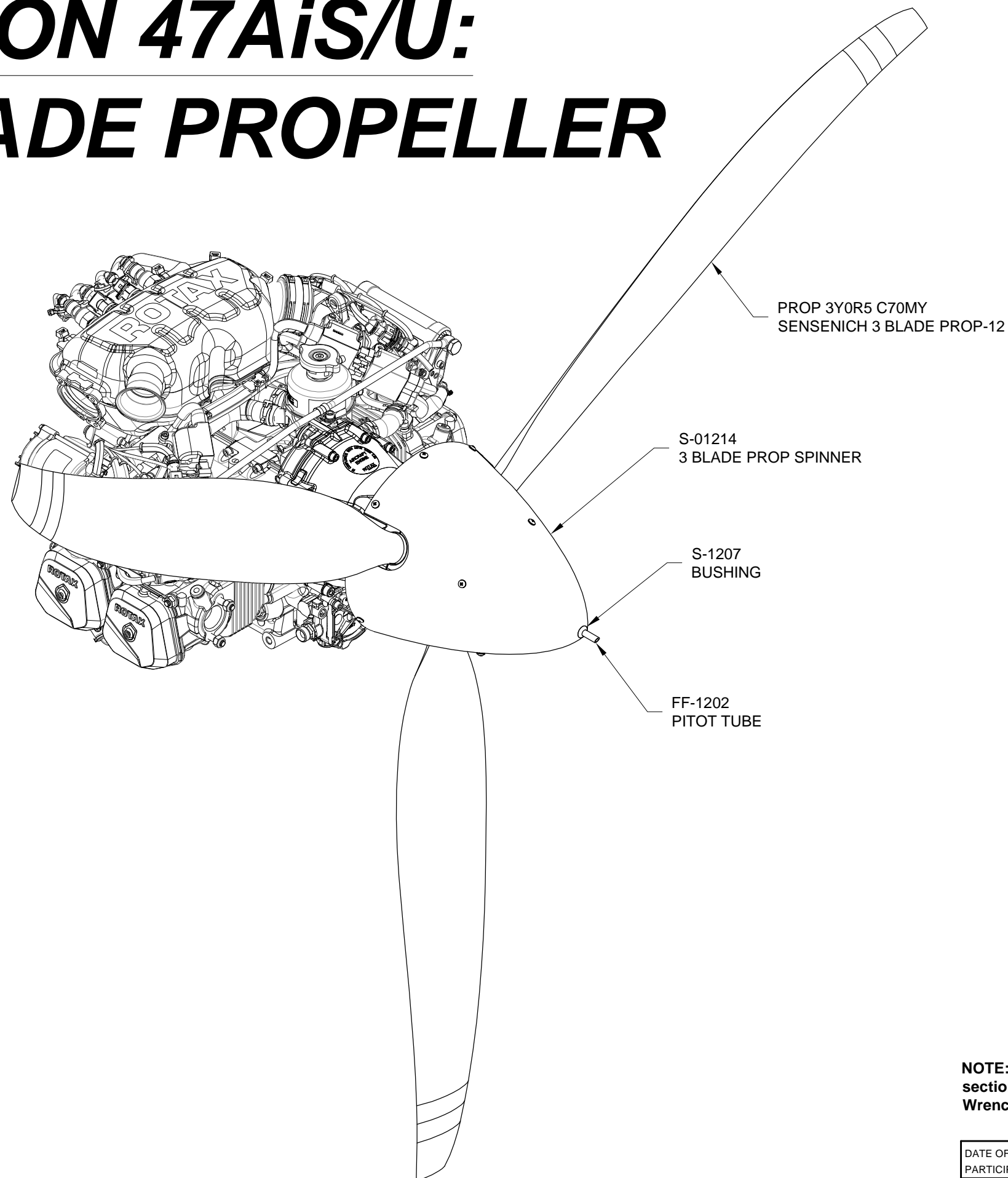
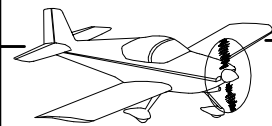


SECTION 47AiS/U: THREE BLADE PROPELLER



NOTE: Special tools required to complete this section include a Magnetic Digital Level, Torque Wrench, and 6 mm Hex Drive.



Step 1: Mark the FF-1202 by wrapping with masking tape as shown in Figure 1. Insert the FF-1202 into the FF-1201 Pitot Block up to the edge of the tape. The threaded portion of the pitot block is aft.

Flip the FF-1202 and FF-1201 over on a flat surface. Align the most forward point of the FF-1202 with the top of the FF-1201 block and make a small scratch to use as an alignment mark on the FF-1202 and FF-1201 as shown in Figure 1.

Step 2: Install a #36 drill bit into the hole in the top of the FF-1201. Press the bit down until it just contacts the FF-1202.

Slip as many washers over the bit as necessary to cover the flutes on the drill bit. At least one of the washers should be an NAS1149F0332P.

Slide a drill chuck over the drill bit and press until the drill chuck is firmly seated against the washers. Tighten the drill chuck.

Step 3: Remove the drill and bit from the FF-1201. Remove one of the NAS1149F0332P thick washers. Insert the drill bit with the remaining washers into the hole in the FF-1201 and drill #36 the FF-1202 using light pressure. Do not distort the FF-1202.

NOTE: These steps are designed to create a dimple in the FF-1202 without drilling through the inner wall of the tube. If the tube is breached, apply a small amount of RTV to the end of the MS51957-36 screw during installation. Check to make sure the RTV has not blocked the airflow path through the F-1202 before proceeding.

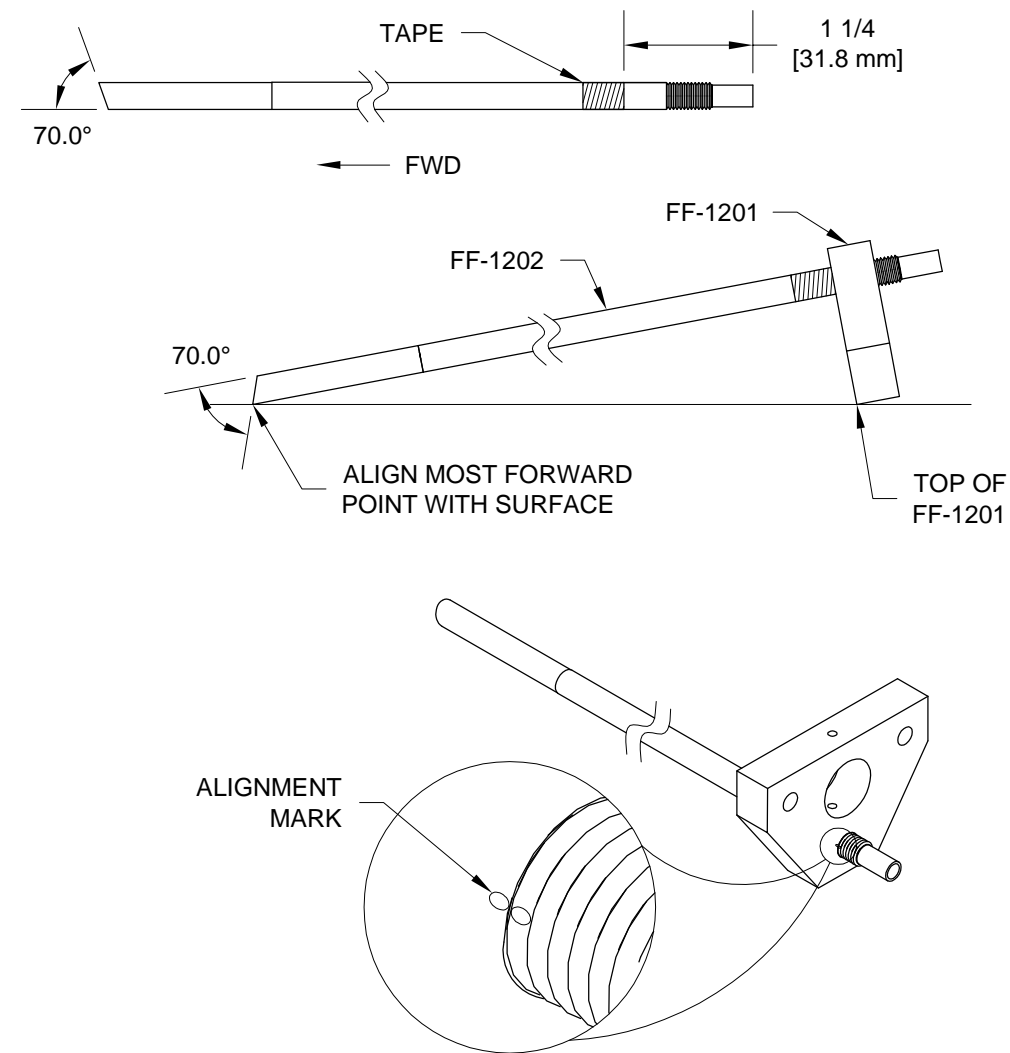


FIGURE 1: DRILLING THE PITOT TUBE

Step 4: Mount the FF-1201 with the hardware called out in Figure 2. The FF-1201 should be mounted with the threaded half aft. Turn the cap screws until they touch the surface of the washers, turn an additional 1/4 turn and stop. Safety wire the cap screws together as shown in Figure 3.

