Installation Instructions for HVW

The following pages describe the adjustment procedure for the High Velocity Whip (HVW), a spring loaded, stored energy arcing horn which provides substantially greater interruption of line charging currents than traditional or other enhanced horn designs. Designed to open a very large air gap within the first cycle after separation, the whip also employs a Delrin® Tip, which assists in the dissipation of ionized gases.

This procedure is intended to provide mounting orientation, critical dimensions and sequence of engagement for proper operation. If at any point in the installation process you have questions or need additional information or assistance, you are encouraged to contact us at 704-392-1396. We welcome the opportunity to assist you and answer your questions.

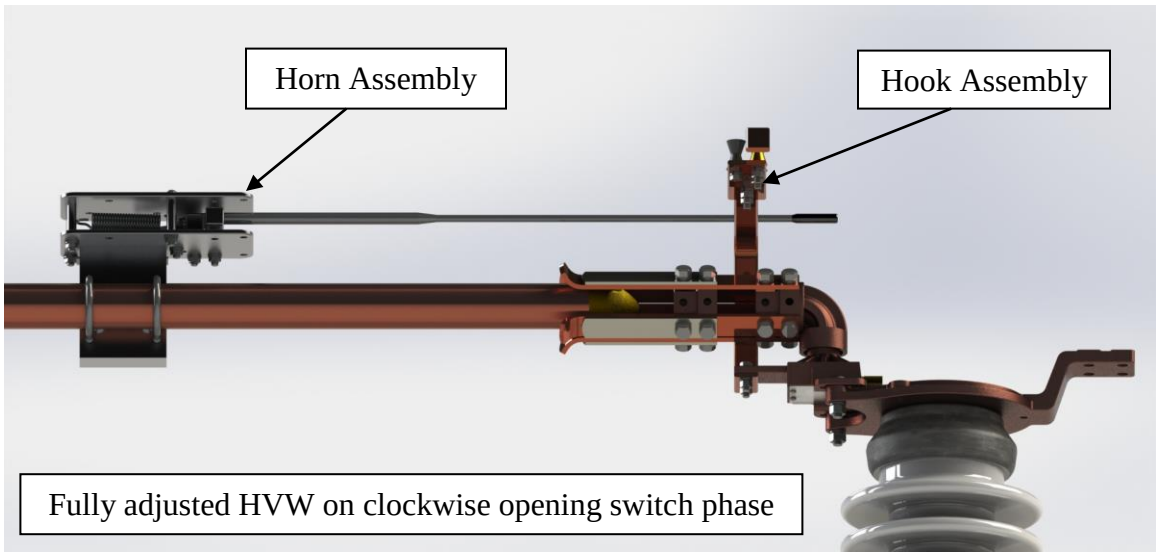


Image 1

I. SUGGESTED TOOLS AND EQUIPMENT

1. 9/16” wrench or socket (2 recommended)
2. Tape measure
3. Sharpie or marker

II. SHIPPING

HVW units are shipped by three different methods:

1. Packaged separately in a cardboard box – this is typically done when the HVW units are ordered for addition to existing, installed switches.

Installation Instructions for HVW

A. Using the assembly drawings at the end of the installation instructions, please confirm that all materials are present and accounted for.
B. If you believe that the shipment is somehow incomplete, please contact SEECO immediately for help and assistance.

2. Mounted on the switch but not adjusted – this is typical when the HVW is ordered with the group operated switch but the switch is not fully assembled and adjusted.

3. Installed on the switch and adjusted – the customer has ordered the group operated switch fully assembled and adjusted and the HVW is included in the factory assembly procedure. No further adjustment action is required by the customer.

III. INSTALLATION AND ADJUSTMENT

A. Initial installation

Step 1 - Remove any existing interruption devices from the switch. It may also be helpful to temporarily disconnect the switch interphase pipe from the rotating insulator so that you can freely open and close the blade of the switch. This is easily accomplished by removing the pin from the clevis at the base of the rotating insulator. It may be necessary to rotate the operating handle a few degrees open to take tension off of the pin before removal.

