991/ 981, MY 2012-

Diagnosis information - DME (DFI)

P000A

Diagnostic information - DME (DFI) control unit

Bank 1 intake camshaft adjustment

Diagnostic conditions
- Perform a short test

or:
- **Engine oil temperature** -10 ... +120 °C (14 … 248 °F)
- **Engine speed** 1,200 ... 6,000 rpm
- None of the following faults stored: P0010, P0020, P2088, P2089, P2092, P2093

Possible fault causes
- ♦ Dynamic driving style when oil level is near minimum (oil foaming)
- ♦ Solenoid valve for hydraulic camshaft adjustment faulty
  ⇒ (e.g. mechanical fault or dirt (oil circuit))
- ♦ Engine oil pressure too low
  ⇒ (e.g. oil thinning, oil thickening, wrong oil quality, oil pressure control or oil pump faulty)
- ♦ Camshaft adjustment faulty
- ♦ Intake camshaft stuck

Fault setting condition(s)
- Actual value/setpoint deviation > 10° on intake camshaft

or
- Intake camshaft adjustment slow

Diagnostic information - DME (DFI) control unit

Bank 2 intake camshaft adjustment

Diagnostic conditions
- Perform a short test

or:
- Engine oil temperature -10 ... +120 °C (14 … 248 °F)
- Engine speed 1,200 .... 6,000 rpm
- None of the following faults stored: P0010, P0020, P2088, P2089, P2092, P2093

Possible fault causes
- ♦ Dynamic driving style when oil level is near minimum (oil foaming)
- ♦ Solenoid valve for hydraulic camshaft adjustment faulty
  ⇒ (e.g. mechanical fault or dirt (oil circuit))
- ♦ Engine oil pressure too low
  ⇒ (e.g. oil thinning, oil thickening, wrong oil quality, oil pressure control or oil pump faulty)
- ♦ Camshaft adjustment faulty
- ♦ Intake camshaft stuck

Fault setting condition(s)
- Actual value/setpoint deviation > 10° on intake camshaft

or
- Intake camshaft adjustment slow

P0010

Diagnostic information - DME (DFI) control unit

Intake camshaft adjustment output stage, bank 1

Diagnostic conditions
- Time since engine start > 10 second(s)
- None of the following faults stored: P1556, P1557, P1558

Possible fault causes
- Short circuit to B+/ground or open circuit in the line (activation)
- Short circuit to ground or open circuit in the lines (power supply)
- Fuse faulty
- Solenoid valve for hydraulic camshaft adjustment faulty

Diagnostic information - DME (DFI) control unit

Bank 1 intake camshaft adjustment

Diagnostic conditions
- Perform a short test

or:
- **Engine oil temperature** -10 ... +120 °C (14 … 248 °F)
- **Engine speed** 1,200 ... 6,000 rpm
- None of the following faults stored: P0010, P0020, P2088, P2089, P2092, P2093

Possible fault causes
- ♦ Dynamic driving style when oil level is near minimum (oil foaming)
- ♦ Solenoid valve for hydraulic camshaft adjustment faulty
  ⇒ (e.g. mechanical fault or dirt (oil circuit))
- ♦ Engine oil pressure too low
  ⇒ (e.g. oil thinning, oil thickening, wrong oil quality, oil pressure control or oil pump faulty)
- ♦ Camshaft adjustment faulty
- ♦ Intake camshaft stuck

Fault setting condition(s)
- Actual value/setpoint deviation > 10° on intake camshaft

or
- Intake camshaft adjustment slow

Diagnostic information - DME (DFI) control unit

Crankshaft position in relation to bank 1 intake camshaft

Diagnostic conditions
- Time since engine start > 10 second(s)

Possible fault causes
- Timing set incorrectly
- Timing chain stretched
- Camshaft adjustment faulty (locking)
- Hall sender rotor (camshaft) wrong or damaged
- Intake camshaft sensor wrong

Fault setting condition(s)
- Adaptation not within the valid value range

Diagnostic information - DME (DFI) control unit

Crankshaft position in relation to bank 2 intake camshaft

Diagnostic conditions
- Time since engine start > 10 second(s)

Possible fault causes
- Timing set incorrectly
- Timing chain stretched
- Camshaft adjustment faulty (locking)
- Hall sender rotor (camshaft) wrong or damaged
- Intake camshaft sensor wrong

Fault setting condition(s)
- Adaptation not within the valid value range

P0020

Diagnostic information - DME (DFI) control unit

Intake camshaft adjustment output stage, bank 2

Diagnostic conditions
- Time since engine start > 10 second(s)
- None of the following faults stored: P1556, P1557, P1558

Possible fault causes
- Short circuit to B+/ground or open circuit in the line (activation)
- Short circuit to ground or open circuit in the lines (power supply)
- Fuse faulty
- Solenoid valve for hydraulic camshaft adjustment faulty

Diagnostic information - DME (DFI) control unit

Bank 2 intake camshaft adjustment

Diagnostic conditions
- Perform a short test

or:
- Engine oil temperature -10 ... +120 °C (14 … 248 °F)
- Engine speed 1,200 .... 6,000 rpm
- None of the following faults stored: P0010, P0020, P2088, P2089, P2092, P2093

Possible fault causes
- ♦ Dynamic driving style when oil level is near minimum (oil foaming)
- ♦ Solenoid valve for hydraulic camshaft adjustment faulty
  ⇒ (e.g. mechanical fault or dirt (oil circuit))
- ♦ Engine oil pressure too low
  ⇒ (e.g. oil thinning, oil thickening, wrong oil quality, oil pressure control or oil pump faulty)
- ♦ Camshaft adjustment faulty
- ♦ Intake camshaft stuck

Fault setting condition(s)
- Actual value/setpoint deviation > 10° on intake camshaft

or
- Intake camshaft adjustment slow

Diagnostic information - DME (DFI) control unit

Oxygen sensor heater driver for oxygen sensor upstream of catalytic converter, bank 1

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

● Engine running > 10 second(s)

Possible fault causes

♦ Loose contact or corrosion on connectors or lines

♦ Short circuit to B+/ground or open circuit in the line (power supply or activation)

♦ Oxygen sensor upstream of catalytic converter, bank 1
faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor heater driver for oxygen sensor upstream of catalytic converter, bank 1

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

● Engine running > 10 second(s)

Possible fault causes

♦ Loose contact or corrosion on connectors or lines

♦ Short circuit to B+/ground or open circuit in the line (power supply or activation)

♦ Oxygen sensor upstream of catalytic converter, bank 1
faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor heater driver for oxygen sensor upstream of catalytic converter, bank 1

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

● Engine running > 10 second(s)

Possible fault causes

♦ Loose contact or corrosion on connectors or lines

♦ Short circuit to B+/ground or open circuit in the line (power supply or activation)

♦ Oxygen sensor upstream of catalytic converter, bank 1
faulty

P0036

Diagnostic information - DME (DFI) control unit

Oxygen sensor heater driver for oxygen sensor downstream of catalytic converter, bank 1

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Engine running > 10 second(s)
- Oxygen sensor heater active

Possible fault causes

♦ Loose contact or corrosion on connectors or lines

♦ Short circuit to B+/ground or open circuit in the line (power supply or activation)

♦ Oxygen sensor downstream of catalytic converter, bank 1 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor heater driver for oxygen sensor downstream of catalytic converter, bank 1

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Engine running > 10 second(s)
- Oxygen sensor heater active

Possible fault causes

♦ Loose contact or corrosion on connectors or lines

♦ Short circuit to B+/ground or open circuit in the line (power supply or activation)

♦ Oxygen sensor downstream of catalytic converter, bank 1 faulty

P0038

Diagnostic information - DME (DFI) control unit

Oxygen sensor heater driver for oxygen sensor downstream of catalytic converter, bank 1

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Engine running > 10 second(s)
- Oxygen sensor heater active

Possible fault causes

♦ Loose contact or corrosion on connectors or lines

♦ Short circuit to B+/ground or open circuit in the line (power supply or activation)

♦ Oxygen sensor downstream of catalytic converter, bank 1 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor(s) upstream of catalytic converter interchanged

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Perform all short tests in sequence (without tank leak test).

or

- Lambda control active
- Driving with:
  - small valve lift (See Actual value A220)
  - large valve lift (See Actual value A220)

Possible fault causes

♦ Oxygen sensors upstream of catalytic converter bank 1 and bank 2 interchanged

Diagnostic information - DME (DFI) control unit

Oxygen sensor(s) downstream of catalytic converter interchanged

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Perform all short tests in sequence (without tank leak test).

or

- Steady driving > 20 minute(s) at:
  - approx. 80 km/h (50 mph)
  - in the highest gear
  - Lambda control (behind catalytic converter) active

Possible fault causes

♦ Oxygen sensors downstream of catalytic converter bank 1 and bank 2 interchanged

Diagnostic information - DME (DFI) control unit

Turbocharger governor

Diagnostic conditions
- Full-load acceleration

Possible fault causes
♦ Boost pressure too high (P0234) at high altitude

Fault setting condition(s)
- Turbocharger exceeds speed limits ⇒ approx. 170,000 ... 180,000 rpm (See ⓘ)

Fault effects
♦ Boost pressure control switched off (boost pressure low)
♦ Reduced engine torque

ⓘ INFORMATION
The turbocharger's speed is calculated from various input variables.

Diagnostic information - DME (DFI) control unit

Oxygen sensor heater driver for oxygen sensor upstream of catalytic converter, bank 2

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

● Engine running > 10 second(s)

Possible fault causes

♦ Loose contact or corrosion on connectors or lines

♦ Short circuit to B+/ground or open circuit in the line (power supply or activation)

♦ Oxygen sensor upstream of catalytic converter, bank 2
faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor heater driver for oxygen sensor upstream of catalytic converter, bank 2

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

● Engine running > 10 second(s)

Possible fault causes

♦ Loose contact or corrosion on connectors or lines

♦ Short circuit to B+/ground or open circuit in the line (power supply or activation)

♦ Oxygen sensor upstream of catalytic converter, bank 2
faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor heater driver for oxygen sensor upstream of catalytic converter, bank 2

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

● Engine running > 10 second(s)

Possible fault causes

♦ Loose contact or corrosion on connectors or lines

♦ Short circuit to B+/ground or open circuit in the line (power supply or activation)

♦ Oxygen sensor upstream of catalytic converter, bank 2
faulty

P0053

Diagnostic information - DME (DFI) control unit

Oxygen sensor heater upstream of catalytic converter, bank 1

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Drive > 10 minute(s) with:
  - Engine at operating temperature
  - at least 1 overrun phase(s) > 6 second(s)
- then idling > 40 second(s)

Possible fault causes

♦ Electrical fault in electric circuit (short circuit) for oxygen sensor heater

♦ Oxygen sensor upstream of catalytic converter bank 1 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor heater driver for oxygen sensor downstream of catalytic converter, bank 2

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Engine running > 10 second(s)
- Oxygen sensor heater active

Possible fault causes

♦ Loose contact or corrosion on connectors or lines

♦ Short circuit to B+/ground or open circuit in the line (power supply or activation)

♦ Oxygen sensor downstream of catalytic converter, bank 2 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor heater driver for oxygen sensor downstream of catalytic converter, bank 2

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Engine running > 10 second(s)
- Oxygen sensor heater active

Possible fault causes

♦ Loose contact or corrosion on connectors or lines

♦ Short circuit to B+/ground or open circuit in the line (power supply or activation)

♦ Oxygen sensor downstream of catalytic converter, bank 2 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor heater driver for oxygen sensor downstream of catalytic converter, bank 2

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Engine running > 10 second(s)
- Oxygen sensor heater active

Possible fault causes

♦ Loose contact or corrosion on connectors or lines

♦ Short circuit to B+/ground or open circuit in the line (power supply or activation)

♦ Oxygen sensor downstream of catalytic converter, bank 2 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor heater upstream of catalytic converter, bank 2

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Drive > 10 minute(s) with:
  - Engine at operating temperature
  - at least 1 overrun phase(s) > 6 second(s)
- then idling > 40 second(s)

Possible fault causes

♦ Electrical fault in electric circuit (short circuit) for oxygen sensor heater

♦ Oxygen sensor upstream of catalytic converter bank 2 faulty

Diagnostic information - DME (DFI) control unit

Mass air flow implausible

ⓘ INFORMATION

One or more additional faults are entered that more precisely indicate the operating ranges in which the fault occurred.

- Near idle speed range:
  - ♦ P1069 + P1070 + P1071
- Lower partial-load range :
  - ♦ P1074 + P1075
- Upper partial-load range :
  - ♦ P1076 + P1077

Diagnostic conditions + Possible fault causes

⇒ see respective document

Fault setting condition(s)

- Unacceptably large deviation of the measured air mass from the calculated air mass.

P0069

Diagnostic information - DME (DFI) control unit

Intake manifold pressure sensor implausible

Diagnostic conditions
- Ignition on > 10 second(s)
- then: Acceleration with wide-open throttle for as long as possible, immediately followed by an overrun phase lasting as long as possible
- None of the following faults stored: P1638, P1639, P0107, P0108, P2228, P2229, P1183, P1184, P1187, P1188, P1189, P1190

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Ground supply faulty
- ♦ Intake manifold pressure sensor faulty

- **ONLY** for '**40-Time after Start**' greater than **0** (see Extended fault memory):
  - ♦ Throttle valve adjusting unit soiled

Fault effects
- ♦ Substitute value from model

Diagnostic information - DME (DFI) control unit

Ambient temperature via CAN
(See Air-conditioning system regulator)

Diagnostic conditions
- NO fault stored in the DME (DFI) control unit
- Driving > 80 km/h (49 mph) for > 15 minute(s)
- then driving > 1 minute(s) under the following conditions:
  - Coolant temperature 47 ... 108 °C (116 … 226 °F)
  - Engine speed 1,200 ... 4,000 rpm
  - Vehicle speed 30 ... 180 km/h (24 … 111 mph)

Possible fault causes
- ♦ Ambient temperature incorrect (sensor trimming incorrect/faulty)
- ♦ Intake air temperature incorrect (sensor trimming incorrect/faulty)

Fault setting condition(s)
- Deviation between **ambient temperature** via CAN and substitute value from model > 25 °C (77 °F)

ⓘ The temperature model depends mainly on the measured intake air temperature.

Fault effects
- ♦ Substitute value from model

P0072

Diagnostic information - DME (DFI) control unit

Ambient temperature via CAN
(See Air-conditioning system regulator)

Diagnostic conditions
- Ignition on > 5 second(s)

Possible fault causes
- ♦ Outside temperature sensor fault
- ♦ The expected signal or message deviates from the specified value.

Fault effects
- ♦ Substitute value from model

Diagnostic information - DME (DFI) control unit

Ambient temperature via CAN
(See Air-conditioning system regulator)

Diagnostic conditions
- Ignition on > 5 second(s)

Possible fault causes
- ♦ Outside temperature sensor fault
- ♦ The expected signal or message deviates from the specified value.

Fault effects
- ♦ Substitute value from model

Diagnostic information - DME (DFI) control unit

Ambient temperature via CAN
(See Air-conditioning system regulator)

Diagnostic conditions
- Ignition on > 5 second(s)

Possible fault causes
- ♦ Outside temperature sensor fault
- ♦ The expected signal or message deviates from the specified value.

Fault effects
- ♦ Substitute value from model

P0076

Diagnostic information - DME (DFI) control unit

Valve lift control driver, bank 1

Diagnostic conditions
- Idle speed > 10 second(s)
- then increase engine speed until the large valve lift has been switched (See Actual value A220)

Possible fault causes
- ♦ Short circuit to B+/ground or open circuit in the line (activation)
- ♦ Short circuit to ground or open circuit in the lines (power supply)
- ♦ Fuse faulty
- ♦ Solenoid valve for hydraulic valve lift control faulty

P0077

Diagnostic information - DME (DFI) control unit

Valve lift control driver, bank 1

Diagnostic conditions
- Idle speed > 10 second(s)
- then increase engine speed until the large valve lift has been switched (See Actual value A220)

Possible fault causes
- ♦ Short circuit to B+/ground or open circuit in the line (activation)
- ♦ Short circuit to ground or open circuit in the lines (power supply)
- ♦ Fuse faulty
- ♦ Solenoid valve for hydraulic valve lift control faulty

P0082

Diagnostic information - DME (DFI) control unit

Valve lift control driver, bank 2

Diagnostic conditions
- Idle speed > 10 second(s)
- then increase engine speed until the large valve lift has been switched (See Actual value A220)

Possible fault causes
- ♦ Short circuit to B+/ground or open circuit in the line (activation)
- ♦ Short circuit to ground or open circuit in the lines (power supply)
- ♦ Fuse faulty
- ♦ Solenoid valve for hydraulic valve lift control faulty

P0083

Diagnostic information - DME (DFI) control unit

Valve lift control driver, bank 2

Diagnostic conditions
- Idle speed > 10 second(s)
- then increase engine speed until the large valve lift has been switched (See Actual value A220)

Possible fault causes
- ♦ Short circuit to B+/ground or open circuit in the line (activation)
- ♦ Short circuit to ground or open circuit in the lines (power supply)
- ♦ Fuse faulty
- ♦ Solenoid valve for hydraulic valve lift control faulty

P00B7

Diagnostic information - DME (DFI) control unit

Engine coolant shutoff valve stuck closed
or
Thermostat stuck closed

Diagnostic conditions

- Uniform driving (only slight changes in rpm and torque)
- Setpoint engine temperature (T005) > 104.25 °C (219.65 °F)
- **Engine coolant temperature** (T020) = setpoint engine temperature (T005)
- **Coolant temperature** at radiator outlet (T025) < 80 °C (176 °F)
- **Engine speed** 1,200 ... 3,500 rpm
- Air conditioner OFF (= heating valve must not switch during diagnostics)

Possible fault causes

♦ Solenoid switchover valve for coolant shutoff valve vacuum unit mechanically stuck
♦ Vacuum lines on the solenoid switchover valve interchanged
♦ Vacuum lines or electrical lines of the solenoid switchover valve interchanged with another solenoid switchover valve
♦ Engine coolant shutoff valve faulty (stuck closed)
♦ Thermostat faulty (stuck closed)
♦ Air trapped in the cooling system (e.g. after repairs were performed on the cooling system)
♦ Incorrect measurement by engine temperature sensor or radiator return temperature sensor, but still in the plausible range (-40...+150 °C/-40...+302 °F)

Diagnostic function ⇒ **See function description**

Diagnostic information - DME (DFI) control unit

Intake manifold pressure sensor implausible

Diagnostic conditions
- Ignition on > 10 second(s)
- then: Acceleration with wide-open throttle for as long as possible, immediately followed by an overrun phase lasting as long as possible
- None of the following faults stored: P1638, P1639, P0107, P0108, P2228, P2229, P1183, P1184, P1187, P1188, P1189, P1190

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Ground supply faulty
- Intake manifold pressure sensor faulty

- **ONLY** for '**40-Time after Start**' greater than **0** (see Extended fault memory):
  - Throttle valve adjusting unit soiled

Fault effects
- Substitute value from model

Diagnostic information - DME (DFI) control unit

Intake manifold pressure sensor: electrical fault

Diagnostic conditions
- Ignition on or engine running

Possible fault causes
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Ground supply faulty
- ♦ Intake manifold pressure sensor faulty

Fault effects
- ♦ Substitute value from model

P0108

Diagnostic information - DME (DFI) control unit

Intake manifold pressure sensor: electrical fault

Diagnostic conditions
- Ignition on or engine running

Possible fault causes
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Ground supply faulty
- ♦ Intake manifold pressure sensor faulty

Fault effects
- ♦ Substitute value from model

Diagnostic information - DME (DFI) control unit

Intake air temperature implausible

Diagnostic conditions
- Vehicle has NOT been and is NOT standing in the sun.
- Engine off > 9 hour(s)
- Engine coolant temperature cooling > 35 °C (95 °F), with:
  - Engine off
- then cold start, at:
  - Coolant temperature < 37 °C (98.6 °F)
  - Difference between intake air temperature <=> engine coolant temperature < 6 °C (42.8 °F)
- then driving, with:
  - Engine running > 23 minute(s)
  - Distance driven > 7 km (4 mi.)
  - Engine coolant temperature up to > 94 °C (201 °F)

Possible fault causes
- ♦ Intake air temperature sensor faulty (in intake manifold pressure sensor)
- ♦ Resistor installed (instead of intake air temperature sensor)

Fault setting condition(s)
- Change in intake air temperature < 1.5 °C (34.7 °F), at:
  - Diagnostic conditions

Fault effects
- ♦ Substitute coolant temperature value

Diagnostic information - DME (DFI) control unit

Intake air temperature sensor: electrical fault

Diagnostic conditions
- Engine running > 2 minute(s)
- Mass air flow < 150 kg/h

Possible fault causes
- Short circuit to B+/ground/between lines or open circuit in the lines
- Intake air temperature sensor faulty

Fault effects
- Substitute value from model

Diagnostic information - DME (DFI) control unit

Intake air temperature sensor: electrical fault

Diagnostic conditions
- Engine running > 2 minute(s)
- Mass air flow < 150 kg/h

Possible fault causes
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Intake air temperature sensor faulty

Fault effects
- ♦ Substitute value from model

P0114

Diagnostic information - DME (DFI) control unit

Intake air temperature sensor: electrical fault

Diagnostic conditions
- Ignition on > 10 second(s)

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Intake air temperature sensor faulty

Diagnostic information - DME (DFI) control unit

Engine coolant temperature implausibly high

Diagnostic conditions

- Driving with:
  - Engine speed > 2,000 rpm
  - Cooling performance high and low
- Then vehicle standstill, with:
  - Idle speed > 75 second(s)
- None of the following faults stored: P0117, P0118, P0119, P3081, P3082

Possible fault causes

♦ Engine coolant temperature sensor faulty
♦ Resistor installed (instead of coolant temperature sensor)

Fault setting condition(s)

- Change in engine coolant temperature < setpoint value (See ⓘ)

ⓘ INFORMATION

Change in setpoint value = depending on engine start temperature

Diagnostic information - DME (DFI) control unit

Engine coolant temperature sensor: electrical fault

Diagnostic conditions
- Ignition on

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Engine coolant temperature sensor faulty

Fault setting condition(s)
- Engine coolant temperature (measured) < -40 °C (-40 °F) (P0117), with:
  - Ignition on or engine running
  - and
  - Intake air temperature > -30 °C (-22 °F)
  - or
  - Engine running > 300 second(s)

or
- Engine coolant temperature (measured) > +130 °C (266 °F) (P0118), with:
  - Ignition on or engine running

Diagnostic information - DME (DFI) control unit

Engine coolant temperature sensor: electrical fault

Diagnostic conditions
- Ignition on

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Engine coolant temperature sensor faulty

Fault setting condition(s)
- Engine coolant temperature (measured) < -40 °C (-40 °F) (P0117), with:
  - Ignition on or engine running
  - and
  - Intake air temperature > -30 °C (-22 °F)
  - or
  - Engine running > 300 second(s)

or
- Engine coolant temperature (measured) > +130 °C (266 °F) (P0118), with:
  - Ignition on or engine running

Diagnostic information - DME (DFI) control unit

Engine coolant temperature sensor: loose contact

Diagnostic conditions
- Ignition on
- None of the following faults stored: P0117, P0118

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Engine coolant temperature sensor faulty

Fault setting condition(s)
- Engine coolant temperature: Actual-value jumps > 3 °C (37 °F)

Fault effects
- ♦ Substitute value = last actual value that was detected as OK, with:
  - Actual-value jumps > 9.75 °C (49.5 °F)

Diagnostic information - DME (DFI) control unit

Accelerator pedal potentiometer implausible

Diagnostic conditions
- Ignition on > 3 second(s)
- then accelerator pedal pressed down fully > 3 second(s)
- then release accelerator pedal fully
- then idling > 10 second(s)

Possible fault causes
- ♦ Short circuit to B+/ground/between lines or open circuit in wiring to potentiometer 1 or 2
- ♦ Accelerator pedal potentiometer 1 or 2 faulty

Fault setting condition(s)
- The two potentiometer values differ too greatly from each other.
- It is not clear which value is incorrect.

Fault effects
- ♦ Engine does not respond to throttle, engine speed 1,000 rpm

Diagnostic information - DME (DFI) control unit

Accelerator pedal potentiometer 1

Diagnostic conditions
- Ignition on > 3 second(s)
- then accelerator pedal pressed down fully > 3 second(s)
- then release accelerator pedal fully
- then idling > 10 second(s)

Possible fault causes
- ♦ Short circuit to B+/ground/between lines or open circuit in wiring to potentiometer 1
- ♦ Accelerator pedal potentiometer 1 faulty

Fault effects
- ♦ The accelerator pedal angle is calculated from the remaining potentiometer signal.
- ♦ No acceleration initially + increased idle speed (approx. 800 rpm)
  - ▶ until the accelerator pedal is released fully.
  - ♦ Then acceleration, with
    - ♦ significantly reduced engine torque (max. approx.100 ... 180 Nm)
    - ♦ and limited engine speed (max. approx. 5,000 rpm)
  - ♦ If the accelerator and brake are pressed at the same time, the engine will run at idle speed.

Diagnostic information - DME (DFI) control unit

Accelerator pedal potentiometer 1

Diagnostic conditions
- Ignition on > 3 second(s)
- then accelerator pedal pressed down fully > 3 second(s)
- then release accelerator pedal fully
- then idling > 10 second(s)

Possible fault causes
- ♦ Short circuit to B+/ground/between lines or open circuit in wiring to potentiometer 1
- ♦ Accelerator pedal potentiometer 1 faulty

Fault effects
- ♦ The accelerator pedal angle is calculated from the remaining potentiometer signal.
- ♦ No acceleration initially + increased idle speed (approx. 800 rpm)
  - ▶ until the accelerator pedal is released fully.
  - ♦ Then acceleration, with
    - ♦ significantly reduced engine torque (max. approx.100 ... 180 Nm)
    - ♦ and limited engine speed (max. approx. 5,000 rpm)
  - ♦ If the accelerator and brake are pressed at the same time, the engine will run at idle speed.

Diagnostic information - DME (DFI) control unit

Oxygen sensor upstream of catalytic converter, bank 1

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

● Idling > 3 second(s)

Possible fault causes

♦ Short circuit to B+/ground or open circuit in the line

♦ Oxygen sensor upstream of catalytic converter bank 1 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor upstream of catalytic converter, bank 1

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

● Idling > 3 second(s)

Possible fault causes

♦ Short circuit to B+/ground or open circuit in the line

♦ Oxygen sensor upstream of catalytic converter bank 1 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor upstream of catalytic converter bank 1, dynamic response

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Perform all short tests in sequence (without tank leak test).

or

- Engine running > 2 minute(s) with:
  - Engine at operating temperature
  - All oxygen sensor(s) ready for operation
- then steady driving > 10 minute(s) at:
  - Engine speed < 800 ... 3,200 rpm
  - Mass air flow 120 … 520 mg/stroke
  - No overrun phase(s)

Possible fault causes

♦ Short circuit to B+/ground/between lines or open circuit in the lines

♦ Different air flow to oxygen sensor downstream of catalytic converter if:

  ♦ Catalytic converter is damaged

  ♦ Components modified or non-genuine components

♦ Oxygen sensor upstream of catalytic converter bank 1 faulty (aged)

Diagnostic information - DME (DFI) control unit

Oxygen sensor heater circuit upstream of catalytic converter, bank 1

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Engine running, with:
  - **Oxygen sensor heater** downstream of catalytic converter active > 180 second(s)
  - Lambda control active
- None of the following faults stored: P0030, P0031, P0032

Possible fault causes

♦ Contact resistance (power supply or activation)

♦ Shunt (high resistance) in heater circuit ⇒ Signal line

♦ Oxygen sensor downstream of catalytic converter, bank 1 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor downstream of catalytic converter, bank 1

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Drive > 2 minute(s) with:
  - Engine at operating temperature
  - Mass air flow > 10 kg/h
- then idling > 30 second(s)

Possible fault causes

♦ Loose contact or corrosion on connectors or lines

♦ Short circuit to B+/ground or open circuit in the line

♦ Oxygen sensor downstream of catalytic converter, bank 1 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor downstream of catalytic converter, bank 1

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Drive > 2 minute(s) with:
  - Engine at operating temperature
  - Mass air flow > 10 kg/h
- then idling > 30 second(s)

Possible fault causes

♦ Loose contact or corrosion on connectors or lines

♦ Short circuit to B+/ground or open circuit in the line

♦ Oxygen sensor downstream of catalytic converter, bank 1 faulty

P013A

Diagnostic information - DME (DFI) control unit

Oxygen sensor downstream of catalytic converter, bank 1

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Perform all short tests in sequence

or

- Engine temperature > 60 °C (140 °F)
- Time since engine start > 10 second(s)
- Catalytic converter temperature 540 ... 750 °C (1,004 ... 1,382 °F)
- Drive for 60 seconds with slight acceleration at 40 ... 130 km/h (24 … 80 mph)
- Active carbon filter loading < 0.7
- Engine speed < 3,000 rpm
- Lambda control ahead of catalytic converter active
- Lambda control behind catalytic converter active
- None of the following faults stored: Oxygen sensor(s) - electrical fault, intake manifold pressure sensor or throttle adjusting unit

Possible fault causes

♦ Short circuit to B+/ground/between lines or open circuit in the lines

♦ Different air flow to oxygen sensor downstream of catalytic converter if:

  ♦ Catalytic converter is damaged

  ♦ Components modified or non-genuine components

♦ Oxygen sensor downstream of catalytic converter, bank 1 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor downstream of catalytic converter, bank 1

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Perform all short tests in sequence

or

- Engine temperature > 60 °C (140 °F)
- Time since engine start > 10 second(s)
- Catalytic converter temperature 540 ... 750 °C (1,004 ... 1,382 °F)
- Drive for 60 seconds with slight acceleration at 40 ... 130 km/h (24 … 80 mph)
- Active carbon filter loading < 0.7
- Engine speed < 3,000 rpm
- Lambda control ahead of catalytic converter active
- Lambda control behind catalytic converter active
- None of the following faults stored: Oxygen sensor(s) - electrical fault, intake manifold pressure sensor or throttle adjusting unit

Possible fault causes

♦ Short circuit to B+/ground/between lines or open circuit in the lines

♦ Different air flow to oxygen sensor downstream of catalytic converter if:

  ♦ Catalytic converter is damaged

  ♦ Components modified or non-genuine components

♦ Oxygen sensor downstream of catalytic converter, bank 1 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor downstream of catalytic converter, bank 2

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Perform all short tests in sequence

or

- Engine temperature > 60 °C (140 °F)
- Time since engine start > 10 second(s)
- Catalytic converter temperature 540 ... 750 °C (1,004 ... 1,382 °F)
- Drive for 60 seconds with slight acceleration at 40 ... 130 km/h (24 … 80 mph)
- Active carbon filter loading < 0.7
- Engine speed < 3,000 rpm
- Lambda control ahead of catalytic converter active
- Lambda control behind catalytic converter active
- None of the following faults stored: Oxygen sensor(s) - electrical fault, intake manifold pressure sensor or throttle adjusting unit

Possible fault causes

♦ Short circuit to B+/ground/between lines or open circuit in the lines

♦ Different air flow to oxygen sensor downstream of catalytic converter if:

  ♦ Catalytic converter is damaged

  ♦ Components modified or non-genuine components

♦ Oxygen sensor downstream of catalytic converter, bank 2 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor downstream of catalytic converter, bank 2

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Perform all short tests in sequence

or

- Engine temperature > 60 °C (140 °F)
- Time since engine start > 10 second(s)
- Catalytic converter temperature 540 ... 750 °C (1,004 ... 1,382 °F)
- Drive for 60 seconds with slight acceleration at 40 ... 130 km/h (24 … 80 mph)
- Active carbon filter loading < 0.7
- Engine speed < 3,000 rpm
- Lambda control ahead of catalytic converter active
- Lambda control behind catalytic converter active
- None of the following faults stored: Oxygen sensor(s) - electrical fault, intake manifold pressure sensor or throttle adjusting unit

Possible fault causes

♦ Short circuit to B+/ground/between lines or open circuit in the lines

♦ Different air flow to oxygen sensor downstream of catalytic converter if:

  ♦ Catalytic converter is damaged

  ♦ Components modified or non-genuine components

♦ Oxygen sensor downstream of catalytic converter, bank 2 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor downstream of catalytic converter, bank 1

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Perform all short tests in sequence

or

- Engine temperature > 60 °C (140 °F)
- Time since engine start > 10 second(s)
- Catalytic converter temperature 540 ... 750 °C (1,004 ... 1,382 °F)
- Drive for 60 seconds with slight acceleration at 40 ... 130 km/h (24 … 80 mph)
- Active carbon filter loading < 0.7
- Engine speed < 3,000 rpm
- Lambda control ahead of catalytic converter active
- Lambda control behind catalytic converter active
- None of the following faults stored: Oxygen sensor(s) - electrical fault, intake manifold pressure sensor or throttle adjusting unit

Possible fault causes

♦ Different air flow to oxygen sensor downstream of catalytic converter if:
  ♦ Catalytic converter is damaged
  ♦ Components modified or non-genuine components

Fault setting condition(s)

- Excessive time offset during edge changes between the lean and rich cycle or between the rich and lean cycle.

