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Advanced Insulation Testing - 2007 Volvo XC70 2.4 D5

This Volvo was delivered as a non-start to the workshop, a code scan was performed that revealed multiple short circuits on various components. The first in the list was fuel pressure sensor short to positive.

The loom at the connector was found to be missing the insulation and the reference line had shorted to the signal circuit. Once repaired, the voltage on the signal line was the expected 0.5 volts with the key on and engine off, and rising to 1.3 volts on cranking, then the engine started. But after 2 seconds the engine stopped and a code for injector short to positive/short to negative was logged.

All the injectors where tested and revealed each had 0.3 ohms across the coil terminals. All good so far. Then they tested the injector circuits from the ECM to each injector. Each line showed 0.1 ohms, and no short between each circuit.

A Megger Tester is an excellent tool to test circuits under load

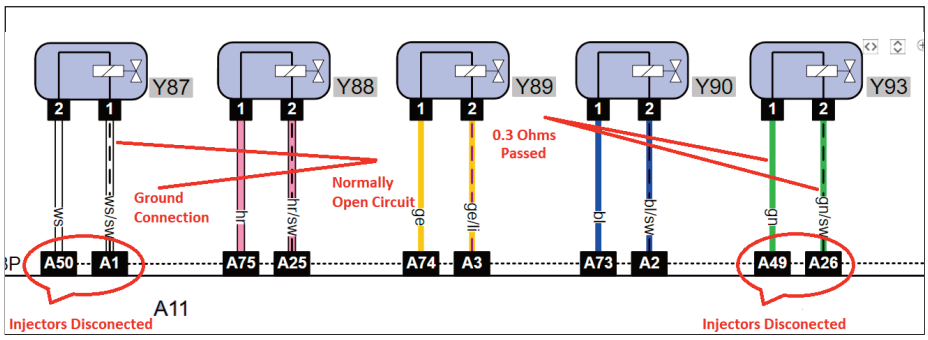
They then tested the circuits to ground and all tested good, no short to earth.

But the fault still persisted and the engine only ran for 2 seconds then logged the code.

The ECM was sent off for test, but came back fault free. I was asked to investigate where to go next.

A megger tester was used to confirm the insulation results from previous insulation checks. Each injector was tested @250 volts and passed with the correct resistance, then the looms from the ECM to the injectors, all passed. Finally, the injector looms to ground were tested and 2 failed @250 volts, showing a short circuit to ground. The insulation was visibly inspected, from end to end, but no damage was found. But after the loom was replaced, the engine ran normally.

The megger tester was intended for high voltage testing on EV and hybrid vehicles, but as CDi systems employ high voltage capacitor discharge in excess of 80 volts to operate the injectors, it is now proving invaluable in a different role.



Seat Ibiza - Engine won't switch off unless the headlights are switched on

This 2012 1.2 litre Ibiza was in the workshop with rather an unusual problem: The engine would only turn off when the key was removed if the lights where turned on.


A chafed wire allowed stray current to power the ignition with the key turned off

The technician checked out the ignition switch to see if the power was switching off, he found the power was not off when the key was off. A new switch was fitted, but the voltage was still present with the key off and the original fault symptom remained.

He then decided to call the Helpline for assistance and a diagram of the power supplies. We supplied a power supply diagram and gave some info on a test plan to be getting on with.

After a day, the technician called for some more help in understanding the VAG diagrams, as he was not familiar with how they where organised.

After some simple testing, he found that with the ignition switch unplugged, the main terminal 15 in the loom remained live.

Working back though the diagram from the ignition, and then the General Module, the reversing light circuit was identified as a problem.

When the reversing light switch was examined, the problem became very apparent. The loom had rubbed through at the switch, and the Lambda Sensor wiring was shorting into this circuit. This kept the circuit, No. 15, powered up and allowed the engine to keep running.

Not only did the helpline guide to the route cause, but the technician also gained some valuable information on how to navigate the VAG diagrams, which are in the beginning difficult to navigate.