Installation

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★ These instructions are also applicable to grounding switches for equivalent models of Mark IV Circuit-Switchers, as well as S&C Line-Rupter™ Switches.

February 2, 2026

Qualified Persons

⚠ WARNING

Only qualified persons knowledgeable in the installation, operation, and maintenance of overhead and underground electric distribution and transmission equipment, along with all associated hazards, may install, operate, and maintain the equipment covered by this publication. A qualified person is someone 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 instruction handbook before installing the grounding switch on a S&C Mark V Circuit-Switcher. Become familiar with the Safety Information on page 3 and Safety Precautions on page 4. The latest version of this publication is available online in PDF format at **sandc.com/en/contact-us/product-literature/**.

Retain This Instruction Sheet

This instruction sheet is a permanent part of the S&C Mark V Circuit-Switcher. Designate a location where users can easily retrieve and refer to this publication.

Proper Application

⚠ WARNING

The equipment in this publication is only intended for the installation of grounding switches on Mark V Circuit-Switchers rated 34.5 kV through 161 kV. The application must be within the ratings furnished for the equipment. Ratings for the S&C Mark V Circuit-Switcher are listed in the ratings table in Specification Bulletin 711-31. The ratings are also on the nameplate affixed to the product.

Understanding Safety-Alert Messages

Several types of safety-alert messages may appear throughout this instruction sheet and on labels and tags attached to the product. Become familiar with these types of messages and the importance of these 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 any portion of this instruction sheet is unclear and assistance is needed, contact the nearest S&C Sales Office or S&C Authorized Distributor, or call the S&C Global Support and Monitoring Center at 1-888-762-1100. Telephone numbers are also listed on S&C's website, sandc.com.

NOTICE

Read this instruction sheet thoroughly and carefully before installing the grounding switch.

Replacement Instructions and Labels

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

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

⚠ DANGER

S&C Mark V Circuit-Switchers 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 your company's operating procedures and rules. Where a discrepancy exists, follow your company's operating procedures and rules.

1. **QUALIFIED PERSONS**. Access to Mark V Circuit-Switchers 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, and flash clothing, 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.
5. **OPERATING MECHANISM AND BASE**. Mark V Circuit-Switchers contain fast-moving parts that can severely injure fingers. Do not remove or disassemble operating mechanisms or remove access panels unless directed by S&C Electric Company.
6. **ENERGIZED COMPONENTS.** Always consider all parts live until de-energized, tested, and grounded. Voltage levels can be as high as the peak line-to-ground voltage last applied to the unit. Units that have been energized or installed near energized lines should be considered live until tested and grounded.
7. **GROUNDING.** The Mark V Circuit-Switcher must be connected to a suitable earth ground at the base of the utility pole, or to a suitable building ground for testing, before energizing the switch and at all times when energized.

   The ground wire(s) must be bonded to the system neutral, if present. If the system neutral is not present, proper precautions must be taken to ensure the local earth ground, or building ground, cannot be severed or removed.
8. **SWITCH POSITION.** Always confirm the **Open/Closed** position of each switch.
   - Switches and terminal pads may be energized from either side.
   - Switches and terminal pads may be energized with the switches in any position.
9. **MAINTAINING PROPER CLEARANCE.** Always maintain proper clearance from energized components.
10. **GROUNDING SWITCH**. Only operate the grounding switch when the Mark V Circuit-Switcher is in the **Open** position. The grounding switch is operated via an S&C Manual Geared Operating Handle or manual nongeared operating handle installed near the base of the grounding switch. "Partway" opening or closing is undesirable. Once the associated circuit-switcher is in the **Open** position, operate the grounding switch until the grounding switch blades are 90 degrees parallel to the pole-unit bases.

Inspection

Examine the shipment for external evidence of damage as soon after receipt as possible, preferably before removal from the carrier's conveyance. Check the bill of lading to make sure all shipping skids, crates, and containers listed thereon are present.

If there is visible loss and/or damage:

1. Notify the delivering carrier immediately.
2. Ask for a carrier inspection.
3. Note condition of shipment on all copies of the delivery receipt.
4. File a claim with the carrier.

If concealed damage is discovered:

1. Notify the delivering carrier within 15 days of receipt of shipment.
2. Ask for a carrier inspection.
3. File a claim with the carrier.

Also notify S&C Electric Company in all instances of loss and/or damage.

Packing

An S&C erection drawing will be found in a water-resistant envelope attached to one of the three pole-units. The grounding switch consists of a manual three-pole group-operated grounding switch, with flexible straps for current transfer at the hinge-end of the blades, and with blades parallel to the pole-unit bases when in the **Open** position. When furnished as original equipment with the circuit-switcher, inclusion of the accessory is designated by the addition of the suffix "-G2" to the circuit-switcher catalog number.

For integer-style circuit-switchers, grounding switch components have already been installed on the Mark V Circuit-Switcher pole-unit. These components have been carefully adjusted at the factory and, under normal circumstances, readjustment should not be necessary.

If the switch is supplied with the catalog option "-A" for pre-assembly, depending on the circuit-switcher rating, the jaw-contact housing may be pre-installed. Handle the skid carefully. A crane is required to remove the crated switch from its conveyance.

When ordered with a circuit-switcher, grounding switch components may be shipped on the same skid as the pole-units or S&C Mounting Pedestals if furnished. Supplemental dimensional details for the grounding switch installation are included on the erection drawing furnished for the applicable circuit-switcher.

Storage

If the grounding switch components must be stored before installation, keep them in a clean, dry, corrosion-free area to protect them from damage. Make sure each skid rests firmly on the ground and is reasonably level. Shoring under the skids may be necessary if the ground is uneven.

Before Starting

NOTICE

Installing Couplings with Piercing Set Screws

This equipment uses piercing set screws to couple the operating handle to the operating pipe, to secure the interphase operating-pipe sections, and to provide stability to couplings joining one or more lengths of pipe.

Before assembling a coupling joint, back the piercing set screws out of the coupling so the tips do not protrude into the body of the coupling. This ensures the coupling's clamp screws can be fully tightened.

