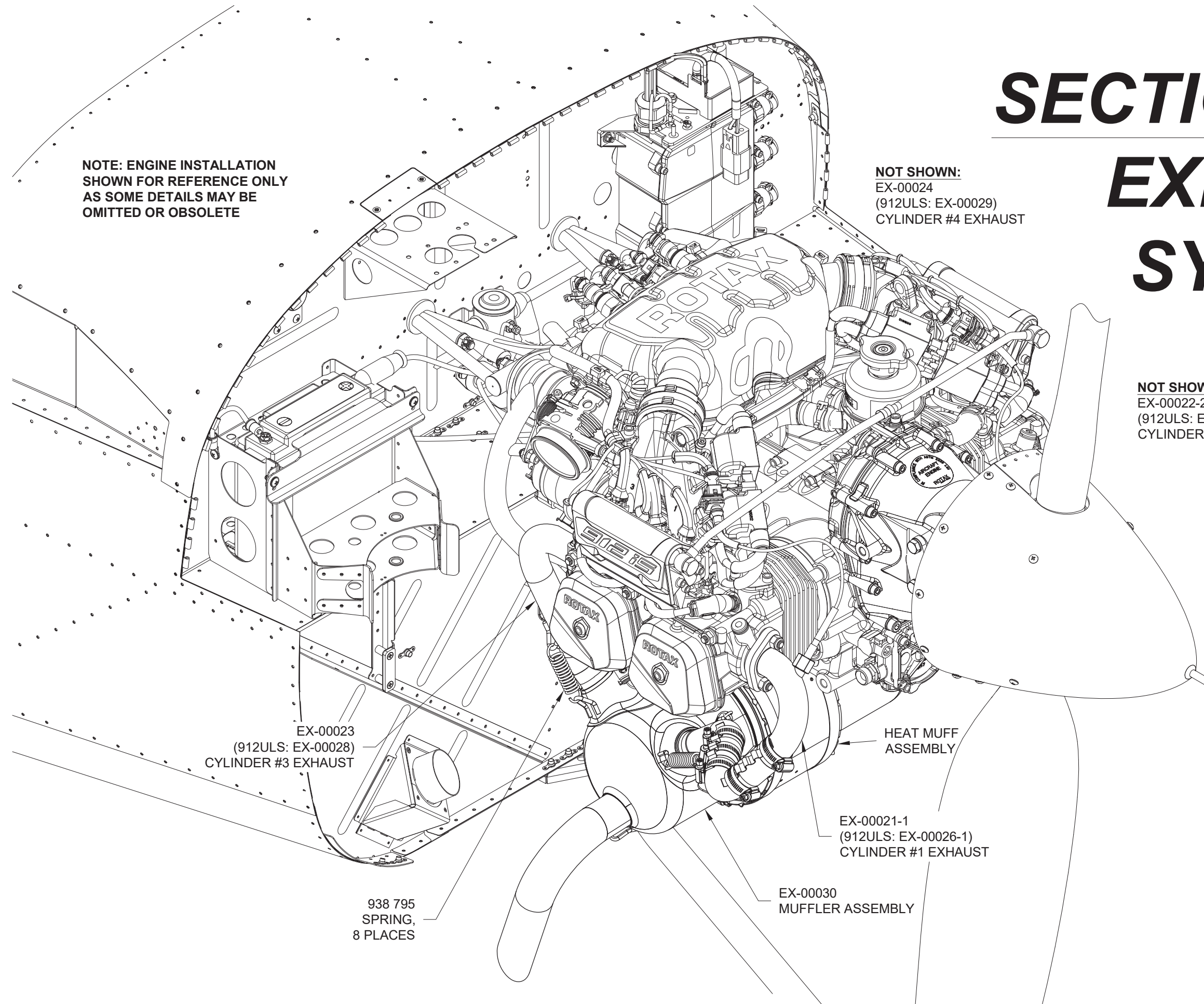


SECTION 48iS/U: EXHAUST SYSTEM

NOTE: ENGINE INSTALLATION
SHOWN FOR REFERENCE ONLY
AS SOME DETAILS MAY BE
OMITTED OR OBSOLETE

NOT SHOWN:
EX-00024
(912ULS: EX-00029)
CYLINDER #4 EXHAUST

NOT SHOWN:
EX-00022-2
(912ULS: EX-00027-2)
CYLINDER #2 EXHAUST



EX-00023
(912ULS: EX-00028)
CYLINDER #3 EXHAUST

HEAT MUFF
ASSEMBLY

EX-00021-1
(912ULS: EX-00026-1)
CYLINDER #1 EXHAUST

EX-00030
MUFFLER ASSEMBLY

938 795
SPRING,
8 PLACES



NOTE: Exhaust installation is similar for the 912iS and 912ULS exhaust systems, differing only in the EGT probe installation. The 912iS installation is shown in all figures, but the installation steps apply to both engines. 912ULS EGT probe installation is covered at the end of this section.

Step 1: Mark 23 locations around each long edge of the FF-00090H Heat Muff Outer, starting 1.3 in [33.0 mm] from one end of the FF-00090H and spaced 0.9 in [22.9 mm] apart around the circumference.

Step 2: Make small flutes at the marked locations using fluting pliers as shown in Figure 1.

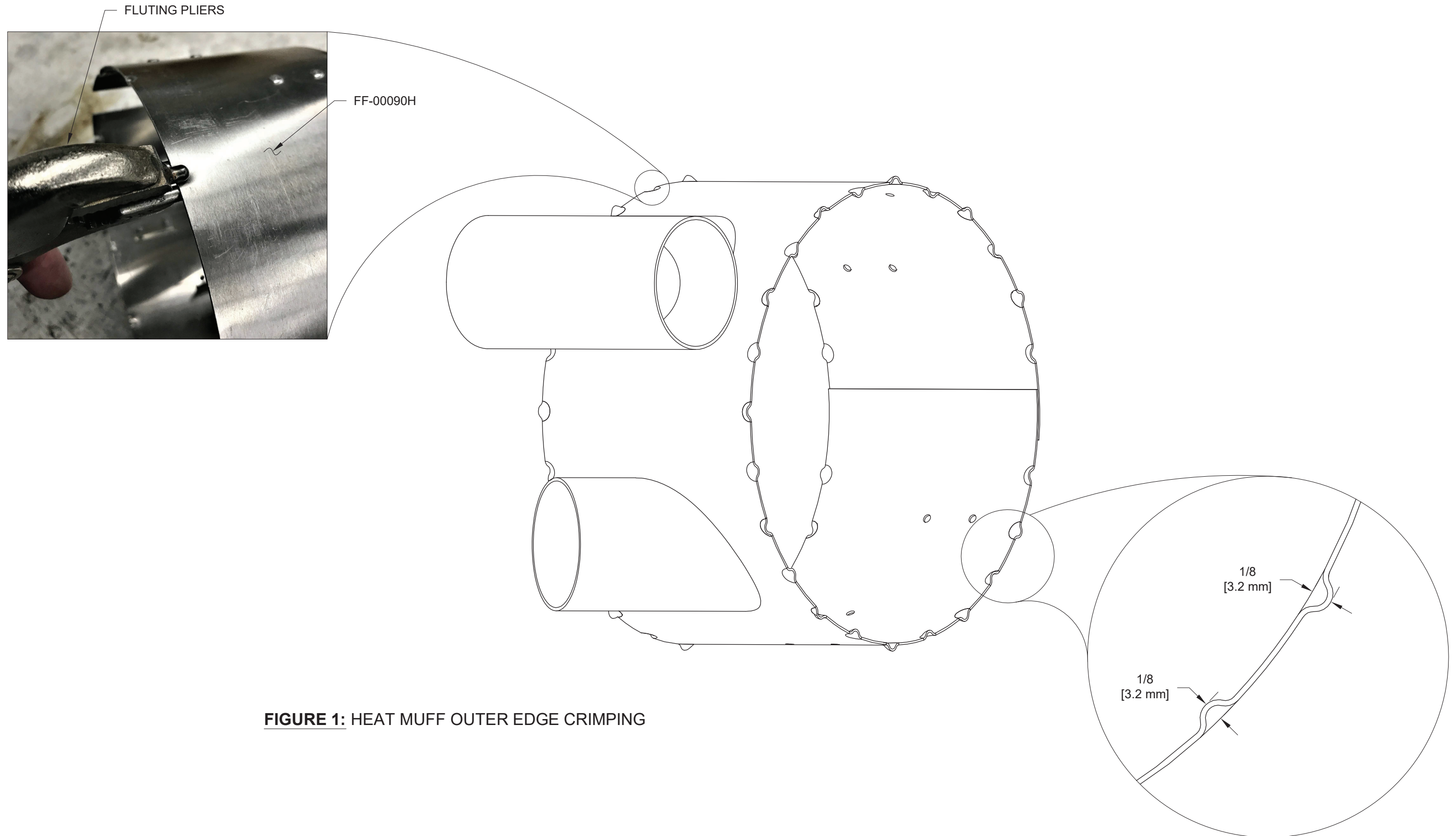
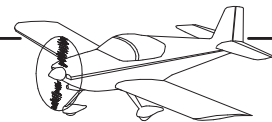


FIGURE 1: HEAT MUFF OUTER EDGE CRIMPING



Step 1: Gently spread, then install the FF-00090A Heat Muff Inner Wrap onto the muffler assembly, placing the seam on the lower aft portion of the muffler assembly.

Secure the FF-00090A with the clamp called out in Figure 1. Position the screw portion of the clamp over the seam in the FF-00090A inner wrap and on the lower aft portion of the muffler assembly. Do not fully tighten the clamp at this time.