Diagnostic information - DME (DFI) control unit

Oxygen sensor downstream of catalytic converter, bank 1

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Perform all short tests in sequence

or

- Engine temperature > 60 °C (140 °F)
- Time since engine start > 10 second(s)
- Catalytic converter temperature 540 ... 750 °C (1,004 ... 1,382 °F)
- Drive for 60 seconds with slight acceleration at 40 ... 130 km/h (24 … 80 mph)
- Active carbon filter loading < 0.7
- Engine speed < 3,000 rpm
- Lambda control ahead of catalytic converter active
- Lambda control behind catalytic converter active
- None of the following faults stored: Oxygen sensor(s) - electrical fault, intake manifold pressure sensor or throttle adjusting unit

Possible fault causes

♦ Different air flow to oxygen sensor downstream of catalytic converter if:
  ♦ Catalytic converter is damaged
  ♦ Components modified or non-genuine components

Fault setting condition(s)

- Excessive time offset during edge changes between the lean and rich cycle or between the rich and lean cycle.

Diagnostic information - DME (DFI) control unit

Oxygen sensor downstream of catalytic converter, bank 1

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Drive > 2 minute(s) with:
  - Engine at operating temperature
  - Mass air flow > 10 kg/h
- then idling > 30 second(s)

Possible fault causes

♦ Loose contact or corrosion on connectors or lines

♦ Short circuit to B+/ground or open circuit in the line

♦ Oxygen sensor downstream of catalytic converter, bank 1 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor heater circuit downstream of catalytic converter, bank 1

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Engine running, with:
  - **Oxygen sensor heater** downstream of catalytic converter active > 180 second(s)
  - Lambda control active
- None of the following faults stored: P0036, P0037, P0038

Possible fault causes

♦ Contact resistance (power supply or activation)

♦ Shunt (high resistance) in heater circuit ⇒ Signal line

♦ Oxygen sensor downstream of catalytic converter, bank 1 faulty

P014A

Diagnostic information - DME (DFI) control unit

Oxygen sensor downstream of catalytic converter, bank 2

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

● Perform all short tests in sequence

or

● Engine temperature > 60 °C (140 °F)
● Time since engine start > 10 second(s)
● Catalytic converter temperature 540 ... 750 °C (1,004 ... 1,382 °F)
● Drive for 60 seconds with slight acceleration at 40 ... 130 km/h (24 … 80 mph)
● Active carbon filter loading < 0.7
● Engine speed < 3,000 rpm
● Lambda control ahead of catalytic converter active
● Lambda control behind catalytic converter active
● None of the following faults stored: Oxygen sensor(s) - electrical fault, intake manifold pressure sensor or throttle adjusting unit

Possible fault causes

♦ Different air flow to oxygen sensor downstream of catalytic converter if:
  ♦ Catalytic converter is damaged
  ♦ Components modified or non-genuine components

Fault setting condition(s)

● Excessive time offset during edge changes between the lean and rich cycle or between the rich and lean cycle.

Diagnostic information - DME (DFI) control unit

Oxygen sensor downstream of catalytic converter, bank 2

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

● Perform all short tests in sequence

or

● Engine temperature > 60 °C (140 °F)
● Time since engine start > 10 second(s)
● Catalytic converter temperature 540 ... 750 °C (1,004 ... 1,382 °F)
● Drive for 60 seconds with slight acceleration at 40 ... 130 km/h (24 … 80 mph)
● Active carbon filter loading < 0.7
● Engine speed < 3,000 rpm
● Lambda control ahead of catalytic converter active
● Lambda control behind catalytic converter active
● None of the following faults stored: Oxygen sensor(s) - electrical fault, intake manifold pressure sensor or throttle adjusting unit

Possible fault causes

♦ Different air flow to oxygen sensor downstream of catalytic converter if:
  ♦ Catalytic converter is damaged
  ♦ Components modified or non-genuine components

Fault setting condition(s)

● Excessive time offset during edge changes between the lean and rich cycle or between the rich and lean cycle.

Diagnostic information - DME (DFI) control unit

Oxygen sensor upstream of catalytic converter, bank 2

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

● Idling > 3 second(s)

Possible fault causes

♦ Short circuit to B+/ground or open circuit in the line

♦ Oxygen sensor upstream of catalytic converter bank 2 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor upstream of catalytic converter, bank 2

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

● Idling > 3 second(s)

Possible fault causes

♦ Short circuit to B+/ground or open circuit in the line

♦ Oxygen sensor upstream of catalytic converter bank 2 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor upstream of catalytic converter bank 2, dynamic response

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Engine running > 2 minute(s) with:
  - Engine at operating temperature
  - All oxygen sensor(s) ready for operation
- then steady driving > 10 minute(s) at:
  - Engine speed < 800 ... 3,200 rpm
  - Mass air flow 120 … 520 mg/stroke
  - No overrun phase(s)

Possible fault causes

♦ Short circuit to B+/ground/between lines or open circuit in the lines

♦ Different air flow to oxygen sensor downstream of catalytic converter if:

♦ Catalytic converter is damaged

♦ Components modified or non-genuine components

♦ Oxygen sensor upstream of catalytic converter bank 2 faulty (aged)

Diagnostic information - DME (DFI) control unit

Oxygen sensor heater circuit upstream of catalytic converter, bank 2

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Engine running, with:
  - **Oxygen sensor heater** downstream of catalytic converter active > 180 second(s)
  - Lambda control active
- None of the following faults stored: P0050, P0051, P0052

Possible fault causes

♦ Contact resistance (power supply or activation)

♦ Shunt (high resistance) in heater circuit ⇒ Signal line

♦ Oxygen sensor downstream of catalytic converter, bank 2 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor downstream of catalytic converter, bank 2

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Drive > 2 minute(s) with:
  - Engine at operating temperature
  - Mass air flow > 10 kg/h
- then idling > 30 second(s)

Possible fault causes

♦ Loose contact or corrosion on connectors or lines

♦ Short circuit to B+/ground or open circuit in the line

♦ Oxygen sensor downstream of catalytic converter, bank 2 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor downstream of catalytic converter, bank 2

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Drive > 2 minute(s) with:
  - Engine at operating temperature
  - Mass air flow > 10 kg/h
- then idling > 30 second(s)

Possible fault causes

♦ Loose contact or corrosion on connectors or lines

♦ Short circuit to B+/ground or open circuit in the line

♦ Oxygen sensor downstream of catalytic converter, bank 2 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor downstream of catalytic converter, bank 2

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Drive > 2 minute(s) with:
  - Engine at operating temperature
  - Mass air flow > 10 kg/h
- then idling > 30 second(s)

Possible fault causes

♦ Loose contact or corrosion on connectors or lines

♦ Short circuit to B+/ground or open circuit in the line

♦ Oxygen sensor downstream of catalytic converter, bank 2 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor heater circuit downstream of catalytic converter, bank 2

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Engine running, with:
  - **Oxygen sensor heater** downstream of catalytic converter active > 180 second(s)
  - Lambda control active
- None of the following faults stored: P0056, P0057, P0058

Possible fault causes

♦ Contact resistance (power supply or activation)

♦ Shunt (high resistance) in heater circuit ⇒ Signal line

♦ Oxygen sensor downstream of catalytic converter, bank 2 faulty

Diagnostic information - DME (DFI) control unit

Lambda control adaptation, bank 1: system too lean

Diagnostic conditions
- Short test

or
- Lambda control active
- Lambda control adapted
- Engine temperature > 60 °C (140 °F)
- Intake air temperature < 80 °C (176 °F)
- Engine running > 45 second(s), at:
  - Engine speed < 800 rpm
- then drive with different operating conditions in the lower and upper load ranges with valve lift switchover from small lift to large lift (A220).

Possible fault causes
- ♦ Leak in exhaust system (engine ⇒ oxygen sensor upstream of catalytic converter)
- ♦ Exhaust system constricted/blocked
- ♦ Fuel injector faulty (mechanical fault)
- ♦ Timing set incorrectly
- ♦ Fault in areas: fuel high pressure, intake manifold pressure sensor, throttle valve adjusting unit, ambient pressure sensor, Intake air temperature sensor, rpm sensor, valve lift control, camshaft adjustment

Fault setting condition(s)
- The diagnostic function should indicate a deviation of more than 20% (2.3 mg/stroke in the range near idle) of the lambda control adaptation + 30% deviation of the lambda controller for longer than 30 seconds.
  (positive deviation ⇒ enrichment)

ⓘ INFORMATION
Opposed adaptation values in connection with misfires indicate that the timing is out of adjustment.

Diagnostic information - DME (DFI) control unit

Lambda control adaptation, bank 1: system too rich

Diagnostic conditions
- Short test

or
- Lambda control active
- Lambda control adapted
- Engine temperature > 60 °C (140 °F)
- Intake air temperature < 80 °C (176 °F)
- Engine running > 45 second(s), at:
  - Engine speed < 800 rpm
- then drive with different operating conditions in the lower and upper load ranges with valve lift switchover from small lift to large lift (A220).

Possible fault causes
- ♦ High fuel content in engine oil.
- ♦ Leak in exhaust system (engine ⇒ oxygen sensor upstream of catalytic converter)
- ♦ Fuel injector faulty (mechanical fault)
- ♦ Timing set incorrectly
- ♦ Fault in areas: fuel high pressure, intake manifold pressure sensor, throttle valve adjusting unit, ambient pressure sensor, Intake air temperature sensor, rpm sensor, valve lift control, camshaft adjustment

Fault setting condition(s)
- The diagnostic function should indicate a deviation of more than 20% (2.3 mg/stroke in the range near idle) of the lambda control adaptation + 30% deviation of the lambda controller for longer than 30 seconds.
  (negative deviation ⇒ leaning)

ⓘ INFORMATION
Opposed adaptation values in connection with misfires indicate that the timing is out of adjustment.

P0174

Diagnostic information - DME (DFI) control unit

Lambda control adaptation, bank 2: system too lean

Diagnostic conditions
- Short test

or
- Lambda control active
- Lambda control adapted
- Engine temperature > 60 °C (140 °F)
- Intake air temperature < 80 °C (176 °F)
- Engine running > 45 second(s), at:
  - Engine speed < 800 rpm
- then drive with different operating conditions in the lower and upper load ranges with valve lift switchover from small lift to large lift (A220).

Possible fault causes
- Leak in exhaust system (engine ⇒ oxygen sensor upstream of catalytic converter)
- Exhaust system constricted/blocked
- Fuel injector faulty (mechanical fault)
- Timing set incorrectly
- Fault in areas: fuel high pressure, intake manifold pressure sensor, throttle valve adjusting unit, ambient pressure sensor, Intake air temperature sensor, rpm sensor, valve lift control, camshaft adjustment

Fault setting condition(s)
- The diagnostic function should indicate a deviation of more than 20% (2.3 mg/stroke in the range near idle) of the lambda control adaptation + 30% deviation of the lambda controller for longer than 30 seconds.
  (positive deviation ⇒ enrichment)

ⓘ INFORMATION
Opposed adaptation values in connection with misfires indicate that the timing is out of adjustment.

P0175

Diagnostic information - DME (DFI) control unit

Lambda control adaptation, bank 2: system too rich

Diagnostic conditions
- Short test

or
- Lambda control active
- Lambda control adapted
- Engine temperature > 60 °C (140 °F)
- Intake air temperature < 80 °C (176 °F)
- Engine running > 45 second(s), at:
  - Engine speed < 800 rpm
- then drive with different operating conditions in the lower and upper load ranges with valve lift switchover from small lift to large lift (A220).

Possible fault causes
- ♦ High fuel content in engine oil.
- ♦ Leak in exhaust system (engine ⇒ oxygen sensor upstream of catalytic converter)
- ♦ Fuel injector faulty (mechanical fault)
- ♦ Timing set incorrectly
- ♦ Fault in areas: fuel high pressure, intake manifold pressure sensor, throttle valve adjusting unit, ambient pressure sensor, Intake air temperature sensor, rpm sensor, valve lift control, camshaft adjustment

Fault setting condition(s)
- The diagnostic function should indicate a deviation of more than 20% (2.3 mg/stroke in the range near idle) of the lambda control adaptation + 30% deviation of the lambda controller for longer than 30 seconds.
  (negative deviation ⇒ leaning)

ⓘ INFORMATION
Opposed adaptation values in connection with misfires indicate that the timing is out of adjustment.

Diagnostic information - DME (DFI) control unit

Fuel high-pressure sensor

Diagnostic conditions
- Time since engine start > 5 second(s)

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Fuel high-pressure sensor faulty

ⓘ INFORMATION
► See also the following Technical Information:
2409 - Fault code P0190 entered in DME control unit - pressure sensor plug available individually (103/13)

Diagnostic information - DME (DFI) control unit

Fuel high-pressure sensor

Diagnostic conditions
- Time since engine start > 5 second(s)

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Fuel high-pressure sensor faulty

ⓘ INFORMATION
► See also the following Technical Information:
2409 - Fault code P0190 entered in DME control unit - pressure sensor plug available individually (103/13)

Diagnostic information - DME (DFI) control unit

Oil temperature stuck (stuck low)

Diagnostic conditions
- Time since engine start > 10 second(s)
- Coolant temperature > 50 °C (122 °F) for > 60 second(s)
- None of the following faults stored: Coolant temperature or oil temperature sensor

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit between lines
- ♦ Oil cooler damaged or blocked
- ♦ Oil temperature sensor faulty

Fault setting condition(s)
- Oil temperature < -10 °C (14 °F), with:
  - Coolant temperature > 50 °C (122 °F) for > 60 second(s)

Diagnostic information - DME (DFI) control unit

Oil temperature sensor

Diagnostic conditions
- Time since engine start > 5 minute(s)
- Coolant temperature -15 ... 115 °C (5 ... 239 °F)
- Oil temperature -39 ... 149 °C (-38 ... 300 °F)

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to ground or open circuit in the lines
- ♦ Oil temperature sensor faulty

Fault setting condition(s)

♦ **P0197:**
- Oil temperature (measured value) < -39 °C (-38 °F), with:
  - Engine running > 300 second(s)

or
- Ignition on or engine running

  and
- Coolant temperature > -15 °C (5 °F)

♦ **P0198:**
- Oil temperature (measured value) > 149 °C (300 °F), with:
  - Ignition on or engine running

  and
  - Coolant temperature < 115 °C (239 °F)

Diagnostic information - DME (DFI) control unit

Oil temperature sensor

Diagnostic conditions
- Time since engine start > 5 minute(s)
- Coolant temperature -15 ... 115 °C (5 ... 239 °F)
- Oil temperature -39 ... 149 °C (-38 ... 300 °F)

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to ground or open circuit in the lines
- Oil temperature sensor faulty

Fault setting condition(s)

♦ P0197:
- Oil temperature (measured value) < -39 °C (-38 °F), with:
  - Engine running > 300 second(s)

or
- Ignition on or engine running

  and
  - Coolant temperature > -15 °C (5 °F)

♦ P0198:
- Oil temperature (measured value) > 149 °C (300 °F), with:
  - Ignition on or engine running

  and
  - Coolant temperature < 115 °C (239 °F)

Diagnostic information - DME (DFI) control unit

Oil temperature sensor

Diagnostic conditions
- Time since engine start > 5 minute(s)
- Coolant temperature -15 ... 115 °C (5 ... 239 °F)
- Oil temperature -39 ... 149 °C (-38 ... 300 °F)

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to ground or open circuit in the lines
- Oil temperature sensor faulty

Fault setting condition(s)

♦ P0197:
- Oil temperature (measured value) < -39 °C (-38 °F), with:
  - Engine running > 300 second(s)

or
- Ignition on or engine running

  and
  - Coolant temperature > -15 °C (5 °F)

♦ P0198:
- Oil temperature (measured value) > 149 °C (300 °F), with:
  - Ignition on or engine running

  and
  - Coolant temperature < 115 °C (239 °F)

P0201

Diagnostic information - DME (DFI) control unit

Fuel injector, cylinder 1

Diagnostic conditions
- Engine running

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Cylinder 1 fuel injector faulty

P0202

Diagnostic information - DME (DFI) control unit

Fuel injector, cylinder 2

Diagnostic conditions
- Engine running

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Cylinder 2 fuel injector faulty

P0203

Diagnostic information - DME (DFI) control unit

Fuel injector, cylinder 3

Diagnostic conditions
- Engine running

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Cylinder 3 fuel injector faulty

P0204

Diagnostic information - DME (DFI) control unit

Fuel injector, cylinder 4

Diagnostic conditions
- Engine running

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Cylinder 4 fuel injector faulty

P0205

Diagnostic information - DME (DFI) control unit

Fuel injector, cylinder 5

Diagnostic conditions
- Engine running

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Cylinder 5 fuel injector faulty

P0206

Diagnostic information - DME (DFI) control unit

Fuel injector, cylinder 6

Diagnostic conditions
- Engine running

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Cylinder 6 fuel injector faulty

Diagnostic information - DME (DFI) control unit

Accelerator pedal potentiometer 2

Diagnostic conditions
- Ignition on > 3 second(s)
- then accelerator pedal pressed down fully > 3 second(s)
- then release accelerator pedal fully
- then idling > 10 second(s)

Possible fault causes
- ♦ Short circuit to B+/ground/between lines or open circuit in wiring to potentiometer 2
- ♦ Accelerator pedal potentiometer 2 faulty

Fault effects
- ♦ The accelerator pedal angle is calculated from the remaining potentiometer signal.
- ♦ No acceleration initially + increased idle speed (approx. 800 rpm)
  - ▶ until the accelerator pedal is released fully.
  - ♦ Then acceleration, with
    - ♦ significantly reduced engine torque (max. approx.100 ... 180 Nm)
    - ♦ and limited engine speed (max. approx. 5,000 rpm)
  - ♦ If the accelerator and brake are pressed at the same time, the engine will run at idle speed.

Diagnostic information - DME (DFI) control unit

Accelerator pedal potentiometer 2

Diagnostic conditions
- Ignition on > 3 second(s)
- then accelerator pedal pressed down fully > 3 second(s)
- then release accelerator pedal fully
- then idling > 10 second(s)

Possible fault causes
- ♦ Short circuit to B+/ground/between lines or open circuit in wiring to potentiometer 2
- ♦ Accelerator pedal potentiometer 2 faulty

Fault effects
- ♦ The accelerator pedal angle is calculated from the remaining potentiometer signal.
- ♦ No acceleration initially + increased idle speed (approx. 800 rpm)
  - ▶ until the accelerator pedal is released fully.
  - ♦ Then acceleration, with
    - ♦ significantly reduced engine torque (max. approx.100 ... 180 Nm)
    - ♦ and limited engine speed (max. approx. 5,000 rpm)
  - ♦ If the accelerator and brake are pressed at the same time, the engine will run at idle speed.

Diagnostic information - DME control unit

Boost pressure control limit exceeded

ⓘ INFORMATION

The boost pressure is judged to be too large and reduced through the boost-pressure control. The fault is detected if the boost pressure control system cannot adjust the boost pressure correctly within the control limits.

Diagnostic conditions

- Full-load acceleration

Possible fault causes

- ♦ Boost pressure adjuster fails to adjust (sufficiently)
- ♦ Wrong value from boost pressure sensor on DME control unit
- ♦ Diverter valve does not open (sufficiently)

Fault effects

- ♦ Boost pressure control switched off (boost pressure low)
- ♦ Reduced engine torque

Diagnostic information - DME (DFI) control unit

Boost pressure sensor (pressure sensor ahead of throttle valve) implausible

Diagnostic conditions
● Ignition on > 10 second(s)
● then: Acceleration with wide-open throttle for as long as possible, immediately followed by an overrun phase lasting as long as possible
● None of the following faults stored: P0237, P0238, P0107, P0108, P2228, P2229, P1183, P1184, P1187, P1188, P1189, P1190

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Ground supply faulty
♦ Boost pressure sensor faulty

Fault effects
♦ Substitute value from model

Diagnostic information - DME (DFI) control unit

Boost pressure sensor (pressure sensor ahead of throttle valve): electrical fault

Diagnostic conditions
- Ignition on or engine running
- None of the following faults stored: P0234

Possible fault causes
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Ground supply faulty
- ♦ Boost pressure sensor faulty

Fault effects
- ♦ Substitute value from model

Diagnostic information - DME (DFI) control unit

Boost pressure sensor (pressure sensor ahead of throttle valve): electrical fault

Diagnostic conditions
- Ignition on or engine running
- None of the following faults stored: P0234

Possible fault causes
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Ground supply faulty
- ♦ Boost pressure sensor faulty

Fault effects
- ♦ Substitute value from model

P025A

Diagnostic information - DME (DFI) control unit

Fuel pump control unit: activation
- Only for rear-wheel drive vehicles

Diagnostic conditions
- Engine start (electric fuel pump activated)

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Open circuit in control line for DME (DFI) control unit ⇒ Fuel pump control unit
- ♦ Faulty power supply or ground supply for fuel pump control unit
- ♦ Fuel pump control unit faulty

- **After work carried out previously:**
  - ♦ Connectors interchanged (fuel pump control unit ◄► electric fuel pump)

ⓘ The connector with 2 cables must be connected to the fuel pump flange, while the connector with 5 cables must be connected to the fuel pump control unit!

P025A

Diagnostic information - DME (DFI) control unit

Fuel pump control unit: activation
- Only for all-wheel drive vehicles

Diagnostic conditions
- Engine start (electric fuel pump activated)

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Open circuit in control line for DME (DFI) control unit ⇒ Fuel pump control unit
- Faulty power supply or ground supply for fuel pump control unit
- Fuel pump control unit faulty

P025C

Diagnostic information - DME (DFI) control unit

Fuel pump control unit: activation
- Only for all-wheel drive vehicles

Diagnostic conditions
- Engine start (electric fuel pump activated)

Possible fault causes
- ♦ Short circuit to B+ in control line for DME (DFI) control unit ⇒ Fuel pump control unit
- ♦ Short circuit to ground in control line for DME (DFI) control unit ⇒ Fuel pump control unit
- ♦ Fuel pump control unit faulty

Diagnostic information - DME (DFI) control unit

Fuel pump control unit: activation
- Only for rear-wheel drive vehicles

Diagnostic conditions
- Engine start (electric fuel pump activated)

Possible fault causes
- ♦ Fault in electric fuel pump area (See ⓘ)
- ♦ Short circuit to ground in control line for DME (DFI) control unit ⇒ Fuel pump control unit
- ♦ Fuel pump control unit faulty

ⓘ INFORMATION
♦ If the fuel pump control unit detects an external or internal fault, it connects the control line to ground for a certain time.
♦ This short circuit to ground is recognized as the fault type >>Below limit value<<, just like an actual short circuit to ground in the control line.

P025D

Diagnostic information - DME (DFI) control unit

Fuel pump control unit: activation
- Only for rear-wheel drive vehicles

Diagnostic conditions
- Engine start (electric fuel pump activated)

Possible fault causes
- ♦ Short circuit to B+ in control line for DME (DFI) control unit ⇒ Fuel pump control unit
- ♦ Fuel pump control unit faulty

P025D

Diagnostic information - DME (DFI) control unit

Fuel pump control unit: activation
- Only for all-wheel drive vehicles

Diagnostic conditions
- Engine start (electric fuel pump activated)

Possible fault causes
- Short circuit to B+ in control line for DME (DFI) control unit ⇒ Fuel pump control unit
- Short circuit to ground in control line for DME (DFI) control unit ⇒ Fuel pump control unit
- Fuel pump control unit faulty

P0261

Diagnostic information - DME (DFI) control unit

Fuel injector, cylinder 1

Diagnostic conditions
- Engine running

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Cylinder 1 fuel injector faulty

P0262

Diagnostic information - DME (DFI) control unit

Fuel injector, cylinder 1

Diagnostic conditions
- Engine running

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Cylinder 1 fuel injector faulty

P0264

Diagnostic information - DME (DFI) control unit

Fuel injector, cylinder 2

Diagnostic conditions
- Engine running

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Cylinder 2 fuel injector faulty

P0265

Diagnostic information - DME (DFI) control unit

Fuel injector, cylinder 2

Diagnostic conditions
- Engine running

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Cylinder 2 fuel injector faulty

P0267

Diagnostic information - DME (DFI) control unit

Fuel injector, cylinder 3

Diagnostic conditions
- Engine running

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Cylinder 3 fuel injector faulty

P0268

Diagnostic information - DME (DFI) control unit

Fuel injector, cylinder 3

Diagnostic conditions
- Engine running

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Cylinder 3 fuel injector faulty

P0270

Diagnostic information - DME (DFI) control unit

Fuel injector, cylinder 4

Diagnostic conditions
- Engine running

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Cylinder 4 fuel injector faulty

P0271

Diagnostic information - DME (DFI) control unit

Fuel injector, cylinder 4

Diagnostic conditions
- Engine running

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Cylinder 4 fuel injector faulty

P0273

Diagnostic information - DME (DFI) control unit

Fuel injector, cylinder 5

Diagnostic conditions
- Engine running

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Cylinder 5 fuel injector faulty

P0274

Diagnostic information - DME (DFI) control unit

Fuel injector, cylinder 5

Diagnostic conditions
- Engine running

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Cylinder 5 fuel injector faulty

P0276

Diagnostic information - DME (DFI) control unit

Fuel injector, cylinder 6

Diagnostic conditions
- Engine running

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Cylinder 6 fuel injector faulty

P0277

Diagnostic information - DME (DFI) control unit

Fuel injector, cylinder 6

Diagnostic conditions
- Engine running

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Cylinder 6 fuel injector faulty

P0298

Diagnostic information - DME (DFI) control unit

Oil temperature implausibly high

Diagnostic conditions
- Time since ignition off > 8 hours, then:
  - Drive > 25 km/h (16 mph) > 45 s within the first 6 minutes after engine start
  - NO drop in temperatures (e.g. due to drive from a garage into a cooler environment)

Possible fault causes
♦ Short circuit to B+/ground/between lines or open circuit in the lines
♦ Engine oil temperature sensor faulty

Fault setting condition(s)
- The temperature measured by the engine oil temperature sensor (T030) deviates too much from the mean value of the engine, engine oil, intake air and ambient air (T160) temperatures.
  (See ⓘ)

Fault effects
♦ Substitute value from model

ⓘ INFORMATION

Step 1
♦ When the engine is started after the ignition has been switched off for more than 8 hours, the engine coolant, engine oil, intake air and ambient air temperatures are compared with each other.
♦ They may deviate from the calculated mean value (T160) by only a certain amount (depending on the switch-off time).
♦ A suspected fault is set if the deviation is too large. However, the fault must still be confirmed in the second step.

Step 2
♦ Within the first six minutes after ignition on, a check is performed to determine whether the following conditions were met:
- Drive > 25 km/h (16 mph) for longer than 45 seconds in total
- None of the four temperatures decreased too much (e.g. due to drive from a garage into a cooler environment)

♦ If all conditions were met, the fault is entered in the fault memory.
♦ If one of the conditions was NOT met, the diagnostic result is rejected and NO fault is entered in the fault memory.
♦ If the vehicle is NOT driven within 6 minutes after starting and the aforementioned conditions are met, the suspected fault is rejected and NO fault is entered in the fault memory.

Diagnostic information - DME control unit

Boost pressure control deviation

ⓘ INFORMATION

The boost pressure is judged to be too low and is increased through boost pressure control. The fault is detected if the boost pressure control system cannot adjust the boost pressure correctly within the control limits.

Diagnostic conditions

- Ambient pressure > 700 mbar (hPa) (below approx. 3,000 m (9,842 ft.) above sea level)
- Full-load acceleration

Possible fault causes

♦ Charge-air cooler or charge-air line(s) (on pressure side) between turbocharger and engine leaking
♦ Charge-air cooler or charge-air line(s) (on pressure side) between turbocharger and engine constricted/blocked
♦ Diverter valve does not close (sufficiently)
♦ Wrong value from boost pressure sensor on DME control unit
♦ Boost pressure adjuster fails to adjust (sufficiently)
♦ 1 turbocharger blocked/faulty

Fault effects

♦ Boost pressure control switched off (boost pressure low)
♦ Reduced engine torque

Diagnostic information - DME (DFI) control unit

Misfiring

Diagnostic conditions
- Engine temperature > -20 °C (-4 °F)
- Idle speed up to the red range on the tachometer
- No overrun phase(s)
- None of the following faults stored: P0335, P0336, P0371, P0373

Possible fault causes

♦ Affected by block heater

♦ Loose contact or corrosion on connectors or lines
♦ Power supply or ground supply faulty

♦ Spark plug(s) oily due to oil entrainment in the cylinder
♦ Wrong spark plug(s)
♦ Mechanical or electrical fault in spark plug(s)
♦ Bar ignition module faulty
♦ Power supply or ground supply faulty

♦ Wrong fuel quality
♦ Fuel tank empty
♦ Water in fuel tank
♦ Fuel line dirty/blocked
♦ Mechanical fault in electric fuel pump
♦ Mechanical fault in fuel high-pressure pump

♦ Fuel injector faulty or borderline
(opens too late/not long enough/not enough or leaking)
♦ Oxygen sensor(s) faulty

♦ Exhaust flap faulty
♦ Exhaust system constricted/blocked
♦ Catalytic converter faulty

♦ Leak in intake-air distributor
♦ Foreign bodies in intake-air distributor
♦ Camshaft adjustment fault
♦ Wrong timing - exhaust camshaft
♦ Valve lift control fault
♦ Valve lifter faulty
(Intake valve has not switched to the other lift or has not switched quickly enough)
♦ Mechanical fault in valve drive
♦ Insufficient compression
(e.g. cylinder liner damaged, valve seat ring faulty, ...)

Fault setting condition(s) (See ⓘ)
● The diagnostic function detects uneven running for the specified cylinder.
● Uneven running is calculated from the expected and actual crankshaft acceleration due to combustion.
● Uneven running is interpreted as a misfire or valve lift fault, depending on type.

ⓘ INFORMATION

♦ It is possible that only one cylinder (or the cylinders of one bank) has/have exceeded the uneven running threshold for a fault entry.
♦ Other cylinders may be just below the level which would result in a fault entry.
♦ See Actual values M005 to M060

P0301

Diagnostic information - DME (DFI) control unit

Misfiring

Diagnostic conditions
- Engine temperature > -20 °C (-4 °F)
- Idle speed up to the red range on the tachometer
- No overrun phase(s)
- None of the following faults stored: P0335, P0336, P0371, P0373

Possible fault causes

♦ Affected by block heater

♦ Loose contact or corrosion on connectors or lines
♦ Power supply or ground supply faulty

♦ Spark plug(s) oily due to oil entrainment in the cylinder
♦ Wrong spark plug(s)
♦ Mechanical or electrical fault in spark plug(s)
♦ Bar ignition module faulty
♦ Power supply or ground supply faulty

♦ Wrong fuel quality
♦ Fuel tank empty
♦ Water in fuel tank
♦ Fuel line dirty/blocked
♦ Mechanical fault in electric fuel pump
♦ Mechanical fault in fuel high-pressure pump

♦ Fuel injector faulty or borderline
(opens too late/not long enough/not enough or leaking)
♦ Oxygen sensor(s) faulty

♦ Exhaust flap faulty
♦ Exhaust system constricted/blocked
♦ Catalytic converter faulty

♦ Leak in intake-air distributor
♦ Foreign bodies in intake-air distributor
♦ Camshaft adjustment fault
♦ Wrong timing - exhaust camshaft
♦ Valve lift control fault
♦ Valve lifter faulty
(Intake valve has not switched to the other lift or has not switched quickly enough)
♦ Mechanical fault in valve drive
♦ Insufficient compression
(e.g. cylinder liner damaged, valve seat ring faulty, ...)

Fault setting condition(s) (See ⓘ)
● The diagnostic function detects uneven running for the specified cylinder.
● Uneven running is calculated from the expected and actual crankshaft acceleration due to combustion.
● Uneven running is interpreted as a misfire or valve lift fault, depending on type.

ⓘ INFORMATION

♦ It is possible that only one cylinder (or the cylinders of one bank) has/have exceeded the uneven running threshold for a fault entry.
♦ Other cylinders may be just below the level which would result in a fault entry.
♦ See Actual values M005 to M060

P0302

Diagnostic information - DME (DFI) control unit

Misfiring

Diagnostic conditions
- Engine temperature > -20 °C (-4 °F)
- Idle speed up to the red range on the tachometer
- No overrun phase(s)
- None of the following faults stored: P0335, P0336, P0371, P0373

Possible fault causes

♦ Affected by block heater

♦ Loose contact or corrosion on connectors or lines
♦ Power supply or ground supply faulty

♦ Spark plug(s) oily due to oil entrainment in the cylinder
♦ Wrong spark plug(s)
♦ Mechanical or electrical fault in spark plug(s)
♦ Bar ignition module faulty
♦ Power supply or ground supply faulty

♦ Wrong fuel quality
♦ Fuel tank empty
♦ Water in fuel tank
♦ Fuel line dirty/blocked
♦ Mechanical fault in electric fuel pump
♦ Mechanical fault in fuel high-pressure pump

♦ Fuel injector faulty or borderline
(opens too late/not long enough/not enough or leaking)
♦ Oxygen sensor(s) faulty

♦ Exhaust flap faulty
♦ Exhaust system constricted/blocked
♦ Catalytic converter faulty

♦ Leak in intake-air distributor
♦ Foreign bodies in intake-air distributor
♦ Camshaft adjustment fault
♦ Wrong timing - exhaust camshaft
♦ Valve lift control fault
♦ Valve lifter faulty
(Intake valve has not switched to the other lift or has not switched quickly enough)
♦ Mechanical fault in valve drive
♦ Insufficient compression
(e.g. cylinder liner damaged, valve seat ring faulty, ...)

