



Types **SSB-T** / **SSB-A**
(copper) *(aluminum)*

Single Side Break
Disconnect Switch

15.5 kV – 72 kV,
1200 A or 2000 A

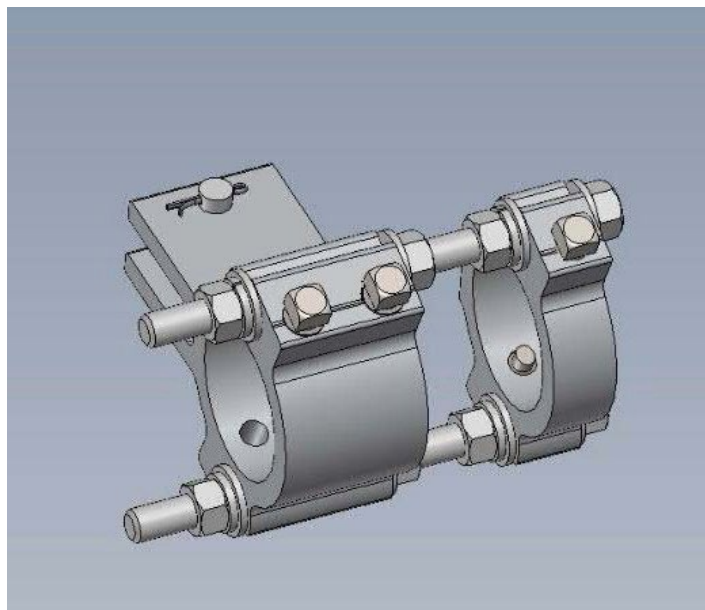
INSTALLATION &

INSTRUCTION

MANUAL

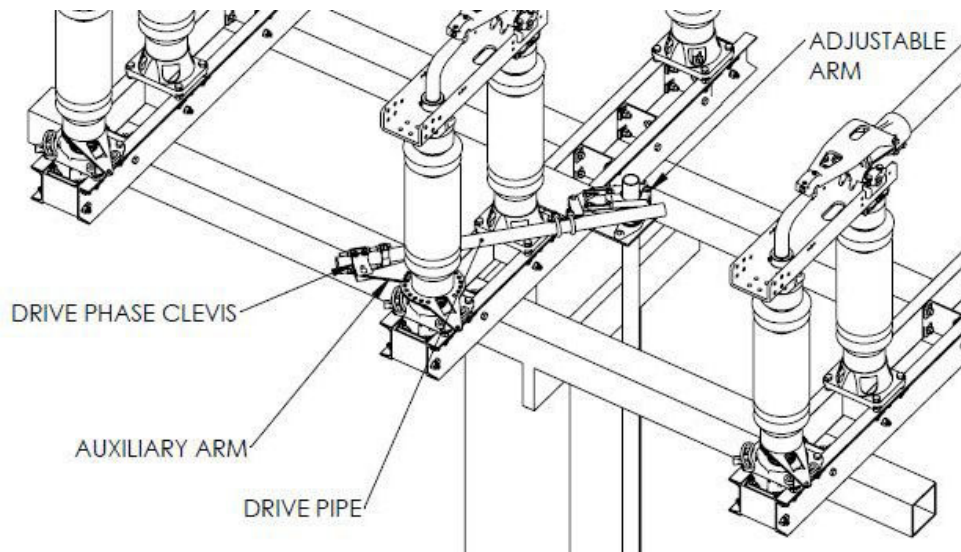
ATTENTION:

Southern States will begin supplying a portion of new operating mechanism designs with Rapid-Set clevises for orders designed after 9/1/23. If your Operating Mechanism print calls for Rapid-Set clevises (see image below for an example), please utilize the instructions on the following pages for all linkage adjustments. If not, please adhere to the standard instructions provided.



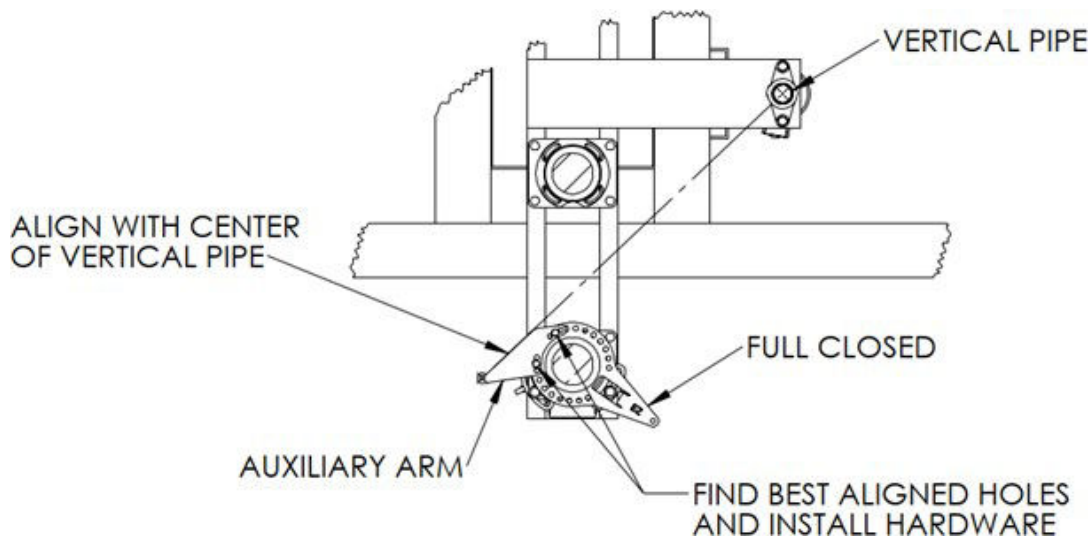


Please scan or use the link below for video instructions of Rapid-Set.
[Southern States Rapid Set Instructions](#)



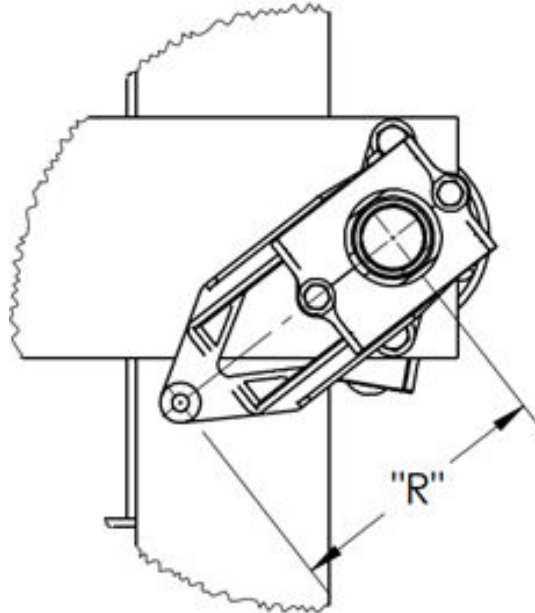
STEP 1:

Install the auxiliary arm by aligning the straight edge of the arm with the center of the vertical pipe and bolting it into place using two of the provided mounting holes. Do this with the switch phase set to the full closed position as shown below.



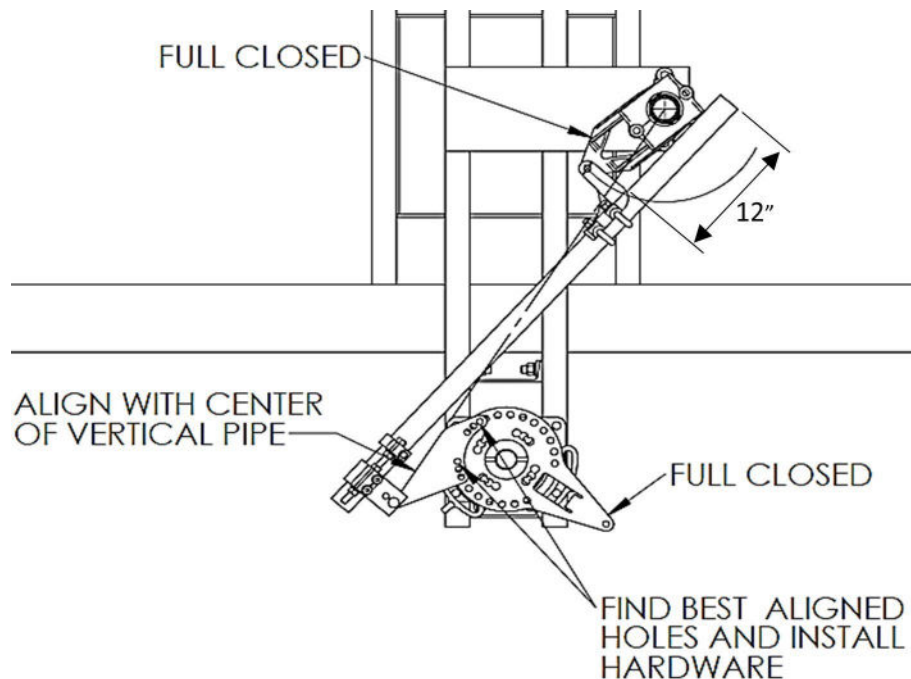
STEP 2:

Install the adjustable arm with the radius "R" set to the recommended length provided in the operating mechanism drawings.



