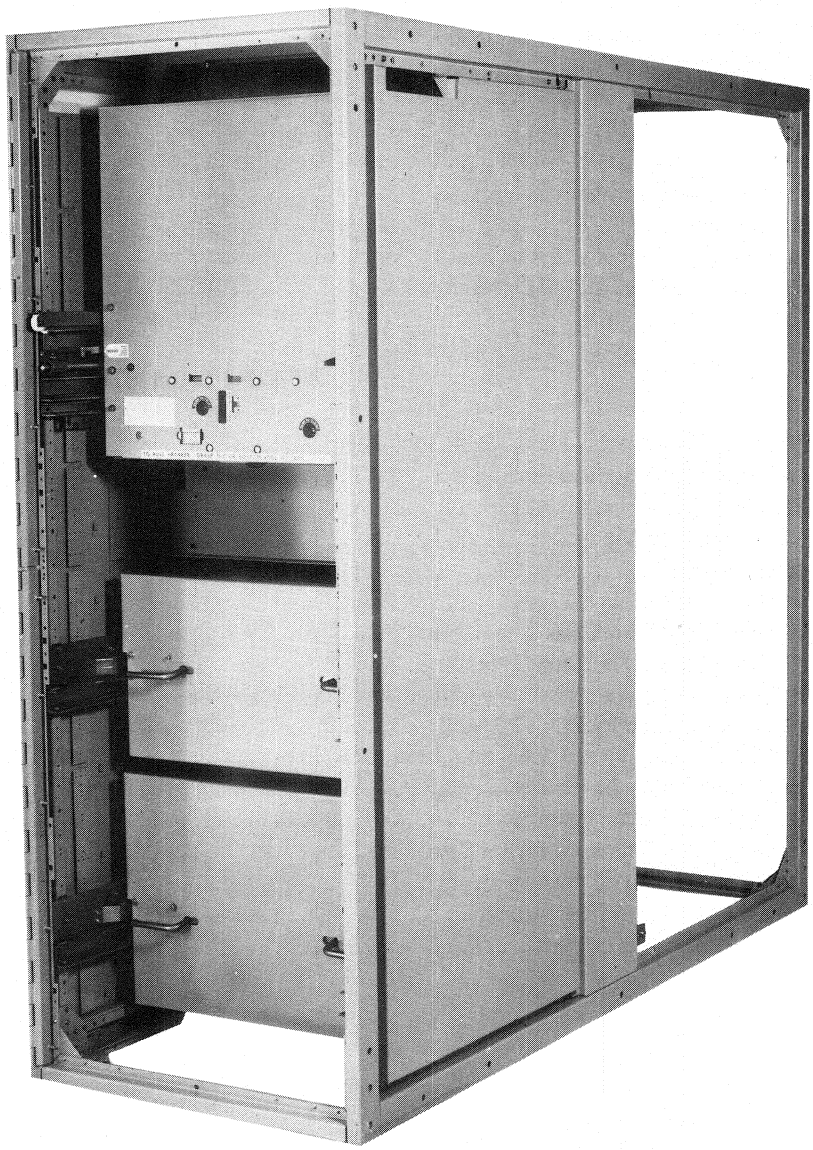
INSTRUCTIONS AND RECOMMENDED PARTS FOR MAINTENANCE

GEK-90209

METAL-CLAD SWITCHGEAR COMPONENTS
TYPES 4.16 AND 13.8
FOR POWER/VAC* CIRCUIT BREAKER
TYPES VB-4.16, VB-7.2, VB-13.8
VB1-4.16 AND BV1-13.8



GENERAL ELECTRIC

CONTENTS

Page No.

Description 3
- Breaker Removable Element 3
- Breaker Lift Truck 3
- Breaker Racking Mechanism 3
- Remote Racking Device 3
- Primary Disconnects 3
- Dummy Removable Element 5
- Ground and Test Device 5

Operation 5
- Breaker Installation 5
- Breaker Racking with Front Door Closed 8
- Remote Racking Attachment 8
- Positive Interlock 8
- Negative Interlock 8
- Spring Discharge Interlock 10
- Interference Interlock 11
- Closing Spring Gag Interlock 12
- Key Lock 10
- Padlocks 11
- Stationary Auxiliary Switch 11
- Breaker Position Switch 11
- Test Cabinet 12

Maintenance 12
- Recommended Annual Maintenance 13

LIST OF ILLUSTRATIONS

Figure No. Page No.

1 Primary Disconnects 1200, 2000, 3000 Amp 4
2 Racking Arm Position Indicator 6
3 Racking Mechanism 7
4 Lift Truck Interlocks 7
5 Positive Interlock 8
6 Negative Interlock 9
7 Key Lock and Padlocks 9
8 Closing Spring Discharge Interlock 10
9 Stationary Auxiliary Switch and Breaker Position Switch 11
10 Interference Interlock 11
11 Test Cabinet 12
12 Left Hand Track Assembly 14
13 Right Hand Track Assembly 14
14 Spreader Bar, Chain and Idler Sprocket 14
15 Porcelain Primary Disconnect 15
16 Polyester Primary Disconnect 15
17 Metal-Clad Breaker Unit 15

DESCRIPTION

BREAKER REMOVABLE ELEMENT

The removable element consists of a,Power/Vac* circuit breaker which includes an operating mechanism, interlocks, primary and secondary disconnecting devices. The Power/Vac* breakers are equipped with wheels for easy movement along the floor.

A lift truck (Fig. 4) may be provided for insertion and removal of the circuit breaker from the metal-clad unit.

Power/Vac* circuit breakers of the same rating are interchangeable in their corresponding metal-clad units. An interference interlock is provided on the rear of each circuit breaker to insure that the properly rated breaker is used with in the proper metal-clad unit. (See OPERATION — INTERFERENCE INTERLOCK).

For a detailed description of the Power/Vac* breaker and its operation the breaker instruction book GEK90207 or GEK97208 should be consulted.

BREAKER LIFT TRUCK

For ease of breaker handling during installation and removal, a breaker lift truck may be furnished as an option accessory (Fig. 4). This accessory device is used to elevate the breaker from the floor or working platform to the level of the tracks in the switchgear cubicle. Docking of the lifting device rails to the switchgear tracks is provided for maximum safety. (See OPERATION - BREAKER INSTALLATION).

BREAKER RACKING MECHANISM

When installed in the switchgear cubicle the removable element is supported by two horizontal steel tracks, one on each side of the cubicle. The racking mechanism moves the breaker element along these tracks between the connected and test positions. This mechanism consists of heavy-duty steel jack screws which carry nuts that engage the sides of the removable element. The racking mechanism may be manually operated with the racking handle which is furnished with each equipment.

The breaker cannot be moved between the connected and test positions unless it has been tripped. The breaker cannot be closed unless it is in the connected or test position.

For a detailed explanation of the racking mechanism refer to description under OPERATION - CLOSED DOOR BREAKER RACKING.

REMOTE RACKING OPERATOR

The electrically operated racking device provides a convenient means for racking a breaker between the connected and test positions from a remote location. It is easily mounted to the breaker unit front door and is designed for quick transfer between units.

The remote racking operator is furnished in two operating voltage versions. The 115 VAC, 50/60 hertz model has a four foot electrical cord with standard three prong plug to fit a grounded receptacle or extension cord. The 230 VAC, 50/60 hertz model has a three wire four foot cord to which the purchaser applies his standard plug.

