/

Blow-off valve

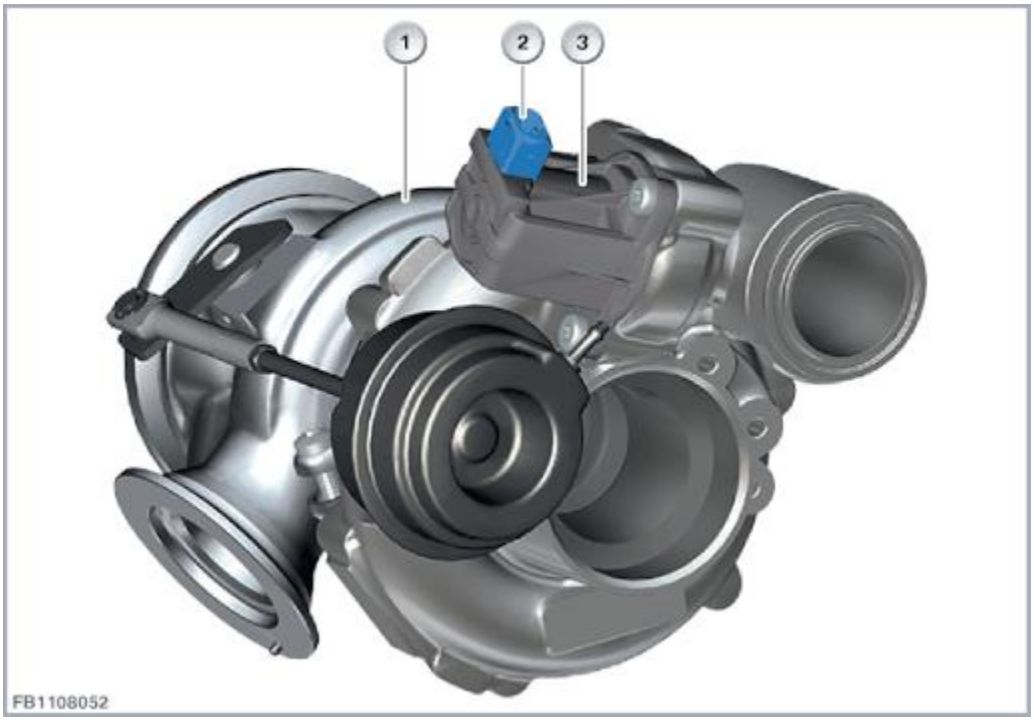
The blow-off valve is attached directly to the exhaust turbocharger.

In order to avoid the occurrence of strong vibrations at the impeller in the case of suddenly closing of the throttle valve (e.g. during gear shift), the blow-off valve opens. This creates a circuit around the compressor. The charging pressure is diverted to the intake side of the compressor.

Functional description

The blow-off valve prevents ”pumping” against the closed throttle valve, thus improving engine acoustics. In addition, the blow-off valve protects the exhaust turbocharger against damage. Another effect: the exhaust turbocharger reacts quickly when the throttle valve is opened again. Without the blow-off valve, the exhaust turbocharger would work against the ram pressure of the closed throttle valve and become slower. On opening the throttle valve, the exhaust turbocharger would react with a delay.

The engine control activates the blow-off valve. The blow-off valve has the positions: open and closed (no intermediate positions).



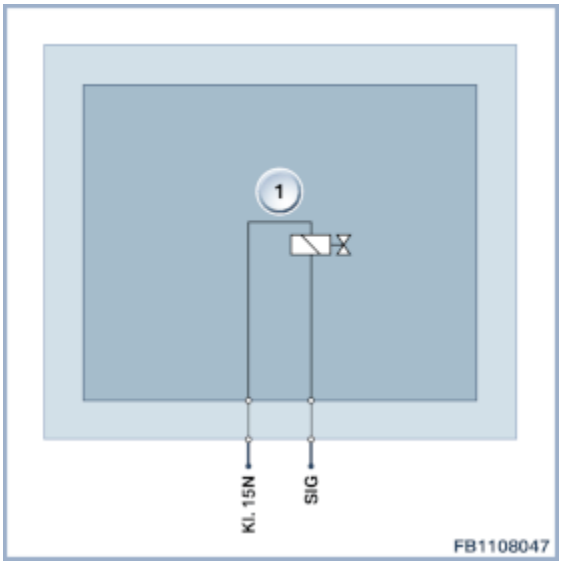
Item	Explanation	Item	Explanation
1	Exhaust turbocharger for bank 2	2	two-pin plug connection

