FEBRUARY, 1989
Revision A

MANUAL 9845-3

OPERATION & MAINTENANCE INSTRUCTIONS

TYPE B VISI/VAC INTERRUPTERS

OPERATION AND MAINTENANCE INSTRUCTIONS
TYPE B VISI/VAC INTERRUPTER

1. INTRODUCTION

These instructions cover the operation and maintenance of Type B Visi/Vac Interrupters. Type B has the stored energy mechanism mounted separately from the 3-phase Visi/Vac interrupter assembly. See Figure 1 for major component identification for Type B interrupters.

The mechanism connects to the interrupter assembly with an adjustable push rod assembly. A strut angle also runs between the mechanism and the interrupter assembly. This angle must be installed for proper operation.

Visi/Vac interrupters are available in 2 different interrupting ratings: 4kA and 12.5kA. The difference between the two types is the vacuum bottle. All servicing instructions are the same for both interrupting ratings.

Type B Visi/Vacs are available with either motor operated or manual operated stored energy spring mechanisms.

Motor operated assemblies allow remote electrical opening and closing operations. Motor operated Visi/Vacs can also be operated manually should control power be lost. Figure 2 shows a motor and a manual operator subassembly. Both types contain one-way clutch bearings on the operator shaft to allow the manual handle to be pumped.

OEMs who mount Visi/Vac interrupters with series fuses must support the lower interrupter terminals with insulators at 9.5" dimension as shown on Figure 5.

2. RATINGS

Ratings for unfused Visi/Vac interrupters are as follows:

RATINGS	4kA DESIGN	12.5kA DESIGN
Maximum operating voltage (rms)	15kV	15kV
Continuous Current (60 Hz - rms)	600 Amp	600 Amp
BIL (1.2 x. 50) full wave	95kV	95kV
1 Minute Dielectric withstand (rms)	36kV	36kV

RATINGS	4kA DESIGN	12.5kA DESIGN
Interrupting Capacity (rms sym)	4kA	12.5kA
Fault Close (rms asym)	20kA	20kA
Carry 12.5kA (rms sym)	1 second	3 seconds

NOTES:

1. The above ratings tested in accordance with C37.72.1.
2. Barriers must be in place to meet the dielectric withstand ratings.

3. INSPECTION, RECEIVING, HANDLING, STORAGE

Upon receipt, the equipment should be unpacked with the shipper present and the equipment inspected for shipping damage before being accepted. The equipment ratings given on the nameplate or shipper should be checked against the purchasing specifications.

If the Visi/Vac interrupters are installed in switchgear manufactured by Square D, no adjustments should be required before the interrupters can be operated. Customer's normal pre-energization testing is still recommended.

If the purchaser of these Visi/Vac interrupters is an OEM manufacturer, then he will need to install them in his equipment (per Figure 1) and adjust per section 14 of these instructions. See Figure 6 for lifting instructions and weights for the Visi/Vac components.

If the Visi/Vac interrupters, or indoor switchgear incorporating these interrupters, must be stored, they should be stored in a clean, dry location.

If incorporated in outdoor switchgear, the heater should be energized if stored in an unheated location.

4. TO OPERATE

A. To Close Electrically: Push red push button momentarily on front of panel. Charging motor will energize. Interrupter will close after motor runs approximately 15 seconds.

B. To Open Electrically: Push green push button momentarily on front of panel. Interrupter will instantly open.

NOTE: 1. Manual handle should not be installed during electrical operation.

2. Motor operated Visi/Vacs have electrical interlock switches which prevent electrical operation if the fuse compartment door is open or the padlock bar is in the out position. (See Figure 9).

3. Figure 7 shows a typical schematic for the Visi/Vac interrupter. Refer to specific job drawings for actual wiring of the Visi/Vac in your application.

C. To Close Manually: Install manual charging handle, through slot on front panel, into manual charging hub. Pump handle up and down until interrupter closes.

D. To Open Manually: Install manual handle as in Step C above. Pump handle up and down. Interrupter will trip after approximately 1 to 3 strokes.

E. To Padlock Interrupter Open: Trip interrupter open manually or electrically. Pull out padlock bar (See Figure 1) and install padlock shackle through small hole in padlock bar. The padlock bar cannot be pulled out far enough to install padlock unless the interrupter is open and all the operating springs are discharged. Do not attempt to charge springs manually if the interrupter is padlocked open. In the event this does happen, it may be necessary to hammer the padlock bar back into the panel when the padlock is removed. The mechanism cannot be charged when the padlock bar is out. A key interlock can also be mounted on the front of the panel to lock the interrupter open.

5. MECHANISM OPERATING SEQUENCE

Assume at start of sequence all springs are discharged, the interrupter is open and motor operator crank is at bottom of its stroke.

NOTE: Red spring on left is for closing. Silver spring on right is for opening.

Closing - See Figure 3

1. Motor operator crank #1 is driven (either manually or electrically) CCW (viewed from right side) and charges the opening spring through links #2 and #3. At approximately 15° before top dead center (BTDC) of the motor operater crank, close latch #4 clears mating surface on charging cam #5 and moves up into its latched position.

2. As motor operator crank continues toward top dead center (TDC), trip latch #6 latches behind notch on trip shaft #7. You will hear it click into position. At TDC, rear edge of trip latch is flush with notch on mechanism frame.

3. Motor operator crank goes over center (you will hear both the close latch #4 and trip latch #6 snap into place at this time and latch the opening spring) and start its down stroke.

4. On the down stroke of the motor operator crank the closing spring is stretched by means of charging crank #8.

5. At approximately 15° before bottom dead center (BBDC), the pin on charging crank #8 releases close latch #4.

6. Release of the close latch allows the red close spring to exert force down on the top crank #9.

7. The force of the closing spring is transmitted from the top crank #9 to the mechanism output shaft #11 through the collapsible trip linkage #10. The trip latch #6 prevents this linkage from collapsing on the closing stroke.

8. The mechanism output shaft #11 closes the Visi/Vac interrupter through the push rod assembly - item 3 on Figure 1.

9. The motor is shut off by motor cut-off switch #20 when the output crank reaches the closed position.

Opening - See Figure 4

A. Electrical

1. Solenoid #12 rotates trip shaft #7 CCW through link #15 and releases trip latch #6 on Figure 3.

2. Release of trip latch #6 allows trip linkage #10 to collapse under force of opening spring.

3. Force of opening spring rotates mechanism output shaft #11 CW and opens the Visi/Vac interrupter through the push rod assembly - item 3 on Figure 1.

B. Manual

1. Pumping of manual handle moves operator output crank #1 upward from bottom dead center (BDC).

2. This upward motion is transmitted to manual trip arm #13 by means of a notch on mechanism input crank #14.

3. Trip arm #13 rotates trip shaft #7 CCW by engagement of roll pin on trip link with a roll pin through trip shaft.

4. Rotation of trip shaft releases trip latch and interrupter trips as described above for electrical tripping.

6. POLE UNIT OPERATION - See Figure 5

Each of the three identical pole units consist of a set of visible disconnect blades #1 in series with a vacuum interrupter bottle #2. The connection between the blades and the vacuum bottle is made via a flexible connector #3.

The opening and closing of the two contacts in series is controlled by sequence cam #4 attached to the visible blades such that seqeuence cam #4 forces the vacuum bottle to always make and break the circuit. The disconnect blades provide visible proof the circuit is open. Therefore:

a. On closing the vacuum bottle closes after the visible blades close.

b. On opening the vacuum bottle opens before the visible blades open.

When closed, the vacuum interrupter contact (inside the vacuum bottle) is held closed with 150 lbs from bias spring #7. The bias spring is compressed by toggle linkage #8 on the blades as the vacuum bottle is closed. It is important that the toggle linkage actually goes over toggle when the interrupter is closed. Otherwise, the vacuum interrupter could blow open and be damaged on high short circuit currents. See Section 10 on Adjustments, if pole does not toggle.

7. INTERLOCKS

The fuse door on the cubicle is interlocked mechanically and electrically with the Visi/Vac mechanism. The Visi/Vac interrupter must be in the open position before the fuse door can be opened. The mechanism cannot be operated electrically with the fuse door open. The latch plate on the door must be positioned carefully to prevent the pin on the mechanism hitting on top of it and preventing the Visi/Vac poles from toggling. See Figure 8.

8. MAINTENANCE

W A R N I N G

Before doing any service or maintenance work, open interrupter and remove all high voltage from the interrupter and then ground interrupter terminals. At this point also momentarily ground blades of interrupter to eliminate any charge on vacuum bottle insulation. Remove low voltage from interrupter controls.

Because of the wide variations in operating conditions, Square D Company recommends each user develop his own maintenance schedule, based on their own conditions. Until such a schedule is developed, we recommend that the Visi/Vac interrupter be inspected after one (1) year in service, or after 150 close-open operations, whichever occurs first. It is also recommended that the Visi/Vac be inspected for damage after faults and contact wear measured, if the Visi/Vac interrupted the fault.

1. Vacuum Bottle Contact Wear

To determine the amount of vacuum bottle contact wear, measure accurately dimension "Y" on the pole unit (at rear right corner) as shown on Figure 5. Subtract dimension measured from value recorded on vacuum bottle to arrive at amount of wear. If wear exceeds values shown below the pole unit should be replaced.

Visi/Vac Rating	Max. Wear
4kA	.100"
12.5kA	.080"

2. Insulating Surfaces

Using a clean, dry cloth, remove all dirt and moisture from the outside of all insulating surfaces.

3. Loose or Worn Parts

Check both the mechanism and pole units for loose hardware, worn or broken parts. Replace or repair as required. Use Loc Tite 262 (red) to lock 1/4-20 screws if necessary to replace copper flexes on pole units. Be careful not to get Loc Tite between the flex and the block, as this will cause a bad connection.

