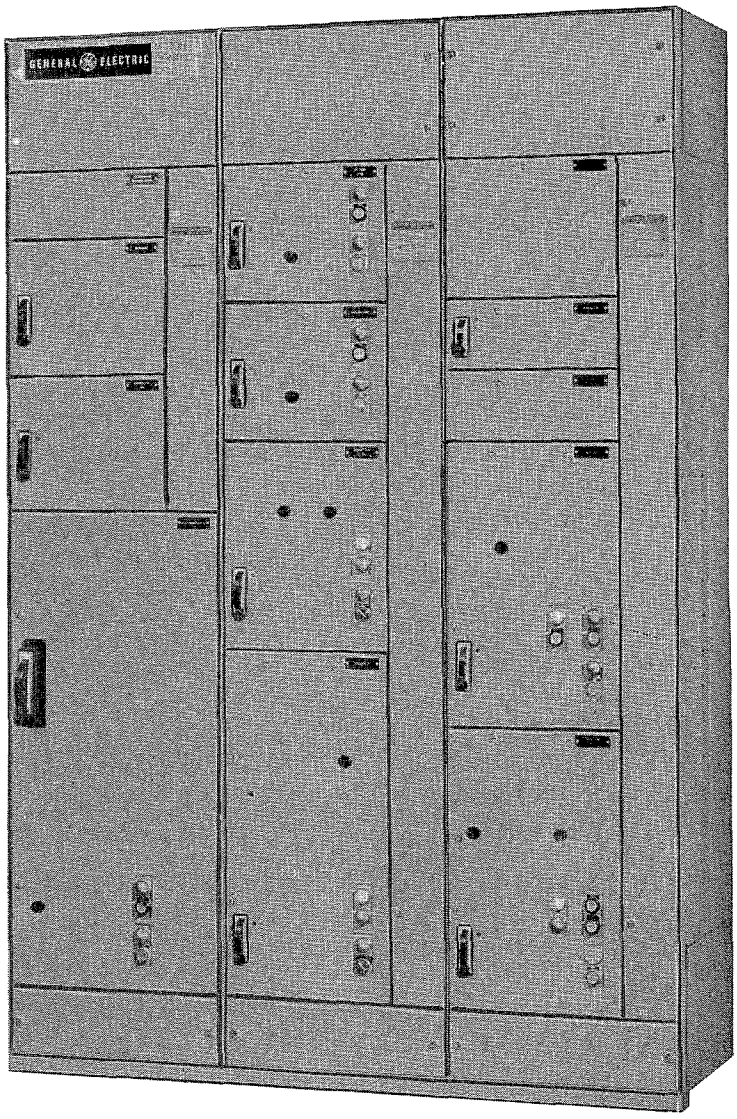
INSTRUCTIONS

INSTALLATION AND MAINTENANCE OF 7700 PLUS AND 2700 PLUS MOTOR CONTROL CENTERS



These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.

GENERAL ELECTRIC

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Since no physical differences exist between the 7700 PLUS and the 2700 PLUS motor control centers, all installation and maintenance instructions apply to both products.

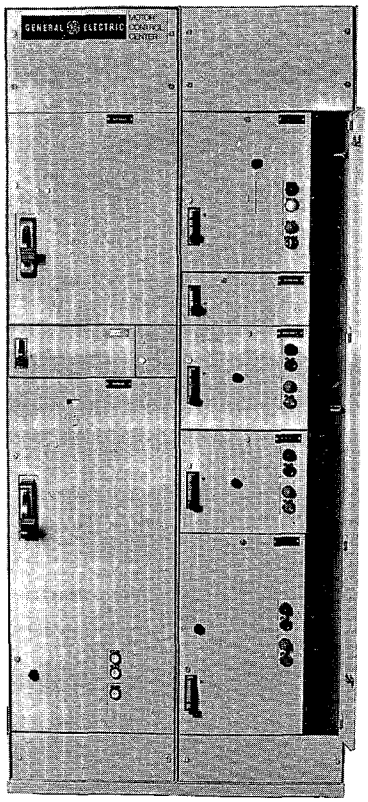


Fig. 1. Typical 7700 PLUS motor control center with separate vertical wiring trough open on one section

CAUTION: *EXTREME CARE SHOULD BE TAKEN WHEN SERVICING CONTROL WIRING OR REMOVING UNITS FOR ANY PURPOSE FROM AN ENERGIZED CONTROL CENTER SINCE POWER FROM AN EXTERNAL SOURCE MAY STILL BE APPLIED.*

GENERAL DESCRIPTION

The standard 7700 PLUS motor control center vertical section is 20-in. wide by 90-in. high (508 mm by 2286 mm) by 20-in.* or 13-in. deep (508 mm or 330.2 mm) (outside dimensions). Sections are fabricated from sheet steel, shaped, and reinforced to form a rigid, enclosed structure in single- or multiple-section lineups.

One and one-half-inch (33.1 mm) removable floor sills and 3-in. (76.2 mm) lifting angles are furnished as standard. Floor sills and lifting angles add 4½ in. (114.3 mm) to the over-all control center height.

Each vertical section is provided with a 6-in. (152.4 mm) high compartment for horizontal wiring and a 12-in. (304.8 mm) high compartment for horizontal wiring. Master terminal boards are furnished on Type C equipment. Either compartment can be located at the top of the section. In back-to-back construction, the 12-in. (304.8 mm) compartment is always at the top when in rear. If a 12-in. (304.8 mm) compartment is also required at rear bottom, only 5½ X spaces can be used for mounting starters.

**Consult motor control center outline drawings furnished by the General Electric Company for dimensions and ratings of equipment on specific installations.*

Control Center Bus

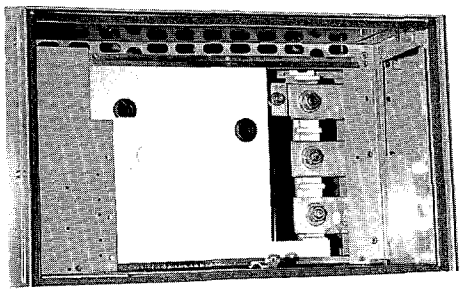


Fig. 2. Isolating panel allows access to main and vertical bus joints

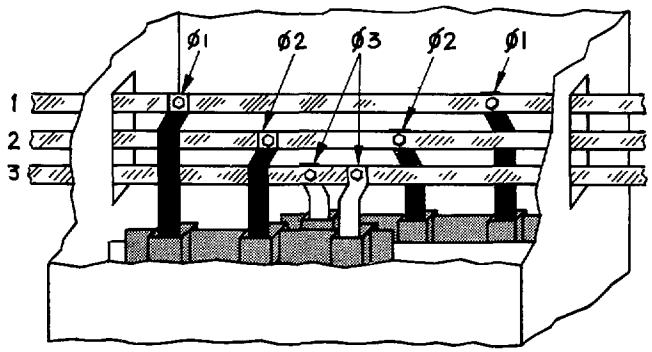


Fig. 3. Phase relation of bus in back-to-back sections furnished with two vertical bus assemblies

Each section has a large, full-length separate vertical wiring trough with separate removable hinged door (Fig. 1).

The main horizontal bus is located at the top of the section, and is front accessible by opening the glass polyester isolating panel which isolates the main bus from the top horizontal wiring compartment (Fig. 2). All electrical joints and mechanical bracing bolts are front accessible.

Vertical bus, 300 amperes or 600 amperes*, is bolted to the main bus, making the phase relation of main and vertical bus 1-2-3 top to bottom and left to right respectively, as viewed from the front. A second vertical bus is added, if required, for mounting units in the rear of the section. This requires a 20-in. (508 mm) deep section. The phase relation of this vertical bus is 1-2-3 left to right as viewed from the rear (Fig. 3).

Ground bus and/or neutral bus, if required, are located near the bottom of the vertical section.

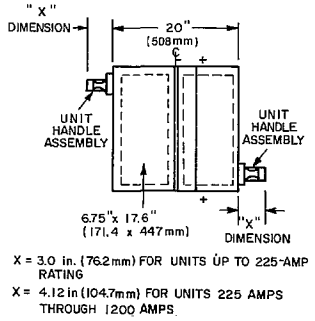


Fig. 4. Top view of 7700 PLUS illustrating typical unit disconnect handle protrusion

Control Center Units

Consult Section 2030 of the General Electric Apparatus Handbook for detailed listings of units available in the 7700 PLUS motor control center.

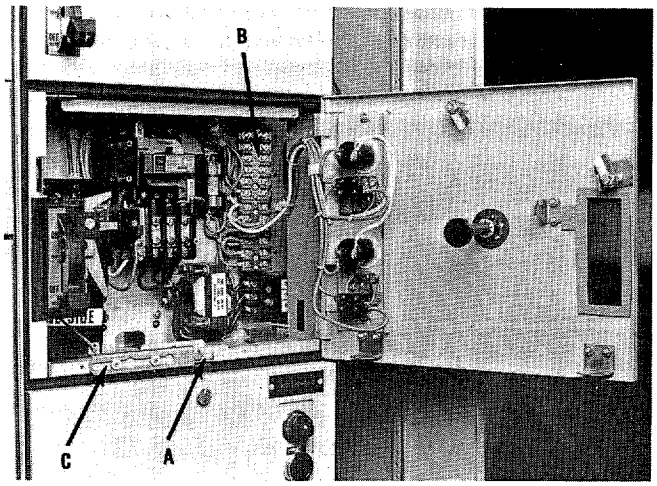


Fig. 5. Typical control center starter unit showing (A) unit disconnect screw, (B) draw-out terminal blocks and (C) unit disconnect screw cover

A unit disconnect screw, (See A, Fig. 5), near the base of the draw-out units is used for insertion and removal of units. A cover (See C, Fig. 5) for the unit disconnect screw is provided to prevent access to the screw unless the unit line disconnect is switched to the OFF position. Simultaneous engagement or disengagement of unit draw-out blocks occurs as the unit is inserted or removed (See B, Fig. 5).

Unit stabs are rated 225 amperes maximum; draw-out control terminal blocks are rated 30 amperes continuous duty; Size 1 and 2 draw-out power terminal blocks are rated 50 amperes continuous duty. Size 3 and 4 draw-out power blocks are rated 100 amperes and 150 amperes continuous duty, respectively.

RECEIVING, HANDLING, STORAGE

Receiving

Before leaving the factory, the motor control center is given a final mechanical and electrical inspection and is packed in keeping with best practices for electrical equipment.

Upon receipt of any apparatus, an immediate inspection should be made for any damage or loss of equipment in transit. Should damage or missing material be noted, a claim should be immediately filed with the carrier and the nearest office of the General Electric Company should be notified. Information such as description of damage, shipping crate numbers, requisition numbers and panel catalog number should accompany the claim. *Do not* remove banding, if present, on vertical bus assembly.