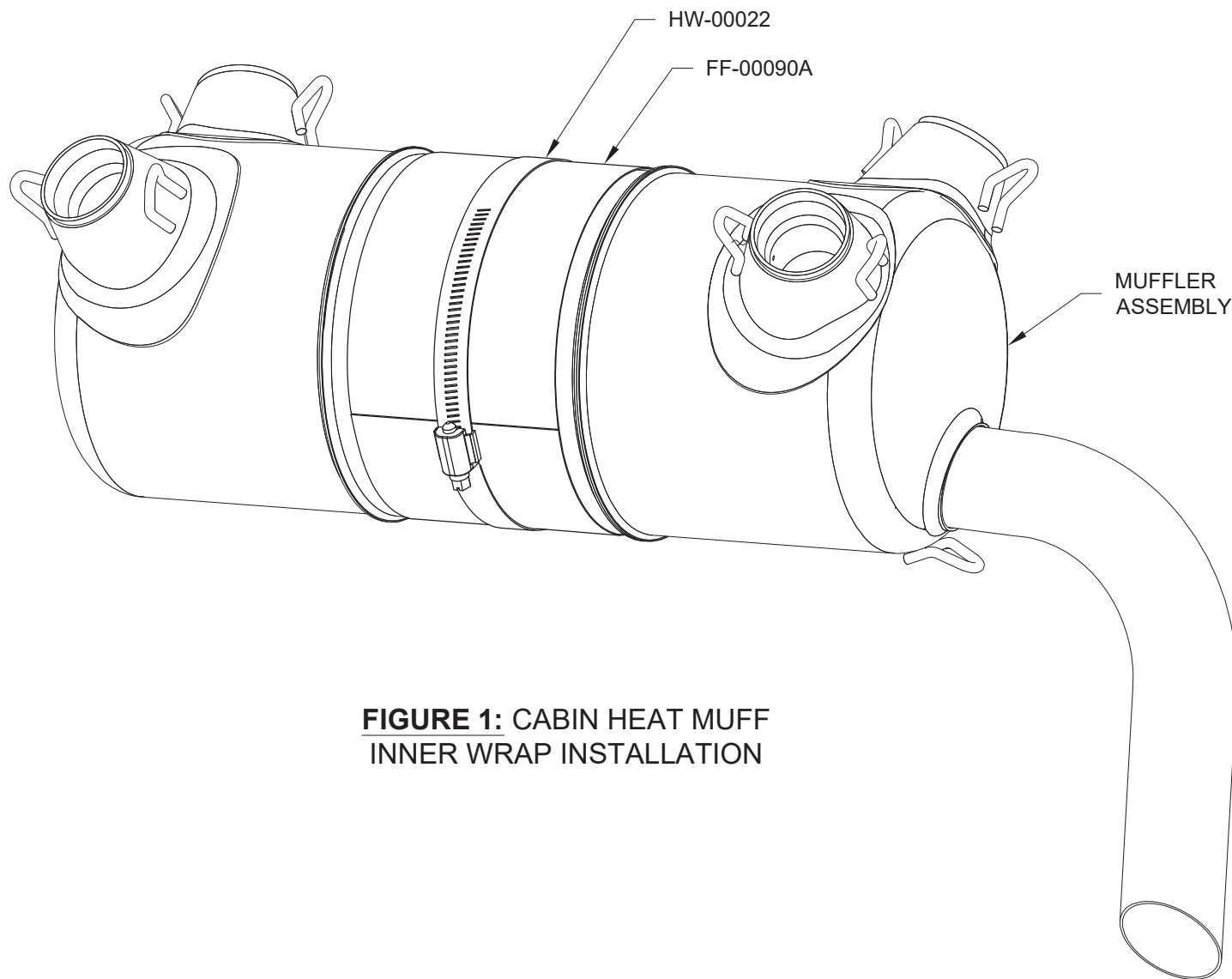


FIGURE 1: CABIN HEAT MUFF INNER WRAP INSTALLATION

Step 3: Separate the FF-00090J Heat Muff Baffles as shown in Figure 3.

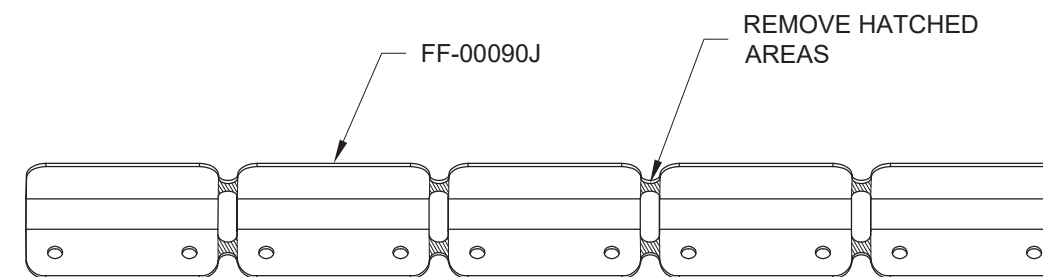


FIGURE 3: SEPARATING THE HEAT MUFF BAFFLES

Step 4: If required, final-drill #30 the .098 [2.5 mm] holes in the FF-00090J and FF-00090H.

Rivet the FF-00090J to the FF-00090H as shown in Figure 4.

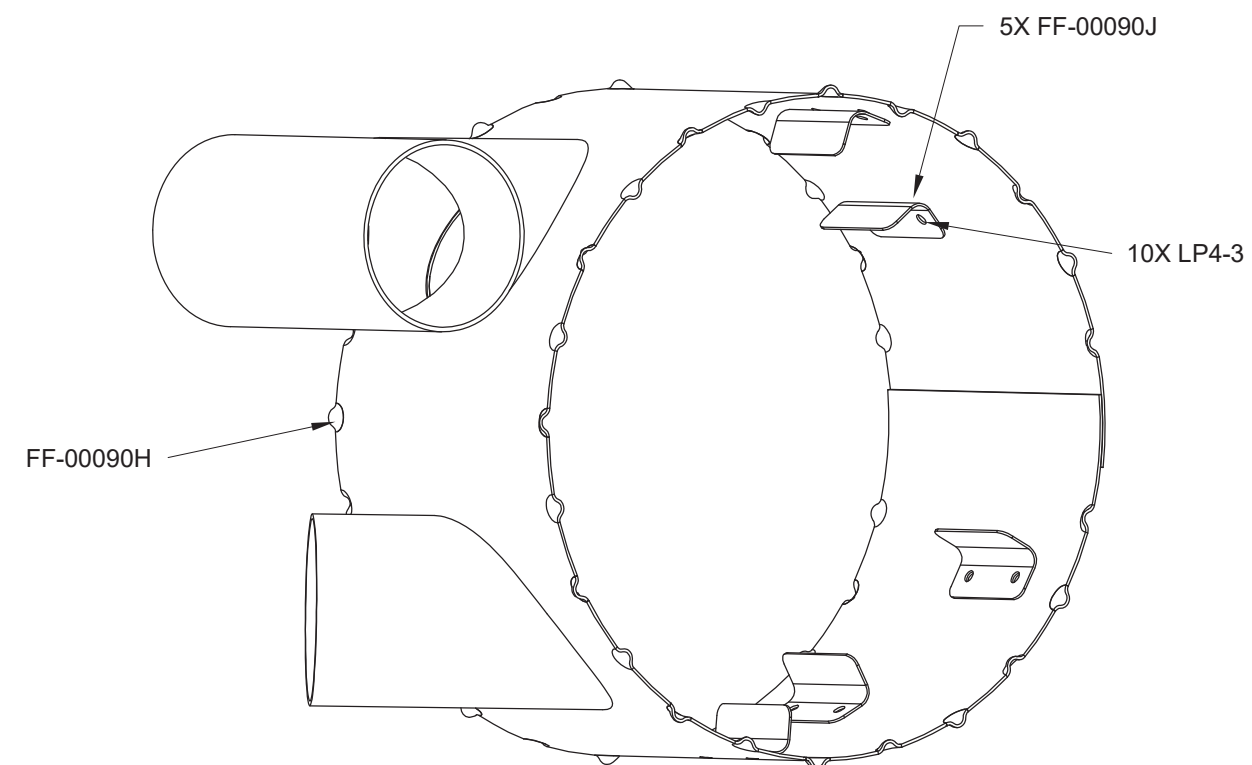


FIGURE 4: HEAT MUFF BAFFLE INSTALLATION

Step 2: Assemble the FF-00090L Heat Muff Rod and the hardware as shown in Figure 2.

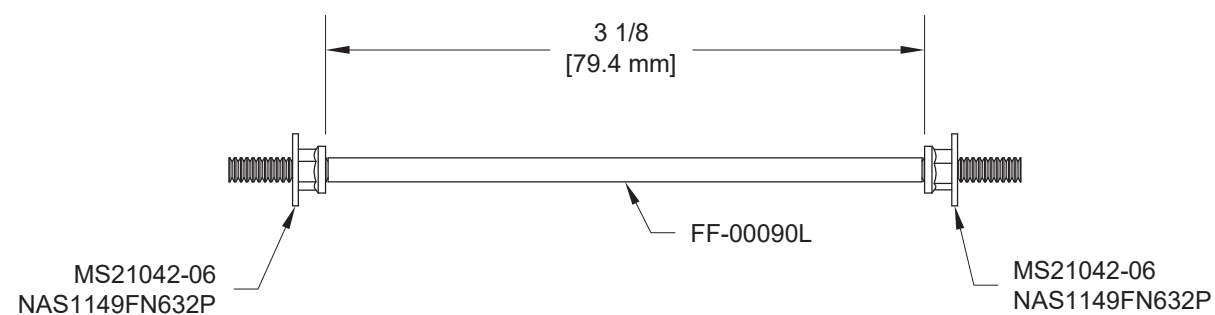


FIGURE 2: HEAT MUFF ROD ASSEMBLY



Step 1: Remove any sharp points formed by the relief notches on the outside of the FF-00090B Heat Muff Ribs; this will provide a better seal after the FF-00090H is installed.

Step 2: Install the FF-00090B, FF-00090K Heat Muff Dam, and Heat Muff Rod Assembly with hardware as shown in Figure 1 and Figure 2. Make sure the FF-00090K is located on the aft side of the muffler assembly as shown in Figure 1 and the small notch in the FF-00090K is positioned over the clamp.

Make sure the FF-00090K is clear of the clamp screw, then tighten the clamp.

Step 3: Verify that the assembled FF-00090B cannot be easily moved along the muffler assembly. As necessary, adjust the inner flanges of the FF-00090B inward to provide greater clamping force. See Figure 1.

