

Camshaft Position Sensors, Checking

The CMP sensor indicates the ignition position for cylinder 1.

If the CMP sensor fails to function, the knock control is switched off and the ignition timing is retarded slightly because the signals can no longer be assigned to the cylinders.

Even without a signal from the CMP sensor, the engine will continue to run and can also be re started.

- ♦ When a malfunction is detected, the engine control module produces one spark for each cylinder on every crankshaft revolution.
- ♦ The fact that the control module is out of phase by one engine revolution does not have any noticeable effect on the injection system. If this happens, the fuel is injected "advanced" (when the intake valve is closed) instead of while the intake valve is open. This has only a minor influence on the quality of the air/fuel mixture.



Note

- ♦ Camshaft Position (CMP) sensor 2 -G163- is located at rear of left cylinder head (bank 2).
- ♦ Camshaft Position (CMP) sensor -G40- is located at front of right cylinder head (bank 1).
- ♦ Location of CMP sensors → *Chapter*.

Checking actuation of CMP sensor

For the following checks, use leads from adapter set -VAG1594-.

- Push back rubber sleeve on relevant CMP sensor connector.
- Connect diode test lamp -VAG1527- to sockets 1 and 2 on CMP sensor connector from rear (connector remains attached to CMP sensor).



Note

Sockets are numbered accordingly on the back of the connector.

- Operate starter for a few seconds.

Diode test lamp must flash briefly on each second engine revolution.



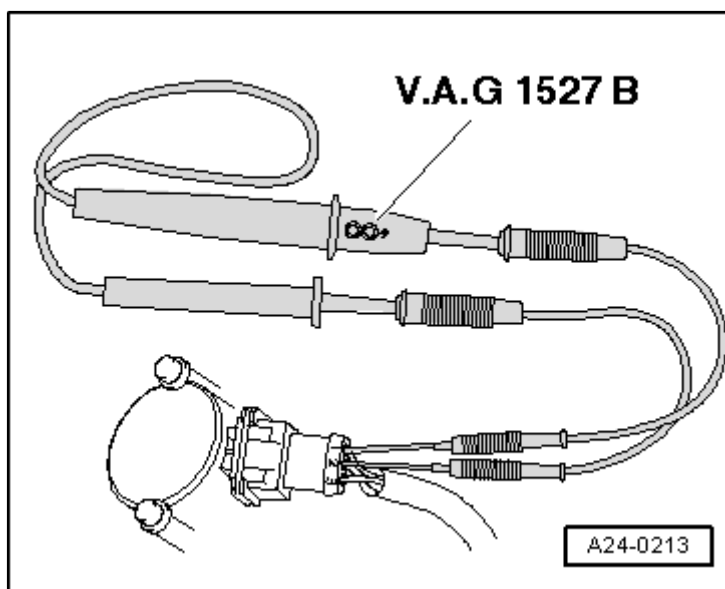
Note

Diode test lamps with a low current consumption continue to glow faintly between impulses from the engine control module (rather than going out completely) and become much brighter when receiving an impulse.

If diode test lamp does not flash, check voltage supply.

Checking power supply for CMP sensor

- Disconnect connector from relevant CMP sensor.
- Switch ignition on.



- Connect hand-held multimeter -VAG1526- (voltage measurement range) between engine Ground and socket 1 of relevant connector.

Specified value: approx. 5 V

Checking signal wiring for CMP sensor

- Switch ignition on.
- Connect hand-held multimeter -VAG1526- to measure voltage between engine Ground and socket 2 of relevant connector.

Specified value: approx. battery voltage

Checking Ground wire for CMP sensor

- Connect hand-held multimeter -VAG1526- for resistance measurement between socket 3 on connector and engine Ground.

Specified value: Continuity

Wire resistance: max. 1.5 Ohm

If the specified values are all achieved and the diode test lamp does not flash (measured between contacts 1 and 2 with starter connector attached):

