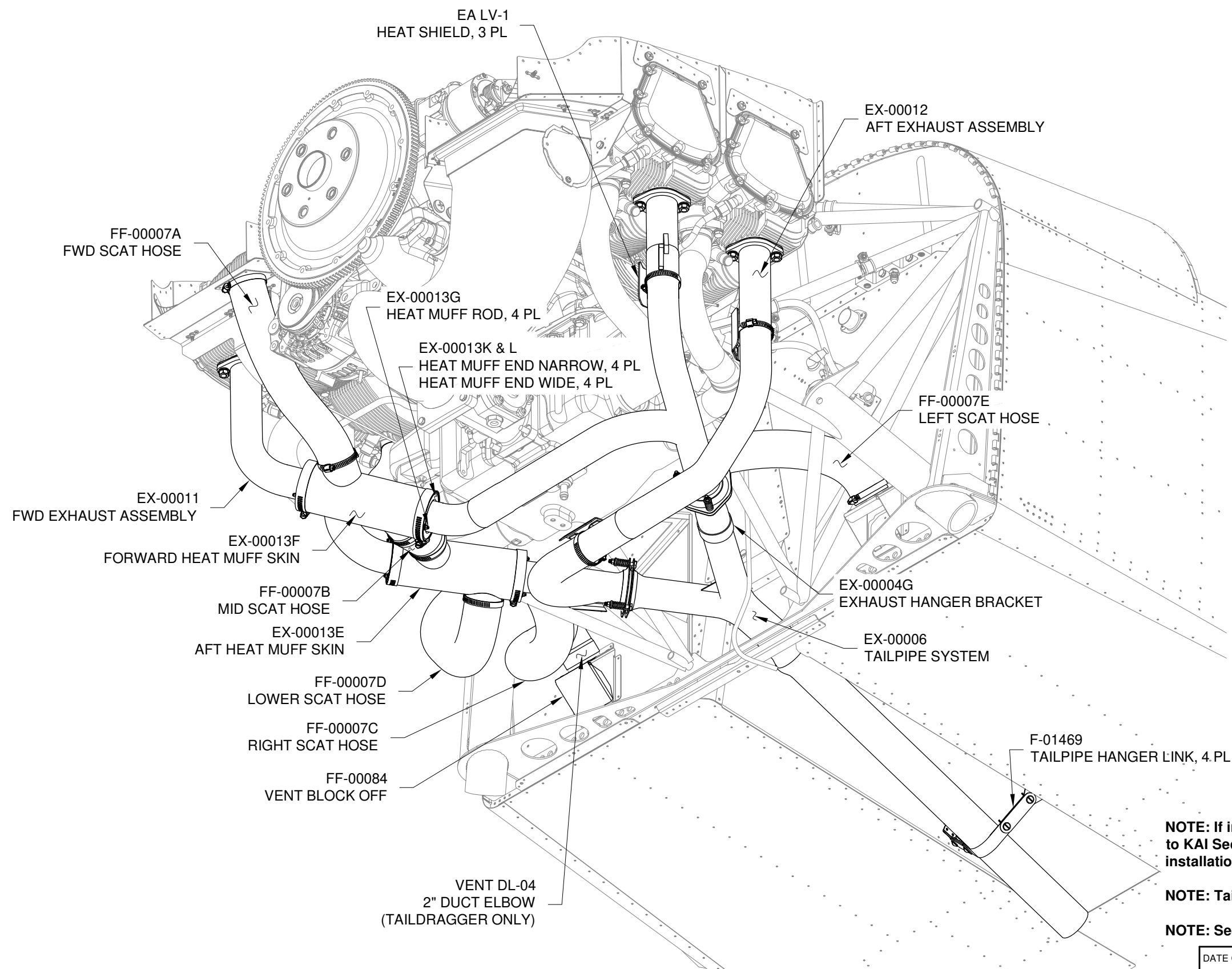


SECTION 48: EXHAUST SYSTEM



NOTE: If installing the IO-390-EXP119 engine, refer to KAI Section OP-62 for alternate exhaust system installation.

NOTE: Taildragger installation shown for clarity.

NOTE: See Section 51 for additional reference.

DATE OF COMPLETION: _____

PARTICIPANTS: _____

DATE: 02/14/23 REVISION: 2 RV-14 PAGE 48-01



Step 1: Separate the F-01469 Tailpipe Hanger Links as shown in Figure 1.

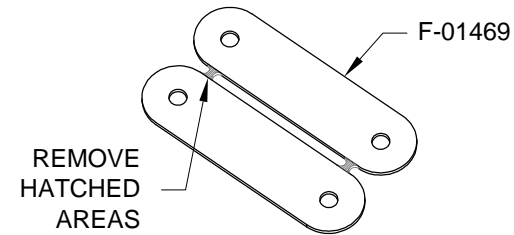


FIGURE 1: TAILPIPE HANGER LINKS

NOTE: For the following steps, refer to Figure 2.

Step 2: Verify the bend angle of the F-01465 Hanger Angles using the Hanger Angle Template found on Page 48-09, Figure 1. If necessary, modify the hanger angles as shown in the right detail view in Figure 2.

Step 3: Install the F-01469 Hanger Links onto the hanger angles. Tighten the nuts by hand to avoid crushing the bushings.

Step 4: Lubricate the slip joints with anti-sieze paste.

Step 5: Connect the EX-00006 Tailpipe System to the F-01469 Hanger Links. Tighten the nuts by hand to avoid crushing the bushings.

Step 6: Install the EX-00006 Tailpipe System, then install the EX-00011 Fwd Exhaust System and EX-00012 Aft Exhaust System. Leave the nuts loose for now and install without lock washers.

Use temporary safety wire as necessary to position the systems for installation.

Step 7: Adjust the slip joint and swaged ball of the tail pipe system so that the swaged ball rests on the aircraft centerline.

Step 8: Check that the tailpipe and hanger brackets rotate freely on their bushing attachments.

EXHAUST FLANGE

EA GASKET 77611

8X

NAS1149F0563P
MS35333-41
NUT-00003

DO NOT TIGHTEN YET

LEFT

FWD

EX-00012

EX-00011

SLIP
JOINT

SLIP
JOINT

EX-00006

SLIP
JOINT

EX-00012

EX-00011

AN3-4
BUSHING TFI-0304-04
NAS1149F0463P 4X
AN310-3
MS24665-132

NOTE REVERSED
ORIENTATION,
BOTH SIDES

F-01465

F-01469, 2 PER SIDE

EX-00006

ROUTE EXHAUST
ABOVE ENGINE
MOUNT (SEE PAGE 48-01)

SWAGED BALL

AIRCRAFT
CENTERLINE

EX-00006

F-01465

123.5°

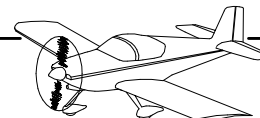
ADJUST
BEND ANGLE

IF NECESSARY,
FINAL-DRILL
(1/4 [6.4 mm])