Handling

Control center sections are always shipped in an upright position, in single or group sections. Sections must be maintained in an upright position during all handling.

Never attempt to jack, lift, or move the equipent at points other than the lifting angle or floor sills. Use two or more chains or cables to distribute weight more evenly. Pinch-bars, pipe rollers, or slings are useful implements for handling equipment; but care must be taken to maintain distributed loading and to always apply leverage at the floor sills and/or lifting angle. Figures 6 and 7 show typical handling techniques.

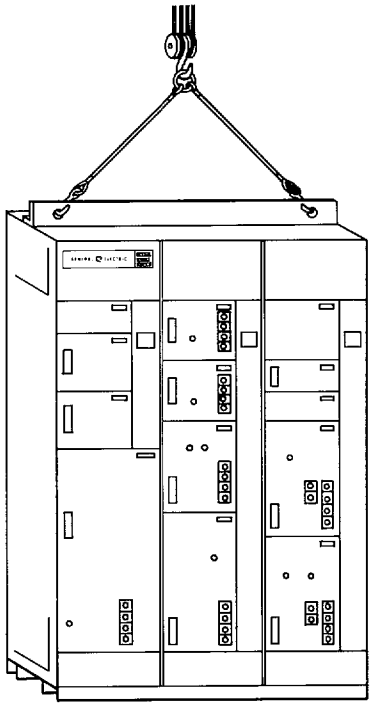


Fig. 6. Using standard lifting angles to hoist the control center

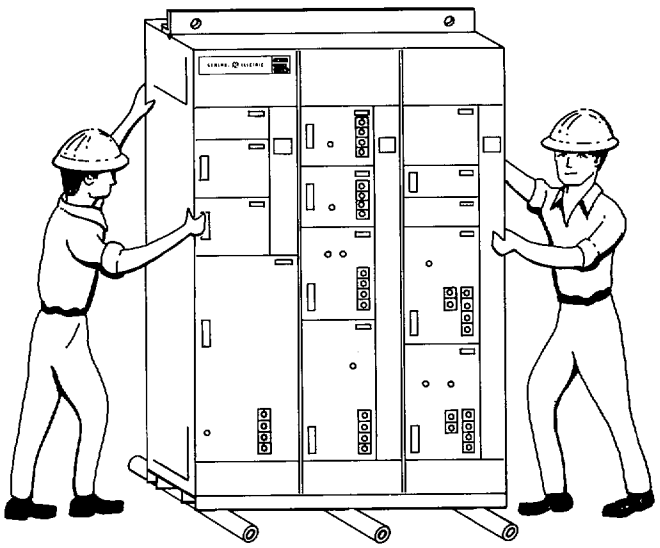


Fig. 7. Positioning the control center with rollers

Storage

NOTE: *If it is necessary to store the equipment for any length of time, the following precautions should be taken:*

1. *Uncrate equipment.*
2. *Store in a clean, dry area at moderate temperature. Cover with a suitable canvas or heavy-duty plastic cover to prevent entrance of foreign material.*
3. *If equipment must be stored in cool or damp areas, not only should the equipment be completely covered, but heat should be provided to prevent condensation of moisture in the equipment. Energize space heaters (if furnished in the equipment) or place a standard 120-volt lamp rated 75-watts inside the bottom of each vertical section.*

Before any installation work is done, consult all drawings furnished by the General Electric Company as well as all applicable contract drawings for the particular installation. Particular attention should be given to the physical location of units in the motor control center and their relation to existing or planned conduits, busways, etc.

Care should be taken to plan for any future conduit entrance in advance of control center installation.

INSTALLATION

Installation of Bottom Entry Conduits

Conduits can be stubbed in, once the location of the motor control center lineup has been established.

Conduit should be stubbed approximately 2 in. (51 mm) above the finished floor line. Figures 8 and 9 show conduit entrance space available at the bottom of standard sections. Exceptions to this available space will be indicated on drawings furnished by the Company for specific installations.

Note that if both 20-in. (508.0 mm) deep and 13-in. (330.2 mm) deep sections are in a single lineup, front lineup is required to properly align main bus bars.

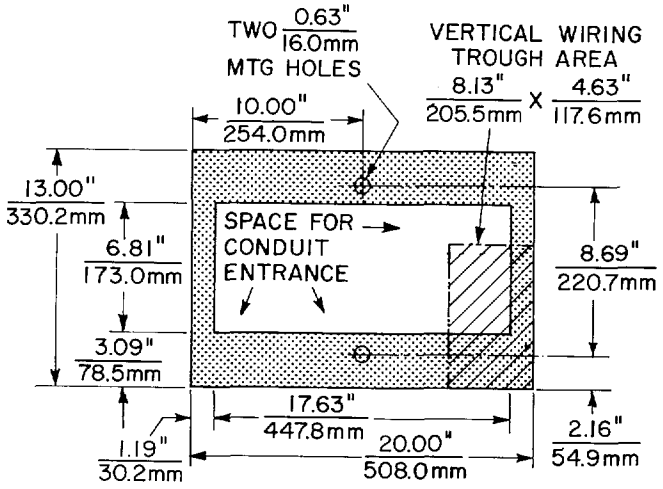


Fig. 8. Bottom conduit entrance space 13-in. (330.2 mm) deep section

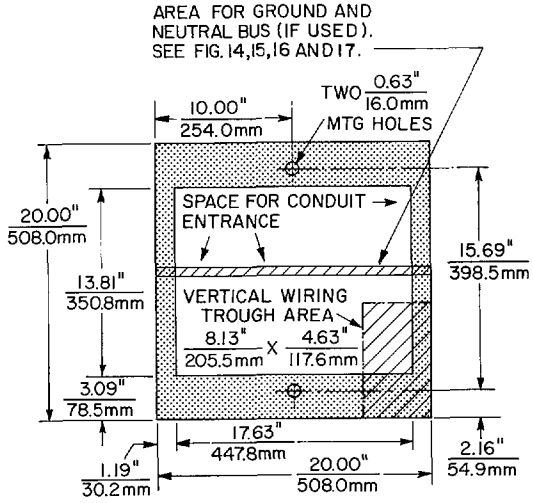


Fig. 9. Bottom conduit entrance space 20-in. (508.0 mm) deep section

Preparation of Flooring

Attention should be given to providing a level, even foundation for the equipment. The Purchaser may elect to install steel members in the floor, properly leveled and grouted, although not normally required (Fig. 10).

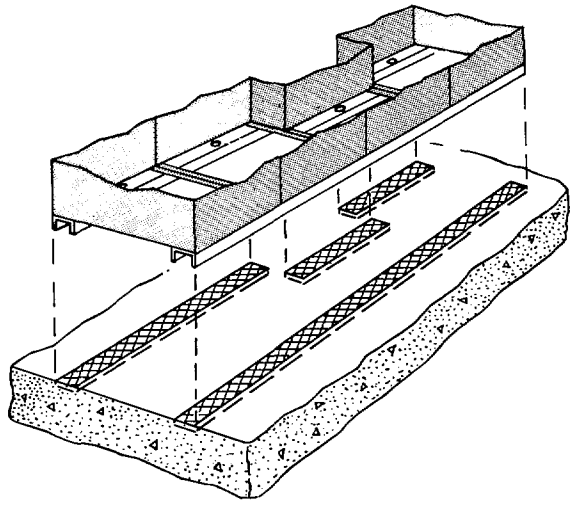


Fig. 10. Installing steel floor members (Note front lineup of 13-in. (330.2 mm) deep section)

The over-all height of the equipment should be considered with respect to head room, top conduit entry space, and line-up with other equipment.

NOTE: *For handle height to be less than 78 in. (198.1 cm) on sections with 6-in. (152.4 mm) wire way on top, the MCC floor sills should be grouted into the floor or removed after MCC has been placed in final position.*

Anchor bolts may be imbedded in the foundation prior to installation, but they must be prelocated per details of Fig. 8 and 9, or per drawings furnished by the Company. For shallow-depth (13-in. [330.2 mm]) sections, anchor bolts or some other form of external bracing is needed.

Positioning and Joining Sections

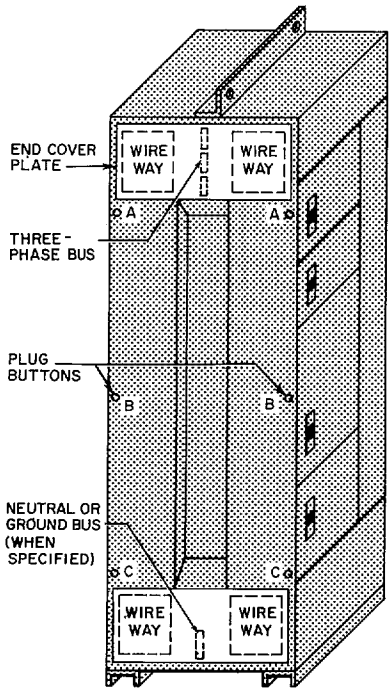


Fig. 11. Side view showing cover plates, plug buttons and joining points for 20-in. (508 mm) deep section

If groups of sections are to be joined together in a final line-up, remove the end cover plates and the plug buttons (Fig. 11) from the sides of the section to be joined.

Carefully check and remove any dirt, dust or bits of packing material from the interior of all sections. Use of a brush, soft cloth, or vacuum cleaner is recommended.

NOTE: *Do not use compressed air if it contains moisture. Remove all hardware packages, drawings, etc., which are shipped with the equipment. Check all nuts, bolts, and electrical joints for tightness.*

All cables should be pulled through conduits to a point where they will be accessible after the equipment is in place. Sections can be moved to their final position and properly leveled.