Fault setting condition(s) (See ⓘ)
● The diagnostic function detects uneven running for the specified cylinder.
● Uneven running is calculated from the expected and actual crankshaft acceleration due to combustion.
● Uneven running is interpreted as a misfire or valve lift fault, depending on type.

ⓘ INFORMATION
♦ It is possible that only one cylinder (or the cylinders of one bank) has/have exceeded the uneven running threshold for a fault entry.
♦ Other cylinders may be just below the level which would result in a fault entry.
♦ See Actual values M005 to M060

P0303

Diagnostic information - DME (DFI) control unit

Misfiring

Diagnostic conditions
- Engine temperature > -20 °C (-4 °F)
- Idle speed up to the red range on the tachometer
- No overrun phase(s)
- None of the following faults stored: P0335, P0336, P0371, P0373

Possible fault causes

♦ Affected by block heater

♦ Loose contact or corrosion on connectors or lines
♦ Power supply or ground supply faulty

♦ Spark plug(s) oily due to oil entrainment in the cylinder
♦ Wrong spark plug(s)
♦ Mechanical or electrical fault in spark plug(s)
♦ Bar ignition module faulty
♦ Power supply or ground supply faulty

♦ Wrong fuel quality
♦ Fuel tank empty
♦ Water in fuel tank
♦ Fuel line dirty/blocked
♦ Mechanical fault in electric fuel pump
♦ Mechanical fault in fuel high-pressure pump

♦ Fuel injector faulty or borderline
(opens too late/not long enough/not enough or leaking)
♦ Oxygen sensor(s) faulty

♦ Exhaust flap faulty
♦ Exhaust system constricted/blocked
♦ Catalytic converter faulty

♦ Leak in intake-air distributor
♦ Foreign bodies in intake-air distributor
♦ Camshaft adjustment fault
♦ Wrong timing - exhaust camshaft
♦ Valve lift control fault
♦ Valve lifter faulty
(Intake valve has not switched to the other lift or has not switched quickly enough)
♦ Mechanical fault in valve drive
♦ Insufficient compression
(e.g. cylinder liner damaged, valve seat ring faulty, ...)

Fault setting condition(s) (See ⓘ)
● The diagnostic function detects uneven running for the specified cylinder.
● Uneven running is calculated from the expected and actual crankshaft acceleration due to combustion.
● Uneven running is interpreted as a misfire or valve lift fault, depending on type.

ⓘ INFORMATION

♦ It is possible that only one cylinder (or the cylinders of one bank) has/have exceeded the uneven running threshold for a fault entry.
♦ Other cylinders may be just below the level which would result in a fault entry.
♦ See Actual values M005 to M060

P0304

Diagnostic information - DME (DFI) control unit

Misfiring

Diagnostic conditions
- Engine temperature > -20 °C (-4 °F)
- Idle speed up to the red range on the tachometer
- No overrun phase(s)
- None of the following faults stored: P0335, P0336, P0371, P0373

Possible fault causes

♦ Affected by block heater

♦ Loose contact or corrosion on connectors or lines
♦ Power supply or ground supply faulty

♦ Spark plug(s) oily due to oil entrainment in the cylinder
♦ Wrong spark plug(s)
♦ Mechanical or electrical fault in spark plug(s)
♦ Bar ignition module faulty
♦ Power supply or ground supply faulty

♦ Wrong fuel quality
♦ Fuel tank empty
♦ Water in fuel tank
♦ Fuel line dirty/blocked
♦ Mechanical fault in electric fuel pump
♦ Mechanical fault in fuel high-pressure pump

♦ Fuel injector faulty or borderline
(opens too late/not long enough/not enough or leaking)
♦ Oxygen sensor(s) faulty

♦ Exhaust flap faulty
♦ Exhaust system constricted/blocked
♦ Catalytic converter faulty

♦ Leak in intake-air distributor
♦ Foreign bodies in intake-air distributor
♦ Camshaft adjustment fault
♦ Wrong timing - exhaust camshaft
♦ Valve lift control fault
♦ Valve lifter faulty
(Intake valve has not switched to the other lift or has not switched quickly enough)
♦ Mechanical fault in valve drive
♦ Insufficient compression
(e.g. cylinder liner damaged, valve seat ring faulty, ...)

Fault setting condition(s) (See ⓘ)
● The diagnostic function detects uneven running for the specified cylinder.
● Uneven running is calculated from the expected and actual crankshaft acceleration due to combustion.
● Uneven running is interpreted as a misfire or valve lift fault, depending on type.

ⓘ INFORMATION
♦ It is possible that only one cylinder (or the cylinders of one bank) has/have exceeded the uneven running threshold for a fault entry.
♦ Other cylinders may be just below the level which would result in a fault entry.
♦ See Actual values M005 to M060

P0305

Diagnostic information - DME (DFI) control unit

Misfiring

Diagnostic conditions
- Engine temperature > -20 °C (-4 °F)
- Idle speed up to the red range on the tachometer
- No overrun phase(s)
- None of the following faults stored: P0335, P0336, P0371, P0373

Possible fault causes

♦ Affected by block heater

♦ Loose contact or corrosion on connectors or lines
♦ Power supply or ground supply faulty

♦ Spark plug(s) oily due to oil entrainment in the cylinder
♦ Wrong spark plug(s)
♦ Mechanical or electrical fault in spark plug(s)
♦ Bar ignition module faulty
♦ Power supply or ground supply faulty

♦ Wrong fuel quality
♦ Fuel tank empty
♦ Water in fuel tank
♦ Fuel line dirty/blocked
♦ Mechanical fault in electric fuel pump
♦ Mechanical fault in fuel high-pressure pump

♦ Fuel injector faulty or borderline
(opens too late/not long enough/not enough or leaking)
♦ Oxygen sensor(s) faulty

♦ Exhaust flap faulty
♦ Exhaust system constricted/blocked
♦ Catalytic converter faulty

♦ Leak in intake-air distributor
♦ Foreign bodies in intake-air distributor
♦ Camshaft adjustment fault
♦ Wrong timing - exhaust camshaft
♦ Valve lift control fault
♦ Valve lifter faulty
(Intake valve has not switched to the other lift or has not switched quickly enough)
♦ Mechanical fault in valve drive
♦ Insufficient compression
(e.g. cylinder liner damaged, valve seat ring faulty, ...)

Fault setting condition(s) (See ⓘ)
● The diagnostic function detects uneven running for the specified cylinder.
● Uneven running is calculated from the expected and actual crankshaft acceleration due to combustion.
● Uneven running is interpreted as a misfire or valve lift fault, depending on type.

ⓘ INFORMATION

♦ It is possible that only one cylinder (or the cylinders of one bank) has/have exceeded the uneven running threshold for a fault entry.
♦ Other cylinders may be just below the level which would result in a fault entry.
♦ See Actual values M005 to M060

Diagnostic information - DME (DFI) control unit

Misfiring

Diagnostic conditions
- Engine temperature > -20 °C (-4 °F)
- Idle speed up to the red range on the tachometer
- No overrun phase(s)
- None of the following faults stored: P0335, P0336, P0371, P0373

Possible fault causes

♦ Affected by block heater

♦ Loose contact or corrosion on connectors or lines
♦ Power supply or ground supply faulty

♦ Spark plug(s) oily due to oil entrainment in the cylinder
♦ Wrong spark plug(s)
♦ Mechanical or electrical fault in spark plug(s)
♦ Bar ignition module faulty
♦ Power supply or ground supply faulty

♦ Wrong fuel quality
♦ Fuel tank empty
♦ Water in fuel tank
♦ Fuel line dirty/blocked
♦ Mechanical fault in electric fuel pump
♦ Mechanical fault in fuel high-pressure pump

♦ Fuel injector faulty or borderline
(opens too late/not long enough/not enough or leaking)
♦ Oxygen sensor(s) faulty

♦ Exhaust flap faulty
♦ Exhaust system constricted/blocked
♦ Catalytic converter faulty

♦ Leak in intake-air distributor
♦ Foreign bodies in intake-air distributor
♦ Camshaft adjustment fault
♦ Wrong timing - exhaust camshaft
♦ Valve lift control fault
♦ Valve lifter faulty
(Intake valve has not switched to the other lift or has not switched quickly enough)
♦ Mechanical fault in valve drive
♦ Insufficient compression
(e.g. cylinder liner damaged, valve seat ring faulty, ...)

Fault setting condition(s) (See ⓘ)
● The diagnostic function detects uneven running for the specified cylinder.
● Uneven running is calculated from the expected and actual crankshaft acceleration due to combustion.
● Uneven running is interpreted as a misfire or valve lift fault, depending on type.

ⓘ INFORMATION
♦ It is possible that only one cylinder (or the cylinders of one bank) has/have exceeded the uneven running threshold for a fault entry.
♦ Other cylinders may be just below the level which would result in a fault entry.
♦ See Actual values M005 to M060

Diagnostic information - DME (DFI) control unit

Knock sensor 1

Diagnostic conditions
- Short test

or
- Engine running, with:
  - Time since engine start > 10 second(s)
  - Engine temperature > 50 °C (122 °F)
  - Engine speed > 1,000 rpm
  - Different load ranges

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to ground or open circuit in the lines
- Knock sensor 1 loose
- Knock sensor 1 faulty
- Engine oil filling level significantly too high

Fault setting condition(s)
The fault is detected if the knock sensor signal does not change sufficiently, depending on the engine speed and load, and possibly also if it is too quiet (noise is less dynamic than expected).

Fault effects
- If the fault is stored, the ignition timing is retarded for all cylinders affecting this knock sensor in the >knock control active< range.
- Knock control adaptation is idle.

Diagnostic information - DME (DFI) control unit

Knock sensor 1

Diagnostic conditions
- Short test

or
- Engine running, with:
  - Time since engine start > 10 second(s)
  - Engine temperature > 50 °C (122 °F)
  - Engine speed > 1,000 rpm
  - Different load ranges

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Knock sensor 1 loose or stuck
- Knock sensor 1 faulty
- Engine oil filling level significantly too high

Fault setting condition(s)
The fault is detected if the knock sensor signal is too weak (noise is >quieter< than expected), depending on the engine speed and load.

Fault effects
- If the fault is stored, the ignition timing is retarded for all cylinders affecting this knock sensor in the >knock control active< range.
- Knock control adaptation is idle.

Diagnostic information - DME (DFI) control unit

Knock sensor 2

Diagnostic conditions
- Short test

or
- Engine running, with:
  - Time since engine start > 10 second(s)
  - Engine temperature > 50 °C (122 °F)
  - Engine speed > 1,000 rpm
  - Different load ranges

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to ground or open circuit in the lines
- Knock sensor 2 loose
- Knock sensor 2 faulty
- Engine oil filling level significantly too high

Fault setting condition(s)
The fault is detected if the knock sensor signal does not change sufficiently, depending on the engine speed and load, and possibly also if it is too quiet (noise is less dynamic than expected).

Fault effects
- If the fault is stored, the ignition timing is retarded for all cylinders affecting this knock sensor in the >knock control active< range.
- Knock control adaptation is idle.

Diagnostic information - DME (DFI) control unit

Knock sensor 2

Diagnostic conditions
- Short test

or
- Engine running, with:
  - Time since engine start > 10 second(s)
  - Engine temperature > 50 °C (122 °F)
  - Engine speed > 1,000 rpm
  - Different load ranges

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Knock sensor 2 loose or stuck
- Knock sensor 2 faulty
- Engine oil filling level significantly too high

Fault setting condition(s)
The fault is detected if the knock sensor signal is too weak (noise is >quieter< than expected), depending on the engine speed and load.

Fault effects
- If the fault is stored, the ignition timing is retarded for all cylinders affecting this knock sensor in the >knock control active< range.
- Knock control adaptation is idle.

Diagnostic information - DME (DFI) control unit

Crankshaft sensor

Diagnostic conditions
- Engine running
- PDK only:
  - then automatic engine stop and restart by the Start/Stop system

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Phase sensor wheel faulty (damaged/bent)
- Crankshaft sensor not installed or installed incorrectly
- Crankshaft sensor faulty

Fault setting condition(s)
- Signal not OK (missing or implausible)

Diagnostic information - DME (DFI) control unit

Crankshaft sensor

Diagnostic conditions
- Engine start
- then driving with overrun phase(s)
- **PDK only**:
  - then 2 x automatic engine stop initiated by Start/Stop system with automatic restart

Possible fault causes
- Starter battery flat, with low ambient temperature
- Loose contact or corrosion on connectors or lines
- Phase sensor wheel faulty (damaged/bent)
- Crankshaft sensor loose
- Crankshaft sensor not installed or installed incorrectly
- Crankshaft sensor faulty

Fault setting condition(s)
- The crankshaft sensor detects too many or not enough tooth flanks on the sensor wheel, at engine start, with engine running or overrun phases

Diagnostic information - DME (DFI) control unit

Crankshaft sensor

Diagnostic conditions
- Engine start
- then driving with overrun phase(s)
- **PDK only**:
  - then 2 x automatic engine stop initiated by Start/Stop system with automatic restart

Possible fault causes
- Starter battery flat, with low ambient temperature
- Loose contact or corrosion on connectors or lines
- Phase sensor wheel faulty (damaged/bent)
- Crankshaft sensor loose
- Crankshaft sensor not installed or installed incorrectly
- Crankshaft sensor faulty

Fault setting condition(s)
- The crankshaft sensor detects too many or not enough tooth flanks on the sensor wheel, at engine start, with engine running or overrun phases

P0341

Diagnostic information - DME (DFI) control unit

Bank 1 intake camshaft sensor

Diagnostic conditions
- Engine running

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Bank 1 intake camshaft sensor faulty
- ♦ Camshaft adjustment faulty (locking) ⇒ only for P0344

Diagnostic information - DME (DFI) control unit

Bank 1 intake camshaft sensor

Diagnostic conditions
- Engine running

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Bank 1 intake camshaft sensor faulty
- ♦ Camshaft adjustment faulty (locking) ⇒ only for P0344

Diagnostic information - DME (DFI) control unit

Bank 1 intake camshaft sensor

Diagnostic conditions
- Engine running

Possible fault causes
- ♦ Dynamic driving style when oil level is near minimum (oil foaming)
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Bank 1 intake camshaft sensor faulty
- ♦ Camshaft rotor (phase sensor wheel) severely damaged
- ♦ Chain tensioner loose/faulty
- ♦ Camshaft controller loose/faulty

P0344

Diagnostic information - DME (DFI) control unit

Bank 1 intake camshaft sensor

Diagnostic conditions
- Engine running

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Bank 1 intake camshaft sensor faulty
- ♦ Camshaft adjustment faulty (locking) ⇒ only for P0344

Diagnostic information - DME (DFI) control unit

Bank 2 intake camshaft sensor

Diagnostic conditions
- Engine running

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Bank 2 intake camshaft sensor faulty
- ♦ Camshaft adjustment faulty (locking) ⇒ only for P0349

Diagnostic information - DME (DFI) control unit

Bank 2 intake camshaft sensor

Diagnostic conditions
- Engine running

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Bank 2 intake camshaft sensor faulty
- ♦ Camshaft adjustment faulty (locking) ⇒ only for P0349

Diagnostic information - DME (DFI) control unit

Bank 2 intake camshaft sensor

Diagnostic conditions
- Engine running

Possible fault causes
- ♦ Dynamic driving style when oil level is near minimum (oil foaming)
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Bank 2 intake camshaft sensor faulty
- ♦ Camshaft rotor (phase sensor wheel) severely damaged
- ♦ Chain tensioner loose/faulty
- ♦ Camshaft controller loose/faulty

Diagnostic information - DME (DFI) control unit

Bank 2 intake camshaft sensor

Diagnostic conditions
- Engine running

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Bank 2 intake camshaft sensor faulty
- ♦ Camshaft adjustment faulty (locking) ⇒ only for P0349

Diagnostic information - DME (DFI) control unit

Power supply, bar ignition module

⚠WARNING
High voltage!
Risk of death or serious injury due to high voltage or high current!
♦ Start engine only if all the bar ignition modules have been installed and connected.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.
♦ Check ground supply.

Diagnostic conditions
- Time since engine start > 2 second(s)
- Engine temperature > -30 °C (-22 °F)

Possible fault causes
♦ Fuse faulty
♦ Short circuit to ground or open circuit in the lines (power supply)

Fault setting condition(s)
The fault is detected only if there is no voltage present at ALL bar ignition modules at contact 3.

P0351

Diagnostic information - DME (DFI) control unit

Bar ignition module on cylinder 1

⚠WARNING
High voltage !
Risk of death or serious injury due to high voltage or high current!
♦ Start engine only if all the bar ignition modules have been installed and connected.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.
♦ Check ground supply.

Diagnostic conditions
- Time since engine start > 2 second(s)
- Engine temperature > -30 °C (-22 °F)

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Short circuit to B+ or open circuit in the lines (ground supply)
♦ Short circuit to ground or open circuit in the lines (power supply)
♦ Short circuit to B+/ground or open circuit in the line (activation)
♦ Bar ignition module on cylinder 1 faulty

P0352

Diagnostic information - DME (DFI) control unit

Bar ignition module on cylinder 2

⚠WARNING
High voltage !
Risk of death or serious injury due to high voltage or high current!
♦ Start engine only if all the bar ignition modules have been installed and connected.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.
♦ Check ground supply.

Diagnostic conditions
- Time since engine start > 2 second(s)
- Engine temperature > -30 °C (-22 °F)

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Short circuit to B+ or open circuit in the lines (ground supply)
♦ Short circuit to ground or open circuit in the lines (power supply)
♦ Short circuit to B+/ground or open circuit in the line (activation)
♦ Bar ignition module on cylinder 2 faulty

P0353

Diagnostic information - DME (DFI) control unit

Bar ignition module on cylinder 3

⚠WARNING
High voltage !
Risk of death or serious injury due to high voltage or high current!
♦ Start engine only if all the bar ignition modules have been installed and connected.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.
♦ Check ground supply.

Diagnostic conditions
- Time since engine start > 2 second(s)
- Engine temperature > -30 °C (-22 °F)

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Short circuit to B+ or open circuit in the lines (ground supply)
♦ Short circuit to ground or open circuit in the lines (power supply)
♦ Short circuit to B+/ground or open circuit in the line (activation)
♦ Bar ignition module on cylinder 3 faulty

P0354

Diagnostic information - DME (DFI) control unit

Bar ignition module on cylinder 4

⚠WARNING
High voltage !
Risk of death or serious injury due to high voltage or high current!
♦ Start engine only if all the bar ignition modules have been installed and connected.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.
♦ Check ground supply.

Diagnostic conditions
- Time since engine start > 2 second(s)
- Engine temperature > -30 °C (-22 °F)

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Short circuit to B+ or open circuit in the lines (ground supply)
♦ Short circuit to ground or open circuit in the lines (power supply)
♦ Short circuit to B+/ground or open circuit in the line (activation)
♦ Bar ignition module on cylinder 4 faulty

P0355

Diagnostic information - DME (DFI) control unit

Bar ignition module on cylinder 5

⚠WARNING
High voltage !
Risk of death or serious injury due to high voltage or high current!
♦ Start engine only if all the bar ignition modules have been installed and connected.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.
♦ Check ground supply.

Diagnostic conditions
- Time since engine start > 2 second(s)
- Engine temperature > -30 °C (-22 °F)

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Short circuit to B+ or open circuit in the lines (ground supply)
♦ Short circuit to ground or open circuit in the lines (power supply)
♦ Short circuit to B+/ground or open circuit in the line (activation)
♦ Bar ignition module on cylinder 5 faulty

P0356

Diagnostic information - DME (DFI) control unit

Bar ignition module on cylinder 6

⚠WARNING
High voltage !
Risk of death or serious injury due to high voltage or high current!
♦ Start engine only if all the bar ignition modules have been installed and connected.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.
♦ Check ground supply.

Diagnostic conditions
- Time since engine start > 2 second(s)
- Engine temperature > -30 °C (-22 °F)

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Short circuit to B+ or open circuit in the lines (ground supply)
♦ Short circuit to ground or open circuit in the lines (power supply)
♦ Short circuit to B+/ground or open circuit in the line (activation)
♦ Bar ignition module on cylinder 6 faulty

Diagnostic information - DME (DFI) control unit

Crankshaft sensor

Diagnostic conditions
- Engine start
- then driving with overrun phase(s)
- then automatic engine stop and restart by the Start/Stop system

Possible fault causes
- ♦ Crankshaft sensor faulty

Fault setting condition(s)
- Implausible direction of rotation signal

Diagnostic information - DME (DFI) control unit

Crankshaft sensor

Diagnostic conditions
- Engine running
- PDK only:
  - then automatic engine stop and restart by the Start/Stop system

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Phase sensor wheel faulty (damaged/bent)
- Crankshaft sensor not installed or installed incorrectly
- Crankshaft sensor faulty

Fault setting condition(s)
- Signal not OK (missing or implausible)

Diagnostic information - DME (DFI) control unit

Crankshaft sensor

Diagnostic conditions
- Engine start
- then driving with overrun phase(s)
- **PDK only**:
  - then 2 x automatic engine stop initiated by Start/Stop system with automatic restart

Possible fault causes
- ♦ Starter battery flat, with low ambient temperature
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Phase sensor wheel faulty (damaged/bent)
- ♦ Crankshaft sensor loose
- ♦ Crankshaft sensor not installed or installed incorrectly
- ♦ Crankshaft sensor faulty

Fault setting condition(s)
- The crankshaft sensor detects too many or not enough tooth flanks on the sensor wheel, at engine start, with engine running or overrun phases

Diagnostic information - DME (DFI) control unit

Secondary-air system, bank 1 and bank 2

Diagnostic conditions
- Perform all short tests from top to bottom, up to and including secondary air.

or

- The diagnostic function starts under the following conditions:
  - Engine running, with:
    - Ambient temperature > 5 °C (41 °F)
    - Engine start temperature 5 ... 40 °C (41 … 90 °F)
    - Secondary-air injection active
  - None of the following faults stored: Oxygen sensor upstream of catalytic converter, engine coolant temperature sensor, camshaft adjustment, ambient pressure, ambient temperature
- Diagnostics is interrupted for as long as the following conditions exist:
  - Engine speed > 3,500 rpm
  - Mass air flow > 750 mg/stroke
  - Overrun phase(s)

ⓘ INFORMATION
♦ The diagnostic function ends with the end of secondary-air injection.
♦ A certain number of measurements must have taken place within diagnostics, between operational readiness of the oxygen sensors and the end of secondary-air injection.
♦ If this is not the case, diagnostics is ended without a result.

Possible fault causes
♦ Air intake duct (secondary pump) constricted/blocked
♦ Short circuit to B+/ground or open circuit in the secondary-air pump relay line (working current circuit)
♦ Secondary-air pump relay faulty
♦ Leak in secondary-air injection lines
♦ Secondary-air valve stuck/frozen
♦ Air intake duct (engine) constricted/coked
♦ Fuel/air mixture preparation not adapted
♦ Secondary air at oxygen sensor upstream of catalytic converter
♦ Catalytic converter faulty (broken)

Fault setting condition(s)
- Actual value <> setpoint lambda control deviation
  - The diagnostic function checks whether deviation of the lambda controllers is as expected upon activation.

P0418

Diagnostic information - DME (DFI) control unit

Secondary-air pump relay driver

Diagnostic conditions
- Ignition on

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in lines for secondary-air pump relay activation
- Secondary-air pump relay faulty

Diagnostic information - DME (DFI) control unit

Primary catalytic converter, bank 1 - inadequate effect

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

Diagnostic conditions

- Perform all short tests in sequence

or

- Engine temperature > 60 °C (140 °F)
- Time since engine start > 10 second(s)
- Catalytic converter temperature 540 ... 750 °C (1,004 ... 1,382 °F)
- Drive for 60 seconds with slight acceleration at 40 ... 130 km/h (24 … 80 mph)
- Active carbon filter loading < 0.7
- Engine speed < 3,000 rpm
- Lambda control ahead of catalytic converter active
- Lambda control behind catalytic converter active
- None of the following faults stored: Oxygen sensor(s) - electrical fault, intake manifold pressure sensor or throttle adjusting unit

Possible fault causes

- If an oxygen sensor fault is entered:
  ♦ Correct the cause of the oxygen sensor fault according to instructions, then perform short test as described above and check whether the catalytic converter fault is entered again

♦ Leak in exhaust system between engine and oxygen sensor downstream of catalytic converter
  ⇒ particularly with mass air flow < 250 mg/stroke
♦ Oxygen sensor upstream and downstream of catalytic converter bank 1 interchanged
♦ Oxygen sensor upstream of catalytic converter bank 1 and bank 2 interchanged
♦ Oxygen sensor downstream of catalytic converter bank 1 and bank 2 interchanged
♦ Catalytic converter bank 1 faulty

P0431

Diagnostic information - DME (DFI) control unit

Primary catalytic converter, bank 2 - inadequate effect

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

Diagnostic conditions

● Perform all short tests in sequence

or

● Engine temperature > 60 °C (140 °F)
● Time since engine start > 10 second(s)
● Catalytic converter temperature 540 ... 750 °C (1,004 ... 1,382 °F)
● Drive for 60 seconds with slight acceleration at 40 ... 130 km/h (24 … 80 mph)
● Active carbon filter loading < 0.7
● Engine speed < 3,000 rpm
● Lambda control ahead of catalytic converter active
● Lambda control behind catalytic converter active
● None of the following faults stored: Oxygen sensor(s) - electrical fault, intake manifold pressure sensor or throttle adjusting unit

Possible fault causes

● If an oxygen sensor fault is entered:
♦ Correct the cause of the oxygen sensor fault according to instructions, then perform short test as described above

♦ Leak in exhaust system between engine and oxygen sensor downstream of catalytic converter
⇒ particularly with mass air flow < 250 mg/stroke
♦ Oxygen sensor upstream and downstream of catalytic converter bank 1 interchanged
♦ Oxygen sensor upstream of catalytic converter bank 1 and bank 2 interchanged
♦ Oxygen sensor downstream of catalytic converter bank 1 and bank 2 interchanged
♦ Catalytic converter bank 2 faulty

P0441

Diagnostic information - DME (DFI) control unit

Tank vent system
- ONLY naturally aspirated engines

Diagnostic conditions
- Tank vent valve short test

or:
- Time since engine start > 2 minute(s)
- Idling > 15 second(s)
- Engine temperature > 40 °C (104 °F)
- Ambient temperature > 4 °C (39 °F)
- Ambient pressure > 730 hPa (= location below approx. 2,400 ... 2,700 m/7,874 ... 8,858 ft.) (A060)
- Vehicle speed = 0 km/h (0 mph)
- Selector-lever position P or N, or no gear engaged
- Steering wheel in center position
- Air conditioning switched off
- All loads switched off
- All oxygen sensor(s) ready for operation
- None of the following faults stored: Oxygen sensor(s), tank vent valve output stage

Possible fault causes
- ♦ Tank vent valve faulty (stuck open or closed)
- ♦ Tank vent valve not installed or installed incorrectly
- ♦ Line between active carbon filter and tank vent valve leaking/trapped/blocked
- ♦ Purge-air line between tank vent valve and intake manifold leaking/trapped/blocked

P0441

Diagnostic information - DME (DFI) control unit

Tank vent system
● 991 Turbo ONLY

Diagnostic conditions (see also ⓘ)
● Tank vent valve short test - lower partial-load range
or:
● Time since engine start > 2 minute(s)
● Idling > 15 second(s)
● Engine temperature > 40 °C (104 °F)
● Ambient temperature > 4 °C (39 °F)
● Ambient pressure > 730 hPa (= location below approx. 2,400 ... 2,700 m/7,874 ... 8,858 ft.) (A060)
● All oxygen sensor(s) ready for operation
● None of the following faults stored: Oxygen sensor(s), tank vent valve output stage
● Vehicle speed > 15 km/h (9 mph)
● The carbon canister is adequately flushed via the tank vent valve (See ⓘ).

Possible fault causes
♦ Tank vent valve faulty (stuck open or closed)
♦ Tank vent valve not installed or installed incorrectly
♦ Line between active carbon filter and tank vent valve leaking/trapped/blocked
♦ Purge-air line between tank vent valve and intake manifold leaking/trapped/blocked
♦ Purge-air line between the tank vent valve and turbocharger (venturi pump) leaks
♦ Check valve between tank vent valve and intake manifold faulty or installed backward
♦ Check valve between tank vent valve and turbocharger (venturi pump) faulty or installed backward

Fault setting condition(s)
● The fault is set if the pressure difference between the ambient pressure and the pressure in the tank vent line is too low when the tank vent valve is activated (depending on the respective engine operating point).

ⓘ INFORMATION
♦ In the lower partial-load range, this is achieved, for example, by driving:
- in 2nd gear
- at approx. 25 km/h (16 mph)
- on a route that is as level as possible
- for approx. 20 seconds
- with tank vent valve open **(L170)**

Diagnostic information - DME (DFI) control unit

Tank vent valve driver

Diagnostic conditions
- Perform tank vent valve short test

or:
- Time since engine start > 10 second(s)
- Tank vent valve activated

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+ or open circuit in the lines (power supply or tank vent valve activation)
- Tank vent valve faulty

Diagnostic information - DME (DFI) control unit

Switch in NVLD module (pneumatic part): **electrical fault**

Diagnostic conditions
- Engine running

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Open circuit in the lines:
  - ♦ NVLD evaluation unit (electronic part) ◄► NVLD module (pneumatic part)
- ♦ NVLD module (pneumatic part) faulty
- ♦ NVLD evaluation unit (electronic part) faulty

Fault setting condition(s)
- Self-diagnostics of the switch by the NVLD evaluation unit (electronic part).

ⓘ INFORMATION
♦ The switch in the NVLD module (pneumatic part) has different resistance values in the two switching states "open" and "closed".
♦ This ensures that an open circuit can be detected.

Setpoint definitions
- Tank pressure -6.0 ... -2.5+/- 0.3 hPa
  - ▶ Switch closed **approx. 0** Ω
- Tank pressure +5.0 ... -2.5+/- 0.3 hPa
  - ▶ Switch open **approx. 1.8 k**Ω

Diagnostic information - DME (DFI) control unit

Switch in NVLD module (pneumatic part) **: faulty**

Diagnostic conditions
- Engine running with and without tank purging phases
  - then , ignition off for > 1 minute

Possible fault causes
♦ NVLD module (pneumatic part) faulty

Fault setting condition(s)
- No state change of the switch (See ⓘ).

ⓘ INFORMATION
♦ The switch in the NVLD module (pneumatic part) changes from "closed" to "open" while the engine is running outside of the tank purging phases .
♦ During tank purging phases, it changes from "open" to "closed".
♦ If this did not happen, the tank vent valve is opened 100% directly after engine off and a check is performed to determine whether the switch changed its state from open to closed.

Setpoint definitions
- Tank pressure -6.0 ... -2.5+/- 0.3 hPa
  - ▶ Switch closed **approx. 0** Ω
- Tank pressure +5.0 ... -2.5+/- 0.3 hPa
  - ▶ Switch open **approx. 1.8 k**Ω

P0452

Diagnostic information - DME (DFI) control unit

Switch in NVLD module (pneumatic part): **electrical fault**

Diagnostic conditions
- Engine running

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Open circuit in the lines:
  - ♦ NVLD evaluation unit (electronic part) ◄► NVLD module (pneumatic part)
- ♦ NVLD module (pneumatic part) faulty
- ♦ NVLD evaluation unit (electronic part) faulty

Fault setting condition(s)
- Self-diagnostics of the switch by the NVLD evaluation unit (electronic part).

ⓘ INFORMATION
♦ The switch in the NVLD module (pneumatic part) has different resistance values in the two switching states "open" and "closed".
♦ This ensures that an open circuit can be detected.

Setpoint definitions
- Tank pressure -6.0 ... -2.5+/- 0.3 hPa
  - ▶ Switch closed **approx. 0** Ω
- Tank pressure +5.0 ... -2.5+/- 0.3 hPa
  - ▶ Switch open **approx. 1.8 k**Ω

P0453

Diagnostic information - DME (DFI) control unit

Switch in NVLD module (pneumatic part): **electrical fault**

Diagnostic conditions
- Engine running

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Open circuit in the lines:
  - ♦ NVLD evaluation unit (electronic part) ◄► NVLD module (pneumatic part)
- ♦ NVLD module (pneumatic part) faulty
- ♦ NVLD evaluation unit (electronic part) faulty

Fault setting condition(s)
- Self-diagnostics of the switch by the NVLD evaluation unit (electronic part).

ⓘ INFORMATION
♦ The switch in the NVLD module (pneumatic part) has different resistance values in the two switching states "open" and "closed".
♦ This ensures that an open circuit can be detected.

Setpoint definitions
- Tank pressure -6.0 ... -2.5+/- 0.3 hPa
  - ▶ Switch closed **approx. 0** Ω
- Tank pressure +5.0 ... -2.5+/- 0.3 hPa
  - ▶ Switch open **approx. 1.8 k**Ω

Diagnostic information - DME (DFI) control unit

Tank system - leak

Diagnostic conditions
▶ See Function description

Possible fault causes
♦ Tank cap loose/does not close (properly)
♦ Tank cap leaking/faulty
♦ Tank vent valve (TEV) mechanically faulty (does not close (properly))
♦ Tank leakage diagnosis module leaking (NVLD module (pneumatic part))
♦ Fuel tank system (with hoses) leaking
♦ NVLD module (pneumatic part) faulty (switch ▶ See ⓘ)

ⓘ INFORMATION
A switch that is stuck open in the **NVLD module** (pneumatic part) **CANNOT** be detected, and this fault therefore leads to the fault entry
>**P0456 - Tank system micro leak**<.

