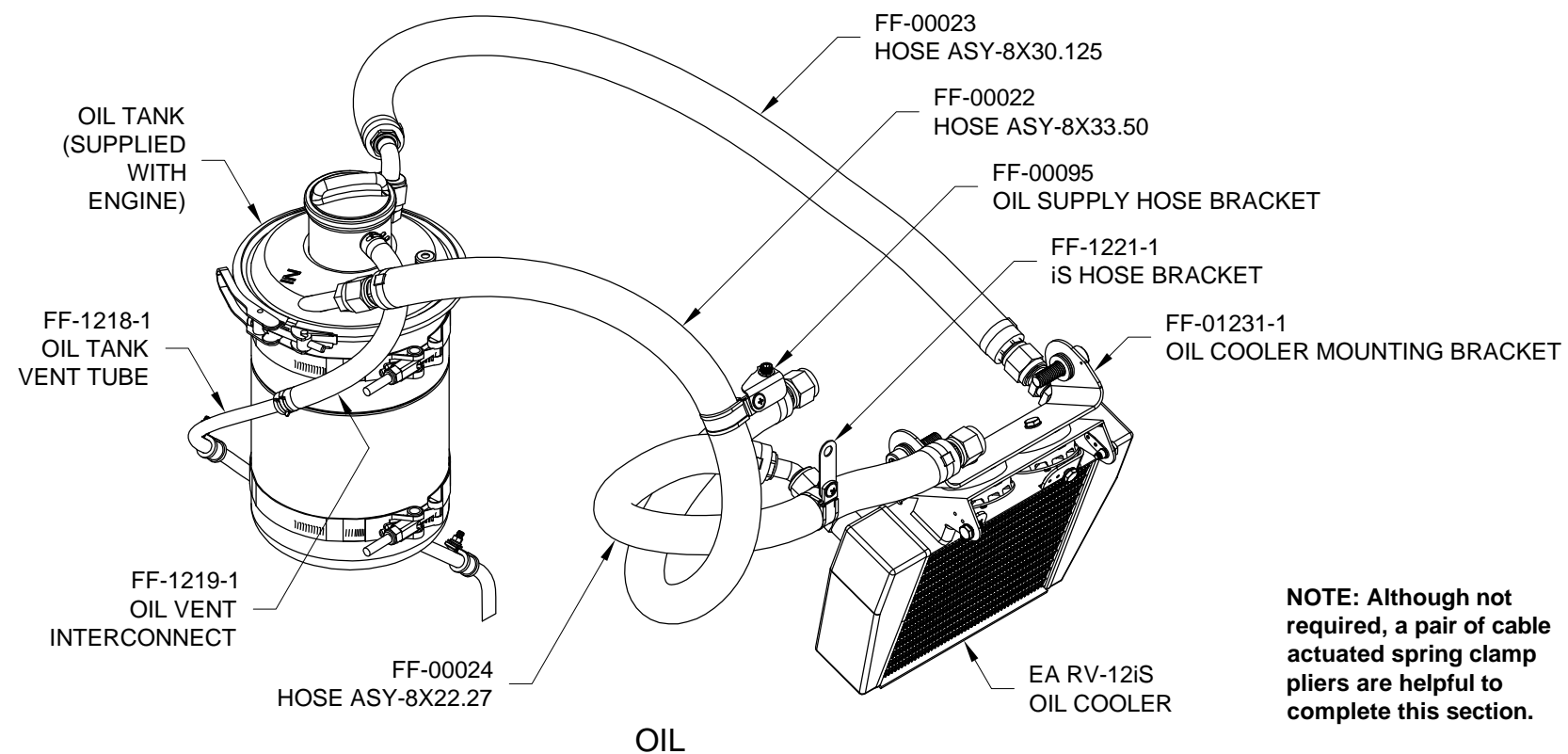
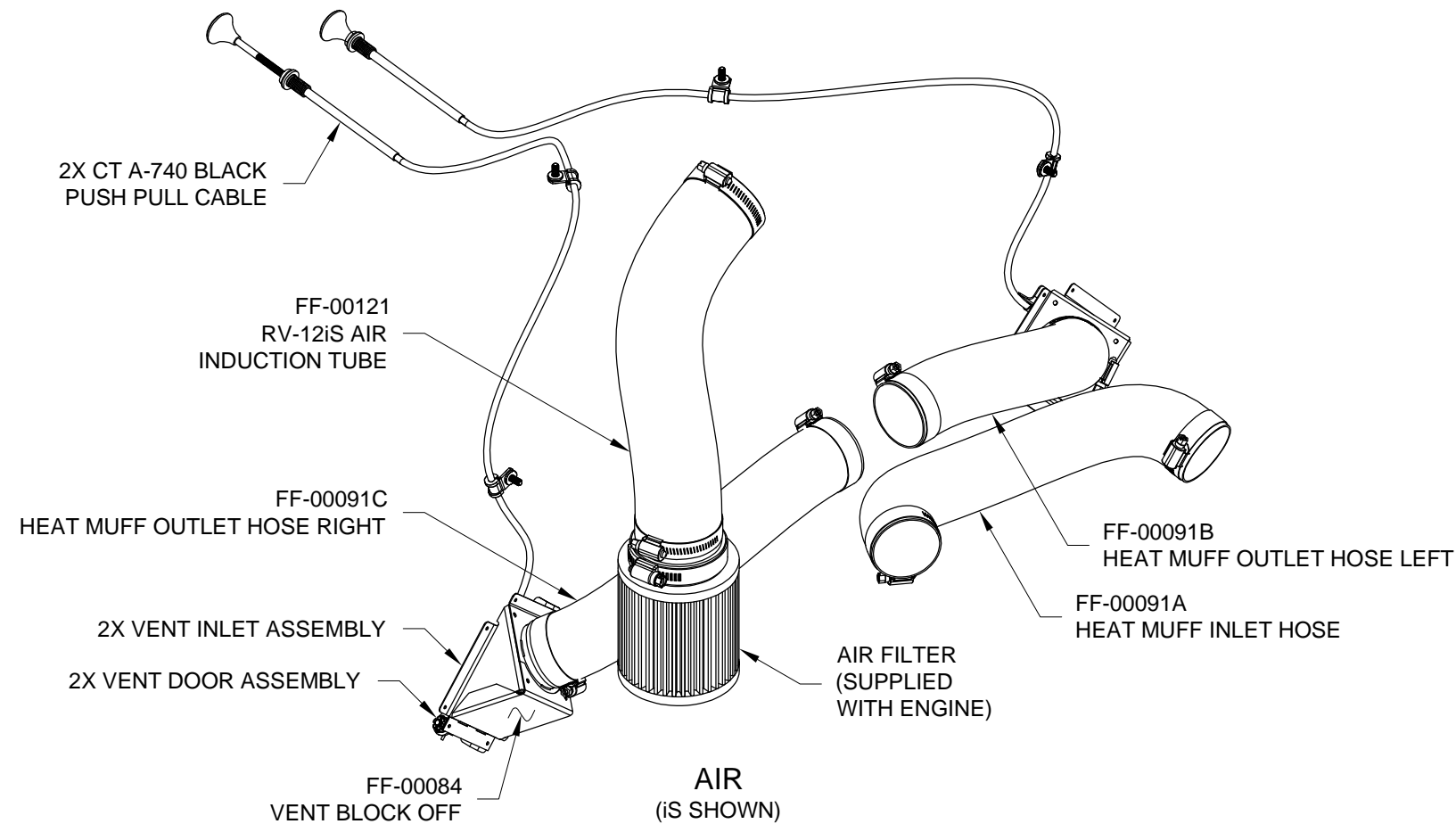
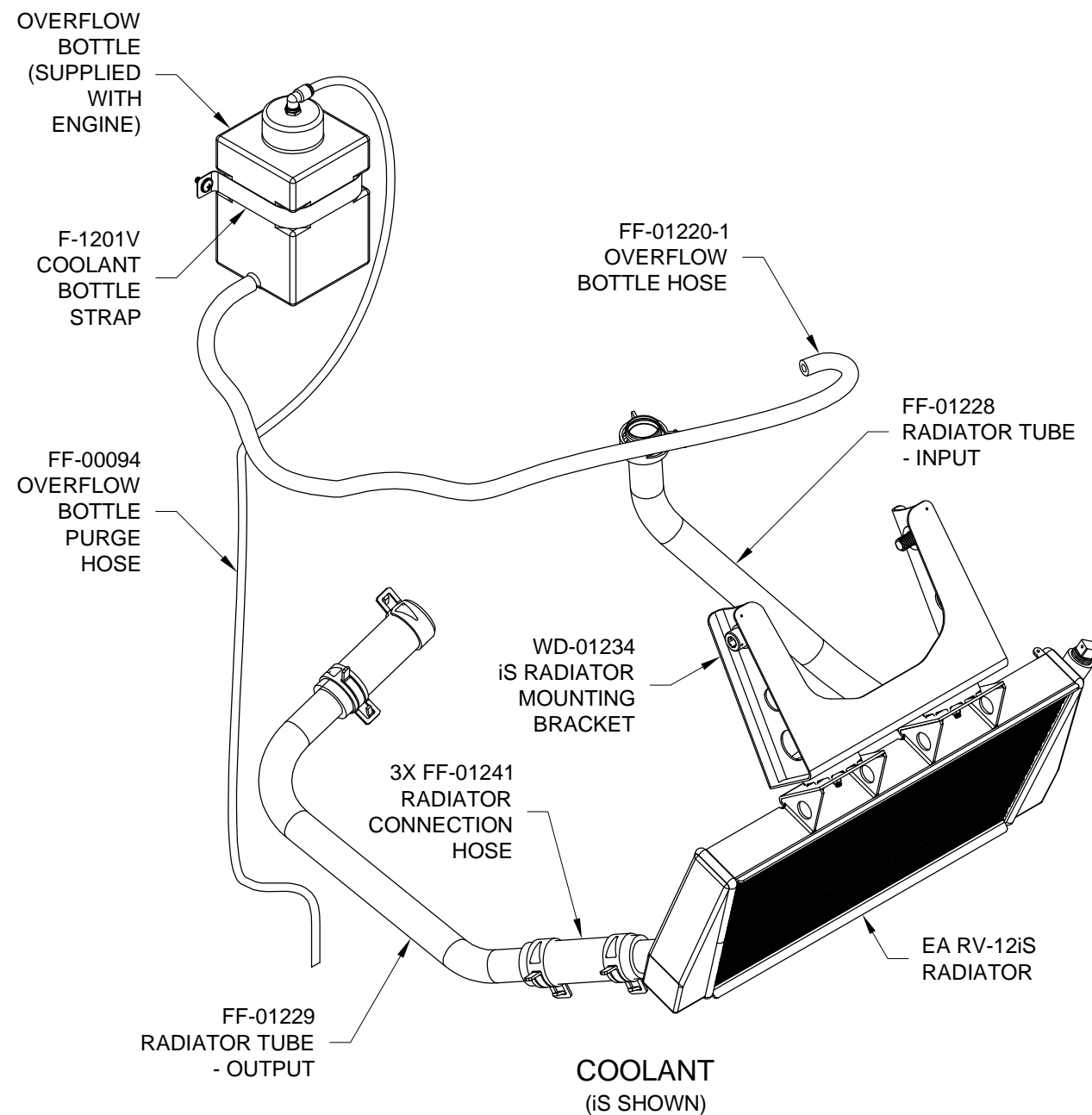


SECTION 50iS/U: COOLING AND HEATING SYSTEM



NOTE: Although not required, a pair of cable actuated spring clamp pliers are helpful to complete this section.



Step 1 (iS): Attach the WD-01234 to the EA RV-12iS RADIATOR as shown in Figure 1.

Step 2 (ULS): Attach the FF-01239 to the FF-01240 and then attach the FF-01240 to the EA RV-12iS RADIATOR as shown in Figure 2.

Step 3: Machine countersink and rivet nutplates to the EA RV-12iS OIL COOLER as shown in the detail view of Figure 1.

NOTE: Refer to Section 5.27 Fluid Fittings regarding thread sealant recommendations and installation tips.

Step 4: Apply pipe thread sealant to and temporarily install the pipe plug in the EA RV-12iS RADIATOR as shown in Figure 1.

Step 5: Apply pipe thread sealant to and install the two adapter fittings in the EA RV-12iS OIL COOLER as shown in Figure 1.

Step 6: Attach the FF-01231-1 to the EA RV-12iS OIL COOLER as shown in Figure 1.

Step 7: Attach the EA RV-12iS OIL COOLER to the EA RV-12iS RADIATOR to create the Radiator and Oil Cooler Assembly as shown in Figure 1.

