

SYSTEM CENTURY® DIGITAL CENTRAL OFFICE

SYSTEM PRECAUTIONS

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Par.	CONTENTS	Page
1.	Introduction	1
2.	Related Information	1
2.01	General	1
2.02	Related Publications	1
3.	Precautions	2
3.01	General	2
3.02	Equipment Room	2
3.03	Tools and Test Equipment	2
3.04	Handling of Electrostatically Sensitive Components	2
3.05	Printed Wiring Board Assemblies	2
3.06	Storage Environment of Electronic Equipment	3
3.07	Office Ground	4
3.08	Floppy Disk System	4
3.09	Other Input/Output Peripheral Devices	4
3.10	Power Equipment	5
3.11	Common Control Frame	5
3.12	Common Control Expansion Frame	5
3.13	Maintenance and Administration Frame	6
3.14	Control and Maintenance Frame	6
3.15	Automatic Message Accounting Frame	6
3.16	Common Equipment Frame	6
3.17	Power Frames	6
3.18	Battery Discharge Frame	6
3.19	Central Processing Unit Frame	6
3.20	Line and Trunk Frame	6
3.21	Main or Combined Distributing Frame	6
3.22	Batteries	7
3.23	Battery Chargers	7
3.24	Equipment Removal and Replacement	7

1. INTRODUCTION

1.01 This section describes the necessary precautions that shall be followed whenever an operator, craftsman, maintenance person, or any other person, does routine or special maintenance tasks with a SYSTEM

CENTURY Digital Central Office (DCO). This section is primarily organized on a frame basis (that conforms with the DCO configuration) wherein the precautions are listed and described relative to a specific frame. Warnings that relate to personnel safety are normally described by the operating companies' own safety regulations.

1.02 This section is reissued to include information related to the common control expansion frame, the control and maintenance frame, and the power, ringing, test access frame.

2. RELATED INFORMATION

2.01 General.

A Sales and Instructional Literature Index of latest available publications can be obtained from your Stromberg-Carlson sales representative or from Publications Services, Stromberg-Carlson Corporation, P.O. Box 1698, Sanford, Florida 32771.

2.02 Related Publications.

The following publications are recommended for use with this document:

01-005-10	Handling of Electrostatically Sensitive Components
23-100-31	Power-Down/Power-Up, Operating Procedures
*23-104-31	Power-Down/Power-Up, Operating Procedures
23-223-51	Equipment Removal and Replacement Procedures

*For systems with a Control and Maintenance Frame (CMF) and a Power, Ringing, Test Access Frame (PRT).

3. PRECAUTIONS

3.01 General.

A precaution is an operating procedure, practice, etc., that, if not strictly observed, results in damage to or destruction of equipment. These precautions are important to the overall safe operation of the DCO and should be carefully complied with.

3.02 Equipment Room.

In the DCO equipment room, it is essential that **NO SMOKING and NO BEVERAGES OR FOODS ON OR NEAR THE EQUIPMENT** instructions be observed to prevent electronic equipment from being contaminated and to prevent any faults caused by spillage of beverages or dropped food particles. It is also essential to keep the equipment room clean of dust particles, since the DCO equipment includes a floppy disk system. This system includes a moving, magnetic-head mechanism and uses diskettes that are vulnerable to dust particles that can cause data errors.

3.03 Tools and Test Equipment.

Procedures for the use of tools and test equipment differ greatly between electronic and electromechanical installations. Solid-state devices, although more reliable than electromechanical devices under normal operating conditions, are more easily damaged by the accidental introduction of foreign voltages. Therefore, certain tools and test equipment commonly used in electromechanical offices must *never* be used on solid-state systems. These include ordinary battery buzzers, ac wire-wrap guns, test picks, and test lamps. The following precautions **MUST** be observed:

- a. Use only hand- or battery-powered wire-wrap guns in equipment frames or cabinets. Ac-powered wire-wrap guns, soldering irons, and lead-verification equipment can only be used at the distributing frames if all cables at the frame end have been completely disconnected from the equipment cabinets. When terminating the outside plant to lines by way of solder-type blocks on the protectors, connect and solder the outside plant first, then wire-wrap the frame end.
- b. Do not carry any metal tools, such as screwdrivers or wrenches, in a hip pocket; be careful of tool pouches when working near the equipment. Tools carried in pockets or pouches can

accidentally come in contact with the equipment (especially blower fans) and cause physical or electrical damage.

