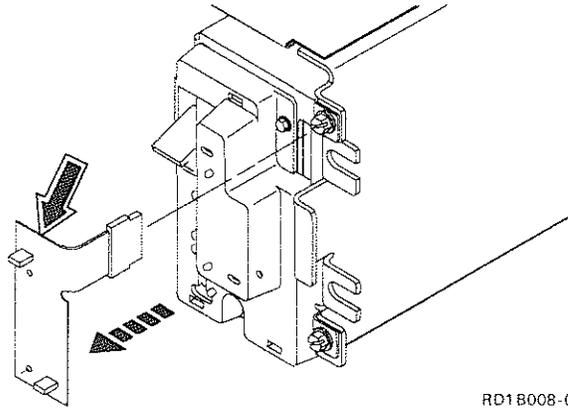
Remove the wire cable retainer.



RD1B007-0

6

Remove the control panel LED assembly by pulling out on the assembly.



RD1B008-0

7

Install the control panel LED assembly in the reverse order of removal.

8

Verify the fix.

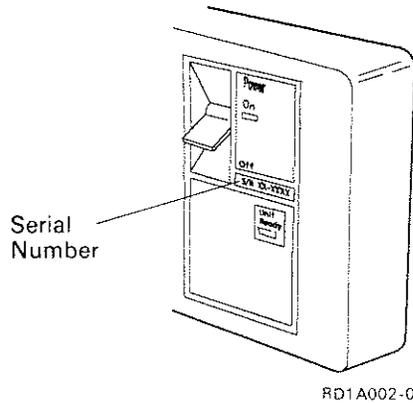
See “Verifying a Good Fix” on page 2-61.

Power Cord R/R

1

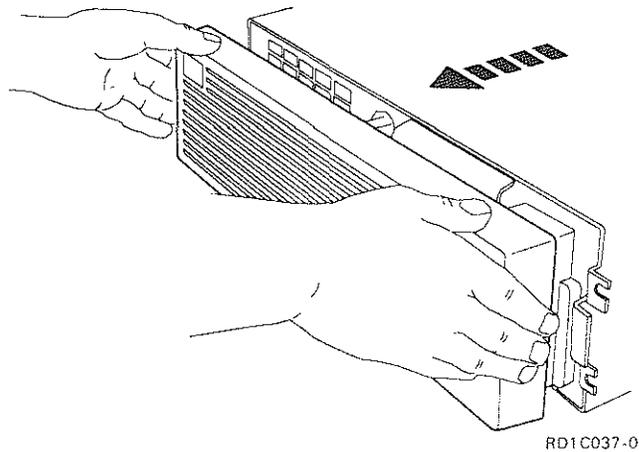
Verify the serial number of the 9332 that is installed.

- Look at the serial number on the front of the control panel.



2

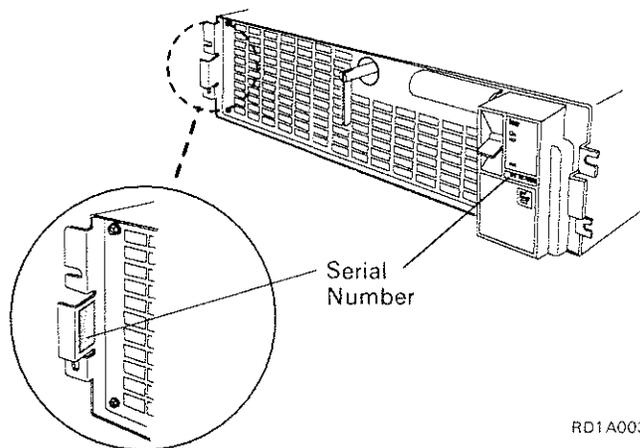
Remove the front cover.



3

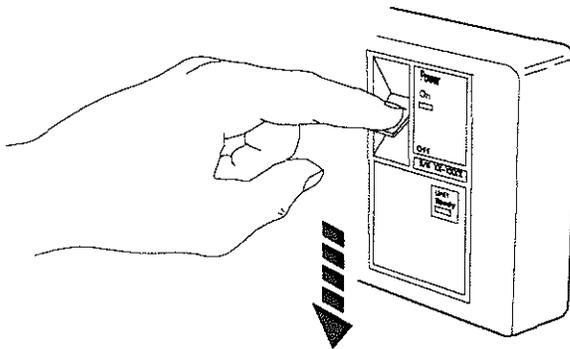
Verify that all serial numbers match.

- Control panel serial number
- Disk drive serial number



4

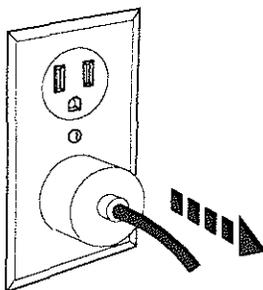
Power off the 9332.



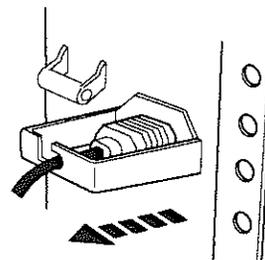
RD1A009-0

5

Disconnect the power cord from the AC power outlet.



Customer Outlet

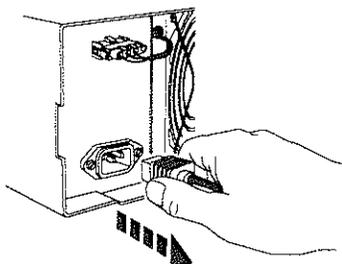


Rack Outlet

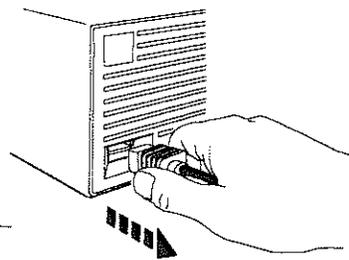
RD1B051-0

6

Disconnect the power cord from the rear of the power supply.



Rack-Mounted Unit



Stand-Alone Unit

RD1B003-0

Power Cord R/R (Continued)**7**

Install the power cord in the reverse order of removal.

8

Verify the fix.

See “Verifying a Good Fix” on page 2-61.

Verifying a Good Fix

Warning: When you power on the 9332, the system must be powered on in order for the 9332 power-on diagnostics to work correctly. If the system is not powered on, the results of the diagnostics can indicate that the 9332 is not OK.

A fix is verified when the following items are completed:

- The 9332 powered on normally.

The following is a normal power-on sequence for the 9332:

1. The unit is powered on.
2. The Power Ready light starts to flash immediately. The Unit Ready light remains off.
3. After 2 to 4 seconds, the Power Ready light comes on continuously and the Unit Ready light starts to flash.
4. After 60 to 90 seconds (maximum of 2 minutes if a reallocate is in process), the Unit Ready light comes on continuously. If after 90 seconds both the Power Ready light and the Unit Ready light are on continuously, the 9332 has completed power-on diagnostic tests and can now perform read and write operations.

*Note: If the 9332 does not power on normally (both Power Ready and Unit Ready lights on continuously), go to "Starting Problem Analysis" in the **Analyzing Problems** manual to analyze the problem indicated by the lights.*

- No system reference codes (SRCs) were indicated at the system after the 9332 powered on.
- System utilities have been run verifying that the system can communicate with the 9332 (no SRCs returned).
- Problem recovery procedures, if specified, for the problem you are working on have been performed.

Getting Ready	3-2
Safety Conditions	3-2
Safety Education	3-2
Chemicals	3-2
Performing the Inspection	3-2
Reference Information	3-2
Verify the Model and Serial Numbers	3-3
Verify Features Installed	3-6
AC Power Cord	3-7
Cover	3-9
AC Safety Grounds	3-10
Safety Labels	3-11

Getting Ready

These procedures were written for use by IBM service representatives only. If these procedures are used by persons other than IBM service representatives, the procedures do not imply or guarantee that the machine has met all safety conditions.

Before performing the inspection procedures in this guide, ensure that present conditions are safe and that the machine is powered off.

Safety Conditions

If present conditions are not safe, you must determine if the condition is serious. For example, the following conditions are not safe:

- Electrical: In the primary power area, a frame that is not grounded
- Mechanical: Missing covers
- Other: Leaking capacitors

You must determine if the problem should be repaired before you can continue with this inspection.

Safety Education

Before performing the inspection procedures in this guide, you must have completed the *Electrical Safety Training Course for IBM Customer Engineers* (77170 or latest level).

Chemicals

Do not use solvents, cleaners, or other chemicals not approved by IBM.

Performing the Inspection

Safety items to protect operators and service personnel from injury are included in the design and assembly of IBM machines. This inspection guide identifies areas of the machine that can be not safe. Use good judgment to identify other safety conditions not covered by this inspection guide.

Reference Information

Ensure that the following reference information is available:

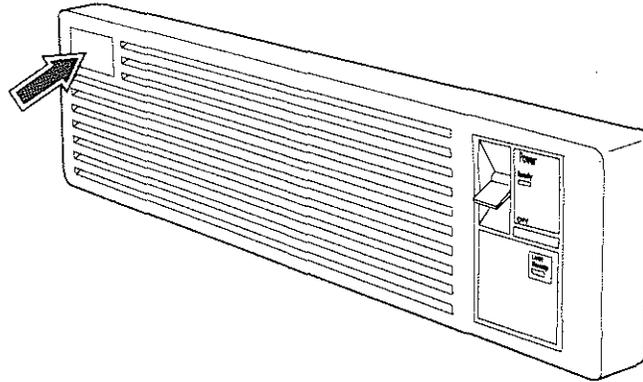
- The customer engineering memorandums (CEMs), engineering change announcements (ECAs), and service aids (SAs) for this machine type.
- *Installing*, SA21-9804
- *Electrical Safety for IBM Customer Engineers*, S229-8124

Verify the Model and Serial Numbers

1

Verify the model number of the 9332 that is installed.