The remote racking operator is provided with a two position directional switch, an "On-Off" circuit breaker and a push button control box attached with a 30 foot extension cord.

Instructions for the remote racking operator are found in GEK 86130 (115 VAC) & GEK 86131 (230 VAC).

PRIMARY DISCONNECTS

The 1200 and 2000 ampere primary disconnects consists of two rows of silver-plated copper fingers mounted on either side of the circuit breaker studs. These fingers are held in place with a spider which positions the fingers and fastens them to the breaker. Wipe pressure is obtained by tension springs between the rows of fingers which pull them together. When the circuit breaker is connected to the metal-clad studs, the spring force on the fingers is divided between the breaker stud and metal-clad studs. See Fig. 1.

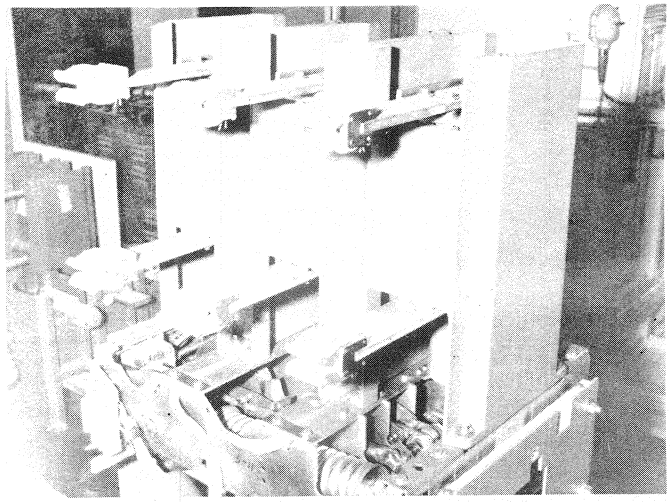
On 3000 ampere primary disconnects silver-plated copper fingers are positioned in a circular configuration and are supported by a non-magnetic spider. This spider spaces the fingers equally around the breaker stud and fastens them to the end of the stud. The fingers are held in contact with the breaker stud by a stainless steel garter spring. A second garter spring on the outer end of the finger provides contact pressure when the finger assembly is connected to the tube in the metal-clad unit. See Fig. 1.

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

To the extent required the products described herein meet applicable ANSI, IEEE and NEMA standards; but no such assurance is given with respect to local codes and ordinances because they vary greatly.

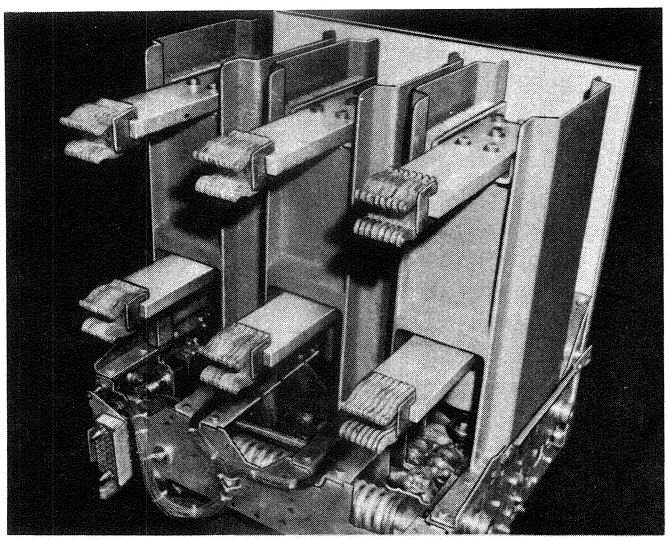
*Registered Trademark of the General Electric Company

1 — 1200 AMP



(8042977)

2 — 2000 AMP



(89184311)

3 — 3000 AMP

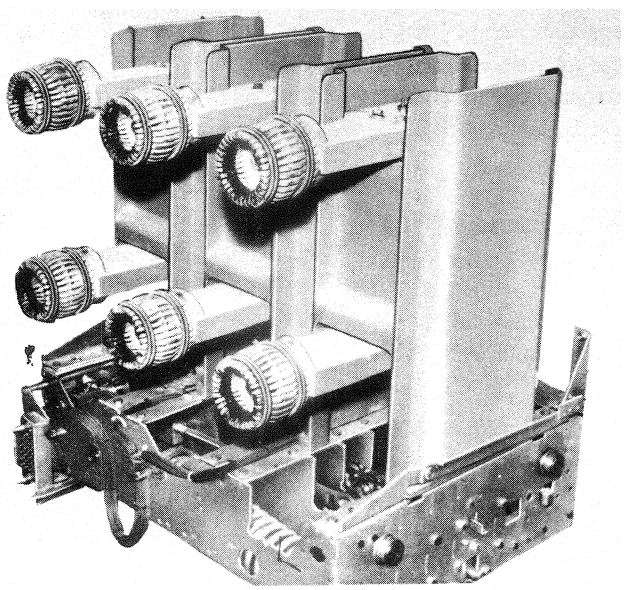


Fig. 1 Primary Disconnects

DUMMY REMOVABLE ELEMENT

Dummy removable elements, are used as a means of isolating circuits or bus sections, where operation is infrequent and circuit breaker cannot be economically justified. The device consists of a circuit breaker mechanism frame and primary insulator supports with six primary studs including disconnecting devices. Copper rods are bolted in the location normally occupied by vacuum interrupters. The stationary structure is the same as for a circuit breaker. When the device is fully racked in, it connects the top set of metal-clad primary disconnects to the bottom set.

An interlock system is provided to insure that the dummy element cannot be racked in or out, unless all sources to which it may connect are de-energized. The dummy element includes an extension from the side which is an exact duplicate of the positive interlock extension on a standard circuit breaker when that breaker is closed. Hence, insofar as the racking mechanism is concerned the dummy element locks exactly like a closed circuit breaker, and the positive interlock prevents it from being racked in or out.

A key lock is provided on the dummy element. It takes a key which becomes available only when all sources, to which the dummy might connect, are de-energized. When the key is available the key interlock can be operated to withdraw the positive interlock extension. The dummy element now looks like an open breaker, and it can be racked in or out. As long as the positive interlock extension is withdrawn, the key is captured and it cannot be released unless the dummy element is in the CONNECTED or TEST position or completely withdrawn. Hence, the sources to which the dummy may connect cannot be re-energized until the dummy is in one of these three positions.

The key for the dummy element interlock will usually be obtained from a transfer lock at which all the source keys are accumulated and captured before the dummy element key can be obtained.

GROUND AND TEST DEVICE

This device is designed to make either the upper or lower primary conductors in the breaker unit readily accessible. The type PVV ground and test device, provides a convenient means of grounding the cables or the bus in order to safeguard personnel who may be working on the cables or the equipment. The device can be used for applying power for high potential tests or for fault location. It can be used to measure insulation resistance (megger). By using potential transformers, it can also be used for phasing out cables. Refer to the instruction book provided for this device. If "hot sticks" are used they should be insulated.

CAUTION—NOTE THAT THE MAIN SWITCHGEAR BUS IS CONNECTED TO THE LOWER STUDS WHEN THE DEVICE IS INSTALLED IN AN UPPER COMPARTMENT AND TO THE UPPER STUDS WHEN THE DEVICE IS INSTALLED IN A LOWER COMPARTMENT.

In addition to the device described above, there is available the deluxe power-operated type GMV device which has a self-contained bus or line selector switch and a separately controlled, power operated, three-phase grounding switch. The GMV device is a dead-front design with mechanical and electrical interlocks, provision for remote control and plug-type cable testing and phasing. The primary conductors required for gounding are self-contained, with no external cable connections required.