Fault setting condition(s)
● Total leakage in tank system :
♦ Diameter > 0.5 mm
ⓘ There may be several small leaks, which correspond in total to the leak determined here.

P0458

Diagnostic information - DME (DFI) control unit

Tank vent valve driver: below limit value

Diagnostic conditions
- Perform tank vent valve short test

or:
- Time since engine start > 10 second(s)
- Leakage diagnosis pump not activated

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to ground (tank vent valve activation)
- Tank vent valve faulty

P0459

Diagnostic information - DME (DFI) control unit

Tank vent valve driver

Diagnostic conditions
- Perform tank vent valve short test

or:
- Time since engine start > 10 second(s)
- Tank vent valve activated

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+ or open circuit in the lines (power supply or tank vent valve activation)
- Tank vent valve faulty

P0464

Diagnostic information - DME (DFI) control unit

Fuel level sensor

Diagnostic conditions
- Ignition on

Possible fault causes
♦ See Instrument cluster fault memory

P0480

Diagnostic information - DME (DFI) control unit

Radiator fan control unit driver

⚠WARNING

Exposed running fan blades!
Danger of limbs being severed!
Risk of serious injury due to ejected foreign bodies!

♦ **ALWAYS** keep hair or clothing out of the rotating range of the fan.
♦ DO NOT reach into the rotating fan.
♦ **DO NOT** place tools or other items in the rotating range of the fan.
♦ Perform work on the fan only with the ignition switched off.
♦ Secure the ignition to prevent it from being switched on accidentally by other persons.

NOTE

Sensitive electronics!
Risk of irreparable damage to electronic components!

♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.

Diagnostic conditions

● Ignition on

Possible fault causes

♦ Short circuit to ground or open circuit in lines (power supply to radiator fan control unit terminal 30)
♦ Short circuit to B+/ground or open circuit in the line (radiator fan control unit activation)
♦ Radiator fan control unit faulty

P0481

Diagnostic information - DME (DFI) control unit

Driver for radiator fan control unit 2

⚠WARNING
Exposed running fan blades!
Danger of limbs being severed!
Risk of serious injury due to ejected foreign bodies!
♦ **ALWAYS** keep hair or clothing out of the rotating range of the fan.
♦ DO NOT reach into the rotating fan.
♦ **DO NOT** place tools or other items in the rotating range of the fan.
♦ Perform work on the fan only with the ignition switched off.
♦ Secure the ignition to prevent it from being switched on accidentally by other persons.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.

Diagnostic conditions
● Ignition on

Possible fault causes
♦ Short circuit to ground or open circuit in lines (power supply to radiator fan control unit terminal 30)
♦ Short circuit to B+/ground or open circuit in the line (radiator fan control unit activation)
♦ Radiator fan control unit faulty

Diagnostic information - DME (DFI) control unit

Secondary-air system, bank 1 and bank 2

Diagnostic conditions
- Perform all short tests from top to bottom, up to and including secondary air.

or

- The diagnostic function starts under the following conditions:
  - Engine running, with:
    - Ambient temperature > 5 °C (41 °F)
    - Engine start temperature 5 ... 40 °C (41 … 90 °F)
    - Secondary-air injection active
  - None of the following faults stored: Oxygen sensor upstream of catalytic converter, engine coolant temperature sensor, camshaft adjustment, ambient pressure, ambient temperature
- Diagnostics is interrupted for as long as the following conditions exist:
  - Engine speed > 3,500 rpm
  - Mass air flow > 750 mg/stroke
  - Overrun phase(s)

ⓘ INFORMATION
♦ The diagnostic function ends with the end of secondary-air injection.
♦ A certain number of measurements must have taken place within diagnostics, between operational readiness of the oxygen sensors and the end of secondary-air injection.
♦ If this is not the case, diagnostics is ended without a result.

Possible fault causes
♦ Air intake duct (secondary pump) constricted/blocked
♦ Short circuit to B+/ground or open circuit in the secondary-air pump relay line (working current circuit)
♦ Secondary-air pump relay faulty
♦ Leak in secondary-air injection lines
♦ Secondary-air valve stuck/frozen
♦ Air intake duct (engine) constricted/coked
♦ Fuel/air mixture preparation not adapted
♦ Secondary air at oxygen sensor upstream of catalytic converter
♦ Catalytic converter faulty (broken)

Fault setting condition(s)
- Actual value <> setpoint lambda control deviation
  - The diagnostic function checks whether deviation of the lambda controllers is as expected upon activation.

Diagnostic information - DME (DFI) control unit

Secondary-air system, bank 1 and bank 2

Diagnostic conditions
- Perform all short tests from top to bottom, up to and including secondary air.

or

- The diagnostic function starts under the following conditions:
  - Engine running, with:
    - Ambient temperature > 5 °C (41 °F)
    - Engine start temperature 5 ... 40 °C (41 … 90 °F)
    - Secondary-air injection active
  - None of the following faults stored: Oxygen sensor upstream of catalytic converter, engine coolant temperature sensor, camshaft adjustment, ambient pressure, ambient temperature
- Diagnostics is interrupted for as long as the following conditions exist:
  - Engine speed > 3,500 rpm
  - Mass air flow > 750 mg/stroke
  - Overrun phase(s)

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♦ The diagnostic function ends with the end of secondary-air injection.
♦ A certain number of measurements must have taken place within diagnostics, between operational readiness of the oxygen sensors and the end of secondary-air injection.
♦ If this is not the case, diagnostics is ended without a result.

Possible fault causes
♦ Air intake duct (secondary pump) constricted/blocked
♦ Short circuit to B+/ground or open circuit in the secondary-air pump relay line (working current circuit)
♦ Secondary-air pump relay faulty
♦ Leak in secondary-air injection lines
♦ Secondary-air valve stuck/frozen
♦ Air intake duct (engine) constricted/coked
♦ Fuel/air mixture preparation not adapted
♦ Secondary air at oxygen sensor upstream of catalytic converter
♦ Catalytic converter faulty (broken)

Fault setting condition(s)
- Actual value <> setpoint lambda control deviation
  - The diagnostic function checks whether deviation of the lambda controllers is as expected upon activation.

Diagnostic information - DME (DFI) control unit

Vehicle speed PSM

Diagnostic conditions
- Driving with:
  - Engine temperature > 30 °C (86 °F)
  - Overrun phase(s) > 1.5 second(s)
  - Engine speed 1.408 .... 3,000 rpm
- None of the following faults stored: U0129, P0503

Possible fault causes
♦ Fault in PSM area

Fault setting condition(s)
- Vehicle speed < 3 km/h or 1 mph (measured value), with:
  - Diagnostic conditions

P0503

Diagnostic information - DME (DFI) control unit

Vehicle speed PSM

Diagnostic conditions
- Driving
- None of the following faults stored: U0129

Possible fault causes
- Fault in PSM area

Fault setting condition(s)
- Vehicle speed > 350 km/h or 218 mph (measured value)

Diagnostic information - DME (DFI) control unit

Idle speed control at stop, lower limit value

Diagnostic conditions
- Engine temperature > 60 °C (140 °F)
- Idling > 20 second(s)
- Vehicle standstill
- Engine without load (A/C system off, steering straight ahead)
- Ambient pressure > 730 hPa (= location below approx 2,400 ... 2,700 m/7,874 ... 8,858 ft.)
  ⇒ See actual value A060-Ambient pressure from DME (measured)
- None of the following functions active: Tank ventilation, Secondary air injection
- None of the following faults stored: Speed, throttle potentiometer, engine temperature, intake air temperature, tank vent valve, tank ventilation system

Possible fault causes
- Fuel quality insufficient
- Air cleaner blocked/frozen
- Air guide ahead of throttle valve blocked
- Ancillary units sluggish
- Exhaust system blocked

Fault setting condition(s)
Idle speed deviation > 20 second(s)

Diagnostic information - DME (DFI) control unit

Idle speed control at stop, upper limit value

Diagnostic conditions
- Engine temperature > 60 °C (140 °F)
- Idling > 20 second(s)
- Vehicle standstill
- Engine without load (A/C system off, steering straight ahead)
- Ambient pressure > 730 hPa (= location below approx 2,400 ... 2,700 m/7,874 ... 8,858 ft.)
  ⇒ See actual value A060-Ambient pressure from DME (measured)
- None of the following functions active: Tank ventilation, Secondary air injection
- None of the following faults stored: Speed, throttle potentiometer, engine temperature, intake air temperature, tank vent valve, tank ventilation system

Possible fault causes
- Intake manifold leaking
- Positive crankcase ventilation leaking
- Throttle valve adjusting unit faulty

Fault setting condition(s)
Idle speed deviation > 20 second(s)

Diagnostic information - DME (DFI) control unit

Idle speed control after cold start at stop, upper limit value

Diagnostic conditions
- Engine temperature -10 °C (14 °F)
- Cold start (catalytic converter heating measure)
- Idling > 20 second(s)
- Vehicle standstill
- Engine without load (A/C system off, steering straight ahead)
- Ambient pressure > 730 hPa (= location below approx 2,400 ... 2,700 m/7,874 ... 8,858 ft.)
  ⇒ See actual value A060-Ambient pressure from DME (measured)
- None of the following functions active: Tank ventilation, Secondary air injection
- None of the following faults stored: Speed, throttle potentiometer, engine temperature, intake air temperature, tank vent valve, tank ventilation system

Possible fault causes
- ♦ Intake manifold leaking
- ♦ Positive crankcase ventilation leaking
- ♦ Throttle valve adjusting unit faulty

Fault setting condition(s)
- Idle speed deviation > 20 second(s) during cold start

P050B

Diagnostic information - DME (DFI) control unit

Ignition timing angle after cold start

Diagnostic conditions
- Cold start
- then driving

Possible fault causes
ⓘ This fault entry is used for information purposes only; the actual cause of the fault is in another area.
♦ Significant engine running problems force the engine control system to leave the permitted ignition timing range in order to keep the engine running.

Diagnostic information - DME (DFI) control unit

Idle speed control after cold start at stop, lower limit value

Diagnostic conditions
- Engine temperature -10 °C (14 °F)
- Cold start (catalytic converter heating measure)
- Idling > 20 second(s)
- Vehicle standstill
- Engine without load (A/C system off, steering straight ahead)
- Ambient pressure > 730 hPa (= location below approx 2,400 ... 2,700 m/7,874 ... 8,858 ft.)
  ⇒ See actual value A060-Ambient pressure from DME (measured)
- None of the following functions active: Tank ventilation, Secondary air injection
- None of the following faults stored: Speed, throttle potentiometer, engine temperature, intake air temperature, tank vent valve, tank ventilation system

Possible fault causes
- ♦ Fuel quality insufficient
- ♦ Air cleaner blocked/frozen
- ♦ Air guide ahead of throttle valve blocked
- ♦ Ancillary units sluggish
- ♦ Exhaust system blocked

Fault setting condition(s)
Idle speed deviation > 20 second(s) during cold start

P0513

Diagnostic information - DME (DFI) control unit

Immobilizer code incorrect from front-end electronics

Diagnostic conditions
- Ignition on

Possible fault causes
- Immobilizer code incorrect from front-end electronics

Fault effects
- Engine cannot be started

Diagnostic information - DME (DFI) control unit

Oil pressure sensor

Diagnostic conditions
- Idling > 1 minute(s), then:
- Engine speed > 3,010 rpm, then:
- Switch off ignition and remove ignition key > 1 minute(s)

Possible fault causes
- Engine oil pressure too low
  (oil level, oil thinning, dirt in oil circuit, oil circuit faulty)
- Oil pressure sensor faulty (incorrect trimming compared with ambient pressure sensor)

Fault setting condition(s)
- Engine oil pressure > 6.2 bar at engine speed < 1,000 rpm

or
- Engine oil pressure < 1.5 bar at engine speed > 3,008 rpm

or
- Deviation between engine oil pressure and ambient pressure > 0.4 bar in control unit run-on (after ignition off)

P0522

Diagnostic information - DME (DFI) control unit

Oil pressure sensor

Diagnostic conditions
- Engine start detected

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to ground or open circuit in the lines
- Oil pressure sensor faulty

P0523

Diagnostic information - DME (DFI) control unit

Oil pressure sensor

Diagnostic conditions
- Engine start detected

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to ground or open circuit in the lines
- Oil pressure sensor faulty

P0524

Diagnostic information - DME (DFI) control unit

Engine oil pressure too low

ⓘ INFORMATION
Technical Information 29/10 (in repair group 1703) must be observed in case of vehicles that have been stationary for an extended period (> 150 days).

Diagnostic conditions
- Engine running
- None of the following faults stored: P0521, P0522, P0523

Possible fault causes
♦ Engine oil pressure too low (oil level, oil thinning, dirt in oil circuit, oil circuit faulty)

Fault setting condition(s)
- Engine oil pressure < setpoint value for longer than 3 second(s)

Diagnostic information - DME (DFI) control unit

Intake camshaft adjustment, bank 1 after cold start
- **during catalytic converter heating measure**

ⓘ INFORMATION
If only the fault for camshaft adjustment after cold start is entered, particular attention should be paid to causes such as viscous engine oil or components that stick when cold.

ⓘ INFORMATION
♦ The catalytic converter heating measures take place for a limited time under certain conditions (cold start).
♦ These include dual injection, timing retardation, additional camshaft adjustment, ...

Diagnostic conditions
- Cold start with catalytic converter heating measure
- then engine speed 1,200 ... 6,000 rpm
- None of the following faults stored: P0010, P0020, P2088, P2089, P2092, P2093

Possible fault causes
♦ Engine oil pressure too low
⇒ (e.g. oil thickening, wrong oil quality, oil pressure control or oil pump sluggish/stuck)
♦ Solenoid valve for hydraulic camshaft adjustment sluggish/stuck
♦ Camshaft adjustment sluggish/stuck
♦ Intake camshaft sluggish/stuck

Fault setting condition(s)
- Intake camshaft actual value/setpoint value deviation too high

Diagnostic information - DME (DFI) control unit

Intake camshaft adjustment, bank 2 after cold start
- **during catalytic converter heating measure**

ⓘ INFORMATION
If only the fault for camshaft adjustment after cold start is entered, particular attention should be paid to causes such as viscous engine oil or components that stick when cold.

ⓘ INFORMATION
♦ The catalytic converter heating measures take place for a limited time under certain conditions (cold start).
♦ These include dual injection, timing retardation, additional camshaft adjustment, ...

Diagnostic conditions
- Cold start with catalytic converter heating measure
- then engine speed 1,200 ... 6,000 rpm
- None of the following faults stored: P0010, P0020, P2088, P2089, P2092, P2093

Possible fault causes
♦ Engine oil pressure too low
⇒ (e.g. oil thickening, wrong oil quality, oil pressure control or oil pump sluggish/stuck)
♦ Solenoid valve for hydraulic camshaft adjustment sluggish/stuck
♦ Camshaft adjustment sluggish/stuck
♦ Intake camshaft sluggish/stuck

Fault setting condition(s)
- Intake camshaft actual value/setpoint value deviation too high

Diagnostic information - DME (DFI) control unit

Fuel high pressure after cold start

ⓘ INFORMATION

♦ Faults in the fuel high-pressure injection system area are frequently caused by defects in the pre-delivery circuit (fuel low pressure).
♦ Therefore, the pre-delivery circuit must be checked first in case of problems in the area of the fuel high-pressure injection system.

ⓘ INFORMATION

♦ The catalytic converter heating measures take place for a limited time under certain conditions after the engine is started.
♦ These include dual injection, timing retardation, additional camshaft adjustment, ...

Diagnostic conditions
- Engine start (cold start + catalytic converter heating measure)
- Engine temperature > -10 °C (14 °F)
- Engine running > 5 second(s)

Possible fault causes
♦ Pre-delivery quantity or pressure in the fuel low-pressure circuit too low
♦ Quantity control valve faulty (in fuel high-pressure pump)
♦ Fuel high-pressure pump faulty

Fault setting condition(s)
Fuel high pressure deviation > 20% (actual value - setpoint value) during catalytic converter heating measure.

Diagnostic information - DME (DFI) control unit

Exhaust temperature sensor, bank 1

Diagnostic conditions
- Ignition on

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines (DME (DFI) control unit - exhaust temperature sensor control unit)
- ♦ Exhaust temperature sensor control unit faulty

Fault effects
- If 1 exhaust temperature sensor is faulty, then substitute value = bank 2 exhaust gas temperature (measured value) + safety reserve
- If 2 exhaust temperature sensors are faulty, then substitute value = exhaust gas temperature (model) + safety reserve

Diagnostic information - DME (DFI) control unit

Exhaust temperature sensor, bank 1

Diagnostic conditions
- Ignition on

Possible fault causes
♦ Short circuit to B+/ground or open circuit in the line (DME (DFI) control unit - exhaust temperature sensor control unit)

Fault effects
- If 1 exhaust temperature sensor is faulty, then substitute value = bank 2 exhaust gas temperature (measured value) + safety reserve
- If 2 exhaust temperature sensors are faulty, then substitute value = exhaust gas temperature (model) + safety reserve

P0546

Diagnostic information - DME (DFI) control unit

Exhaust temperature sensor, bank 1

Diagnostic conditions
- Ignition on

Possible fault causes
♦ Short circuit to B+/ground or open circuit in the line (DME (DFI) control unit - exhaust temperature sensor control unit)

Fault effects
- If 1 exhaust temperature sensor is faulty, then substitute value = bank 2 exhaust gas temperature (measured value) + safety reserve
- If 2 exhaust temperature sensors are faulty, then substitute value = exhaust gas temperature (model) + safety reserve

Diagnostic information - DME (DFI) control unit

Exhaust temperature sensor, bank 2

Diagnostic conditions
- Ignition on

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines (DME (DFI) control unit - exhaust temperature sensor control unit)
- ♦ Exhaust temperature sensor control unit faulty

Fault effects
- If 1 exhaust temperature sensor is faulty, then substitute value = bank 2 exhaust gas temperature (measured value) + safety reserve
- If 2 exhaust temperature sensors are faulty, then substitute value = exhaust gas temperature (model) + safety reserve

Diagnostic information - DME (DFI) control unit

Exhaust temperature sensor, bank 2

Diagnostic conditions
- Ignition on

Possible fault causes
♦ Short circuit to B+/ground or open circuit in the line (DME (DFI) control unit - exhaust temperature sensor control unit)

Fault effects
- If 1 exhaust temperature sensor is faulty, then substitute value = bank 2 exhaust gas temperature (measured value) + safety reserve
- If 2 exhaust temperature sensors are faulty, then substitute value = exhaust gas temperature (model) + safety reserve

Diagnostic information - DME (DFI) control unit

Exhaust temperature sensor, bank 2

Diagnostic conditions
- Ignition on

Possible fault causes
♦ Short circuit to B+/ground or open circuit in the line (DME (DFI) control unit - exhaust temperature sensor control unit)

Fault effects
- If 1 exhaust temperature sensor is faulty, then substitute value = bank 2 exhaust gas temperature (measured value) + safety reserve
- If 2 exhaust temperature sensors are faulty, then substitute value = exhaust gas temperature (model) + safety reserve

P0556

Diagnostic information - DME (DFI) control unit

Vacuum sensor: implausible

Diagnostic conditions
- Under the following conditions 5x while driving:
  - Driving > 40 second(s) with:
    - Brake pedal not pressed
  - then driving with brake pedal pressed, at:
    - Vehicle speed > 10 km/h (6 mph)
    - Brake pressure > 10 bar
  - then driving > 40 second(s) with:
    - Brake pedal not pressed
  - then driving with brake pedal pressed, at:
    - Vehicle speed > 10 km/h (6 mph)
    - Brake pressure > 10 bar

Possible fault causes
- ♦ Vacuum system faulty
- ♦ Brake booster faulty
- ♦ Vacuum sensor faulty

Fault setting condition(s)
- Vacuum is retained despite braking operations under diagnostic conditions (see above)

Fault effects
- ♦ Start/Stop system not active

P0557

Diagnostic information - DME (DFI) control unit

Brake vacuum sensor: electrical fault

Diagnostic conditions
- Ignition on

Possible fault causes
- Short circuit to B+/ground/between lines or open circuit in the lines
- Brake vacuum sensor faulty

Fault effects
- Start/Stop system not active

P0558

Diagnostic information - DME (DFI) control unit

Brake vacuum sensor: electrical fault

Diagnostic conditions
- Ignition on

Possible fault causes
- Short circuit to B+/ground/between lines or open circuit in the lines
- Brake vacuum sensor faulty

Fault effects
- Start/Stop system not active

P0564

Diagnostic information - DME (DFI) control unit

Cruise control operating stalk

Diagnostic conditions
- Ignition on

Possible fault causes
♦ Fault in steering wheel electronics area

Fault effects
♦ Cruise control does not work

P0568

Diagnostic information - DME (DFI) control unit

Cruise control operating stalk

Diagnostic conditions
- Ignition on

Possible fault causes
♦ Fault in steering wheel electronics area

Fault effects
♦ Cruise control does not work

P0571

Diagnostic information - DME (DFI) control unit

Brake light switch

Diagnostic conditions
- Ignition on

Possible fault causes
♦ Fault in PSM control unit area

Fault setting condition(s)
- Brake light switch position implausible

P0597

Diagnostic information - DME (DFI) control unit

Thermostat driver

Diagnostic conditions
- Ignition on

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to ground or open circuit in the lines
- Thermostat faulty

P0598

Diagnostic information - DME (DFI) control unit

Thermostat driver

Diagnostic conditions
- Ignition on

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to ground or open circuit in the lines
- Thermostat faulty

P0599

Diagnostic information - DME (DFI) control unit

Thermostat driver

Diagnostic conditions
- Ignition on

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to ground or open circuit in the lines
- Thermostat faulty

P0601

Diagnostic information - DME (DFI) control unit

Control unit faulty

Diagnostic conditions
- Ignition on > 10 second(s)
- then idling > 30 second(s)
- then engine speed > 1,000 rpm > 60 seconds with:
  - Vehicle standstill
- then driving > 60 second(s)

Possible fault causes
♦ DME (DFI) control unit faulty

P0603

Diagnostic information - DME (DFI) control unit

Control unit faulty

Diagnostic conditions
- Ignition on > 10 second(s)
- then idling > 30 second(s)
- then engine speed > 1,000 rpm > 60 seconds with:
  - Vehicle standstill
- then driving > 60 second(s)

Possible fault causes
♦ DME (DFI) control unit faulty

P0604

Diagnostic information - DME (DFI) control unit

Control unit faulty

Diagnostic conditions
- Ignition on > 10 second(s)
- then idling > 30 second(s)
- then engine speed > 1,000 rpm > 60 seconds with:
  - Vehicle standstill
- then driving > 60 second(s)

Possible fault causes
♦ DME (DFI) control unit faulty

P0605

Diagnostic information - DME (DFI) control unit

Control unit faulty

Diagnostic conditions
- Ignition on > 10 second(s)
- then idling > 30 second(s)
- then engine speed > 1,000 rpm > 60 seconds with:
  - Vehicle standstill
- then driving > 60 second(s)

Possible fault causes
♦ DME (DFI) control unit faulty

P0606

Diagnostic information - DME (DFI) control unit

Control unit faulty

Diagnostic conditions
- Ignition on > 10 second(s)
- then idling > 30 second(s)
- then engine speed > 1,000 rpm > 60 seconds with:
  - Vehicle standstill
- then driving > 60 second(s)

Possible fault causes
♦ DME (DFI) control unit faulty

Diagnostic information - DME (DFI) control unit

Control unit function monitoring

Diagnostic conditions
- Ignition on > 10 second(s)
- then idling > 30 second(s)
- then engine speed > 1,000 rpm > 60 seconds with:
  - Vehicle standstill

Possible fault causes
- ♦ Faults that lead to limp-home mode (See ⓘ)
- ♦ DME (DFI) control unit software error

  ► Re-programming (See ⓘ)

ⓘ INFORMATION
- ♦ When a serious fault is detected in the engine control system (control unit or parts such as the throttle valve, etc.), the control unit switches to a limp-home program and simultaneously stores a corresponding fault. The >Reduced engine power< warning message is displayed in the instrument cluster.
- ♦ This fault might not be detected again immediately away after a restart.
- ♦ Fault P0607 is therefore stored as well, and the control unit already switches to the limp-home program during the restart.
- ♦ If one or more **other faults** are entered in addition to fault P0607:
  - ♦ First correct the other faults,
  - ♦ then clear the fault memory and meet the diagnostic conditions (see above).
- ♦ If **only** fault P0607 is stored, there is an error in the software (DME (DFI) control unit).

P0611

Diagnostic information - DME (DFI) control unit

Control unit faulty

Diagnostic conditions
- Ignition on > 10 second(s)
- then idling > 30 second(s)
- then engine speed > 1,000 rpm > 60 seconds with:
  - Vehicle standstill
- then driving > 60 second(s)

Possible fault causes
♦ DME (DFI) control unit faulty

P0627

Diagnostic information - DME (DFI) control unit

Fuel pump relay final stage

Diagnostic conditions
- Engine running > 10 second(s)

Possible fault causes
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Fuel pump relay faulty

P0628

Diagnostic information - DME (DFI) control unit

Fuel pump relay final stage

Diagnostic conditions
- Engine running > 10 second(s)

Possible fault causes
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Fuel pump relay faulty

P0629

Diagnostic information - DME (DFI) control unit

Fuel pump relay final stage

Diagnostic conditions
- Engine running > 10 second(s)

Possible fault causes
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Fuel pump relay faulty

Diagnostic information - DME (DFI) control unit

Sensor voltage 1

Diagnostic conditions
- Ignition on > 10 second(s)

Possible fault causes
- Short circuit to B+/ground or open circuit in the line
- Pedal sensor faulty
- Oil pressure sensor faulty
- Fuel high-pressure sensor faulty
- Boost pressure sensor faulty, with:
  - Turbocharger
- Clutch rpm sensor faulty , with:
  - Manual transmission

Fault setting condition(s)
- Deviation in sensor voltage:
  - < 4.7 V (P0642)

  or
  - > 5.3 V (P0643)

at:
- Connector [A], contact 40

  or
- Connector [A], contact 42

  or
- Connector [B], contact 18

Diagnostic information - DME (DFI) control unit

Sensor voltage 1

Diagnostic conditions
- Ignition on > 10 second(s)

Possible fault causes
- Short circuit to B+/ground or open circuit in the line
- Pedal sensor faulty
- Oil pressure sensor faulty
- Fuel high-pressure sensor faulty
- Boost pressure sensor faulty, with:
  - Turbocharger
- Clutch rpm sensor faulty , with:
  - Manual transmission

Fault setting condition(s)
- Deviation in sensor voltage:
  - < 4.7 V (P0642)

  or
  - > 5.3 V (P0643)

at:
  - Connector [A], contact 40

  or
  - Connector [A], contact 42

  or
  - Connector [B], contact 18

Diagnostic information - DME (DFI) control unit

Sensor voltage 2

Diagnostic conditions
- Ignition on > 10 second(s)

Possible fault causes
- ♦ Short circuit to B+/ground or open circuit in the line
- ♦ Pedal sensor faulty
- ♦ Throttle valve adjusting unit faulty

Fault setting condition(s)
- Deviation in sensor voltage:
  - ♦ < 4.7 V (P0652)

  or
  - ♦ > 5.3 V (P0653)

at:
- ♦ Connector [A], contact 53

  or
- ♦ Connector [B], contact 62

Diagnostic information - DME (DFI) control unit

Sensor voltage 2

Diagnostic conditions
- Ignition on > 10 second(s)

Possible fault causes
- ♦ Short circuit to B+/ground or open circuit in the line
- ♦ Pedal sensor faulty
- ♦ Throttle valve adjusting unit faulty

Fault setting condition(s)
- Deviation in sensor voltage:
  - ♦ < 4.7 V (P0652)

  or
  - ♦ > 5.3 V (P0653)

at:
- ♦ Connector [A], contact 53

  or
- ♦ Connector [B], contact 62

Diagnostic information - DME (DFI) control unit

Power supply, terminal 15 or 87

Diagnostic conditions
- Ignition on

or
- Engine running

Possible fault causes
- Vehicle electrical system supply voltage too high (e.g. jump-lead starting)
- Vehicle electrical system supply voltage too low
- Contact resistance, loose contact or corrosion on connectors or lines (DME (DFI) control unit)

Fault setting condition(s)
- Deviation of supply voltage at terminal 15 or 87:
  - < 10 V (P0658/P2531)

  or
  - > 16 V (P0659/P2532)

at:
- DME (DFI) control unit - connector [A], contact 34 ⇒ Terminal 15
- DME (DFI) control unit - connector [A], contact 3/5/6 ⇒ Terminal 87

Diagnostic information - DME (DFI) control unit

Power supply, terminal 15 or 87

Diagnostic conditions
- Ignition on

or
- Engine running

Possible fault causes
- Vehicle electrical system supply voltage too high (e.g. jump-lead starting)
- Vehicle electrical system supply voltage too low
- Contact resistance, loose contact or corrosion on connectors or lines (DME (DFI) control unit)

Fault setting condition(s)
- Deviation of supply voltage at terminal 15 or 87:
  - < 10 V (P0658/P2531)

  or
  - > 16 V (P0659/P2532)

at:
- DME (DFI) control unit - connector [A], contact 34 ⇒ Terminal 15
- DME (DFI) control unit - connector [A], contact 3/5/6 ⇒ Terminal 87

Diagnostic information - DME (DFI) control unit

Variable intake manifold driver

ⓘ INFORMATION

♦ On **981S** and **991S** vehicles **without Power Kit (X51)**, the variable intake manifold solenoid valve switches the **tuning flap**.
♦ On vehicles **with Power Kit (X51)**, the variable intake manifold solenoid valve switches the **intake manifold flaps ahead of the intake valves**.
♦ On vehicles with Power Kit (X51), variable intake manifold solenoid valve 2 actuates the tuning flap.

Diagnostic conditions
● Ignition on

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Short circuit to B+/ground or open circuit in the line (power supply or activation)
♦ Solenoid valve for intake manifold switch-over faulty

Diagnostic information - DME (DFI) control unit

Variable intake manifold driver

ⓘ INFORMATION

♦ On **981S** and **991S** vehicles **without Power Kit (X51)**, the variable intake manifold solenoid valve switches the **tuning flap**.
♦ On vehicles **with Power Kit (X51)**, the variable intake manifold solenoid valve switches the **intake manifold flaps ahead of the intake valves**.
♦ On vehicles with Power Kit (X51), variable intake manifold solenoid valve 2 actuates the tuning flap.

Diagnostic conditions
● Ignition on

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Short circuit to B+/ground or open circuit in the line (power supply or activation)
♦ Solenoid valve for intake manifold switch-over faulty

P0662

Diagnostic information - DME (DFI) control unit

Variable intake manifold driver

ⓘ INFORMATION

♦ On **981S** and **991S** vehicles **without Power Kit (X51)**, the variable intake manifold solenoid valve switches the **tuning flap**.
♦ On vehicles **with Power Kit (X51)**, the variable intake manifold solenoid valve switches the **intake manifold flaps ahead of the intake valves**.
♦ On vehicles with Power Kit (X51), variable intake manifold solenoid valve 2 actuates the tuning flap.

Diagnostic conditions
● Ignition on

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Short circuit to B+/ground or open circuit in the line (power supply or activation)
♦ Solenoid valve for intake manifold switch-over faulty

Diagnostic information - DME (DFI) control unit

Driver for variable intake manifold 2

ⓘ INFORMATION

♦ On vehicles **with Power Kit (X51)**, variable intake manifold solenoid valve 2 switches the **tuning flap**.
♦ The variable intake manifold solenoid valve (see fault code P0660/P0661/P0662) switches the intake manifold flaps ahead of the intake valves here.
♦ On vehicles **without Power Kit (X51)**, variable intake manifold solenoid valve 2 is **not fitted**.

Diagnostic conditions
● Ignition on

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Short circuit to B+/ground or open circuit in the line (power supply or activation)
♦ Variable intake manifold solenoid valve 2 faulty

Diagnostic information - DME (DFI) control unit

Driver for variable intake manifold 2

ⓘ INFORMATION

♦ On vehicles **with Power Kit (X51)**, variable intake manifold solenoid valve 2 switches the **tuning flap**.
♦ The variable intake manifold solenoid valve (see fault code P0660/P0661/P0662) switches the intake manifold flaps ahead of the intake valves here.
♦ On vehicles **without Power Kit (X51)**, variable intake manifold solenoid valve 2 is **not fitted**.

Diagnostic conditions
● Ignition on

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Short circuit to B+/ground or open circuit in the line (power supply or activation)
♦ Variable intake manifold solenoid valve 2 faulty

Diagnostic information - DME (DFI) control unit

Driver for variable intake manifold 2

ⓘ INFORMATION

♦ On vehicles **with Power Kit (X51)**, variable intake manifold solenoid valve 2 switches the **tuning flap**.
♦ The variable intake manifold solenoid valve (see fault code P0660/P0661/P0662) switches the intake manifold flaps ahead of the intake valves here.
♦ On vehicles **without Power Kit (X51)**, variable intake manifold solenoid valve 2 is **not fitted**.

