Cooper Power Systems

Type KFVE and KFVME (27kV) Bus Bar Kit KRK710-1 Installation Instructions

Service Information
KFE10010-E

961047KM

Figure 1.
Type KFVE and KFVME (27kV) bus bar kit KRK710-1.

Contents

SAFETY FOR LIFE

Kyle Distribution Switchgear products meet or exceed all applicable industry standards relating to product safety. We actively promote safe practices in the use and maintenance of our products through our service literature, instructional training programs, and the continuous efforts of all Kyle employees involved in product design, manufacture, marketing, and service.

We strongly urge that you always follow all locally approved safety procedures and safety instructions when working around high voltage lines and equipment and support our “Safety For Life” mission.

SAFETY INFORMATION

Following is important safety information. For safe installation and operation of this equipment, be sure to read and understand all cautions and warnings.

Safety Instructions

Following are general caution and warning statements that apply to this equipment. Additional statements, related to specific tasks and procedures, are located throughout the manual.

Hazard Statement Definitions

This manual contains two types of hazard statements:

WARNING: **Refers to hazards or unsafe practices which could result in severe personal injury, or death, and equipment damage.**

CAUTION: **Refers to hazards or unsafe practices which could result in damage to equipment or in personal injury**.

WARNING: Hazardous voltage. De-energize the switchgear before installing this kit. Follow all locally approved safety practices and procedures when working around high voltage lines and equipment. Failure to comply may result in contact with high voltage which will cause death or severe personal injury. T232.1

WARNING: Before installing, operating, maintaining, or testing this equipment, carefully read and understand the contents of this manual. Improper operation, handling, or maintenance can result in death, severe personal injury, and equipment damage. G101.0

WARNING: This equipment is not intended to protect human life. Follow all locally approved procedures and safety practices when installing or operating this equipment. Failure to comply can result in death, severe personal injury and equipment damage. G102.1

CAUTION: Follow all locally approved safety practices when lifting and mounting the equipment. Use the lifting lugs provided. Lift the load smoothly and do not allow the load to shift. Improper lifting can result in equipment damage. G106.1

PRODUCT INFORMATION

Introduction

The information contained in this kit is organized into the following major categories; *Safety Information, Kit Parts, Product Information, Installation, and Testing.* Refer to table of contents for page numbers.

Service Information KFE10003-E provides maintenance information and testing procedures for Kyle® reclosers.

Description

The bus bar kit for Type KFVE and KFVME reclosers includes the necessary parts to upgrade the dielectric withstand capabilities of the recloser.

New bus bars and fuses have been provided for the replacement of the bushing leads and the insulating support board.

