



Installation Instructions for HVW Arcing Horn

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.

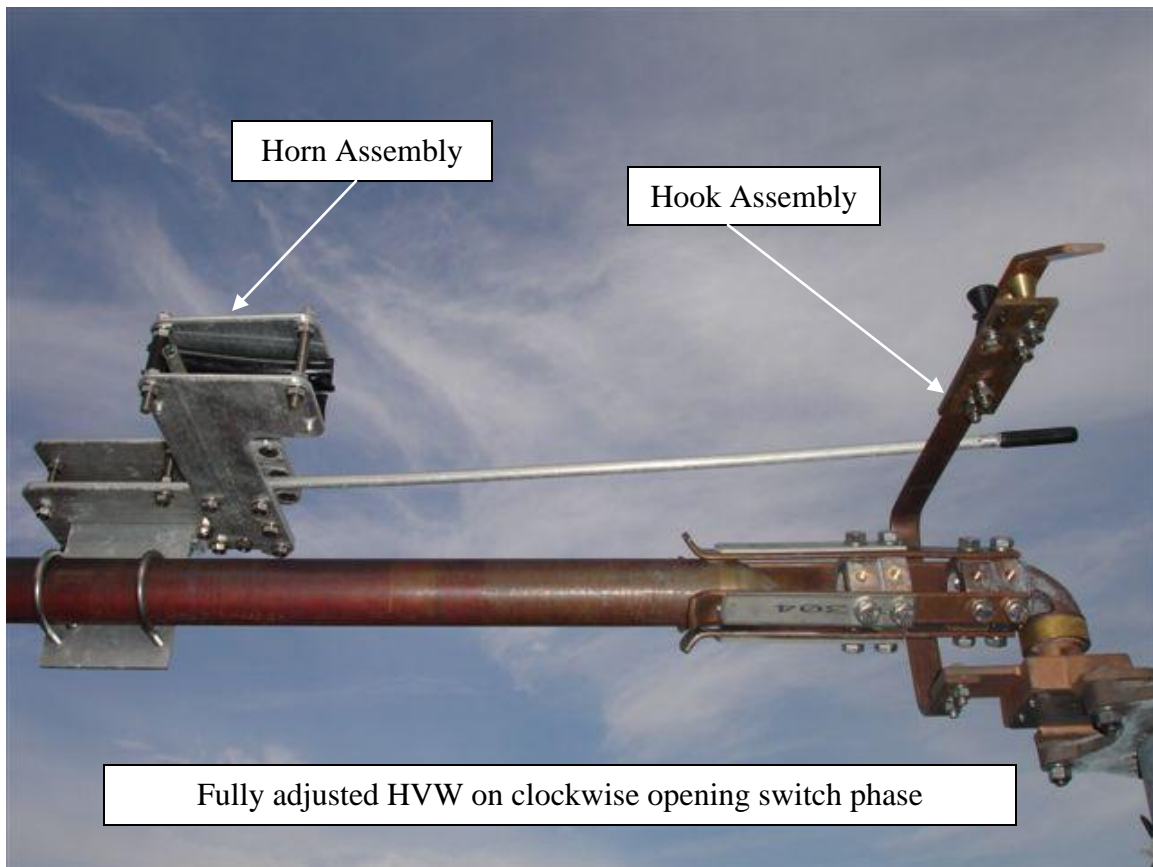


Image 1

I. SUGGESTED TOOLS AND EQUIPMENT

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



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II. SHIPPING

HVW units are shipped by three different methods:

- A. Packaged separately in a cardboard box – this is typically done when the HVW units are ordered for addition to existing, installed switches.
 - 1. Using the assembly drawings at the end of the installation instructions, please confirm that all materials are present and accounted for.
 - 2. If you believe that the shipment is somehow incomplete, please contact SEECO immediately for help and assistance.
- B. 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.
- C. 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 dampening section (black PVC tubing) will point toward the opening direction of the switch and the whip arm should be in line with the blade. Position the horn assembly by measuring 25" from the tip of the blade to the edge of the forward U- Bolt as shown.

