SIEMENS

# Vacuum Circuit Breakers (Vehicle)

## Type DPR/DPU*
## 4.16kV to 15kV

Instructions
Installation
Operation
Maintenance
**SGIM-9908F**



*"U" in DPU defines an upgrade in MVA or amperage rating from the original. See rating label to determine what has been uprated.

# ⚠ DANGER

**Hazardous voltages and high-speed moving parts.**

**Will cause death, serious injury or equipment damage.**

De-energize and ground the equipment before maintenance. Maintenance should be performed only by qualified personnel.

The use of unauthorized parts should not be used in the repair of the equipment.

Follow all safety instructions contained herein.

## IMPORTANT

The information contained herein is general in nature and not intended for specific application purposes. It does not relieve the user of responsibility to use sound practices in application, installation, operation, and maintenance of the equipment purchased. Siemens reserves the right to make changes in the specifications shown herein or to make improvements at any time without notice or obligations. Should a conflict arise between the general information contained in this publication and the contents of drawings or supplementary material or both, the latter shall take precedence.

## QUALIFIED PERSON

For the purpose of this manual a qualified person is one who is familiar with the installation, construction or operation of the equipment and the hazards involved. In addition, this person has the following qualifications:

(a) **is trained and authorized** to de-energize, clear, ground, and tag circuits and equipment in accordance with established safety practices.

(b) **is trained** in the proper care and use of protective equipment such as rubber gloves, hard hat, safety glasses or face shields, flash clothing, etc., in accordance with established safety practices.

(c) **is trained** in rendering first aid.

## SUMMARY

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 local sales office.

The contents of this instruction manual shall not become part of or modify any prior or existing agreement, commitment or relationship. The sales contract contains the entire obligation of Siemens Power Transmission & Distribution, Inc. The warranty contained in the contract between the parties is the sole warranty of Siemens Power Transmission & Distribution, Inc. Any statements contained herein do not create new warranties or modify the existing warranty.

# Vacuum Circuit Breakers (Vehicle)

## Table of Contents

# Introduction and Safety

### Introduction
The DPR family of vacuum circuit breakers is designed to meet all the applicable ANSI, NEMA and IEEE standards. Successful application and operation of this equipment depends as much upon proper installation and maintenance by the user as it does upon the careful design and fabrication by Siemens.

The purpose of this Instruction Manual is to assist the user in developing safe and efficient procedures for the installation, maintenance and use of the equipment.

Contact the nearest Siemens representative if any additional information is desired.

**⚠DANGER**

**Hazardous voltages and high-speed moving parts.**

**Will cause death, serious injury or property damage.**

Only qualified persons thoroughly familiar with the equipment, instruction manuals and drawings should install, operate and/or maintain this equipment.

### Qualified Person
For the purpose of this manual a Qualified Person is one who is familiar with the installation, construction or operation of the equipment and the hazards involved. In addition, this person has the following qualifications:

- Training and authorization to energize, de-energize, clear, ground and tag circuits and equipment in accordance with established safety practices.
- Training in the proper care and use of protective equipment such as rubber gloves, hard hat, safety glasses, face shields, flash clothing, etc., in accordance with established safety procedures.
- Training in rendering first aid.

### Signal Words
The signal words “Danger”, “Warning” and “Caution” used in this manual indicate the degree of hazard that may be encountered by the user. These words are defined as:

**Danger** - Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

**Warning** - Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

**Caution** - indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

### Dangerous Procedures
In addition to other procedures described in this manual as dangerous, user personnel must adhere to the following:

1. Always work on de-energized equipment. Always de-energize a circuit breaker, and remove it from the switchgear before performing any tests, maintenance or repair.
2. Always perform maintenance on the circuit breaker after the spring-charged mechanisms are discharged.
3. Always let an interlock device or safety mechanism perform its function without forcing or defeating the device.

### Field Service Operation
Siemens can provide competent, well-trained Field Service Representatives to provide technical guidance and advisory assistance for the installation, overhaul, repair and maintenance of Siemens equipment, processes and systems. Contact regional service centers, sales offices or the factory for details, or telephone Siemens Field Service at 1-800-241-4453.

# Receiving, Handling and Storage

### Introduction

This manual covers the Receiving, Handling and Storage instructions for circuit breakers shipped separately from the switchgear. This section of the manual is intended to help the user identify, inspect and protect the circuit breaker prior to its installation.

### Receiving Procedure

Make a physical inspection of the shipping container before removing or unpacking the circuit breaker. Check for shipment damage or indications of rough handling by the carrier. Check each item against the manifest to identify any shortages.

Accessories such as the manual charging crank, the racking crank and the split plug jumper are shipped separately.

**Shipping Damage Claims (when applicable)** - Follow normal shipment damage procedures, which should include:

1. Check for visible damage upon arrival.

2. Visible damage must be noted on delivery receipt, and acknowledged with driver's signature. Notation, "Possible internal damage, subject to inspection" must be on delivery receipt.

3. Notify the Siemens Sales office immediately of any shipment damage.

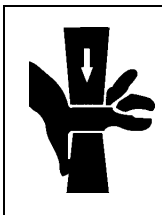
4. Arrange for carrier's inspection. Do not move the unit from its unloading point.

### Handling Procedure

1. Carefully remove the shipping carton from the circuit breaker. Keep the shipping pallet for later use if the circuit breaker is to be stored prior to its installation.

2. Inspect for concealed damage. Notification to carrier must take place within 15 days to assure prompt resolution of claims.

3. Each circuit breaker should be appropriately lifted, using lifting sling rated for at least 2,000 lbs. Circuit breaker shall be lifted by Upper "B" phase post insulator.



**Heavy weight. Can cause death, serious injury, or property damage.**

Use of a qualified rigger to hoist the circuit breaker.

4. The palleted circuit breaker can also be moved using a properly rated fork-lift vehicle. The pallets are designed for movement by a standard fork-lift vehicle.

### Storage Procedure

1. When the circuit breaker will be placed on its pallet for storage, be sure the unit is securely bolted to the pallet and covered with polyethylene film at least 10 mils thick.

**Indoor Storage** - Whenever possible, store the circuit breaker indoors. The storage environment must be clean, dry and free of such items as construction dust, corrosive atmosphere, mechanical abuse and rapid temperature variations.

