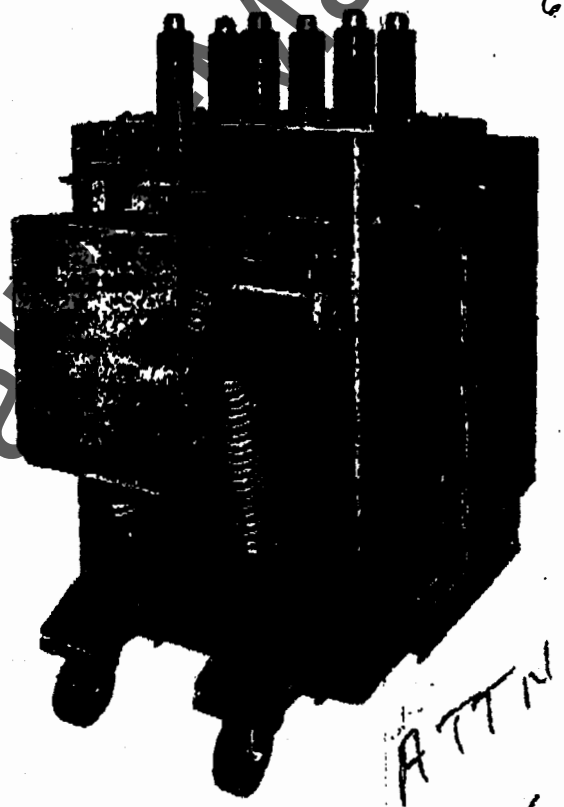
GEK-7328

INSTRUCTIONS AND RECOMMENDED PARTS FOR MAINTENANCE

MAGNE-BLAST CIRCUIT BREAKER

TYPES

AM-13.8-750-4C
AM-13.8-750-4CB
AM-13.8-750-4H
AM-13.8-750-4HB



CONTENTS

MEDIUM VOLTAGE SWITCHGEAR DEPARTMENT

GENERAL ELECTRIC

PHILADELPHIA, PA.

GEK-7322

INSTRUCTIONS AND RECOMMENDED PARTS FOR MAINTENANCE

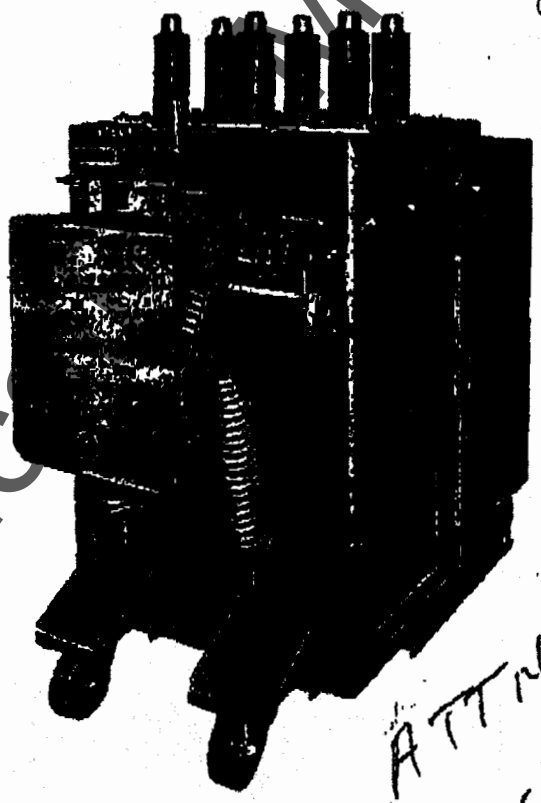
TO: MARK HAWKINS

MAGNE-BLAST CIRCUIT BREAKER

Donald Veal
610-921-6173

TYPES

AM-13.8-750-4C
AM-13.8-750-4CB
AM-13.8-750-4H
AM-13.8-750-4HB



CONTENTS

ATTN: CHRIS MURPHY

FROM DON VEAL

MEDIUM VOLTAGE SWITCHGEAR DEPARTMENT

GENERAL ELECTRIC

PHILADELPHIA, PA.

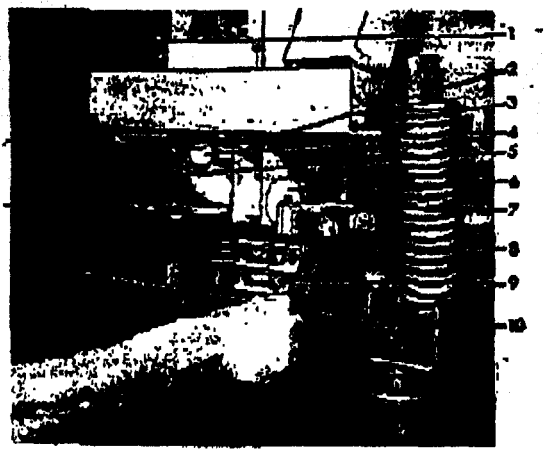


Figure 1. (8034475) Spring Blocking Device

1. Charge-Discharge Indicator
2. Support Bolts
3. Driving Pawl
4. Manual Close Lever
5. Motor
6. Eccentric
7. Closing Spring
8. Manual Charging Wrench
9. Fuse
10. Spring Blocking Device

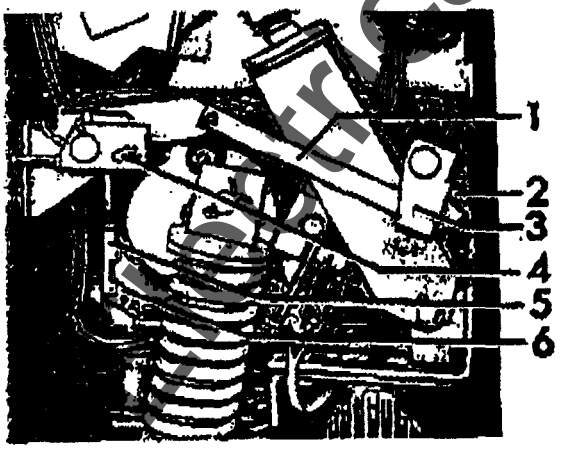


Figure 3. (8038806) Spring Discharge Linkage

1. Link
2. Adjusting Bolt
3. Trip Latch Crank
4. Discharge Crank
5. Adjusting Clevis
6. Spring Release Crank

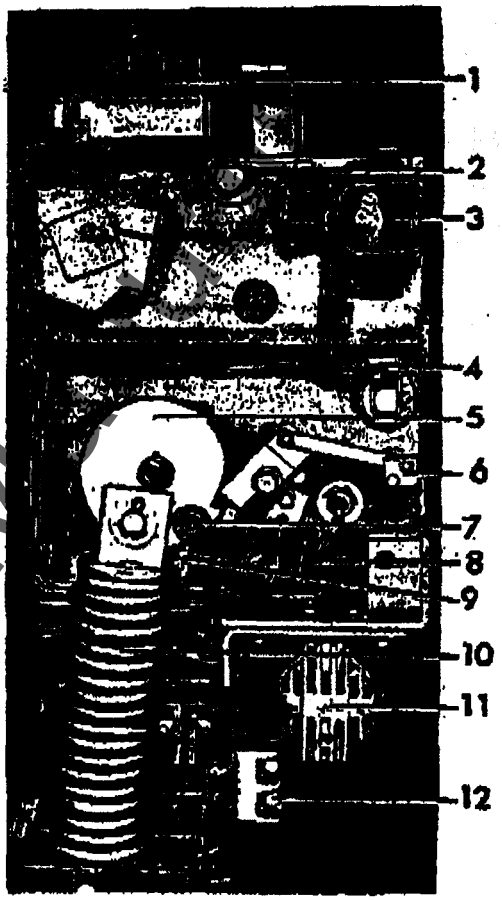


Figure 2. (8034473) Left Side View ML-13 Operating Mechanism

1. Secondary Coupler
2. Interlock Switches
3. Auxiliary Switch
4. Latch Checking Switch
5. Switch Cam
6. Charge-Discharge Indicator
7. Closing Latch Roller
8. Power Switches
9. Closing Latch
10. Closing Springs
11. Motor
12. Fuses

