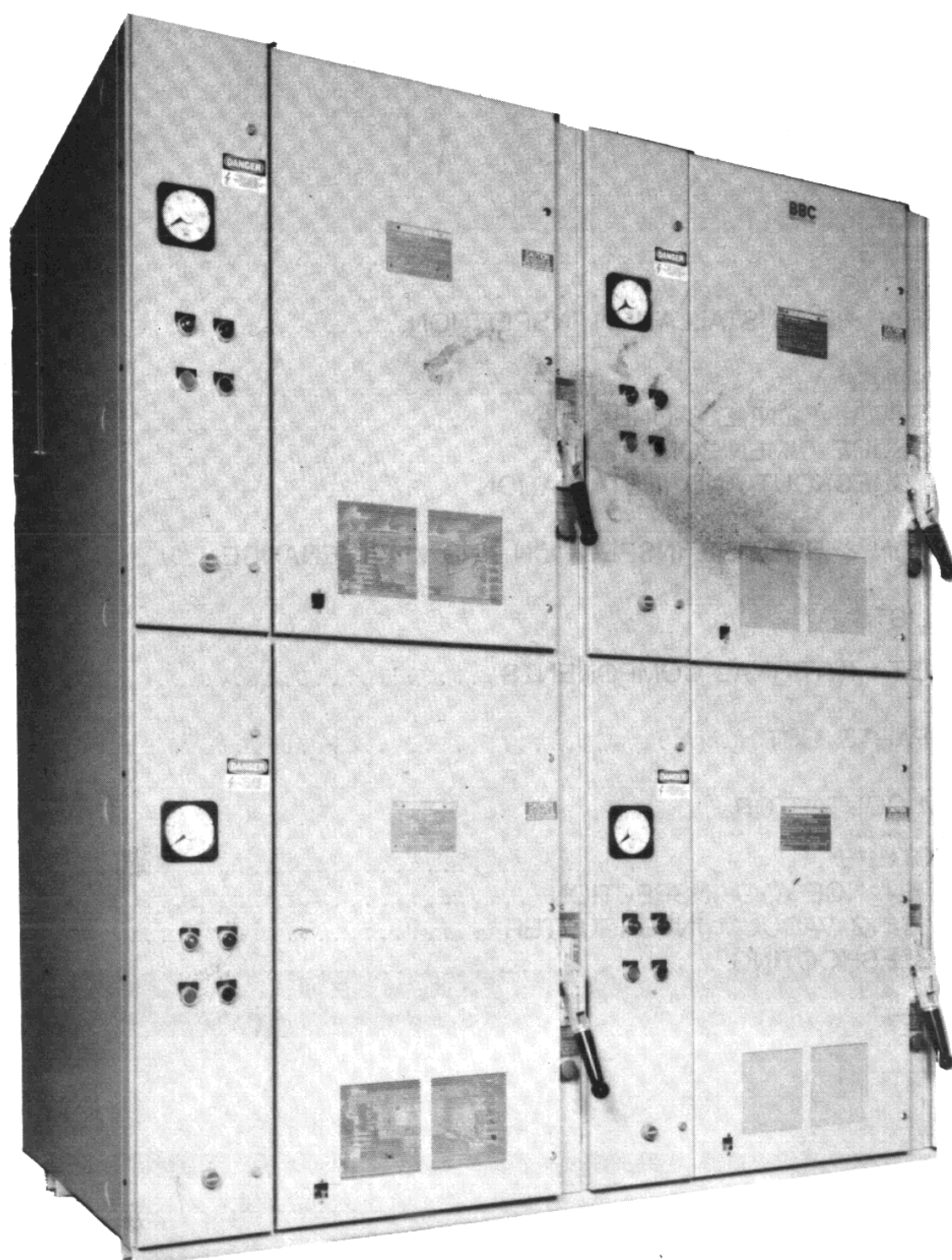


Installation/Maintenance Instructions

Medium Voltage Motor Starter

Series 7850VAC
2400, 4160 and 6900 Volts



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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 nearest District Office

MEDIUM VOLTAGE VACUUM STARTERS
2500-7200 VOLTS MAXIMUM
NEMA CLASS E2

The Series 7850 starter is designed for safe and dependable operation of 2200 V thru 6900 V, 50/60 Hertz, AC motors.

CONTROLLER

The NEMA Class E2 controller is a compact design with numerous safety features using a drawout contactor. Accessible power and control fuses, isolated by removable barriers, makes fuse removal an easy task. Vacuum bottles and coil are easily changed (no special tools required).

The 7850VAC controller compact and lightweight design allows easy handling, cutting installation costs. The controller's reduced size, allows generous wiring area further reducing installation cost. This unique design allows flexibility in making field changes in starter position as well as changing the rating of the starter due to changing HP requirements.

INTERLOCK SYSTEMS

The Series 7850 enclosure and drawout mechanism interlock systems are in accordance with NEMA and UL standards and provide maximum safety for personnel and equipment.

A - Door Interlock

The controller door is interlocked with the main isolating switch handle. The door cannot be opened if the main isolating switch is in the energized or "CONN" (connected) position. In addition the handle cannot be moved to the "CONN" position while the door is open. In case of an emergency, a defeater is provided to allow the door to open while the switch is energized. The defeater can be reached by removing the set screw on the face of the operating mechanism just above the handle assembly. Refer to Fig. No. 1.

"IMPORTANT INSTRUCTION" FOR KNOWLEDGEABLE AND QUALIFIED ELECTRICAL MAINTENANCE PERSONNEL ONLY

If the contactor position "ON" "OFF" indicator in the viewing window at the lower left corner of the controller door remains in the "ON" position, and the red release button below the operating handle mechanism **cannot be depressed** after a "stop/open" signal has been completed in the control circuit, an interlocking mechanism prevents opening the isolating gap (moving the operating handle mechanism to withdraw the contactor stabs from the line and load bus).

To defeat this interlock feature, use the following instructions.

1. **DISCONNECT MEDIUM VOLTAGE FEEDING THE CONTROLLER** — Contactor "ON" indication may be the result of welded high voltage contacts.

CAUTION: FAILURE TO DISCONNECT HIGH VOLTAGE FEEDING THE CONTROLLER MAY RESULT IN DANGER TO LIFE AND DAMAGE TO PROPERTY.

2. Unscrew the captive fasteners along the right side of the contactor door.
3. Defeat the door interlock by removing the 7/16 inch slotted set screw at the top of the operating handle mechanism casting and rotate the now exposed slotted defeater counter clockwise with a screwdriver. After this operation, **REPLACE THE SLOTTED SET SCREW.**
4. With the controller high voltage door open, the area of interference can be located at the end of the rod attached to the red release button (below the operating handle mechanism). By removing the bolt that attaches the "stop" onto the drawout contactor shaft, and removing the stop, the red release button can be depressed and in turn will allow the operating handle to be moved to the "DISC" position (simultaneously withdrawing the contactor and closing the line bus shutter).
5. Remove the contactor for inspection and/or repair.

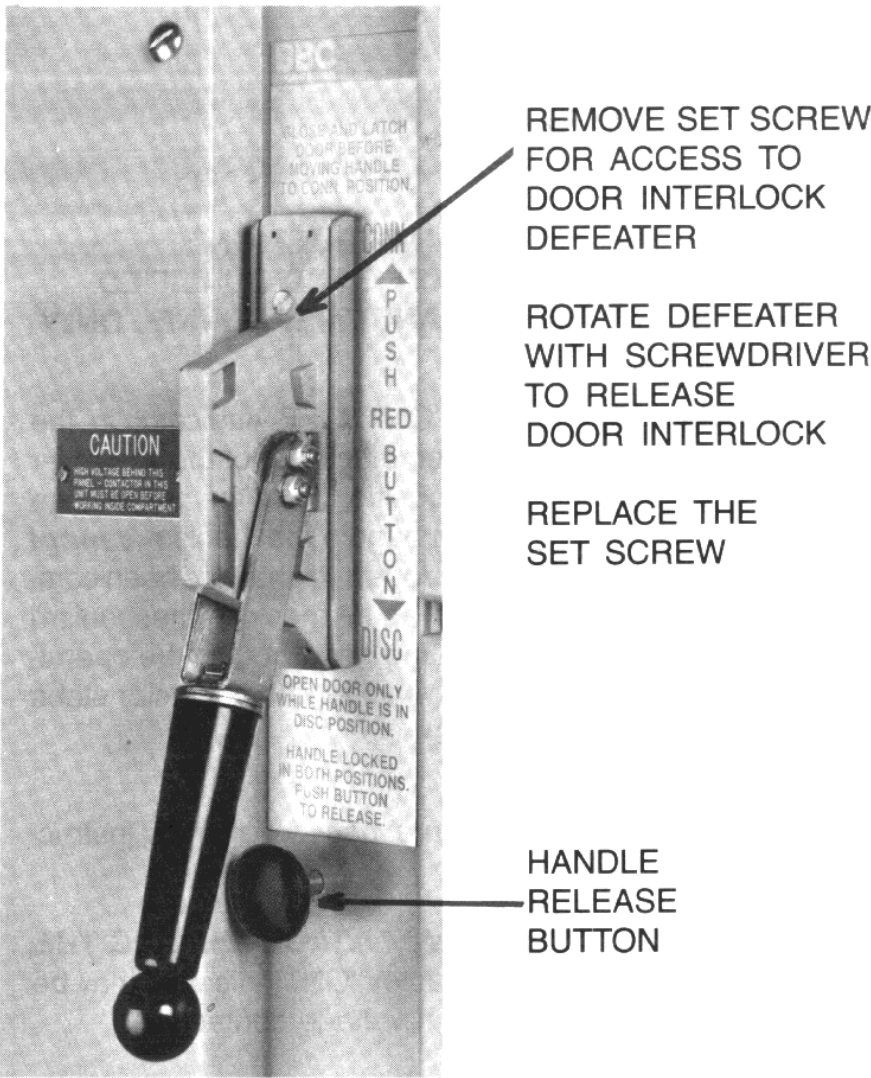


Figure 1
Mechanical Door Interlock

B - Handle and Contactor Interlock (Mechanical)

To prevent accidental withdrawal of the contactor when it is energized, a mechanical interlock is provided. To move the operating handle from the "CONN" to the "DISC" (disconnected) position, it is necessary to first de-energize the contactor; then push the red handle release button located below the operating handle and hold while moving from "CONN" to "DISC". Reference Figure No. 1.