**Outdoor Storage** - Outdoor storage is not recommended. When no other option is available, the circuit breaker must be completely covered and protected from rain, snow, dirt and all other contaminants.

**Space Heating** - Space heating must be used for **both indoor and outdoor** storage to prevent condensation and corrosion. When stored outdoors, 250 watts per circuit breaker of space heating is recommended.

### Vehicle Function and Operational Interlocks

Type DPR circuit breakers are comprised of the interrupter/operator module fitted to a vehicle. This interrupter/operator module is an integral arrangement of operating mechanism, dielectric system, vacuum interrupters, and means of connecting the primary circuit. The vehicle supports the interrupter/operator module, providing mobility and fully coordinated application in Westinghouse type DH-P switchgear.

This manual should be used jointly with the Circuit Breaker Operator manual, E50001-F710-A251-V3-4A00.

### Alignment

All aspects of the circuit breaker structure which impact alignment and interchangeability are checked at the factory. Field adjustment will not normally be required, but variations in existing switchgear may require field adjustment.

**Hazardous voltages and high-speed moving parts. Will cause death, serious injury, and property damage.**

De-energize before working on this equipment.

Do not by-pass interlocks or otherwise make interlocks inoperative.

### Recommended Tools

- Racking Crank: Original circuit breaker racking crank may be used.

### Installing Circuit Breaker Into Cubicle

**Note:** CLOCKWISE ROTATION of racking crank for inserting circuit breaker. COUNTERCLOCKWISE ROTATION of racking crank for removal of circuit breaker.

### Levering Device and Circuit Breaker Interlock

**Figure 1a** shows the two extreme positions of the levering device. The main parts of the device are **Figure 1b**:

1. The nut
2. The guide tube
3. The levering shaft
4. The levering interlock

These are part of the chassis assembly. The nut is fastened securely to the guide tube and is housed in a casting fastened to the extreme rear of the chassis as shown in **Figure 1c.**

The basic operation is for the nut to turn onto the screw which is mounted on the rear wall of the cubicle. Since the nut is securely fastened to the chassis, it pulls the circuit breaker into the CONNECTED position.

The guide tube is slotted lengthwise for a distance about equal to the travel of the circuit breaker. The levering shaft has 2 rectangular keys welded to it which slide in the guide tube slot. Thus, as the levering shaft is rotated the guide tube and nut are also rotated. As the nut consequently moves on the screw, by clockwise rotation, the screw extends farther and farther toward the front of the circuit breaker, pushing the levering shaft with it. Consequently the levering shaft stands still relative to the screw and other cubicle parts, including the door. Thus, the end of the levering shaft is always the same distance behind the door, whether the circuit breaker is in the TEST or CONNECTED position, or in between.

As the circuit breaker is levered in, the keys on the levering shaft move toward the end of the guide tube slot. As the rear key comes out of the slot, the levering shaft turns freely and the circuit breaker moves no further. The end of the guide tube is shaped like a steep-pitch one-turn screw thread so that when the levering shaft is rotated counterclockwise, the rear key will catch and enter the slot, and rotate the guide tube and nut, and the circuit breaker will be withdrawn.

The levering interlock is designed to prevent moving the circuit breaker into or out of the CONNECTED position if the circuit breaker contacts are in the closed position. The levering interlock consists essentially of a movable key which can enter the elongated keyway in the front part of the levering shaft. The key is spring-operated by the closing and opening movement of the circuit breaker contact linkage. When the circuit breaker is in the closed position, a force is applied through a spring to the key, to make it enter the keyway on the levering shaft. The levering shaft may be left in any position so that the keyway may not line up with the key. However, since the key is pressing against the shaft, it will snap into the keyway on the first rotation of the shaft as the keyway comes in line with the key.

Thus, the levering shaft cannot be rotated any further and no more movement of the circuit breaker can occur as long as it is in the closed position.

If you try to turn the levering shaft as hard as possible while the circuit breaker is closed, the levering shaft pin, where the levering-in crank is attached, will be broken. This protects the internal parts of the interlock against mechanical damage and prevents unintentional withdrawing or insertion of the circuit breaker while it is closed, which is very dangerous.

If the pin is broken it should become clear that the circuit breaker must be opened before it is withdrawn and the broken pin must be replaced.

**Floor Interlock and Operating Lever**
The circuit breaker interlocking system prevents closing the circuit breaker while the circuit breaker is being levered into or out of the CONNECTED position.

This is done by the Floor Interlock and the Automatic Tripping Lever **(Figure 2).** In operation, the rear end of this lever is pushed upward by a floor cam on the very first movement of the circuit breaker from the TEST position toward the CONNECTED position, or from the CONNECTED position toward the TEST position.

The lifting of the Tripping Lever, through its connected linkage, lifts the tripping-trigger, and the floor cam holds it in this tripped position as long as the circuit breaker is not at one of its limits of travel. If there is an attempt to close the circuit breaker while it is not completely in the CONNECTED or TEST positions, the mechanism will cause a trip free operation and the circuit breaker contacts will not close.