Diagnostic conditions
● Ignition on

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Short circuit to B+/ground or open circuit in the line (power supply or activation)
♦ Variable intake manifold solenoid valve 2 faulty

Diagnostic information - DME (DFI) control unit

Start delay due to undervoltage

Diagnostic conditions
- DME (DFI) control unit is viable (voltage > 5 V at A34 (terminal15) + ground)
- Ignition is switched on (voltage present at A34)

Possible fault causes
- If the actual value > A010-DME SUPPLY VOLTAGE<
in the FreezeFrame of the fault entry P0685 was
stored at **<** 8.0 V:
  - ♦ Voltage is too low or voltage will drop when the engine starts (see ⓘ).

- If the actual value > A010-DME SUPPLY VOLTAGE<
in the FreezeFrame of the fault entry P0685 was
stored at **>** 8.0 V:
  - ♦ Open circuit in power supply for main-relay control circuit
  - ♦ Short circuit to ground or open circuit in the lines between main relay and DME (DFI) control unit (DME (DFI) control unit power supply)
  - ♦ Short circuit to B+ or open circuit in the lines between DME (DFI) control unit and main relay (main relay activation)
  - ♦ Main relay faulty

Fault setting condition(s)
- A check is carried out once to determine whether the voltage at A3/A5/A6 has exceeded the min. value of 5.0 V.
- Test duration 0.0 to approx. 0.5 seconds after ignition on, or after control unit reset.

Fault effects
♦ Fuel injection is blocked.

ⓘ INFORMATION
♦ According to specifications, the DME main relay must work only at 8.0 V or higher.
♦ There are also relays that work at a significantly lower voltage.
♦ The entire engine control system can work at 5.0 V or higher.
♦ If the start voltage drops, this can cause the diagnosis to detect the fault > **START DELAY DUE TO UNDERVOLTAGE**< and fuel injection will be blocked.
♦ The starter relay can also pick up at 3 V.
♦ This means that the starter might still turn, but the engine cannot start.

Possible behaviors and displays:
- Start voltage < 5 V:
  - ♦ Starter might turn
  - ♦ Engine does not start
  - ♦ NO DME fault entries because the DME (DFI) control unit is not viable.

- Start voltage > 5 V … < 8 V

+ DME main relay does NOT work:
- Starter turns
- Engine does not start
- DME fault entry P0685 with FreezeFrame actual value
>A010-DME SUPPLY VOLTAGE< = 0 V
- NO DME fault entry P0686 because these diagnostic conditions (> 8.0 V at A34) were not met.

- Start voltage > 5 V … < 8 V

+ DME main relay is working:
- Starter turns
- Engine starts
- NO DME fault entries

- Start voltage > 8 V

+ DME main relay does NOT work:
- Starter turns
- Engine does not start
- DME fault entry P0685 with FreezeFrame actual value
>A010-DME SUPPLY VOLTAGE< = 0 V
- DME fault entry P0686 with FreezeFrame actual value
>A010-DME SUPPLY VOLTAGE< = 0 V

- Start voltage > 8 V

+ DME main relay is working:
- Starter turns
- Engine starts
- NO DME fault entries

Diagnostic information - DME (DFI) control unit

Main relay off

Diagnostic conditions
- Vehicle voltage > 8.0 V
- Ignition off
- Control unit run-on completed (See ⓘ)
- Then ignition on

Possible fault causes
♦ Main relay faulty (contact stuck)
♦ Short circuit to B+ in line between main relay and DME (DFI) control unit (DME (DFI) control unit power supply)
♦ Short circuit to ground in line between DME (DFI) control unit and main relay (main relay activation)

Fault setting condition(s)
- Power supply for DME (DFI) control unit > 4.0 V at connector [A], contact 3/5/6, with :
- Power supply for DME (DFI) control unit > 0.0 V at connector [A], contact 34 (terminal 15)

ⓘ INFORMATION
♦ After the ignition is switched off (terminal 15), the DME control unit switches to control unit run-on mode.
♦ The run-on period depends on many underlying conditions (e.g. engine temperature for fan operation).
The run-on duration can be 1 minute when the engine is cold and up to 45 minutes when the engine is hot.

Diagnostic information - DME (DFI) control unit

Main relay ON

Diagnostic conditions
- Vehicle voltage > 8.0 V
- Ignition on

Possible fault causes
♦ Main relay faulty
♦ Open circuit in power supply for main-relay control circuit
♦ Short circuit to ground or open circuit in the lines between main relay and DME (DFI) control unit (DME (DFI) control unit power supply)
♦ Short circuit to B+ or open circuit in the lines between DME (DFI) control unit and main relay (main relay activation)

Fault setting condition(s)
- Power supply for DME (DFI) control unit < 6.0 V at connector [A], contact 3/5/6, with :
  - Power supply for DME (DFI) control unit > 8.0 V at connector [A], contact 34 (terminal 15)

Diagnostic information - DME (DFI) control unit

Transmission control unit fault

Diagnostic conditions

Engine running

Possible fault causes

♦ Fault entry in PDK control unit (see ⓘ)

ⓘ INFORMATION

Different fault healing strategies in the engine and transmission control units can lead to a situation in which the original transmission fault no longer exists in the transmission fault memory (healed) but the note (P0700) nevertheless remains entered in the engine control unit (not yet healed).

Diagnostic information - DME (DFI) control unit

Torque intervention from transmission control unit implausible

Diagnostic conditions
- Drive with gear changes

Possible fault causes
- ♦ Shifting in PDK takes too long

Fault setting condition(s)
- The torque intervention by the PDK control unit takes too long; it is therefore implausible for the DME control unit.

P0705

Diagnostic information - DME (DFI) control unit

Selector-lever position implausible

Diagnostic conditions
- Drive with gear changes

Possible fault causes
- Selector-lever position is reported as implausible

P0716

Diagnostic information - DME (DFI) control unit

Manual transmission speed sensor: difference from engine speed

Diagnostic conditions
- Time since engine start > 5 second(s)
- Clutch closed

Possible fault causes
- Clutch plate slipping
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Manual transmission speed sensor loose
- Rpm sensor wheel in transmission faulty

Fault effects
- Reduced engine torque

Diagnostic information - DME (DFI) control unit

Manual transmission speed sensor: implausible or no signal

Diagnostic conditions
- Time since engine start > 5 second(s)
- Clutch closed

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Manual transmission speed sensor loose
- Manual transmission speed sensor faulty
- Rpm sensor wheel in transmission faulty

Fault effects
- Reduced engine torque

Diagnostic information - DME (DFI) control unit

Manual transmission speed sensor: implausible or no signal

Diagnostic conditions
- Time since engine start > 5 second(s)
- Clutch closed

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Manual transmission speed sensor loose
- Manual transmission speed sensor faulty
- Rpm sensor wheel in transmission faulty

Fault effects
- Reduced engine torque

Diagnostic information - DME (DFI) control unit

Cruise control clutch switch (upper) up

Diagnostic conditions
- Drive with at least 40 gear changes

Possible fault causes
- ♦ Gear change without clutch actuation
- ♦ Short circuit to B+ in cruise control clutch switch (upper) - DME (DFI) control unit
- ♦ Cruise control clutch switch (upper) faulty

Fault setting condition(s)
- 20 gear changes, with:
  - Cruise control clutch switch (upper) indicates clutch NOT actuated

or

- 40 gear changes, with:
  - Cruise control clutch switch (upper) indicates clutch actuated

Fault effects
- ♦ Start/Stop system does not function

Diagnostic information - DME (DFI) control unit

Cruise control clutch switch (upper) up

Diagnostic conditions
- Drive with at least 40 gear changes

Possible fault causes
- ♦ Gear change without clutch actuation
- ♦ Short circuit to B+ in cruise control clutch switch (upper) - DME (DFI) control unit
- ♦ Cruise control clutch switch (upper) faulty

Fault setting condition(s)
- 20 gear changes, with:
  - Cruise control clutch switch (upper) indicates clutch NOT actuated

or

- 40 gear changes, with:
  - Cruise control clutch switch (upper) indicates clutch actuated

Fault effects
- ♦ Start/Stop system does not function

Diagnostic information - DME (DFI) control unit

Cruise control clutch switch (upper) up

Diagnostic conditions
- Drive with at least 40 gear changes

Possible fault causes
- ♦ Gear change without clutch actuation
- ♦ Short circuit to B+ in cruise control clutch switch (upper) - DME (DFI) control unit
- ♦ Cruise control clutch switch (upper) faulty

Fault setting condition(s)
- 20 gear changes, with:
  - Cruise control clutch switch (upper) indicates clutch NOT actuated

or

- 40 gear changes, with:
  - Cruise control clutch switch (upper) indicates clutch actuated

Fault effects
- ♦ Start/Stop system does not function

Diagnostic information - DME (DFI) control unit

Clutch switch interlock (lower)

Diagnostic conditions
- Ignition on and clutch pedal fully depressed
- None of the following faults stored: P0830

Possible fault causes
- ♦ Short circuit to ground in signal line
- ♦ Clutch switch interlock (lower) faulty (stuck closed)

Fault setting condition(s)
- Clutch switch interlock (lower) actuated with:
  - Clutch switch for cruise control (upper) not actuated

Fault effects
- ♦ Engine start possible, with:
  - Clutch pedal not pressed

P0835

Diagnostic information - DME (DFI) control unit

Clutch switch interlock (lower)

Diagnostic conditions
- When engine start is detected

and
- Clutch pedal fully depressed

or

- Starter does not turn

and
- Following sequence 3 x in series:
  - Clutch pedal fully depressed
  - Ignition lock position 2 (terminal 50 - engine start) > 3 second(s) (> 9 seconds in total)
  - then:
    - Ignition off

      and
    - Release clutch pedal

Possible fault causes
- Short circuit to B+ or open circuit in signal line
- Clutch switch interlock (lower) faulty (stuck open)

Fault setting condition(s)
- Ignition lock position 2 (terminal 50 - engine start) > 9 second(s) in total (See Diagnostic conditions)

Fault effects
- Starter does not turn
- Display in instrument cluster > Press clutch pedal <

Diagnostic information - DME (DFI) control unit

Clutch switch implausible in relation to clutch travel sensor (parking brake control unit - EPB)

Diagnostic conditions
- Ignition on
- Completely depress the clutch pedal once and release it again
- None of the following faults stored: P0830, P0831, P0834, P0835, U0128, U0417

Possible fault causes
- ♦ Fault in clutch travel sensor (connected to parking brake control unit) WITHOUT fault entry
- ♦ Short circuit to B+ in clutch switch interlock (lower) - DME (DFI) control unit
- ♦ Cruise control clutch switch (upper) faulty
- ♦ Short circuit to B+ in clutch switch interlock (lower) - DME (DFI) control unit
- ♦ Clutch switch interlock (lower) faulty

Fault setting condition(s)

ⓘ The signals for the upper clutch switch (cruise control clutch switch (upper)) and lower clutch switch (clutch switch interlock (lower)) are compared with the clutch pedal travel (parking brake control unit ▶ CAN ▶ SG_dfi).

- The fault is entered when the clutch pedal is fully depressed,
  if the upper switch switches too late (compared to the travel signal),

or

  if the lower one switches too early (compared to the travel signal).
- The fault is entered when the clutch pedal is released,
  if the upper switch switches too early (compared to the travel signal),

or

  if the lower one switches too late (compared to the travel signal).

Fault effects
- ♦ Start/Stop system does not function

Diagnostic information - DME (DFI) control unit

P/N input signal, open circuit/short circuit to B+

Diagnostic conditions
- Ignition on > 3 second(s)
- then start engine, with:
  - Brake pressed
  - Selector-lever position P or N

Possible fault causes
♦ Open circuit/short circuit to B+ in signal line

Fault setting condition(s)
Deviation in signal for P/N input signal and signal via CAN

Fault effects
♦ Starter does not turn

Diagnostic information - DME (DFI) control unit

P/N input signal, short circuit to ground

Diagnostic conditions
- Ignition on > 3 second(s)
- then start engine, with:
  - Brake pressed
  - Selector-lever position P or N

Possible fault causes
♦ Short circuit to ground in signal line

Fault setting condition(s)
Deviation in signal for P/N input signal and signal via CAN

Fault effects
♦ Engine start possible, with:
- Selector-lever position R or D or M

Diagnostic information - DME (DFI) control unit

Torque request from PSM implausible

Diagnostic conditions
● Drive with PSM intervention for vehicle stabilization

Possible fault causes
♦ Fault in PSM control unit area

Fault setting condition(s)
● Torque request from PSM is implausibly high compared to driver setpoint torque (via accelerator pedal).

Fault effects
♦ All torque requests from the PSM are ignored for this trip ⇒ PSM interventions restricted.

Diagnostic information - DME (DFI) control unit

Fuel high pressure quantity

ⓘ INFORMATION

♦ Faults in the fuel high-pressure injection system area are frequently caused by defects in the pre-delivery circuit (fuel low pressure).
♦ Therefore, the pre-delivery circuit must be checked first in case of problems in the area of the fuel high-pressure injection system.

Diagnostic conditions
- Engine speed 450 .... 4,000 rpm
- Engine temperature - 10 ... +100 °C (14 … 212 °F)
- Driving with different operating conditions

Possible fault causes
♦ Pre-delivery quantity or pressure in the fuel low-pressure circuit too low
♦ Quantity control valve faulty (in fuel high-pressure pump)
♦ Fuel high-pressure pump faulty

Fault setting condition(s)
Deviation in quantity control actual value (fuel high pressure)

Diagnostic information - DME (DFI) control unit

Fuel pressure/quantity too low at start

ⓘ INFORMATION 1

This fault entry can be caused by various reasons.
♦ If the fault was **NOT entered while the engine was starting**, but while the engine was running normally, a check must be carried out in the **crankshaft sensor** area (**See** ⓘ **2**).
♦ Fault finding in the fuel area must only be carried out if a customer complains that starting times are too long AND if the fault was entered while the engine was starting.
♦ If there is no such customer complaint, however, the only measure to be taken is to clear the fault memory.

Diagnostic conditions
● Engine start
● Engine temperature - 10 ... +100 °C (14 … 212 °F)
● Engine running > 5 second(s)

Possible fault causes
♦ Short-term failure of the engine speed signal as a result of a crankshaft sensor fault with or without a corresponding fault entry
(See ⓘ 2)
♦ Pre-delivery quantity or pressure in the fuel low-pressure circuit too low
(See ⓘ **3**)
♦ Quantity control valve faulty (in fuel high-pressure pump)
♦ Fuel high-pressure pump faulty

Fault setting condition(s)
● The fuel pressure required for carrying out a high-pressure start was not reached or was not reached quickly enough
ⓘ Low-pressure start is enabled; starting takes considerably longer (up to 2 sec.).

ⓘ INFORMATION 2

● If engine speed = 0, a starting setpoint value is set for the fuel high pressure that is higher than the setpoint value at idle speed or at a low load.
● An engine start is detected if the engine speed increases from 0 to > 300 rpm.
● When an engine start is detected, a check determines whether the measured fuel high pressure reaches the setpoint value within a certain number of engine revolutions.
⇒ If the engine's speed signal fails briefly (e.g. 6/1,000 seconds) and is then restored, the following things happen:
1. Engine speed = 0 ▶ Starting setpoint value for the fuel high pressure is set.
2. Engine speed increases to over 300 rpm ▶ Engine start is detected.
3. Comparison of setpoint value and actual value of the fuel high pressure ▶ Fault entry P1023, although there was no actual engine start.
4. Entries in the extended fault memory for P1023 are as follows:
♦ *40_Time after Start* > 5 s
♦ *40_Engine RPM* > 600 rpm

♦ *40_Vehicle Speed* > 0 km/h (0 mph)

ⓘ INFORMATION 3

Faults in the fuel high-pressure injection system area are frequently caused by defects in the pre-delivery circuit (fuel low pressure).
♦ Therefore, the pre-delivery circuit must be checked first in case of problems in the area of the fuel high-pressure injection system.

P1024

Diagnostic information - DME (DFI) control unit

Fuel high pressure too high after engine off

Diagnostic conditions
- Engine temperature - 10 ... +100 °C (14 … 212 °F)
- Engine running > 5 second(s)
- then ignition off > 10 second(s)

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines ▶ Fuel high-pressure sensor
- ♦ Quantity control valve faulty (in fuel high-pressure pump)

Fault setting condition(s)
- Fuel high pressure drops too slowly after engine off

Diagnostic information - DME (DFI) control unit

Fuel high pressure adaptation

ⓘ INFORMATION 1

♦ Faults in the fuel high-pressure injection system area are frequently caused by defects in the pre-delivery circuit (fuel low pressure).
♦ Therefore, the pre-delivery circuit must be checked first in case of problems in the area of the fuel high-pressure injection system.

Diagnostic conditions
- Engine speed 450 .... 4,000 rpm
- Engine temperature - 10 ... +100 °C (14 … 212 °F)
- Driving with different operating conditions

Possible fault causes
♦ Pre-delivery quantity or pressure in the fuel low-pressure circuit too low
♦ Fuel high-pressure adaptation required (See ⓘ 2)
♦ Fuel high-pressure pump faulty

ⓘ INFORMATION 2

♦ The old values must be deleted prior to a new adaptation of the fuel high-pressure ranges.
♦ The fuel high-pressure adaptation values can be deleted using >PIWIS Tester II< as follows: >DME< ⇒ >Maintenance/repairs< ⇒ >Delete adaptation values<

P1026

Diagnostic information - DME (DFI) control unit

Fuel high pressure implausible

ⓘ INFORMATION

♦ Faults in the fuel high-pressure injection system area are frequently caused by defects in the pre-delivery circuit (fuel low pressure).
♦ Therefore, the pre-delivery circuit must be checked first in case of problems in the area of the fuel high-pressure injection system.

Diagnostic conditions
- Time since engine start > 5 second(s)
- Engine temperature - 10 ... +100 °C (14 … 212 °F)
- Engine running/driving

Possible fault causes (See Fault setting condition(s))
- Below limit value:
  - ♦ Pre-delivery quantity or pressure in the fuel low-pressure circuit too low
  - ♦ Fuel tank (driven) empty
    - ► See Extended fault memory
    - ⇒ Actual value **40-Fuel Level Input** [**0%**]

- Below limit value or above limit value :
  - ♦ Quantity control valve faulty (in fuel high-pressure pump)
  - ♦ Fuel high-pressure pump faulty

Fault setting condition(s) (See ⓘ)
♦ Below limit value:
- Continuous average fuel high pressure < 10 bar

♦ Above limit value:
- Continuous average fuel high pressure > 135 bar

ⓘ INFORMATION

► See Extended fault memory
⇒ 21-Environmental condition for first fault occurrence /B070-Fuel high pressure actual value
⇒ 21-Environmental condition for first fault occurrence /B060-Fuel high pressure setpoint value

Conversion:
♦ 10,000 hPa = 10 bar = 10,000 mbar
♦ 1,000 kPa = 10 bar = 10,000 mbar
♦ 1 MPa = 10 bar = 10,000 mbar

P1027

Diagnostic information - DME (DFI) control unit

Fuel high pressure fluctuates

Diagnostic conditions
- Engine speed 450 .... 4,000 rpm
- Engine temperature - 10 ... +100 °C (14 … 212 °F)
- Driving with different operating conditions

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines ▶ Fuel high-pressure sensor
- ♦ Quantity control valve sluggish (in fuel high-pressure pump)

Fault setting condition(s)
The fuel high pressure fluctuates by +/- 25 bar from the setpoint fuel pressure.

Diagnostic information - DME (DFI) control unit

Fuel high-pressure sensor stuck

ⓘ INFORMATION

♦ Faults in the fuel high-pressure injection system area are frequently caused by defects in the pre-delivery circuit (fuel low pressure).
♦ Therefore, the pre-delivery circuit must be checked first in case of problems in the area of the fuel high-pressure injection system.

Diagnostic conditions
- Engine running (driving)
- Engine temperature - 10 ... +100 °C (14 … 212 °F)

Possible fault causes
♦ Pre-delivery quantity or pressure in the fuel low-pressure circuit too low
♦ Fuel high-pressure sensor faulty

Fault setting condition(s)
No change in the fuel high-pressure sensor voltage line, with:
- Engine running

Diagnostic information - DME (DFI) control unit

Fuel high-pressure sensor stuck at engine start

ⓘ INFORMATION

♦ Faults in the fuel high-pressure injection system area are frequently caused by defects in the pre-delivery circuit (fuel low pressure).
♦ Therefore, the pre-delivery circuit must be checked first in case of problems in the area of the fuel high-pressure injection system.

Diagnostic conditions
- Engine start
- Engine temperature - 10 ... +100 °C (14 … 212 °F)

Possible fault causes
♦ Pre-delivery quantity or pressure in the fuel low-pressure circuit too low
♦ Fuel high-pressure sensor faulty

Fault setting condition(s)
No change in the **fuel high-pressure sensor** voltage line, at:
- Engine start

P1036

Diagnostic information - DME (DFI) control unit

Fuel high pressure: too low/too high

Diagnostic conditions
- Engine running
- Fuel high-pressure pump operates normally, i.e.:
  - no engine stop
  - no overrun phase

Possible fault causes
- Pre-delivery quantity or pressure in the fuel low-pressure circuit too low
- Loose contact or corrosion on connectors or lines ▶ **Fuel high-pressure sensor**
- **Quantity control valve** sluggish (in **fuel high-pressure pump**)
- **Fuel high-pressure pump** faulty

Fault setting condition(s)
- The actual fuel high-pressure value deviates from the setpoint fuel pressure by more than 20 bar for longer than 5 seconds.
  - Actual value too low ⇒ P1036
  - Actual value too high ⇒ P1037

ⓘ INFORMATION
•V6 Turbo engines ONLY
The >Fuel high-pressure pump< system tests can be used for testing
⇒ See Diagnostics ▶ DME ▶ Maintenance/repairs ▶ System tests
ⓘ See F1 Help there!

Diagnostic information - DME (DFI) control unit

Fuel high pressure: too low/too high

Diagnostic conditions
- Engine running
- Fuel high-pressure pump operates normally, i.e.:
  - no engine stop
  - no overrun phase

Possible fault causes
- Pre-delivery quantity or pressure in the fuel low-pressure circuit too low
- Loose contact or corrosion on connectors or lines ▶ **Fuel high-pressure sensor**
- **Quantity control valve** sluggish (in **fuel high-pressure pump**)
- **Fuel high-pressure pump** faulty

Fault setting condition(s)
- The actual fuel high-pressure value deviates from the setpoint fuel pressure by more than 20 bar for longer than 5 seconds.
  - Actual value too low ⇒ P1036
  - Actual value too high ⇒ P1037

ⓘ INFORMATION
•V6 Turbo engines ONLY
The >Fuel high-pressure pump< system tests can be used for testing
⇒ See Diagnostics ▶ DME ▶ Maintenance/repairs ▶ System tests
ⓘ See F1 Help there!

Diagnostic information - DME (DFI) control unit

Air cleaner flap solenoid valve driver

Diagnostic conditions
- Engine start

Possible fault causes
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Air cleaner flap solenoid valve faulty

ⓘ INFORMATION
The air cleaner flap solenoid valve is briefly switched on and is then switched off again after the engine start.

Diagnostic information - DME (DFI) control unit

Air cleaner flap solenoid valve driver

Diagnostic conditions
- Engine start

Possible fault causes
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Air cleaner flap solenoid valve faulty

ⓘ INFORMATION
The air cleaner flap solenoid valve is briefly switched on and is then switched off again after the engine start.

Diagnostic information - DME (DFI) control unit

Air cleaner flap solenoid valve driver

Diagnostic conditions
- Engine start

Possible fault causes
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Air cleaner flap solenoid valve faulty

ⓘ INFORMATION
The air cleaner flap solenoid valve is briefly switched on and is then switched off again after the engine start.

P1044

Diagnostic information - DME (DFI) control unit

Acoustic simulator solenoid valve driver

Diagnostic conditions
- Ignition on

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground or open circuit in the line (power supply or activation)
- Acoustic simulator solenoid valve faulty

P1045

Diagnostic information - DME (DFI) control unit

Acoustic simulator solenoid valve driver

Diagnostic conditions
- Ignition on

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground or open circuit in the line (power supply or activation)
- Acoustic simulator solenoid valve faulty

P1046

Diagnostic information - DME (DFI) control unit

Acoustic simulator solenoid valve driver

Diagnostic conditions
- Ignition on

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground or open circuit in the line (power supply or activation)
- Acoustic simulator solenoid valve faulty

P1050

Diagnostic information - DME (DFI) control unit

Tank vent system
● 991 Turbo ONLY

Diagnostic conditions (see also ⓘ)
● Tank vent valve short test - lower partial-load range
or:
● Time since engine start > 2 minute(s)
● Idling > 15 second(s)
● Engine temperature > 40 °C (104 °F)
● Ambient temperature > 4 °C (39 °F)
● Ambient pressure > 730 hPa (= location below approx. 2,400 ... 2,700 m/7,874 ... 8,858 ft.) (A060)
● All oxygen sensor(s) ready for operation
● None of the following faults stored: Oxygen sensor(s), tank vent valve output stage
● Vehicle speed > 15 km/h (9 mph)
● The carbon canister is adequately flushed via the tank vent valve (See ⓘ).

Possible fault causes
♦ Tank vent valve faulty (stuck open or closed)
♦ Tank vent valve not installed or installed incorrectly
♦ Line between active carbon filter and tank vent valve leaking/trapped/blocked
♦ Purge-air line between tank vent valve and intake manifold leaking/trapped/blocked
♦ Purge-air line between the tank vent valve and turbocharger (venturi pump) leaks
♦ Check valve between tank vent valve and intake manifold faulty or installed backward
♦ Check valve between tank vent valve and turbocharger (venturi pump) faulty or installed backward

Fault setting condition(s)
● The fault is set if the pressure difference between the ambient pressure and the pressure in the tank vent line is too low when the tank vent valve is activated (depending on the respective engine operating point).

ⓘ INFORMATION
♦ In the lower partial-load range, this is achieved, for example, by driving:
- in 2nd gear
- at approx. 25 km/h (16 mph)
- on a route that is as level as possible
- for approx. 20 seconds
- with tank vent valve open **(L170)**

Diagnostic information - DME (DFI) control unit

Mass air flow implausibly high (leakage adaptation)

Diagnostic conditions
- Idling > 2 minute(s)
- Driving with different operating conditions
- None of the following faults stored: Intake manifold pressure sensor, throttle valve adjusting unit, ambient pressure sensor, Intake air temperature sensor, rpm sensor, valve lift control, camshaft adjustment

Possible fault causes
- Oil filler cap leaking
- Positive crankcase ventilation hose leaking
- Leak in intake system - between throttle valve and engine (intake valve)
- Tank vent valve faulty - closed
- Intake manifold pressure sensor - electr. plug connection loose, oxidized, corroded, interrupted
- Fault in area of intake manifold pressure sensor, throttle valve adjusting unit, ambient pressure sensor, Intake air temperature sensor, rpm sensor, valve lift control, camshaft adjustment

Fault setting condition(s)
- Unacceptably large deviation between measured mass air flow and calculated mass air flow , with increasing deviation over an extended period (See ⓘ)

ⓘ INFORMATION
This diagnostic function monitors the intake system between the throttle valve and engine (intake valves).
- A mass air flow is calculated from the signals from the throttle valve potentiometer, engine speed sensor, intake air temperature sensor and ambient pressure sensor as well as other engine operating values.
- The calculated mass air flow is compared with that measured by the pressure sensor.
- A deviation may be due to both the calculated mass air flow and the measured mass air flow.

P1070

Diagnosis information - Control unit DME (DFI)

Mass air flow, implausible too low (leakage adaptation)

Diagnostic conditions

- Idle speed > 2 Minute(s)
- Trip with different operating conditions
- none of the following faults stored: Intake manifold pressure sensor, **Throttle adjusting unit**, **Ambient pressure sensor**, **Intake air temperature sensor**, **Speed sensor**, **Valve lift control**, **Camshaft adjustment**

Possible fault causes

♦ **Throttle body dirty**

ⓘ **A thin film of dirt in the closing area of the throttle valve in the throttle body suffices, especially if engine adaptation values were reset previously.**

♦ **Exhaust system** Blocked

/ Cross section Narrowed
♦ Intake manifold pressure sensor - **Electrical plug connection** loose, oxidized, corroded, interrupted
♦ Tank vent Faulty - open (mechanical / electric)
♦ Fault in area Intake manifold pressure sensor, **Throttle adjusting unit**, **Ambient pressure sensor**, **Intake air temperature sensor**, **Speed sensor**, **Valve lift control**, **Camshaft adjustment**

Fault setting condition(s)

- Impermissibly large deviation of the measured air mass from the calculated air mass. , at:
  - Increasing deviation over an extended period

(See ⓘ)

ⓘ INFORMATION

In this diagnosis, the intake system between the throttle valve and the engine (intake valves) is monitored.

♦ A mass air flow is calculated from the signals from the throttle potentiometer, engine speed sensor, intake air temperature sensor and ambient pressure sensor as well as other engine operating values.
♦ The calculated mass air flow is compared with that measured by the pressure sensor.
♦ A deviation may be due to both the calculated mass air flow and the measured mass air flow.

P1071

Diagnostic information - DME (DFI) control unit

Mass air flow in near idle speed range, implausibly high

Diagnostic conditions
- Idling > 30 s,
  - then engine speed > 1,500 rpm > 1 s,
    - then idling > 30 s
- None of the following faults stored: Intake manifold pressure sensor, throttle valve adjusting unit, ambient pressure sensor, Intake air temperature sensor, rpm sensor, valve lift control, camshaft adjustment

Possible fault causes
- ♦ Oil filler cap open
- ♦ Positive crankcase ventilation hose leaking
- ♦ Leak in intake system - between throttle valve and engine (intake valve)
- ♦ Tank vent valve faulty - open
- ♦ Intake manifold pressure sensor - electr. plug connection loose, oxidized, corroded, interrupted
- ♦ Fault in area of intake manifold pressure sensor, throttle valve adjusting unit, ambient pressure sensor, intake air temperature sensor, rpm sensor, valve lift control, camshaft adjustment, variable intake manifold

Fault setting condition(s)
- Excessive deviation of the throttle valve position during the current engine idling phase compared to the most recent and the penultimate engine idling phases (See ⓘ)

ⓘ INFORMATION
The diagnostic function checks whether the value
H040-Mass air flow correction factor deviates too much from the value during the last engine idling phase:
- ♦ If NO, the new value is used as the next reference value, and diagnostics begins again in the next engine idling phase.
- ♦ If YES, the test is repeated in the next engine idling phase and compared with the value of the penultimate engine idling phase:
  - ♦ If NO relevant deviation still exists, the new value is used as the next reference value.
  - ♦ The fault is entered if a relevant deviation exists AGAIN. The following information, among other data, is stored in the extended fault memory:

1. XX-Correction value after throttle valve adaptation

This percentage is determined from a characteristic, depending on the intake air temperature, during every throttle valve adaptation.
It serves to prevent incorrect diagnoses that can occur due to adaptation taking place when the throttle valve is too warm or cold.

2. XX-Correction value for mass air flow at idle

Snapshot of the actual value H040 approx. 3 sec. after idling begins (= stabilized state). It is used for comparison with the same value of the most recent (or penultimate if a fault is suspected) idling phase.

3. XX-Difference between the correction values of two idling phases

Difference in the snapshot of actual value H040 between the current idling phase and the same value of the most recent (or penultimate if a fault is suspected) idling phase.

4. XX-Throttle value taught in case of violated environmental conditions

1=YES / 0=NO

Diagnostic information - DME (DFI) control unit

Mass air flow in lower partial-load range, implausibly high

Diagnostic conditions
- Driving with different operating conditions
- None of the following faults stored: Intake manifold pressure sensor, throttle valve adjusting unit, ambient pressure sensor, Intake air temperature sensor, rpm sensor, valve lift control, camshaft adjustment

Possible fault causes
♦ Intake manifold pressure sensor - electr. plug connection loose, oxidized, corroded, interrupted
♦ Fault in area of intake manifold pressure sensor, throttle valve adjusting unit, ambient pressure sensor, intake air temperature sensor, rpm sensor, valve lift control, camshaft adjustment, variable intake manifold

Fault setting condition(s)
- Unacceptably large deviation between measured mass air flow and calculated mass air flow (See ⓘ).

ⓘ INFORMATION
This diagnostic function monitors the intake system between the throttle valve and engine (intake valves).
♦ A mass air flow is calculated from the signals from the throttle valve potentiometer, engine speed sensor, intake air temperature sensor and ambient pressure sensor as well as other engine operating values.
♦ The calculated mass air flow is compared with that measured by the pressure sensor.
♦ A deviation may be due to both the calculated mass air flow and the measured mass air flow.

Diagnostic information - DME (DFI) control unit

Mass air flow in lower partial-load range, implausibly low

Diagnostic conditions
- Driving with different operating conditions
- None of the following faults stored: Intake manifold pressure sensor, throttle valve adjusting unit, ambient pressure sensor, Intake air temperature sensor, rpm sensor, valve lift control, camshaft adjustment

Possible fault causes
- Throttle housing dirty

ⓘ A thin film of dirt in the closing area of the throttle valve in the throttle housing suffices, especially if engine adaptation values were reset previously.

