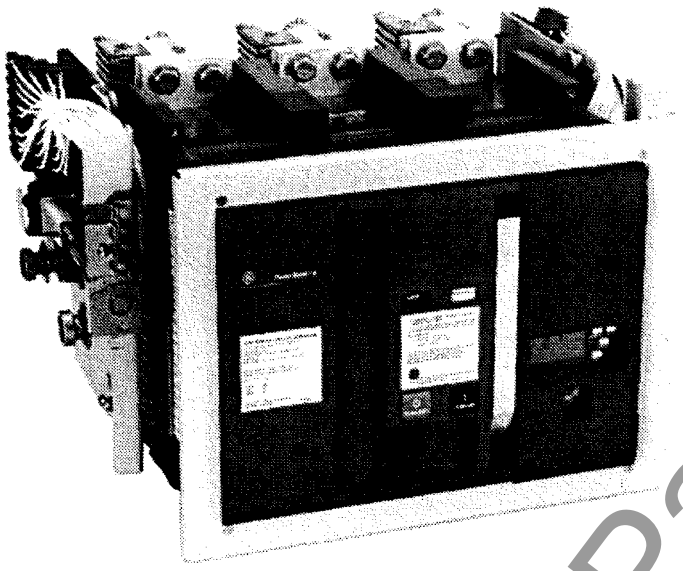
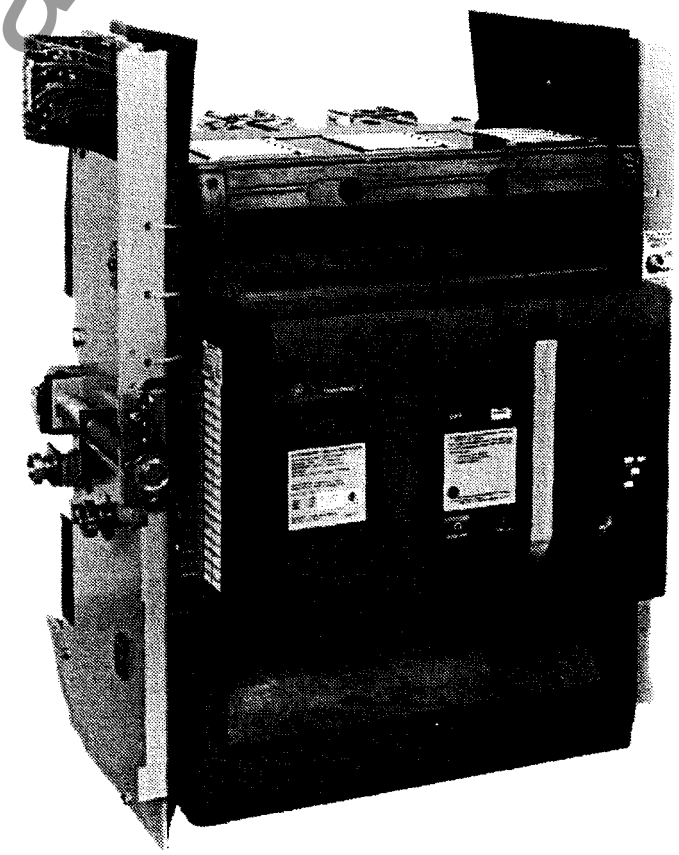
Power Break® II Circuit Breakers

Draw-Out 800–4000 Ampere Frames





GEH–6271B

WARNINGS, CAUTIONS, AND NOTES AS USED IN THIS PUBLICATION

WARNINGS

Warning notices are used in this publication to emphasize that hazardous voltages, currents, or other conditions that could cause personal injury are present in this equipment or may be associated with its use.

Warning notices are also used for situations in which inattention or lack of equipment knowledge could cause either personal injury or damage to equipment.

CAUTIONS

Caution notices are used for situations in which equipment might be damaged if care is not taken.

NOTES

Notes call attention to information that is especially significant to understanding and operating the equipment.

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Description

Types SSD and SHD Power Break II draw-out circuit breakers are used in types SPS and SPH substructures, with appropriate catalog numbers listed in Table 1. Draw-out construction permits activation of a new feeder, allows rapid replacement of a circuit breaker, and facilitates inspection and maintenance of the draw-out breaker with no need to de-energize the entire switchboard.