These instructions are for field assembly and installation of manually operated S&C Grounding Switches, rated 61,000 amperes momentary, when furnished as original equipment for all vertical-break style circuit-switchers and all integer-style circuit-switchers, and for all center-break style circuit-switchers rated 115 kV through 161 kV.

Install the grounding switch only after the circuit-switcher and its power train have been completely installed and adjusted.

Note: If a grounding switch is to be added to an existing circuit-switcher installation, the components should be assembled in accordance with the special drawings provided.

Installing the Grounding Switch on Vertical-Break and Center-Break Style Circuit-Switchers

Proceed with the following steps:

STEP 1. Install the interphase shafts, positioned as shown on the erection drawing. At the same time, slip the stop levers over the shafts and position them to correspond with the locations of the stop plates on the interphase bearing brackets attached to the circuit-switcher pole-unit bases. Also, slip split-ring spacers over the shafts and place two of the spacers against each bearing bracket so the spacers position the blade clamps (to be installed in Step 2) in alignment with the jaw contacts. See Figure 1 on page 7. Do not tighten the piercing set screws in the stop levers at this time. The levers will be adjusted later.

Grounding switches rated 115 kV through 161 kV include a counterbalance assembly shipped with the miscellaneous power-train components. Attach the counterbalance assembly to the outboard pole-unit designated on the erection drawing. See Figure 2 on page 8 and Figure 3 on page 9. One of the interphase shaft sections is predrilled at one end. Install the shaft section positioned so the predrilled end is toward the pole-unit base where the counterbalance assembly is mounted. Slide the interphase shaft over the counterbalance assembly, align the hole in the shaft with the matching hole in the counterbalance assembly, and couple them with the pin provided.

STEP 2. Install the grounding switch blade clamps on the interphase shaft in the locations shown on the erection drawing but do not tighten.

STEP 3. Insert a blade assembly into the socket of the blade clamp adjacent to the drive-lever location. Raise the blade assembly toward the **Closed** position (See Figure 1 on page 7) and adjust as follows:

(a) Rotate the blade assembly in the blade clamp until the sides of the blade-contact assembly are parallel to the jaw-contact fingers.

(b) Move the blade clamp along the interphase shaft so the blade-contact assembly enters the jaw contact on center. If necessary, one of the split-ring spacers may be pried apart and removed from the interphase shaft to permit sufficient movement of the blade clamp.

(c) Position the blade assembly in the blade clamp so, with the spring-loaded blade-contact assembly held in the straight (in-line) position, it enters the jaw contact with a ½-inch (13-mm) clearance between the end of the blade-contact assembly and the upper lip of the jaw-contact housing.

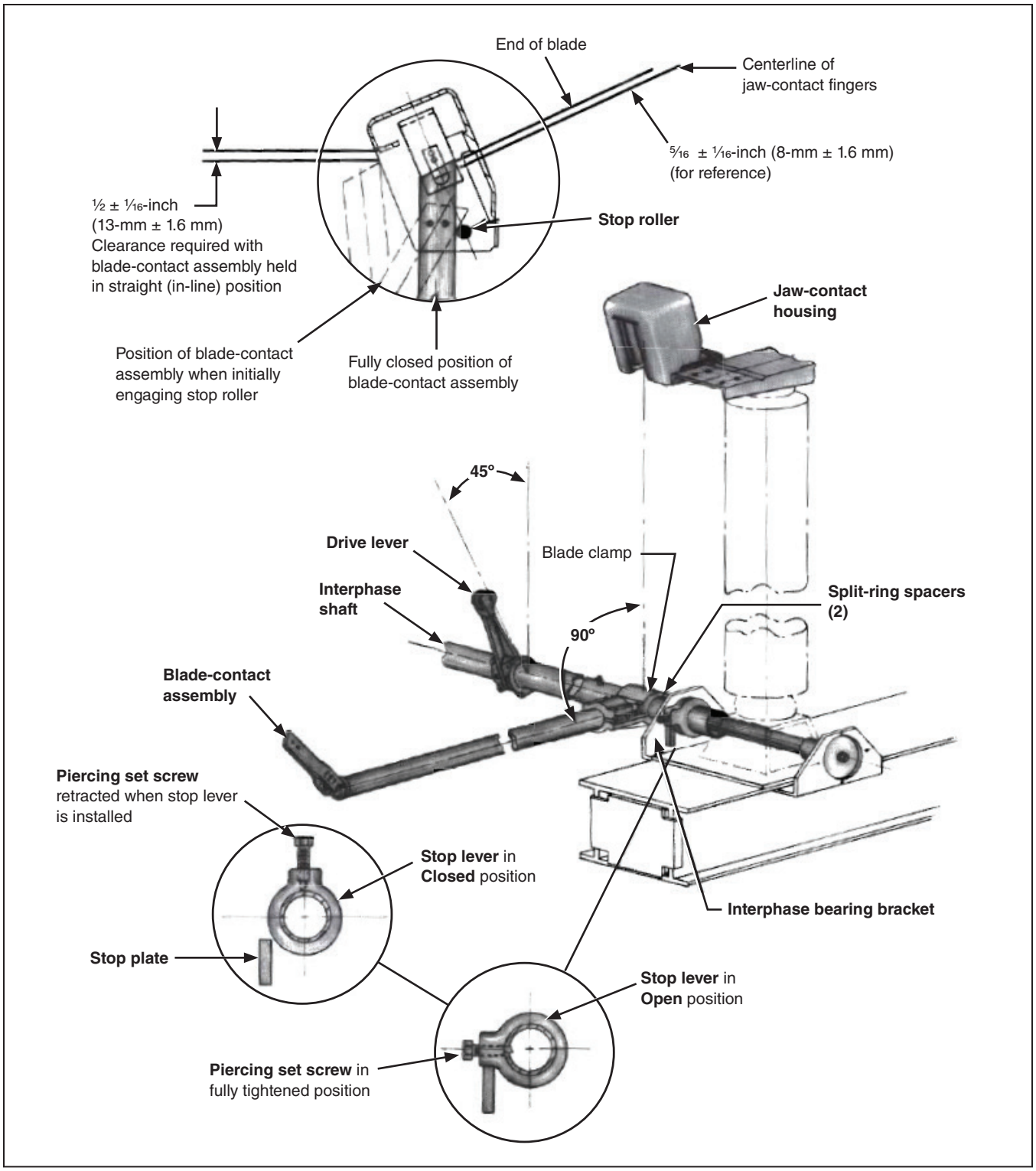

Figure 1. Pole-unit in Open position.