The GMV device is designed for maximum safety to personnel while accomplishing all the basic required grounding and testing functions. Refer to the instruction book provided for this device.

OPERATION

The metal-clad switchgear provides safe operation and easy removal and replacement of the circuit breaker. Circuit breakers of the same type, rating and duplicate wiring may be interchanged. Various interlocks are provided between the metal-clad and breaker to insure safe operation. The following instructions explain how these interlocks should function. If the breaker and metal-clad do not function in the manner called for in these instructions, do not force, modify, adjust or remove any interlocks. Consult your local General Electric Installation and Service representative. Failure to follow the following instructions could result in serious injury.

BREAKER INSTALLATION AND REMOVAL

With all primary and control power circuits deenergized and before installing the breaker clean the mating surfaces of the metal-clad and circuit breaker primary disconnects, secondary disconnects and ground shoe and apply a thin coating of 0282A2048 P009 contact grease. This will prevent galling of the silvered-contact surfaces.

Check the racking mechanism to make certain that it is in the disconnect position, see Fig. 3. The tape indicator should read "Disc/Test" and the drive nuts on the jack screws should

be in the forward position against their respective stops. The racking mechanism is accurately leveled and checked at the factory and should need no adjustment.

Check the circuit breaker to ensure that it is in the "OPEN" and "DISCHARGED" condition.

Pick up the breaker with the lift truck by moving it in such a position that the channel type rails on the lift truck slide over the wheels on the side of the breaker until the breaker engages the forward stop.

Lock the breaker on the truck by pushing down the breaker wheel locking plate (2) Fig. 4 and then pull the handle (3) Fig. 4 on the truck locking bar toward the lift truck mast.

Operate the lift truck crank to raise the breaker until the truck rails are slightly higher than the rails in the metal-clad unit into which the breaker is to be inserted. Move the lift truck toward the metal-clad unit and lower the lift truck slightly, if necessary, to engage the docking hooks and check that the lift truck rails are approximately level.

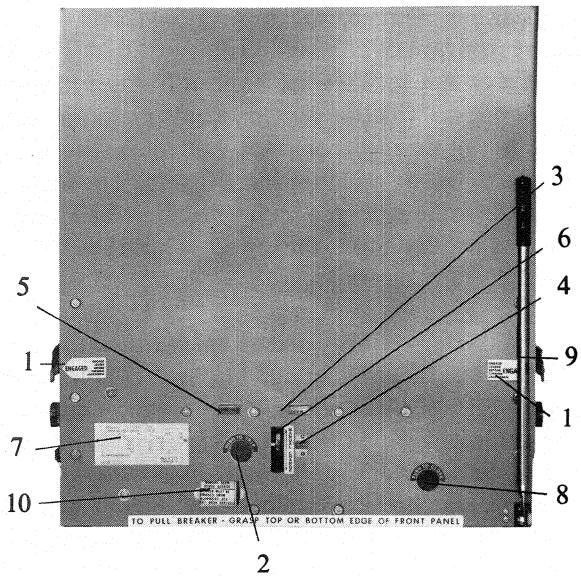
Push the handle (3) Fig. 4 on the truck locking bar toward the metal-clad. This action releases the breaker wheel locking plate and locks the lift truck and metal-clad rails together.

Release the right side safety latch (4) Fig. 4 and push the breaker into the metal-clad unit until the racking arms are engaged as indicated by the label on the front cover of the breaker. (1) Fig. 2. A safety catch on the right hand metal-clad rail will prevent the breaker from rolling back out in case the racking arms are not engaged, see Fig. 17.

The lift truck may now be released by pushing down the breaker wheel locking plate (2) Fig. 4 and pulling the handle (3) Fig. 4 on the truck locking bar toward the lift truck mast.

To remove the breaker from the metal-clad unit reverse the above procedure. Check the circuit breaker to be sure that it is in the "open" position. Rack the breaker from the "Connect" position to "Disconnect/Test". Disengage the racking mechanism by raising both racking arms and roll the breaker forward. Move the lift truck into position to engage the rails and connect the docking hooks. After disengaging the safety catch on the right hand rail the breaker can now be rolled forward onto the lift truck for transporting away.

After the breaker has been racked fully into the connected position and then is removed from the unit, the engagement and alignment of the primary disconnect fingers on the breaker studs may be checked with respect to the stationary conductor in the unit. (THE SWITCHGEAR MUST BE DEENERGIZED FOR THIS CHECK.)



1 — Indicator
2 — Push to Trip Open
3 — Open-Close Indicator
4 — Counter
5 — Charge Indicator
6 — Manual Charge
7 — Nameplate
8 — Manual Close
9 — Breaker Racking Lever
10 — Close Spring Gag Access

Fig. 2 Racking Arm Position Indicator Level

Use the racking handle to turn the jackscrew several turns toward the connected position, until the shutters are opened to uncover the opening to the insulation tube and stationary conductor in the unit. Inspect the impression made in the coating of contact lubricant 0282A2048 P009 on the stationary conductor surface by the breaker primary disconnect fingers:

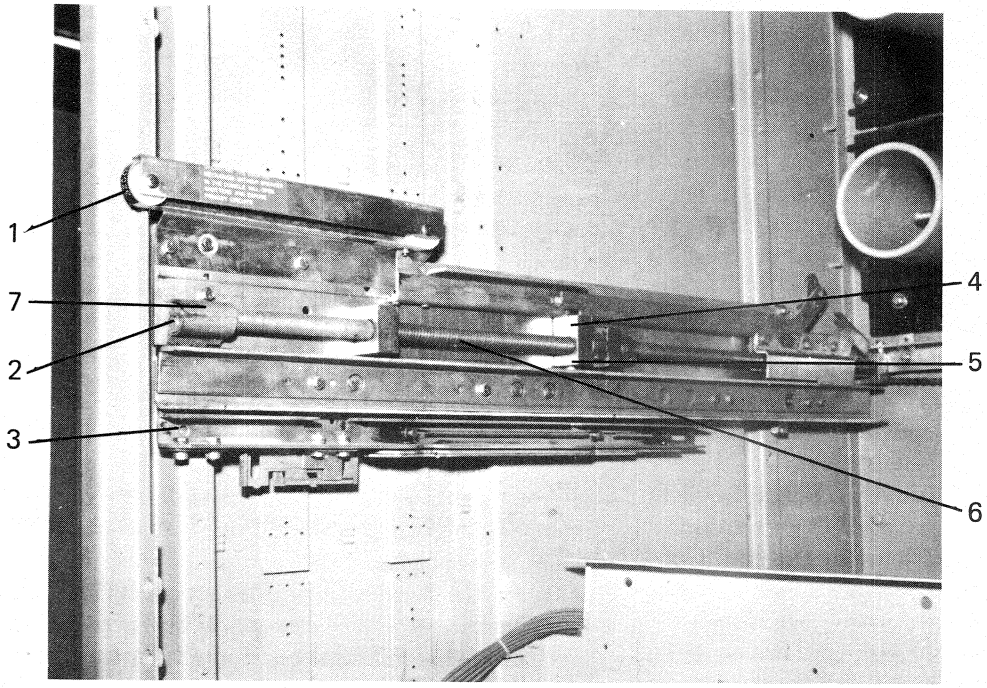
On 1200 and 2000 ampere ratings, there must be heavy impressions of all fingers on both the top and bottom of the stationary conductor bar. The impressions should extend back from the front end of the bar a minimum of 1/2 inch and should be no closer than 3/16 inch to either side of the bar.