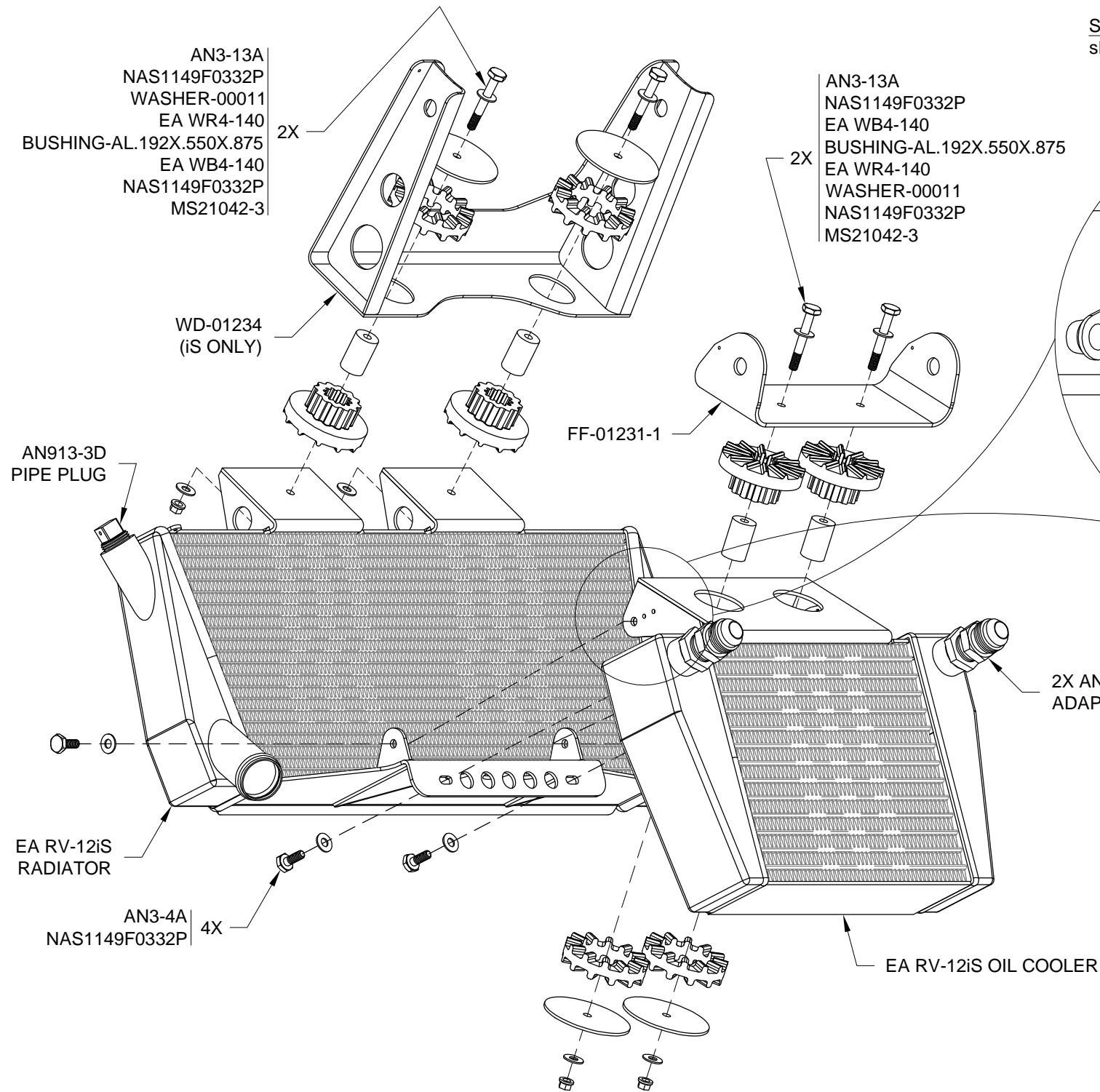


FIGURE 1: RADIATOR & OIL COOLER ASSEMBLY
(iS RADIATOR BRACKET SHOWN)

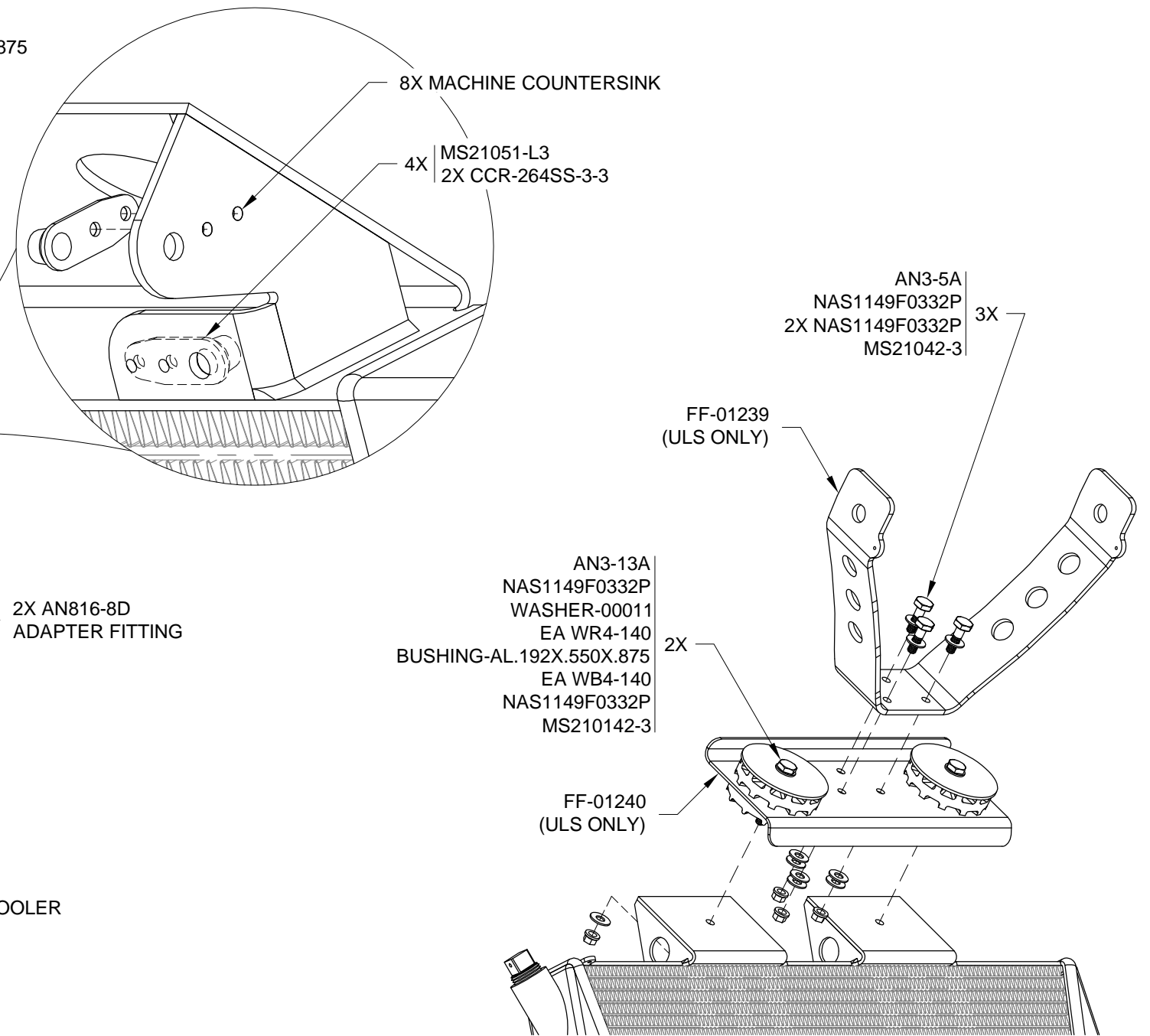


FIGURE 2: ULS RADIATOR BRACKET
(ULS ONLY)



Step 1: Attach the FF-00022 and FF-00024 to the engine as shown in Figure 1.

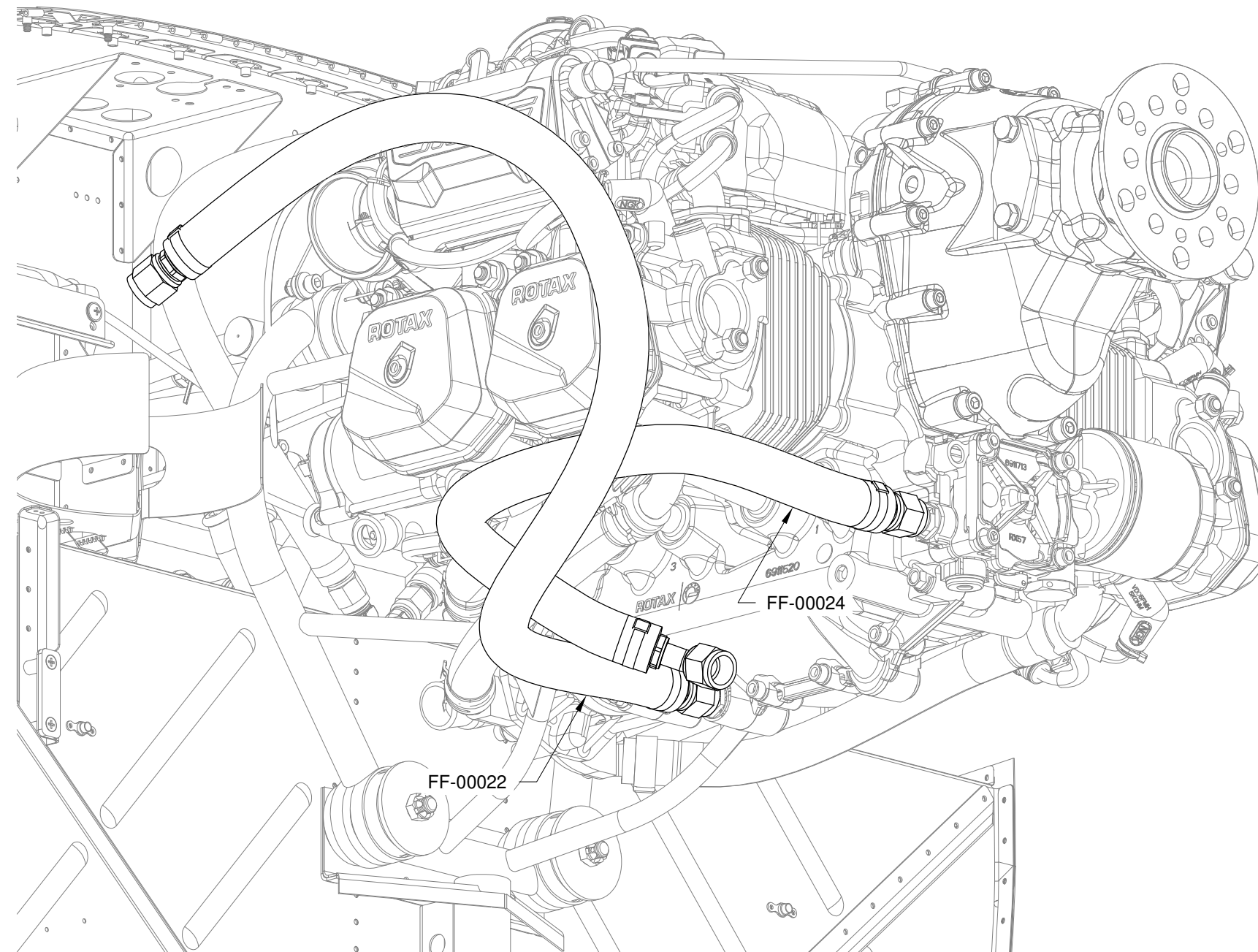


FIGURE 1: ATTACH OIL HOSES TO THE ENGINE
(IS SHOWN, SIMILAR LOCATIONS FOR ULS)



Step 1: Temporarily attach the Radiator and Oil Cooler Assembly to the engine as shown in Figures 1 and 2.

Install the COWL 12iS BOTTOM. Verify that the Radiator and Oil Cooler Assembly is centered left/right with the openings in the cowl. Increase the number and/or adjust the position of the washers as required to center the assembly. At least 6 washers are required between each bolt and the engine to prevent bottoming of the bolt. Ensure that the brackets are not distorted by the washers.

Step 2: Torque the bolts to 190 in-lbs and safety wire.