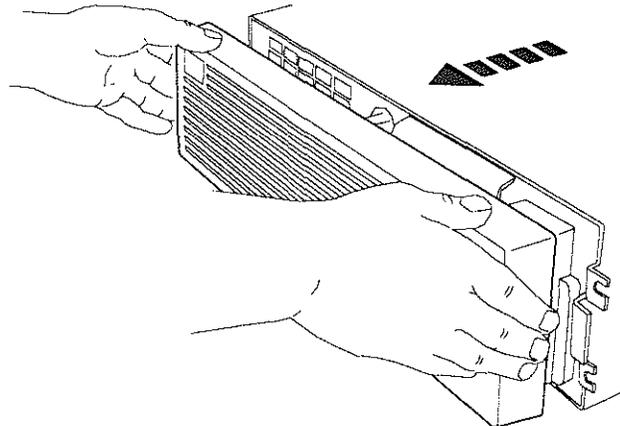
- Look at the nameplate on the front cover.
 - Model 200
 - Model 400



RD1B013-0

2

Remove the front cover.

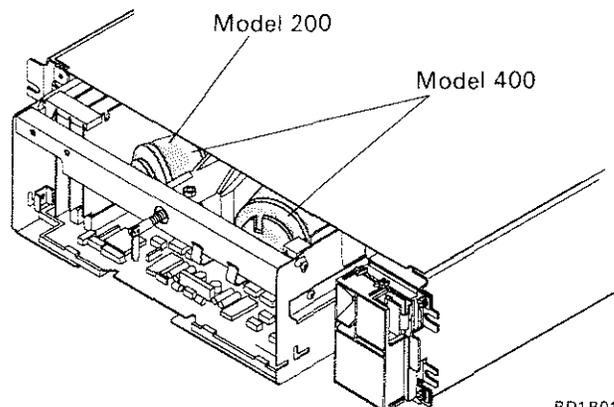


RD1C037-0

3

Observe the number of actuators present.

- Model 200 = one actuator
- Model 400 = two actuators



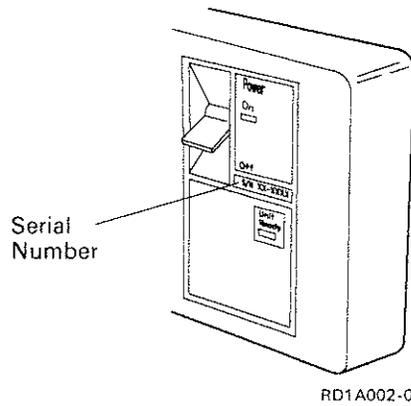
RD1B014-0

Verify the Model and Serial Numbers (Continued)

4

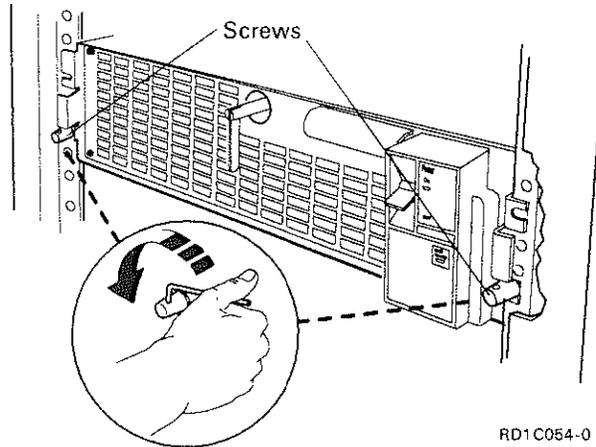
Verify the serial number of the 9332 that is installed.

- Look at the serial number on the front of the control panel.



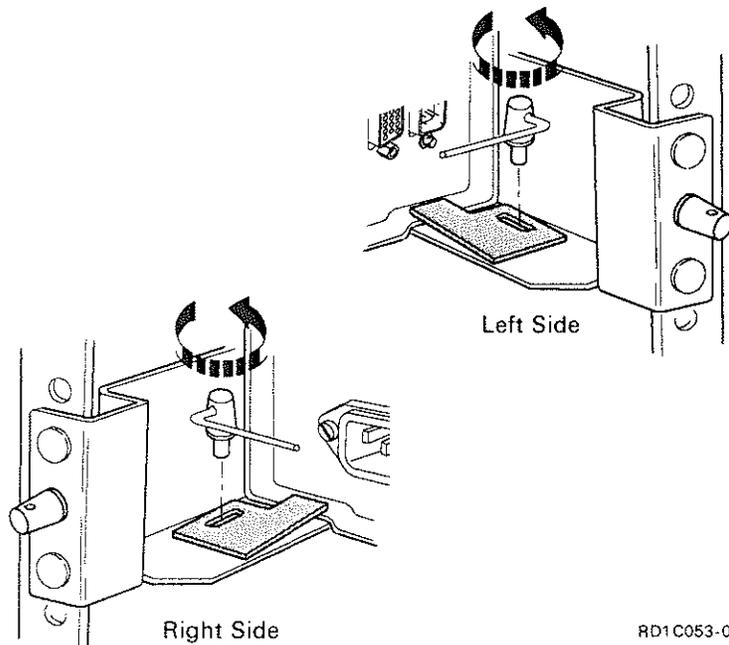
5

Remove the two screws that hold the front of the 9332 to the rack.



6

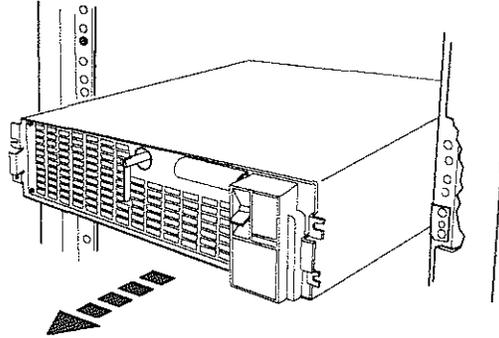
Remove the two screws and brackets that hold the rear of the 9332 to the rails.



7

Slide the 9332 enclosure forward on the rail about 10 centimeters (4 inches).

Note: You should be able to see the serial number on the information plate (top of disk unit).

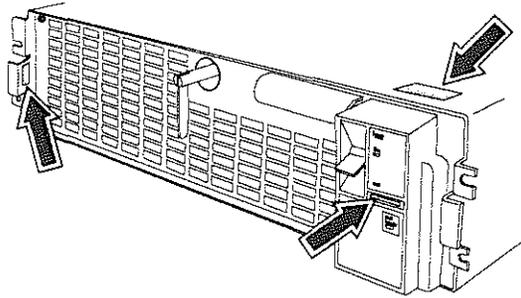


RD1C061-0

8

Verify that all serial numbers match.

- Information plate serial number (top of disk unit)
- Control panel serial number
- Disk drive serial number (left side)



RD1B057-0

Verify Features Installed

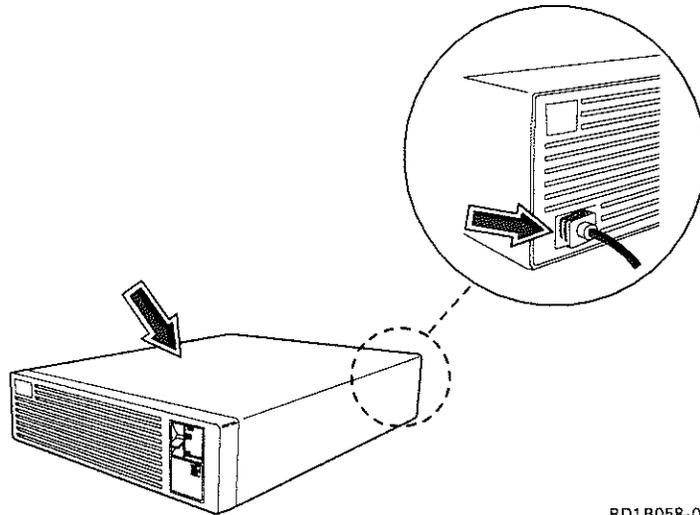
1

The 9332 can have the stand-alone cover feature installed.

2

Verify that the stand-alone cover feature is installed.

- Look for the stand-alone covers that are used to cover the 9332.
- Look for the power cord at the rear of the 9332 that matches the AC power in your country.



RD1B058-0

AC Power Cord

1

Remove the power cord from the customer outlet or rack outlet.

2

Check the power cord for visible cracks, wear, or damage.

AC Power Cord (Continued)**3**

Ensure that the power cord has the correct power plug. See "Power Cords" in Chapter 4 of this manual.

4

Check for 0.2 ohm or less of resistance between the power cord ground and the power supply frame.

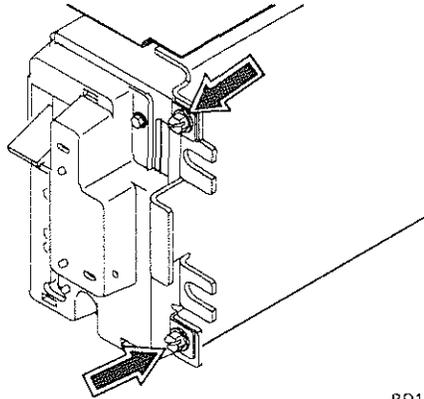
Cover

Ensure that the cover is not damaged and that no sharp edges are present.