- Air cleaner dirty/blocked/frozen
- Air intake (ahead of air cleaner) constricted
- Air guide ahead of throttle valve blocked/cross-section constricted
- Exhaust system blocked/cross-section constricted
- Intake manifold pressure sensor - electr. plug connection loose, oxidized, corroded, interrupted
- Tank vent valve faulty - closed (mechanical/electrical fault)
- Fault in area of intake manifold pressure sensor, throttle valve adjusting unit, ambient pressure sensor, intake air temperature sensor, rpm sensor, valve lift control, camshaft adjustment, variable intake manifold

Fault setting condition(s)
- Unacceptably large deviation between measured mass air flow and calculated mass air flow (See ⓘ).

ⓘ INFORMATION

This diagnostic function monitors the intake system between the throttle valve and engine (intake valves).
- A mass air flow is calculated from the signals from the throttle valve potentiometer, engine speed sensor, intake air temperature sensor and ambient pressure sensor as well as other engine operating values.
- The calculated mass air flow is compared with that measured by the pressure sensor.
- A deviation may be due to both the calculated mass air flow and the measured mass air flow.

Diagnosis information - Control unit DME (DFI)

Mass air flow upper partial-load range, implausible Too high

Diagnostic conditions

● Trip with different operating conditions
● none of the following faults stored: Intake manifold pressure sensor, **Throttle adjusting unit**, **Ambient pressure sensor**, **Intake air temperature sensor**, **Speed sensor**, **Valve lift control**, **Camshaft adjustment**

Possible fault causes

♦ Intake manifold pressure sensor - **Electrical plug connection** loose, oxidized, corroded, interrupted
♦ Fault in area Intake manifold pressure sensor, **Throttle adjusting unit**, **Ambient pressure sensor**, **Intake air temperature sensor**, **Speed sensor**, **Valve lift control**, **Camshaft adjustment**

Fault setting condition(s)

● Impermissibly large deviation of the measured air mass from the calculated air mass.
(See ⓘ)

ⓘ INFORMATION

In this diagnosis, the intake system between the throttle valve and the engine (intake valves) is monitored.

♦ A mass air flow is calculated from the signals from the throttle potentiometer, engine speed sensor, intake air temperature sensor and ambient pressure sensor as well as other engine operating values.
♦ The calculated mass air flow is compared with that measured by the pressure sensor.
♦ A deviation may be due to both the calculated mass air flow and the measured mass air flow.

Diagnostic information - DME (DFI) control unit

Mass air flow in upper partial-load range, implausibly low

Diagnostic conditions
● Driving with different operating conditions
● None of the following faults stored: Intake manifold pressure sensor, throttle valve adjusting unit, ambient pressure sensor, Intake air temperature sensor, rpm sensor, valve lift control, camshaft adjustment

Possible fault causes
♦ Air cleaner dirty/blocked/frozen
♦ Air intake (ahead of air cleaner) constricted
♦ Air guide ahead of throttle valve blocked/cross-section constricted
♦ Exhaust system blocked/cross-section constricted
♦ Intake manifold pressure sensor - electr. plug connection loose, oxidized, corroded, interrupted
♦ Fault in area of intake manifold pressure sensor, throttle valve adjusting unit, ambient pressure sensor, Intake air temperature sensor, rpm sensor, valve lift control, camshaft adjustment

Fault setting condition(s)
● Unacceptably large deviation between measured mass air flow and calculated mass air flow (See ⓘ).

ⓘ INFORMATION
This diagnostic function monitors the intake system between the throttle valve and engine (intake valves).
♦ A mass air flow is calculated from the signals from the throttle valve potentiometer, engine speed sensor, intake air temperature sensor and ambient pressure sensor as well as other engine operating values.
♦ The calculated mass air flow is compared with that measured by the pressure sensor.
♦ A deviation may be due to both the calculated mass air flow and the measured mass air flow.

P1084

Diagnostic information - DME (DFI) control unit

Signal from boost pressure adjuster, bank 1, faulty
(Electronic adjuster for turbocharger)

Diagnostic conditions
- Ignition on, then:
  - Switch off ignition
  - Switch on ignition

Possible fault causes
♦ Loose contact or corrosion on connectors or lines (signal line feedback)
♦ Boost pressure adjuster (electronic adjuster for turbocharger) faulty

Fault effects
♦ Boost pressure control switched off (boost pressure low)
♦ Reduced engine torque

P1085

Diagnostic information - DME (DFI) control unit

Boost pressure adjuster, bank 1: electrical fault
(Electronic adjuster for turbocharger)

Diagnostic conditions
- Ignition on, then:
  - Switch off ignition
  - Switch on ignition

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Power supply or ground supply faulty
- ♦ Boost pressure adjuster (electronic adjuster for turbocharger) faulty

Fault effects
- ♦ Boost pressure control switched off (boost pressure low)
- ♦ Reduced engine torque

P1086

Diagnostic information - DME (DFI) control unit

Boost pressure adjuster, bank 1: electrical fault
(Electronic adjuster for turbocharger)

Diagnostic conditions
- Ignition on, then:
  - Switch off ignition
  - Switch on ignition

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Power supply or ground supply faulty
- ♦ Boost pressure adjuster (electronic adjuster for turbocharger) faulty

Fault effects
- ♦ Boost pressure control switched off (boost pressure low)
- ♦ Reduced engine torque

P1087

Diagnostic information - DME (DFI) control unit

Signal from boost pressure adjuster, bank 2, faulty
(Electronic adjuster for turbocharger)

Diagnostic conditions
- Ignition on, then:
  - Switch off ignition
  - Switch on ignition

Possible fault causes
♦ Loose contact or corrosion on connectors or lines (signal line feedback)
♦ Boost pressure adjuster (electronic adjuster for turbocharger) faulty

Fault effects
♦ Boost pressure control switched off (boost pressure low)
♦ Reduced engine torque

Diagnostic information - DME (DFI) control unit

Boost pressure adjuster, bank 2: electrical fault
(Electronic adjuster for turbocharger)

Diagnostic conditions
- Ignition on, then:
  - Switch off ignition
  - Switch on ignition

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Power supply or ground supply faulty
- ♦ Boost pressure adjuster (electronic adjuster for turbocharger) faulty

Fault effects
- ♦ Boost pressure control switched off (boost pressure low)
- ♦ Reduced engine torque

P1089

Diagnostic information - DME (DFI) control unit

Boost pressure adjuster, bank 2: electrical fault
(Electronic adjuster for turbocharger)

Diagnostic conditions
- Ignition on, then:
  - Switch off ignition
  - Switch on ignition

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Power supply or ground supply faulty
- ♦ Boost pressure adjuster (electronic adjuster for turbocharger) faulty

Fault effects
- ♦ Boost pressure control switched off (boost pressure low)
- ♦ Reduced engine torque

Diagnostic information - DME (DFI) control unit

Ambient temperature sensor: deviation
(See Air-conditioning system regulator)

Diagnostic conditions
- Time since ignition off > 8 hours, then:
  - Drive > 25 km/h (16 mph) > 45 s within the first 6 minutes after engine start
  - NO drop in temperatures (e.g. due to drive from a garage into a cooler environment)

Possible fault causes
♦ Short circuit to B+/ground/between lines or open circuit in the lines
♦ Ambient temperature sensor faulty

Fault setting condition(s)
- The temperature measured by the ambient temperature sensor (T050) deviates too much from the mean value of the engine, engine oil, intake air and ambient air temperatures (T160) (See ⓘ).

Fault effects
♦ Substitute value from model

ⓘ INFORMATION

Step 1
♦ When the engine is started after the ignition has been switched off for more than 8 hours, the engine coolant, engine oil, intake air and ambient air temperatures are compared with each other.
♦ They may deviate from the calculated mean value (T160) by only a certain amount (depending on the switch-off time).
♦ A suspected fault is set if the deviation is too large. However, the fault must still be confirmed in the second step.

Step 2
♦ Within the first six minutes after ignition on, a check is performed to determine whether the following conditions were met:
- Drive > 25 km/h (16 mph) for longer than 45 seconds in total
- None of the four temperatures decreased too much (e.g. due to drive from a garage into a cooler environment)

♦ If all conditions were met, the fault is entered in the fault memory.
♦ If one of the conditions was NOT met, the diagnostic result is rejected and NO fault is entered in the fault memory.
♦ If the vehicle is NOT driven within 6 minutes after starting and the aforementioned conditions are met, the suspected fault is rejected and NO fault is entered in the fault memory.

P1114

Diagnostic information - DME (DFI) control unit

Intake air temperature sensor: deviation

Diagnostic conditions
- Time since ignition off > 8 hours, then:
  - Drive > 25 km/h (16 mph) > 45 s within the first 6 minutes after engine start
  - NO drop in temperatures (e.g. due to drive from a garage into a cooler environment)

Possible fault causes
- Short circuit to B+/ground/between lines or open circuit in the lines
- Intake air temperature sensor faulty

Fault setting condition(s)
- The temperature measured by the intake air temperature sensor (T040) deviates too much from the mean value of the engine, engine oil, intake air and ambient air temperatures (T160) (See ⓘ)

Fault effects
- Substitute value from model

ⓘ INFORMATION

Step 1
- When the engine is started after the ignition has been switched off for more than 8 hours, the engine coolant, engine oil, intake air and ambient air temperatures are compared with each other.
- They may deviate from the calculated mean value (T160) by only a certain amount (depending on the switch-off time).
- A suspected fault is set if the deviation is too large. However, the fault must still be confirmed in the second step.

Step 2
- Within the first six minutes after ignition on, a check is performed to determine whether the following conditions were met:
  - Drive > 25 km/h (16 mph) for longer than 45 seconds in total
  - None of the four temperatures decreased too much (e.g. due to drive from a garage into a cooler environment)
- If all conditions were met, the fault is entered in the fault memory.
- If one of the conditions was NOT met, the diagnostic result is rejected and NO fault is entered in the fault memory.
- If the vehicle is NOT driven within 6 minutes after starting and the aforementioned conditions are met, the suspected fault is rejected and NO fault is entered in the fault memory.

Diagnostic information - DME (DFI) control unit

Oil pressure control valve: power supply

ⓘ INFORMATION

♦ The oil pressure control valve is supplied with 12 V while the engine is running.
♦ A short circuit to B+ can be detected only during control unit run-on.

Diagnostic conditions

- Engine running, then:
- Ignition off > 1 minute(s)

Possible fault causes

♦ Short circuit to B+ (power supply to oil pressure control valve)
♦ Oil pressure control valve faulty

P1148

Diagnostic information - DME (DFI) control unit

Oil pressure control valve: power supply

Diagnostic conditions
- Engine running

Possible fault causes
- Open circuit/short circuit to ground (power supply to oil pressure control valve)
- Short circuit to B+/ground or open circuit in the line (oil pressure control valve activation)
- Oil pressure control valve faulty

P1149

Diagnostic information - DME (DFI) control unit

Oil pressure control valve: power supply

Diagnostic conditions
- Engine running

Possible fault causes
- Open circuit/short circuit to ground (power supply to oil pressure control valve)
- Short circuit to B+/ground or open circuit in the line (oil pressure control valve activation)
- Oil pressure control valve faulty

Diagnostic information - DME (DFI) control unit

Oil pressure control valve: activation

ⓘ INFORMATION

♦ The oil pressure control valve is controlled via a PWM signal.
♦ The PWM signal depends, among other things, on the ambient conditions (temperatures, off time, etc.), operating point of the engine (rpm, load, oil temperature), measured oil pressure (at the oil pressure sensor) …
♦ A fault is detected if the PWM signal is outside a defined range for > 8 seconds.

Diagnostic conditions
● Engine running

Possible fault causes
♦ Short circuit to B+ (oil pressure control valve activation)
♦ Open circuit/short circuit to B+ (power supply to oil pressure control valve)
♦ Oil pressure control valve faulty

Diagnostic information - DME (DFI) control unit

Oil pressure control valve: activation

ⓘ INFORMATION

♦ The oil pressure control valve is controlled via a PWM signal.
♦ The PWM signal depends, among other things, on the ambient conditions (temperatures, off time, etc.), operating point of the engine (rpm, load, oil temperature), measured oil pressure (at the oil pressure sensor) …
♦ A fault is detected if the PWM signal is outside a defined range for > 8 seconds.
♦ The oil pressure is reduced to the minimum pressure in the event of a short circuit to ground.

Diagnostic conditions
● Engine running

Possible fault causes
♦ Short circuit to ground (oil pressure control valve activation)
♦ Open circuit/short circuit to ground (power supply to oil pressure control valve)
♦ Oil pressure control valve faulty

Fault effects
♦ Power supply to oil pressure control valve - is switched off

Diagnostic information - DME (DFI) control unit

Oil pressure control valve: activation

ⓘ INFORMATION

♦ The oil pressure control valve is controlled via a PWM signal.
♦ The PWM signal depends, among other things, on the ambient conditions (temperatures, off time, etc.), operating point of the engine (rpm, load, oil temperature), measured oil pressure (at the oil pressure sensor) …
♦ A fault is detected if the PWM signal is outside a defined range for > 8 seconds.

Diagnostic conditions
● Engine running

Possible fault causes
♦ Open circuit (oil pressure control valve activation)
♦ Open circuit/short circuit to ground (power supply to oil pressure control valve)
♦ Oil pressure control valve faulty

P1154

Diagnostic information - DME (DFI) control unit

Engine compartment temperature implausible

Diagnostic conditions
- Time since ignition off > 8 hours, then:
  - Drive > 25 km/h (16 mph) > 45 s within the first 6 minutes after engine start
  - NO drop in temperatures (e.g. due to drive from a garage into a cooler environment)

Possible fault causes
♦ Short circuit to B+/ground/between lines or open circuit in the lines
♦ Engine compartment temperature sensor faulty

Fault setting condition(s)
- The temperature measured by the engine compartment temperature sensor (T060) deviates too much from the mean value of the engine coolant, engine oil, intake air and ambient air temperatures (T160).

Fault effects
♦ Substitute value from model

ⓘ INFORMATION

Step 1
♦ When the engine is started after the ignition has been switched off for more than 8 hours, the engine coolant, engine oil, intake air and ambient air temperatures are compared with each other.
♦ They may deviate from the calculated mean value (T160) by only a certain amount (depending on the switch-off time).
♦ A suspected fault is set if the deviation is too large. However, the fault must still be confirmed in the second step.

Step 2
♦ Within the first six minutes after ignition on, a check is performed to determine whether the following conditions were met:
- Drive > 25 km/h (16 mph) for longer than 45 seconds in total
- None of the four temperatures decreased too much (e.g. due to drive from a garage into a cooler environment)

♦ If all conditions were met, the fault is entered in the fault memory.
♦ If one of the conditions was NOT met, the diagnostic result is rejected and NO fault is entered in the fault memory.
♦ If the vehicle is NOT driven within 6 minutes after starting and the aforementioned conditions are met, the suspected fault is rejected and NO fault is entered in the fault memory.

P1157

Diagnostic information - DME (DFI) control unit

Engine compartment temperature sensor

Diagnostic conditions
- Ignition on

Possible fault causes
- Short circuit to B+/ground/between lines or open circuit in the lines
- Engine compartment temperature sensor faulty

P1158

Diagnostic information - DME (DFI) control unit

Engine compartment temperature sensor

Diagnostic conditions
- Ignition on

Possible fault causes
- Short circuit to B+/ground/between lines or open circuit in the lines
- Engine compartment temperature sensor faulty

P115A

Diagnostic information - DME (DFI) control unit

Exhaust gas implausible, bank 1

Diagnostic conditions
Perform all short tests in sequence
or
● Engine temperature > 60 °C (140 °F)
● Time since engine start > 10 second(s)
● Catalytic converter temperature 540 ... 750 °C (1,004 ... 1,382 °F)
● Drive for 60 seconds with slight acceleration at 40 ... 130 km/h (24 … 80 mph)
● Active carbon filter loading < 0.7
● Engine speed < 3,000 rpm
● Lambda control ahead of catalytic converter active
● Lambda control behind catalytic converter active
● None of the following faults stored: Oxygen sensor(s) - electrical fault, intake manifold pressure sensor or throttle adjusting unit

Possible fault causes
♦ Oxygen sensor downstream of catalytic converter, bank 1 faulty

Fault setting condition(s)
● The oxygen sensor ahead of the bank 1 catalytic converter measures the corresponding oxygen value after mixture lean-out/enrichment.
● Despite a sufficiently long waiting time, the corresponding voltage limit value (< 150 mV / > 800 mV) is not reached at the oxygen sensor behind the bank 1 catalytic converter.

Diagnostic information - DME (DFI) control unit

Exhaust gas implausible, bank 2

Diagnostic conditions
Perform all short tests in sequence
or
● Engine temperature > 60 °C (140 °F)
● Time since engine start > 10 second(s)
● Catalytic converter temperature 540 ... 750 °C (1,004 ... 1,382 °F)
● Drive for 60 seconds with slight acceleration at 40 ... 130 km/h (24 … 80 mph)
● Active carbon filter loading < 0.7
● Engine speed < 3,000 rpm
● Lambda control ahead of catalytic converter active
● Lambda control behind catalytic converter active
● None of the following faults stored: Oxygen sensor(s) - electrical fault, intake manifold pressure sensor or throttle valve adjusting unit

Possible fault causes
♦ Oxygen sensor downstream of catalytic converter, bank 2 faulty

Fault setting condition(s)
● The oxygen sensor ahead of the bank 2 catalytic converter measures the corresponding oxygen value after mixture lean-out/enrichment.
● Despite a sufficiently long waiting time, the corresponding voltage limit value (< 150 mV / > 800 mV) is not reached at the oxygen sensor behind the bank 2 catalytic converter.

Diagnostic information - DME (DFI) control unit

Exhaust gas implausible, bank 1

Diagnostic conditions
Perform all short tests in sequence
or
● Engine temperature > 60 °C (140 °F)
● Time since engine start > 10 second(s)
● Catalytic converter temperature 540 ... 750 °C (1,004 ... 1,382 °F)
● Drive for 60 seconds with slight acceleration at 40 ... 130 km/h (24 … 80 mph)
● Active carbon filter loading < 0.7
● Engine speed < 3,000 rpm
● Lambda control ahead of catalytic converter active
● Lambda control behind catalytic converter active
● None of the following faults stored: Oxygen sensor(s) - electrical fault, intake manifold pressure sensor or throttle adjusting unit

Possible fault causes
♦ Oxygen sensor downstream of catalytic converter, bank 1 faulty

Fault setting condition(s)
● The oxygen sensor ahead of the bank 1 catalytic converter measures the corresponding oxygen value after mixture lean-out/enrichment.
● Despite a sufficiently long waiting time, the corresponding voltage limit value (< 150 mV / > 800 mV) is not reached at the oxygen sensor behind the bank 1 catalytic converter.

Diagnostic information - DME (DFI) control unit

Exhaust gas implausible, bank 2

Diagnostic conditions
Perform all short tests in sequence
or
● Engine temperature > 60 °C (140 °F)
● Time since engine start > 10 second(s)
● Catalytic converter temperature 540 ... 750 °C (1,004 ... 1,382 °F)
● Drive for 60 seconds with slight acceleration at 40 ... 130 km/h (24 … 80 mph)
● Active carbon filter loading < 0.7
● Engine speed < 3,000 rpm
● Lambda control ahead of catalytic converter active
● Lambda control behind catalytic converter active
● None of the following faults stored: Oxygen sensor(s) - electrical fault, intake manifold pressure sensor or throttle valve adjusting unit

Possible fault causes
♦ Oxygen sensor downstream of catalytic converter, bank 2 faulty

Fault setting condition(s)
● The oxygen sensor ahead of the bank 2 catalytic converter measures the corresponding oxygen value after mixture lean-out/enrichment.
● Despite a sufficiently long waiting time, the corresponding voltage limit value (< 150 mV / > 800 mV) is not reached at the oxygen sensor behind the bank 2 catalytic converter.

P1165

Diagnostic information - DME (DFI) control unit

Boost pressure adjuster driver, bank 1
(Electronic adjuster for turbocharger)

Diagnostic conditions
- Switch on ignition

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Boost pressure adjuster (electronic adjuster for turbocharger) faulty

Fault effects
- ♦ Boost pressure control switched off (boost pressure low)
- ♦ Reduced engine torque

P1166

Diagnostic information - DME (DFI) control unit

Boost pressure adjuster driver, bank 1
(Electronic adjuster for turbocharger)

Diagnostic conditions
- Switch on ignition

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Boost pressure adjuster (electronic adjuster for turbocharger) faulty

Fault effects
- ♦ Boost pressure control switched off (boost pressure low)
- ♦ Reduced engine torque

P1167

Diagnostic information - DME (DFI) control unit

Boost pressure adjuster driver, bank 1
(Electronic adjuster for turbocharger)

Diagnostic conditions
- Switch on ignition

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Boost pressure adjuster (electronic adjuster for turbocharger) faulty

Fault effects
- ♦ Boost pressure control switched off (boost pressure low)
- ♦ Reduced engine torque

P1168

Diagnostic information - DME (DFI) control unit

Boost pressure adjuster driver, bank 2
(Electronic adjuster for turbocharger)

Diagnostic conditions
- Switch on ignition

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Boost pressure adjuster (electronic adjuster for turbocharger) faulty

Fault effects
- ♦ Boost pressure control switched off (boost pressure low)
- ♦ Reduced engine torque

P1169

Diagnostic information - DME (DFI) control unit

Boost pressure adjuster driver, bank 2
(Electronic adjuster for turbocharger)

Diagnostic conditions
- Switch on ignition

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Boost pressure adjuster (electronic adjuster for turbocharger) faulty

Fault effects
- ♦ Boost pressure control switched off (boost pressure low)
- ♦ Reduced engine torque

P1170

Diagnostic information - DME (DFI) control unit

Boost pressure adjuster driver, bank 2
(Electronic adjuster for turbocharger)

Diagnostic conditions
- Switch on ignition

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Boost pressure adjuster (electronic adjuster for turbocharger) faulty

Fault effects
- ♦ Boost pressure control switched off (boost pressure low)
- ♦ Reduced engine torque

Diagnostic information - DME (DFI) control unit

Intake manifold pressure sensor: electrical fault

Diagnostic conditions
- Ignition on or engine running
- None of the following faults stored: P0234, P1638, P1639, P0107, P0108, P2228, P2229

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Ground supply faulty
- ♦ Intake manifold pressure sensor faulty

- **Turbo only**
  - Only if fault P1189 or P1190 (boost pressure sensor) is entered at the same time:
- ♦ Leak in vacuum hose at boost pressure control cycle valve or wastegate
- ♦ Boost pressure control cycle valve leaking
- ♦ Wastegate leaking

Fault setting condition(s)
- The actual value exceeds the defined upper or lower limit (H065)

Fault effects
- ♦ Substitute value from model

Diagnostic information - DME (DFI) control unit

Intake manifold pressure sensor: electrical fault

Diagnostic conditions
- Ignition on or engine running
- None of the following faults stored: P0234, P1638, P1639, P0107, P0108, P2228, P2229

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Ground supply faulty
- ♦ Intake manifold pressure sensor faulty

- **Turbo only**
  - Only if fault P1189 or P1190 (boost pressure sensor) is entered at the same time:
- ♦ Leak in vacuum hose at boost pressure control cycle valve or wastegate
- ♦ Boost pressure control cycle valve leaking
- ♦ Wastegate leaking

Fault setting condition(s)
- The actual value exceeds the defined upper or lower limit (H065)

Fault effects
- ♦ Substitute value from model

Diagnostic information - DME (DFI) control unit

Ambient pressure sensor implausible

Diagnostic conditions
- Ignition on > 10 second(s)
- then: Acceleration with wide-open throttle for as long as possible, immediately followed by an overrun phase lasting as long as possible
- None of the following faults stored: P1638, P1639, P0107, P0108, P2228, P2229, P1183, P1184, P1187, P1188, P1189, P1190

Possible fault causes
- Fault P0069 also entered:
  - ♦ Intake manifold pressure sensor fault

- No fault P0069 entered:
  - ♦ DME (DFI) control unit faulty

Fault effects
- ♦ Substitute value from model

P1187

Diagnostic information - DME (DFI) control unit

Ambient pressure sensor: electrical fault

Diagnostic conditions
- Ignition on or engine running
- None of the following faults stored: P1638, P1639, P0107, P0108, P2228, P2229

Possible fault causes
♦ DME (DFI) control unit faulty

Fault setting condition(s)
- The actual value exceeds the defined upper or lower limit.
  > *A060-Ambient pressure from DME (measured)* <

Fault effects
♦ Substitute value from model

Diagnostic information - DME (DFI) control unit

Ambient pressure sensor: electrical fault

Diagnostic conditions
- Ignition on or engine running
- None of the following faults stored: P1638, P1639, P0107, P0108, P2228, P2229

Possible fault causes
♦ DME (DFI) control unit faulty

Fault setting condition(s)
- The actual value exceeds the defined upper or lower limit.
  > *A060-Ambient pressure from DME (measured)* <

Fault effects
♦ Substitute value from model

P1189

Diagnosis information - Control unit DME (DFI)

Boost-pressure sensor (Pressure sensor forward Throttle valve) Electrical fault

Diagnostic conditions

- Ignition on or Engine running

- none of the following faults stored: P0234, P0237, P0238, P0107, P0108, P2228, P2229

Possible fault causes

♦ Loose contact or corrosion on connectors or lines
♦ Ground supply Faulty
♦ **Boost-pressure sensor** Faulty

- **Only if fault P1183 or P1184 (**Intake manifold pressure sensor**) is entered at the same time:**
  ♦ **Vacuum hose** leaks to **Frequency valve, boost control** or Wastegate
  ♦ **Frequency valve, boost control** leaks
  ♦ Wastegate leaks

Fault setting condition(s)

- The actual value exceeds the defined upper or lower limit.
  > **H210 Boost pressure actual value (measured)** <

Fault effects

♦ Substitute value from model

P1190

Diagnosis information - Control unit DME (DFI)

Boost-pressure sensor (Pressure sensor forward Throttle valve) Electrical fault

Diagnostic conditions

- Ignition on or Engine running

- none of the following faults stored: P0234, P0237, P0238, P0107, P0108, P2228, P2229

Possible fault causes

♦ Loose contact or corrosion on connectors or lines
♦ Ground supply Faulty
♦ **Boost-pressure sensor** Faulty

- **Only if fault P1183 or P1184 (**Intake manifold pressure sensor**) is entered at the same time:**
  ♦ **Vacuum hose** leaks to **Frequency valve, boost control** or Wastegate
  ♦ **Frequency valve, boost control** leaks
  ♦ Wastegate leaks

Fault setting condition(s)

- The actual value exceeds the defined upper or lower limit.
  > **H210 Boost pressure actual value (measured)** <

Fault effects

♦ Substitute value from model

P1251

Diagnostic information - DME (DFI) control unit

Signal to boost pressure adjuster, bank 1, faulty
(Electronic adjuster for turbocharger)

Diagnostic conditions
- Ignition on, then:
  - Switch off ignition
  - Switch on ignition

Possible fault causes
- Voltage drop, at:
  - Engine start
- Power supply or ground supply faulty
- Loose contact or corrosion on connectors or lines (signal line request)
- Boost pressure adjuster (electronic adjuster for turbocharger) faulty

Fault setting condition(s)
- The electronic adjuster indicates that the signal from the DME (DFI) control unit is faulty (frequency, periods, ...).

Fault effects
- The signal from the DME (DFI) control unit is not used by the electronic adjuster.
- Boost pressure control switched off (boost pressure low)
- Reduced engine torque

Diagnostic information - DME (DFI) control unit

Boost pressure adjuster, bank 1, sluggish
(Electronic adjuster for turbocharger)

Diagnostic conditions
- Driving (different load ranges), then:
  - Switch off ignition
  - Switch on ignition

Possible fault causes
♦ Connecting rod (ball socket) stiff/faulty (electronic adjuster for turbocharger <=> turbocharger)
♦ Boost pressure adjuster (electronic adjuster for turbocharger) stiff/faulty
♦ Turbocharger stiff/faulty

Fault setting condition(s)
- The electronic adjuster indicates that the current position deviates by at least 2.5° from the required position for more than 2 s.

Fault effects
♦ Boost pressure control switched off (boost pressure low)
♦ Reduced engine torque

P1253

Diagnostic information - DME (DFI) control unit

Boost pressure adjuster adjustment range, bank 1
(Electronic adjuster for turbocharger)

Diagnostic conditions
- Ignition on, then:
  - Switch off ignition
  - Switch on ignition

Possible fault causes
♦ Turbocharger not adapted following replacement
♦ Electronic adjuster for turbocharger has no or incorrect basic setting/adaptation
♦ Electronic adjuster for turbocharger stiff/faulty
♦ Connecting rod broken/disengaged/blocked (electronic adjuster for turbocharger - turbocharger)
♦ Turbocharger sluggish/jammed

Fault setting condition(s)
- The electronic adjuster indicates that the current adjustment range of the boost pressure adjuster deviates from the adjustment range taught during the teaching process (is exceeded or not reached).

Fault effects
♦ Boost pressure control switched off (boost pressure low)
♦ Reduced engine torque

Diagnostic information - DME (DFI) control unit

Boost pressure adjuster temperature, bank 1
(Electronic adjuster for turbocharger)

Diagnostic conditions
● Engine running

Possible fault causes
♦ Heat shield damaged
♦ Boost pressure adjuster (electronic adjuster for turbocharger) - exhaust system, distance too low

Fault setting condition(s)
● Boost pressure adjuster (electronic adjuster for turbocharger) temperature > 135 °C

Fault effects
♦ Boost pressure control switched off (boost pressure low)
♦ Reduced engine torque

P1255

Diagnostic information - DME (DFI) control unit

Signal to boost pressure adjuster, bank 2, faulty
(Electronic adjuster for turbocharger)

Diagnostic conditions
- Ignition on, then:
  - Switch off ignition
  - Switch on ignition

Possible fault causes
- Voltage drop, at:
  - Engine start
- Power supply or ground supply faulty
- Loose contact or corrosion on connectors or lines (signal line request)
- Boost pressure adjuster (electronic adjuster for turbocharger) faulty

Fault setting condition(s)
- The electronic adjuster indicates that the signal from the DME (DFI) control unit is faulty (frequency, periods, ...).

Fault effects
- The signal from the DME (DFI) control unit is not used by the electronic adjuster.
- Boost pressure control switched off (boost pressure low)
- Reduced engine torque

Diagnostic information - DME (DFI) control unit

Boost pressure adjuster, bank 2, sluggish
(Electronic adjuster for turbocharger)

Diagnostic conditions
- Driving (different load ranges), then:
  - Switch off ignition
  - Switch on ignition

Possible fault causes
♦ Connecting rod (ball socket) stiff/faulty (electronic adjuster for turbocharger <=> turbocharger)
♦ Boost pressure adjuster (electronic adjuster for turbocharger) stiff/faulty
♦ Turbocharger stiff/faulty

Fault setting condition(s)
- The electronic adjuster indicates that the current position deviates by at least 2.5° from the required position for more than 2 s.

Fault effects
♦ Boost pressure control switched off (boost pressure low)
♦ Reduced engine torque

Diagnostic information - DME (DFI) control unit

Boost pressure adjuster adjustment range, bank 2
(Electronic adjuster for turbocharger)

Diagnostic conditions
- Ignition on, then:
  - Switch off ignition
  - Switch on ignition

Possible fault causes
♦ Turbocharger not adapted following replacement
♦ Electronic adjuster for turbocharger has no or incorrect basic setting/adaptation
♦ Electronic adjuster for turbocharger stiff/faulty
♦ Connecting rod broken/disengaged/blocked (electronic adjuster for turbocharger - turbocharger)
♦ Turbocharger sluggish/jammed

Fault setting condition(s)
- The electronic adjuster indicates that the current adjustment range of the boost pressure adjuster deviates from the adjustment range taught during the teaching process (is exceeded or not reached).

Fault effects
♦ Boost pressure control switched off (boost pressure low)
♦ Reduced engine torque

P1258

Diagnostic information - DME (DFI) control unit

Boost pressure adjuster temperature, bank 2
(Electronic adjuster for turbocharger)

Diagnostic conditions
● Engine running

Possible fault causes
♦ Heat shield damaged
♦ Boost pressure adjuster (electronic adjuster for turbocharger) - exhaust system, distance too low

Fault setting condition(s)
● Boost pressure adjuster (electronic adjuster for turbocharger) temperature > 135 °C

Fault effects
♦ Boost pressure control switched off (boost pressure low)
♦ Reduced engine torque

P1261

Diagnostic information - DME (DFI) control unit

Boost pressure adjuster, bank 1, not adapted
(Electronic adjuster for turbocharger)

Diagnostic conditions
- Ignition on, then:
  - Switch off ignition
  - Switch on ignition

Possible fault causes
♦ Bank 1 boost pressure adjuster (electronic adjuster for turbocharger) not adapted

Fault effects
♦ Boost pressure control switched off (boost pressure low)
♦ Reduced engine torque

Diagnostic information - DME (DFI) control unit

Boost pressure adjuster, bank 2, not adapted
(Electronic adjuster for turbocharger)

Diagnostic conditions
- Ignition on, then:
  - Switch off ignition
  - Switch on ignition

Possible fault causes
♦ Bank 1 boost pressure adjuster (electronic adjuster for turbocharger) not adapted

Fault effects
♦ Boost pressure control switched off (boost pressure low)
♦ Reduced engine torque

P1265

Diagnostic information - DME (DFI) control unit

Crash signal

Diagnostic conditions
● Ignition on

Possible fault causes
♦ Short circuit to B+/ground or open circuit in the wiring for the signal line (airbag triggering unit)

P1280

Diagnostic information - DME (DFI) control unit

Fuel pump control unit
- Only for rear-wheel drive vehicles

Diagnostic conditions
- Engine start (electric fuel pump activated)

Possible fault causes
- Fuel pump control unit faulty

P1280

Diagnostic information - DME (DFI) control unit

Fuel pump control unit
- Only for all-wheel drive vehicles

Diagnostic conditions
- Switch on ignition or engine start (electric fuel pump activated)

Possible fault causes
♦ Fuel pump control unit implausible

Fault effects
♦ The control unit attempts to bring the fuel pump to the setpoint value.