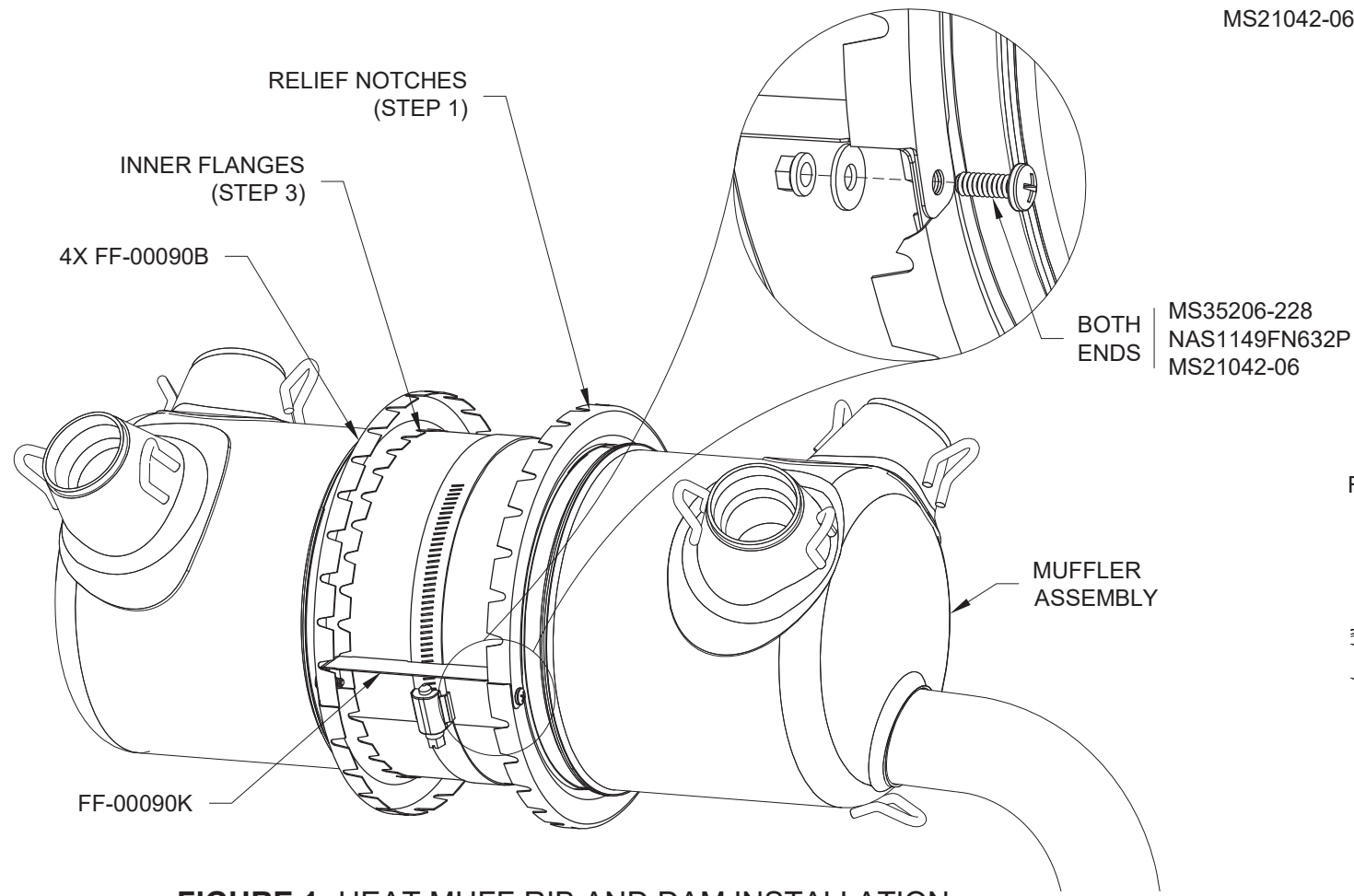


FIGURE 1: HEAT MUFF RIB AND DAM INSTALLATION

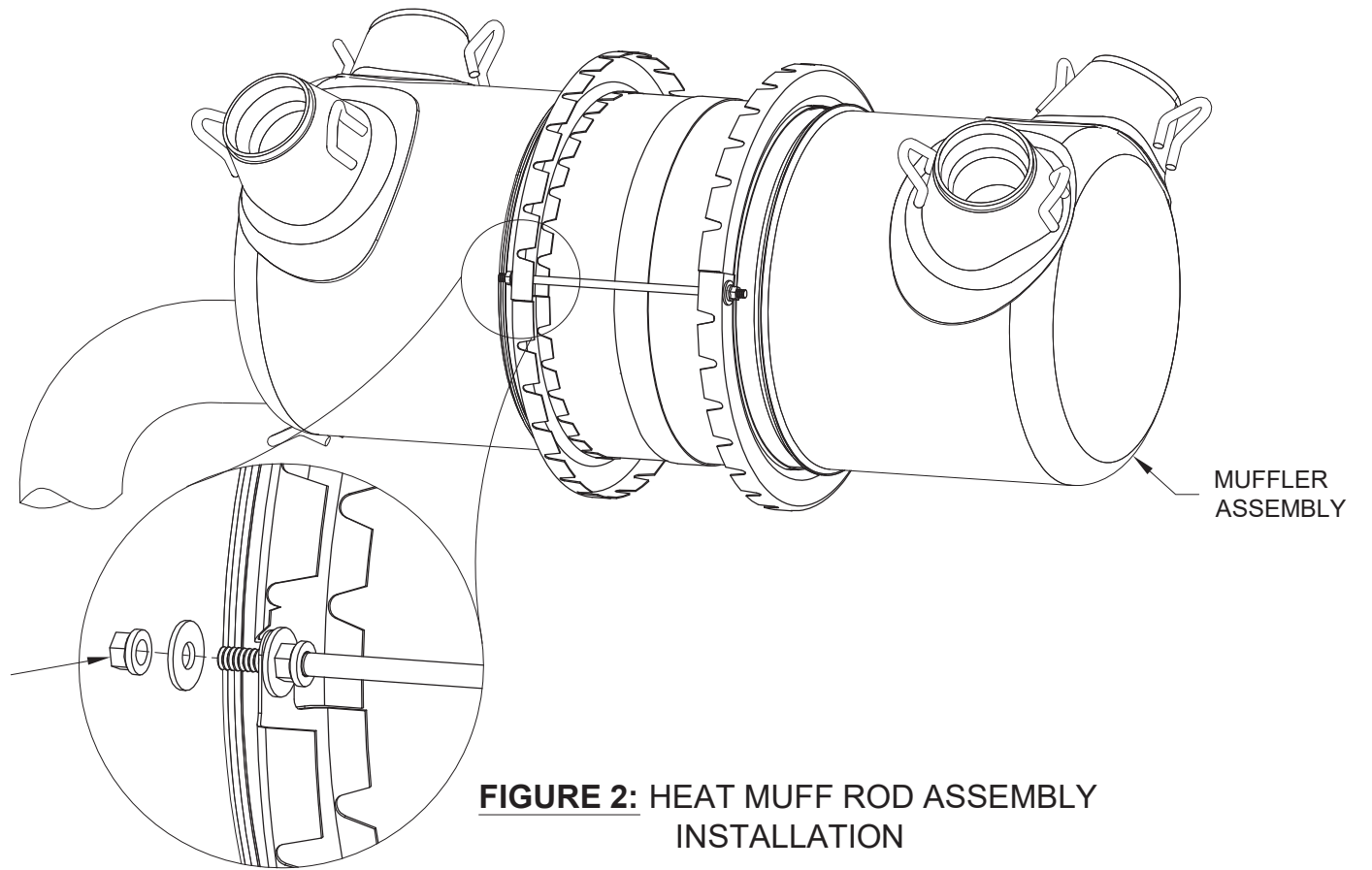


FIGURE 2: HEAT MUFF ROD ASSEMBLY INSTALLATION

Step 4: Gently spread the FF-00090H, then slide it along its axis, over and onto the four FF-00090B. Align the FF-00090H as shown in Figure 3, with the FF-00090K between the inlet and outlet tubes of the FF-00090H

Step 5: Secure the FF-00090H using the clamps called out in Figure 4, positioned as shown. Do not fully tighten the clamps at this time.

For the remainder of this section, this assembly will be called the Heat Muff Assembly.

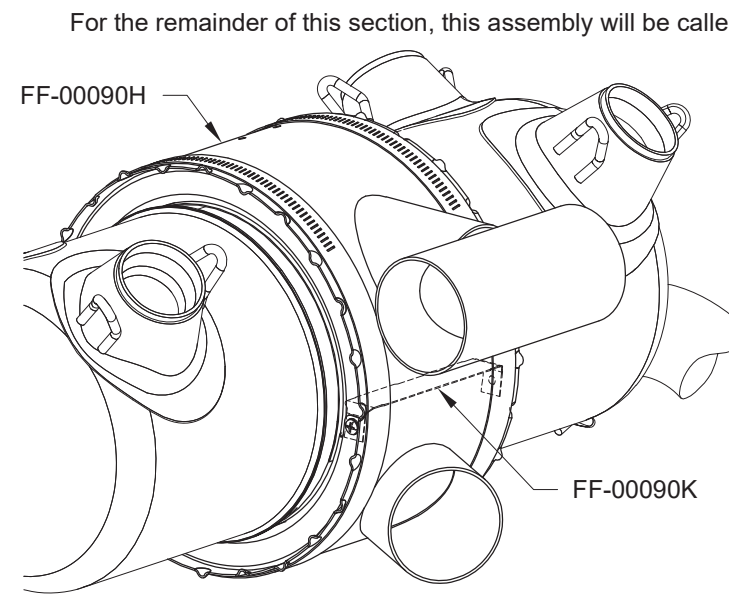


FIGURE 3: FF-00090H INSTALLATION

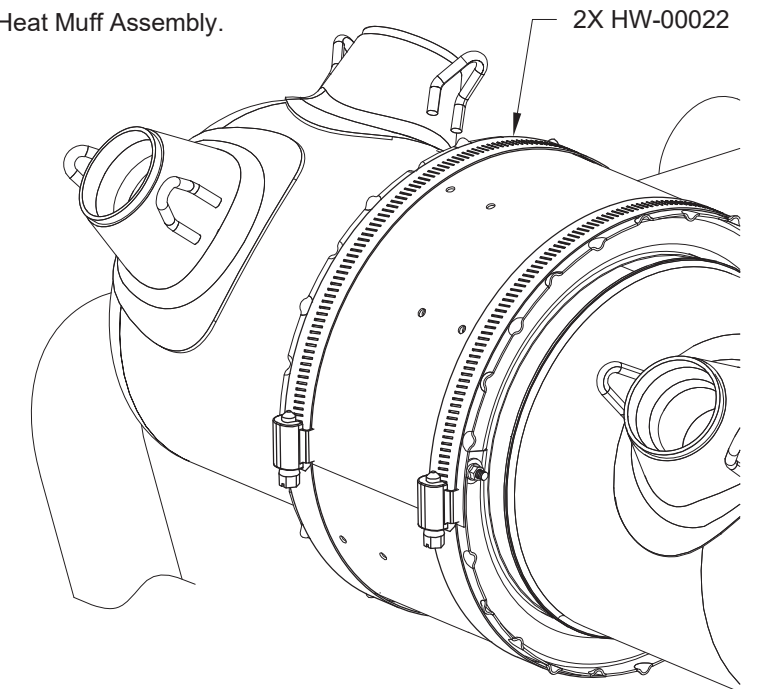
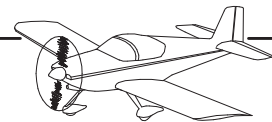


FIGURE 4: CLAMP INSTALLATION



NOTE: Details of the engine installation that do not pertain to the exhaust system are shown for reference only as some features may have been omitted or are obsolete.

Step 1: Remove the exhaust port plugs and exhaust stud nuts from all four cylinders of the engine. Keep the nuts for use in this section.

NOTE: The EX-00021-1 Cylinder #1 Exhaust is called out by its components as shown in Figure 2 during the installation process and as an assembly once installed.

Step 2: Identify the EX-00021E as shown in Figure 2, then install the EX-00021E into the right side forward exhaust port as shown in Figure 1. Tighten the exhaust nuts until the EX-00021E is seated in the cylinder, but still free to rotate with light pressure.

