

## **Service Bulletin 60**

**Subject:** Stewart Warner Electric Sending Units

**Applicability:** Sportsman Aircraft kits shipped from August 2006 through March 23 2007, with main and auxiliary fuel tanks designed for Stewart Warner electric fuel sending units: Glasair Aviation LLC part #201-40030-03.

**Compliance Time:** Prior to first flight and fuel system calibration or, prior to next flight if currently flying.

### **Discussion and Background Information:**

After investigating problems Sportsman customers have reported in calibrating their fuel tanks (in relation to EFIS calibration procedures), we discovered that some of the float arms are getting hung up on the rheostat case of the sending unit. Our investigation showed that on all of the sending units we inspected the wire float arm has less than a 90 degree angle at the point where it clamps to the plastic arm on the sending unit, which induces pressure against the rheostat plastic case and gets sticky or hung up in approximately 25-50% of cases.


Our investigation also revealed the fact that a few of the oval-shaped floats themselves were sticking on the float arm and not spinning freely. If the float doesn't spin freely on the arm, it won't float "flat" on the surface of the fuel, preventing the rheostat from reaching full travel thereby indicating less than full and empty readings.

### **Required Action:**

If the sending units are not installed: Perform an inspection of all sending units to verify no friction or interference between the plastic float arm and the plastic case. We recommend removing the float arm and bending the base angle to 90 degrees as outlined below.

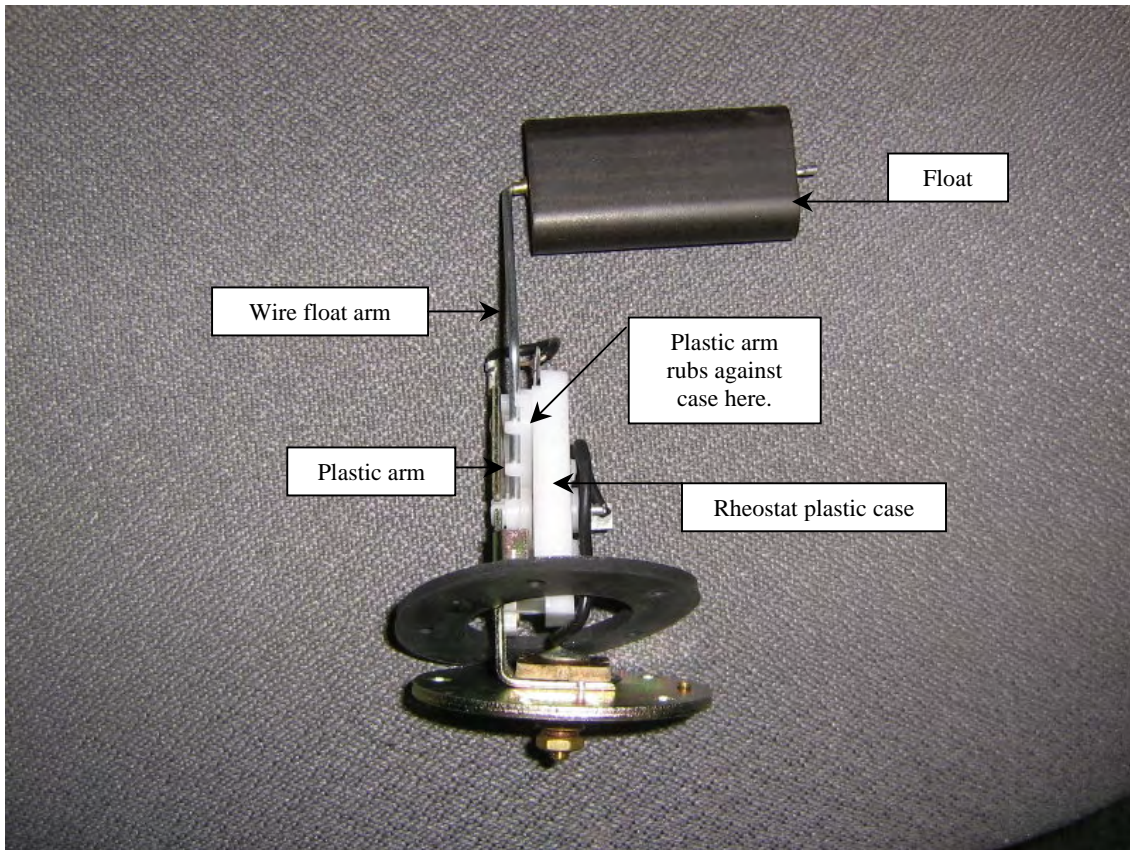
If the wings are complete with tanks and sending units installed: Our recommendation is to test each sending unit at empty and full fuel with an ohmmeter or with the AFS calibration screen method outlined below to verify the float travel is complete in both directions.


