

15. Fuel Sending Unit



Section Objective: The correct installation of the electronic fuel sending unit.

Required Parts: Fuel level sending unit #FL-PE-01

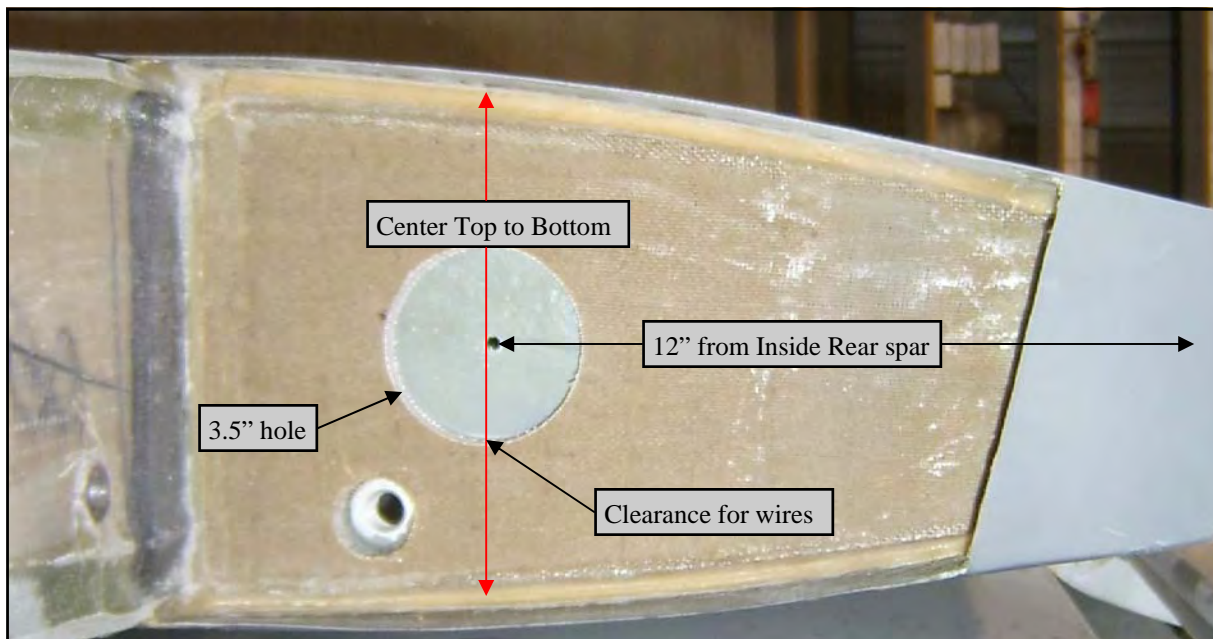
Required Hardware: Aeropoxy resin PR2032, Aeropoxy hardener PH3660,

Required tools: 1/4" drill bit, 3 1/2" hole saw,

Required Conditions: Temperature above 60F for 24 hours.

Skills or Training: Ability to properly mix 24 hour epoxy.

1. Use the picture on this page as a guide.
2. Measure forward from the inside of the rear wing spar 12"
3. At this line make a mark that is centered vertically on the rib. Should be roughly 4-4.25" from the bottom.
4. Drill a 1/4" pilot hole thru the rib and the tank.
5. Next using a 3.5" hole saw **Drill Thru the Rib Only!!! Do not go thru the Tank!!!** There will be about a 1/8" and 1/4" gap between the rib and tank.
6. Once this is done use a sanding drum on an air-tool or dremel and make a small bump out in the bottom of the hole, this will give clearance for the sending unit wires.