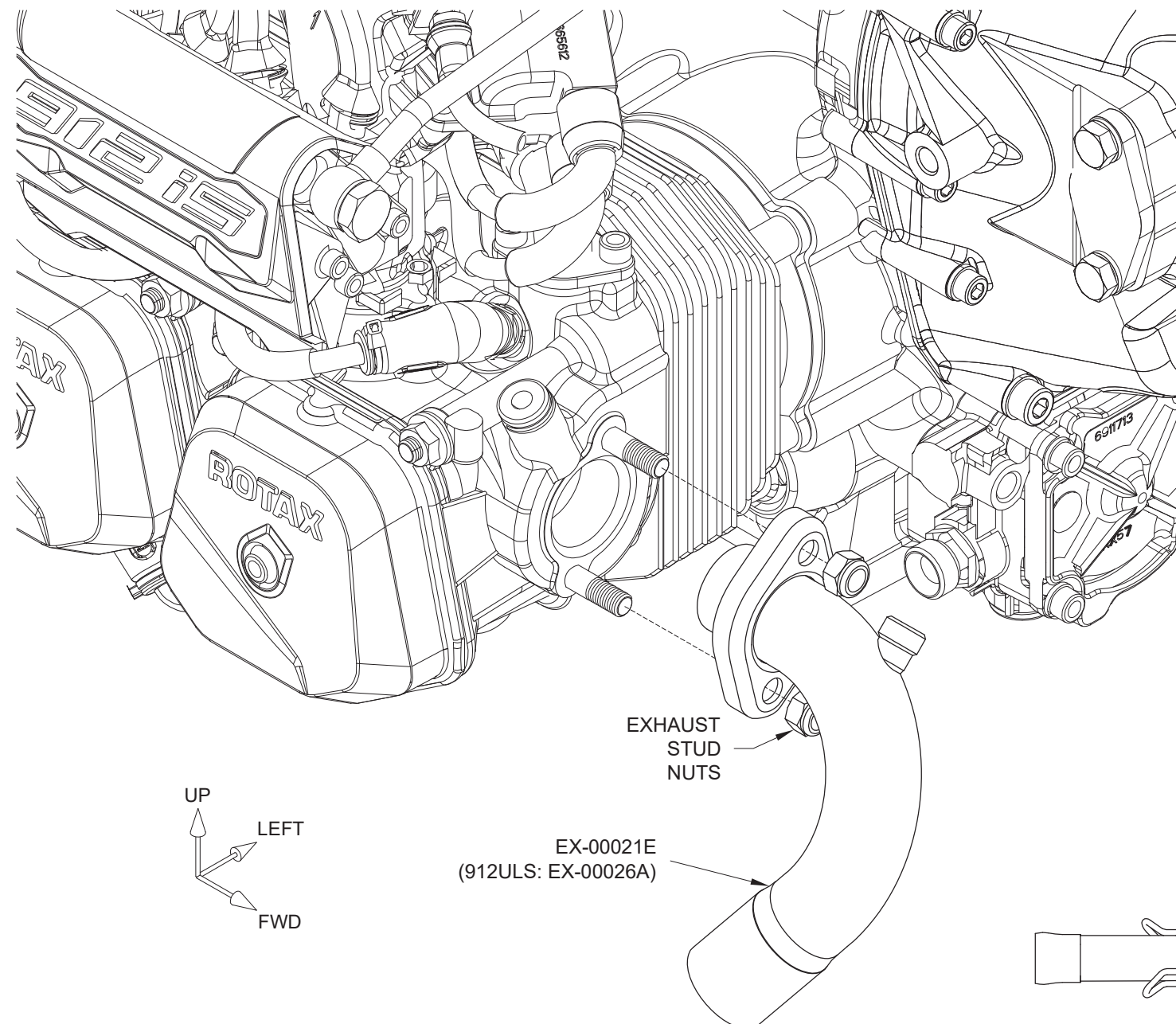


FIGURE 1: CYLINDER #1 EXHAUST INSTALLATION

Step 3: Install the EX-00022-2 into the left side forward exhaust port as shown in Figure 3. Start the exhaust stud nuts onto the studs but do not tighten further than the point at which the exhaust stud begins to extend beyond the end of the nut.

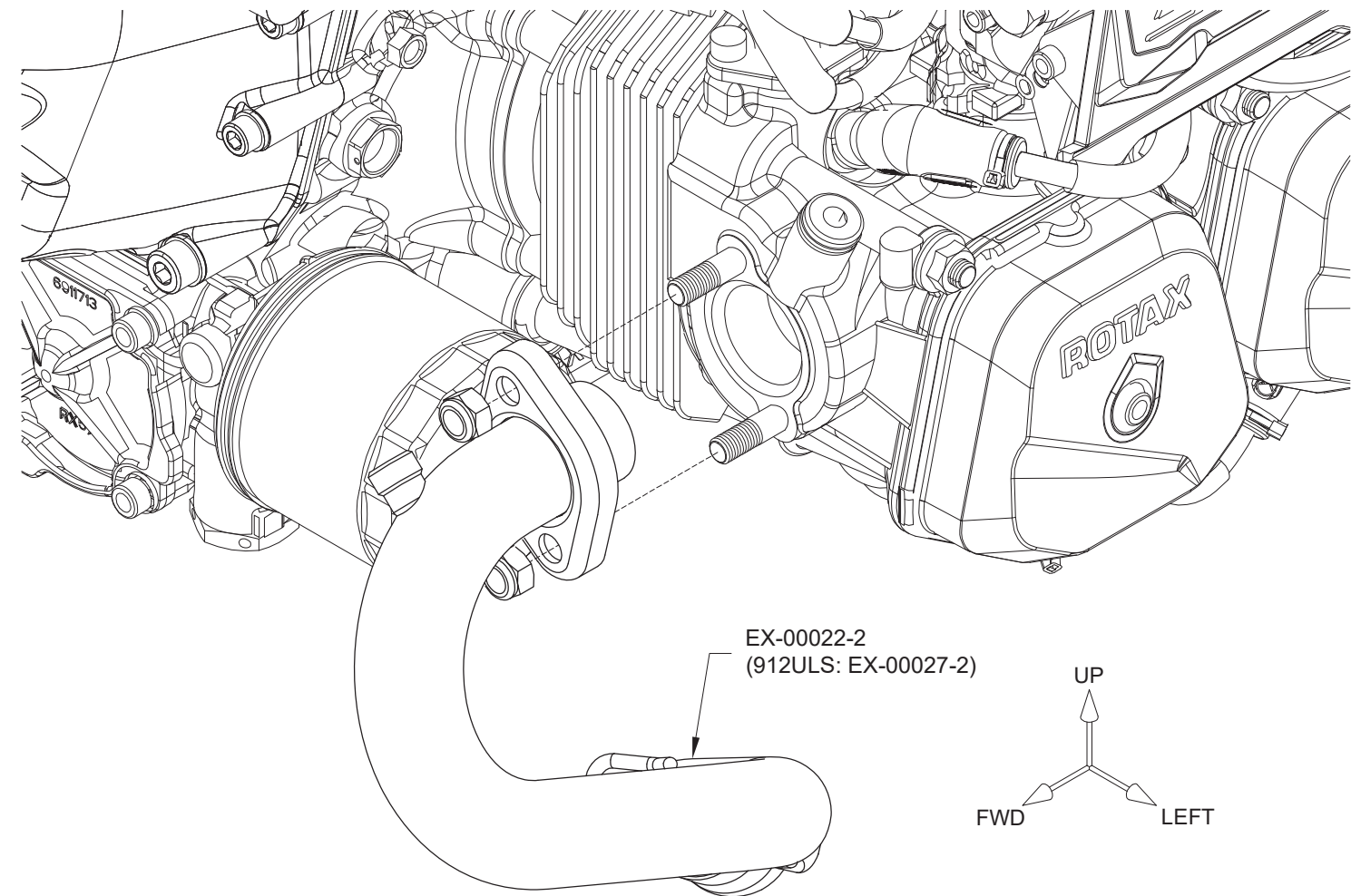


FIGURE 3: CYLINDER #2 EXHAUST INSTALLATION

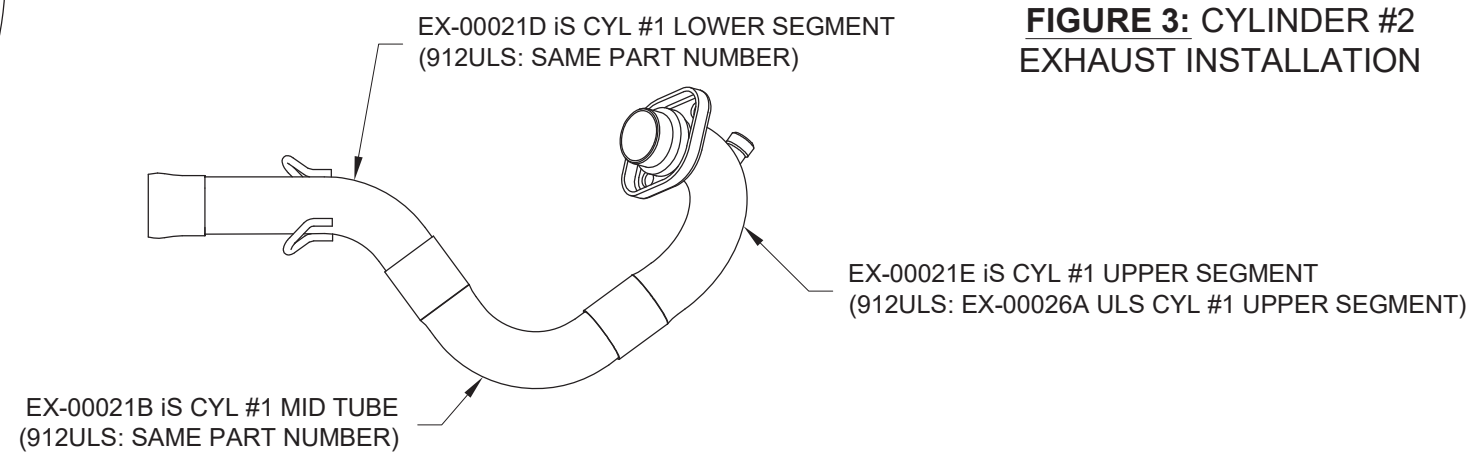
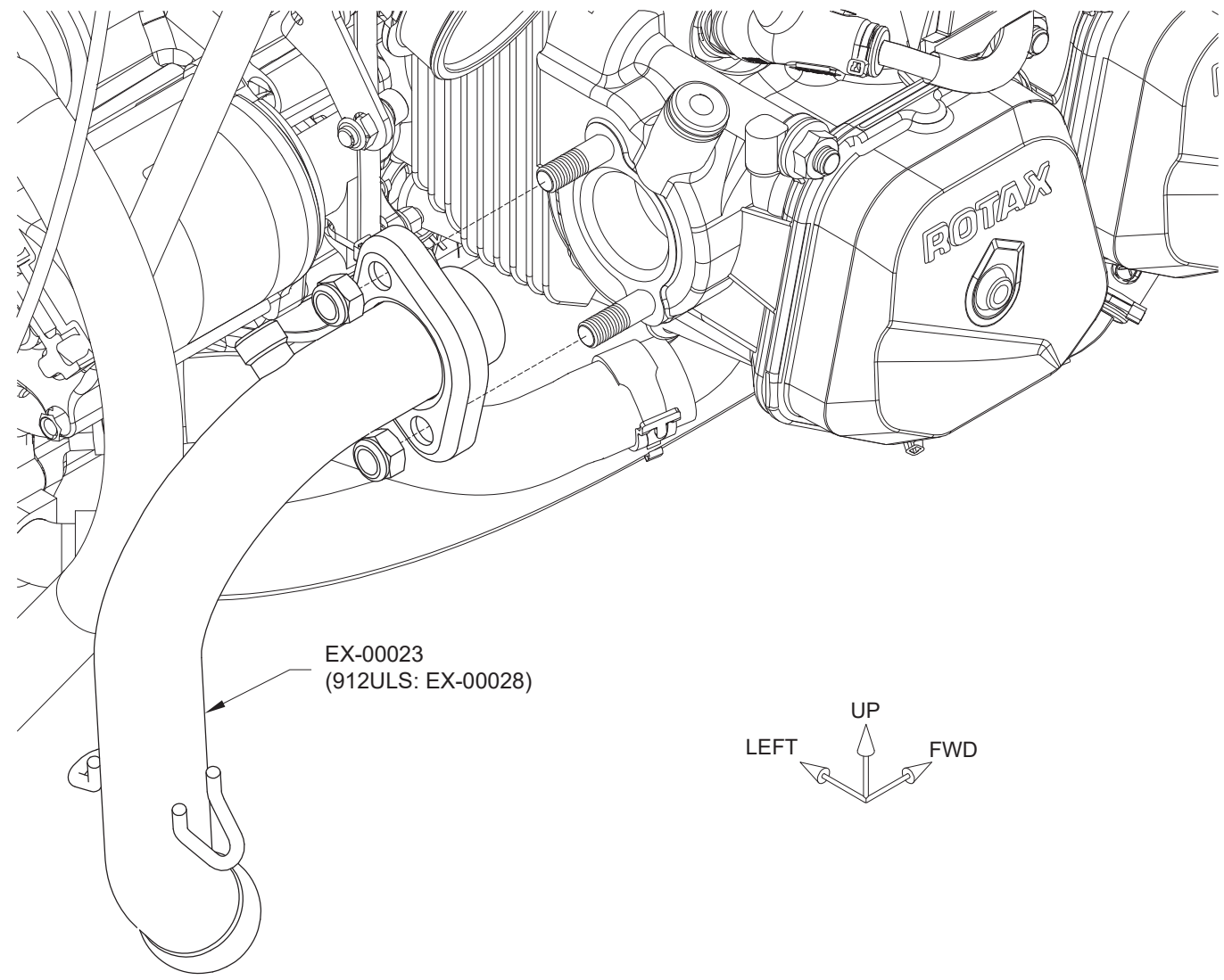