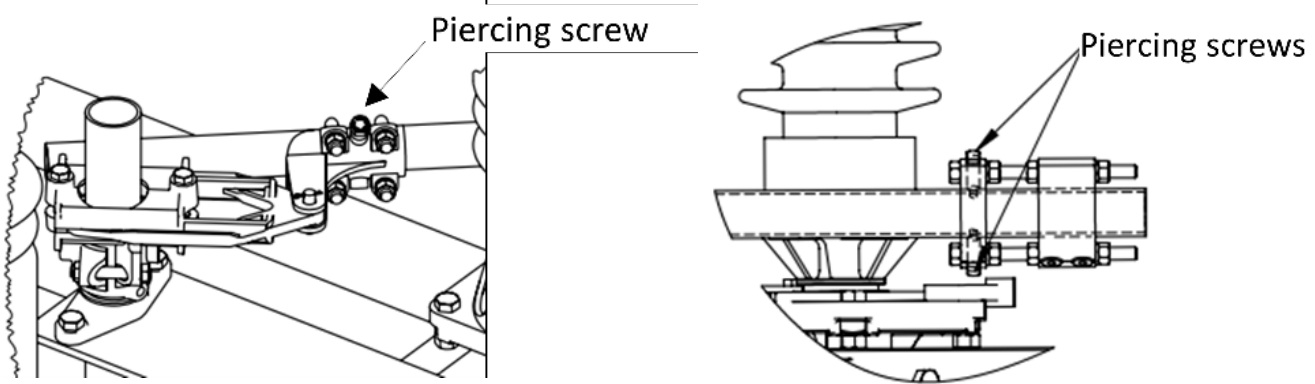
STEP 3:

Install the auxiliary arm Rapid-Set clevis and drive pipe. Ensure that roughly 12" of pipe extends beyond the adjustable arm clevis connection so that the pipe makes contact with the adjustable arm in the position shown. This may be the open or closed position depending on the job specific drawings. The pipe should contact the adjustable arm in this position.



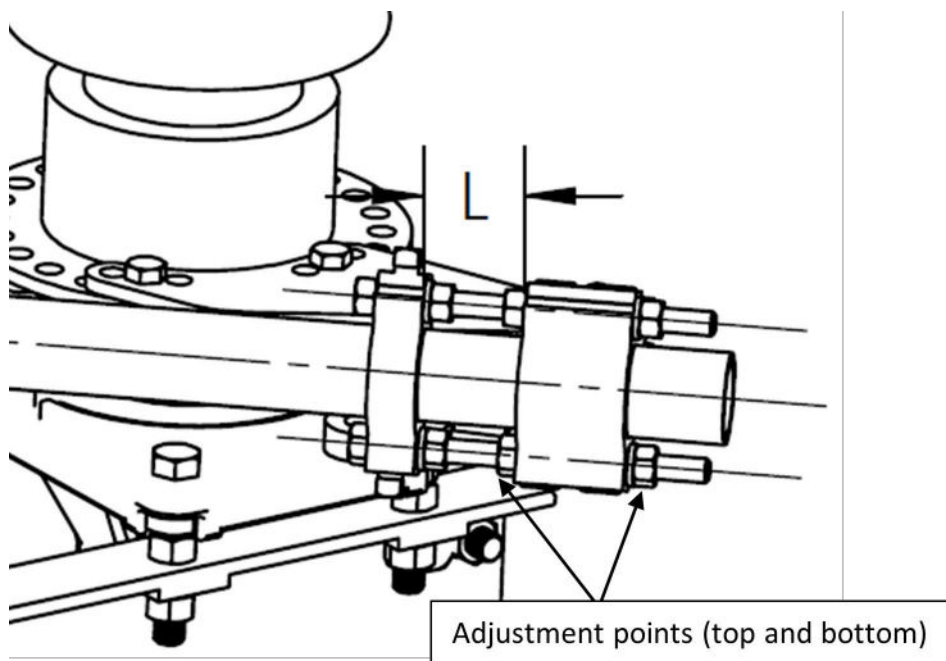
STEP 4:

With the auxiliary arm properly aligned with the vertical pipe and the switch phase in the full closed position, pierce the pipe at both ends. **NOTE:** U-bolt style clevises require pre-drilling on all pipes thicker than SCH40. Drill guides are provided on the operating mechanism BOM when required. Pierce the adjustable arm clevis by hand tightening until it penetrates the pipe and continue until snug (note piercing screw may still have threads showing). Do not remove plastic caps from the Rapid-Set clevis at this time. To pierce the Rapid-Set clevis, tighten each piercing screw until the head contacts the aluminum extrusion. Do not over tighten.



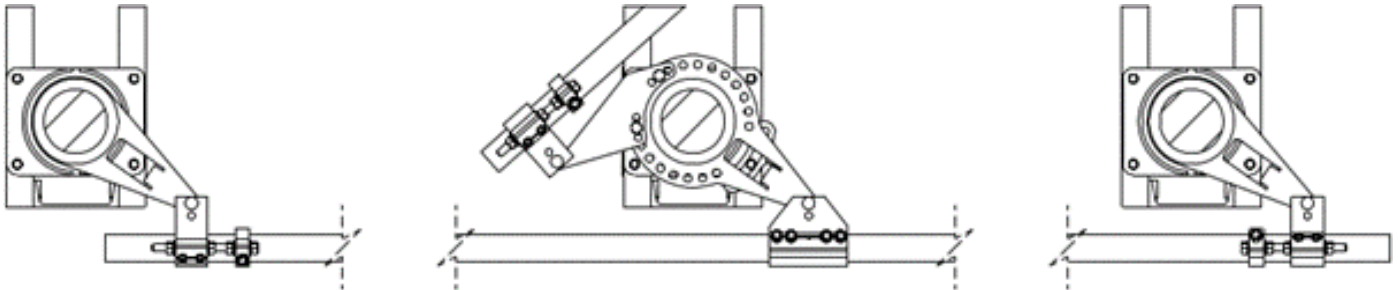
STEP 5:

Begin to manually open the phase using the operator. Observe the phase closed and open stops during operation and modify the length of the adjustable arm as needed to provide the proper amount of travel. Lengthen the arm to add travel and shorten the arm to decrease travel. The mechanism should have sufficient toggle (spring load) during closed and open position. To balance the force at closed and open positions, adjust the length "L" of the Rapid-Set clevis by adjusting the four nuts shown below. Ensure that both the top and bottom sets are adjusted in equal increments.



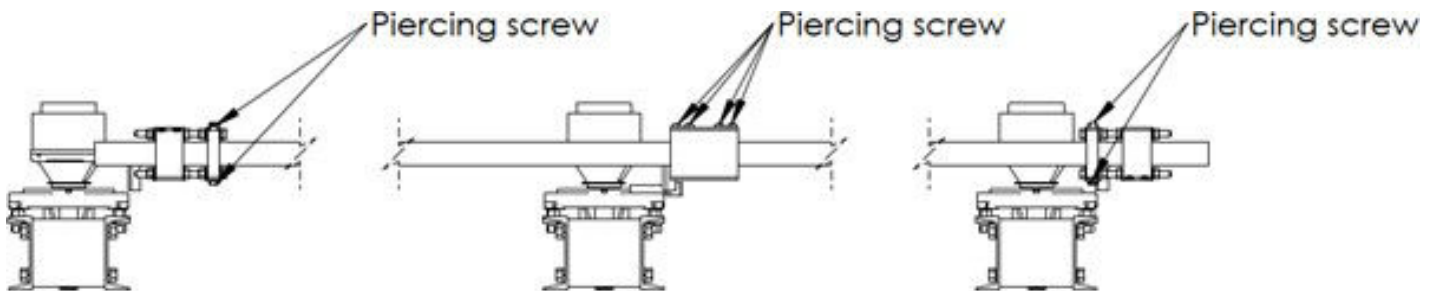
STEP 6:

After the drive phase is adjusted to operate correctly, set all phases to full closed, and install the interphase pipe following the procedure below.