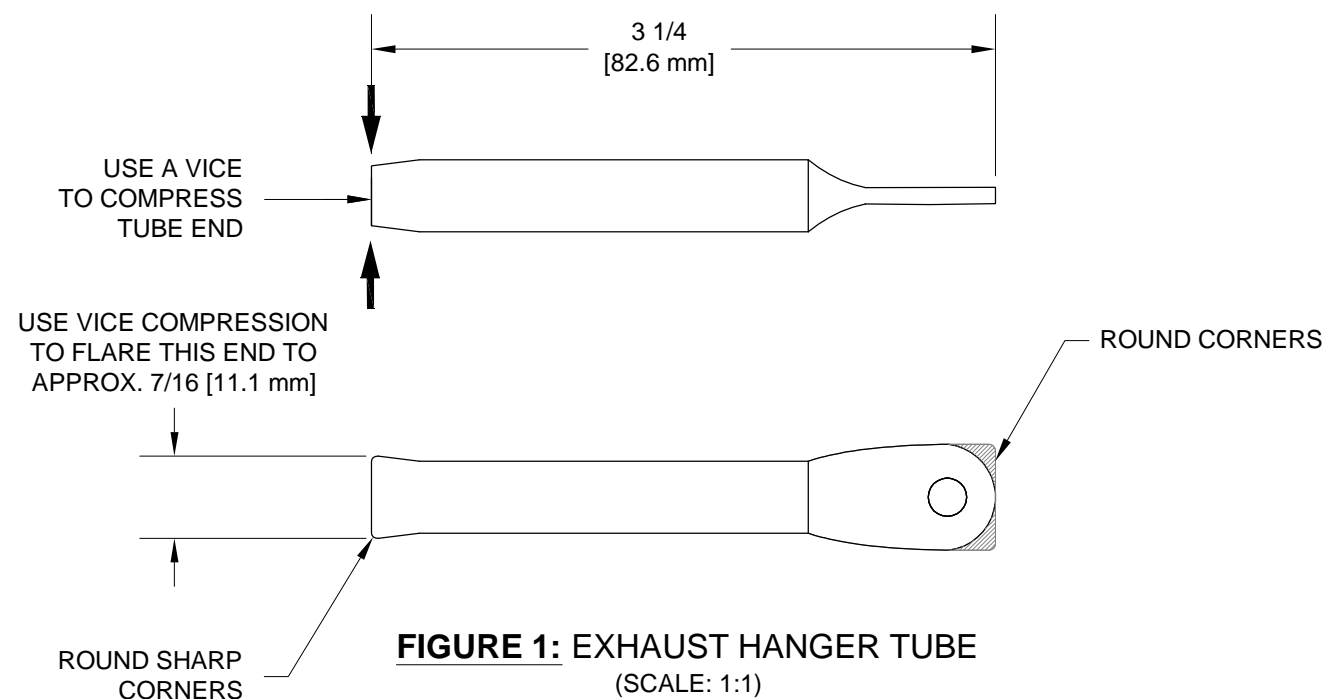
6X

AN3-13A
SPRING 13/32 X 1
NAS1149F0363P
MS21042-3

FIGURE 2: EXHAUST SYSTEM INSTALLATION
(ENGINE OMITTED FOR CLARITY)

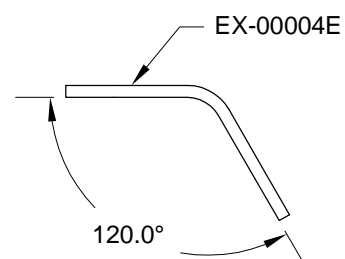


Step 1: Modify two EX-00004B Exhaust Support Tubes as shown in Figure 1.



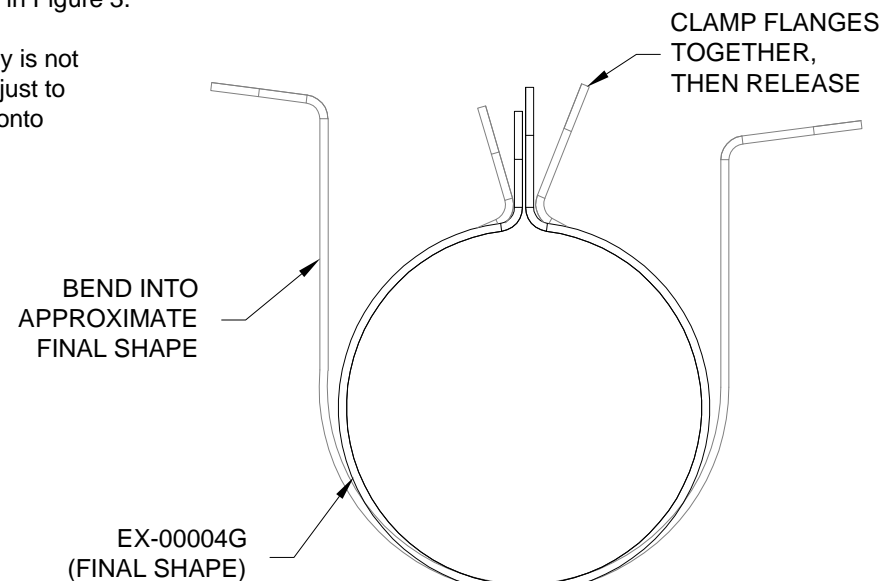
Step 2: Adjust the bend angle of the EX-00004E Exhaust Hanger Support Tab to the angle shown in Figure 2.

Step 3: Prime or paint the exhaust hanger support tab.



Step 4: Bend the EX-0004G Exhaust Hanger Bracket into the shape shown in Figure 3.

Duplicating the shape perfectly is not necessary, the bracket will adjust to correct shape when installed onto the tailpipe system.