AC Safety Grounds

1

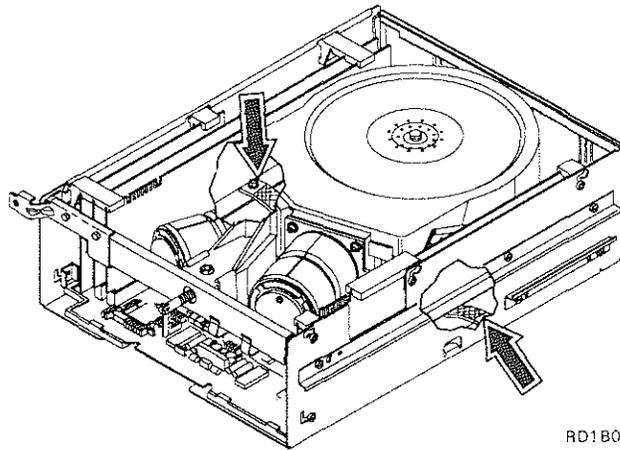
Ensure that the power supply mounting screws are tight.



RD1B011-0

2

Ensure that the grounding straps between the disk enclosure and the disk drive are attached.



RD1B062-0

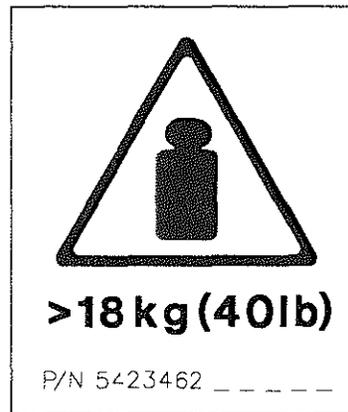
Safety Labels

Ensure that the system has all of the safety labels shown.

Warranty Label

DO NOT SERVICE PARTS ON THIS UNIT. REMOVAL OF ANY PARTS WILL VOID WARRANTY.

Weight Label



Trained Personnel Only

Note: The power supply must be removed to see the safety label. See "AC/DC Power Supply R|R" on page 2-10.

**HAZARDOUS AREA
TRAINED SERVICE
PERSONNEL ONLY**

RD1B060-0

Using This Catalog 4-2
Assembly 1: 9332 Final Assembly 4-4
Assembly 2: Rack Mounting Group 4-6
Assembly 3: Stand-alone Cover Group 4-8
Assembly 4: Unit Assembly 4-10
Assembly 5: Disk Enclosure Assembly/Logic Cards 4-12
Signal Cable Assembly 4-14
Power Cords 4-15

Using This Catalog

How This Catalog Is Arranged

This catalog contains assembly illustrations on the left-hand page. An associated assembly index and parts list is on the right-hand page.

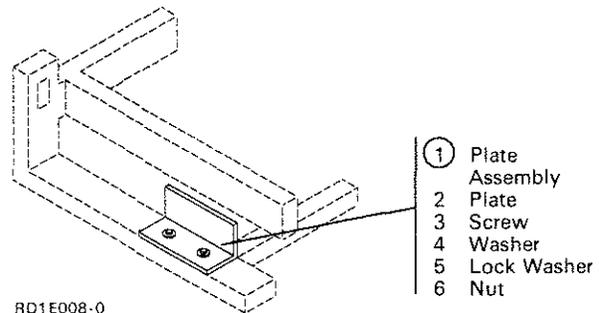
Finding and Ordering the Correct Part

1. Locate the index number for a part on the left-hand page.
2. Locate the index number in the associated table on the right-hand page.
3. Order the part number associated with the index number.

Note: If you order a part that needs a label, order the label in the correct language. For example, a part on a Quebec machine should have a Canadian French-language label instead of a French-language label.

Using Stacked Index Numbers

Stacked index numbers are used when showing a part and its attaching hardware. The circled index number indicates that the figure includes all parts in the assembly.



Using the Part Number Index

When you know a part number and want to find the page where the part is illustrated, use the part number index starting on page P-1. This index numerically lists all part numbers with associated index and assembly numbers.

Using the Index and Part Number Listings

The information associated with the reverse keys describes terms and information in the example table below.

- A** AR (as required) in the Units column indicates that the quantity is used as required.
- B** NR (not recommended) in the Units column indicates that you can order the part, but the part is not recommended for field replacement. Order the next higher assembly.
- C** NP (not procurable) in the Units column indicates that you cannot order the assembly. Order the detail parts separately.

D NO NO. (no number) in the Part Number column indicates that no assembly part number has been assigned to this group of parts. Order the detail parts separately.

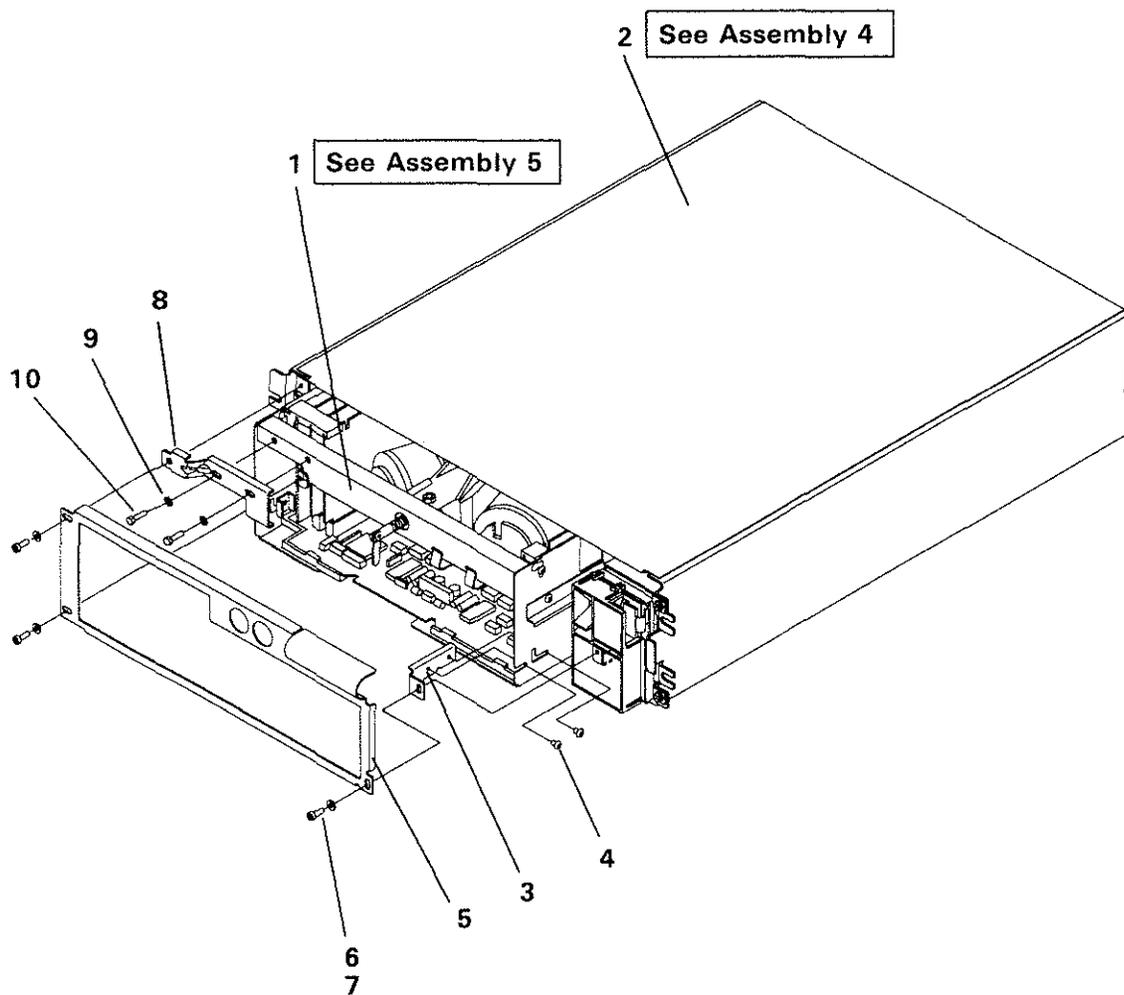
E Items are offset in the Description column to indicate the position of a part relative to its next higher assembly. For example:

- | | | | |
|------|---|----------------------------------|--------------------------------|
| 1 | 2 | 3 | 4 |
| Unit | | | |
| • | Assemblies and detail parts of unit | | |
| • | Attaching parts for assemblies and detail parts | | |
| • | • | Subassemblies | |
| • | • | Attaching parts of subassemblies | |
| • | • | • | Detail parts for subassemblies |

Asm-Index	Part Number	Units	Description
1-	D NO NO.		BEZEL AND OPERATOR PANEL ASSEMBLY
-			
-1	7362299	B NR 1	E • Bracket, LED and Switch
-2	8330754	1	• Potentiometer
-3	5552875	1	• Potentiometer
-4	1621811	3	• Knob Asm
-5	1940	A AR 3	• LED, Light
-6	5552875	1	• Block, LED
-7	2767401	C NP 2	• Clip

