Checking the Crank Angle Sensor (CAS, B10)

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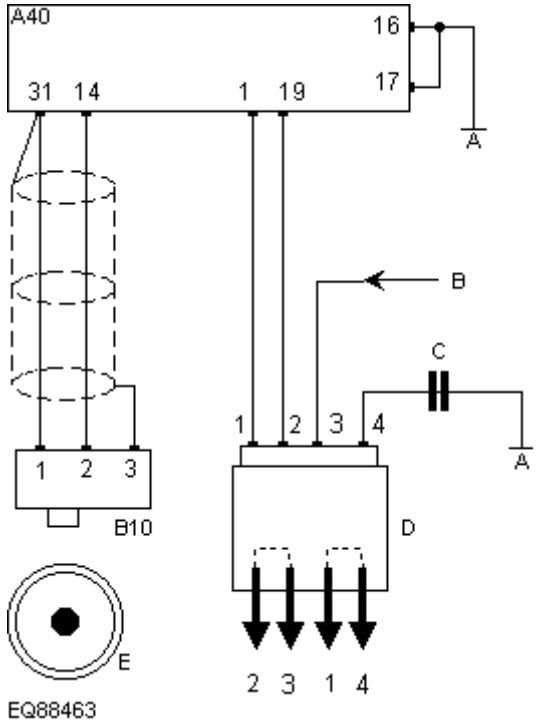
Test 1A: General

1. Inspect the CAS multi-plug for corrosion, and damage.
2. Check that the multi-plug terminal pins are fully pushed home and making good contact with the sensor.
3. Remove the CAS from the engine block. Inspect the end surface for corrosion and damage.
4. Check the sensor for damage, dirt or oil.
5. Check the pins on the fly wheel for damage, missing or bent pins.
6. Check that there is a small clearance between the sensor and the pin of the pulse wheel (5).
7. A fault in any of the above areas are common reasons for a poor or inaccurate signal.

Test 1B: Checking the sensor input signal and circuit with a Scantool

1. Attach a suitable Scantool to the Data Link Connector (DLC).
2. Select the Scantool Datastream function in order to monitor component operation.
3. Start the engine and allow it to idle.
4. The instrument will usually display the signal as an RPM that will vary according to the engine speed. (Refer to the table in measurement values).



Drawing Key:

A. Ground
B. Supply from FP relay : t5 (: t4 Citroen)
C. Suppressor (some models)
D. Ignition coil (DIS type)
E. Flywheel

Test 2A: Checking the sensor signal voltage (oscilloscope)

1. Component voltage tests are best carried out with a BOB connected between the loom and the ECM (see warnings, number 3) ; alternatively back-probe the signal terminal after gaining access to the back of the multi-plug connector.
2. Connect the negative oscilloscope probe to ground.
3. Connect the positive oscilloscope probe to the wire attached to the sensor signal terminal.
4. Crank (if a non-runner) or start the engine and allow it to idle. A small AC voltage should be obtained. See waveform
5. Better results are usually obtained by probing the + terminal although the waveform may also be obtained upon the sensor ground return if it is not connected to the shield wire or to ground.
6. Run the engine at various engine speeds and check for a consistent signal.
7. Whilst carefully watching the 'scope, gently tap the sensor and then wiggle the sensor multi-plug A variation in the voltage may reveal a poor connection or a defect in the sensor.

Test 2B: Checking the sensor signal voltage (AC voltmeter)

Non-runner

1. Detach the sensor multi-plug.
2. Connect the negative AC voltmeter probe to ground.
3. Connect the positive AC voltmeter probe to the wire attached to the sensor signal terminal.
4. Crank the engine. The instrument should display a small AC rms voltage.

Note: The AC voltmeter at least proves that a signal is being generated by the sensor. However, the AC voltage is an average voltage and does not clearly show that the sinewave is regular in formation or that the sensor is faulty or that the flywheel is damaged.

1. Start the engine and run it at 2000 rpm prior to commencing the test.

   Note: Measuring the sensor output with the engine running can be a little tricky. It is possible that the engine will not start with the voltmeter connected. Also, if the voltmeter is attached with the engine running it might stall or even misfire as the throttle is opened. This is because a small amount of current is diverted from the circuit to drive the meter, and this could be enough to cause the engine to misfire or stall. No damage will result to the engine so long as the voltmeter meets the correct specification.

2. Connect the negative AC voltmeter probe to ground.
3. Connect the positive AC voltmeter probe to the wire attached to the sensor signal terminal.
4. The instrument should display a small consistent AC rms voltage.

Test 2C: Evaluation of CAS waveform

1. Check for even peaks. Peaks that are much smaller than the others would indicate a missing or damaged CAS lobe.

   Note: In some instances, a much larger waveform than expected could also be indicative of a fault.

2. If no signal, or a very weak or intermittent signal:
   a. Check the sensor for damage, dirt or oil
   b. Check the flywheel for damage
   c. Check the air gap
   d. Measure the CAS resistance

Test 3A: Checking the sensor resistance

1. Detach the ECM multi-plug (see warnings, number 3) or or detach the sensor wiring multi-plug.
2. Connect an ohmmeter between the sensor terminals and measure the resistance (Refer to the table in measurement values).

   Note: even if the resistance is within the quoted specifications, this does not prove that the sensor can generate an acceptable signal.

Test 3B: Checking continuity of circuit

1. Check for continuity of the signal and ground return wiring between the sensor and the ECM.
2. Check the continuity of the component shield wire (where fitted).

Test 3C: Checking the CAS shield connection

1. The CAS may have a shield wire (not in all cases). Locate the wiring multi-plug connector or disconnect the ECM multi-plug (see Warnings, number 3).
2. Attach an ohmmeter probe to one of the sensor terminals (1 or 2).
3. Attach the other ohmmeter probe to the shield wire terminal. A reading of infinity should be obtained.
4. Move the ohmmeter probe from the shield wire terminal and connect it to ground. A reading of infinity should also be obtained.

   Note: The shield wire in some systems is connected to the CAS ground return wire. In such a case continuity will be registered on the ohmmeter and this is normal for that vehicle. Refer to the wiring diagrams for the system under test to determine how the CAS is wired.