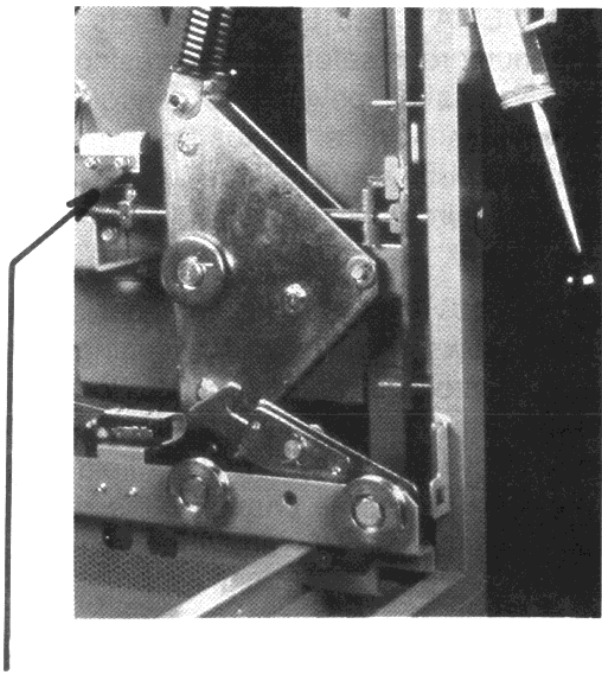
When the contactor is energized, it should not be possible to push the handle release button in. If the button can be depressed, it should be adjusted. Loosen bolt A. Depress handle release button B and adjust in 1/4 turn increments to eliminate play in release button when unit is energized. Retighten bolt. With button depressed, dimension C should be approximately 1/16" as shown in illustration No. 1.

C - Mechanical Latch

The mechanical latch is mounted on the right contactor carriage rail and serves to locate and hold the contactor in both the disengaged and test positions. The latch is released by pivoting the latch assembly upward and manually rolling the controller into the desired position. Reference Figure No. 3.

D - Switch Electrical Interlock
(Contactor to Frame)

The normally open electrical interlock, located on the left side of the rear wall of the main switch compartment, closes only when the contactor is fully engaged, supplying power to the control circuit. The switch is pre-set at the factory and no adjustment is required. Reference Figure No. 4.



LOOSEN TO ADJUST SWITCH POSITION

Figure 2
Handle and Contactor Interlock Adjustment

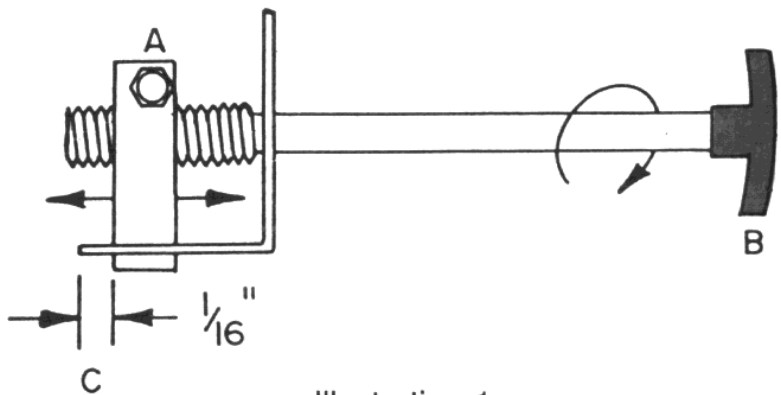


Illustration 1

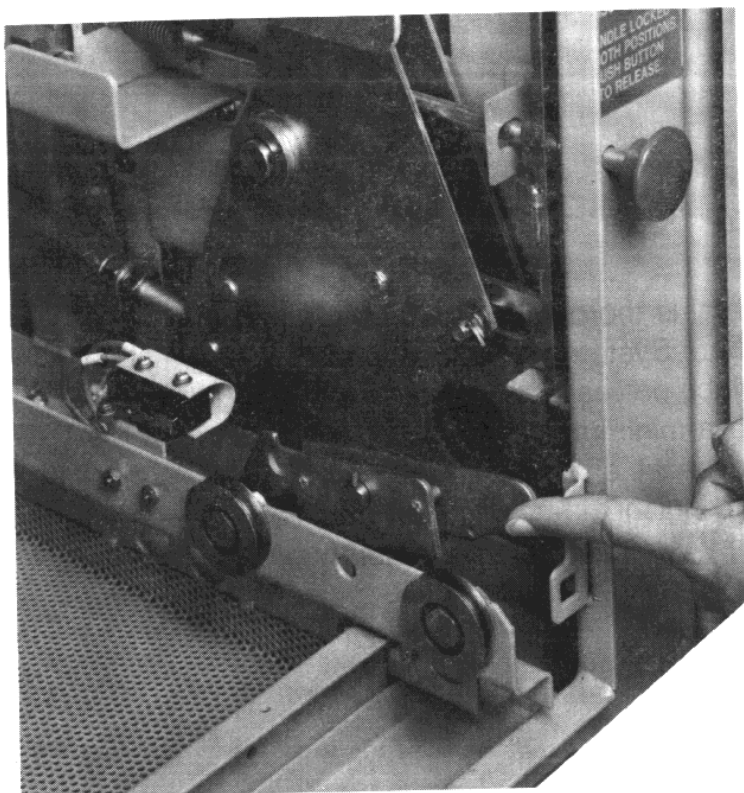


Figure 3
Pivot Upward to Defeat Latch

ELECTRICAL
INTERLOCK

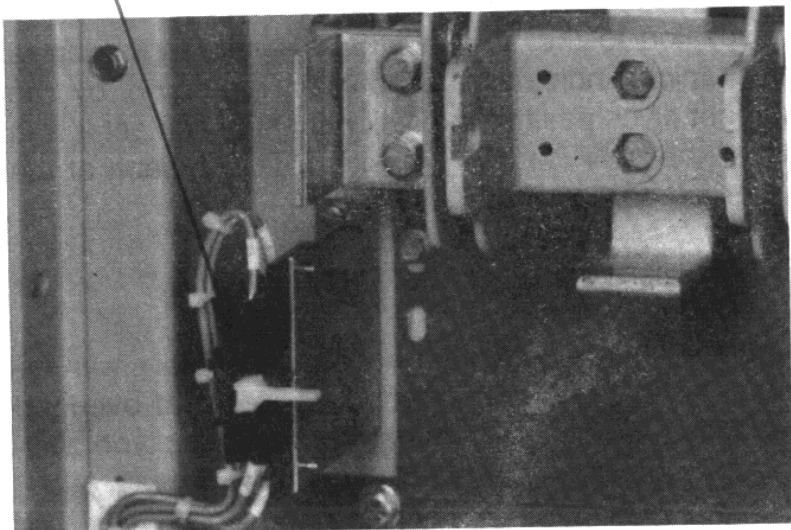


Figure 4
Electrical Interlock Switch

E - Test Power Switch

The test power switch interlock located on the middle of the right contactor carriage rail, disconnects the test circuit when the contactor is moved from the test position to the disengaged position. If this does not occur, the action of this switch may be adjusted by loosening the mounting screws as shown in Figure No. 5.

F - Handle Interlock Switch
(Electrical)

This electrical interlock works in conjunction with the handle and contactor interlock, section "B", page 4. The normally closed electrical interlock opens while the handle release button is depressed, disconnecting the fused leg of the control power transformer from the control circuit. If this does not occur, the action of this switch may be adjusted by loosening the mounting screws as shown in Figure No. 2.

LOOSEN TO ADJUST
SWITCH POSITION

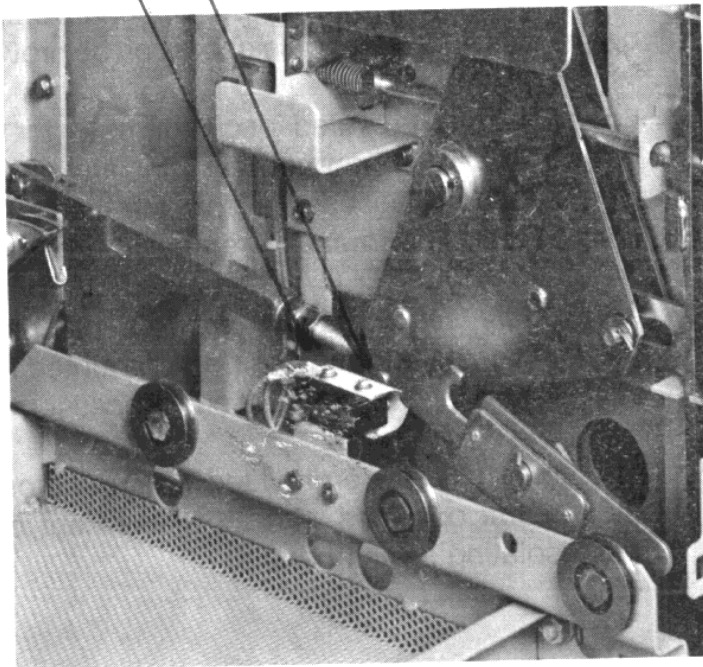


Figure 5
Test Power Switch Adjustment

DUAL CONTACTOR POSITION INDICATION

In addition to the "CONN-DISC" handle indication, a mechanical indicator mechanically operated by the magnet gives positive indication that the contactor is in either the "ON" or "OFF" position. This is seen at the lower left corner of the starter door.

OVERCURRENT PROTECTION

Ambient compensated thermal overload relays with external hand reset are provided as standard overload protection. Special switchboard or magnetic type overcurrent protection is available.

ENCLOSURES

Rugged, heavy gauge steel, NEMA 1 construction.

Features:

Basic welded starter modules, 29" wide by 45" high by 24" deep.

Add-on type modular, separate low voltage compartments with individual doors.

Ventilated openings at the top and bottom of the enclosure for heat dissipation. Optional ventilated openings in starter module doors can be provided.

Load terminals provided for customer motor leads in a separate compartment on fully rated standoff type insulators, accessible from the inside of the controller compartment by removing a barrier.

Completely self-contained drawout mechanism with all wheels and moving parts mounted in the enclosure, allowing a lighter controller assembly.

Line connections are provided with an automatic shutter that operates with the movement of the main isolating switch handle.

FINISH

The metal is thoroughly cleaned, using a 5 stage Iron Phosphate System. The metal is then thoroughly dried after which polyester dry powder is applied electrostatically to a minimum thickness of 1 mil and then cured in an oven at a temperature of 425 degrees F. This standard finish meets requirements for the 500 hour salt spray test for corrosion resistant enclosures. Standard color is ANSI-61, Gray.