RD1 E010-0

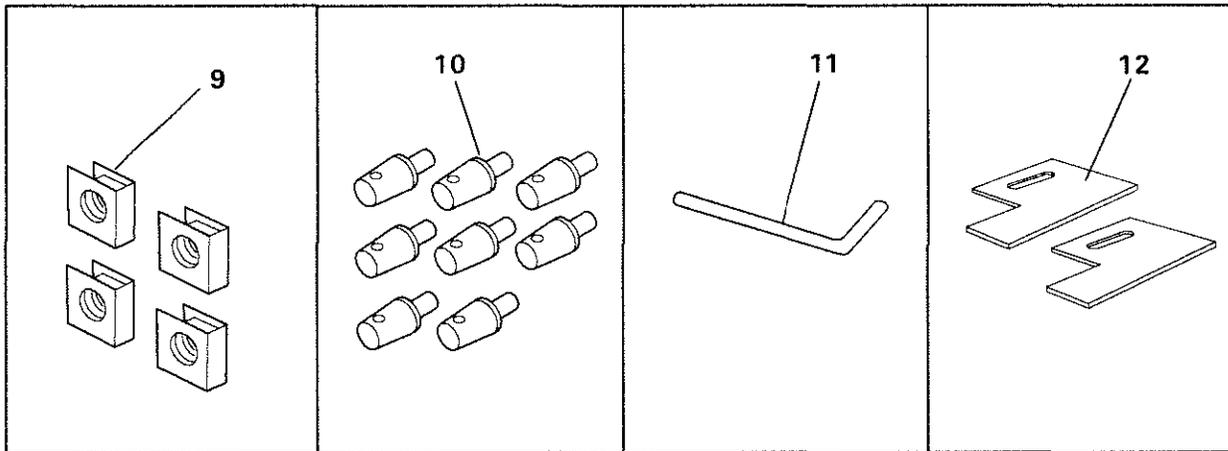
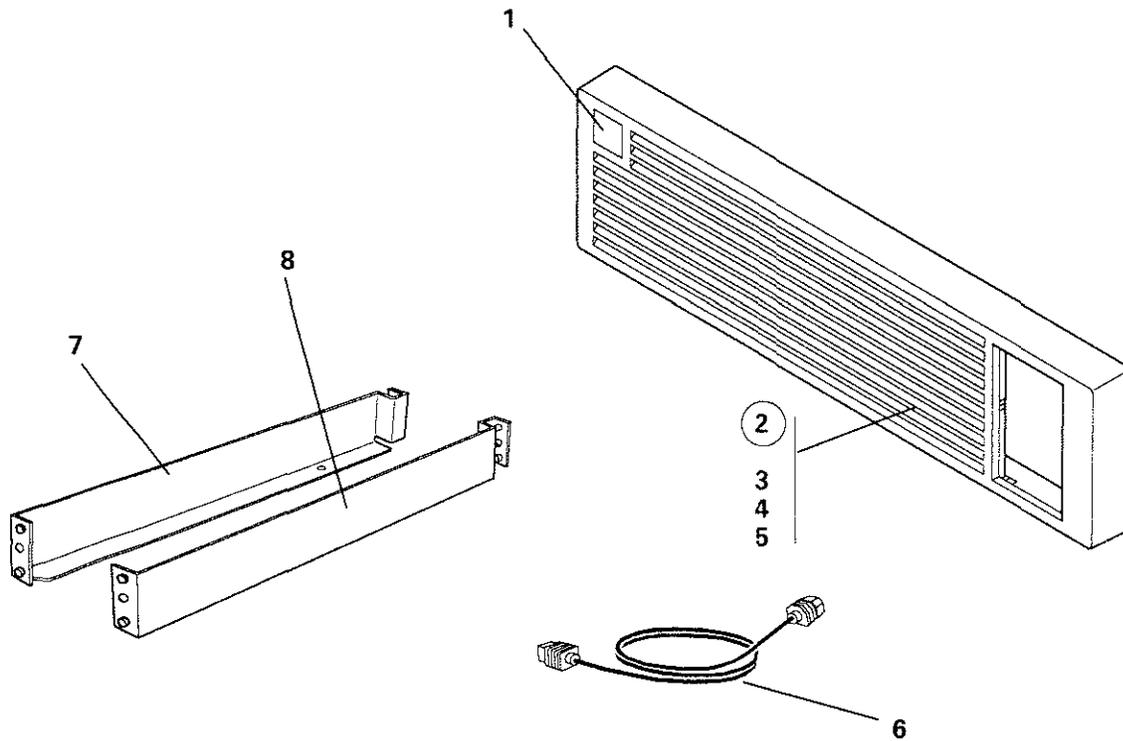
Assembly 1: 9332 Final Assembly



RD1E001

Asm - Index	Part Number	Units	Description
1 -	8264573		9332 Final Assembly (Model 200)
-	8264574		9332 Final Assembly (Model 400)
-1	2453450	NR 1	. Disk Enclosure Assembly (1 actuator) (see Assembly 5)
-1	2453650	NR 1	. Disk Enclosure Assembly (2 actuators) (see Assembly 5)
-2	8264580	1	. Unit Assembly
-3	8264619	1	. Stop (right)
-4	2453410	2	. Screw, Button-Hex Hd M4 x .7 x 6 Lg
-5	8264616	1	. Screen
-6	1621510	3	. Screw, Hex Socket Hd M4 x .7 x 10 Lg
-7	1622304	3	. Washer
-8	8264618	1	. Stop (left)
-9	1622346	2	. Lock Washer
-10	1673724	2	. Screw, Hex Hd M4 x .7 x 10 Lg

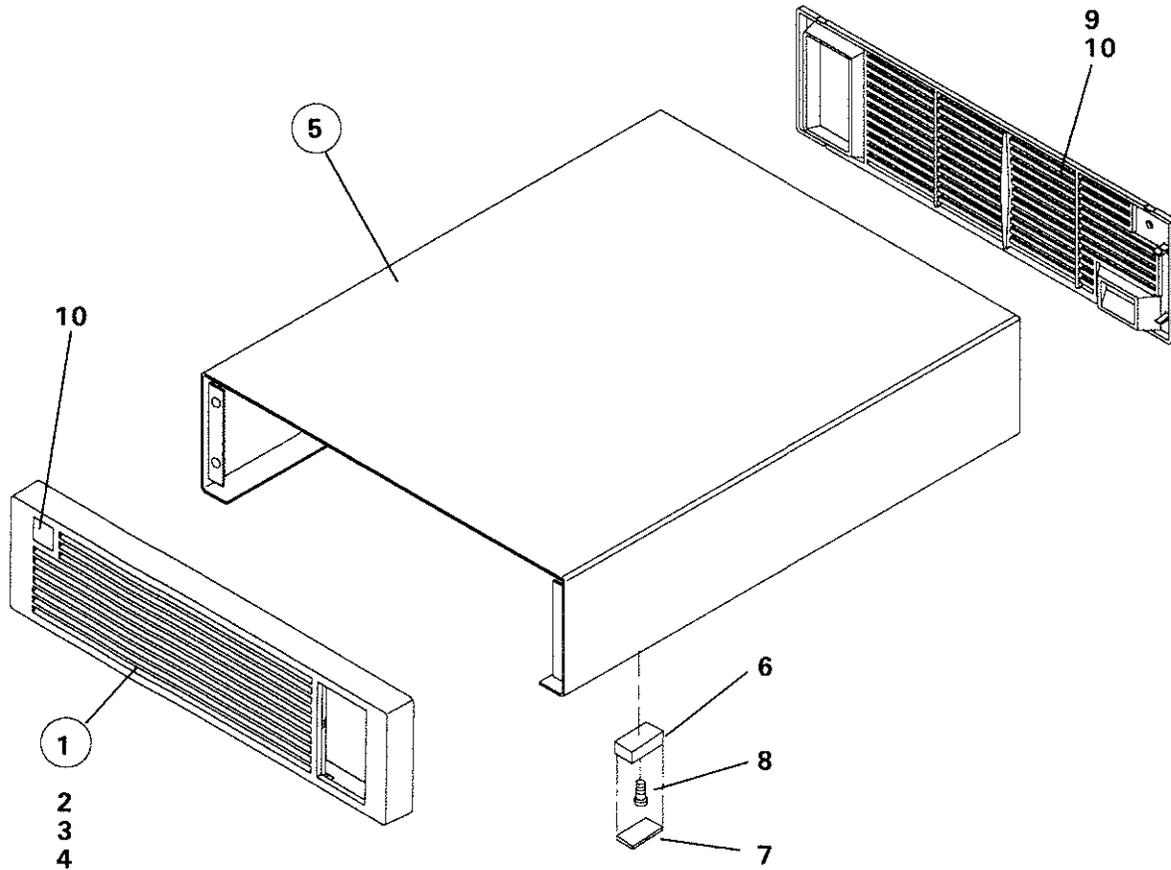
Assembly 2: Rack Mounting Group



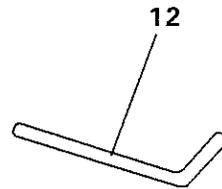
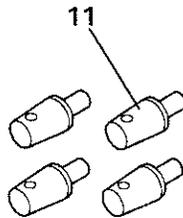
RD1E005

Asm - Index	Part Number	Units	Description
2-	8264579	1	Rack Mounting Group (Model 200)
-	8264582	1	Rack Mounting Group (Model 400)
-1	8265457	1	. Nameplate (Model 200 only)
-1	8265459	1	. Nameplate (Model 400 only)
-2	8264584	1	. Cover Assembly (front)
-3	8265462	2	. . Clip
-4	79778	2	. . Screw, Self-Tapping .312 in. Lg
-5	6200562	1	. . Holder (tightening rod)
-6	375892	1	. Power Cord
-7	375816	1	. Rail (left)
-8	375714	1	. Rail (right)
-9	375867	4	. Nut Clip
-10	6200684	8	. Screw
-11	6200972	1	. Tightening Rod
-12	8264577	2	. Bracket (rear hold down)

