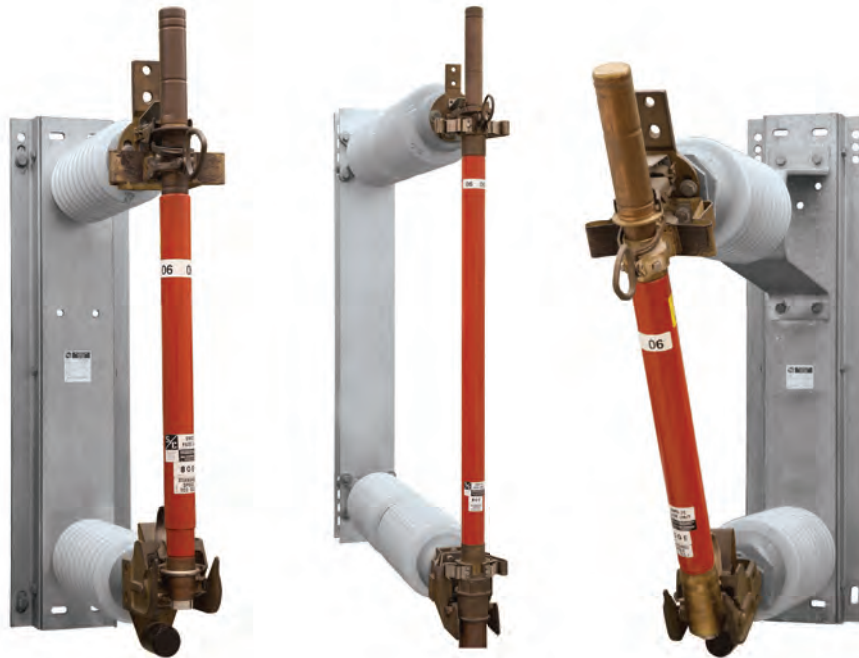


Field Assembly And Installation

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Introduction

Qualified Persons

WARNING

Only qualified persons who are knowledgeable in the installation, operation, and maintenance of overhead and underground electric distribution equipment, along with all associated hazards, may install, operate, and maintain the equipment covered by this publication. A qualified person is someone who is trained and competent in:

- The skills and techniques necessary to distinguish exposed live parts from nonlive parts of electrical equipment
- The skills and techniques necessary to determine the proper approach distances corresponding to the voltages to which the qualified person will be exposed
- The proper use of special precautionary techniques, personal protective equipment, insulated and shielding materials, and insulated tools for working on or near exposed energized parts of electrical equipment

These instructions are intended ONLY for such qualified persons. They are not intended to be a substitute for adequate training and experience in safety procedures for this type of equipment.

Read this Instruction Sheet

NOTICE

Thoroughly and carefully read this instruction sheet and all materials included in the product's S&C Instruction Handbook before installing or operating your S&C Types SMD-1A, SMD-2B, SMD-2C, and SMD-3 Power Fuses. Familiarize yourself with the Safety Information and Safety Precautions on pages 3 through 4. The latest version of this publication is available online in PDF format at sandc.com/en/support/product-literature/.

Retain this Instruction Sheet

This instruction sheet should be available for reference whenever S&C Types SMD-1A, SMD-2B, SMD-2C, and SMD-3 Power Fuses are used. Retain this instruction sheet in a location where you can easily retrieve and refer to it.

Proper Application

WARNING

S&C Type SMD-1A, SMD-2B, SMD-2C and SMD-3 Power Fuses must only be used for specific fusing applications that are within the ratings of the model selected. S&C Types SMD-1A, SMD-2B, SMD-2C, and SMD-3 Power Fuse ratings are listed on a ratings label attached to the unit.

Warranty

The warranty and/or obligations described in S&C's Price Sheet 150 "Standard Conditions of Sale – Immediate Purchasers in the United States" (or Price Sheet 153, "Standard Conditions of Sale – Immediate Purchasers Outside the United States"), plus any special warranty provisions, as set forth in the applicable product-line specification bulletin, are exclusive. The remedies provided in the former for breach of these warranties shall constitute the immediate purchaser's or end user's exclusive remedy and a fulfillment of the seller's entire liability. In no event shall the seller's liability to the immediate purchaser or end user exceed the price of the specific product that gives rise to the immediate purchaser's or end user's claim. All other warranties, whether express or implied or arising by operation of law, course of dealing, usage of trade or otherwise, are excluded. The only warranties are those stated in Price Sheet 150 (or Price Sheet 153), and THERE ARE NO EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ANY EXPRESS WARRANTY OR OTHER OBLIGATION PROVIDED IN PRICE SHEET 150 (OR PRICE SHEET 153) IS GRANTED ONLY TO THE IMMEDIATE PURCHASER AND END USER, AS DEFINED THEREIN. OTHER THAN AN END USER, NO REMOTE PURCHASER MAY RELY ON ANY AFFIRMATION OF FACT OR PROMISE THAT RELATES TO THE GOODS DESCRIBED HEREIN, ANY DESCRIPTION THAT RELATES TO THE GOODS, OR ANY REMEDIAL PROMISE INCLUDED IN PRICE SHEET 150 (OR PRICE SHEET 153.)

