

Blink code	Problem	Possible Defect
1 - 2	Supplied voltage smaller 10.2 V	Battery, alternator, control unit, wiring
	<b>Testing</b>	
	Voltage drop at plus and ground terminals; Battery discharged; Alternator or control unit defective.	
2 - 1	Knock sensor monitoring	Knock sensor supplies excessively large signal or K/CP control unit is defective.
2 - 2	Knock sensor monitoring	Knock sensor supplies excessively small or no signal, or K/CP control unit is defective.

**Testina**

1. Check plug connection on knock sensor for correct seating and inspect spring contacts.
2. Remove plug connector on K/CP control unit. Connect ohmmeter to terminals 11 and 13.

Control value: 270 - 330 Kohm

If 0 ohms or  $\infty$  are indicated, check wiring connections (including ground contact). Exact inner resistance of the knock sensor does not rule out a defect in the sensor. If necessary, replace knock sensor.

3. Check fastening of knock sensor. Be sure to observe tightening torque, and use fastening bolt without washer.

Tightening torque: 9 Nm as from mod. 88, 20 Nm

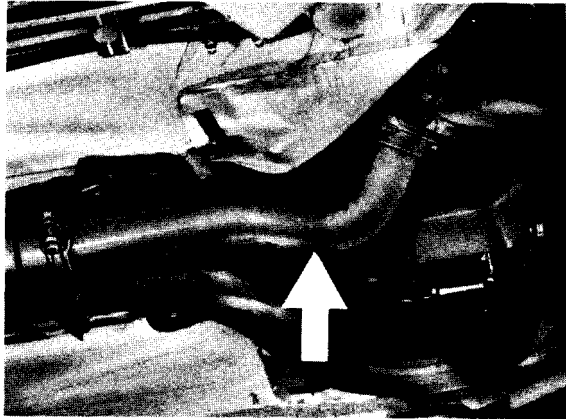
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Blink code	Problem	Possible Defect
2 - 3	Knock control unit defective	Exchange knock control unit
3 - 1	Charging pressure too low or no charging pressure	Charging pressure regulator valve stuck in open position.

### Testing

The exhaust system should be cold for testing the charging pressure control valve.

1. Lift vehicle, start engine, and let idle.
2. Check bypass pipe for warming.



If the bypass pipe heats up, the charging pressure control valve is defective, i.e. is stuck in the open position. Remove bypass pipe, and check and if necessary replace charging pressure control valve.

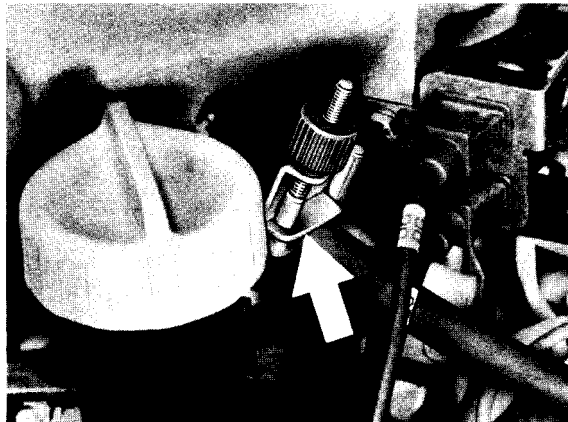
Blink code	Problem	Possible Defect
3 - 1	Charging pressure too low: 0.3 bar (positive pressure) basic charging pressure available	Localising defect

#### **N o t e**

The "charging pressure too low" problem is only stored in memory when the difference in pressure from normal pressure is 0.45 bar; this problem can thus exist without setting off a blink code defect indication.

#### **T e s t i n g**

1. Pinch off actuating line to charging pressure control valve with hose clamp.



2. Test-drive vehicle and measure charging pressure with pressure gage P9103/2. If charging pressure is available and climbs above 0.7 bar (positive pressure) following systems can be considered to be in good order:
  - Charging pressure control valve
  - Exhaust turbocharger
  - Air intake system
  - Air circulation valve
3. The cause of the problem must then be located in the timing valve area.

### - Checking timing valve

The function of the timing valve and of actuation can be acoustically checked.

1. Start engine and give a quick spurt of gas at the throttle. When the air flap in the air flow sensor swings more than 60%, the actuation of the timing valve begins. A light clicking should be audible from the timing valve, or should be able to be felt with a metal rod.
2. If no function of the timing valve can be heard, measure voltage supply to valve. Remove plug connector at timing valve and connect red/green lead and ground on voltmeter.