Draw-Out Breaker	Substructure
SSD08X2##	SPSDOS08
SHD08X2##	SPHDOS08
SSD16X2##	SPSDOS16
SHD16X2##	SPHDOS16
SSD20X220	SPSDOS20
SHD20X220	SPHDOS20
SSD25X###	SPSDOS25
SHD25X###	SPHDOS25
SSD30X3##	SPSDOS30
SHD30X3##	SPHDOS30
SSD40X4##	SPSDOS40
SHD40X4##	SPHDOS40

Note: In the breaker catalog number, replace "X" with "B" for MicroVersaTrip Plus™ or MicroVersaTrip PM™ Trip Units or with "D" for Power+™ Trip Units

Table 1. Catalog numbers of draw-out breakers and corresponding substructures.

Features

The features described below are illustrated in Figures 1, 2, and 3.

Primary Disconnects. Primary power is fed through multiple-finger primary disconnects when the breaker is in the connected position.

Secondary Disconnects. Control power is provided through the secondary disconnects in the test and connected positions only. All accessories terminate at dedicated positions regardless of the combination of accessories installed.

Rollers. The rollers on the sides of the breaker ride on retractable rails in the draw-out substructure for easy installation and removal.

Draw-Out Mechanism. A racking shaft powers a centrally mounted screw through a chain drive into a fixed nut in the substructure. A special speed wrench is supplied with an integral 1/2-inch square-drive socket to aid in installation and removal.

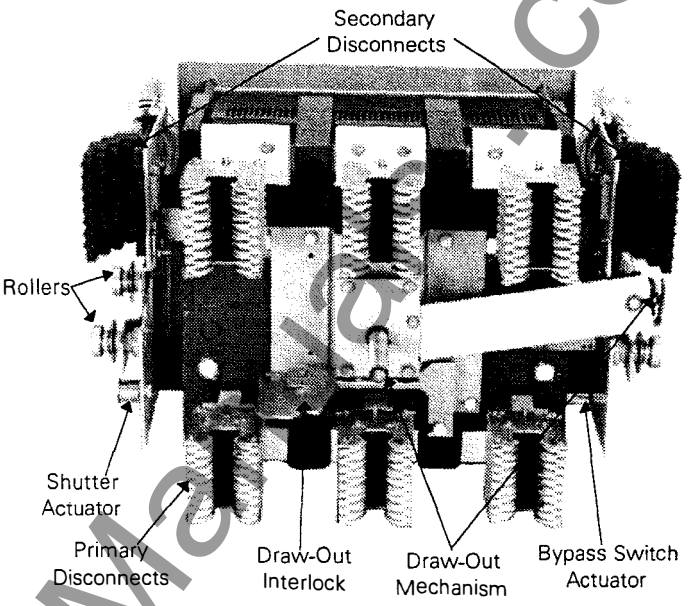

Figure 1. Rear view of the Power Break® II draw-out circuit breaker.

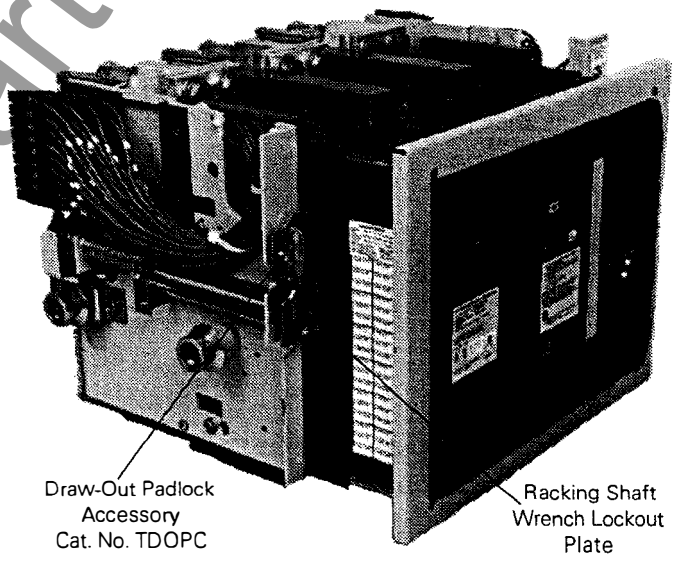

Figure 2. Left side of the breaker, showing the padlock accessory and racking shaft lockout plate.