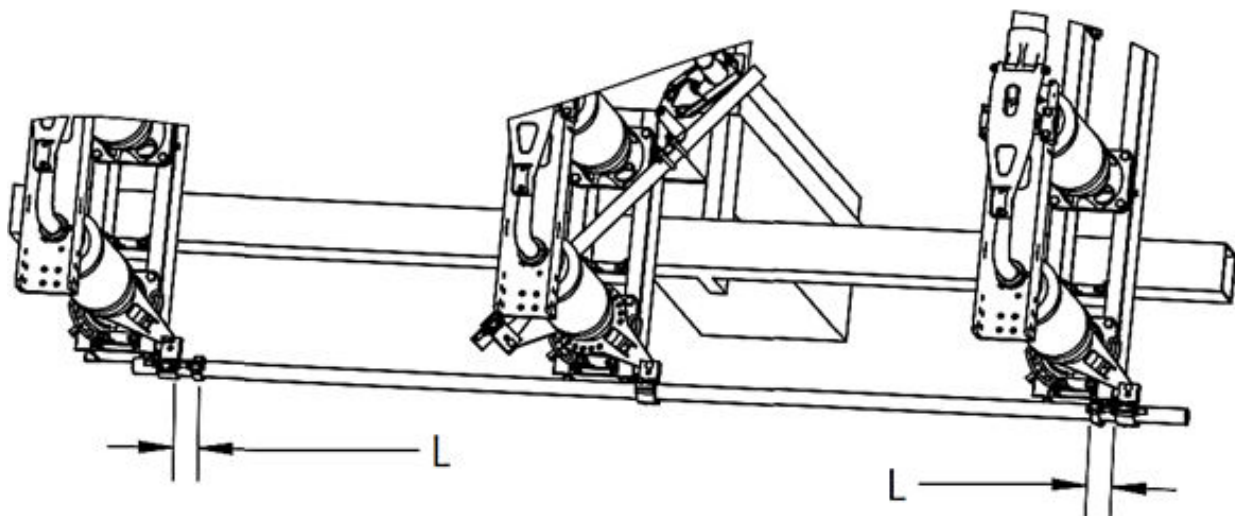


For switches driven by the center phase:

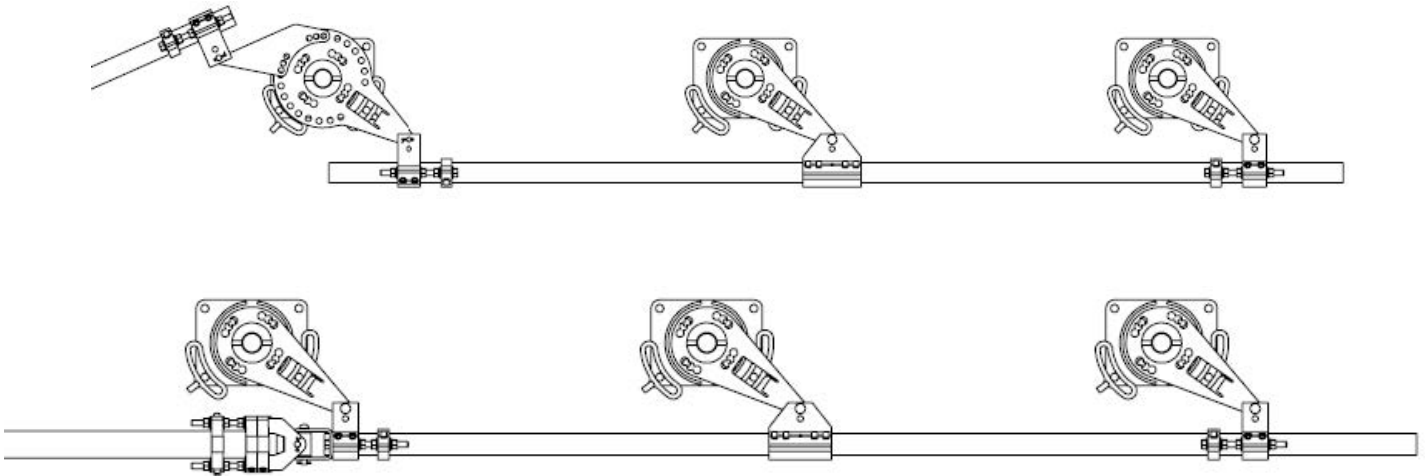
- With the interphase pipe centered and all clevises in place, pierce the interphase pipe at the locations shown. Do not remove plastic caps at this time.



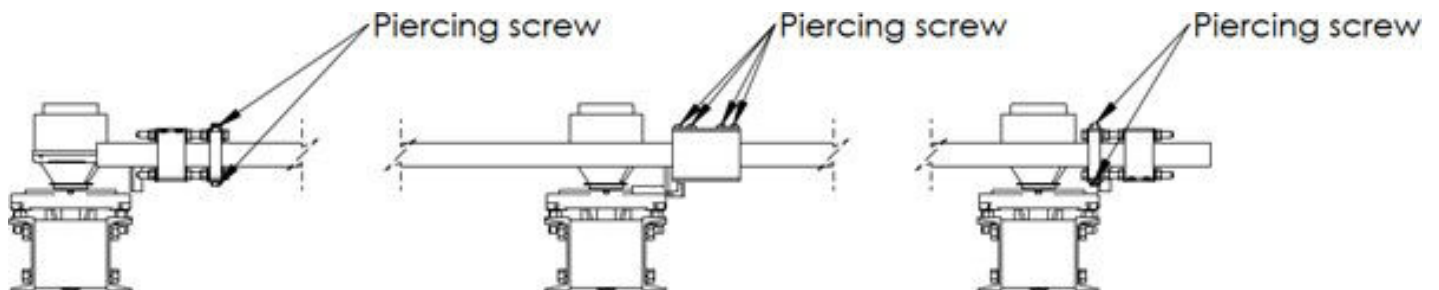
- Adjust the timing of the two driven phases by adjusting the length "L" of each Rapid-Set clevis.



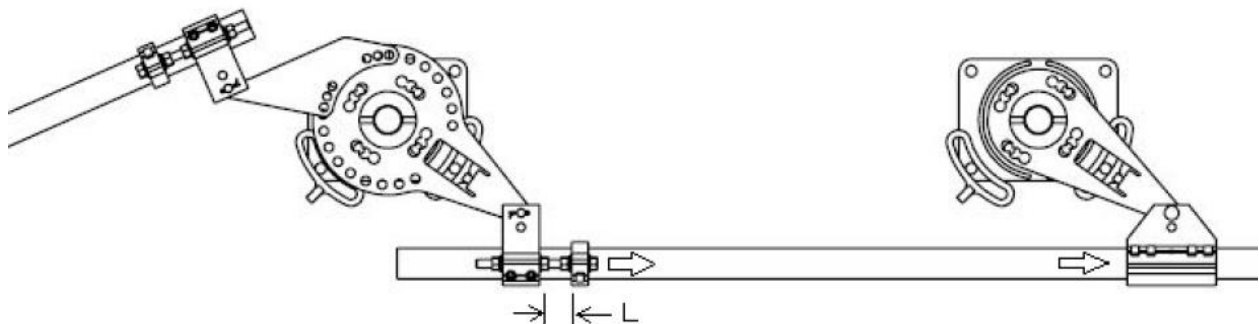
For switches driven by one of the end phases:



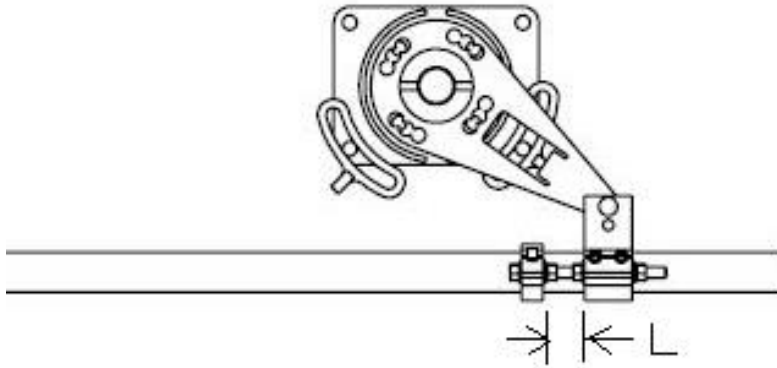
- a. With the interphase pipe centered and all clevises in place, pierce the interphase pipe with at the locations shown. Do not remove plastic caps at this time.