RATINGS & SPECIFICATIONS

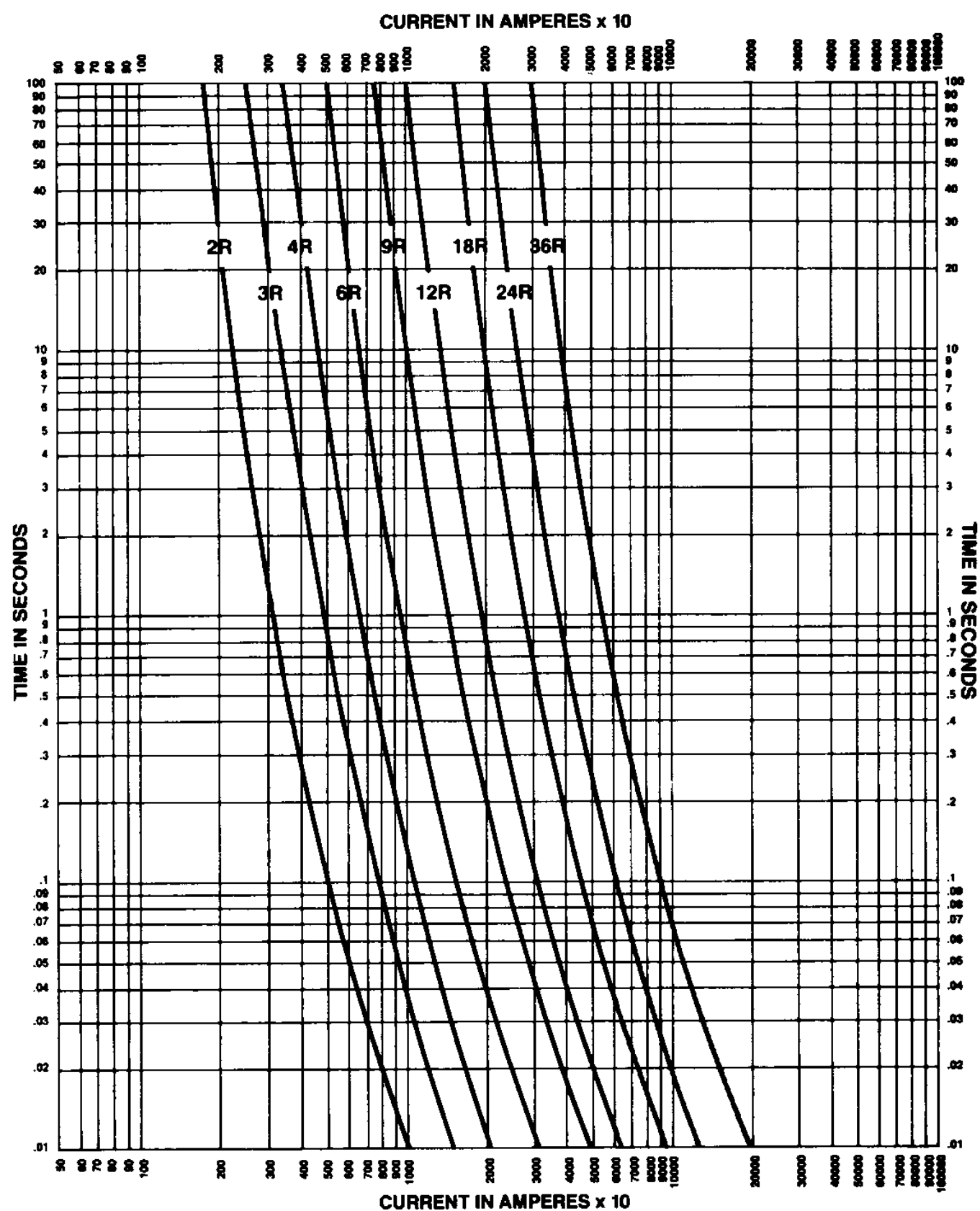
Rated Utilization Voltage	2.4, 4.16, 6.9kV
Interrupting Rating Unfused (E-1)	50MVA
Interrupting Rating Fused (E-2)	400MVA at 4.6kV
Maximum Insulation Voltage	7.2kV
Interrupting Rating	7kA
Rated Current (Enclosed)	400 Amps.
Endurance—Mechanical Life	2.5 Million Opr.
Endurance—Electrical Life	0.25 Million Opr.
Impulse Withstand	60kV (1.2 x 50MS)
Dielectric Strength	11.3kV (1 Min.)

RATING DATA FOR GOULD SHAWMUT TYPE
A240R, A480R AND GEC TYPE KD POWER FUSES

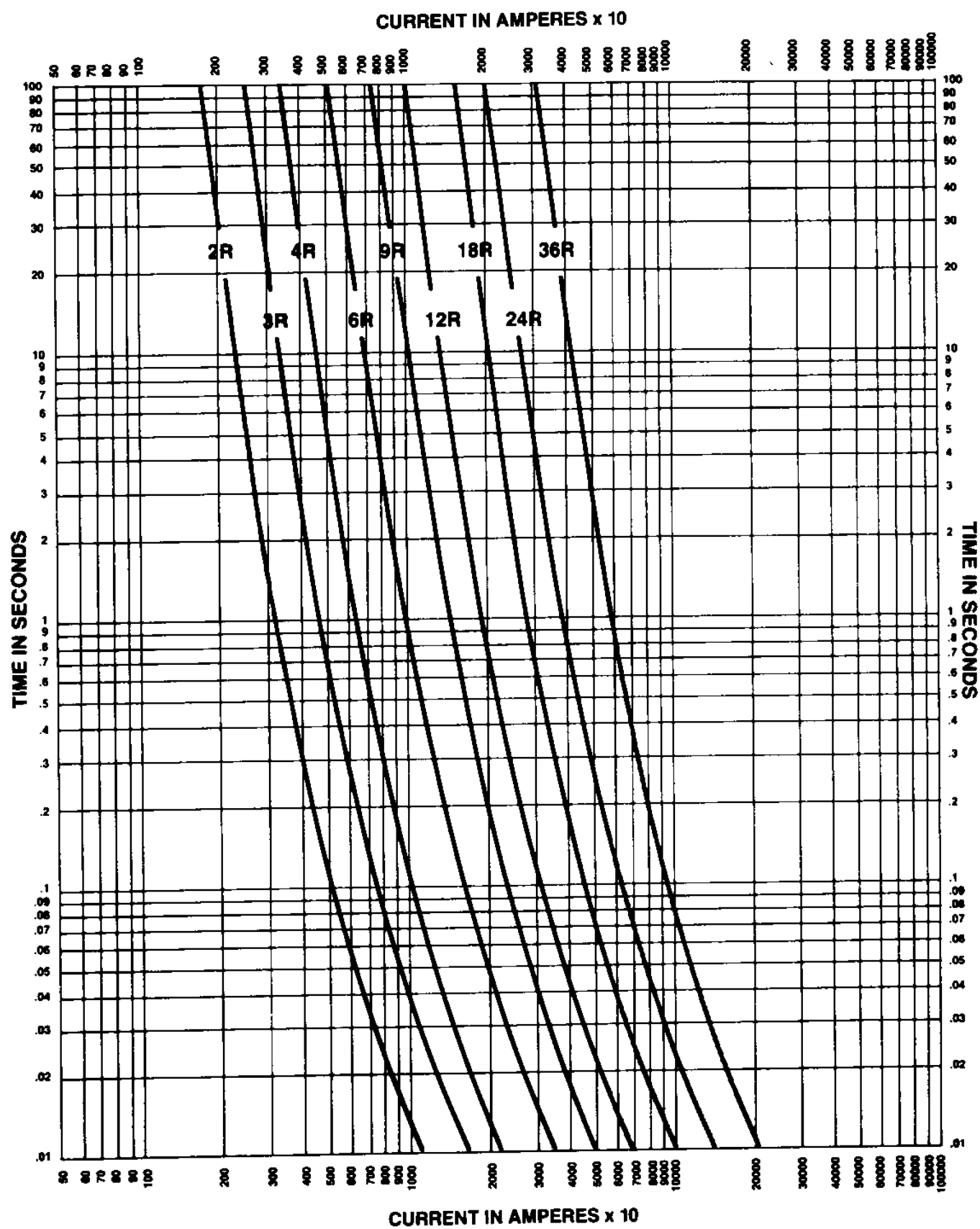
FUSE CATALOG NUMBER		FUSE VOLTAGE RATING	FUSE SIZE	FUSE CONTINUOUS CURRENT AT 40°C AMBIENT	INTERRUPTING RATINGS 60Hz	
GOULD SHAWMUT	GEC (ENGLISH ELECTRIC)				TOTAL RMS AMPS	THREE-PHASE MVA (SYMMETRICAL)
A240R-2R	KDAX2R	GOULD 2400	2R	70	GOULD— 80,000 @ 2400V (ASYMMETRICAL) GEC— 50,000 @ 5500V (SYMMETRICAL)	GOULD— 210 @ 2400V
A240R-3R	KDAX3R		3R	100		
A240R-4R	KDAX4R		4R	130		
A240R-6R	KDAX6R		6R	170		
A240R-9R	KDAX9R	GEC 5500	9R	200		
A240R-12R	KDAX12R		12R	230		
	KDRX20R		20R	315		
	KDRX24R		24R	350		
A480R-2R	KDAX2R	GOULD 4800	2R	70	GOULD— 100,000 @ 4800V (ASYMMETRICAL) GEC— 50,000 @ 5500V (SYMMETRICAL)	GOULD— 500 @ 4800V
A480R-3R	KDAX3R		3R	100		
A480R-4R	KDAX4R		4R	130		
A480R-6R	KDAX6R		6R	170		
A480R-9R	KDAX9R	GEC 5500	9R	200		GEC— 476 @ 5500V
A480R-12R	KDAX12R		12R	230		
	KDRX20R		20R	315		
	KDRX24R		24R	350		