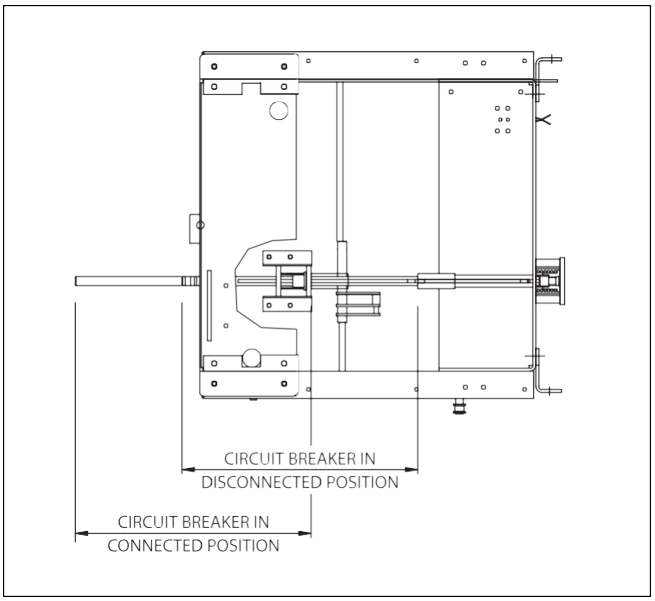



**Figure 1a.** Positions of the Levering Device

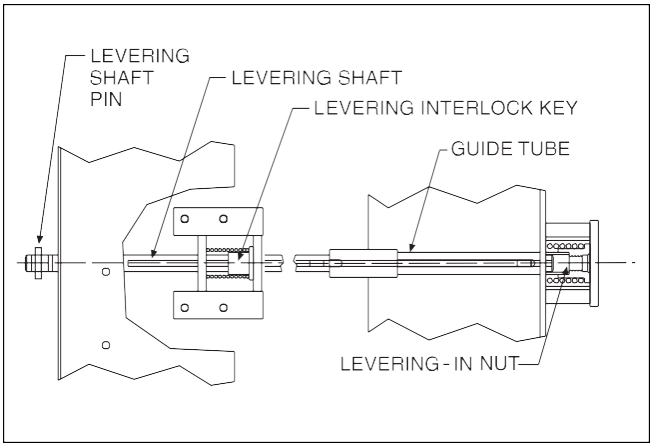



**Figure 1b.** Levering Device

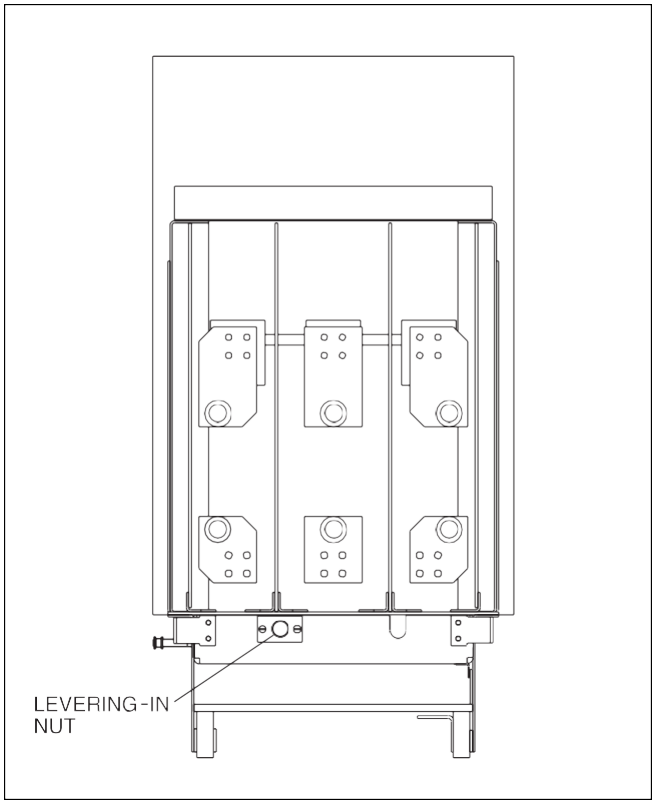



**Figure 1c.** Vehicle Rear View

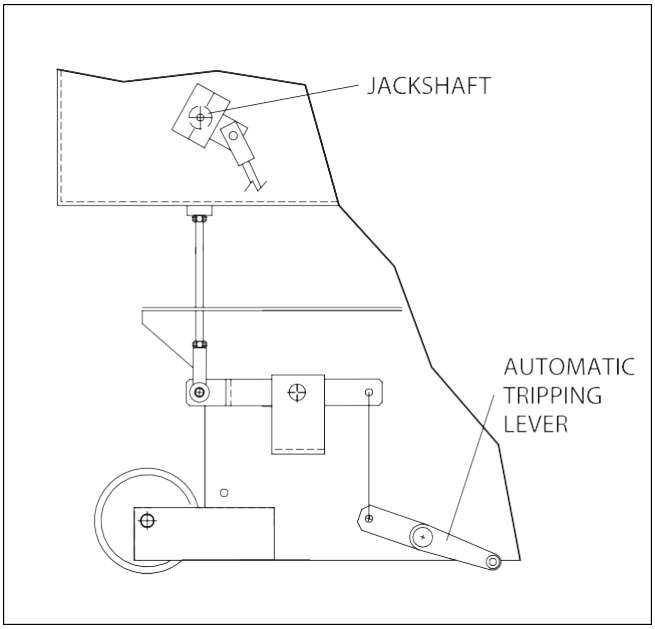



**Figure 2.** Floor Interlock and Operating Lever

### Automatic Floor Tripping and Closing Spring Release

**⚠CAUTION**

The closing spring, if charged, will automatically discharge when the circuit breaker is withdrawn from the switchgear.

The Floor Interlock and Automatic Tripping Lever activates the tripping trigger as the circuit breaker is withdrawn from the cubicle Test position. This, together with the automatic floor closing spring release, acts to discharge the closing spring and trips the circuit breaker as it is withdrawn from the cubicle.

### Secondary Contacts

The 15 point secondary contact block is mounted on a slideable plate on the inside of the left hand chassis side plate. This sliding plate is operated by a round folding rod with a "T" handle, extending from the L.H. upper corner of the mechanism panel. Above this rod is the secondary contact levering handle. When the circuit breaker is in the TEST position, the secondary contact block is normally disconnected and in the forward position against the rear of the chassis.

When you wish to operate the circuit breaker electrically while it is in the TEST position, the folding rod is lifted to the horizontal position enough to unhook it from the panel, and then pushed to the rear until the cross-pin engages with the slots of the levering handle, as shown in **Figure 3.** The handle is then pressed down to make final engagement of the secondary contacts.

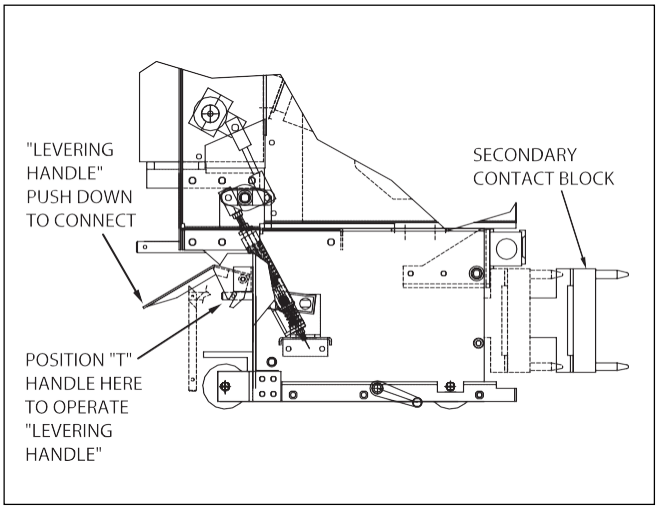



**Figure 3.** Secondary Contact Operation

### Rail Latch (Figure 4)

The purpose of the rail latch is as follows.