- b. Adjust the timing of the center phase by adjusting the length "L" of the Rapid-Set clevis attached to the drive phase.



- c. Set the timing of the last phase by adjusting the length “L” of the Rapid-Set clevis attached to the last phase.

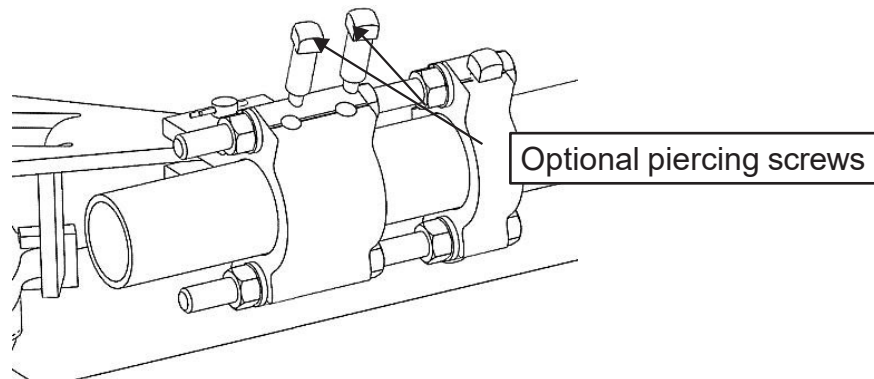


STEP 7:

With all the phases adjusted, open and close the three phase assembly and inspect for proper operation. Once adjustments are finalized, pierce all remaining connections (switch operator, adjustable arm, etc).

STEP 8:

Each Rapid-Set clevis is provided with 2 extra piercing screws. These are for optional use. To install these, remove the plastic cover caps and install them as shown below. Note, adding these will restrict any additional adjustment. Remove them before making any adjustments and then reinstall them on the bottom side of the clevis.



The Quality Name in High Voltage Switching

Safety Information

WARNING

IMPROPER HANDLING, INSTALLATION, OPERATION OR MAINTENANCE OF THIS EQUIPMENT MAY CAUSE IMMEDIATE HAZARDS WHICH WILL LIKELY RESULT IN SERIOUS PERSONNEL INJURY OR DEATH.

WARNING

The equipment covered by this publication must be handled, installed, operated and maintained by qualified persons who have direct knowledge and experience dealing with the hazards involved and are thoroughly trained in the handling, installation, operation and maintenance of high voltage transmission and distribution equipment. These instructions are meant for only such **Qualified Persons**. They are not intended to be a substitute for adequate training and experience in safety procedures for this type of equipment. **Please ensure that you are using the latest installation and maintenance instructions.**

A **Qualified Person** is one who is trained in and has skills necessary:

- to read and comprehend this instruction book – understanding that these instructions are general in nature
- to accept personal responsibility to prepare and maintain an intrinsically safe work environment and maintain control of the work site to safeguard all persons present
- to develop and implement a proper rigging, lifting, and installation plan along with all safety precautions required to insure safe and proper lifting and installation of the equipment.
- to distinguish between energized and non-energized parts
- to determine proper approach distances to energized parts
- to properly work with and around energized or de-energized equipment that may be pressurized with gas
- for proper use of personal protective equipment, insulating and shielding materials, insulated tools for working near energized and /or pressurized electrical equipment
- to recognize and take necessary precautions for the unique and dynamic conditions of site and specialized equipment to maintain a safe work environment during handling, installation, operation, and maintenance of high voltage switching equipment

The instructions in this manual are general guidelines for this type of equipment and not specific to the equipment supplied. Portions of it may not be applicable or may not have complete instructions for your specific equipment. Please ensure that you are using the latest installation and maintenance instructions.

If you do not understand any part of these instructions or need assistance, contact Southern States Service Division at 770-946-4562 during normal business hours (8:00am – 4:30pm EST, M-F) or 770-946-4565 after normal business hours.

The Quality Name in High Voltage Switching

Southern States, LLC

Equipment Receipt, Installation, Use, Operation and Maintenance Terms

(“Terms of Use”)

The purchaser (“Purchaser”) of certain Equipment (the “Equipment”) identified in the Instruction Manual accompanying these Terms of Use sold by Southern States, LLC (“Southern States”), by Purchaser’s acceptance or Use of Equipment in any way, agrees to the Terms of Use set forth below (the word “Use” herein means receipt, testing, inspection, installation, operation, maintenance and otherwise handling the Equipment):

- Purchaser represents and warrants that it is fully qualified to Use the Equipment, and that it is a sophisticated user of the Equipment with a high level of expertise in the Use of the Equipment and Purchaser knows that Southern States is relying on Purchaser’s sophistication and expertise with respect to the Equipment.
- The Purchaser will, within seven (7) days after receipt of the Equipment, inspect the Equipment and identify and notify Southern States in writing of any missing parts, damage or defects observed in the Equipment.
- The Purchaser will Use the Equipment, only in conformity with all manuals, data sheets and instructions provided by Southern States, and in keeping with sound engineering, utility and safety practice. Purchaser will at its own expense, provide all necessary labor, supplies, and facilities required to Use the Equipment.
 - The Purchaser may use its own personnel or engage a third party to Use the Equipment. The Purchaser shall insure that it only utilizes personnel who are fully qualified or certified by a reputable certification agency to Use the Equipment. In the event that Purchaser cannot find such qualified personnel, the Purchaser will notify Southern States and seek its advice to determine a mutually agreeable solution.
 - By separate agreement, Southern States may provide such services and the personnel to conduct such services in connection with the installation of the Equipment. In the event Southern States agrees to provide personnel to install, maintain, and operate the Equipment, such personnel will function only in an advisory capacity and shall have no responsibility for the supervision, or the quality or workmanship of such installation, maintenance, or operation of the Equipment.
- The Purchaser shall not install and operate the Equipment in a way such that a single point of Equipment failure leads to a cascading event or consequential damage to any person or property. Purchaser shall ensure redundancy in its system at all times. Purchaser acknowledges and agrees that electric service is by nature subject to interruptions due to Equipment failures and shall not agree to provide service free from the effects of Equipment failures.
- The Equipment will be maintained and inspected as provided by this instruction manual and in compliance with best industry practices, but in no event will the Equipment be inspected and tested less frequently than once in every 6 months.
- The Purchaser shall not repair, dismantle, or alter any of the Equipment without Southern States’ written consent.
- Any failure of Equipment either in service, testing or inspection will be promptly reported in writing to Southern States within 24 hours of the failure so that adequate evidence can be collected, appropriate diagnostic tests can be conducted, and analysis of the failure can be determined.
- Southern States will have no liability for any direct, indirect, consequential or remote damage or injury, whether or not foreseen or foreseeable, to the Purchaser or any third party or person for any damages or injury to person or property caused by Purchaser’s or any third party’s actions, whether or not negligent, in the Use of the Equipment. Purchaser shall indemnify and hold Southern States and its employees, officers and directors against any damage or injury caused in whole or part by Purchaser’s or any third party’s action whether or not negligent, resulting from the Use of the Equipment. Southern States expressly rejects any liability to third parties. The Purchaser expressly waives any claim against Southern States, its employees, officers, directors and affiliates, for injury or damage to person or property resulting from Use of the Equipment not directly and solely caused by Southern States’ negligence. For the purposes of clarity, Southern States shall not be liable, and be fully indemnified by the Purchaser, for the following related to the Equipment: normal wear and tear, excessive use and loading, improper interference or maintenance on the part of the Purchaser or third parties, incomplete or false information given by the Purchaser, inappropriate or improper Use, faulty operation, installation or start-up, faulty or careless handling, improper maintenance, use of unsuitable operating materials/substitute materials, defective construction work, hazardous ambient conditions unknown to the Purchaser, chemical, electro-chemical or electrical influences, changes to the subject of delivery made without Southern States consent.
- In the event that Southern States is found by a court of competent jurisdiction or a properly empaneled arbitral body to be liable to the Purchaser for any reason, Southern States shall be entitled to a reduction in the liability by taking into account the exceptions provided by statute, law, and any counterclaims Southern States may have against Purchaser.
- The failure of Purchaser to comply with these Terms of Use herein shall void any and all warranties related to the Equipment. These Terms of Use shall be deemed to be part of the binding contractual agreements between Purchaser and Southern States related to the Equipment and shall govern over any inconsistent term or provision in such other contractual agreements.