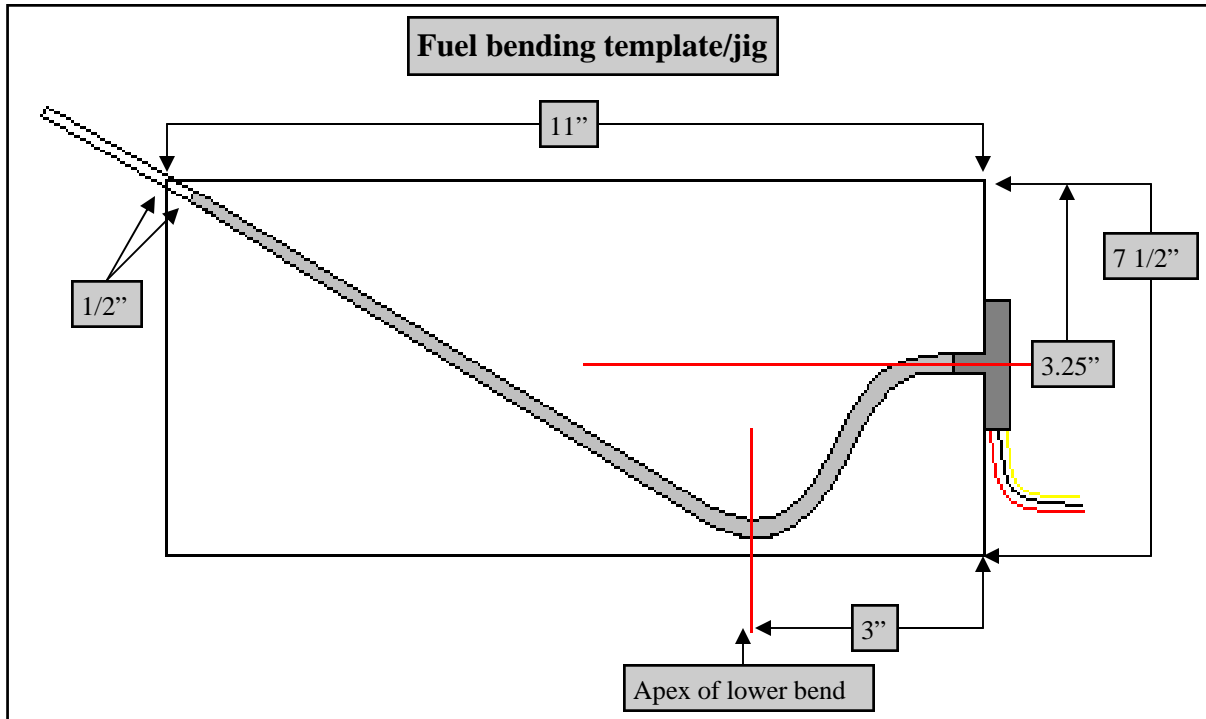
7. Next will be bending the probe.
8. The probe is bendable in the first 5" from the white unit at the end. It is marked with a sharpie and "Bend".
9. Use the picture below and the next few drawings to bend it. Take your time and read carefully.



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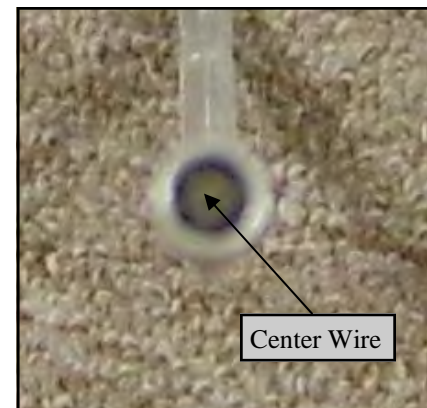


10. The probe can be bent easily by using a brake line bending tool or any tubing bender for small tubing.
11. Start by drawing a template. You can use some scrap plywood or card board or the top of your tool box, my is permanent for use with many planes. This template will be universal for both sides.
12. Draw a box that is 11" by 7 1/2".
13. Measure down 3 1/4" this will be the center of our simulated tank.
14. Now measure out 3" from the end you plan to have the white electrical end on (as shown in the picture). This will be a target point for the apex of the lower bend.
15. The other target point is the upper corner of the opposite end of the box.



16. Bend your probe so that it will go down to the lower reference point. It should have about 1/4" gap between it and the outside of the box.
17. Continue the bend up to the opposite corner. The probe will be too long. Just make sure it goes up there for now.
18. From where the probe crosses the upper corner of the box, measure into the box 1/2". This is where you will cut the probe off. Should be about 2 3/8" from the end +/- 1/4".
19. Cut this section off using a tubing cutter **do not cut with a band saw.**

