Checking ignition system
Checking Hall senders -G40 and -G163

The Hall sender indicates the ignition position for cylinder 1.

If the Hall sender 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 Hall sensor, the engine will continue to run and can also be re started.

- □ When a fault is detected, the engine control unit produces one spark for each cylinder on every crankshaft revolution.
- □ The fact that the control unit 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 "upstream" (before the closed inlet valve) instead of while the inlet valve is open. This has only a minor influence on the quality of the air/fuel mixture.

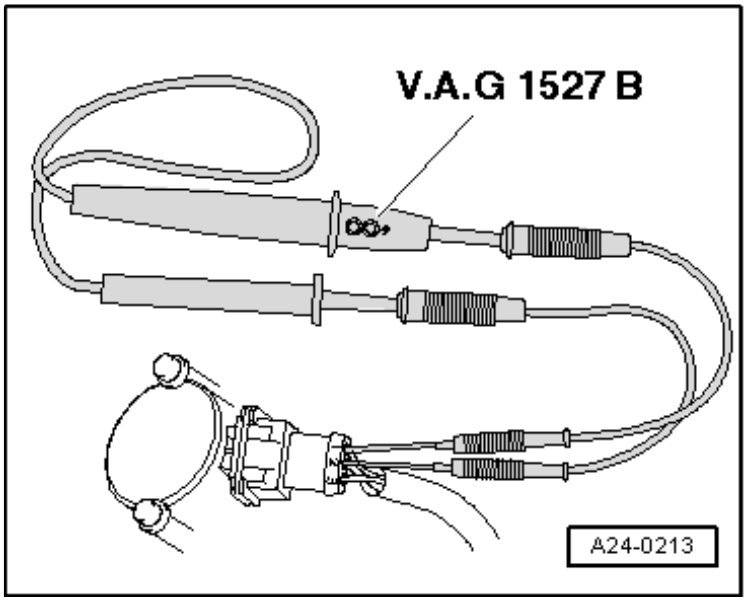
Notes:

- □ Hall sender -G163 is located at rear of left cylinder head (bank 2).
- □ Hall sender -G40 is located at front of right cylinder head (bank 1).
- □ Fitting location of Hall sensor => Page 24-6.

Checking actuation of Hall sender

For following checks, use leads from adapter set V.A.G 1594.

- – Push back rubber sleeve on relevant Hall sender connector.
- – → Connect the V.A.G 1527 diode test lamp to contacts 1 and 2 on the Hall sender connector from the rear (the connector remains attached to the Hall sender).



Note:

Contracts are numbered accordingly on the back of the connector.

- – Operate the starter for a few seconds.

The diode test lamp must flash briefly on each second engine revolution.

Note:

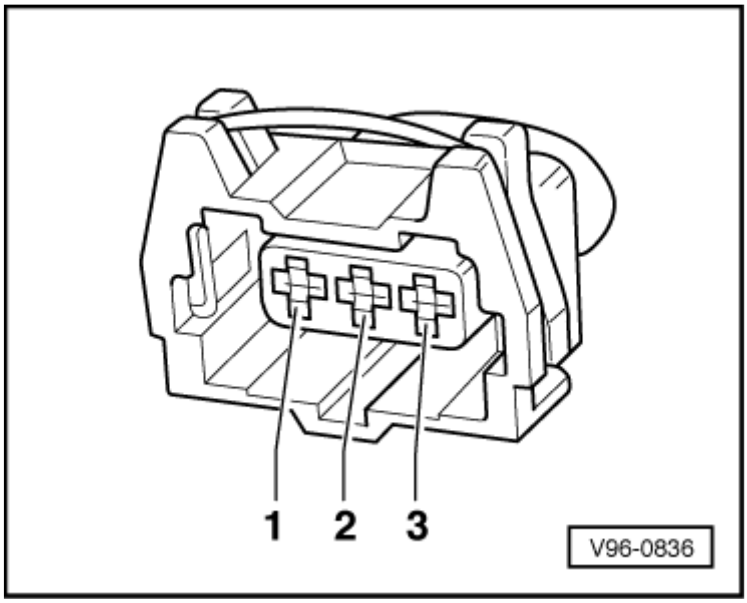
Diode test lamps with a low current draw continue to glow faintly between impulses from the engine control unit

(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 Hall sender

- - Disconnect connector from relevant Hall sender.
- - → Connect hand-held multimeter V.A.G 1526 (voltage measurement range) between engine earth and socket 1 of relevant connector.
- - Switch the ignition on.



Specified value: approx. 5 V.