Understanding Safety-Alert Messages

Several types of safety-alert messages may appear throughout this instruction sheet and on labels and tags attached to your S&C Types SMD-1A, SMD-2B, SMD-2C, and SMD-3 Power Fuses. Familiarize yourself with these types of messages and the importance of these various signal words:

⚠ DANGER

“DANGER” identifies the most serious and immediate hazards that will likely result in serious personal injury or death if instructions, including recommended precautions, are not followed.

⚠ WARNING

“WARNING” identifies hazards or unsafe practices that can result in serious personal injury or death if instructions, including recommended precautions, are not followed.

⚠ CAUTION

“CAUTION” identifies hazards or unsafe practices that can result in minor personal injury if instructions, including recommended precautions, are not followed.

NOTICE

“NOTICE” identifies important procedures or requirements that can result in product or property damage if instructions are not followed.

Following Safety Instructions

If you do not understand any portion of this instruction sheet and need assistance, contact your nearest S&C Sales Office or S&C Authorized Distributor. Their telephone numbers are listed on S&C’s website sandc.com, or call the S&C Global Monitoring and Support Center at 1-888-762-1100.

NOTICE

Read this instruction sheet thoroughly and carefully before installing your S&C Types SMD-1A, SMD-2B, SMD-2C, and SMD-3 Power Fuses.



Replacement Instructions and Labels

If additional copies of this instruction sheet are needed, contact your nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

It is important that any missing, damaged, or faded labels on the equipment be replaced immediately. Replacement labels are available by contacting your nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

DANGER



S&C Types SMD-1A, SMD-2B, SMD-2C, and SMD-3 Power Fuses operate at high voltage. Failure to observe the precautions below will result in serious personal injury or death.

Some of these precautions may differ from company operating procedures and rules. Where a discrepancy exists, users should follow their company's operating procedures and rules.

1. **QUALIFIED PERSONS.** Access to S&C Types SMD-1A, SMD-2B, SMD-2C, and SMD-3 Power Fuses must be restricted only to qualified persons. See the "Qualified Persons" section on page 2.
2. **SAFETY PROCEDURES.** Always follow safe operating procedures and rules.
3. **PERSONAL PROTECTIVE EQUIPMENT.** Always use suitable protective equipment, such as rubber gloves, rubber mats, hard hats, safety glasses, arc-flash clothing, and fall-protection, in accordance with safe operating procedures and rules.
4. **SAFETY LABELS.** Do not remove or obscure any of the "DANGER," "WARNING," "CAUTION," or "NOTICE" labels and tags. Remove tags ONLY if instructed to do so.
5. **ENERGIZED COMPONENTS.** Always consider all parts live until de-energized, tested, and grounded.
6. **MAINTAINING PROPER CLEARANCE.** Always maintain proper clearance from energized components.
7. **Do not leave fuse units installed in the fuse mounting hanging open.** Once closed in, the fuse units will not be damaged by rain or high humidity. However, the watertightness of the exhaust end of the fuse units cannot be guaranteed; therefore, as a precaution, fuse units should not be left hanging open. Any rain or snow that might enter could affect the solid-materials lining. Moreover, when in storage, these fuse units should be protected from excessive moisture.
8. **Do not remove the fuse unit from its carton until ready to use.**
9. **Handle fuse units with care.** Do not drop or throw them.
10. **Do not place hand over the upper seal of the fuse unit when handling.** There is the remote possibility that the current-responsive section of the fuse unit may have been weakened in shipping or handling. As a result, the spring-loaded actuating pin may be unpredictably released and driven forcibly through the upper seal.

The following instructions are for field assembly, installation, and maintenance of S&C Power Fuses—Types SMD-1A, SMD-2B, SMD-2C, and SMD-3 in ratings of 34.5 kV, 46 kV, and 69 kV. When equipped with the proper end fittings, SMD-1A, SMD-2B, SMD-2C, and SMD-3 Fuse Units are interchangeable in the same mountings except as follows:

- An SMD-2B, SMD-2C, or SMD-3 Fuse Unit must not be installed in an SMD-1A right-angle style mounting unless the catalog number stamped on the nameplate of the mounting carries an “R” supplement such as catalog number 192006R2.
- An SMD-3 Fuse Unit cannot be installed in an SMD-1A, SMD-2B, or SMD-2C upright or pedestal style mounting; conversely, an SMD-1A, SMD-2B, or SMD-2C Fuse Unit cannot be installed in an SMD-3 upright or pedestal style mounting.

Because of differences in interrupting ratings, fuse units of different types should not be interchanged without first checking application requirements.

Note: In April 1955 the latch-and-upper contact assemblies and the upper end fittings used on these power fuses were redesigned. To identify mountings (or live parts) and fuse-unit end fittings reflecting this change, a supplement was added to the corresponding catalog numbers—186924R1, for example.

Upper end fittings of the pre-April 1955 design will not necessarily latch into the latch-and-upper-contact assembly of the improved design. More specifically, if the casting which mounts on the upper insulator bears No. S-60015 or S-60016, do not attempt to use fuse-unit end fittings having “nose” casting No. S-55979 or S-55562.

The latch-and-upper-contact assembly of the previous design will, however, accommodate the new upper end fittings.

Assembling and Installing Mountings

Instructions given in this section are based on the use of standard station post insulators. Steps 1, 2, and 3 that follow apply to 69-kV mountings (and 34.5-kV and 46-kV mountings when ordered without insulators and/or a mounting base). Steps 1, 2, and 3 do not apply to 34.5-kV or 46-kV mountings furnished complete.