4. Lubrication

It is not necessary to disassemble any of the mechanism or the current carrying parts to relubricate them until the interrupter has operated approximately 1000 close-open cycles. The unit should not be washed down with high pressure cleaning solution. Square D does not recommend this practice. It will void the warranty. Wipe dirt or grime off before relubricating.

Use Mobil synthetic grease type SHC-32 to relubricate gears, bearing and latch surfaces on both the mechanism and the interrupter pole units. Also use SHC-32 to lubricate the knife blade contact surfaces. Clean the knife blade contact surfaces with a solvent such as mineral spirits before relubricating.

Other types of greases should not be substituted for SHC-32, as they may not be compatible with synthetic greases and might impair the lubricating properties of the Mobil 28 grease applied at the factory. Mobil 28 is the military spec version of SHC-32.

It is recommended that the VISI/VAC interrupter be manually operated several times after lubrication and observed for proper operation.

9. TESTING

The tests listed below have been performed at the factory prior to shipment. The values and procedures are listed here as a guide to re-testing interrupter performance after maintenance.

W A R N I N G

KEEP CLEAR OF MOVING PARTS AS INJURY MAY OCCUR DUE TO MOVING BLADES AND SPRING DISCHARGING MECHANISM. HIGH VOLTAGE BUS MUST BE DE-ENERGIZED AND GROUNDED BEFORE PERFORMING TESTS 1 ,2 , 3 and 4.

1. Operation and Time Limits

a. Mechanism charges and closes within 18 seconds (max) after the motor is energized at 100% (120 VAC) rated control voltage.

b. Mechanism charges and closes when energized at 85% (100 VAC) rated control voltage. Time to close will be longer than at 100% rated voltage.

c. Interrupter opens within 3.5 cycles after trip coil is energized at 85 to 100% rated control voltage.

2. Contact Overlap Timing Check

Vacuum interrupter and disconnect blades (which are connected in series) have a time differential between them during closing and opening operations.

During "closing", (blades close first) the differential time is:

Visi/Vac Rating	Differential Time
4kA	9-12 milliseconds
12.5kA	11-14 milliseconds

During "opening", (vacuum interrupter opens first) the differential time is:

Visi/Vac Rating	Differential Time
4kA	12-18 milliseconds
12.5kA	15-20 milliseconds

Consult the factory on repair instructions if the times you measure are less than those listed.

3. Contact Resistance (Interrupter Closed)

Measure contact resistance from the upper contact pad (disconnect stationary contact) to the block at the bottom of the vacuum interrupter. Resistance values not to exceed 85 microhms, when new. For reference, the resistance of the vacuum interrupter [alone] normally will not exceed 30 microhms. Resistance values will change after the interrupter is in service.

4. Dielectric Tests

W A R N I N G

HIGH VOLTAGE INCOMING LINE CABLES ARE TO BE DE-ENERGIZED AND ISOLATED FROM INTERRUPTER. OUTGOING LOAD CABLES ARE TO BE DE-ENERGIZED AND ISOLATED FROM INTERRUPTER.

KEEP AREA CLEAR OF PERSONNEL NOT IN-VOLVED IN TEST. USE RECOGNIZED SAFETY PRECAUTIONS WHILE PERFORMING DIELEC-TRIC TEST.

WHILE HIGH VOLTAGE IS PRESENT, MAINTAIN A DISTANCE OF 6' FROM THE INTERRUPTER.

DO NOT EXCEED THE SPECIFIED TEST VOL-TAGE AS RADIATION INJURIOUS TO PERSON-NEL MAY BE EMITTED.

a. Interrupter-Primary Parts Apply 36kV AC, 60Hz to each of the following connections for one minute:

1. Interrupter Closed

Phase to Phase Energize each phase separately with other phases and interrupter frame grounded.

2. Interrupter Open

Across Contacts Energize each of the top stationary terminals of each phase of the interrupter separately, ground bottom contact of interrupter frame and both ends of all other phases.

Across Vacuum Interrupter Alone Energize bottom contact of each vacuum interrupter, ground pivot assembly (between blade pivot and vacuum interrupter). This test is performed to verify the presence of vacuum within the vacuum interrupter.

W A R N I N G

DISCHARGE TO GROUND THE VACUUM INTERRUPTER CONTACTS (MOVABLE AND STATIONARY) AND DISCONNECT BLADES BEFORE HANDLING. THESE AREAS CAN RETAIN STATIC CHARGE AFTER A HIPOT TEST.

b. Control Circuits

NOTE: Isolate all control circuits from ground. Isolate charging motor and solid state devices from rest of control circuits. The solid state devices are not to be hi-potted.

1. Control and secondary wiring to ground Apply 1500 volts AC for (1) one minute between the isolated control circuits and ground. All switches closed during test.

2. Charging Motor With motor isolated from rest of control circuit, apply 900 volts AC for (1) one minute between motor lead, and grounded frame of interrupter.

10. POLE UNIT ADJUSTMENTS - FIGURE 5

NOTE: Adjustments 10 through 14 are normally only required when installing new assemblies for repair. Adjustment #14 required on new assemblies installed by OEMs.

1. Install pole unit parts on frame and (with blades closed) align blades on each pole with jaw so that they are straight. Move jaw assembly to center blade spacer in jaw. Tighten insulators.

2. Adjust clamp force on jaw contact by adjusting length of springs to 2-7/16" length $\pm$ 1/16".

3. Toggle blade mechanism by pulling pullrod #9.

4. Measure dimension Y closed and record.

5. Open pole unit.

CAUTION: You must push on pullrod #9 to open blades. Do not try to pull blades open directly.

6. Adjust vacuum bottle contact gap to values below by adjusting nut #5.

   4 KA $Y_{open} = Y_{Closed} + .250$ inch.

   12 KA $Y_{open} = Y_{Closed} + .394$ inch.

   CAUTION: This nut must never be readjusted with the interrupter closed, as it can affect the interrupting capacity.

7. Reclose pole unit and toggle blade mechanism. Adjust turn buckle #10 to get dimension Z values below. You must open pole unit to adjust turnbuckle #10. Lock turnbuckle with set screw #11. This set screw must be loc-tited (262 red).

   4kA Z = .100 inch.
   12.5kA Z = .080 inch.

11. TRIP LATCH OVERLAP ADJUSTMENT - ON SPRING MECHANISM SUBASSEMBLY

    Adjust trip latch overlap on mechanism to 1/16 inch $\pm$ .01 as shown on Figure 3 before installing close and opening springs. Adjust overlap by moving bracket on which roll pin through trip shaft rests.

12. MECHANISM ADJUSTMENTS - WITH INTERRUPTER ASSEMBLY AND MECHANISM IN CUBICLE. (NOTE: ALL ADJUSTMENTS ARE MADE BY OPERATING THE MECHANISM "MANUALLY")

    CAUTION:
    a) Do not operate mechanism unless main pullrod is connected to the switch. Operation of the mechanism with pullrod not connected to the switch could damage mechanism parts and affect factory adjustments.
    b) Strut Angle #4 between the mechanism and switch MUST be installed prior to mechanism operation. Figures 12 & 13.

    1. Operate mechanism until operator output crank #2 is approximately 15° BTDC (Before Top Dead Center). Figure 11.

    2. Then adjust turnbuckle #1 (Figure 11) CW or CCW until charging cam #7 is just high enough for closing latch to latch. Figure 16.

    3. Now operate mechanism until operator output crank #2 of operator is at Top Dead Center. Figure 11.

    4. Check to see that the back edge of the trip latch #1 is flush with the notch in the mechanism housing. Figure 12. If not flush, adjust mechanism output shaft stop bolt #3 (either "Up" or "Down") until the trip latch #1 is flush with the notch. Figure 12.

NOTES: 1) Adjusting the mechanism output shaft stop bolt #3 "up" moves the trip latch #1 toward the "back" ofthe mechanism housing and "down" moves it toward the "front" of the housing.

2) During trip latch adjustment, if the switch shaft stop #2 is against the switch shaft stop bolt #3, adjust the stop bolt #3 "in" until the shaft stop #2 is not against it. (Approximately .06 clearance) Figure 15.

5. Operate mechanism until interrupter closes. Operator outputcrank #2 should be approximately 15° BBDC (Before bottom dead center), Figure 11.

NOTE: Reference: 15° adjustments of operator output crank

- Lengthen turnbuckle - Closing latch latches sooner and switch closes later.
- Shorten turnbuckle - Closing latch latches later and switch closes sooner.

Ideally, the closing latch latches at about the same angle "BTDC" as the switch closes "BBDC", approximately 15°.

NOTE: Any adjustment of the turnbuckle will require re-adjustment of the trip latch. Reference adjustment No. 4 above.

13. INTERRUPTER TO MECHANISM ADJUSTMENT - IN THE CUBICLE

NOTE: ALL ADJUSTMENTS ARE MADE BY OPERATING THE MECHANISM "MANUALLY".

CAUTION: TO PREVENT POSSIBLE INJURY, DO NOT DEVIATE FROM SEQUENCE ORDER.

1. Be sure NO power can be supplied to the mechanism trip coil.

2. Remove tension spring #1 from trip arm #2 and position trip arm #2 so it cannot engage with the notch on the input crank #3 or bind during mechanism operation. Figure 14.

3. Operate mechanism until switch just closes and "over toggles". Figure 17.

4. Remove manual charging handle from operator.

5. Disconnect all three pole assembly push rods from interrupter shaft cranks #4 by removing cotter key and clevis pin #5 . Figure 15.

6. Disconnect pullrod assembly #2 (between mechanism and interrupter) from interrupter crank #1 by removing cotter key and clevis pin #3. DO NOT disconnect by removing bolts. Figure 13.

