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Engine sensors

Engine coolant temperature (ECT) sensor

Checking - Fig. 18

Technical Data	
Temperature	**Resistance**
10°C	3530-4100 Ω
20°C	2350-2670 Ω
30°C	1585-1790 Ω
40°C	1085-1230 Ω
50°C	763-857 Ω
60°C	540-615 Ω
80°C	292-326 Ω
90°C	215-245 Ω

- Ensure ignition switched OFF.
- Disconnect ECT sensor multi-plug.
- Relieve residual pressure in cooling system.
- Remove ECT sensor from engine.
- Immerse ECT sensor probe in coolant of specified temperature.
- Check resistance between ECT sensor terminals.
- ECT sensor may be checked in situ if engine temperature and resistance readings are compared.

Crankshaft position (CKP) sensor

Checking resistance - Fig. 19

Technical Data	
Terminals	**Resistance**
1 & 2	300-400 Ω

- Ensure ignition switched OFF.
- Disconnect CKP sensor multi-plug.
- Check resistance between CKP sensor terminals Fig. 19 [1].

Checking signal - Fig. 19

Technical Data	
Terminals	**Voltage**
1 & 2	1-4 V ac (fluctuating)

NOTE: Disconnect injector multi-plugs before cranking tests, to avoid damage to catalytic converter(s).

- Ensure ignition switched OFF.
- Disconnect CKP sensor multi-plug.
- Adjust voltmeter to measure alternating current.
- Briefly crank engine.
- Check voltage between CKP sensor terminals **Fig. 19** [2].

Camshaft position (CMP) sensor

Checking supply voltage - Fig. 20

Technical Data	
Terminals	**Voltage**
1 & 3	5 V approx.

- Ensure ignition switched OFF.
- Disconnect CMP sensor multi-plug.
- Switch ignition ON.
- Check voltage between harness multi-plug terminals.

Checking signal - Fig. 20

Technical Data	
Terminals	**Voltage**
2 & 3	3,5-4,5 V (fluctuating)

- Ensure ignition switched OFF.
- Do not disconnect multi-plug. Access CMP sensor multi-plug terminals.
- Start engine.
- Allow to idle.
- Check voltage between multi-plug terminals.

Knock sensor (KS)

Checking - Fig. 21

Technical Data	
Tightening torque	20 Nm

- Ensure ignition switched OFF.

- Disconnect KS multi-plug.
- Remove KS.
- Ensure cylinder block and KS mating faces are free from corrosion and clean.
- Refit KS.
- Tighten fixing to specified torque.

Checking operation - Fig. 22

Technical Data	
Terminals	**Voltage**
15 & 51	0,2-1 V (fluctuating)

NOTE: Due to small size of engine control module (ECM) harness multi-plug pins it is advisable to use a breakout box.

- Ensure ignition switched OFF.
- Disconnect ECM multi-plug.
- Connect breakout box between ECM and harness multi-plug.
- Start engine.
- Allow to idle.
- Check voltage between breakout box terminals.
- Increase engine speed sharply.
- Check that voltage increases.

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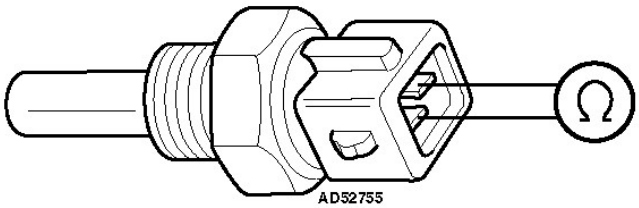

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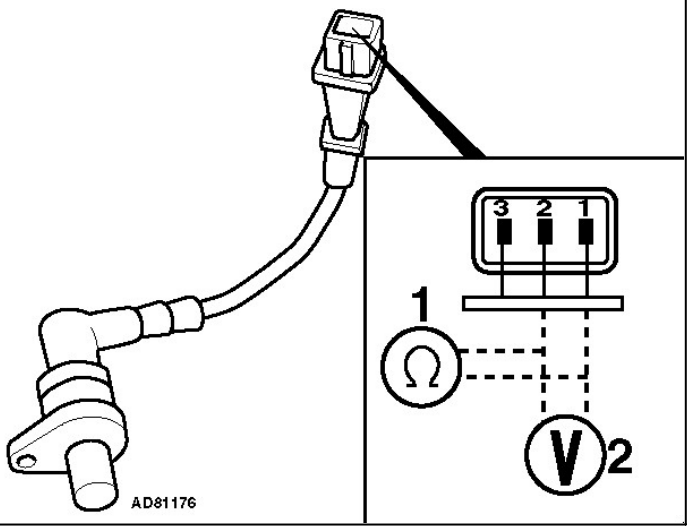

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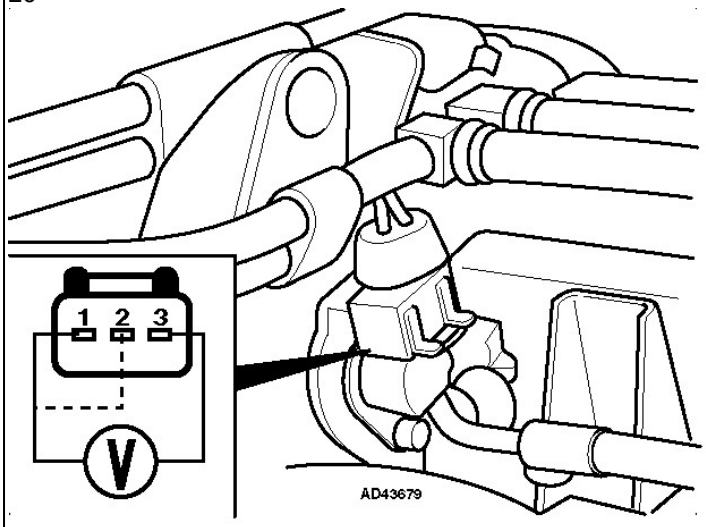

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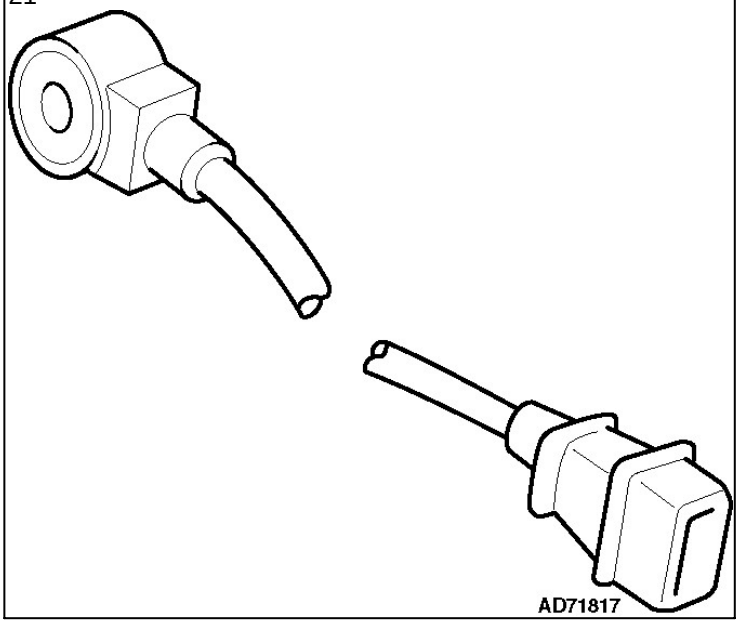

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