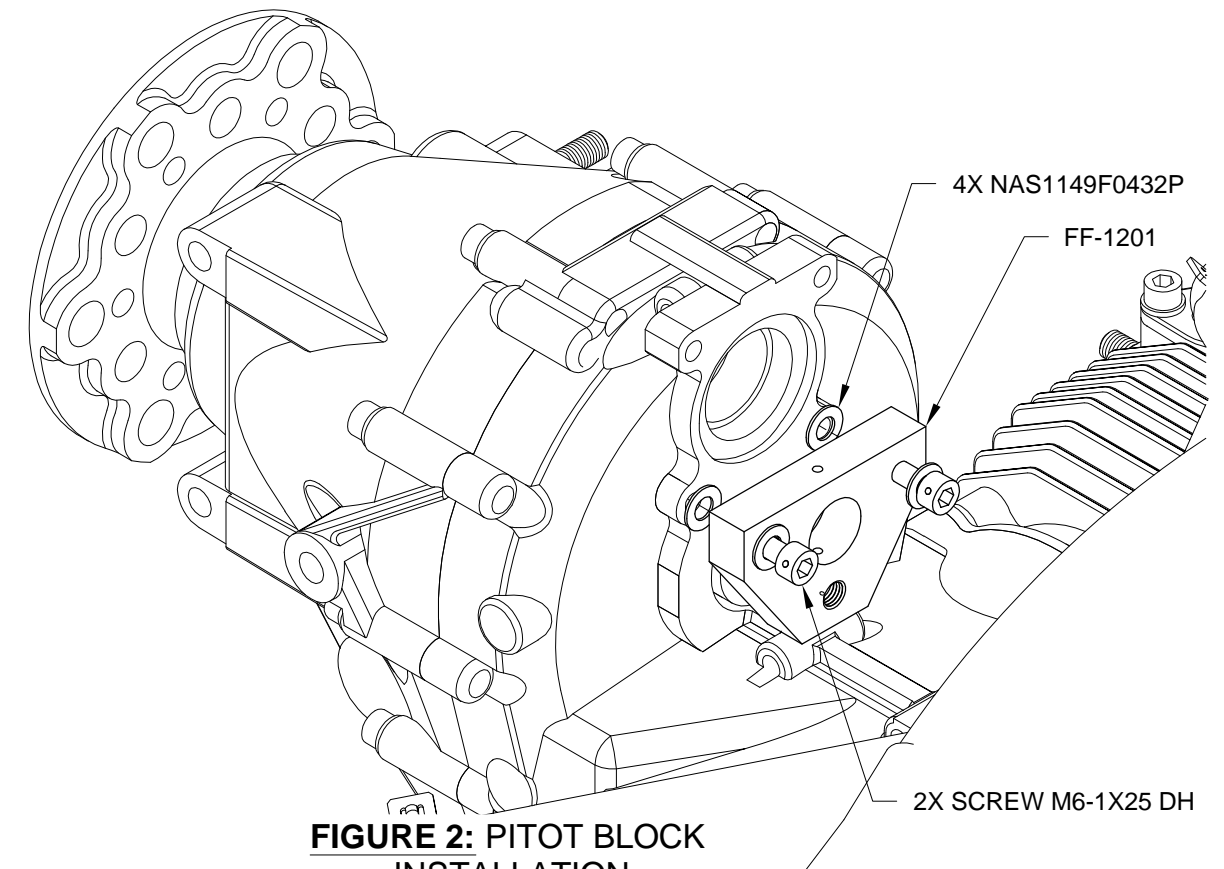


FIGURE 2: PITOT BLOCK INSTALLATION

Step 5: Modify the end of the MS51957-36 screw to be pointed as shown in the detail view of Figure 3. A belt sander works well here.

Step 6: Insert the MS51957-36 shown in Figure 3 to "tap" the #36 hole in the FF-1201. Remove the screw and insert the FF-1202 through the prop shaft (not shown) and into the FF-1201. Turn the FF-1202 until the marks made on the FF-1202 and FF-1201 align. Insert the MS51957-36 as shown in Figure 3 and tighten by hand until it just bottoms on the FF-1202. Check that the front of the FF-1202 is properly oriented. The head of the MS51957-36 will not be in contact with the pitot block.

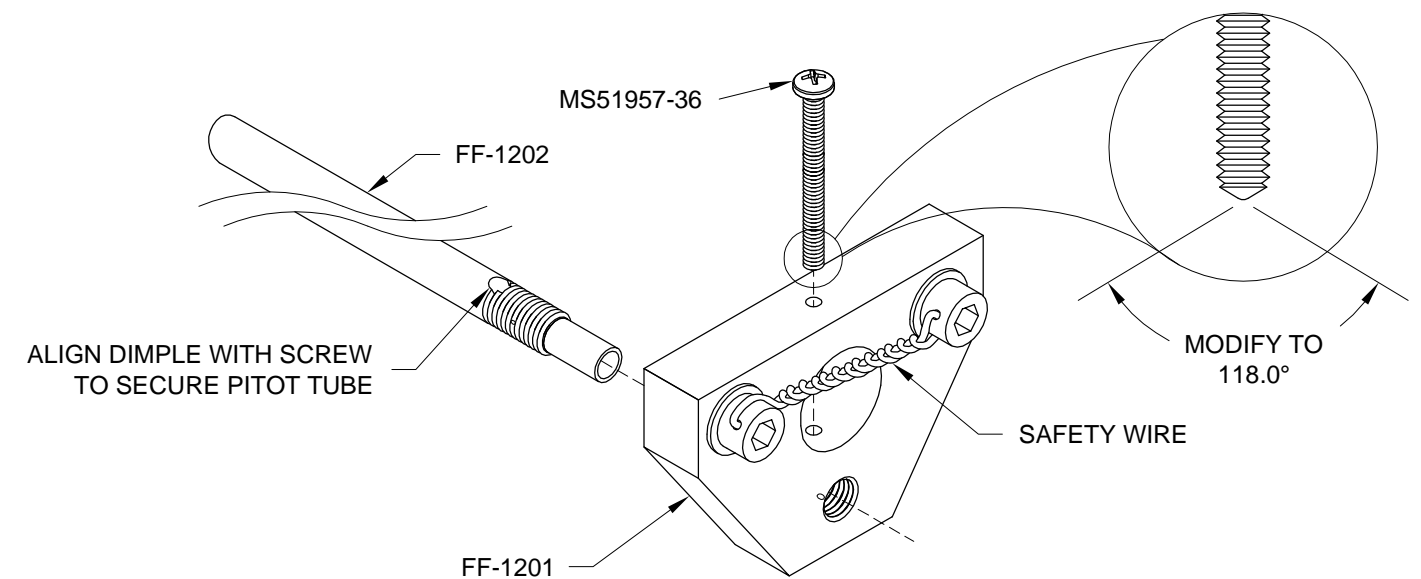


FIGURE 3: ATTACHING THE PITOT TUBE

NOTE: This page refers to components provided in the Avionics Kit, denoted by (*).

Step 1: Fabricate the FF-1216 Pitot Line by cutting 54 1/2 in. [138.4 cm] from the PT-030X1/4X55 tube.

Step 2: Fabricate the FF-1217 Pitot Interconnect by cutting 1 in. [25.4 mm] from the PT-SI-062X3/8X1.5 tube.

Step 3: Place the FF-1217 over the aft end of the FF-1202 and over the FF-1216 as shown in Figures 1 and 2. The FF-1216 and FF-1202 should butt against each other.