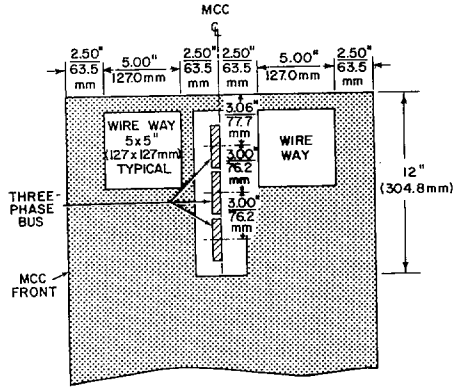


Fig. 12. Side view showing top area dimensions for 20-in. (508 mm) deep section with 2-in. (50.8 mm) bus bars

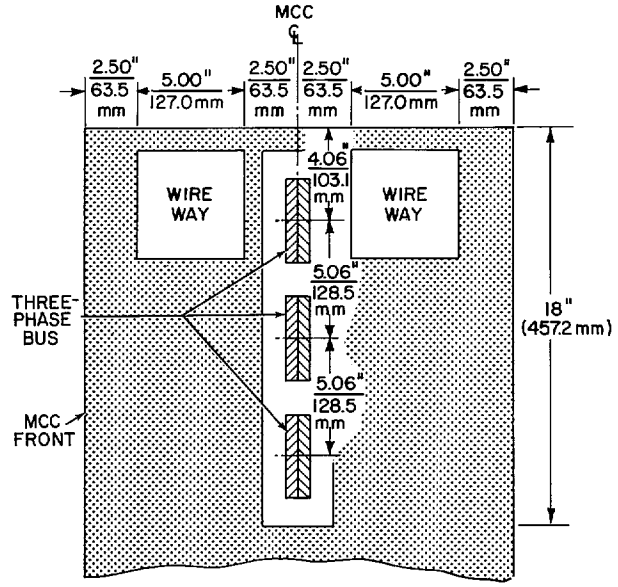


Fig. 13. Side view showing top area dimensions for 20-in. (508 mm) deep section with 4-in. (101.6 mm) bus bars

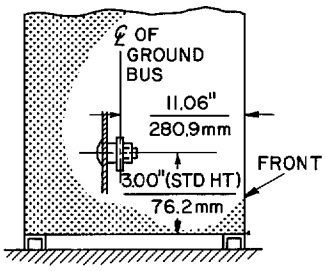


Fig. 14. Ground bus bolted directly to section frame

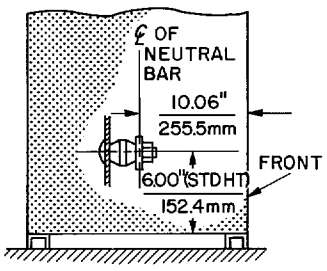


Fig. 15. Insulated neutral bus

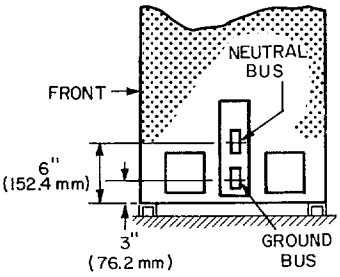


Fig. 16. Standard location of ground and neutral bus for the 12-in. (304.8 mm) compartment at the bottom of MCC ("normal position")

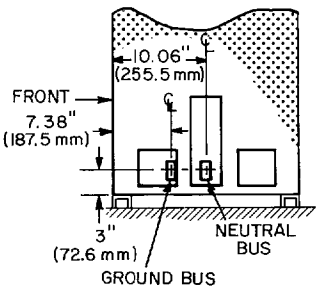


Fig. 17. Standard location of ground and neutral bus for the 12-in. (304.8 mm) compartment at the top of MCC ("lowered position")

Positioning and Joining Sections (Cont'd)

Main, neutral and ground bus splice bars (with all associated hardware) are furnished, as necessary, to join sections together. (See Fig. 12 through 16 for approximate dimensional data for main, neutral and ground bus). If the sections are furnished with the 6-in. (152.4 mm) horizontal wiring compartment at the top, removal of the top unit and top horizontal barrier is necessary to gain access to the main bus.

Figures 18 through 20 illustrate progressive steps in installing main bus splice plates for the 2-in. (50.8 mm) bus. Figures 21 and 22 illustrate installing main bus splice plates for the 4-in. (101.6 mm) bus. The procedure for installing either bus splice is basically the same. Ground or neutral bus splice plates are similarly installed in the bottom wiring compartment; however, units need not be removed when making neutral and ground bus splices in the bottom horizontal wiring compartment.

After completing main bus splices, all joints should be tightened per TABLE 1 and the main bus isolating panel fully closed.

Section side plates, where sections are joined together at installation, should be bolted together at points A, B and C (Fig. 11).

TABLE 1. Torque Values for Medium Carbon Steel Bolts Used in Motor Control Center Buswork

Bolt Size		Copper Joints Lb-ft (kg-m)† Min Max	Aluminum Joints Lb-ft (kg-m)† Min Max
3/8 - 16		12 - 16 (1.66-2.21)	11 - 14* (1.52-1.94)
1/2 - 13		30 - 39 (4.15-5.39)	24 - 27* (3.32-3.73)
2-inch (50.8 mm) Bus Splice Plate	1/2 - 13	24 - 27* (3.32-3.73)	24 - 27* (3.32-3.73)
4-inch (101.6 mm) Bus Splice Plate	3/8 - 16	11 - 14* (1.52-1.94)	11 - 14* (1.52-1.94)
	1/2 - 13	24 - 27* (3.32-3.73)	24 - 27* (3.32-3.73)

**Denotes torque requirements for bus joints used in conjunction with a Bellvill spring-lock washer. DO NOT OVERTIGHTEN.*

†Also known as Newton meter (Nm).

NOTE: *When assembling or connecting to aluminum bus, care should be taken to apply suitable joint compound between contacting surfaces.*

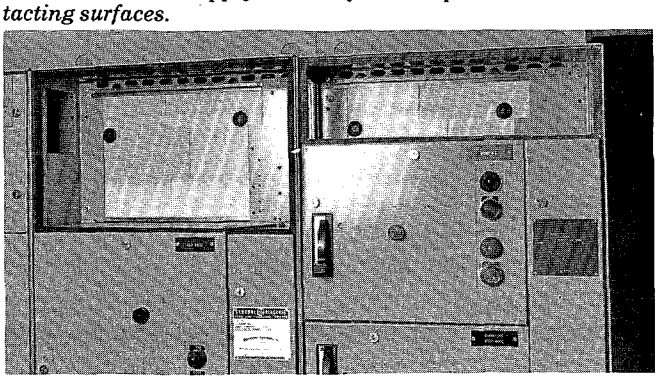


Fig. 18. Remove top unit and shelf

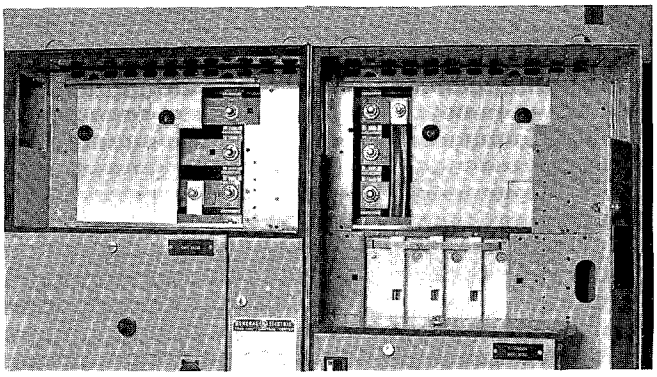


Fig. 19. Remove top horizontal shelf and nuts from main bus support studs

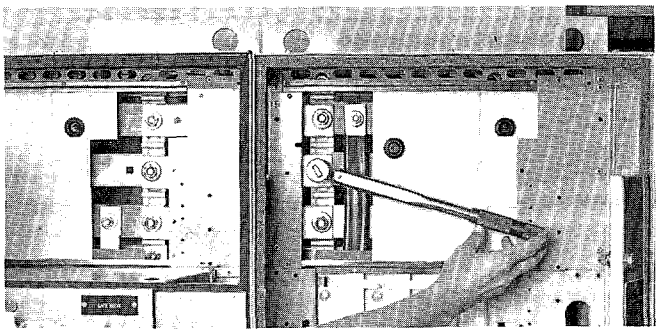


Fig. 20. Insert splice bus bar in left-hand section, extend to right-hand section and secure. All joints should be tightened per torque values (TABLE 1). Close isolating panels before replacing top shelves and units

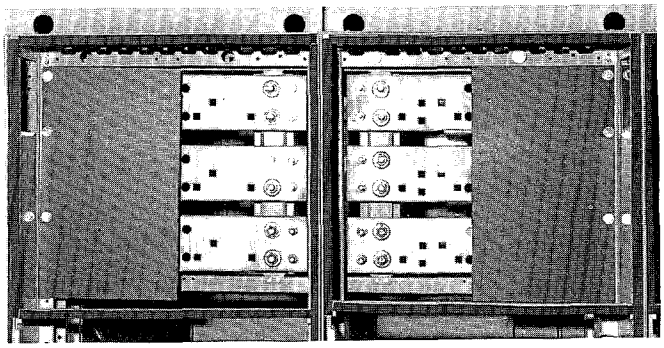


Fig. 21. Remove top horizontal barriers, nuts and washers from main bus support studs

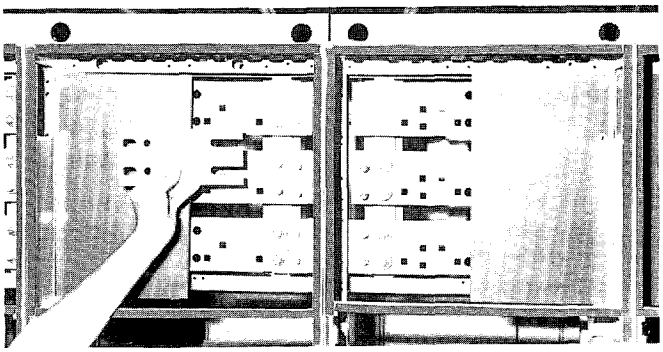


Fig. 22. Insert splice plates so that the slotted side is on the right. Replace nuts and washers on bus support studs and tighten per TABLE 1

Installation of Top Entry Conduits

After the motor control center is in place, leveled, and sections joined together, conduits can be brought into the top of sections as required. Figures 23 and 24 show conduit entry space available for conduits entering the top of standard sections. Refer to drawings furnished by the General Electric Company for deviations on specific installations.

Always remove top cover plates when drilling holes for conduits. This is to prevent small metal chips from falling into the panels and causing serious damage.

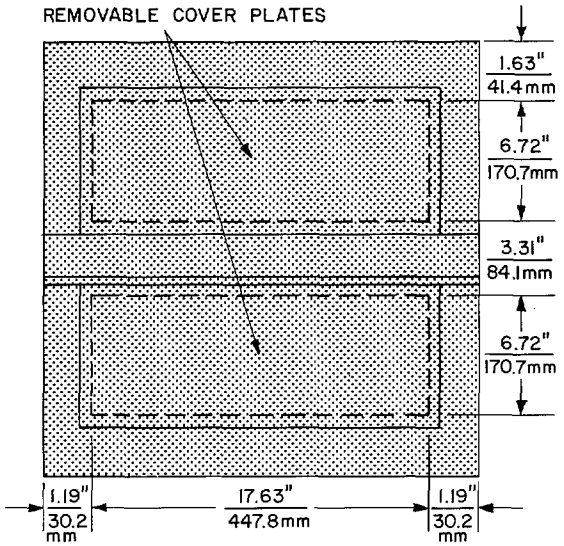


Fig. 23. Top conduit entrance space 20-in. (508 mm) deep section

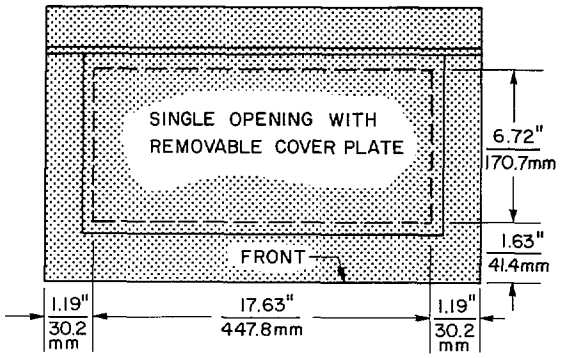


Fig. 24. Top conduit entrance space 13-in. (330 mm) deep section

EQUIPMENT WIRING

Main Incoming Power Cables

Main cables normally terminate at the line side of the main motor control center disconnect, or at an incoming line lug compartment.