Indication: Battery voltage

3. Apply battery voltage and ground to timing valve.

The valve must audibly switch.

Timing valve inner resistance  
18 - 45 ohms.

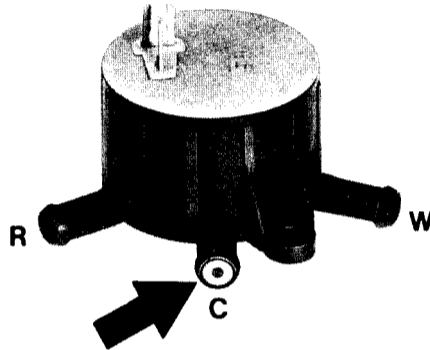
4. Check blue/red lead from timing valve to K/CP control unit terminal 2.

If all functions are okay, replace K/CP control unit.

### Note

Actuation of the timing valve does not occur with simultaneous presence of a defect code on test adapter.

5. Check exhaust line from solenoid valve connection "R" to intake air cowl for ease of flow.

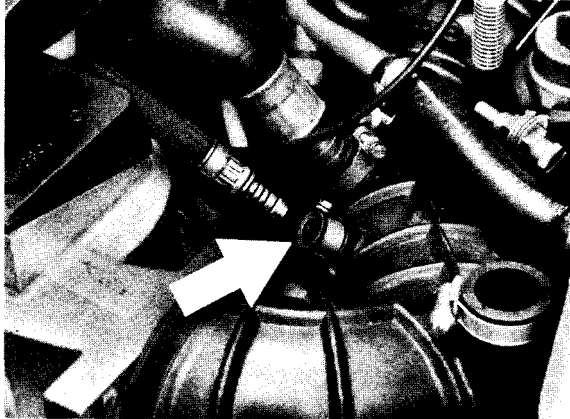


C - Connection to pressure pipe

R - Return to intake side

W - Control lead to charging pressure control valve

6. Visually inspect connection at intake air cowl for rubber residue (reduction of cross-section).

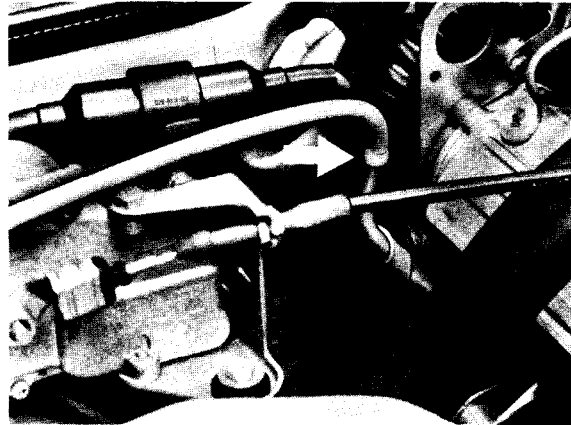


If no charging pressure is obtained despite cutting off the control line to the charging pressure control valve, other causes must be investigated.

- Check exhaust system for leaks.

- Exhaust system obstructed (catalytic converter models)

1. Connect pressure gage P9103/2 at exhaust collection pipe in engine compartment.



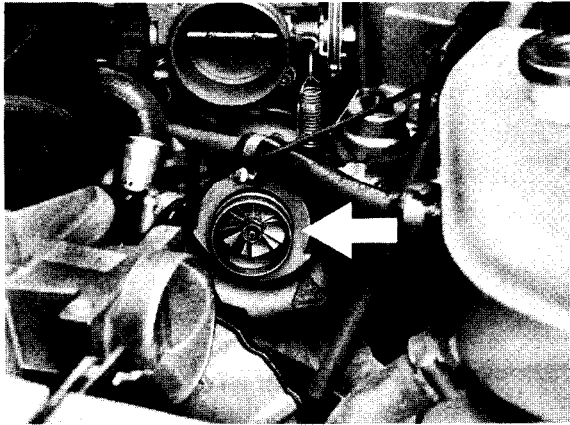
2. Test-drive vehicle. Test values: At full load with engine speed of 3500 rpm and approx. 0.7 bar charging pressure, exhaust pressure should be  $0.8 \pm 0.1$  bar.

- Check sealing of suction and charging pressure system (see Test Point 13).

Check throttle for complete opening.