On 3000 ampere ratings, there must be heavy impressions of all the fingers on the cylindrical conductor. The impressions should extend back from the front end a minimum of 1/2 inch.

If the contact wipe is not proper, adjustments will be necessary.

DO NOT MAKE ANY ADJUSTMENT. COMMUNICATE WITH THE NEAREST GENERAL ELECTRIC COMPANY INSTALLATION AND SERVICE ENGINEERING OFFICE FOR INSTRUCTIONS.

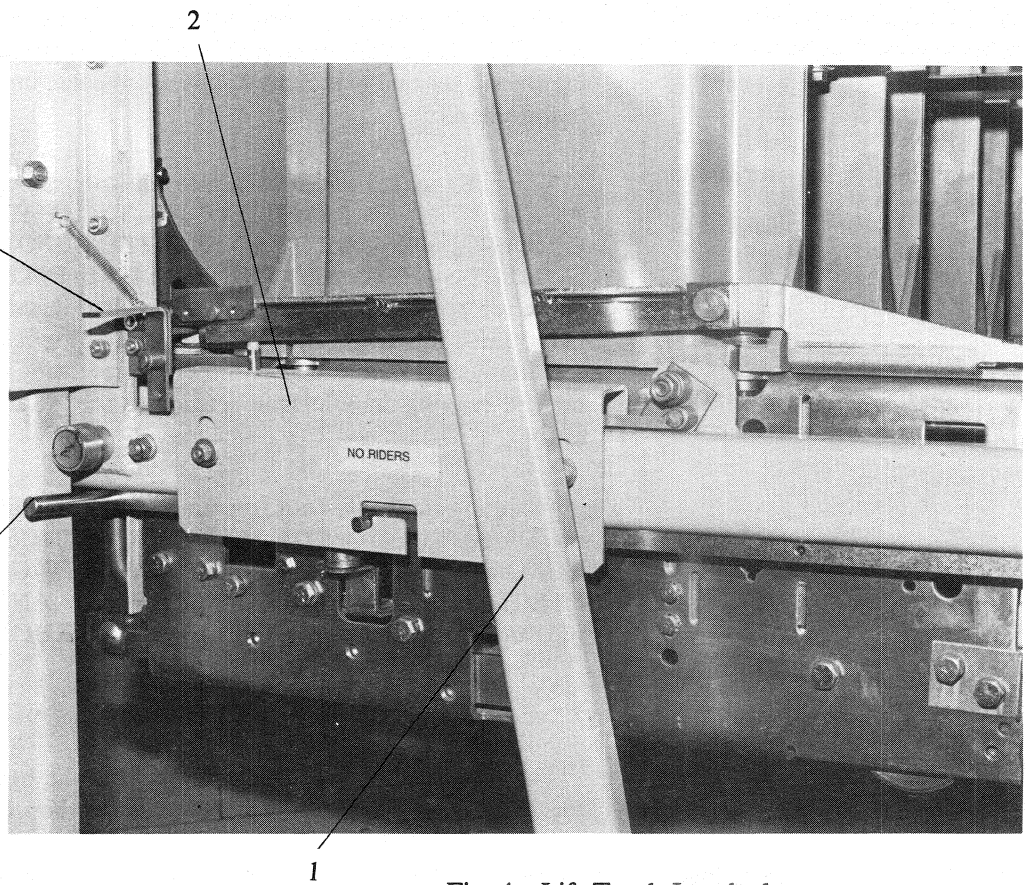
Fig 3 (8043123)



1 — Position Indicator
2 — Racking Shaft
3 — Rail
4 — Shaft Bearing
5 — Racking Nut
6 — Jack Screw
7 — Interlock

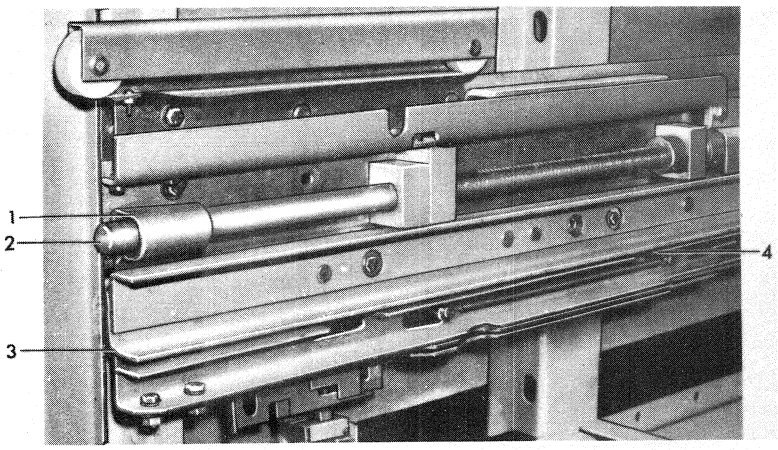
Fig. 3 Racking Mechanism

Fig. 4 (W58301)



1 — Lift Truck Brace
2 — Wheel Locking Plate
3 — Truck Locking Bar Handle
4 — Safety Latch Handle

Fig. 4 Lift Truck Interlocks



1 — Interlock
2 — Racking Shaft
3 — Rail
4 — Slot

Fig. 5 Positive Interlock

BREAKER RACKING WITH FRONT DOOR CLOSED

The circuit breaker can be racked in and out of the "Connect" position with the front door of the metal-clad closed. For maximum safety the breaker must always be racked with the front door closed when primary power is connected to the metal-clad. Make sure the breaker is open before attempting to rack the breaker. The breaker is installed in the metal-clad unit as described in BREAKER INSTALLATION. Engage the racking arms and then close the front door of the unit and secure it. Insert the racking handle into the hole in the left side of the front door and engage the racking mechanism by pushing it in fully. Rack the breaker by rotating the handle clockwise (60 turns are required) until a positive stop is felt. The breaker is now in the fully connected position and the tape indicator should read "Conn".

To rack the circuit breaker from the "Connected" to the "Disconnect/Test" position be sure that the breaker is open then turn the handle counterclockwise.

REMOTE RACKING ATTACHMENT

The breaker may be racked between the "Disconnect/Test" and "Connected" positions electrically using the remote racking device. See DESCRIPTION — REMOTE RACKING ATTACHMENT.

POSITIVE INTERLOCK

The positive interlock functions to prevent racking a breaker between the "Connect" and the "Disconnect/Test" positions except when the primary contacts are open.

The positive interlock consists of a bar which protrudes from the left side of a closed breaker to engage a slot in the left-side-racking mechanism when the breaker is in either the "Disconnect/Test" or "Connected" position. When the interlock is engaged the racking mechanism cannot be operated. (See Fig. 5.)

To test the function of the positive interlock install a circuit breaker following the instructions given under BREAKER INSTALLATION. For the test the control power circuits in the metal-clad must be energized.

Place the breaker in the "Disconnect/Test" position and connect the secondary disconnect device by pulling down on the breaker handle and horizontally inserting the lever arm fully into the breaker to engage the secondary disconnects. This will actuate the spring-charging motor and charge the breaker-closing springs. Close the front door of the unit and secure it. BEFORE PROCEEDING WITH THIS CHECK IT IS NECESSARY THAT THE PRIMARY CIRCUITS BE DE-ENERGIZED. Close the breaker with the control switch on the front of the door then insert the racking har into the hole in the unit door. When attempting to insert racking handle a definite stop should be encountered preventing the socket on the racking handle from engaging the racking mechanism.