3	Blow-off valve

Structure and inner electrical connection

The blow-off valve is connected via a two-pin plug connection.

The blow-off valve is a solenoid valve. The blow-off valve is supplied with voltage via terminal 15N. Activation by the engine control occurs on the earth side.



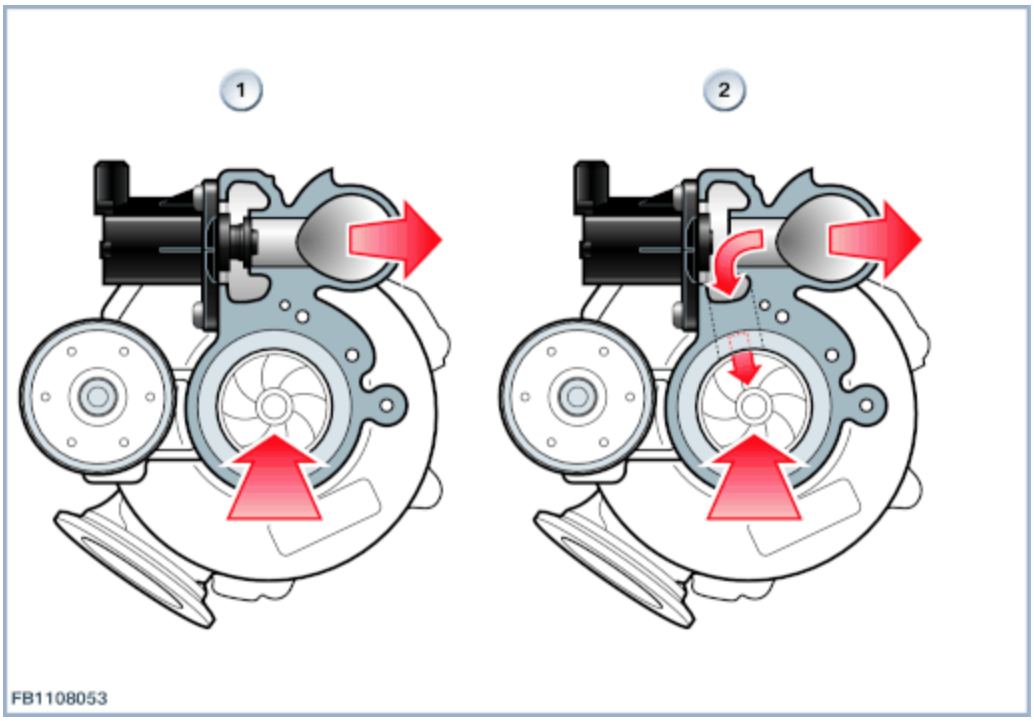
Item	Explanation
1	Blow-off valve

Pin assignments

Pin	Explanation
Kl. 15N	Terminal 15, voltage supply
SIG	Activation of the blow-off valve

Schematic overview and setpoint values

The blow-off valve dissipates unwanted charging pressure peaks that can occur when the throttle valve is closed.