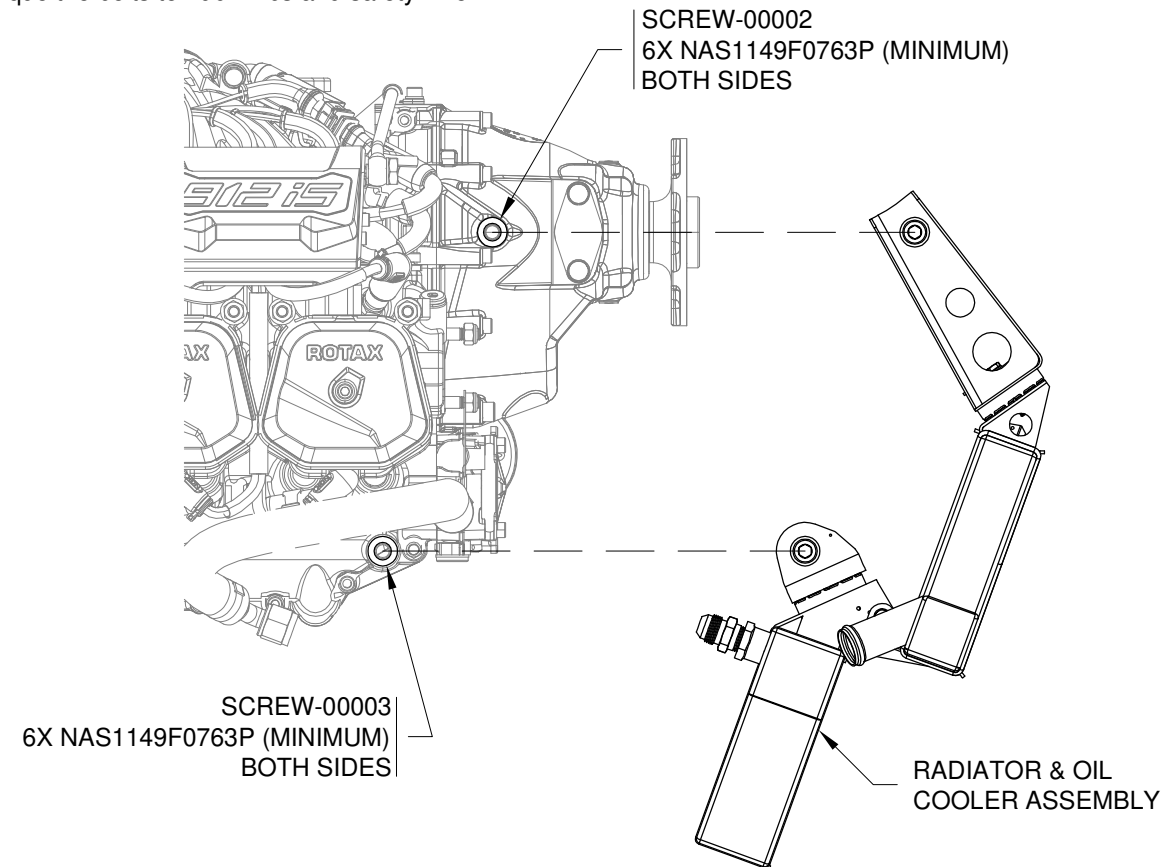


FIGURE 1: ATTACH RADIATOR & OIL COOLER ASSEMBLY

WASHERS (SEE FIG 1)
EACH SIDE OF BRACKET
AS REQ'D BOTH SIDES
RADIATOR AND OIL COOLER

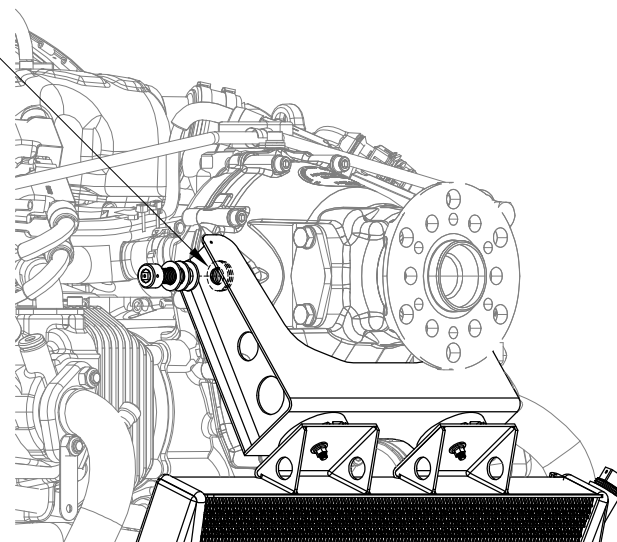


FIGURE 2: HARDWARE DETAIL

Step 3 (iS): Cut three 4 in. [10.2 cm] lengths of EA HOSE H151 to create three FF-01241, one of which will be used on the next page. Verify that there is no debris inside the hoses, wipe with isopropyl alcohol as required.

Step 4 (ULS): Cut two 4 in. [10.2 cm] lengths of EA HOSE H151 to create two FF-01241. Verify that there is no debris inside the hoses, wipe with isopropyl alcohol as required.

Step 5: Mark a pair of insertion lines 1 in. [25.4 cm] and 1 1/4 in. [31.8 cm] from the ends of each FF-01241.

NOTE: All radiator tubes in this section should be inserted at least 1 in. [2.5 cm] into their couplers (FF-01241 or FF-01238), with 1 1/4 in. [3.2 cm] being desirable. Adjust engagement as required to eliminate any pre-load on the radiator tubes.

NOTE: If leaks are detected after filling the system with coolant (not completed in this section), ensure that the clamp is positioned firmly against the bead at the end of the leaking radiator tube.

Step 6: Attach the FF-01229 to the engine with a FF-01241 as shown in Figure 3.

Step 7: Attach the FF-01229 to the EA RV-12iS RADIATOR with a FF-01241 as shown in Figure 3.

Step 8: Attach the FF-00024 to the EA RV-12iS OIL COOLER as shown in Figure 3.

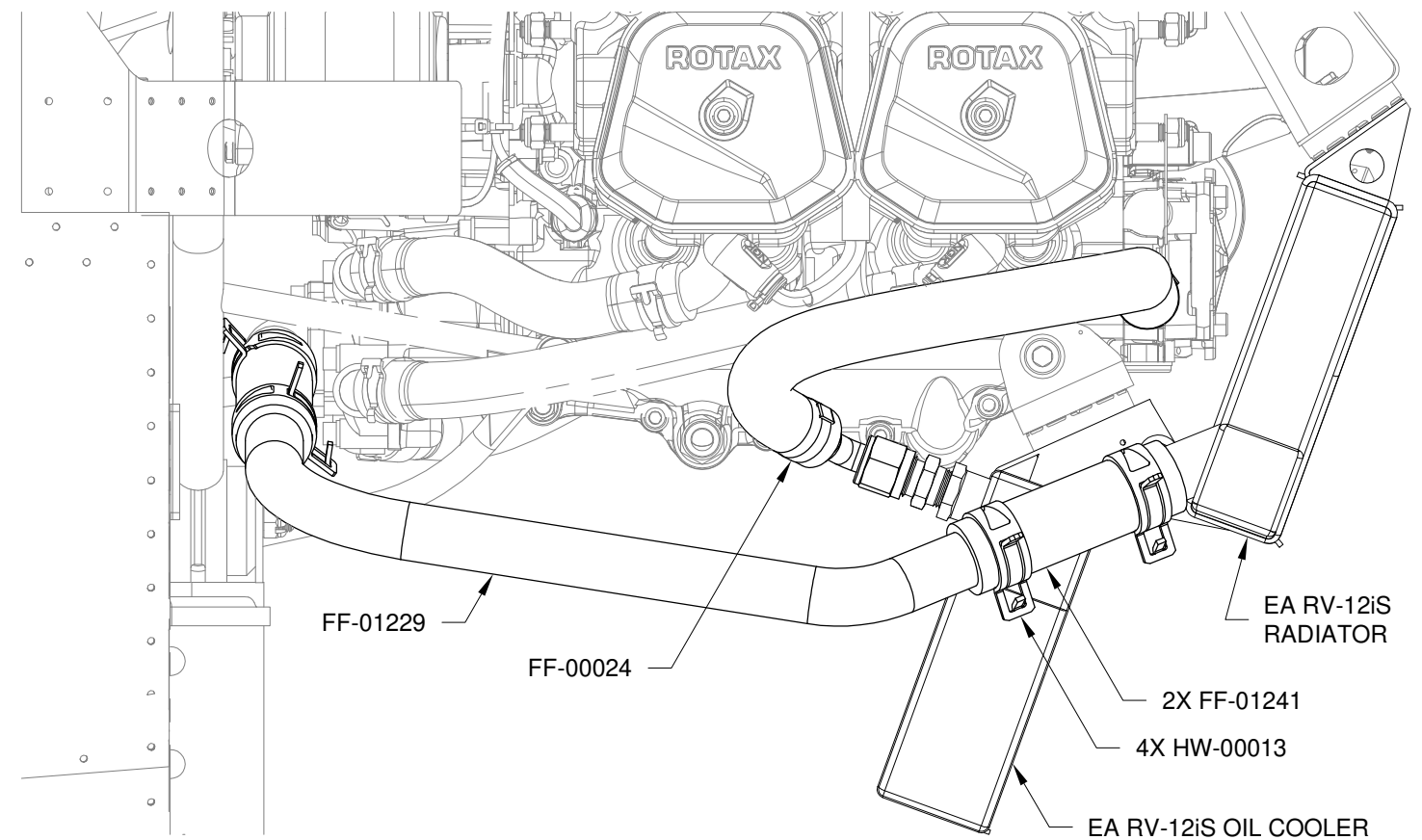
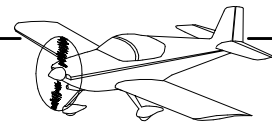


FIGURE 3: RADIATOR & OIL HOSES - RIGHT SIDE



Perform the steps on this page for an iS installation. Skip to the next page for an ULS installation.

Step 1: Locate and/or detach the preformed radiator outlet hose from the left side of the engine. See Figure 1.

Step 2: Use a screwdriver, or equivalent, to move the lower heatshrink up the woven sheath as shown in Figure 2.

Step 3: Mark a sheath trim line around the circumference of the woven sheath 5/16 in. [7.9 mm] below the bend tangent of the preformed hose. See Figure 2.

Step 4: Insert a narrow piece of scrap metal under the woven sheath up to the mark.

Step 5: Use a razor blade to cut a slit in the woven sheath from the lower end of the hose up to the marked line as shown in Figure 3. Keep the scrap metal between the hose and the razor blade in order to protect the hose.

Step 6: Use a pair of scissors to cut away the woven sheath along the previously marked line.

Step 7: Mark a hose trim line around the circumference of the preformed hose 1 13/32 in. [35.7 mm] below the bend tangent of the preformed hose. See Figure 2.

Step 8: Use a utility knife, or equivalent, to cut the preformed hose along the second marked line. Verify that there is no debris inside the hose, wipe with isopropyl alcohol as required.

Step 9: Move the lower heatshrink (from Step 2) down until it straddles the cut end of the woven sheath. Use a heat gun to re-shrink the heatshrink. See Figure 4.

Step 10: Reattach the modified preformed radiator hose to the engine.

Step 11: Attach the FF-00023 to the EA RV-12iS OIL COOLER as shown in Figure 1.

Step 12: Attach the FF-01228 to the engine as shown in Figure 1.

Step 13: Attach the FF-01228 to the EA RV-12iS RADIATOR with a FF-01241 as shown in Figure 1.

Step 14: Bond a 1 in. [25.4 mm] long scrap of preformed radiator outlet hose to the FF-01228 with RTV as shown in Figure 1.

Step 15: Secure the FF-01228 to the #4 cylinder coolant hose with two tie-wraps as shown in Figure 1. Place a layer of RTV between the tie-wrap and the scrap of preformed radiator hose.