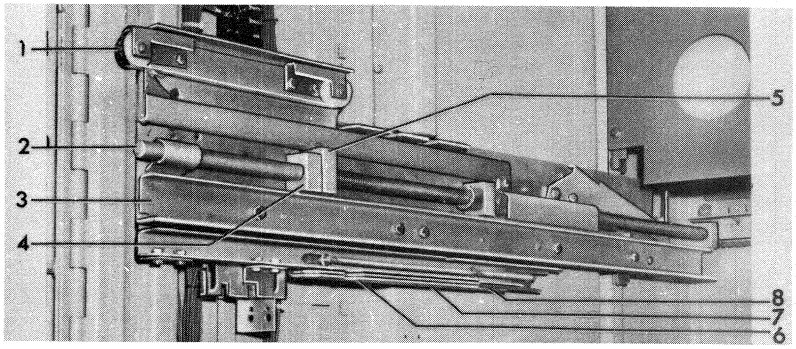
Trip the breaker and rack it into the connected position. AGAIN IT IS EMPHASIZED THAT THE PRIMARY CIRCUITS MUST BE DE-ENERGIZED BEFORE MAKING THIS CHECK OF THE POSITIVE INTERLOCK. Close the breaker and insert the racking handle into the hole in the unit door. When attempting to insert the racking handle a definite stop should be encountered preventing the socket on the racking handle from engaging the racking mechanism.

If the interlock does not function as indicated in either of the above cases DO NOT MAKE ANY ADJUSTMENT. COMMUNICATE WITH THE NEAREST GENERAL ELECTRIC COMPANY INSTALLATION AND SERVICE ENGINEERING OFFICE FOR INSTRUCTIONS.

NEGATIVE INTERLOCK

The negative interlock functions to hold the breaker in a mechanical and electrical trip-free mode when it is b racked between the "Disconnect/Test" and "Connect" p tions. As an added precaution the negative interlock will trip the breaker and hold it trip-free if an attempt is made to

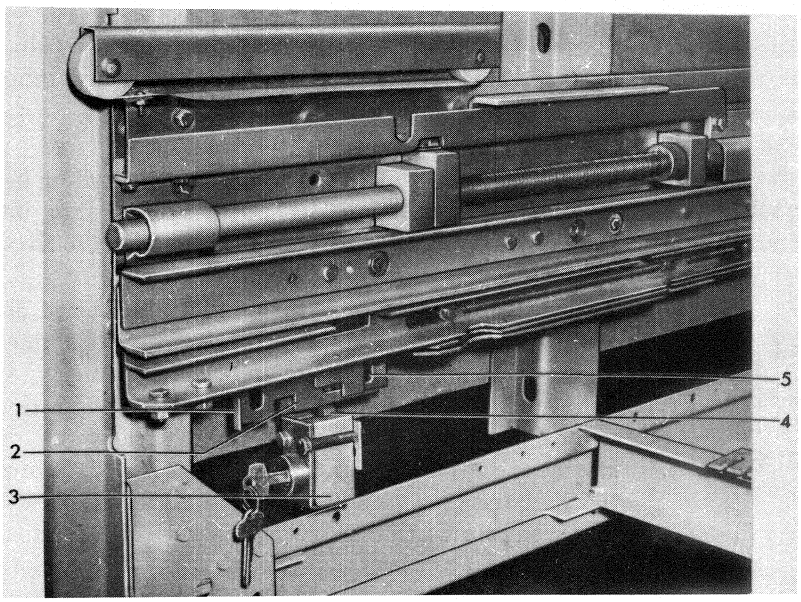
Fig. 6 (8918431F)



1 — Position Indicator
2 — Racking Shaft
3 — Rail
4 — Bearing
5 — Racking Nut
6 — Forward Slot
7 — Cam
8 — Rear Slot

Fig. 6 Negative Interlock

Fig. 7 (8918438D-2)



1 — Notched Sliding Link
2 — Detent
3 — Keylock
4 — Bolt
5 — Slot

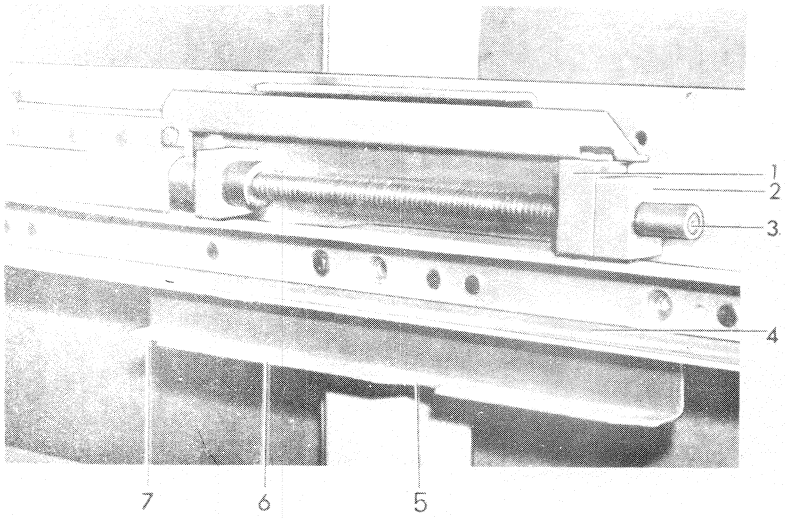
Fig. 7 Key Lock and Padlocks

operate the racking mechanism when the breaker is closed and in either the "Disconnect/Test" or "Connect" position, and the positive interlock fails to function.

The negative interlock consists of two notched members in the left-side-track assembly which operate the negative (trip latch) interlock roller on the left side of the breaker. Refer to Fig. 6. On the metal-clad one member is stationary and the other is a spring-loaded slide attached to the racking mechanism. A third member, a notched sliding link, provides the key lock functions and is described under KEY LOCKS. See Fig. 7.

To test the function of the negative interlock install a circuit breaker following the instructions given under BREAKER INSTALLATION. For this test the control power circuits in the metal-clad must be energized.

Place the breaker in the "Disconnect/Test" position and connect the secondary disconnect device by pulling down on the breaker handle and inserting the level arm fully into the breaker. This will actuate the spring-charging motor and charge the breaker-closing springs. Close the breaker using either the control switch or the manual close button. Push the sliding link located on the front of the left track rearward. Refer to Fig. 7. This will cause the negative interlock roller on the breaker to depress and trip the breaker. Leave the sliding link in the rearward position and attempt to close the breaker using the control switch. Nothing should happen. Now attempt to close the breaker by depressing the manual close button. The closing springs will discharge but the breaker should remain open. Return the sliding link to the forward position.



1 — Racking Nut
2 — Bearing
3 — Jack Screw
4 — Rail
5 — Disconnect/Test Slot
6 — Operating Cam
7 — Connect Slot

Fig. 8 (891843

Fig. 8 Closing Spring Discharge Interlock

Rack the circuit breaker into the connected position and close it either manually or electrically. Push the sliding link rearward and verify that the breaker trips. With the sliding link in the rearward position attempt to close the breaker using the control switch. Again, nothing should happen. Now attempt to close the breaker by depressing the manual close button. Again, the closing springs will discharge but the breaker should remain open.