The incoming line lug compartment is normally located approximately 15½ in. (393.7 mm) from either top or bottom of any section, or as specified by the Purchaser. Figures 25 and 26 give details of these lug compartment arrangements.

NOTE: *Refer to motor control center outline drawings furnished by General Electric Company for the quantity and size of the incoming line lugs.*

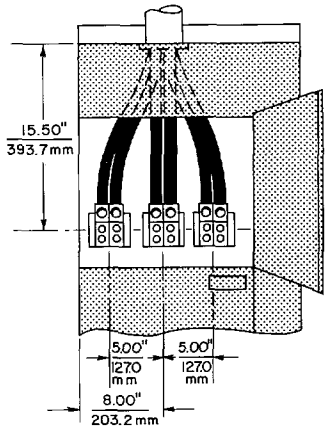


Fig. 25. Typical top entry of main cables to incoming line lug compartment

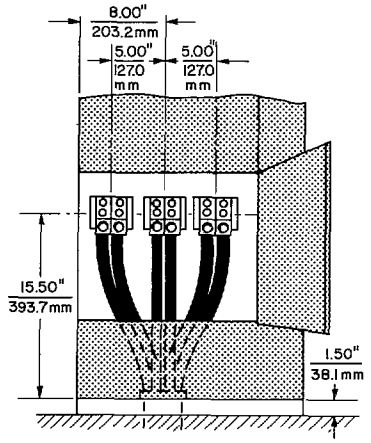


Fig. 26. Typical bottom entry of main cables to incoming line lug compartment

Incoming line lugs are located in the front of the motor control center. When locating conduit for a 20-in. (508.0 mm) deep section, care must be taken to locate conduit in the front portion of available conduit entrance space in order to avoid any sharp cable bends.

Where the system available short circuit is greater than 14,000 amperes RMS symmetrical, cables should be firmly secured between the top of the enclosure and incoming lugs. If incoming cables run through wire troughs, the cables should be securely clamped on 12-in. (304.8 mm) centers. An insulated bushing at the conduit termination is also recommended.

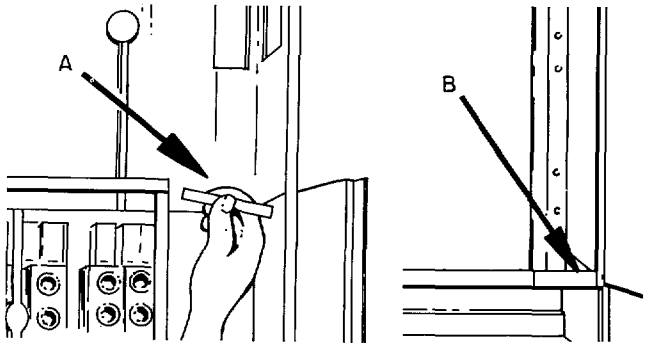


Fig. 27. Remove top and bottom horizontal barrier extensions (A and B) to facilitate lay-in wiring in the vertical wire trough

Individual Unit Wiring

Remove the top and bottom horizontal shelf extensions (Fig. 27) to allow full access to the vertical wiring trough for "lay-in" wiring.

NOTE: *All power wiring from units should be securely tied to the brackets mounted along the right-hand side of the vertical section. Control wiring from each unit should be neatly bundled and wrapped.*

Figures 28 and 29 show typical installation wiring being performed.

When making connections with aluminum cable, care should be taken to apply suitable joint compound and to adhere to the instructions of the cable manufacturers.

NOTE: *When installing cables, attention should be given to avoid the possibility of cable insulation being damaged by any sharp edges (steelwork, screws, etc.).*

Where access to the rear of section is available, cables can be brought into the space behind the vertical bus and brought forward into the front wire trough area through any of the modular openings in the right-hand steel support plate (Fig. 30).

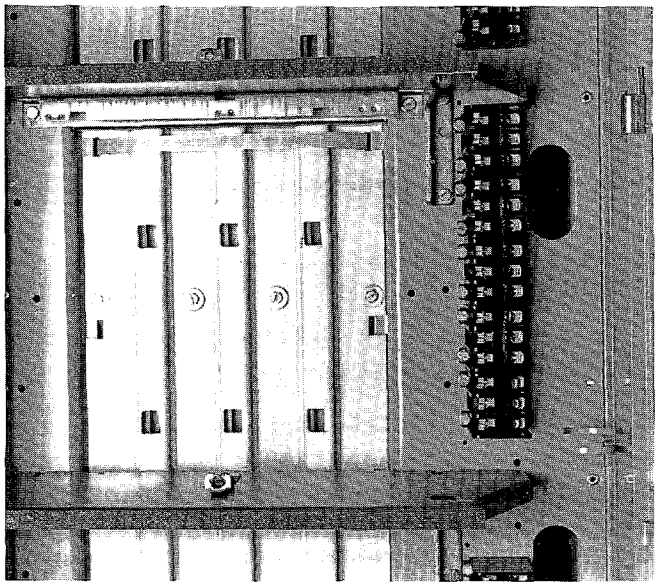


Fig. 28. Easily accessible lay-in wiring in vertical wiring trough

Wiring Type C Terminal Boards

Type C master terminal boards are always located within the 12-in. (304.8 mm) horizontal wiring compartment.

Figures 31 and 32 show a typical Type C terminal board arrangement. Brackets can be removed and swung outward for easy accessibility without disturbing wiring. Sufficient slack should be allowed in cables connected to terminals so that the terminal boards can be swung out during maintenance.

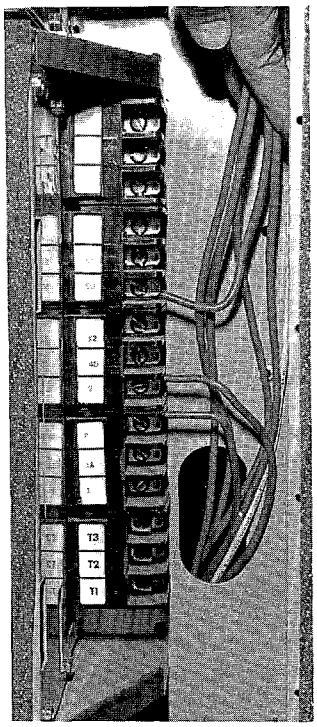


Fig. 29 Wiring connected to drawout terminal blocks

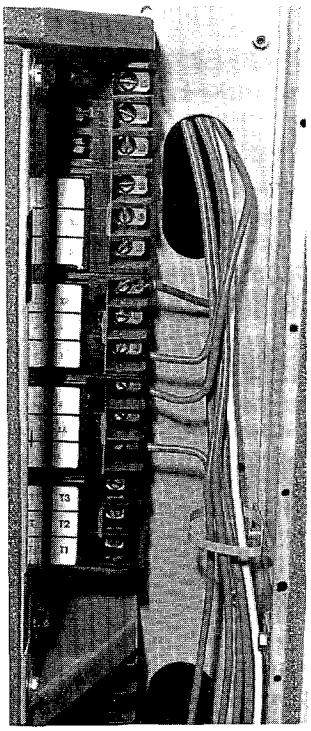


Fig. 30. Cables can be pulled in rear of section and brought forward through modular openings to front wire trough

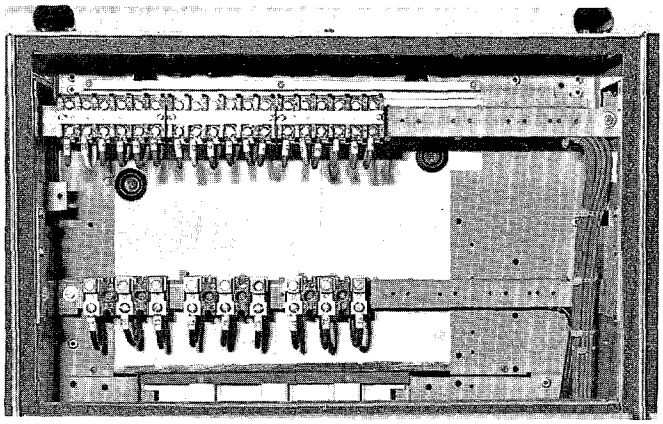


Fig. 31. Typical Type C terminal board at top of section

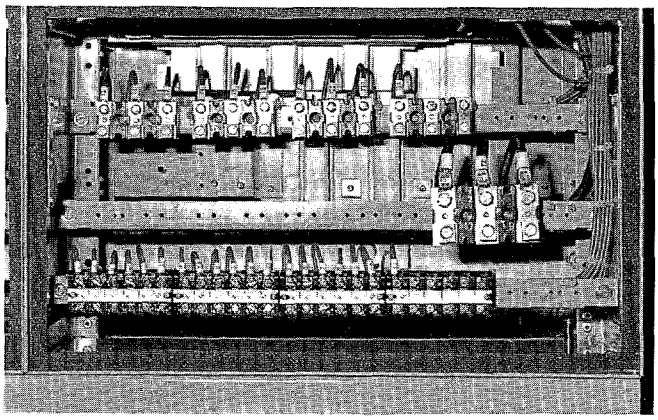


Fig. 32. Typical Type C terminal board at bottom of section

Wiring Between Sections

See Fig. 12 for dimensions of the side cutouts in each vertical section for wiring between sections. Cross wiring may be accomplished at both top and bottom of sections.

INSTALLATION OF MOTOR CONTROL CENTER UNITS

Any unit ordered separately is shipped from the factory complete with door and associated hardware. The horizontal shelf assembly should be ordered separately if required.

The general procedure for mounting a draw-out unit horizontal barrier assembly, door and associated hardware, in a section is as follows:

1. Select the proper holes in left- and right-hand vertical steel plates for mounting the horizontal shelf (A) and support bracket (B), (Fig. 33). The vertical distance (C) is equal to the height of the unit to be installed.