Step 2 - Loosen the attachment hardware on the Horn Assembly and slide it onto the blade of the switch as shown in Image 2. For correct orientation of the Horn Assembly, the damping cylinder will be on the side toward the pole and the Whip Arm should be in line with the blade. Look down the long axis of the blade and visually confirm that the attachment channel legs (with U-bolts) points back towards the face of the pole (see Image 3). Position the Horn Assembly by measuring 5” from the tip of the Whip Arm to the edge of the forward side of the Hook Assembly as shown in Image 4. Once you have confirmed the proper orientation of the Horn Assembly, tighten the nuts evenly on the U-bolts. Do not deform the channel.

Installation Instructions for HVW

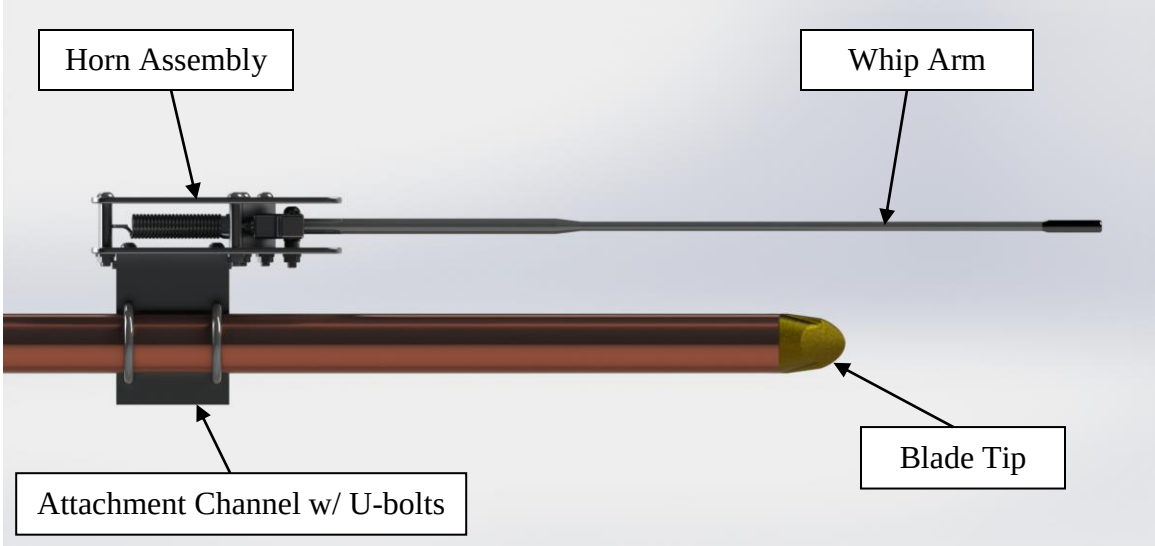


Image 2

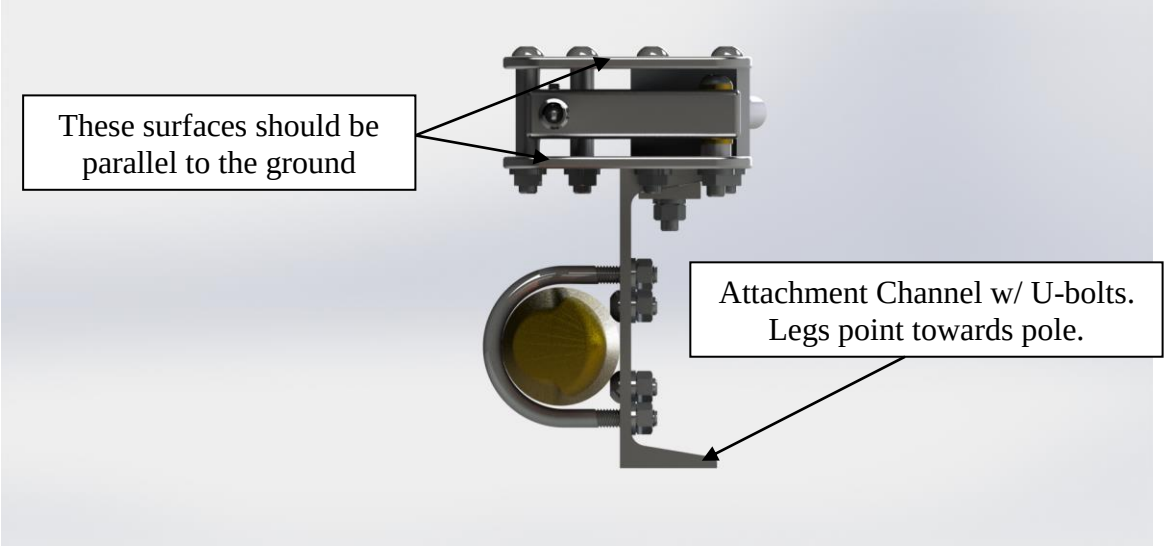


Image 3

Installation Instructions for HVW

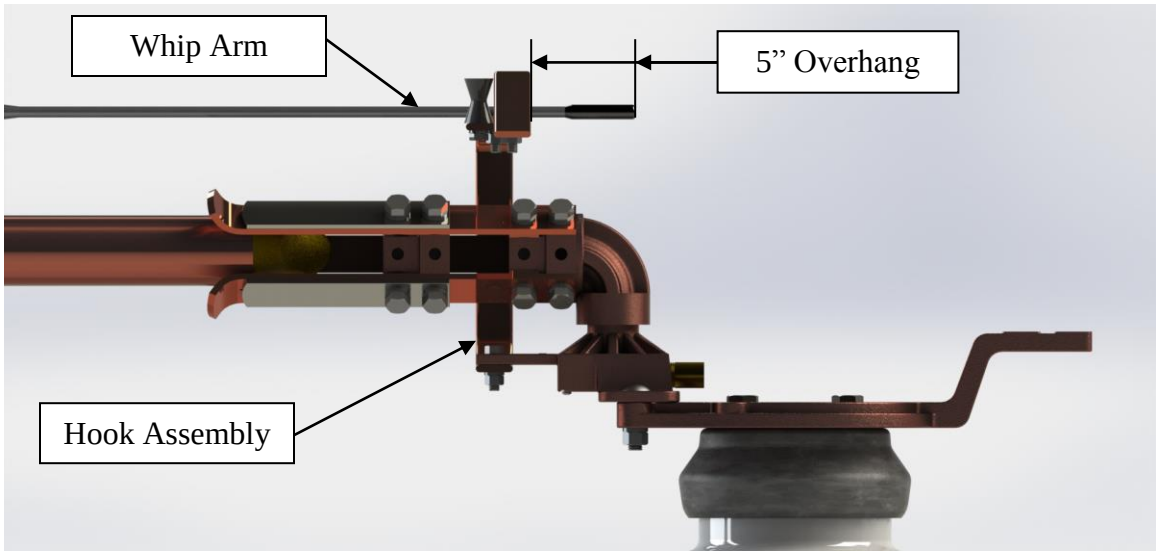


Image 4

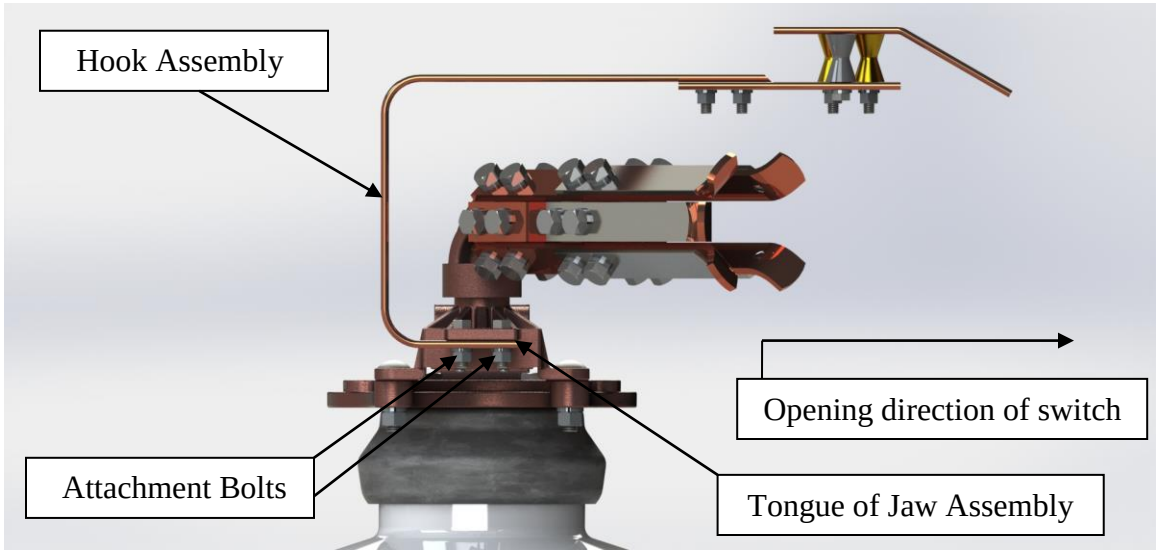


Image 5

Step 3 – Bolt Hook Assembly to the bottom of the tongue of the switch Jaw Assembly as shown in Image 5, using included hardware. The Hook Assembly should be oriented with the opening of the hook towards the opening direction of the switch

