INSTRUCTIONS

for the Installation, Care and Operation of Circuit Breakers and Accessories

TYPE [illegible] MOVABLE PORTION
[illegible]-10/250R
[illegible] MAGNETIC
POWER CIRCUIT BREAKER
AND AUXILIARY EQUIPMENT
(STORED ENERGY OPERATOR)

[illegible] DET-6657-1

These instructions are not intended to cover all details or variations that may be encountered in connection with the installation, operation, and maintenance of this equipment. Should additional information be desired contact the Allis-Chalmers Company.

ALLIS-CHALMERS MFG. CO.

BOSTON WORKS, BOSTON, MASS.

ALLIS-CHALMERS MANUFACTURING COMP

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ALLIS-CHALMERS MANUFACTURING COMPA

ILLUSTRATIONS FOR

MAGNETIC BREAKER AND AUXILIARY EQUIPMENT

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1	MAGNETIC BREAKER
2	ARC CHUTE
3	STUD AND SUPPORT
4	OPERATOR
11	AUXILIARY

CAUTIONS TO BE OBSERVED IN THE INSTALLATION, OPERATION AND MAINTENANCE

AIR MAGNETIC CIRCUIT BREAKERS

1. Examine breaker when delivered [illegible] any DAMAGE.
2. Breaker shipped TIED in CLOSED [illegible]
3. Remove SHIPPING BRACES and FASTENINGS.
4. Hoist breaker only with SPREADER [illegible] HOOKS.
5. Store to keep breaker and [illegible] CLEAN and DRY.
6. Operating power LEADS must be large enough to avoid VOLTAGE DROP.
7. Before adjusting or repairing, disconnect breaker from all sources of POWER and see that breaker is OPEN and springs are DISCHARGED.
8. Unbolt BLOW-OUT COILS AND ARC CHUTE SUPPORTS before tilting arc chutes.
9. Avoid CLEANING FLUIDS detrimental to insulation or metals.
10. Keep GRAPHITE off insulation [illegible] quality of arcing contacts.
11. Do not dress Silver Contact Surfaces.
12. During SLOW-CLOSE operation, prevent [illegible] mechanism by PULLING LANYARD when load is picked up.
13. Reconnect BLOW-OUT COILS AND ARC CHUTE SUPPORTS before ENERGIZING breaker.
14. Remove SPRING CHARGING HANDLE before energizing breaker control bus.
15. Remove MECHANISM LOCKING PIN before energizing breaker control bus.

PART 1 - INTRODUCTION

GENERAL

is-Chalmers power circuit breakers are the products of advanced research
design. They are precision electrical equipment, tested to current ASA,
, and NEMA Standards, and manufactured in accordance with highest standards

PROPER CARE IS ESSENTIAL TO GOOD OPERATION

successful operation of this circuit breaker depends on proper installatio
maintenance as a complement to [illegible] design and fabrication.

information and instructions contained in this book are to aid you in
talling and maintaining the equipment so that you will obtain the highly
isfactory service of which they are capable.

following numbering system has been adopted for ready reference in this
truction book:

1.2 - Refers to Section [illegible]

4-220 - Refers to Item #220 on illustration marked Figure 4

ease pass this information along to your engineering, erection personnel, and
rvicemen who will then be better able to assist you in realizing the best servi
e this equipment.

INSPECTION AND SHIPPING

ing assembly and when circuit breakers are completed, they are subjected
a series of tests and inspections. Packing is especially done to assure
imum protection during shipment.

RECEIPT

n receipt of the circuit breaker, remove all packing braces and examine
breaker and auxiliary equipment carefully to see that no damage has occurre
ing transit. If any injury is discovered, a claim for damages should be
ed at once with the transportation company and the Allis-Chalmers Manufactur
pany notified.

STORAGE

the breaker cannot be set up immediately in its permanent location, and
s necessary to store the equipment, it should be kept in a clean dry place
protected from dust, the action of corrosive gases, from coal combustion
ducts, etc., and from mechanical injury.

1.6 REMOVE SHIPPING SUPPORTS

This circuit breaker has been shipped [illegible] in the closed position. Bracing braces that were installed [illegible] moving parts stationary in transit, must be removed. Fastenings [illegible] hold moving components of auxiliaries closed position during transit must be removed.

1.7 HANDLING

In moving a circuit breaker after shipping crates or supports have been removed, and in handling the breaker with a crane or hoist, hooks should be attached only to special supports provided for the purpose and a spreader used where necessary to prevent distortion of frame members. Avoid short catches which would place too much stress on parts of the breaker such as bushings, insulating parts, fittings, etc., which are not designed primarily for structural strength.

1.8 PRE-INSTALLATION SERVICE

Circuit breakers are completely [illegible] adjusted, and tested at the factory. However, since there are possibilities [illegible] fastenings may have become loosened during [illegible] therefore, they should be checked thoroughly and [illegible] necessary as instructed hereinafter before energization. The breaker [illegible] operated several times manually at first, and then electrically, [illegible] after installation in position before the breaker is ready for service.

Bushings and other insulating parts should be clean and dry. All contact surfaces should be inspected to see that they are clean and smooth. (Do not [illegible] press silver surfaces.)

PART 2 - INSTALLATION

2.1 GENERAL

hough the circuit breaker was completely adjusted, tested and packed maximum protection in transit, it is necessary that adequate steps taken to prepare the unit for installation.

REMOVE SHIPPING BRACES

eaker is shipped in closed position. Remove all shipping braces and tenings used to hold trip latch (1-?) and other moving parts of breaker auxiliaries.

PREPARE BREAKER FOR INSPECTION

epare breaker for installation inspection and servicing outside of cubicle. ove phase barriers (see Section 6.3a) and tilt back arc chutes to expose erior of breaker (see Section 6.3b).

INSPECT AND CHECK BREAKER

amine for any moisture, dirt and other foreign material, which could impair imum breaker performance.

ually slow-close the breaker (see Section 3.5). Carefully watch the ration of the operator linkage and the contacts. Contacts should mate perly but need not make at the same time on all phases.

rate breaker several times electrically to check for smooth operation to check adjustment of motor cutoff switch. (See Section 4.2).

lt arc chutes back to upright position (see Section 6.3b) and replace riers (see Section 6.3a & b). Make certain all hardware is securely tened, especially the six blowout coil connections.