FIGURE 2: EX-00021-1 CYLINDER #1 EXHAUST (912ULS: EX-00026-1 CYLINDER #1 EXHAUST)

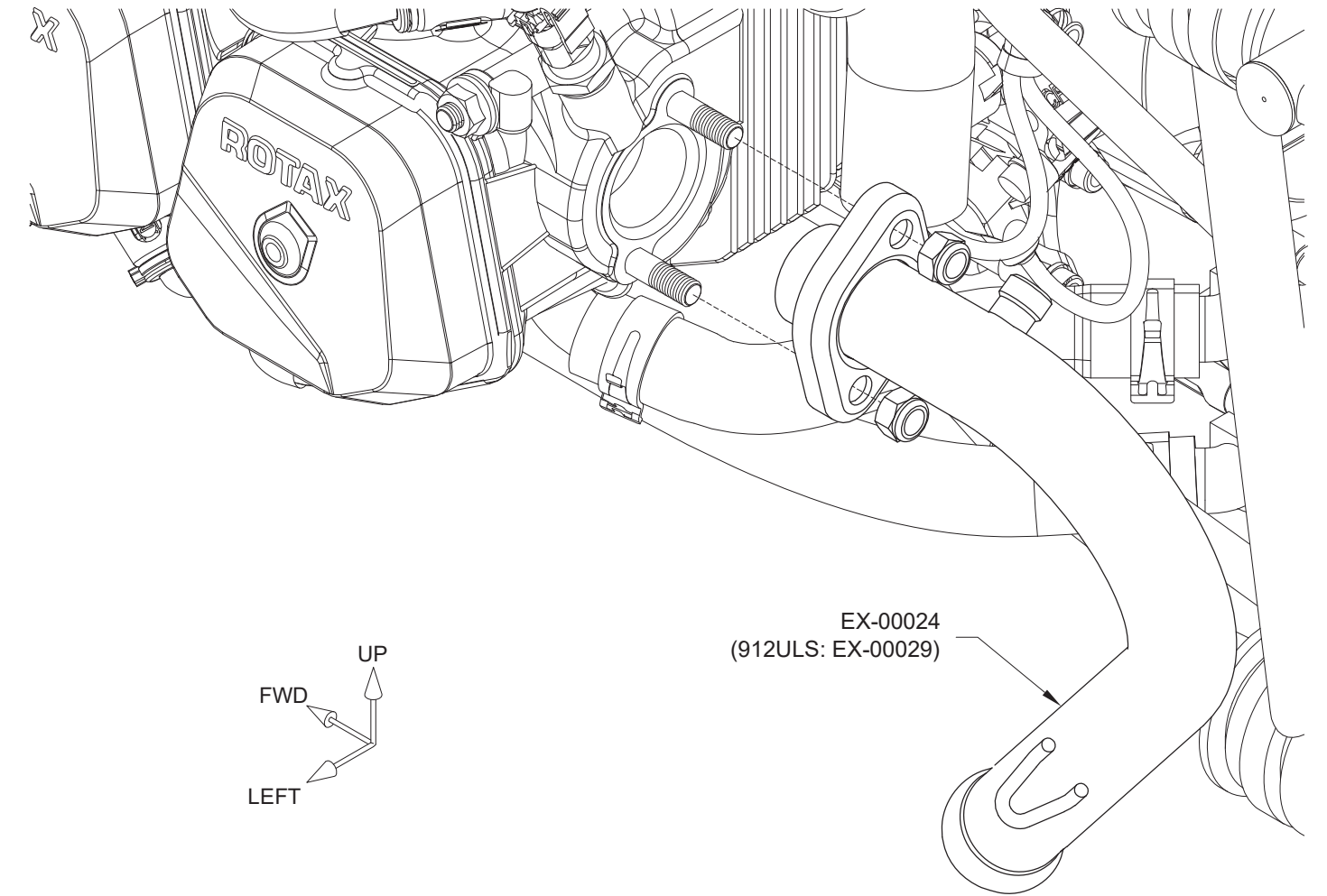


Step 1: Install the EX-00023 into the right side aft exhaust port as shown in Figure 1. Start the exhaust stud nuts onto the studs but do not tighten further than the point at which the exhaust stud begins to extend beyond the end of the nut.

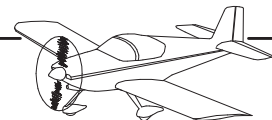


**FIGURE 1: CYLINDER #3
EXHAUST INSTALLATION**

Step 2: Install the EX-00024 into the left side aft exhaust port as shown in Figure 2. Start the exhaust stud nuts onto the studs but do not tighten further than the point at which the exhaust stud begins to extend beyond the end of the nut.



**FIGURE 2: CYLINDER #4
EXHAUST INSTALLATION**



Step 1: Apply a light coating of high-temp nickel based anti-seize paste to the inside surfaces of the four ball-joint receptacles on the muffler assembly.

Step 2: Attach the muffler assembly to the EX-00022-2, EX-00023, and EX-00024 exhaust pipes using the springs shown in Figure 1. To prevent damage to the springs, use a short piece of safety wire formed into a loop and held in pliers as an installation tool to stretch and engage the springs.

Although the springs may be installed in any orientation, it may be necessary to install the springs in a particular orientation to ensure there is no contact between the coils of the springs and the exhaust pipes or muffler assembly.

Step 3: Tighten the exhaust stud nuts on the cylinder #2, #3, and #4 exhaust pipes enough to seat each exhaust pipe in its port on the engine, but do not fully tighten the nuts yet.

Step 4: Grasp the muffler assembly and apply force in the fore-aft direction while moving the muffler assembly side-to-side approximately one inch [25.4 mm] each side of center. This will allow the muffler assembly and all the exhaust pipes to settle into their final "least-stress" positions.

Step 5: Position the muffler assembly so that it is centered on the engine and tighten the exhaust stud nuts on cylinders #2, #3, and #4 equally so the flange remains parallel to the face of the cylinder head. Torque the nuts to the value found in the Rotax 912iS Installation Manual, Section 78-00-00.

NOTE: Do not tighten the Cylinder #1 exhaust stud nuts at this time. They will be torqued after the radiator is installed.

Step 6: Lubricate the slip joints with high-temp nickel base anti-seize, then install the EX-00021B and EX-00021D as shown in Figure 1 and on Page 48iS/U-09 Figure 1. Ensure the lower end of the EX-00021D is fully seated into the muffler assembly and both slip joints have a minimum of 1 in. [25.4 mm] engagement.

Step 7: Using the method described in Step 2, attach the muffler assembly to the EX-00021D exhaust assembly using the springs shown in Figure 1.

Step 8: Grasp the EX-00021B and apply force in the fore-aft direction while moving the tube side-to-side and up and down to allow the slip joints and springs to settle into their "least-stress" positions.

Step 9: Install EA LV-1 Heat Shields onto Cylinder #1, #2, and #4 exhaust with clamps as shown in Figure 1. Position the EA LV-1 as shown and tighten the clamps.

Step 10: Check for a minimum 1/4 in. [6.4 mm] clearance between the EA LV-1 and both springs on the Cylinder #2 exhaust (EX-00022-2) and Cylinder #4 exhaust (EX-00024). Adjust the bend angle of the EA LV-1 if necessary to provide clearance to both springs.

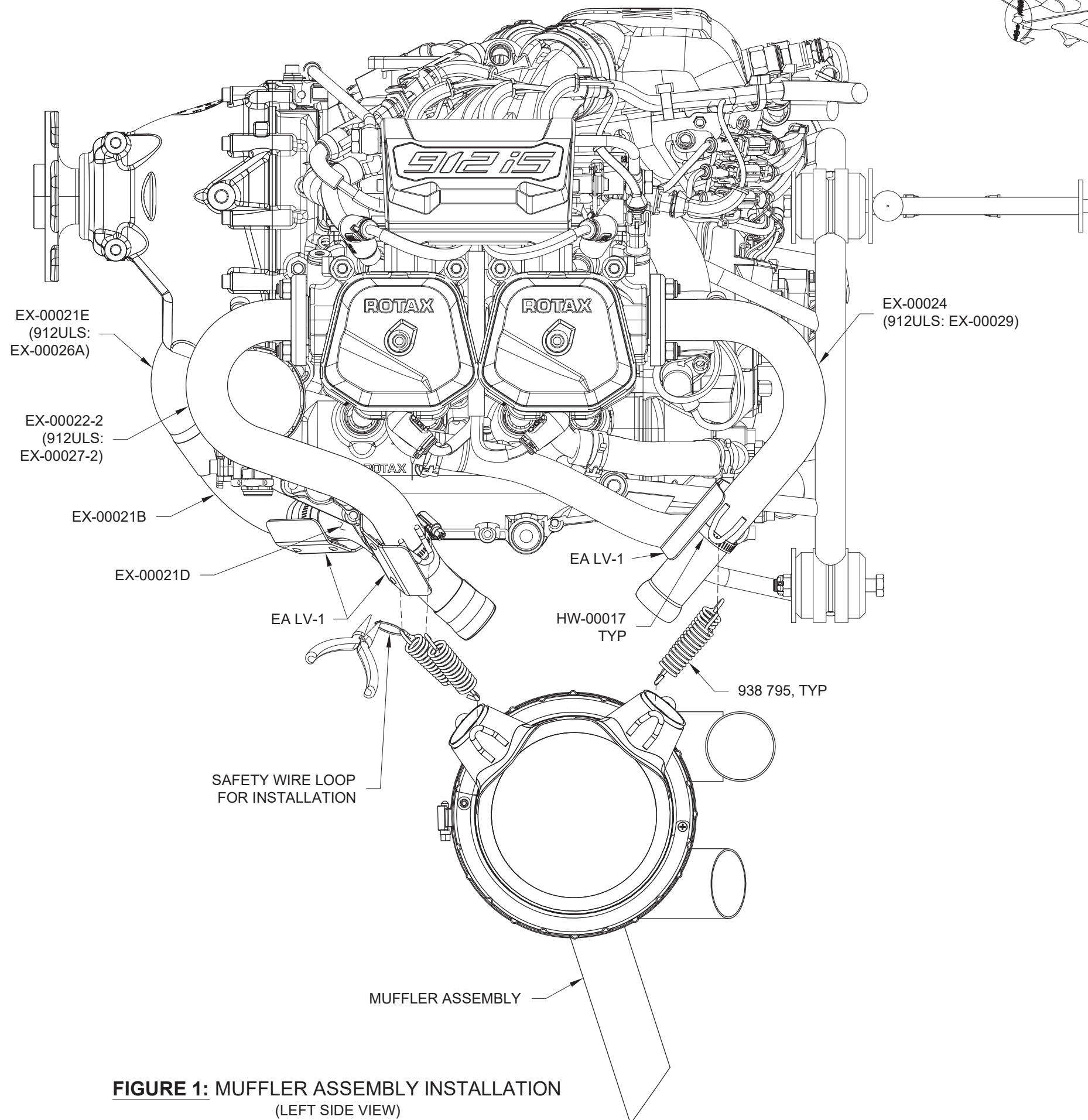
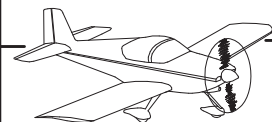


FIGURE 1: MUFFLER ASSEMBLY INSTALLATION
(LEFT SIDE VIEW)



Step 1: Adjust the position of the Heat Muff Assembly so that it does not interfere with the engine mount, as shown in Figure 1. Tighten the clamps that hold the heat muff in place.