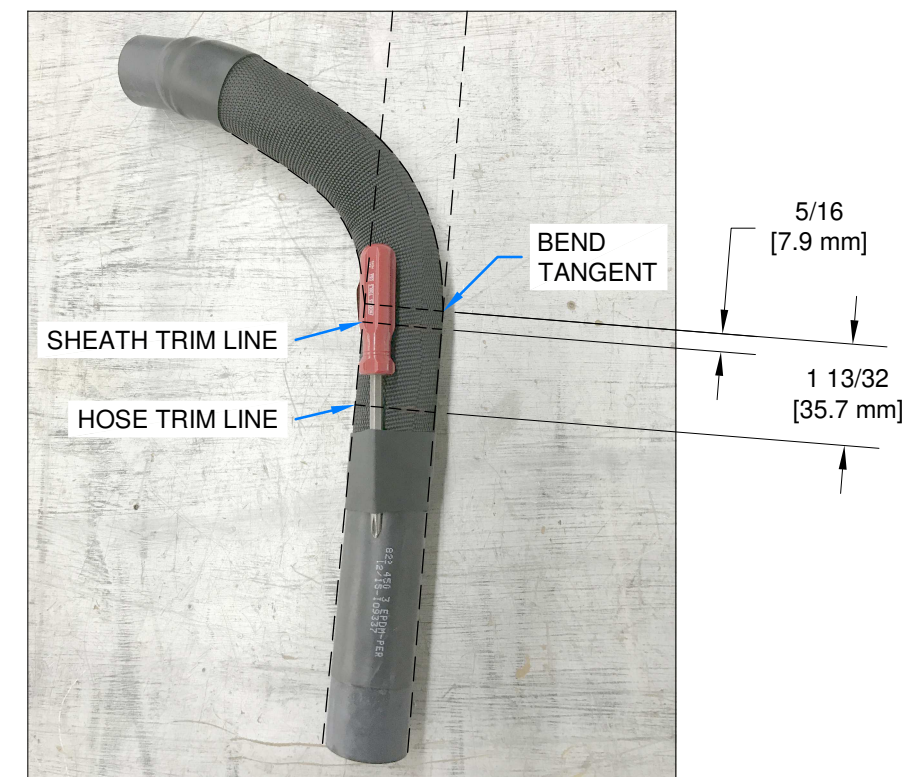


FIGURE 2: MOVE HEATSHRINK

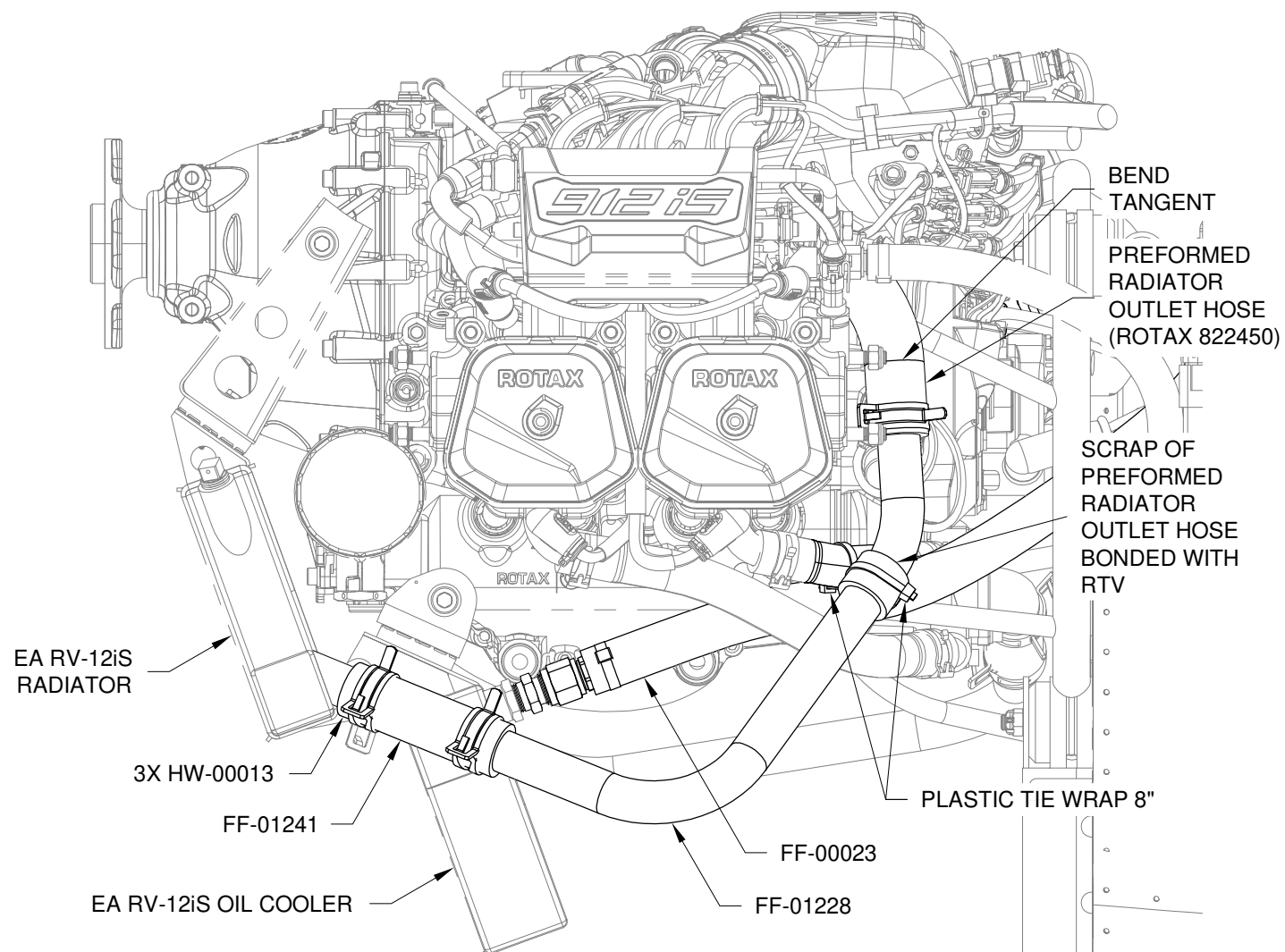


FIGURE 1: RADIATOR & OIL HOSES - LEFT SIDE (iS ONLY)

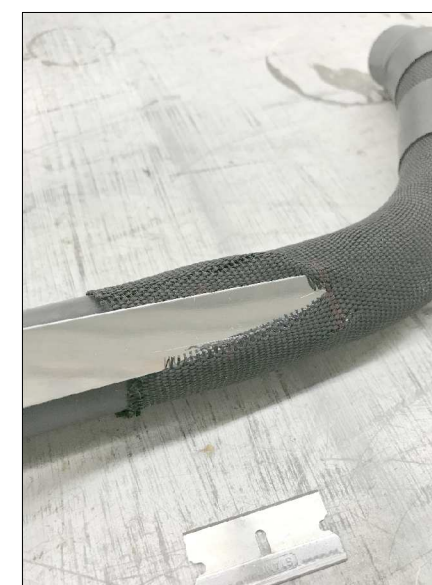
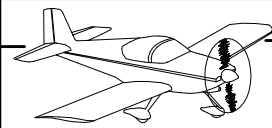


FIGURE 3: CUT WOVEN SHEATH



FIGURE 4: SHRINK HEATSHRINK



Perform the steps on this page for an ULS installation.

Step 1: Attach the FF-00023 to the EA RV-12iS OIL COOLER as shown in Figure 1 on the previous page.

Step 2: Cut two 6 1/4 in. [15.9 cm] lengths of EA HOSE H151 to create two FF-01238. Verify that there is no debris inside the hoses, wipe with isopropyl alcohol as required.

Step 3: Attach the FF-01237 to the engine with a FF-01238 and FF-01242 as shown in Figure 1.

Step 4: Attach the FF-01237 to the EA RV-12iS RADIATOR with a FF-01238 as shown in Figure 1.

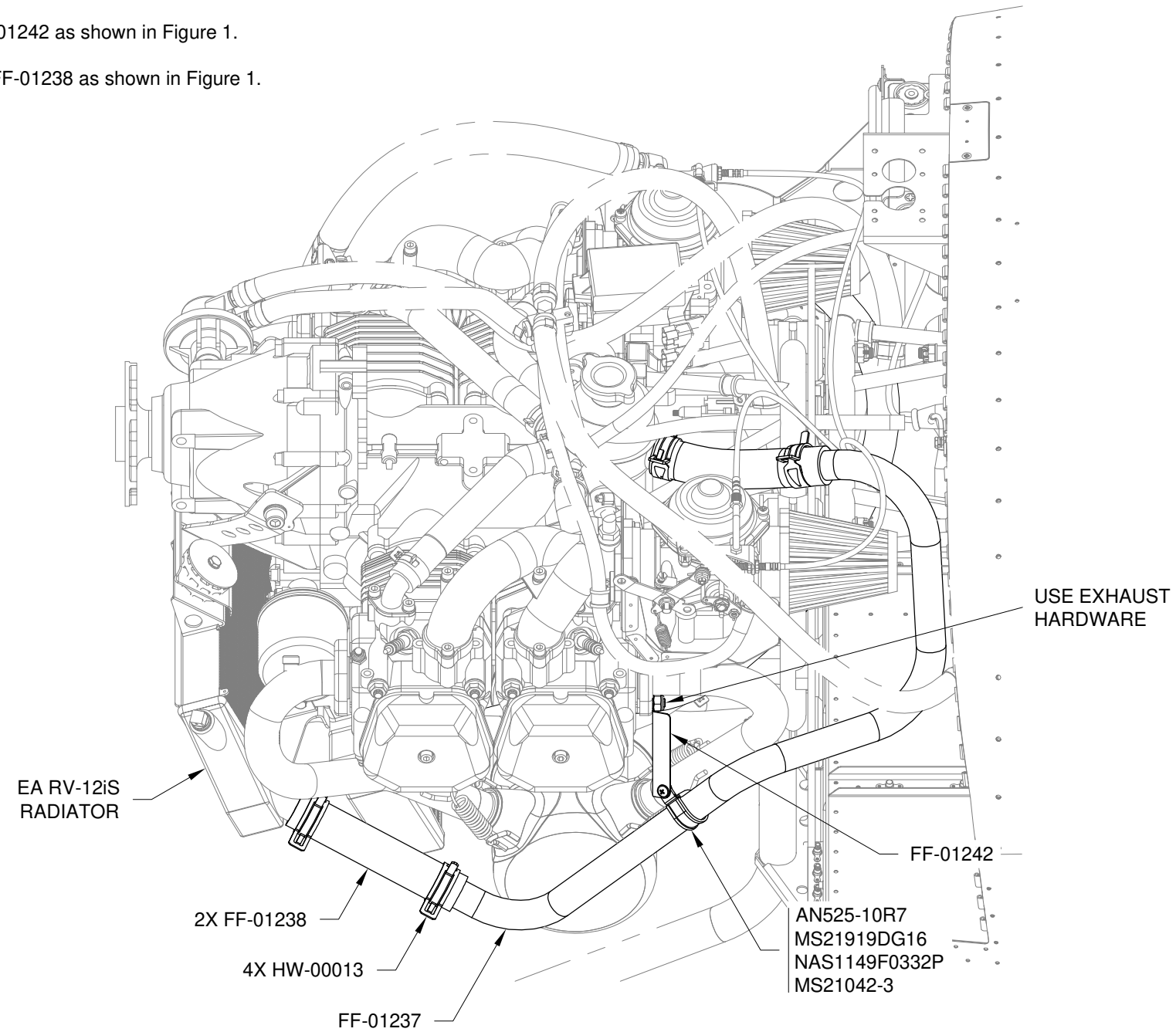
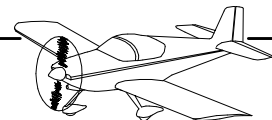


FIGURE 1: RADIATOR & OIL HOSES - LEFT SIDE
(ULS ONLY)



Step 1: Install the Oil Tank using two band clamps in the orientation shown in Figure 1. If desired, trim the ends of the band clamp bolts but leave at least a 1/4 in. [6.4 mm] of exposed threads.

Step 2: Cut a 8 in. [20.3 cm] length of EA HOSE H177 to create the FF-1219-1.

Step 3: Cut a 22 3/4 in. [57.8 cm] length of AT0-035X3/8 to create the FF-1218-1.

Step 4: Slip the FF-1219-1 onto the barbed stem of the Oil Tank and secure with a clamp as shown in Figure 1.

Step 5: Insert the FF-1218-1 into the FF-1219-1 and clamp as shown in Figure 1.

Step 6: Bend the FF-1218-1 to follow the firewall stiffener as shown in Figure 1. Secure the FF-1218-1 to the stiffener with cushioned clamps.

Step 7: Attach the FF-00022 and FF-00023 to the Oil Tank as shown in Figure 2.

Step 8 (Optional): Trim the excess from the FF-1221-1 and paint the exposed steel surfaces. See Figure 3.

Step 9 (ULS): Install the cushioned clamps around the FF-00022 and FF-00024 as shown in Figure 2.

Step 10 (iS): Install the cushioned clamps around the FF-00022 and FF-00024 as shown in Figure 2.

Route the Rotax Ambient Air, Pressure, Temperature Sensor (AAPT) wire through the FF-00022 cushioned clamp. See Figure 2 on Page 50iS/U-10.

DO NOT final torque the FF-00022 clamp hardware just yet.