INSERTION MECHANISM

breaker insertion mechanism should be checked and lubricated if necessary proper operation to prevent jamming during insertion. The breaker should moved into position so that it can be rolled straight into the cubicle with inimum of friction on the wheels and guides in the cubicle. (see Section 2.6

MECHANICAL INTERLOCK SWITCH

e mechanical interlock switch opens the spring charging motor circuit before breaker can be moved within the cubicle. Screw (1-[illegible]) must be rotated one rter turn allowing the switch (1-[illegible]) to open. This action removes the e under foot lever (1-20) permitting it to be depressed so as to move the aker in the cubicle.

switch must be locked in the closed position before operating the breaker ctrically.

mbering system is explained in Section 1.2

2.7 GROUNDING CONTACTS

Check to see that grounding fingers [illegible] on bottom of breaker will make proper contact with stationary [illegible] and in cubicle. Check for proper grounding contact when breaker is moved into cubicle.

2.8 MECHANICAL INTERLOCKS

Test mechanical interlock plunger (1-6) and make sure that it operates freely and has no binds nor interference. Lever (1-9) must be rotated to allow switch (1-24) to open before [illegible] (1-20) can be depressed.

2.9 POSITION IN CUBICLE

Move the breaker into each of its three positions in the cubicle; disconnected position, test position, and operating position. Test to make sure that breaker can be closed electrically only in its test position and in its operating position. Note that switch (1-24) must be in its closed position to energize the meter circuit. Where switchboard has more than one of this type of the same size and rating of breaker, each circuit breaker should be tried in each of the three positions in several cubicles to assure interchangeability.

2.10 OPERATE IN TEST POSITION

The breaker should be operated [illegible] to see that all parts work correctly. Final preparation for its operating position. Make sure that secondary contacts of breaker are in alignment with secondary contacts in the cubicle.

Move the breaker slowly to its operating position. Check alignment of all six breaker contacts for proper engagement with the cubicle primary studs. The alignment of breaker and cubicle guiding cambacks should be close enough so that the contact fingers on the breaker will mesh with the studs in the cubicle without jamming. Check to see that all secondary fingers are making contact with the secondary bus.

PART 3 - [illegible] OPERATION

3.1 DESCRIPTION OF OPERATOR (Fig. 4)

The stored energy operator consists of [illegible] systems: (a) the driving system, (b) the spring linkage, and [illegible] closing linkage. The systems are disengaged from each other except [illegible] specific function; thus, the driving system and spring linkage are completely free of each other except when the spring linkage is reset and ready to be charged. Similarly the spring linkage and closing linkage are free of each other except during [illegible] operation.

3.1a DRIVING SYSTEM

The driving system consists of a motor driving a pinion (4-2) which, in turn, drives two spur gears (4-3). A [illegible] crank (4-4) is mounted on each spur gear shaft; it is driven by a pin (4-5) fastened to the spur gear; and it drives the spring linkage.

3.1b SPRING LINKAGE

This system consists of four closing springs (4-6), two links (4-7), two links (4-9), one link (4-10), [illegible] (4-11) and crank (4-2).

When the linkage is reset, the [illegible] charged by crank (4-4) driving the rolls (4-24) fastened to [illegible] links (4-8 & 4-10) go over toggle. At the start of this [illegible] link (4-9) will be in tension, allowing a gap between latch (4-13) and roll (4-19). Following part way through the charging operation, the springs are being charged, the action of roll (4-19) coming against latch (4-13) will be heard. The action of links (4-9 & 4-10) going over [illegible] be heard at the end of the charging operation.

Releasing closing latch (4-13) will cause the closing springs to drive the breaker closing linkage (see below). During this operation, the spring charging linkage remains over toggle until near the end of its stroke when the toggle is broken by crank (4-12) striking the kick-off screw (4-32). The spring linkage immediately resets allowing the breaker closing linkage room to reset when tripped.

3.1c BREAKER CLOSING LINKAGE

This system consists of two links (4-21), two links (4-23) and arm (4-22). It is always free to operate in any of its motions as it is not secured to the spring charging linkage.

In the closing operation the spring charging linkage drives toggle roll (4-15) over toggle against stop (4-29), thus pushing the breaker through arm (4-22). Depressing latch (4-27) during a closing operation prevents the breaker from closing, thereby making it trip free.

3.2 CHARGING SPRINGS

The closing springs (4-6) will charge as soon as the breaker control bus is energized. Should the springs [illegible], check the motor cutoff adjustment (see Section 4.2).

The springs can be manually charged by inserting the charging handle down guide tube (1-27) to engage the gearmotor. Rotate the handle in the direction shown until the spring linkage is [illegible] to go over toggle (see Section 3.1b).

REMOVE CHARGING HANDLE BEFORE ENERGIZING BREAKER CONTROL CIRCUIT.

3.3 CLOSING BREAKER

When the springs are fully charged, the breaker can be closed manually by pulling lanyard (1-26) or electrically by energizing the closing circuit. This rotates latch (4-13) allowing the closing springs (4-6) to close the breaker.

3.4 OPENING BREAKER

The breaker can be tripped manually by depressing trip rod (1-3) or electrically by energizing the trip circuit. This rotates latch (4-27) allowing the closing linkage to open the breaker.

The tripping action described above will take place at any time during a closing operation, either manual or electrical, and regardless of whether or not the armature is energized. The mechanism is electrically and mechanically trip-free in any position.

3.5 MANUALLY SLOW-CLOSING BREAKER

In order to check and make adjustments, the breaker can be closed slowly and mechanically held in any position of the closing stroke. The following procedure should be followed:

a.) Remove breaker from cubicle and disconnect all power circuits.

b.) Be certain that control circuit is open and closing springs are discharged.

c.) Insert mechanism locking pin into hole (1-28). It will be necessary to rotate gear (4-6) to allow pin to pass through hole. The pin should snap behind crank (1-39) and through hole in opposite side of operator frame.

d.) Insert spring charging handle into guide tube (1-27) and engage with gearmotor. Turn handle in direction opposite to direction indicated on shield until resistance is felt. Pull manual closing lanyard (1-26) and continue turning handle. The breaker contacts will slowly close.