Racking Shaft Wrench Lockout Plate. This interlock prevents engagement of the wrench when the breaker contacts are closed.

Draw-Out Position Switch. This switch is wired back into the breaker trip unit. MicroVersaTrip PM™ Trip Units can communicate the breaker position (test or connected) on the POWER LEADER™ Communication Network.

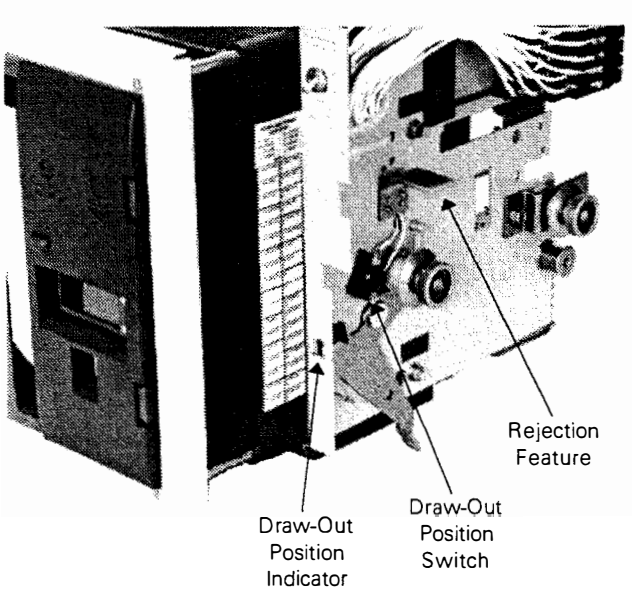

Figure 3. Right side of the breaker, showing the rejection feature, draw-out position switch, draw-out position indicator, and electric operator cutoff switch.

Draw-Out Position Indicator. Indicates whether the breaker is in the connected, test, or disconnect position.

Electric Operator Cutoff Switch. Prevents cycling of the spring-charging motor during installation or removal of a breaker.

Draw-Out Interlock. This feature trips a closed circuit breaker if the wrench interlock is deliberately defeated. The breaker is tripped before the primary disconnects part as the breaker is racked out and before the primary disconnects engage as the breaker is racked in.

Rejection Feature. This feature prevents insertion of a breaker into a substructure of lower ampere rating or higher short-circuit rating. It does not reject a breaker with incompatible control wiring. See the label on the breaker or Table 1 for the proper substructure catalog number. (Also shown in Figure 8.)

Table 2 illustrates the rejection scheme logic. Note that breakers may be safely used in higher-rated substructures. However, local and industry codes and standards require that conductors be sized to the substructure. Therefore, installing breakers in substructures with higher ratings is possible, but not economical.

Breaker	Substructure
SSD08202, X204, X208	SPSDOS08
SHD08X202, X204, X208	SPHDOS08
SSD16X210, X216	SPSDOS16
SHD16X210, X216	SPHDOS16
SSD20X220	SPSDOS20
SHD20X220	SPHDOS20
SSD25X210, X220, X325	SPSDOS25
SHD25X210, X220, X325	SPHDOS25
SSD30X330	SPSDOS30
SHD30X330	SPHDOS30
SSD40X440	SPSDOS40
SHD40X440	SPHDOS40

Note: In the breaker catalog number, replace "X" with "B" for MicroVersaTrip Plus™ or MicroVersaTrip PM™ Trip Units or with "D" for Power+™ Trip Units

Table 2. Illustration of the rejection-scheme logic, showing which breakers may be installed in which substructures.

Draw-Out Padlock Accessory. When a padlock is installed, this feature works with the racking shaft lockout plate to prevent engagement of the racking shaft wrench.

Shutter Actuator. A stud actuates the optional shutter accessory.

By-Pass Switch Actuator. Operates the optional by-pass switch accessory.

Lifting Bar. The Lifting Bar, catalog number TDOLB, is available for safe handling of the draw-out breaker, as illustrated in Figures 4 and 5.

Installing the Breaker

Use the following procedure to install the draw-out breaker into the substructure.

1. Attach the Lifting Bar, catalog number TDOLB, by locating the hooks on the bar beneath the shoulder studs of the breaker, as illustrated in Figures 4 and 5.
2. Pull out the substructure rails until they drop into the horizontal locked position. Lower the breaker so that the grooves in the rollers drop over the rails.
3. Make sure the grooves in all rollers straddle the rails, as illustrated in Figure 6, then remove the Lifting Bar and push the breaker into the substructure until it stops in the DISCONNECTED position. Then lift the rails and push them in to the stored position.