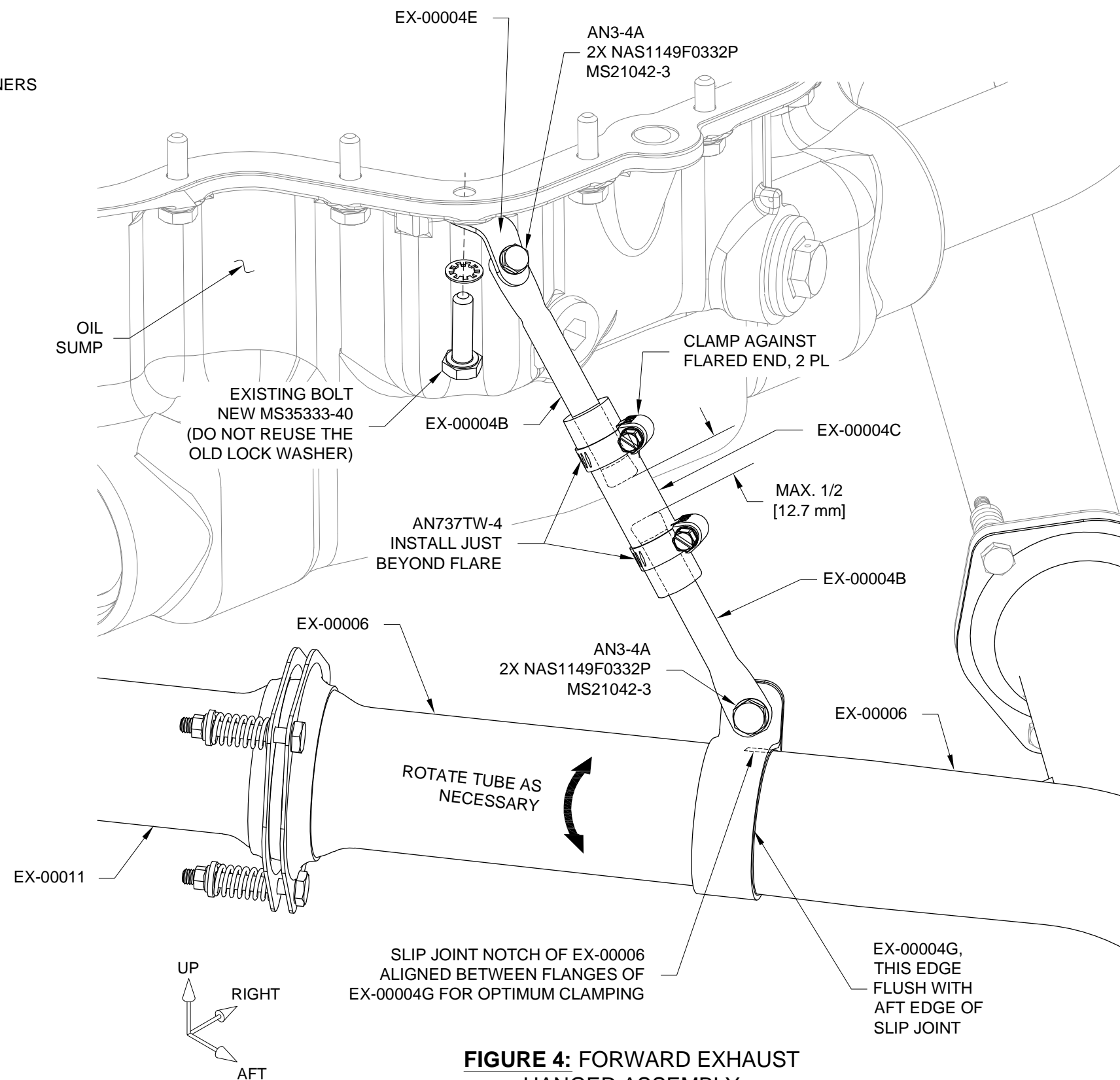


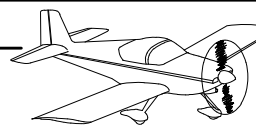
Step 5: Install the Forward Exhaust Hanger Assembly as shown in Figure 4.

Step 6: Verify that the slip joint in the tailpipe system has been clamped in place by the exhaust hanger bracket, and cannot be easily slid back and forth.

Step 7: Install lock washers under the exhaust flange nuts as shown on Page 48-02, Figure 2.

Step 8: Tighten the exhaust flange nuts. Use a torque value of 180-200 in/lbs.





Step 1: Modify the Right Vent Assembly as shown in Figure 1.

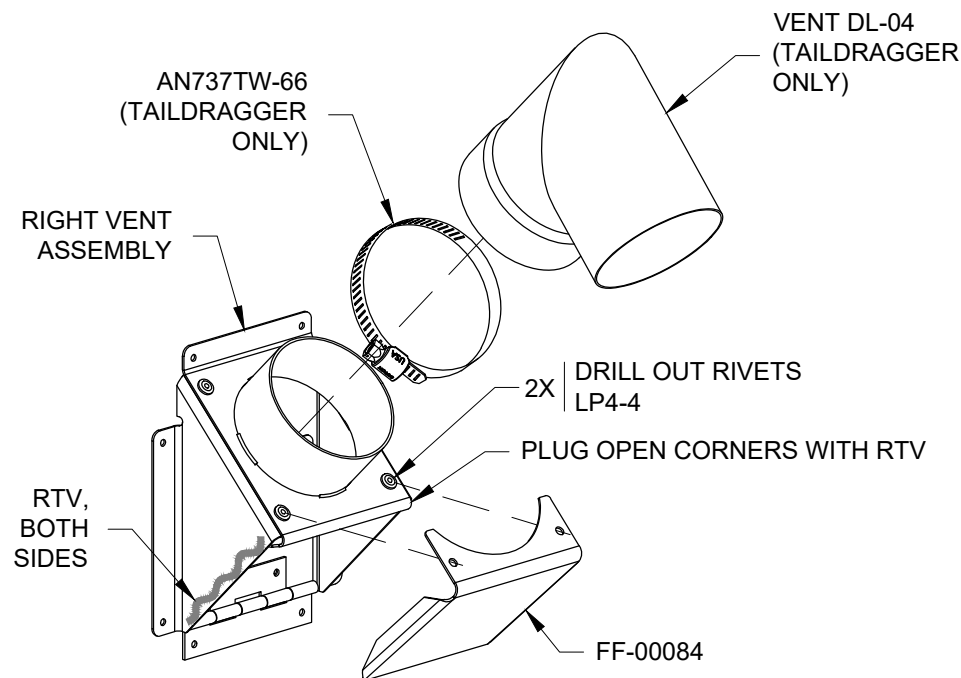


FIGURE 1: MODIFY RIGHT VENT ASSEMBLY

Step 2: Install the two Heat Muff Assemblies as shown in Figure 2 and Figure 3. Position the wider EX-00013L Heat Muff Ends on the inboard sides.

Step 3: Verify that the Heat Muff Assemblies cannot be easily moved along the exhaust tubes.

As necessary for a tighter fit, final-drill the through rod holes in the EX-00013K & L Heat Muff Ends, loosely reassemble the Heat Muff Assembly, tighten the hose clamps, and then tighten the lock nuts. See Figure 2.