3.5 MANUALLY SLOW-CLOSING BREAKER (Continued)

CAUTION: As the contacts approach the breaker closed position, observe the position of the cranks (4-4) on rolls (4-24). Care should be taken that the cranks do not pass by the rolls, allowing the contacts to snap open.

Since the motor gears are self-locking, the contacts can be cranked to any position and held for as long as desired.

a) To prepare for normal operation:

Trip breaker open.

Remove spring charging [illegible]

Remove mechanism locking [illegible]

PART 4 - ADJUSTMENTS

4.1 GENERAL

The breaker has been completely [illegible] at the factory. However, adjustments or fastenings [illegible] loosened during shipment, storage, or installation, [illegible] checked and corrected, if necessary, before breaker is operated electrically. Manual operation of breaker should be used for preliminary operation to see that all parts are free and work smoothly. The bushings and other insulating parts should be clean and dry. All contact surfaces should be inspected to see that they are clean and smooth. (Do not dress silver surfaces.) Removal of all phase barriers and removal or raising of [illegible] assembly gives access to breaker for checking adjustments.

The paragraphs immediately following [illegible] the proper adjustments and methods of making same on the Allis-Chalmers [illegible] Air Magnetic Power Circuit Breaker. Adjustment values are all tabulated [illegible] Appendix B attached.

4.2 MOTOR COAST (Fig. 4)

The motor cut-off switch (4-16) [illegible] the motor circuit to allow the driving cranks (4-4) to coast after [illegible] toggles. Adjustment is made by means of screw [illegible] adjust screw to just touch switch rod.

4.3 CLOSING LATCH (Fig. 4)

The closing latch (4-21) should [illegible] roll (4-14) approximately 5/32 above the lower edge of the latch face. Adjustment is made by screw (4-26). If unstable increase bite. If hard to [illegible] decrease bite.

4.4 TRIP LATCH (Fig. 4)

The trip latch (4-27) should engage [illegible] roll (4-14) approximately 5/32 above the lower edge of the latch face. Adjustment is made by screw (4-65).

When the breaker is "open", the trip latch (4-27) should clear its latch roll (4-14) by 1/32± 1/64. Adjustment [illegible] by screw (4-75).

4.5 CLOSING SOLENOID (4-37)

The armature should move freely and [illegible] no binds. There should be clearance between the trip pin and latch when [illegible] solenoid is de-energized. The travel of the armature should be such that [illegible] manual actuation will trip the latch and have a 1/8 to 3/16 after-travel. [illegible] adjustment is made by shimming the solenoid

4.6 TRIP SOLENOID (4-36)

Action and adjustment are identical [illegible] closing solenoid (see Section 4.5).

4.7 SPRING POSITION SWITCH (4-34)

The spring position switch (4-34), which is mounted on top of the operator frame, indicates when the springs are charged. Its contacts should close just before the springs are completely charged. Adjustment is made by screw (4-35).

4.8 LATCH CHECK SWITCH (4-1)

The latch check switch, which is mounted on the front of the operator, opens the closing circuit when the trip latch is not set. Proper adjustment has been made and should require no change.

4.9 AUXILIARY SWITCH (Fig. 11)

The auxiliary switch (11-15) has been adjusted at the factory and should normally not require further adjustment. However, before the breaker is placed in service a check should be made to see that the crank arm (11-10) throws approximately equal distances on either side of a vertical center line. The adjustment for throw of crank arm is made by positioning the clevis on the auxiliary switch connecting rod. After correct adjustment is made, make sure all fastenings and locknuts are secure. Each rotor (11-3) can be adjusted individually in steps of 90 degrees merely by pressing the contact to one side against the spring and rotating it within its insulated rotor housing until it snaps into the desired position.

4.10 INTERLOCK PLUNGER (Fig. 1)

The foot lever (1-20) operates the interlock plunger (1-18) as well as the trip latch. Depressing the lever with the breaker out will cause plunger (1-18) sufficiently to release the breaker permitting it to be moved in the cubicle. The interlock is in proper adjustment when the plunger (1-18) is positioned to 1-3/4 ± 1/16 above the floor line, and causes tripping of breaker contacts when it is raised to a level not more than 2-1/16 above the floor line. The latch tripping rod associated with the foot lever should be slide of the trip latch (4-27).

4.11 ARCING CONTACT HINGE JOINT (Fig. 3)

The arcing contact joint is in proper adjustment when each spring washer is deflected approximately 0.015 inches.

This adjustment is obtained by tightening nut (3-4) until all parts are snug fit; then tighten the nut 3/4 to 1 turn more.

4.12 CONTACT PRESSURE OF HINGE JOINT (Fig. 3)

When the hinge joint contact pressure is in proper adjustment, a pull of from 7 to 9 lbs is required to move the contact toward the open position. This pull is measured as follows:

Remove pin (1-46) and detach link (1-47) from the disconnect arms (3-18) and (3-19). Move the disconnect to a position just short of "contact make".

Attach a spring scale to the disconnect eight inches above screw (3-24) and in a direction perpendicular to the longest edge of the disconnect arm. A pull of from 7 to 9 lbs should be required to move the disconnect toward the open position.

Adjustment is made by tightening [illegible] nut (3-[illegible]).

Before attaching link (1-47) to [illegible] (3-18) and (3-19), check contact alignment (Section 4.13) [illegible] (Section 4.14).

4.13 CONTACT ALIGNMENT (Fig. 3)

The horizontal pairs of main contact fingers should "make" with the moving contact simultaneously. (Note: Contacts on different phases should not necessarily "make" simultaneously.)

On MA-75/150B Breakers - If not already detached, remove pin (1-46) and detach link (1-47) from disconnect arms (3-18) and (3-19). Detach arcing contact (3-10) from yoke (3-2) by removing pin (3-26). Move the disconnect toward the closed position until it just touches a main contact finger. (See Fig. 3, View A-A, main contact fingering). Dimension g should then be no greater than .020 inches.