7. Adjust one pole assembly pullrod #6 until approximately three (3) threads extend through the pullrod pivot #7. Figure 15.

8. Rotate interrupter shaft #1 and reconnect previously adjusted pole assembly pullrod #6 to shaft crank using clevis pin and cotter key #5.

9. Adjust main pullrod assembly #2 until hole in pullrod lines up with hole in interrupter crank #1. Reconnect using clevis pin and cotter key. Figure 13.(NOTE: Clevis pin should be loose)

10. Adjust the two remaining assembly pullrods #6 until holes in pullrods line up with holes in shaft cranks #4. Figure 15.

11. Reconnect pullrods to shaft cranks using clevis pins and cotter keys. (NOTE: Clevis pins should be loose).

12. Place trip arm #2 back in its original position and replace tension spring #1. Figure 14.

13. Install handle and operate mechanism through complete cycle.

14. With interrupter closed, check blades can be moved in and out 1/8" at jaw without going out of toggle.

15. With interrupter "open", set distance between switch shaft stop #2 and switch shaft stop bolt #3 to approximately .06". Figure 15.

14. MAIN PULLROD ADJUSTMENT - IN THE CUBICLE

NOTE: OEMs must only make these adjustments when installing Visi/Vacs in their cubicles. Adjustments 10, 11, 12 and 13 were made at the factory.

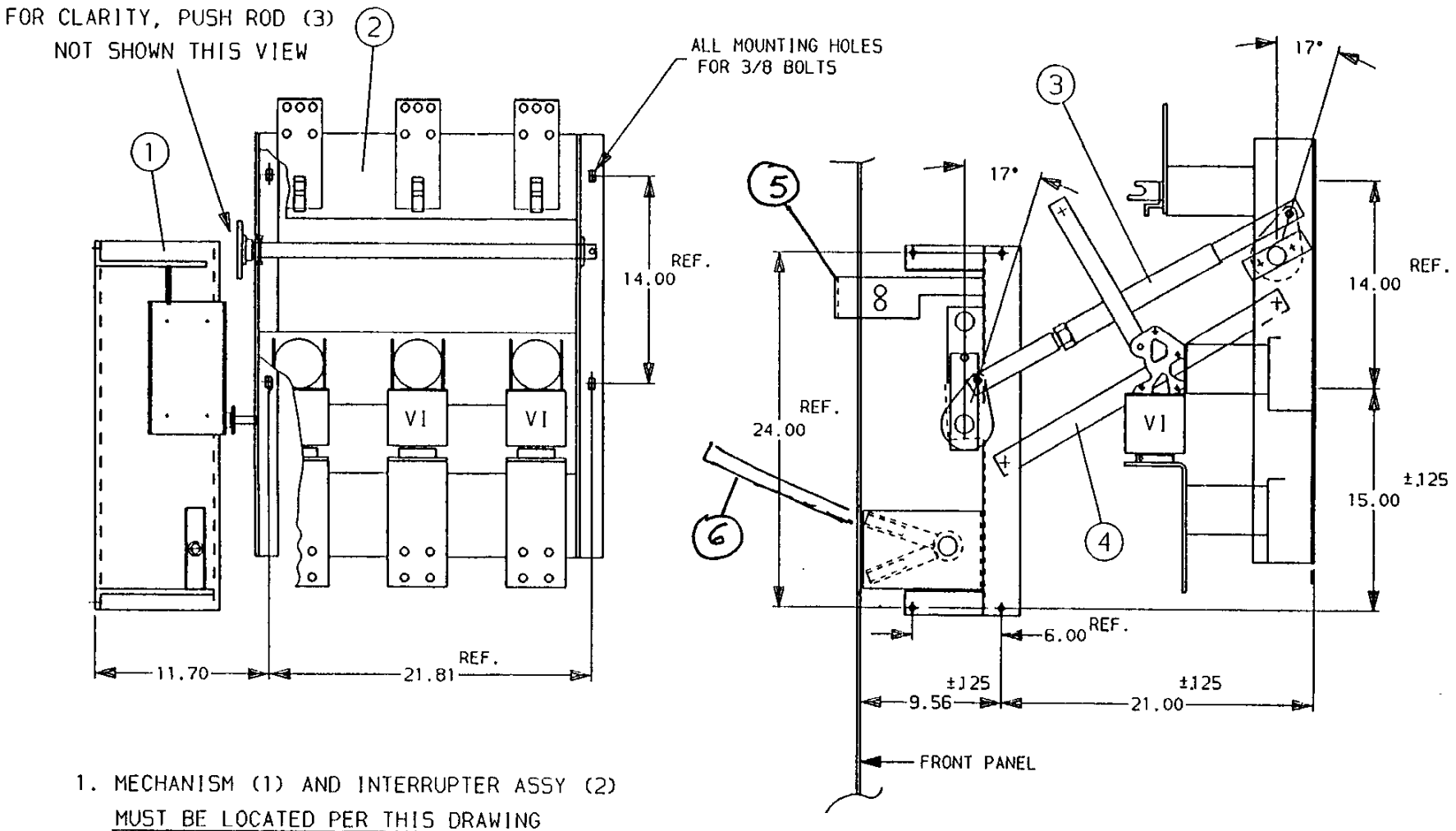
1. Using manual charging handle, operate mechanism until interrupter just closes and "over toggles". Figure 17.
2. Remove handle from operator.
3. Disconnect main pullrod assembly #2 from interrupter crank #1 by removing cotter key and clevis pin #3. DO NOT disconnect by removing bolts. Figure 13.
   NOTE: If poles have not "toggled", reference Figure 17, "toggle" by hand by pulling on pole pullrods.
4. Adjust main pullrod assembly until hole in pullrod lines up with hole in interrupter crank. Reconnect using clevis pin and cotter key. (NOTE: Clevis pin should be loose).

5. Operate the interrupter several times using the manual charging handle. If the interrupter and mechanism does not operate properly, readjust per sections 12 and 13 above.

15. RECOMMENDED SPARE PARTS AND/OR RENEWAL PARTS

Quantities are not based upon expected fatigue or wear problems, but upon possible field contingencies where movable assemblies are operated and possibly damaged and may require fast replacement of such parts from stock.

	Interrupter Quantities On Hand		
Description	1-5	6-50	Part #'s
Interrupter Parts			
1. Lower Interrupter Ass'y	1	2	48119-067-50
2. Upper Interrupter Ass'y	-	1	48119-004-50
3. Mechanism	-	2	48119-144-52
4. Open Spring	1	2	48930-008-01
5. Close Spring	1	2	48930-011-01
6. Push Rods	1	2	48119-063-01
7. Charging Motor	-	1	48119-201-50
8. Worm Gear Ass'y	-	1	48119-202-50
9. Limit Switch Ass'y	1	2	26202-07093
10. Trip Solenoid Ass'y	1	2	48119-156-50
11. Terminal Block	1	2	48119-204-01



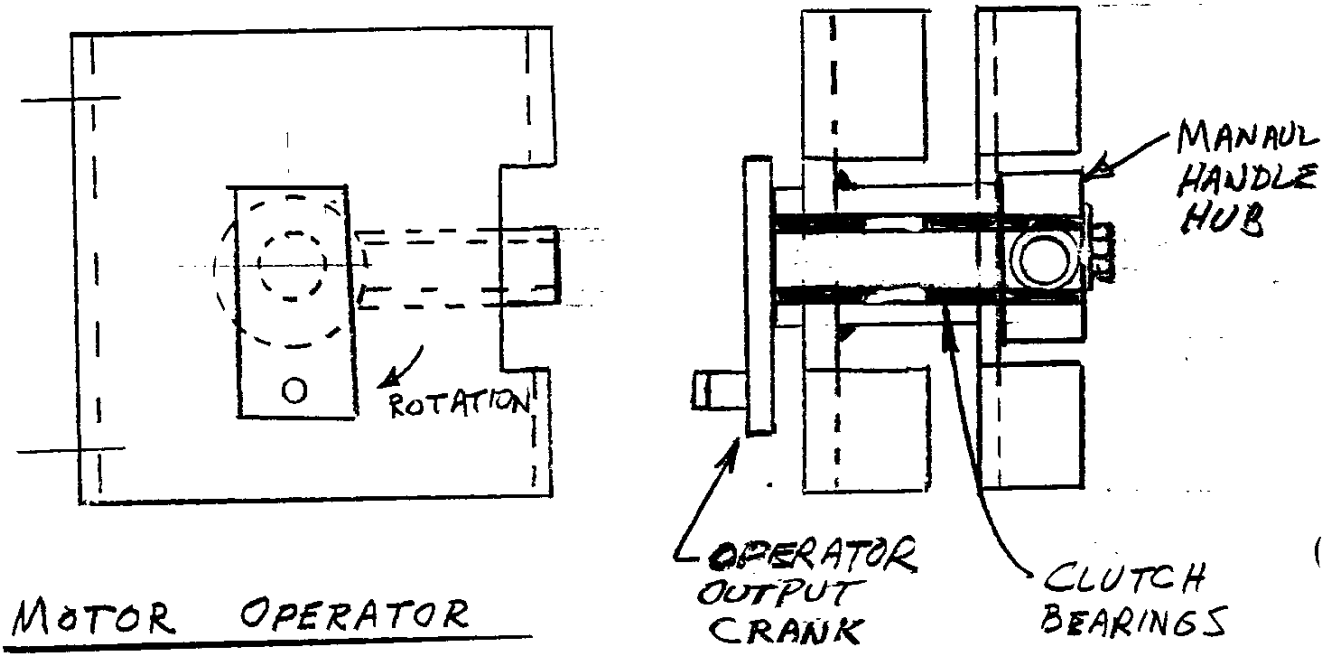
1. MECHANISM (1) AND INTERRUPTER ASSY (2)
   MUST BE LOCATED PER THIS DRAWING
   TO OBTAIN CORRECT OPERATION.
   SUPPORT ANGLE (4) MUST BE INSTALLED.
2. SEE DRAWING #D48119-380 FOR COMPLETE OUTLINE DIMENSIONS
3. MAIN PUSH ROD (3) TO BE INSTALLED WITH MECHANISM SPRINGS DISCHARGED AND INTERRUPTER OPEN, AS SHOWN.
   DO NOT CHARGE SPRINGS BEFORE INSTALLING PUSH ROD.