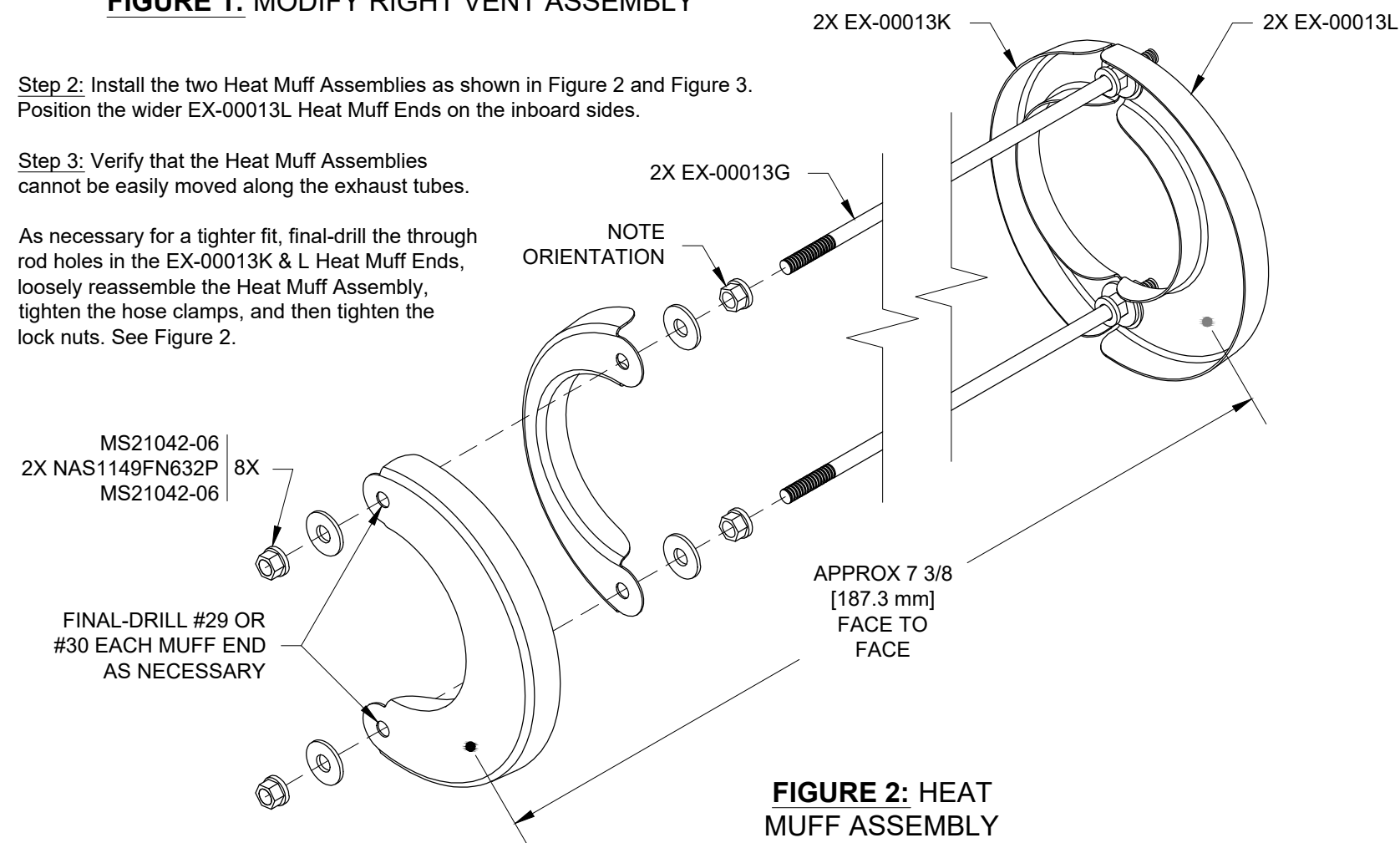


FIGURE 2: HEAT MUFF ASSEMBLY

Step 4: Gently spread, then install the EX-00013F Forward Heat Muff Skin and EX-00013E Aft Heat Muff Skin. Install by sliding the skin along its axis, over and onto the Heat Muff Assemblies. Do not attempt to install the skins from the bottom or sides: over-spreading the skins will cause permanent deformation. See Figure 3.

As closely as possible, align the heat muff skin tubes called-out in Figure 3.

Step 5: Secure the heat muff skins using the clamps called out in the detail view of Figure 3. Position the screw portion of the clamp over the seam in the heat muff skins.

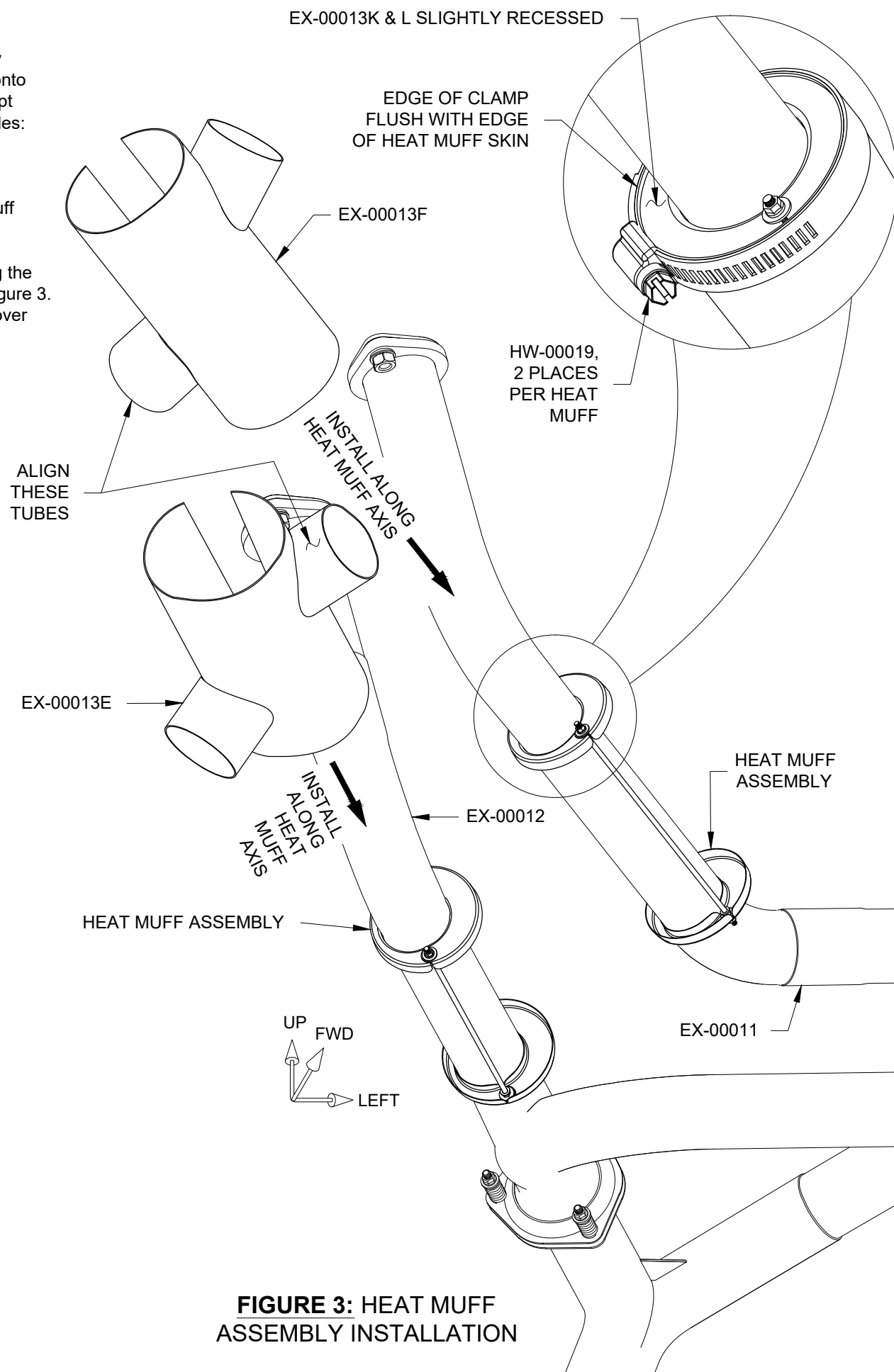


FIGURE 3: HEAT MUFF ASSEMBLY INSTALLATION

NOTE: The scat hose lengths provided are a "best case" length. Individual firewall forward installations may vary slightly.

Step 1: Fabricate the scat hoses by using a sharp knife and a wire cutter to cut the 2 in. scat hose into the following lengths:

Part #		Length	UNSPPOOL WIRE 3/4 [19.1 mm] FROM END. CUT OFF HALF THE LENGTH OF THE UNSPOOLED WIRE
FF-00007A	Fwd Scat Hose	13 1/2 in. [342.9 mm]	
FF-00007B	Mid Scat Hose	2 1/2 in. [63.5 mm]	
FF-00007C	Right Scat Hose	10 1/2 in. [266.7 mm]	
FF-00007D	Lower Scat Hose	16 in. [406.4 mm]	
FF-00007E	Left Scat Hose (Tri-Gear)	24 in. [609.6 mm]	
FF-00007E	Left Scat Hose (Tail Dragger)	25 in. [635.0 mm]	

Step 2: Remove all wire from the inside of the FF-00007B Mid Scat Hose.