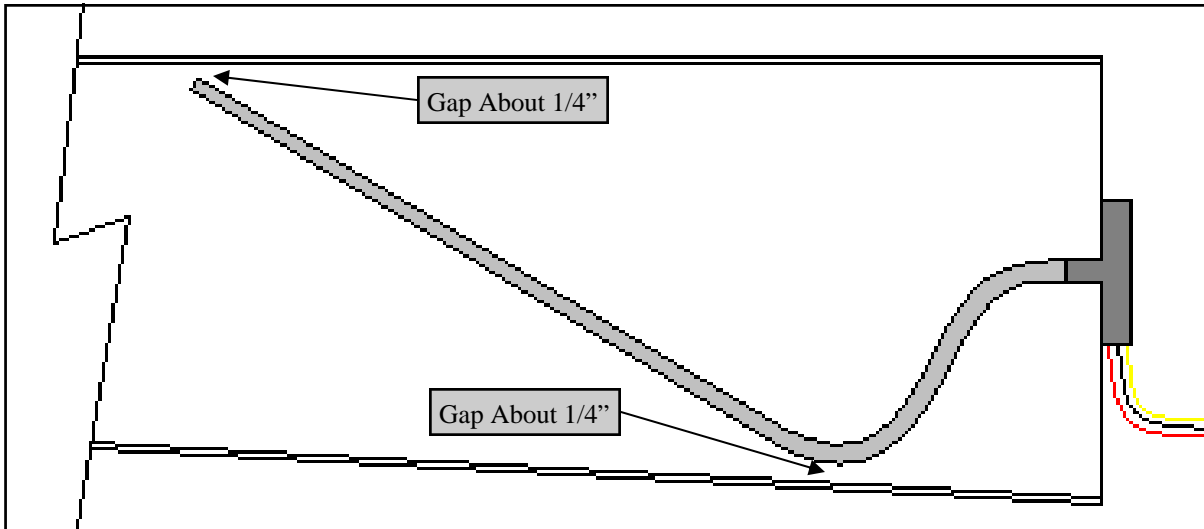
20. Once the tubing is cut the left over part will not come off. It is held in place by a small plastic spacer inside the tube. Cut the brass center wire off about 1" from the end of the fuel probe.
21. Next use a sharp exacto knife or utility blade to cut away the aluminum tube that has been forced in when cutting.
22. When it is cut out enough use a small jewelers file to clean up the rest.
23. Lightly blow in the small vent hole at the electronic end to get out any aluminum shavings.
24. Cut the brass tube off flush with the end of the probe.
25. The side cutters will crimp the end and squash it out and that is fine leave it this way, this will prevent the plastic spacers in side from sliding out.



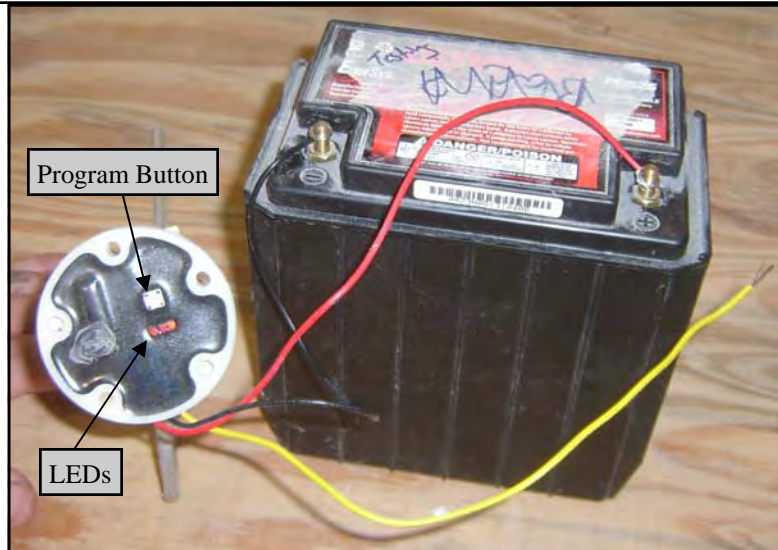
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26. With the probes both bent and cut to the initial shape now mark one left and one right. Next you will make them fit each tank specifically. Even though the drawing is very close the unit will still need a little tweaking.
27. If you have not done it yet, drill the 1/4" pilot hole in the tank to fit the end of the probe, about 3/8".
28. Slide the probe in place. With the white part against the tank tip the unit until the end touches the top of the tank. This is where your best guess will come in. You don't want to tip the unit and hit the tank instantly but that is touch with a little angle change. The estimate would be about a 1/4" gap. Even if it were a 1/2" gap the tank would still be very accurate.