STEP 1. *Vertical, Inverted, and Upright Styles:*

Attach insulators to mounting base as illustrated in Figure 1 on page 7, using four $\frac{1}{2}$ —13×1-inch galvanized bolts and lock washers with each insulator. Before fully tightening the mounting bolts, adjust the insulators to attain the appropriate spacing as shown in Figure 1 on page 7. To compensate for minor variations in the insulators, it may be necessary to rotate one or both insulators either 90° or 180° to attain the specified center-to-center dimensions. Shim the insulators if necessary. Fully tighten the mounting bolts.

⚠ CAUTION

For inverted style mountings, the “dish” of the insulator skirts must face away from the mounting base, as shown in Figure 1 on page 7.

Vertical-Offset Style: Attach one insulator to the mounting base as illustrated in Figure 2 on page 9 using four $\frac{1}{2}$ —13×1-inch galvanized bolts and lock washers. Next, attach the insulator pedestal to the mounting base as shown in Figure 2 on page 9 using four $\frac{1}{2}$ —13×1 $\frac{1}{4}$ -inch galvanized bolts, lock washers, and nuts. (Flat washers are used on the 46-kV and 69-kV models when fastening the outside leg of the insulator pedestal to the base.) Attach the other insulator to the insulator pedestal using four $\frac{1}{2}$ —13×1 $\frac{1}{4}$ -inch galvanized bolts, lock washers, and spacers. Fully tighten all mounting bolts.

Right-Angle and Pedestal Styles: Attach insulators to mounting base as illustrated in Figure 3 on page 11 or Figure 4 on page 12 as applicable, using four $\frac{1}{2}$ —13×1-inch galvanized bolts and lock washers with each insulator. Fully tighten the mounting bolts.

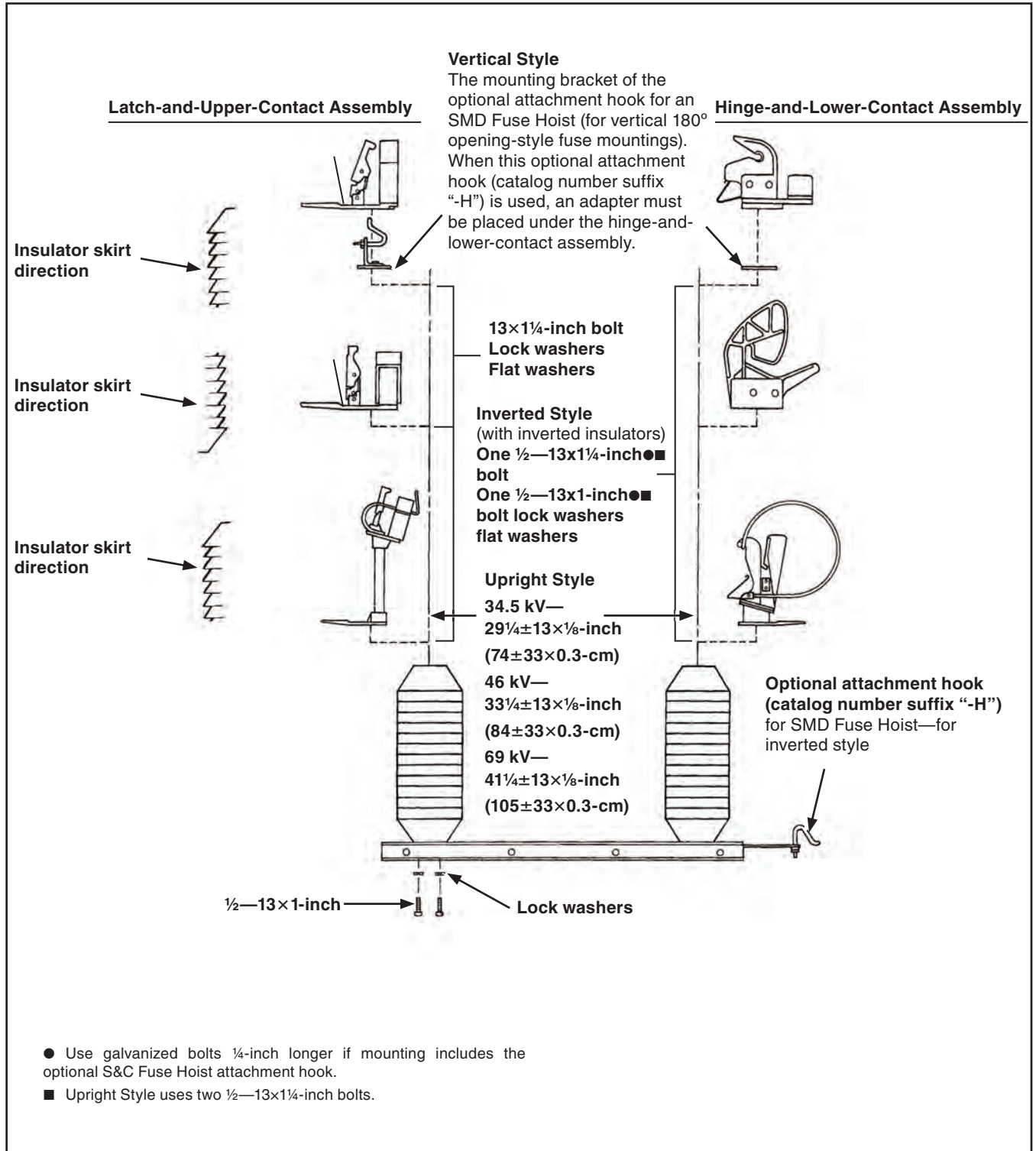


Figure 1. Assembly of mounting, vertical style, inverted style, and upright style.