Diagnostic information - DME (DFI) control unit

Electric fuel pump: electrical fault
● Only for rear-wheel drive vehicles

Diagnostic conditions
● Engine start (electric fuel pump activated)

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Short circuit to B+/ground/between lines or open circuit in wiring for fuel pump control unit ⇒ Electric fuel pump
♦ Open circuit in ground line for electric fuel pump
♦ Electric fuel pump faulty

P1281

Diagnostic information - DME (DFI) control unit

Fuel pump control unit: overtemperature
● Only for all-wheel drive vehicles

Diagnostic conditions
● Switch on ignition or engine start (electric fuel pump activated)

Possible fault causes
♦ Overloading of fuel pump control unit

Fault effects
♦ The control unit attempts to bring the fuel pump to the setpoint value.

Diagnostic information - DME (DFI) control unit

Electric fuel pump: sluggish

Diagnostic conditions
- Switch on ignition or engine start (electric fuel pump activated)

Possible fault causes
- Foreign body in electric fuel pump
- Fuel line blocked
- Electric fuel pump faulty

Fault setting condition(s)
- Current draw max. 30% > setpoint value

Fault effects
- The control unit attempts to bring the fuel pump to the setpoint value.

Diagnostic information - DME (DFI) control unit

Electric fuel pump: electrical fault
● Only for rear-wheel drive vehicles

Diagnostic conditions
● Engine start (electric fuel pump activated)

Possible fault causes
♦ Supply voltage for fuel pump control unit too low
♦ Supply voltage for fuel pump control unit too high
♦ Loose contact or corrosion on connectors or lines

Fault setting condition(s)
● Supply voltage for fuel pump control unit < 3 V
or
● Supply voltage for fuel pump control unit > 15 V for > 1 hour(s)
or
● Supply voltage for fuel pump control unit > 17 V for > 1 minute(s)

P1283

Diagnostic information - DME (DFI) control unit

Electric fuel pump: blocked
- Only for all-wheel drive vehicles

Diagnostic conditions
- Switch on ignition or engine start (electric fuel pump activated)

Possible fault causes
- Foreign body in electric fuel pump
- Electric fuel pump faulty

Fault setting condition(s)
- Current draw at least 30% > setpoint value

Fault effects
- The control unit attempts to bring the fuel pump to the setpoint value.

P1284

Diagnostic information - DME (DFI) control unit

Electric fuel pump: electrical fault

Diagnostic conditions
- Switch on ignition or engine start (electric fuel pump activated)

Possible fault causes
- ♦ Short circuit in lines for fuel pump control unit ⇒ Electric fuel pump
- ♦ Electric fuel pump faulty

Fault effects
- ♦ Electric fuel pump switched off
- ♦ Electric fuel pump activated and tested after 50 ... 150 millisecond(s)

Diagnostic information - DME (DFI) control unit

Electric fuel pump: electrical fault

Diagnostic conditions
- Switch on ignition or engine start (electric fuel pump activated)

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Open circuit in lines for fuel pump control unit ⇒ Electric fuel pump
- Open circuit in ground line for electric fuel pump
- Electric fuel pump faulty

Fault effects
- Electric fuel pump switched off
- Electric fuel pump activated and tested after 50 ... 150 millisecond(s)

Diagnostic information - DME (DFI) control unit

Speed deviation

Diagnostic conditions
- Switch on ignition or engine start (electric fuel pump activated)

Possible fault causes
- Supply voltage for fuel pump control unit too low
- Loose contact or corrosion on connectors or lines
- Leak in fuel line
- Fuel line blocked
- Foreign body in electric fuel pump
- Electric fuel pump sluggish

Fault setting condition(s)
- Speed of electric fuel pump deviates from setpoint speed, at:
  - Supply voltage for fuel pump control unit < 12.5 V
  - Fuel counter-pressure too high
  - Fuel counter-pressure too low
  - Electric fuel pump sluggish

Fault effects
- The control unit attempts to bring the fuel pump to the setpoint value.

P1287

Diagnostic information - DME (DFI) control unit

Electric fuel pump: brief failure

Diagnostic conditions
- Switch on ignition or engine start (electric fuel pump activated)

Possible fault causes
♦ Loose contact or corrosion on connectors or lines

Fault setting condition(s)
- Electric fuel pump failed briefly while driving

Fault effects
♦ The control unit attempts to bring the fuel pump to the setpoint value.

Diagnostic information - DME (DFI) control unit

Fuel high-pressure sensor implausible

ⓘ INFORMATION

♦ Faults in the fuel high-pressure injection system area are frequently caused by defects in the pre-delivery circuit (fuel low pressure).
♦ Therefore, the pre-delivery circuit must be checked first in case of problems in the area of the fuel high-pressure injection system.

Diagnostic conditions
- Time since engine start > 250 second(s)
- Engine temperature - 10 ... +100 °C (14 … 212 °F)
- Engine speed 450 .... 4,000 rpm
- Lambda control active

Possible fault causes
♦ Pre-delivery quantity or pressure in the fuel low-pressure circuit too low
♦ Fuel high-pressure system leaking
♦ Fuel high-pressure sensor faulty
♦ Fuel high-pressure pump faulty

Fault setting condition(s)
Long-term deviation in fuel high-pressure actual value - setpoint value
(The setpoint value is calculated using several variables, e.g. lambda control, quantity control valve, ...).

Diagnostic information - DME (DFI) control unit

Fuel high-pressure sensor implausible

ⓘ INFORMATION

♦ Faults in the fuel high-pressure injection system area are frequently caused by defects in the pre-delivery circuit (fuel low pressure).
♦ Therefore, the pre-delivery circuit must be checked first in case of problems in the area of the fuel high-pressure injection system.

Diagnostic conditions
- Time since engine start > 250 second(s)
- Engine temperature - 10 ... +100 °C (14 … 212 °F)
- Engine speed 450 .... 4,000 rpm
- Lambda control active

Possible fault causes
♦ Pre-delivery quantity or pressure in the fuel low-pressure circuit too low
♦ Fuel high-pressure system leaking
♦ Fuel high-pressure sensor faulty
♦ Fuel high-pressure pump faulty

Fault setting condition(s)
Long-term deviation in fuel high-pressure actual value - setpoint value
(The setpoint value is calculated using several variables, e.g. lambda control, quantity control valve, ...).

Diagnostic information - DME (DFI) control unit

Bank 2 intake camshaft timing

Diagnostic conditions
- Time since engine start > 10 second(s)

Possible fault causes
- ♦ Timing wrong (chain jump)
- ♦ Camshaft sensor loose
- ♦ Timing set incorrectly (after repairs)
- ♦ Hall sender rotor (camshaft) wrong or damaged

Fault setting condition(s)
Current timing <> stored timing (last engine run)

Diagnostic information - DME (DFI) control unit

Bank 1 intake camshaft timing

Diagnostic conditions
- Time since engine start > 10 second(s)

Possible fault causes
- ♦ Timing wrong (chain jump)
- ♦ Camshaft sensor loose
- ♦ Timing set incorrectly (after repairs)
- ♦ Hall sender rotor (camshaft) wrong or damaged

Fault setting condition(s)
Current timing <> stored timing (last engine run)

P1346

Diagnostic information - DME (DFI) control unit

Valve lift control, bank 1

Diagnostic conditions
- Perform a short test

or
- Driving with slight acceleration, with:
  - Small lift (actual value A220):
    - Time since engine start > 5 minute(s)
    - Engine speed 1,250 ... 1,600 rpm (actual value A020)
    - Mass air flow 180 … 350 mg/stroke (actual value H010)
  - Large lift (actual value A220):
    - Time since engine start > 5 minute(s)
    - Engine speed 1,250 ... 2,100 rpm (actual value A020)
    - Mass air flow 300 … 600 mg/stroke (actual value H010)

Possible fault causes
- ♦ Dynamic driving style when oil level is near minimum (oil foaming)
- ♦ Engine oil pressure too high or too low
- ♦ Loose contact or corrosion on connectors or lines (power supply for solenoid valve for hydraulic valve lift control)

Fault setting condition(s)
Based on the oscillation behavior of the camshafts, the diagnostic function detects that all the valves have either not switched to the other lift or have not switched quickly enough during valve lift switchover.

Diagnostic information - DME (DFI) control unit

Valve lift control, bank 2

Diagnostic conditions
- Perform a short test

or
- Driving with slight acceleration, with:
  - Small lift:
    - Time since engine start > 5 minute(s)
    - Engine speed 1,250 ... 1,600 rpm (actual value A020)
    - Mass air flow 180 … 350 mg/stroke (actual value H010)
  - Large lift (actual value A220):
    - Time since engine start > 5 minute(s)
    - Engine speed 1,250 ... 2,100 rpm (actual value A020)
    - Mass air flow 300 … 600 mg/stroke (actual value H010)

Possible fault causes
- ♦ Dynamic driving style when oil level is near minimum (oil foaming)
- ♦ Engine oil pressure too high or too low
- ♦ Loose contact or corrosion on connectors or lines (power supply for solenoid valve for hydraulic valve lift control)

Fault setting condition(s)
Based on the oscillation behavior of the camshafts, the diagnostic function detects that all the valves have either not switched to the other lift or have not switched quickly enough during valve lift switchover.

P1359

Diagnostic information - DME (DFI) control unit

Valve lift control, cylinder **1**

Diagnostic conditions
- Driving (partial load) > 5 minute(s), with:
  - Engine speed 1,600 ... 3,000 rpm (actual value A020)
  - Mass air flow 180 … 350 mg/stroke (actual value H010)
- then engine running > 2 minute(s) with:
  - Mass air flow 90 … 120 mg/stroke (actual value H010)

Possible fault causes
- ♦ Dynamic driving style when oil level is near minimum (oil foaming)
- ♦ Engine oil pressure too high or too low
- ♦ Fuel injector faulty or borderline
  (opens too late/not long enough/not enough or leaking)
- ♦ Bar ignition module faulty
- ♦ Leak in intake-air distributor
- ♦ Insufficient compression
  (e.g. cylinder liner damaged, valve seat ring faulty, ...)
- ♦ Valve lifter faulty
  (Intake valve has not switched to the other lift or has not switched quickly enough)

Fault setting condition(s)
- The diagnostic function detects uneven running for the specified cylinder.
- Uneven running is calculated from the expected and actual crankshaft acceleration due to combustion.
- Uneven running is interpreted as a misfire or valve lift fault, depending on type.

Diagnostic information - DME (DFI) control unit

Valve lift control, cylinder **6**

Diagnostic conditions
- Driving (partial load) > 5 minute(s), with:
  - Engine speed 1,600 ... 3,000 rpm (actual value A020)
  - Mass air flow 180 … 350 mg/stroke (actual value H010)
- then engine running > 2 minute(s) with:
  - Mass air flow 90 … 120 mg/stroke (actual value H010)

Possible fault causes
- ♦ Dynamic driving style when oil level is near minimum (oil foaming)
- ♦ Engine oil pressure too high or too low
- ♦ Fuel injector faulty or borderline
  (opens too late/not long enough/not enough or leaking)
- ♦ Bar ignition module faulty
- ♦ Leak in intake-air distributor
- ♦ Insufficient compression
  (e.g. cylinder liner damaged, valve seat ring faulty, ...)
- ♦ Valve lifter faulty
  (Intake valve has not switched to the other lift or has not switched quickly enough)

Fault setting condition(s)
- The diagnostic function detects uneven running for the specified cylinder.
- Uneven running is calculated from the expected and actual crankshaft acceleration due to combustion.
- Uneven running is interpreted as a misfire or valve lift fault, depending on type.

P1361

Diagnostic information - DME (DFI) control unit

Valve lift control, cylinder **2**

Diagnostic conditions
- Driving (partial load) > 5 minute(s), with:
  - Engine speed 1,600 ... 3,000 rpm (actual value A020)
  - Mass air flow 180 … 350 mg/stroke (actual value H010)
- then engine running > 2 minute(s) with:
  - Mass air flow 90 … 120 mg/stroke (actual value H010)

Possible fault causes
- ♦ Dynamic driving style when oil level is near minimum (oil foaming)
- ♦ Engine oil pressure too high or too low
- ♦ Fuel injector faulty or borderline
  (opens too late/not long enough/not enough or leaking)
- ♦ Bar ignition module faulty
- ♦ Leak in intake-air distributor
- ♦ Insufficient compression
  (e.g. cylinder liner damaged, valve seat ring faulty, ...)
- ♦ Valve lifter faulty
  (Intake valve has not switched to the other lift or has not switched quickly enough)

Fault setting condition(s)
- The diagnostic function detects uneven running for the specified cylinder.
- Uneven running is calculated from the expected and actual crankshaft acceleration due to combustion.
- Uneven running is interpreted as a misfire or valve lift fault, depending on type.

P1362

Diagnostic information - DME (DFI) control unit

Valve lift control, cylinder **4**

Diagnostic conditions
- Driving (partial load) > 5 minute(s), with:
  - Engine speed 1,600 ... 3,000 rpm (actual value A020)
  - Mass air flow 180 … 350 mg/stroke (actual value H010)
- then engine running > 2 minute(s) with:
  - Mass air flow 90 … 120 mg/stroke (actual value H010)

Possible fault causes
- ♦ Dynamic driving style when oil level is near minimum (oil foaming)
- ♦ Engine oil pressure too high or too low
- ♦ Fuel injector faulty or borderline
  (opens too late/not long enough/not enough or leaking)
- ♦ Bar ignition module faulty
- ♦ Leak in intake-air distributor
- ♦ Insufficient compression
  (e.g. cylinder liner damaged, valve seat ring faulty, ...)
- ♦ Valve lifter faulty
  (Intake valve has not switched to the other lift or has not switched quickly enough)

Fault setting condition(s)
- The diagnostic function detects uneven running for the specified cylinder.
- Uneven running is calculated from the expected and actual crankshaft acceleration due to combustion.
- Uneven running is interpreted as a misfire or valve lift fault, depending on type.

Diagnostic information - DME (DFI) control unit

Valve lift control, cylinder **3**

Diagnostic conditions
- Driving (partial load) > 5 minute(s), with:
  - Engine speed 1,600 ... 3,000 rpm (actual value A020)
  - Mass air flow 180 … 350 mg/stroke (actual value H010)
- then engine running > 2 minute(s) with:
  - Mass air flow 90 … 120 mg/stroke (actual value H010)

Possible fault causes
- ♦ Dynamic driving style when oil level is near minimum (oil foaming)
- ♦ Engine oil pressure too high or too low
- ♦ Fuel injector faulty or borderline
  (opens too late/not long enough/not enough or leaking)
- ♦ Bar ignition module faulty
- ♦ Leak in intake-air distributor
- ♦ Insufficient compression
  (e.g. cylinder liner damaged, valve seat ring faulty, ...)
- ♦ Valve lifter faulty
  (Intake valve has not switched to the other lift or has not switched quickly enough)

Fault setting condition(s)
- The diagnostic function detects uneven running for the specified cylinder.
- Uneven running is calculated from the expected and actual crankshaft acceleration due to combustion.
- Uneven running is interpreted as a misfire or valve lift fault, depending on type.

Diagnostic information - DME (DFI) control unit

Valve lift control, cylinder **5**

Diagnostic conditions
- Driving (partial load) > 5 minute(s), with:
  - Engine speed 1,600 ... 3,000 rpm (actual value A020)
  - Mass air flow 180 … 350 mg/stroke (actual value H010)
- then engine running > 2 minute(s) with:
  - Mass air flow 90 … 120 mg/stroke (actual value H010)

Possible fault causes
- ♦ Dynamic driving style when oil level is near minimum (oil foaming)
- ♦ Engine oil pressure too high or too low
- ♦ Fuel injector faulty or borderline
  (opens too late/not long enough/not enough or leaking)
- ♦ Bar ignition module faulty
- ♦ Leak in intake-air distributor
- ♦ Insufficient compression
  (e.g. cylinder liner damaged, valve seat ring faulty, ...)
- ♦ Valve lifter faulty
  (Intake valve has not switched to the other lift or has not switched quickly enough)

Fault setting condition(s)
- The diagnostic function detects uneven running for the specified cylinder.
- Uneven running is calculated from the expected and actual crankshaft acceleration due to combustion.
- Uneven running is interpreted as a misfire or valve lift fault, depending on type.

P1372

Diagnostic information - DME (DFI) control unit

Valve lift control, bank 1

Diagnostic conditions

- Perform a short test

or:

- **Engine oil temperature** < 111 °C (232 °F)

- Small lift:
  - **Engine speed** 1,500 ... 3,000 rpm
  - Mass air flow
    - > 500 … > 100 mg/stroke (depending on: **engine speed**)

- Large lift:
  - **Engine speed** 2,000 ... 5,000 rpm
  - Mass air flow
    - > 700 … > 300 mg/stroke (depending on: **engine speed**)

Possible fault causes

♦ Dynamic driving style when oil level is near minimum (oil foaming)
♦ Oil supply too low
⇒ (e.g. dirty (oil circuit), ...)
♦ Large differences in exhaust backpressure between banks (e.g. due to constricted or blocked passage of an exhaust branch).
♦ **Electronic adjuster for turbocharger** disengaged
♦ Wrong timing, one bank (**intake camshaft** or **exhaust camshaft**)
♦ **Solenoid valve for hydraulic valve lift control** faulty
⇒ (mechanical fault or electrical fault in circuit)
♦ 1 **oxygen sensor(s)** aged or faulty

Fault setting condition(s)

- Based on the lambda controllers, the diagnostic function detects that all the valves on this bank have either not switched to the other lift or have not switched quickly enough during valve lift switchover.

P1373

Diagnostic information - DME (DFI) control unit

Valve lift control, bank 2

Diagnostic conditions

- Perform a short test

or:

- **Engine oil temperature** < 111 °C (232 °F)

- Small lift:
  - **Engine speed** 1,500 ... 3,000 rpm
  - Mass air flow
    - > 500 … > 100 mg/stroke (depending on: **engine speed**)

- Large lift:
  - **Engine speed** 2,000 ... 5,000 rpm
  - Mass air flow
    - > 700 … > 300 mg/stroke (depending on: **engine speed**)

Possible fault causes

♦ Dynamic driving style when oil level is near minimum (oil foaming)
♦ Oil supply too low
⇒ (e.g. dirty (oil circuit), ...)
♦ Large differences in exhaust backpressure between banks (e.g. due to constricted or blocked passage of an exhaust branch).
♦ **Electronic adjuster for turbocharger** disengaged
♦ Wrong timing, one bank (**intake camshaft** or **exhaust camshaft**)
♦ **Solenoid valve for hydraulic valve lift control** faulty
⇒ (mechanical fault or electrical fault in circuit)
♦ 1 **oxygen sensor(s)** aged or faulty

Fault setting condition(s)

- Based on the lambda controllers, the diagnostic function detects that all the valves on this bank have either not switched to the other lift or have not switched quickly enough during valve lift switchover.

P1380

Diagnostic information - DME (DFI) control unit

Control unit faulty

Diagnostic conditions
- Ignition on > 10 second(s)
- then idling > 30 second(s)
- then engine speed > 1,000 rpm > 60 seconds with:
  - Vehicle standstill
- then driving > 60 second(s)

Possible fault causes
♦ DME (DFI) control unit faulty

Diagnostic information - DME (DFI) control unit

Valve lift control - one bank in wrong lift

Diagnostic conditions

- Perform a short test (See ⓘ)

  ► At the end of the short test, check the following two actual values in the detail view of the short test:

  ♦ LV01 Status, bank 1 valve lift after short test

  ♦ LV02 Status, bank 2 valve lift after short test

  ⇒ **If a fault occurred during the short test, the faulty bank will be displayed.**

or (See ⓘ)

- Engine oil temperature < 111 °C (231 °F)
- Small lift:
  - Engine speed 1,000 ... 2,000 rpm
  - Mass air flow
    - 150 ... 400 mg/stroke
  - Intake camshaft adjustment > 11°
- Large lift:
  - Engine speed 2,000 ... 4,000 rpm
  - Mass air flow
    - > 550 … > 325 mg/stroke (depending on:

Possible fault causes

♦ Oil supply too low

⇒ (e.g. dirty (oil circuit), scavenging restrictor faulty (cylinder head), ...)

♦ Large differences in exhaust backpressure between banks (e.g. due to constricted or blocked passage of an exhaust branch).

♦ Wrong timing, one bank (intake camshaft or exhaust camshaft)

♦ Solenoid valve for hydraulic valve lift control faulty

⇒ (mechanical fault or electrical fault in circuit)

♦ Oxygen sensor upstream of catalytic converter aged/faulty

Fault setting condition(s)

♦ Using the lambda controllers, the diagnostic function detects that all valves on one bank are stuck in the small **or** large lift.

ⓘ INFORMATION

The diagnostic function CANNOT detect which bank is faulty while the vehicle is moving.

♦ It is possible to read out which bank is faulty after a short test.

♦ The engine must continue running for this.

Diagnostic information - DME (DFI) control unit

Valve lift control - one bank in wrong lift

Diagnostic conditions

- Perform a short test (See ⓘ)

  ► At the end of the short test, check the following two actual values in the detail view of the short test:

  ♦ LV01 Status, bank 1 valve lift after short test

  ♦ LV02 Status, bank 2 valve lift after short test

  ⇒ **If a fault occurred during the short test, the faulty bank will be displayed.**

or (See ⓘ)

- Engine oil temperature < 111 °C (231 °F)
- Small lift:
  - Engine speed 1,000 ... 2,000 rpm
  - Mass air flow
    - 150 ... 400 mg/stroke
  - Intake camshaft adjustment > 11°
- Large lift:
  - Engine speed 2,000 ... 4,000 rpm
  - Mass air flow
    - > 550 … > 325 mg/stroke (depending on:

Possible fault causes

♦ Oil supply too low

⇒ (e.g. dirty (oil circuit), scavenging restrictor faulty (cylinder head), ...)

♦ Large differences in exhaust backpressure between banks (e.g. due to constricted or blocked passage of an exhaust branch).

♦ Wrong timing, one bank (intake camshaft or exhaust camshaft)

♦ Solenoid valve for hydraulic valve lift control faulty

⇒ (mechanical fault or electrical fault in circuit)

♦ Oxygen sensor upstream of catalytic converter aged/faulty

Fault setting condition(s)

♦ Using the lambda controllers, the diagnostic function detects that all valves on one bank are stuck in the small **or** large lift.

ⓘ INFORMATION

The diagnostic function CANNOT detect which bank is faulty while the vehicle is moving.

♦ It is possible to read out which bank is faulty after a short test.

♦ The engine must continue running for this.

Diagnostic information - DME (DFI) control unit

Bank 1 misfire after cold start

Diagnostic conditions
- Cold start (catalytic converter heating measure)
- Idle speed up to the red range on the tachometer
- No overrun phase(s)
- None of the following faults stored: P0335, P0336, P0371, P0373

Possible fault causes

♦ Affected by block heater

♦ Loose contact or corrosion on connectors or lines
♦ Power supply or ground supply faulty

♦ Spark plug(s) oily due to oil entrainment in the cylinder
♦ Wrong spark plug(s)
♦ Mechanical or electrical fault in spark plug(s)
♦ Bar ignition module faulty
♦ Power supply or ground supply faulty

♦ Wrong fuel quality
♦ Fuel tank empty
♦ Water in fuel tank
♦ Fuel line dirty/blocked
♦ Mechanical fault in electric fuel pump
♦ Mechanical fault in fuel high-pressure pump

♦ Fuel injector faulty or borderline
(opens too late/not long enough/not enough or leaking)
♦ Oxygen sensor(s) faulty

♦ Exhaust system constricted/blocked
♦ Catalytic converter faulty

♦ Leak in intake-air distributor
♦ Foreign bodies in intake-air distributor
♦ Camshaft adjustment fault
♦ Wrong timing - exhaust camshaft
♦ Valve lift control fault
♦ Valve lifter faulty
(Intake valve has not switched to the other lift or has not switched quickly enough)
♦ Mechanical fault in valve drive
♦ Insufficient compression
(e.g. cylinder liner damaged, valve seat ring faulty, ...)

Fault setting condition(s)

● The diagnostic function detects uneven running for the specified cylinder.
● Uneven running is calculated from the expected and actual crankshaft acceleration due to combustion.
● Uneven running is interpreted as a misfire or valve lift fault, depending on type.

Diagnostic information - DME (DFI) control unit

Bank 2 misfire after cold start

Diagnostic conditions
- Cold start (catalytic converter heating measure)
- Idle speed up to the red range on the tachometer
- No overrun phase(s)
- None of the following faults stored: P0335, P0336, P0371, P0373

Possible fault causes

♦ Affected by block heater

♦ Loose contact or corrosion on connectors or lines
♦ Power supply or ground supply faulty

♦ Spark plug(s) oily due to oil entrainment in the cylinder
♦ Wrong spark plug(s)
♦ Mechanical or electrical fault in spark plug(s)
♦ Bar ignition module faulty
♦ Power supply or ground supply faulty

♦ Wrong fuel quality
♦ Fuel tank empty
♦ Water in fuel tank
♦ Fuel line dirty/blocked
♦ Mechanical fault in electric fuel pump
♦ Mechanical fault in fuel high-pressure pump

♦ Fuel injector faulty or borderline
(opens too late/not long enough/not enough or leaking)
♦ Oxygen sensor(s) faulty

♦ Exhaust system constricted/blocked
♦ Catalytic converter faulty

♦ Leak in intake-air distributor
♦ Foreign bodies in intake-air distributor
♦ Camshaft adjustment fault
♦ Wrong timing - exhaust camshaft
♦ Valve lift control fault
♦ Valve lifter faulty
(Intake valve has not switched to the other lift or has not switched quickly enough)
♦ Mechanical fault in valve drive
♦ Insufficient compression
(e.g. cylinder liner damaged, valve seat ring faulty, ...)

Fault setting condition(s)

● The diagnostic function detects uneven running for the specified cylinder.
● Uneven running is calculated from the expected and actual crankshaft acceleration due to combustion.
● Uneven running is interpreted as a misfire or valve lift fault, depending on type.

Diagnostic information - DME (DFI) control unit

Ignition timing angle after cold start

Diagnostic conditions
- Cold start
- then driving

Possible fault causes
ⓘ This fault entry is used for information purposes only; the actual cause of the fault is in another area.
♦ Significant engine running problems force the engine control system to leave the permitted ignition timing range in order to keep the engine running.

P1432

Diagnostic information - DME (DFI) control unit

Vacuum system leaking - cooling system fault

Diagnostic conditions
- Vehicle standstill
- Idle speed
- Brake pedal NOT pressed

or
- Brake pedal pressed with uniform pressure
- None of the following faults stored: P0557, P0558

Possible fault causes
- ♦ Contact resistance on plug connection to the brake vacuum sensor
- ♦ Leak in vacuum system area (See ⓘ)

Fault effects

1. The message >Cooling system fault< is displayed in the instrument cluster if a leak is detected in the vacuum system. Reason:

ⓘ The cooling system with thermal management also includes vacuum-actuated shutoff valves.

2. If there is no vacuum, the vacuum-actuated flaps and valves (see ⓘ 1) can no longer be closed, which can lead to malfunctions.
Perceptible effects could include:
- ♦ lack of torque
- ♦ no heating power
- ♦ the exhaust flap, air cleaner flap and acoustic simulator are permanently set to >loud<

3. Lack of brake boost.

Diagnostic function
- ♦ The vacuum sensor is used to check whether the pressure in the system has fallen below a certain value in a certain time.
- ♦ It is not important here whether the connected solenoid change-over valves were actuated at the time of the diagnostic test.
- ♦ The >Vacuum system< system test in the PIWIS Tester can be used for complete testing of the vacuum system, because all solenoid switchover valves are forcibly actuated at the time of the diagnostic test in this case.

ⓘ INFORMATION

1. The system includes:
- ♦ Mechanical vacuum pump
- ♦ Vacuum check valve
- ♦ Brake booster
- ♦ Coolant shutoff valve and relevant solenoid change-over valve, respectively for:
  - ♦ Heat exchanger for heating

- Engine (short-circuit loop)
- Heat exchanger for transmission oil
- Heat exchanger for clutch fluid (PDK only)

- Vacuum unit and relevant solenoid change-over valve, respectively for:
  - Variable intake manifold (tuning flap)
  - Air cleaner flap
  - Exhaust flap
  - Acoustic simulator
  - Variable intake manifold 2 (Power Kit X51)
  - Diverter valve (Turbo)
- Vacuum lines to all components mentioned above

2. There may be several small leaks, which correspond in total to the leak determined here.

P1433

Diagnostic information - DME (DFI) control unit

Vacuum system leaking - cooling system fault

Diagnostic conditions
- Engine running
- Press the brake pedal and release it again
- Then do NOT press the brake for approx. 1 minute
- None of the following faults stored: P0557, P0558

Possible fault causes
♦ Contact resistance on plug connection to the brake vacuum sensor
♦ Leak in vacuum system area (See ⓘ)

Fault effects
1. The message >Cooling system fault< is displayed in the instrument cluster if a leak is detected in the vacuum system. Reason:
ⓘ The cooling system with thermal management also includes vacuum-actuated shutoff valves.

2. If there is no vacuum, the vacuum-actuated flaps and valves (see ⓘ 1) can no longer be closed, which can lead to malfunctions.
Perceptible effects could include:
♦ lack of torque
♦ no heating power
♦ the exhaust flap, air cleaner flap and acoustic simulator are permanently set to >loud<

3. Lack of brake boost.

Diagnostic function
♦ The vacuum sensor is used to check whether the pressure in the system has fallen below a certain value in a certain time.
♦ As soon as the brake pedal is released, the pump output is calculated based on the engine speed and subtracted from the work to be performed in order to bring the absolute pressure below a certain threshold.
♦ It is not important here whether the connected solenoid change-over valves were actuated at the time of the diagnostic test.
♦ The >Vacuum system< system test in the PIWIS Tester can be used for complete testing of the vacuum system, because all solenoid switchover valves are forcibly actuated at the time of the diagnostic test in this case.

ⓘ INFORMATION
1. The system includes:
♦ Mechanical vacuum pump
♦ Brake booster
♦ Vacuum check valve
♦ Coolant shutoff valve and relevant solenoid change-over valve, respectively for:

- ♦ Heat exchanger for heating
- ♦ Engine (short-circuit loop)
- ♦ Heat exchanger for transmission oil
- ♦ Heat exchanger for clutch fluid (PDK only)

♦ Vacuum unit and relevant solenoid change-over valve, respectively for:

- ♦ Variable intake manifold (tuning flap)
- ♦ Air cleaner flap
- ♦ Exhaust flap
- ♦ Acoustic simulator
- ♦ Variable intake manifold 2 (Power Kit X51)
- ♦ Diverter valve (Turbo)

♦ Vacuum lines to all components mentioned above

2. There may be several small leaks, which correspond in total to the leak determined here.

P1460

Diagnostic information - DME (DFI) control unit

Radiator fan 1: overtemperature

⚠WARNING

Exposed running fan blades!
Danger of limbs being severed!
Risk of serious injury due to ejected foreign bodies!

- **ALWAYS** keep hair or clothing out of the rotating range of the fan.
- DO NOT reach into the rotating fan.
- **DO NOT** place tools or other items in the rotating range of the fan.
- Perform work on the fan only with the ignition switched off.
- Secure the ignition to prevent it from being switched on accidentally by other persons.

NOTE

Sensitive electronics!
Risk of irreparable damage to electronic components!

- **DO NOT** carry out electrical tests.
- **DO NOT** connect external power sources.

ⓘ INFORMATION

- The control unit is activated by the DME control unit via a signal line.
- In the opposite direction, the control unit can report faults to the DME control unit.

Diagnostic conditions

- Radiator fan 1 activated > 5 minute(s)

Possible fault causes

- Radiator air intake 1 covered (car cover)
- Control unit for radiator fan 1 faulty

Fault setting condition(s)

- Overtemperature in control unit for radiator fan 1

Fault effects

- Radiator fan 1 switched off

P1461

Diagnostic information - DME (DFI) control unit

Radiator fan 1: electrical fault

⚠WARNING
Exposed running fan blades!
Danger of limbs being severed!
Risk of serious injury due to ejected foreign bodies!
♦ **ALWAYS** keep hair or clothing out of the rotating range of the fan.
♦ DO NOT reach into the rotating fan.
♦ **DO NOT** place tools or other items in the rotating range of the fan.
♦ Perform work on the fan only with the ignition switched off.
♦ Secure the ignition to prevent it from being switched on accidentally by other persons.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.