29. If you must bend the unit doing so by hand is a good way, very little adjustment is needed to get a good result at the tip. Take your time it is better to only bend the probe one way and not back and forth.
30. Repeat this technique for the bottom of the probe as well.
31. Now work the other probe in the same manner.
32. It is a good idea to test the probe before installation.
33. Strip back the red and black wire about 3/4".
34. Wrap the red wire around the positive post and put the nut on it.

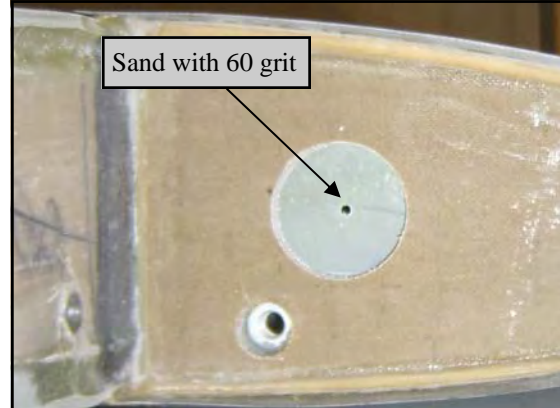


35. Hold the white button down and then hold the black wire to the ground post. This resets the unit.
36. The red light will come on. It will eventually start blinking the end LED.
37. Push the button. It will turn off then start blinking the other end LED. This has set the low point.
38. Push the button again, it will turn off then come on blinking the other LED every 10 seconds or so. The unit is operating correctly.
39. When you program the unit once it is installed the process will be similar. Read those directions carefully.
40. This was just to test the unit and make sure your bends or cut in the end did not short the unit. Taking them out once they are bonded in is a lot of fun so better to check now.
41. Set these aside and get ready to bond them in.

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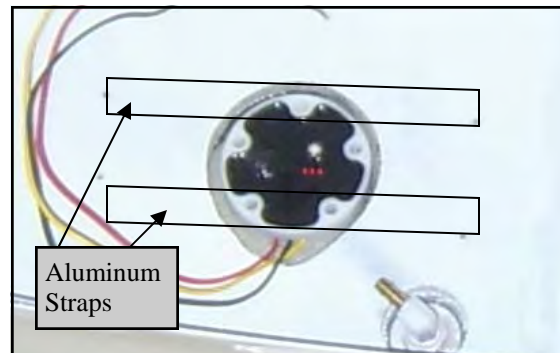
42. Go back to the hole that you cut in the rib to get to the fuel tank.
43. Sand the side of the with 60 grit sandpaper. It must be sanded well, the surface should not have any shiny area left. This is very important sand it very well or the sending unit will not stick.
44. Clean the area with acetone.
45. Next sand the base of the sending unit that will be against the tank. The plastic is shiny and must be sanded until the shiny is all gone and the face is scratched and sanded well.



46. Using scrap aluminum say 1/16" thick or so. Make 4 straps to hold the sending unit in place while it dries.
47. The straps should be 1" wide by about 7" long. Drill a 1/8" hole in each end for a sheet screw. Set aside for now.
48. Before beginning to glue, remember to wear gloves and be very careful not to touch the white program button on the sending unit. This has been done, and when the button gets glued the unit wont program so than you will get to do this all over again.



49. Mix up about 2.5 ounces total 24 hour epoxy. This would be 2.0oz of the resin and 0.5oz of the hardener.
50. Use a brush to wet out the mating surfaces of the tank and sending units.
51. Mix the rest of the epoxy with flox until you get a mashed potato consistency mix.
52. Put a 1/4" to 3/8" thick pile on the sending unit base as shown in the picture.
53. Insert the sending unit in to the tank and press into place, do not push the unit all the way to the tank ut enough to settle firmly into the flox.
54. Use the straps you made earlier to hold the unit in place.
55. Use #6 3/8" long sheet screws to secure the straps in place.
56. Make sure that no glue runs down around the unit and gets on the program button.
57. The process is the same for both units.



58. After the units have cured for at least 24 hours remove the aluminum straps.
59. Coil up the wires so they are not in the way and refer to the Princeton installation guide for proper wiring and calibration.