1. The rail latch prevents accidental damage to the cubicle levering device screw or the levering-in nut on the circuit breaker. Without this rail latch, the levering device screw and possibly the levering-in nut would be damaged if the circuit breaker were pushed into the cubicle so as to bump the levering-in nut hard against the end of the levering device screw.
2. The rail latch holds the circuit breaker in the TEST position. In order to lever the circuit breaker in to the CONNECTED position, press down rail latch (conveniently performed by foot) and push the circuit breaker 1/4 to 3/8 inch so as to get the levering device nut against the screw.

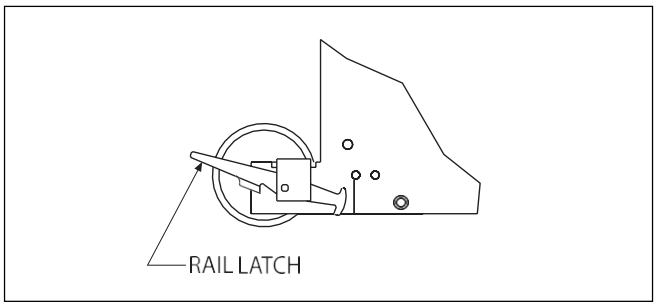



**Figure 4.** Rail Latch

### Continuous Current Interlock

The continuous current interlock functions to ensure circuit breaker and cubicle of like continuous current ratings are applied, and that circuit breakers with dissimilar continuous current ratings are excluded from cubicles of unlike current ratings.

### Removing Circuit Breaker from Cubicle

**⚠CAUTION**

The circuit breaker may open and its closing spring may discharge as it is withdrawn from the cubicle. It depends on whether the circuit breaker was left closed or open, or whether the spring was left charged or discharged.

To remove the circuit breaker from the operating position, trip the circuit breaker open, and engage the levering crank on the levering device shaft. Turn the crank counterclockwise until the crank rotates freely. Pull the circuit breaker toward the front of the cubicle until the rail latch engages the slot in the rail. The circuit breaker is now secured in the TEST position.

To remove the circuit breaker from the cubicle, press down on the rail latch to free the circuit breaker from the rail. Pull the circuit breaker out of the cubicle.

### Control Cable Box

The type DPR circuit breaker employs a plug-in cable which completes circuit breaker electrical connections between the mechanism housing and the vehicle's secondary disconnects.

### Insulating Barriers

Insulating barriers are required for use on type DPR circuit breakers.

Interphase and exterior barriers are removed or inserted vertically and are bolted to vehicle assembly.

# Maintenance

### Introduction and Maintenance Intervals

Periodic inspections and maintenance are essential to obtain safe and reliable operation of the circuit breaker as well as the switchgear.

**⚠DANGER**

**Hazardous voltages and high-speed moving parts.**

**Will cause death, personal injury, and property damage.**

De-energize before working on this equipment.

Read instruction manuals, observe safety instructions, and limit use to qualified personnel.

When circuit breakers and/or the switchgear are operated under "Usual Service Conditions", maintenance and lubrication is recommended at ten year intervals or at the number of operations indicated in **Table 3**. "Usual" and "Unusual" service conditions for Medium Voltage Metal-Clad Switchgear are defined in ANSI C37.20.2, section 8.1. Generally, "usual service conditions" are defined as an environment in which the equipment is not exposed to excessive dust, acid fumes, damaging chemicals, salt air, rapid or frequent changes in temperature, vibration, high humidity, and extremes of temperature.

The definition of "usual service conditions" is subject to a variety of interpretations. Because of this, you are best served by adjusting maintenance and lubrication intervals based on your experience with the equipment in the actual service environment.

Regardless of the length of the maintenance and lubrication interval, Siemens recommends that circuit breakers and switchgear should be inspected and exercised annually.

### Recommended Maintenance and Lubrication

Periodic maintenance and lubrication should include all the tasks shown in **Table 1**. Recommended procedures for each of the listed tasks are provided in this section of the manual.

**⚠WARNING**

**Failure to properly maintain the equipment could result in death, serious injury or product failure, and can prevent successful functioning of connected apparatus.**

Instructions should be carefully reviewed, understood, and followed.

The maintenance tasks in **Table 1** must be performed regularly.

**Table 1** — Maintenance Tasks

- Circuit Breaker Operator tasks
- Checks of the primary power path
  - Cleanliness check
  - Primary disconnects
- Fastener check
- Electrical control checks
  - Wiring and terminals check
  - Secondary disconnect check
  - Automatic spring charging check
  - Electrical close and trip check
- Vacuum integrity check
- High potential test
- Insulation and contact resistance tests
- Inspection and cleaning of circuit breaker insulation
- Racking mechanism
- MOC actuator system
  - Cubicle MOC forces
  - Pantograph setup
- Floor interlock and operating lever
- Functional tests
- Periodic maintenance intervals

The list of tasks in **Table 1** does not represent an exhaustive survey of maintenance steps necessary to ensure safe operation of the equipment. Particular applications may require further procedures. 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 local Siemens sales office.

**⚠DANGER**

**The use of unauthorized parts in the repair of the equipment, or tampering by unqualified personnel will result in dangerous conditions which will cause death, serious injury or equipment damage.**

**Follow all safety instructions contained herein.**

### Removal from Switchgear

Prior to performing any inspection or maintenance checks or tests, the circuit breaker must be removed from the switchgear. The Installation and Initial Functional Tests section describes the removal procedure in detail. Principal steps are repeated here for information and guidance, but without the details of the preceding section.

1. The first step is to de-energize the circuit breaker. Pressing the Trip pushbutton opens the circuit breaker prior to removal from the switchgear (Refer to Circuit Breaker Operator / Manual E50001-F710-A251-V3-4A00).

2. The second step in the removal procedure is to de-energize control power to the circuit breaker. Open the control power disconnect device.
3. Rack the circuit breaker to the “DISCONNECT” position.
4. Perform the spring discharge check. This is done by first pressing the red Trip pushbutton. Second, press the black Close pushbutton. Third, press the red Trip pushbutton again, and observe the spring condition indicator. It should read Discharged (Refer to Circuit Breaker Operator / Manual E50001-F710-A251-V3-4A00).
5. Remove the circuit breaker from the switchgear.