TYPE B MOUNTING

FIGURE 1

FIG. 2 - OPERATOR SUB ASS'YS

MANUAL OPERATOR



MOTOR OPERATOR

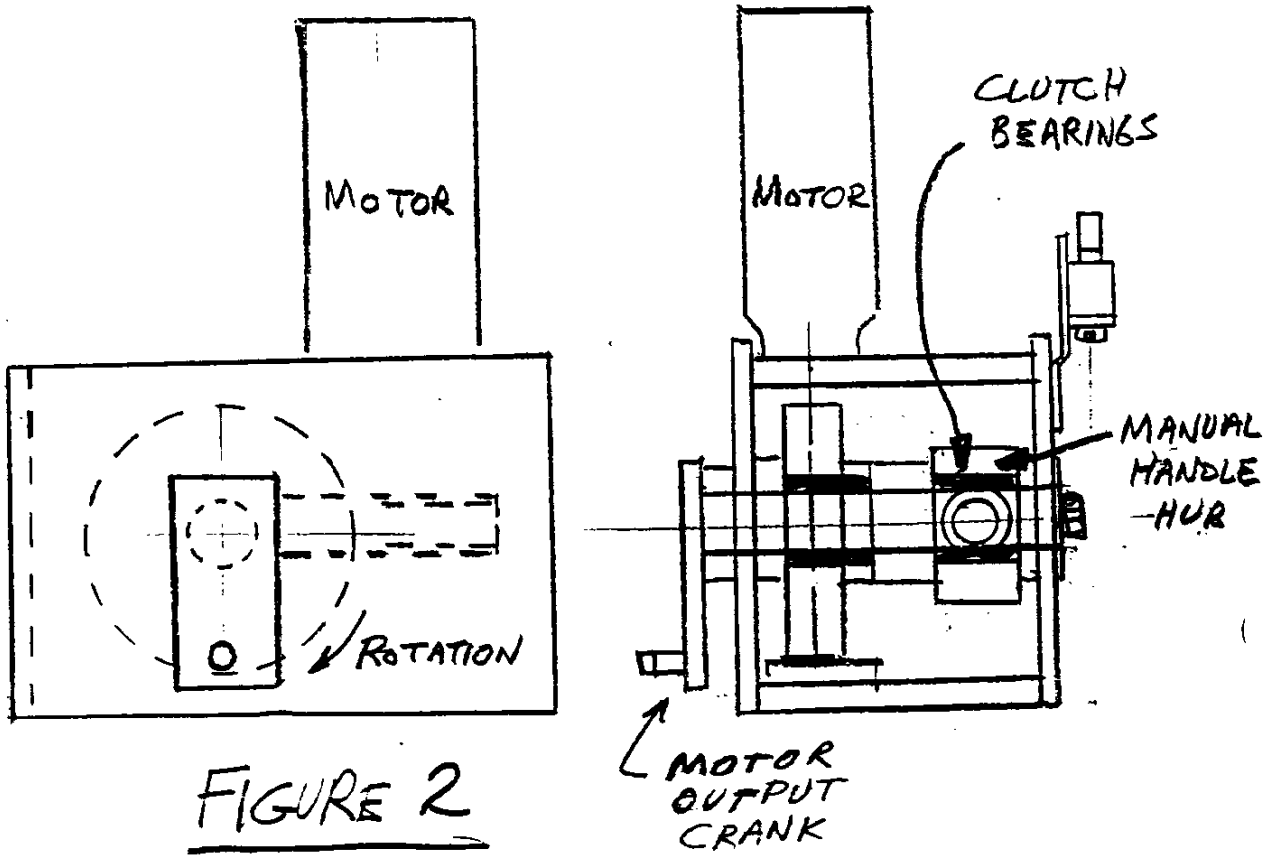


FIGURE 2

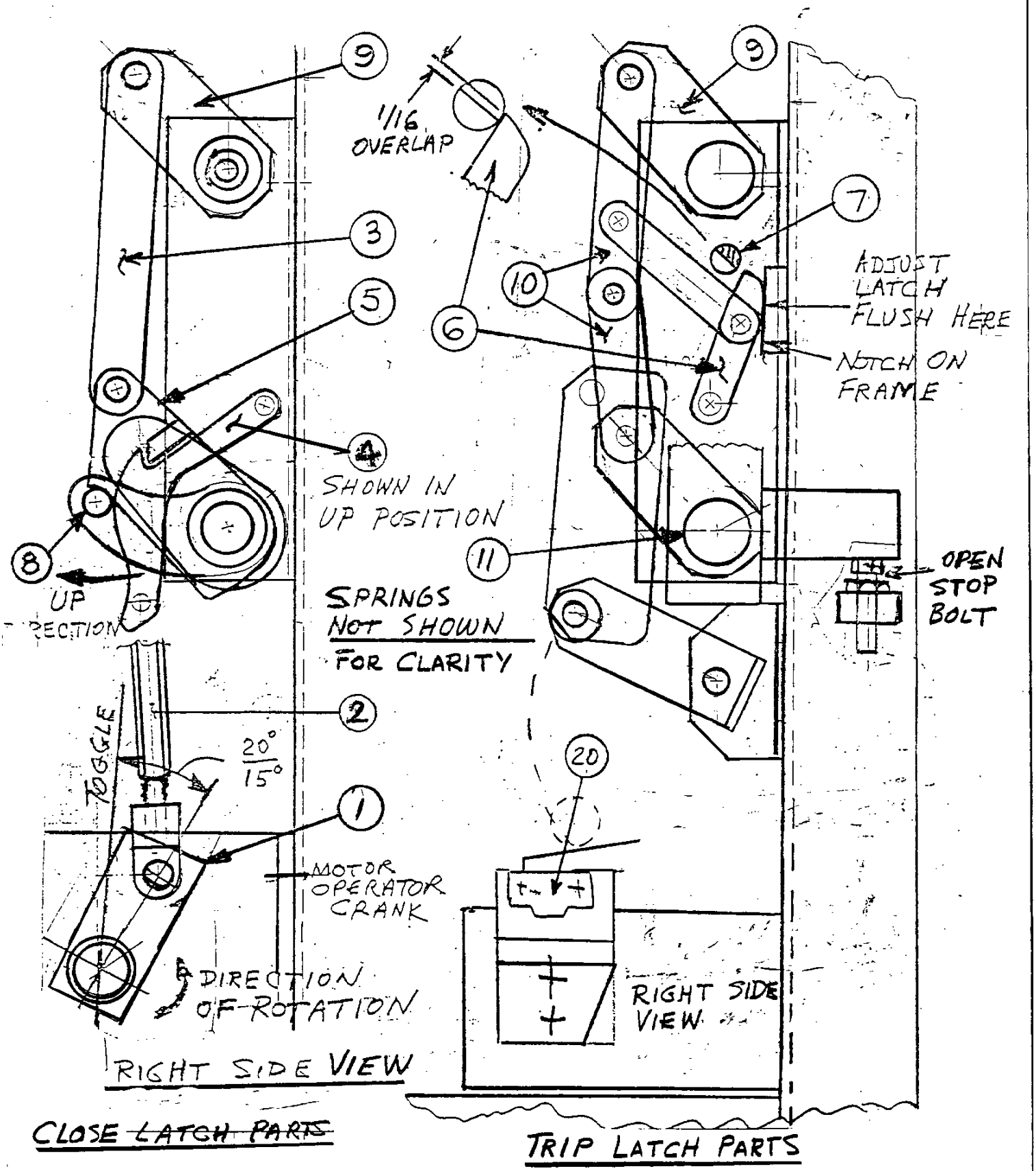


FIGURE 3 - MECHANISM

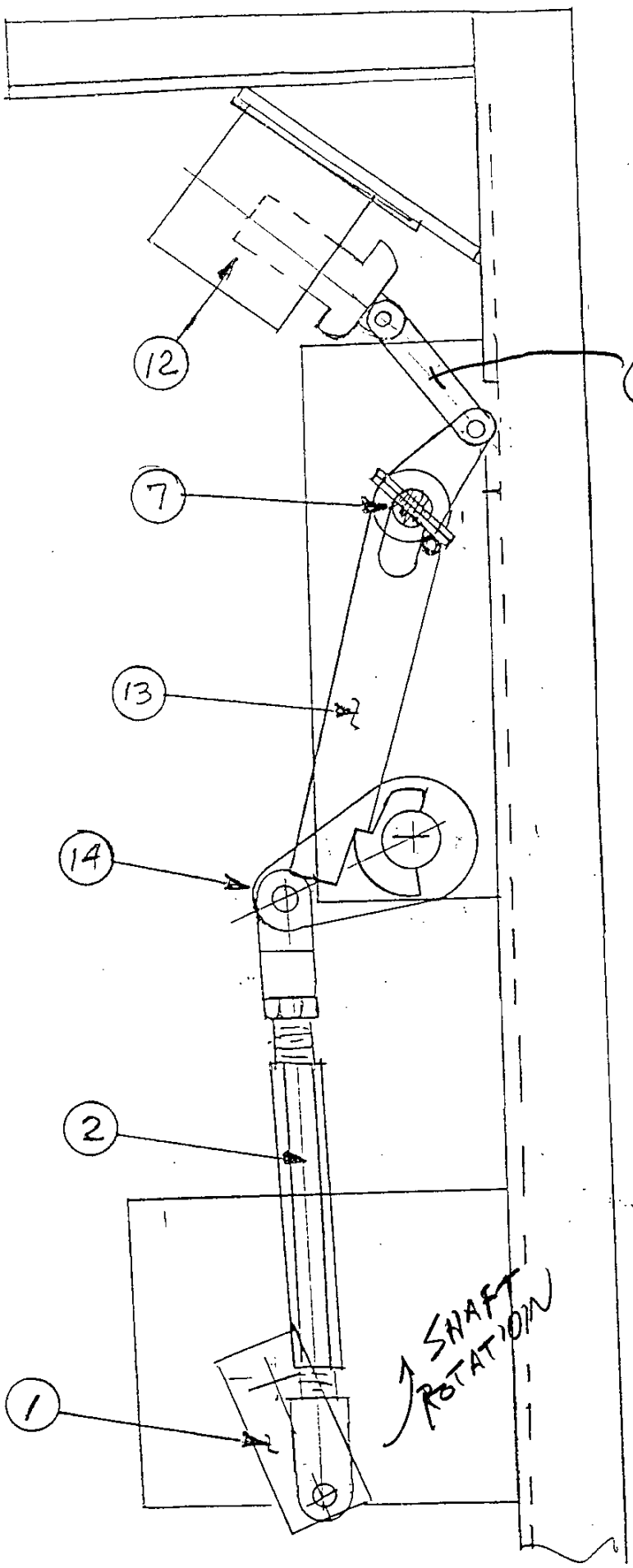


FIGURE 4

RIGHT SIDE VIEW

TRIP LINKAGE

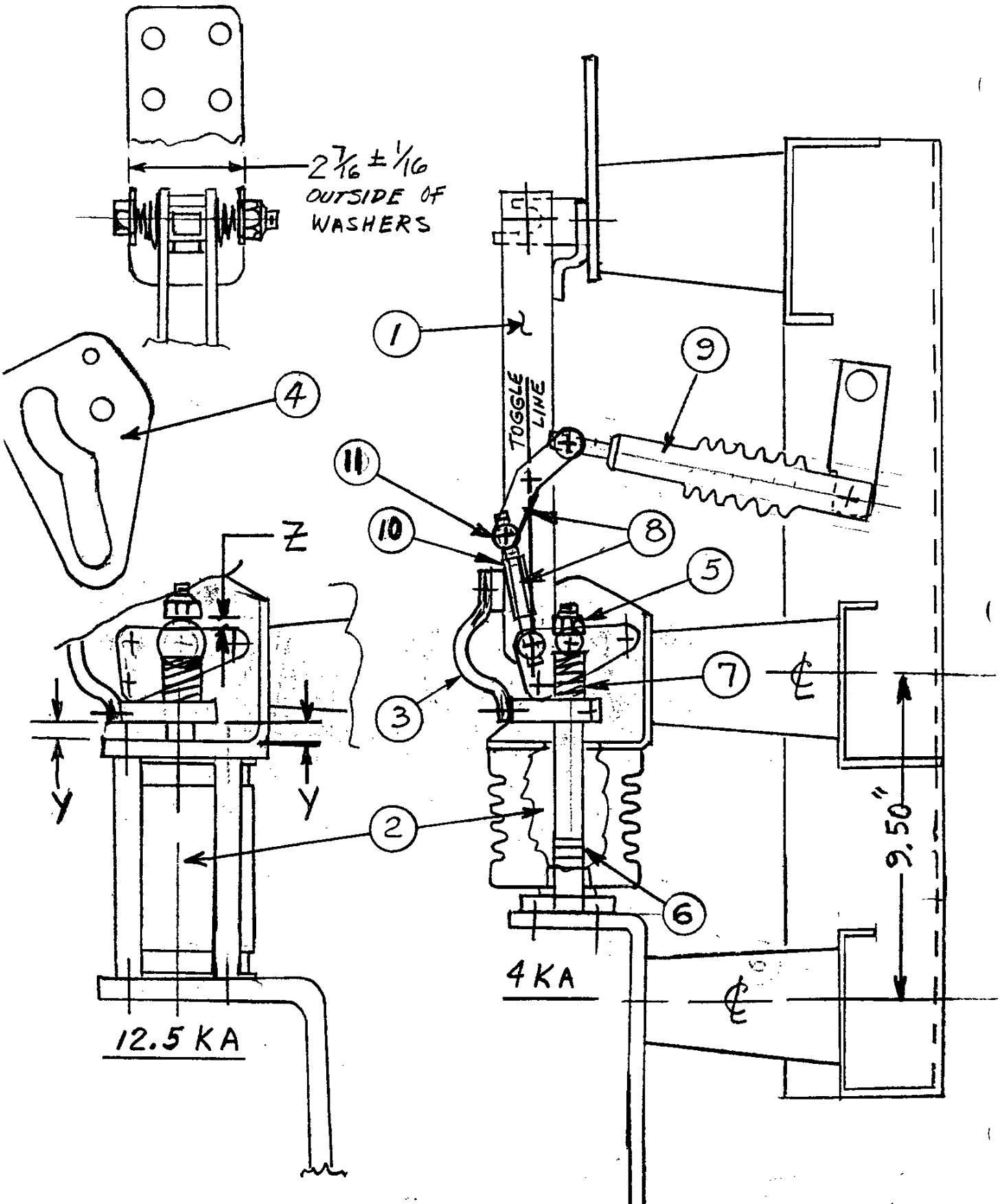


FIGURE 5 POLE UNIT

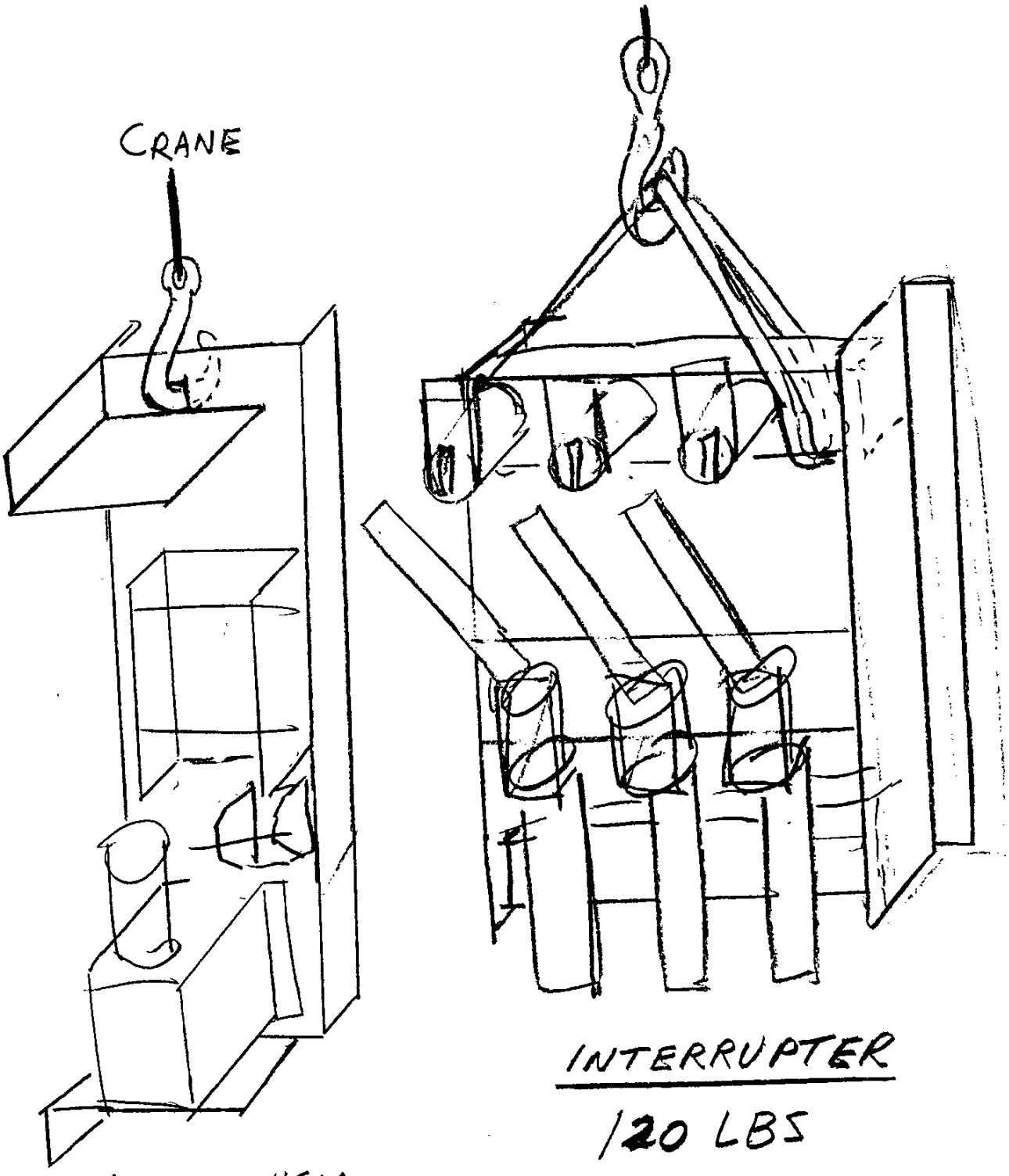


FIGURE 6 - LIFTING

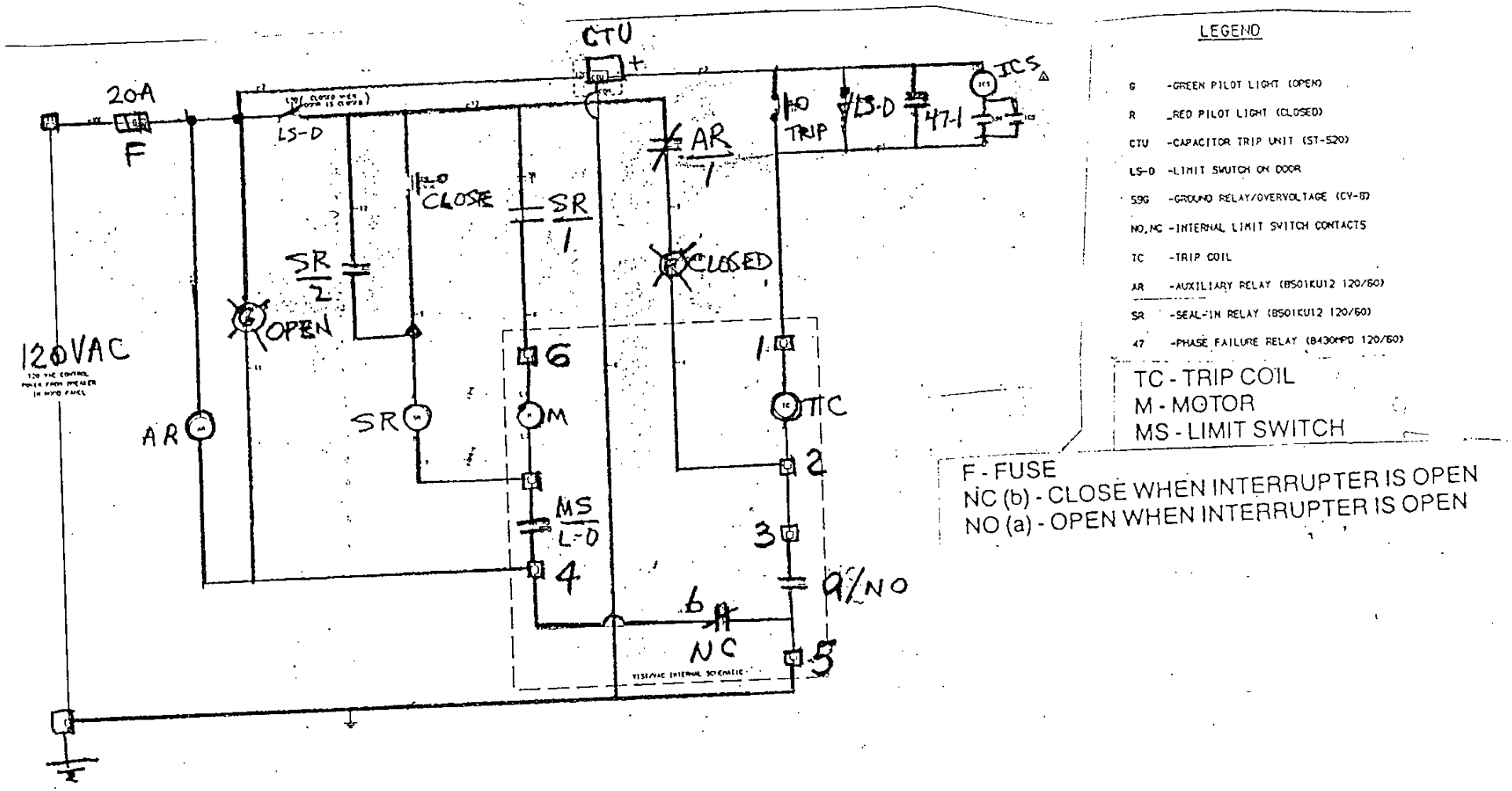


FIGURE 7 - TYPICAL V/V CIRCUIT

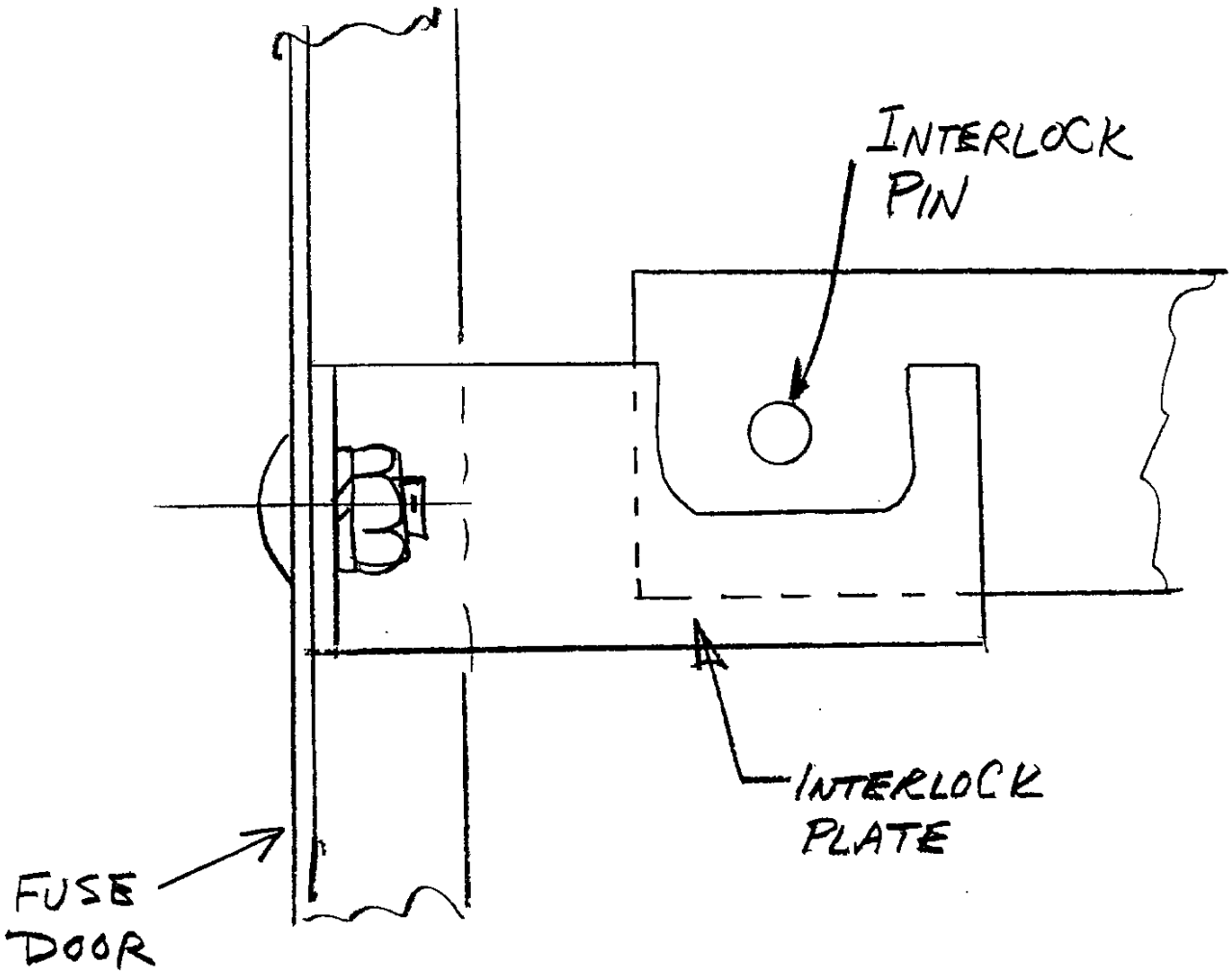


FIGURE 8- DOOR INTERLOCK

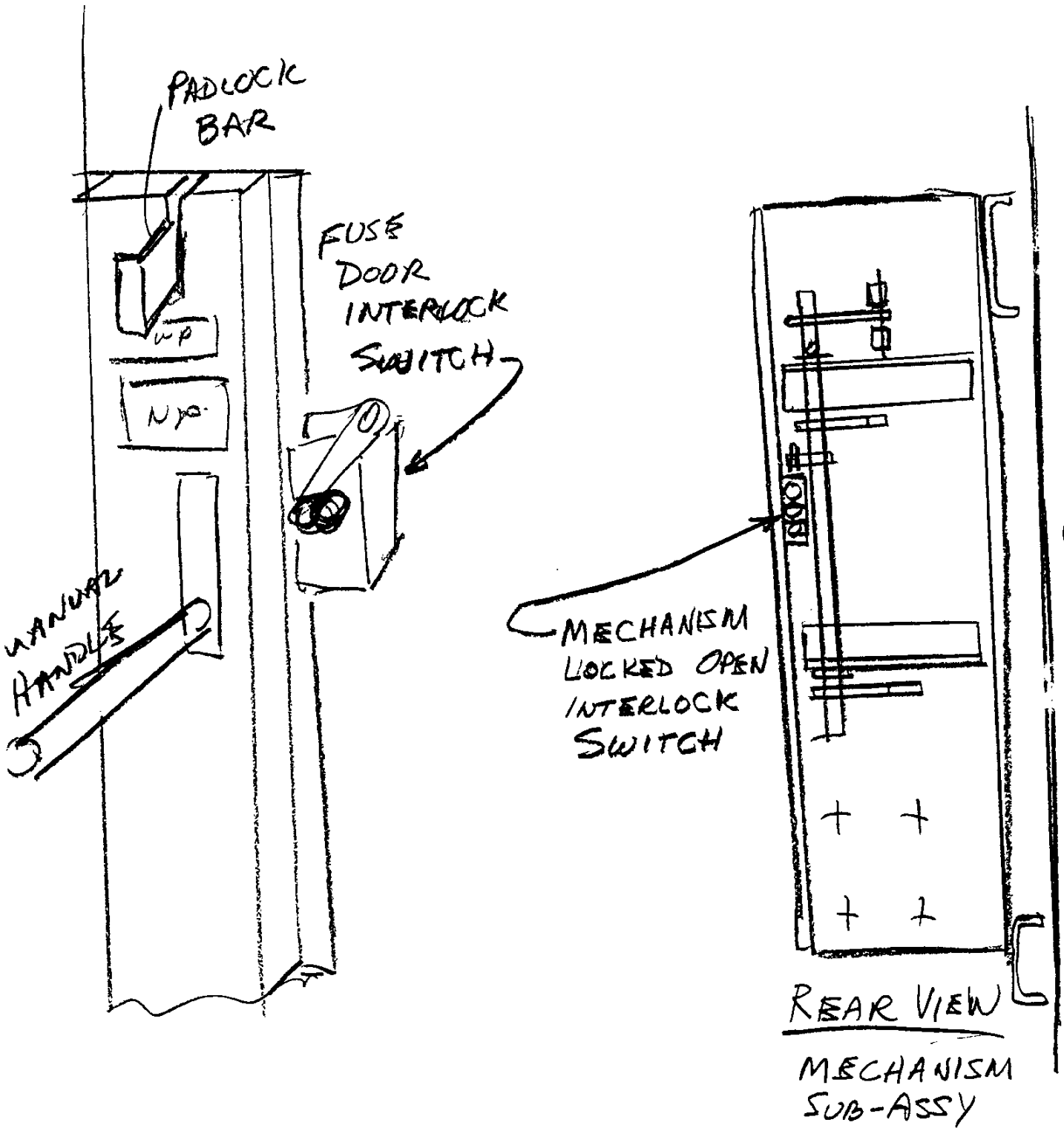


FIGURE 9 - INTERLOCK SWITCHES

10-20-88

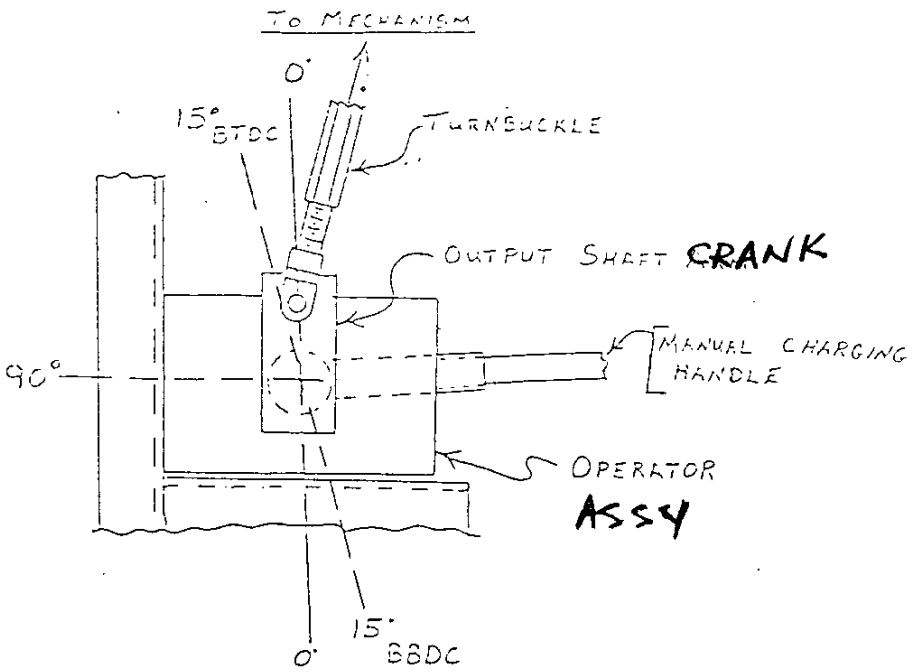


FIGURE 11

MECHANISM RIGHT SIDE

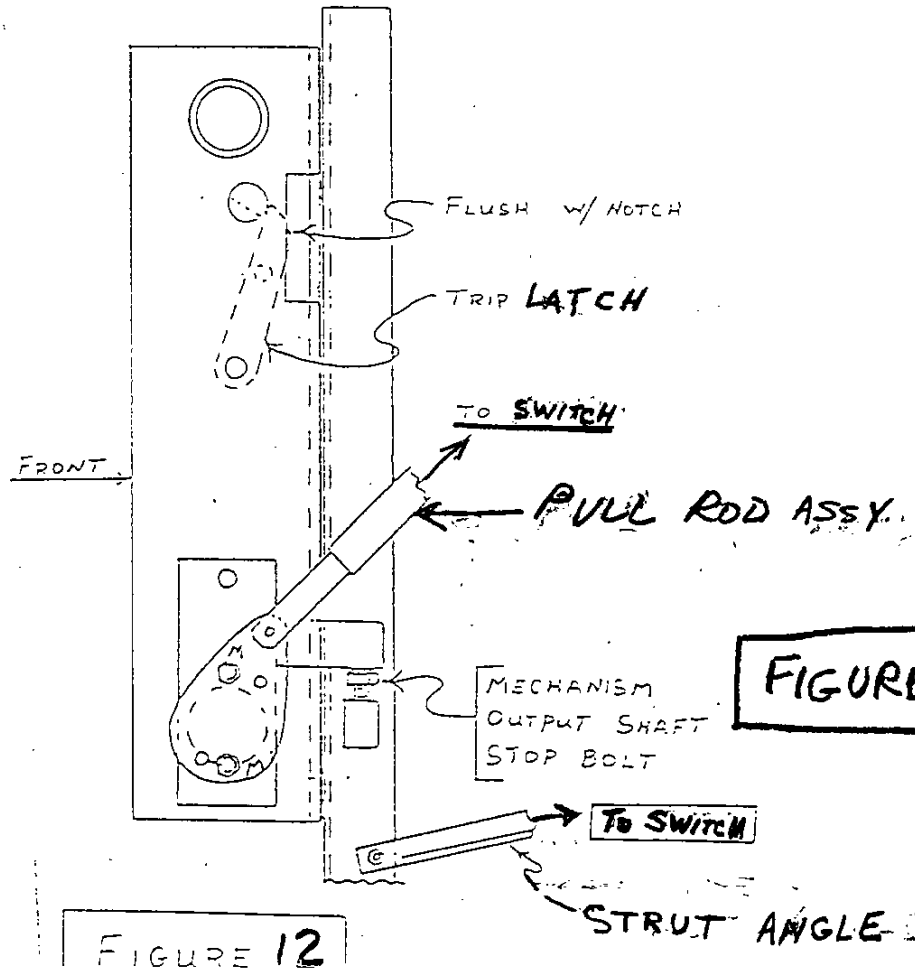