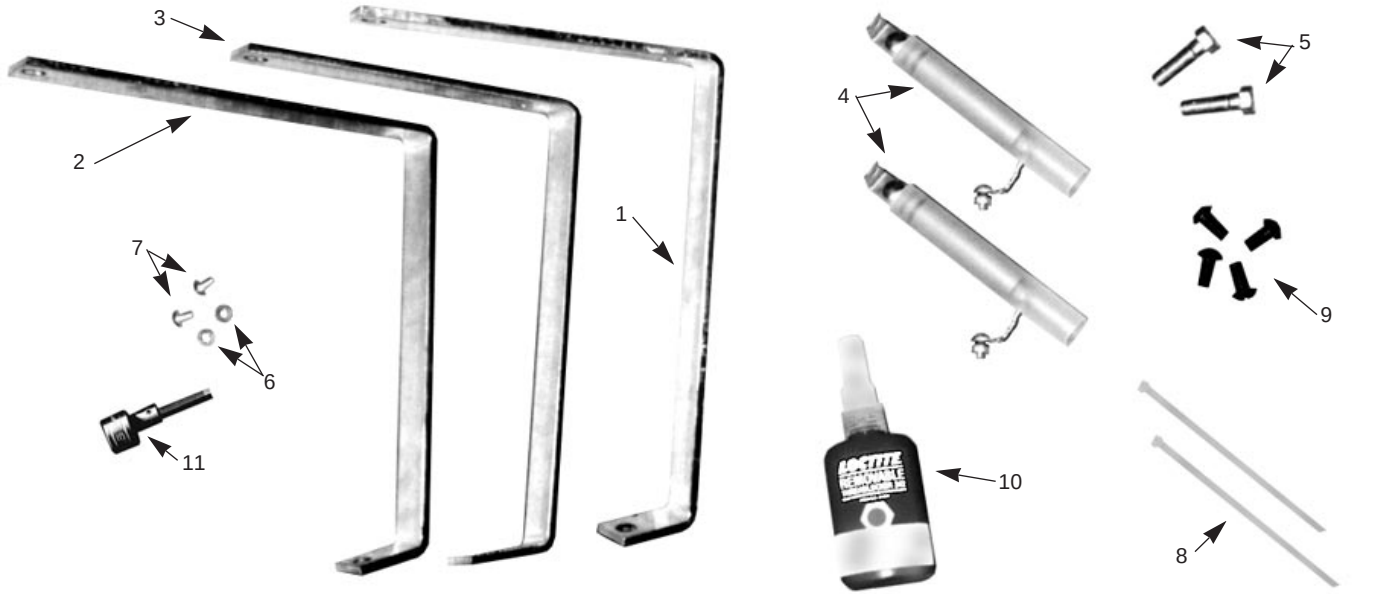


Figure 2.
Type KFVE and KFVME (27kV) bus bar kit KRK710-1.

TABLE 1
Bus Bar Kit KRK710-1 for Type KFVE and KFVME (27kV)

Item	Quantity	Catalog Number	Description
1	1	KRK1231F	A Phase Bus Bar
2	1	KRK1232F	B Phase Bus Bar
3	1	KRK1233F	C Phase Bus Bar
4	2	KRK1280-1	Fuse Assembly
5	2	K730101143150Q	Hex Head Capscrew
6	2	K900830025000A	Lockwasher
7	2	K721525125037A	Round Head Machine Screw
8	2	KP2358A5	Wire Tie
9	4	K732101137075A	Button Head Capscrew
10	1	KP2364A1	Loctite
11	1	KP2410A1	Hex Wrench
12	1	KA2048-426	Kit Instructions

INSTALLATION

Disassembly Procedures

WARNING: Hazardous voltage. De-energize the switchgear before installing this kit. Follow all locally approved safety practices and procedures when working around high voltage lines and equipment. Failure to comply may result in contact with high voltage which will cause death or severe personal injury. T232.1

CAUTION: Equipment damage. Recloser must be open (yellow operating handle, under sleethood, down) before untanking. Tripping the mechanism out of oil will cause excessive mechanical shock to the operating mechanism, which will cause accelerated wear and/or damage to the mechanism. T202.0

The entire installation process should be conducted in a clean environment such as a repair shop.

CAUTION: Follow all locally approved safety practices when lifting and mounting the equipment. Use the lifting lugs provided. Lift the unit smoothly and do not allow the unit to shift. Improper lifting can result in equipment damage. G106.2

1. After the recloser has been de-energized, remove the recloser from service.
2. With the recloser in the Open position, untank the recloser by loosening the six head bolts and washers on the head casting. Carefully lift the head assembly out of the tank using the lifting lugs (refer to Figure 3).