On MA-250B Breakers [illegible] from disconnect arms (3-18) and (3-19) [illegible] sliding device move the disconnects [illegible] toward the closed position until a main contact finger is touched. Dimension g should then be no greater than .020 inches.

Adjustment is made by loosening [illegible] (3-22) and rotating the contact assembly. Alignment (dimension g) should be checked after tightening nuts (3-22).

Alignment is checked and adjusted on each phase separately. Be sure there are no binds between contacts (3-11) preventing proper wiping action with the disconnect arms.

Attach arcing contact (3-10) to yoke (3-2), but check contact lead (Section 4.14), before attaching link (1-47) to disconnect arms (3-18) and (3-19).

4.14 CONTACT LEAD (Fig. 3)

Contact lead should be checked and adjusted only when the contacts are in alignment (see Section 4.13).

The arcing contacts (3-9, 10, 27, 28) should "make" before the main contacts. Measure and adjust each phase separately as follows:

If not already detached, remove pin (1-46) to detach link (3-47) from disconnect arms (3-18) and (3-19). Move the disconnect toward the closed position until the arcing contacts just touch (See Fig. 3, View A-A, arcing contacts engaging).

The shortest gap between the bottom contact fingers (3-11) and the disconnect arms (3-18) and (3-19) should be 1/4 inch plus 0, - 1/32. (Dimension b in View A-A of Fig. 3). Adjustment is made by lengthening or tightening nut (3-1).

Reconnect link (3-47) to disconnect arms (3-18) and (3-19) using pin (1-46).

4.15 CONTACT STROKE (Fig. 3)

Contact stroke should be checked and adjusted only when the contacts are in proper alignment (See Section 4.13).

In order to insure proper wiping action and contact pressure, the stroke of the disconnect must be maintained in proper adjustment. Check and adjust as follows:

With breaker in closed position, dimension a (View A-A of Fig. 3) on the top pair of fingers should be 1/16 plus 1/32 -0. Adjustment is made with the breaker in the open position by increasing or decreasing the effective length of link (1-47) by means of nuts (1-16). Each phase is adjusted individually.

After making the above adjustments, on all three phases, trip the breaker open and check to see that dimension c is 4-7/8 inches plus or minus 1/8 on all three phases. (On breakers with more than four contacts per phase, dimension c is still measured to the second from top contact.)

Adjustment for dimension d is made by first removing pin (1-33) on each puffer. After loosening nut (1-42), increase (or decrease) effective length of rod end (1-40) by screwing (or unscrewing) it into piston (1-44). Adjust rod ends (1-40) on both puffers the same amount. Tighten nuts (1-42), replace pin (1-33), and check dimension d.

PART 5 - MAINTENANCE

5.1 GENERAL

Safety of the operator and continuity of electric service of loads connected to circuit breakers are dependent upon proper operation of the breakers. In order to keep circuit breakers in proper operating condition, it is recommended that a routine service inspection should be made every six months or 2000 operation intervals, whichever comes first. The interval service interval and the amount of servicing required will usually be determined by the particular conditions at the installation and will be influenced by such things as the number of operations, number of fault interruptions, cleanliness of the equipment and past experience with the equipment.

Servicing is usually intended to cover cleaning, greasing, lubricating, tightening, inspection, tests, etc. A permanent record is usually desirable and should list for each serial number the date, operation counter reading, general condition of equipment, and work done by serviceman.

Be sure that the breaker and its associated equipment is disconnected from all electric power and that the breaker is in the open position before any maintenance is attempted.

5.2 CONTACTS

Inspect all contacts frequently for evidence of overheating or arcing. Replace badly pitted or burned contacts before they are damaged to such an extent as to cause improper operation of the breaker.

5.3 BARRIER STACKS

The barrier stacks are fragile and should be handled carefully. The barrier stacks should be inspected for cracked or broken plates in the areas of the slots. The stacks should be replaced when a sooty glaze is observed on the full length of the edges of most of the plates. They should be likewise replaced if plates are broken or cracked. Before closing the breaker and cubicle, inspect for pieces of barrier or arc-resistant material which would obviously indicate breakage.

5.4 BREAKER TIMING

Check the contact adjustment and breaker timing, also check adjustments of auxiliary equipment and see that it is functioning properly. A comparison of breaker timing at any period of maintenance with that taken when the breaker was new will immediately indicate the presence of maladjustment or friction should the timing vary more than a total of 2 cycles on closing with the same coils.

5.5 LUBRICATION

Lubrication is of the utmost importance and a special effort should be made to assure that all moving parts are [illegible] and properly lubricated at all times. The disconnect [illegible] and the locking solenoid armature are lubricated with microfine dry graphite. Graphite should be rubbed in well and all excess carefully removed.

CAUTION: GRAPHITE MUST BE [illegible] ACCURACY OF REPLACEMENT, AS IT CANNOT BE [illegible]

Bearing Pins and other moving parts should be lightly lubricated with a light film of Beacon P-290 or [illegible] needle bearings which in general not require frequent lubrication, but care should be taken to prevent entrance of dirt and foreign material during maintenance work. Mating surfaces of main and arcing contacts should not be lubricated.

5.6 MAINTENANCE GUIDE

Refer to the attached "[illegible] and Adjustments", Appendix A, for a digest of pertinent instruction information, a guide to simple and convenient maintenance procedures.

PART 6 - REPLACEMENT PARTS

6.1 HOW TO ORDER

When ordering replacement parts, it is very important to give complete information. This information should consist of:

(1) Breaker serial number

(2) Number of pieces required

(3) Reference number

(4) Instruction book number

(5) Description of part (See instruction book descriptions where available)

(6) Rated voltage of all switches, relays, and coils ordered

(7) Rated amperes of all switches, relays, and coils ordered

(8) Rated voltage of breaker

(9) Rated amperes of breaker

The breaker serial number is necessary to determine the correct identity of a part; without this serial number, [illegible] cannot be sure of the correct identity of the desired part.

If any doubt exists as to the instruction book reference or the description, a dimensional sketch of the desired part should be made to properly identify it.

6.3 REPLACING PARTS

Before removing any part, observe its location and adjustment. By so doing, it is usually possible to avoid any appreciable amount of adjustment work after the installation of the replacement part.