- c. Do not use tools or test equipment that can introduce foreign voltages into the system. This includes electric buzzers and wire-wrap guns. For example: A battery-powered buzzer operates on only 6 to 9 volts, but the voltage induced across the buzzer coil when the magnetic field collapses can reach a momentary peak in excess of 100 volts, which can destroy solid-state devices.

3.04 Handling of Electrostatically Sensitive Components.

- a. The following precautions **MUST** be observed in all work areas where static-sensitive components and assemblies are handled:

1. Personnel should avoid wearing clothes made of wool, nylon, or any synthetic material that is known to be a major source of static buildup.
2. Gloves and finger covers, unless made of cotton, must be avoided when handling these components or assemblies.

CAUTION. *The office equipment uses metal oxide semiconductor (MOS) devices (fig. 1). Special handling of PWBAs (Stromberg-Carlson identifies these with a red designation strip titled CAUTION STATIC SENSITIVE) that contain these devices is required. All personnel, tools, test equipment, and metal objects that come in contact with MOS devices must be electrically grounded. Any static and/or foreign voltage that is introduced into these devices can damage them permanently.*

- b. For additional information, refer to the section titled *Handling of Electrostatically Sensitive Components*, referenced in paragraph 2.02.

3.05 Printed Wiring Board Assemblies.

The following precautions **MUST** be observed when handling and storing PWBAs:

- a. Do not handle by the gold-plated contacts (fig. 1) or apply direct pressure to the components.
- b. Do not rub, scratch, or scrape the printed wiring side with a sharp or abrasive object.
- c. Do not expose to excessive heat or humidity.
- d. Do not do any unauthorized modifications, repairs, or adjustments.
- e. Do not use abrasive cleaners or erasers to clean the gold-plated contacts.
- f. Do not mark with any writing instrument, such as a lead pencil, that leaves a conductive deposit.
- g. Do not stack side-by-side or on top of each other so the surfaces or components make contact.

- h. Do not store in an area that contains smoke, air pollutants (gas, dust, etc.), or other air-bound particles that may contain harmful agents; store PWBA's that contain MOS devices in conductive bags.

3.06 Storage Environment of Electronic Equipment.

- a. The following precautions *MUST* be observed when storing electronic equipment:
 1. Do not allow the ambient temperature of the storage area to go below 32 °F (0 °C) or exceed 120 °F (49 °C).
 2. Do not allow the humidity to exceed 65 percent.
- b. For additional information, refer to the section titled *Guidelines for Storage of Electronic Equipment*, referenced in paragraph 2.02.