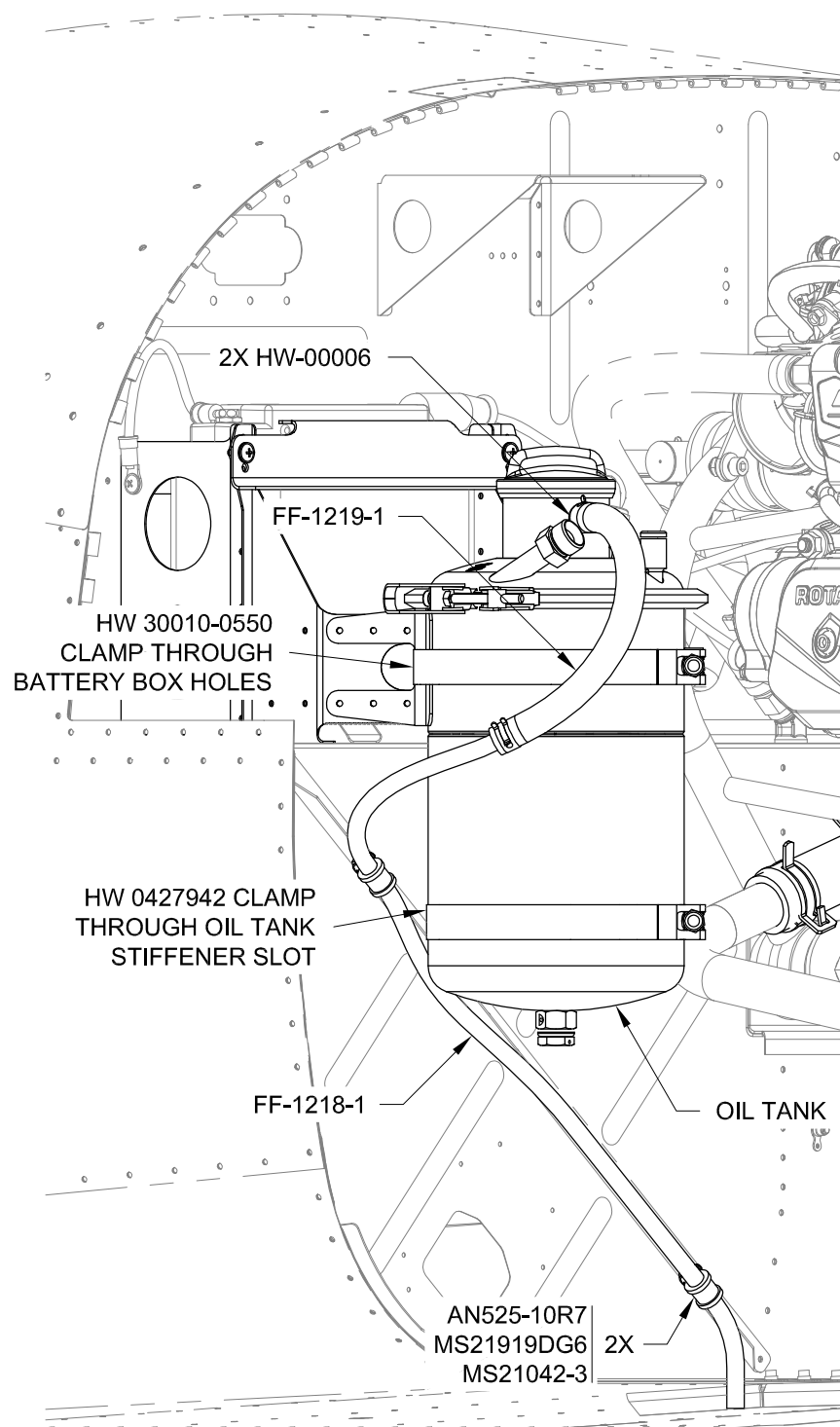


FIGURE 1: INSTALL OIL TANK & VENT TUBE

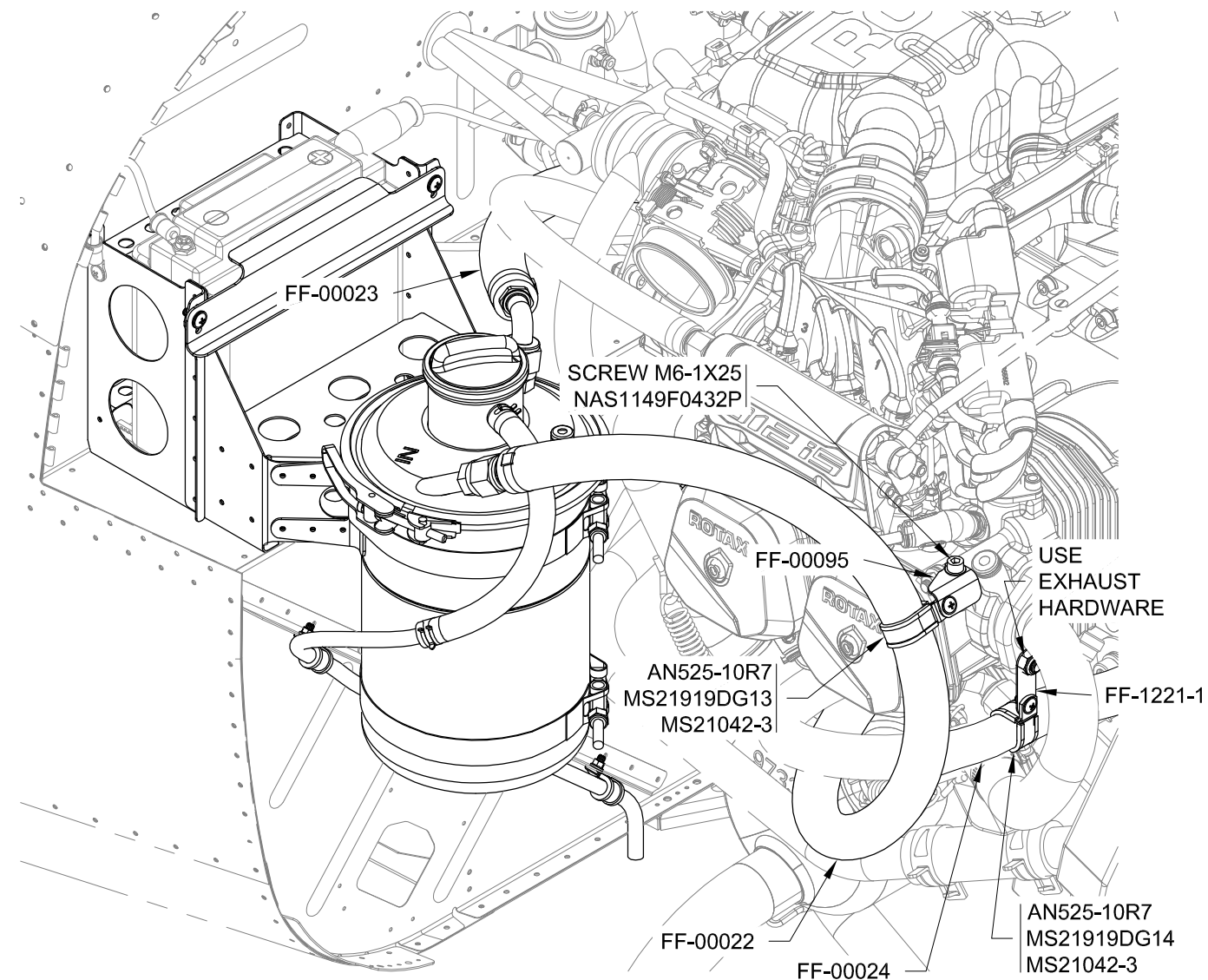


FIGURE 2: ATTACH & SECURE OIL HOSES

INSTALL CLAMP USING THIS HOLE

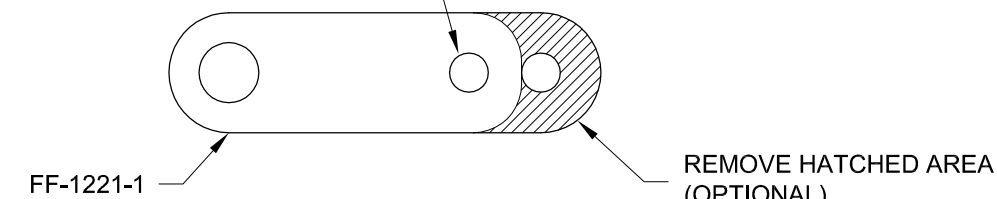


FIGURE 3: FF-1221-1



Perform the steps on this page for an iS installation. Skip to the next page for an ULS installation.

Step 1: Position the Overflow Bottle as shown in Figure 1. To prevent chaffing, apply a thin layer of RTV to the aft side of the bottle wherever it contacts the firewall. Allow the RTV to fully cure before bottle installation.

Step 2: Remove the Overflow Bottle cap and drill 3/8 a hole centered on the existing vent hole in the cap.

Step 3: Attach the FLF-00007 to the Overflow Bottle cap as shown in Figure 1. A 9/16 socket can be used to press the push nut onto the elbow and over the cap.

Step 4: Cut a 40 in. [101.6 cm] length of PT-035X1/4 tube to create the FF-00094.

Step 5: Mark the FF-00094 7/16 in. [11.1 mm] from one end (this will be the upper end).

Step 6: Insert the marked end of the FF-00094 into the FLF-00007 until the mark aligns with the end of the FLF-00007.

Step 7: Route the FF-00094 downward and secure the outlet to the FF-1218-1. See Figure 1.

Step 8: Cut a 34 in. [86.4 cm] length of EA HOSE H175 to create the FF-01220-1.

Step 9: Slip the FF-01220-1 (with clamp) over the stem on the Overflow Bottle and clamp as shown in Figure 1.

Step 10: Attach the Overflow Bottle to the firewall as shown in Figure 1.

Step 11: Route the free end of the FF-01220-1 forward and around the right side of the Airbox. Slide the free end (with clamp) over the barbed stem on the Expansion Tank and clamp as shown in Figure 1.

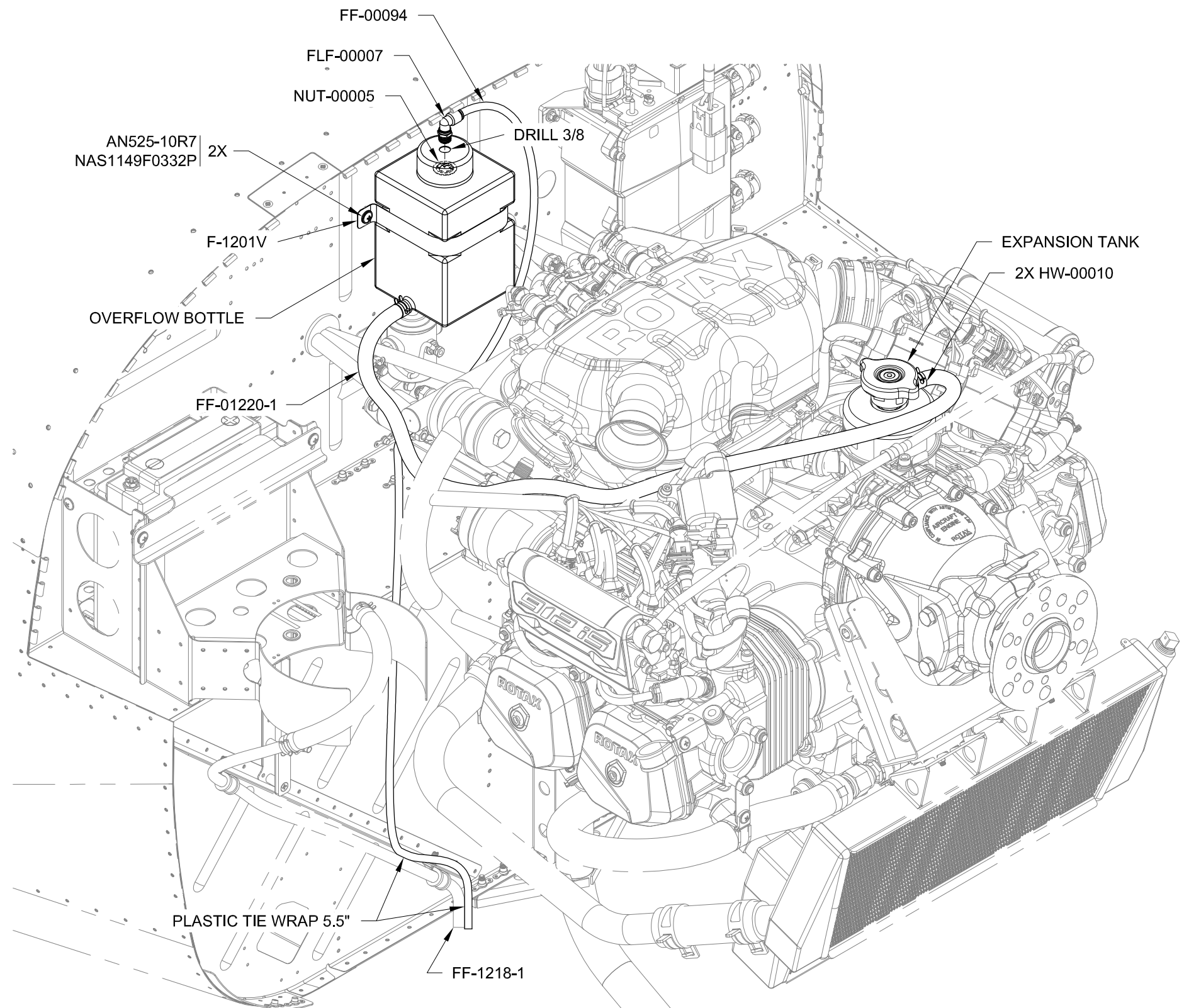
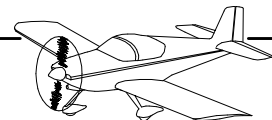


FIGURE 1: OVERFLOW BOTTLE
(iS ONLY)



Perform the steps on this page for an ULS installation.

Step 1: Position the Overflow Bottle as shown in Figure 1. To prevent chaffing, apply a thin layer of RTV to the aft side of the bottle wherever it contacts the firewall. Allow the RTV to fully cure before bottle installation.

Step 2: Remove the Overflow Bottle cap and drill 3/8 a hole centered on the existing vent hole in the cap.

Step 3: Attach the FLF-00007 to the Overflow Bottle cap as shown in Figure 1. A 9/16 socket can be used to press the push nut onto the elbow and over the cap.

Step 4: Cut a 40 in. [101.6 cm] length of PT-035X1/4 tube to create the FF-00094.

Step 5: Mark the FF-00094 7/16 in. [11.1 mm] from one end (this will be the upper end).

Step 6: Insert the marked end of the FF-00094 into the FLF-00007 until the mark aligns with the end of the FLF-00007.

Step 7: Route the FF-00094 downward and secure the outlet to the FF-1218-1 and FF-01225. See Figure 1.

Step 8: Cut a 18 5/8 in. [47.3 cm] length of EA HOSE H175 to create the FF-01220-2.

Step 9: Slip the FF-01220-2 (with clamp) over the stem on the Overflow Bottle and clamp as shown in Figure 1.

Step 10: Attach the Overflow Bottle to the firewall as shown in Figure 1.

Step 11: Route the free end (with clamp) of the FF-01220-2 forward and slide it over the barbed stem on the Expansion Tank and clamp as shown in Figure 1.