(d) Refer to Figure 2 and tighten the blade clamp bolts as follows:

For 34.5-kV through 69-kV ratings: Torque the clamp bolts equally to final tightness so the clamps pull down evenly

For 115-kV through 161-kV ratings: Torque the inner bolts to final tightness, and then torque the outer bolts to final tightness.

(e) A flexible strap for current transfer to ground is attached to the blade clamp. Connect the free end of the flexible strap to a suitable earth ground.●

Do not install the other two blades until so directed in Step 6 on page 15

STEP 4. Move the installed blade to the fully **Open** position (approximately 90 degrees from its **Closed** position). With the blade in this position, place the associated stop lever against its stop. Then, tighten the piercing set screw, piercing the interphase shaft, and continue turning until a firm resistance is felt. See Figure 1 on page 7.

STEP 5. Attach the drive lever to the interphase shaft in the position shown on the erection drawing so, in both the **Open** and **Closed** positions, it will be at an angle of 45 degrees from the vertical (to provide 90 degrees of travel). See Figure 2. Torque the drive-lever U-bolts to final tightness, but do not tighten the piercing set screws at this time.

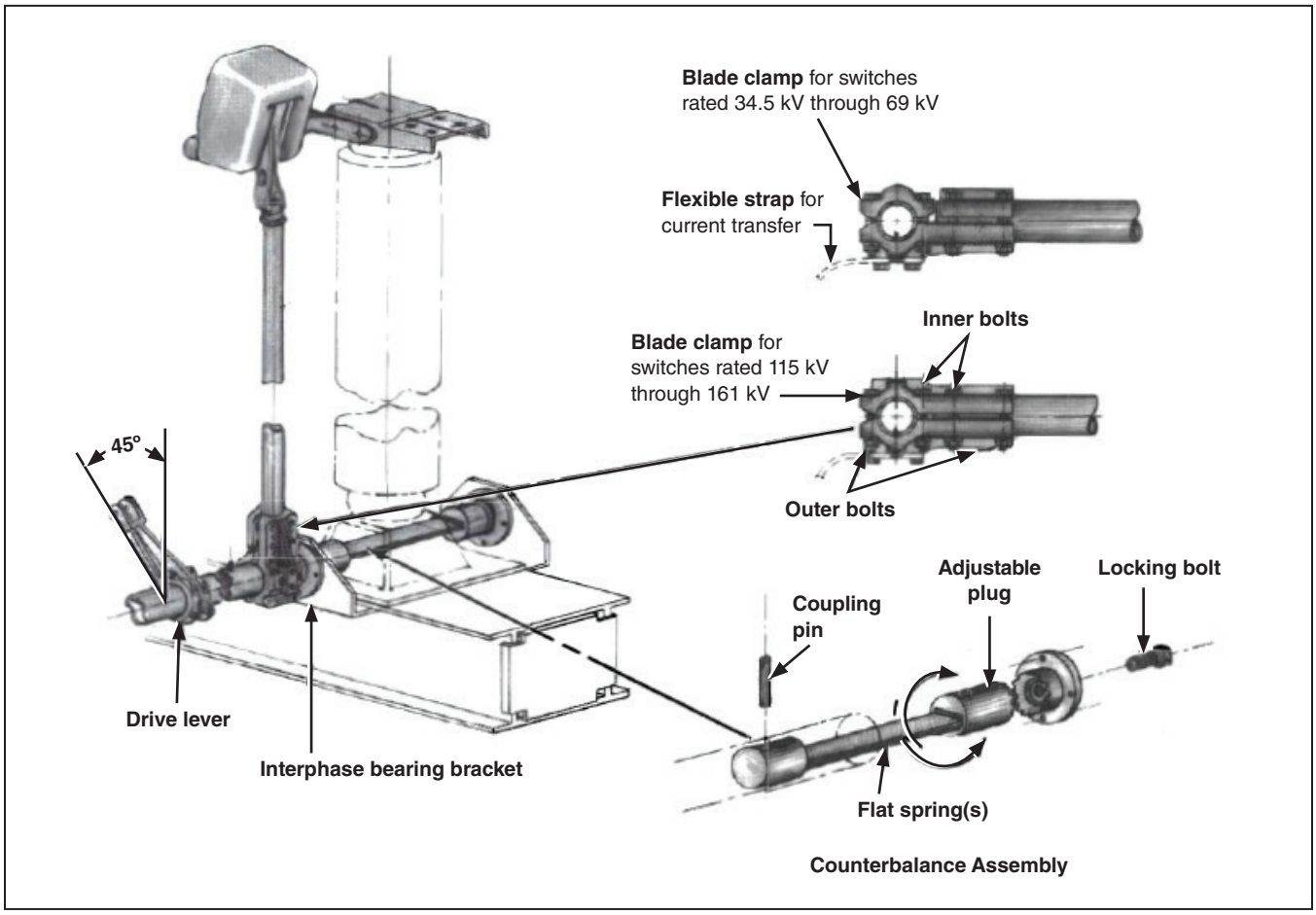

Figure 2. Pole-unit in Closed position.

● These grounding recommendations may differ from the standard operating and safety procedures of certain electric utility companies. Where a discrepancy exists, the operating procedures of the electric utility apply.

