



Intake manifold/ boost pressure sensors

Testing and test values

Vehicles	Product	PIERBURG No. ¹⁾
Alfa Romeo; Audi; Citroen; Daewoo; Fiat; Fiat; Ford; Honda; Hyundai; Kia; Lancia; Nissan; Opel; Renault; Saab; Seat; Skoda; Suzuki; Vauxhall; Volvo; Volkswagen;	Intake manifold / boost pressure sensor	7.18222.01.021.0



Potential complaints:

- Loss of power
- Misfires during acceleration
- Fluctuating idle speed
- Malfunction indicator lamp lights up
- P0105 ... P0109 “Intake manifold pressure sensor ...” or “Boost pressure sensor ...”

The **intake manifold pressure sensor** measures the absolute pressure in the intake manifold after the throttle valve. In conjunction with the signals from the speed sensor and the intake air temperature sensor, it can be used to calculate the intake air mass.

The absolute pressure acts as a basis for mixture formation and ignition control.

The **boost pressure sensor** measures the absolute pressure before the throttle valve. The engine control unit uses its signal to calculate a correction value for the boost pressure.



Intake manifold pressure sensor (left) and boost pressure sensor (right) in VW Golf VI (highlighted in red)

Some designs also have an NTC (Negative Temperature Coefficient) as a **temperature sensor**.

This means that the influence of the temperature on the density is taken into account.

The temperature sensor also provides an input variable for the coolant circuit.

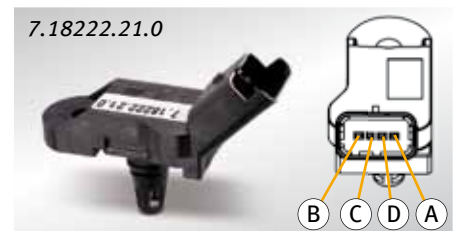
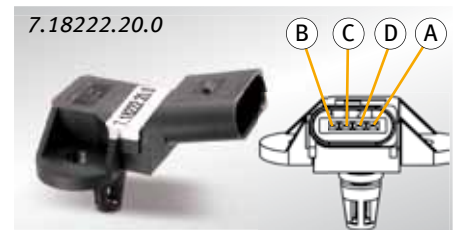
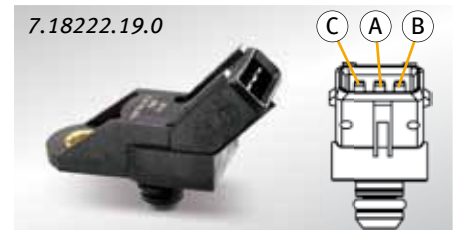
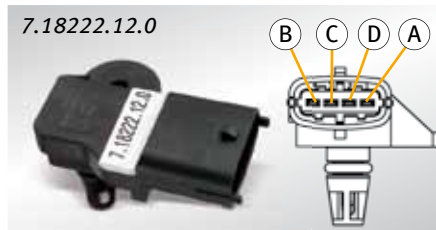
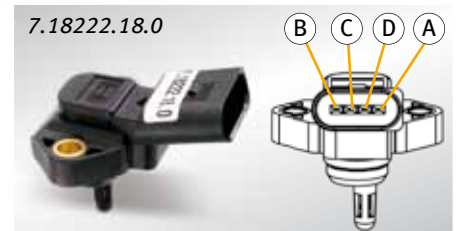
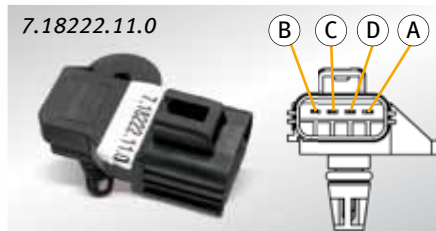
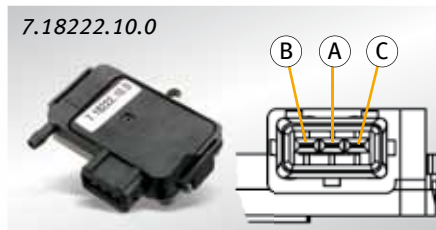
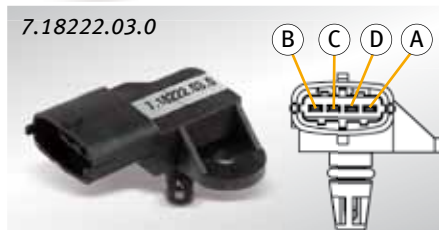
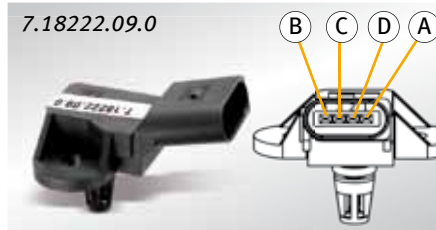
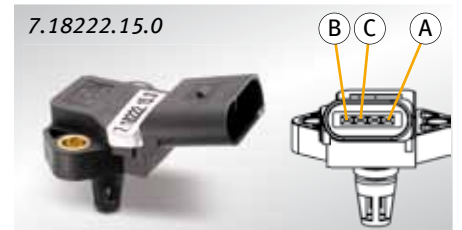
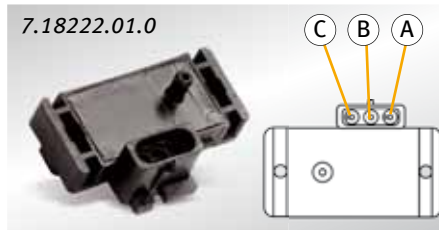
! The frequently used abbreviation “MAP sensor” refers to “manifold absolute pressure”.