Consult factory for 6.9 kV fuse data

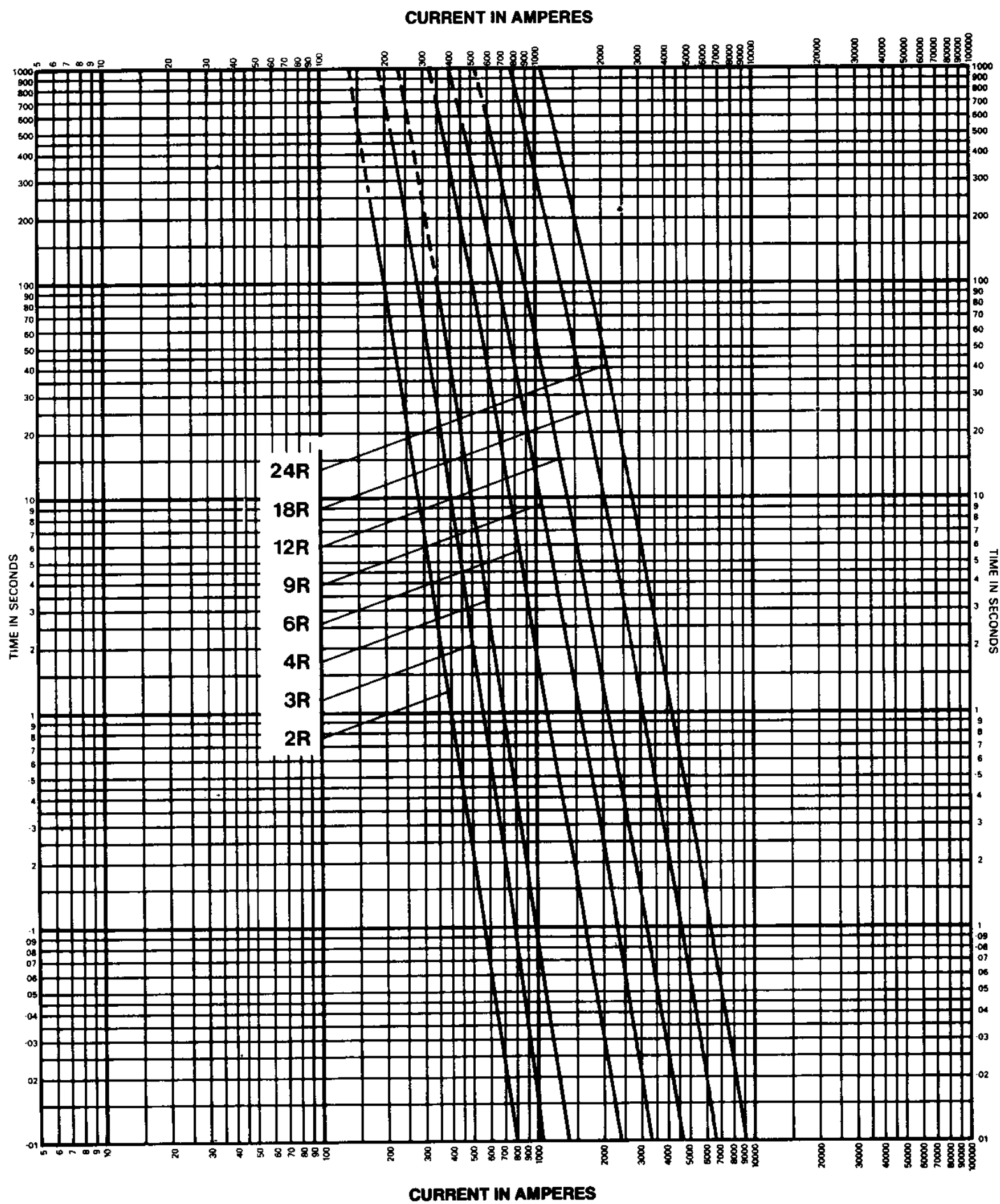
Minimum Melt Time—Current Data 2R-36R, 2400 Volts



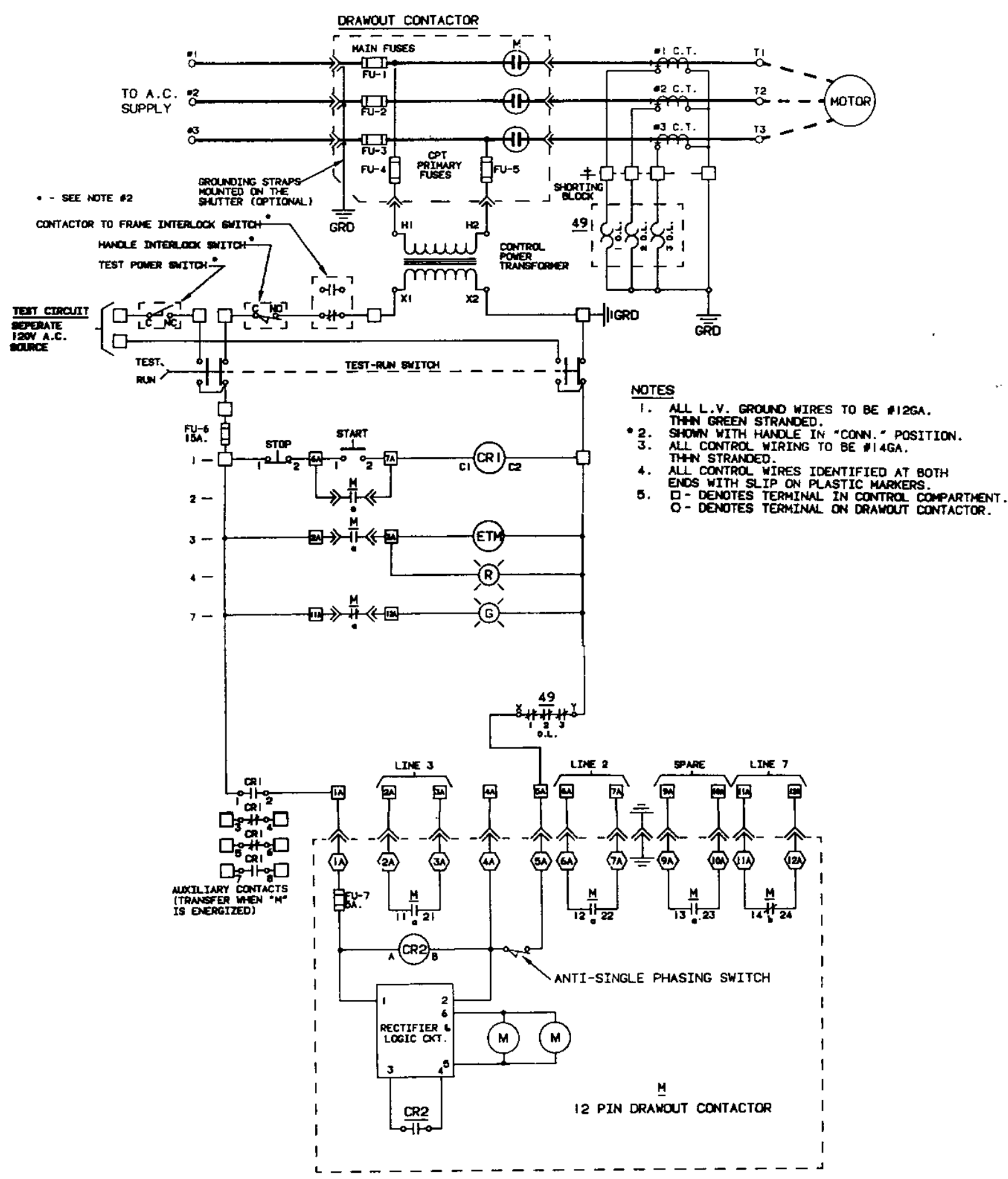
A480R/A720R
Minimum Melt Time—Current Data
2R-36R, 4800 Volts—A480R
2R-18R, 7200 Volts—A720R



Minimum Melting Time—Current
Characteristics for Types KDAX and KDBX



SCHEMATIC DIAGRAM



SCHEMATIC DIAGRAM 5000 VOLT STARTER

INSTALLATION

RECEIVING

Before accepting shipment from the transportation company, a thorough inspection of the 7850VAC Medium Voltage Starters should be made. If damage has been incurred during transit, the carrier should be notified at once and damage claim filed. The Company is not responsible for damage after equipment is released to the carrier. The Company will, upon request, assist in filing a claim with the carrier. The nearest Brown Boveri Sales Office should be notified and all pertinent information provided.

STORAGE

After receipt and in the event that installation cannot be made at once, the unit should be stored in a clean, dry, well-ventilated location. Equipment should not be stored outdoors even if completely covered. If units are subjected to either low temperature or moisture, approximately 100 watts of heat should be introduced into each section. It is recommended that the factory-installed plastic covering be left intact until the equipment is ready for installation.

HANDLING

All 7850VAC Starters should be handled with utmost care to avoid possible damage due to severe shock. Shipping skids, plastic covering, and open crating should be left intact as long as possible to facilitate handling and protection. Equipment may be moved with fork lift type equipment or by the use of rollers. Any force used to move equipment should be applied to the skid rather than the units themselves. Equipment should be stabilized while being moved to prevent any possibility of tipping. It may also be moved with an overhead crane. When using overhead equipment, the slings should be supported under the skids and cable spreaders should be used above the equipment to avoid damage. Enclosures may be supplied with lifting angles, if specified, to facilitate overhead handling.

UNCRATING

CAUTION **DO NOT UNPACK UNITS BEFORE READING** **ALL UNPACKING INSTRUCTIONS FULLY**

Care should be taken during unpacking to avoid damage to units. Equipment should be allowed to attain room temperature before removing the covering in order to minimize condensation. When the unit is at room temperature, remove covering and crating material.

"DO NOT MOVE THE OPERATING HANDLE"

For shipping purposes the handle interlock mechanism has been blocked. Damage will occur if the handle is operated before the unit is completely and properly unpacked.

Unscrew the captive door fasteners and open the door. Remove the tie wraps holding the interlock mechanism behind the operating handle. Remove the shipping stop in the front of the left contactor carriage rail. The contactor is now free to be slowly racked forward to the "DISC" position by using the operating handle. Using the mechanical latch, see Fig. 3, the contactor may be pulled forward to the "TEST" position. The contactor will latch in the test position. See Figure No. 7. After the equipment is unpacked it should be checked against the packing list. Should any shortages or deviations occur, contact the local BBC office.

GENERAL PRE-INSTALLATION INSPECTION

- 1 - With the optional 7850 PLD lift mechanism or other lifting means in position, defeat the mechanical latch mechanism as described in section "C", page 4. Roll the contactor out of the cabinet and follow steps 2 thru 7 on page 13.

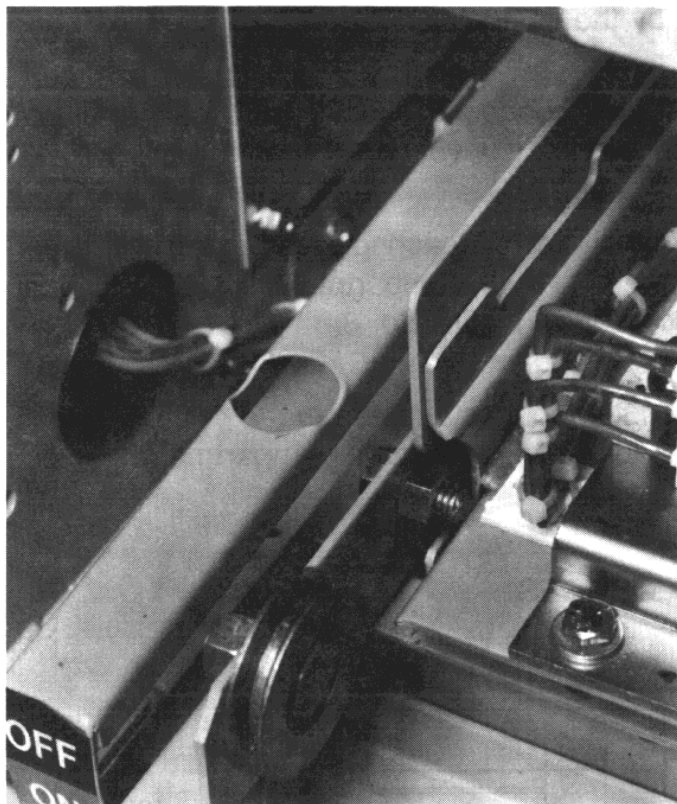


Figure 6
Shipping Stop Location

- 2 - Check all parts for secure mounting and good electrical connections. Inspect visually for overall good condition.
- 3 - Check fuses for snug fit in clips. Check fuse clips for deformity and secure mounting.
- 4 - By defeating door and handle interlocks (reference interlock section for description, page 3) while contactor is removed from the cabinet, inspect the line stab assembly and operation of isolation shutter.
- 5 - Inspect cabinet for dents or other damage. Swing doors to make sure they pivot easily. Check wiring for secure connections and to be sure insulation is in good condition.
- 6 - Check control circuit plug and receptacles for bent pins or other damage.
- 7 - Make sure cable clamps and insulators are in good condition.