Step 2: Install the bottom cowl. Check that the exhaust pipe on the muffler assembly lines up with the opening in the bottom cowl.

Adjust the side-to-side position of the muffler assembly if/as required to achieve side-to-side alignment with the cowl opening.

Enlarge the exhaust pipe opening in the bottom cowl forward or aft as required to achieve sufficient opening to install/remove the cowl and to provide at least 3/4 in. [19.1 mm] of clearance between the exhaust pipe and the edge of the opening in the cowl when installed.

When satisfied with the fit of the bottom cowl and exhaust pipe, remove the cowl and verify that all eight exhaust stud nuts are properly torqued.

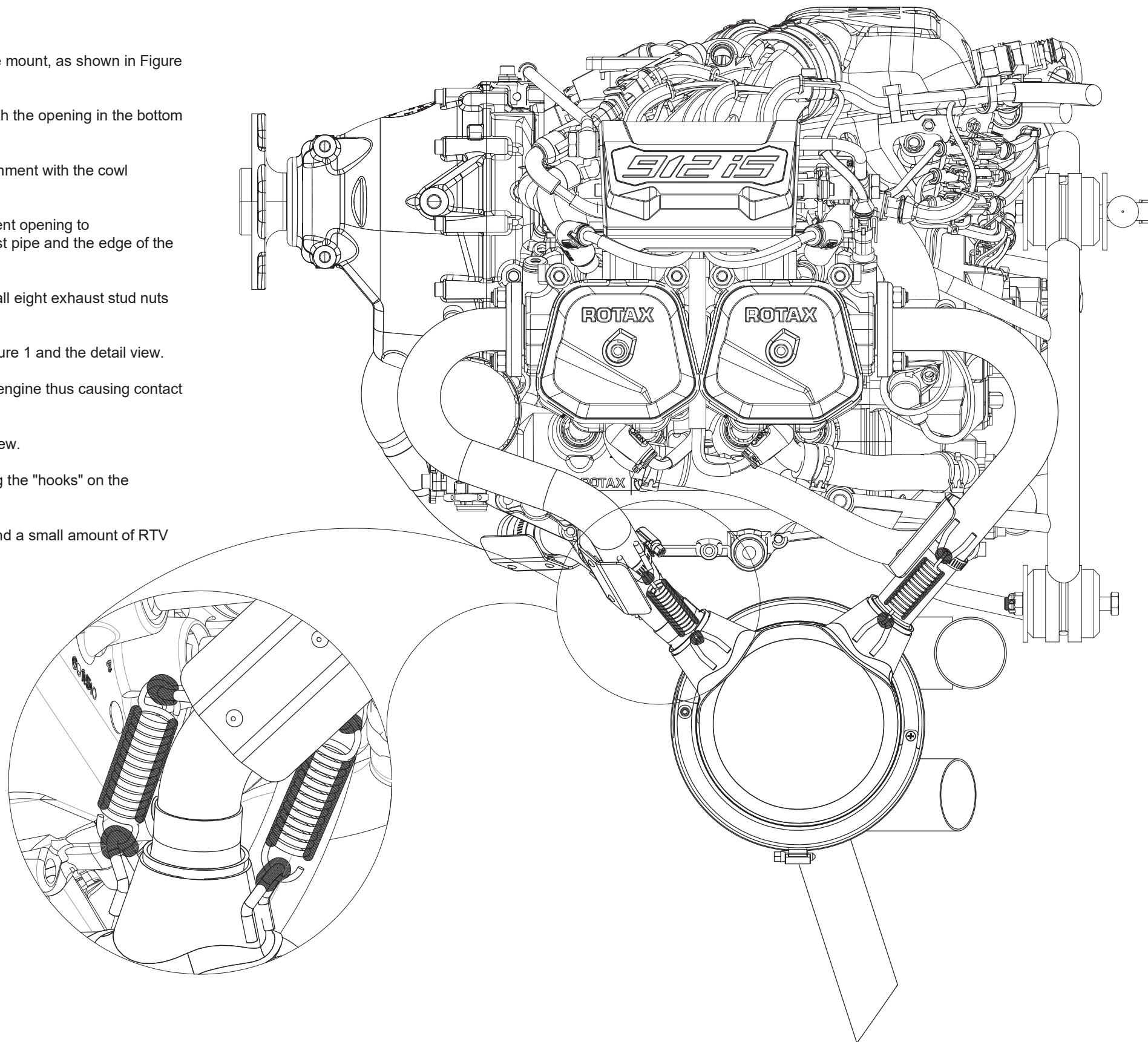
Step 3: Apply a bead of RTV Sealant to the forward and aft sides of each spring as shown in Figure 1 and the detail view.

Applying a bead of RTV to both sides of the spring keeps it from vibrating in resonance with the engine thus causing contact wear or premature failure of the spring.

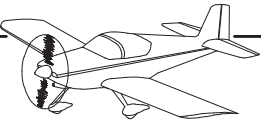
Step 4: Place a small amount of RTV over the spring ends as shown in Figure 1 and the detail view.

RTV on the spring ends keeps the spring from rotating in resonance with the engine thus causing the "hooks" on the exhaust pipes and muffler to wear.

Step 5: Verify that all eight springs have two beads each of RTV along the length of the spring and a small amount of RTV at each "hook" as shown in Figure 1 and the detail view.



**FIGURE 1: EXHAUST SYSTEM INSTALLATION
(LEFT SIDE VIEW)**



NOTE: Steps on this page apply only to 912iS Exhaust installation. See Page 48iS/U-11 for 912ULS EGT sensor installation.

Step 1: Apply a light coating of high-temp nickel based anti-seize to the threads of the Cylinder #1 EGT sensor.

Step 2: Install the Cylinder #1 EGT sensor into the Cylinder #1 exhaust as shown in Figure 1. Ensure the sensor wires are not interfering with other components. Torque the EGT sensor to the value found in the Rotax 912iS Maintenance Manual, Section 76-70-00.

If necessary to allow sufficient slack in the EGT wire, loosen, rotate and retighten the bracket holding the plug at the upper end of the wire.

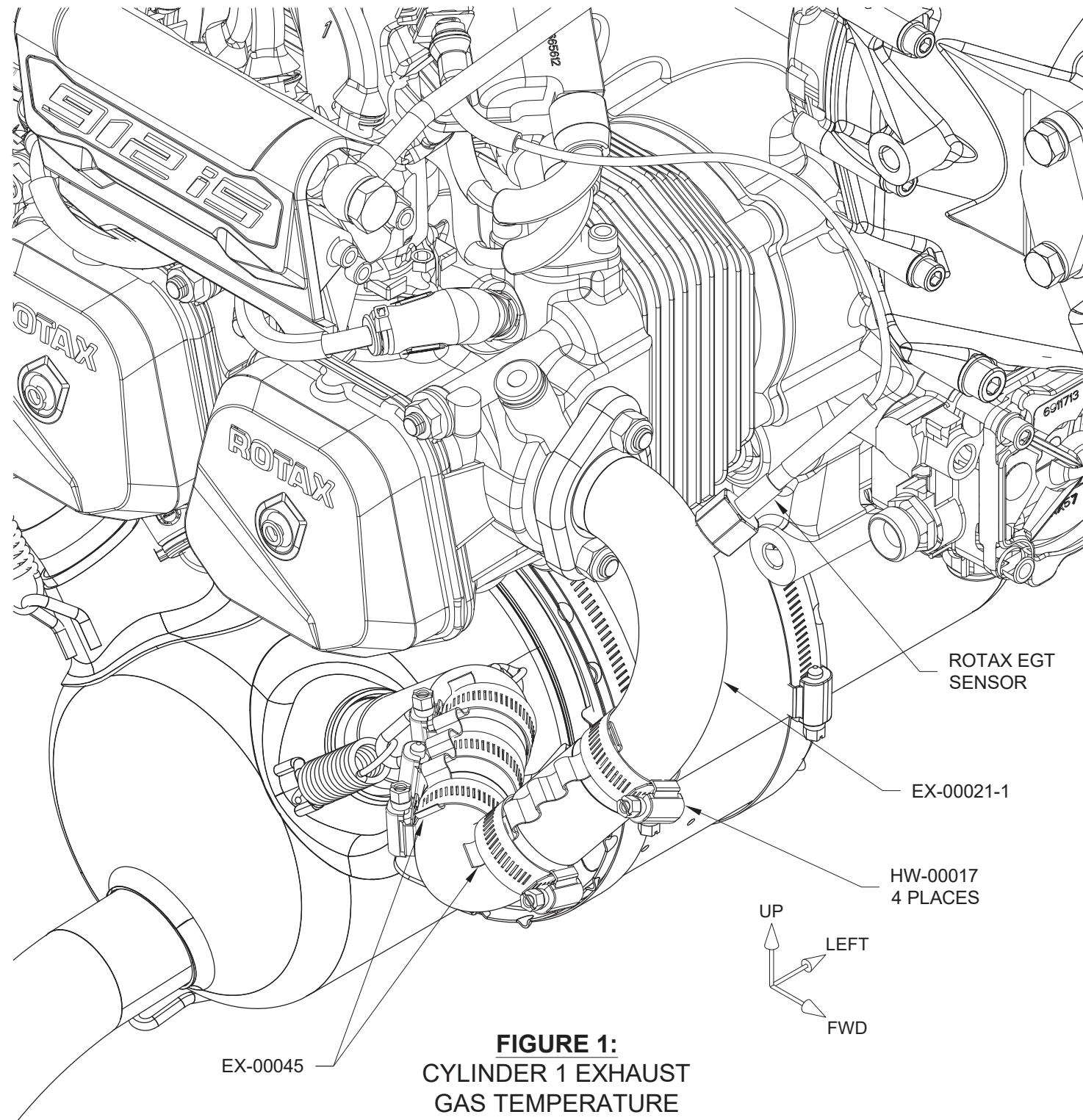


FIGURE 1:
CYLINDER 1 EXHAUST
GAS TEMPERATURE
SENSOR INSTALLATION

Step 3: Install the EX-00045 Exhaust Flat Springs across the slip joints of the Cylinder #1 Exhaust as shown in Figure 1.

