



SUB-1 Motor Operator Installation and Operation Instructions

I. INTRODUCTION TO SEECO SUB1 MOTOR OPERATORS

Thank you for purchasing a SEECO motor operator. We are excited to be able to provide this product to you and we are certain that it will fulfill your performance expectations. The SEECO motor operator is designed and fabricated with the philosophy of quality, functionality and reliability, as well as installation (application) simplicity in mind. We appreciate all comments with regard to our product and welcome any suggested modifications to the design, which would better suit your future application needs. We are particularly interested in hearing any suggestions related to field installation which may help you perform a more timely and efficient installation.

Following are the installation and operation instructions for the SEECO Model SUB1 Motor Operator. The purpose of these instructions is to outline a step-by-step, descriptive procedure for the field installation and setup of the SUB1.

If you need assistance after reading this document, please contact our factory:

Phone: (704)-893-0222 (7am – 5pm EST)

Phone: (704)-907-9674 (outside normal business hours)

Email: Engineering@seecoswitch.com

Website: www.seecoswitch.com

II. MOTOR OPERATOR INSTALLATION INSTRUCTIONS

A. SWITCH ADJUSTMENT

1. The switch **must** be properly adjusted before beginning the installation of the motor operator. Please refer to the separate installation instructions provided with the switch assembly documentation.

B. MOTOR ATTACHMENT

1. Remove the existing switch lever handle, lock segment assembly and ground strap (If applicable)
2. Determine the motor mounting position as outlined on the mounting drawing provided, use as many existing holes on the structure or pole as possible.
3. Determine the switch control pipe cutting point; pipe is to extend down into the coupling or universal joint far enough to allow the self-piercing setscrews to firmly grasp the pipe.
 - a. Cut switch control pipe to required length.
4. Attach the motor with the mounting bracket to the structure or pole, inserting the switch control pipe into the coupling or universal joint.



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5. **DO NOT PIERCE** the pipe coupling setscrews until final adjustments have been completed later in this procedure. The coupling setscrews should remain loose to allow independent rotation of the switch control pipe and motor operator.