When checked with an ohmmeter, the sending unit rheostat should read from 30 to 250 ohms +/- 5 ohms on either end. (A sampling of sending units resulted in an average of 31 to 248 ohms). The ohmmeter will read more than 32 ohms if it doesn't reach the lowest point of travel and less than 248 ohms if it doesn't reach the highest point. If this is the case, drain all fuel from the tank at the next convenient opportunity and remove the sending unit for inspection and a remedy.

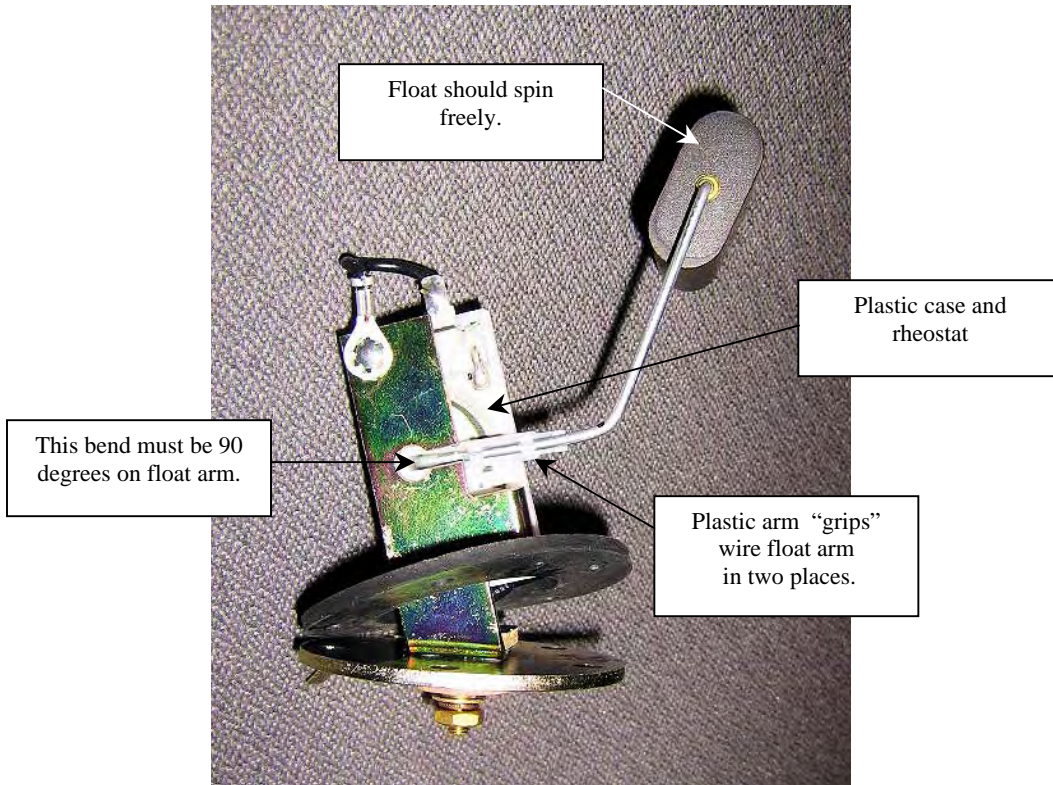
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**Warning:** Be sure to completely tape off the fuel tank opening to keep debris from entering the tank and to eliminate the possibility of explosion due to accidental ignition of fuel vapors.