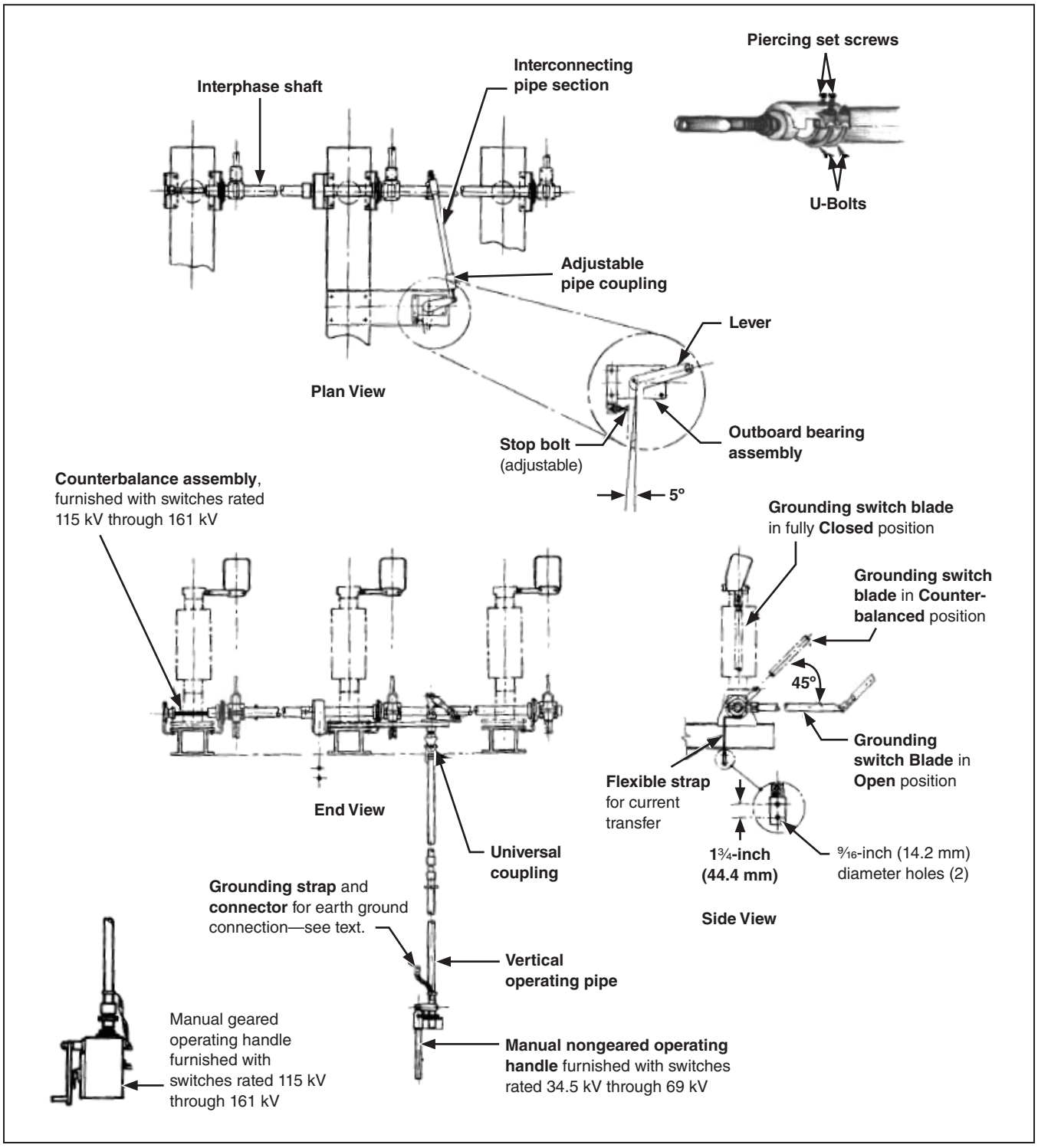

Figure 3. Typical three-pole configuration.

STEP 6. Mount the outboard bearing assembly in the position shown on the erection drawing. See Figure 3 on page 9.

STEP 7. With the grounding switch blade fully **Closed** and the outboard bearing lever against its Closed stop, install the interconnecting pipe section between the interphase drive lever and the outboard bearing lever, as shown on the erection drawing. Pipe sections are precut to the correct lengths. The adjustable pipe couplings may be shortened or lengthened as required to accept the pipe sections furnished. Do not cut the pipes themselves.

Adjust the stop on the outboard bearing assembly to allow the bearing lever to travel approximately 5 degrees over center to provide a positive-toggle condition when the grounding switch blade is fully **Closed**. See Figure 3 on page 9.

Now turn the take-up nuts of the adjustable pipe couplings to remove all play in the interconnecting linkage. Then, tighten the nuts to lock the couplings in position. See Figure 3 on page 9. Make sure the grounding switch blade-contact assembly is driven firmly against the jaw-contact stop roller.

Check for proper blade closure by manually pulling the blade assembly away from its **Closed** position. See Figure 4. With a pull-out force of approximately 40 pounds applied at the position indicated, blade deflection should be no more than indicated.

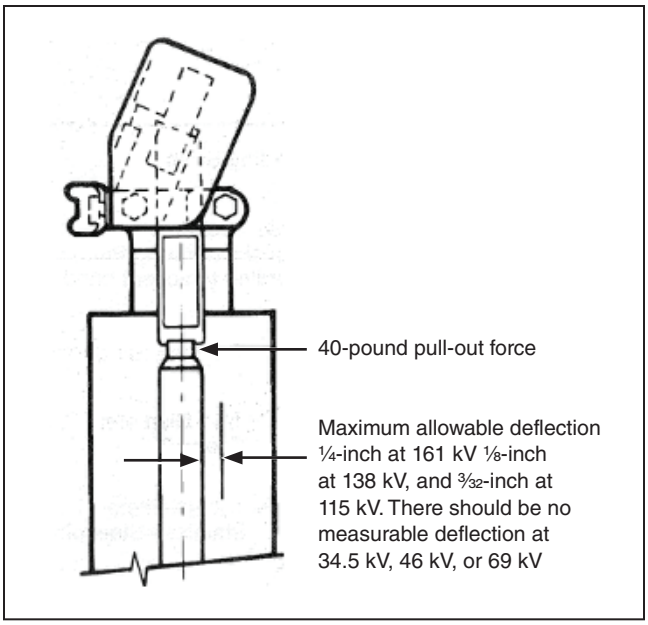

Figure 4. Blade closure verification.