Step 4: Apply a light coating of high-temp nickel based anti-seize to the threads of the Cylinder #2 EGT sensor.

Step 5: Install the Cylinder #2 EGT sensor into the Cylinder #2 exhaust as shown in Figure 2. Ensure the sensor wires are not interfering with other components. Torque the EGT sensor to the value found in the Rotax 912iS Maintenance Manual, Section 76-70-00.

If necessary to allow sufficient slack in the EGT wire, loosen, rotate and retighten the bracket holding the plug at the upper end of the wire

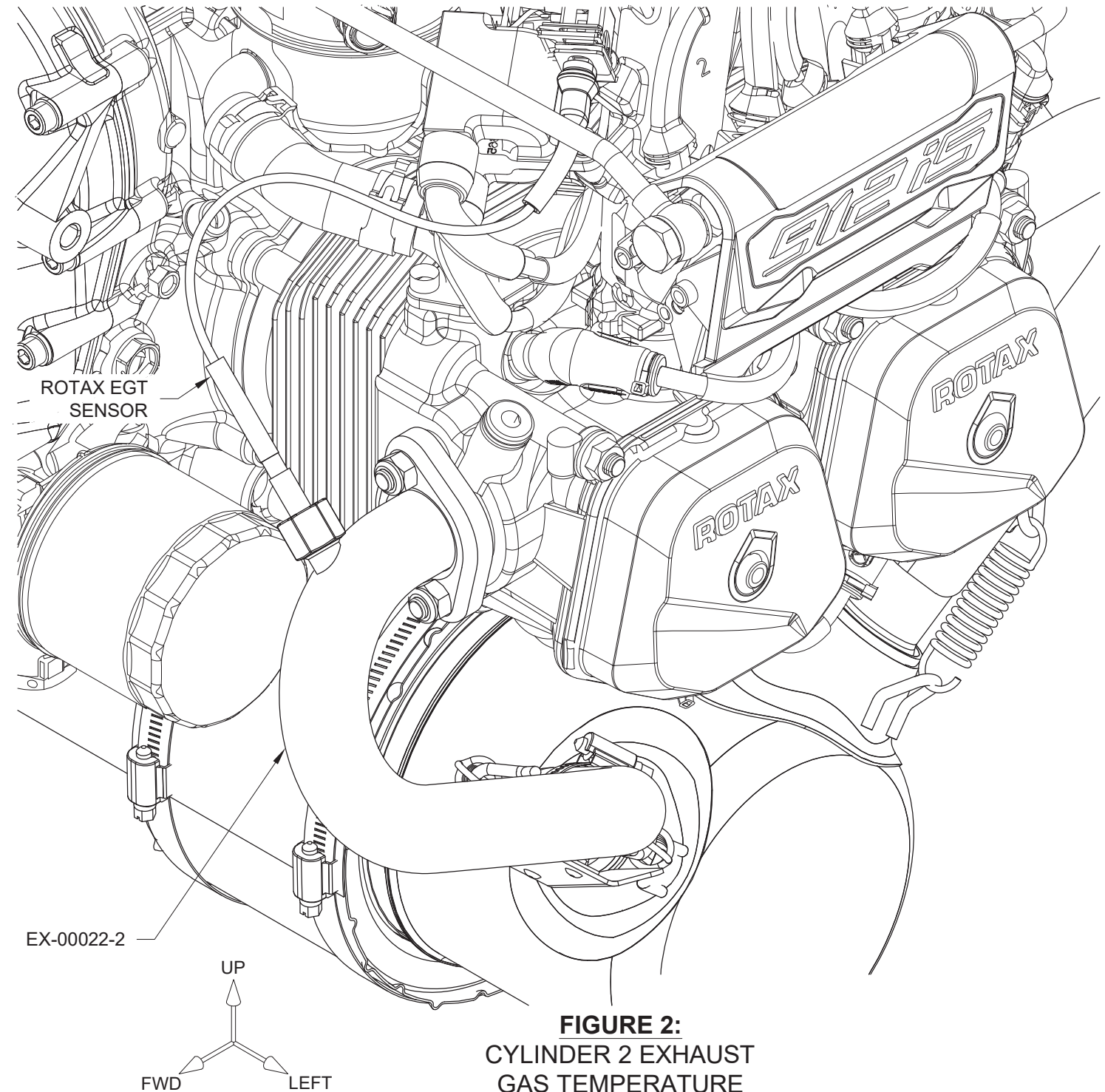


FIGURE 2:
CYLINDER 2 EXHAUST
GAS TEMPERATURE
SENSOR INSTALLATION



NOTE: Steps on this page apply only to 912iS Exhaust installation. See page 48iS/U-11 for 912ULS EGT sensor installation.

Step 1: Apply a light coating of high-temp nickel based anit-seize to the threads of the Cylinder #3 EGT sensor.

Step 2: Install the Cylinder #3 EGT sensor into the Cylinder #3 exhaust as shown in Figure 1. Ensure the sensor wires are not interfering with other components. Torque the EGT sensor to the value found in the Rotax 912iS Maintenance Manual, Section 76-70-00.

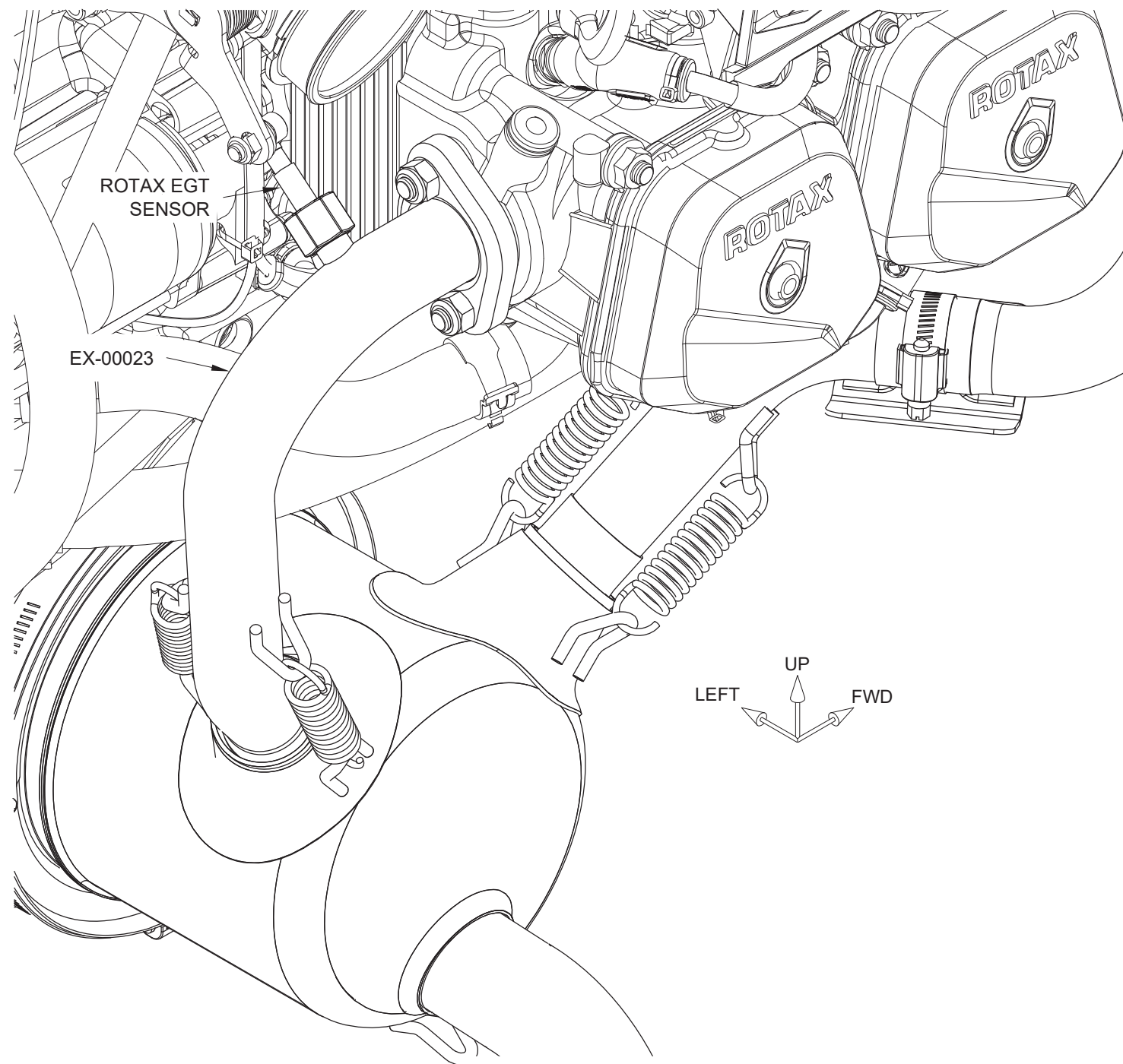


FIGURE 1:
CYLINDER 3 EXHAUST
GAS TEMPERATURE
SENSOR INSTALLATION

Step 3: Apply a light coating of high-temp nickel based anit-seize to the threads of the Cylinder #4 EGT sensor.

Step 4: Install the Cylinder #4 EGT sensor into the Cylinder #4 exhaust as shown in Figure 2. Ensure the sensor wires are not interfering with other components. Torque the EGT sensor to the value found in the Rotax 912iS Maintenance Manual, Section 76-70-00.