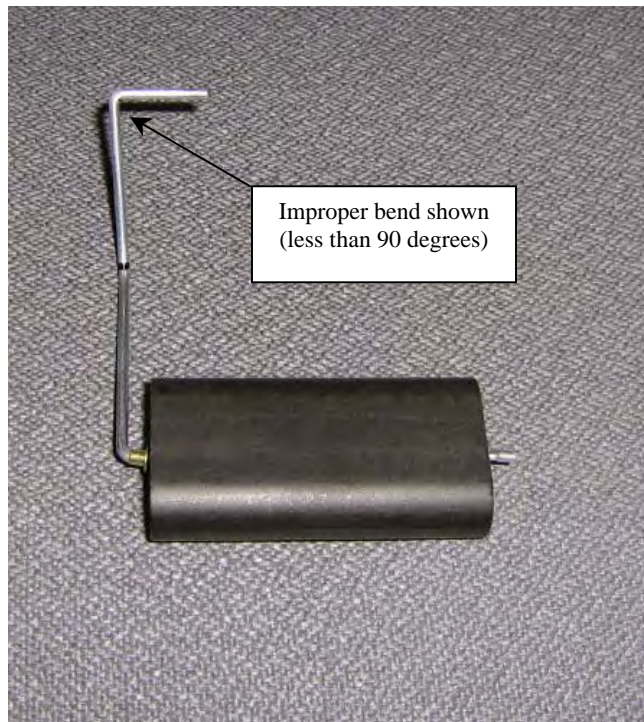
To check for stuck floats using the Advanced Flight Systems 3400 or 3500, after confirming the wiring or related connections are not at fault. Access the tank calibration screen on the EFIS. Select the tank to be checked (Note: Tank signal designations are listed on page 54 in the AFS Manual). When empty, each sensor valve should read 100 +/- 25. When full, each sensor should read 900 +/- 25. If the float on the sender contacts the bottom or top of the tank before the sensor reaches its travel stops, the value will be slightly greater than 125 empty and less than 875 when full. If the number is somewhere between these two values and does not change as fuel quantity changes, the float is most likely stuck.