Installing the Grounding Switch on Integer-Style Circuit-Switchers

Proceed with the following steps:

STEP 1. Mount the outboard bearing assembly in the position shown on the erection drawing. See Figure 3 on page 9.

STEP 2. With the grounding switch blade fully **Closed** and the outboard bearing lever against its Closed stop, install the interconnecting pipe section between the interphase drive lever and the outboard bearing lever, as shown on the erection drawing. Pipe sections are precut to the correct lengths. The adjustable pipe couplings may be shortened or lengthened as required to accept the pipe sections furnished. Do not cut the pipes themselves.

Adjust the stop on the outboard bearing assembly to allow the bearing lever to travel approximately 5 degrees over center to provide a positive-toggle condition when the grounding switch blade is fully **Closed**. See Figure 3 on page 9.

Now turn the take-up nuts of the adjustable pipe couplings to remove all play in the interconnecting linkage. Then, tighten the nuts to lock the couplings in position. See Figure 3 on page 9. Make sure the grounding switch blade-contact assembly is driven firmly against the jaw-contact stop roller.

Check for proper blade closure by manually pulling the blade assembly away from its **Closed** position. See Figure 4 on page 10. With a pull-out force of approximately 40 pounds applied at the position indicated, blade deflection should be no more than indicated.

STEP 3. Raise the blade assembly toward the **Closed** position (See Figure 1 on page 7) and adjust as follows:

(a) Rotate the blade assembly in the blade clamp until the sides of the blade-contact assembly are parallel to the jaw-contact fingers.

(b) Move the blade clamp along the interphase shaft so the blade-contact assembly enters the jaw contact on center. If necessary, one of the split-ring spacers may be pried apart and removed from the interphase shaft to permit sufficient movement of the blade clamp.

(c) Position the blade assembly in the blade clamp so, with the spring-loaded blade-contact assembly held in the straight (in-line) position, it enters the jaw contact with a ½-inch (13-mm) clearance between the end of the blade-contact assembly and the upper lip of the jaw-contact housing.

(d) Refer to Figure 2 on page 8 and tighten the blade clamp bolts equally to final tightness so the clamp pulls down evenly. Then, tighten the piercing set screws, piercing the pipe, and continue turning until a firm resistance is felt.

Installing the Manual Nongeared Operating Handle

If a manual geared operating handle is to be installed, skip to "Installing the Manual Geared Operating Handle" on page 14.

Complete the following steps to install the manual nongeared operating handle:

STEP 1. Install the vertical operating-pipe section (or sections) and, if required, the guide bearing assembly (or assemblies) in accordance with the dimensions shown on the erection drawing. Work from the outboard bearing assembly downward.

One of the pipe sections furnished will be predrilled with through-holes near one end to accept the manual operating handle. Install this pipe section last, with the holes at the lower end.

It is advisable to clamp the couplings on each pipe section as work progresses. However, do not clamp the section of vertical operating pipe where the manual operating handle is to be attached until so directed (after connection has been made to the handle).

If more than one vertical operating-pipe section is specified, a universal coupling is used to join the upper pipe section to the next pipe section. Any additional pipe sections are joined with rigid couplings.

Torque the clamp bolts to final tightness. Then, tighten the piercing set screws, piercing the pipe, and continue turning until a firm resistance is felt.

STEP 2. Position the through-hole at the lower end of the lowest vertical operating-pipe section, referred to above, to provide operation of the handle in the desired quadrant. (The handle will be at 90 degrees to the holes.) Torque the clamp bolt in the coupling on the upper end of the lowest vertical operating-pipe section to final tightness. Then, tighten the associated piercing set screw, piercing the pipe, and continue turning until a firm resistance is felt.

STEP 3. If a key interlock is to be used, omit Step 3 and Step 4.

Using the ½-inch-diameter stainless steel pin furnished, fasten the operating handle assembly to the lowest vertical operating-pipe section. (The pin should engage the through-hole in the vertical operating pipe nearest the position shown on the erection drawing.) Using one of the through-holes provided in the handle flange, secure the ½-inch-diameter pin to the handle with the ½-inch-diameter Groov-Pin provided. Tighten the piercing set screw on the operating handle assembly, piercing the pipe, and continue turning until a firm resistance is felt. See Figure 5.

STEP 4. Slide the foot bearing assembly onto the lowest vertical operating-pipe section and bolt it to the pedestal or structure at the position shown on the erection drawing. Adjust the guide bearings toward or away from the pedestal or structure, if necessary, to keep the vertical operating-pipe sections aligned and plumb. Alignment slots are provided for this purpose.

STEP 5. If a key interlock is not specified, omit Step 5.

The interlock group includes a Superior Key Interlock, Type B-6003-1 Mk II single or multiple key (or equivalent), with ⅜-inch (9.5 mm) bolt projection and ¾-inch (19 mm) bolt travel, locking disc, and interlock bracket. If "provision only" for a key interlock is specified, the interlock will not be included. Assemble with the operating handle assembly as follows:

(a) Slide the interlock bracket, locking disc, operating handle assembly, and foot bearing assembly onto the lowest vertical operating-pipe section with the locking disc and the operating handle assembly

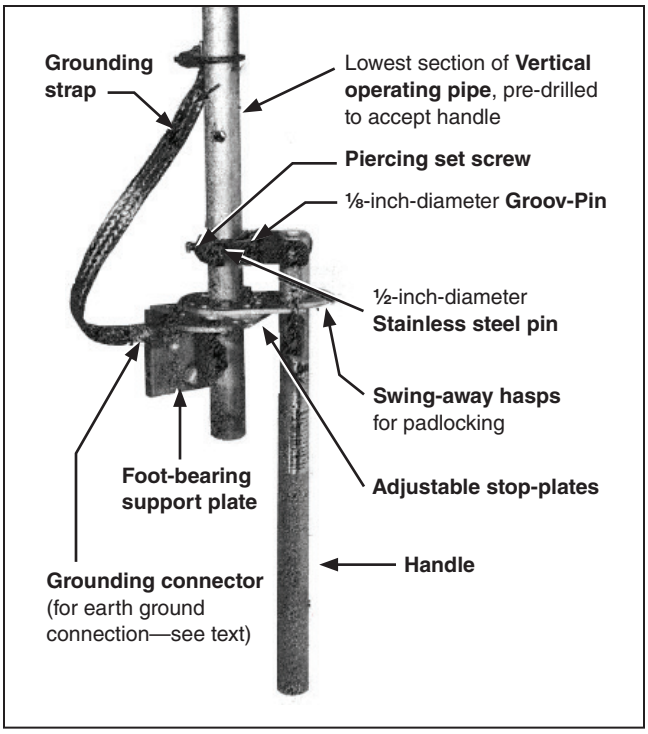

Figure 5. Foot bearing assembly and operating handle assembly.