A positive interlock (2) Figure 4 and interlock switch (2) Figure 2, are provided between the breaker and metal-clad unit to prevent raising or lowering of the breaker in the unit while in a closed position and to prevent a closing operation when the breaker is not in either the fully raised or lowered position. To insure that this interlock will function during manual as well as during electrical operation of the equipment, both mechanical and electrical blocking is provided. If for any reason the closing springs should be discharged against the positive interlock the mechanism will be jammed and be inoperable. The mechanism can be released and returned to the reset position by pushing in on the trip lever (8) Figure 5. It may require more than normal force to release the interlock.

A plunger interlock, Figure 14 can be provided when required to operate a stationary auxiliary switch and/or a rod interlock mounted in the metal clad unit.

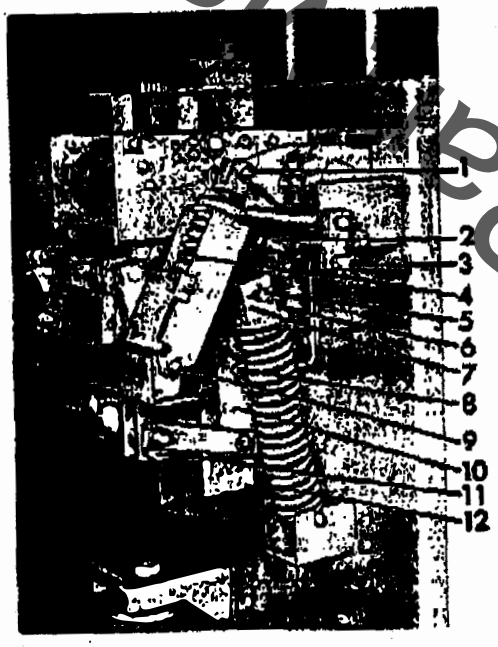


Figure 4. (8038804) Right Side View ML-13 Operating Mechanism

1. Upper Spring Pin
2. Latching Pawls
3. Positive Interlock Roller
4. Opening Spring
5. Cam Shaft
6. Ratchet Wheel
7. Bearing Block
8. Driving Pawl
9. Lower Spring Pin
10. Driving Pawl Lever
11. Eccentric
12. Closing Spring

When the breaker is used interchangeably with type MS-13 solenoid operated breakers in M-36 metal-clad units, fuses (12) Figure 2, are mounted on the breaker for protection of the motor and closing circuit. These breakers are identified by "C" suffix in the breaker nomenclature.

In cases where breakers with type ML-13 mechanisms must match and line up with breakers having type ML-11 mechanisms the spring charging circuit for both mechanisms should be fused with Buss Company Fusetrons as follows:

Cont. Volt.	Fuse Size	Cat. No.
48v d-c	10A	FRN 10
110v d-c	4A	FRN 4
125v d-c	4A	FRN 4
115v a-c	4A	FRN 4
220v d-c	2.5A	FRN 2.5
250v d-c	2.5A	FRN 2.5
230v a-c	2.5A	FRN 2.5

Spring Charging

The mechanism has a high speed gear motor (10) Figure 5, that compresses a set of closing springs through the action of an eccentric, ratchet, and pawl assembly. The rotary action of the motor is converted to a straight stroke through the eccentric (11) Figure 4, and a lever that carries a spring loaded driving pawl (3) Figure 1.

Figure 5.(8038803) Front View ML-13 Operating Mechanism

1. Auxiliary Switch
2. Open - Close Indicator
3. Trip Coil
4. Prop Spring
5. Operation Counter
6. Trip Latch
7. Charge-Discharge Indicator
8. Manual Trip Lever
9. Manual Close Lever
10. Motor

The pawl advances the ratchet wheel (6) Figure 4 a few degrees each stroke where it is held in position by the latching pawls (2). When the ratchet wheel has been rotated approximately 180 degrees the closing springs (12) will be fully compressed. As the ratchet wheel continues to rotate, the spring load will shift over center and attempt to discharge. After a few degrees of rotation, the closing roller (7) Figure 2, will engage the closing latch (9) and the compressed springs will be held by the latch until a closing operation is required. During the last few degrees of the ratchet wheel rotation the power switches (8) are opened and the driving pawl is raised from the ratchet wheel surface. This allows the motor and driving mechanism to coast to a natural stop expending all residual energy.

During the time the springs are being compressed a relay (17) Figure 6, is energized to hold the closing circuit open. The relay remains energized until the springs are fully charged and the control switch contacts are re-set.

The closing springs may be charged manually if control voltage is lost. A 5/8" ratchet wrench can be used to rotate the eccentric in a counter clockwise direction until the indicator reads "Charged" and the driving pawl is raised from the ratchet wheel. The use of the ratchet wrench provides for maximum safety in the event that control power is suddenly restored without warning. In this event, the motor drive will override the ratchet wrench and continues to charge the springs.

Closing Operation

The breaker can be closed electrically by energizing the spring release solenoid (16) Figure 6, or manually by pushing the close button (9) Figure 5. In either method the closing latch is rotated from under the closing roller to release the closing springs (10) Figure 2. The energy in the springs is used to rotate a cam (16) Figure 7 and close the breaker through the operating mechanism linkage. During the closing operation the mechanism is trip-free at all times. The breaker is held closed by the closing prop (14) moving into position under the prop pin (13). During the closing operation the opening springs (4) Figure 4, are compressed and held ready for an opening operation with the trip latch (8) Figure 7 bearing against the trip latch roller (9).

When the closing operation of the breaker is completed and the closing latch is fully reset,

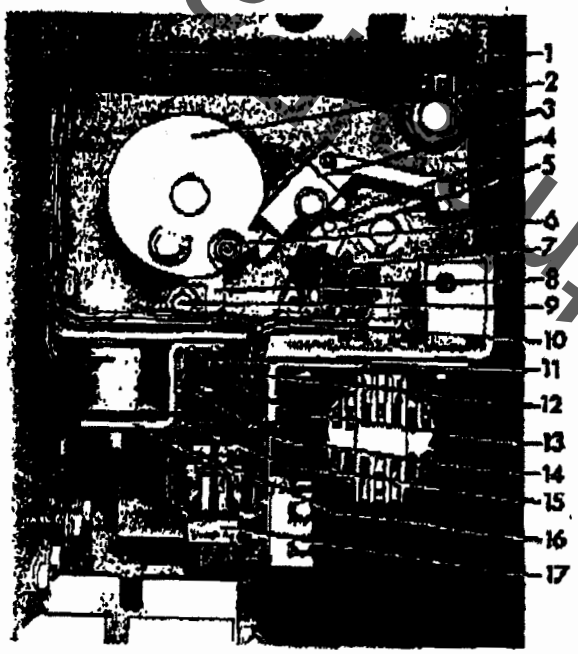


Fig. 6 (8034467) Control Mechanism

1. Latch Checking Switch
2. Switch Cam
3. Switch Striker
4. Switch Support Bolts
5. Switch Support
6. Closing Latch Roller
7. Power Switches
8. Closing Latch
9. Closing Latch Shaft
10. Latch Adjusting Screw
11. Release Coil Bolts
12. Closing Latch Spring
13. Latch Monitoring Switch
14. Switch Mounting Bracket
15. Spring Release Solenoid
16. Release Coil Support
17. Control Relay

the contacts of the latch monitoring switch closes to permit the spring charging motor to be energized and recharge the closing springs.