Test values: See p. 3

Test sequence: See p. 4

Subject to change. Products may differ from illustrations.

¹⁾ For classification and spares refer to the current catalogues, TecDoc-CD or systems based on TecDoc data.


Overview and contacts



Test values

Trade no.	Lower test value			Upper test value		
	Lower absolute pressure p_{low}		Output voltage U_{low}	Upper absolute pressure p_{high}		Output voltage U_{high}
	[mbar]	[psi]	[mV]	[mbar]	[psi]	[mV]
7.18222.01.0	150	2.17	261 (± 4%)	1020	14.8	4958 (± 4%)
7.18222.02.0	400	5.8	1349 ... 1484	1000	14.5	4427 ... 4562
7.18222.03.0	400	5.8	1552.5 ... 1687.5	1000	14.5	3982.5 ... 4117.5
7.18222.04.0	400	5.8	688 ... 823	2100	30.7	3833 ... 3968
7.18222.05.0	400	5.8	1532.5 ... 1667.5	1000	14.5	3966.1 ... 4101.1
7.18222.06.0	400	5.8	698.6 ... 833.6	2100	30.7	3843.6 ... 3978.6
7.18222.07.0	400	5.8	1341 ... 1476	1000	14.5	4416 ... 4551
7.18222.08.0	400	5.8	698.6 ... 833.6	2100	30.7	3843.6 ... 3978.6
7.18222.09.0	400	5.8	1552.5 ... 1687.5	1000	14.5	3982.5 ... 4117.5
7.18222.10.0	400	5.8	1372.5 ... 1507.5	1000	14.5	4357.5 ... 4492.5
7.18222.11.0	400	5.8	1552.5 ... 1687.5	1000	14.5	3982.5 ... 4117.5
7.18222.12.0	400	5.8	712.5 ... 847.5	2000	29.0	3672.5 ... 3807.5
7.18222.13.0	400	5.8	1314.5 ... 1449.5	1000	14.5	3882.5 ... 4017.5
7.18222.14.0	400	5.8	612.5 ... 747.5	2600	37.7	3945.5 ... 4080.5
7.18222.15.0	400	5.8	1552.5 ... 1687.5	1000	14.5	3982.5 ... 4117.5
7.18222.16.0	400	5.8	1530.5 ... 1665.5	1000	14.5	3972.5 ... 4107.5
7.18222.17.0	400	5.8	1221.3 ... 1356.3	1000	14.5	3904.5 ... 4039.5
7.18222.18.0	400	5.8	640.5 ... 775.5	2600	37.7	3984.5 ... 4119.5
7.18222.19.0	400	5.8	1341 ... 1476	1000	14.5	4416 ... 4551
7.18222.20.0	400	5.8	1228.5 ... 1363.5	1000	14.5	3922.5 ... 4057.5
7.18222.21.0	400	5.8	1552.5 ... 1687.5	1000	14.5	3982.5 ... 4117.5

Trade No.	NTC resistance [Ω] at		
	25°C	85°C	100°C
7.18222.03.0	2080	280	180
7.18222.09.0	2080	280	180
7.18222.11.0	2080	280	180
7.18222.12.0	2080	280	180
7.18222.18.0	2080	280	180
7.18222.20.0	2080	280	180
7.18222.21.0	2080	280	180

Please note:
 The specified test values for the upper and lower pressure are absolute pressure values.

Test conditions:
 Supply voltage: 5.0 [V]
 Temperature: 23 ± 5 [°C]

Example: At an ambient pressure of around 1000 mbar, the specified **absolute pressure** of 400 mbar corresponds to a **vacuum** of around 600 mbar.



1 kPa = 10 mbar = 0.145 psi

Contacts	
A	Earth
B	Output signal
C	Supply voltage 5 V
D	NTC

Test sequence: See p. 4



Testing intake manifold / boost pressure sensors

Equipment:

- Vacuum hand pump or suitable vacuum source and manometer for vacuum
- Multimeter or scan tool
- For temperature measurement: Thermometer (up to 100°C). Suitable equipment for generating heat, e.g. hot air gun



Measurement of output voltage on intake manifold pressure sensor (highlighted) in Audi A4 TFSI

Testing the supply voltage

- Disconnect the plug from the sensor.
- Turn on the ignition.
- Set the multimeter measuring range to “DC voltage”.
- Measure the supply voltage between the pin (C) and earth (A).

Set-point value: 5 V

If this set-point value is not attained, the fault in the voltage supply must be located.

! An earth fault at the engine control unit can cause the measured values from the intake manifold pressure sensor to be falsified, resulting in an error message.

Testing the output signal

- Remove the pressure sensor from the intake manifold.
- Connect the vacuum hand pump to the pressure sensor.
- Turn on the ignition.
- Set the multimeter measuring range to “DC voltage”.
- **Set the lower** absolute pressure value p_{low} (see table, page 3).
- Test the lower output signal U_{low} between the pin (B) and earth (A).
Set-point value: See table, page 3
- **Set the upper** absolute pressure value p_{high} (see table, page 3).
- Test the upper output signal U_{high} between the pin (B) and earth (A).
Set-point value: See table, page 3

Testing the temperature sensor (NTC)

- Remove the pressure sensor from the intake manifold.
- Turn on the ignition.
- Set the multimeter measuring range to “Resistance”.
- Using a hot air gun (or a similar tool) and a thermometer, set one of the three testing points: 25°C, 85°C or 100°C.
- Measure the resistance value between the pin (D) and earth (A).
Set-point value: See table, page 3

! If a measured value is not attained, the intake manifold pressure sensor must be replaced.