CAUTION: The breaker must be OFF before it is connected. If the breaker is charged, press the ON button to close the breaker contacts, then press the OFF button to open the contacts.

ATTENTION: Le disjoncteur doit être en position OFF avant qu'il ne soit embroché. Si le ressort de fermeture du disjoncteur est chargé, fermer les contacts du disjoncteur par action sur le bouton ON, puis appuyer sur le bouton OFF pour ouvrir les contacts.

4. Engage the 1/2-inch square end of the racking shaft with the supplied wrench, catalog number TDORT, and rotate the shaft clockwise to draw the breaker into the TEST or CONNECTED position, as illustrated in Figure 7. The compartment position indicator is shown in Figure 8.

NOTE: If the breaker does not fit the structure, check the rejection relationship, illustrated in Figure 8, to verify that a correctly rated breaker is being installed. Table 1 lists the correct draw-out substructure for each breaker frame.

NOTE: Si le disjoncteur ne rentre pas dans le berceau, vérifier le détrompeur illustré dans les figure 8, qui empêche l'insertion d'un mauvais calibre de disjoncteur. La Table 1 définis le berceau convenable à chaque taille de disjoncteur.

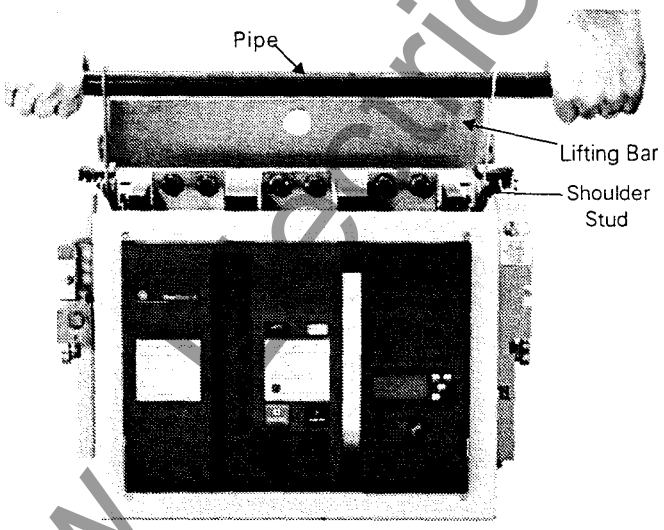

Figure 4. Lifting Bar attached to a draw-out breaker for manual lifting.

Figure 5. Lifting Bar attached to a draw-out breaker for lifting with a hoist.

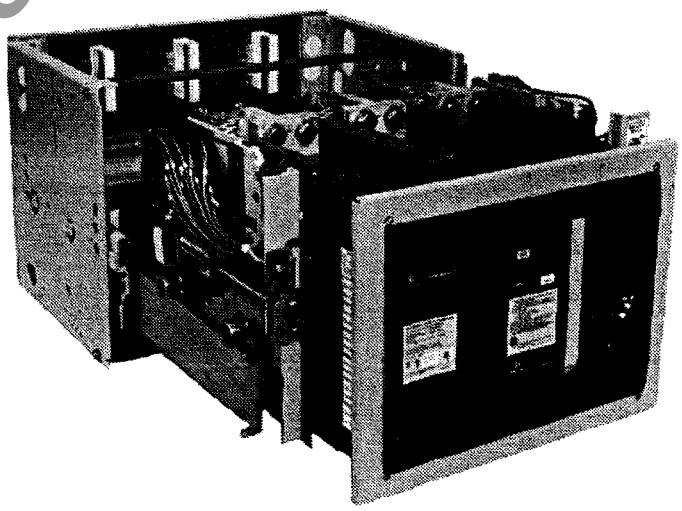

Figure 6. Breaker installed on rails, ready to be pushed into the substructure.