The Quality Name in High Voltage Switching

LIMITED WARRANTY

Southern States, LLC (“SLLC”) warrants only to the Warranty Holder (hereinafter defined as the “End User” or the “Immediate Purchaser”, as applicable, pursuant to the terms and conditions of this Limited Warranty as set forth below), that the Product identified below will, upon shipment, be free of defects in workmanship and material for the applicable Warranty Period. The “Warranty Period” is that period of time during which this Limited Warranty is effective, and such period begins on the invoice date issued by SLLC for the Product, and continues until the earlier to occur of (1) the expiration of the Warranty Duration period, or (2) the Number of Operations, both as specified in the table below. If the Product is both purchased and installed within the United States or Canada, this Limited Warranty is granted to each end user of the Product who acquired the Product for its own use during the Warranty Period (“End User”). In all other situations, this Limited Warranty is granted only to the first purchaser of the Product (“Immediate Purchaser”) from SLLC. No primary or remote purchaser or owner of the Product who is not a Warranty Holder may claim any benefit under this Limited Warranty, or any remedial promise included in this Limited Warranty. SLLC shall, upon prompt written notice from the Warranty Holder, correct a nonconforming Product by repair or replacement at the sole discretion of SLLC of the nonconforming Product or any part or component of a nonconforming Product necessary in SLLC’s discretion to make such Product conforming. Any transportation charges, labor for removing, reinstalling the Product or part, and/or costs related to providing access to the Product shall be the responsibility of the Warranty Holder. Correction in this manner will constitute the Warranty Holder’s exclusive remedy and fulfillment of all SLLC’s liabilities and responsibilities hereunder. SLLC’s duty to perform under this limited warranty may be delayed, at SLLC’s sole option, until SLLC has been paid in full for all products purchased by the Warranty Holder. No such delay will extend the Warranty Period. If SLLC does not make such repair or replacement, SLLC’s liability for damages on account of any claimed nonconformity will in no event exceed the purchase price of the Product in question. This Limited Warranty does not apply to any Product that has been disassembled, repaired, or altered by anyone other than SLLC. This Limited Warranty will not apply to any Product that has been subjected to improper or abnormal use of the Product. SLLC has no responsibility to repair or replace any Product or component thereof manufactured by another party, but SLLC will assign, to the extent assignable, to the Warranty Holder any manufacturers’ warranty that applies to products and components not manufactured by SLLC.

THIS LIMITED WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES. THERE ARE NO OTHER EXPRESS, IMPLIED, OR STATUTORY WARRANTIES. ALL IMPLIED WARRANTIES WHICH MAY ARISE BY IMPLICATION OF LAW, OR APPLICATION OF COURSE OF DEALING OR USAGE OF TRADE, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, NONINFRINGEMENT OR OTHERWISE ARE EXPRESSLY EXCLUDED. SLLC SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY CONSEQUENTIAL, INCIDENTAL, INDIRECT, EXEMPLARY, SPECIAL, OR PUNITIVE DAMAGES, EVEN IF SLLC HAS BEEN ADVISED OF THE POSSIBILITY OF SAME. THE WARRANTY HOLDER IS SOLELY RESPONSIBLE FOR THE SUITABILITY OF THE PRODUCT FOR ANY PARTICULAR APPLICATION.

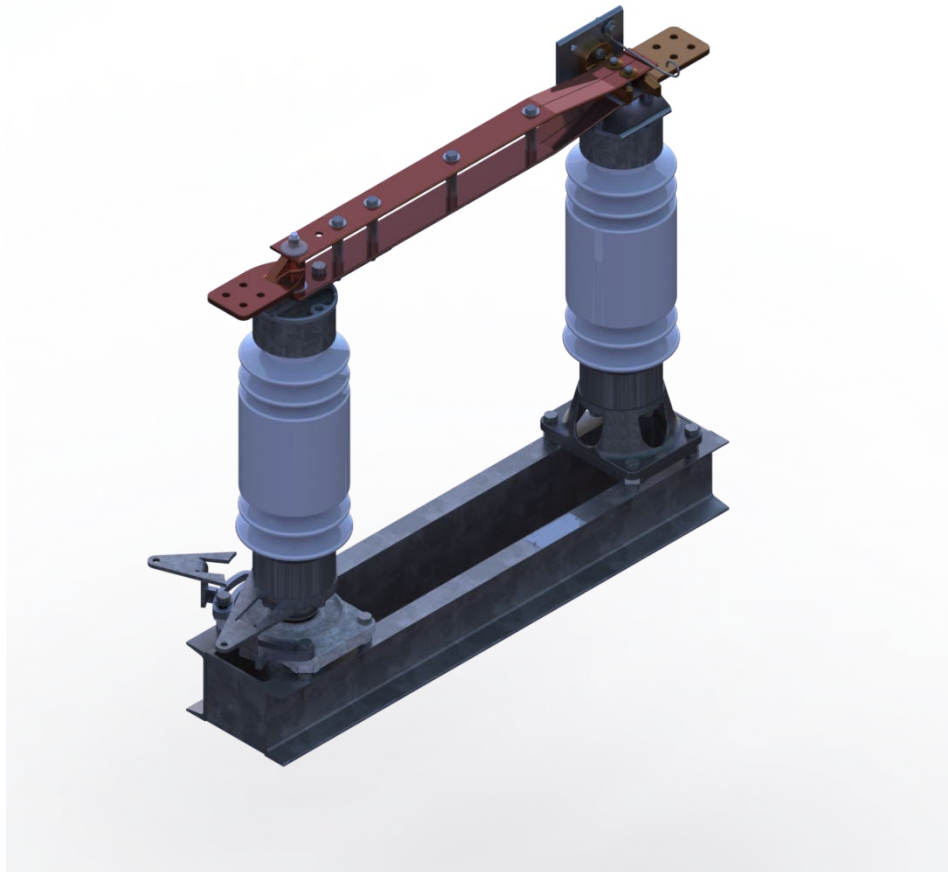
Product Purchased Region	Product Installed Region	Warranty Holder	Warranty Duration
U.S and Canada	U.S and Canada	End User	Five (5) years
All Other Conditions		Immediate Purchaser	Earlier of 1 year from installation or 18 months from shipment

The Quality Name in High Voltage Switching

Type SSB-T / SSB-A

Single Side Break Disconnect Switch

15.5 kV – 72.5 kV, 1200A or 2000A



The Quality Name in High Voltage Switching

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The Quality Name in High Voltage Switching

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Summary & Introduction

Summary & Introduction

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. Southern States reserves the right to make changes in the specifications shown herein or to make improvements at any time without notice or obligation. 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.

Summary

These instructions do not purport to cover all details or variations in equipment, or provide for every possible contingency to be met in connection with installation, operation or maintenance. Should 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 Southern States Representative.

The contents of this instruction manual should not become part of or modify any prior or existing agreement, commitment or relationship. The sales contract contains the entire obligation of Southern States. The Warranty contained in the contract between the parties is the sole warranty of Southern States. Any statements contained herein do not create new warranties or modify the existing warranty.

Summary & Introduction

Introduction

The Southern States type **SSB-T** (*copper live part construction*) and **SSB-A** (*aluminum live part construction*) are three pole, single-throw, two insulator, single rotating stack, side-break, group-operated, outdoor air disconnect switches. Each switch can be operated using a manual or electrical motor operator.

The installation procedure for all mounting positions and operating schemes are similar and explained herein. A system of pipes, bearing, and adjustable length arms are utilized to open and close the switch from a ground level operator.

The instructions contained within this manual are necessary for the safe installation, maintenance, and operation of the SSB-T / SSB-A switch. A qualified person, familiar with this of type equipment, should carefully read and follow the instructions.

These instructions are intended to provide a general guideline for the installation, adjustment, and maintenance of the SSB-T / SSB-A switch. It is not possible to cover all details, equipment variations, and potential conditions. Contact Southern States, LLC in the event conditions associated with a specific application are not sufficiently addressed.

All photographs and sketches in this manual are for illustration purposes only and may not be to scale. Refer to the Unit Assembly drawing or the Operating Mechanism drawing provided with each disconnect switch for specific details. During installation, it may be necessary to make adjustments other than those described in this manual. Contact your local representative or the factory if questions should arise.

Southern States After Sales and Service Department is available for field installation assistance along with providing parts support for all Southern States products.