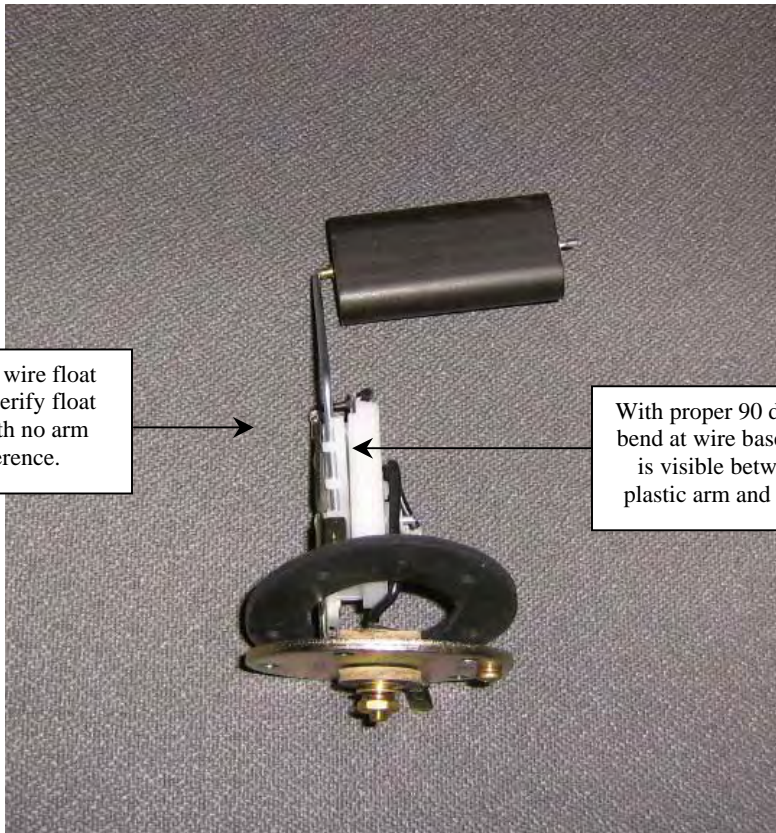
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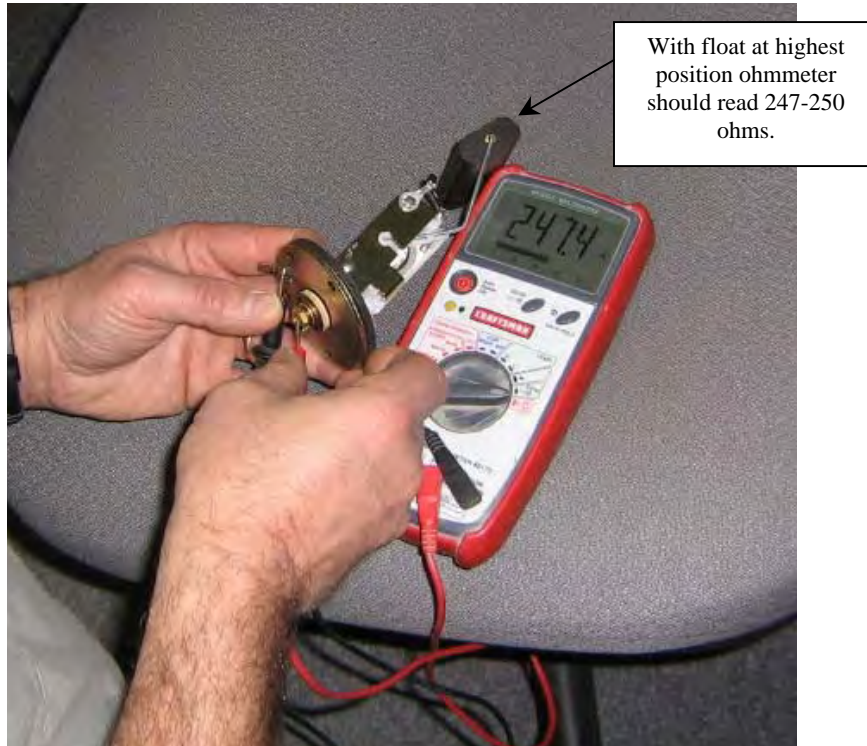
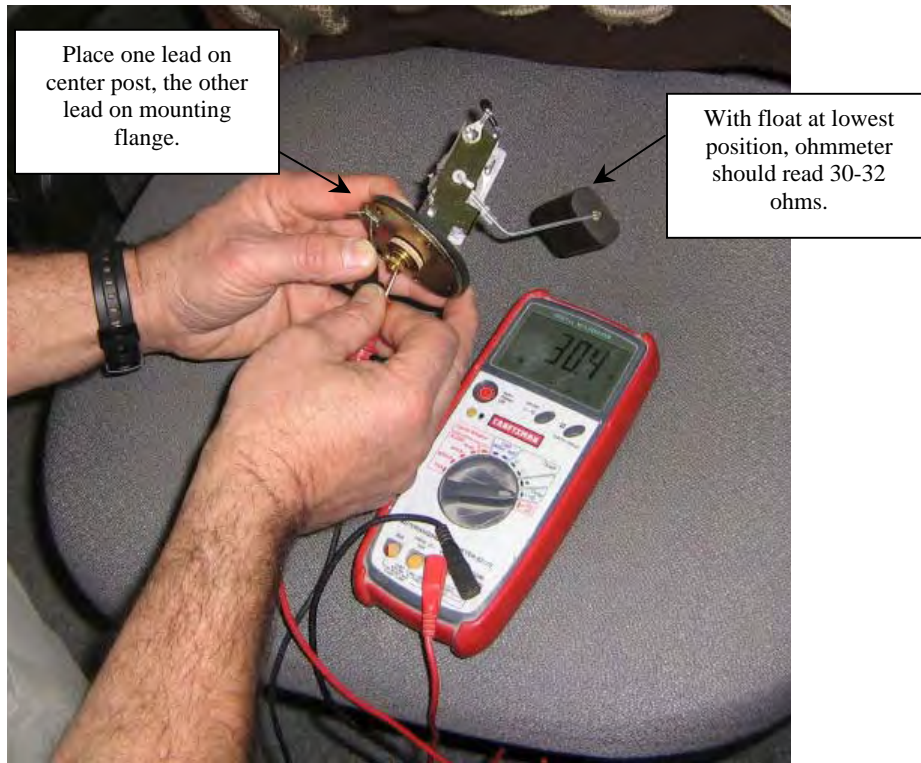
Remove the wire float arm from the plastic arm by putting pressure on the wire end on the backside of the unit and gently prying wire from grips on plastic arm.




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## Installation of Stewart Warner Electric Sending Units

Step 1: Proper orientation and travel

Note: There is one style of sending unit, which is oriented the same in main and aux (left and right) wing tanks.