Opening Operation

The breaker can be opened either electrically by energizing the trip coil (3) Figure 5, or manually by pushing the trip lever (6). In each method the trip latch is rotated off the trip latch roller, permitting the operating mechanism linkage to collapse. The energy stored in the opening springs is released to provide the required opening speed for successful interruption of the circuit.

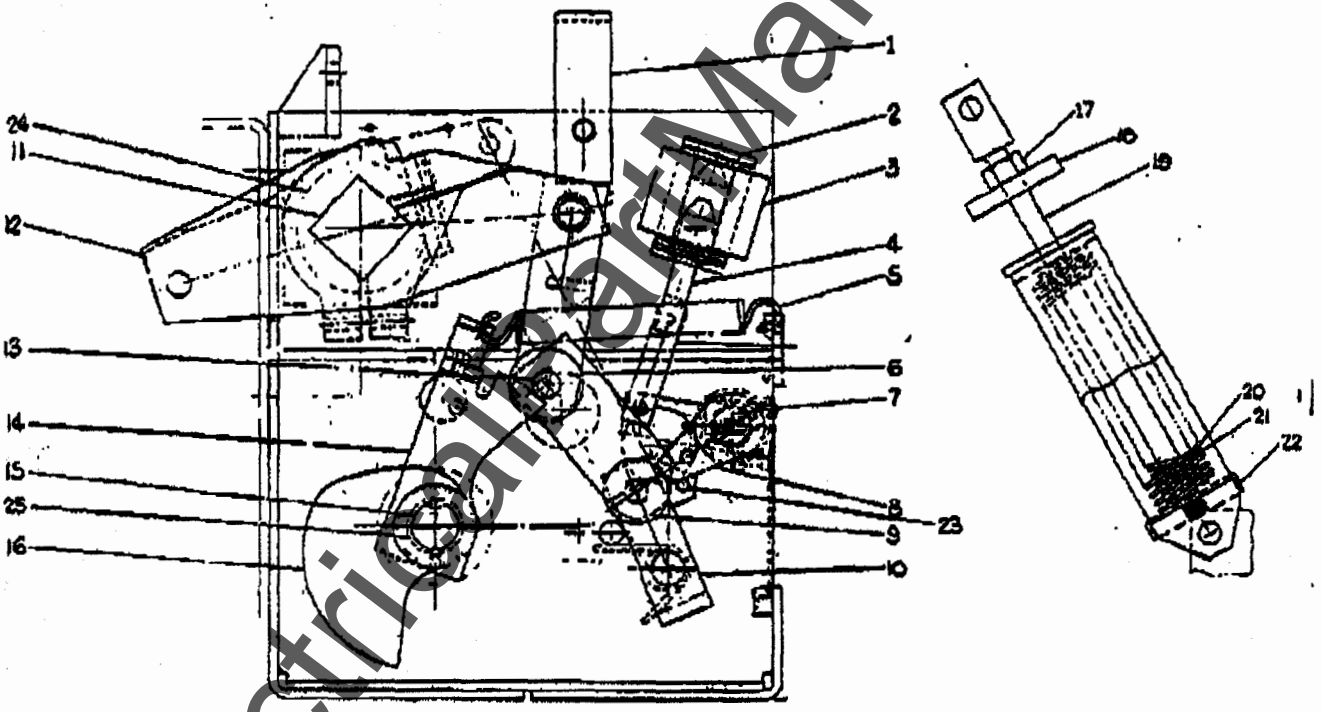


Fig. 7 (0114C5320) Sectional Side View of Mechanism

1. Handle
2. Trip Coil Support
3. Trip Coil
4. Trip Armature
5. Prop Reset Spring
6. Cam Follower Roller
7. Trip Shaft
8. Trip Latch
9. Trip Latch Roller
10. Trip Latch Roller Support
11. Crank Shaft
12. Cranks
13. Prop Pin
14. Prop
15. Drive Shaft
16. Cam
17. Check Nut
18. Stop Plate
19. Spring Rod
20. Spring
21. Spring
22. Spring Guide
23. Stop Pin
24. Main Shaft Bearing
25. Cam Shaft Bearing

As the breaker opens to interrupt a current, the arc first starts at the arcing contacts (7 & 24) Figure 8, transfers to the arc runner (8 & 9) and energizes the blow-out coils (6 & 11). This action introduces a magnetic field between the pole pieces (4 & 10) of the interrupter that forces the arc deeper into the arc chute (3). At the time the arcing contacts part a discharge of air is expelled through the booster tube (25) across the arc. This air flow assists the arc transfer and interruption by blowing the arc away from the contacts and into the arc chute. As the magnetic field forces the arc deeper into the interrupter along the diverging arc runners, the field is progressively increased by the insertion of each additional blow-out coil into the circuit.