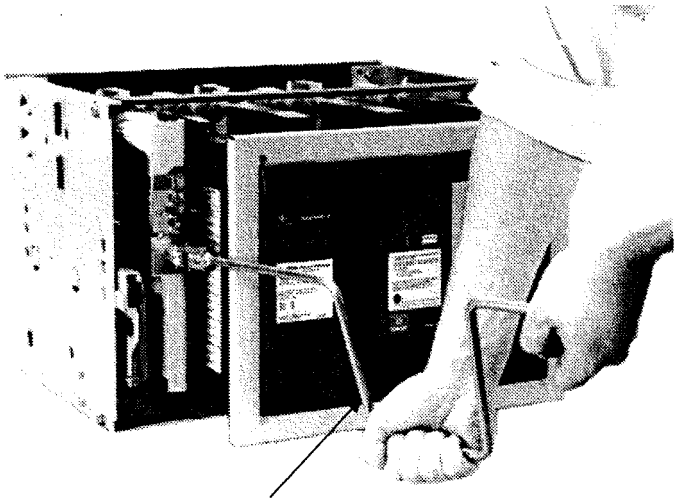

Figure 7. Wrench attached to the breaker racking shaft.

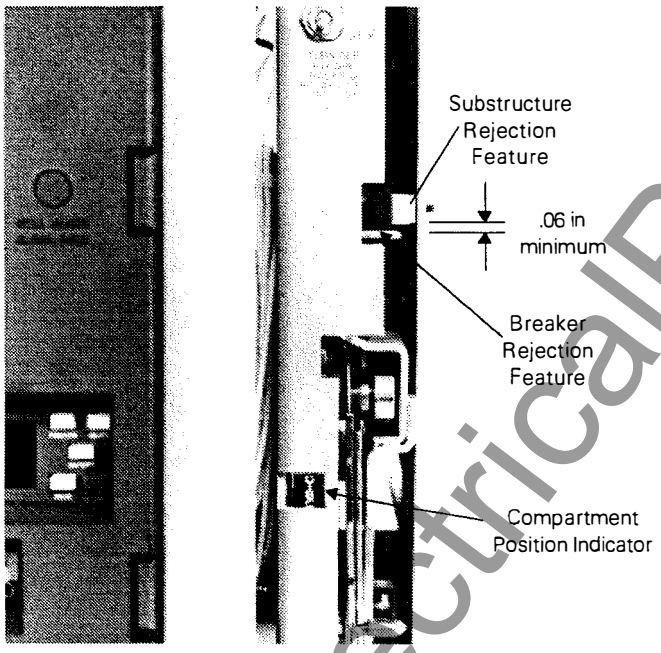

Figure 8. Compartment position indicator on the front of the breaker.

Removing the Breaker

Use the following procedure to remove the draw-out breaker from the substructure.

CAUTION: The breaker must be OFF before it is disconnected and removed.

ATTENTION: Le disjoncteur doit être en position OFF avant qu'il ne soit débroché et déposé.

1. Engage the 1/2-inch square end of the racking shaft with the supplied wrench, catalog number TDORT, as illustrated in Figure 7, and rotate the shaft counter-clockwise to withdraw the breaker to the TEST or DISCONNECTED position. The compartment position indicator is shown in Figure 8.
2. Pull the substructure rails out as far as possible until they drop into the horizontal locked position, as illustrated in Figure 9.
3. From the DISCONNECTED position, pull the breaker out on the rails until the front rollers fall into the detent, as illustrated in Figure 6.
4. The breaker can now be rotated about the front roller by pulling forward, as illustrated in Figure 10, for inspection of the rear of the breaker, or it can be completely removed after attaching the Lifting Bar, as illustrated in Figures 4 and 5.

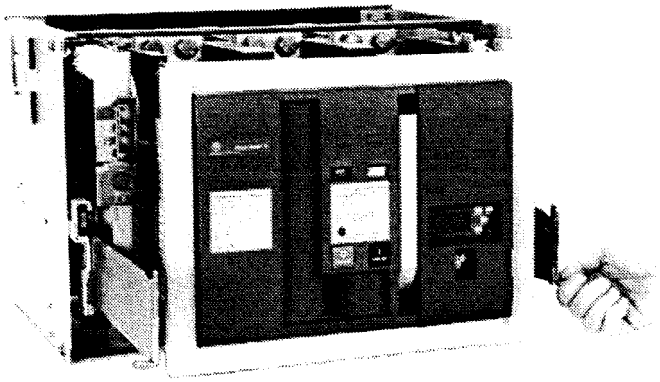

Figure 9. Withdrawing the substructure rails.