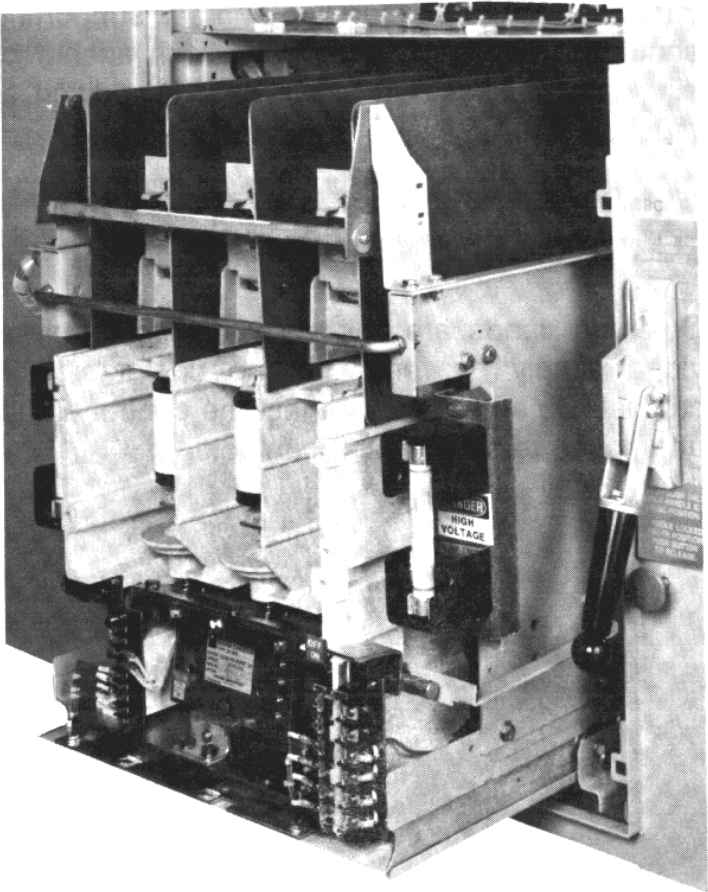


Figure 7
Test Position

POSITIONING

All enclosures should be positioned with as much clearance as possible away from all columns and obstructions. At least the minimum space as allowed by local code should be provided in front of the unit. If the optional 7850 PLD contactor lift mechanism is to be used, allow at least 39" in front of units. The rear of these devices may be placed against the wall, however, the rear covers are removable and the units may be mounted with space behind them for installation convenience. Reference page 14 for basic cabinet dimensions. Refer to outline drawings supplied with specific equipment for exact mounting bolt locations and conduit areas. **CAUTION:** Observe warning with regard to combustible floors.

Each unit is provided with mounting channels that may either be set on the floor or embedded in it. Although these units are free standing and self-supporting, they should be securely bolted down with anchor bolts to eliminate the possibility of "walking." In addition, all units must be level to insure proper operation.

ELECTRICAL CONNECTIONS

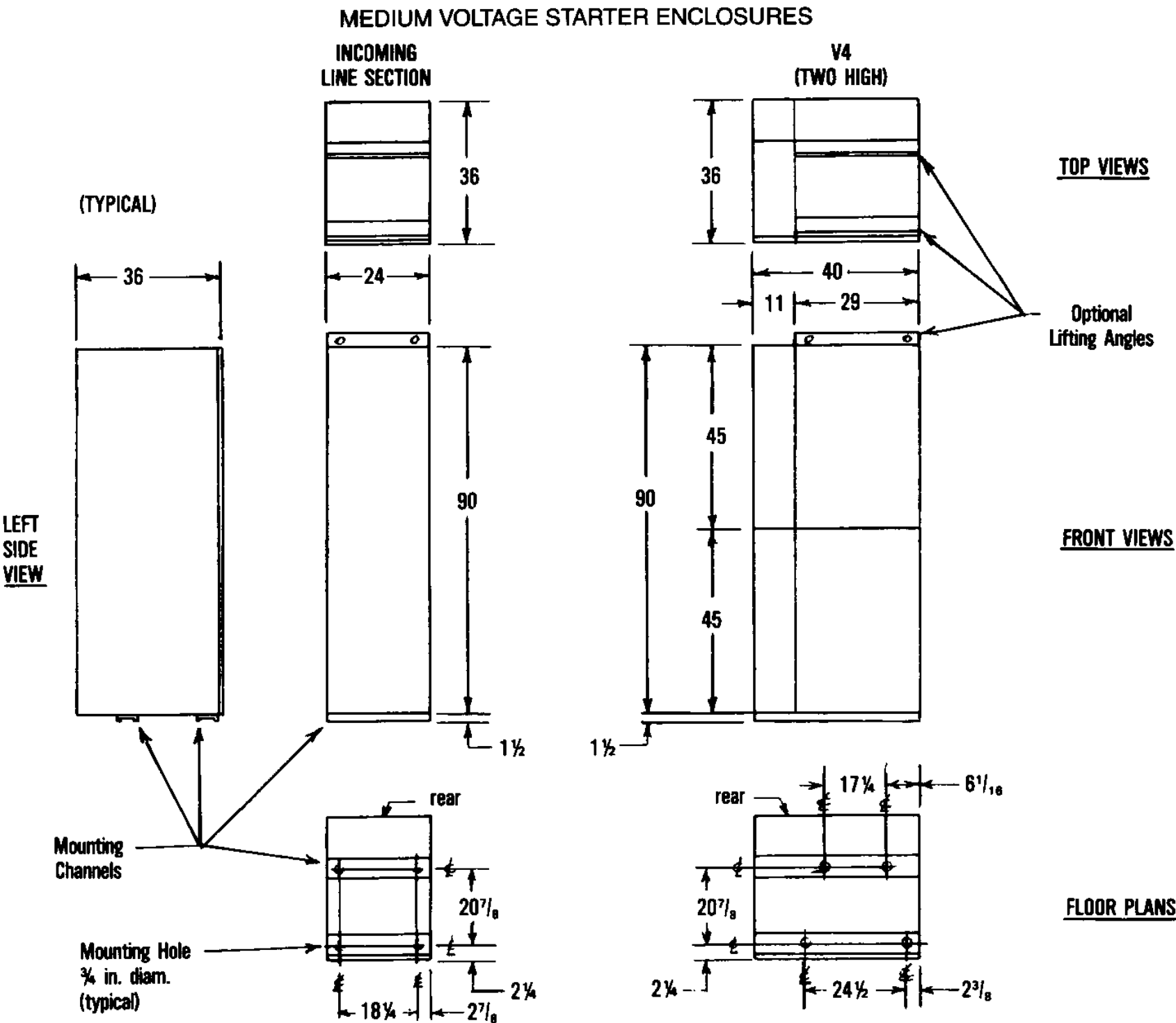
Customer leads are connected to the terminals provided simply by removing the contactor from the cabinet. Be sure to disconnect the control plug before attempting removal of the contactor.

Line connections should be made first. A separate incoming line section may be supplied for cable sizes as specified by the customer.

Load cables are connected directly to the load terminals located behind the low voltage compartment.

These terminals can be reached by removing the barrier between the contactor compartment and the terminal compartment. See Figure No. 8.

External control connections are made to the terminal block located in the low voltage compartment.



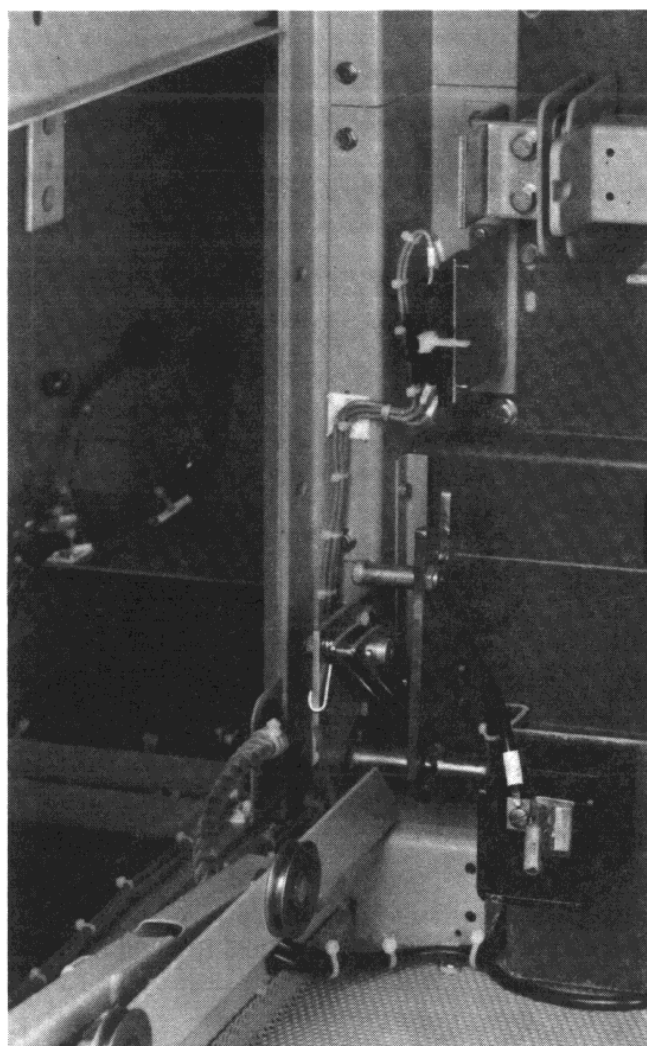


Figure 8
Load Terminal Access
(Illustrated with barrier removed)

FINAL CHECKOUT AND INSTALLATION

CAUTION

MAKE SURE MAIN POWER SOURCE IS LOCKED OPEN BEFORE INSTALLING CONTACTOR

Install contactor in the cabinet in the "test" position. See Figure No. 7 for "test" position. Connect the control plug. Connect test source to the proper test terminals as shown in the wiring diagram provided with the specific device. (The high voltage control transformer is not connected to the circuit in the test position.) Move the "TEST-RUN" selector switch, located in the low voltage compartment, to the "TEST" position. Energize the contactor.