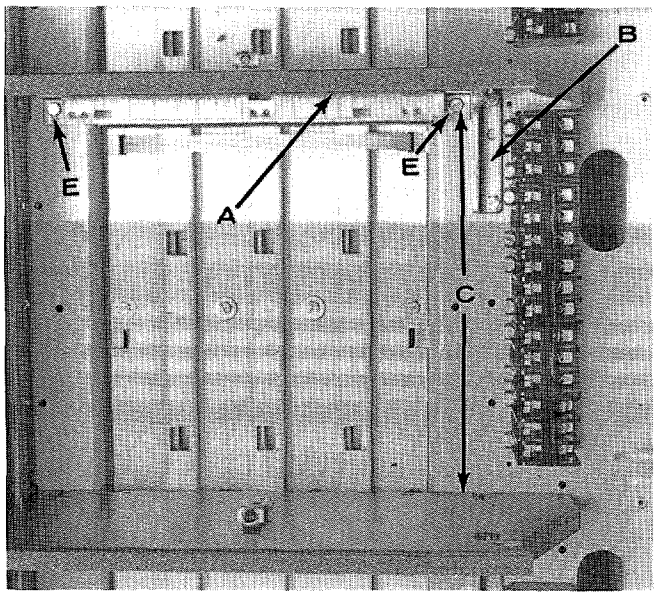


Fig. 33. Mounting the horizontal shelf assembly

2. Mount shelf assembly (A) and support bracket with ¼-20 self-threading screws at points (E) as shown in Fig. 33.

3. If draw-out terminal blocks are furnished with the unit, install the fixed half of all draw-out blocks in the intended unit space in the section. Figures 34 and 35 show details of mounting. Location of these blocks is determined by alignment with the terminal blocks mounted on the right side of the starter unit. Insert slotted mounting tabs under screw heads (A). Snap dart clip (B) into hole (C), to retain terminal block in proper position. Tighten screws (A). Power blocks to be mounted in the section are furnished with a box-type lug and are normally to be mounted below control blocks.

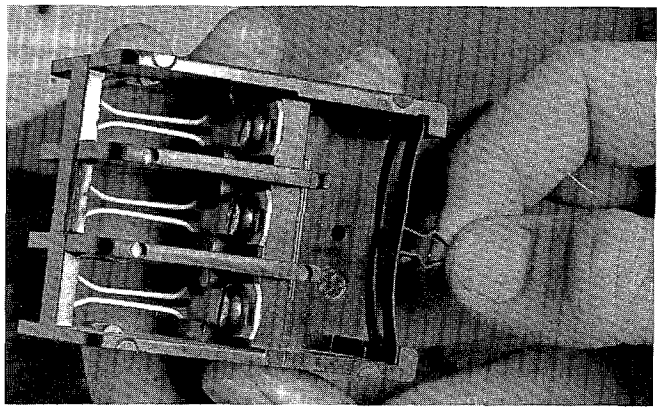


Fig. 34. Position snap dart clip to retain terminal block

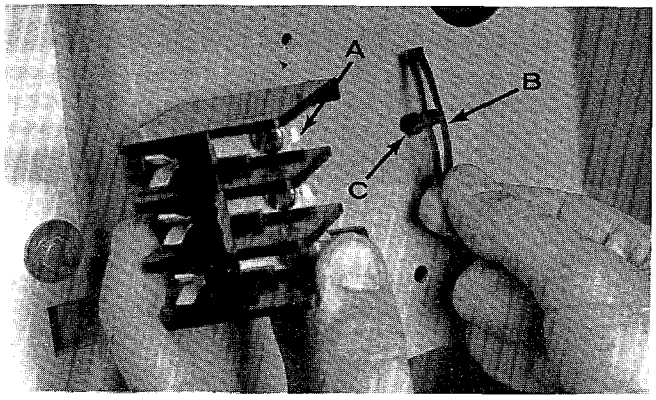


Fig. 35. Mounting terminal block

4. Before installing the unit, open the unit door and wiring gutter door, and turn the upper unit latches (Fig. 36) to a horizontal position. (Larger units are furnished with one or two latches at the top of the unit.)

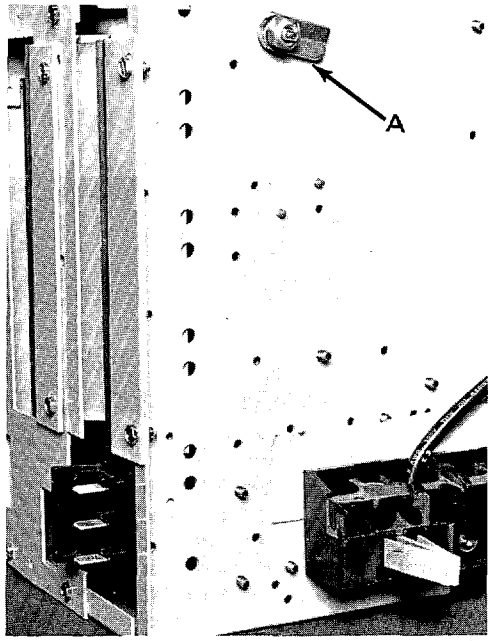


Fig. 36. Rear view showing upper unit latch (A) in horizontal position

INSTALLATION OF MOTOR CONTROL CENTER UNITS (Cont'd)

5. Install the unit by placing the base of the unit on the forward portion of the shelf and sliding the unit into the section. The guide should engage with the slot in the base of the unit.

NOTE: *The unit line disconnect must be in the OFF position to allow access to the unit disconnect screw.*

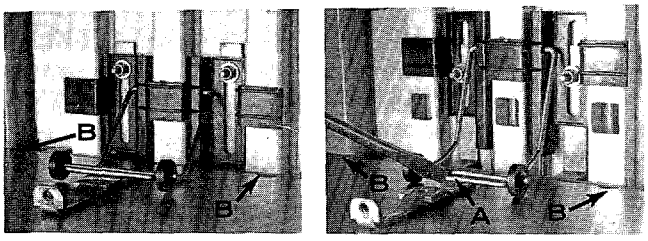
When the disconnect screw engages with the guide, the stabs are in contact with the vertical bus bars. This unit disconnect screw must then be turned by a screwdriver to complete the unit stab engagement with the control center bus. Should any binding be noted during this operation, a careful check should be made for interference with draw-out terminal blocks, etc. When the unit is fully racked into the section, the upper unit latches (Fig. 36) should be turned one-quarter turn to lock the unit in place. Visually check for full engagement of all terminal blocks on unit with adjacent fixed blocks in section.

6. Tighten screws.

Larger units (reduced voltage starter units, large, two-speed starters, etc.) are normally furnished bolted to the section structure.

Although these units can generally be added in the field, details and degree of complexity will vary. Consult your General Electric Company Sales Representative for information in advance of anticipated field work on such assemblies. Give full details of any desired additions or changes.

OPTIONAL SHUTTER ASSEMBLY



CLOSED OPEN

Fig. 37. Optional shutter assembly

The unit shutter slides down to cover the stab holes when the draw-out feeder or starter is removed. On racking-in a unit, the back of the unit saddle presses against point (A) forcing cover to rise vertically exposing the stab holes in bus. To field install shutter assembly refer to Fig. 37.

WARNING: *DE-ENERGIZE THE CONTROL CENTER BUS BEFORE PERFORMING ANY WORK IN THIS AREA.*

1. Loosen (2) screws at Points (B) to make a gap of approximately 0.125 in. (3.17 mm) between flat washer and vertical bus insulator.
2. Insert shutter-assembly mounting tabs under screw heads (B) being certain that mounting slots have bottomed.
3. Tighten (2) mounting screws (B) to secure shutter assembly to structure.
4. Manually operate shutter assembly to insure smooth, free vertical movement.
5. Motor control center unit can now be installed.

WARNING: *SINCE SOME UNITS MAY STILL HAVE CONTROL POWER APPLIED FROM AN EXTERNAL SOURCE EVEN THOUGH THE UNIT DISCONNECT HAS BEEN SWITCHED TO THE OFF POSITION, EXTREME CARE SHOULD BE TAKEN IN REMOVING UNITS FROM AN ENERGIZED CONTROL CENTER.*

REMOVAL OF DRAW-OUT CONTROL CENTER UNITS

Generally, the procedure for removing units is the reverse of that observed for installing units.

1. Switch the unit disconnect to the OFF position; then open unit door and wiring gutter door.
2. Turn one-quarter turn latches on door to open door.
3. Turn upper unit latches one-quarter turn to release top of unit.
4. Turn one-quarter latches on wire trough door and open.
5. Using screwdriver, rack out unit by turning lower unit disconnect screw counter-clockwise until screw disengages from guide.
6. Slide unit remaining distance out of section, taking care that unit does not drop as it is withdrawn.

To replace the unit door after a unit has been withdrawn from the motor control center:

1. Remove the pushbutton/indicating light bracket (if applicable).
2. Lift unit door from hinge pins.
3. Place door on motor control center and secure with one-quarter turn latches.

OPTIONAL POWER LOCKOUT DEVICE

The power lockout device is an option available with Size 5, 6 and 7 starter units and feeder units rated over 225 amperes. This option allows the unit disconnect to be de-energized from the line power source without having to remove the motor control center from service. The power lockout device may be padlocked in the de-energized position.

OPERATING HANDLES AND DOOR INTERLOCKS

All 7700 PLUS draw-out motor control center units are furnished with the operating handle mounted integral with the unit structure. The integral handle mechanism is equipped with an interlock arm which engages with a catch on the inside of the unit door to prevent inadvertent opening of the door when the branch circuit disconnect is switched ON. Switching to OFF, or turning the access screw counter-clockwise, allows access to the unit. (See Fig. 38)

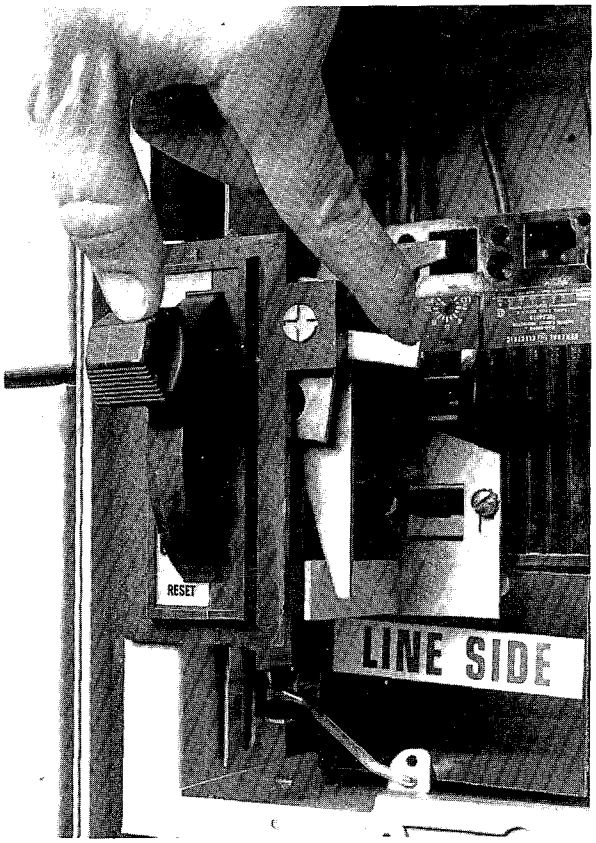


Fig. 38. Operating handle and door interlocks

A cover for the unit disconnect screw is provided to prevent turning of this screw unless the branch circuit disconnect is switched to the OFF position. This cover is mechanically linked with the vertical handle such that the branch circuit disconnect must be switched to the OFF position to expose the unit disconnect screw.