Item	Explanation	Item	Explanation
1	Compressor bypass valve closed	2	Compressor bypass valve open

Observe the following setpoint values for the blow-off valve:

Variable	Value
Voltage range	8 to 16 V
Response time at 20 C and 13 V	≤ 40 ms
Power consumption at 25 C and 13 V	approx. 1 A
Temperature range	-40 °C to 140 °C

Diagnosis instructions

Failure of the component

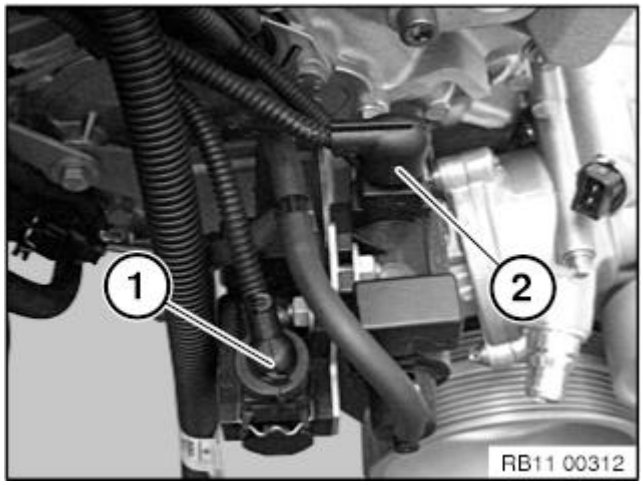
If the blow-off valve fails, the following behaviour is to be expected:

- Fault entry in the engine control unit
- Emergency operation with substitute value

11 74 509Replacing both pressure converters for the turbocharger (S63T 0)

Necessary preliminary tasks:

- Remove right intercooler.

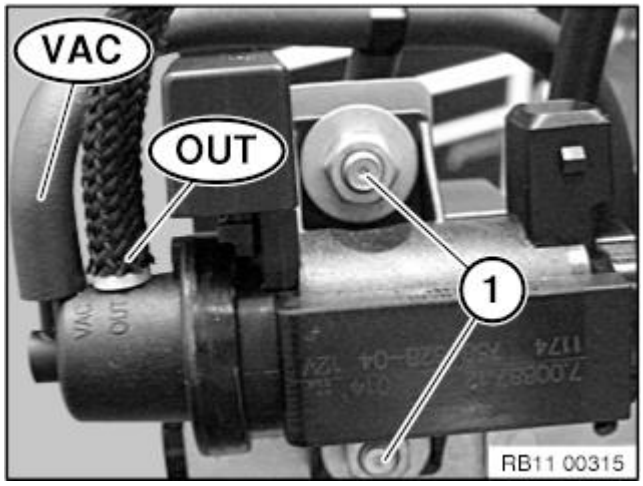


Pressure converter, cylinders 1-4:

Disconnect plug connection (1) on pressure converter.

Pressure converter, cylinders 5-8:

Disconnect plug connection (2) on pressure converter.



Pressure converter, cylinders 1-4:

Disconnect vacuum hose at connection (VAC = vacuum reservoir).

Disconnect vacuum hose at connection (OUT= turbocharger vacuum unit).

Unscrew nuts (1).

Tightening torque 11 65 9AZ.

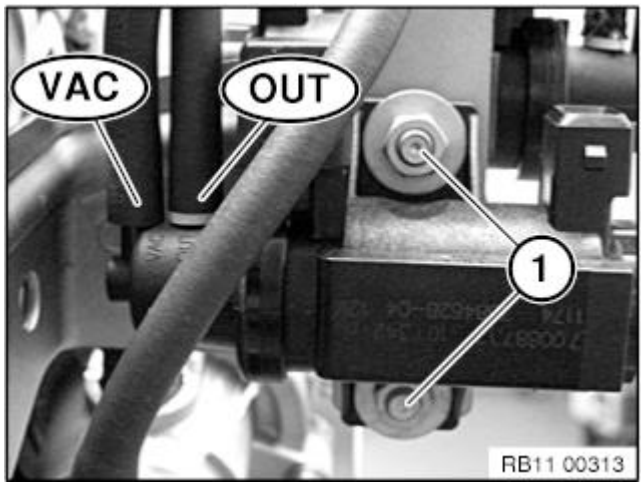
Remove pressure converter (EDPDW).