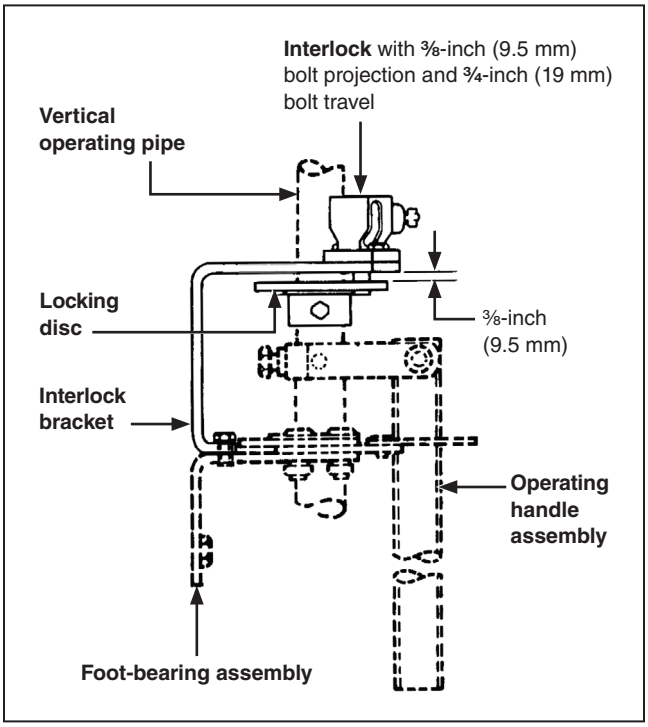

Figure 6. Key interlock group detail.

between the interlock bracket and the foot bearing assembly. Bolt the foot bearing assembly to the pedestal or structure at the position shown on the erection drawing. Adjust the guide bearings toward or away from the pedestal or structure, if necessary, to keep the vertical operating-pipe sections aligned and plumb. Alignment slots are provided for this purpose.

(b) Using the ½-inch-diameter stainless steel pin furnished, fasten the operating handle assembly to the lowest vertical operating-pipe section. (The pin should engage the through-hole in the pipe nearest the position shown on the erection drawing.) Using one of the through-holes provided in the handle flange, secure the ½-inch-diameter pin to the handle with the ½-inch-diameter Groov-Pin provided. Tighten the piercing set screw on the operating handle assembly, piercing the pipe, and continue turning until a firm resistance is felt. See Figure 5 on page 12.

(c) Attach the interlock bracket to the foot bearing assembly, using the ½–13 × l-inch screws and lockwashers furnished.

(d) Attach the key interlock to the interlock bracket and extend the bolt.

(e) With the grounding switch in the **Open** position, use the interlock bolt to position the locking disc so the bolt enters the **Open**-position slot in the disc. Hold the locking disc ⅜-inch (9.5-mm) below the interlock bracket (See Figure 6 on page 12) and drill 7⁄16-inch holes through the vertical operating-pipe section, using the holes in the locking-disc collar as pilots. Attach the locking disc to the pipe, using the ⅜–16×3-inch bolt, nut, and lockwasher furnished.

Note: Key interlocks are intended for proper sequencing of switching operations; they are not intended to provide security. The operating handle assembly includes swing-away hasps for padlocking the grounding switch in either the **Open** or **Closed** position.

STEP 6. Loosen the bolts securing the adjustable stop-plates to the foot-bearing support plate. See Figure 5 on page 12. Place the switch in the fully **Open** position and adjust the **Open** position stop-plate so the handle, when lowered, fits into the **Open**-position slot. Mark, on the support plate, the location of the Open-position stop-plate.

Fully close the switch and apply sufficient pressure to the handle in the closing direction to remove all play in the operating-pipe linkage. Now adjust the closed position stop-plate so the handle will require even greater pressure to force it into the closed-position slot. Mark, on the support plate, the location of the **Closed** position stop-plate.

While holding both stop-plates in the previously marked positions, torque the bolts to secure the stop plates to the support plate. Move the handle to the **Switch-Open** position and verify the handle, when lowered, fits into the **Open**-position slot.

Then, move the handle to the **Switch-Closed** position. Verify all play in the operating-pipe linkage has been taken up *before* the handle can be lowered into the **Closed**-position slot and, further, substantial pressure is required to force the handle into the **Closed**-position slot. Attainment of this "windup" tension in the operating linkage is essential to ensure positive switch closure.

The operating handle assembly includes swing-away hasps for padlocking the grounding switch in either the **Open** or **Closed** position

STEP 7. Ground the vertical operating pipe as follows. Fasten the end of the flexible strap having the shorter ferrule to the vertical operating-pipe section, a few inches above the manual operating handle, using the connector provided. Then, connect the free end of the flexible strap to a suitable earth ground, using the grounding connector at that end of the strap.●

● These grounding recommendations may differ from the standard operating and safety procedures of certain electric utility companies. Where a discrepancy exists, the operating procedures of the electric utility apply.

Installing the Manual Geared Operating Handle

STEP 1. Mount the S&C Manual Geared Operating Handle in the position shown on the erection drawing.

Attach a flexible coupling to the output shaft of the geared operating handle. See Figure 7. Thread the attachment bolts through the flexible coupling plate and through the coupling flange on the output shaft. Tighten the bolts to draw the flexible plate flush against the flange; this will deform the threads in the flexible plate, resulting in a binding, nonslip connection. Install and tighten the self-locking nuts. Do not use lockwashers with the attachment bolts.