While the unit is energized, push the contactor back into the enclosure to its "stop" position. The contactor should de-energize during this procedure. If the contactor has not de-energized by the time the unit has reached this position, return it to the "test" position. De-energize the contactor using the control circuit stop button. Disconnect the control plug and remove the unit from the cabinet. Check the operation of the test power microswitch and adjust or replace as necessary. See "interlock systems" section of description, page 5, section E.

All other contactor operation assemblies have been set and checked at the factory. If, during start up, the main contactor does not close, refer to maintenance section for trouble shooting information.

OPERATION & ROUTINE INSPECTION AND
MAINTENANCE

OPERATION

CAUTION
BEFORE PLACING UNIT INTO
OPERATION, VERIFY THAT ALL NECESSARY
FIELD INSTALLATION TESTS, INCLUDING
DIELECTRIC AND PROPER PHASING,
HAVE BEEN MADE

With the operating handle in the "DISC" position, check to be sure all parts removed during the inspection and testing have been replaced. Close the doors and re-tighten the captive fasteners. The operating handle may now be moved to the "CONN" position, moving the contactor into the engaged position. Electrical sequence of the starter can be traced on the schematic wiring diagram(s) provided with the equipment.

MAINTENANCE

CAUTION
MAKE SURE THE CONTACTOR IS DISENGAGED
BEFORE ANY INSPECTION OR MAINTENANCE
PROCEDURES ARE ATTEMPTED

Under normal operating conditions, starters should be inspected monthly. In applications where frequent starting is required or where unusually dirty or corrosive conditions exist, a more frequent inspection interval is recommended.

Contactors should be routinely cleaned and all dirt and dust removed.

TROUBLESHOOTING CHART

PROBLEM	PROBABLE CAUSES	CORRECTIVE ACTION
Contactor will not close	Control circuit or main fuses blown	Inspect fuses, replace if blown
	Magnet coil defective	Check magnet operation - replace coil as necessary
	Control relays defective	Check control relays and replace if defective
	Potential transformer defective	Check potential transformer - replace if defective
	Overload Relay defective	Check overload relay - replace if defective
	Rectifier defective	Check rectifier and replace if defective
	Remote reset button or solenoid defective	Replace defective parts
	TEST-RUN switch in test position	Move switch to RUN position
	Electrical interlocks defective	Check function of interlocks - replace as required

CABINET — INTERNAL COMPONENTS

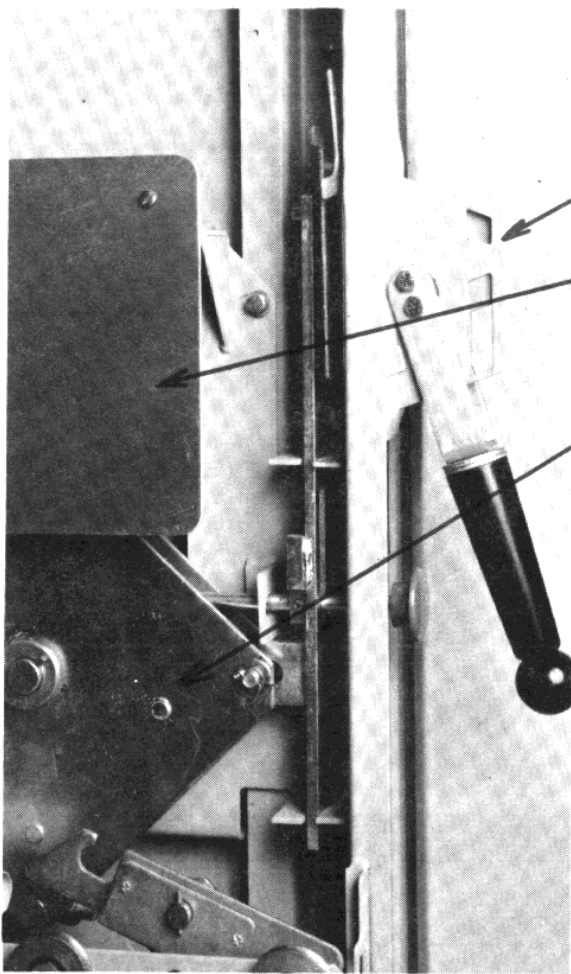


Figure 9

- No. 921838T01 Handle Assembly
1 Per Switch
- No. 887565A00 Barrier
1 Per Switch
- No. 369455T01 Over-Center Mechanism
1 Per Switch

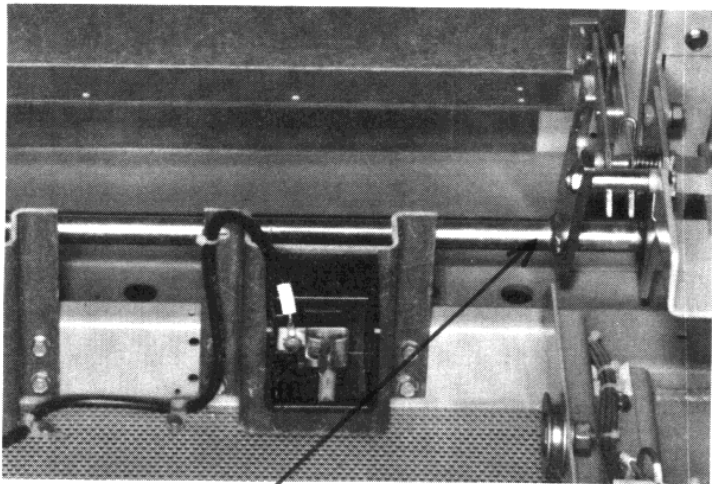


Figure 10

- No. 369453T01 Rack Assembly
1 Per Switch

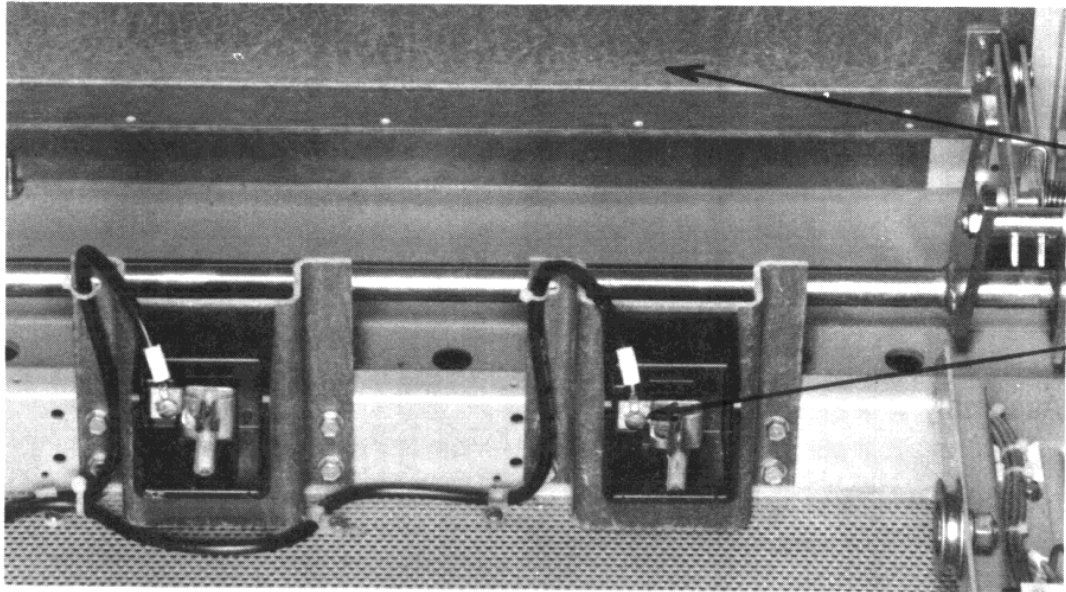
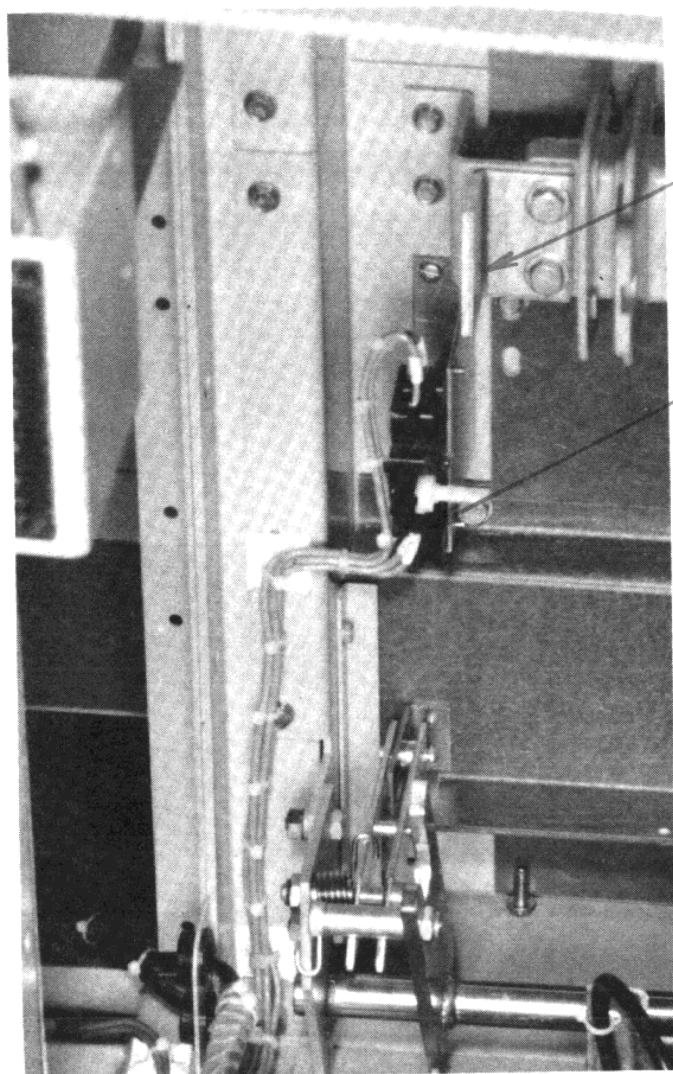


Figure 11

- No. 921815K01 Shutter Assembly
1 Per Switch
- No. 921835T01 Stab Assembly
2 Per Switch