Figure 39 also shows the method provided for locking the vertical handle in the OFF position. A drilling pattern is furnished for padlocking in the ON position if desired.

With the unit door open, an interlock prevents switching the branch circuit disconnect ON without first defeating the interlock. To operate any branch circuit disconnect, the interlock arm (Fig. 38) must be held in a depressed position while switching the handle to the ON position.

All vertical handles on circuit breakers are trip-indicating. To reset a circuit breaker that has tripped, the handle must be depressed past OFF to the RESET position.

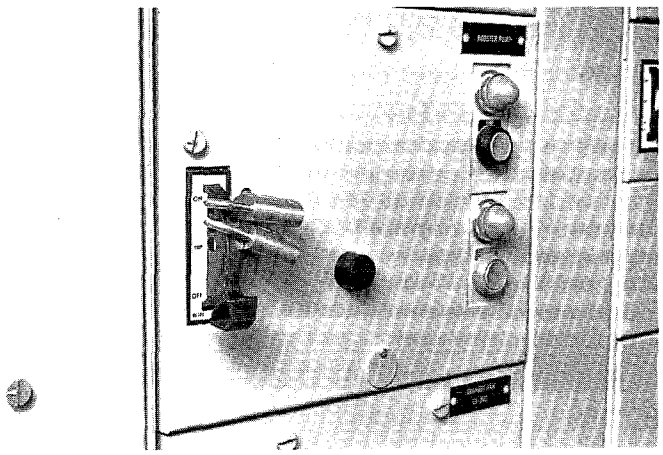


Fig. 39. Vertical handle padlocked in OFF position

TEST OPTION (Motor Disconnect)

The test option (motor disconnect) consists of a hinged motor lead block which is a two-position switch (Figs. 40 and 41). With the handle moved to the TEST position, the three-phase load cables are opened, disconnecting the load from the starter. With the switch in the RUN position, the load is connected to the starter.

NOTE: *This test block is not a load-breaking switch. DO NOT OPEN UNDER LOAD.*

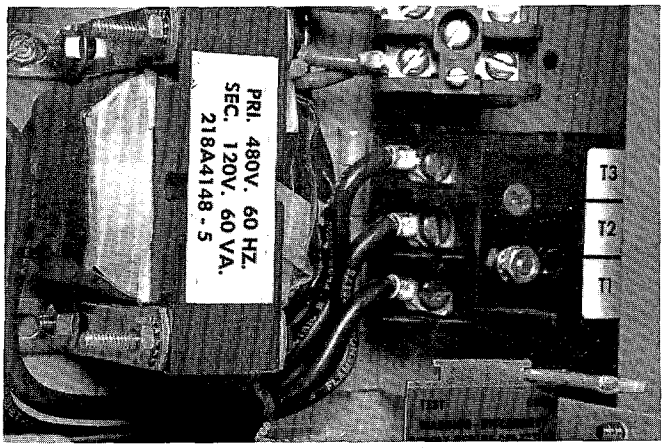


Fig. 40. Motor block engaged in RUN position

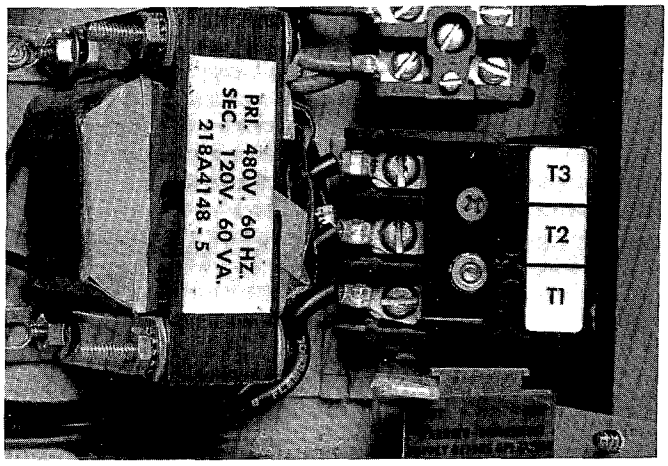


Fig. 41. Motor block disengaged from motor leads in TEST position

OPERATION

Preparation for Initial Operation

In addition to the normal circuit checking after wiring is completed, the following specific actions should be taken before energizing the equipment:

1. Check and tighten any electrical connections (lugs, bus splices, etc.) that may have loosened during shipping, handling and installation. Although all connections are carefully checked at the factory before shipment, good practice dictates that connections, particularly throughout the power circuit, be checked prior to operation. For all bus connections use torque ratings, TABLE 1, page 7.

2. Megger all terminals and bus for grounds. Instruments or control devices sensitive to megger voltage should be isolated from the circuit.

3. Operate each magnetic device by hand to see that all moving parts operate freely. Check all electrical interlock contacts for proper operation.

NOTE: *Certain parts, such as arc chutes, are tied to prevent breakage during shipment. Remove all such ties and make sure the arc chutes are seated properly.*

CAUTION: *DO NOT REMOVE HORIZONTAL STEEL BANDINGS FROM VERTICAL BUS ASSEMBLY.*

4. Current transformers are shipped with a shunt across the secondary if the circuit is not complete. Remove the shunt after completing connections to transformer secondary.

5. Make sure that the horsepower rating and voltage of the motor agree with the rating stamped on the nameplate of the unit to which it is connected.

6. Check each overload heater against the full-load current listed on each motor nameplate.

CAUTION: *CHECK CURRENT-TRANSFORMER-OPERATED OVERLOAD RELAYS TO BE CERTAIN AN OVERLOAD HEATER IS IN PLACE. STARTERS SHOULD NOT BE OPERATED WITHOUT OVERLOAD PROTECTION.*

7. Check all pneumatic or motor-driven timers for proper time interval settings.

8. Clean interior of equipment with a clean brush, soft cloth or vacuum cleaner.

9. Close and latch all doors and turn all branch circuit disconnects to the OFF position before energizing the motor control center.

CAUTION: *MAKE SURE THAT THE MOTOR CONTROL CENTER ENCLOSURE IS SOLIDLY GROUNDED.*

MAINTENANCE OF EQUIPMENT

The Purchaser should prepare a maintenance program consisting of a checklist of items to be covered periodically on the installed equipment. Although the frequency and extent of the maintenance program will vary with equipment usage, environmental conditions, etc., the following actions should be included in any prepared checklist:

After De-energizing the Equipment

1. Remove accumulated dust and dirt. Use brush, soft cloth or vacuum cleaner.

2. Wipe all main bus insulators and vertical bus barriers.

3. Inspect main and vertical bus joints and main bus supports and tighten if necessary. Refer to TABLE 1, page 7.

4. Inspect all wiring from units for deterioration of insulation.

5. Remove draw-out units and check stabs and all unit wiring. Remove accumulated dust from horizontal barriers and in area of stabs.

6. Check all starter contacts. They need only be replaced when nearly all the silver tip is gone and the contact tip support is exposed. Do not file the contacts. Filing or otherwise dressing the contacts only results in lost tip material and reduces starter life.

7. Check all unit wiring for deterioration of insulation and tighten all connections.

8. Visually check meters and instruments and check critical instrument calibrations.

9. Check unit door interlocks for proper operation.

10. Check all indicating lights and replace as required.

11. If fuse replacement is necessary, always install the same type and rating fuses furnished with the motor control center. Evolution in fuse design has produced fuses which are mechanically equivalent but not electrically equivalent. They may not have the same short circuit withstandability and current-limiting ability.

CAUTION: *DUE TO UNIT INTERCONNECTIONS, THERE MAY BE VOLTAGE PRESENT IN CIRCUITS EVEN THOUGH BRANCH CIRCUIT DISCONNECT IS OPEN.*

RENEWAL PARTS

Due to the variety of components furnished in the 7700 PLUS motor control center, stock of spare parts will vary. Consideration should be given, however, to maintaining an adequate supply of the following:

1. Overload heaters.
2. Power and control circuit fuses.
3. Replacement (starter) contact kits.
4. Starter coils.
5. Pilot lights.
6. Pushbuttons.
7. Circuit breakers/fusible switches.
8. Extra draw-out terminal blocks.
9. Complete starters and/or spare units as warranted by installation needs.

Your General Electric Sales Engineer will be glad to assist you in the preparation of a recommended parts list tailored to your specific installation.

ORDERING ADDITIONAL OR REPLACEMENT UNITS

The following information is needed for the proper equipment to be supplied.

1. All data on motor control center master nameplate.
2. If unit is to be a duplicate of any existing unit, all data on that unit nameplate, located right of unit side.
3. NEMA control center class: I or II.
4. NEMA wiring type: A, B or C.
5. NEMA enclosure type: 1, 2, 3R, or 12.
6. Power supply: _____ volts, _____ phase, _____ Hertz.
7. Control power: _____ volts, _____ Hertz.
8. Designation: nameplate and title.
9. Motor characteristics: _____ HP, _____ RPM, _____ C° temp. rise, _____ amps FLC, _____ secs. accelerating time, _____ service factor.
10. Disconnect:
    a. Fusible switch _____ amps, fuse type and clips.
    b. Circuit breaker: _____ frame, _____amps.
11. NEMA starter size: 1, 2, 3, 4, 5, 6, or 7.
12. Starter type; FVNR, FVR, RVNR, 2-speed_____ winding.
13. Accessories
    a. Pushbuttons: START-STOP, FORWARD, REVERSE, UP, DOWN, etc.
    b. Transfer switch: H-O-A.
    c. Pilot lights: quantity, color and type.
    d. Interlocks: quantity NO and NC.
    e. Control power transformer.
14. Unit X height or space available.
15. Are horizontal barriers or other parts required?
16. Circuitry.
17. All other modifications.
18. Specify if MCC is for 7700 PLUS or 2700 PLUS.

ADDITIONAL INFORMATION

For other information, refer to the nearest sales office of the General Electric Company and give full details, including equipment nameplate data. Nameplates are prominently displayed on the motor control center lineup, giving details of service, voltage, frequency, factory order number, etc. Similar nameplates are mounted on each motor control center unit.

OVERLOAD HEATER SELECTION

For continuous-rated motors with a service factor of 1.15 to 1.25, selecting the heater with maximum motor amps equal to or immediately greater than the motor full-load current provides a maximum of 125-percent protection. For continuous-rated motors with no service factor, multiply the full-load current of the motor by 0.90 and use this value to select the heater.

To protect the heater during short circuit, provide motor branch circuit protection in accordance with the National Electrical Code.