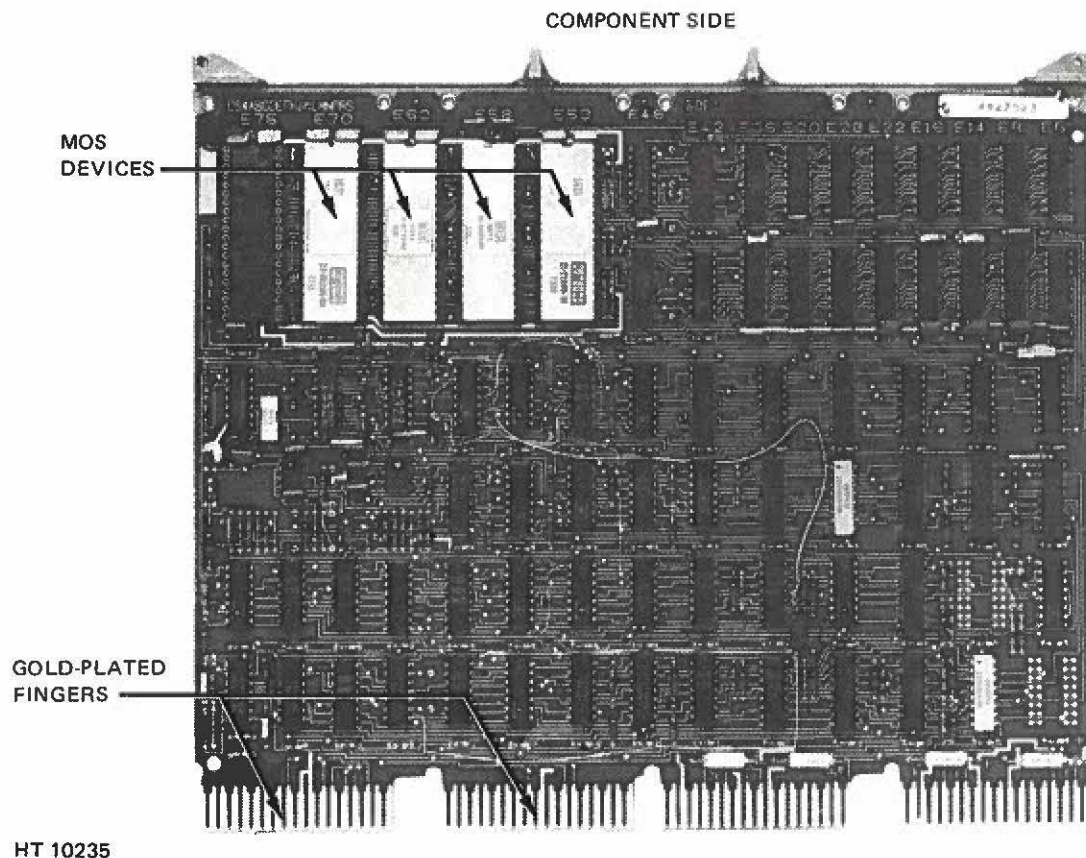


Figure 1. PWBA With Mos Devices

3.07 Office Ground.

Before doing maintenance actions that include the removal or replacement of the main ground feeders (cables), ensure that some means of positive identification has been furnished; ground should be removed only during good weather.

3.08 Floppy Disk System.

The following precautions *MUST* be observed when operating, storing, handling, or shipping a floppy disk drive and/or diskette:

- a. The front cover of the disk drive unit(s) should be opened only when inserting or removing a diskette; otherwise, data will be incorrectly read or recorded.
- b. The DCO operator shall use the \$DMOUNT command before removing a diskette and the \$MOUNT command after replacing a diskette to/from a disk drive unit.
- c. When diskettes are stored for short periods, they should be kept in their envelopes; stored horizontally in a DCO equipment room environment away from any magnetic sources; and if stored vertically, should be supported to prevent permanent deformation.
- d. When diskettes are stored for long periods, they should be kept in their original shipping containers within an ambient temperature range of 32 °F (0 °C) to 120 °F (49 °C); they should be placed away from any magnetic sources.
- e. When shipping diskettes (especially in the cargo hold of an aircraft), make sure there is at least 3 inches (7.6 cm) of packaging on all sides, to protect against any magnetic sources. Also, label the package DO NOT EXPOSE TO PROLONGED HEAT OR SUNLIGHT.
- f. When handling diskettes, the following precautions *MUST* be complied with:
 1. Do not write on the diskette envelope. Write any information on a label before putting it on the permanent envelope.
 2. Do not use paper clips or staples on the permanent diskette envelope.

3. Do not use writing instruments, such as lead or grease pencils, that leave flakes on the removable diskette jacket; use felt-tipped pens only.

4. Do not touch any of the exposed diskette surfaces; handle only by the area intended for the operator (fig. 2).

5. Do not attempt to clean the diskette.

6. Keep the diskette away from magnets, magnetic sources (such as the door latch of the floppy disk drive), or tools that may have become magnetized. Any diskette exposed to a magnetic field can lose information.

7. Do not expose the diskette to direct sunlight or any other heat source.

8. If a diskette has been exposed to temperatures outside of the operating range of 59 °F to 85 °F (15 °C to 30 °C), allow 5 minutes for temperature stabilization before use. The diskette should be removed from the jacket during this time.

9. To protect the diskette from dust and dirt, always return it to the removable jacket supplied.

10. Protect the diskette envelope from liquids, dust, and metallic materials.

11. Do not place heavy objects on the diskette.

12. Do not store the diskette on top of cabinets or in places where it can be subjected to dirt being blown by fans.

3.09 Other Input/Output Peripheral Devices.

The following precautions *MUST* be observed when operating an input/output (I/O) device (for example, a DECwriter*, teletypewriter, magnetic tape unit, etc.):

*DECwriter is a registered trademark of the Digital Equipment Corporation.