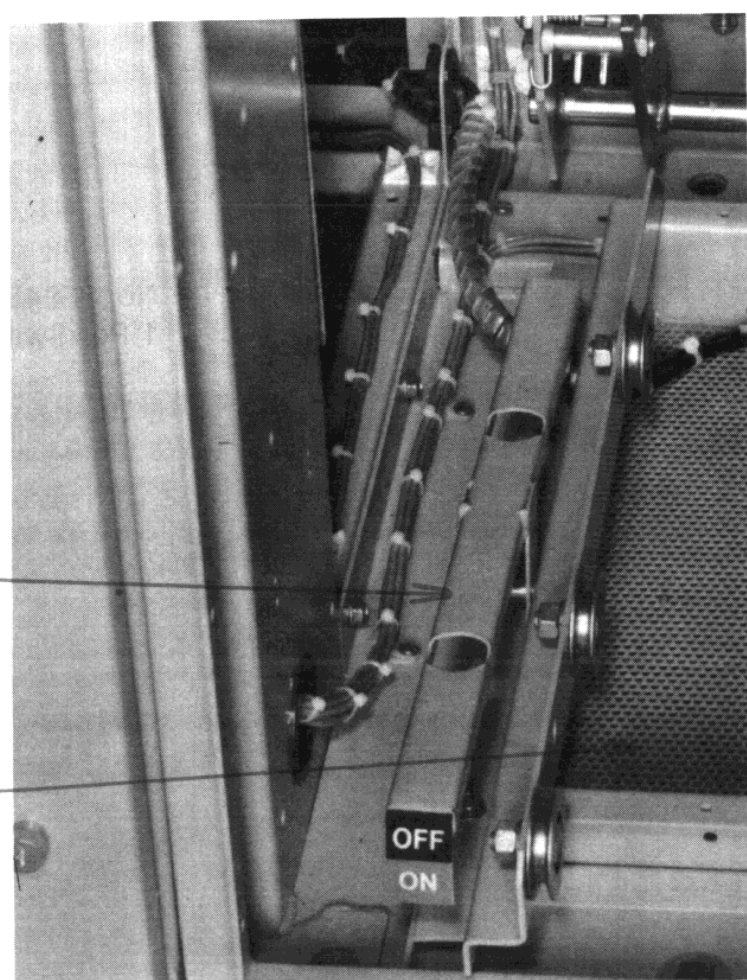
No. 887521A00 Switch Stop
2 Per Switch

No. 150121000 Electrical Interlock
1 Per Switch

Figure 12

No. 921830T01 Walking Beam Assembly
1 Per Switch

No. 369457T01 Chassis Assembly
1 Per Switch



RECOMMENDED SPARE PARTS
5kV VACUUM CONTACTOR

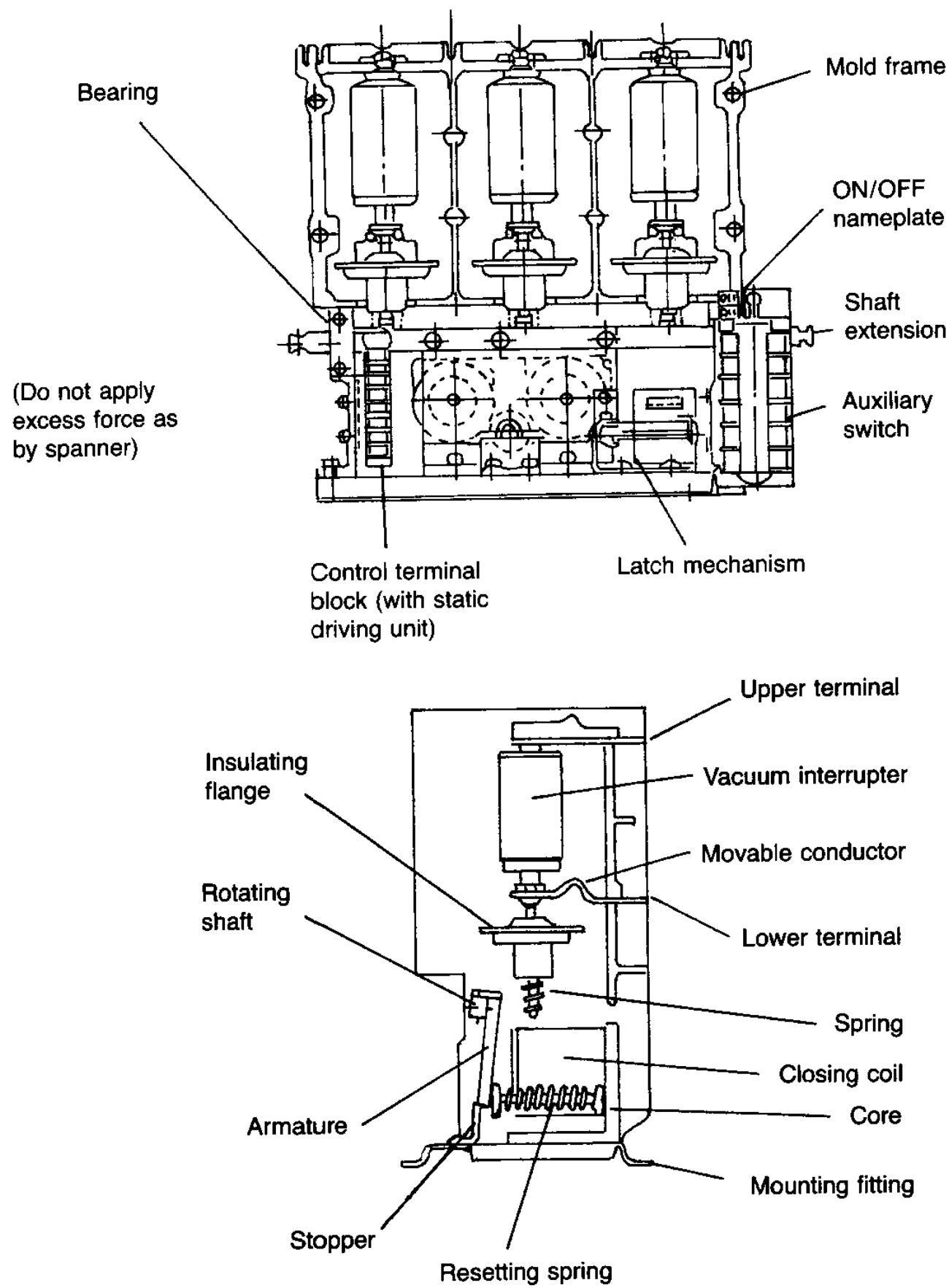
The following items are Recommended Spare Parts for the 7850VAC vacuum contactor. One (1) complete set for each ten (10) contactors or fraction thereof.

Description	Catalog Number	Mimimum Recommended Quantity
Fuse Block Assembly	83944T01	2
Microswitch	887777A00	1
Plunger	140299200	3
CPT Primary Fuse	*FU-4,5	2
CPT Secondary Fuse	*FU-6	2
Rectifier Fuse	*FU-7	1
Main Power Fuses	*FU-1,2,3	3
Vacuum Interrupter (Bottle)	785V001	3
Aux. Contact Block	785V002	1
Closing Coil	785V005	1

Refer inquiries to your local BBC District Office or Low-Voltage Systems Division, Sanford, FL.

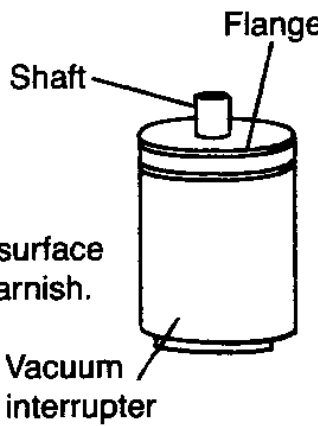
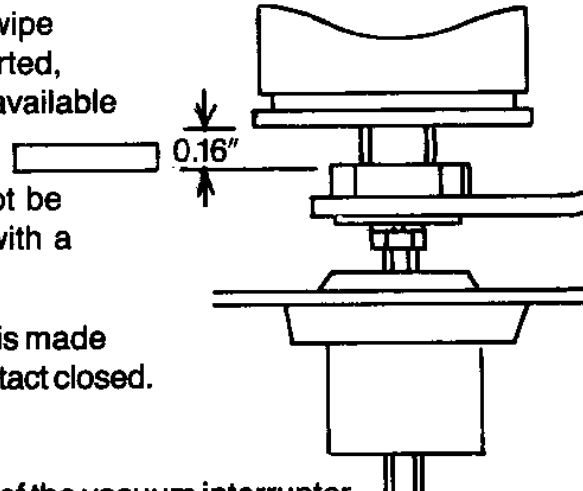
*See layout drawings for appropriate catalog number.

Structure



NOTE: By removing the control terminal block, the printed circuit board can also be pulled out together with the terminal block.