Contact After Sales and Service at 770-946-4562, 7:30am-4:00pm EST Monday-Friday.
After Hours: 770-946-4565

Distinctive signal words are used to indicate the degree of hazard that may be encountered by the user. Identification of the signal words and their definition follow:

▲ DANGER

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

▲ CAUTION

Indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

▲ WARNING

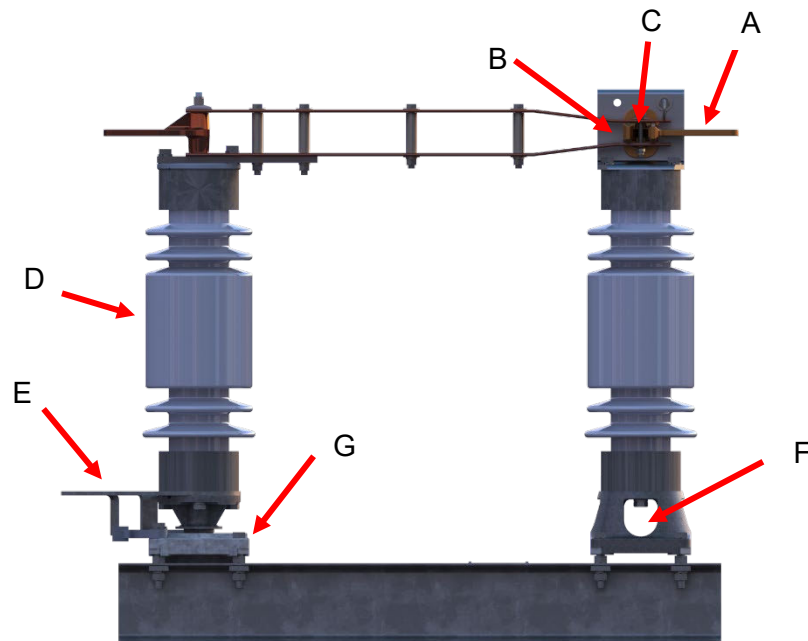
Indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury.

Product Description

Typical Switch

The SSB-T and SSB-A switch consists of the following single pole assemblies:

- Live Parts – *blades with hinges, terminal pads, and contacts*
- Bases
- Insulators
- Interphase & Control Pipes with Hardware
- Outboard Bearing & Operator



- A – Terminal Pad
- B – Contact
- C – Contact Adjusting Bolt Contact
- D – Rotating Insulator
- E – Lever
- F – Spacer
- G – Bearing

Figure 1: Typical SSB-T / SSB-A Disconnect Switch & Common Terminology

Ratings

Ratings (1200 A)					
Maximum Voltage Rating	15.5 kV	27 kV	38 kV	48.3 kV	72.5 kV
BIL	110 kV	150 kV	200 kV	250 kV	350 kV
Rated Power Frequency	60 Hz				
Continuous Current	1200 A				
Short-Time Symmetrical Withstand (3 sec)	38 kA RMS				
Peak Withstand	99 kA				
Ambient Temperature Rating	-40°C to +50°C Standard (-50°C Optional)				

Ratings (2000 A) *					
Maximum Voltage Rating	15.5 kV	27 kV	38 kV	48.3 kV	72.5 kV
BIL	110 kV	150 kV	200 kV	250 kV	350 kV
Rated Power Frequency	60 Hz				
Continuous Current	2000 A				
Short-Time Symmetrical Withstand (3 sec)	44 kA RMS				
Peak Withstand	114 kA				
Ambient Temperature Rating	-40°C to +50°C Standard (-50°C Optional)				

* 2000 A rating is only available using copper switch (SSB-T)

Receiving, Handling & Storage

Receiving, Handling & Storage

Receiving & Unpacking

Unpack the equipment and check for damages or shortages immediately. The bill-of-material from the Unit Assembly (switch) and Operating Mechanism drawings should be used for this purpose and can be found in the cardboard tube housing inside the op mech container. If damage or a shortage is noted, file a claim immediately with the carrier and contact the factory.

Storage

All components of the SSB-T / SSB-A single side break disconnect switch are suitable for outdoor use and do not have any special storage requirements. If a motor operator is furnished be sure to connect the heater circuit, using the provided external wiring, while the unit is in storage. Discard the wiring upon installation.

Typical crating is intended for storage less than 1 year. If long term storage is required please notify factory at time of order placement so that special crating can be used.

Installation & Adjustment Procedures

Installation & Adjustment Procedures

Preferred Switch Assembly Method

- 1.1. When insulators are shipped installed on the switch, proceed to page 7 - Mounting Disconnect Switch onto the Structure.
- 1.2. **Set up bases at ground level on transverse beams (base supports):**
Make sure the base support beams are level, then secure the switch bases to them so that during adjustment the switch does not tip over, The switch poles in most cases are top heavy and easily tipped over after installing the insulators.
- 1.3. **Removal of live parts:**
Open the blade and remove the contact end live parts assembly (see Figure 3). Now remove the hinge end live parts assembly (see Figure 2). Rotate the insulator bearing to the fully closed position.

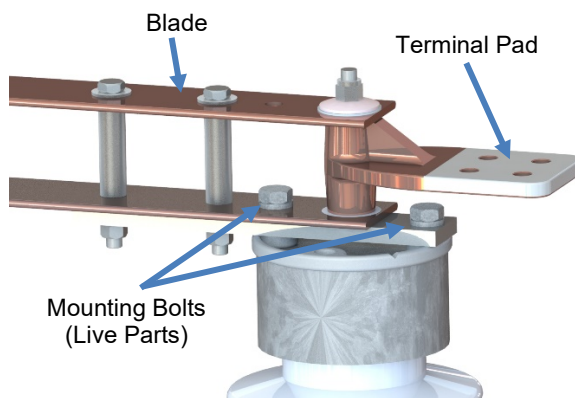


Figure 2: Hinge End

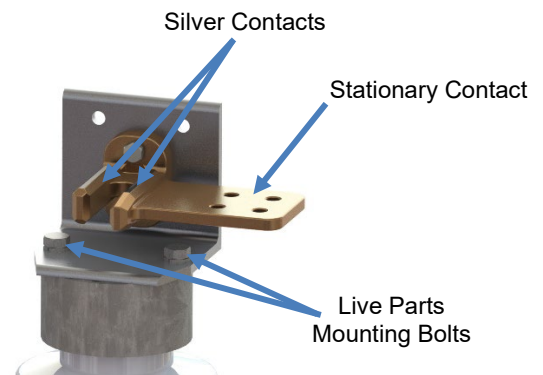


Figure 3: Contact End – Switch Open

- 1.4. **Stack insulators:**
Consult your single-pole sub-assembly and control arrangement drawings for proper positioning of levers, spacers, etc. Sort out hardware. Install and plumb the insulators, leaving all bolts finger tight. Do not tighten. Wrench tightening of insulator bolts will be done in Part E.
- 1.5. **Mount live parts on insulators:**
Be sure the rotating insulator bearing (Figure 5) is in the closed position. Mount the hinge end live parts in the closed position (Figure 2), Open the blade and mount the contact end live parts (Figure 3). Live parts on this switch may be handled by one man. Now tighten all bolts!

Installation & Adjustment Procedures

Mounting Disconnect Switch onto the Structure

⚠ CAUTION

Rigging used to hit the poles should be attached to the base with steadying guides attached to prevent lipping of the switch pole. Do not lift the switch by attaching to the live parts. Lift the switch poles onto the structure, being sure the blade is in the closed position. Refer to the control arrangement drawing for proper placement of the switch on the structure.

- Check mounting surfaces for unevenness. Switch bases will warp on uneven surfaces. Use shims under bases to level if necessary.
- Bolt bases solidly to the structure.

Installation & Adjustment Procedures

Adjustment

Adjustment of Switch in Closed Position

If the blade does not align properly with the contact, improper operation and possible damage will result. Check to make sure all bolts are tight. Variances in insulators may cause some misalignment, which will require shimming of the insulator to obtain proper alignment. Note: A simpler method would be to center and tighten the rotating stack/blade end and leave the contact end slightly loose. Manually close the blade and allow the contact to center itself. If the contact is entering the blade too low or too high, use the jacking bolts to align and tighten the contact in place once properly aligned and fully closed.

Adjustment of Switch in Open Position

Rotate the hinge end Insulator stack to the open position. Refer to the assembly drawing for the min. open gap dimension (Figure 4). Check stops on rotating bearing at base of the rotating insulator; be sure these stops have been set to allow the proper angle of rotation (Figure 5).