Assembling and Installing Mountings

STEP 2. For Vertical, Inverted, and Upright Styles: Step 2 does not apply.

Vertical-Offset, Right-Angle, and Pedestal Styles: Attach the latch-and-upper-contact assembly mounting bracket to the appropriate insulator, as shown in Figure 2 on page 9, Figure 3 on page 11, or Figure 4 on page 12, as applicable, using two $\frac{1}{2}$ —13×1-inch galvanized bolts and lock washers for the right-angle style, two $\frac{1}{2}$ —13× $\frac{7}{8}$ -inch galvanized bolts and lock washers for the vertical-offset style, and four $\frac{1}{2}$ —13×1-inch galvanized bolts, lock washers, and flat washers for the pedestal style mounting. Then, attach the hinge-and-lower-contact assembly mounting bracket to the other insulator as shown in Figure 2 on page 9, Figure 3 on page 11, or Figure 4 on page 12, as applicable, using the same type and number of bolts, lock washers, and flat washers as used in the installation of the latch assembly mounting bracket.

Note: Mounting brackets for vertical-offset style mountings must be installed with the *short* leg attached to the insulator cap. Mounting brackets for pedestal-style mountings must be installed with the *long* leg attached to the insulator cap. Do not fully tighten mounting bolts at this time. Position mounting brackets as required to obtain the “F” dimension shown in Figure 2 on page 9, Figure 3 on page 11, or Figure 4 on page 12, as applicable. If further adjustment is necessary, shim the insulators and/or rotate them 90° or 180° as required to obtain the “F” dimension.

For the pedestal style mounting: Lay a straightedge across the top of both brackets and note whether it rests flat on each surface. If adjustment is necessary, slide both brackets back and forth on their insulator caps as required. Recheck the “F” dimension and readjust if necessary. Tighten all bolts.

Vertical and Inverted Styles: Attach the latch-and-upper-contact assembly to one insulator as shown in Figure 1 on page 7 using two $\frac{1}{2}$ —13×1 $\frac{1}{4}$ -inch galvanized bolts, lock washers, and flat washers. Then, attach the hinge-and-lower-contact assembly to the other insulator as shown in Figure 1 on page 7, using one $\frac{1}{2}$ —13×1 $\frac{1}{4}$ -inch galvanized bolt, lock washer, and flat washer for the inner hole and one $\frac{1}{2}$ —13×1-inch galvanized bolt and lock washer for the outer hole. Do not fully tighten the mounting bolts at this time.

Upright Style: Attach the latch-and-upper-contact assembly to one insulator as shown in Figure 1 on page 7 using three $\frac{1}{2}$ —13×1 $\frac{1}{4}$ -inch galvanized bolts, lock washers, and flat washers. Then, attach the hinge-and-lower-contact assembly to the other insulator, as shown in Figure 1 on page 7, using two $\frac{1}{2}$ —13×1 $\frac{1}{4}$ -inch galvanized bolts, lock washers, and flat washers. Do not fully tighten the mounting bolts at this time.

Vertical-Offset, Right-Angle, and Pedestal Styles: Attach the latch-and-upper contact assembly to the mounting bracket as illustrated in Figure 2 on page 9, Figure 3 on page 11, or Figure 4 on page 12, as applicable, using two $\frac{1}{2}$ —13×1 $\frac{1}{2}$ -inch galvanized bolts, flat washers, lock washers, and nuts. (Use three bolts, flat washers, lock washers, and nuts for the pedestal style mounting.) Then, attach the hinge-and-lower-contact assembly to its mounting bracket as illustrated in Figure 2 on page 9, Figure 3 on page 11 or Figure 4 on page 12 as applicable, using two $\frac{1}{2}$ —13×1 $\frac{1}{2}$ -inch galvanized bolts, lock washers, and nuts (and flat washers on pedestal style mounting). Do not fully tighten mounting bolts at this time.