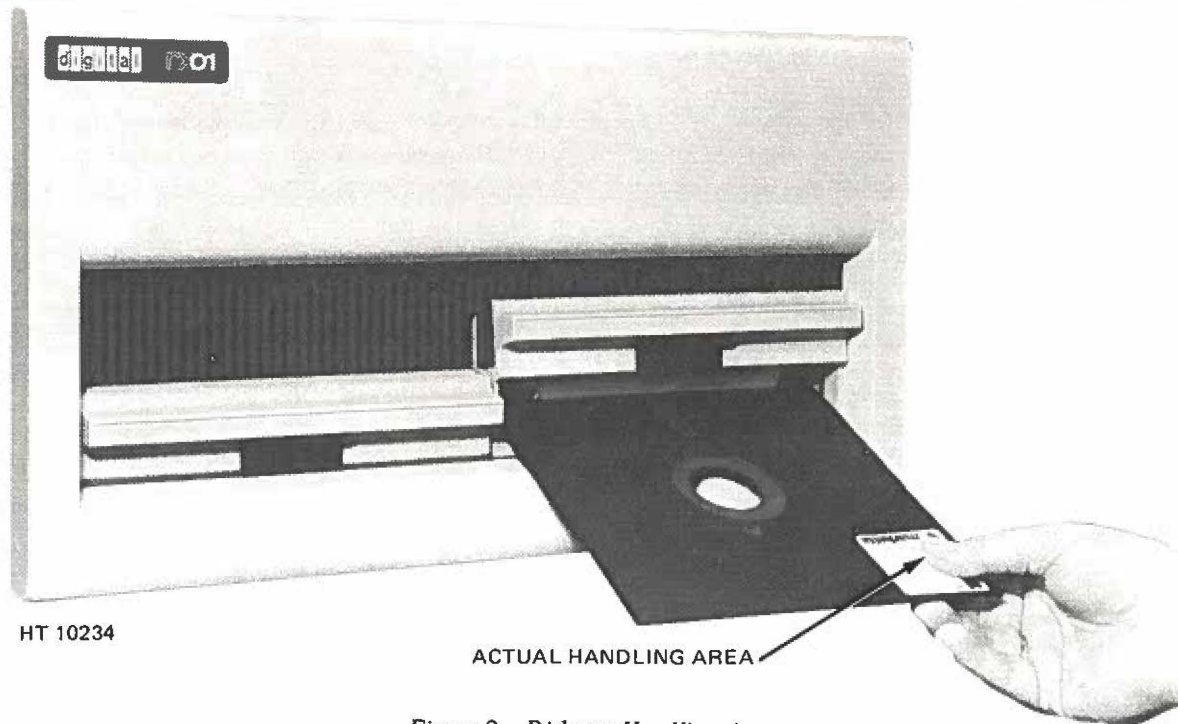


Figure 2. Diskette Handling Area

- a. If the I/O device has a cover, it should be kept closed whenever power is applied.
- b. Use only a lint-free cloth to clean the surface (for example, cover, keyboard, or tape deck) of various I/O devices where equipped.
- c. Do not use any surface of the device to hold pencils, paper clips, staples, etc. If an object accidentally falls into the device, turn the power off, unplug the power cord from the receptacle, and carefully remove the object.
- d. When removing/replacing a magnetic tape reel (especially one partially filled with tape) to/from a magnetic tape unit, make sure that the reel is properly handled (not by the outer edges of the reel) to prevent physical damage to the tape, which can cause data errors.
- e. Whenever the magnetic tape reel is not in use, install a reel cover to protect it from dust particles and physical damage.
- a. Remove or insulate metal objects (especially jewelry).
- b. Whenever possible, remove power from equipment that is to be worked on.
- c. Do not open heavily loaded circuits; reduce the load beforehand.
- d. Do not substitute a higher capacity fuse for a lower capacity fuse in any circuit; use a fuse puller when replacing cartridge or knife fuses.

3.10 Power Equipment.

The following precautions *MUST* be observed when working in power rooms and around exposed power terminals and bus bars:

3.11 Common Control Frame.

This frame contains matrix switch/port control store cells, blower fans, and power supply units. This frame contains PWBA's having MOS devices. Precautions relative to this frame are described in paragraphs 3.03, 3.04, 3.05, 3.06, and 3.10.