As shown in photo 1 below, the sending unit rectangular rheostat case angles upwards when properly orientated in the tank. The float will be at the lowest position.

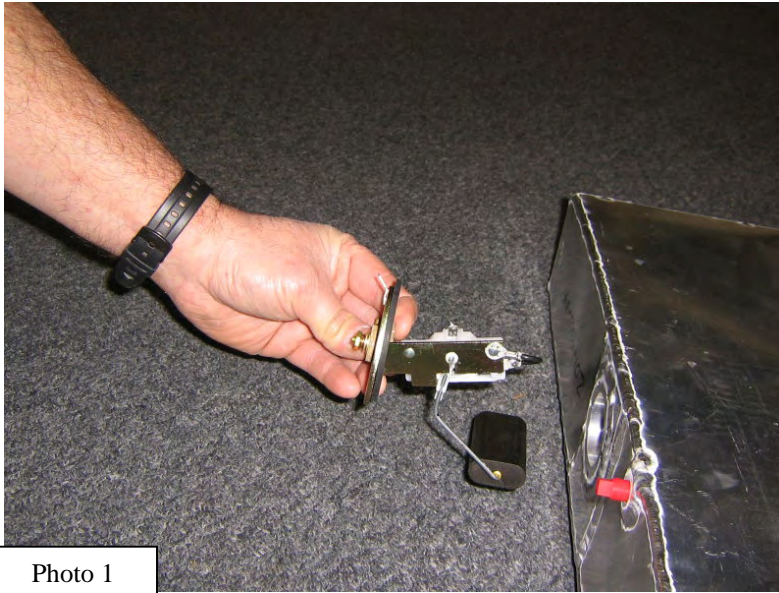


Photo 1

Photo 2 shows proper orientation on all tanks with the ground screw positioned over the non-threaded hole.