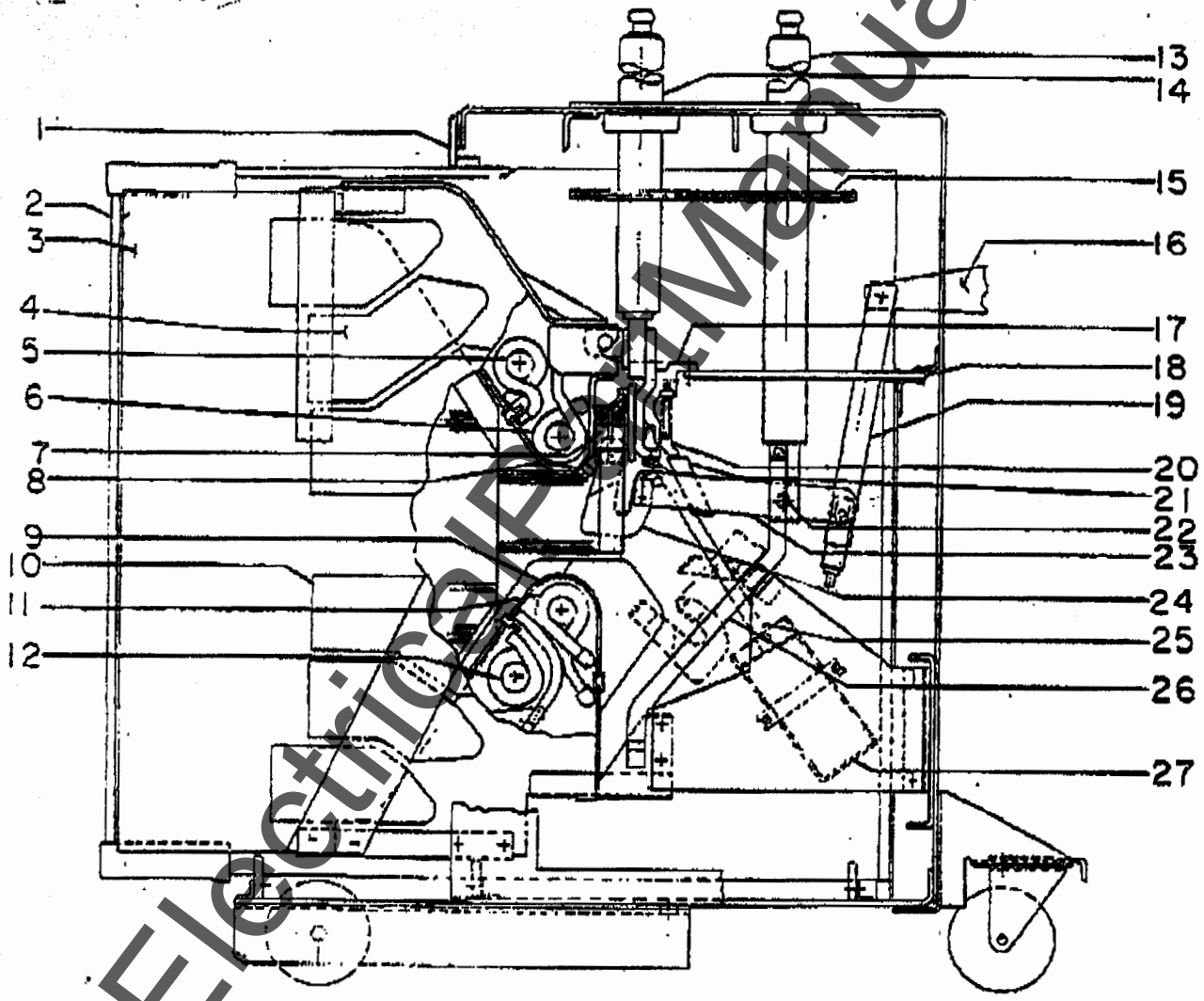


Fig. 8 (0132C2777) Cross Section of Breaker Pole Unit

1. Box Barrier Catch
2. Box Barrier
3. Arc Chute Side
4. Upper Pole Pieces
5. Upper Blow Out Core
6. Upper Blow Out Coil
7. Stationary Arcing Contact
8. Upper Arc Runner
9. Lower Arc Runner
10. Lower Pole Pieces
11. Lower Blow Out Coil
12. Lower Blow Out Core
13. Front Bushing
14. Rear Bushing
15. Upper Horizontal Barrier
16. Main Operating Crank
17. Spring Retainer
18. Lower Horizontal Barrier
19. Operating Rod
20. Stationary Primary Contact
21. Movable Primary Contact
22. Hinge Cup Bearing
23. Contact Arm Assembly
24. Movable Arcing Contact
25. Booster Tube and Piston
26. Connection Bar
27. Booster Cylinder

The arc chute has a series of interleaving ceramic fins, Figure 19. As the arc is forced into the interrupter it is lengthened in the gradually deepening serpentine path between the fins so that the electrical resistance of the arc is rapidly increased and its heat is absorbed by the ceramic material. The increased resistance reduces the magnitude and phase angle of the current and at an early current zero the arc cannot re-establish itself and interruption occurs.

Trip Free Operation

If the trip coil circuit is energized while the breaker is closing, the trip armature will force the trip latch (8) Figure 7 away from the trip roller (9) causing the mechanism linkage to collapse and the breaker to re-open. The closing cam (16) will complete its closing stroke and the springs will re-charge as in a normal closing operation.

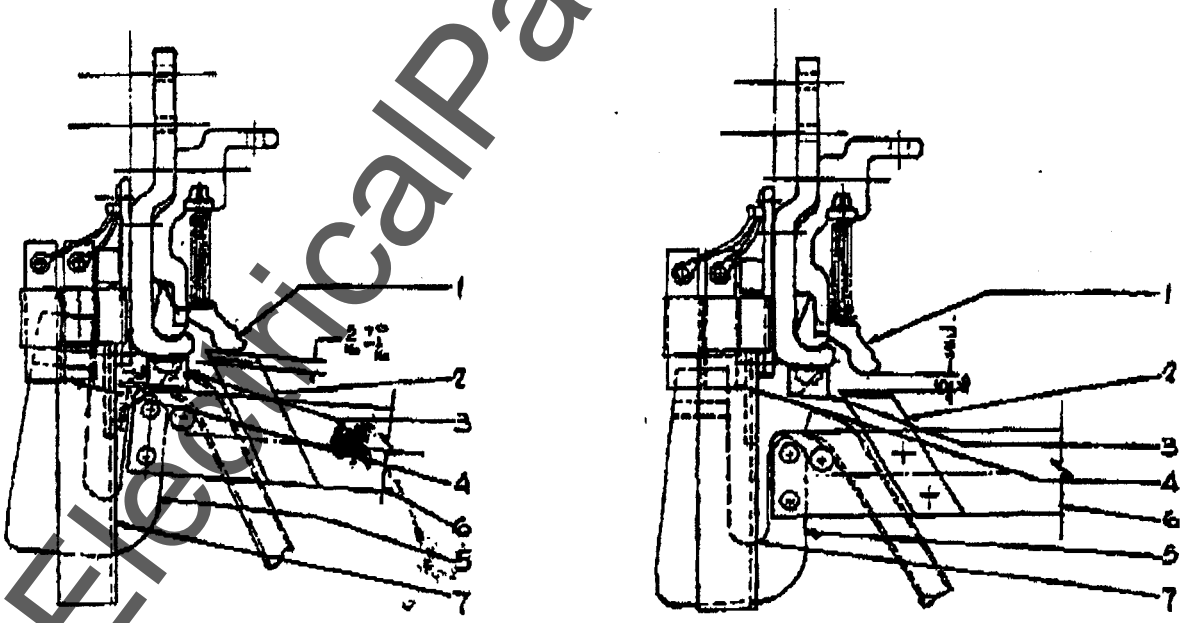
ADJUSTMENTS

All adjustments should be checked during periodic inspections and whenever it becomes necessary to repair or replace parts that have become worn or defective while in service. The following adjustments are listed in the order in which they are to be checked after removing the box barriers and front cover from the breaker.

DO NOT WORK ON EITHER THE BREAKER OR MECHANISM UNLESS THE CLOSING SPRINGS ARE BLOCKED AND THE OPENING SPRINGS HAVE BEEN TRIPPED OPEN OR MECHANICALLY BLOCKED. THIS MEASURE IS REQUIRED TO PREVENT ACCIDENTAL CLOSING OR TRIPPING.

Arcing Contact Wipe

Refer to Figure 9. Close the breaker until



Primary Contact Wipe

Arcing Contact Wipe

Figure 9 (0132C2778) Contact Adjustments

1. Stationary Primary Contacts
2. Movable Primary Contacts
3. Buffer Block
4. Stationary Arcing Contacts
5. Movable Arcing Contacts
6. Contact Arm
7. Throat Baffle

the arcing contacts just touch. This can be determined with the use of a circuit continuity tester such as a light indicator or bell set. In this position, the gap between the stationary primary contacts (1) and the movable primary contact (2) should be 5/16" or greater. This setting has been made in the factory and no adjustment is provided. A wiper of less than 5/16" is an indication that the arcing contacts need to be replaced. When making this check, see that the movable arcing contact (5) passes between the probes on the upper arc runner without touching. Also check for clearance between the arcing contact (5) and the slot in the throat baffle (7) during entire stroke of the moving contact assembly.

Primary Contact Wipe

Refer to Figure 9, when the breaker is closed the stationary primary contacts (1) should rise from 1/4" to 5/16". Before checking this dimension be sure the mechanism is re-set so that the prop pin (13) Figure 7 is resting on the prop. To obtain the proper contact adjustment, open the breaker and, referring to Figure 10, loosen the check nut (4) and turn the adjusting nut (3). Screwing up on the adjusting nut will decrease the primary contact wipe, down will increase it. Tighten the check nut, close the breaker and recheck the wipe. With the primary contact wipe correctly adjusted, the clearance between the contact arm (6) Figure 9 and the buffer block (3) should be 1/16" or greater when the breaker is fully closed.