3.12 Common Control Expansion Frame.

This frame contains timeslot interchange/telephony preprocessor (TSI/TP) cells, blower fans, and power supply units. This frame contains PWBA's having MOS devices. Precautions relative to this frame are described in paragraphs 3.03, 3.04, 3.05, 3.06, and 3.10.

3.13 Maintenance and Administration Frame.

This frame contains the basic maintenance panel, maintenance and administration (M&A) cell, call processing unit/tone and pulse cells, blower fans, floppy disk system, and power supply units. The M&A cell contains memory (located on a PWBA) having MOS devices. Precautions relative to this frame are described in paragraphs 3.03, 3.04, 3.05, 3.06, 3.08, and 3.10, and also include the following:

CAUTION. Do not remove or replace a Digital Equipment Corporation PWBA (for example, central processing unit and memory) unless power has been removed from the associated cell. (Refer to section titled Power-Down/Power-Up, Operating Procedures, referenced in paragraph 2.02.)

3.14 Control and Maintenance Frame.

This frame contains the basic maintenance panel, M&A cell, call processing unit/tone and pulse cells, blower fans, power supply units, and either a floppy disk system or a maintenance and test access selector control cell. The control and maintenance frame contains PWBA's having MOS devices. Precautions relative to this frame are described in paragraphs 3.03, 3.04, 3.05, 3.06, 3.08, and 3.10 and also include the following:

CAUTION. Do not remove or replace a Digital Equipment Corporation PWBA (for example, CPU and memory) unless power has been removed from the associated cell. (Refer to section titled Power-Down/Power-Up Operating Procedures, referenced in paragraph 2.02.)

3.15 Automatic Message Accounting Frame.

This frame contains a tape control cell and magnetic tape units. The tape control cell contains PWBA's. Precautions relative to this frame are described in paragraphs 3.03, 3.05, 3.06, 3.09, and 3.10.

3.16 Common Equipment Frame.

This frame contains multifrequency signal detector cells, an M&A expansion cell (when the DCO system requires more than one common control sector), miscellaneous PWBA's for adaptation of specific customer options, and tape/drum announcement equipment. Precautions relative to this frame are described in paragraphs 3.03, 3.05, 3.06, and 3.10.

3.17 Power Frames.

Power frames 1, 2, 3, 4, and PRF can contain -48-volt power distribution assemblies, a ring monitor and maintenance cell, a frequency meter panel assembly, a receiver-off-hook generator, and, if required, paystation power supply units (48V and 130V). Refer to the section titled *Power-Down/Power-Up, Operating Procedures*, referenced in paragraph 2.02, before operating any switches or circuit breakers in these frames. Precautions relative to these frames are described in paragraphs 3.03, 3.05, 3.06, 3.07, and 3.10.

3.18 Battery Discharge Frame.

This frame contains one main discharge control panel for each 1920 ports equipped in the DCO system. Refer to the section titled *Power-Down/Power-Up, Operating Procedures*, referenced in paragraph 2.02, before operating any switches or circuit breakers in this frame. Precautions relative to this frame are described in paragraphs 3.03, 3.06, 3.07, and 3.10, and also include the following:

CAUTION. Before power is applied, alarm fuses must be installed; they provide a circuit for the DCO power-loss alarm indicators.