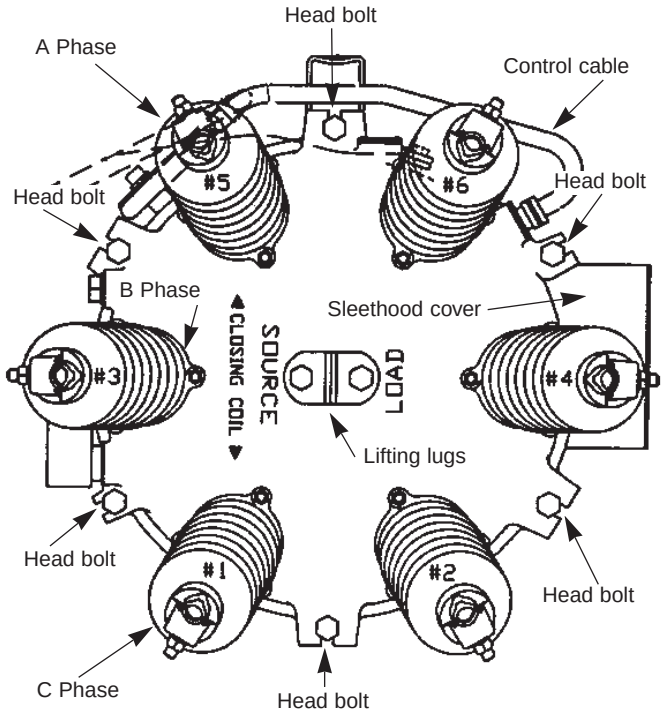
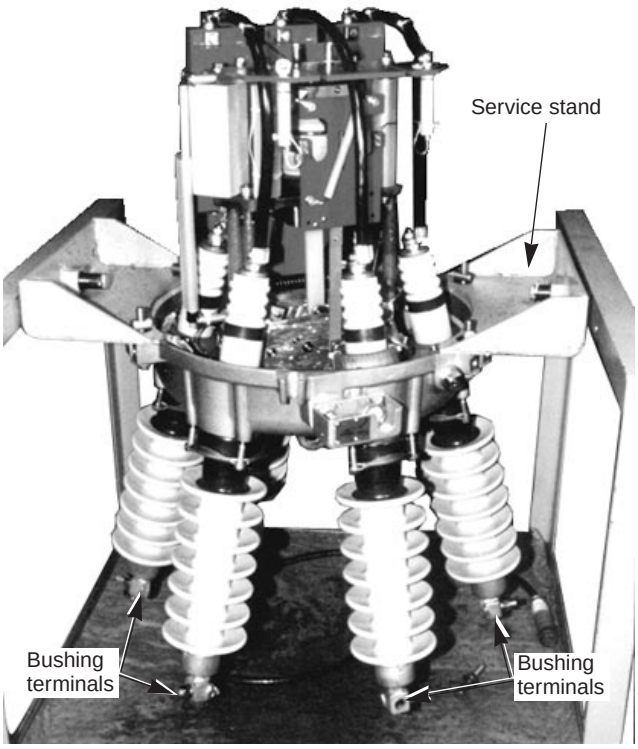


Figure 3.
Top view of head casting.

3. Invert the head assembly (refer to Figure 4) and if a service stand is not available, the head assembly will have to be gently set directly on the six bushing terminals.

   Note: The bushing terminals should be set on a rubber mat or a piece of plywood on a level surface.



961048KM

Figure 4.
Inverted head assembly.

IMPORTANT: The following parts from the original assembly will be reused during this retrofit:

- 2 steel lockwashers from bridge plate
- 3 brass hex head capscrews, 3 bronze lockwashers, and 3 brass flatwashers from bottom of interruper assembly
- 4 steel lockwashers from the interrupter support plate
- 3 1/2 in. nuts, 3 bronze lockwashers and 3 silver plated flatwashers from the bushing studs

4. Remove the three hex head capscrews, bronze lockwashers and brass flatwashers connecting the bushing leads to the bottom of the interrupter assembly and save the hardware (refer to Figure 5).

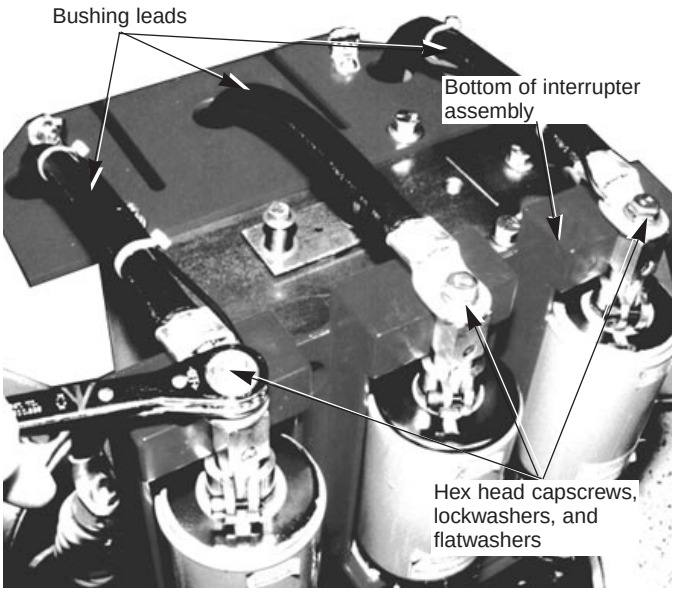


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Figure 5.
Bottom view of mechanism.