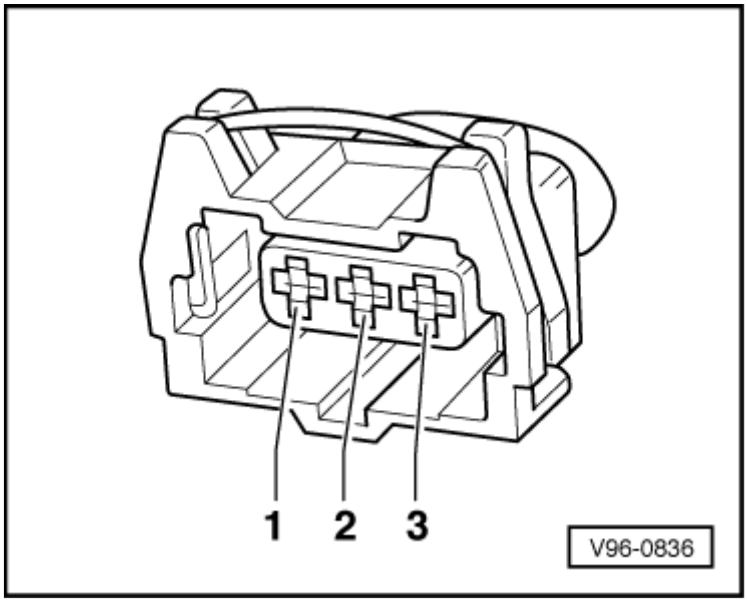
Checking signal wiring for Hall sender

- - → Connect hand-held multimeter V.A.G 1526 to measure voltage between engine earth and socket 2 of relevant connector.
- - Switch the ignition on.

Specified value: approx. battery voltage

Checking earth wire for Hall sender

- - → Connect hand-held multimeter V.A.G 1526 for resistance measurement between socket 3 on the connector and the engine earth.



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).,

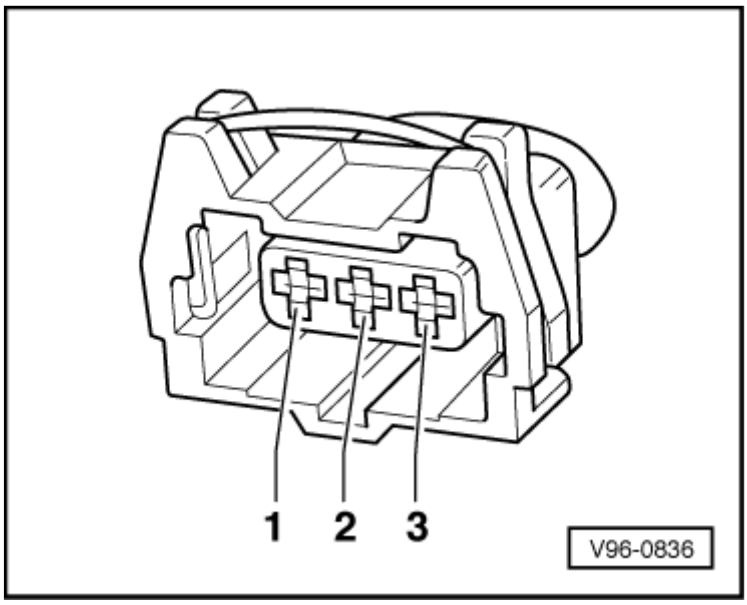
- - Replace relevant Hall sender.

If specifications are not attained, check wiring connections.

Checking wiring between Hall sender and engine control unit

- - Connect test box V.A.G 1598/31 to wiring harness for engine control unit; do not connect the engine control unit => Page 24-12.

- - → Check the wiring from the Hall sender....
- - ... to engine control unit for open circuit and short to positive or earth.



Hall sender -G40 (Bank 1)

3-pin connector on wiring harness, socket	Test box V.A.G 1598/31, socket
1 (positive)	98
2 (signal)	87
3 (earth)	108

Hall sender -G163 (Bank 2)

3-pin connector on wiring harness, socket	Test box V.A.G 1598/31, socket
1 (positive)	98
2 (signal)	86
3 (earth)	108

Wire resistance: max. 1.5 Ohm

- - Rectify any open/short circuit as necessary.

=> Current Flow Diagrams, Electrical Fault-finding and Fitting Locations binder

- - If a trial erasure of the fault memory is followed by the replaced indication of a fault relating to the camshaft sensor (Hall sender) although all previous tests were OK, the following faults are possible:
  - - Rotor ring for Hall sender

misaligned, check phase location.

Checking phase location of Hall sender

- - Connect the vehicle diagnostic, testing and information system VAS 5051 or fault reader V.A.G 1551 and select engine electronics control unit 1 with "Address word" 01 => Page 01-15.
  For this purpose, the engine must be running at idling speed.

→ Indicated on display:

Rapid data transfer
HELP
Select function XX

- - Press keys 0 and 8 for the 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 results for Hall sender.

	Display zones			
	1	2	3	4
Display group 93: Phase locations of Hall senders (bank 1 and bank 2), engine idling				
Display	xxx rpm	xx %	-15....10 °CA	-15....10 ° CA
Display	Engine speed	Engine load	Phase location bank 1	Phase location bank 2
Range	min.: 550 rpm max.: 7200 rpm			
Specified value	600... 820 rpm	xx %	-15....10 °CA	-15....10 ° CA
			If the specified values are	

Note		not obtained: -Unbolt the Hall sender, then check to ensure that the rotor ring is correctly aligned on the camshaft (if it is incorrectly installed, the retainer tab will be pressed flat when the securing screw is tightened). -Additionally check engine timing.