Installation note:

Cylinder 1-4 is equipped with a fabric hose (OUT).

Pressure converter, cylinders 5-8:

Disconnect vacuum hose at connection (VAC = vacuum reservoir).



Disconnect vacuum hose at connection (OUT= turbocharger vacuum unit).

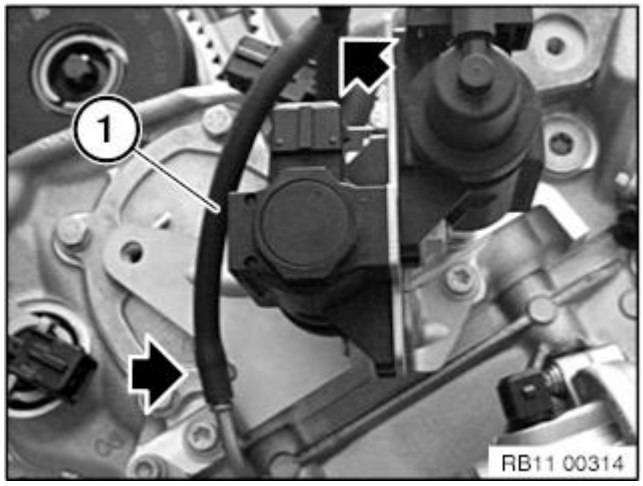
Unscrew nuts (1).

Tightening torque 11 65 9AZ.

Remove pressure converter (EDPDW).

Installation note:

Cylinder 5-8 is equipped with a moulded hose (OUT).



Vacuum line (1) to vacuum tank.

Separate the vacuum line (1) at the T-piece and connection to the vacuum tank.

Removing and installing/replacing right charge air cooler (S63 B44 T 0)

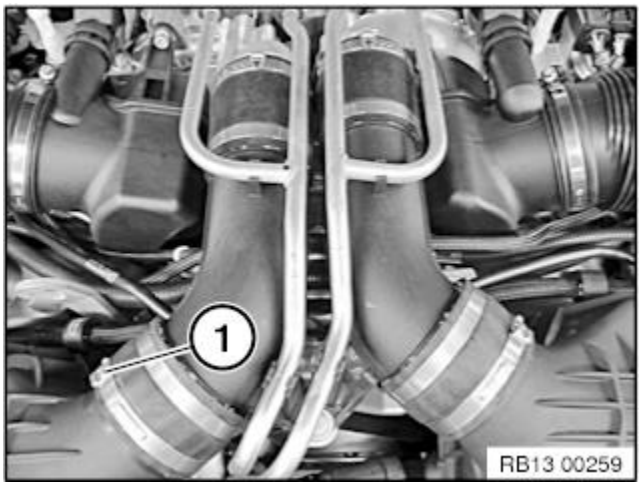
Warning!

Risk of scalding!

Only perform this repair work after engine has cooled down!

Necessary preliminary work:

- Remove right-hand intake silencer housing
- Pinch off coolant hoses at the charge air cooler using pinch-off tool (to prevent coolant from escaping).

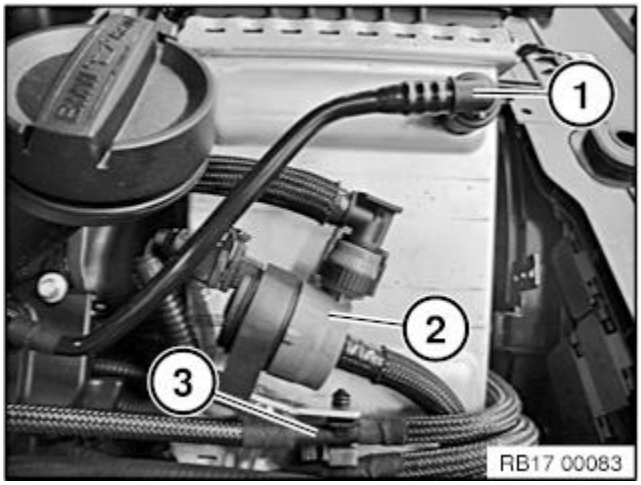


Release clamp (1).