Step 3: Modify the ends of the wires inside the scat hoses as shown in Figure 1.
The goal is to reduce the diameter of the wire loop and allow the wire to rest inside the unbent loops without pushing against the inside of the orange material.

Step 4: Tuck the end of the wire inside the remaining wire loops. Verify that the bent end of the wire rests on an unbent wire loop, and not against the inside of the orange material.

Step 5: Reduce the BUSH AL .197 X .313 X .968 Bushing to a length of 3/4 in. [19.1 mm].

Step 6: Install the VENT-00002 2" Duct Tee and clamps as shown in Figure 2. See Figure 3 and Figure 4 for additional detail. Use safety wire to secure the smaller clamps to aid in installation.

BEND INWARD,
1/4 [6.4 mm] FROM WIRE END

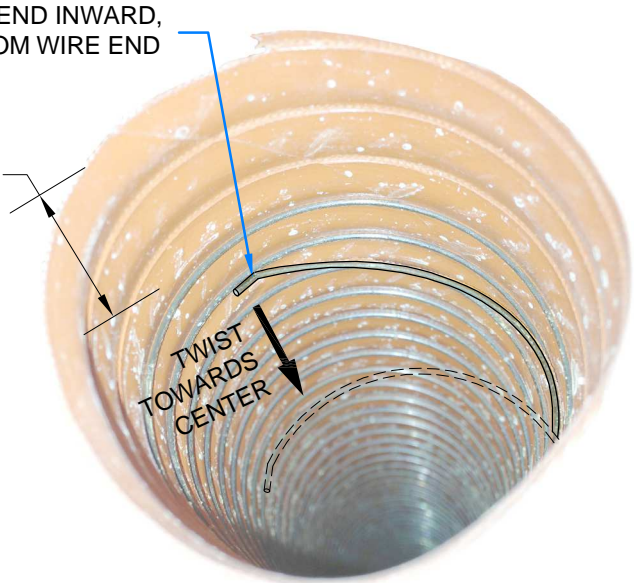


FIGURE 1: SCAT HOSE PREPARATION

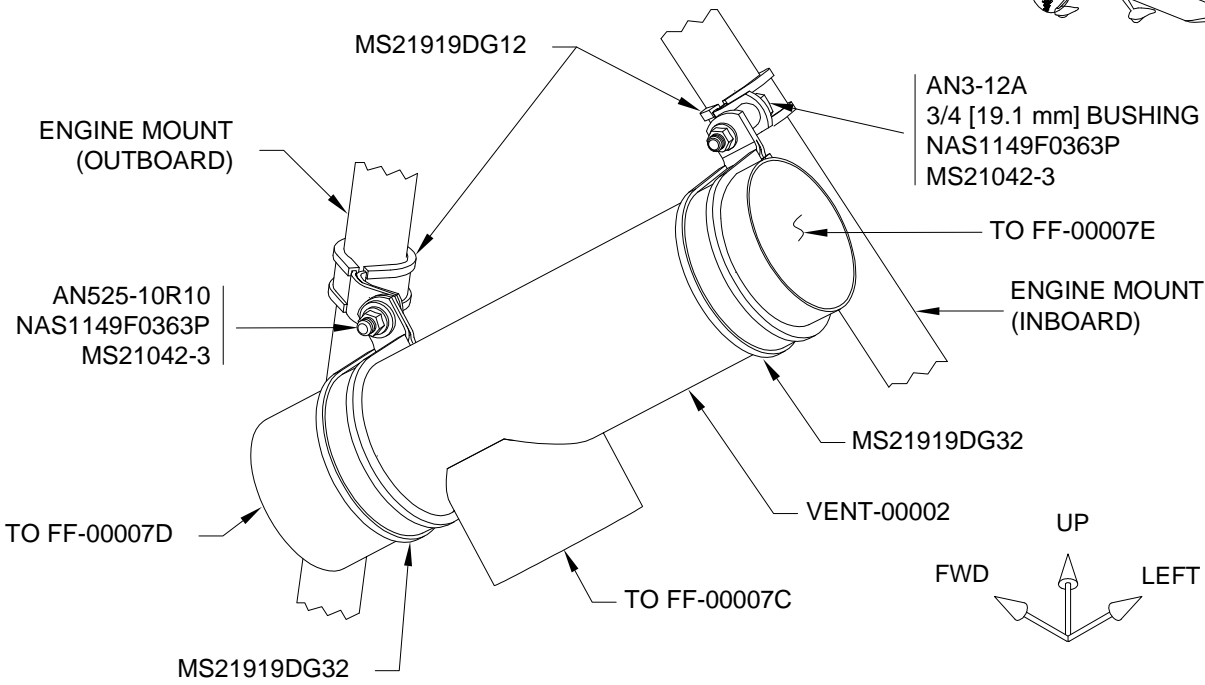


FIGURE 2: TEE INSTALLATION

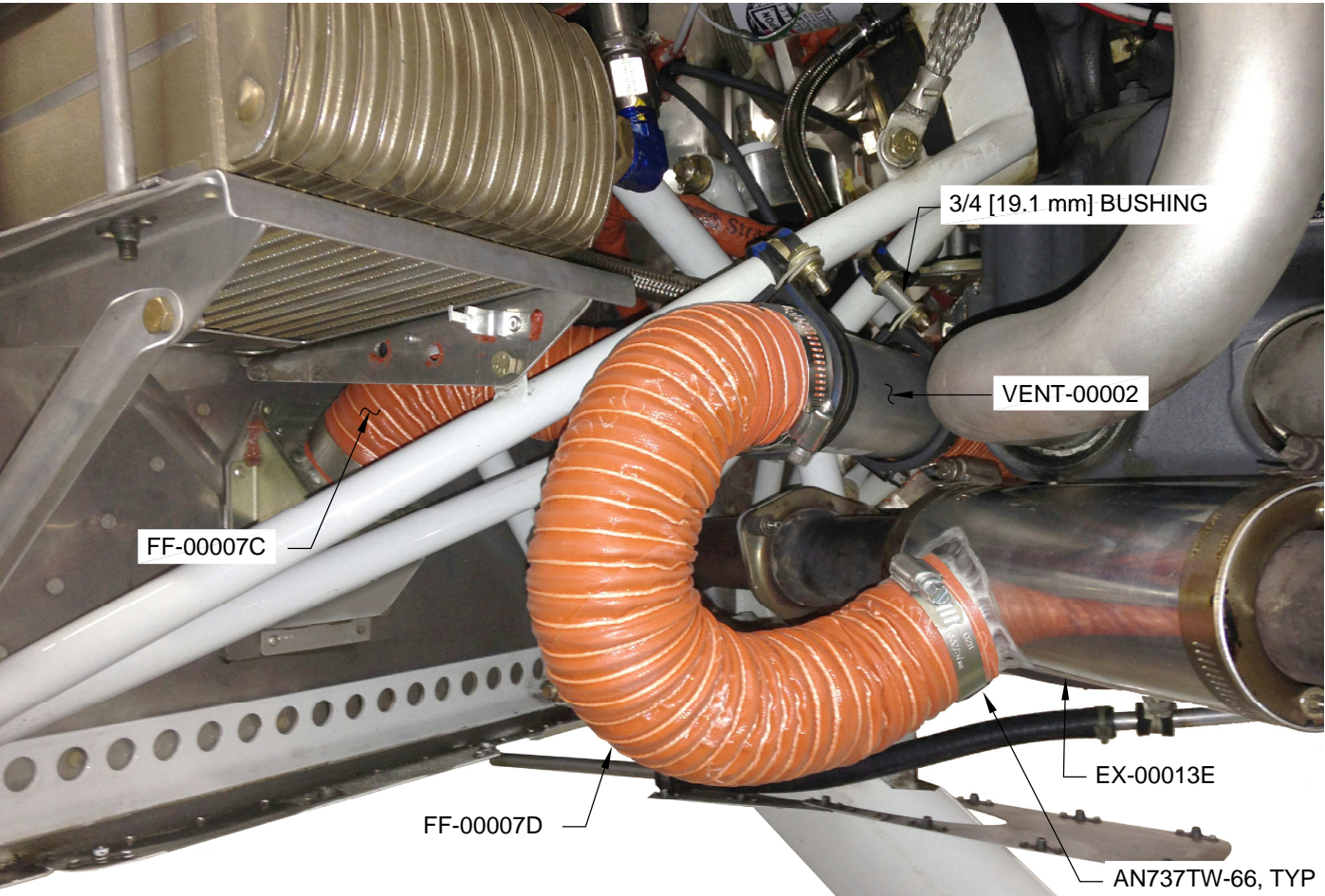


FIGURE 3: SCAT TUBE INSTALLATION (TRI-GEAR ONLY)

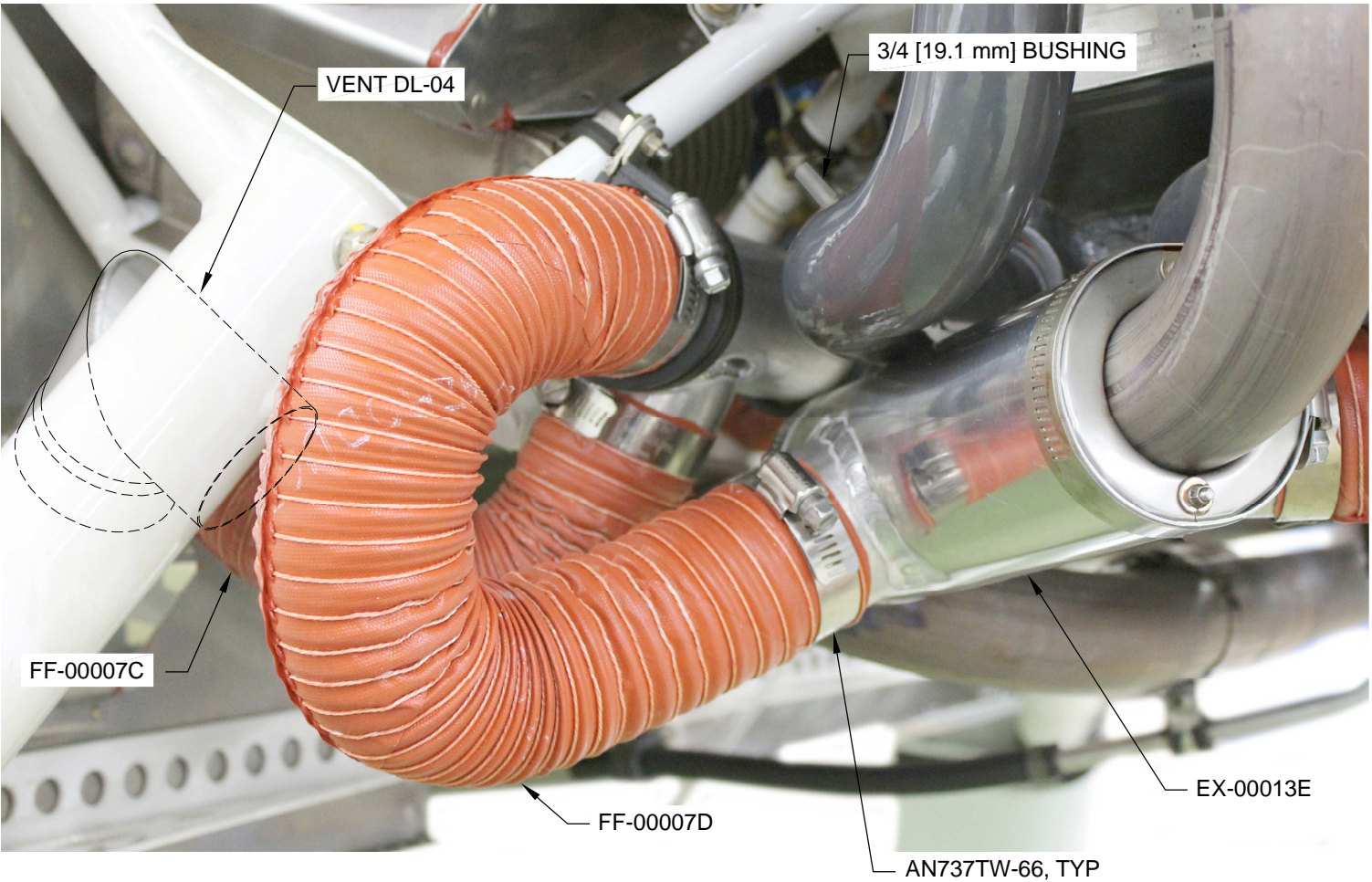
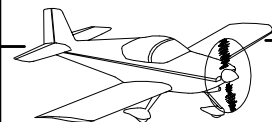


FIGURE 4: SCAT TUBE INSTALLATION (TAIL DRAGGER ONLY)



Step 1: Apply a 1/4 in. [6.4 mm], continuous line of RTV along the scat hose. This will prevent the string from unraveling if a break occurs. See Figure 1.

Step 2: Temporarily route and install the scat hoses, ensuring that they route as shown in Figure 2, and on Page 48-05, Figure 3 and Figure 4. Strive for minimal contact between the scat hoses and other components. In some areas, light contact with other components may be unavoidable.

Where light contact is unavoidable, protect the contact areas by applying a generous (larger than 1/2 in. [12.7 mm] in diameter) bead of RTV on the scat hose.

Adjust the routing as necessary by experimenting with the position and rotation of the heat muff assemblies and clamps. If necessary, trim the length of the scat hoses.

Except for the FF-00007B Mid Scat Hose, the wire loops inside the scat hoses should terminate just before the end of the aluminum tube where it will be installed. To minimize wear and tear on the scat hoses, avoid excess (greater than 1/4 in. [6.4 mm]) lengths of unsupported scat hose. See Figure 1.

Step 3: Verify that each scat hose is secured at both ends with a clamp. See Figure 2.

Step 4: Install the three EA LV-1 Heat Shield Assemblies where shown in Figure 2. Position the heat shield assemblies to best protect the items called out.