C. FEATURES OF THE SUB 1 CABINET

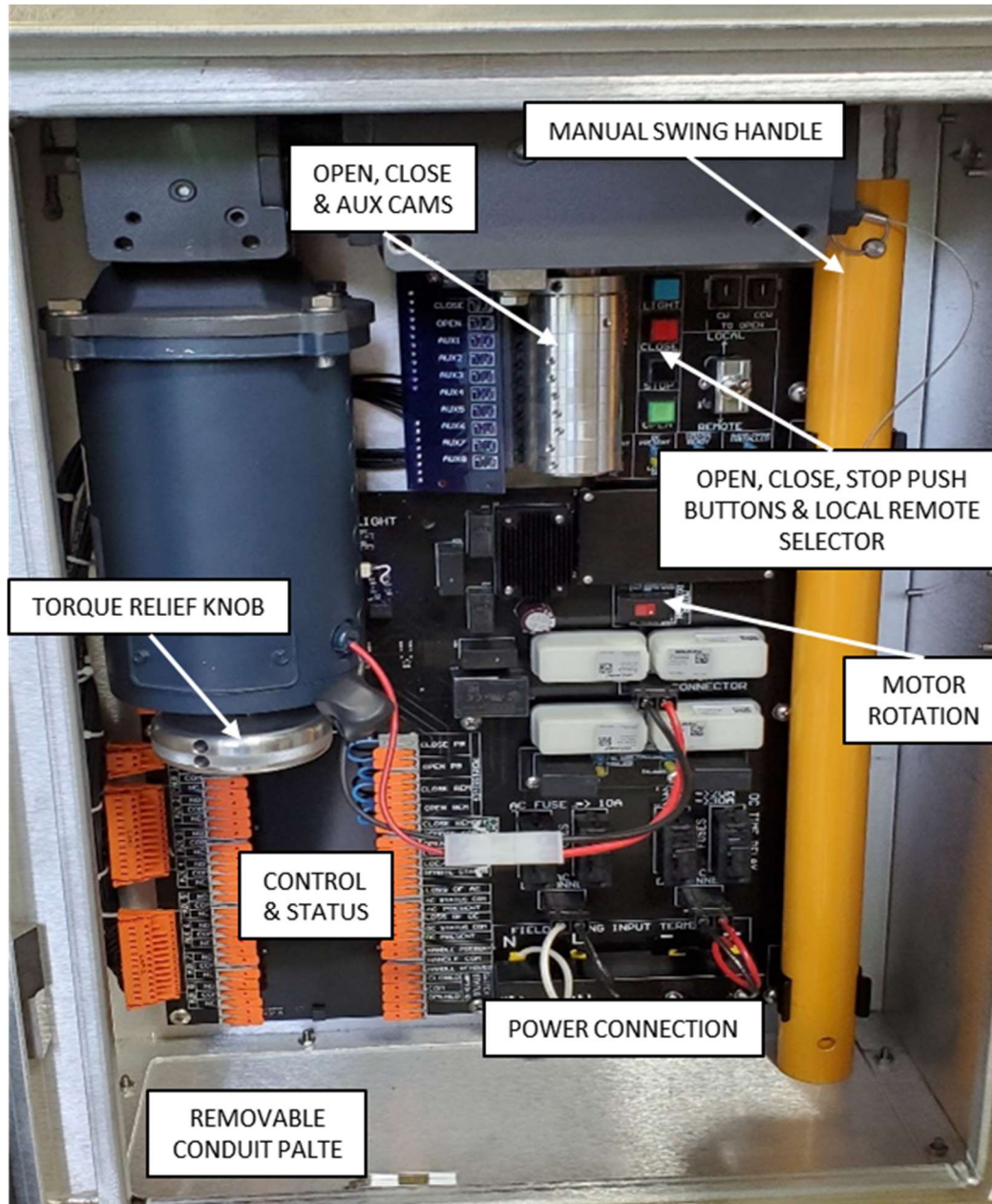


Figure 1 – Inside SUB1 Cabinet