Installation Instructions for HVW

B. Adjustment for Switch Closing

Step 4 – Pull the blade towards the closed position until the Whip Arm engages the leading edge of the Hook Contact as shown in Image 6. The Whip Arm should strike the Hook Contact at least ½" up from the bottom of the contact. Repeat this step multiple times to confirm that the whip will consistently engage above the reference line.

1. If necessary, you may bend the horizontal 'leg' of the hook up or down to ensure that the whip arm engages properly. See Image 7.
2. Caution: Do not change or alter the 90 degree lower bend or the shape of the adjustable hook contact.
3. To bend the horizontal 'leg' of the hook, firmly grasp the vertical upright 'leg' with one hand just below the upper bend. With your free hand, grasp the hook at the bolted connection and gently push up or pull down as necessary to achieve proper engagement per Image 6.

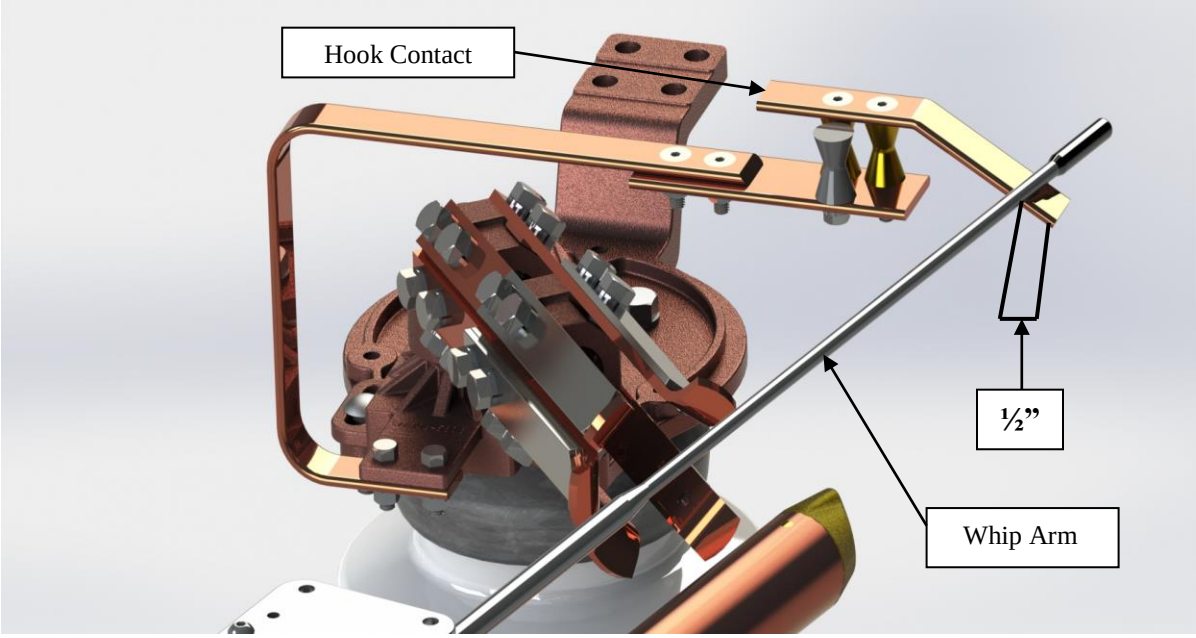


Image 6

Installation Instructions for HVW

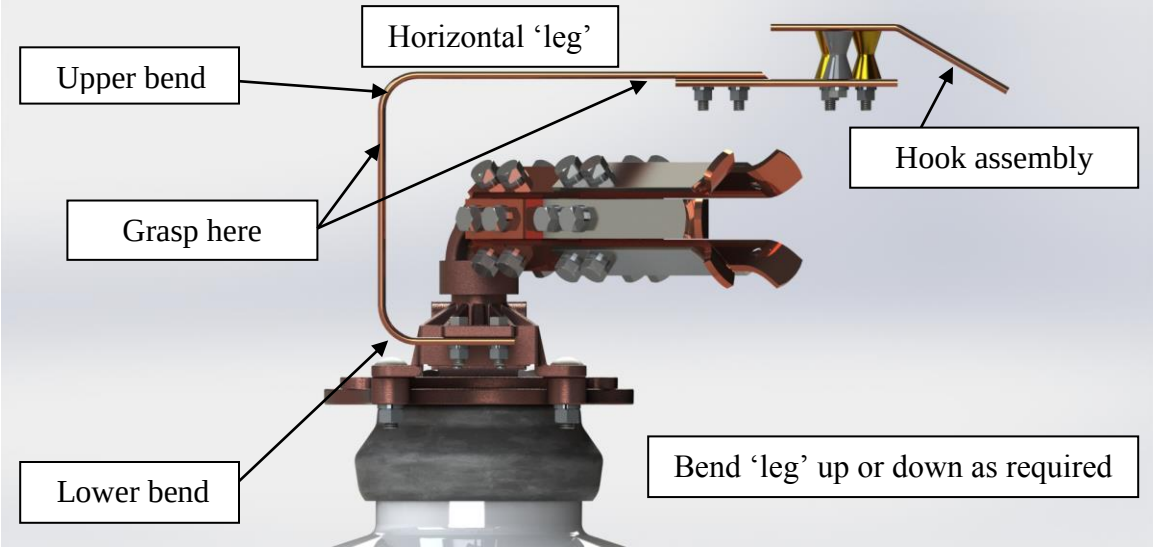


Image 7

Step 5 – Pull the blade into the jaw until the blade/jaw engagement is straight and the switch is fully closed. See Image 1. Observe and confirm that the Whip Arm rides up and over the Hook Contact without binding or hesitation. After clearing the Hook Contact, the Whip Arm will wipe (travel) across the horizontal 'leg' of the hook. Repeat this step to confirm that continuous contact is maintained between the Whip Arm and the hook as the whip travels across the horizontal 'leg'. If necessary, repeat step 3 and re-adjust the position of the hook to ensure continuous contact along the horizontal 'leg'.

C. Adjustment for Switch Opening

Step 6 – From the fully closed position, slowly push the blade in the open direction until the Whip Arm makes tangent contact with the Brass Spacer. See Image 8. The Delrin Spacer is provided to help extinguish any arc as the whip is released. Proper operation should be as shown in the following sequence of engagement:

[Caution: the HVW is a stored energy, spring loaded mechanism. As the Whip Arm clears the Delrin Spacer, the arm will move with tremendous speed and force. Injury can occur if you do not maintain sufficient clearance from the moving Whip Arm at separation.]

1. The Whip Arm makes initial contact with the Brass Spacer only. See Image 8.
2. As the blade continues to open, the Whip Arm maintains contact with the Brass Spacer and then contact is made with the Delrin Spacer.
3. The Whip Arm clears (separates from) the Brass Spacer but maintains contact with the Delrin Spacer.