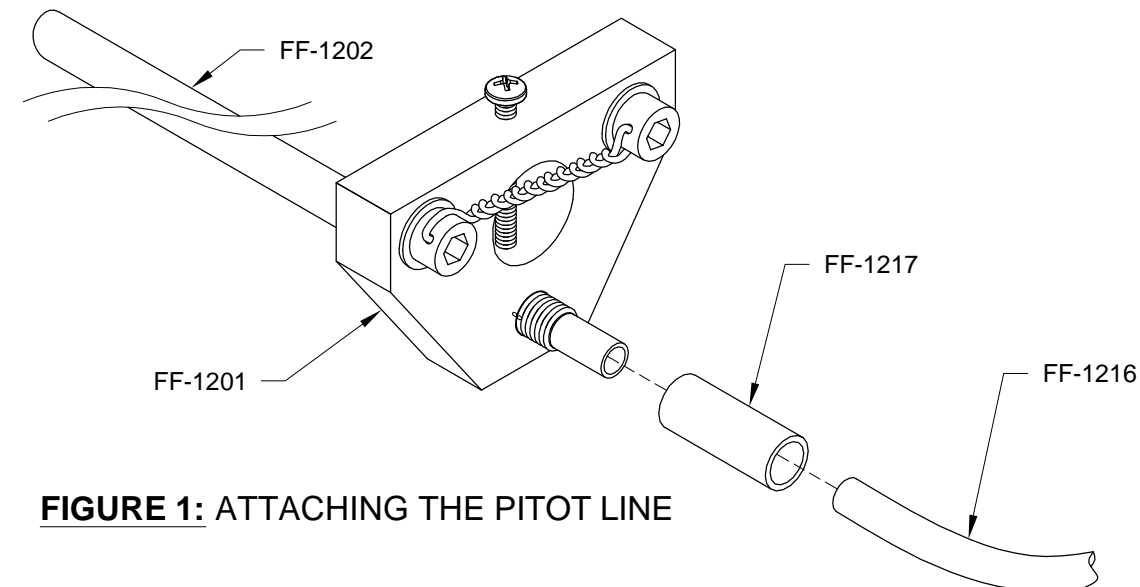
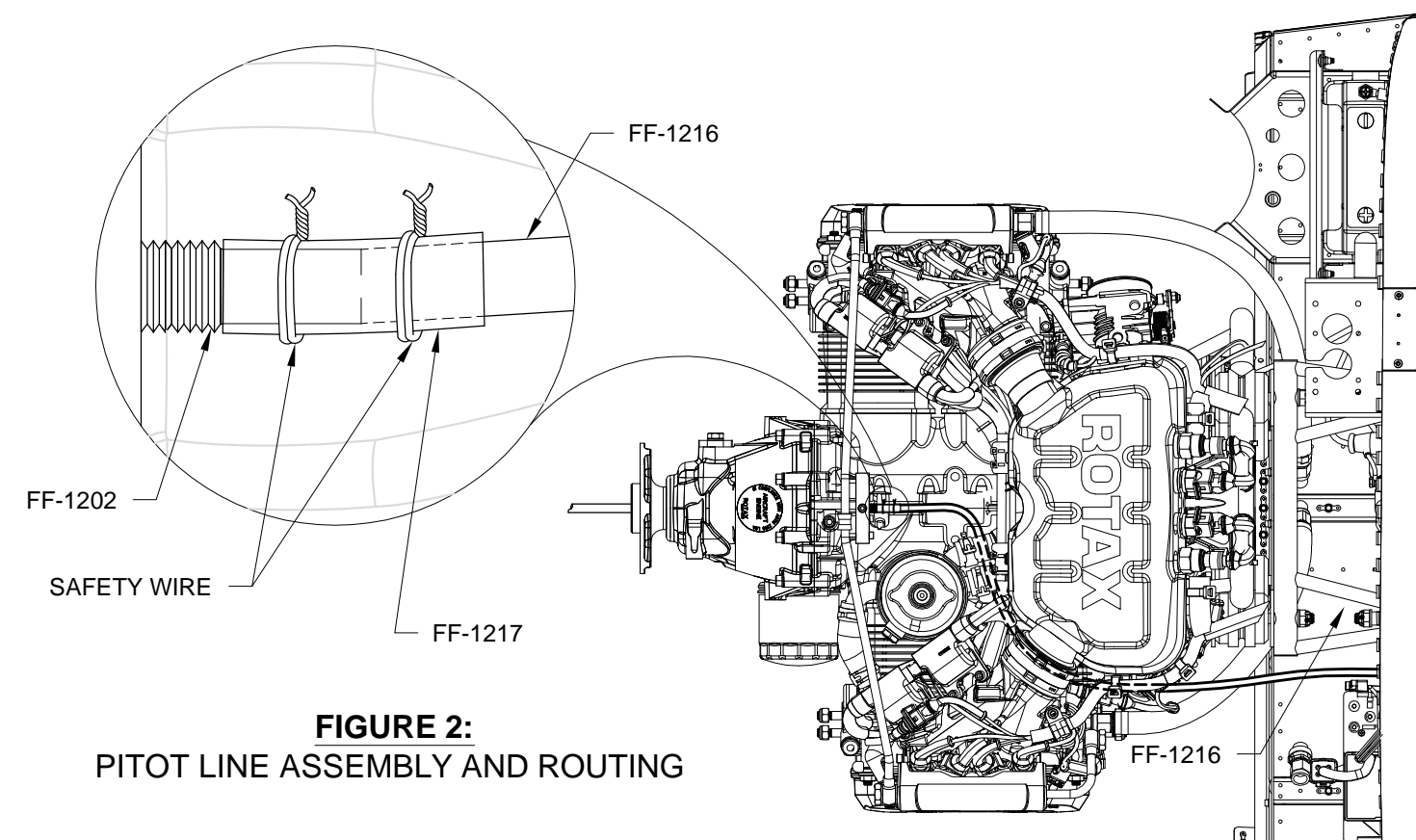


FIGURE 1: ATTACHING THE PITOT LINE

Step 4: Double-wrap safety wire around the FF-1217 as shown in Figure 2.

Step 5: Route the FF-1216 as shown in Figure 2 and Figure 3. Temporarily cover the aft end of the FF-1216 to keep debris from entering the line and temporarily secure the tube until it is connected during the avionics installation.



**FIGURE 2:
PITOT LINE ASSEMBLY AND ROUTING**

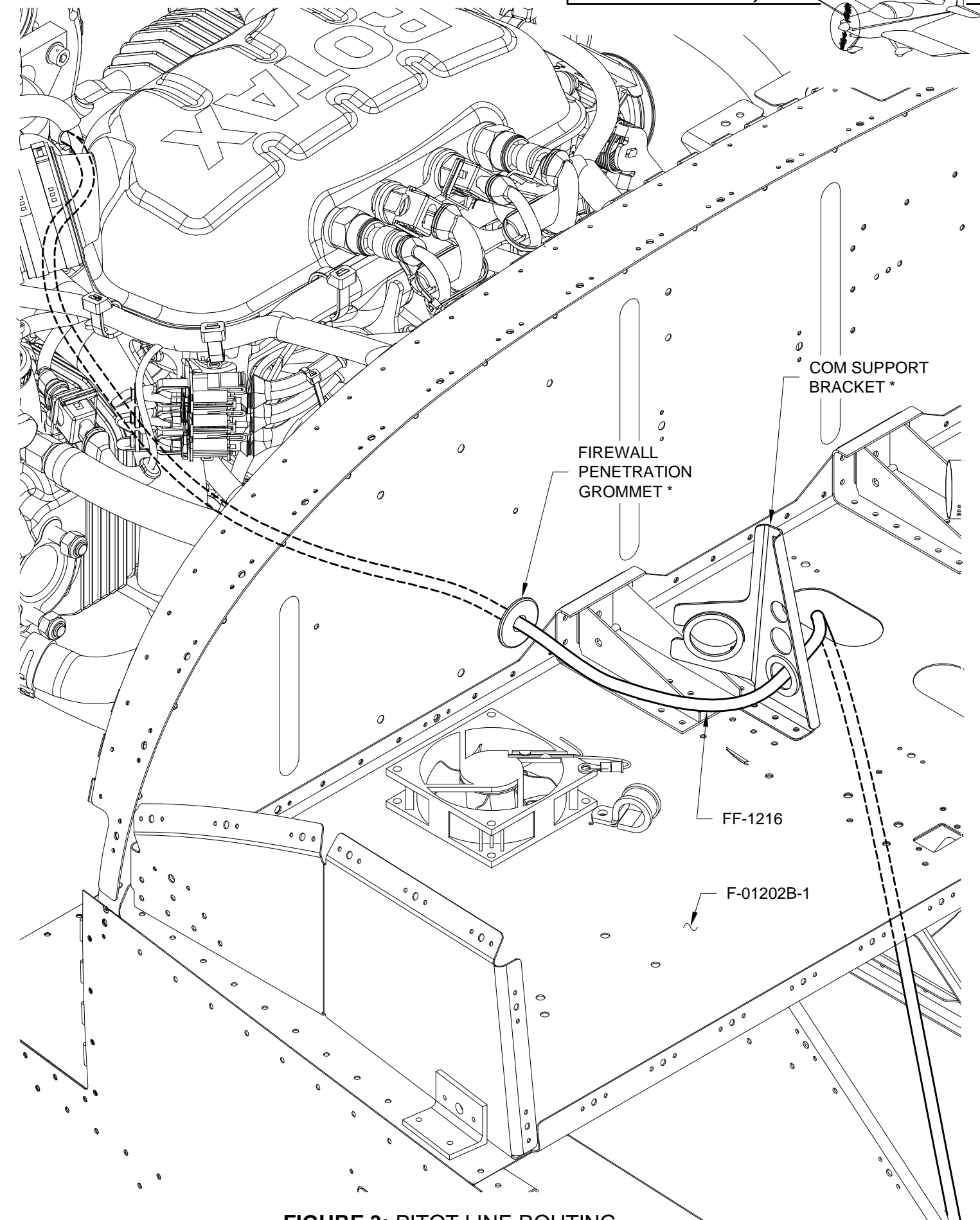


FIGURE 3: PITOT LINE ROUTING



WARNING: Before continuing, read the documentation concerning propeller installation included with your propeller and engine.

Step 1: Trim and sand the aft portion of the S-01214 to the scribe line as shown in Figure 1.

Step 2: Label each prop blade cutout area (on the inside surface) so it can be relocated to its original position later. See Figure 1.

Step 3: Carefully remove the propeller cutout areas on the sides of the S-01214 as shown in Figure 1. Start by drilling several holes with a step drill or plexi bit about 1/16 in. [1.6 mm] inside of the pre-marked radius at the top of the propeller cutout area.

Step 4: Cut slits along the pre-marked lines up to the curved portion of each cutout using a fine tooth hacksaw blade. The top portion of the section to be removed should break away from the S-01214. A file or snips may be used to remove the material. Save the lower portion of the removed sections, shown shaded, to make the S-1202C Gap Fillers later.

