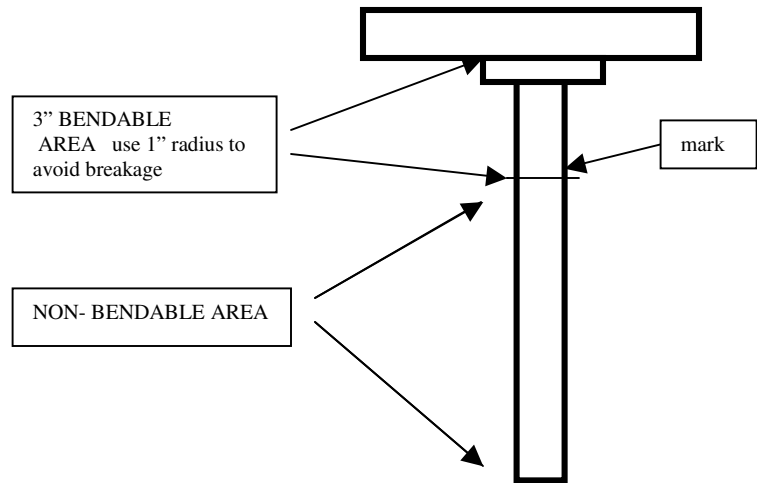


FALCON GAUGE

Fuel Level Sender Installation Instructions

Read these instructions first before working on the sender

12" sender may be cut down to 4 ½"
24" sender may be cut down to 12 ½"
12" & 24" bendable area is the 1st 3" of the senders' tubing from the mounting flange. DO NOT bend the non-bendable area.
Very Important: If you have to recalibrate the sender, you must empty your fuel and restart from step 1.



Because the electronics are designed to measure hydrocarbons, the gauge will read FULL, if the probe touches water, providing another way to determine if the fuel tank has been contaminated. The probe will also read FULL, if it touches metal. Therefore, when planning installation, care must be taken to isolate the probe from any possible contact from metal.

Turbulence induced fuel (slash) has little effect on the system because the fuel being measured is inside the probe and the fuel can not move fast enough to effect the gauge.

Probe Length: The probe length is determined by the depth of the tank and the owner's decision as to the amount of the fuel to be kept in reserve. Probes are supplied in increments of 1 foot, so it is necessary to know whether the tank is 12" or 24" deep. The user trims back the probe to the depth determined with a tubing cutter, then calibrates the probe by adjusting the "empty" and "full" trim pots in the probe head following the instructions.

The minimum a 12" probe can be cut back is 4 ½" measured from the plastic boss the probe tube is mounted in. A 24" probe can be cut back to 12 ½". The standard probe head is 1" high, including the studs.

The probe is dead accurate, reading linearly. However, most aircraft fuel tanks are not linear- the sides are not parallel with the probe. As a result, most gauges will be "off" at some point in the needle travel. Depending upon the tanks shape, some readings may be off to some degree. The amount of which can be "carded" adjacent to the gauge or on the gauge glass.

BENDABLE OR NON-BENDABLE: If a probe location requires the probe to be bent, a "bendable" probe must be used. The bendable area of the probe (marked by black line on the tube is about 3" from the plastic boss. BEND THE TUBE ONLY IN THIS AREA. Between line and the open end of the probe should remain straight. The mark represents the full level of the probe.

Do not use rectifier/regulator to operate the system. A battery must be used to operate off of the lighting coil. The gauge will go to full for 5-10 seconds when power is first applied.

A. SENSOR PREPARATION

1. Measure the depth of your tank from the outside top to the bottom.
2. Using a tubing cutter, cut the outside tube approximately ¼" shorter than the measured depth. Remove the outer tube and cut the inside tube. Using a pair of wire cutters (do not let the inside and outside tube touch). Use insulators from the piece that was cut off and slide onto the inside tube to prevent the two tubes from touching. The meter will peg full if the two tubes are touching.
3. When using a bendable probe, the tube does not have to run straight up and down, it might be more practical to have it run diagonally.

CAUTION!!! Disconnect the battery before making any electrical connections.

4. The probe is a 12V DC unit. Use a 120 ohm 3 watt resistor for 28V DC in series with the red lead of the probe. Do not use battery charger for the calibration or operation. It's recommended to use a tube or tank of fuel the same depth as your fuel tank for calibration, as this procedure requires you to remove the probe from the tank several times.