Assembly 3: Stand-alone Cover Group



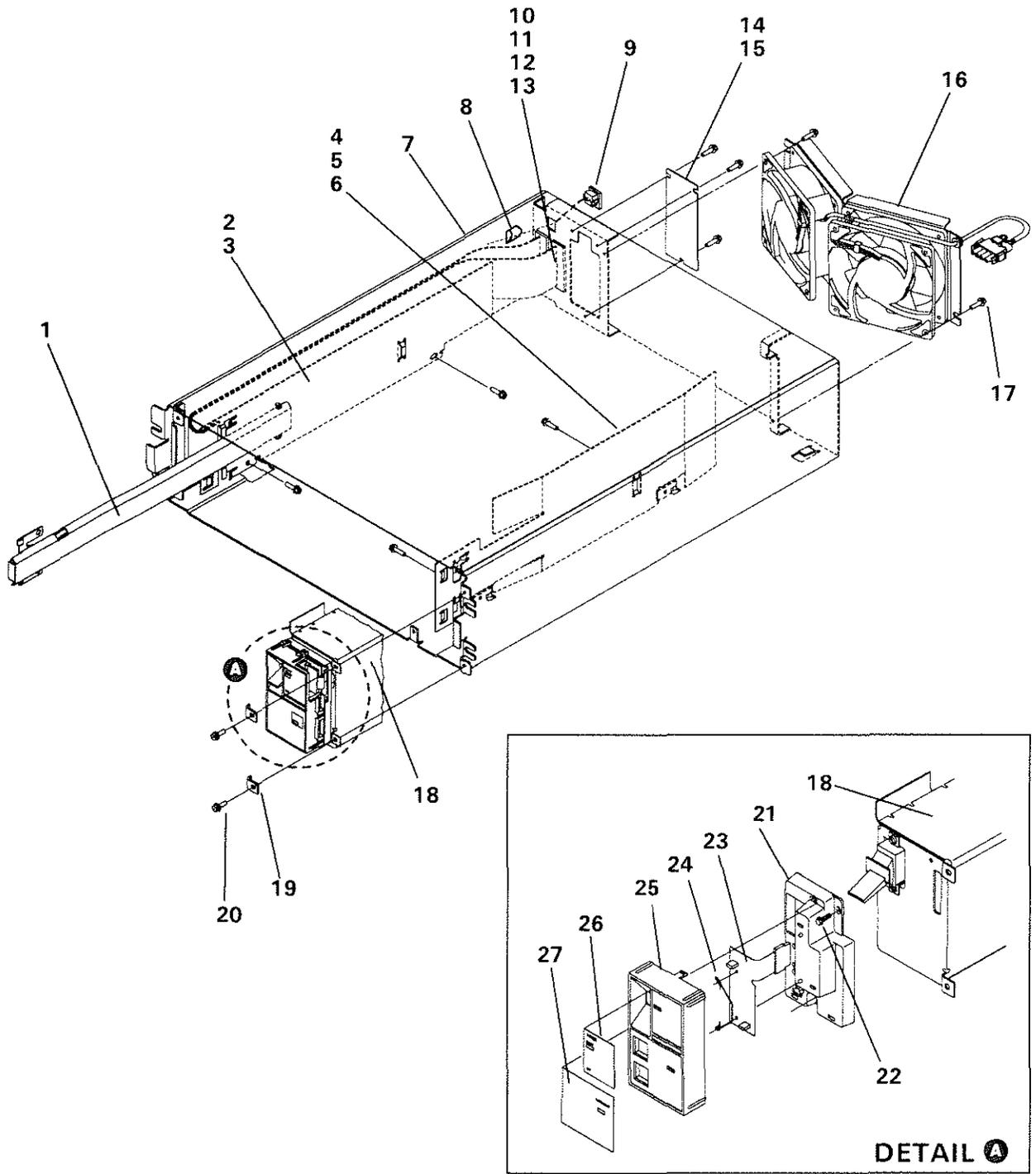
FOR POWER CORD
PART NUMBERS SEE
"POWER CORDS"



RD1E004

Asm - Index	Part Number	Units	Description
3 -	8264596		Stand-alone Cover Group (Model 200)
-	8264575		Stand-alone Cover Group (Model 400)
-1	8265451	1	. Cover Assembly (front)
-2	8265462	2	. . Clip
-3	79778	2	. . Screw, Self-Tapping .312 in. Lg
-4	6200562	1	. . Holder (tightening rod)
-5	8265452	1	. Cover Assembly (top)
-6	8264597	4	. . Foot
-7	8264599	4	. . Pad
-8	1621190	4	. . Screw, Slot Pan Hd M4 x .7 x 8 Lg
-9	8265453	1	. Cover (rear)
-10	8265457	2	. Nameplate (Model 200 only)
-10	8265459	2	. Nameplate (Model 400 only)
-11	6200684	4	. Screws
-12	6200972	1	. Tightening Rod

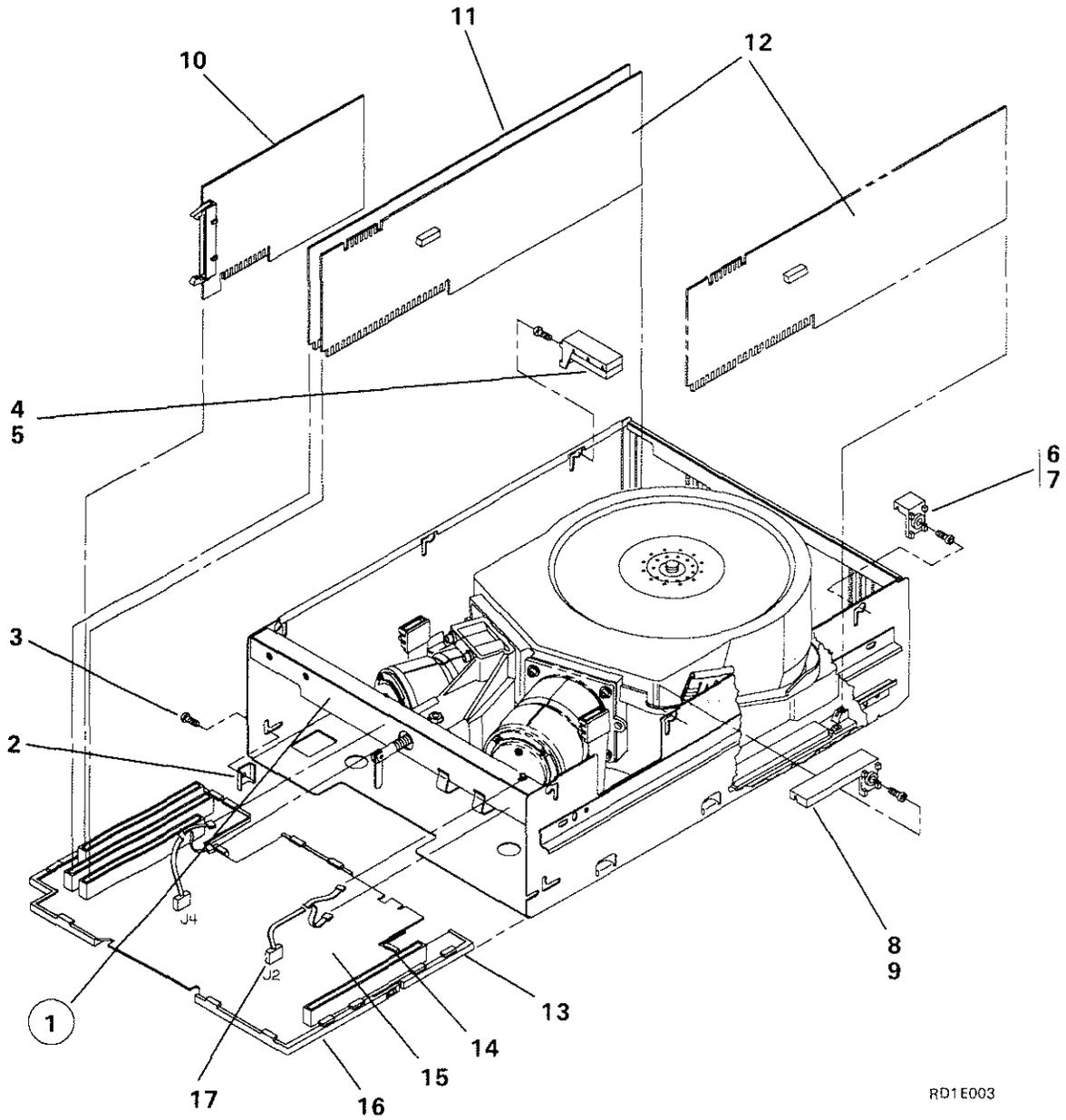
Assembly 4: Unit Assembly



RD1E002

Asm - Index	Part Number	Units	Description
4 -	8264580	1	Unit Assembly
-1	8264623	2	. Slide (2 sections)
-2	8264651	1	. Bracket (left)
-3	1621812	2	. Screw,Thd-Roll Hex Wshr Hd M4 x .7 x 8 Lg
-4	8264652	1	. Bracket (right)
-5	1621850	1	. Screw,Thd-Roll Pan Hd M4 x .7 x 6 Lg
-6	1621832	1	. Screw,Thd-Roll Hex Wshr Hd M4 x .7 x 5 Lg
-7	8264598	NR 1	. Enclosure
-8	2596291	2	. Clip (cable)
-9	8264629	1	. Address Switch Assembly
-10	8264628	1	. Signal Cable Assembly
-11	6495342	2	. Screw (female)
-12	6495343	2	. Screw (male)
-13	150209	4	. Lock Washer
-14	8264607	1	. Cover Plate
-15	1621812	3	. Screw,Thd-Roll Hex Wshr Hd M4 x .7 x 8 Lg
-16	8264609	1	. Fan Assembly
-17	1621812	2	. Screw,Thd-Roll Hex Wshr Hd M4 x .7 x 8 Lg
-18	8264255	1	. Power Supply
-19	8264640	2	. Stiffener
-20	1621812	2	. Screw,Thd-Roll Hex Wshr Hd M4 x .7 x 8 Lg
-21	8264648	1	. Frame
-22	1621829	2	. Screw,Thd-Roll Hex Wshr Hd M3 x .5 x 6 Lg
-23	8264642	1	. LED Assembly
-24	8264638	1	. Spring Retainer
-25	8264647	1	. Bezel
-26	8264595	1	. Decal (power on, English)
-27	8264594	1	. Decal (unit check, English)