Be careful to insure that the horn assembly is properly oriented relative to the circumference of the blade as shown in Image 3. Look down the long axis of the blade and visually confirm that the attachment channel (with U-bolts) points vertically toward 12 o'clock. Once you have confirmed the proper orientation of the horn assembly, tighten the nuts evenly on the U-bolts. Do not deform the channel.



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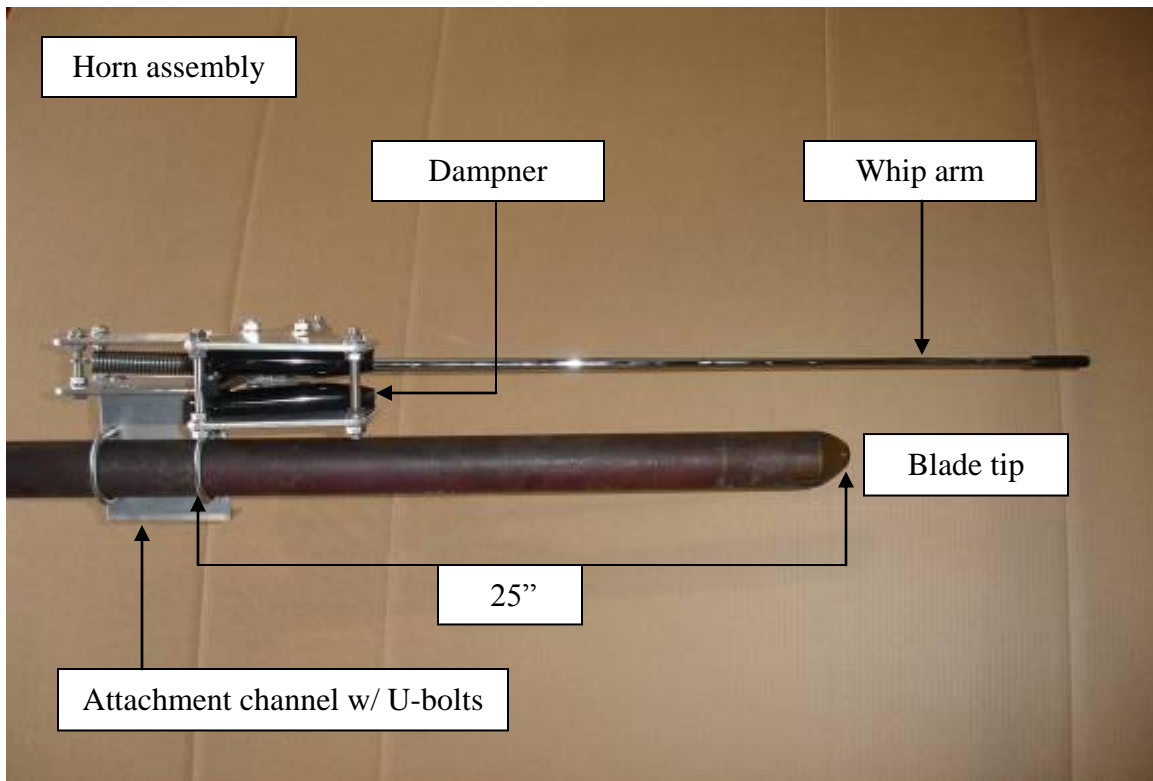