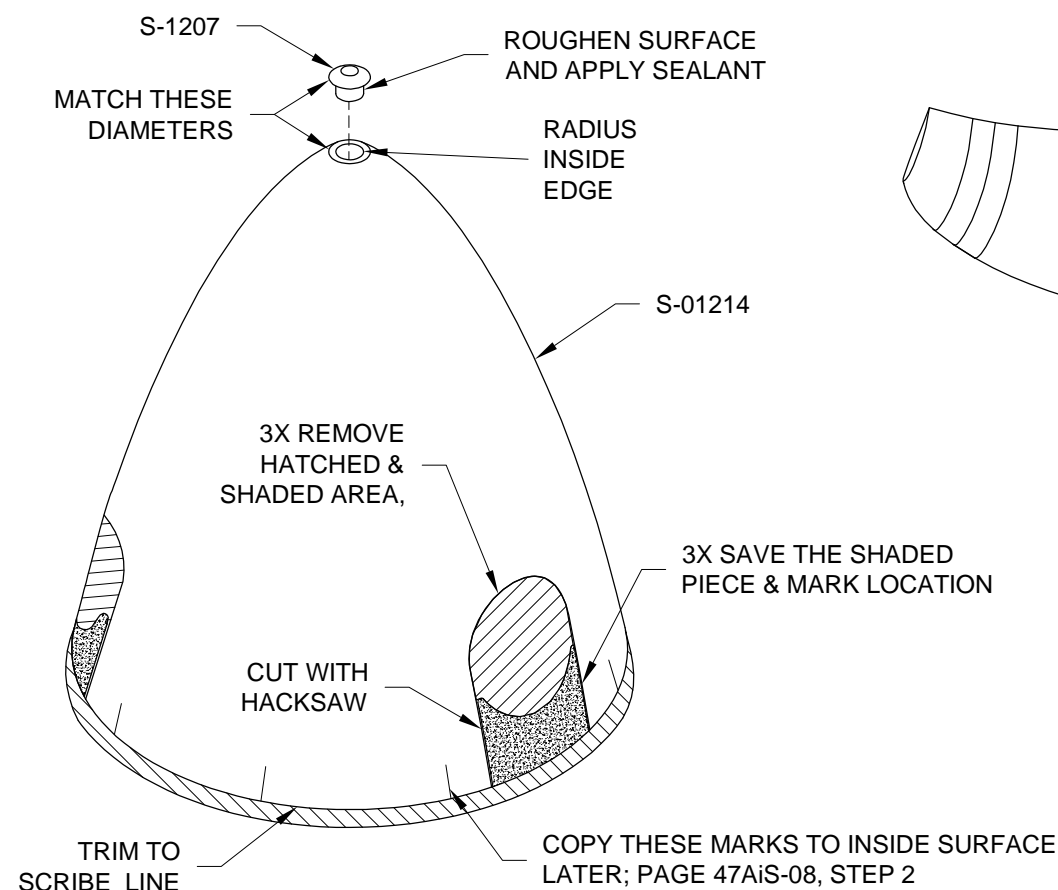


FIGURE 1: MAKING THE PROPELLER CUTOUT

Step 5: Finish the cutouts to the trim line with a sanding block and sandpaper wrapped around a round object such as a piece of broom handle or small can.

Step 6: Insert the S-01213 bulkhead into the spinner. Align the web of the S-01213 close to perpendicular to the centerline axis of the S-01214. Mark the edge of the flange onto the S-01214 and remove. Sand down any lumps or high spots on the S-01214 to achieve a more uniform fit with the S-01213.

Step 7: Sand the tip of the S-01214 until the outer diameter matches the outside diameter of the S-1207 as shown in Figure 1. Remove a little at a time with a flat sanding block. Care should be taken to keep the surface level.

Step 8: Using sandpaper, create a small radius on the inside edge of the S-01214 opening to allow the S-1207 to mate properly. See Figure 1.

Step 9: Roughen the surface of the S-1207 with coarse grit sandpaper where it will contact the S-01214. Apply a thin smear of fuel tank sealant to the S-1207 and insert in the S-01214. See Figure 1. Remove the excess sealant. Let the sealant fully cure before continuing.

Step 10: Assemble the propeller on a bench using the six outermost bolts. Space the hub off the bench surface so the blades can rotate. Rotate the blades so they have some (slight) positive pitch at the tip. Finger-tighten the six bolts.

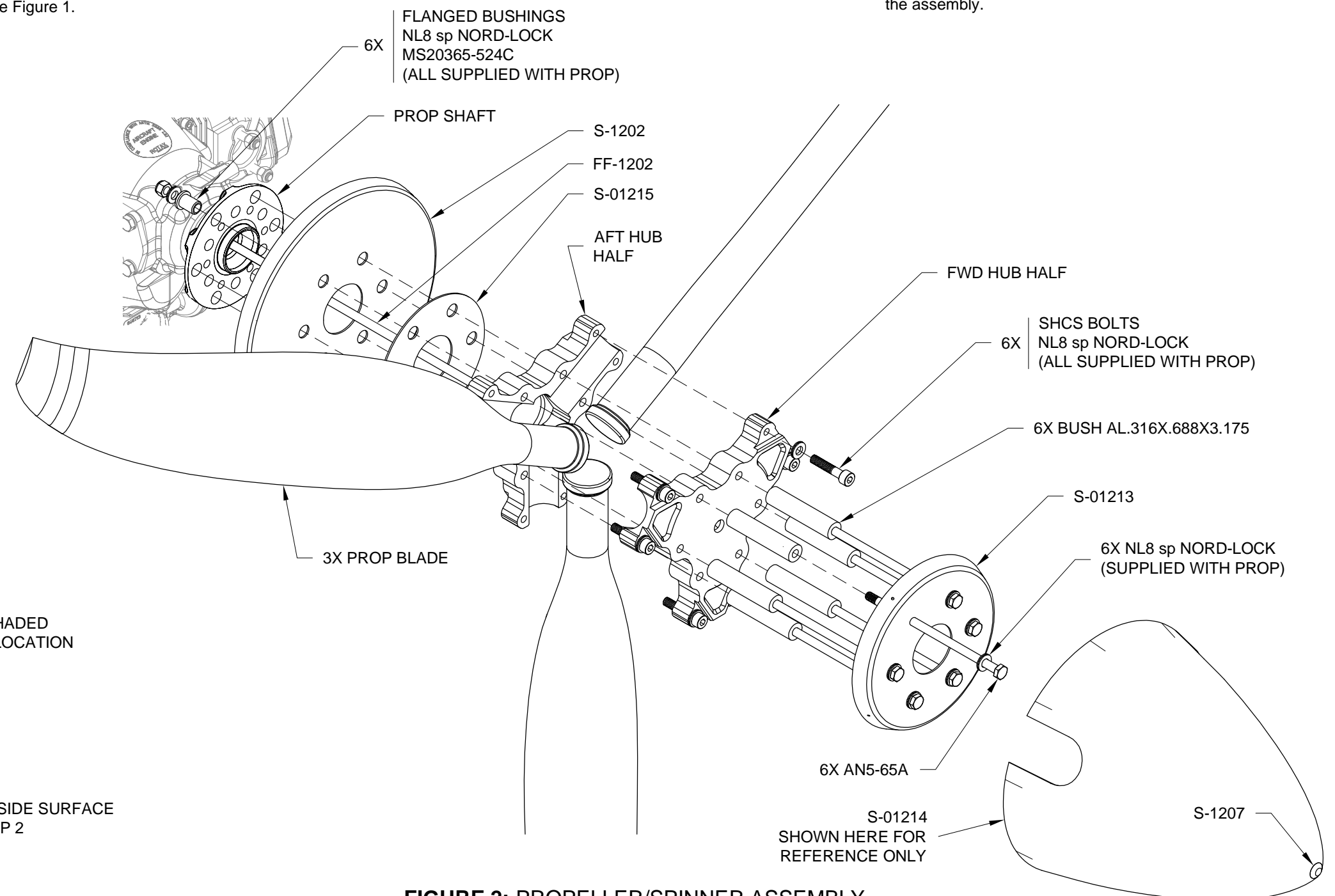


FIGURE 2: PROPELLER/SPINNER ASSEMBLY

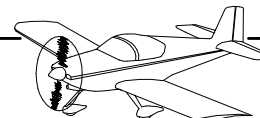
NOTE: If/as required add one or two NAS1149F0532P Washers between each BUSH AL.316X.688X3.175 and S-01213.

CAUTION: Do not place a plain washer next to a Nord-Lock washer.

NOTE: If the A-1879 Rotax 063 Spacer is supplied with the prop discard S-01215. If the aft prop hub half already has an integral .063 raised boss do not use a spacer.

Step 11: Attach the S-1202 Aft Spinner Bulkhead, S-01215 Prop Hub Spacer, propeller assembly, BUSH AL.316X.688X3.175, and S-01213 Front Spinner Bulkhead with the hardware called out in Figure 2.

Tighten the six AN5 bolts just enough to remove the play in the assembly.



NOTE: It is very important for the aircraft to remain as motionless as possible throughout the propeller pitching procedure.

NOTE: Never rotate the propeller in a clockwise direction more than one turn when viewed from the front looking aft.

Step 1: Rotate the propeller until one blade is approximately parallel to the floor. See Figure 1.

Step 2: Place the TOOL-00002 Prop Pitch Bracket on the trailing edge of the propeller blade so it hangs across the aft face of the blade at the inboard end of stripe. See Figures 2 and 3.

Step 3: Place a magnetic digital level on top of TOOL-00002 then rotate the blade until it is level. See Figure 3.

Step 4: Measure from the floor to the tip of the blade. This measurement will be used to place the other blades in the same position. Start by using a plumb bob to find a point directly below, then mark the spot with a piece of tape.

Step 5: Place a magnetic digital level on the canopy deck and zero reference it. Make certain that the level is resting flat against the canopy deck and not interfering with any rivet heads. See Figure 4.