Installation Instructions for HVW

4. The Delrin Tip of the Whip Arm drags across the Delrin Spacer as separation occurs. See Image 9.

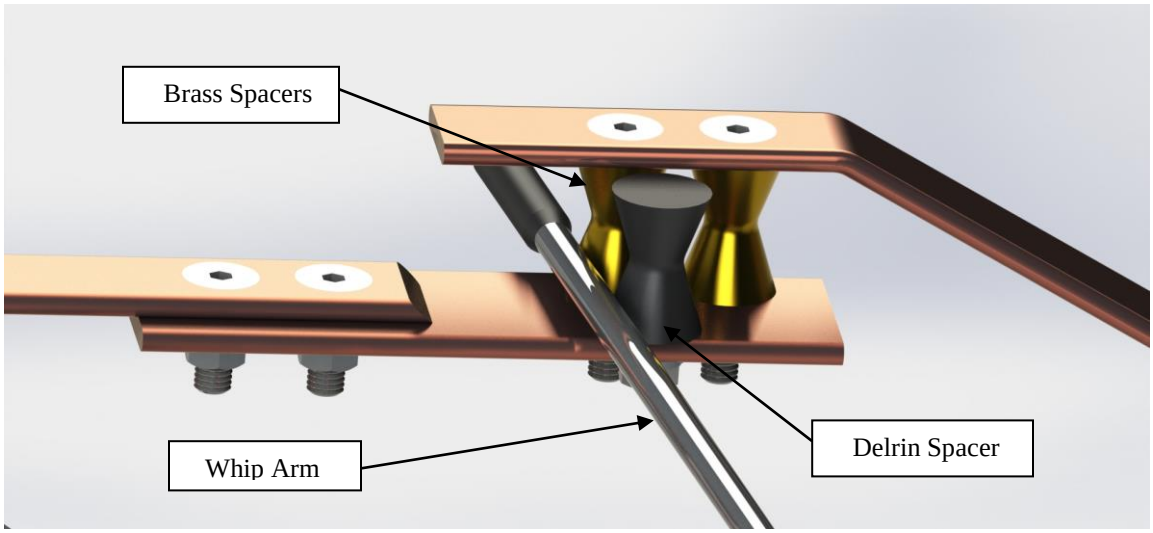


Image 8

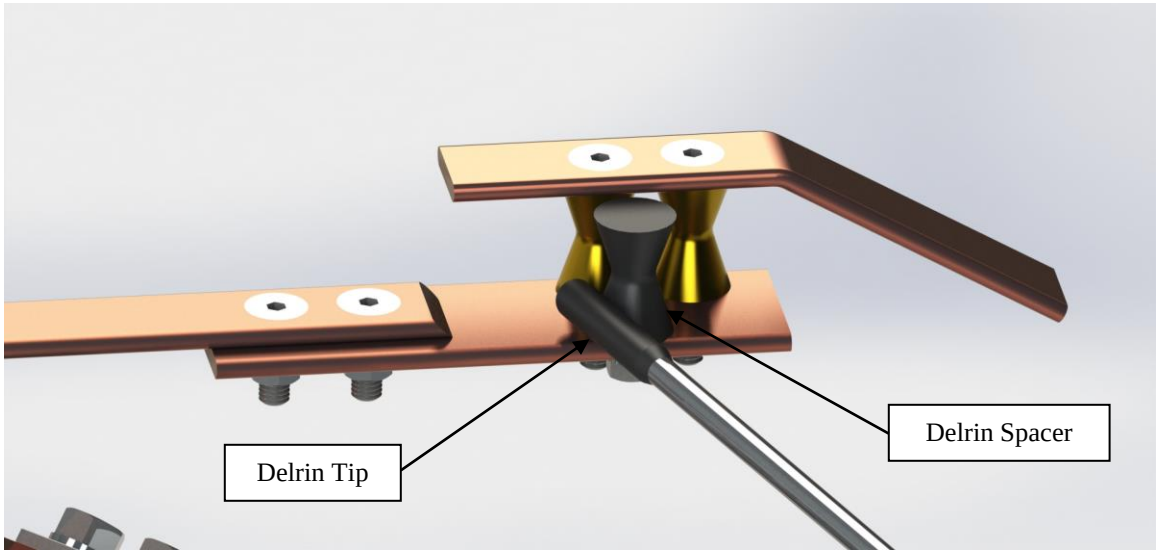


Image 9

D. Confirm Proper Operation

Step 8 – Operate the switch phase several times to make sure that the HVW assembly separates and re-sets consistently. Correct operation will be demonstrated by:

Installation Instructions for HVW

In opening –

1. The Whip Arm separating from the hook without binding or hesitation.
2. Final separation occurs only between the Delrin Tip of the Whip Arm and the Delrin Spacer.
3. The Whip Arm travels through the open gap of the switch at high speed.
4. The Whip Arm moves through the full travel cycle and returns to the original 'rest' or re-set position, i.e. it does not stop short.
5. The Whip Arm does not recoil or rebound back into the open gap of the switch.