**- Check turbocharger**

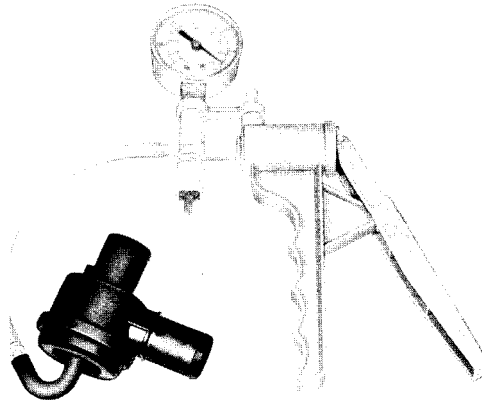
1. Remove intake air cowl and check compressor impeller of turbocharger for damage.



2. Check turbocharger shaft by hand for ease of motion and excessive play.
3. The turbine (exhaust side) can be checked only after dismantling turbocharger.

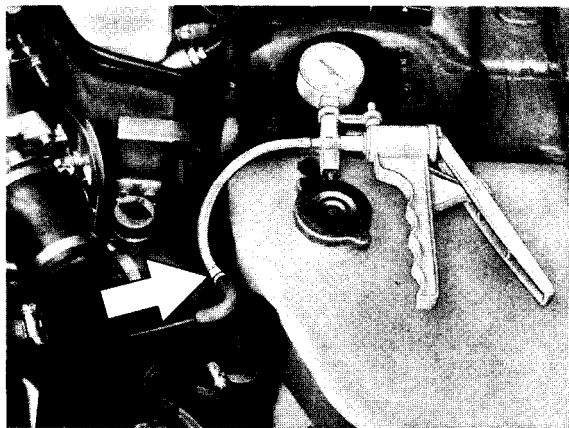
**- Check bypass-air valve for function,**

1. Remove bypass-air valve and apply approx. 0.5 bar negative pressure with vacuum hand pump.



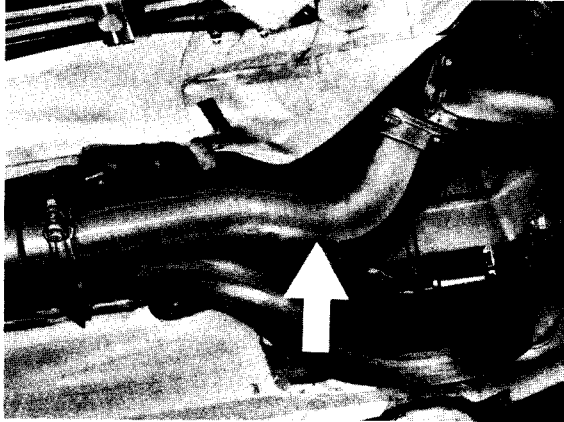
The bypass-air valve should open with the applied negative pressure remaining present.

2. Install bypass-air valve, start engine, and allow to idle. Connect vacuum hand pump to connection line of air circulation valve.



The suction system negative pressure must be present at the connection. This means that when engine is in operation with charging pressure, the bypass-air valve is acted upon by the charging pressure and remains closed.

2. Start engine and allow to idle. After a short time the exhaust pipe to the charging pressure control valve should heat up while the bypass pipe remains cold (charging pressure control valve closed).



3. Apply approx. 0.6 bar pressure (max. 1.0 bar) to charging pressure control valve with the hand pump. The bypass pipe should then likewise heat up (charging pressure control valve open).

When the applied pressure is suddenly removed, the valve should close with an audible "click".

If functioning is not as described, replace charging pressure control valve.

Blink code	Problem	Possible Defect
3 - 2	Excessive charging pressure	Charging pressure control valve is not being actuated

**Testing**

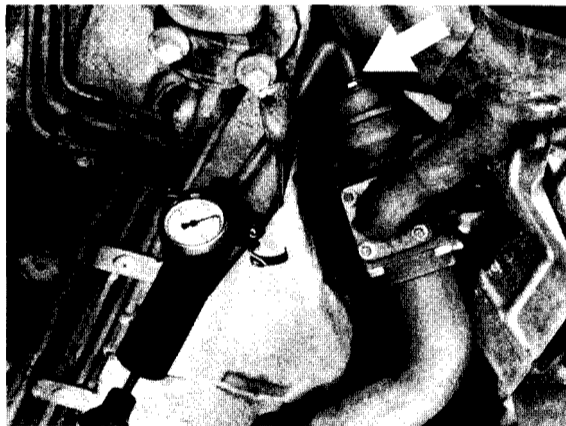
Check actuation line to charging pressure control valve for flow-through and damage.