CAUTION: BEFORE REMOVING ANY PART, MAKE SURE THAT THE BREAKER AND ITS OPERATING MECHANISM IS DISCONNECTED FROM ALL ELECTRIC POWER AND THAT THIS BREAKER IS IN THE OPEN POSITION.

6.3a PHASE BARRIERS (Fig. 1)

Lift wires of panel spring assembly (1-34) out of slots (1-14) to release panel (1-32). Lift and remove [illegible] center phase screw (1-23). The phase barrier assemblies (1-[illegible]) can now be lifted and removed from the breaker. Note: On [illegible] remove screw (1-2) and remove barrier (1-25) prior to above [illegible].

6.3b TILTING ARC CHUTES (Fig. 1)

Remove phase barriers (see Section 6.3a). Remove screws (1-23), (1-37) of each phase. Remove screws (1-39) [illegible] (1-17) to remove barriers (1-19) and (1-22). With arc chute support [illegible], tilt back the arc chutes.

After tilting arc chutes upright and replacing barriers, be sure screws (1-17) (1-23), (1-37), and (1-39) are [illegible] tightened securely on all three phases.

6.3c BARRIER STACKS (Fig. 1)

Tilt back arc chutes (See Section 6.3b). Remove four screws (2-2), barrier (2-1), from each arc chute. Slide [illegible] stack (2-23) through top of arc chute.

When sliding a barrier stack into [illegible] chute, care should be taken to see that the end containing the [illegible] slots goes in first.

APPENDIX A

SCHEDULE OF CHECKS AND ADJUSTMENTS

This tabulation is intended to [illegible] reference for servicing of this equipment. Other items may be added as experience dictates. For a thorough understanding of the breaker it is recommended that the instruction book be studied.

1- Breaker should be prepared for removal outside of its cubicle. Breaker must be in the open position and disconnected from electric power. Remove phase barriers (Section 6.3a) and [illegible] to expose breaker interior (Section 6.3b). Remove screws (1-23) [illegible] and (1-39) and Barrier (1-22) prior to raising arc chutes.

2- Operate breaker manually to check [illegible] operation and freedom of movement.

3- Visually inspect all parts during [illegible] phases of servicing.

4- If a travel recording device is available, it will furnish an excellent indication of the mechanical operation of the breaker. Refer to Section 5.4.

5- Clean all parts of breaker. A vacuum cleaner is useful for removing dust from generally inaccessible places.

6- Check meter cams per Section [illegible]

7- Check trip latch (4-27) adjustment per Section 4.4.

8- Check latch roll stop screw (4-74) adjustment per Section 4.4.

9- Check closing latch (4-13) adjustment per Section 4.3.

10- Check trip solenoid (4-36) adjustment per Section 4.6.

11- Check closing solenoid (4-37) [illegible] per Section 4.7.

12- Check control relay for proper [illegible]

13- Operation counter is actuated by [illegible] which should be adjusted for minimum force by positioning of the [illegible] arm. Record counter reading.

14- Check trip interlock plunger (1-[illegible] per Section 4.10.

15- Check all wiring for frayed or [illegible] wires, tighten all terminals.

16- Check all hardware for tightness. Note that Stover locknuts are used in many places. These nuts may be identified by the slightly egg-shaped hole on one end and the parallel grooves on the corresponding face of the nut.

17- Operate breaker manually and electrically. Check operation at minimum close and trip voltage if possible.

18- Check spring position switch for proper action per Section 4.7.

19- Remove disconnect arms as a unit by removing screw (3-24) and nut (3-14). Refer to Fig. 3. Carefully inspect all contact surfaces in hinge joint. Silver washer (3-25) and adjacent surfaces should be clean and free of roughness or galling. Lubricate silver washer [illegible] by rubbing in microfine dry graphite used sparingly. [illegible] hinge joint per Section 4.12.

20- Check arcing contact hinge [illegible]

21- Inspect condition of auxiliary [illegible]

22- Inspect condition of control [illegible]

23- Check contact alignment per Section [illegible]

24- Check contact lead per Section [illegible]

25- Check contact stroke per Section [illegible]

26- Check for barrier stack [illegible]

27- Check condition of contacts.