If necessary, renew clamp.

Attention!

When loosening the coolant hoses from the charge air cooler, make sure that the connector remains connected to the throttle body. Coolant may not penetrate the plug connection at the throttle body.



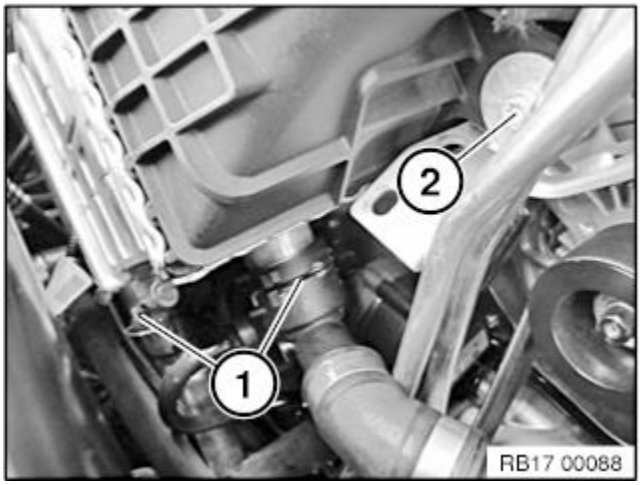
Risk of damage! Do not remove the plastic coolant hose (1) with the disconnection tool. This could damage hoses.

Unlock and detach coolant hose (1).

Remove tank vent valve (2) from charge air cooler.

Release wiring harnesses (3) from charge air cooler.

Attention!



When loosening the coolant hoses from the charge air cooler, make sure that the connector remains connected to the throttle body. Coolant may not penetrate the plug connection at the throttle body.

Disconnect coolant hoses (1) with the disconnection tool.

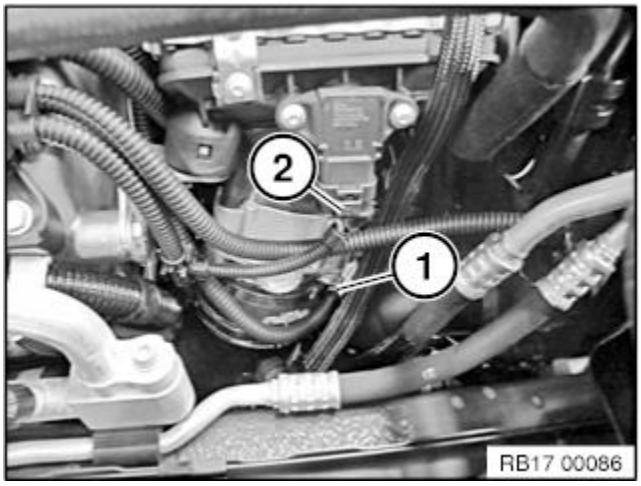
Release and disconnect coolant hoses (1).

Release screw (2).

Tightening torque 13 71 6AZ.

Release clamp (1).

Tightening torque 13 71 7AZ.



Unlock connector (2) and remove.

Pull off top of charge air cooler from air duct.

Pull charge air cooler towards top out of rubber mounts until connector is accessible from throttle body.

Unlock connector and pull off from throttle body.

Remove charge air cooler together with throttle body towards top.

Only on replacement of charge air cooler:

Remounting the throttle body.