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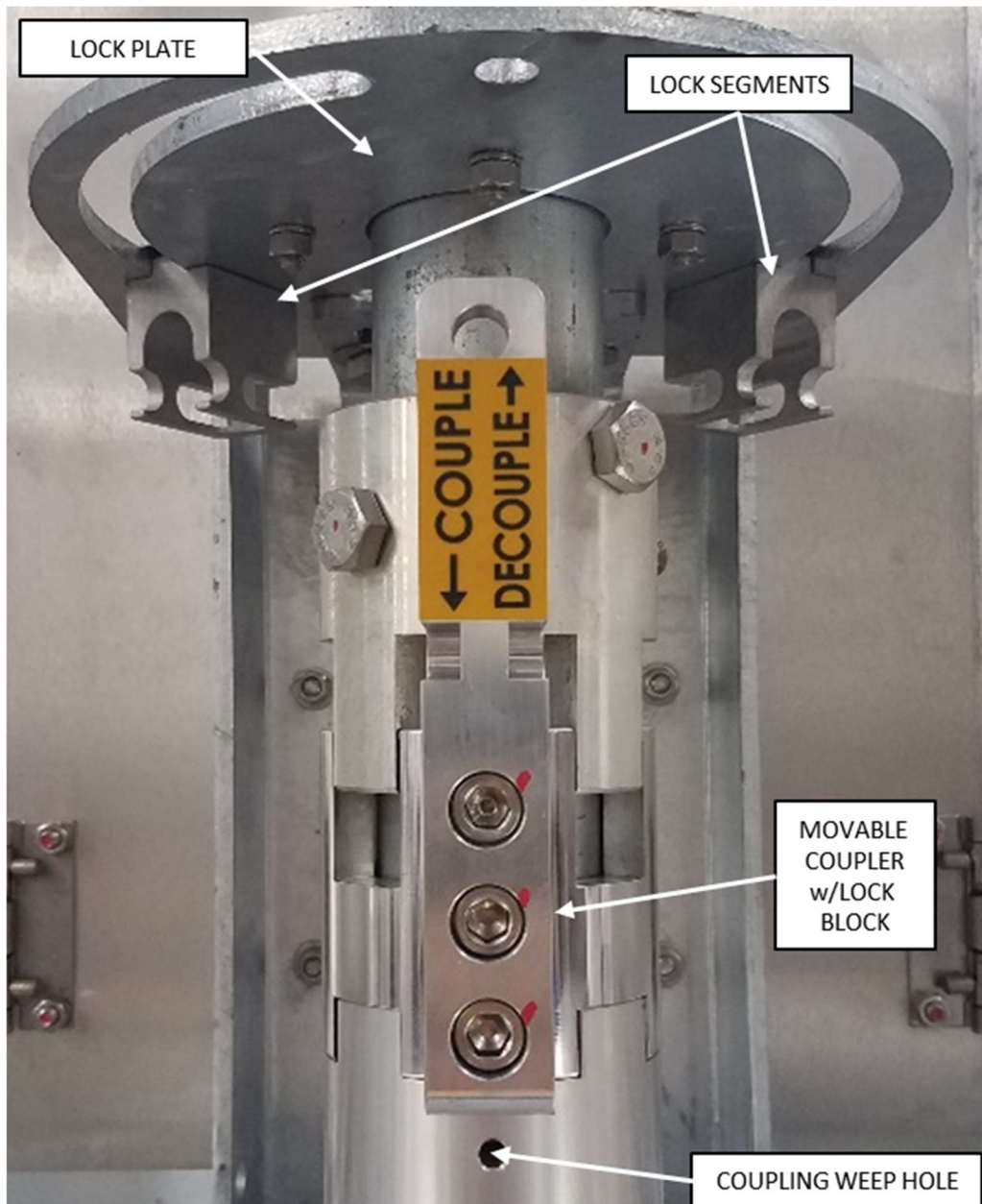