5. Be sure the unit is dry before you attempt to calibrate. Residual fuel left inside the tube will give erroneous readings and affect the calibration. If your unit has been immersed in fuel, let it dry before you calibrate. The “empty” and “full” adjustment screws are located on top of the unit. A small slotted screwdriver is required to make the adjustments.
6. Turn both EMPTY and FULL adjustments full in a CCW (counterclockwise) position. Make the wiring connections as shown in the wiring diagram below.
7. Slowly turn the “empty” screw CW (clockwise) until the needle on the gauge goes to the EMPTY mark. The needle should be on or just below the empty mark. Now turn the screw CCW to make sure the needle starts to move upscale immediately, then turn CCW to indicate tank level.
8. Put the probe completely into the fuel. Turn the FULL screw CW until the needle indicates fuel level in your tank. For best results, the probe should be completely immersed in the fuel. If you accidentally adjust below your actual fuel tank level, turn the full screw to the FULL CCW position: then CW to indicate tank level.
9. Remove the probe from the fuel. The needle should go to the empty mark or just above. Shake the probe a few times to remove the residue fuel. The needle should now rest on the empty mark.

B. INSTALLATION

1. Place the gasket on the sender unit, align the holes and apply a sealer such as permatex on the gasket. Put a small amount of sealant in the mounting holes and insert the mounting screws.
2. Place the sending unit in the tank. Note the holes are not symmetrical, rotate until the holes line up, and then tighten down the mounting screws.
3. Connect a wire from the sender terminal (yellow) on the sender to the sender terminal on the gauge. Connect a wire from the NEG terminal (black) to a ground bus. Connect a wire from the POS bus (master switch) 12 volt DC.
4. Now installation is completed. Put a generous amount of sealant over the wire terminal and the adjustment screws.
5. Connect the battery and turn on the main switch, the meter will go above the empty mark then to the correct fuel level.

C. TROUBLESHOOTING

1. Meter pointer stays above full mark when main switch is turned on. Possibly
 - a. Full tank of gas
 - b. Water in fuel tank
 - c. Meter not grounded properly
 - d. Sender wire is touching NEG terminal or wiring
 - e. Center rod is touching the outside tube
 - f. Sender not calibrated
2. Meter pointer stays at “empty”. Possibly:
 - a. No power to sender
 - b. No power to gauge
3. Sender not connected to gauge. Meter fluctuates. Possibly:
 - a. Wire connections loose
 - b. Wire connections corroded

D. POSSIBLE PROBE LOCATION

There are 6 possible locations for fuel probes in various difficult tank locations:

#1 is an installation of a bendable probe from the wing-tip end of a wet wing or wing tank. This will work, but the probe may be very long (96” is the record so far), causing extra installation steps. Probes over 24” are ½” CD for strength, but an eight foot probe will require additional support inside the tank.

#2 is a bottom mount system, required at times when the only opening or space available is at the bottom of the tank. No problem with installation, except obvious care must be taken to seal the opening and boltholes. Probes to be installed from the bottom up may be calibrated in the right side up position.

#3 is a 90 deg. Bendable probe installation in a wet wing. The problem here is that the probe will not be reading the total depth of the tank. It can however, be calibrated to read accurately once the fuel level reaches the “readable” portion of the probe.

#4 is a standpipe installation. A good solution to the mounting problems posed by wet wings. It requires the builder to create a standpipe in which to mount the probe. The standpipe can be made of any non-metallic material, such as ABS, PVC or fiberglass. It should be longer than the height of the fuel and mounted in any convenient location. The top of the standpipe should be equivalent to the height of the fuel in a full tank and the bottom an inch below the bottom of the tank. The diameter of the standpipe should be a minimum of ½” ID and be topped by a 3” D. Flange on which to mount the probe. Plumb the standpipe to the fuel line (a tee will work) and vent the top of the

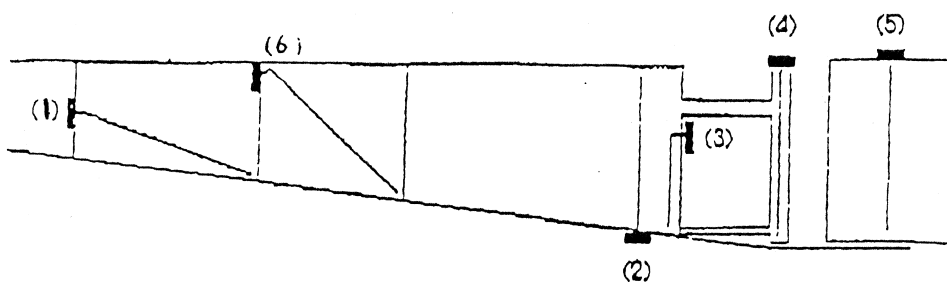
standpipe back to the tank, directly outside through a fuselage vent or to a fuselage vent system. If the machine has a header tank whose top is lower than the wing fuel level, a standpipe can be extended from the top of the tank in which to mount the probe.

#5 Is an example of a probe installed in a header tank, which is as high as the fuel level in the wings at full.

#6 See #1

**** When using a bendable probe as in #1 and #6, you may wish to slightly bend the probe up then down diag. This will allow you to read more fuel. As shown on fig. #6

These instructions may not work with other manufacturer's probes and gauges.



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