Assembly 5: Disk Enclosure Assembly/Logic Cards



RD1 E003

Asm - Index	Part Number	Units	Description
5 -	None		Disk Enclosure Assembly/Logic Cards
-1	2453672	1	. Disk Enclosure (1 actuator) w/o Logic Cards
-1	2453673	1	. Disk Enclosure (2 actuators) w/o Logic Cards
-2	6202598	1	. . Retainer, Board
-3	2453410	2	. . Screw, Button Hex M4 x .7 x 6 Lg
-4	2453641	3	. . Retainer, Card
-5	2453410	3	. . Screw, Button Hex M4 x .7 x 6 Lg
-6	2453640	2	. . Retainer, Card (Model 400 only)
-7	2453410	2	. . Screw, Button Hex M4 x .7 x 6 Lg (Model 400 only)
-8	6494514	1	. . Retainer, Card (Model 400 only)
-9	2453410	1	. . Screw, Button Hex M4 x .7 x 6 Lg (Model 400 only)
-10	xxxxxxx	1	. Driver/Receiver Card
-11	xxxxxxx	1	. I/O Adapter Card
-12	xxxxxxx	2	. Servo Card (Model 200 has only one card)
-13	2453655	1	. Shroud (rear)
-14	2453620	2	. Clip
-15	xxxxxxx	1	. Driver Board
-16	2453656	1	. Shroud (front)
-17	2453545	2	. VCM Cable (Model 200 has only one cable)

Signal Cable Assembly

Notes:

1. *The 9332 can be installed at any point in the signal cable path.*
2. *The length of the signal cable is determined by the customer when the 9332 is ordered. The location of the host or arrangement of other I/O units determines the length of cable needed.*
3. *When determining the length of the cable, allow for any cable path bends or drops that occur as the cable goes to the next unit. For example, the distance from the floor to the rear of a stand-alone unit (installed on a table), or the distance from a rack-mounted unit to another unit (installed at some other table or rack).*
4. *The total length of all the signal cables in a string cannot be more than 75 meters (246 feet). Calculate the total cable length in your string as follows: (4 meters for the system or controller) + (2 meters for each attached disk unit) + (length of all other signal cables ordered for the string).*

Cable Length	Feature Code
0.6 meter (2 feet)	9801
1.5 meters (5 feet)	9802
2.5 meters (8.2 feet)	9803
4.0 meters (13.1 feet)	9804
6.0 meters (19.7 feet)	9805
10 meters (32.8 feet)	9806
20 meters (65.6 feet)	9807
30 meters (98.4 feet)	9808
40 meters (131.2 feet)	9809
60 meters (196.8 feet)	9810

Power Cords

To find the correct power cord for your installation, do the following:

1. Find your country name in Chart 1 on page 4-16.
2. Select the code number from the 125 Vac or 250 Vac column following your country name.
3. Locate that code number in the Type Code column of Chart 2 on page 4-17.
4. From Chart 2, order the part number shown for that type code.

For example, if your country name is Canada, you have two plug types to choose from: type code 5 (125 Vac) or type code 1 (250 Vac). Ensure that the plug type matches your electrical outlet and order the specified part number.

Chart 1

Country Name	125 Vac	250 Vac
Algeria		9
Andorra		9
Antigua		12
Argentina		4
Australia		7
Austria		9
Bahamas	5	1
Bahrain		12
Bangladesh		11
Barbados	5	1
Belgium		9
Benin Republic		9
Bermuda	5	1
Bolivia		8
Brazil	5	1
Brunei		12
Bulgaria		9
Burma		11
Canada	5	1
Cayman Islands (BWI)	5	
Chad		9
Channel Islands		12
Chile		14
Colombia	5	1
Congo		9
Costa Rica	5	1
Cyprus		12
Denmark		10
Dominican Republic	5	1
Ecuador	5	1
Egypt		9
El Salvador	5	1
Finland		9
France		9
Germany (West)		9
Greece		9
Guatemala	5	1
Guinea		9
Guyana	5	1
Haiti	5	1
Honduras	5	1
Hong Kong		12
Iceland		9
India		12
Indonesia		3
Ireland		12
Israel		15
Italy		14
Ivory Coast		9
Jamaica	5	1
Japan	5	1
Kenya		12
Kuwait		12

Country Name	125 Vac	250 Vac
Lebanon		9
Liechtenstein		13
Luxembourg		9
Malagasy		9
Malaysia		12
Mali		9
Mauritania		9
Mauritius		9
Mexico	5	
Monaco		9
Morocco		9
Netherlands		9
Netherland-Antilles	5	1
New Caledonia		9
New Zealand		7
Nicaragua	5	
Niger		9
Norway		9
Oman		12
Pakistan		11
Panama	5	1
Papua New Guinea		3
Paraguay		8
Peru		1
Philippines	5	1
Portugal		9
Qatar		12
Saudi Arabia		12
Senegal		9
Sierra Leone		12
Singapore		12
South Africa		11
South Korea	5	1
Spain		9
Sri Lanka		11
Surinam	5	
Sweden		9
Switzerland		13
Taiwan	5	1
Thailand		1
Togo		9
Trinidad	5	1
Tunisia		9
Turkey		9
United Arab Emirates		12
United Kingdom		12
Upper Volta		9
Uruguay		8
U.S.	5	1
U.S./Chicago	6	2
Venezuela	5	1
Western Samoa		7
Yugoslavia		9

Chart 2

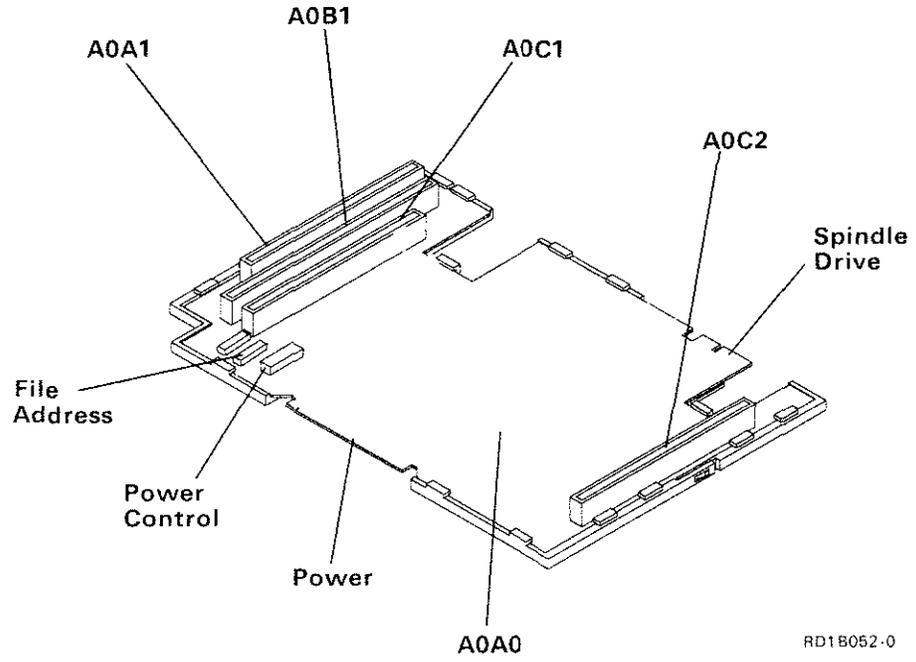
Type Code	Plug Configuration	Part Number
1		1838574 (2.8 meter)
2		1838576 (1.8 meter)
3	No Plug	4437620
4		6952291 (2.8 meter)
5		6952300 (2.8 meter)
6		6952301 (1.8 meter)
7		6952311 (2.8 meter)
8		6952319 (4.3 meter)
9		6952320 (2.8 meter)

Type Code	Plug Configuration	Part Number
10		6952329 (2.8 meter)
11		6952347 (2.8 meter)
12		6952356 (2.8 meter)
13		6952365 (2.8 meter)
14		6952375 (1.8 meter)
15		6952383 (2.8 meter)