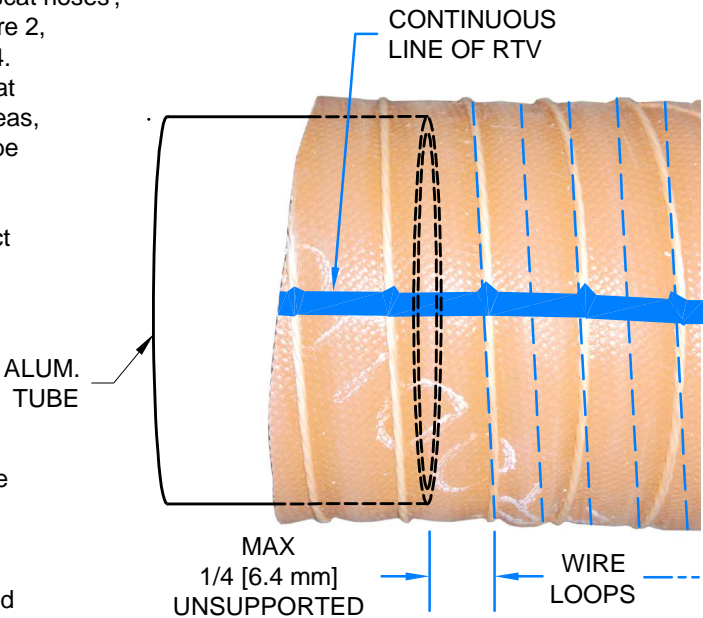


FIGURE 1: SCAT HOSE PREPARATION

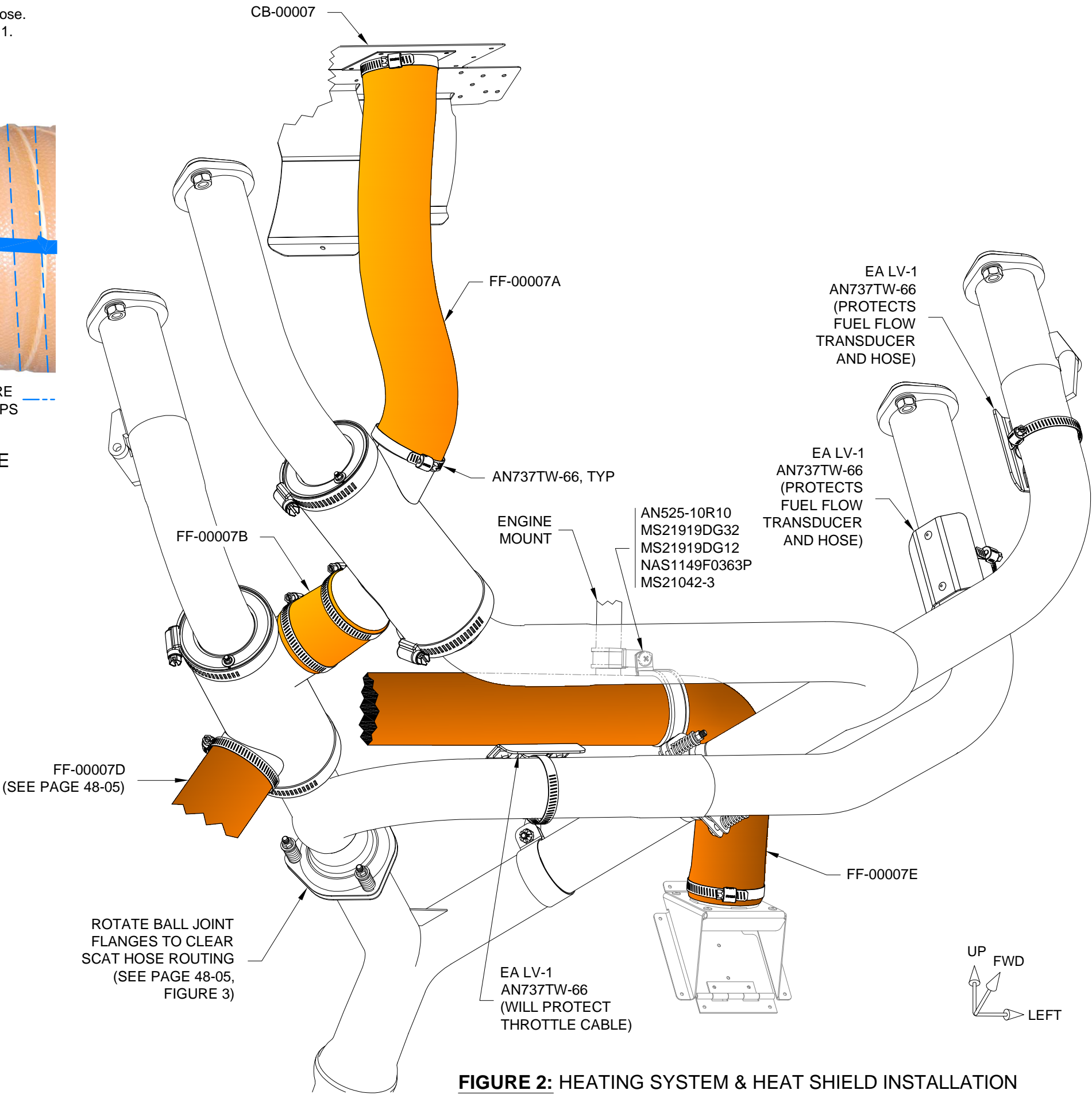
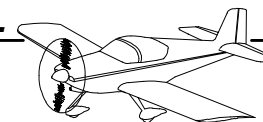


FIGURE 2: HEATING SYSTEM & HEAT SHIELD INSTALLATION



NOTE: The sensors shown in this section are shown for convenience. These may be ordered and installed at this time if the avionics choice has been determined by the builder:

ES SENSOR KIT DYN-AFS IO-LYC (Dynon or Advanced Flight Systems)

ES SENSOR KIT GARMIN IO-LYC (Garmin G3X Avionics)

Different sensors will be required for other avionics choices.

It is the responsibility of the builder to ensure that the senders are compatible with their choice in avionics.

NOTE: See Section 51: Powerplant Miscelanea, for additional images of the EGT Probe wire routing.

Step 1: Install the EGT Probes where shown in Figure 1 and Figure 2.

Step 2: Route the EGT wires as shown in Figure 1 and Figure 2. Position a dip or loop (as wire length allows) in the wire adjacent to each probe.

Step 3: Bend the spring on each probe to position the lowest point of the dip or loop lower than the probe. This will create a low point to prevent oil and other fluids from wicking into the probe.