Image 2

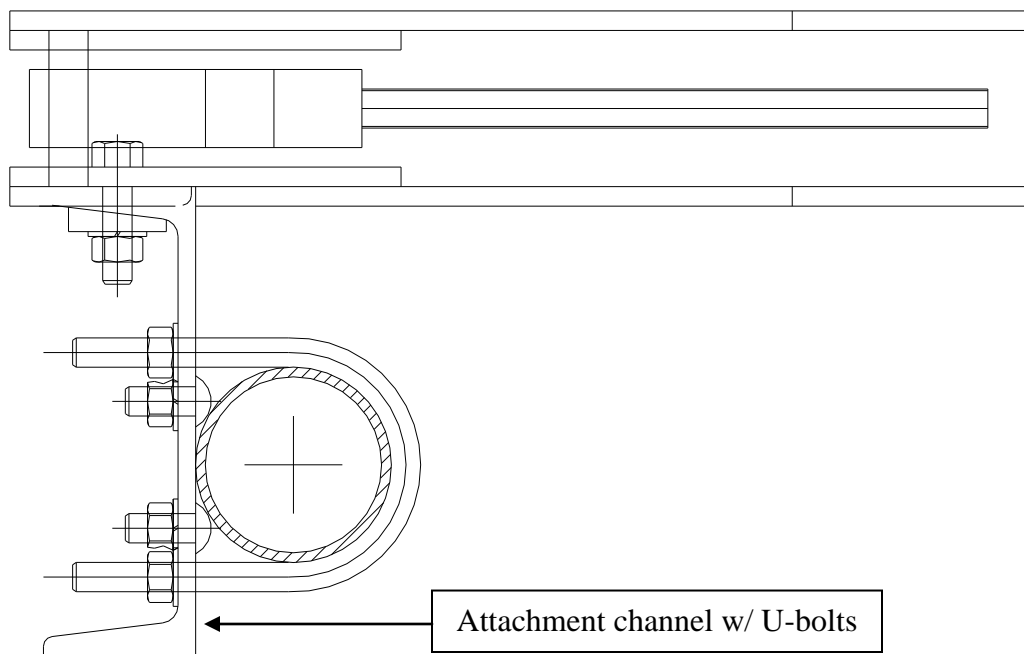


Image 3



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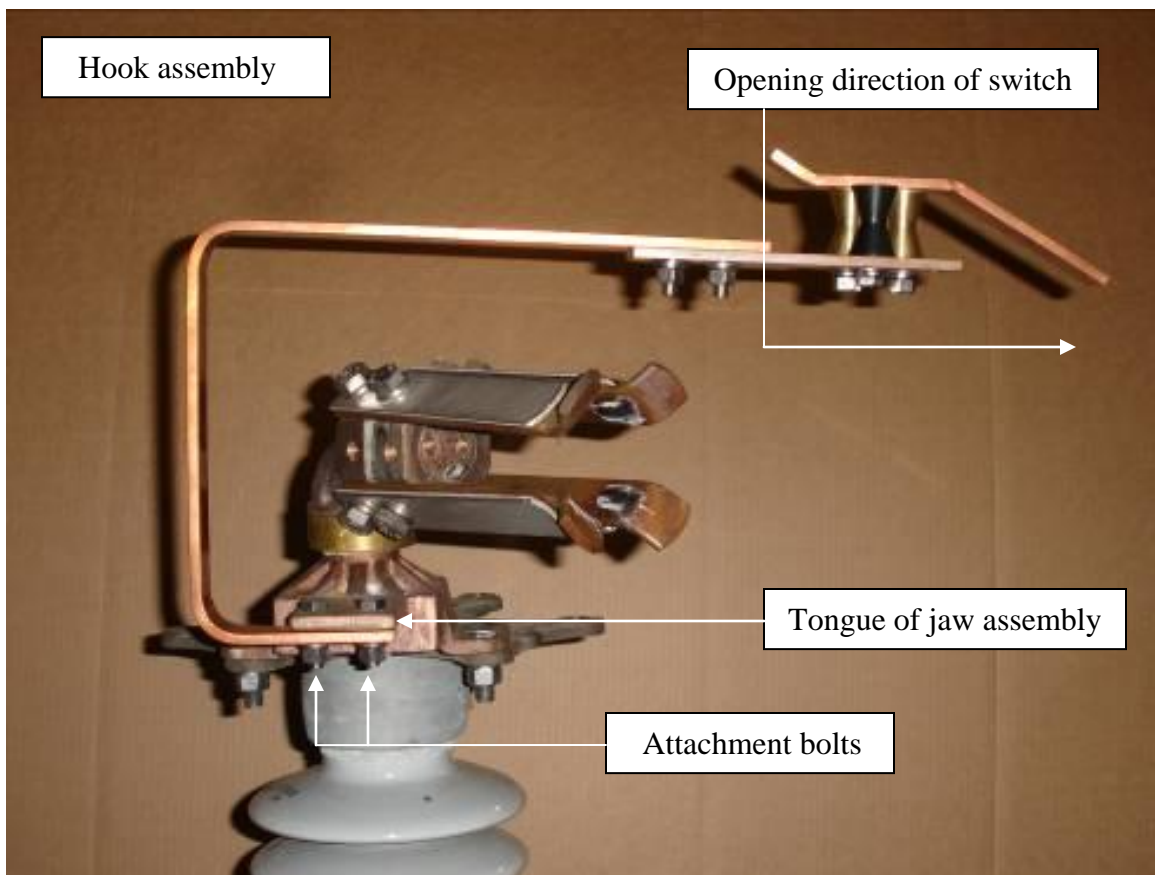