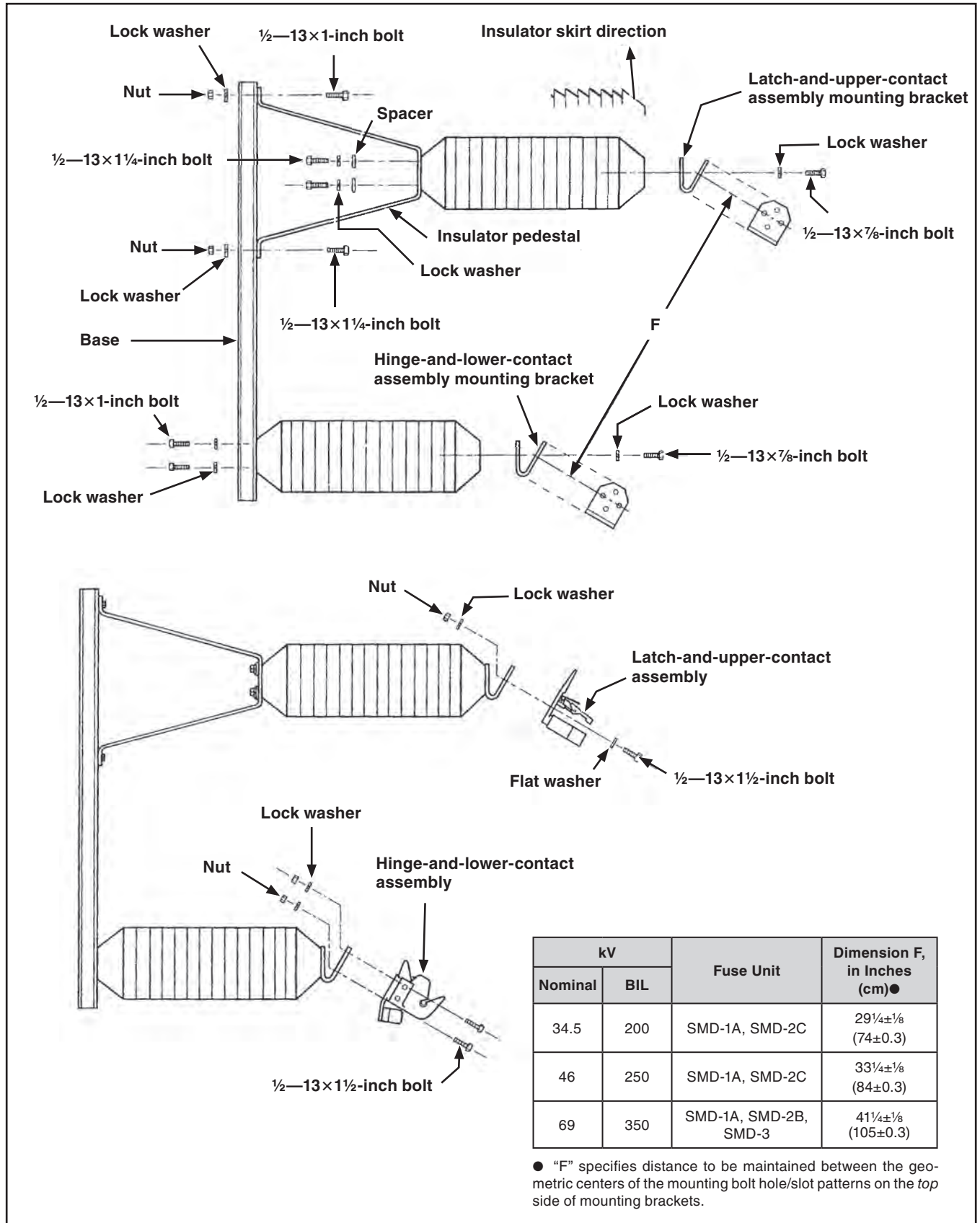


Figure 2. Assembly of mounting, vertical-offset style.

Assembling and Installing Mountings

STEP 3. Hoist the fuse mounting and bolt it into position on the supporting structure. Do not hoist the fuse mounting by rigging on the live parts. If necessary, shim the mounting base to eliminate any distortion caused by irregularities in the supporting structure.

STEP 4. Make electrical connections.

⚠ DANGER

Do not energize the fuse mountings at this time.

If aluminum-alloy body connectors● are used, the following procedures should be used:

- (a) Thoroughly wire-brush the current-transfer surfaces of each connector and immediately apply a liberal coating of Penetrox A® (available from Burndy Corporation) to the brushed surfaces.

- (b) Wire-brush each fuse-mounting terminal pad and apply a coating of Penetrox A. Then, bolt the connectors to the terminal pads.

- (c) Prepare the conductors using established procedures and clamp them in their respective connectors.

If rigid bus is used, slotted holes must be provided at the point of attachment to the terminal pads at the latch end of vertical and inverted style mountings so subsequent adjustments can be made as described under the “Adjustments” section on page 12. In addition, flexible expansion joints must be furnished. The above-listed aluminum-alloy body connector preparation procedures should be followed, as applicable, when aluminum bus is used.

● “Mass-anode” type connectors, such as the catalog number 5300 series offered by S&C, that have been designated by the connector manufacturer as being suitable for direct attachment to copper-bearing alloy terminal pads.