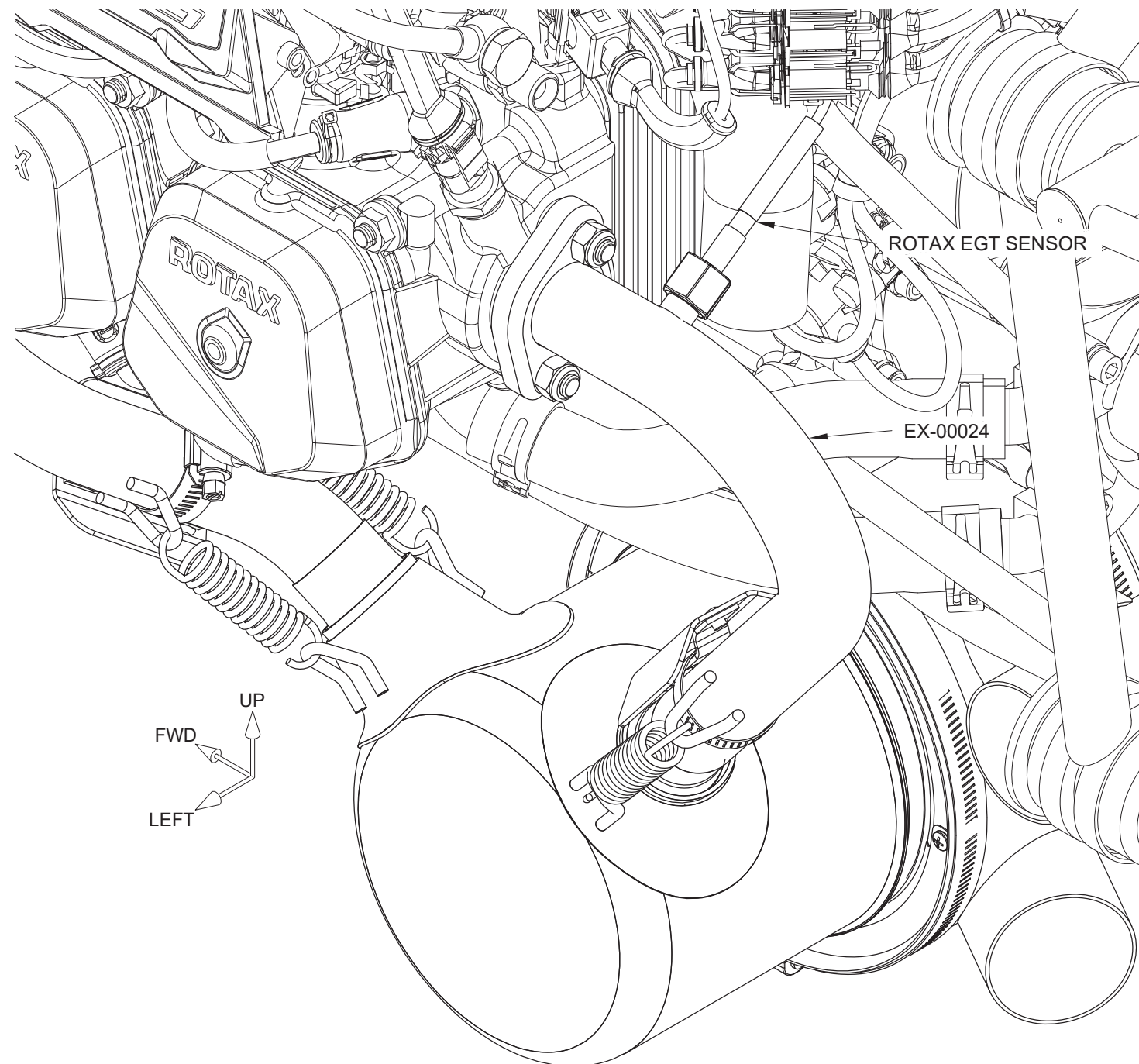
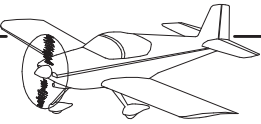


FIGURE 2:
CYLINDER 4 EXHAUST
GAS TEMPERATURE
SENSOR INSTALLATION



NOTE: Steps on this page apply only to 912ULS Exhaust installation. See Pages 48iS/U-09 & 10 for 912iS EGT sensor installation.

NOTE: Details of the engine installation that do not pertain to the exhaust system are shown for reference only as some features may have been omitted or are obsolete.

NOTE: The two Exhaust Gas Temperature (EGT) sensors are supplied in the Engine Sensor Kit, included in the Avionics Kit.

Step 1: Install one of the EGT sensors into the EX-00028 Cylinder #3 Exhaust as shown in Figure 1.

The EGT sensor wire is routed from the exhaust along the right carburetor fuel hose (not shown in Figure 1) upward and inboard to the top of the engine where it then follows the pitot line aft and down to the point where its spade connectors are mated to the EGT-R wires coming from the aft side of the firewall.

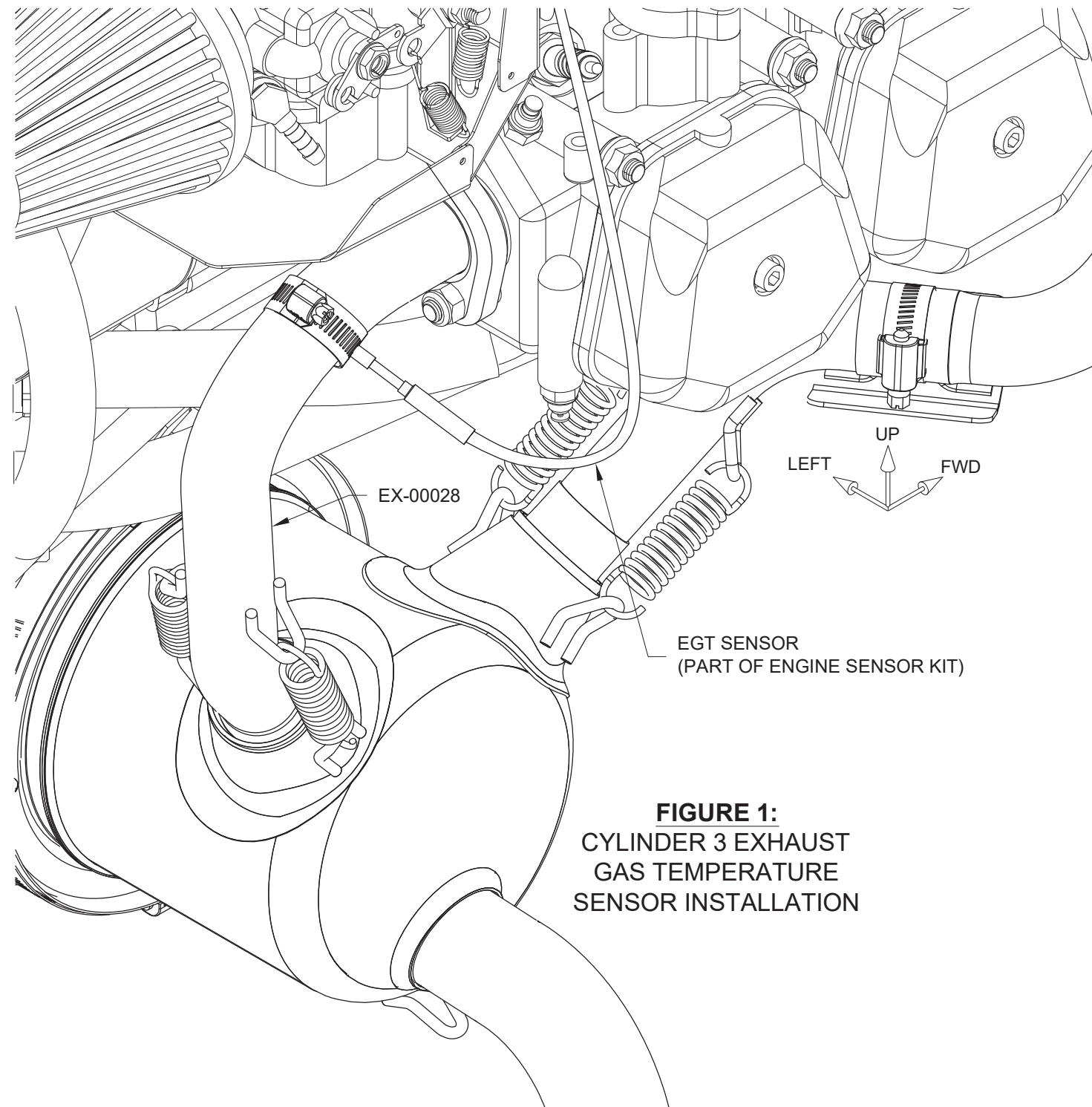


FIGURE 1:
CYLINDER 3 EXHAUST
GAS TEMPERATURE
SENSOR INSTALLATION

Step 2: Install the remaining EGT sensor into the EX-00029 Cylinder #4 Exhaust as shown in Figure 2.

The EGT sensor wire is routed from the exhaust along the left carburetor fuel hose (not shown in Figure 2) upward and inboard to the top of the engine where it then follows the pitot line aft and down to the point where its spade connectors are mated to the EGT-L wires coming from the aft side of the firewall.

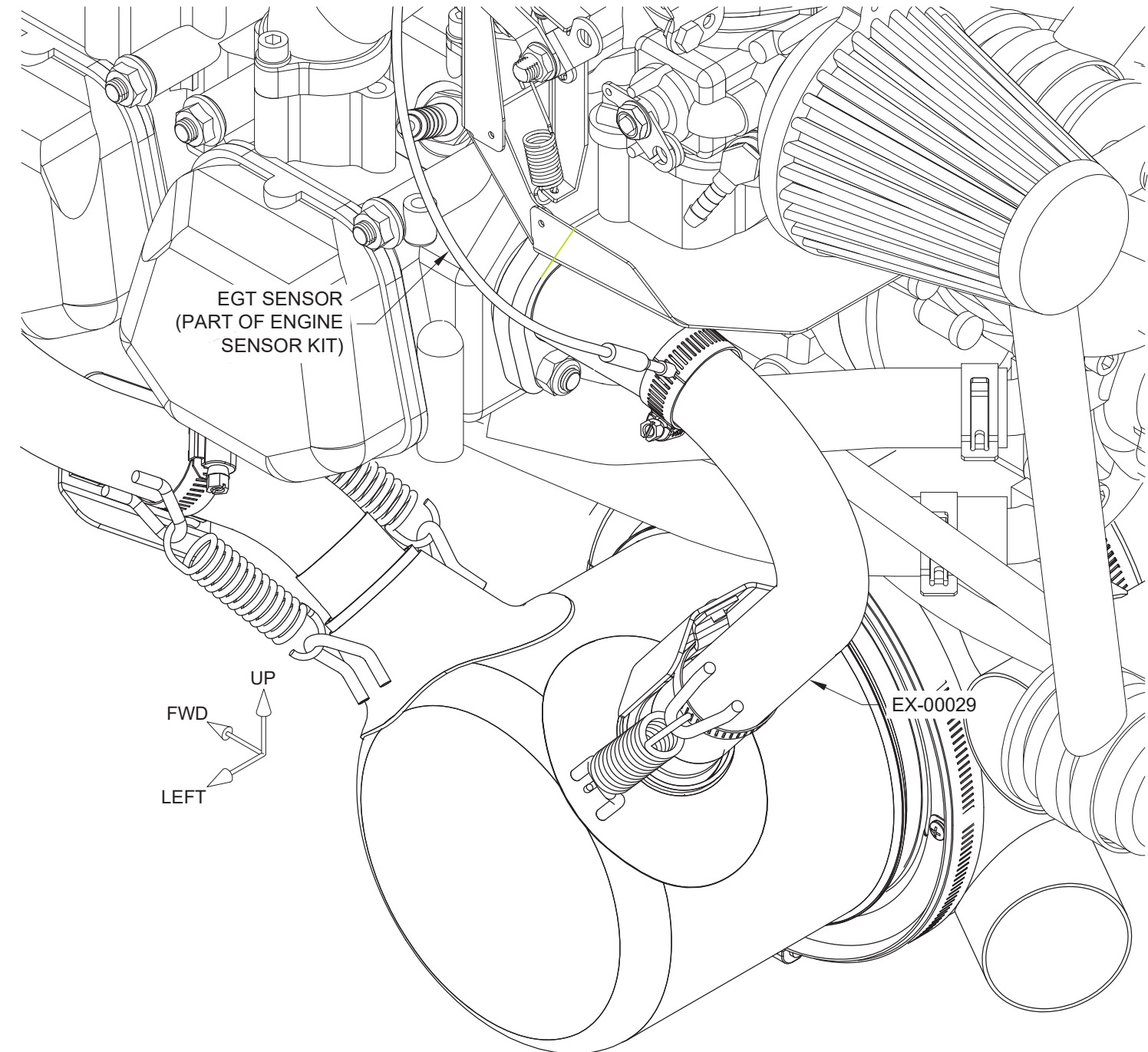


FIGURE 2:
CYLINDER 4 EXHAUST
GAS TEMPERATURE
SENSOR INSTALLATION



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