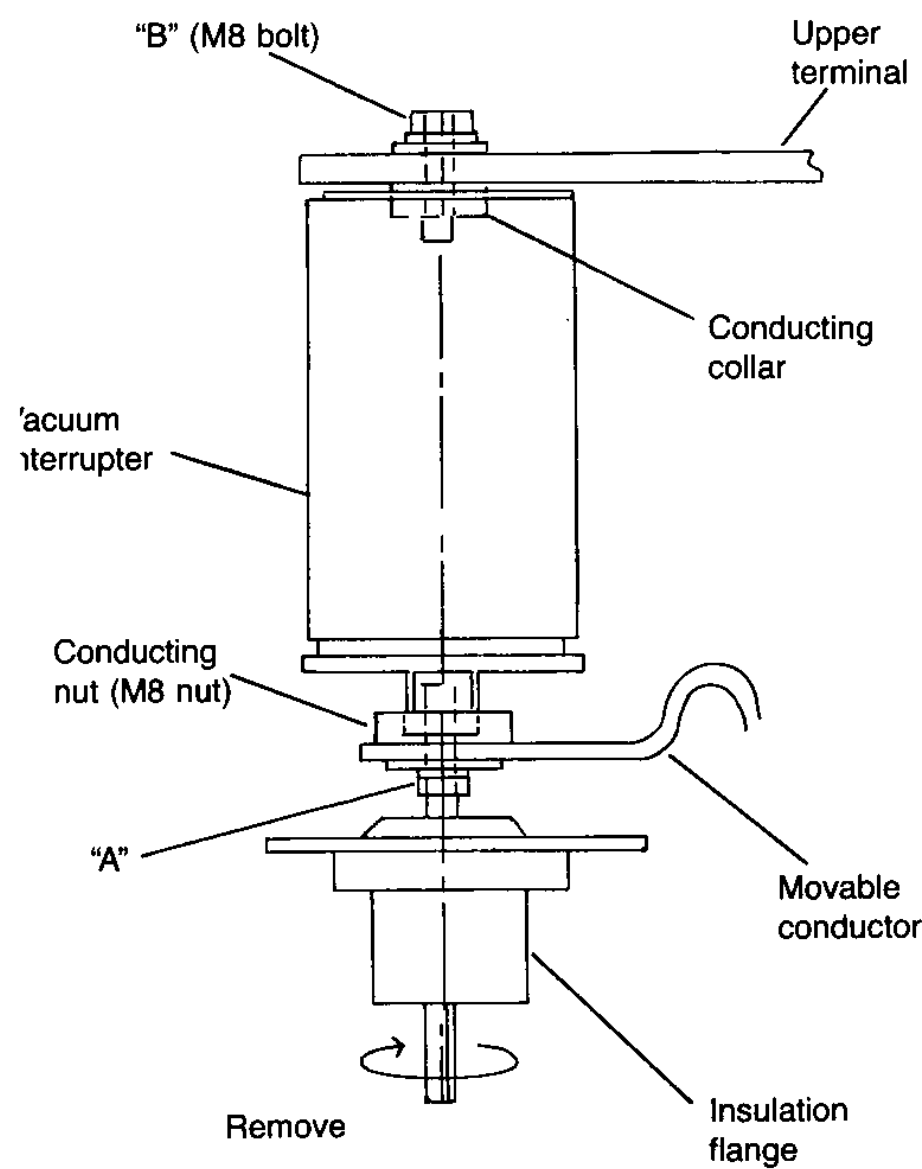
MAINTENANCE

Location	Maintenance procedure
Vacuum inter-rupter	<p>* Check the upper and lower flange and conducting shaft to see if they are contaminated or rusted.</p> <p>If contaminated clean with dry cloth.</p> <p>If rusted replace with new ones.</p> <p>NOTE: Do not touch the ceramics surface as it is applied with silicon varnish.</p>  <p>Flange</p> <p>Shaft</p> <p>Vacuum interrupter</p>
	<p>* Check the main contact wear in the vacuum interrupter.</p> <p>If the wear gauge (wipe gauge) can be inserted, then the contact is available for continued use.</p> <p>If the gauge cannot be inserted, replace with a new one.</p> <p>NOTE: This check is made with the contact closed.</p>  <p>0.16"</p>
	<p>* Check the vacuum of the vacuum interrupter.</p> <p>Apply AC 10kV between the upper and lower terminals for one minute.</p> <p>If there are no sparks, the vacuum interrupter is available for continued use.</p> <p>If there is any spark, replace with a new one.</p> <p>NOTE: If there is a vacuum failure, push down the insulating flange at the bottom of the vacuum interrupter. Then the interrupter can easily be pushed down.</p>

Location	Maintenance procedure												
Vacuum inter-rupter	<p>(Reference) Criteria for gap and wipe</p> <p>(Inches)</p> <table><tr><th></th><th>Gap</th><th>Wipe</th><th>Allowable wear</th></tr><tr><td>Normally energized type</td><td>0.16 + 0.008</td><td>0.10</td><td>0.08</td></tr><tr><td>Latch type</td><td>0.16 + 0.008</td><td>0.09</td><td>0.07</td></tr></table>		Gap	Wipe	Allowable wear	Normally energized type	0.16 + 0.008	0.10	0.08	Latch type	0.16 + 0.008	0.09	0.07
	Gap	Wipe	Allowable wear										
Normally energized type	0.16 + 0.008	0.10	0.08										
Latch type	0.16 + 0.008	0.09	0.07										
Bearing	* Check if the mounting bolts are tight . Retighten if loose.												
Closing coil	* Check for discoloration. Brown (reddish brown) available for continued use. Black (trace of overheat) . . . replace with new one.												
Latch mechanism	NOTE: When manually closing the latch, hold the central part of the rotating shaft with a spanner and operate it. * Check that the roller has no scores. * Pour oil in the rotating parts.												
Auxiliary switch	* Check that there is a wipe remaining. * Check if the contact is burned or worn. When it is burned or worn, replace it. (Reference) Criteria for gap and wipe (Inches) <table><tr><th></th><th>Gap</th><th>Wipe</th></tr><tr><td>a-contact</td><td>0.16 ± 0.016</td><td>0.12 ± 0.012</td></tr><tr><td>b-contact</td><td>0.16 ± 0.016</td><td>0.12 ± 0.012</td></tr><tr><td>Delay b-contact</td><td>0.10 ± 0.012</td><td>0.18 ± 0.02</td></tr></table> * Check if the auxiliary switch is not mounted with excess inclination or if the mounting plate is not loose. If the switch is inclined or loose, correct it.		Gap	Wipe	a-contact	0.16 ± 0.016	0.12 ± 0.012	b-contact	0.16 ± 0.016	0.12 ± 0.012	Delay b-contact	0.10 ± 0.012	0.18 ± 0.02
	Gap	Wipe											
a-contact	0.16 ± 0.016	0.12 ± 0.012											
b-contact	0.16 ± 0.016	0.12 ± 0.012											
Delay b-contact	0.10 ± 0.012	0.18 ± 0.02											

PROCEDURE FOR REPLACING VACUUM INTERRUPTER
When the vacuum interrupter has reached a specified life (electrical and mechanical life: 250,000 operations) or when it is damaged, it should be replaced in the following sequence.

Mounting section of vacuum interrupter



REMOVING

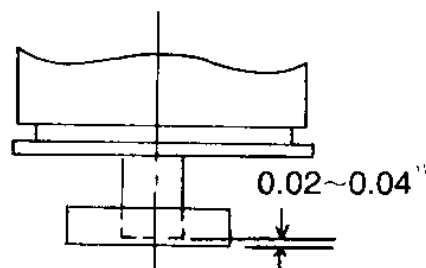
- (1) Hold the insulating flange with left hand and loosen the nut "A" with spanner.
- (2) Turn the insulating flange forwardly with right hand and turn it until it comes off the movable shaft of the vacuum interrupter.
- (3) With the vacuum interrupter held by left hand, loosen and remove the bolt "B" with box wrench (M8).

- (4) While pushing down the insulating flange, pull the vacuum interrupter forward to remove it.

At this time the conducting collar can also be removed. Keep it for later use.

MOUNTING

- (1) Remove the conducting nut from the dismounted vacuum interrupter and attach it to the new vacuum interrupter as shown below.



Conducting
nut

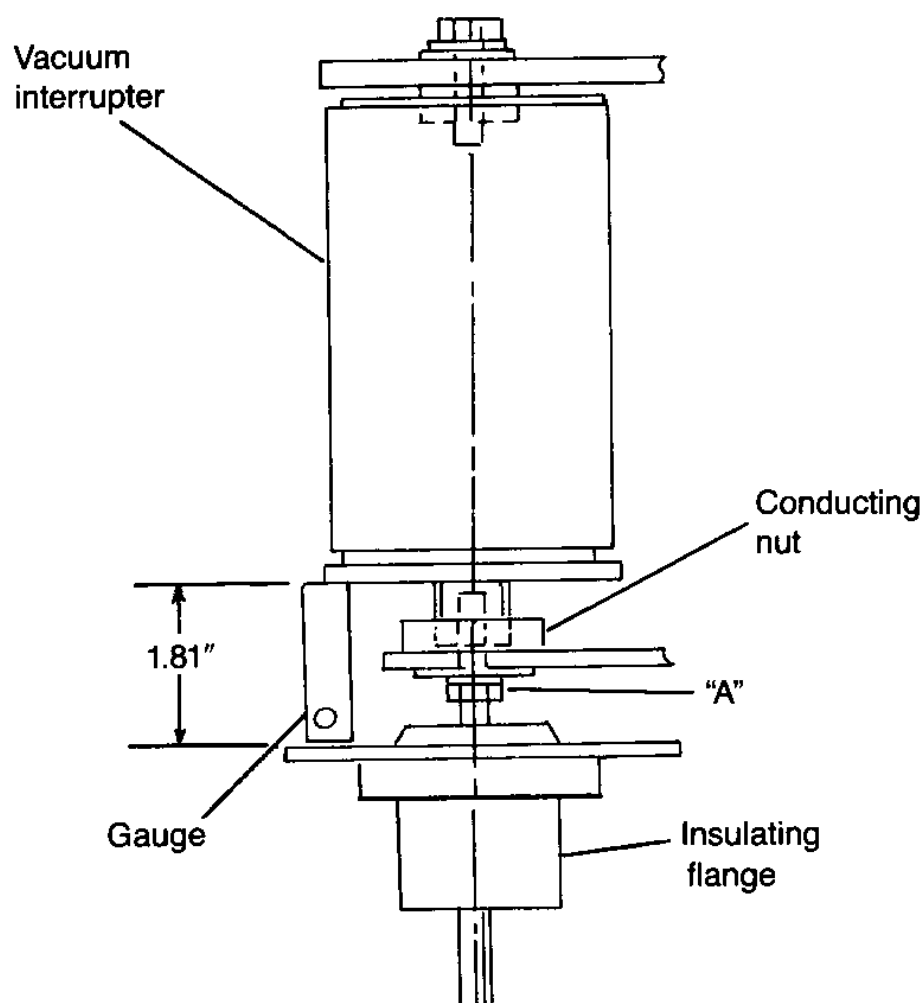
- (2) Put the conducting collar on the upper part of the vacuum interrupter (stationary terminal) and assemble the vacuum interrupter in its position.

- (3) Hold the vacuum interrupter with left hand and fasten the bolt “B” (with the torque of 8.67 foot-pounds).
- (4) Push down the insulating flange, align the insulating flange stud with the movable shaft of the vacuum interrupter and then, while turning the flange toward the inside, insert it. (When you have given the insulating flange 3 to 4 turns, stop).

ADJUSTING THE MAIN CONTACT GAP OF THE VACUUM INTERRUPTER

- (1) With only the control circuit energized, close the vacuum contactor. Check that the armature is attracted to the core.

Mounting section of the vacuum interrupter



- (2) Turn the insulating flange until the gap is 1.81 inches.

- (3) With the adjustment made, hold the insulating flange immovable with one hand and fasten the nut "A".

NOTE:

- It is necessary to arrange so that the movable conductor is straight.
- Check that the conducting nut does not rotate.

- (4) Turn off the control circuit power supply.

OPERATION CHECK

In no-load condition, perform 20 electrical operations to confirm normal operation.

TROUBLESHOOTING CHART

Phenomena							Predicted causes	Countermeasures
Will not close	Pole not opened. (Latch type)	Overheated trip coil		Abnormally overheated coil	Latch is not hooked	Hunting motion	Survey main circuit without voltage. <div>CAUTION—REMOVE ALL POWER BEFORE INSPECTING.</div>	If inspection and/or countermeasure is difficult, inform the manufacturer immediately.
●	●				●	●	Too low a power supply voltage.	Lessen the voltage drop to increase the voltage to 90% or more of the rating.
●	●	●		●	●		Difference in control voltage.	Proper rating.
●	●						Defective control circuit.	Check connection diagram.
●	●				●	●	Imperfect connection and/or loose Screw.	Ensure that the connection plug Screw is tight.
●	●						Bad control switch contact.	Clean, if contact resistance is large.
●	●				●		Wrong terminal connection.	Connect correctly.
●					●		Blown power supply fuse.	Remove cause of fault and replace.
●	●						Disconnected coil.	Survey cause and replace with new item.
●				●			Faulty drive unit.	Check the current of coil.
●				●	●	●	Imperfect latch mechanism.	Excite connection coil and survey latch hook.
●					●		Mechanism jammed.	Oil corresponding portion.
		●					Wrong auxiliary adjustment.	Adjust relay b-contact gap to 0.10 ± 0.01 inches, when connected.
	●						Faulty auxiliary contact.	Clean or replace.



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