STEP 2. Install the vertical operating-pipe section (or sections) and, if required, the guide bearing assembly (or assemblies) between the universal coupling at the outboard bearing assembly and the flexible coupling at the handle. Work from the outboard bearing assembly downward.

If more than one vertical operating-pipe section is specified, a universal coupling is used to join the upper pipe section to the next pipe section. Any additional pipe sections are joined with rigid couplings.

Torque the clamp bolts to final tightness. Then, tighten the piercing set screws, piercing the pipe, and continue turning until a firm resistance is felt.

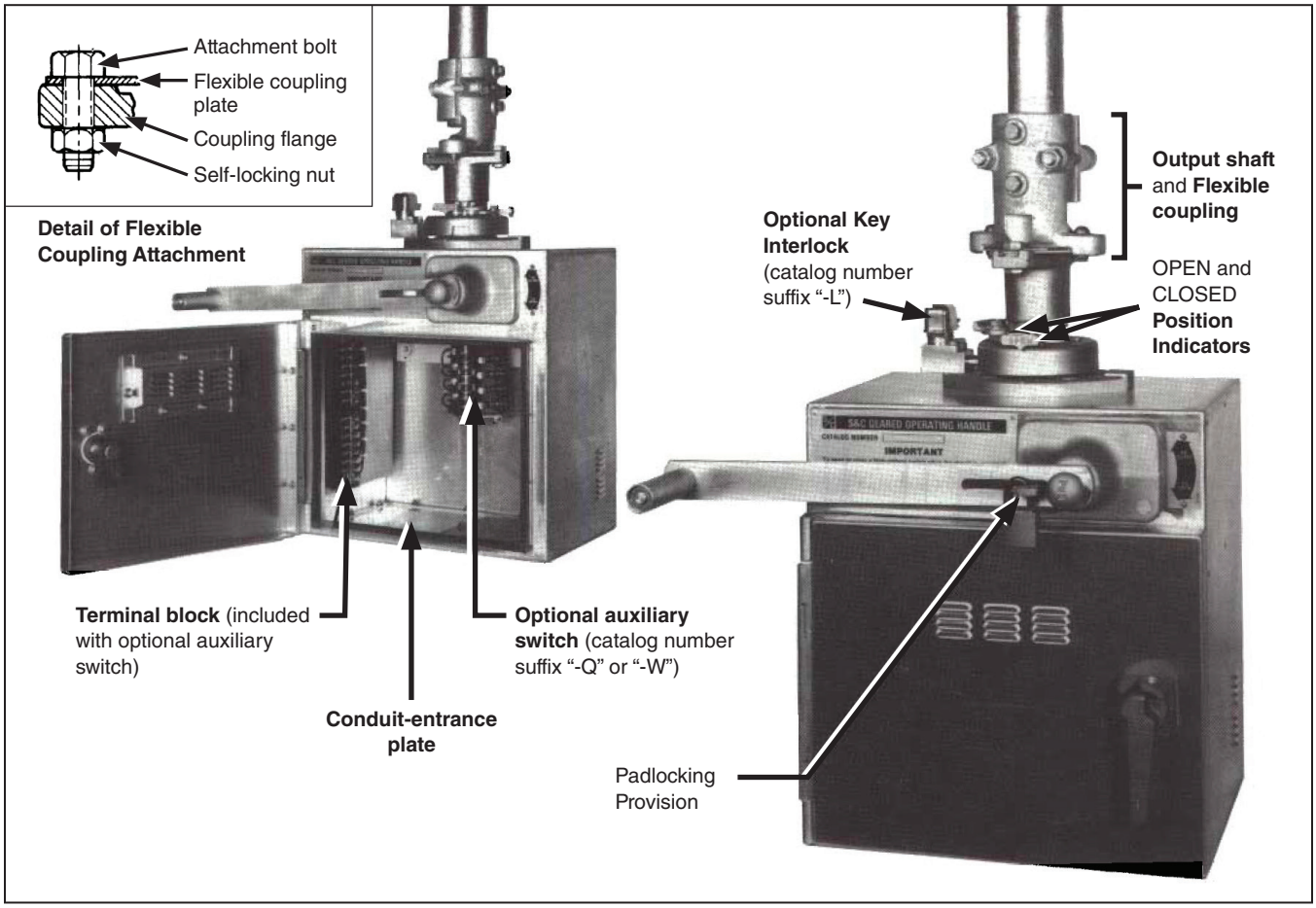

Figure 7. S&C Manual Geared Operating Handle.

STEP 3. If a key interlock is not specified, omit Step 3.

The key interlock group includes a Superior Key Interlock, Type B-4003-1, with stainless steel locking bolt, zero bolt projection, and ¾-inch bolt travel; a hinged dust cover; an interlock adapter; and an interlock collar bolted to the output shaft of the manual geared operating handle. The interlock collar is provided with a slot to accept the key interlock bolt. If "provision only" for a key interlock is specified, the interlock will not be included. Proceed as follows:

(a) Using the manual geared operating handle, crank the grounding switch to its fully **Open** position.

(b) Remove the bolts fastening the interlock collar to the output shaft.

(c) Rotate the interlock collar to the position where the key interlock bolt, when extended, will be centered in the slot in the collar. Then, replace and tighten the bolts to fasten the interlock collar in that position. Note these same bolts are also used for the OPEN and CLOSED position indicators to be set as described in the following step.

STEP 4. Using the manual geared operating handle, crank the grounding switch to its fully **Open** position and set the OPEN position indicator on the output shaft of the manual geared operating handle so this indicator is visible from the front of the handle. Then, fully close the grounding switch and set the CLOSED position indicator on the output shaft of the manual geared operating handle so this indicator is visible from the front of the handle.

STEP 5. Ground the vertical operating pipe as follows. Fasten the end of the flexible strap having the shorter ferrule to the vertical operating-pipe section, a few inches above the manual operating handle, using the connector provided. Then, connect the free end of the flexible strap to a suitable earth ground, using the grounding connector at that end of the strap.●

STEP 6. Using the operating handle, move the grounding switch to the fully **Closed** position and install the other two blade assemblies in the manner described in Step 3 on page 6. Then, check these two blade assemblies for proper blade closure as prescribed in the last paragraph of Step 7 on page 10.