5. Remove the three nuts, bronze lockwashers and flatwashers from the bottom of the bushings on the source-side (refer to Figure 3) and save the hardware (refer to Figure 6).

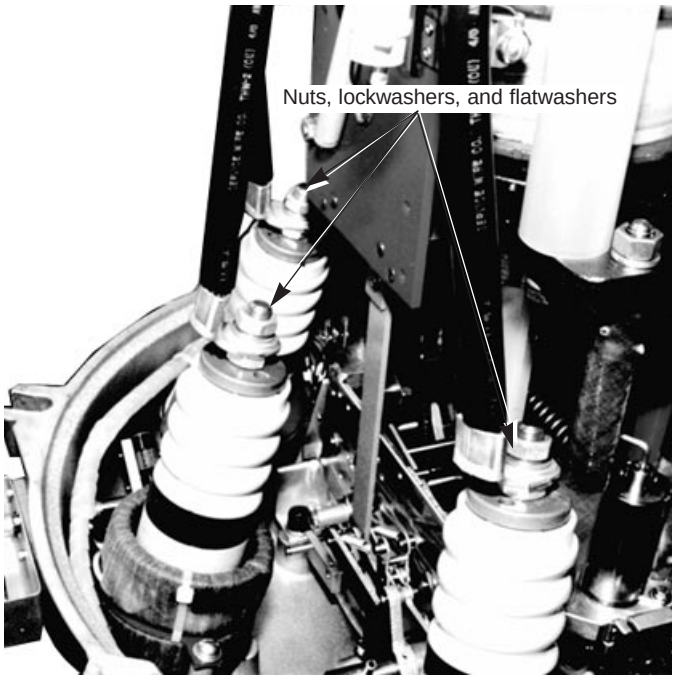

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Figure 6.
Bottom of bushings.

6. Remove the round head capscrews, hex nuts, bronze lockwashers and brass flatwashers from the contactor plate used to connect the fuse leads, and discard the hardware (refer to Figure 7).

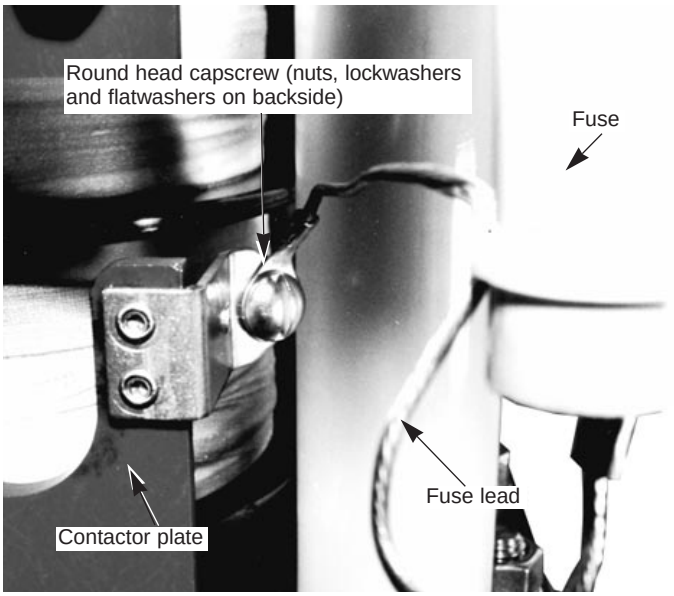

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Figure 7.
Fuse lead attachment.

7. Remove the two hex head capscrews, lockwashers, and steel flatwashers from the bushing lead support board (refer to Figure 8).

A. Discard the steel flatwashers and discard the hex head capscrews but keep the lockwashers for reuse during reassembly.