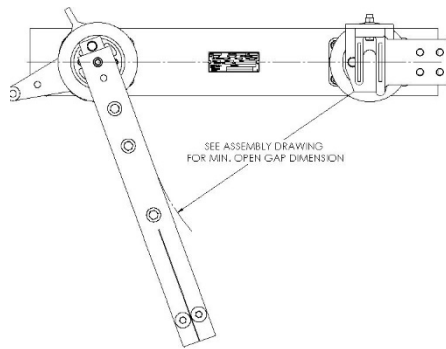


Figure 4: Blade Shown Fully Open

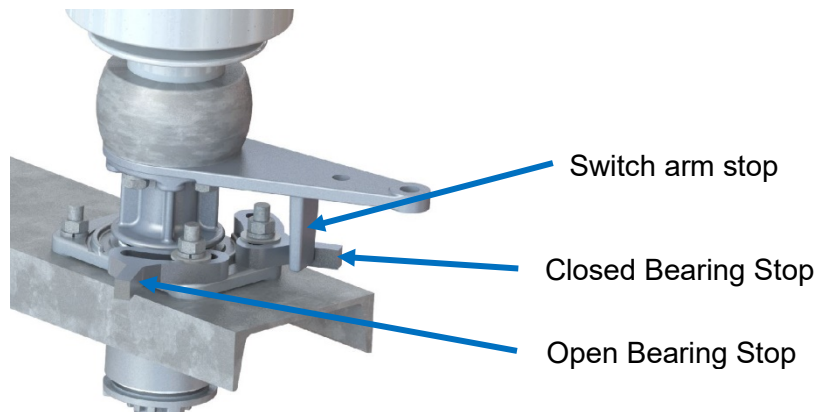


Figure 5: Rotating Insulator Bearing

Installation & Adjustment Procedures

Adjustment of Contact Pressure

The correct contact pressure has been pre-set at the factory and should not need adjustment. If for some reason you find it necessary to adjust the contact pressure, follow these rules:

- Consult your single-pole assembly drawing for the correct contact pressure at the hinge and contact end.
- To increase the contact pressure, tighten the contact adjusting bolt (Figure 6). Be cautious about applying too much pressure as it may cause galling of the silver contact surfaces.
- The blade tip must come down into the jaw in its center, without dragging on either side as shown in Figure 6. Use the jacking bolts that support the jaw insulator to tilt the insulator sideways, if necessary, to ensure this condition.

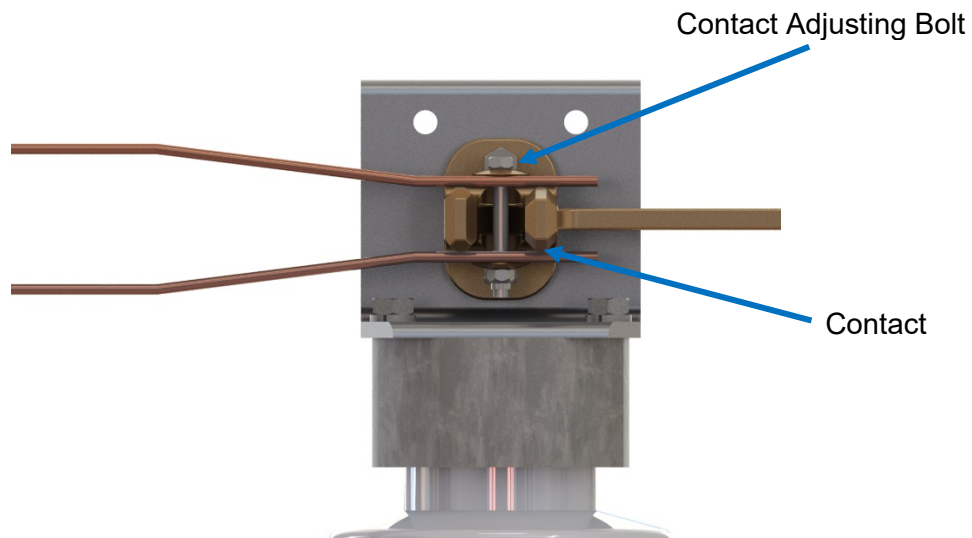


Figure 6: Contact End Shown Fully Closed

Installation & Adjustment Procedures

Arcing Horn Adjustment

If arcing horns are supplied and adjustment is required proceed as follows:

- Operate Switch.
- Blade should make light to firm sliding contact along the straight portion of the horn until the switch is fully closed.
- Readjustment of the arcing horn can be done by grasping it firmly and bending until the action described above is achieved. The arcing horns should have light pressure, not forcing the blade into place when closing. See Figure 7.

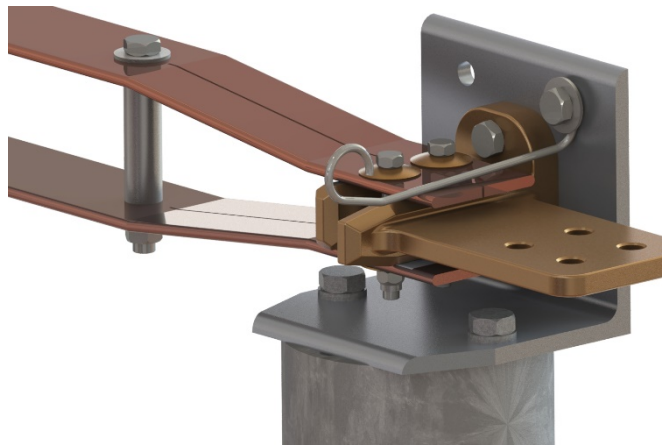


Figure 7: Adjusting Arcing Horn

Check Single-Pole Adjustments

Be sure each single pole is properly adjusted before connecting the controls and operators. Operate Switch.

- With the switch bolted solidly to the structure, check to make sure that the single-pole opening is as specified in the single-pole assembly drawing. If readjustment is required, refer to page 8 - Adjustment.
- Check blade to be sure it meets the contact squarely. If it does not, refer to page 8 - Adjustment.
- Recheck other adjustments as required

Installation & Adjustment Procedures

Operating Mechanism Adjustment

If a motor operator is used, DO NOT USE ELECTRICAL OPERATION until the following adjustments are completed.

NOTE: The setting of the adjustable arm on the Operating Mechanism Drawing is a calculated dimension. To adjust precisely:

- 1) The adjustable arm should travel at least 180 degrees from toggle closed to toggle open. This adjustment can be done in a neutral position where the adjustable arm is perpendicular to the clevis. (Exceptions may occur. Refer to the Operating Mechanism Drawing.) Manually test operate.
- 2) If the switch does not fully open, the radius of the arm is too short. To correct:
 - a. Check first to see that nothing has slipped.
 - b. Return the switch to the closed position.
 - c. Loosen the adjustable arm and clevis bolts as shown below.
 - d. Lengthen the radius of the adjustable arm in $\frac{1}{4}$ inch increments or less and allow the clevis to reposition itself the same distance (shorten-ing the pipe).
 - e. Test operate again and adjust as necessary.

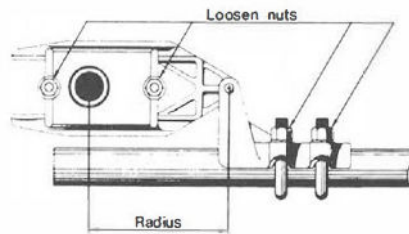


Figure 8: Operating Mechanism Adjustment

- 3) If the switch is fully open before the control handle reaches the open position, the radius of the adjustable arm is too long. To correct:
 - a. Check to see that nothing has slipped.
 - b. Return the switch to the closed position.
 - c. Loosen the adjustable arm and clevis bolts as shown above.
 - d. Shorten the radius of the adjustable arm about $\frac{1}{4}$ inch and allow the clevis to reposition itself (lengthen-ing the pipe).
 - e. Test operate again and adjust as necessary.

Note: All poles of the fully adjusted switch should operate simultaneously. Slight adjustment of the interphase clevises may be necessary to coordinate all three poles.

- 4) When the switch is completely adjusted, securely tighten all bolts, and tighten all set screws until the pipe walls are pierced. (For heavy wall pipe, drill the set screw holes, using the threaded drill guides sup-plied and a $\frac{1}{4}$ " drill.)

Recommended Inspection & Maintenance

Recommended Inspection & Maintenance

Southern States' disconnect switches are designed to operate with minimum maintenance. While disconnecting switches are not readily serviced at frequent intervals, *periodic inspection is important for satisfactory operation and maximized overall life*. Frequency of inspection and maintenance depends on the installation site, weather, atmospheric conditions, experience of operating personnel, and any special operation requirements.