STEP 7. Now, using the operating handle, move the grounding switch to the fully **Open** position, and place the stop levers associated with the just-installed blade assemblies against their stops (see Step 4 on page 8). Then, tighten the piercing set screws, piercing the interphase shaft, and continue turning until a firm resistance is felt.

STEP 8. Open and close the grounding switch to check for positive toggle at the outboard bearing assembly and for correct entry and complete closure of all three blade assemblies. Make any necessary readjustments, and re-tighten all clamp bolts and U-bolts to final tightness. Then, tighten each piercing set screw in the blade clamps, interphase drive lever, and drive-linkage pipe couplings, piercing the pipe, and continue turning until a firm resistance is felt.

● These grounding recommendations may differ from the standard operating and safety procedures of certain electric utility companies. Where a discrepancy exists, the operating procedures of the electric utility apply.

STEP 9. The counterbalance assembly included with grounding switches rated 115 kV through 161 kV is factory-loaded to offset the weight of the blades at a point approximately 45 degrees from the **Open** position.

In the unlikely event readjustment is required, close the blades to reduce the spring load. Mark the position of the mating teeth. See Figure 2 on page 8. Then, loosen the locking bolt at the outboard end of the counterbalance assembly. Rotate the adjustable plug in the blade closing direction to increase the spring loading, or in the blade-opening direction to decrease the spring loading. Re-tighten the locking bolt at the end of the counterbalance assembly.

STEP 10. If the S&C Manual Geared Operating Handle is furnished with an auxiliary switch, catalog number suffix " -Q" or " -W," the switch will be mounted inside the operating-handle enclosure, along with a terminal block for user's connections. Each auxiliary-switch contact is operated by a cam-actuated roller. A contact is closed if its roller is disengaged from a cam and, conversely, a contact is open if its roller is engaged by a cam. The cams are individually adjustable in 4.5-degree increments. Adjustment of the cams is accomplished as follows:

(a) Raise (or lower) the cam toward its adjacent spring until the cam is separated from the teeth of the inner gear. See Figure 8.

(b) Rotate the cam to advance or retard engagement with its roller.

(c) Lower (or raise) the cam making sure the teeth are in mesh with the inner gear.

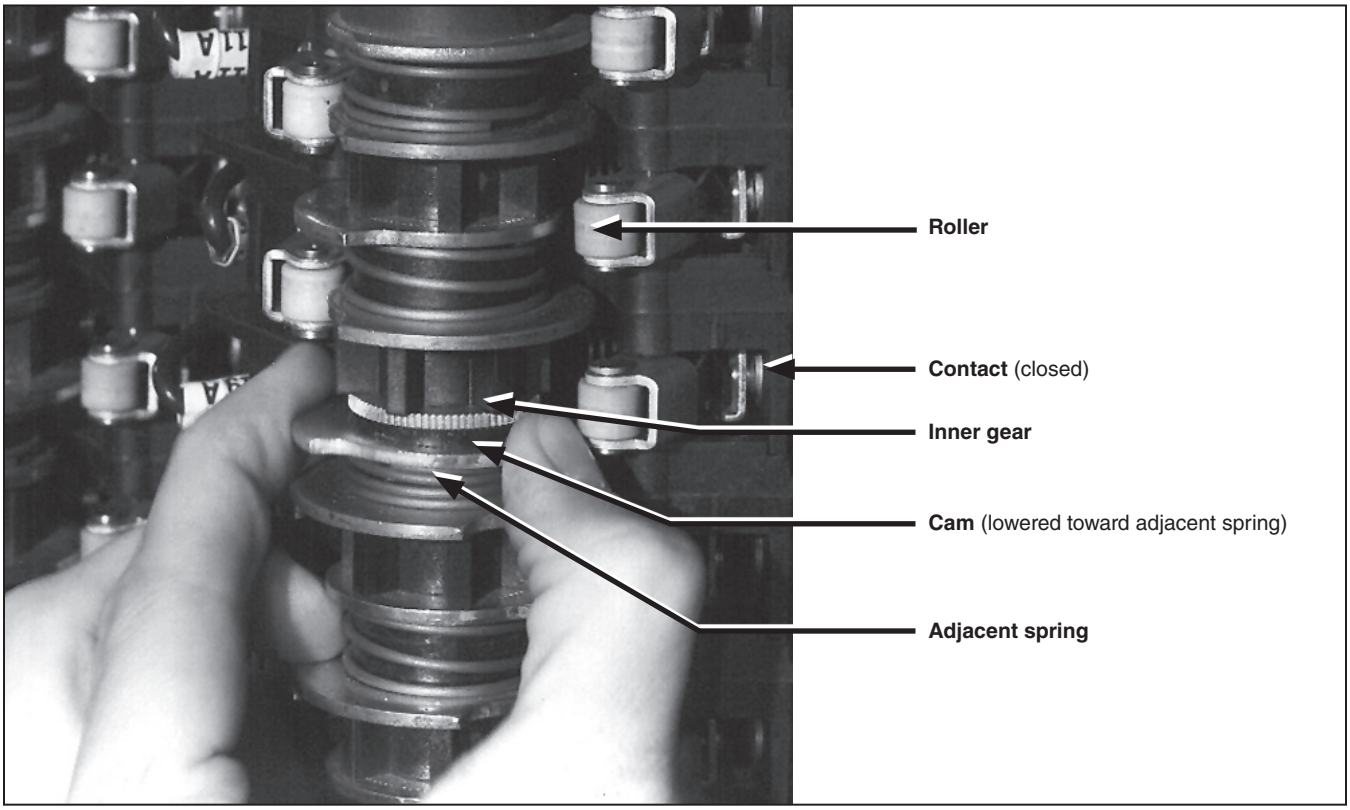

Figure 8. Adjustment of cams on auxiliary switch.

To ensure the grounding switch's continued proper performance, it should be inspected in accordance with S&C's recommended schedule and procedures contained in S&C Instruction Sheet 711-590.