If the interlock does not function as indicated in either of the above cases DO NOT MAKE ANY ADJUSTMENT. COMMUNICATE WITH THE NEAREST GENERAL ELECTRIC COMPANY INSTALLATION AND SERVICE ENGINEERING OFFICE FOR ADDITIONAL INSTRUCTIONS.

SPRING DISCHARGE INTERLOCK

The spring discharge interlock consists of a notched member in the right-side-track assembly which activates the spring discharge roller on the right side of the breaker. Refer to Fig. 8.

The function of the spring discharge interlock is to prevent the breaker closing spring from being charged unless the breaker is in the "Connect" or "Disconnect/Test" position or removed from the cubicle. In addition, it will mechanically discharge the breaker springs when the breaker is moved between any of the above mentioned positions and prevent recharging by opening the close-latch-monitoring switch in the breaker spring-charging circuit.

To test the function of the spring-discharge interlock install a circuit breaker following the instructions given under BREAKER INSTALLATION. For this test the control power circuits in the metal-clad must be energized.

Place the breaker in the "Disconnect/Test" position and connect the secondary disconnect device by pulling down on the breaker handle and inserting the level arm fully in the breaker. This will actuate the spring-charging motor and charge the breaker-closing springs.

Rack the breaker toward the connected position using the manual racking handle. The spring-discharge interlock should discharge the breaker springs in three to five turns.

Continue to rack the breaker to the connected position. Just before reaching the connected position, the spring charging motor will be reenergized and charge the closing spring Rack the breaker toward the disconnected position. The spring discharge interlock should discharge the breaker closing springs in 3 to 5 turns. Continue to rack the breaker to the disconnect position. Reenergize the secondary disconnect device as before and this will cause the spring charging motor to charge the breaker closing springs. Raise the racking arms to the release position and roll the breaker forward. The spring discharge interlock should discharge the breaker closing springs before traveling 1/2 inch.

If the interlock does not function as indicated DO NOT MAKE ANY ADJUSTMENT. COMMUNICATE WITH THE NEAREST GENERAL ELECTRIC COMPANY INSTALLATION AND SERVICE ENGINEERING OFFICE FOR INSTRUCTIONS.

KEY LOCK

On the lefthand breaker racking mechanism track is a provision for a key lock. The purpose of this lock is to keep the breaker from closing in the "Test" and "Connect" positions by operating the negative interlock see Fig. 7. To operate the key lock (3) in order to remove the key, push slide (1) to the rear and extend the bolt (4) of the lock into slot This allows the key to be removed and prevents the break from closing. The key lock does not prevent motion of the racking mechanism.

PADLOCKS

Two positions for a possible 3 padlocks each are provided on the racking mechanism. See Fig. 7. The front position ...s the breaker from closing in the "Test" and "Connect" ...ion. To obtain this position push slide (1) Fig. 7 to the rear and insert the padlock in the slotted opening just forward of the keylock (3). This gives the same interlocking function as the keylock and does not block the motion of the racking mechanism.

The second position for padlocks (5) is behind the key lock. A padlock in this slot will prevent any motion of the racking mechanism by keeping the hexagon turning shaft covered.

STATIONARY AUXILIARY SWITCH

An auxiliary switch can be provided at the bottom of the breaker compartment so that additional contacts can be actuated by the operation of the breaker. The breaker will operate this switch when it is in the "Test" or "Connect" position. See Fig. 9.

BREAKER POSITION SWITCH

A position switch can be provided at the bottom of a breaker compartment so that it will be operated by a bracket on the breaker frame when the breaker is in the "Connect" p...ition. When the breaker is withdrawn, a spring will return ...witch to its normal position. See Fig. 9.

INTERFERENCE INTERLOCK

The function of the mechanical interference interlock is to permit only breakers with the same ratings to be inserted in any specific compartment.

This interlock consists of two comb-like plates, one on the equipment and a mating plate on the breaker. The equipment interference plate is permanently fastened to a cross member located just below the breaker mechanism frame device panel. (See Fig. 10.)

TO PREVENT DAMAGE DO NOT REMOVE REPLACE OR READJUST THE RATING INTERFERENCE PLATES ON EITHER THE METAL-CLAD UNIT OR THE POWER VAC* CIRCUIT BREAKER. IN CASE OF A PROBLEM CONSULT YOUR NEAREST GENERAL ELECTRIC COMPANY INSTALLATION AND SERV-I... ENGINEERING OFFICE.

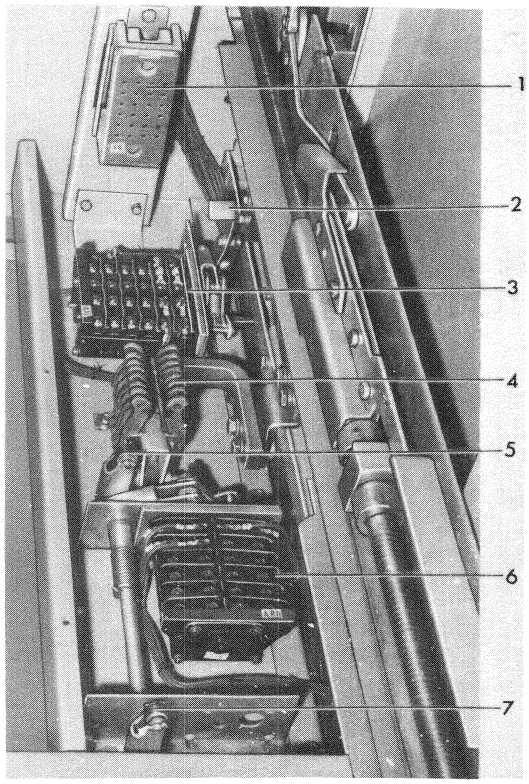


Fig. 9 (8918438H)

1 — Secondary Coupler
2 — Position Switch Actuator
3 — Position Switch
4 — Ground Show
5 — Stationary Auxiliary Switch Connect Position Actuator
6 — Stationary Auxiliary Switch
7 — Stationary Auxiliary Switch Test Position Actuator

Fig. 9
Stationary Auxiliary Switch and Breaker Position Switch

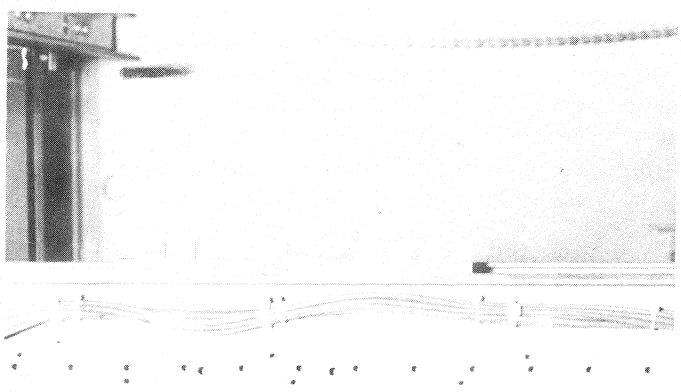


Fig. 10 (8043071)