Figure 2 – Motor Operator Coupling



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D. FIELD WIRING CONNECTIONS

1. Connect field wiring - AC voltage, DC voltage, status and control connections.
 - a. Refer to connection label or appropriate wiring diagram(s) for the connection points
(NOTE: STATUS AND CONTROL POINTS ARE ISOLATED DRY CONTACTS)

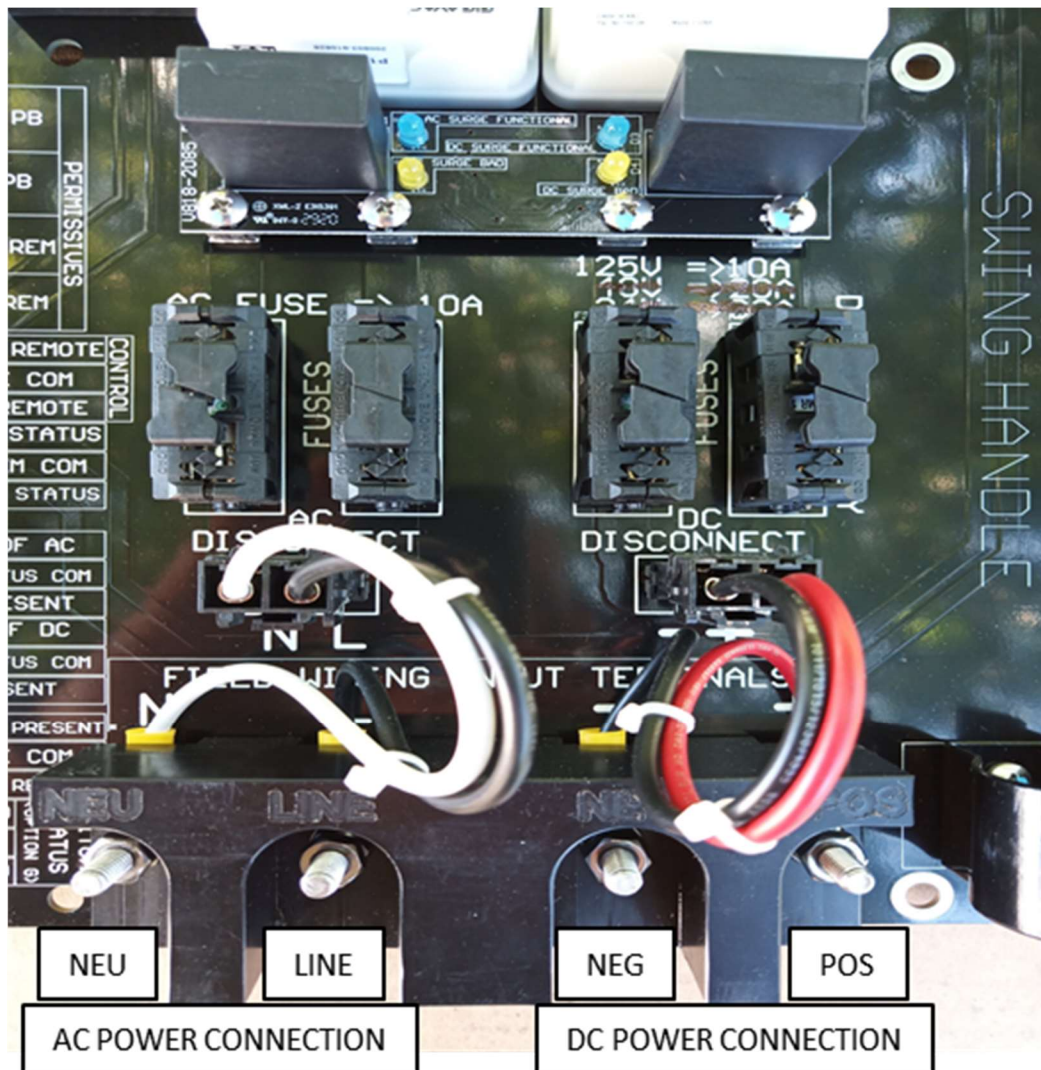


Figure 3 – AC & DC Power Connections



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Figure 4 – Status and Control Connections Labeled on Circuit Board

E. MOTOR ROTATION & POSITIONING OF COUPLING COMPONENTS

1. Raise the movable coupler to the decoupled position, make sure SUB1 is in the LOCAL position and press the 'OPEN' (or 'CLOSE') pushbutton and verify that the direction of motor rotation matches the direction of rotation required to open (or close) the overhead switch.
 - a. If direction of rotation is not correct, reverse the motor rotation direction per Figure 5



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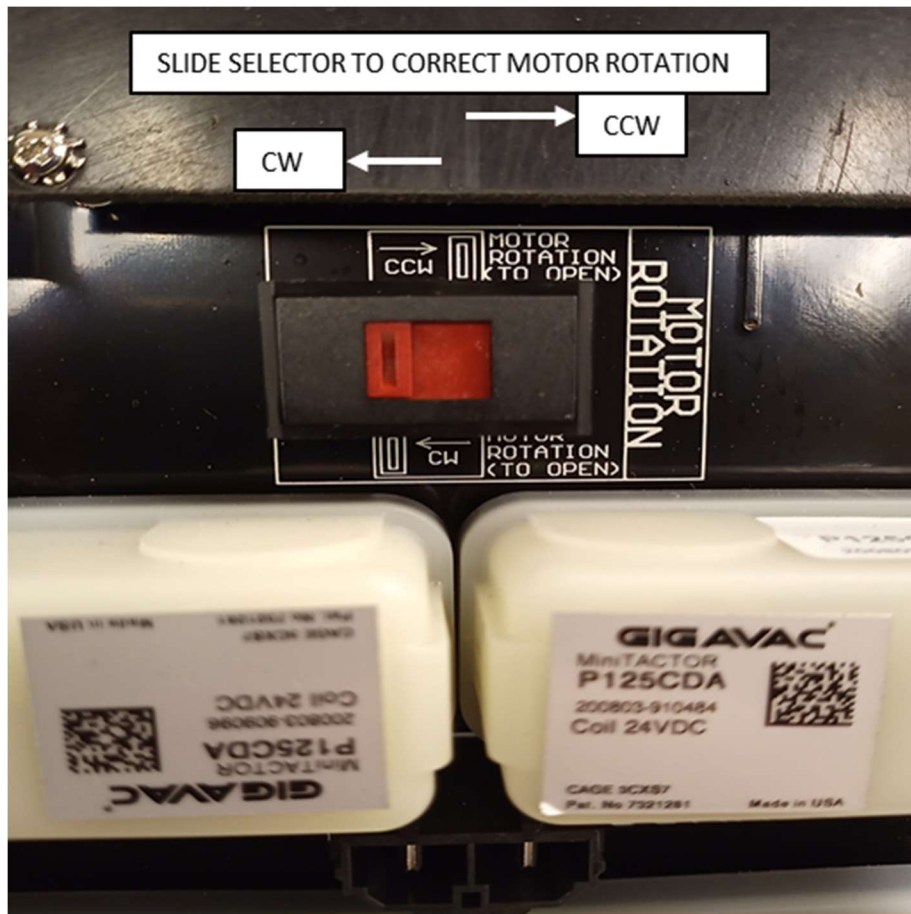