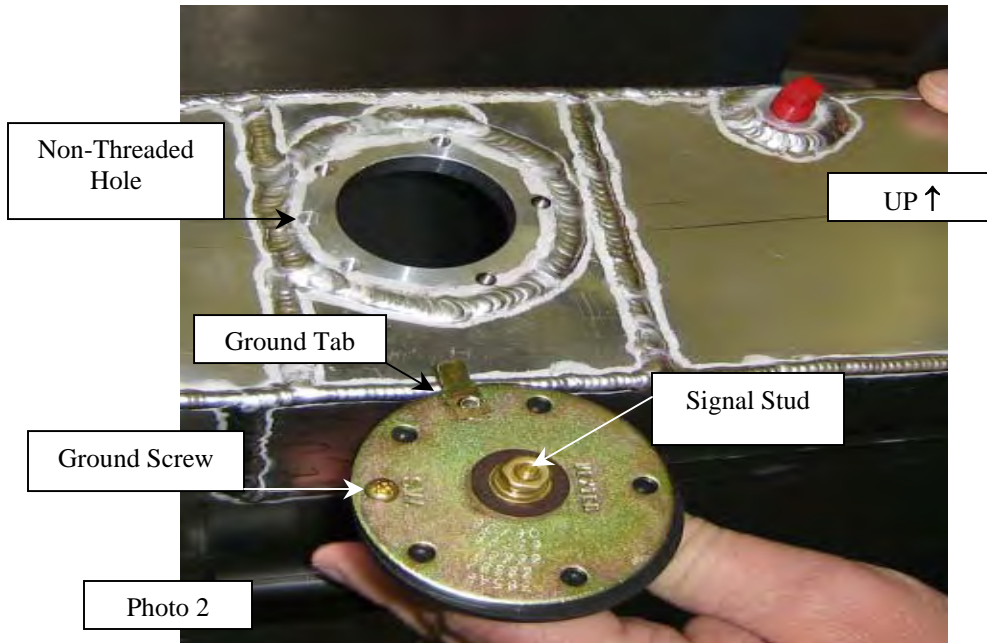

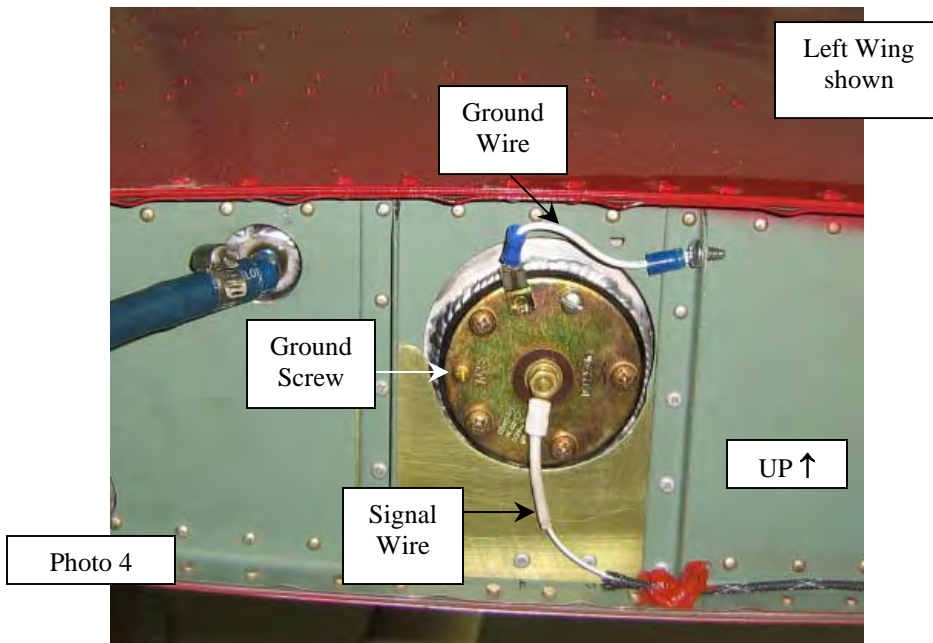
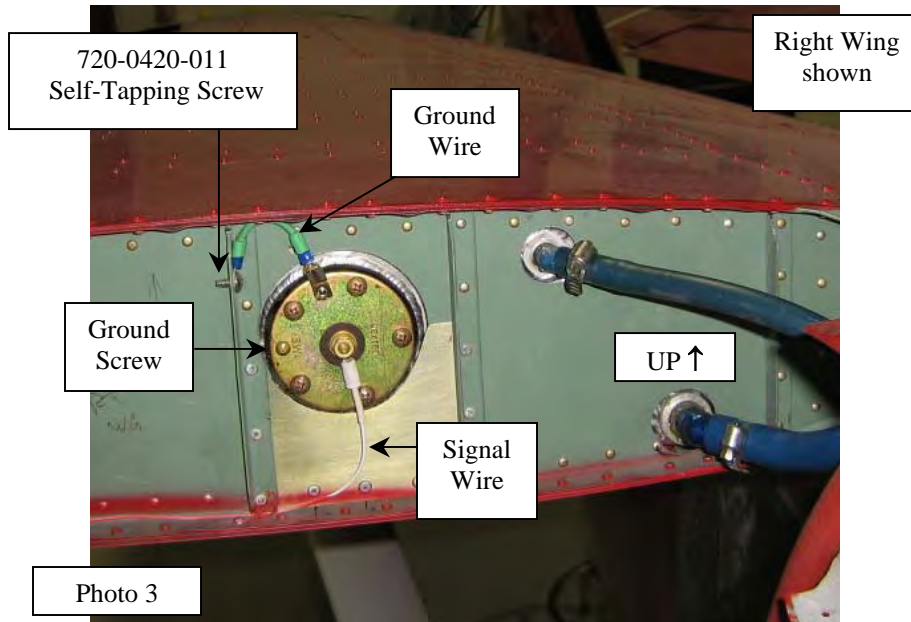


Photo 2

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Photos 3 and 4 show left hand and right hand main tank installations with #20 AWG ground wire and signal wires installed.




The ground wire is attached to the end rib stiffener with a 720-0420-011 (#8 X 3/8 Pk Screw). The sending unit plate is grounded with a female blade terminal on the grounding tab, or, a ring terminal on the grounding screw.

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Per the manufacturer's instructions, the rubber gasket is installed dry (no sealant). NAS603-8P machine screws and lock washers are supplied to secure the sending unit to the fuel tank. The NAS603-8P screw measures 0.45" from the base of the lock washer to the end of the threads. This length works out to be a correct squeeze on the rubber gasket when the screw bottoms out.

Torque the screws down until the first resistance is felt with the screw bottoming in the holes. Do not substitute a screw of a different length.

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