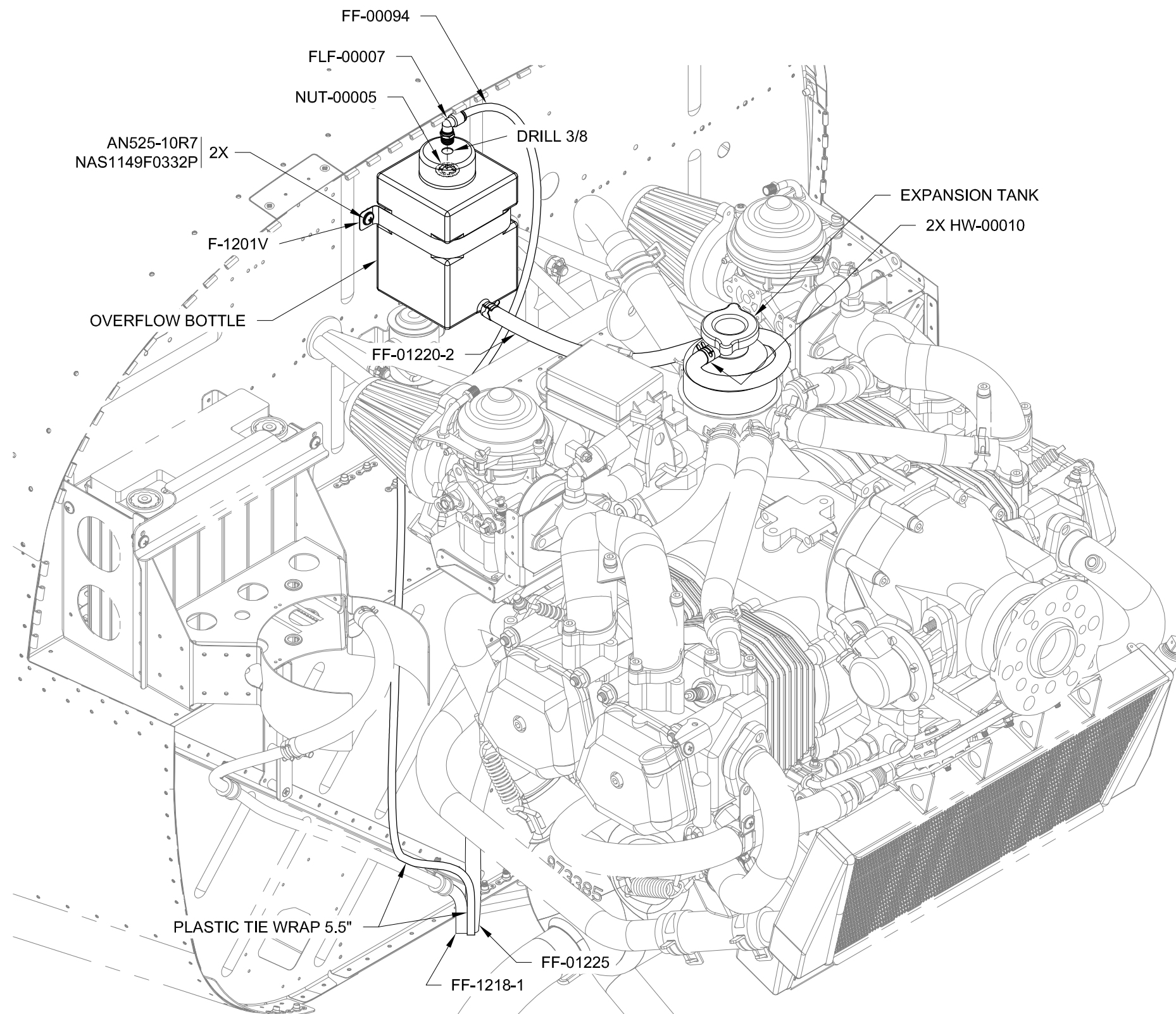
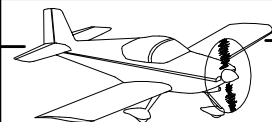


FIGURE 1: OVERFLOW BOTTLE
(ULS ONLY)



Perform the steps on this page for an iS installation.

Step 1: Remove the FF-00120 from the COWL-00006. See Figure 1.

Step 2: Assemble the parts shown in Figure 1 to create the Air Induction Filter Assembly.

The Air Induction Filter Assembly will be attached to the COWL-00006 upon final installation of the COWL 12iS BOTTOM.

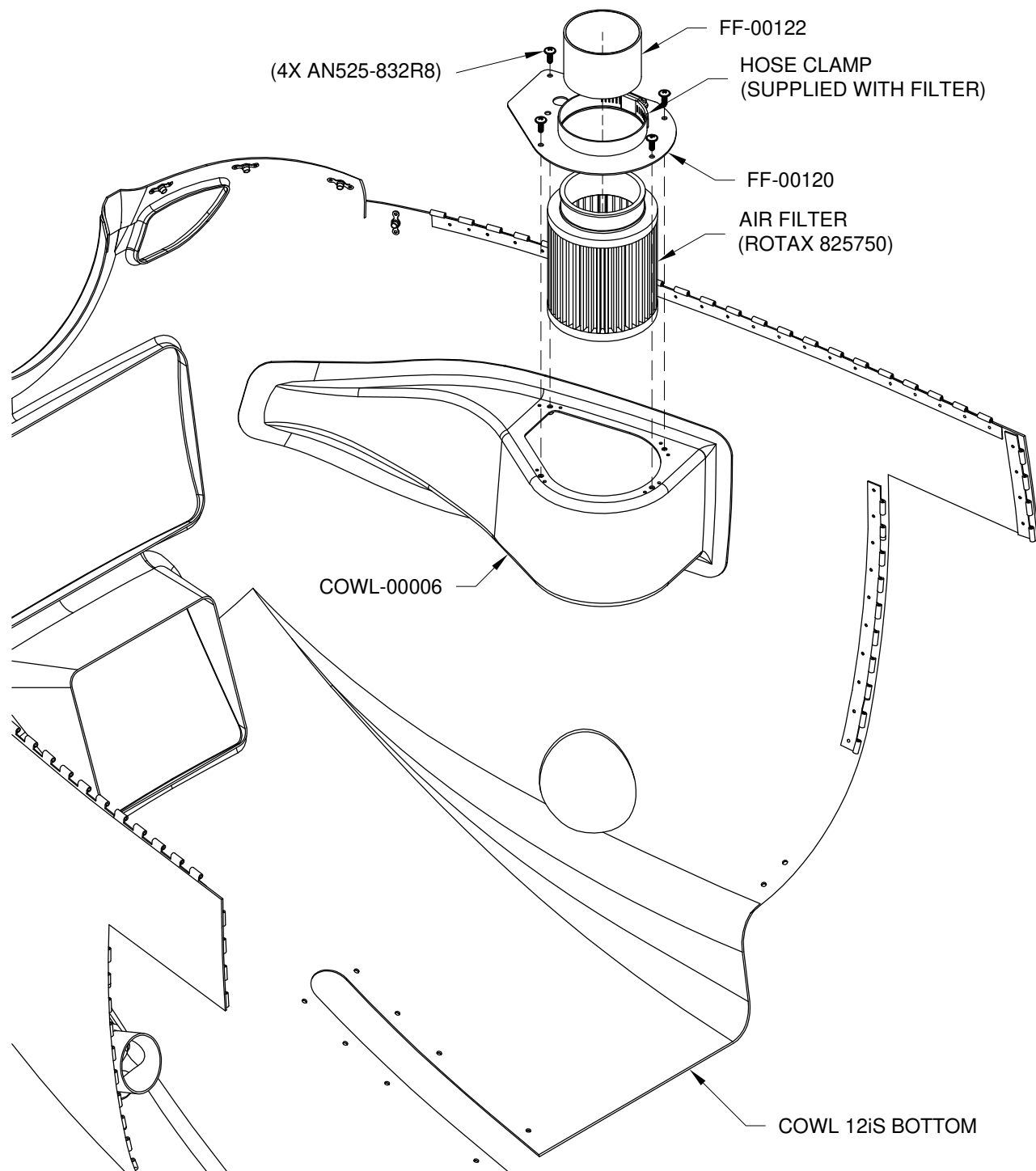


FIGURE 1: AIR INDUCTION FILTER ASSEMBLY
(iS ONLY)

Step 3: Cut a 13 in. [33.0 cm] piece of 2.5 in. [6.4 cm] diameter SCAT tube to create the FF-00121.

Step 4: Unspool the wire from inside of the FF-00121 up to 3/4 in. [19.1 mm] from one end of the tube. Cut off the first half of the unspooled wire and discard. Bend the first 1/4 in. [6.4 mm] of the remaining wire inward at a 90.0° angle.

Twist the unspooled wire to reduce its diameter within the FF-00121. Tuck the end of the wire inside one of the wire loops that are still attached to the outer orange material.

Repeat this step for the other end of the FF-00121. The goal is to have the wire rest inside the FF-00121 at both ends without it pushing hard against the outer orange material.

Step 5: Attach the FF-00121 to the engine and to the Air Induction Filter Assembly (i.e. FF-00122) as shown in Figure 2.

Step 6: Attach the Rotax Ambient Air, Pressure, Temperature Sensor (AAPTS) to the Air Induction Filter Assembly as shown in Figure 2.

Step 7: Adjust the AAPTS wire as required and final torque the FF-00022 cushioned clamp hardware.

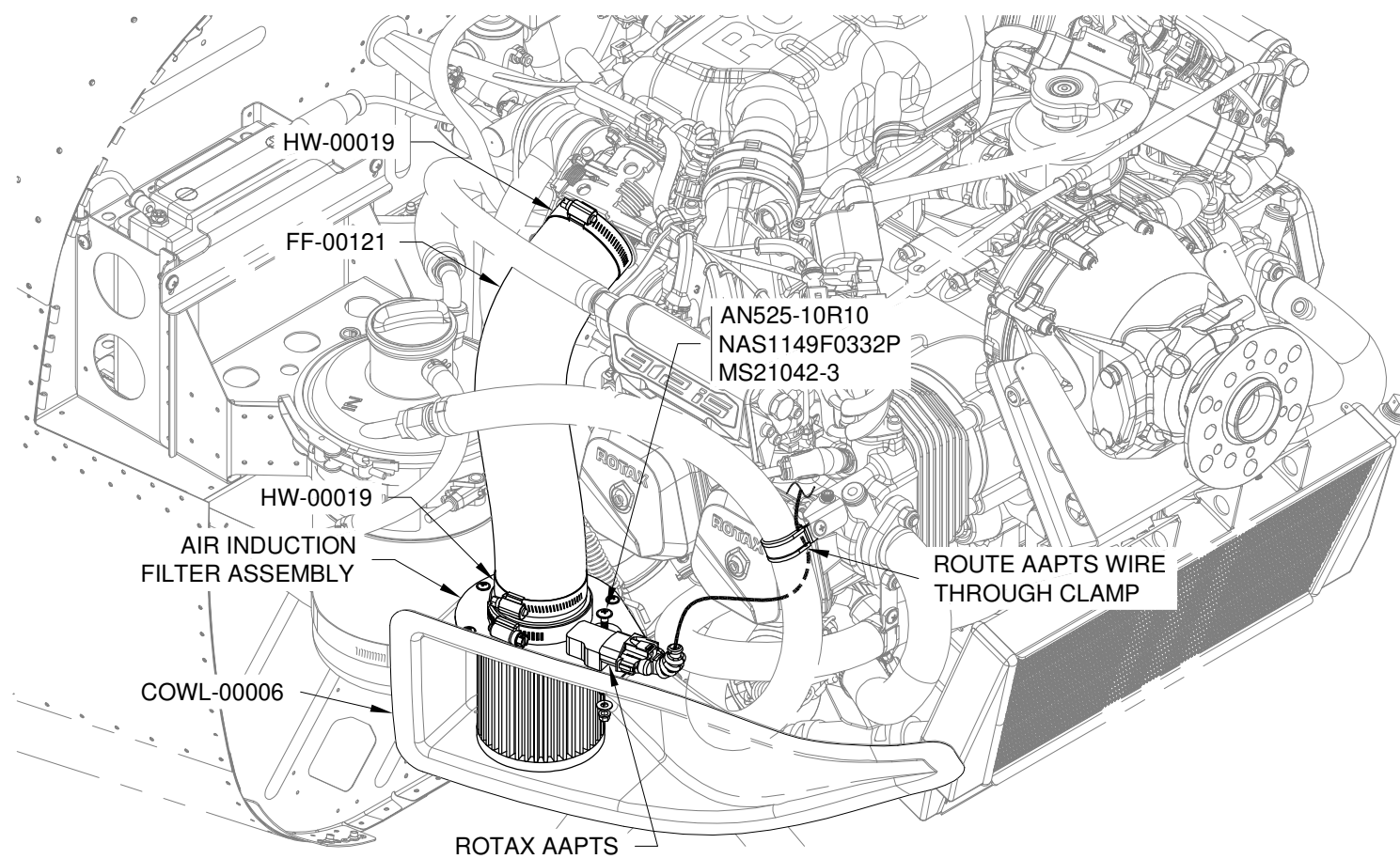
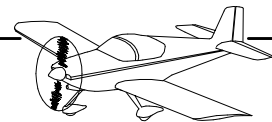


FIGURE 2: AIR INDUCTION FILTER ASSEMBLY ATTACHMENT
(iS ONLY)



NOTE: Fabricate two identical Vent Door Assemblies and two Vent Inlet Assemblies.

Step 1: Fabricate two VENT-00001D from MS20257-C2 stainless steel hinge using the dimensions given in Figure 1. Trim the hinge pins to the length of the finished parts and insert.