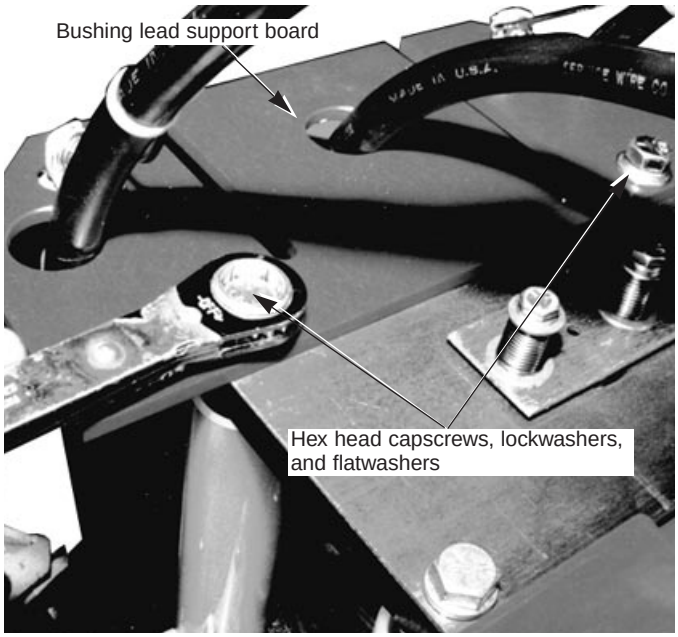

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Figure 8.
Bushing lead support board.

B. Remove and discard the bushing lead support board, the three black bushing leads, and the two fuses (refer to Figure 9).

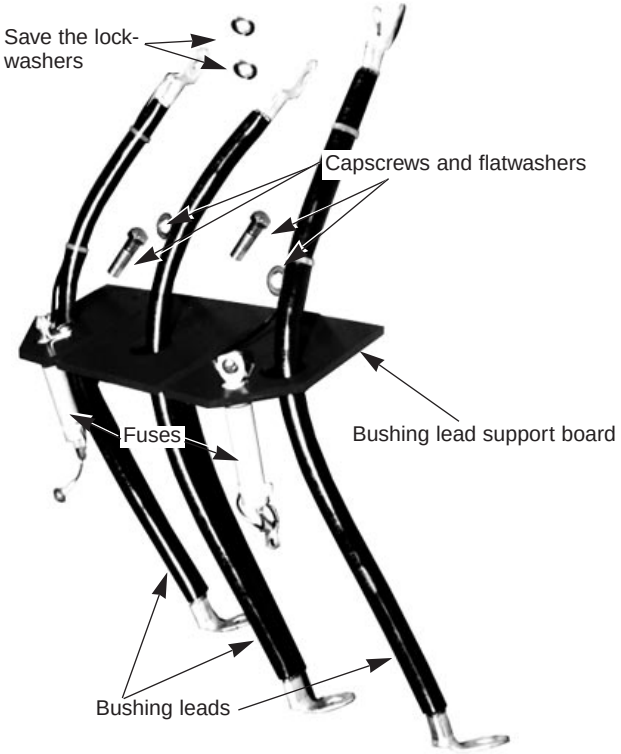

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Figure 9.
Discarded components.

Capscrew Replacement

There are four button head capscrews included with this kit to replace the four hex head capscrews currently used on the interrupter mounting plate.

IMPORTANT: To prevent the interrupter mounting plate from shifting, replace one hex head capscrew with one button head capscrew at a time.

1. **One at a time** replace the four hex head capscrews holding the interrupter support plate with the four button head capscrews (refer to Figure 10).
   - **A.** Reuse the lockwashers with the button head capscrews. Discard the hex head capscrews and the flatwashers.
   - **B.** The threads of each screw hole must be free of oil before applying Loctite to the threads of the button head capscrews. If oil is present, flush the holes with alcohol to remove all traces of oil.
   - **C.** Torque (using the hex wrench included in this kit) each button head capscrew to 15 Nm (140 in. lbs.).

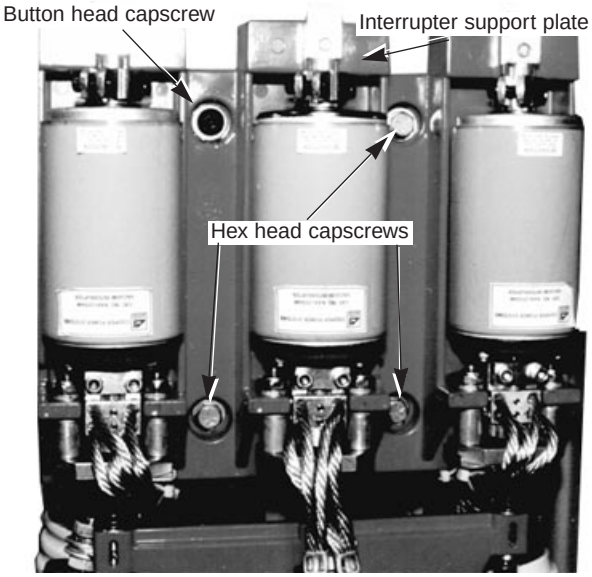

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Figure 10.
Capscrew replacement.