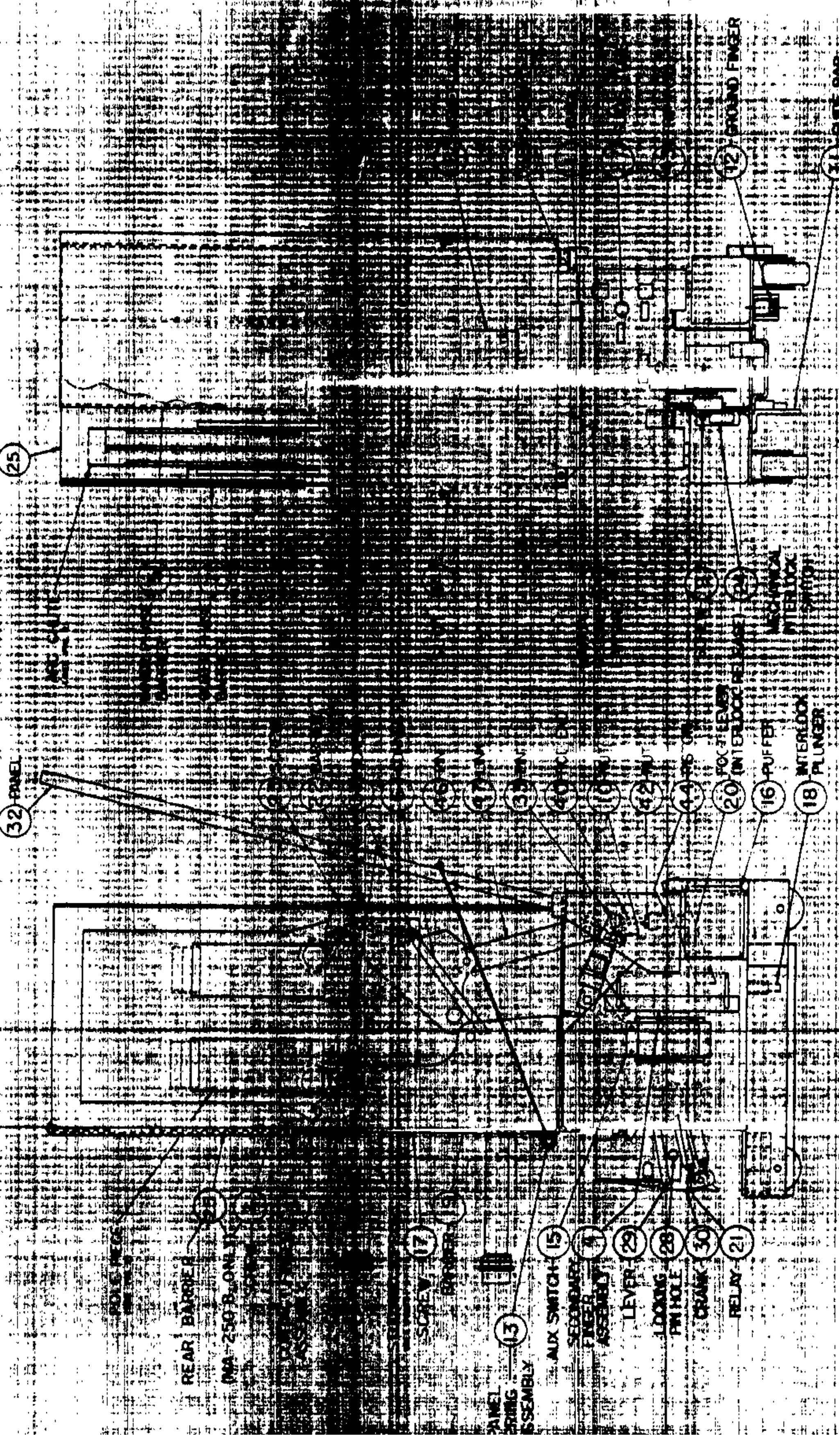
28- Reassemble breaker. Be sure [illegible] (3-17) and (3-39) are secured in each phase.

29- Check breaker in cubicle. [illegible] Check operation of trip interlock plunger in test position and fully inserted position. Check secondary wiring fingers for good contact. Check grounding contact for good contact.

30- GENERAL

The above points will provide a quick reference for maintenance procedures. Other items may be added as experience dictates. For a thorough understanding of the equipment, the instruction book should be studied. Refer to Part 5 for general comments on maintenance and lubrication.