Image 4

Step 3 – Bolt hook assembly to the bottom of the tongue of the switch jaw assembly as shown in Image 4 using included hardware. The hook assembly should be oriented with the opening of the hook towards the opening direction of the switch

B. Adjustment for Switch Closing

Step 4 – Pull the blade towards the closed position until the whip arm engages the leading edge of the adjustable hook contact as shown in Image 5. The whip arm should strike the hook contact at least 1/2” 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 6.
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



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the bolted connection and gently push up or pull down as necessary to achieve proper engagement per Image 5.

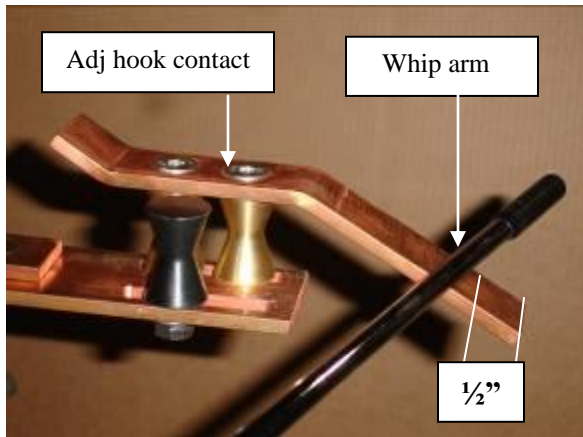


Image 5

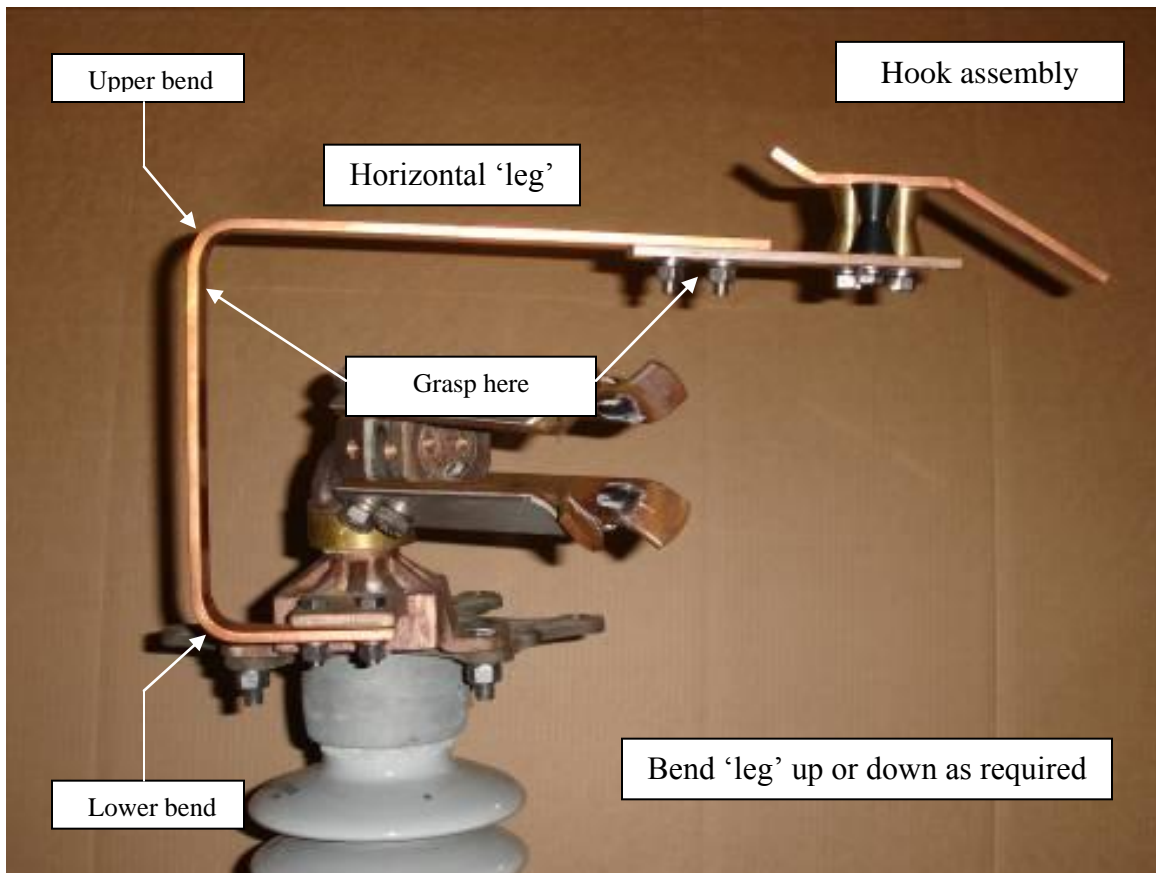


Image 6