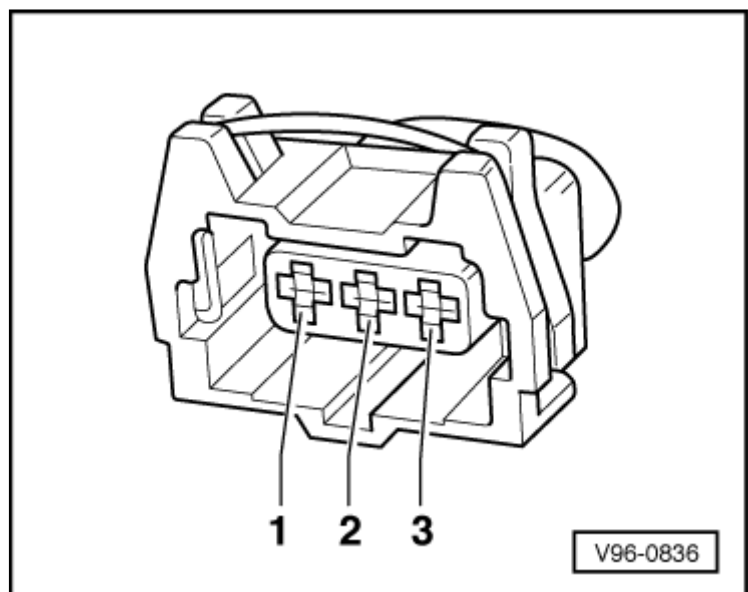
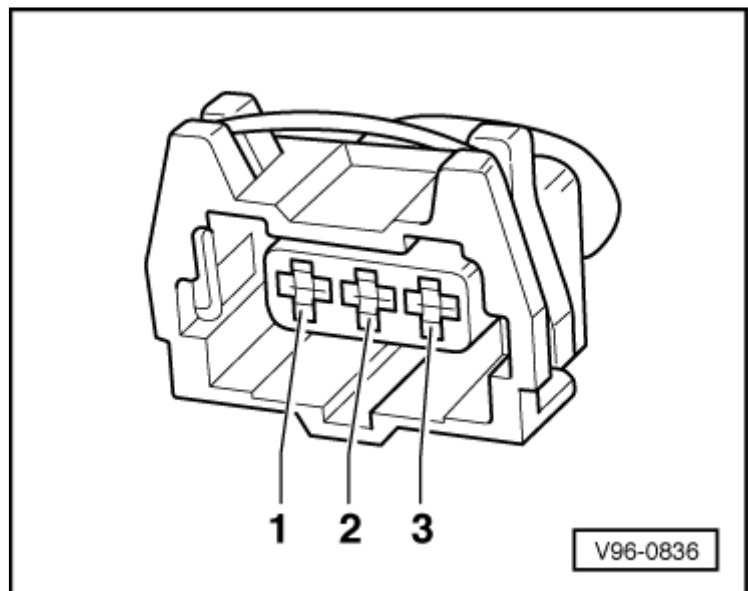
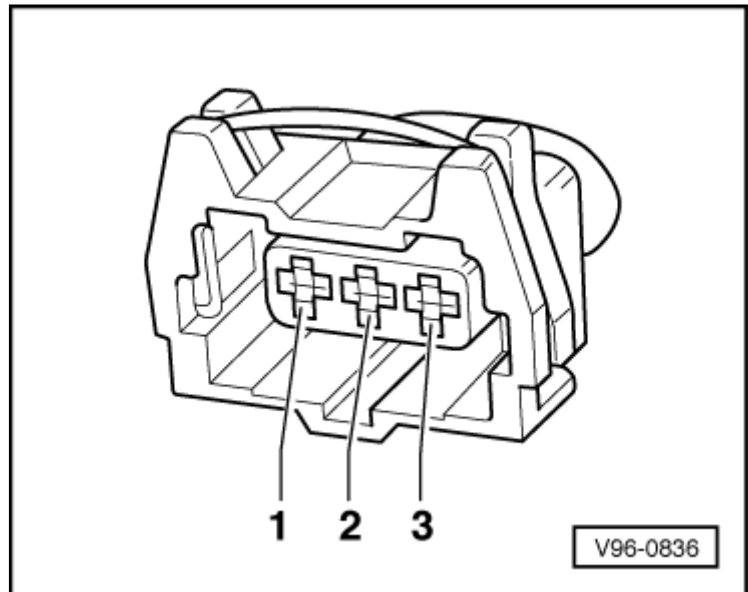
- Replace relevant CMP sensor.

If specifications are not attained, check wiring connections.

Checking wiring between CMP sensor and engine control module.

- Connect test box -VAG1598/31- to wiring harness for engine control module; do not connect engine control module → **Chapter**.
- Check wiring from CMP sensor ...
- ... to engine control module for checking for open circuit and short to positive or Ground.

Camshaft Position (CMP) sensor -G40- (Bank 1)



3-pin connector on wiring harness, socket	Test box -VAG1598/31- socket
1 (positive)	98
2 (signal)	87
3 (Ground)	108

Camshaft Position (CMP) sensor 2 -G163- (Bank 2)

3-pin connector on wiring harness, socket	Test box -VAG1598/31- socket
1 (positive)	98
2 (signal)	86
3 (Ground)	108

Wire resistance: max. 1.5 Ohm

- Correct any open/short circuit as necessary. → [Wiring diagrams, Troubleshooting & Component locations](#)

If a trial erasure of the DTC memory is followed by the replaced indication of a DTC relating to the CMP sensor although all previous tests were OK, the following malfunctions are possible:

- Rotor ring for CMP sensor misaligned, check phase location.
- Read readiness code. Generate readiness code again if DTC memory was erased, → [Chapter](#).

Checking phase location of CMP sensor

- Connect vehicle diagnostic, testing and information system - VAS5051- or Scan Tool -VAG1551- and select engine electronics control module 1 with "Address word" 01 → [Chapter](#) or → [Chapter](#). For this purpose, engine must be running at idle speed.

Indicated on display

Rapid data transfer HELP Select function XX
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- Press keys **[0]** and **[8]** for function "Read measured value block" and confirm entry with **[Q]** key.

Indicated on display

Read measured value block Enter display group number XXX

- Press keys **[0]**, 9 and 3 for "display group number 93" and confirm entry with **[Q]** key.

Indicated on display:

Read measured value block 93 → 1 2 3 4

- Check specified values for CMP sensor.

	Display zones			
	1	2	3	4
Display group 93: Phase locations of CMP sensors (bank 1 and bank 2), engine idling				
Display	xxx rpm	xx%	-15...10° crankshaft	-15...10° crankshaft
Display	Engine speed	Engine load	Phase location bank 1	Phase location bank 2
Range	min.: 550 rpm			

	max.: 7200 rpm			
Specified value	670 ... 820 rpm	xx%	-15...10° crankshaft	-15...10° crankshaft-
Note:	<p>If the specifications are not attained, unscrew CMP sensor and check to ensure that the rotor ring is correctly mounted on the camshaft (if it is incorrectly installed, the catch will be pressed flat when the securing screw is tightened). Additionally, check engine control times.</p>			