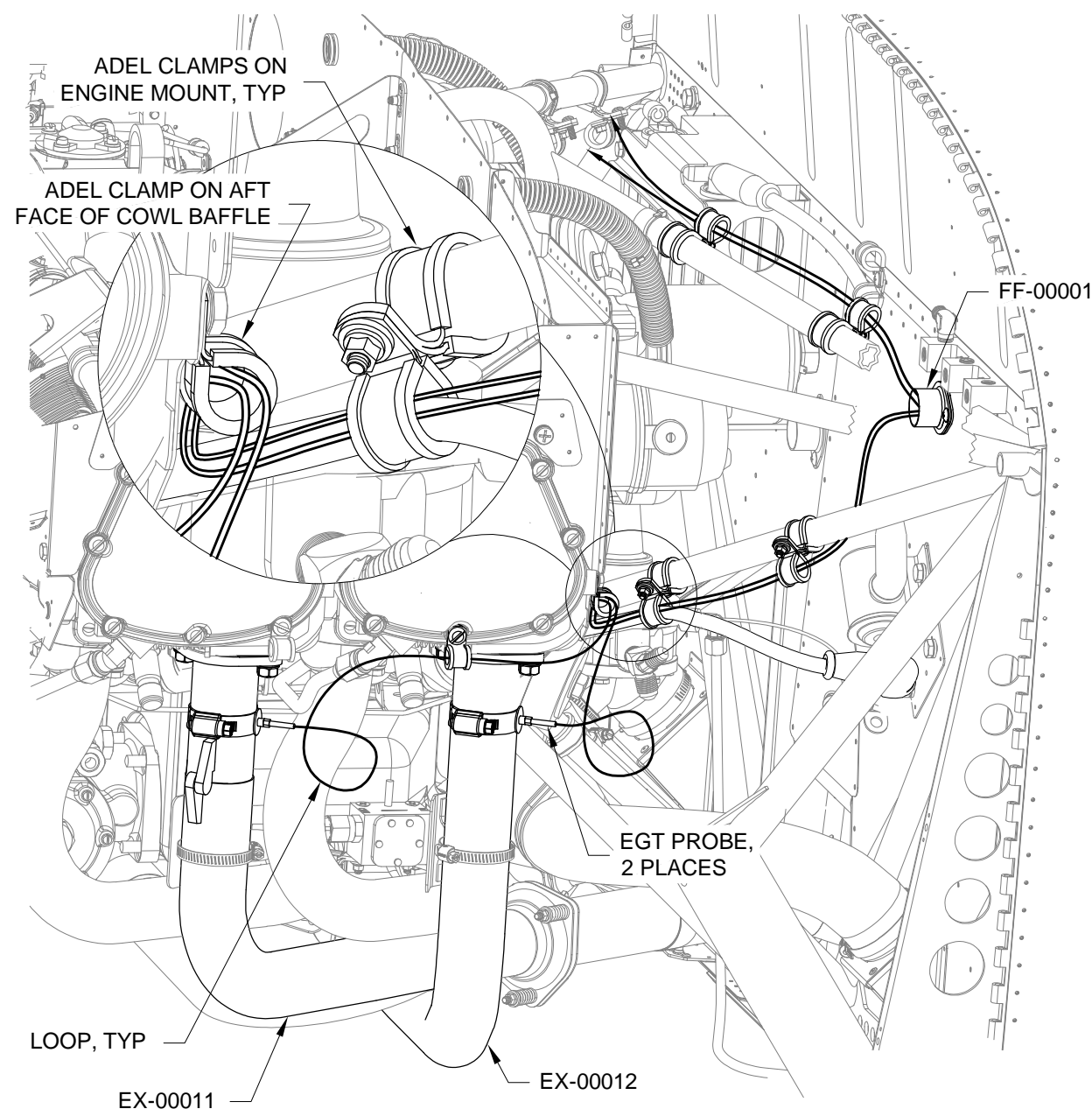


FIGURE 1: LEFT SIDE EGT INSTALLATION

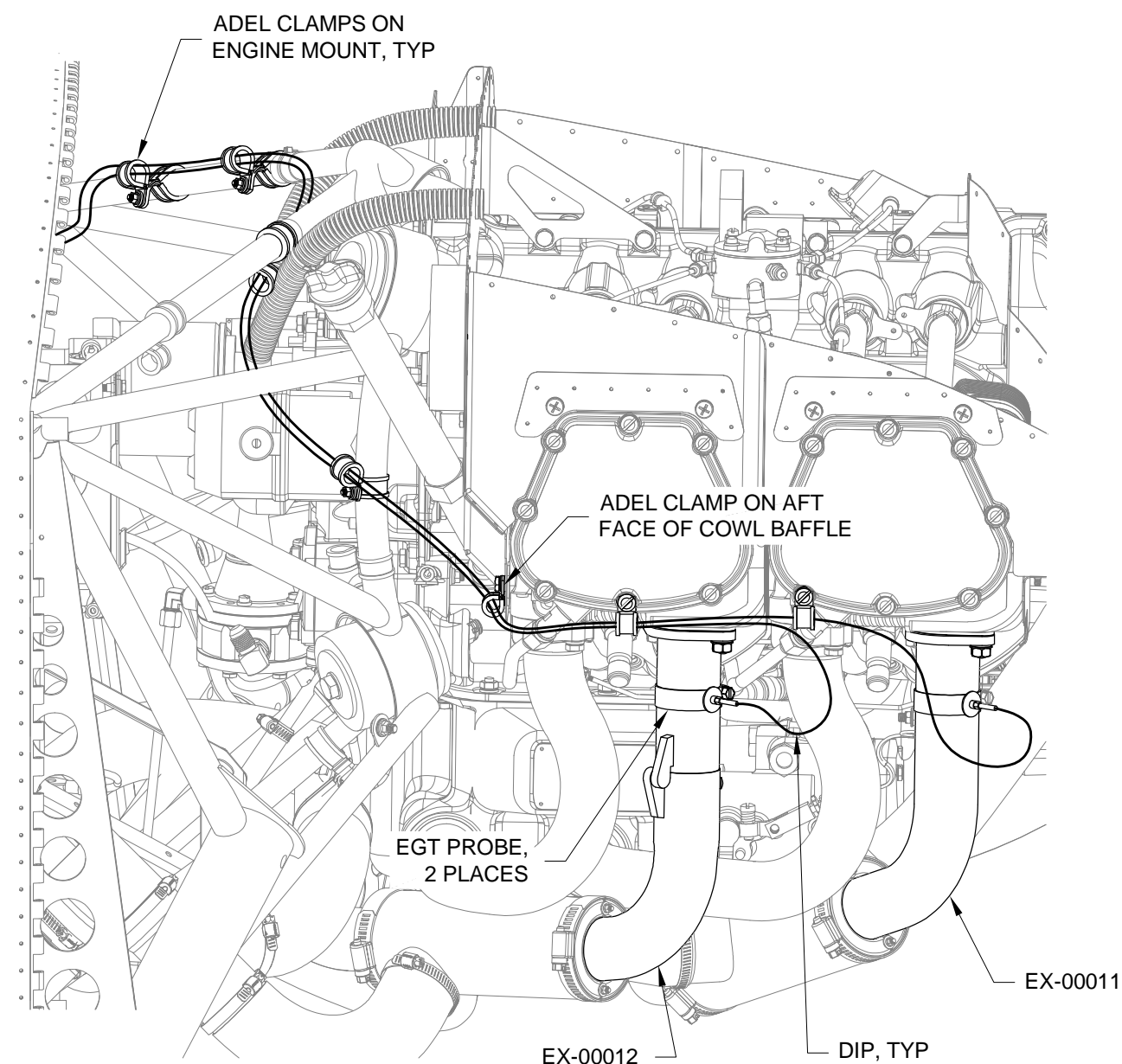


FIGURE 2: RIGHT SIDE EGT INSTALLATION



THIS PAGE INTENTIONALLY LEFT BLANK

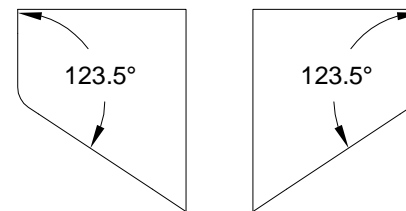
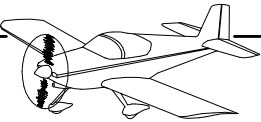


FIGURE 1: HANGER ANGLE TEMPLATE



THIS PAGE INTENTIONALLY LEFT BLANK