**Circuit Breaker Operator Tasks**
Perform tests as described in manual E50001-F710-A251-V3-4A00.

**Checks of the Primary Power Path**
Refer to Circuit Breaker Operator Manual E50001-F710-A251-V3-4A00.

**Cleanliness Check**
Refer to Circuit Breaker Operator Manual E50001-F710-A251-V3-4A00.

In addition to the circuit breaker operator, **Figure 5** shows a side view of the circuit breaker with the insulating barriers removed in order to show the upper and lower primary disconnects.

These components must be clean and free of dirt and any foreign objects. Use a dry lint free cloth. For stubborn dirt, use a clean cloth saturated with denatured alcohol (except for the vacuum interrupters). For stubborn dirt on a vacuum interrupter use a damp cloth and then thoroughly dry using a dry lint free cloth.

The phase barriers are plates of glass polyester insulating material which are attached to the circuit breaker to provide suitable electrical insulation between the vacuum interrupter primary circuits and the switchgear.

Always re-install the phase barriers carefully to their original location prior to inserting the circuit breaker into the switchgear.

**Primary Disconnects**
**Figure 5** is a side view of the circuit breaker showing the upper and lower primary disconnects.

Inspect the primary disconnect arms for physical integrity and absence of mechanical damage. Any evidence of burning or pitting would indicate weakness of the contact finger springs.

Using a clean cloth saturated with denatured alcohol, clean old lubricant from primary disconnects, and apply contact lubricant (part #15-172-791-233) in a thin layer.

**Fastener Check**
Inspect all fasteners for tightness. Replace any fasteners that appear to have been frequently removed, show damage or are missing.

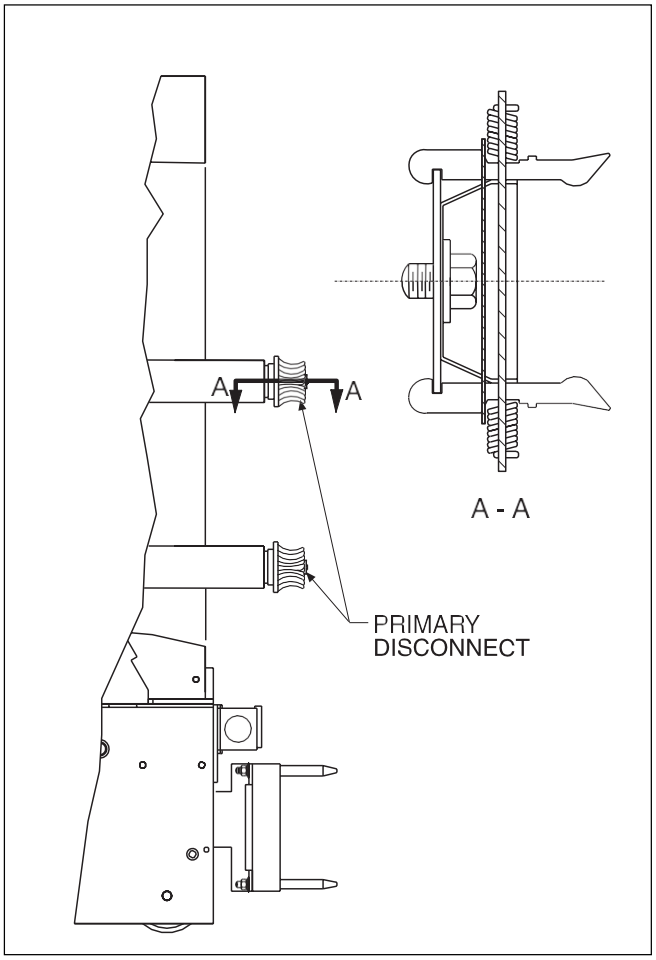



**Figure 5.** Primary Power Path

**Electrical Control Checks:**

**Wiring and Terminals Check**
Refer to Circuit Breaker Operator Manual E50001-F710-A251-V3-4A00.

**Secondary Disconnect Check**
In addition to checking the terminals of the secondary disconnect, ensure that secondary disconnect assembly moves freely and is aligned for proper engagement.

**Automatic Spring Charging Check**
Refer to Circuit Breaker Operator Manual E50001-F710-A251-V3-4A00.

**Electrical Close and Trip Check**
Refer to Circuit Breaker Operator Manual E50001-F710-A251-V3-4A00.

**Vacuum Integrity Check**
Refer to Circuit Breaker Operator Manual E50001-F710-A251-V3-4A00.

**High Potential Test**
Refer to Circuit Breaker Operator Manual E50001-F710-A251-V3-4A00.

**Insulation and Contact Resistance Test**
Refer to Circuit Breaker Operator Manual E50001-F710-A251-V3-4A00.

> **Note:** Maximum Contact Resistance is read from primary bus stab to primary bus stab with primary disconnects removed. A value of 13 micro-ohms should be added to the maximum contact resistance specified in the Circuit Breaker Operator Manual E50001-F710-A251-V3-4A00.

**Inspection and Cleaning of Circuit Breaker Insulation**
Refer to Circuit Breaker Operator Manual E50001-F710- A251-V3-4A00.

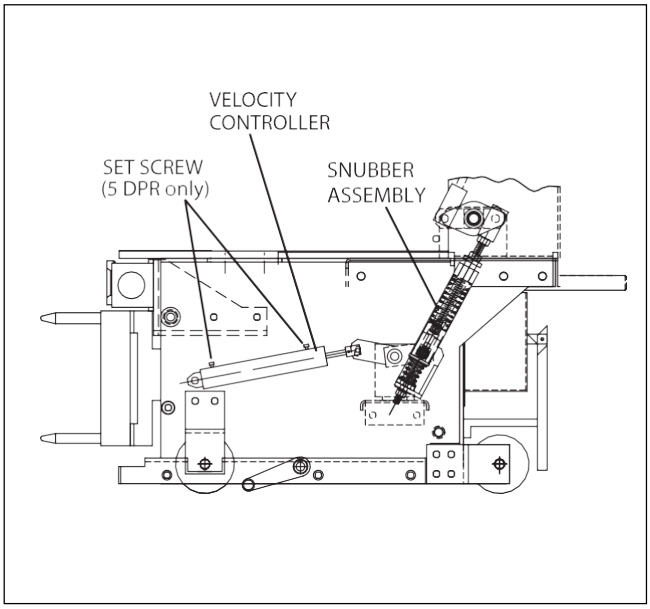



**Figure 6.** Velocity Controller and Snubber Assembly

**Racking Mechanism**
Remove existing lubricant from racking mechanism. Apply Klueber Isoflex Topas L 32 lubrication (part # 3AX11333H.) to the slid- ing, rotating and articulating surfaces. For inaccessible surfaces, Klueber Isoflex Topas L32N SPRAY LUBE (part # 15-172-879-201) may be used.