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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 adjustable 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 7. The Delrin spacer is provided with a slot for adjustment. If necessary, adjust the position of the Delrin spacer forward or backward to insure 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 7.
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
4. The Delrin tip of the whip arm drags across the Delrin spacer as separation occurs. See Image 8.

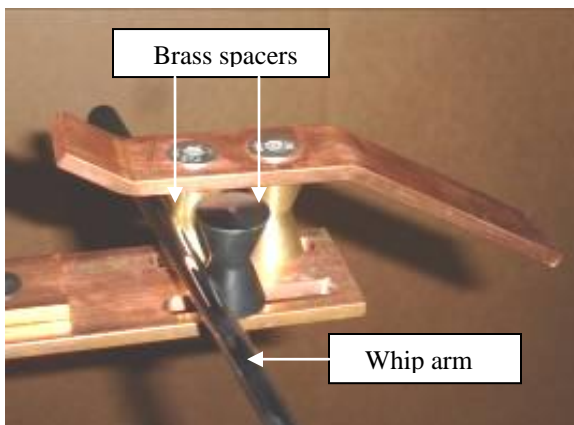


Image 7

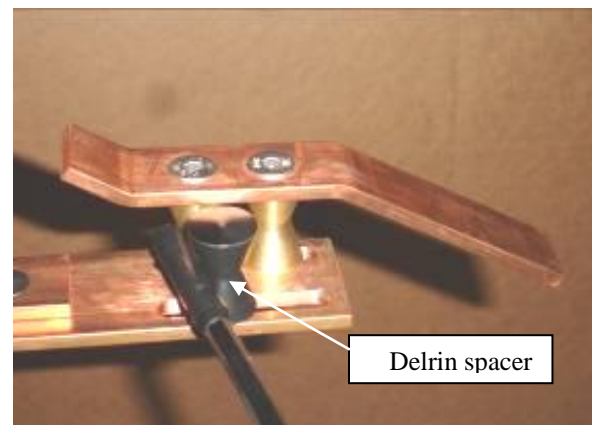


Image 8



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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:

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 adjustable hook contact at least ½” up from the bottom 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.



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SECTION "A-A"