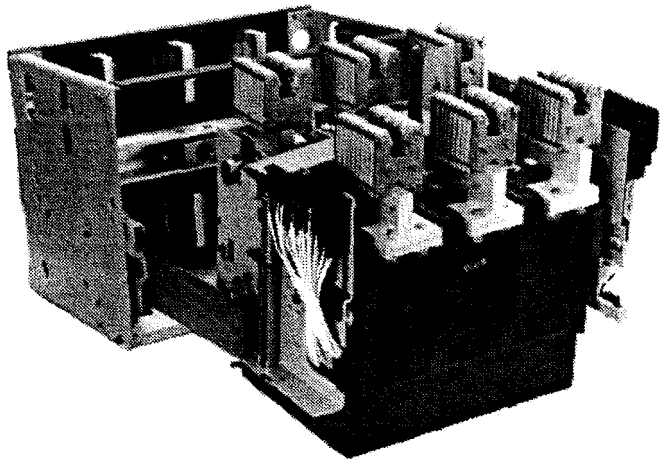

Figure 10. Rotating the breaker forward for inspection.

Maintenance Procedures

A regular maintenance schedule should be established to obtain the best service and reliability. Plant operating and local conditions dictate the frequency of inspections required.

A permanent record should be kept of all maintenance work. It will be a valuable reference for subsequent maintenance work and station operation. Records should include reports of tests performed, condition of equipment, and repairs and adjustments.

Maintenance employees must follow all recognized safety practices, such as those contained in the National Electrical Safety Code and in company or other safety regulations. Solid insulation surrounding an energized conductor in power apparatus must never be relied upon to provide protection to personnel.

Draw-out structure and connections should be given the following overall maintenance at least annually. Maintenance frequency depends on the severity of service and atmospheric conditions. Equipment subject to highly repetitive operation may require more frequent maintenance.

While some of these steps can be done with the breaker in the tilt-out position, a complete check can only be made after removing the breaker from the rails.

WARNING: Before attempting any work on draw-out devices, ensure that all sources of power—primary and secondary—have been de-energized.

AVERTISSEMENT: Avant de commencer toute intervention sur des appareils débrochable, vérifier que toutes les alimentations de puissance, à la fois primaire et secondaire, sont coupées.

1. Thoroughly clean the equipment by removing all dust and other accumulations. Wipe or vacuum clean the buses and supports. Do not use compressed air for blowing out equipment.
2. Inspect buses and/or terminal lug connections for signs of overheating or weakening of insulating supports. Check indicating devices and mechanical and key interlocks for proper functioning. Lubricate all moving and rubbing parts with a suitable lubricant, such as Mobil 28 red grease.
3. Check primary and secondary disconnecting surfaces for signs of abnormal wear or overheating. If required, clean contacts with a suitable solvent. Discoloration of silvered surfaces is not harmful unless atmospheric conditions cause deposits, such as sulfides, on the contact surfaces.
4. Check to see that all anchor bolts and structure bolts are tight. Inspect all cable or bus connections for signs of overheating and tighten all loose connections. Check that all secondary connections are secure and all control wiring is intact.
5. After cleaning with the breaker removed, measure and record resistances to ground and between phases of insulation on buses and connections. Since definite limits cannot be given for satisfactory resistance values, keep a record of resistance readings so that weakening of insulation from one maintenance period to the next can be recognized by comparing readings. Readings should be taken under similar conditions each time, if possible, and the record should include temperature and humidity.

   High potential tests are not required, but if it seems advisable, based on insulation resistance tests or after repairs, test voltage should not exceed 75% of the factory test voltage, which is two times the rating plus 1000 volts.
6. Operate each breaker in the TEST position to ensure proper functioning. This is particularly important for breakers that normally remain in either the opened or closed positions for long periods.
7. When the equipment is subject to unusual conditions, such as contaminating fumes and excessive moisture, schedule maintenance at more

frequent intervals. In this case, this procedure may not be sufficient and additional precautions may be necessary to protect the equipment.

Lubrication

All the areas subject to friction are liberally coated at the factory with Mobil 28 red grease. If the contact surfaces, the breaker power screw, and the interlock pin are cleaned during maintenance, coat the primary disconnect contact surfaces, the threads of the nut or screw, and the interlock pin with Mobil 28.

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