FIGURE 12

FIGURE 12

SWITCH LEFT SIDE

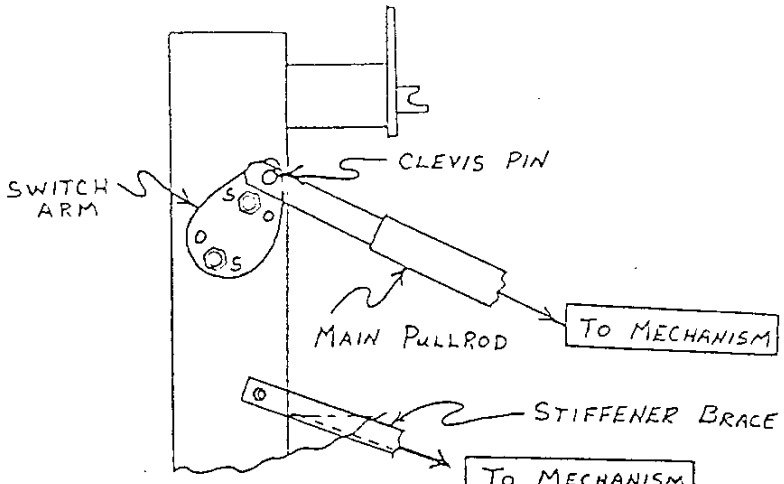


FIGURE 13

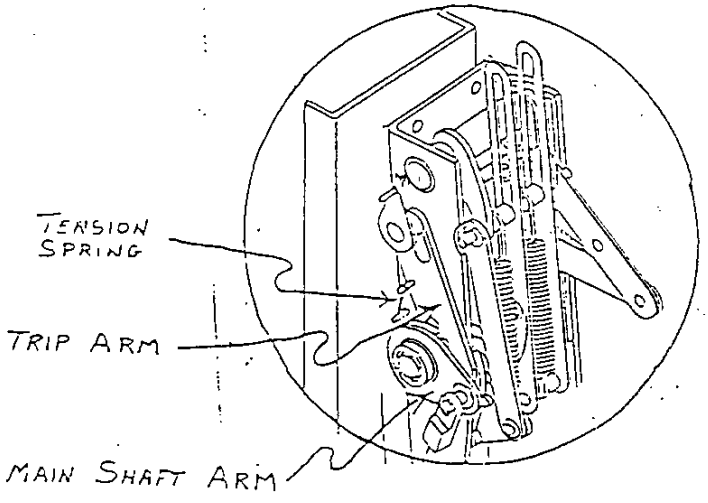


FIGURE 14

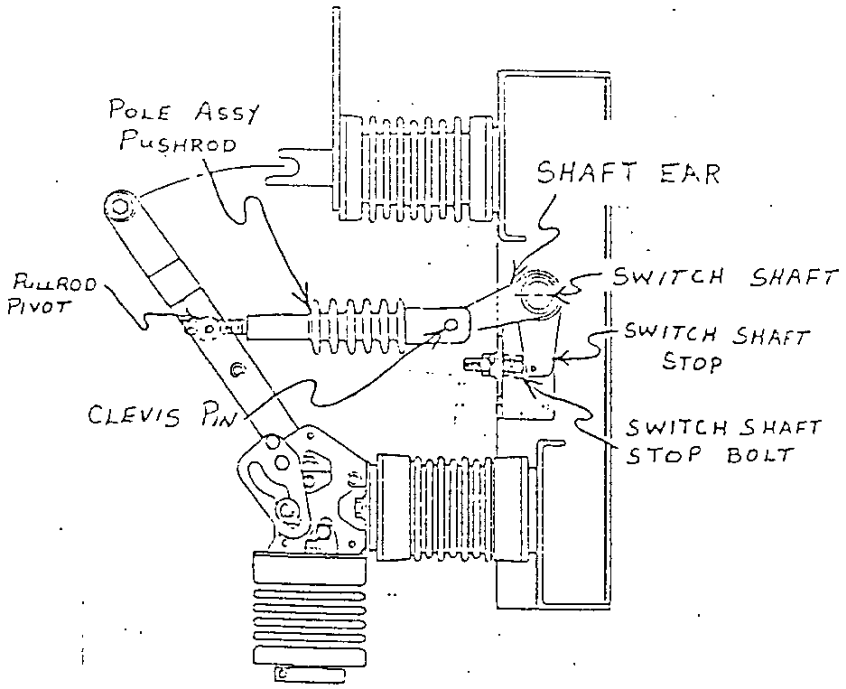


FIGURE 15

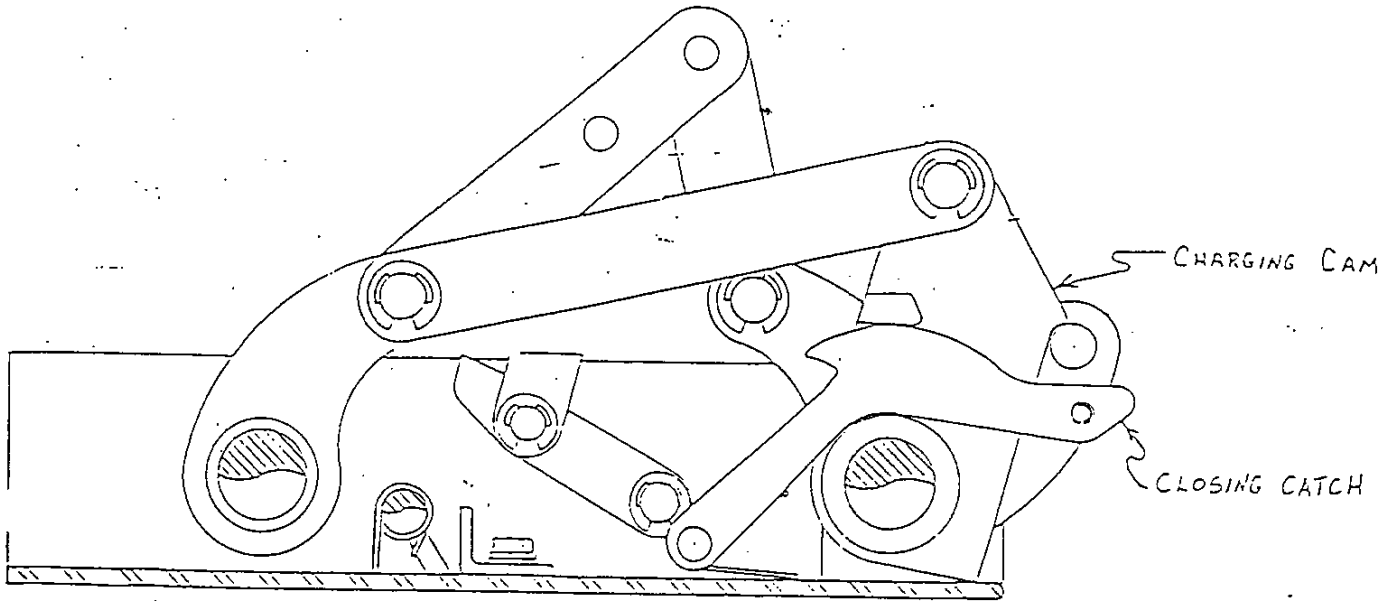


FIGURE 16

10-20-88

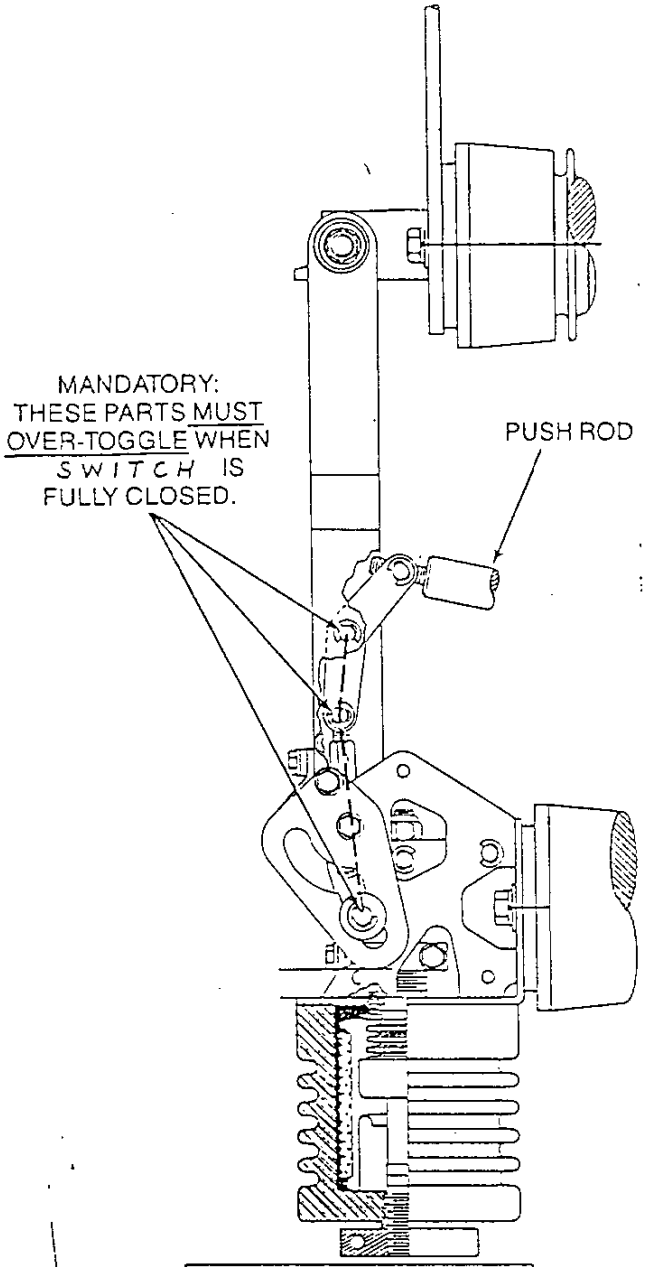


FIGURE 17

POTENTIAL FIELD PROBLEMS

1. Motor runs/pump manual handle and Mechanism will not charge.

   * Clutches stripped in Operator
   * Gears stripped in Operator
   * Main turnbuckle not on output shaft of Operator

2. Mechanism operates but Switch will not close or Switch closes and opens immediately.

   * Main turnbuckle not adjusted properly
   * Trip latch not adjusted properly
   * Trip latch broke/chipped