Charging pressure control valve sticks in closed position or the membrane leaks.

**Testing**

The exhaust system should be cold during testing of the charging pressure control valve.

1. Lift vehicle. Disconnect actuating line to charging pressure control valve and connect pressure pump (VAG 1274).





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<b>Blink code</b>	<b>Problem</b>	<b>Possible Defect</b>
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Timing valve has continuous current

**Testing**

1. Remove plug connector at timing valve and switch on ignition.
  
2. Connect both contacts of plug connector with test lamp.  
If the test lamp lights up, the lead to the K/CP control unit (red/blue term 2) must be checked for ground connection or the K/CP control unit is defective.

3 - 3

Pressure sensor in K/CP control unit defective

Replace control unit

**N o t e**

Flashing code 3 - 3 may be caused by a defective throttle valve potentiometer. Therefore, first check the throttle valve potentiometer in accordance with Item 9 before replacing the control unit.

4 - 1

Throttle potentiometer

Plug connector has fallen off; supply line to potentiometer has ground contact; potentiometer is defective.

**N o t e**

If defect signal 3 - 3 is present at the same time, the pressure sensor is in good condition.

4 - 2

Throttle potentiometer

Check leads to potentiometer for short circuits. Potentiometer defective.

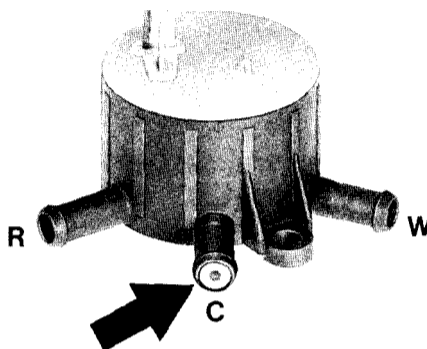
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<b>Blink code</b>	<b>Problem</b>	<b>Possible Defect</b>
		<b>Actuation line to timing valve is broken or throttle at connection "C" of timing valve is blocked.</b>

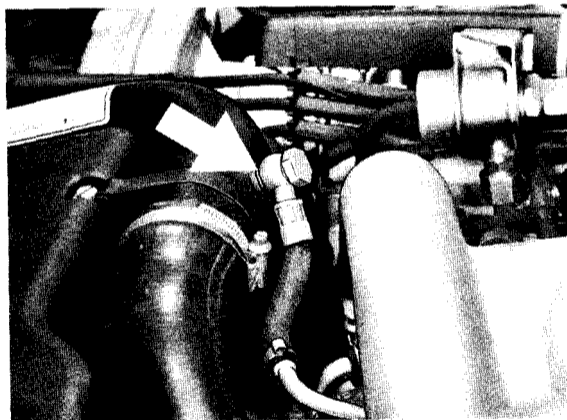
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### **Testing**

- 1. Remove timing valve and check throttle at connection "C".**



- 2. Check lead from pressure pipe to timing valve for flowthrough or interruption.**



## TEST POINT 15

**Ignition Signal  
from DME to K/CP  
Control Unit**

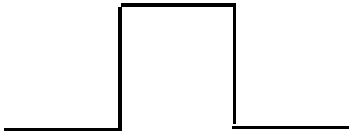
1. Pull off plug connector on K/CP control unit. Connect oscilloscope at plug terminal 9 and ground.
2. Start engine.  
A square wave signal should become visible on the screen.

**Note**

The engine can be operated without the K/CP control unit in an emergency or for troubleshooting purposes.

In order to do this, the ignition signal must be bridged at the K/CP control unit plug terminals 9 and 16 with an auxiliary wire.

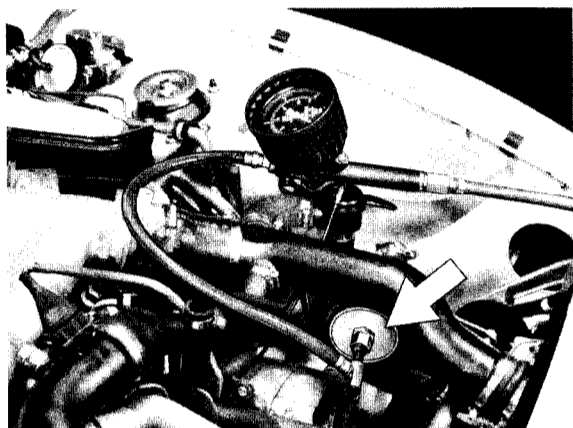
The engine will then run with reduced power.