In closing –

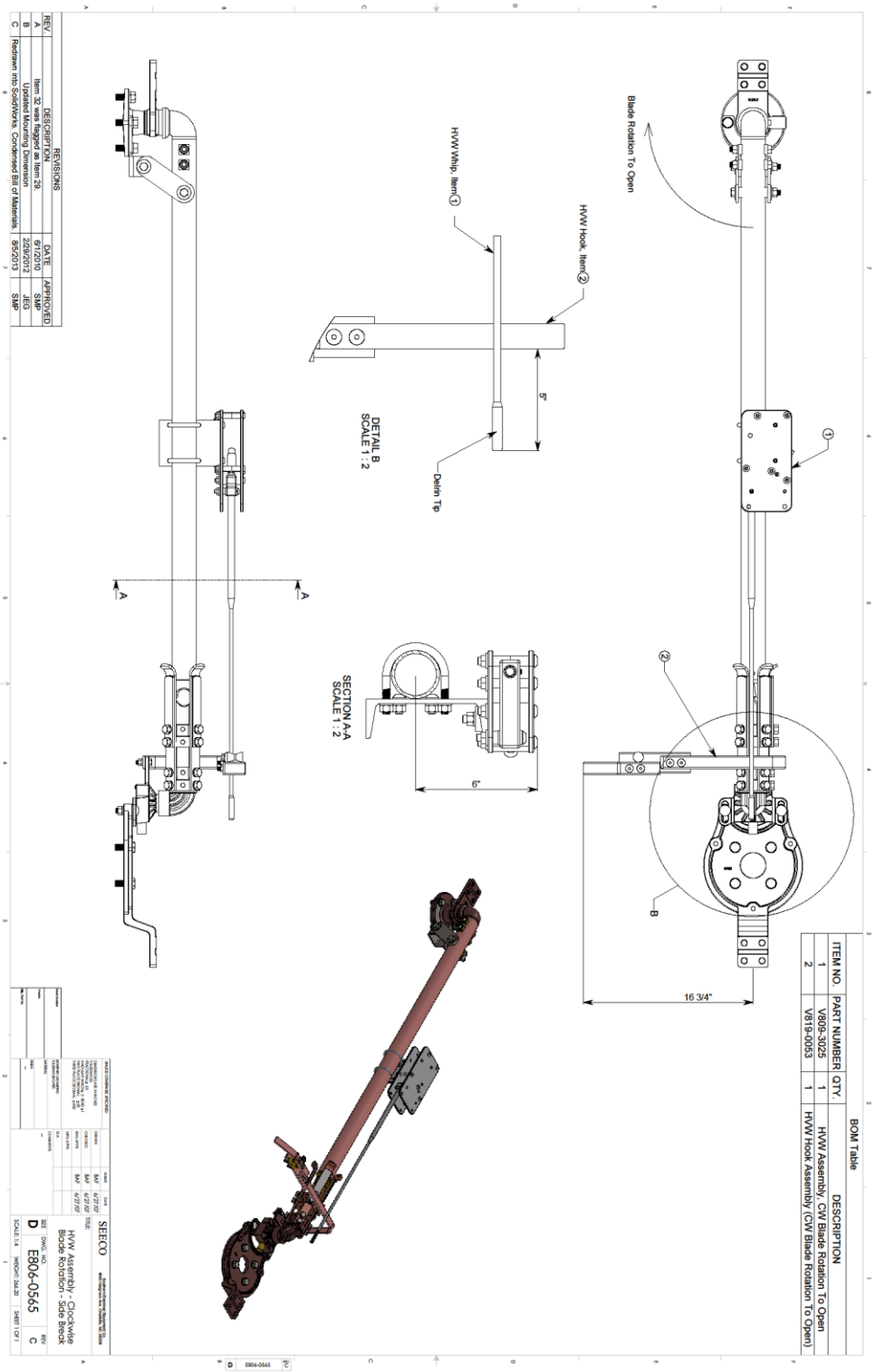
6. The Whip Arm engages the Hook Contact at least ½" up from the bottom edge of the contact.
7. The Whip Arm rides up and over the Hook Contact without binding or hesitation.
8. The Whip Arm maintains continuous contact as it travels across the horizontal 'leg' of the hook.

If the HVW does not consistently operate as described above, please contact SEECO at (704) 392-1396 for guidance and assistance.

Step 9 - If you previously pulled the pin on rotating insulator clevis, replace it now to restore operation through the pipe linkage. Repeat this procedure for all phases.

Note: Installation for a counter-clockwise opening switch is the same procedure as the clockwise opening switch.

Installation Instructions for HVW



Installation Instructions for HVW