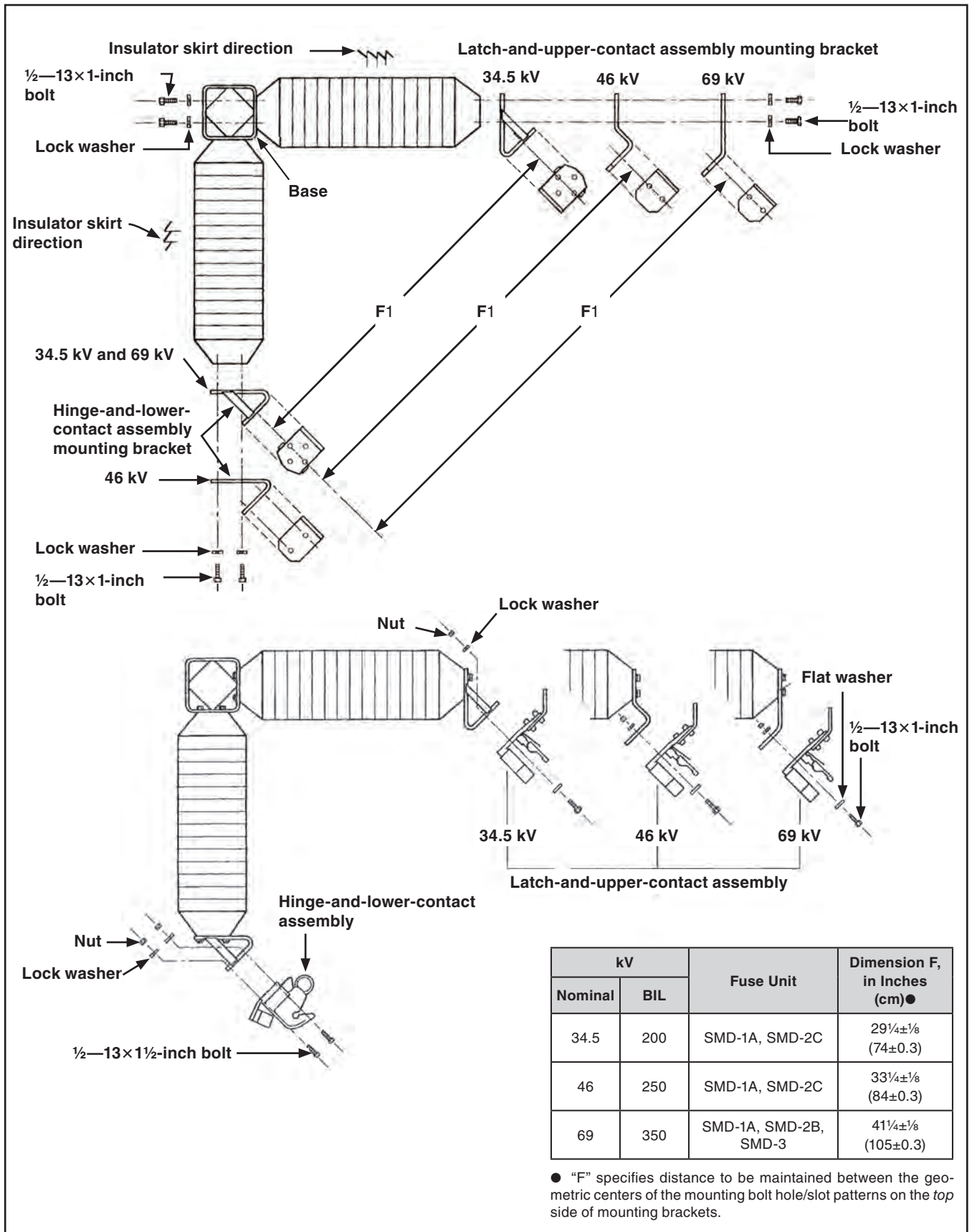


Figure 3. Assembly of mounting, right-angle style.

Assembling and Installing Mountings

STEP 5. A coating of NO-OX-ID® “A” Contact Lubricant (available from Sanchem, Inc.), was applied to the contact-finger surfaces of the latch-and-upper-contact assembly and hinge-and-lower-contact assembly at the factory. See Figure 5 on page 13 for the relative location of these surfaces on the latch-and-upper-contact assembly. Verify the presence of this oxidation-

inhibiting grease and that it is still free of contaminants. If necessary, clean the contact surfaces with a nontoxic, nonflammable solvent and apply a coating of NO-OX-ID® “A” Contact Lubricant or similar nonmetallic-filler oxidation-inhibiting grease.