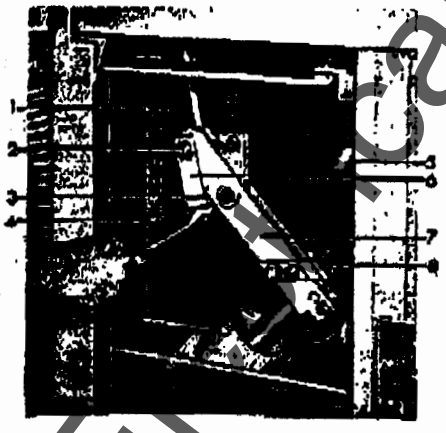


Figure 10. (8038802) Adjustable Coupling For Making Primary Contact Wipe Adjustments

1. Operating Rod
2. Operating Rod Pin
3. Adjusting Nut
4. Check Nut
5. Stationary Primary Contacts
6. Yoke
7. Contact Arm
8. Movable Primary Contacts

Primary Contact Gap

Refer to Figure 10. With the breaker closed, press the manual trip button allowing the breaker to trip open normally. Do not force the contacts open wider by hand. The gap between the stationary primary contacts (5) and the movable primary contact (8) measured between the closest points, should be 5 1/8" to 5 9/16". To change this gap, loosen the check nut (17), Figure 7, and turn the adjusting nut (18) on stud (19). Screwing the adjusting nut down will decrease the primary contact gap. Tighten the check nut and re-measure the contact gap (close and trip the breaker before checking the measurement). Whenever the primary contact gap is changed, the primary contact wipe should be rechecked and if necessary, readjusted.

Opening Buffer Clearance

Refer to Figure 25. Remove the operating rod pin (1) and set the primary contact gap at the maximum value. The clearance between the buffer block (3) and the contact arm (2) should be 1/16" to 3/16". To change this gap, add or remove shims (4) between the buffer block and the support. With the contact arm touching the buffer, the gap between the movable arcing contact (24) Figure 8 and the booster cylinder (27) should be a minimum of 1/4". Replace the operating rod pin.

WHEN WORKING ON THE MECHANISM IN THE CLOSED POSITION, KEEP FINGERS CLRAR OF THE LINKAGE, AS ACCIDENTAL TRIPPING CAN CAUSE SEVERE INJURY.

Trip Latch Wipe

Refer to Figure 7. The wipe of the trip latch (8) on the trip roller (9) should be from 3/16" to 1/4". This can be measured by putting a film of grease on the latch (8), closing the breaker part way, and tripping. The mechanism has the proper trip latch wipe when the latch rests against the stop pin (23). No adjustment is provided and a visual inspection is usually all that is required. If this setting is not correct, look for insufficient travel of the trip shaft (7).

Trip Armature Travel

Refer to Figure 7. The trip armature (4) should have 7/32" to 9/32" travel before the trip latch (8) starts to move. This can be adjusted by moving the trip coil support (2) and/or by adjusting the trip armature screw (13), Figure 11. A locking screw located behind the trip armature screw must first be loosened. Retighten locking screw after making adjustment.

Release Latch Wipe

Refer to Figure 6. The wipe between the release latch (8) and roller (6) should be 3/16" to 1/4". If re-setting is required, loosen, set, and re-tighten adjustment nut and screw (10).

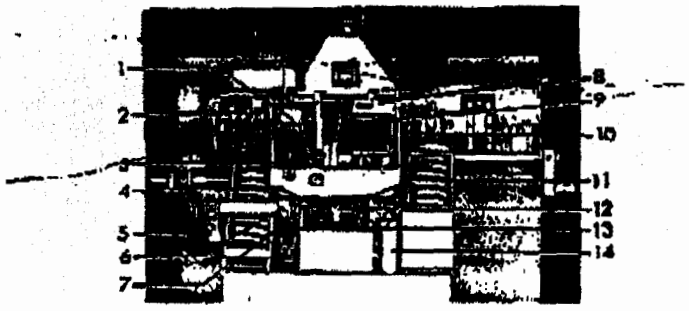


Figure 11. (8038803) Auxiliary Switch and Trip Coil

1. Open - Close Indicator
2. Auxiliary Switch
3. Prop Spring
4. Trip Latch Spring
5. Spring Discharge Crank
6. Switch Arm
7. Cotter Pin
8. Trip Coil Support
9. Trip Coil
10. Mounting Bolts
11. Trip Latch
12. Latch Set Screw
13. Trip Arm Screw
14. Manual Trip Lever

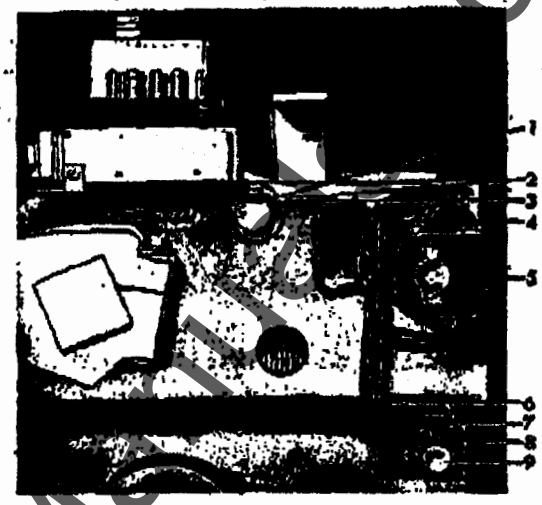


Figure 12. (8034474) Positive Interlock Switch

1. Positive Interlock Shaft
2. Switch Arm
3. Switch Support
4. Interlock Switch
5. Auxiliary Switch
6. Switch Support
7. Latch Checking Switch
8. Switch Arm
9. Trip Shaft

Release Latch Monitoring Switch

Refer to Figure 6. The release latch must be fully re-set and the latch monitoring switch (13) operated before the motor will start. When the latch is fully reset the clearance between the switch striker arm and the switch mounting bracket (14) is 1/32" or less, this can be adjusted by bending the striker arm.

Motor and Relay Switches

Refer to Figure 6. With the closing springs blocked rotate the switch cam (2) until the switch striker (3) has traveled the maximum amount (about 180 degrees rotation of cam). At this point the clearance between the striker and the switch support (9) should be 1/32" or less. This can be adjusted by loosening the switch support mounting bolts (4) and rotating the support.

Interlock Switch Wipe

Refer to Figure 12. With the positive interlock in the reset, or normal position the clearance between the interlock switch arm (2) and the switch mounting plate (3) should be 1/32" or less. This can be adjusted by bending the switch arm.

Driving Pawl Adjustment

Refer to Figure 4. The driving pawl (8) must advance the ratchet wheel (6) sufficiently on each stroke to allow the latching pawls (2) to fall into the ratchet teeth. This should be checked with the closing spring load against the driving members. With the mechanism unblocked, hand charge the closing springs with the manual charging wrench until they are slightly more than half charged. Slowly rotate the charging wrench until the driving pawl has traveled through its return stroke and check the maximum clearance between the pawl and the ratchet tooth. Rotate the charging wrench until the driving pawl has advanced the ratchet tooth to its maximum travel. Now check the clearance between the ratchet tooth and the latching pawl. The clearance should be approximately equal for both the driving and latching pawls and not less than .015" in either case.