ALLIS-CHALMERS MANUFACTURING COMPANY



FIG

TYPICAL MAGNETIC BREAKER

ALLIS-CHALMERS MANUFACTURING COMPA

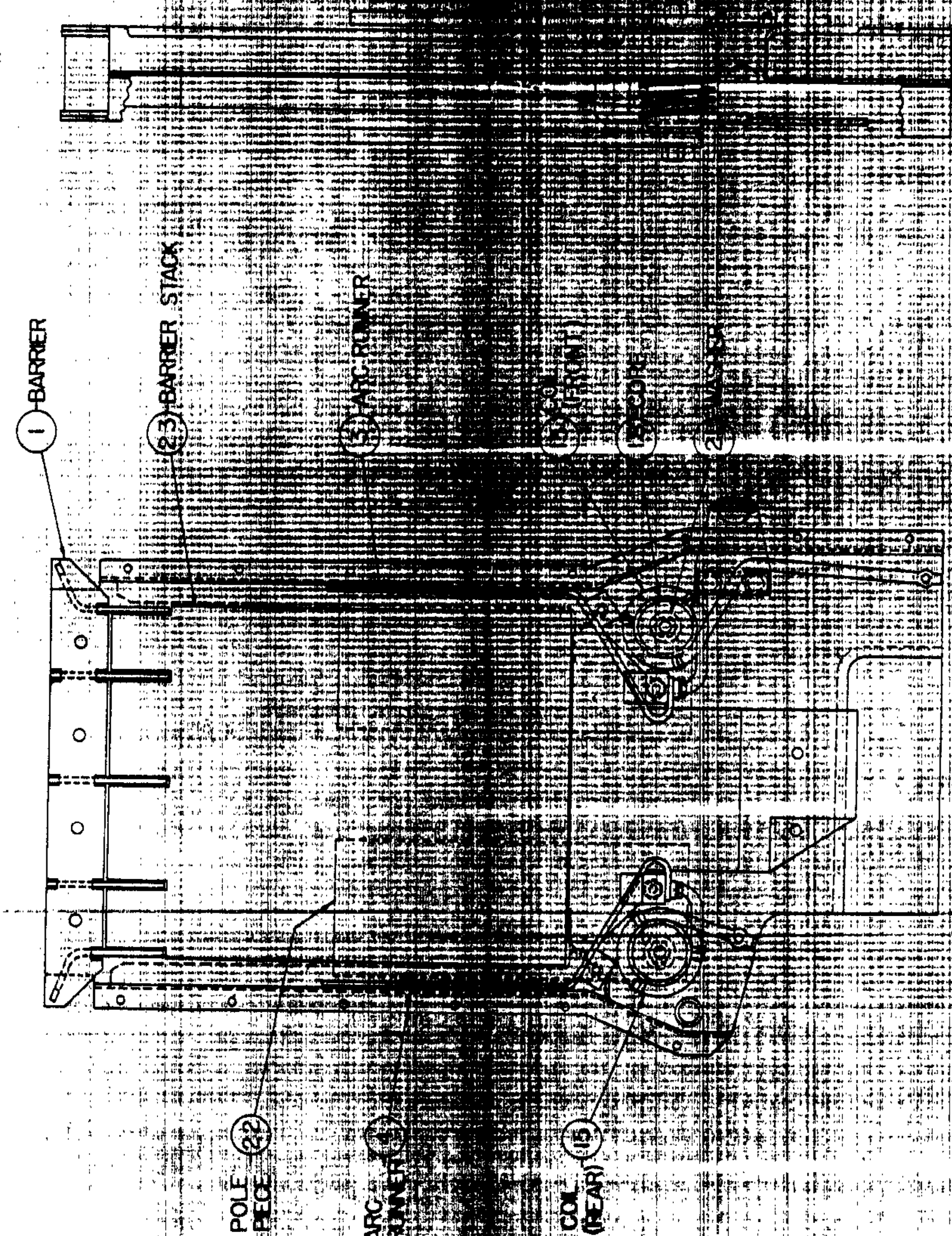


FIG 2

ALLIS-CHALMERS MANUFACTURING COMPANY

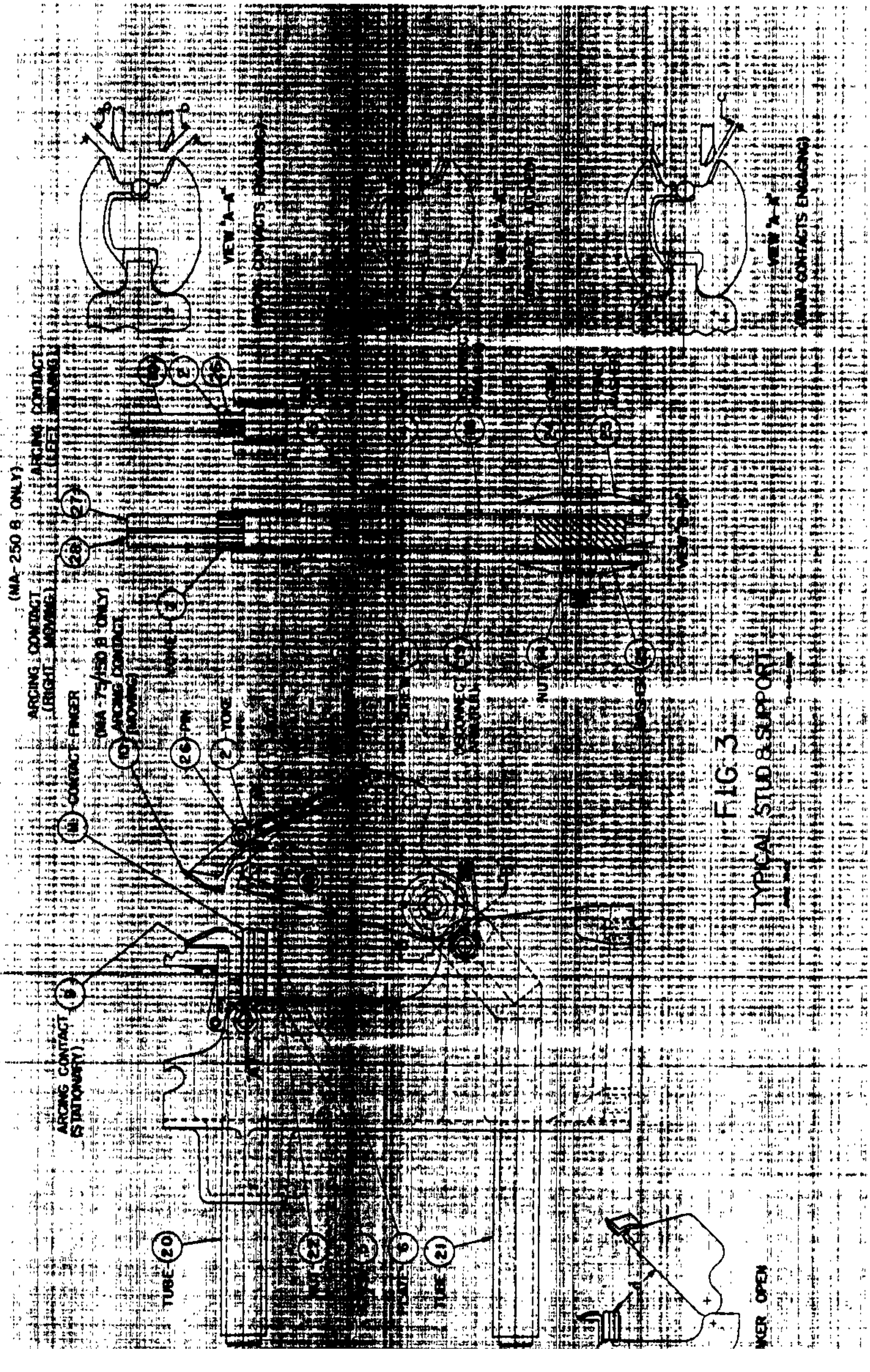