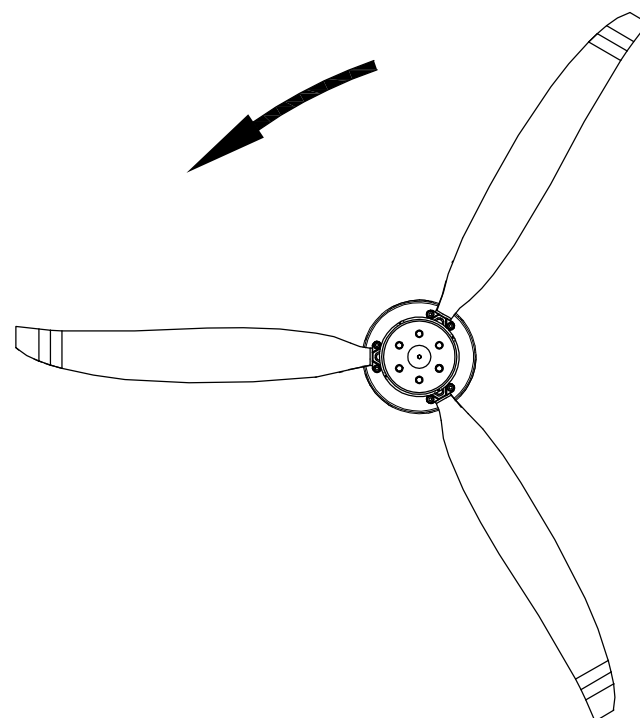


FIGURE 1:
POSITION BLADE PARALLEL TO FLOOR
(FRONT VIEW LOOKING AFT)

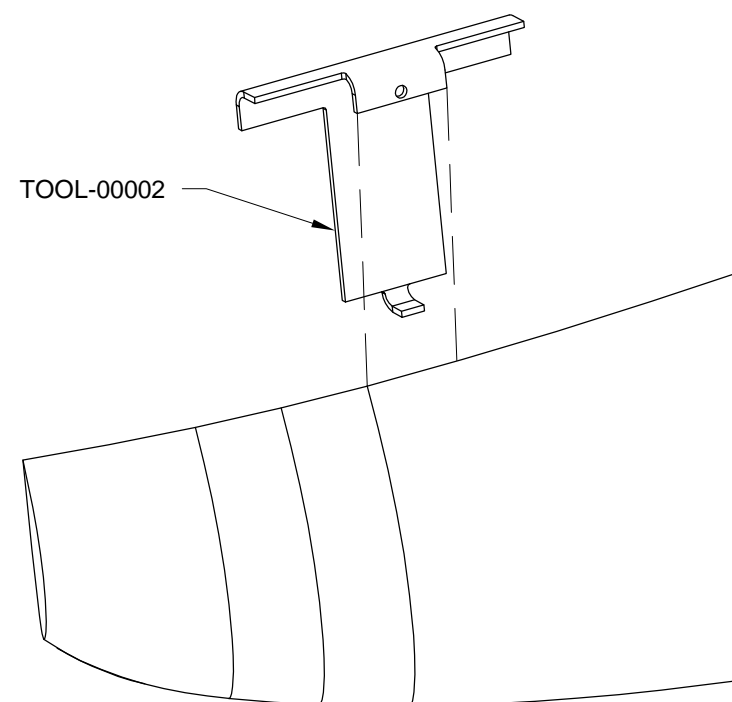


FIGURE 2: PLACE TOOL ON BLADE

MAGNETIC DIGITAL LEVEL



FIGURE 3: ORIENT BLADE
HORIZONTALLY



FIGURE 4: ZERO LEVEL ON CANOPY DECK



NOTE: It is very important for the aircraft to remain as motionless as possible throughout the propeller pitching procedure.

Step 1: Pick up the level resting on the canopy deck and, without changing its left/right orientation, rotate it to attach to TOOL-00002 as shown in Figures 1 thru 3. Check to make sure the TOOL-00002 (and attached level) are still aligned to the inboard edge of the solid white portion of the blade's tip. See Figure 1. Push against the front face of the flange of the TOOL-00002 to seat it properly. See Figure 2.

Note the measured angle on the digital level and record it. The correct angle is exactly 71.1 +/- 0.1 degrees for 912 iS. Use this same angle as a starting point for the 912 ULS. If the measured angle does not match the recommended angle, gently change the pitch angle in the required direction using hands only.

When the recommended pitch angle is achieved, slowly tighten the outboard two propeller bolts corresponding to that blade only. Frequently check the indicated angle while tightening the bolts to ensure the blade stays at the recommended pitch angle.

Step 2: Remove the magnetic level and tool from the prop blade and place the level back on the canopy deck and zero reference it.

Step 3: Rotate the prop and repeat the steps on pages 47iS/U-05 and 47iS/U-06 to set the pitch of the next two propeller blades.

Step 4: When finished, the blades should be within 0.1 degrees relative to each other. Torque the six outer prop clamp bolts to the propeller manufacturer's specifications. Torque the six inner mounting AN5 hex bolts to 220-240 in-lbs.

Step 5: The S-1202 Spinner Backplate has a tendency to become 'dished' during the forming process which may result in minimal clearance or undesirable contact between the backplate and the prop hub even though the S-01215 Prop Hub Spacer is present. To achieve the clearance called out in Figure 4 straighten the backplate by pushing aft on its outer edges, bending evenly to avoid warping, until the approximate clearance is achieved.

Check for a warped backplate by temporarily mounting a fixed object near the flange of the backplate, rotating the prop and observing the gap between the object and flange. A constant gap during prop rotation indicates the backplate is not warped.

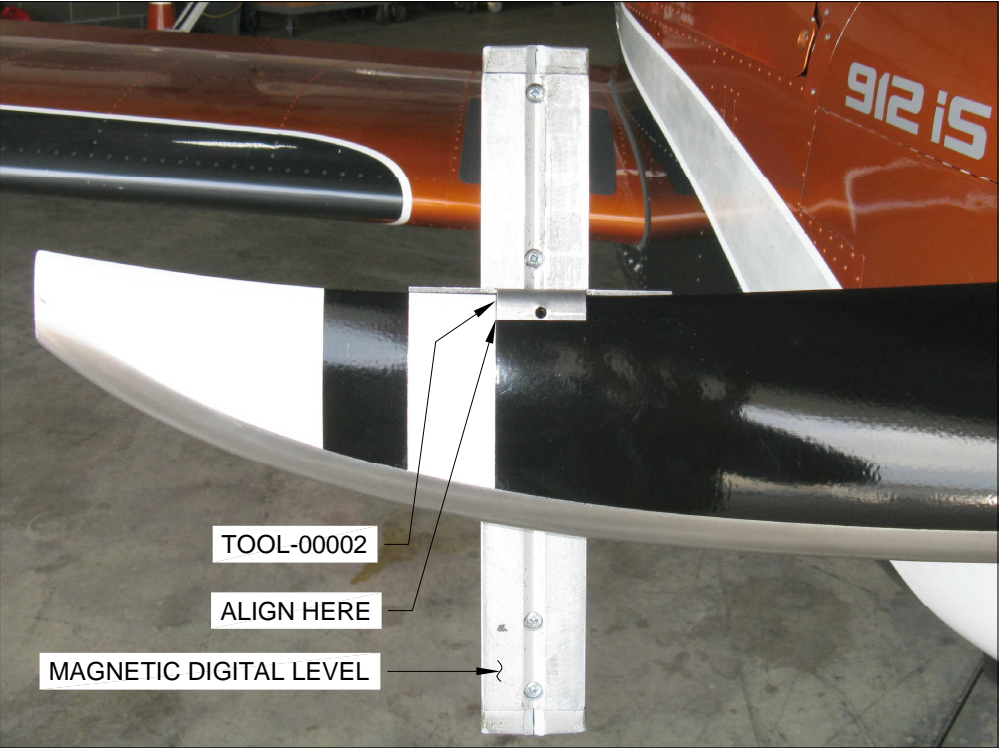
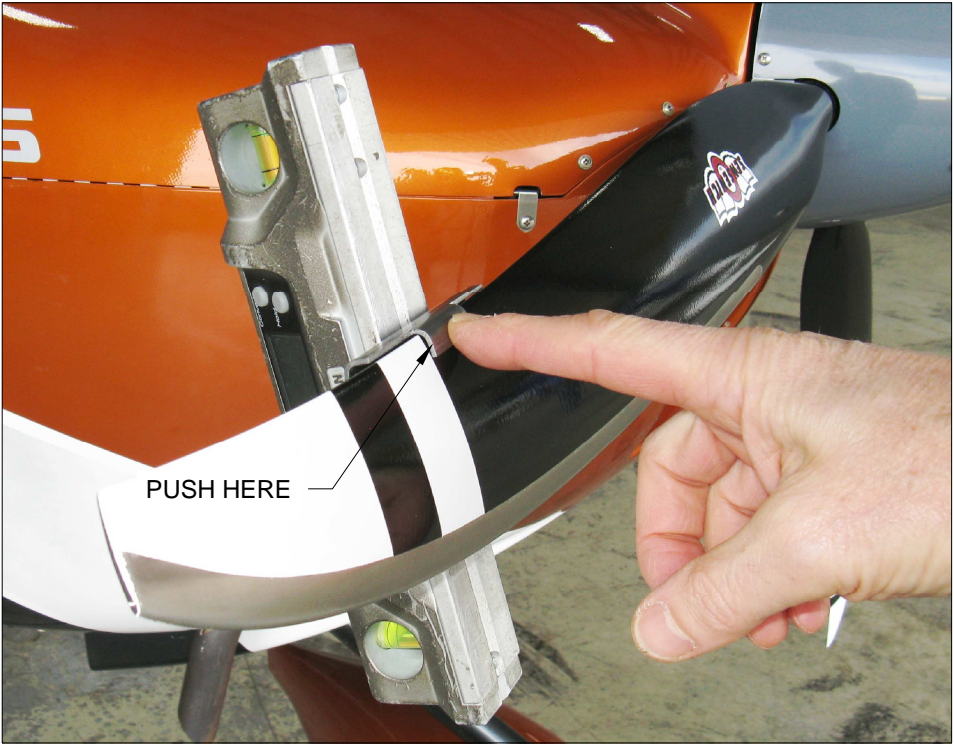