   * Trip shaft broke/chipped
   * Trip shaft not set properly or stuck in release position
   * Closing catch broke
   * Charging cam broke

3. Switch closes and opens within approximately two (2) seconds of closing.

   * Electric Operator
     - Motor coasting enough to trip Switch open.(Check turnbuckle adjustment)
     - Control power,to motor, not broken by limit switch
   * Manual Operator
     - Closing spring not fully collapsed and pulls turnbuckle up enough to trip Switch open. Caused by Mechanism upper pivot arm not against stop block.(Check turnbuckle and main pullrod adjustment)

4. Switch will not toggle.

   *Stop bolt on switch shaft set incorrectly (too long)
   * Main pullrod set incorrectly (too long)
   * Pole assembly pullrods set incorrectly (some short & some long)
   * Vacuum interrupter turnbuckle broken
   * Vacuum interrupter turnbuckle set with edge hitting foil connector block (Prolong condition will break turnbuckle)
   * Activator cam on side of pole assembly loose or damaged
   * Excess friction or drag robbing energy from Mechanism
   * Brace between Switch and mechanism pan not secure
   * Switch and/or mechanism pan not bolted down tight

5. Switch will not trip open electrically.
   * Electric problem
   * Solenoid burned out
   * Solenoid mounted too low (can lead to burn out of solenoid)
   * Trip link between solenoid and trip shaft arm too long (adjust solenoid)

6. Motor on electric Operator will energize when manual safety lockout handle is pulled out.

   * Safety lockout limit switch not set properly
     NOTE: This condition will strip clutches in the Operator

VISI-VAC

STANDARD INFORMATION

1. Check all E-Clips on both Vacuum Interrupter and Mechanism. Replace if missing.

2. Loose hardware can cause numerous problems. Check for this problem first.

3. Loctite all hardware and set screws on the vacuum interrupter pole assemblys. Loctite all set screws on the Mechanism.
(Use Loctite 262 -red)

4. Grease ALL moving parts -Switch, Mechanism, and Operator with Mobile 28 or Mobile SHC-32 grease.

5. NEVER operate Mechanism unless it is connected to the Switch with the main pullrod.

6. Be extremely careful when working on the Mechanism and/or Switch when the Mechanism is charged. (springs stretched)