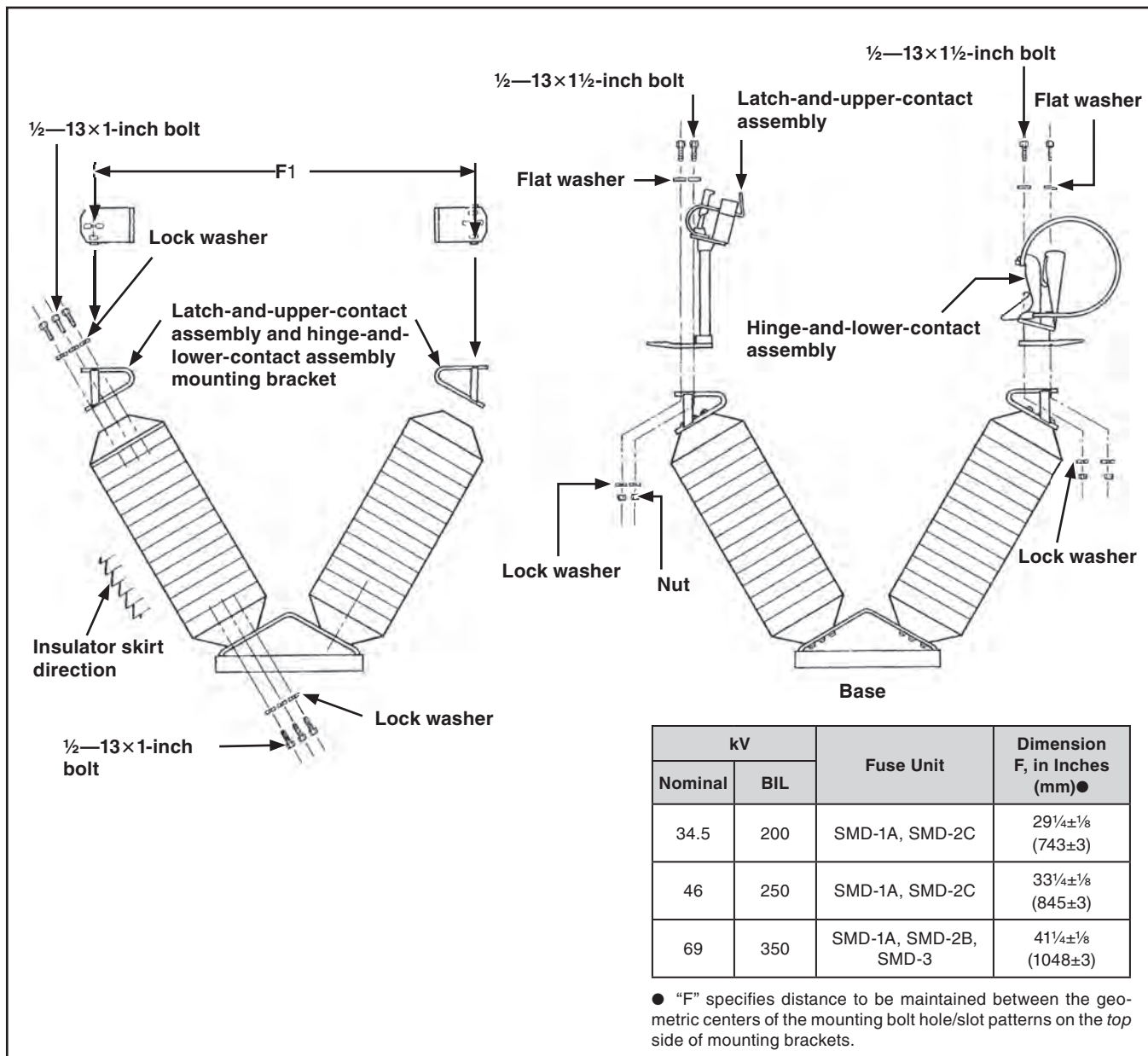


Figure 4. Assembly of mounting, pedestal style.

These instructions apply to all mounting styles.

⚠ DANGER

Be sure the mounting is de-energized **and** properly grounded before making any adjustments to the mounting.

STEP 1. Place a fuse-unit assembly (fuse unit with end fittings attached as directed in S&C Instruction Sheet 212-501) into the mounting in the open position.

STEP 2. *Vertical and Inverted Styles:* Loosen the bolts that secure the hinge-and-lower-contact assembly to its insulator. Bring the fuse-unit assembly toward the **Closed** position, but do not engage the latch. The nose projection on the upper end fitting should make contact with the roller in the latch-and-upper-contact assembly approximately on center. See Figure 5. Make any necessary adjustments by rotating the hinge-and-lower-contact assembly on its axis using the fuse-unit assembly as a lever. Then, tighten the hinge-and-lower-contact assembly mounting bolts securely.

Vertical-Offset, Upright, and Right-Angle Styles: Loosen the bolts that secure the hinge casting to its bracket weldment. Bring the fuse-unit assembly toward the **Closed** position, but do not engage the latch. The nose projection on the upper end fitting should make contact with the roller in the latch casting approximately on center. See Figure 5. Make any necessary adjustments by rotating the hinge casting on its axis using the fuse-unit assembly as a lever. Then, tighten the hinge casting mounting bolts securely.

STEP 3. *Vertical and Inverted Styles:* Again bring the fuse-unit assembly toward the **Closed** position and check that the wing contacts mate squarely with the stationary contacts. See Figure 5. If necessary, loosen the mounting bolts that secure the latch-and-upper-contact assembly to its insulator and rotate the latch-and-upper-contact assembly as required to obtain correct contact engagement. Tighten the mounting bolts just enough to hold the adjustment. When this adjustment is properly made, the wing contacts of the fuse-unit assembly will mate squarely with the surfaces of the stationary contacts as the fuse-unit assembly approaches the **Closed** position.

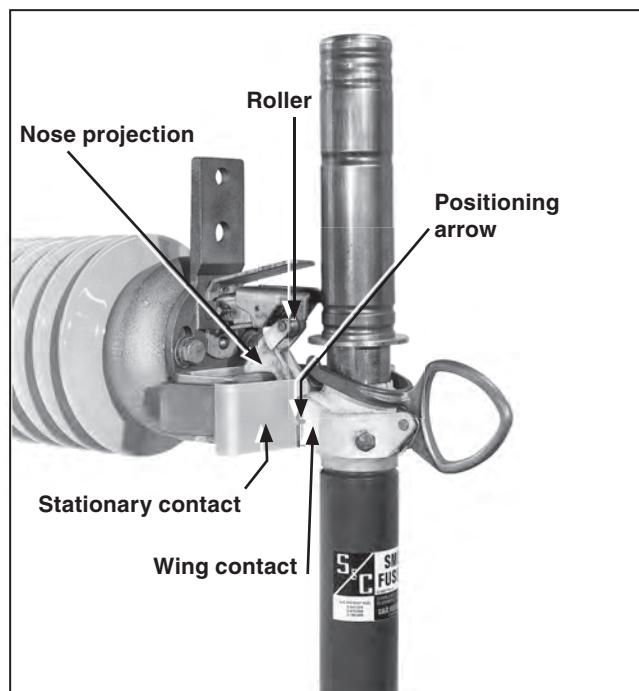


Figure 5. Adjustment of latch-and-upper-contact assembly.