The following heater tables should be used for selecting overload heaters in each phase on three-phase motors. Refer to the General Electric Company for other applications.

TABLE 2. CR206 Starters

Maximum Motor Amps	Heater Number CR123	Maximum Fuse or C/B trip Rating	Maximum Motor Amps	Heater Number CR123	Maximum Fuse or C/B trip Rating
SIZE 1 — CR224C STANDARD AND AMBIENT-COMPENSATED OVERLOAD RELAYS					
0.45	C0.54A	3	4.47	C4.66A	15
.49	C0.60A	3	4.95	C5.26A	15
.53	C0.66A	3	5.49	C5.92A	20
.59	C0.71A	3	5.91	C6.30A	20
.65	C0.78A	3	6.47	C6.95A	25
.76	C0.87A	3	7.20	C7.78A	25
.84	C0.97A	3	8.22	C8.67A	30
.93	C1.09A	3	8.72	C9.55A	30
1.04	C1.18A	3	9.67	C10.4B	35
1.15	C1.31A	3	10.4	C11.3B	35
1.27	C1.48A	3	11.0	C12.5B	40
1.39	C1.63A	3	12.4	C13.7B	45
1.55	C1.84A	6	13.2	C15.1B	50
1.73	C1.96A	6	15.4	C16.3B	50
1.89	C2.20A	6	17.1	C18.0B	60
2.05	C2.39A	6	18.1	C19.8B	70
2.28	C2.68A	6	20.0	C21.4B	70
2.47	C3.01A	6	21.5	C22.8B	80
2.79	C3.26A	10	22.5	C25.0B	80
3.31	C3.56A	10	23.9	C27.3B	80
3.70	C3.77A	12	26.3	C30.0B	90
4.06	C4.19A	15	27.0	C33.0B	90

NOTE: *Relay tripping current for 40 C ambient is the minimum value of current range under Maximum Motor Amps multiplied by 1.25. Minimum motor amps for C0.54A is 0.41 amps.*

SIZE 2 — CR224D STANDARD AND AMBIENT-COMPENSATED OVERLOAD RELAYS					
5.85	C6.30A	20	17.0	C18.0B	60
6.47	C6.05A	20	18.7	C19.8B	70
7.35	C7.78A	25	20.4	C21.4B	80
8.06	C8.67A	30	22.7	C22.8B	80
9.03	C9.55A	30	24.7	C25.0B	90
9.61	C10.4B	30	26.3	C27.3B	90
10.5	C11.3B	35	29.5	C30.3B	100
11.6	C12.5B	40	33.5	C33.0B	110
12.5	C13.7B	45	37.8	C36.6B	125
13.6	C15.1B	50	41.9	C40.0B	150
16.7	C16.3B	60	43.2	C43.2B	150
			45.0	C46.0B	150

NOTE: *Relay tripping current for 40 C ambient is the minimum value of current range under Maximum Motor Amps multiplied by 1.25. Minimum motor amps for C6.30A is 5.48 amps.*

SIZE 3 — CR224E STANDARD OVERLOAD RELAYS					
18.7	F23.3B	70	44.9	F56.7B	175
21.4	F24.3B	80	50.1	F61.4B	175
22.7	F27.0B	80	53.3	F65.8B	200
26.1	F30.0B	90	56.7	F71.9B	225
28.1	F32.7B	100	63.9	F77.2B	225
31.6	F35.7B	110	66.6	F84.8B	250
33.6	F39.5B	125	72.3	F91.4B	275
36.1	F43.0B	125	80.1	F104C	275
41.0	F48.7B	150	84.0	F114C	300

NOTE: *Relay tripping current for 40 C ambient is the minimum value of current range under Maximum Motor Amps multiplied by 1.25. Minimum motor amps for F23.3B is 18.4 amps.*

When starter unit is provided with 100-amp fuseholders, maximum motor current is 52.5 amps when in 2X (24-inch) unit space and 68.5 amps when in 2½X (30-inch) unit space.

SIZE 3 — CR224E AMBIENT-COMPENSATED OVERLOAD RELAYS (3 heaters)					
18.4	F23.3B	70	44.7	F56.7B	175
21.1	F24.3B	80	52.6	F61.4B	175
22.1	F27.0B	80	53.6	F65.8B	200
26.1	F30.0B	90	57.1	F71.9B	225
28.0	F32.7B	100	65.3	F77.2B	225
31.3	F35.7B	110	68.1	F84.8B	250
34.3	F39.5B	125	75.8	F91.4B	275
35.4	F43.0B	125	84.7	F104C	275
42.2	F48.7B	150	90.0	F114C	300

NOTE: *Relay tripping current for 40 C ambient is the minimum value of current range under Maximum Motor Amps multiplied by 1.25. Minimum motor amps for F23.3B is 17.8 amps.*

OVERLOAD HEATER SELECTION (Cont'd)

TABLE 2. CR206 Starters (Cont'd)

Maximum Motor Amps	Heater Number CR123	Maximum Fuse or C/B trip Rating	Maximum Motor Amps	Heater Number CR123	Maximum Fuse or C/B trip Rating
SIZE 4 — CR224F STANDARD OVERLOAD RELAYS					
33.2	F35.7B	110	73.9	F84.8B	250
35.1	F39.5B	125	82.4	F91.4B	275
37.9	F43.0B	125	95.2	F104C	300
46.0	F48.7B	150	99.9	F114C	350
49.9	F56.7B	175	105.0	F118C	400
55.6	F61.4B	175	113.0	F133C	400
59.2	F65.8B	200	124.0	F149C	400
61.9	F71.9B	225	133.0	F161C	400
71.6	F77.2B	225			

NOTE: *Relay tripping current for 40 C ambient is the minimum value of current range under Maximum Motor Amps multiplied by 1.25. Minimum motor amps for F35.7B is 29.3 amps.*

SIZE 4 — CR224F AMBIENT-COMPENSATED OVERLOAD RELAYS					
31.1	F35.7B	110	70.7	F84.8B	250
34.3	F39.5B	125	76.4	F91.4B	275
36.7	F43.0B	125	88.7	F104C	300
42.6	F48.7B	150	93.5	F114C	350
46.6	F56.7B	175	103.0	F118C	350
52.7	F61.4B	175	109.0	F133C	400
55.6	F65.8B	200	119.0	F149C	400
58.7	F71.9B	225	131.0	F161C	400
67.2	F77.2B	225	135.0	F174C	400

NOTE: *Relay tripping current for 40 C ambient is the minimum value of current range under Maximum Motor Amps multiplied by 1.25. Minimum motor amps for F35.7B is 28.8 amps.*

SIZE 5 — CR224C STANDARD AND AMBIENT-COMPENSATED OVERLOAD RELAYS (3 heaters) — GPC CT				
118.0	C5.92A		200.0	C10.4B
128.0	C6.30A		221.0	C11.3B
138.0	C6.95A		237.0	C12.5B
155.0	C7.78A		262.0	C13.7B
168.0	C8.67A		270.0	C15.1B
184.0	C9.55A			

NOTE: *Relay tripping current for 40 C ambient is the minimum value of current range under Maximum Motor Amps multiplied by 1.25. Minimum motor amps for C5.92A is 109 amps.*

Maximum Motor Full-load Current	Current Transformer Secondary Maximum Amps	Heater Number CR123
SIZE 5 — CR224C STANDARD AND AMBIENT-COMPENSATED OVERLOAD RELAYS CT RATIO 300/5		
113	1.89	C2.20A
123	2.05	C2.39A
137	2.28	C2.68A
148	2.47	C3.01A
167	2.79	C3.26A
198	3.31	C3.56A
222	3.70	C3.79A
244	4.06	C4.19A

TABLE 3. CR286 Starters

Maximum Motor Full-load Current	Current Transformer Secondary Maximum Amps	Heater Number CR123
SIZE 6 — STANDARD AND AMBIENT-COMPENSATED OVERLOAD RELAYS CT RATIO 600/5		
226	1.89	C2.20A
246	205	C2.39A
274	2.28	C2.68A
296	2.47	C3.01A
335	2.79	C3.26A
397	3.31	C3.56A
444	3.70	C3.79A
487	4.06	C4.19A
SIZE 7 — STANDARD AND AMBIENT-COMPENSATED OVERLOAD RELAYS CT RATIO 800/5		
446	2.79	C3.26A
530	3.31	C3.56A
592	3.70	C3.79A
650	4.06	C4.19A
715	4.47	C4.66A

OVERLOAD RELAY HEATER SELECTION AND SETTING OF MAG-BREAK® MOTOR CIRCUIT PROTECTOR

To maintain overcurrent and short-circuit protection, the following instructions for selection of overload relay heaters and setting of the MAG-BREAK motor circuit protector must be followed.

IMPORTANT: *THE BREAKER HAS BEEN SET AT THE FACTORY TO THE MINIMUM TRIP SETTING. AFTER INSTALLATION, ADJUSTMENT SHOULD BE MADE ACCORDING TO VALUES SHOWN ON HEATER SELECTION TABLE.*

1. Determine motor full-load current and service factor from motor nameplate.

2. For continuous rated motors with service factor of 1.15 to 1.25, select heater from table to match motor full-load current. For continuous rated motors with service factor of 1.0, multiply motor full-load current by 0.9 and use this value to select heater.

3. Referring to TABLE 4, verify that the MAG-BREAK catalog number is correct for the motor full-load current and set trip adjustment to the recommended value.

4. If motor cannot be started without tripping a circuit protector, increase trip setting one step at a time until motor can be consistently started, but do not exceed the maximum setting shown.

NOTE: *Maximum MAG-BREAK setting listed does not exceed 13X the lower value of the full-load motor current range specified. For motor currents higher in the current range, maximum setting may be increased, provided the trip current at this setting does not exceed 13X full-load amperes as specified in N.E.C.*

Overload relay tripping current in 40 C ambient is the minimum value of full-load current multiplied by 1.25.