Fig. 10 Interference Interlock

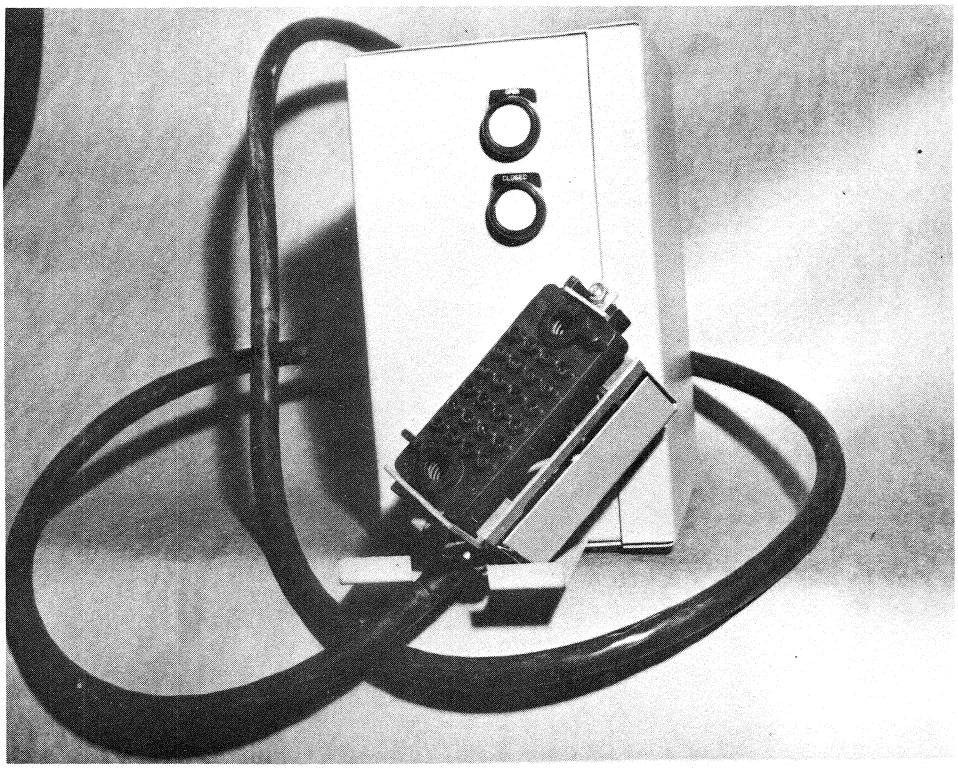


Fig. 11 Test Cabinet

CLOSING SPRING GAG INTERLOCK

A INTERLOCK IS PROVIDED AT EITHER THE FRONT OR REAR ON THE LIFT SIDE OF THE BREAKER FRAME TO PREVENT RACKING IN A BREAKER WHICH HAS THE SPRING BLOCKING DEVICE (PIN OR PLATE) IN THE GAGED POSITION. THE SPRING BLOCKING DEVICE MUST BE REMOVED SO THE INTERLOCK INTERFERENCE MAY RESET TO ALLOW THE BREAKER TO BE RACKED.

SEE BREAKER INSTRUCTION BOOK GEK-90207 OR GEK-90208 FOR USE OF THE CLOSING SPRING BLOCKING DEVICE.

CAUTION: GAGGING CLOSING SPRINGS WHEN THEY ARE IN THE DISCHARGED POSITION CAN DAMAGE THE BREAKER. THE BREAKER S FRAME MAY BE DEFORMED AND/OR THE GE MOTOR MAY BE DAMAGED.

TEST CABINET

The test cabinet, Fig. 11 is used to operate a breaker that has been removed from the metal-clad equipment. It should be installed on the wall at a location where maintenance and testing of the breaker can be conveniently done. Conduits must be installed for cables to supply control power for testing. Make certain that the green ground conductor is connected to the electrical ground.

MAINTENANCE

A regular maintenance schedule should be established to obtain the best service and reliability from the switchgear. Plant operating and local conditions will dictate the frequency of inspection required. For specific information regarding the maintenance of devices, such as circuit breakers, relays, meters, etc., refer to the separate instruction book furnished for each device. The test cabinet, if furnished, provides a convenient means for maintaining the circuit breakers. Under normal conditions the protective relays do not operate, therefore, it is important to check the operation of these devices regularly.

A permanent record of all maintenance work should be kept, the degree of detail depending on the operating conditions. In any event, it will be a valuable reference for subsequent maintenance work and for station operation. It is recommended that the record include reports of tests made, the condition of equipment and repairs and adjustments that were made.

BEFORE ANY COVERS ARE REMOVED OR ANY DOORS OPENED WHICH PERMIT ACCESS TO THE PRIMARY CIRCUITS, IT IS ESSENTIAL THAT THE CIRCUIT OR CIRCUITS BE DE-ENERGIZED AND BREAKERS BE WITHDRAWN TO THE TEST P TION AND TAGGED.

The primary circuits of metal-clad switchgear are insulated in order to reduce the size of the equipment. However, this

insulation, except in one or two instances, requires a certain amount of air gap between phases and to ground to complete the insulation. Inserting any object in this air space, when equipment is energized, whether it be a tool or a part of the , may under certain conditions, in effect, short circuit air gap and may cause a breakdown in the primary circuit to ground and cause serious damage or injury or both.

Care should be exercised in the maintenance and checking procedures that accidental tripping or operation is not initiated.

RECOMMENDED ANNUAL MAINTENANCE

The switchgear structure and connections should be given the following overall maintenance at least annually. All maintenance work must be done with both the primary and control power circuits deenergized.

1. Thoroughly clean the equipment, preferably using a heavy duty vacuum cleaner to remove all dust and other accumulations.
2. Clean racking mechanism and lubricate jack screws and gears with lubricant 0282A2048 P009.
3. Check primary disconnecting device contacts for signs of abnormal wear or overheating. Discoloration of the silvered surfaces is not ordinarily harmful unless atmospheric conditions cause deposits such as sulphides on the contacts. If necessary the deposits can be removed with a good grade of silver polish.

   Sandpaper, steel wool or abrasive cleaners shouls never be used on silver-plated parts.

   Before replacing breaker, apply a thin coat of contact lubricant 0282A2048 P009 to breaker studs for lubrication.
4. Check tightness and continuity of all control connections and wiring.

RENEWAL PARTS

ORDERING INSTRUCTIONS

Renewal parts should be ordered from the Medium Voltage Switchgear Business Section.

Specify the quantity, reference number, description and this bulletin number.

Standard hardware, such as screws, bolts, nuts, washers, are not listed. Such items should be purchased locally.

For prices, refer to the nearest office of the General Electric Company.

If parts listed separately are to be assembled at the factory, order must so state.

Not all parts shown herein will be used on any one equipment. Parts not used in original equipment should not be ordered as renewal parts.