If adjustment is required for either pawl the springs must first be fully charged and blocked. Loosen seven motor support bolts (2) Figure 1 and move entire motor assembly to the rear if the clearance is under the minimum at the latching pawls, and to the front if the clearance is under the minimum at the driving pawl. Move the motor assembly approximately twice the dimensional increase required at the pawl. Be certain the motor assembly is moved straight forward or rearward and tighten the one bolt on the right side of the mounting frame first to assure proper alignment. After tightening the remaining bolts the springs should be released and the clearance again checked as described above.

AUXILIARY DEVICES

Latch Checking Switch

Refer to Figure 13. Charge the closing springs sufficiently to reset the mechanism linkage. Rotate the trip latch (4) by pressing the manual trip lever to open the latch checking switch (2). Allow the trip latch to reset slowly and determine the point at which the contacts are made by using a circuit continuity tester (light indicator, bell set, etc). The contacts of the latch checking switch should just make when the gap between the trip latch (4) and the stop pin (5) located on the latch roller link (7) is 1/16". There should be a minimum of 1/64" between the switch arm (3) and the switch support (1). To obtain adjustment of the latch checking switch, bend the latch checking switch arm (3).

Plunger Interlock

Refer to Figure 14. With the breaker in the closed position, the vertical distance "A" from the top of the plunger bolt (1) to the bottom of the breaker lifting rail (3) should be 11- 7/32" to 11- 11/32". To change this adjustment, add or remove washers (2).

Auxiliary Fuses

Refer to Figure 15. On breakers with "C" suffix, a set of protecting fuses (10) are mounted on the front of the breaker. These fuses are the primary protective devices for the closing control circuit on those breakers that are used in metal-clad units designed for solenoid operated breakers.

Inspection and Test

1. For ease in reviewing the adjustments, the following are recapitulated:
   a. Primary contact wipe: 1/4" to 5/16".
   b. Arcing contact wipe: 5/16" or greater gap at primary contacts.
   c. Primary contact gap: 5-1/8" to 5-9/16".
   d. Trip latch wipe: 3/16" to 1/4" with trip latch resting against stop pin.
   e. Trip armature travel 7/32" to 9/32".
   f. Release latch wipe: 3/16" to 1/4".

Figure 14. (8034464) Plunger Interlock

1. Plunger Bolt
2. Washer
3. Breaker Lifting Rail

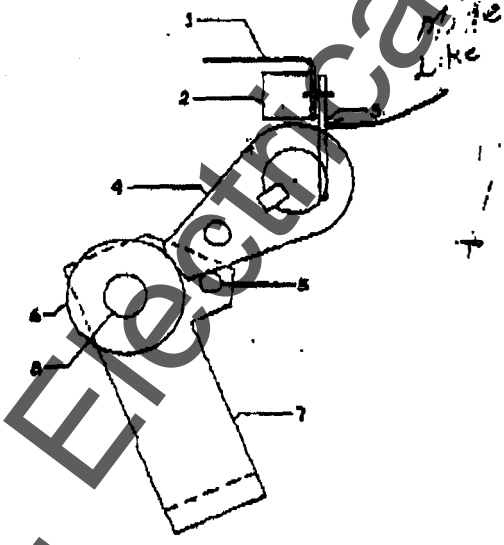


Figure 13 (0114C5320) Latch Checking Switch

1. Switch Support
2. Latch Checking Switch
3. Switch Arm
4. Trip Latch
5. Reset Pin Stop
6. Latch Roller
7. Latch Roller Link
8. Latch Roller Pin

Figure 15 (8034471) Driving Elements

1. Mounting Bolts
2. Manual Close Button
3. Eccentric
4. Retaining Ring
5. Hex Charging Stud
6. Driving Link
7. Motor Support
8. Retaining Ring
9. Motor
10. Fuse

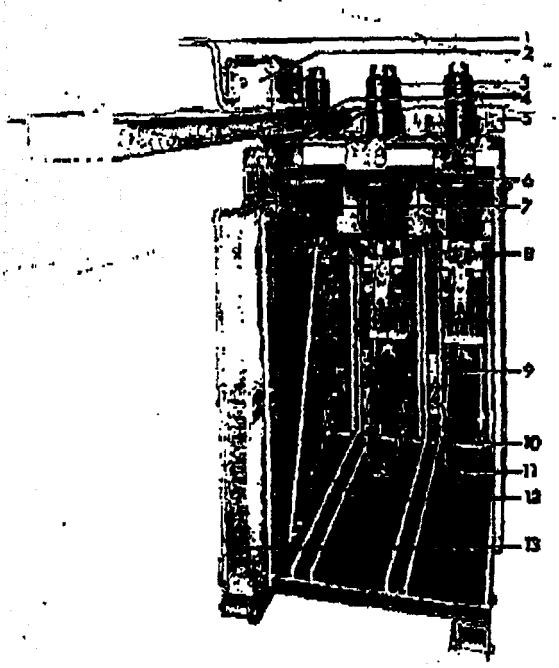


Figure 16 (8034810) Interrupter Partially Removed Showing Accessibility of Arcing Contacts

1. Handle
2. Trolley
3. Rear Bushing
4. Arc Chute Lifter
5. Angle Support
6. Grappling Hooks
7. Lifting Bolt
8. Upper Supporting Bolt
9. Movable Arcing Contact
10. Support Bracket
11. Lower Supporting Bolt
12. Lower Interrupter Support
13. Arc Chute

Breaker Contacts

By removing the box barrier the movable and stationary primary contacts and the movable arcing contacts can be inspected. The stationary arcing contacts can be inspected only after removing the interrupter. If the contacts are burned or pitted, they can be made smooth with a fine file.

After completing inspection of the contacts, check the contact adjustments as specified under ADJUSTMENTS.

Mechanism

A careful inspection should be made to check for loose nuts or bolts and broken retaining rings. All cam, roller, and latch surfaces should be inspected for any evidence of damage or excessive wear. Lubricate the mechanism as outlined below, then, using the manual charging wrench, open and close the breaker several times to make certain that the mechanism operates freely throughout its entire stroke. Check the mechanism adjustments as specified under ADJUSTMENTS. Check the control wiring for tightness of connections and damaged insulation.

Bushings and Insulation

The surface of the bushings should be kept clean and unmarred to prevent moisture absorption. If the insulation surface should become damaged, it should be sanded and cleaned, and should be refinished with either clear varnish or clear resin. Allow to dry smooth and hard.

All other insulation parts on the breaker should be kept clean and dry. Smoke or dust collected between inspection periods should be wiped off, and if dampness is apparent, heaters should be installed in the metal clad switchgear to insure dryness.

Insulation Test

When insulation has been repaired or replaced, or when breaker has been operating in adverse moisture conditions, it is recommended that the insulation be checked before the breaker is placed back in service. A standard 60 hertz high potential test at 27,000 volts RMS for one minute will normally indicate whether the breaker is satisfactory for service. With the breaker contacts in the fully opened position, apply the test potential to each terminal of the breaker individually with all other terminals and the breaker frame grounded. After high potential tests are made on organic insulating materials, these materials should be inspected for visible leakage current paths, and necessary action must be taken to repair or replace insulation that may have been affected by moisture absorption.

If the breaker secondary wiring is to be given a hi-potential test at 1500 volts, remove both of the motor leads from the terminal board. Failure to disconnect the motor from the circuit may cause damage to the winding insulation.

