



# Start with the basics!

**“I find a lot of problems can be found and resolved on our initial visual checks when we are presented with a problem car.”**

## Maurice Donovan

In this issue's Case Study, MD is presented with a vehicle that has an intermittent problem. All of our readers know what this is like...you jump in the car and great, it plays up. Bring it into our workshop and it starts to run normal, what do we do?



In this instance we are presented with a Japanese imported car, an early 90's Toyota Aristo with a 2JZ-GTE engine. It had been to various other workshops before it was brought to me by a frustrated customer. We drove the car and sure enough it did have an intermittent fault, the symptom being loss of power.



We found access to data information on this import model difficult to source. To add to this our scan tools would not communicate with this car. So as per usual we started with the basics.

So, now that we have experienced the problem on the test drive, our next step is to carry out a visual and in doing so it was discovered the cam sensor plug is badly broken and the sensor terminals were covered in oil. Not a good recipe as oil attracts moisture and this could short out the sensor.

We informed our customer about this issue but stressed that it may/may not fix the intermittent problem but that it needed attention and should be addressed.



The vehicle came back to my workshop. It was decided we needed to check all our power supply inputs and grounds at the ECU. This is an important part of diagnostics. Before doing so we always start with the battery. If we have a good battery and good power supply and grounds at the battery we can safely move onto the ECU.

As an example of the importance of this, I recently had a help request from a

fellow technician. This particular truck was sending the tech nuts. Our scantool revealed there was an EGR valve related fault code, but nothing could be found that would cause a fault with the EGR circuitry or the valve itself. Even though the battery and all the power supply and grounds had supposedly been checked, it all came up to be ok. In the end we traced the fault to a faulty battery and simply fitting a new one fixed the EGR fault code.

So, I cannot stress how critical having a good battery and good power supply and grounds are. Without good grounds and power it can drive even the best of us loopy, trust me I know. The other thing that surprises me is the amount of techs who do not know how to properly check for powers or grounds. If you do not test your powers and grounds on a loaded circuit you are wasting your time.

Many think an ohmmeter will verify a good ground.



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(An ohmmeter is an instrument that measures electrical resistance.)

Let me tell you this, you could not be further from the truth if you think an ohmmeter is the answer. A voltage drop occurs whenever electrical current passes through a point of resistance. Resistance restricts the flow of electrons causing a voltage drop, but without the flow of electrons the ohmmeter may not show the resistance in the circuit you are testing.

As you all know, there are three types of voltage checks. One being an open circuit voltage check where you unplug a device with a key on, and you want to see if you have power to it. That's known as an open circuit voltage test. When we do that, we actually haven't accomplished anything because when we unplug let's say the fuel pump, for example, we took the normal loading effect of the fuel pump out of the circuit. So we want to leave these components hooked up. We want to do the dynamic load voltage test.

The same goes for the second type of voltage test and that is when we back probe a circuit, but we do not load the circuit, this again is a pointless test, we want to do our third type of voltage test and that is a dynamic load voltage test.



Now, back to our issue with our import car...

When we accessed the Engine Control Module (ECU) on this car and in order to carry out our voltage drop tests, we discovered a piggy back aftermarket device wired into the main ECU wiring harness.

(It was actually a tuning device supposedly there to enhance the performance of the car, generally speaking I find these add-ons often do more harm than good.)

We immediately removed this device and road tested the car, and it was a different car all together. It performed better and it ran smoothly without any more driveability problems.

When the customer picked up his car, he could not believe the difference in the way this car drove, and he was ecstatic that we nailed this problem. He had sent his car to numerous workshops in the past without a fix when in reality, all we did was start with the basics! We now have another customer who will recommend us to others! This issue could easily have been found by previous workshops who did not start with the basics and obviously threw their hands in the air.

So, in summary it is always important to cover the basics, and while checking these basics we often notice visual items of concern, as in this case.

In fact we find a lot of problems can be sorted out and found on our initial visual checks when we are presented with a problem car. So never rule out the basics when dealing with a modern car with a driveability issue.

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