RD1E007-0

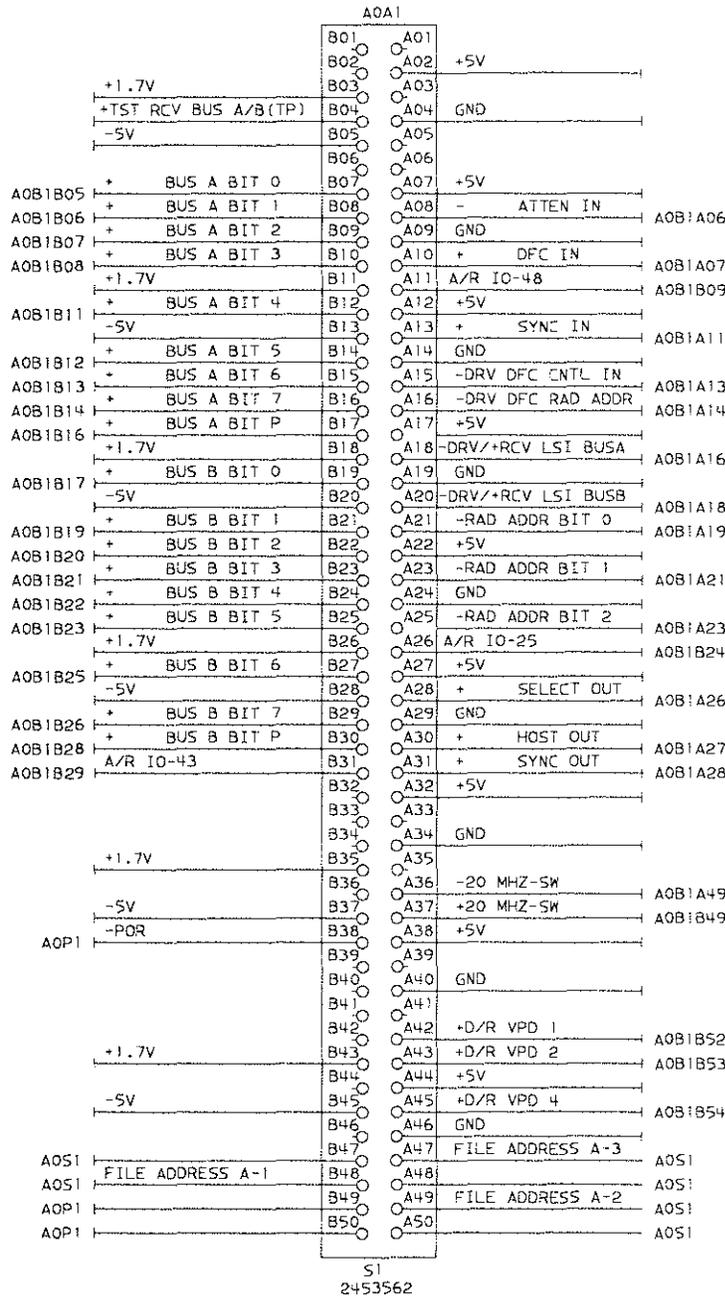
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Card Locations



Driver/Receiver Card Connector

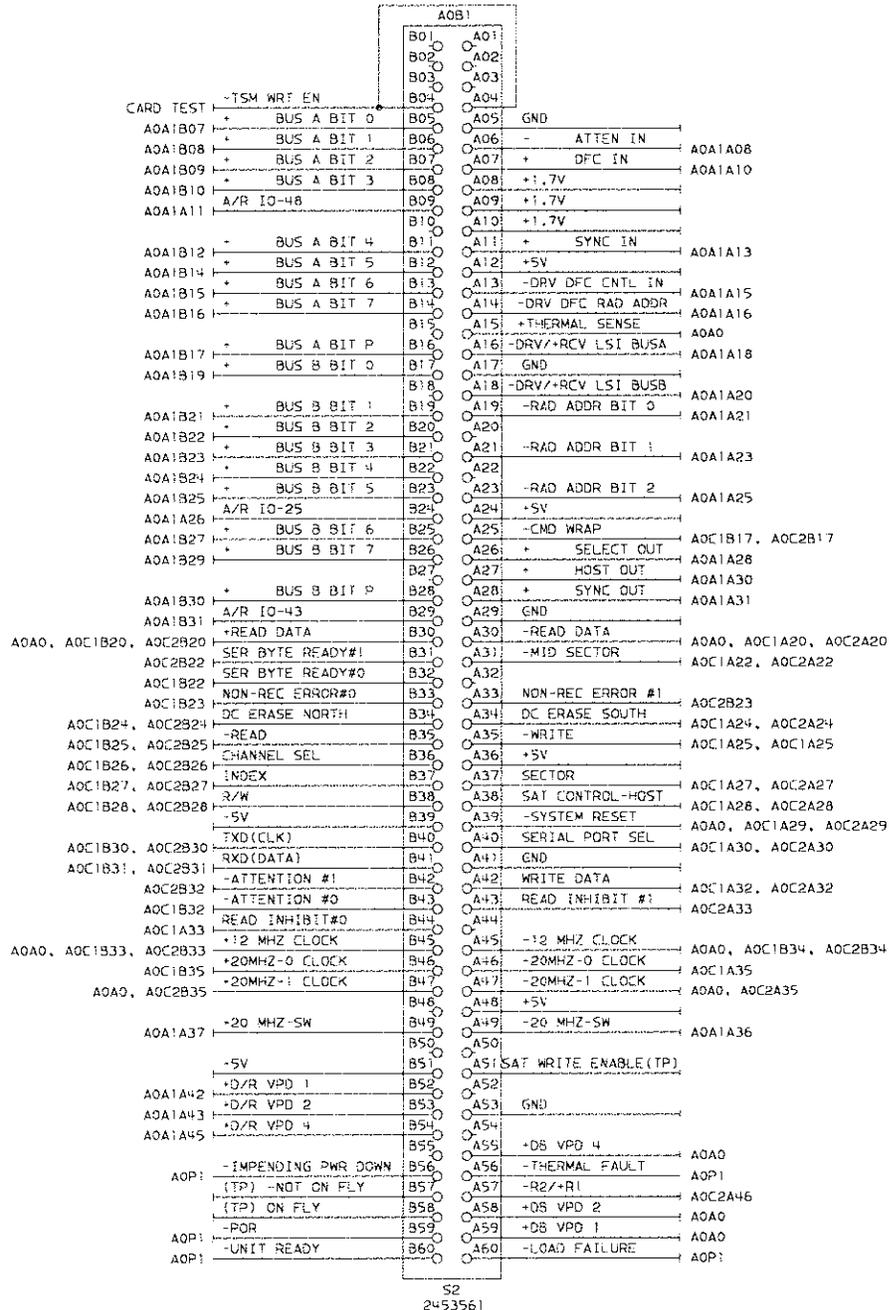
Location A0A1



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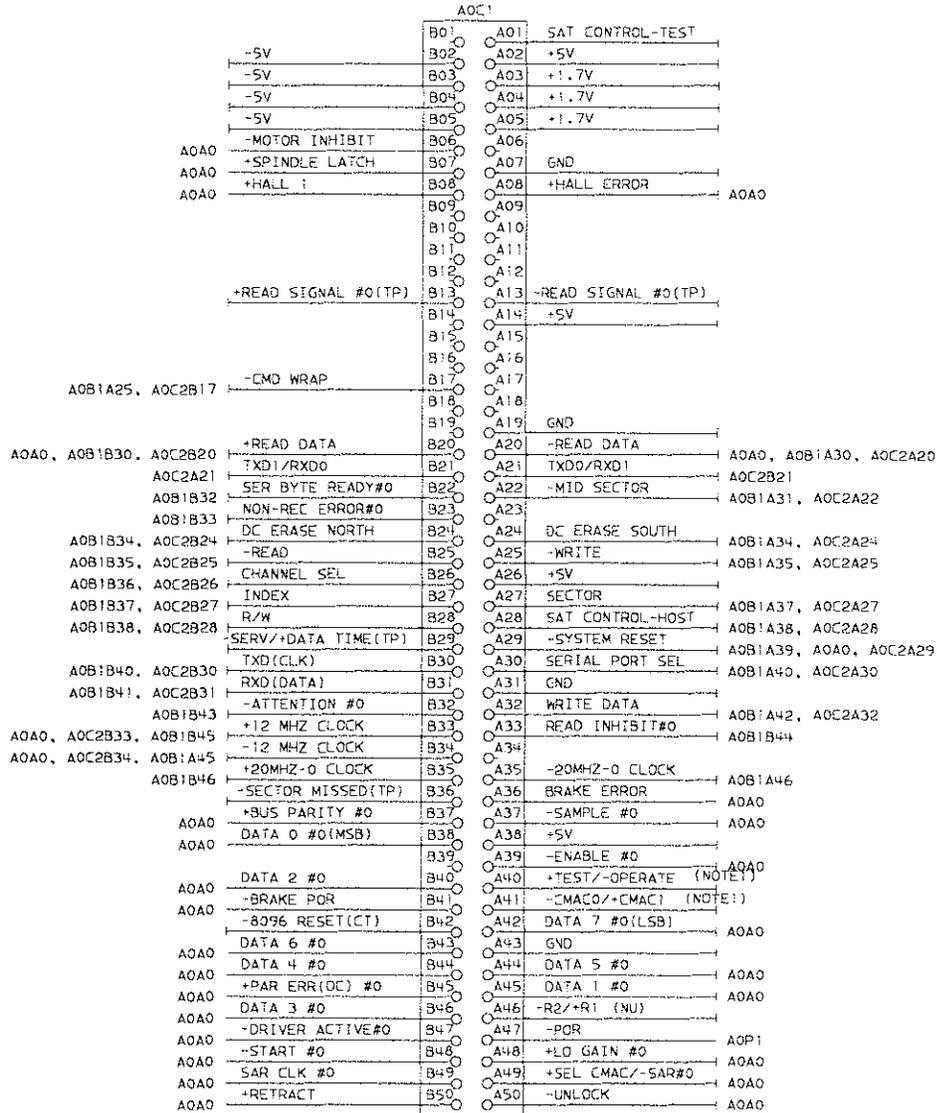
I/O Adapter Card Connector