Figure 5 – SUB1 Motor Rotation Selector

2. Verify that the overhead switch is in the fully 'closed' position and position the manual operating handle clevis at either the left or right front corner of the motor operator cabinet as appropriate based upon the direction of switch operation. Take care to keep the coupling block and swing handle clevis lined up. If necessary, loosen the coupling setscrews, re-position as needed and re-tighten the setscrews.
3. Use the manual operating handle to place the overhead switch in the fully 'open' position. Note the handle position. If necessary, loosen the coupling setscrews, re-position the manual handle and re-tighten the setscrews as needed so that the horizontal travel of the manual operation handle is centered at the front of the motor operator cabinet. This allows easy access to the coupling and swing handle in both the 'open' and 'closed' positions. Field conditions may warrant alternate locations, user discretion is advised.



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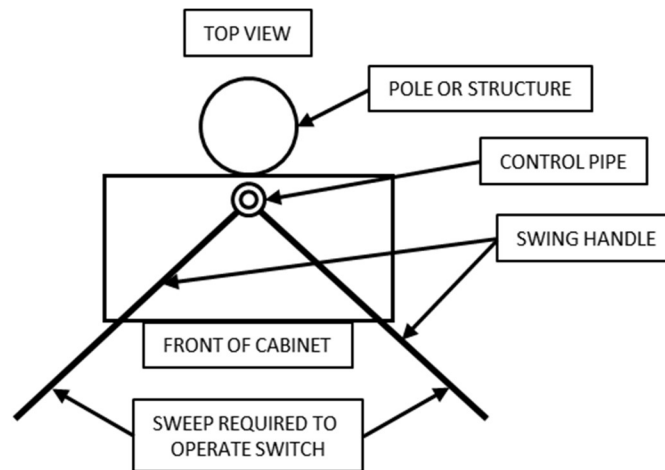


Figure 6 – Top view of SUB1 & Manual Swing Handle Positions

F. ADJUSTING 'OPEN' AND 'CLOSED' LIMIT SWITCHES

1. Verify that the motor coupling mechanism is uncoupled. Use the manual operation handle to place the overhead switch in the fully 'closed' position. Press the 'Close' motor pushbutton. Loosen the 'close' limit switch cam setscrew using the hex key wrench (provided) and adjust the cam position (repeat 'open' and 'close' pushbutton operation) until the motor stops at the correct 'close' position (coupling only aligned when block and weep hole are lined up). Note that the limit switch cam is adjusted in the OPPOSITE direction of the desired direction of motor rotation. Lightly tighten the cam setscrew while making adjustments, do not fully tighten until final adjustments are completed.
2. Verify that the motor coupling mechanism is uncoupled. Use the manual operation handle to place the overhead switch in the fully 'open' position. Press the 'Open' motor pushbutton. Loosen the 'open' limit switch cam setscrew using the hex key wrench (provided) and adjust the cam position (repeat 'close' and 'open' pushbutton operation) until the motor stops at the correct 'open' position (coupling only aligned when block and weep hole are lined up). Note that the limit switch cam is adjusted in the OPPOSITE direction of the desired direction of motor rotation. Lightly tighten the cam setscrew while making adjustments, do not fully tighten until final adjustments are completed.
3. At this point, both the 'Open' and 'Closed' motor limit switch positions should be initially set for motor operation of the switch.
4. Padlock the movable coupling into the 'coupled' position and operate the switch with the motor operator to verify normal operation. Note that the switch may not reach its fully open or closed positions due to twist in the control pipe.



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5. If necessary, make further small adjustments of the limit switch cams in both the 'Open' and 'Closed' positions to compensate for the twist in the control pipe by repeating Steps 2 and 3 above. It is normal for the coupling mechanism to 'bind' slightly after final limit switch adjustments due to minor overtravel of the motor. The motor is supplied with a manual torque relief knob allow the motor to be rotated by hand to relieve tension in the coupling mechanism. Note that manual rotation of the motor does not in any way affect the electrical limit switch stopping positions set by the 'open' and 'close' cams. The motor will return to these positions when operated electrically.
6. After final adjustments have been completed and proper operation of the switch with the motor operator has been verified, pierce the switch control pipe setscrews on the motor coupling or universal joint.