**MOC Actuator System**
Refer to **Figure 6 & 7**.

MOC actuator system shall be maintained and lubricated as following:

1. Visually inspect to confirm that the velocity controller is not leaking oil.
2. Verify that both setscrews on the velocity controller are tight (5 DPR only).
3. Verify velocity controller rod resistance. Remove shoulder bolt, washer and stop nut, and verify rod resistance by pushing rod “in” and “out”. Re-assemble the velocity controller assembly.
4. Check snubber for visual damage (broken clips and loose hardware).
5. Verify and adjust cubicle MOC components as needed to match pantograph reference dimensions shown in **Figure 7**.
6. Lubricate cubicle pantograph. Apply Klueber Isoflex Topas L 32 lubrication (part # 3AX11333H..) to pantograph area of MOC actuator pin interface (CONNECT and TEST (if available) positions).

Maintenance of the circuit breaker MOC actuator system DOES NOT mitigate the requirements to maintain cubicle mounted MOC system components. These shall be maintained in accordance with IEEE C37.59 and the original equipment manufacturer’s recommendations.

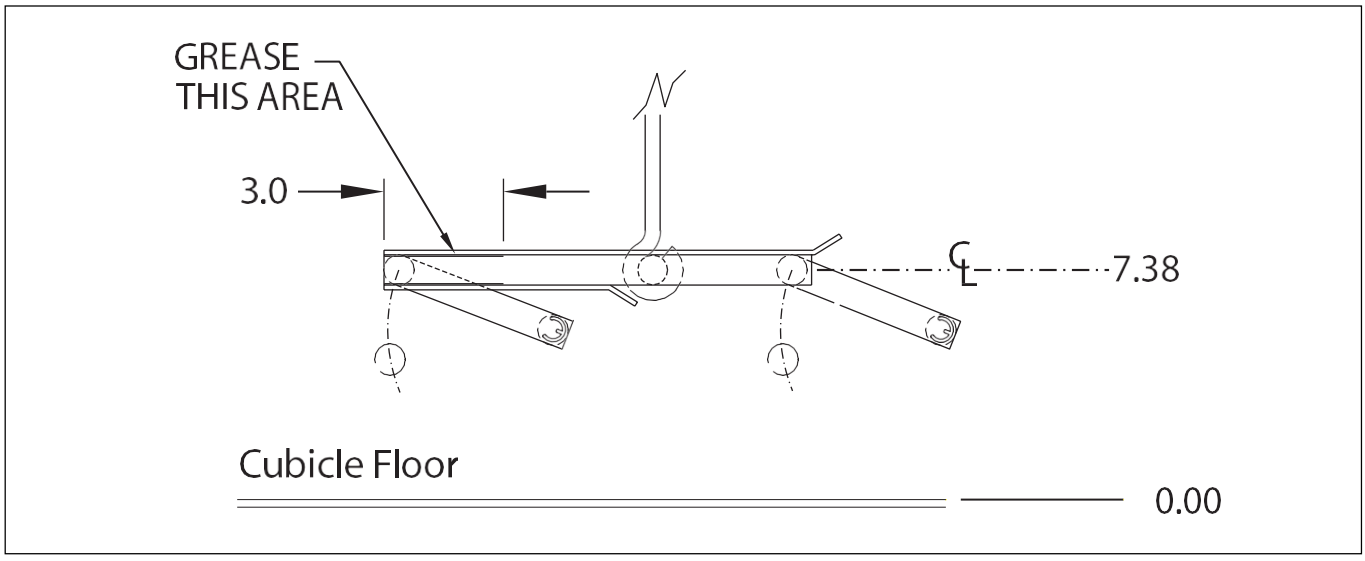



**Figure 7.** Cubicle Pantograph Setup

### Cubicle MOC Forces

Reference **Table 2** for the nominal and maximum forces required to operate the cubicle MOC's. The force measurement is made by operating the cubicle pantograph. The force is measured when operating the pantograph at the location corresponding to the MOC actuator pin interface with the pantograph when the circuit breaker is in the Connect position.

**Table 2** — Cubicle MOC Forces

| | MOC operator force |
|---|---|
| 1 Tier | 20 +/- 5 lbs |
| 2 Tier | 40 +/- 5 lbs |
| 3 Tier | 60 +/- 5 lbs |

### Pantograph Setup

Reference **Figure 7** for the setup of the cubicle pantograph. This figure matches the original equipment manufacturer's setup.

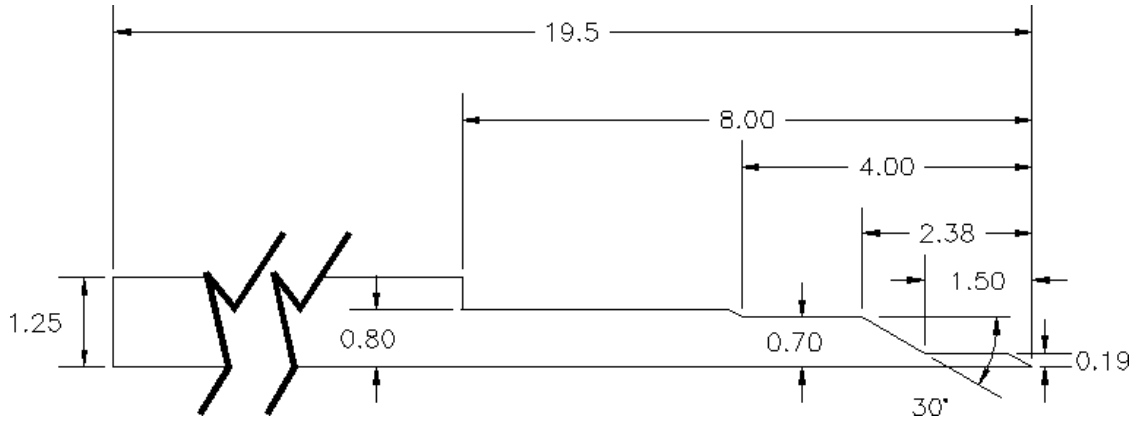
The cubicle maintenance details for the Cubicle MOC forces and the Pantograph setup are provided for reference only.