FIGURE 1: LOCATING THE PROP PITCH BRACKET



**FIGURE 3: MEASURING THE PITCH ANGLE
(IGNORE THE SPINNER)**



**FIGURE 2: SEATING THE PROP PITCH BRACKET
(IGNORE THE SPINNER)**

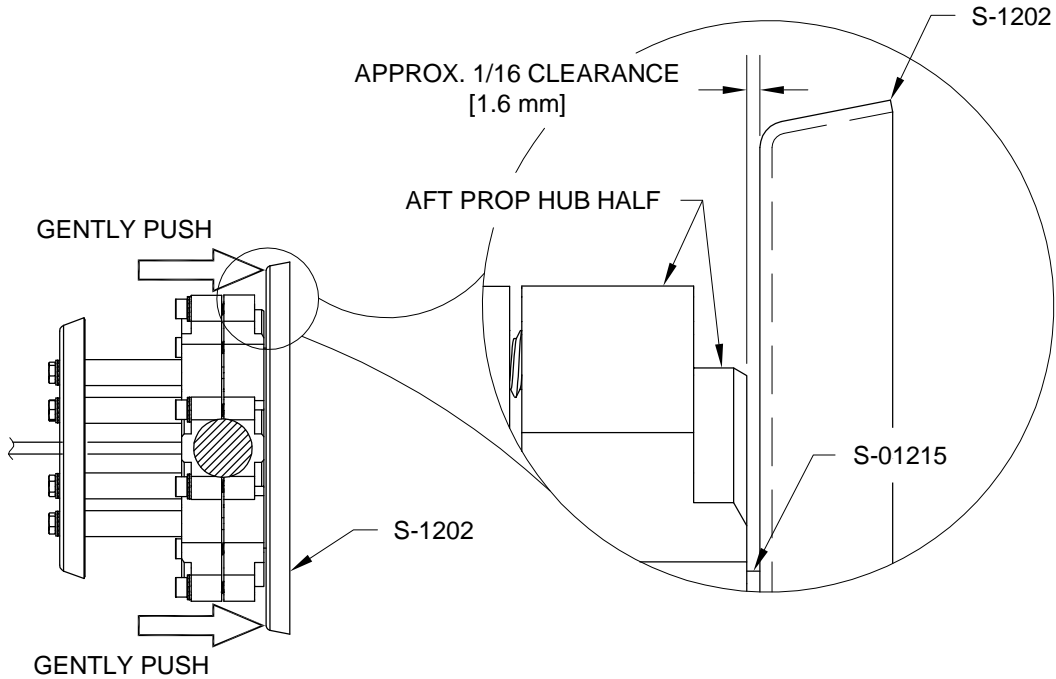
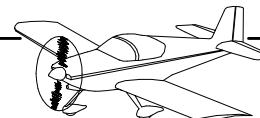


FIGURE 4: STRAIGHTENING THE SPINNER BACKPLATE



Step 1: Tape magnets to the pilot holes in the S-01213 flange in preparation for match drilling the S-01214. Refer to Section 5.18 for more information.

Step 2: Tape around the the propeller blades to prevent scratching during S-01214 installation.

Step 3: Slide the S-01214 Spinner over the assembly with the FF-1202 extending through the S-1207 in the front of the S-01214. See Page 47AiS-04 Figure 2. Be sure the S-01214 is seated firmly on the S-01213 and S-1202 (any overhang of the S-01214 beyond the S-1202 will be trimmed after the S-01214 is drilled and clecoed in place).

Step 4: Clamp the S-01214 to the S-1202.

Step 5: Attach a ruler to a chair, step ladder, or other support so that the end of the ruler is centered vertically and horizontally at the end of the FF-1202 as shown in Figure 1. The ruler and support should be clear of the FF-1202, the propeller, and the S-01214.

Step 6: Remove the lower spark plug on each cylinder to allow the propeller to turn easily by hand. Verify that the ignition is disabled (battery disconnected or switches off).

Step 7: The end of the FF-1202 will track with the angle of the S-01214. Turn the propeller by hand while looking aft as shown in the detail view of Figure 1. Adjust the S-01214 until the end of the FF-1202 remains centered on the corner of the ruler within 1/16 in. [1.6 mm].

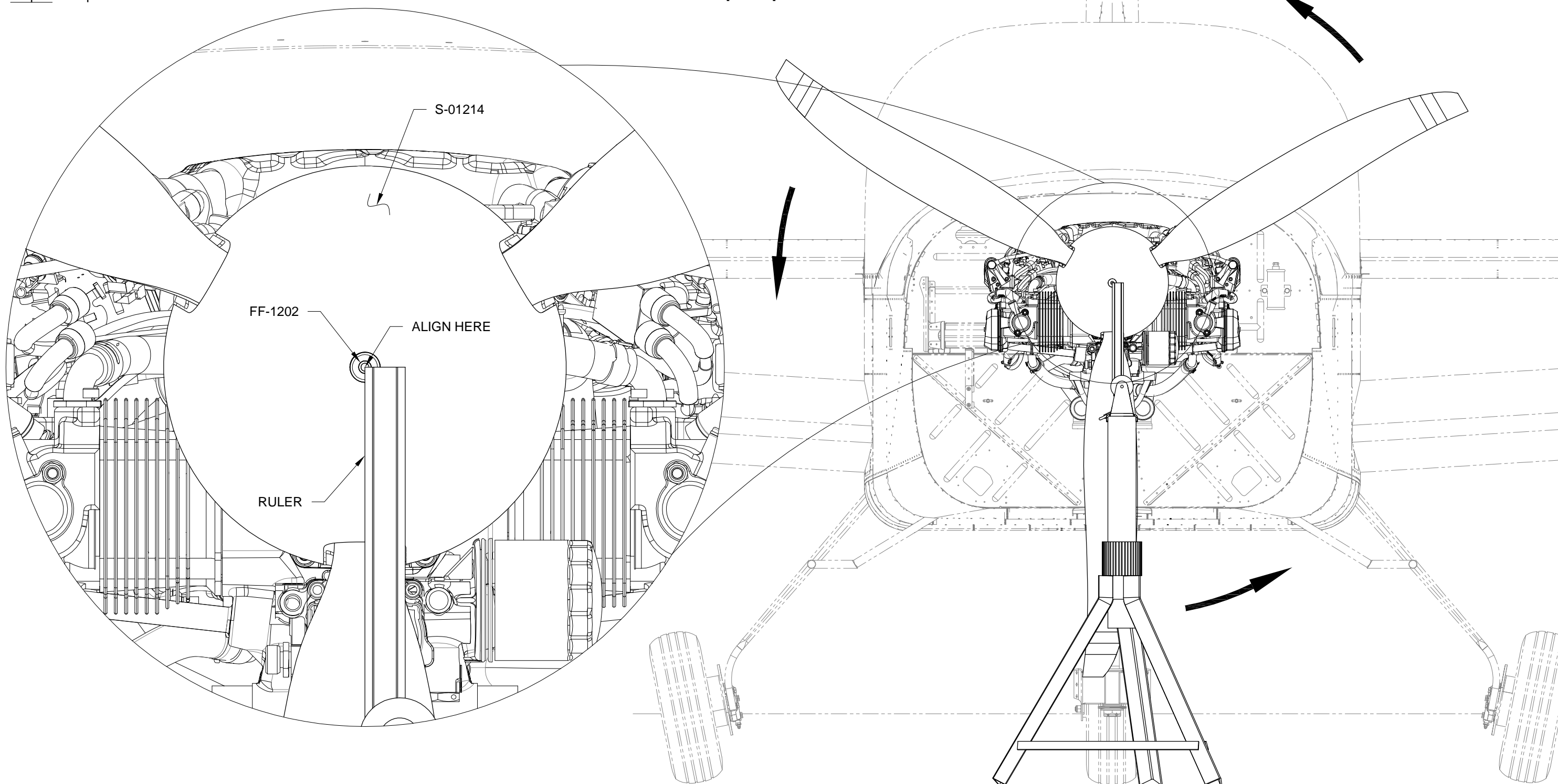
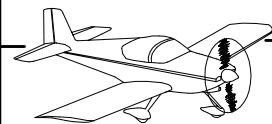


FIGURE 1: SPINNER ALIGNMENT



NOTE: Clear drill shavings as required before continuing to the next hole.

Step 1: Match-Drill #30 the pilot holes for the four screws that secure the S-01214 to the S-01213 Front Spinner Bulkhead. Refer to Section 5.18 for information on match-drilling opaque fiberglass parts. Cleco the drilled holes.

Step 2: Using a fine tip felt pen mark the inner surface of the S-01214 along the edge or perimeter of the S-1202 flange. See Figure 1 Detail. Remove the S-01214.