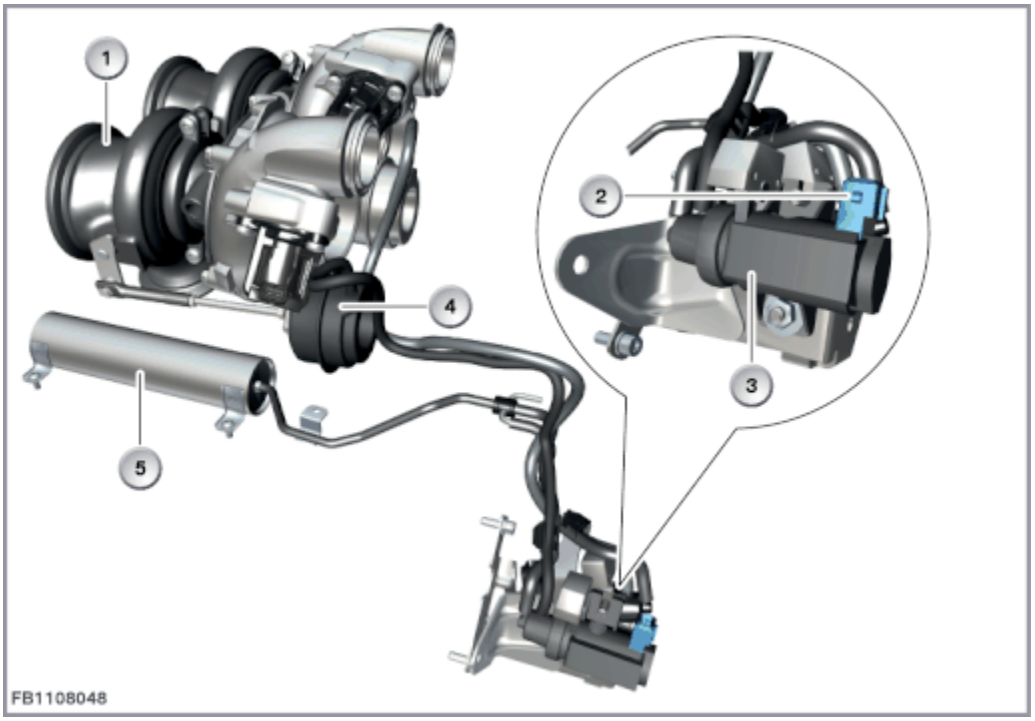
Pressure converter, wastegate valve

Two exhaust turbochargers are switched in parallel for turbocharging. The two exhaust turbochargers ensure a quick response, even at low engine speeds. Mechanical wastegate valves provide the charging pressure control. A portion of the exhaust gases is fed via the wastegate valve to the turbine.

Functional description

The charging pressure is regulated by the engine control via a wastegate valve. The wastegate valve is adjusted pneumatically by a diaphragm box. An pressure converter applies a partial vacuum to the diaphragm box.

The engine control activates the pressure converter by means of a pulse-width modulated signal. This sets a corresponding partial vacuum at the pressure converter, and this determined the opening angle of the wastegate valve.

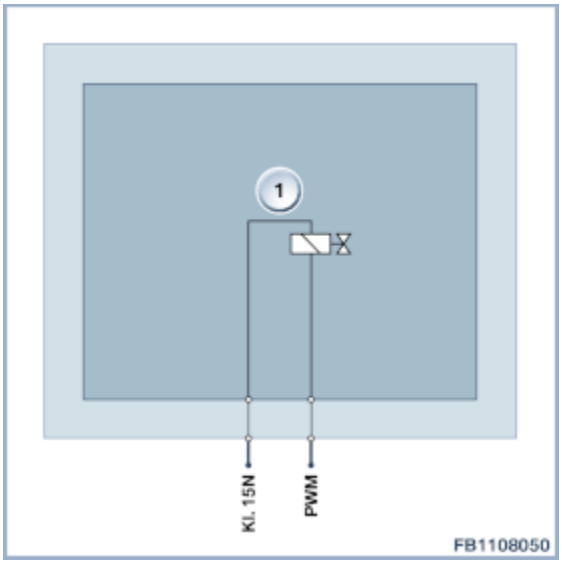


Index	Explanation	Index	Explanation
1	Exhaust turbocharger for bank 1	2	two-pin plug connection
3	Pressure converter, wastegate valve	4	Vacuum unit
5	Vacuum reservoir		

Structure and inner electrical connection

The pressure converter is connected via a two-pin plug connection.