**Floor Interlock and Operating Lever Adjusting Instructions**

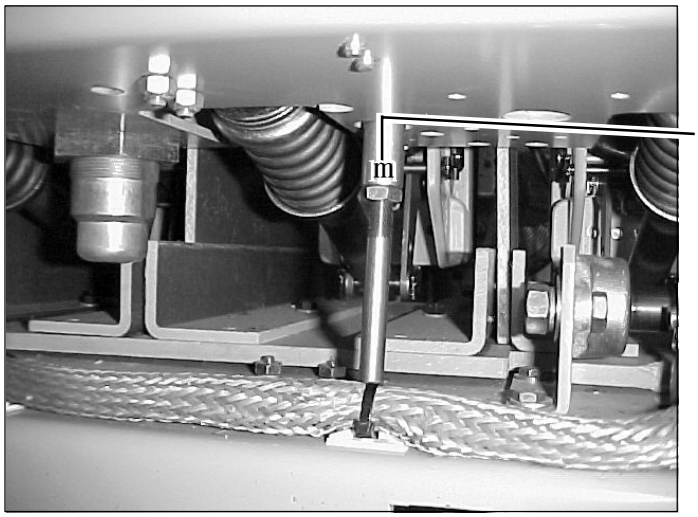
**The circuit breaker must be open and discharged prior to removing any covers.**

Tools required:

- 1/2 inch wrench or socket (5DPR only)
- 7/16 inch wrench or socket
- 9/16 inch open end wrench
- Midsize flat tip screwdriver
- Adjustment tool 18-671-185-059




Adjustment tool 18-671-185-059, Steel Bar, 0.38 x 1.25 x 19.5 inches



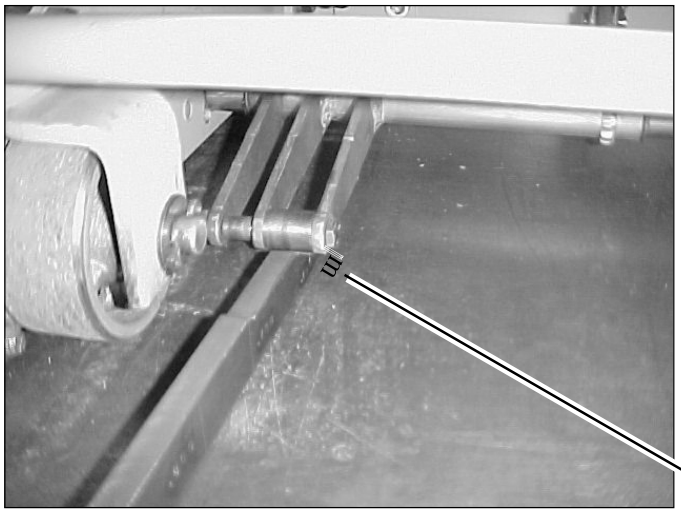

**Step 1**

Move circuit breaker on to a smooth flat surface

Loosen hex-jam nut using a 9/16 inch wrench on indicated clevis by turning it counterclockwise.

Turning the 3/8 inch rod counterclockwise moves the roller down (decreasing clearance between floor and roller).

Turning the 3/8 inch rod clockwise moves the roller up (increasing clearance between floor and roller).



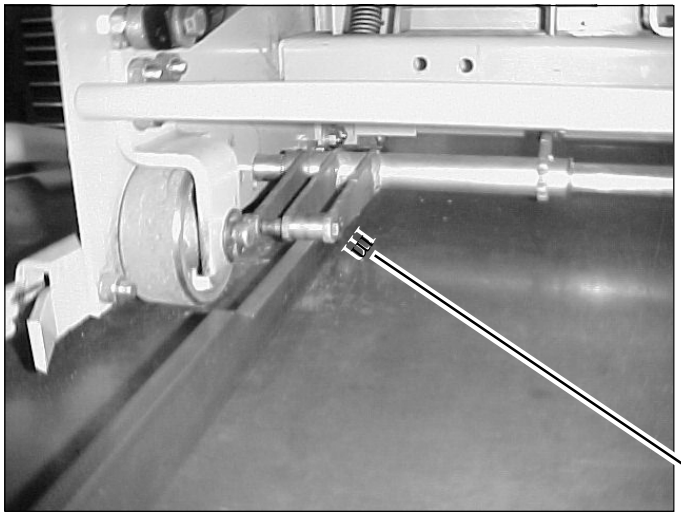
With the circuit breaker closing spring discharge roller (large roller) displaced 0.19 inches above the floor using the adjustment tool, the roller should have some resistance to rotation but must be able to be rotated manually.

Note: This is an initial setting and may be changed per these instructions.

**Step 2**

Tighten the 9/16 inch jam-nut on the indicated clevis. (Nut is shown in step 1)

0.19 inch step.



**Step 3**

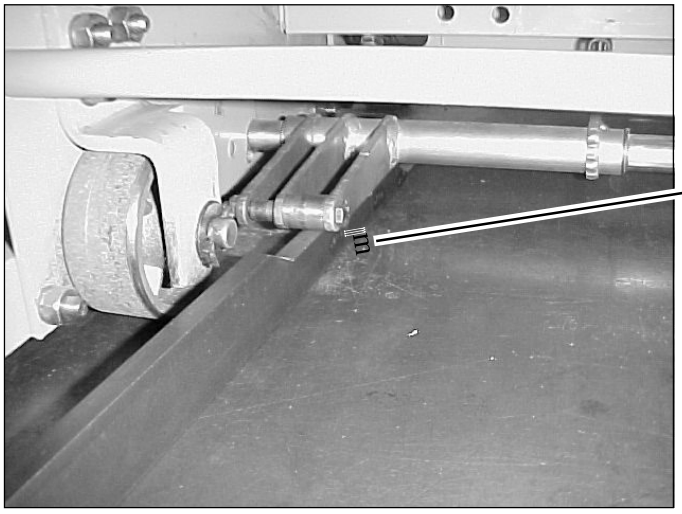
Charge the circuit breaker closing spring until it is latched and the closing spring indicator reads CHARGED.