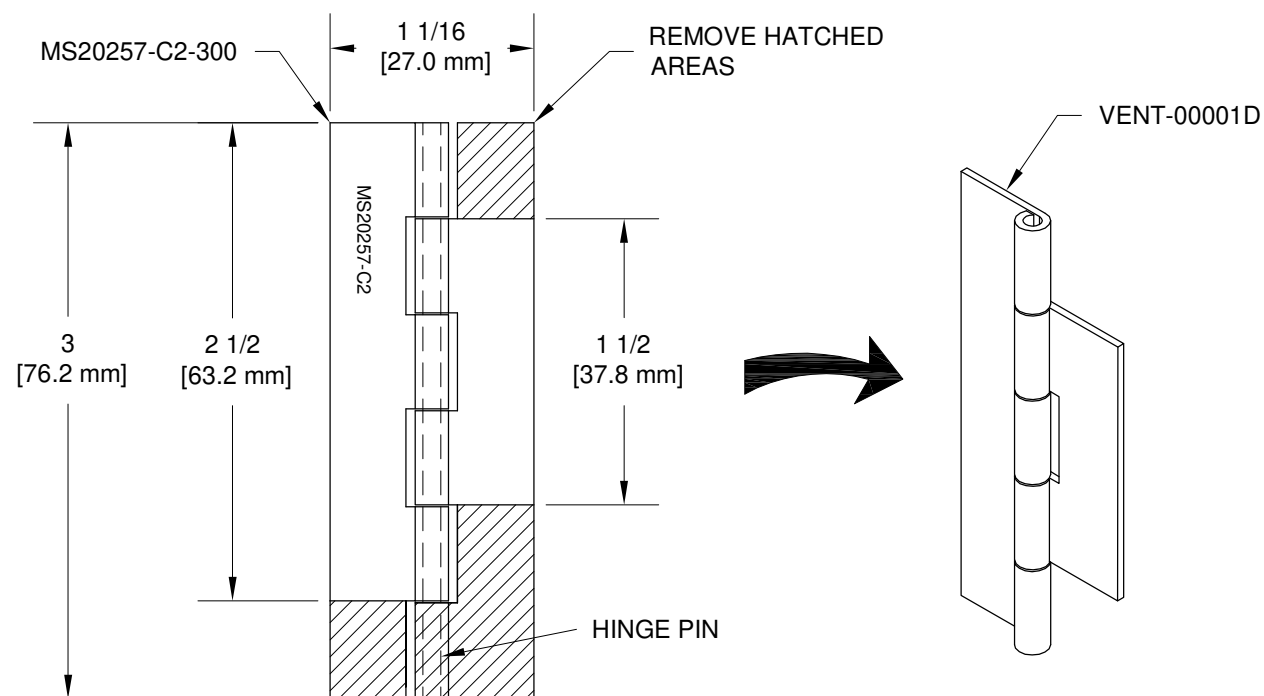


FIGURE 1: FABRICATE HINGES
(ONE PART SHOWN)

NOTE: Center the hinge halves within their side to side play and firmly clamp all parts before match-drilling.

Step 2: Center the two halves of one VENT-00001D on one VENT-00001CE and match-drill #40 the holes in the VENT-00001CE into the VENT-00001D. Repeat for the remaining VENT-00001D. See Figure 2.

Step 3: Dimple the #40 holes in the VENT-00001D as shown in Figure 2.

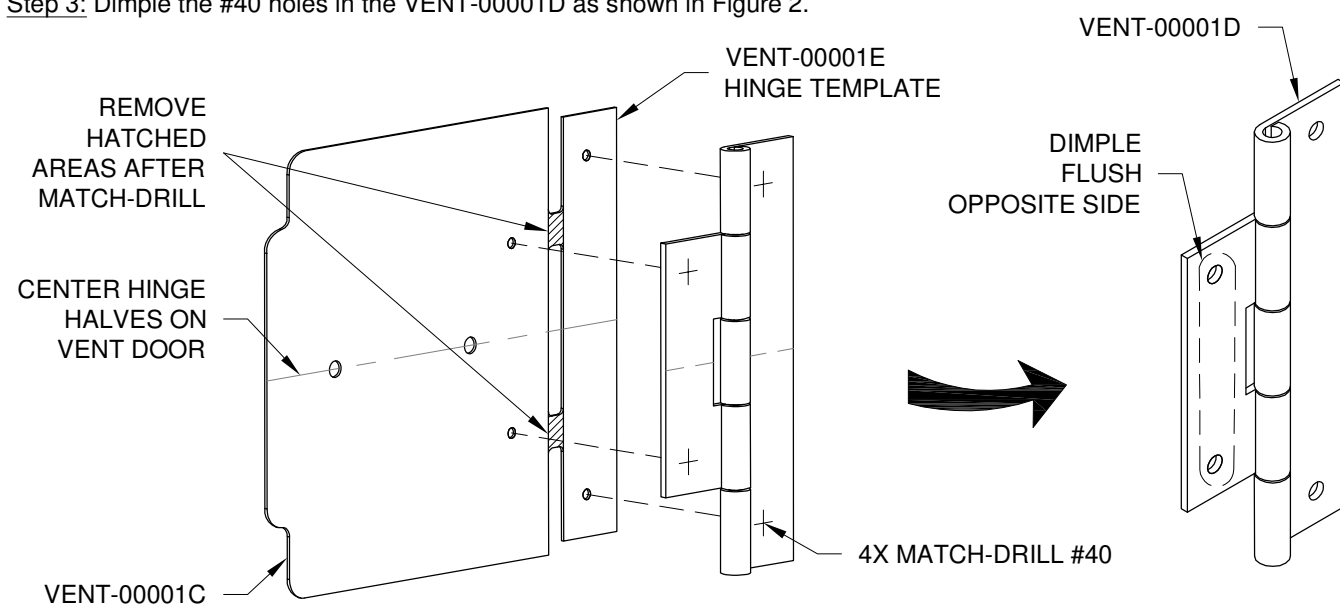


FIGURE 2: MATCH-DRILL & DIMPLE HINGES
(ONE SET SHOWN)

Step 4: Separate and discard the VENT-00001E template from the VENT-00001CE as shown in Figure 2.

Step 5: Separate and final-drill the VENT-00001A-L & -R and F-14103 as shown in Figure 3.

Step 6: Final-Drill the VENT-00001B as shown in Figure 4.

Step 7: Prime the VENT-00001A-L & -R, VENT-00001B, and FF-00084 if desired.

Step 8: Machine countersink the #40 holes in the VENT-00001D and VENT-00001F as shown in Figure 4.

Step 9: Dimple the VENT-00001C as shown in Figure 4.

Step 10: Rivet the VENT-00001D and VENT-00001F to the VENT-00001C as shown in Figure 4.

Hereafter refer to this as the Vent Door Assembly.

Step 11: Rivet the VENT-00001B to the VENT-00001A-L & -R as shown in Figure 4.

Hereafter refer to this as the Vent Inlet Assembly.

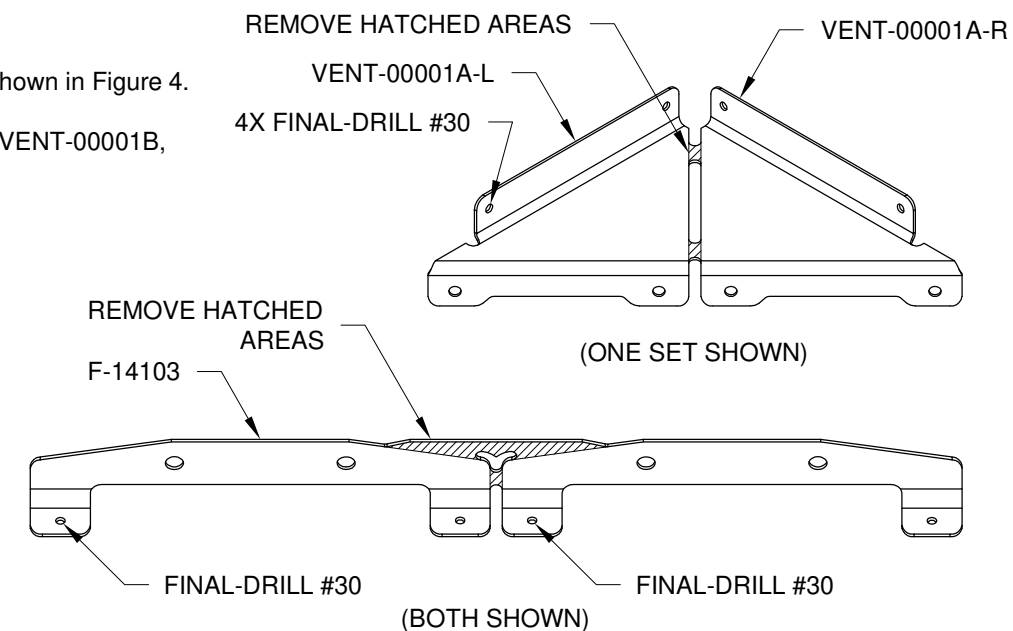


FIGURE 3: SEPARATE VENT SIDES & CABLE BRACKETS

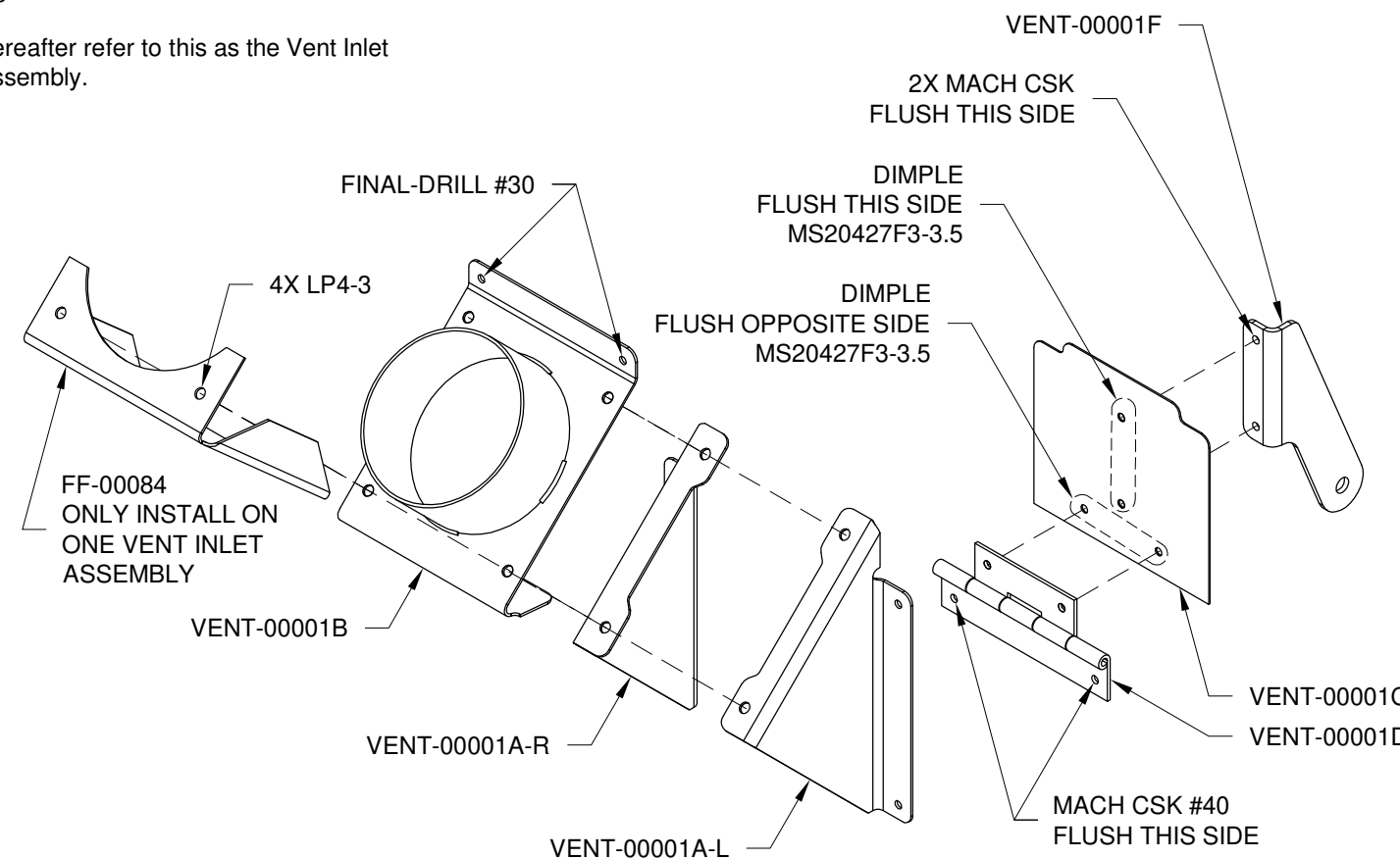


FIGURE 4: VENT DOOR ASSEMBLY AND VENT INLET ASSEMBLY
(ONE SET SHOWN)

Step 1: Rivet the Vent Door Assemblies to the lower firewall and F-14103 as shown in Figures 1 and 2. Note the orientation of the F-14103 in Figure 2.

Step 2: Cleco the Vent Inlet Assembly (the one without the FF-00084) to the left side (Pilot's side) of the firewall. Open and close the vent door while applying left and right side loads on the door. File the vent door as required to remove interference with the Vent Inlet Assembly.

Final-Drill #30 the Vent Inlet Assembly holes into the firewall.

Step 3: Repeat Step 2 for the right side (Co-Pilot's side).

