

Testing the Fuel Tank Sending Unit and Dash Mounted Fuel Gauge

The following is based on, and contains excerpts from, a tech article written by Mike Ash and Dave Smith for the MGA Register. These tests and procedures are the same for most cars that use the “FT” style Smiths sending units with an internal winding and die cast aluminum base.



To perform these tests, you may need to drain the fuel tank before removing the sending unit from the tank. Remember that gasoline is a highly flammable liquid, and that the vapor in a gas tank is a highly explosive gas. Be very careful to keep open flames away, and not to do anything that could create a spark near the tank.

The gas gauge system can be baffling to diagnose and repair – especially considering that a poor ground (at the tank unit or at the gauge,) a frayed wire, or “gremlins” could be the cause. This test procedure has been developed by using information contained in the Jaguar Factory Manual and information provided by Nisonger Company. The test requires a volt/ohm multimeter.

Testing the Fuel Tank Sending Unit

To test the sending unit with your multimeter on $\Omega \times 10$, the unit should show approximately 1 ohm with the arm down (fuel tank empty) and approximately 9 ohms with the arm up (fuel tank full). If there is too much less than 1 ohm, there is risk of damaging the fuel gauge coils. Zero ohms, which indicates a direct short, for even a few seconds, could burn out the coils.

Testing the Dash Mounted Fuel Gauge

To test the gauge, remove the gauge from the dashboard, taking care to mark the wires for reattachment. (The terminals on the back of the gauge are marked “T” for connection to the Tank unit, and “B” for connection to the Battery via the ignition switch.) Test the wire that goes from the gauge to the tank sending unit with a multimeter meter (on the $\Omega \times 10$ range). There should be virtually no resistance (zero Ohms). The wire must be unattached at both ends for this test. If the wire is open, or has more than 2-3 ohm resistance, replace as needed. The Gauge is designed to operate with an upper coil and a lower coil. It is the balance between these coils that moves the fuel indicator needle. The coils must be tested separately. ***Do not test for more than one second.***

Test the top coil by giving 12 volts for a split second to the B-terminal while the gauge body is grounded. The “T” terminal should be left open. If the needle swings to FULL, the top coil is working correctly.

Test the bottom coil by giving a short burst of 12 volts to the B-terminal while both the gauge body and “T” terminal are grounded. If your gauge is working properly, the bottom coil will overcome the top coil and the needle will swing to EMPTY. ***To reiterate: Do not run either test for more than one second.***

Identify your problem before buying a replacement tank sending unit or fuel gauge – or for that matter, any replacement part. You could spend a lot of money, wind up burning out the new replacements, and even make the situation worse. Think of it as replacing a fuse. If you do not figure out why the fuse blew in the first place and fix the problem, and instead simply keep replacing fuses, all you will do is waste time and money as each replacement fuse blows as well.