The pressure converter is a proportional valve. The pressure converter is supplied with voltage from terminal 15N. Activation by the engine control is pulse-width modulated.



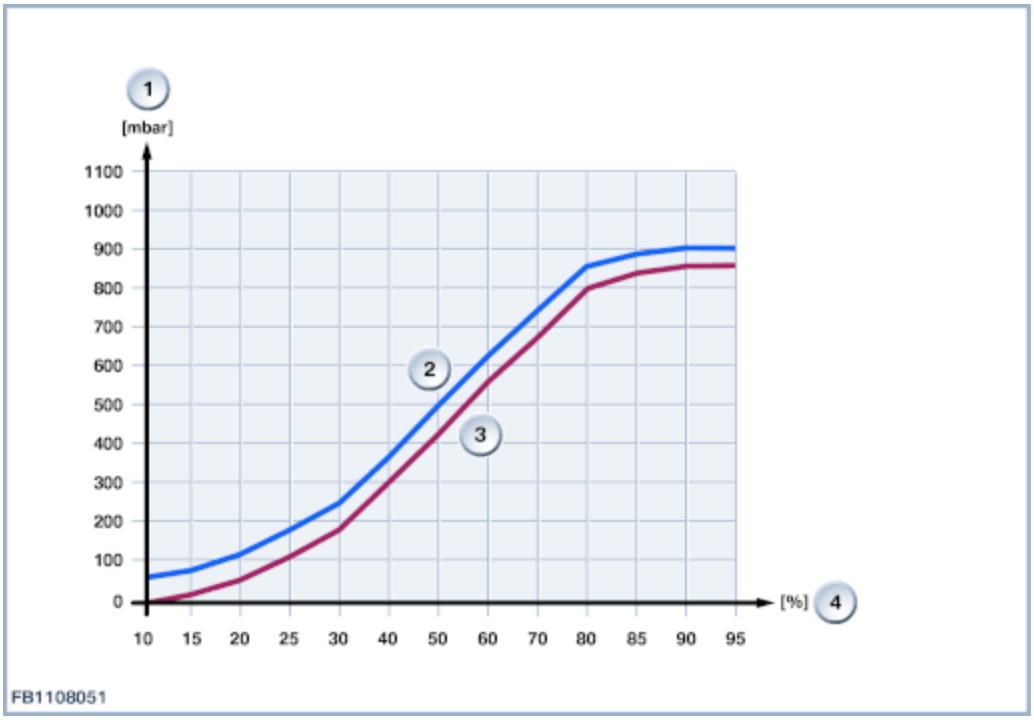
Index	Explanation	Index	Explanation
1	Pressure converter, wastegate valve		

Pin assignments

Pin	Explanation
Kl. 15N	Terminal 15, voltage supply
PWM	Pulse-width modulated activation of pressure converter

Characteristic curve and setpoint values

The pressure converter is activated by a pulse-width-modulated signal. The duty cycle is between 15 and 65 % (depending on engine operation). The supply vacuum is 700 mbar. Depending on the duty cycle, the vacuum can be continuously adjusted.



Characteristic curve valid for 950 mbar

Index	Explanation	Index	Explanation
1	Vacuum activation	2	Maximum characteristic curve
3	Minimum characteristic curve	4	Duty cycle

Observe the following setpoint values for the wastegate valve pressure converter:

Size	Value
Voltage range	10.8 to 16 V
Duty cycle (depending on engine operation)	15 to 65%
Control voltage frequency	300 Hz
Vacuum build-up response time	200 ms
Resistance at 20 °C	9.8 to 11.2 Ω
Temperature range	-40 °C to 140 °C

Diagnosis instructions

Failure of the component

If the wastegate valve pressure converter fails, the following behaviour is to be expected:

- Fault entry in the engine control unit
- Emergency operation with substitute value

General notes

If activation by pulse width modulation fails, the pressure converter is activated in emergency operation with a fixed pulse duty factor.