During operational testing, the switch should be opened and closed several times, if possible, to clean the contacts and free the moving parts. A visual inspection, when the switch is wet, or temperature scanning detector may indicate hot spots that could serve as potential sources of trouble. Directional microphones or ultrasonic detectors can be used to locate local corona sources on the switches which can be eliminated during normal switch maintenance.

NOTE

It is recommended that maintenance on these switches be performed in accordance with ANSI STANDARDS **C37.30.1-2011**. In addition, well-established live-line servicing and maintenance procedures may be used in accordance with user practices and local and OSHA regulations.

Table 1: Recommended Installation and Maintenance Table

		Installation Tests	Patrolling Inspection 6-months	Routine 5 Year *	Periodic 10 Year *
Insulators	Contamination	X	X	X	X
	Damage	X	X	X	X
Cabinet (if motor operator supplied)	Any loose parts on the floor of the cabinet?	X	X	X	X
	Wiring Secure	X	X	X	X
	Links Secure	X	X	X	X
	Inspect Mechanism for loose parts	X	X	X	X
	Heaters Energized	X	X	X	X
	Door Seal	X	X	X	X
	Operational Tests	X		X	X
Electrical	Contact Resistance	X		X	X
Liveparts Inspection	Inspect Contacts	X		X	X
	Inspect Arcing Horns	X		X	X

***NOTE:** Inspection/maintenance is suggested to be performed every two (2) years when installed in harsh environments with excessive airborne contaminants such as salt spray and industrial pollutants.

Recommended Inspection & Maintenance

Patrolling Inspection (6 Months)

The patrolling inspection is a largely visual inspection on an energized unit in service. The frequency of the inspection is determined by the local conditions and policies of the owner of the equipment.

- Inspect the insulators for breaks, cracks, burns, or cement deterioration. Clean insulators particularly where abnormal conditions such as salt deposits, cement dust, or acid fumes exist to minimize possibility of a flashover.
- If an accompanying motor operator is supplied, check the cabinet for loose parts and ensure that all wiring is secure, the heater is energized, and the door is sealed.

Routine Inspection and Maintenance (5 year)



The disconnect switch must be de-energized, disconnecting from all electrical power sources before servicing.

- Perform patrolling inspection (above), checking insulators and cabinet
- Once the disconnect switch is de-energized, test operate the switch multiple times.
- Check the switch for alignment, contact pressure, eroded contacts, corrosion, and mechanical malfunction, replacing damaged or eroded components if necessary. If contact pitting is minor, smooth the surface with a clean, fine sandpaper. It is recommended to clean and reapply C5-A grease during any operation or maintenance cycle, as exposed surfaces (*such as contacts*) are vulnerable to environmental conditions and contaminants that can decrease the effectiveness of the grease over time. During reapplication, clean and wipe down the contact surfaces with a green Scotchbrite pad, reapply C5-A grease, and remove any excess grease until an evenly coated, thin film is present.
- Inspect arcing horns for signs of excessive arc damage and replace if necessary.
- Check blade lock or latch for adjustment.
- Inspect all live parts for scarring, gouging, or sharp points that could contribute to excessive radio noise and corona. Check corona balls and rings for damage that could impair effectiveness.
- Inspect interphase linkages, operating rods, levers, bearings, etc. to assure that adjustments are correct, all joints are tight, and pipes are not bent.
- Check for simultaneous closing of all blades and for proper seating in the closed position.
- Inspect and check all safety interlocks while testing for proper operation.

Periodic Inspection and Maintenance (10 year)



The disconnect switch must be de-energized, disconnecting from all electrical power sources before servicing.

- Follow instructions for 5-year Routine Inspection and Maintenance

Appendix

Appendix A: Operating Mechanism Installation

Manual and Motor Operated

These switches are designed to be opened and closed as a three-phase unit by a system of pipes that translates the rotation movement of an operator on the ground - whether manual or motor - to simultaneous rotation of the end insulator of each switch pole. Figure 9 shows alternate operating mechanism designs, each of which is employed as being the simplest arrangement for a given structure. In all cases, however, the operating principle re-mains the same, and the methods of in-stallation and adjustment are virtually identical.

Refer to the Operating Mechanism Drawing provided with your switch and follow these steps:

- 1) Have all switch poles completely closed. Install all components shown on the Operating Mechanism Drawing, including interphase pipe, vertical pipe, all brackets, bushings, etc., and the adjustable crank arm.

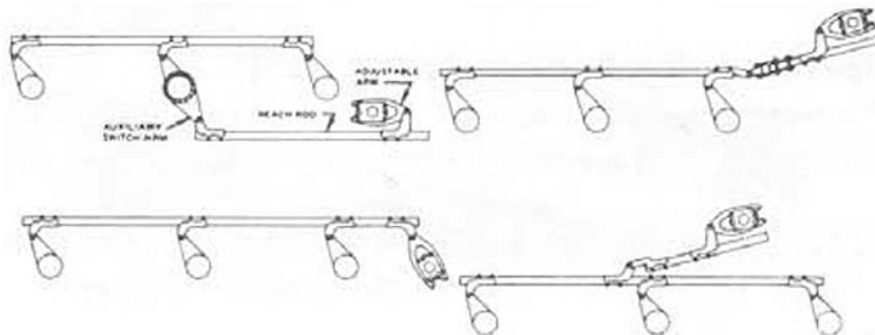


Figure 9: Alternate Operating Mechanism Designs

CAUTION

The weight of the vertical pipe must be entirely supported by the pipe collar above the vertical bearing. The housing of neither the manual gear operator nor the motor operator was designed to support this weight. Additionally, if the vertical pipe is not suspended at the dimension shown, the decoupler mechanism will jam. A gap of no less than 1/4" gap is needed between the operator and the control coupling.

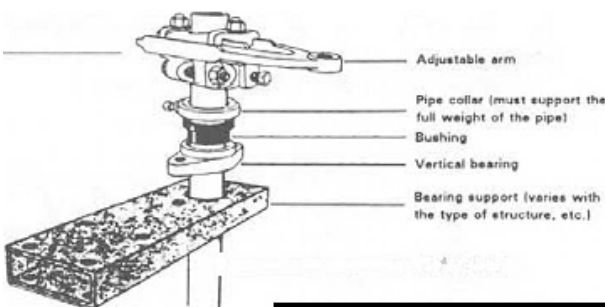


Figure 10: Operating Mechanism

Appendix B: General Installation Notes

When a switch uses an auxiliary switch arm, installation will be easier if this pole is adjusted before installing the interphase pipe. This will eliminate trying to coordinate and adjust all three poles at once.

1. If the components have self-piercing set screws, during installation tighten them to only grip the pipe (match mark to check for slip-page) and drive them in only after adjustments are completed.
2. If a motor operator is used, at this point refer to its installation instructions for mounting, checkout procedure and trial operations.

Threaded Clevises

When threaded clevises are specified, one is generally attached to the adjustable arm, and two more to the center phase switch arm. (Refer to the plan view of the operating mechanism drawing, and the illustration above.)

Operating mechanism adjustments consist mainly of incremental lengthening and/or shortenings of the pipes that connect the switch arms together. To make these adjustments, simply loosen both jam nuts "A" and screw the stud in or out as required. Be sure to retighten both jam nuts securely.

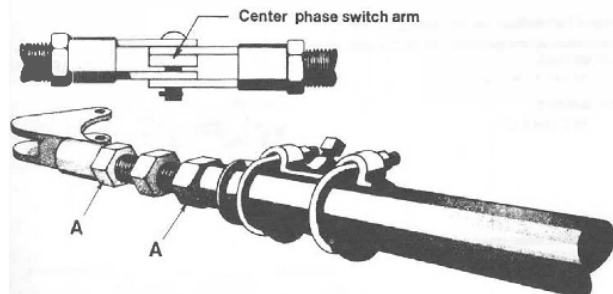


Figure 11: Threaded Clevises

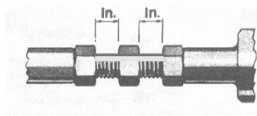
DO NOT SCREW THE STUD OUT OF THE CLEVISES.



This could cause the pipe to fall, resulting in serious injury to personnel below. Be sure the initial setting is correct, and do not adjust beyond the maximum allowable dimension. If adjustment beyond the maximum allowable dimension is needed, loosen the U-bolts on the outboard phase clevis and reposition the pipe toward the center phase.

Initial Dimension For:

- 3/4" stud: **11/16"**
- 1" stud: **1/2"**



Maximum Allowable For:

- 3/4" stud: **1 3/16"**
- 1" stud: **1"**



Maximum Allowable For:

- 3/4" stud: **1 3/16"**
- 1" stud: **1"**



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