

## RETURN TO SENDER

The petrol gauge on Dave Todd's MG Midget had never worked since he bought the car. We had checked the gauge a while ago by connecting the output terminal on the back of the gauge to earth, and the gauge climbed to 'Full'. This indicated that the gauge itself was OK. We therefore suspected that the sender unit in the petrol tank was faulty.

When we had another session working on the problem we discovered that now there appeared to be no live feed to the petrol gauge from the voltage stabiliser unit and we couldn't get it to read 'Full' when we earthed the output connection. We weren't sure why this change had happened, but like most old cars Dave's Midget appeared to have had a lot of wiring modifications over the years, and something may have come adrift! Tracing the wiring was very difficult because the correct colour codes hadn't been used for these modifications and we decided that the simplest thing was to install a new live feed wire from the voltage stabiliser unit to the petrol gauge and isolate the existing wiring. When this was done the gauge then responded OK to the earthing test.

Once we had power as far as the gauge, we then turned our attention to the sender unit in the tank. Unlike the MGB, where the sender unit is on the side of the tank, in the case of the Midget the sender unit is on the top of the tank, and the tank has to be emptied and removed before the unit can be accessed (Fig 1).



Fig 1. Top of petrol tank showing sender unit (white).

Dave had removed the tank and found that the sender unit looked very new, and also there was only one connection onto the sender unit, although there were three spade terminals available (Fig 2).

Looking at the wiring diagram in the workshop manual it appears that the original sender units had a steel cap and only required one connection, the live feed from the gauge. The earth return path is carried out via the connection between the steel cap and the steel tank, which in turn is earthed to the bodyshell where it is bolted to the car.

Dave's sender unit appeared to be a fairly new aftermarket item which was made largely of nylon, so that it would not earth to the petrol tank like the original design would, and it would need a separate earth. Therefore the way this 'new' sender unit was installed it would never have worked. We assume the previous owner had not realised the need for a separate earth and had just given up after replacing the sender unit, re-installing the tank, and finding his gauge still did not work!



Fig 2. Top of sender unit showing original single connection wire.

We are not sure why there are three spade terminals on the 'new' sender unit while just two (live and earth) are needed. The third connection may be for a low fuel level warning light, not normally fitted to the Midgets, and therefore in this case redundant.

We removed the sender unit from the tank and put an AVO meter across two of the terminals. By moving the float from the down (tank empty) position to the up (tank full) position we got resistances of 210 ohms and 19 ohms respectively. These values agreed well with published figures, so we were confident that the sender unit was working properly and the main problem was the lack of an earth lead on the unit.

We then connected an earth lead to one of the terminals on the sender unit and fixed it to a suitable earth point inside the boot.

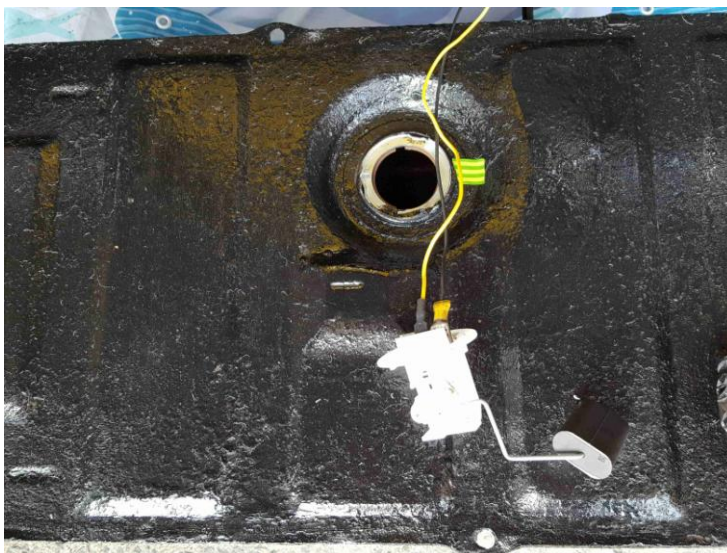


Fig 3. Sender unit outside tank showing float arm and two connections to the unit (one live, one earth).

Before putting the unit back in the tank, and bolting the tank back underneath the car, we tested everything by moving the float arm up and down manually and checking that the gauge was responding as it should. Problem solved for the cost of a metre of wire!

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