Reassembly Procedures

1. In the top of the bridge plate, use the two 1-1/2 inch capscrews supplied with the kit and the two previously saved lockwashers to reattach the bridge plate (refer to Figure 11).

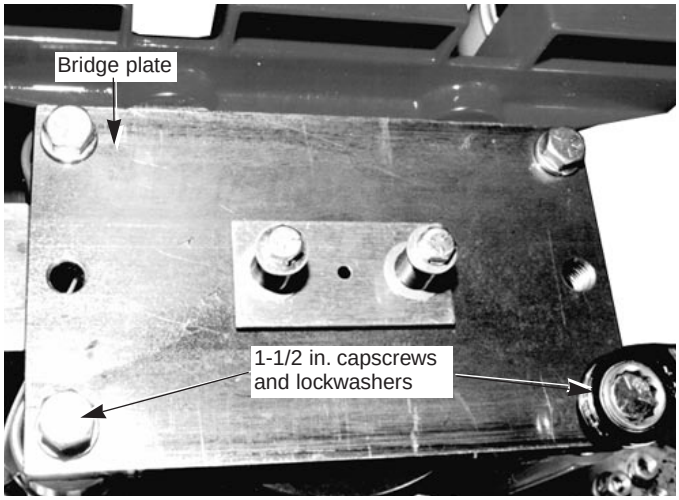

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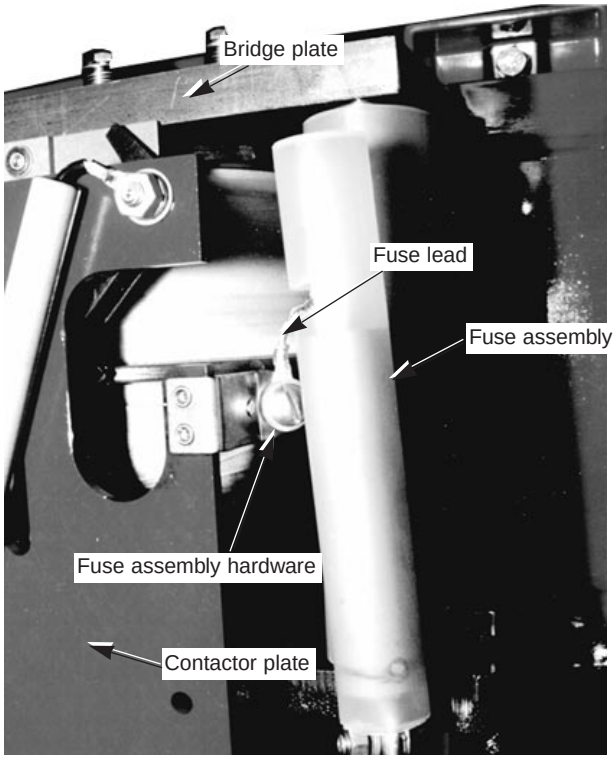
Figure 11.
Bridge plate attachment.

2. Attach the two fuse assemblies to the contactor plate. Use the hardware attached to the fuse assemblies (refer to Figure 12).

3. Train the fuse leads as shown the Figure 12.



961056KM

Figure 12.
Fuse assembly.