Location A0B1



Servo 1 Card Connector

Location A0C1



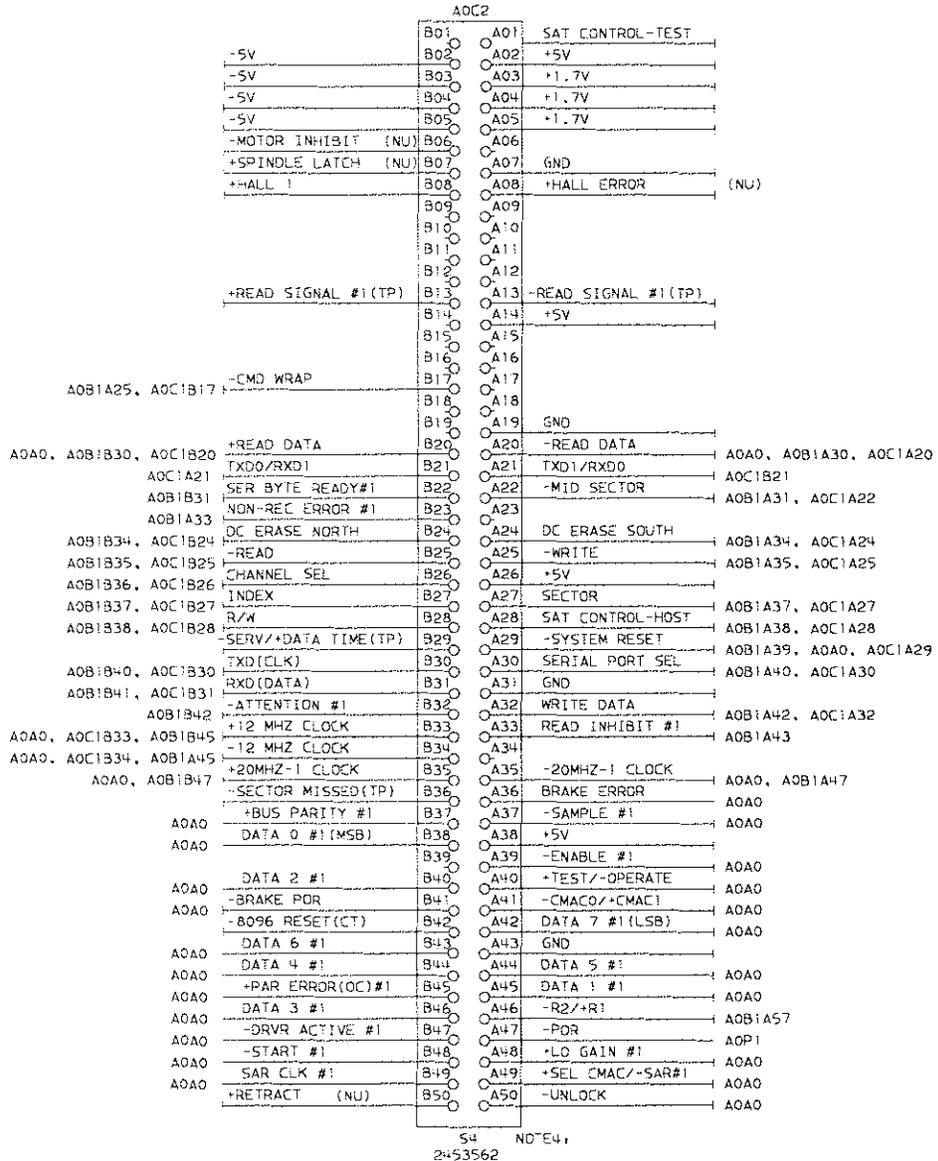
S3
245.3562

- NOTE1: PIN TIED TO GND
- NOTE2: PIN TIED TO -5V THRU RESISTOR R26
- NOTE3: PIN TIED TO -5V THRU RESISTOR R137
- NOTE4: USED ONLY ON ASM 6494589

RD18054-0

Servo 2 Card Connector

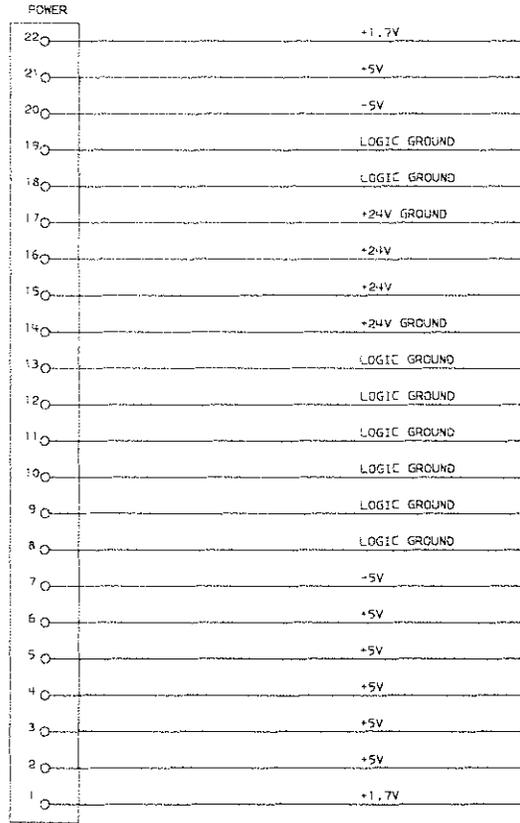
Location A0C1



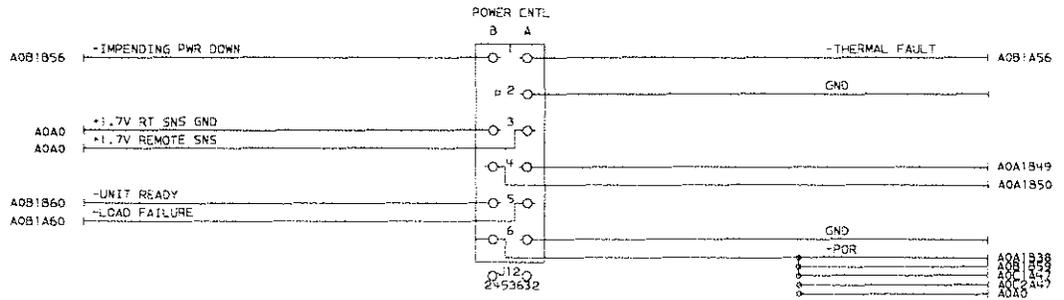
NOTE1: PIN TIED TO GND
 NOTE2: PIN TIED TO +5V
 THRU RESISTOR R26
 NOTE3: PIN TIED TO +5V
 THRU RESISTOR R137
 NOTE4: USED ONLY ON ASM 6494589

RD1B061-0

Power Supply and Power Control

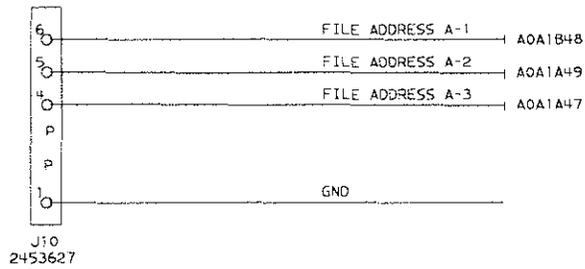
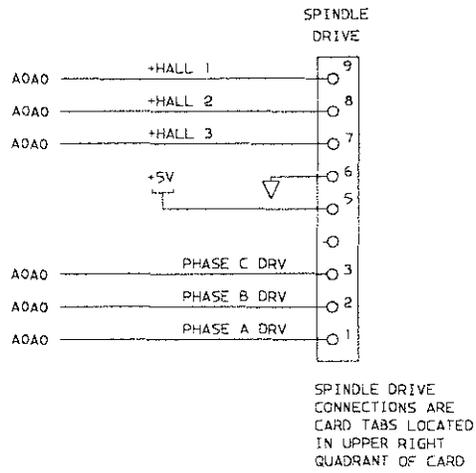


POWER CONNECTIONS
ARE CARD TABS LOCATED
IN FRONT CENTER OF CARD



RD1B055-0

Miscellaneous Connectors



RD1B056-0

This glossary includes terms and definitions from the *IBM Vocabulary for Data Processing, Telecommunications, and Office Systems*, GC20-1699.

AR. As required.

asm. Assembly.

controller. A device that controls the operation of one or more input or output devices.

driver. A source that sends (drives) a signal from one location to another.

ESD. Electrostatic discharge.

FRU. Field-replaceable unit.

LED. Light-emitting diode.

No no. No number.

NP. Not procurable.

NR. Not recommended.

R/R. Removal/replacement.

rack-mounted unit. A device that is placed in a rack.

SRC. System reference code.

stand-alone unit. A device that is placed on a table or shelf, instead of in a rack.

U.S. United States.

VCM. Voice coil motor.

G

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	5-12	4-13		4-	4-11
	5-15	4-13	8264582	2-	4-7
150209	4-13	4-11	8264584	2-2	4-7
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1621850	4-5	4-11	8264623	4-1	4-11
1622304	1-7	4-5	8264628	4-10	4-11
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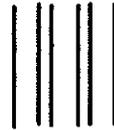
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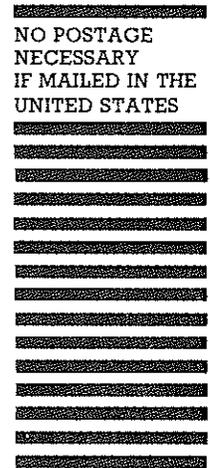
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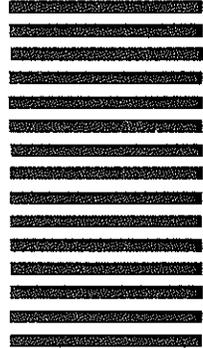
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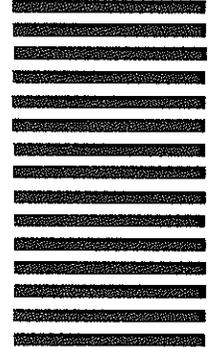
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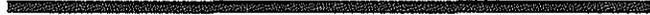


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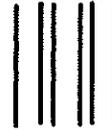
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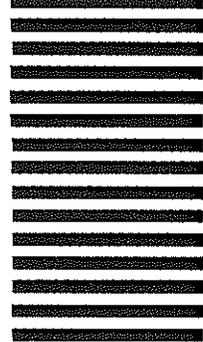
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