WARNING: *SET OVERLOAD RELAY FOR AUTOMATIC RESET ONLY IF MOTOR CIRCUIT WILL REMAIN OPEN WHEN RELAY RECLOSES. A RELAY WITH NC CONTACT ONLY IS IN AUTOMATIC RESET POSITION WHEN SPRING ON SIDE IS MOVED TO THE LOWER NOTCH. FOR A RELAY WITH NO-NC CONTACTS, ADJUSTMENT SLIDE IS PULLED OUT AS INDICATED ON RELAY.*

WARNING: *WHEN CORRECTLY SET, TRIPPING OF THE MAG-BREAK MOTOR CIRCUIT PROTECTOR IS AN INDICATION THAT A FAULT CURRENT HAS BEEN INTERRUPTED. THE MOTOR CONTROLLER SHOULD BE EXAMINED AND REPLACED, IF DAMAGED, IN ORDER TO PROVIDE CONTINUED PROTECTION AGAINST FIRE AND OTHER HAZARDS. IF BURNOUT OF THE OVERLOAD RELAY HEATER OCCURS, THE COMPLETE OVERLOAD RELAY MUST BE REPLACED.*

TABLE 4. Heater Selection

Motor Full-load Current	Heater No. CR123	MAG-BREAK Cat. No. TEC	MAG-BREAK Setting	
			Rec.	Max.
SIZE 1 — STANDARD OVERLOAD RELAYS				
0.65-0.74	C0.87A	36003	LO	LO
.75- .84	C0.97A	36003	LO	LO
.85- .92	C1.09A	36003	LO	1
.93-1.02	C1.18A	36003	LO	1
1.03-1.10	C1.31A	36003	LO	2
1.11-1.23	C1.48A	36003	LO	2
1.24-1.36	C1.63A	36003	LO	3
1.39-1.49	C1.84A	36003	LO	4
1.50-1.67	C1.96A	36003	1	4
1.68-1.79	C2.20A	36003	1	5
1.80-1.98	C2.39A	36003	1	6
1.99-2.24	C2.68A	36003	2	7
2.25-2.43	C3.01A	36003	3	8
2.44-2.75	C3.26A	36007	LO	2
2.76-3.25	C3.56A	36007	LO	3
3.26-3.43	C3.79A	36007	LO	4
3.44-4.03	C4.19A	36007	1	4
4.04-4.43	C4.66A	36007	1	5
4.44-4.94	C5.26A	36007	2	6
4.95-5.36	C5.92A	36007	2	7

OVERLOAD RELAY HEATER SELECTION AND SETTING OF MAG-BREAK® MOTOR CIRCUIT PROTECTOR (Cont'd)

TABLE 4. Heater Selection (Cont'd)

Motor Full-load Current	Heater No. CR123	MAG-BREAK Cat. No. TEC	MAG-BREAK Setting Rec.	MAG-BREAK Setting Max.
SIZE 1 — STANDARD OVERLOAD RELAYS (Cont'd)				
5.37- 5.77	C6.30A	36007	3	8
5.78- 6.35	C6.95A	36015	LO	2
6.36- 6.92	C7.78A	36015	LO	3
6.93- 7.99	C8.67A	36015	LO	3
8.00- 8.47	C9.55A	36015	1	4
8.48- 9.19	C10.4B	36015	1	5
9.20-10.0	C11.3B	36015	1	6
10.1 -10.7	C12.5B	36015	2	6
10.8 -12.0	C13.7B	36015	2	7
12.1 -12.9	C15.1B	36015	3	8
13.0 -15.1	C16.3B	36030	LO	3
15.2 -16.3	C18.0B	36030	LO	4
16.4 -17.9	C19.8B	36030	1	4
18.0 -19.7	C21.4B	36030	1	5
19.8 -21.2	C22.8B	36030	1	6
21.3 -22.3	C25.0B	36030	2	7
22.4 -23.5	C27.3B	36030	2	8
23.6 -25.5	C30.3B	36030	3	8
25.6 -27.0	C33.0B	36050	LO	3
SIZE 1 — AMBIENT-COMPENSATED OVERLOAD RELAYS*				
0.66- 0.76	C0.87A	36003	LO	LO
.77- .84	C0.97A	36003	LO	LO
.85- .93	C1.09A	36003	LO	1
.94- 1.04	C1.18A	36003	LO	1
1.03- 1.15	C1.31A	36003	LO	2
1.16- 1.27	C1.48A	36003	LO	2
1.28- 1.39	C1.63A	36003	LO	3
1.40- 1.55	C1.84A	36003	LO	4
1.56- 1.73	C1.96A	36003	1	4
1.74- 1.89	C2.20A	36003	1	5
1.90- 2.05	C2.39A	36003	2	6
2.06- 2.28	C2.68A	36003	2	7
2.29- 2.47	C3.01A	36003	3	8
2.48- 2.79	C3.26A	36007	LO	2
2.80- 3.31	C3.56A	36007	LO	3
3.32- 3.70	C3.79A	36007	LO	4
3.71- 4.06	C4.19A	36007	1	5
4.07- 4.47	C4.66A	36007	1	5
4.48- 4.95	C5.26A	36007	2	6
4.96- 5.49	C5.92A	36007	2	7
5.50- 5.91	C6.30A	36007	3	8
5.92- 6.47	C6.95A	36015	LO	2
6.48- 7.20	C7.78A	36015	LO	3
7.21- 8.22	C8.67A	36015	LO	3
8.23- 8.72	C9.55A	36015	1	4
8.73- 9.67	C10.4B	36015	1	5
9.68-10.4	C11.3B	36015	1	6
10.5 -11.0	C12.5B	36015	2	7
11.1 -12.4	C13.7B	36015	2	7
12.5 -13.2	C15.1B	36030	3	2
13.3 -15.4	C16.3B	36030	LO	3
15.5 -17.1	C18.0B	36030	LO	4
17.2 -18.0	C19.8B	36030	1	5
18.1 -20.0	C21.4B	36030	1	5
20.1 -21.5	C22.8B	36030	2	6
21.6 -22.5	C25.0B	36030	2	7
22.6 -23.9	C27.3B	36030	2	8
24.0 -26.3	C30.3B	36030	3	8
26.4 -27.0	C33.0B	36050	LO	4
SIZE 2 — STANDARD OVERLOAD RELAYS				
8.81- 9.27	C10.4B	36015	1	5
9.28- 9.99	C11.3B	36015	1	6
10.0 -11.1	C12.5B	36015	2	6
11.2 -12.1	C13.7B	36015	2	7
12.2 -13.1	C15.1B	36015	3	8
13.2 -15.5	C16.3B	36030	LO	3
15.6 -16.8	C18.0B	36030	LO	4
16.9 -18.0	C19.8B	36030	1	5
18.1 -19.7	C21.4B	36030	1	5
19.8 -21.6	C22.8B	36030	1	6
21.7 -23.9	C25.0B	36030	2	7
24.0 -25.5	C27.3B	36030	3	8
25.6 -28.2	C30.3B	36030	3	9
28.3 -31.5	C33.0B	36050	LO	4
31.6 -35.8	C36.6B	36050	1	5
35.9 -39.0	C40.0B	36050	1	7
39.1 -40.6	C44.0B	36050	2	8
40.7 -45.0	C46.0B	36050	2	8

This heater table for use with ambient-compensated overload relays (with red reset arm).

Motor Full-load Current	Heater No. CR123	MAG-BREAK Cat. No. TEC	MAG-BREAK Setting Rec.	MAG-BREAK Setting Max.
SIZE 2 — AMBIENT-COMPENSATED OVERLOAD RELAYS*				
9.04- 9.61	C10.4B	36015	1	5
9.62-10.5	C11.3B	36015	1	6
10.6 -11.6	C12.5B	36015	2	7
11.7 -12.5	C13.7B	36015	3	8
12.6 -13.6	C15.1B	36015	3	9
13.7 -16.7	C16.3B	36030	LO	3
16.8 -17.9	C18.0B	36030	1	5
18.0 -18.7	C19.8B	36030	1	5
18.8 -20.4	C21.4B	36030	1	6
20.5 -22.7	C22.8B	36030	2	7
22.8 -24.7	C25.0B	36030	2	8
24.8 -26.3	C27.3B	36030	3	9
26.4 -29.5	C30.3B	36050	LO	4
29.6 -33.5	C33.0B	36050	LO	5
33.6 -37.8	C36.6B	36050	1	6
37.9 -41.9	C40.0B	36050	1	7
42.0 -43.2	C44.0B	36050	2	9
43.3 -45.0	C46.0B	36050	3	9
SIZE 3 — STANDARD AND AMBIENT-COMPENSATED OVERLOAD RELAYS†				
17.8 -18.4	F23.3B	36030	1	5
18.5 -21.1	F24.3B	36030	1	6
21.2 -22.1	F27.0B	36030	2	7
22.2 -26.1	F30.0B	36030	3	7
26.2 -28.0	F32.7B	36050	LO	4
28.1 -31.3	F35.7B	36050	LO	4
31.4 -34.3	F39.5B	36050	1	5
34.4 -35.4	F43.0B	36050	1	6
35.5 -42.2	F48.7B	36050	1	7
42.3 -44.7	F56.7B	36050	2	9
44.8 -52.6	F61.4B	36100	LO	3
52.7 -53.6	F65.8B	36100	1	4
53.7 -57.1	F71.9B	36100	1	4
57.2 -65.3	F77.2B	36100	1	5
65.4 -68.1	F84.8B	36100	1	6
68.2 -75.8	F91.4B	36100	2	6
75.9 -84.7	F104C	36100	2	8
84.8 -90.0	F114C	36100	3	9
SIZE 4 — STANDARD OVERLOAD RELAYS				
28.8 -31.1	F35.7B	36050	LO	4
31.2 -34.3	F39.5B	36050	LO	5
34.4 -36.7	F43.0B	36050	1	6
36.8 -42.6	F48.7B	36050	1	7
42.7 -46.6	F56.7B	36050	2	9
46.7 -52.7	F61.4B	36100	LO	3
52.8 -55.6	F65.8B	36100	LO	4
55.7 -58.7	F71.9B	36100	1	5
58.8 -67.2	F77.2B	36100	1	5
67.3 -70.7	F84.8B	36100	2	6
70.8 -76.4	F91.4B	36100	2	7
76.5 -88.7	F104C	36100	2	8
88.8 -93.5	F114C	36150	LO	3
93.6 -99.9	F118C	36150	LO	3
100 -105	F133C	36150	LO	4
106 -113	F149C	36150	LO	4
114 -131	F161C	36150	1	5
132 -135	F174C	36150	1	6
SIZE 4 — AMBIENT-COMPENSATED OVERLOAD RELAYS*				
28.8 -31.1	F35.7B	36050	LO	4
31.2 -34.3	F39.5B	36050	LO	5
34.4 -36.7	F43.0B	36050	1	6
36.8 -42.6	F48.7B	36050	1	7
42.7 -46.6	F56.7B	36050	2	9
46.7 -52.7	F61.4B	36100	LO	3
52.8 -55.6	F65.8B	36100	LO	4
55.7 -58.7	F71.9B	36100	1	5
58.8 -67.2	F77.2B	36100	1	5
67.3 -70.7	F84.8B	36100	2	6
70.8 -76.4	F91.4B	36100	2	7
76.5 -88.7	F104C	36100	2	8
88.8 -93.5	F114C	36150	LO	3
93.6 -103	F118C	36150	LO	3
104 -109	F133C	36150	LO	4
110 -119	F149C	36150	LO	4
120 -131	F161C	36150	1	5
132 -135	F174C	36150	1	6

†*This heater table for use with standard overload relay (with black reset arm) or ambient-compensated overload relays (with red reset arm).*

GENERAL ELECTRIC COMPANY, U.S.A.
INDUSTRIAL CONTROL DEPARTMENT

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