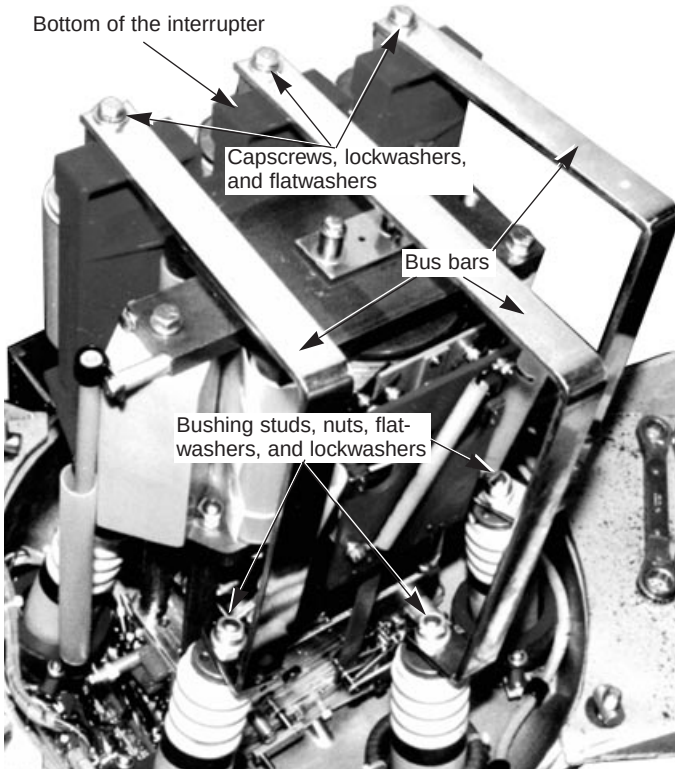
4. Place a bus bar on each of the bushing studs and align the bus bar screw holes on the bottom of the interrupter (refer to Figure 13). The bus bars are pre-formed at different angles to fit in only one position. It may be necessary to switch the bus bars around to determine their exact position.

A. Attach the bus bars to the bottom of the interrupter using the capscrews, bronze lockwashers and brass flatwashers saved earlier (refer to Figure 13).

B. Tighten the bus bars to the bottom bushing studs using the previously saved nuts, flatwashers and lockwashers. Place a flatwasher on the bottom bushing stud first, then the bus bar, followed with another flatwasher, the lockwasher, and then the nut (refer to Figure 13). Tighten the bus bar hardware.

Note: To prevent strain on the bus bars, adjustment of the hardware on either side of the bus bar may be necessary for a tight connection.

5. Connect the fuse bracket to the bottom of the bus bar in the pre-drilled hole with the lockwasher and slotted screw furnished with the kit. Then tighten the carriage bolt on the bracket at the botton of the fuse (refer to Figure 14).



961057KM

Figure 13.
Bus bars.

6. Push the fuse insulator down (toward the bushings) as far as it will go. Place a wire tie (furnished with the kit) around the bottom of the fuse and tighten the tie (refer to Figure 14). This will protect the insulator from sliding down when the unit is replaced in the tank.

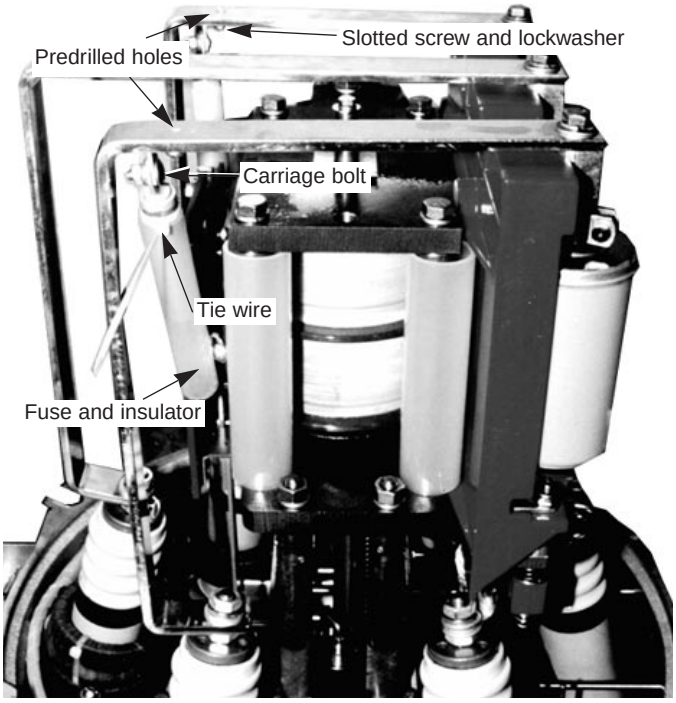


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Figure 14.
Fuse assembly attachment.