**Step 4**

Roll the circuit breaker closing spring discharge roller (large roller) onto the 0.70 inch step of the adjustment tool.

The circuit breaker closing spring should discharge, the circuit breaker indicator should indicate OPEN and the spring indicator should read DISCHARGED.

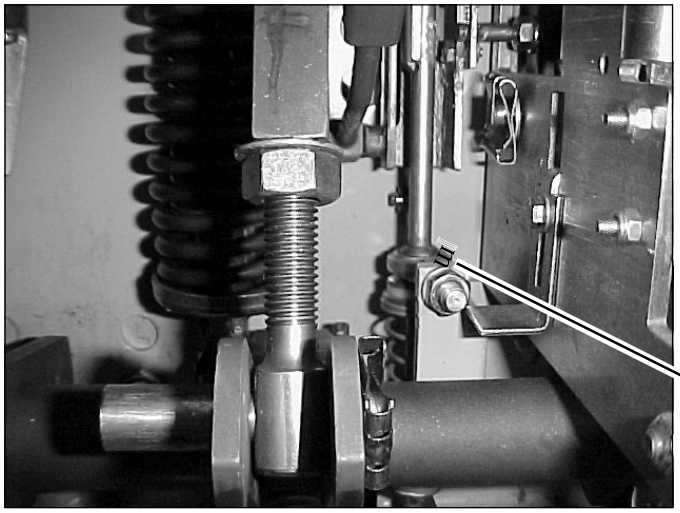
0.70 inch step.



**Step 5**

Roll the circuit breaker closing spring discharge roller (large roller) onto the 0.80 inch step of the adjustment tool and then off the tool.

0.80 inch step.

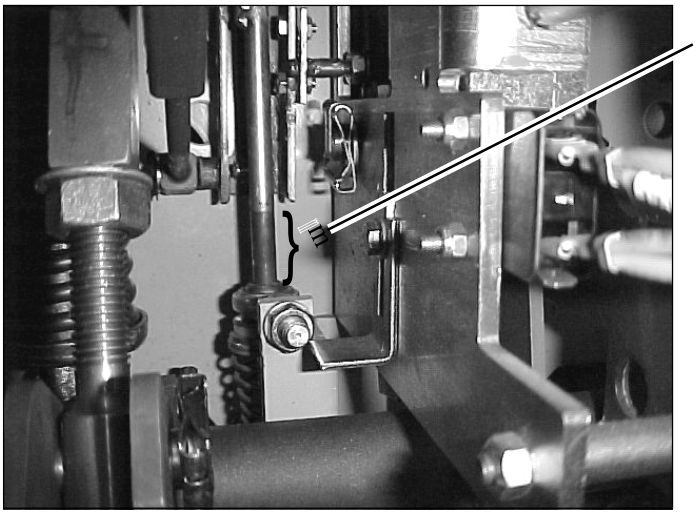


**Step 6**

Verify that the actuating push rod fully rests to its original position by observing the grease wipe on the actuating push rod at the eyebolt.

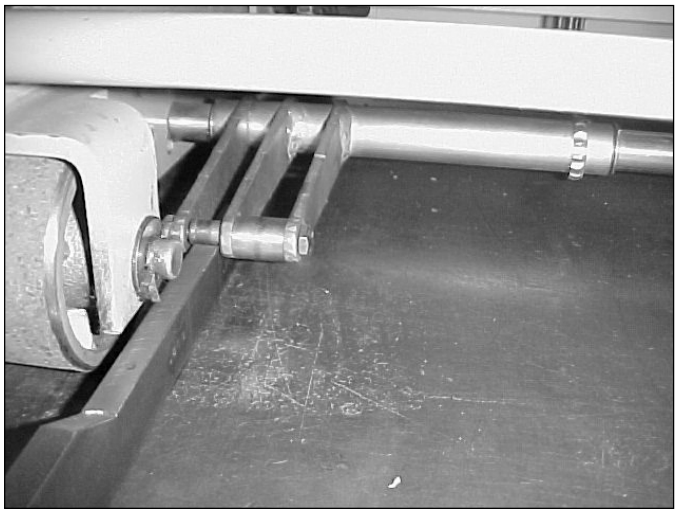
(Push rod shown with the circuit breaker rolled off the adjustment tool.)

No grease wipe should be shown! This confirms that the rod is at its reset position.



Attention: Grease wipe visible after removal of adjustment tool indicates that the actuating push rod has not reset!

(Push rod shown with the circuit breaker rolled on to the 0.80 inch step of the adjustment tool.)



**Step 7**

Roll the circuit breaker trip roller (smaller roller located towards the outer edge of the circuit breaker) onto the 0.70 inch step of the adjustment tool.

**Step 8**

Charge circuit breaker closing spring until it is latched and closing spring indicator reads CHARGED.

**Step 9**

Attempt to close the circuit breaker by pressing the black close button on the front of the circuit breaker.
Verify that circuit breaker is trip-free (closing spring will discharge but circuit breaker jackshaft should not rotate).

**Step 10**

To ensure proper adjustment of the Floor Interlock and Operating Lever repeat steps 3 to 9 a minimum of 2 times.

If the results cannot be achieved, loosen the hex-jam nut on the 3/8 inch rod of the indicated clevis with the 9/16 inch wrench and turn the rod half a turn counterclockwise. Tighten hex-jam nut, then repeat steps 3 through 9.

If the expected results in steps 3 through 9 still cannot be obtained, repeat step 10 until steps 3 through 9 can be successfully completed.

Note: The minimum height of the spring discharge interlock roller (large roller) from the floor shall not be less than 0.05 inches with the roller having some resistance to rotation but still able to be rotated manually.

**Functional Tests**
Refer to Circuit Breaker Operator Manual E50001-F710-A251-V3-4A00.

**Periodic Maintenance Intervals**
Refer to Circuit Breaker Operator Manual E50001-F710-A251-V3-4A00 and **Table 3**.

**Table 3** — Periodic Lubrication Interval

| Item | Lubrication Interval |
|---|---|
| Primary Disconnect contact surfaces | 100 racking operations or 10 years |
| Racking Mechanism | |
| MOC Actuator System | 10,000 operations or 10 years |

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