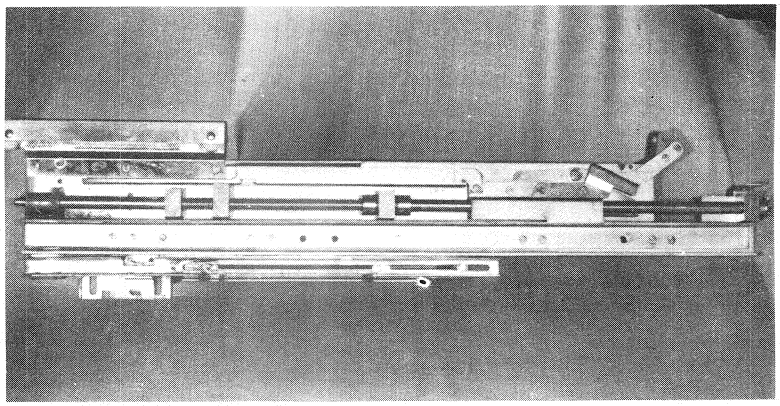


Fig. 12 Left Hand Track Assembly

Fig. 12 (8042974)

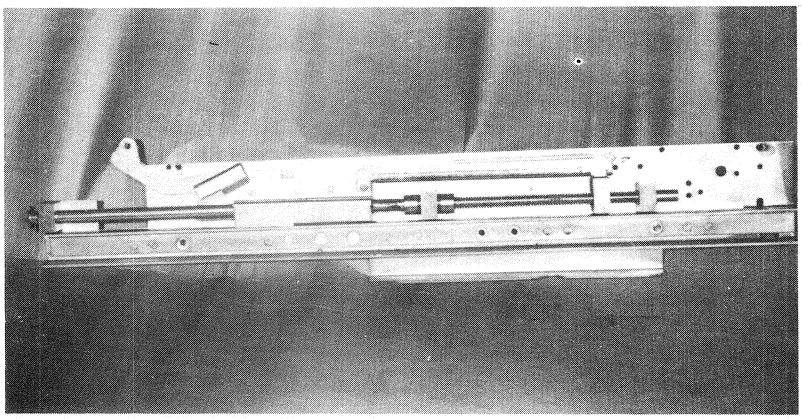


Fig. 13 Right Hand Track Assembly

Fig. 13 (8042976)

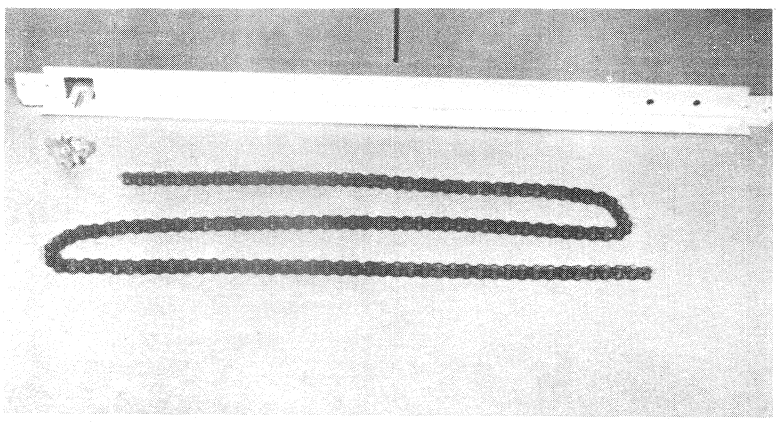


Fig. 14 Spreader Bar, Chain and Idler Sprocket

Fig. 14 (8042972)

Fig. 15 (8043056)

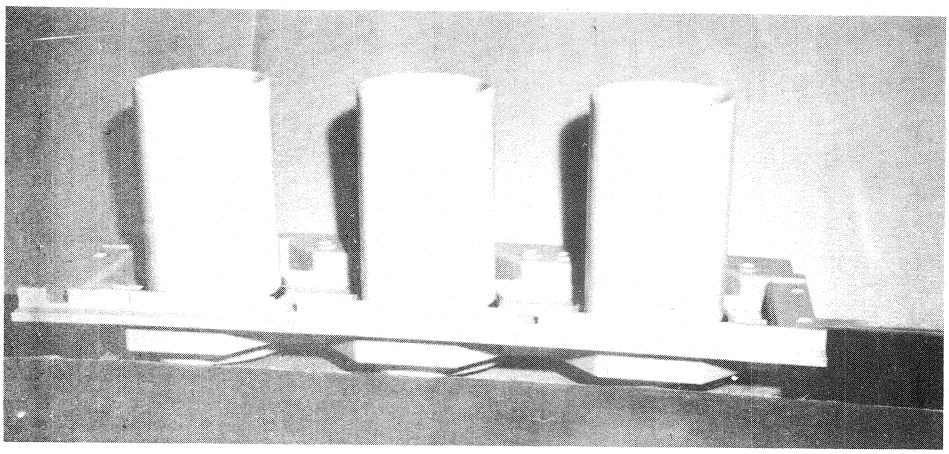


Fig. 15 Porcelain Primary Disconnect

Fig. 16 (8043057)

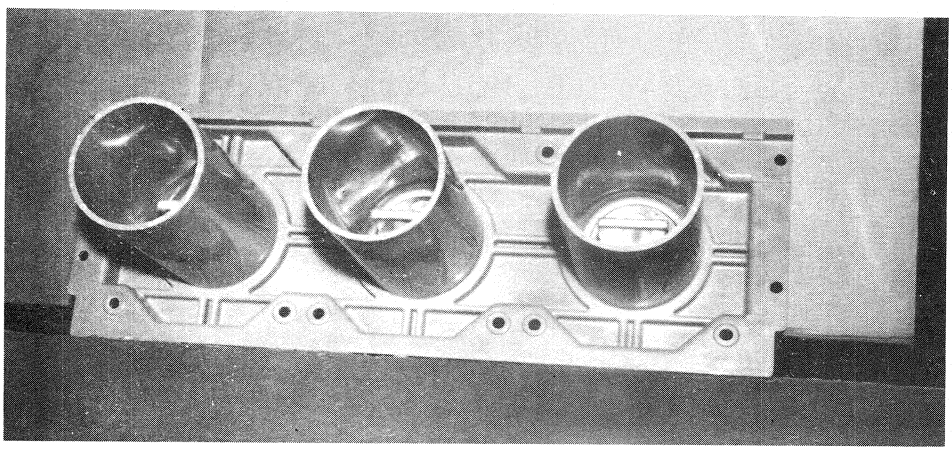


Fig. 16 Polyester Primary Disconnect

Fig. 17 (8042978)

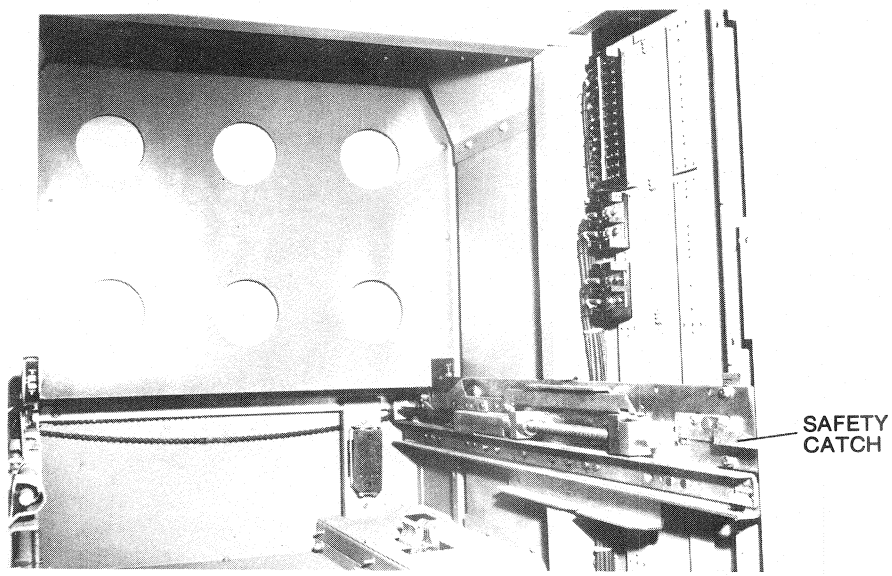


Fig. 17 Breaker Unit

GENERAL ELECTRIC COMPANY
MEDIUM VOLTAGE SWITCHGEAR BUSINESS SECTION
BURLINGTON, IOWA 52601

GENERAL ELECTRIC