If no signal is present,  
replace DME control unit.

**TEST POINT 13****I n t a k e   P r e s s u r e  
S y s t e m   S e a l i n g**

1. Check all connection points after air flow sensor for tight fit and sealing.
2. Using the locally-made tool (see Workshop Manual 944, page 24-15), build up 0.5 bar pressure in intake system and check sealing.

**TEST POINT 14****A l t i t u d e   C o r r e c t i o n  
B o x**

(Test below 1000 m/3300 ft above sea level)

The altitude correction box is located above the K/CP control unit.

1. Let engine idle. Remove oxygen sensor plug connector and measure CO before catalytic converter.
2. Remove plug connection of altitude correction box and bridge plug connections with a suitable wire.

The CO test value should change approx. 1% towards leanness.

3. Connect plug connection on altitude correction box with ohmmeter.

Control value:  $\infty$  ohms (switch open)

Above approx. 1000 m/3300 ft above sea level, the switch in the altitude correction box is closed.

Control value: 0 ohms

**T e s t i n g   O x y g e n  
S e n s o r   ( S e n s o r  
V o l t a g e )**

- 1. The same test requirements apply as for the oxygen sensor function test.**
- 2. Disconnect oxygen sensor plug connector.**
- 3. Connect voltmeter at terminal 1 (plug half to sensor).**

**The voltage should be in the area of 0.1 v to 1.0 v.**

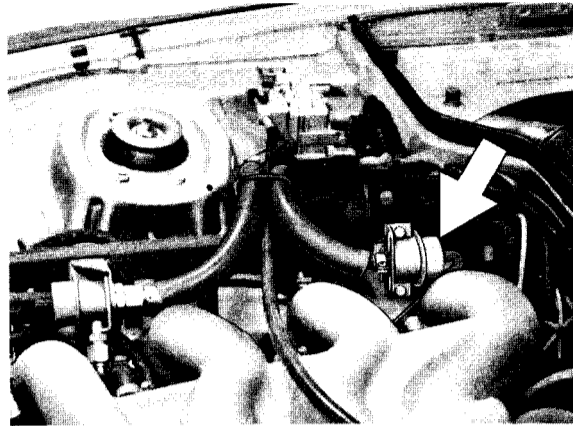
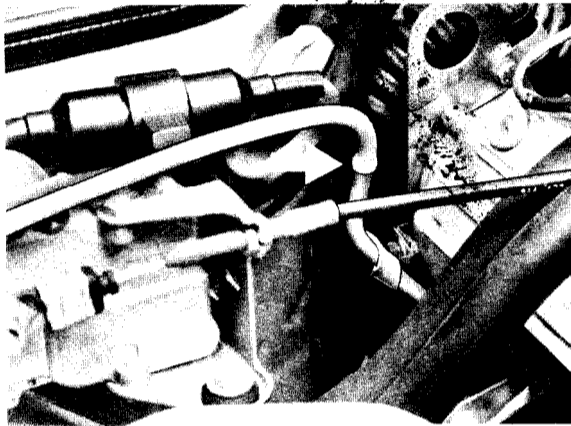
**(Sensor voltage depends on oxygen content in exhaust).**

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**TEST POINT 16****Oxygen Sensor  
Function****(Short test)**

- Engine at operating temperature
- Idle speed correctly set.

1. Connect exhaust tester at collection nozzle in engine compartment.



The CO value should rise.

4. Re-connect plug connection on oxygen sensor. The CO value should set itself to the control value of  $0.6 \pm 0.2\%$ .

If there is no change in the CO level, there is a defect in the oxygen sensor or in the DME control unit.

**DME Control Unit  
(Oxygen Control  
Function)**

2. Detach plug connection of oxygen sensor and note CO value.
3. Pull off negative pressure line from fuel pressure regulator and close with suitable stopper.

1. The same test requirements apply as for the oxygen sensor function test.

2. Temporarily connect terminal 1 on the oxygen sensor plug connector (plug half to control unit) to ground with an auxiliary lead.

The CO level should rise.

If there is no change in the CO level check connection to DME control unit (terminal 24 green), and if necessary replace control unit.