Adjustments

Vertical-Offset, Upright, and Right-Angle Styles: Again, bring the fuse-unit assembly toward the **Closed** position and check that the wing contacts mate squarely with the stationary contacts. See Figure 5 on page 13. If necessary, loosen the mounting bolts that secure the latch casting to its bracket weldment and rotate the latch casting as required to obtain correct contact engagement. Tighten the mounting bolts just enough to hold the adjustment. When this adjustment is properly made, the wing contacts of the fuse-unit assembly will mate squarely with the surfaces of the stationary contacts as the fuse-unit assembly approaches the **Closed** position.

STEP 4. Next, bring the fuse-unit assembly to the fully closed position.

⚠ WARNING

An SMD fuse manufactured prior to the fall of 1963 cannot be slammed shut. It lacks the latch stop indicated in Figure 6, and must be closed with a deliberately positive motion and solid follow-through. Or, it may be closed as a two-stage operation: (1) swing the fuse unit upward to bear against the upper contact; and (2) push the fuse unit into the contact with a follow through motion. These methods of closing give the latching members time to seat properly and prevent the fuse unit from recoiling out of the contact.

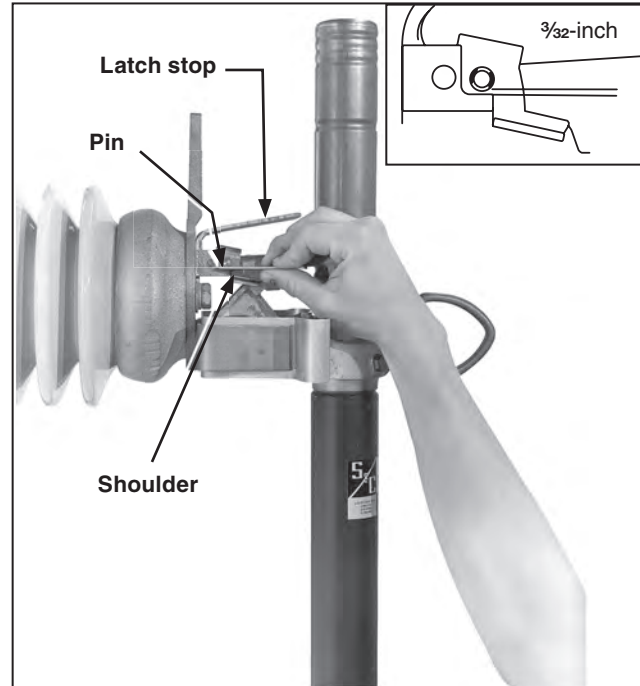


Figure 6. Checking clearance between pin on latch assembly and shoulder contact casting.

STEP 5. With the fuse-unit assembly closed, check for $\frac{3}{32}$ -inch (2 mm) clearance between the pin on the latch assembly and the shoulder on the contact casting below. See Figure 6.

A gauge, attached to the latch assembly, is provided for this purpose. If the clearance is less than the $\frac{3}{32}$ -inch (2 mm) gauge thickness, readjust the latch-and-upper-contact assembly by moving it toward the hinge assembly until $\frac{3}{32}$ -inch (2 mm) clearance is obtained.

Note: Moving the latch-and-upper contact assemblies toward or away from the hinge end of the mounting may introduce an offset of the wing contacts with respect to the stationary contacts. (The stationary contacts may extend as much as $\frac{1}{8}$ -inch (3 mm) beyond wing contacts in adjustment.) This offset is acceptable, but the wing contacts should still mate squarely with the stationary contacts.

 **DANGER**

These fuses are not intended for closing on an energized circuit. Always be sure the source connections to the fuse are de-energized before attempting a closing operation.

STEP 6. Adjustment of the fuse in the sequence outlined on page 14 will ensure maximum ease of operation. When closing the fuse, the upper end fitting of the fuse-unit assembly should be brought to within 2 to 3 inches (51 to 76 mm) of the latch-and-upper-contact assembly and then guided sharply closed. Check for proper latching by pushing on the fuse-unit assembly against its stop. Then, release. Definite resilience should be felt.

DANGER

Before performing any opening or closing operations, all incoming and outgoing leads to the fuse mountings *must* be de-energized *and* properly grounded.

Vertical, Vertical-Offset, Inverted, and Right-Angle Styles

Hookstick operation: The fuse-unit assembly is opened by a downward pull on the pull-ring using a conventional hookstick. It can be eased down or permitted to drop freely. To close the fuse-unit assembly, use a conventional hookstick to engage the pull-ring and to swing the fuse unit to within 2 to 3 inches (51 to 76 mm) of the latch-and-upper-contact assembly and then move it sharply to the **Closed** position.

Hand operation: These fuse-unit assemblies can be opened and closed by hand.

Upright and Pedestal Styles

The fuse-unit assembly is opened by pulling the pull-ring back toward the hinge end of the fuse unit. Opening and closing operations must be performed by hand.

Note: Instructions for fuse unit assembly, installation, and maintenance are found in S&C Instruction Sheet 212-501.