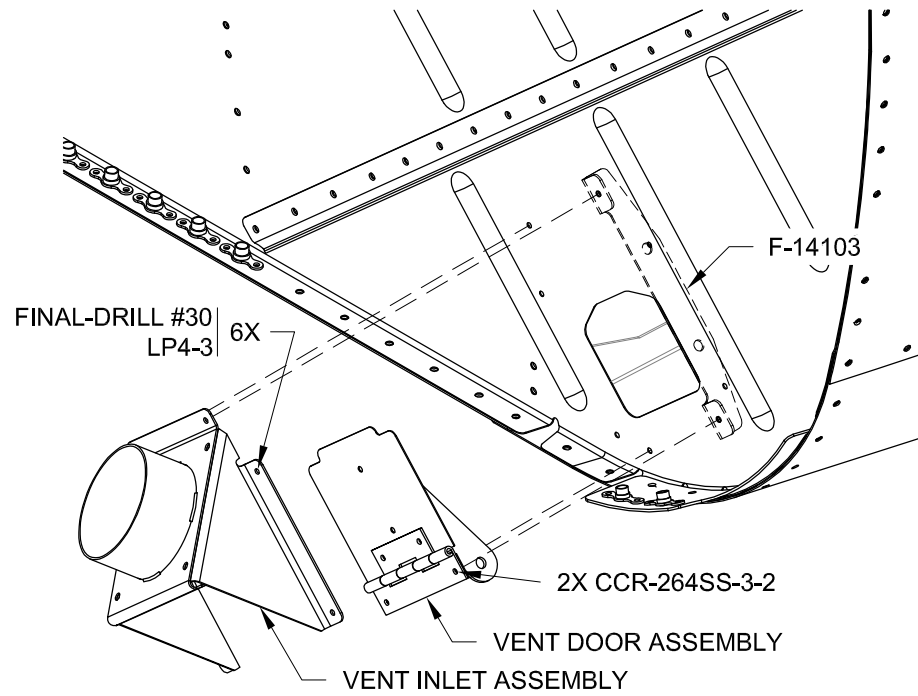


FIGURE 1: INSTALLING THE VENT DOOR & INLET ASSEMBLIES (LEFT SIDE SHOWN)

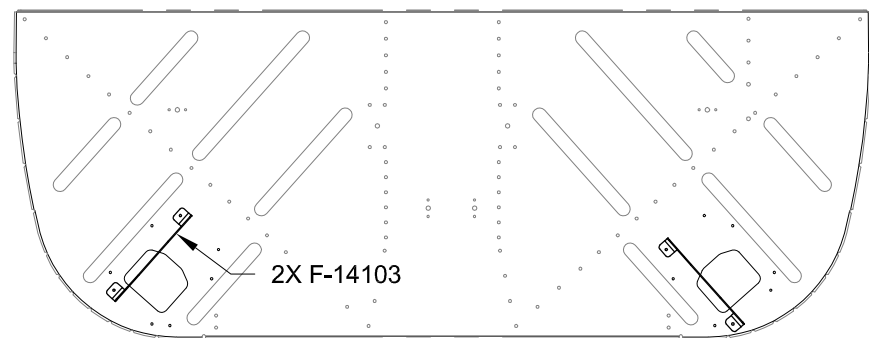


FIGURE 2: CABLE BRACKET ORIENTATION (AFT SIDE VIEW LOOKING FORWARD)

Step 4: Rivet the Vent Inlet Assemblies to the firewall and F-14103 as shown in Figure 1. Install the Vent Inlet Assembly with the FF-00084 on the right side.

Step 5: Pull out the knob of each CT A-740 BLACK to create a minimum gap between the knob and shank as shown in Figure 3.

Step 6: Use a die grinder to trim the CT A-740 BLACK to the length shown in Figure 3.

Step 7: Push in the knob of each CT A-740 BLACK until the "cushion gap" remains between the knob and shank as shown in Figure 3. This will ensure that the vent doors close fully (i.e. the movement of the vent doors will be limited by contact with the firewall and not by the push pull cables themselves).

Step 8: Fully close the Vent Door Assemblies.

Step 9: Route the ends of both CT A-740 BLACK through the F-01246 and install as shown in Figure 4.

Ensure that each Vent Door Assembly is halfway open when its knob is pulled out halfway.

Ensure that each Vent Door Assembly is fully closed before the knob contacts the shank.

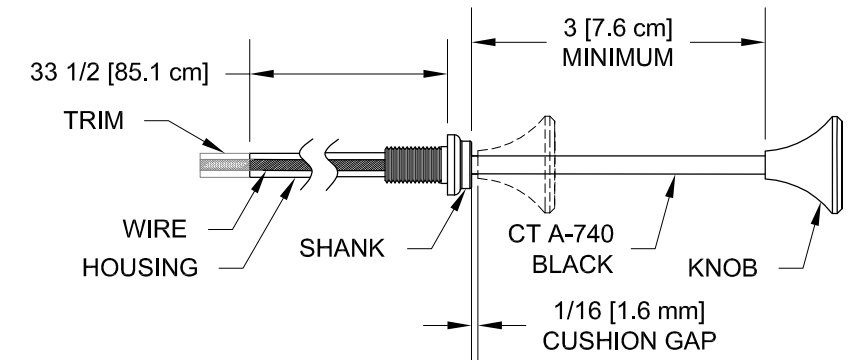


FIGURE 3: TRIMMING THE CABIN HEAT CABLES

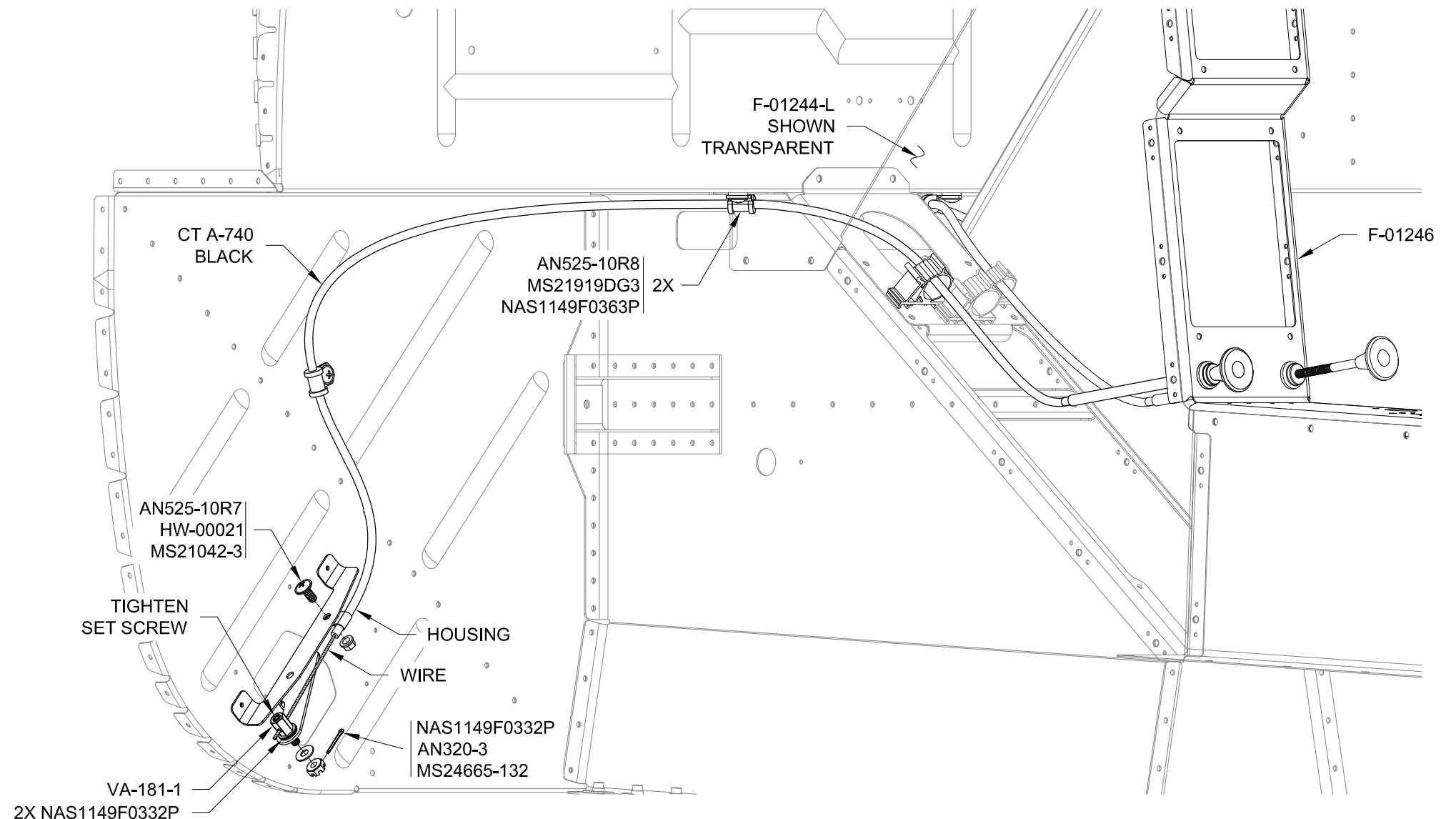
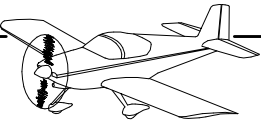


FIGURE 4: ROUTING THE CABIN HEAT CABLES (LEFT SIDE SHOWN)



Step 1: Cut one 17 in. [43.2 cm] and two 13 in. [33.0 cm] pieces of 2 in. [5.1 cm] diameter SCAT tube to create the FF-00091A, B, & C, respectively.

Step 2: Perform Step 4 on Page 50iS/U-10 to finish the ends of each SCAT tube.

Step 3: Connect the FF-00091A, B, & C to the heat muff as shown in Figure 1.

Step 4: Connect the FF-00091B, & C to the two Vent Inlet Assemblies as shown in Figure 1.

Step 5: If required, rotate the three EA LV-1 HEAT SHIELDS that are installed on the exhaust system so that they aim directly at the nearest radiator tube. Secure the heat shields.

Step 6: If desired, seal any gaps in the Vent Inlet Assemblies with RTV as shown in Figure 1. This will increase heater performance.

The FF-00091A will be connected to the VENT-00003 upon final installation of the COWL 12iS BOTTOM COWL. **DO NOT** over tighten the hose clamp or it will crush the VENT-00003.

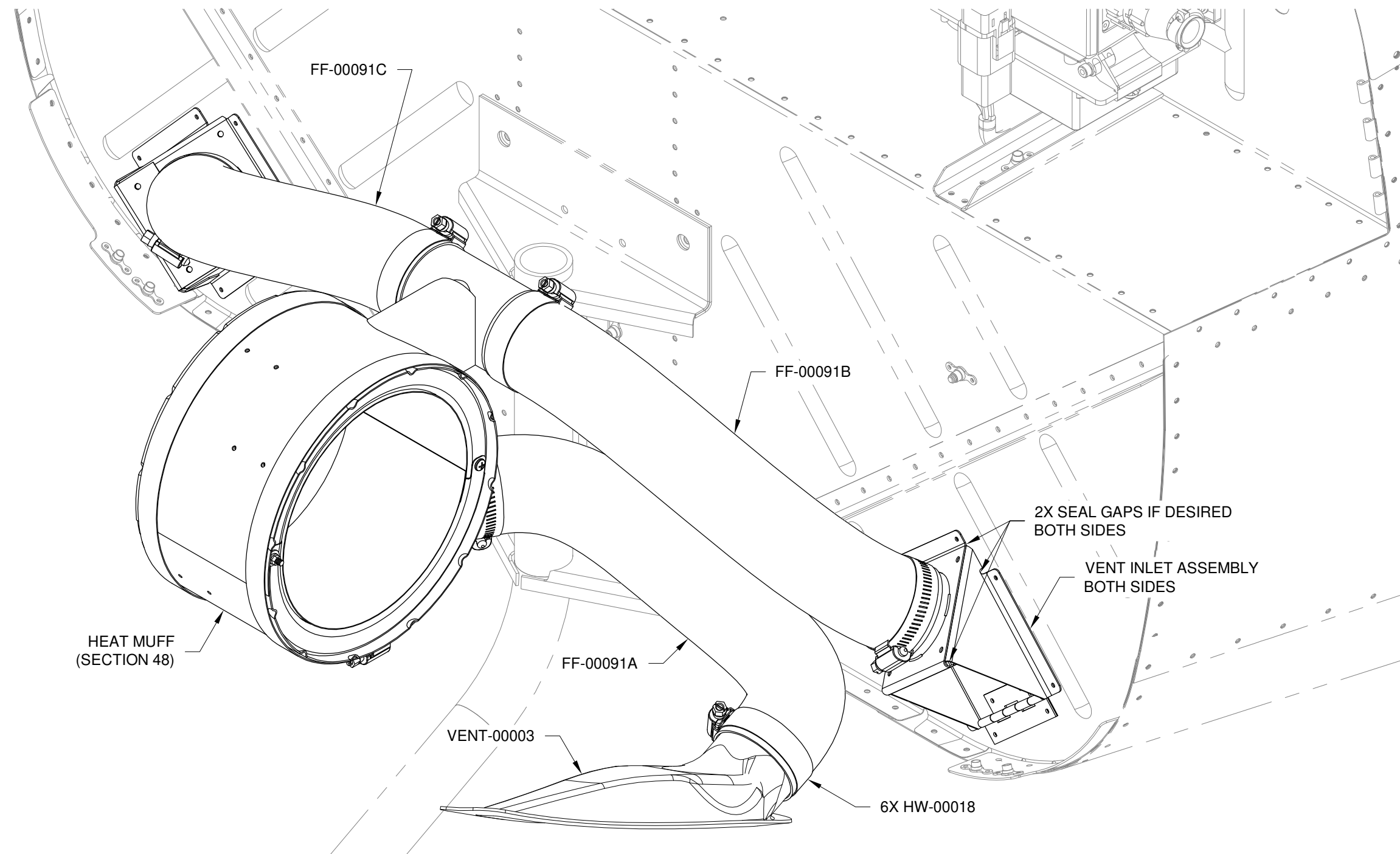


FIGURE 1: ATTACH HEAT MUFF HOSES



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