BILL OF MATERIAL

ITEM	PART NUMBER	QTY	DESCRIPTION
1	W809-8673	2	BASE PLATE
2	W809-8680	1	MOVING CONTACT
3	W809-8681	1	RIVET BLOCK
4	1172812	4	BRKCS. 3/8"-18 X 3/4" LG. STN. STL.
5	SS940	1	SPRING ANCHOR
6	6340 6289	1	SNIP ANCHOR/ELEMENT
7	W809-8682	1	SNIP ARM
8	LC-1254-02-S	1	SPRING
9	W809-8683	1	DETAIN TOE
10	W809-8984	1	BRKCS AND PLUNGER
11	W809-8985	1	SNIP ARM STOP RING
12	1172817	4	BRKCS. 3/8"-18 X 1 1/2" LG. STN. STL.
13	0716 7257	3	STOOL. 3/8"-16 X 3 1/2" LG. STN. STL.
14	072812	48	3/8"-18 FLANGED LOCK NUT
15	74116	1	1/2" SHOULDER BOLT X 1 1/4" STN. STL.
16	1172827	2	SET SCREW 1/4"-20 X 1/4" STN. STL.
17	74E28	2	U-BOLT 2" STN. STL.
18	07167245	2	3/8"-18 HEX NUT. STN. STL.
19	1173031	2	BALL PLUNGER. STN. STL.
20	72840	1	SNCS. 1/4"-20 X 1" LG. STN. STL.
21	1X873	2	3/8" BEVELLED FLANGE WASHER
22	71020	8	3/8" LOCKWASHER. STN. STL.
23	70111	2	WASCS. 3/8"-18 X 2 1/2" LG. STN. STL.
24	W809-4686	2	SNIP PLATE
25	20109	4	BRKCS. 3/8"-18 X 1 1/2" LG. STN. STL.
26	W809-8987	1	BRKCSER MOVING BLOCK
27	07167365	2	1/4"-20 JAW NUT. STN. STL.
28	W809-8988	1	SNIP BRKCS. TUBE
29	W819-0033	1	HVW HORN ASSEMBLY
30	59872	2	3/8" SS Lock Washer
31	59879	2	HEX NUT. 3/8" X 1 1/4" LG. SS
32	59885	2	HEX NUT. 3/8"

SECTION "A-A"

HVW ASSEMBLY (CUT AWAY)

SECO Southern Electrical Equipment Co. Inc. Drawing No. 1
Charlotte, North Carolina CALL D-71866-1086



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BILL OF MATERIAL

ITEM	PART NUMBER	QTY	DESCRIPTION
1	WB00-9879	2	BASE PLATE
2	WB00-9880	1	ADJUSTING SCREW
3	WB00-9881	1	FLYER BLOCK
4	1172813	4	BOLTS 3/8"-18 X 3/4" LG. STN. STL.
5	SS490	1	SPRING ANCHOR
6	6340-9882	1	SNAP REINFORCEMENT
7	WB00-9882	1	SNAP ARM
8	LC-1256-05-5	1	SPRING
9	WB00-9883	1	DEFINING PIN
10	WB00-9884	1	BRAKE PAD BARRIER
11	WB00-9885	1	SNAP ARM STOP AND
12	1172817	4	BOLTS 3/8"-18 X 1 1/2" LG. STN. STL.
13	0718 2857	3	STUDS 3/8"-18 X 3 1/2" LG. STN. STL.
14	0718182	48	3/8"-18 FLANGED LOCK NUTS
15	74118	1	1/2" SHOULDER BOLT X 1 1/4" STN. STL.
16	1172827	2	SET SCREWS 1/4"-20 X 1/4" STN. STL.
17	74628	2	U-BOLT 2" STN. STL.
18	0718286	2	3/8"-18 HEX NUT STN. STL.
19	1173331	2	BALL PLUNGER STN. STL.
20	28840	1	SNCS 1/4"-20 X 1" LG. STN. STL.
21	118073	2	3/8" BEVELLED FLANGE WASHER
22	71020	8	3/8" LOCKWASHER STN. STL.
23	70117	2	WASCS 3/8"-18 X 2 1/2" LG. STN. STL.
24	WB00-9886	2	SNCS PLATE
25	70109	4	WASCS 3/8"-18 X 1 1/2" LG. STN. STL.
26	WB00-9887	1	BARRIER MOUNTING BLOCK
27	0718285	2	1/4"-20 JAW NUTS STN. STL.
28	WB00-9888	1	SNCS BRACKET TUBE
29	WB19-0033	1	HVW HORN ASSEMBLY
30	58802	2	3/8" SS Lock Washer
31	58809	2	WASCS 3/8"-18 X 1 1/4" LG. SS
32	58365	2	HEX NUT 3/8"

SECTION "A-A"

SECO Switchgear Division
Charlotte, North Carolina

SECO
Southern Electrical Equipment Co. Inc.
4045 Hargrove Ave. Charlotte, NC 28208

REV. NO. 1
DATE 11/06/06