Step 3: Copy the screw location lines around the outside surface of the S-01214 (see Figure 1, Page 47AiS/U-04) to the inside surface with a fine point pen.

Step 4: At each screw location line on the inside of the S-01214 measure forward from the marked edge of the S-1202 the distance shown in Figure 1. Drill #40 pilot holes at these screw hole locations.

Step 5: Reinstall the S-01214 and cleco to the S-01213. Match-Drill #40 the screw holes from the S-01214 into the S-1202, installing clecoes along the way. To prevent "pillowing" of the S-01214 between the screws, start drilling midway between the propeller blade cutouts, working outward toward the cutouts. See Figure 1.

Step 6: Remove any overhang of the S-01214 beyond the S-1202. A sanding block works well here.

Step 7: Make three S-1202C Gap Fillers out of the pieces trimmed from the S-01214 using the template at the end of this section. Test fit the S-1202C and trim as needed to clear the propeller by 1/16 - 1/8 in. [1.6 - 3.2 mm].

Step 8: Final-Drill #19 all the holes common to the S-01214, S-01213, and S-1202 as shown in Figure 1. Clamp the S-01214 to the S-1202, inserting #8 screws to maintain alignment.

Step 9: Remove the S-01214 and make alignment marks on the inside of the S-01214, the S-1202, and the S-01213 so that they can be reassembled in the same relative positions later. Remove the S-01213, the six BUSH AL.316X.688X3.175, the propeller and S-1202. Install (clamp) the S-1202 into the S-01214, inserting #8 screws for alignment.

Step 10: Clamp the three S-1202C to the S-1202 and drill #40 three holes for each part. See Figure 1. Cleco each hole as it is drilled. Remove the clecos and all S-1202C.

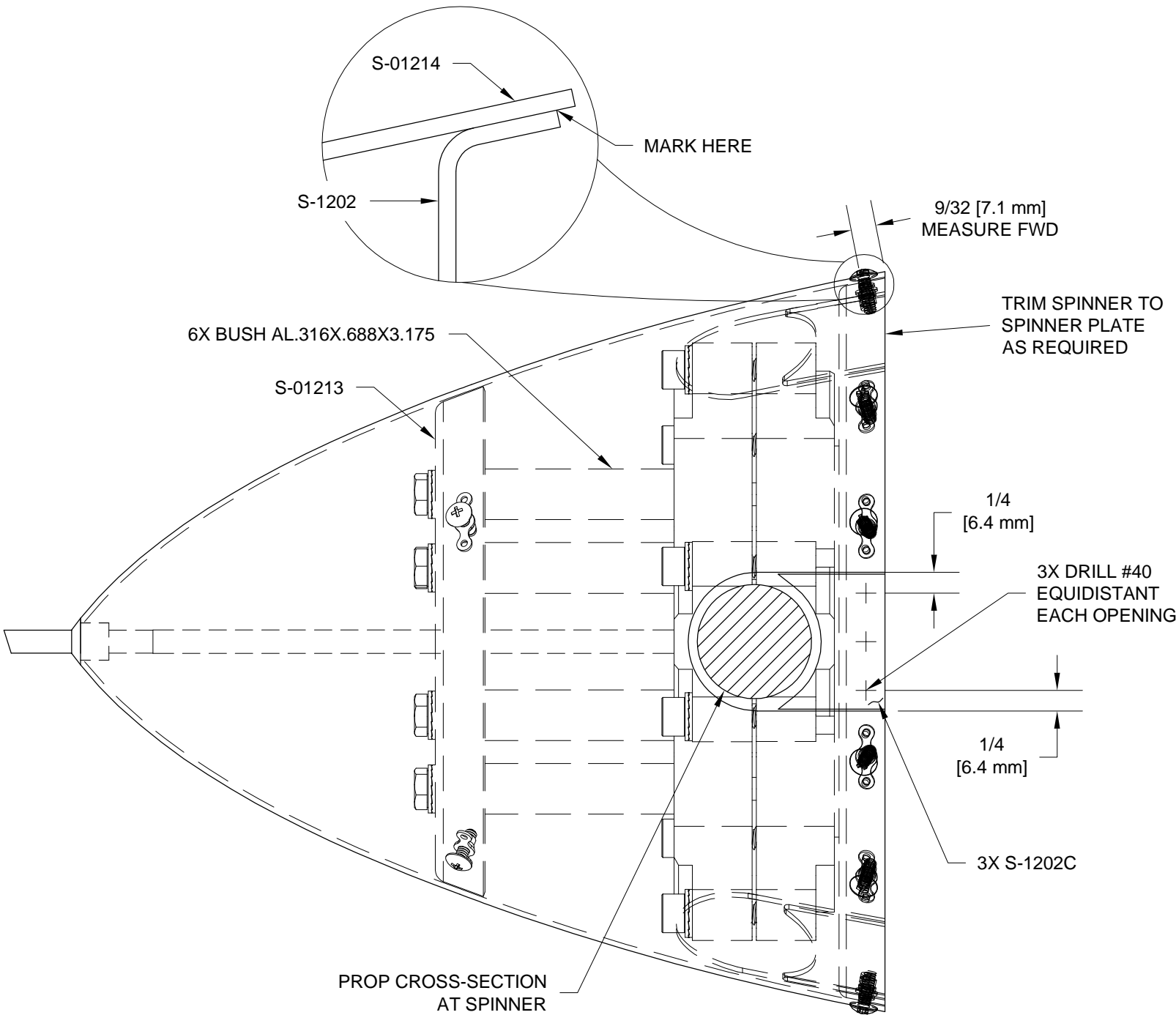


FIGURE 1: SPINNER INSTALLATION



NOTE: To locate the nutplate rivet holes, the nutplate is held in place with a mounting screw and the nutplate is used as a drill template. Cleco the first rivet hole to prevent the nutplate from rotating while locating the second rivet hole. It is important on curved surfaces that the nutplate is match-drilled from the side of the part on which it will later be installed.

Step 1: Drill #40 holes in the S-1202 for the rivets used to attach the nutplates called out in Figure 1.

NOTE: Rivets should be slightly under-set when installed in fiberglass parts. Machine countersinks into fiberglass that are up to .005 too shallow are acceptable, even preferable, to countersinks which are too deep.

Step 2: Machine countersink all #40 holes in the S-1202C for flush rivets.

Step 3: Machine countersink all nutplate rivet holes in the S-1202, and S-01213 for flush rivets.

Step 4: Deburr all holes drilled, then rivet the nutplates called out in Figure 1 to the S-1202 and S-01213.

Step 5: Rivet the S-1202C to the S-1202 using the rivets called out in Figure 2.

Step 6: Reinstall the S-1202, propeller assembly, BUSH AL.316X.688X3.175, and S-01213 using the alignment marks made earlier. See Page 47iS/U-04, Figure 2.