Lubrication

In order to maintain reliable operation, it is important that all circuit breakers be properly lubricated at all times. Most of the bearings and rolling surfaces utilize a new type of dry lubrication that will require no maintenance and will last the life of the equipment. Only few bearings and surfaces listed in the chart, Figure 17, require lubrication. These have been properly lubricated during assembly at the factory, using the finest grades of lubricants available. However, even the finest oils and greases have a tendency to oxidize with age, as evidence by hardening and darkening in color. Elimination of the hardened lubricant is essential for the proper operation of circuit

1. Assembly Bolts
2. Assembly Bolt
3. Upper Brace
4. Upper Pole Pieces
5. Assembly Bolt
6. Side Brace
7. Lower Pole Pieces
8. Lower Brace
9. Assembly Bolt
10. Assembly Bolts
11. Assembly Bolts
12. Upper Interrupter Support
13. Assembly Bolts
14. Upper Insulation
15. Assembly Bolts
16. Side Shield
17. Assembly Bolts
18. Lower Interrupter Support
19. Assembly Bolts
20. Assembly Bolts

Figure 18. (8039452) Interrupter Assembly

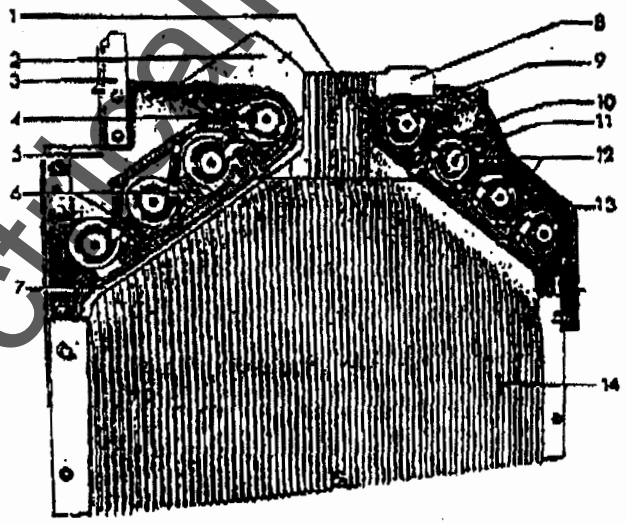


Fig. 19 (8039453) Interrupter Assembly with Side Removed

1. Throat Cooler
2. Lower Insulation
3. Lower Coil Connection
4. Lower Arc Runner
5. Lower Arc Runner Assembly
6. Lower Arc Runner Spacers
7. Lower Runner Shield
8. Upper Insulation
9. Upper Arc Runner
10. Blowout Coil
11. Blowout Core
12. Upper Arc Runner Spacers
13. Upper Arc Runner Assembly
14. Arc Chute Side

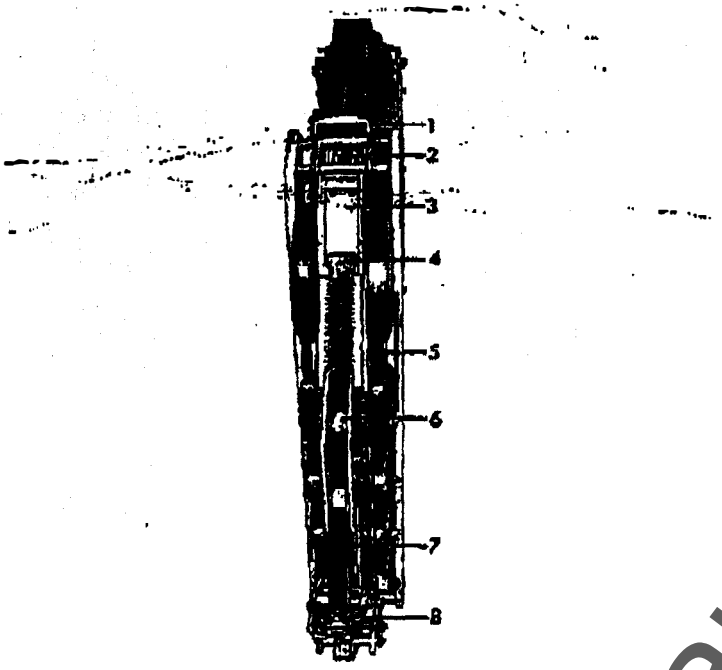


Figure 20. (8039455) Interrupter Assembly

1. Upper Support
2. Upper Coil Connection
3. Insulation
4. Upper Arc Runner
5. Side Shield
6. Lower Arc Runner Assembly
7. Lower Coil Connection
8. Connection Nut

Figure 21. (8029373) Arc Chute Fin Spacing

CONTACTS

Open the breaker and remove the box barriers and interrupters as previously described. To remove the contacts, proceed as follows:

A. Stationary Arcing Contacts (10), Figure 22.

1. Disconnect the contact braids (7) from the contact fingers by removing four bolts and locking plates (8).
2. Grasp the lower end of the contact fingers with pliers and move contact assembly towards rear of stud to remove from stud assembly.
3. To disassemble braids from stud plate remove one bolt (5).
4. To disassemble stud plate from contact support, remove two bolts (6).
5. Reassemble in the reverse order, make sure locking plates are properly re-assembled with bolts (8).

B. Movable Arcing Contact (15) Figure 23.

1. Remove the assembly bolts (14) making note of quantity and location of shims and spacers used between contacts and contact arms.
2. Reassemble in reverse order, re-using the shims and spacers.
3. Close the breaker slowly to check that the movable arcing contact is approximately centered on the stationary arcing contact and that it does not rub on either side of the throat barrier (11).

NOTE: Whenever it is found necessary to replace arcing contacts on any pole of a breaker it is recommended that both the stationary and movable contacts on that pole be replaced at the same time.

C. Stationary Primary Contacts (9), Figure 24.

1. Compress the contact spring (6) by use of the spring compressor.
2. Remove spring and spring guide (1).
3. Raise the contact finger to clear the primary contact stop plate (8) and lift the finger out of contact support (7). Remove one contact finger at a time.

1. Apply a thin coating of D50H47 grease on the hinged edge of the finger (9) then place it on the contact support (7) so

that it is retained by stop plate (8).

2. Open spring compressor (3) and assemble spring guide, spring and spring compressor (Figure 24A).

3. Turn nut (2) in clockwise direction to compress contact spring (Figure 24B). Hold spring firmly in yoke on spring compressor to prevent spring from slipping out of the compressor.

4. Place washer (not shown) on guide on top of spring, place top of guide into hole in spring retainer (4) and the round end of spring guide in cutout in primary finger (Figure 24C).