7. Carefully place the head assembly into the tank.

A. The head assembly must be adjusted to seat over the cover gasket properly.

B. The sleethood should be located 90° from the tank pole mounting bracket (refer to Figure 15).

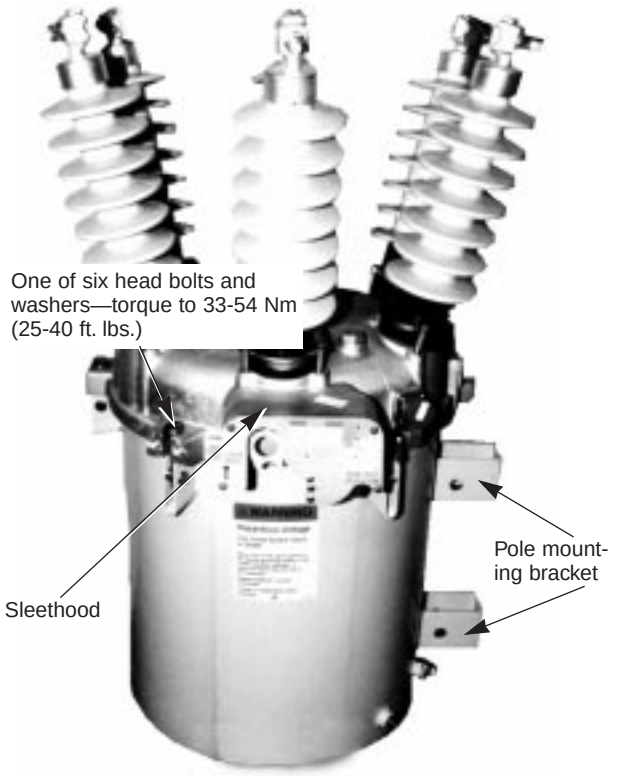

Figure 15.
Head assembly placement.

8. Tighten the six head bolts and washers on the head assembly of the tank in an alternating pattern according to the sequence shown in Figure 16. Torque each head bolt to 33-54 Nm (25-40 ft. lbs.).

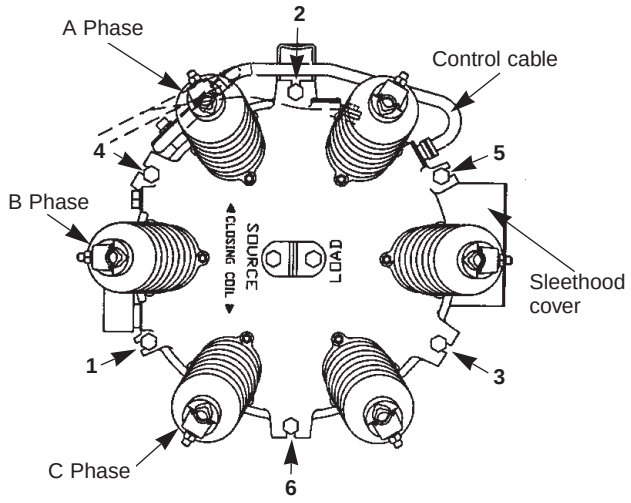

Figure 16.
Head bolt torque sequence.

TESTING

Safety Requirements

WARNING: Before installing, operating, maintaining, or testing this equipment, carefully read and understand the contents of this manual. Improper operation, handling, or maintenance can result in death, severe personal injury, and equipment damage. G101.0

WARNING: Hazardous voltage. The switchgear and high voltage transformer must be in a test cage or similar protective device to prevent accidental contact with the high voltage parts. Solidly ground all equipment. Failure to comply can result in death, severe personal injury, and equipment damage. T221.3

When high-voltage closing is used, both the recloser and the high-voltage test transformer must be enclosed in a test cage to prevent accidental contact with live high-voltage parts. All metering and measuring equipment must be located outside the test cage. Observe proper grounding and test procedures.

High-Potential Tests

CAUTION: Radiation. At voltages up to the specified test voltages, the radiation emitted by the vacuum interrupter is negligible. However, above these voltages, radiation injurious to personnel can be emitted. See *Service Information S280-90-1, Vacuum Interrupter Withstand Test Voltage Ratings Information* for further information. G109.2

After the installing the bus bar kit, conduct a high potential test of the unit. The high potential withstand tests of the recloser should be performed as described in the *KFE10003-E Maintenance Instructions*.

SAFETY FOR LIFE

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Cooper Power Systems

Quality from Cooper Industries

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