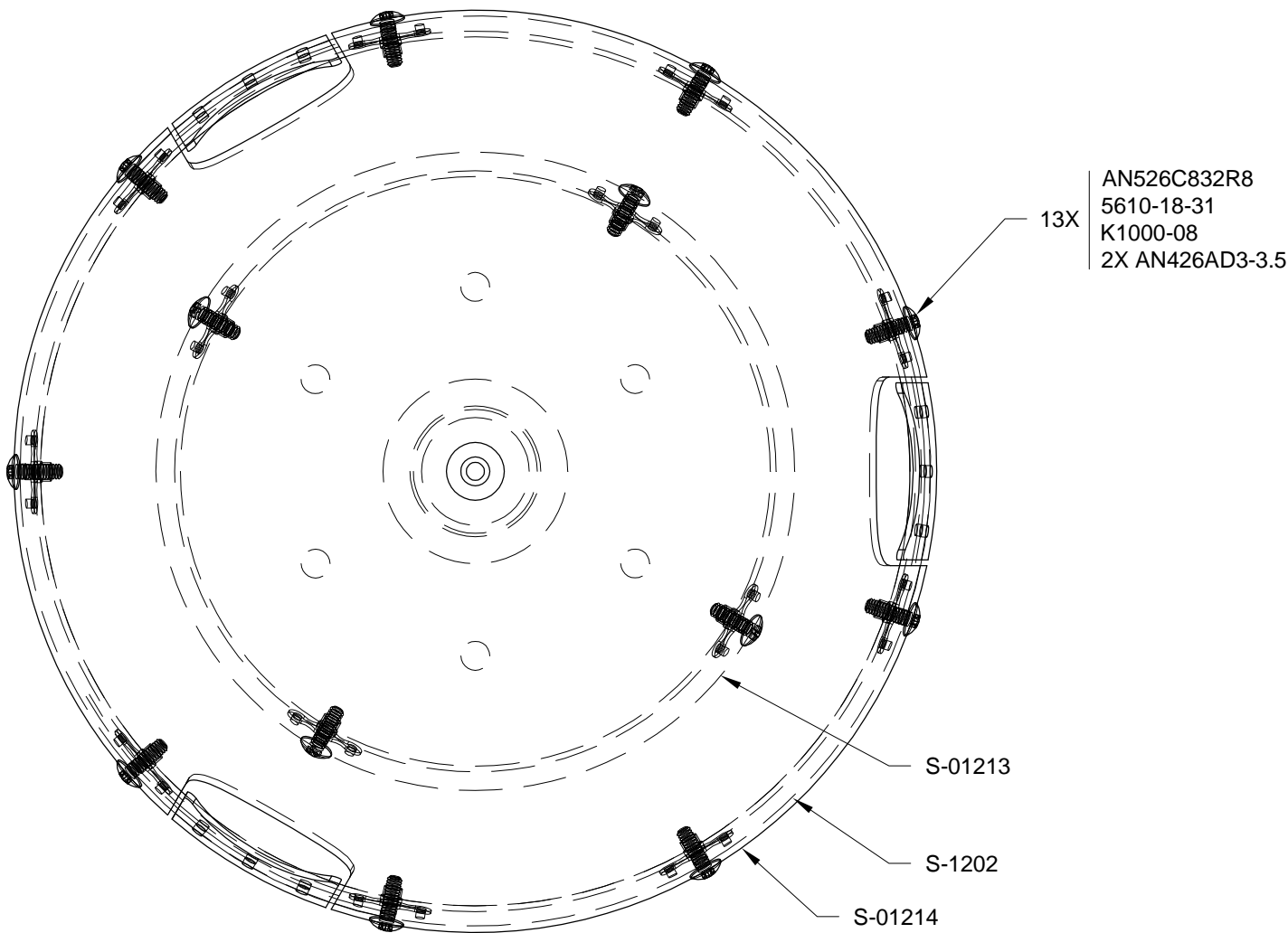


FIGURE 1: SPINNER INSTALLATION

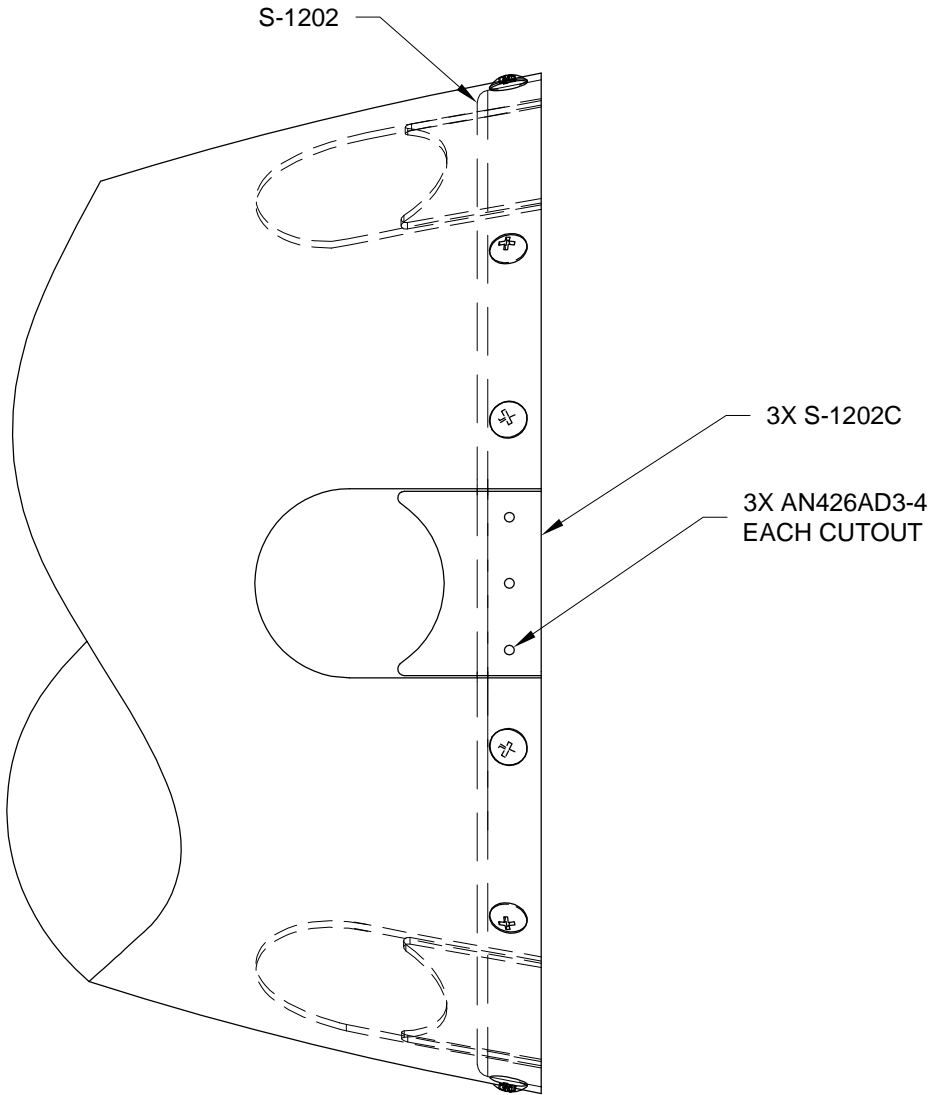
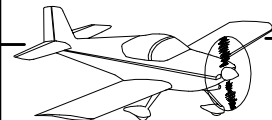


FIGURE 2: GAP FILLER PLACEMENT



Step 1: Attach the S-01214 to the S-01213 and the S-1202 as shown in Figure 1 using the screws and washers called out on page 47AiS/U-09.

Step 2: Reinstall the lower spark plugs removed on Page 47iS/U-07.

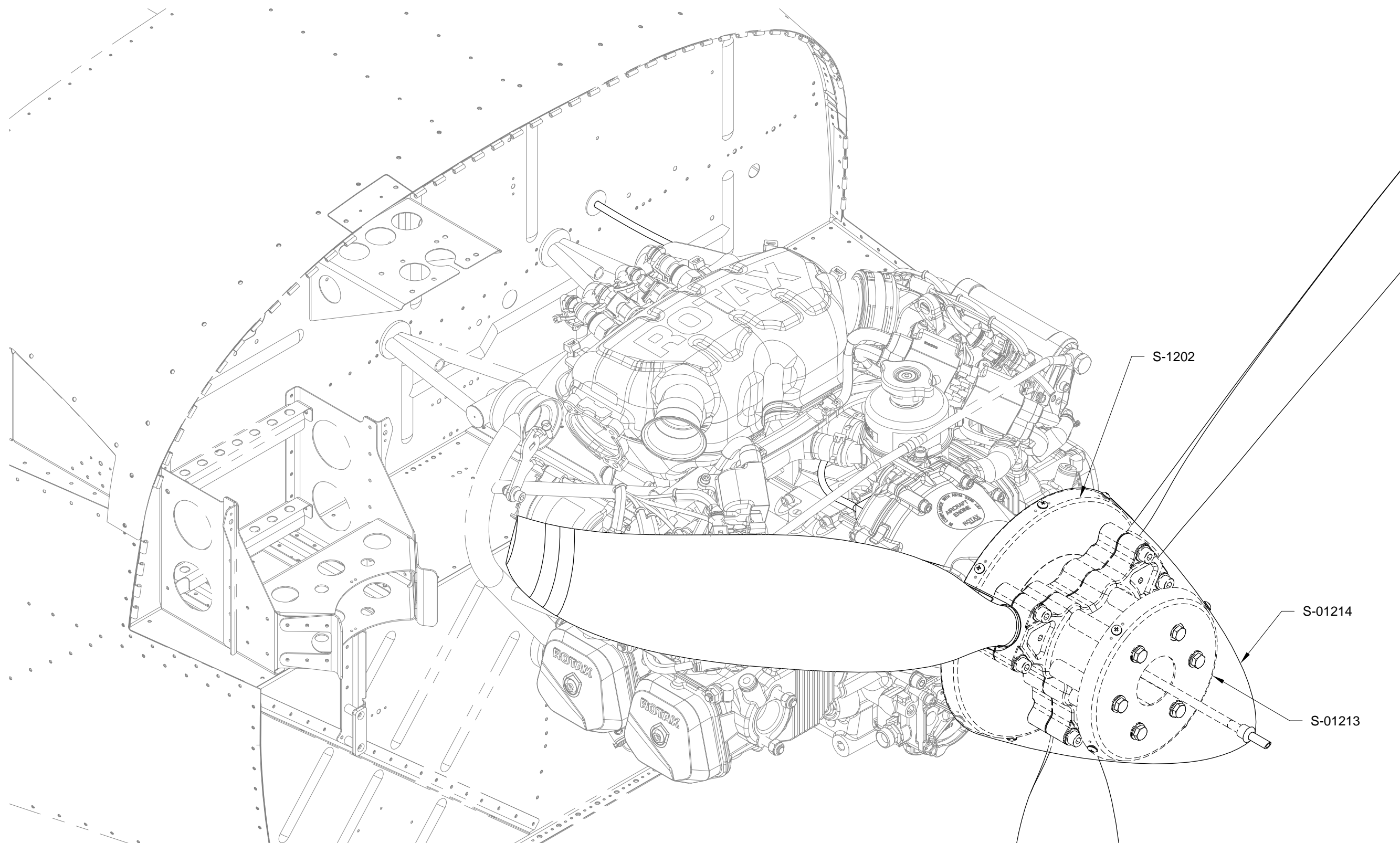


FIGURE 1: SPINNER INSTALLATION



10 9/16
[268.3 mm]

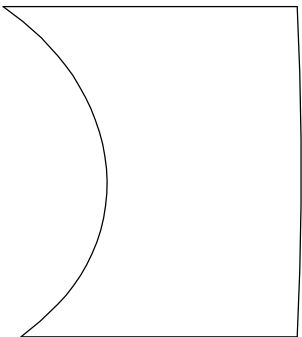


FIGURE 1: S-1202C TEMPLATE

(NOTE: CHECK PRINTED SCALE 1:1 PER SECTION 3 BEFORE USING THIS TEMPLATE!)

16
[406.4 mm]



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