5. Hold spring assembly firmly in place and remove spring compressor.

D. Movable Primary Contacts (12), Figure 23.

To replace the movable primary contacts on a 1200 ampere breaker proceed as follows:

1. Disassemble nuts from assembly bolts (13) and remove the movable primary contacts (12).

2. Reassemble in reverse order.

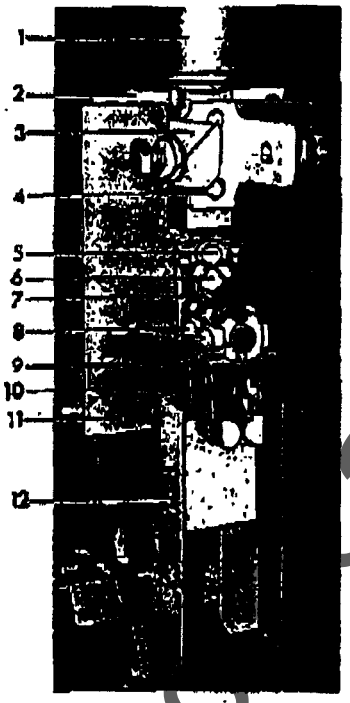


Figure 22. (8039457) Rear Bushing Assembly

1. Rear Bushing
2. Contact Support
3. Guide and Support for Interrupter
4. Bolts for Contact Support
5. Bolt For Flexible Braid
6. Mounting Bolt
7. Flexible Braid
8. Connection Bolt
9. Stud for Mounting Arcing Fingers
10. Stationary Arcing Contact Assembly
11. Baffle
12. Throat Baffle

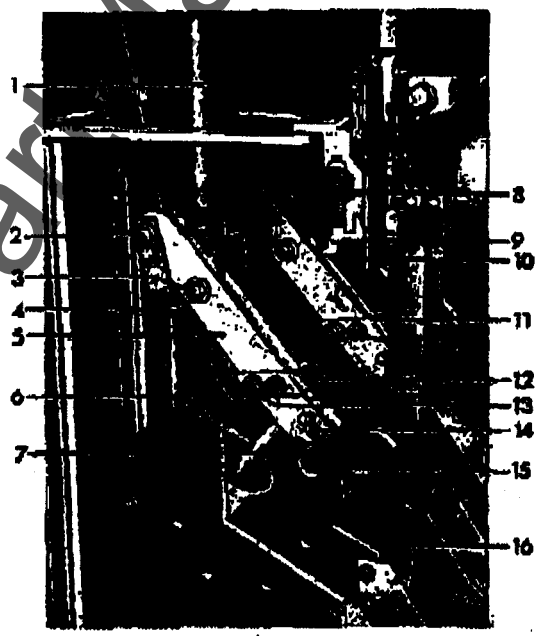


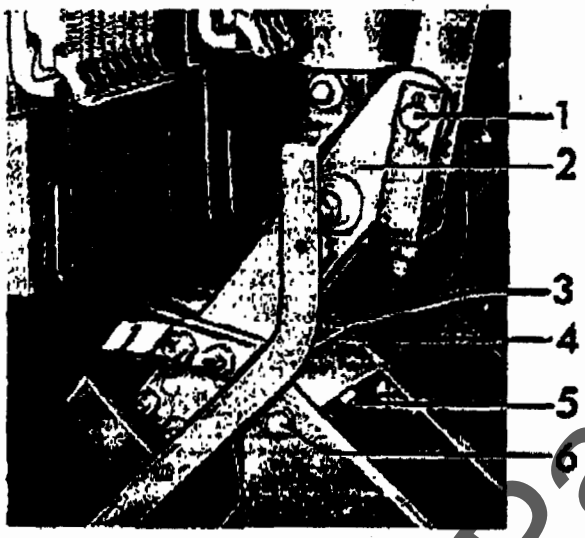
Figure 23. (8039459) Contact Assembly

1. Front Bushing
2. Operating Rod Pin
3. Hinge Pin
4. Cup Bearing
5. Contact Arm
6. Opening Buffer
7. Piston Assembly
8. Contact Springs
9. Stationary Primary Contacts
10. Closing Buffer
11. Throat Barrier
12. Movable Primary Contacts
13. Assembly Bolts
14. Assembly Bolts
15. Movable Arcing Contact
16. Connection Bar

4 After reassembling springs check the open gap at the primary contacts as described under PRIMARY CONTACT GAP.

OPENING BUFFER

To remove the buffer assembly, remove assembly bolt (6) Figure 25. The buffer may be further disassembled by removing assembly bolts (5). Reassemble in reverse order and check buffer clearance as explained under adjustment.



1. Operating rod pin
2. Contact arm
3. Buffer block
4. Shims
5. Assembly bolts
6. Assembly bolts

Figure 25. (8039456) Opening Buffer Assembly

RENEWAL PARTS

It is recommended that sufficient renewal parts be carried in stock to enable the prompt replacement of any worn, broken, or damaged parts. A stock of such parts minimize service interruptions caused by breakdowns, and saves time and expense When continuous operation is a primary consideration, more renewal parts should be carried, the amount depending upon the severity of the service and the time required to secure replacements.

Renewal parts which are furnished may not be identical to the original parts since improvements are made from time to time. The parts which are furnished, however, will be interchangeable.

NOTE: The listed terms "Right" and "Left" apply when facing the mechanism end of the breaker.

ORDERING INSTRUCTIONS

1. Always specify the complete nameplate data of both the breaker and the mechanism.
2. Specify the quantity, catalog number (if listed), reference number (if listed), and description of each part ordered, and this bulletin number.
3. Standard hardware, such as screws, bolts, nuts, washers, etc., are not listed and should be purchased locally.
4. For prices, refer to the nearest office of the General Electric Company.

PARTS RECOMMENDED FOR NORMAL MAINTENANCE

In the following tabulations are listed those parts of the breaker and operating mechanism which are usually recommended for stock for normal maintenance. Other parts can be obtained by contacting the nearest office of the General Electric Company.

RECOMMENDED RENEWAL PARTS FOR MAGNEBLAST BREAKERS

TYPE AM-13.8-750-4 (*) 1200 & 2000 AMPERE

(* SUFFIX LETTERS H, C, B, R)

Fig. No.	Ref. No.	Ampere Rating	Type	Catalog No.	No. Req'd.	Description
8	27	All	All	0267B0292P002	3	Booster Cylinder
10	1	All	Δ	0268B0708G001	3	Operating Rod Assembly
10	1	All	B	0268B0708G007	3	Operating Rod Assembly
22	7	All	All	0208A80170001	3	Flexible Connector (Left, Long)
22	7	All	All	0208A80170002	3	Flexible Connector (Right, Long)
22	7	All	All	0208A80170003	3	Flexible Connector (Left, Short)
22	7	All	All	0208A80170004	3	Flexible Connector (Right, Short)
22	12	All	All	0208A80160001	3	Throat Barrier Assembly
22	10	All	All	0213X0344G032	3	Arcing Contact Assembly
23	8	All	Δ	0121A5964P001	18	Primary Contact Finger Spring
23	8	All	B	0121A5964P001	24	Primary Contact Finger Spring
23	9	All	Δ	0114C5382P002	18	Primary Contact Finger
23	9	All	B	0114C5382P002	24	Primary Contact Finger
23	12	All	Δ	0114C5382P004	6	Movable Primary Contact
23	12	All	B	0137A9164P003	6	Movable Primary Contact
23	12	All	B	0137A9164P004	6	Movable Primary Contact
23	15	All	All	0108B5936G001	3	Movable Arcing Contact
23	7	All	All	0213XD3430093	3	Tube & Piston Assembly
19	8	All	All	0208A80150001	3	Upper Shield Assembly (Right)
19	8	All	All	0208A80150002	3	Upper Shield Assembly (Left)
19	1	All	All	0132C7200001	3	Throat Cooler Assembly (Right)
19	1	All	All	0132C7200002	3	Throat Cooler Assembly (Left)
19	2	All	All	0132C7722P009	3	Lower Runner Barrier (Right)
19	2	All	All	0132C7722P010	3	Lower Runner Barrier (Left)
19	7	All	All	0132C7722P012	3	Lower Runner Shield (Right)
19	7	All	All	0132C7722P013	3	Lower Runner Shield (Left)
20	3	All	All	0108B5520P008	3	Insulation Plate
*	*	All	All	0265C0153P009	6	Upper Runner Insulation

Δ All Except Breakers with "B" in Suffix
* Not Illustrated