



PMM SUZUKI G WAGON (No jokes please)

### **OLD DOGS DO LEARN NEW TRICKS**

Postman Pat dropped his van off with a DTC Throttle pot voltage low, having been into the agents for a new potentiometer and advice to change the PCM.

Let's take a step back for a moment, the first rule of diagnostics "never accept a third party opinion".

We checked the DTC register and confirmed a DTC consummate with the advice given to our customer.

Attaching a scope to the TPI, it's worth mentioning here that access to the entire engine sensors and PCM is simplicity itself. Checking the TPI output we discovered a rather erratic response. The second rule of diagnostics always check outputs first, it saves time, and the theory goes something like "if the output is OK the supply and ground must be OK.

We discovered an intermittent output similar to a faulty potentiometer, however to apply another core rule, never accept an output error without checking power and ground. We confirmed the ground reference by reversing the ground lead on the battery to the positive terminal and confirming a negative potential differential. The next test was the power supply, normal supply voltage should be + 5v.

This is where the problem hinged; the power was erratic suggesting a wiring or PCM error. Having checked the power supply at the furthestmost point from the PCM the next check was to repeat the procedure at the PCM.

The voltage here was correct at 5.02v. Concluding a wiring error between the ECM and the component.

This is the moment where the old dog "me", had to learn new tricks.

I have often argued in training sessions that common sense dictates it's easier to supplement a faulty circuit rather than cutting open a loom.

In keeping with this doctrine we ran a new circuit between the TPI socket and PCM, having cut the original circuit at both ends removing the possibility of a short to earth. So far so good the TPI output was normal between 0.5v-4.5v.

The mil lamp was out, DTCs clear, job done, a test drive confirmed normal vehicle operation with no intermittent errors.

The next day the vehicle was returned back to us, the mil lamp had returned on an intermittent basis. We repeated the previous procedure only to find the TPI was working normally?

However the ambient air sensor positioned next to the TPI had no reference voltage whatsoever.

A quick check confirmed the correct voltage at the PCM.

The penny dropped at this point, we had to bite the bullet and cut the loom open and the repair what was obviously multiple sensor problems.

Common sense should also apply when looking for wiring loom errors. Look for signs of water ingress points, and movement or strain between chassis and engine.

The G Wagon demonstrated text book problems between the bulk head and engine manifold. The loom was secured robustly. Removing the loom between the key sensors and cutting back beyond the stress areas revealed "several" broken circuits. The error circuits included reference supply to the air temp sensor, and both circuits to the charcoal solenoid which interestingly did not support a DTC.

We then soldered and heat shrank the loom, routing it more sympathetically to avoid movement stress.

The serial tool we used was the AD 300 which did not support the G Wagon in the EOBD 16 pin menu, but what the hell the Vitara selection coped without problems. Live data was fully supported and helped assess the PCM data quickly.

The lessons learned by me: in future when faced with a loom current error expect and prepare for other errors if not current, then soon to create further problems.

The extra repairs did not take us long approx 1 hr, because we where up to speed with loom runs and PCM pin-outs. We took the view that our decision to supplement the TPI circuit was not sound and did not change further to do the job right.

**Take note**