FIG. 3
TYPICAL STUD & SUPPORT

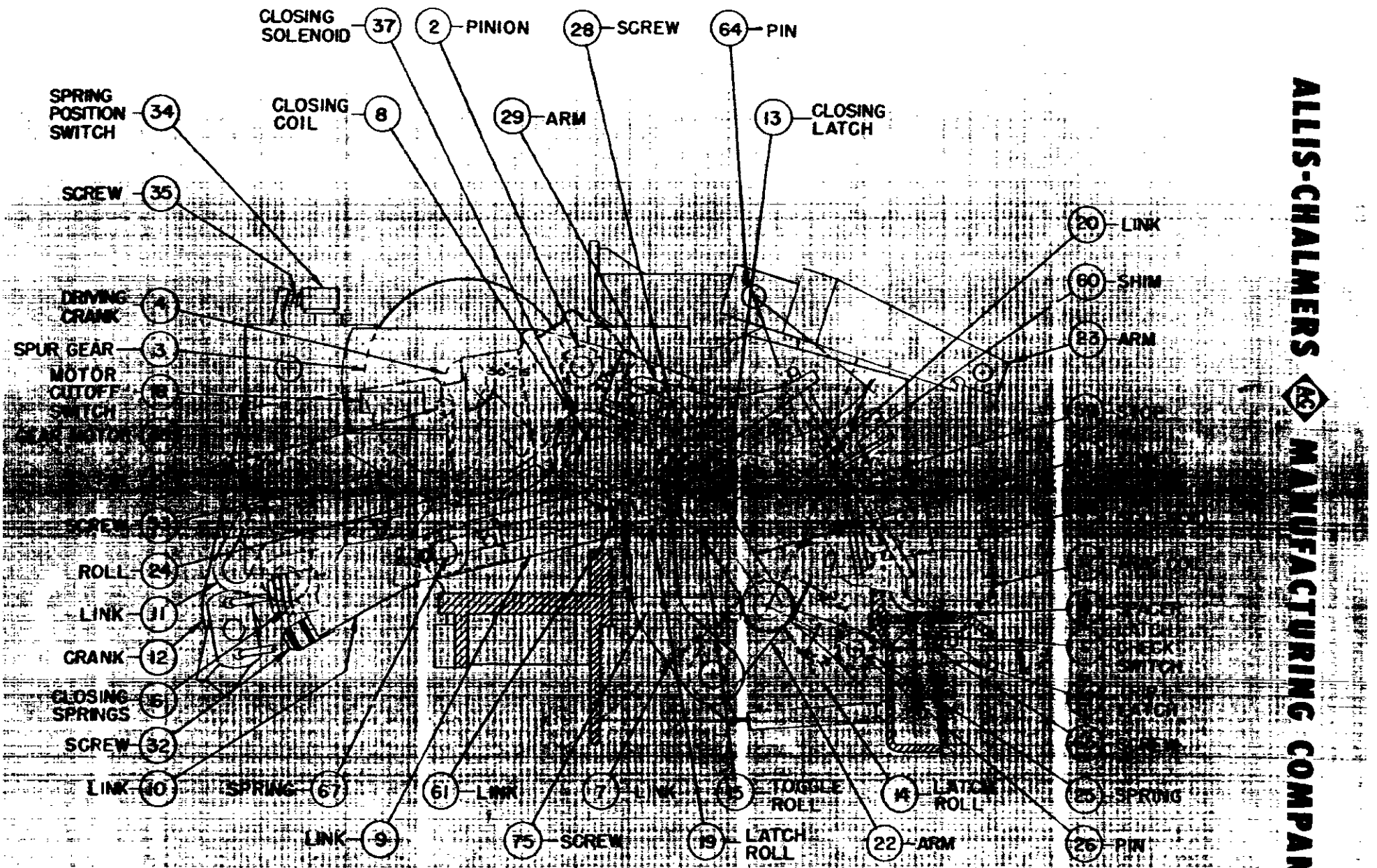


FIG. 4

ALLIS-CHALMERS MANUFACTURING COMPANY

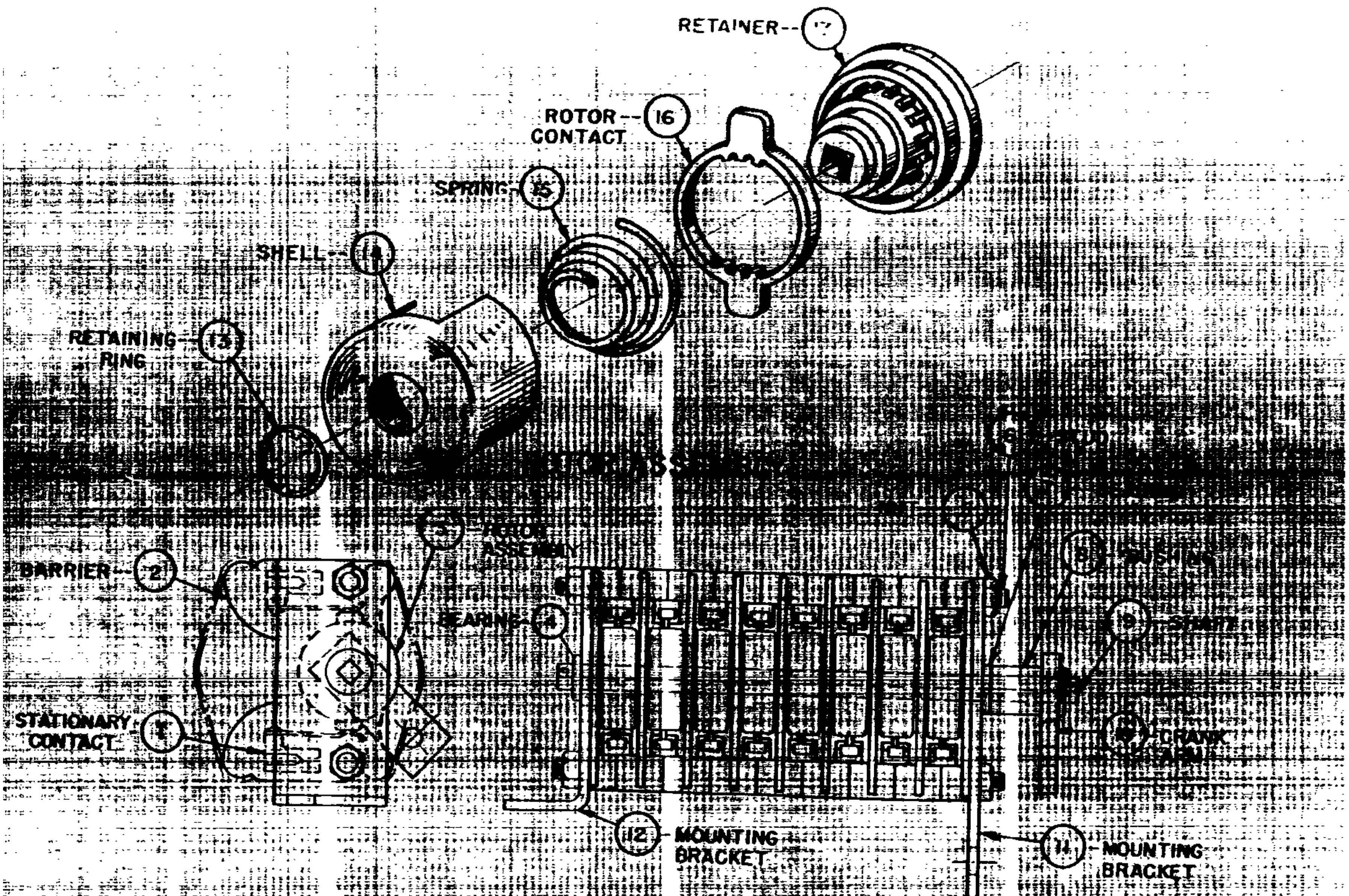


FIG. 11

TYPICAL AUXILIARY SWITCH