3.19 Central Processing Unit Frame.

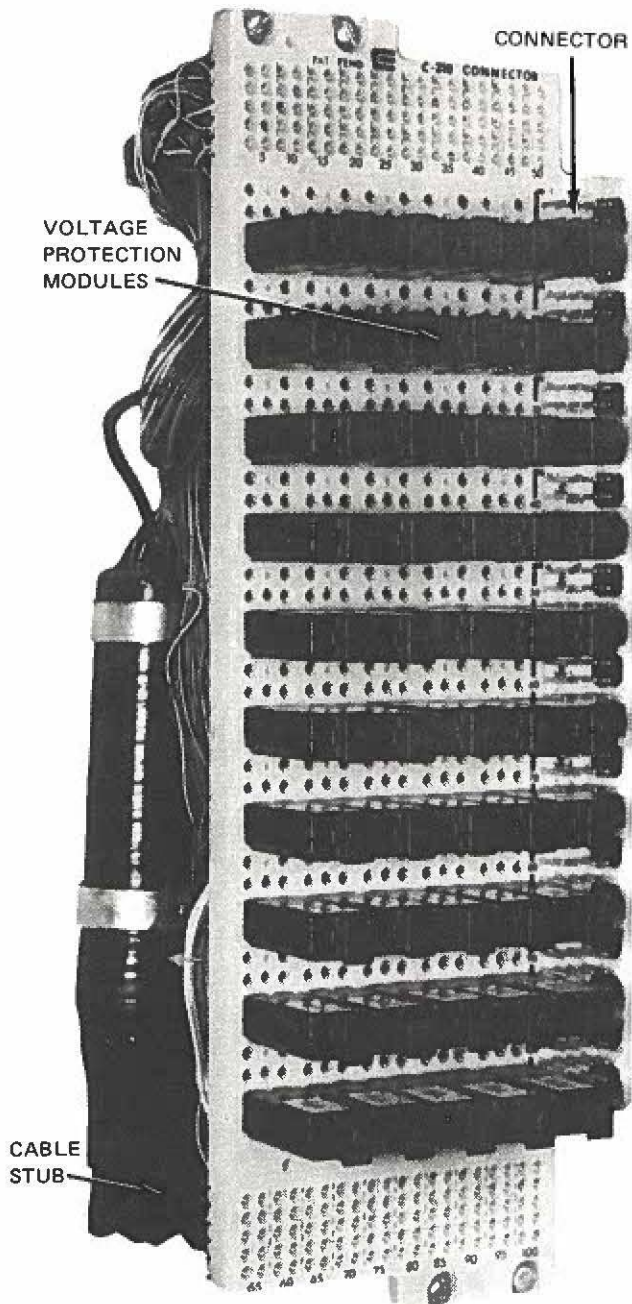
This frame is installed in DCO systems that specify Model 11/34 central processing units (CPUs). This frame contains PWBA's not manufactured by Stromberg-Carlson (CPU cards and memory cards), blower fans, and power supply units. Precautions relative to this frame are described in paragraphs 3.03, 3.04, 3.05, 3.06, 3.10, and the CAUTION included with paragraph 3.12.

3.20 Line and Trunk Frame.

This frame contains port group cells and a supervisory panel. Refer to the section titled *Power-Down/Power-Up, Operating Procedures*, referenced in paragraph 2.02, before doing any actions to the supervisory panel. Precautions relative to this frame are described in paragraphs 3.03, 3.05, 3.06, and 3.10.

3.21 Main or Combined Distributing Frame.

This frame contains main frame connectors that have voltage-protection modules plugged into them (fig. 3). Precautions relative to this frame are described in paragraphs 3.03 and 3.07 and also include the following:



HT 10233

Figure 3. Main Frame Connector

- a. Do not force a protector module into any five-pin terminal, to avoid excessive pressure and possible subsequent damage) on the connector pins.
- b. Do not cause any physical stress or strain to the connector base, plug-in module, or cable stub.

3.22 Batteries.

Precautions relative to batteries are described in paragraphs 3.03 and 3.10. The following precautions **MUST** also be observed when working on or around batteries:

- a. Do not smoke, use an open flame, operate a spark-producing tool, or place metal tools on top of cells; sparks can cause an explosion of hydrogen-gas fumes in or near the cells.
- b. Do not lift a cell by its terminal posts; support the cell from the bottom.
- c. Do not slide cells across rough surfaces; severe scratching of the plastic container's bottom can result in stressing and/or rupturing of the jar, with subsequent loss of electrolyte.
- d. Do not pour water into acid when preparing electrolyte; always pour acid into water.
- e. Do not use a wire brush, steel wool, or emery cloth to clean terminals; they will damage the lead plating. Remove corrosion by neutralizing with a baking-soda/water solution.
- f. Do not strike a cell (especially the terminal post) with any sharp, blunt, or hard instrument.
- g. Do not use a single wrench to connect cables to the terminal posts; use two wrenches or some countertorquing measure to avoid excessive stress to the terminals.

3.23 Battery Chargers.

Refer to the manufacturer's documentation to operate a battery charger and for associated precautions. Additional precautions relative to battery chargers are described in paragraphs 3.03 and 3.10.

3.24 Equipment Removal and Replacement.

For the removal/replacement of Stromberg-Carlson equipment, refer to the section titled *Equipment Removal and Replacement Procedures*, referenced in paragraph 2.02. For the removal/replacement of other manufactured equipment, refer to the manufacturer's documentation.



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