G. HANDLE, LOCK SEGMENT ADJUSTMENT

1. Verify that the manual operation manual swing handle socket is correctly positioned (aligned with the movable coupling section tab). Tighten the swing handle pipe clamp bolt and piercing setscrews.
2. Loosen, adjust and tighten the coupling lock segment stop block mounting bolts for the switch 'Open' and 'Closed' positions, lock segments slide in arc of lock plate.

H. OPTIONAL EQUIPMENT, PROVIDED WITH SUFFIX 'G' IN CATALOG

1. The Switch Open/Closed assembly provides true switch position status (independent of motor position, if uncoupled) utilizing dry contact limit switches.

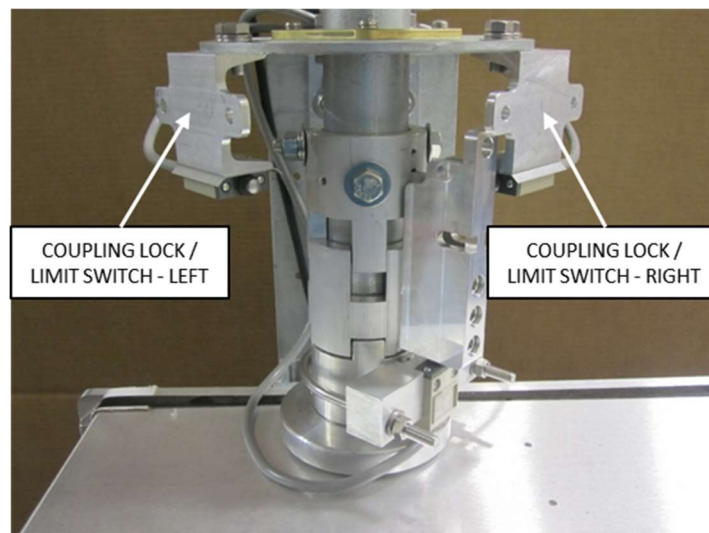


Figure 7 – Optional Coupling Block for Switch Status



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2. Setup/Adjustment:

a. Adjustment has three primary steps.

- 1 Make sure that the motor rotation to open and close the switch is fully adjusted per the previous instructions.
- 2 Adjusting the Coupling lock/limit switch adjustment, right and left.
With the motor and switch in either the fully open or fully closed position, lift the coupler and disengage from the coupled position. Loosen the coupling lock adjustment bolts, and position the coupling lock so that a padlock can be placed through the lock plate, coupling lock, and coupler. The limit switch on the coupling lock should be pressed in when a padlock is through the padlocking point.
- 3 Plug in the correct switch position plug to 'CW TO OPEN' or 'CCW TO OPEN'.

With the coupling locks now set, the open/closed status indication can be set. There are two plugs provided to plug into on the SUB1 Main Board. (Labelled 'CCW to open' and 'CW to open', located just above the LOCAL/ REMOTE selector). The plug that represents the switch control pipe rotation to move into the open position can be plugged into either CW OPEN or CCW OPEN.

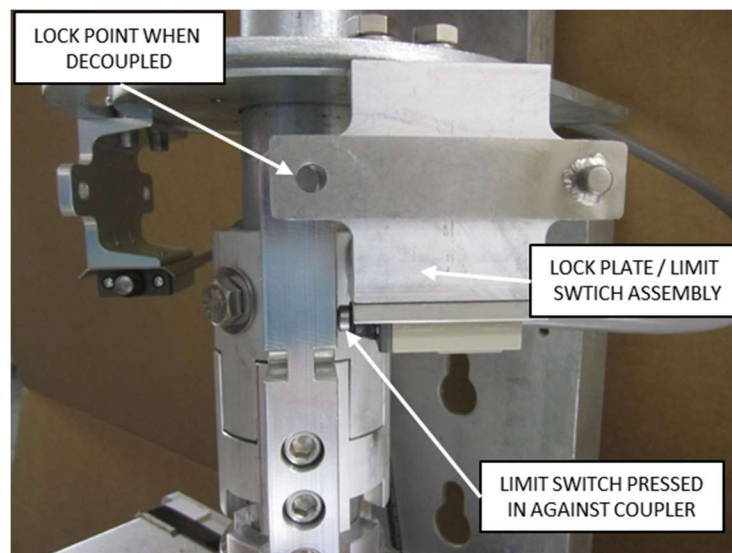


Figure 8 – Coupling Lock / Limit Switch