ⓘ INFORMATION
♦ The control unit is activated by the DME control unit via a signal line.
♦ In the opposite direction, the control unit can report faults to the DME control unit.

Diagnostic conditions
● Radiator fan 1 activated > 5 minute(s)

Possible fault causes
♦ Radiator fan 1 faulty
♦ Control unit for radiator fan 1 faulty

Fault effects
♦ Radiator fan 1 switched off

P1462

Diagnostic information - DME (DFI) control unit

Radiator fan 1: internal power supply

⚠WARNING

Exposed running fan blades!
Danger of limbs being severed!
Risk of serious injury due to ejected foreign bodies!

- **ALWAYS** keep hair or clothing out of the rotating range of the fan.
- DO NOT reach into the rotating fan.
- **DO NOT** place tools or other items in the rotating range of the fan.
- Perform work on the fan only with the ignition switched off.
- Secure the ignition to prevent it from being switched on accidentally by other persons.

NOTE

Sensitive electronics!
Risk of irreparable damage to electronic components!

- **DO NOT** carry out electrical tests.
- **DO NOT** connect external power sources.

ⓘ INFORMATION

- The control unit is activated by the DME control unit via a signal line.
- In the opposite direction, the control unit can report faults to the DME control unit.

Diagnostic conditions

- Radiator fan 1 activated > 5 minute(s)

Possible fault causes

- Radiator fan 1 faulty
- Control unit for radiator fan 1 faulty

P1463

Diagnostic information - DME (DFI) control unit

Radiator fan 2: overtemperature

⚠WARNING
Exposed running fan blades!
Danger of limbs being severed!
Risk of serious injury due to ejected foreign bodies!
♦ **ALWAYS** keep hair or clothing out of the rotating range of the fan.
♦ DO NOT reach into the rotating fan.
♦ **DO NOT** place tools or other items in the rotating range of the fan.
♦ Perform work on the fan only with the ignition switched off.
♦ Secure the ignition to prevent it from being switched on accidentally by other persons.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.

ⓘ INFORMATION
♦ The control unit is activated by the DME control unit via a signal line.
♦ In the opposite direction, the control unit can report faults to the DME control unit.

Diagnostic conditions
● Radiator fan 2 activated > 5 minute(s)

Possible fault causes
♦ Radiator air intake 2 covered (car cover)
♦ Control unit for radiator fan 2 faulty

Fault setting condition(s)
● Overtemperature in control unit for radiator fan 2

Fault effects
♦ Radiator fan 2 switched off

P1464

Diagnostic information - DME (DFI) control unit

Radiator fan 2: electrical fault

⚠WARNING

Exposed running fan blades!
Danger of limbs being severed!
Risk of serious injury due to ejected foreign bodies!

- ♦ **ALWAYS** keep hair or clothing out of the rotating range of the fan.
- ♦ DO NOT reach into the rotating fan.
- ♦ **DO NOT** place tools or other items in the rotating range of the fan.
- ♦ Perform work on the fan only with the ignition switched off.
- ♦ Secure the ignition to prevent it from being switched on accidentally by other persons.

NOTE

Sensitive electronics!
Risk of irreparable damage to electronic components!

- ♦ **DO NOT** carry out electrical tests.
- ♦ **DO NOT** connect external power sources.

ⓘ INFORMATION

- ♦ The control unit is activated by the DME control unit via a signal line.
- ♦ In the opposite direction, the control unit can report faults to the DME control unit.

Diagnostic conditions

- Radiator fan 2 activated > 5 minute(s)

Possible fault causes

- ♦ Radiator fan 2 faulty
- ♦ Control unit for radiator fan 2 faulty

Fault effects

- ♦ Radiator fan 2 switched off

P1465

Diagnostic information - DME (DFI) control unit

Radiator fan 2: internal power supply

⚠WARNING
Exposed running fan blades!
Danger of limbs being severed!
Risk of serious injury due to ejected foreign bodies!
♦ **ALWAYS** keep hair or clothing out of the rotating range of the fan.
♦ DO NOT reach into the rotating fan.
♦ **DO NOT** place tools or other items in the rotating range of the fan.
♦ Perform work on the fan only with the ignition switched off.
♦ Secure the ignition to prevent it from being switched on accidentally by other persons.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.

ⓘ INFORMATION
♦ The control unit is activated by the DME control unit via a signal line.
♦ In the opposite direction, the control unit can report faults to the DME control unit.

Diagnostic conditions
● Radiator fan 2 activated > 5 minute(s)

Possible fault causes
♦ Radiator fan 2 faulty
♦ Control unit for radiator fan 2 faulty

P1466

Diagnostic information - DME (DFI) control unit

Radiator fan 1: mechanical fault

⚠WARNING

Exposed running fan blades!
Danger of limbs being severed!
Risk of serious injury due to ejected foreign bodies!

- ♦ **ALWAYS** keep hair or clothing out of the rotating range of the fan.
- ♦ DO NOT reach into the rotating fan.
- ♦ **DO NOT** place tools or other items in the rotating range of the fan.
- ♦ Perform work on the fan only with the ignition switched off.
- ♦ Secure the ignition to prevent it from being switched on accidentally by other persons.

NOTE

Sensitive electronics!
Risk of irreparable damage to electronic components!

- ♦ **DO NOT** carry out electrical tests.
- ♦ **DO NOT** connect external power sources.

ⓘ INFORMATION

- ♦ The control unit is activated by the DME control unit via a signal line.
- ♦ In the opposite direction, the control unit can report faults to the DME control unit.

Diagnostic conditions

- Radiator fan 1 activated > 5 minute(s)

Possible fault causes

- ♦ Radiator fan 1 sluggish or blocked
- ♦ Radiator fan 1 faulty

Fault setting condition(s)

- Current draw for radiator fan 1 too high

Fault effects

- Sluggish:
  - ♦ Radiator fan 1 speed reduced to 0 rpm
- Blocked:
  - ♦ Engine shakes loose

P1467

Diagnostic information - DME (DFI) control unit

Radiator fan 2: mechanical fault

⚠WARNING

Exposed running fan blades!
Danger of limbs being severed!
Risk of serious injury due to ejected foreign bodies!

- ♦ **ALWAYS** keep hair or clothing out of the rotating range of the fan.
- ♦ DO NOT reach into the rotating fan.
- ♦ **DO NOT** place tools or other items in the rotating range of the fan.
- ♦ Perform work on the fan only with the ignition switched off.
- ♦ Secure the ignition to prevent it from being switched on accidentally by other persons.

NOTE

Sensitive electronics!
Risk of irreparable damage to electronic components!

- ♦ **DO NOT** carry out electrical tests.
- ♦ **DO NOT** connect external power sources.

ⓘ INFORMATION

- ♦ The control unit is activated by the DME control unit via a signal line.
- ♦ In the opposite direction, the control unit can report faults to the DME control unit.

Diagnostic conditions

- Radiator fan 2 activated > 5 minute(s)

Possible fault causes

- ♦ Radiator fan 2 sluggish or blocked
- ♦ Radiator fan 2 faulty

Fault setting condition(s)

- Current draw for radiator fan 2 too high

Fault effects

- Sluggish:
  - ♦ Radiator fan 2 speed reduced to 0 rpm
- Blocked:
  - ♦ Engine shakes loose

P1477

Diagnostic information - DME (DFI) control unit

Engine coolant shutoff valve stuck closed
or
Thermostat stuck closed

Diagnostic conditions

- Uniform driving (only slight changes in rpm and torque)
- Setpoint engine temperature (T005) > 104.25 °C (219.65 °F)
- **Engine coolant temperature** (T020) = setpoint engine temperature (T005)
- **Coolant temperature** at radiator outlet (T025) < 80 °C (176 °F)
- **Engine speed** 1,200 ... 3,500 rpm
- Air conditioner OFF (= heating valve must not switch during diagnostics)

Possible fault causes

♦ Solenoid switchover valve for coolant shutoff valve vacuum unit mechanically stuck
♦ Vacuum lines on the solenoid switchover valve interchanged
♦ Vacuum lines or electrical lines of the solenoid switchover valve interchanged with another solenoid switchover valve
♦ Engine coolant shutoff valve faulty (stuck closed)
♦ Thermostat faulty (stuck closed)
♦ Air trapped in the cooling system (e.g. after repairs were performed on the cooling system)
♦ Incorrect measurement by engine temperature sensor or radiator return temperature sensor, but still in the plausible range (-40...+150 °C/-40...+302 °F)

Diagnostic function ⇒ **See function description**

P1478

Diagnostic information - DME (DFI) control unit

Engine coolant shutoff valve stuck closed
or
Thermostat stuck closed

Diagnostic conditions

- Uniform driving (only slight changes in rpm and torque)
- Setpoint engine temperature (T005) > 104.25 °C (219.65 °F)
- **Engine coolant temperature** (T020) = setpoint engine temperature (T005)
- **Coolant temperature** at radiator outlet (T025) < 80 °C (176 °F)
- **Engine speed** 1,200 ... 3,500 rpm
- Air conditioner OFF (= heating valve must not switch during diagnostics)

Possible fault causes

♦ Solenoid switchover valve for coolant shutoff valve vacuum unit mechanically stuck
♦ Vacuum lines on the solenoid switchover valve interchanged
♦ Vacuum lines or electrical lines of the solenoid switchover valve interchanged with another solenoid switchover valve
♦ Engine coolant shutoff valve faulty (stuck closed)
♦ Thermostat faulty (stuck closed)
♦ Air trapped in the cooling system (e.g. after repairs were performed on the cooling system)
♦ Incorrect measurement by engine temperature sensor or radiator return temperature sensor, but still in the plausible range (-40...+150 °C/-40...+302 °F)

Diagnostic function ⇒ **See function description**

P1502

Diagnostic information - DME (DFI) control unit

Throttle valve adjusting unit

Diagnostic conditions
- Vehicle standstill
- Coolant temperature 5 ... 100 °C (41 ... 212 °F)
- Intake air temperature 5 ... 30 °C (41 … 86 °F)
- Accelerator pedal not pressed (0%)
- Ignition off
- then switch on ignition > 60 second(s) with engine off

Possible fault causes
- ♦ Adaptation was not performed (successfully).
- ♦ Throttle valve adjusting unit faulty

P1506

Diagnostic information - DME (DFI) control unit

Throttle valve adjusting unit

Diagnostic conditions
- Vehicle standstill
- Coolant temperature 5 ... 100 °C (41 ... 212 °F)
- Intake air temperature 5 ... 30 °C (41 … 86 °F)
- Accelerator pedal not pressed (0%)
- Ignition off
- then switch on ignition > 60 second(s) with engine off

Possible fault causes
- ♦ Adaptation was not performed (successfully).
- ♦ Throttle valve adjusting unit faulty

P1507

Diagnostic information - DME (DFI) control unit

Throttle valve adjusting unit

Diagnostic conditions
- Vehicle standstill
- Coolant temperature 5 ... 100 °C (41 ... 212 °F)
- Intake air temperature 5 ... 30 °C (41 … 86 °F)
- Accelerator pedal not pressed (0%)
- Ignition off
- then switch on ignition > 60 second(s) with engine off

Possible fault causes
- ♦ Adaptation was not performed (successfully).
- ♦ Throttle valve adjusting unit faulty

P1508

Diagnostic information - DME (DFI) control unit

Control unit function monitoring

Diagnostic conditions
- Ignition on > 10 second(s)
- then idling > 30 second(s)
- then engine speed > 1,000 rpm > 60 seconds with:
  - Vehicle standstill

Possible fault causes
- ♦ Power supply or ground supply faulty ⇒ See P1559
- ♦ DME (DFI) control unit software error ▶ Re-program

ⓘ INFORMATION
- ♦ All calculations for functions in the control unit are monitored by a higher-level unit.
- ♦ A fault is entered if monitoring detects implausible calculations.

P1509

Diagnostic information - DME (DFI) control unit

Control unit function monitoring

Diagnostic conditions
- Ignition on > 10 second(s)
- then idling > 30 second(s)
- then engine speed > 1,000 rpm > 60 seconds with:
  - Vehicle standstill

Possible fault causes
♦ Power supply or ground supply faulty ⇒ See P1559
♦ DME (DFI) control unit software error ▶ Re-program

ⓘ INFORMATION
♦ All calculations for functions in the control unit are monitored by a higher-level unit.
♦ A fault is entered if monitoring detects implausible calculations.

Diagnostic information - DME (DFI) control unit

Starter activation with powertrain closed

Diagnostic conditions
- Restart by Start/Stop system

Possible fault causes
- DME (DFI) control unit faulty

Fault setting condition(s)
- The starter was actuated by the Start/Stop system although a closed powertrain was detected (gear engaged + clutch closed).

Fault effects
- Start/Stop system deactivated

►Diagnostic information - DME (DFI) control unit

Throttle valve adjusting unit - adaptation aborted due to environmental condition

Diagnostic conditions
- Vehicle standstill
- Coolant temperature 5 ... 100 °C (41 ... 212 °F)
- Intake air temperature 5 ... 30 °C (41 ... 86 °F)
- Accelerator pedal not pressed (0%)
- Ignition off
- then switch on ignition > 60 second(s) with engine off

Possible fault causes
♦ Adaptation aborted due to environmental condition

Fault setting condition(s)
- One or more of the stated conditions were not met.
  (See ⓘ)

Fault effects
♦ Engine cannot be started

ⓘ INFORMATION
Forced adaptation can be performed using the PIWIS Tester.

Diagnostic information - DME (DFI) control unit

Ambient temperature via CAN
(See Air-conditioning system regulator)

Diagnostic conditions
- Ignition on > 5 second(s)

Possible fault causes
- ♦ Outside temperature sensor fault
- ♦ The expected signal or message deviates from the specified value.

Fault effects
- ♦ Substitute value from model

Diagnostic information - DME (DFI) control unit

Switch-off time fault

Diagnostic conditions
- Engine running
- then switch off ignition
  - after 6 ... 40 seconds:
    - Ignition on > 10 minute(s), with :
      - Instrument cluster ready for operation
- then switch off ignition ▶ until the run-on phase is over (See ⓘ 1)
- No fault entry P1570

Possible fault causes
- ♦ The power supply of the DME (DFI) control unit was interrupted during control unit run-on. (e.g.: battery faulty/disconnected)
- ♦ Instrument cluster coded incorrectly
- ♦ Fault in CAN drive or CAN comfort area
- ♦ Instrument cluster failed or faulty

Fault setting condition(s)
- The power supply to the DME (DFI) control unit was interrupted during control unit run-on.

or
- No or implausible time pulse from the gateway control unit within 60 seconds, with:
  - Ignition on

ⓘ INFORMATION

1. After the ignition is switched off (terminal 15), the DME control unit switches to control unit run-on mode.
The run-on duration of the engine compartment purge fan AFTER ignition off depends on the engine compartment temperature.
- ♦ It is as follows for the following engine compartment temperatures:
  - ♦ < 45 °C (113 °F) for approx. 50 seconds
  - ♦ 45 ... 70 °C (113 … 158 °F) for approx. 200 seconds
  - ♦ > 70 °C (158 °F) for up to 20 minutes

2. The DME control unit receives time information from the instrument cluster at regular intervals (approx. 4 sec.) when the ignition is on.

3. The switch-off time A145_Time since engine stop (manual via ignition lock) comes from the instrument cluster. The gateway routes this to the DME control unit.

P1533

Diagnostic information - DME (DFI) control unit

Switch-off time fault

Diagnostic conditions
- Engine running
- then switch off ignition
  - after 6 ... 40 seconds:
    - Ignition on > 10 minute(s), with :
      - Instrument cluster ready for operation
- then switch off ignition ▶ until the run-on phase is over (See ⓘ 1)
- No fault entry P1570

Possible fault causes
- ♦ The power supply of the DME (DFI) control unit was interrupted during control unit run-on. (e.g.: battery faulty/disconnected)
- ♦ Instrument cluster coded incorrectly
- ♦ Fault in CAN drive or CAN comfort area
- ♦ Instrument cluster failed or faulty

Fault setting condition(s)
- The power supply to the DME (DFI) control unit was interrupted during control unit run-on.

or
- No or implausible time pulse from the gateway control unit within 60 seconds, with:
  - Ignition on

ⓘ INFORMATION

1. After the ignition is switched off (terminal 15), the DME control unit switches to control unit run-on mode.
The run-on duration of the engine compartment purge fan AFTER ignition off depends on the engine compartment temperature.
- ♦ It is as follows for the following engine compartment temperatures:
  - ♦ < 45 °C (113 °F) for approx. 50 seconds
  - ♦ 45 ... 70 °C (113 … 158 °F) for approx. 200 seconds
  - ♦ > 70 °C (158 °F) for up to 20 minutes

2. The DME control unit receives time information from the instrument cluster at regular intervals (approx. 4 sec.) when the ignition is on.

3. The switch-off time A145_Time since engine stop (manual via ignition lock) comes from the instrument cluster. The gateway routes this to the DME control unit.

P1536

Diagnostic information - DME (DFI) control unit

Oil pump activation

ⓘ INFORMATION

♦ The measured oil pressure is compared with the setpoint oil pressure.
♦ The setpoint oil pressure depends, among other things, on the ambient conditions (temperatures, off time, etc.), operating point of the engine …
♦ A fault is detected if the PWM signal is outside a defined range for > 30 seconds.

Diagnostic conditions
● Engine running

Possible fault causes
♦ Dynamic driving style when oil level is near minimum (oil foaming)
♦ Engine oil pressure too low (oil level, oil quality, oil thinning, dirt in oil circuit, oil circuit faulty - increased leakage inside the engine)
♦ Engine oil pressure too high (oil quality, oil thickening, dirt in oil circuit, oil circuit faulty)
♦ Oil pressure sensor faulty (incorrect trimming)
♦ Oil pressure control valve faulty
♦ Oil pump faulty

Diagnostic information - DME (DFI) control unit

Oil pump activation

ⓘ INFORMATION

♦ The measured oil pressure is compared with the setpoint oil pressure.
♦ The setpoint oil pressure depends, among other things, on the ambient conditions (temperatures, off time, etc.), operating point of the engine …
♦ A fault is detected if the PWM signal is outside a defined range for > 30 seconds.

Diagnostic conditions
● Engine running

Possible fault causes
♦ Dynamic driving style when oil level is near minimum (oil foaming)
♦ Engine oil pressure too low (oil level, oil quality, oil thinning, dirt in oil circuit, oil circuit faulty - increased leakage inside the engine)
♦ Engine oil pressure too high (oil quality, oil thickening, dirt in oil circuit, oil circuit faulty)
♦ Oil pressure sensor faulty (incorrect trimming)
♦ Oil pressure control valve faulty
♦ Oil pump faulty

Diagnostic information - DME (DFI) control unit

Oil pump activation

ⓘ INFORMATION

♦ The oil pressure control valve is controlled via a PWM signal.
♦ The PWM signal depends, among other things, on the ambient conditions (temperatures, off time, etc), operating point of the engine (rpm, load, oil temperature), measured oil pressure (at the oil pressure sensor) …
♦ A fault is detected if the PWM signal is outside a defined range for > 8 seconds.

Diagnostic conditions
● Engine running

Possible fault causes
♦ Engine oil pressure too low (oil level, oil quality, oil thinning, dirt in oil circuit, oil circuit faulty)
♦ Engine oil pressure too high (oil quality, oil thickening, dirt in oil circuit, oil circuit faulty)
♦ Oil pressure sensor faulty
♦ Oil pressure control valve faulty
♦ Oil pump faulty

Diagnostic information - DME (DFI) control unit

Oil pump activation

ⓘ INFORMATION

♦ The oil pressure control valve is controlled via a PWM signal.
♦ The PWM signal depends, among other things, on the ambient conditions (temperatures, off time, etc), operating point of the engine (rpm, load, oil temperature), measured oil pressure (at the oil pressure sensor) …
♦ A fault is detected if the PWM signal is outside a defined range for > 8 seconds.

Diagnostic conditions
● Engine running

Possible fault causes
♦ Engine oil pressure too low (oil level, oil quality, oil thinning, dirt in oil circuit, oil circuit faulty)
♦ Engine oil pressure too high (oil quality, oil thickening, dirt in oil circuit, oil circuit faulty)
♦ Oil pressure sensor faulty
♦ Oil pressure control valve faulty
♦ Oil pump faulty

P1540

Diagnostic information - DME (DFI) control unit

Throttle valve adjusting unit

Diagnostic conditions
- Vehicle standstill
- Coolant temperature 5 ... 100 °C (41 ... 212 °F)
- Intake air temperature 5 ... 30 °C (41 … 86 °F)
- Accelerator pedal not pressed (0%)
- Ignition off
- then switch on ignition > 60 second(s) with engine off

Possible fault causes
- ♦ Adaptation was not performed (successfully).
- ♦ Throttle valve adjusting unit faulty

Diagnostic information - DME (DFI) control unit

Throttle valve adjusting unit

Diagnostic conditions
- Vehicle standstill
- Coolant temperature 5 ... 100 °C (41 ... 212 °F)
- Intake air temperature 5 ... 30 °C (41 … 86 °F)
- Accelerator pedal not pressed (0%)
- Ignition off
- then switch on ignition > 60 second(s) with engine off

Possible fault causes
- ♦ Adaptation was not performed (successfully).
- ♦ Throttle valve adjusting unit faulty

Diagnostic information - DME (DFI) control unit

Throttle valve adjusting unit - start test

Diagnostic conditions
- **Throttle valve adjusting unit** adapted
- Switch on ignition , then
  - Switch off ignition for > 1 **min.**
    - Switch on ignition

Possible fault causes
♦ Throttle valve adjusting unit faulty

Fault setting condition(s)
The start test was faulty twice in a row (See ⓘ).

ⓘ INFORMATION
Start test: When the ignition is switched on , the throttle valve is opened by a certain value, and must then close on its own.

Diagnostic information - DME (DFI) control unit

Throttle valve adjusting unit - start test

Diagnostic conditions
- **Throttle valve adjusting unit** adapted
- Switch on ignition , then
  - Switch off ignition for > 1 **min.**
    - Switch on ignition

Possible fault causes
♦ Throttle valve adjusting unit faulty

Fault setting condition(s)
The start test was faulty twice in a row (See ⓘ).

ⓘ INFORMATION
Start test: When the ignition is switched on , the throttle valve is opened by a certain value, and must then close on its own.

Diagnostic information - DME (DFI) control unit

Throttle valve adjusting unit stuck

Diagnostic conditions
- Throttle valve adjusting unit adapted
- Vehicle standstill
- No gear engaged or selector-lever position P or N
- Intake air temperature > 5 °C (41 °F)
- Idle speed
- then short acceleration
- then engine speed > 2,200 rpm

Possible fault causes
- Throttle valve adjusting unit frozen
- Throttle valve adjusting unit faulty

P1546

Diagnostic information - DME (DFI) control unit

Wheel speed implausible

Diagnostic conditions
- Driving

Possible fault causes
- Fault in PSM area

Fault setting condition(s)
- The wheel speed deviates from the other wheel speeds for too long.

P1547

Diagnostic information - DME (DFI) control unit

Wheel speed implausible

Diagnostic conditions
- Driving

Possible fault causes
- Fault in PSM area

Fault setting condition(s)
- The wheel speed deviates from the other wheel speeds for too long.

P1548

Diagnostic information - DME (DFI) control unit

Wheel speed implausible

Diagnostic conditions
- Driving

Possible fault causes
- ♦ Fault in PSM area

Fault setting condition(s)
- The wheel speed deviates from the other wheel speeds for too long.

P1549

Diagnostic information - DME (DFI) control unit

Wheel speed implausible

Diagnostic conditions
- Driving

Possible fault causes
♦ Fault in PSM area

Fault setting condition(s)
- The wheel speed deviates from the other wheel speeds for too long.

P1550

Diagnostic information - DME (DFI) control unit

Control unit function monitoring

Diagnostic conditions
- Ignition on > 10 second(s)
- then idling > 30 second(s)
- then engine speed > 1,000 rpm > 60 seconds with:
  - Vehicle standstill

Possible fault causes
♦ Power supply or ground supply faulty ⇒ See P1559
♦ DME (DFI) control unit software error ▶ Re-program

ⓘ INFORMATION
♦ All calculations for functions in the control unit are monitored by a higher-level unit.
♦ A fault is entered if monitoring detects implausible calculations.

P1552

Diagnostic information - DME (DFI) control unit

Control unit function monitoring

Diagnostic conditions
- Ignition on > 10 second(s)
- then idling > 30 second(s)
- then engine speed > 1,000 rpm > 60 seconds with:
  - Vehicle standstill

Possible fault causes
♦ Power supply or ground supply faulty ⇒ See P1559
♦ DME (DFI) control unit software error ▶ Re-program

ⓘ INFORMATION
♦ All calculations for functions in the control unit are monitored by a higher-level unit.
♦ A fault is entered if monitoring detects implausible calculations.

Diagnostic information - DME (DFI) control unit

Control unit function monitoring, wake-up

ⓘ INFORMATION

♦ The entered fault code P1553 or P1555 is merely an indication that the DME control unit performed a reboot in its internal monitoring unit.
♦ This normally remains unnoticed by the driver.
♦ If a **customer complaint** stating that manual engine starting (**starting with the key**) was refused, was aborted or took too long, the DME control unit is faulty.
♦ If **no such customer complaint** exists, the **DME control unit is OK!**

Diagnostic conditions
● Vehicle voltage > 11 V
● Switch the ignition on and then start the engine

Possible fault causes
● If a customer complaint stating that manual engine starting (starting with the key) was refused, was aborted or took too long, the DME control unit is faulty.
● If **no such customer complaint** exists, the **DME control unit is OK!** ► Erase fault memory.

Fault effects
♦ None if this is only a once-off occurrence.
or
♦ Starting with the key was refused or aborted or took too long.

Diagnostic information - DME (DFI) control unit

Control unit function monitoring, wake-up

ⓘ INFORMATION

♦ The entered fault code P1553 or P1555 is merely an indication that the DME control unit performed a reboot in its internal monitoring unit.
♦ This normally remains unnoticed by the driver.
♦ If a **customer complaint** stating that manual engine starting (**starting with the key**) was refused, was aborted or took too long, the DME control unit is faulty.
♦ If **no such customer complaint** exists, the **DME control unit is OK!**

Diagnostic conditions
● Vehicle voltage > 11 V
● Switch the ignition on and then start the engine

Possible fault causes
● If a customer complaint stating that manual engine starting (starting with the key) was refused, was aborted or took too long, the DME control unit is faulty.
● If **no such customer complaint** exists, the **DME control unit is OK!** ► Erase fault memory.

Fault effects
♦ None if this is only a once-off occurrence.
or
♦ Starting with the key was refused or aborted or took too long.

P1556

Diagnostic information - DME (DFI) control unit

Control unit faulty

Diagnostic conditions
- Ignition on > 10 second(s)
- then idling > 30 second(s)
- then engine speed > 1,000 rpm > 60 seconds with:
  - Vehicle standstill
- then driving > 60 second(s)

Possible fault causes
♦ DME (DFI) control unit faulty

P1557

Diagnostic information - DME (DFI) control unit

Control unit faulty

Diagnostic conditions
- Ignition on > 10 second(s)
- then idling > 30 second(s)
- then engine speed > 1,000 rpm > 60 seconds with:
  - Vehicle standstill
- then driving > 60 second(s)

Possible fault causes
♦ DME (DFI) control unit faulty

P1558

Diagnostic information - DME (DFI) control unit

Control unit faulty

Diagnostic conditions
- Ignition on > 10 second(s)
- then idling > 30 second(s)
- then engine speed > 1,000 rpm > 60 seconds with:
  - Vehicle standstill
- then driving > 60 second(s)

Possible fault causes
♦ DME (DFI) control unit faulty

P1559

Diagnostic information - DME (DFI) control unit

Control unit restart during operation (warm reset)

Diagnostic conditions
● Engine start

Possible fault causes
♦ Vehicle electrical system voltage < 6 V during starting process (e.g. battery discharged or faulty), e.g. due to contact resistance in the lines to the DME control unit.
♦ Excessive difference in internal monitoring processes in the control unit, e.g. in case of reversal of the engine's direction of rotation due to inadvertent shifting into reverse gear when the vehicle is driving forward.

Fault setting condition(s)
This fault is entered if the DME control unit performs a restart during operation (soft reboot/warm reset).

Diagnostic information - DME (DFI) control unit

Vehicle speed PSM

Diagnostic conditions
- Driving with:
  - Engine temperature > 30 °C (86 °F)
  - Overrun phase(s) > 1.5 second(s)
  - Engine speed 1.408 .... 3,000 rpm
- None of the following faults stored: U0129, P0503

Possible fault causes
♦ Fault in PSM area

Fault setting condition(s)
- Vehicle speed < 3 km/h or 1 mph (measured value), with:
  - Diagnostic conditions

P1563

Diagnostic information - DME (DFI) control unit

Cruise control coding

Diagnostic conditions
- Ignition on

Possible fault causes
- Vehicle data incorrect
  (See PIWIS Tester II ▶ Additional menu [F7] ▶ Maintenance of vehicle data)
- Vehicle equipment wrong
- DME (DFI) control unit coded incorrectly - The data record does not match the vehicle.
- Steering wheel electronics control unit coded incorrectly

P1565

Diagnostic information - DME (DFI) control unit

Adaptive cruise control (ACC) implausible

Diagnostic conditions
- Driving

Possible fault causes
- Fault in adaptive cruise control (ACC) area

Fault setting condition(s)
- Simultaneous detection of
  - Request: Acceleration - adaptive cruise control (ACC)

  and
  - Input signal: Brake light switch

Diagnostic information - DME (DFI) control unit

Internal power supply (R/C)

Diagnostic conditions
- Vehicle voltage > 11 V
- Engine compartment and engine cold
- Engine running, then:
  - Switch off ignition
  - Switch on ignition after approx. 1 minute

Possible fault causes
- ♦ Power supply to the DME (DFI) control unit was interrupted (See ⓘ)
- ♦ R/C component in the DME (DFI) control unit faulty

ⓘ INFORMATION
This fault can be entered if the power supply to the DME (DFI) control unit is interrupted within the first 45 seconds after switching ignition off (discharge time of the R/C) and is then restored again immediately afterwards and the ignition is switched on.
- After the ignition is switched off (terminal 15), the DME control unit switches to control unit run-on mode.
- The run-on period depends on many underlying conditions (e.g. engine temperature for fan operation).

The run-on duration can be 1 minute when the engine is cold and up to 45 minutes when the engine is hot.

Diagnostic information - DME (DFI) control unit

Accelerator pedal potentiometer implausible

Diagnostic conditions
- Ignition on > 3 second(s)
- then accelerator pedal pressed down fully > 3 second(s)
- then release accelerator pedal fully
- then idling > 10 second(s)

Possible fault causes
- ♦ Short circuit to B+/ground/between lines or open circuit in wiring to potentiometer 1 and 2
- ♦ Accelerator pedal potentiometer 1 and 2 faulty

Fault setting condition(s)
- Both potentiometers detected as faulty.
- Individual faults are also entered in most cases.

Fault effects
- ♦ Engine does not respond to throttle, engine speed 1,000 rpm

P1577

Diagnostic information - valid for all control units

Read out control unit fault memory content

INFORMATION
This fault code indicates one or more faults/notes in the fault memory of the designated control unit.
Existing faults/notes in the designated control unit must be processed first.

NOTE
Use the [F7] button to show/hide notes in the fault memory.

Possible fault causes

- Fault in the designated control unit
- Note in the designated control unit

Fault effects

- Functions in the control unit are available only with restrictions
- Functions in the control unit are not available

P1582

Diagnostic information - DME (DFI) control unit

Control unit faulty

Diagnostic conditions
- Ignition on > 10 second(s)
- then idling > 30 second(s)
- then engine speed > 1,000 rpm > 60 seconds with:
  - Vehicle standstill
- then driving > 60 second(s)

Possible fault causes
♦ DME (DFI) control unit faulty

P1599

Diagnostic information - DME (DFI) control unit

Neutral position implausible - without power transmission

Diagnostic conditions
- Engine running
- Vehicle speed 0 km/h (0 mph)
- Clutch pedal NOT pressed

Possible fault causes
- Neutral position sensor loose
- Neutral position sensor faulty
- Faults in the area of the shift lever on the transmission/shift module (loose, worn out, ...)

Fault setting condition(s)
- The detected angle of the neutral sensor (C014) deviates by more than 11.25° from the adapted neutral position mean value (C020),
and the DME control unit detects power transmission interrupted (See Diagnostic conditions).

⇒ This means that the fault is detected when the neutral position is NOT detected although there is clearly NO power transmission in the powertrain when the clutch is closed.

Fault effects
- Start/Stop system does not function

Diagnostic information - DME (DFI) control unit

Neutral position sensor: open circuit/short circuit to B+

Diagnostic conditions
- Ignition on
- Shift lever in lower shift gate (2, 4, 6)

Possible fault causes
- Short circuit to B+ or open circuit in the lines
- Neutral position sensor faulty

Fault setting condition(s)
- PWM signal 100% (normal range 10 ... 90%)

Fault effects
- Start/Stop system does not function

Diagnostic information - DME (DFI) control unit

Neutral position implausible - with power transmission

Diagnostic conditions
- In upper (1, 3, 5, 7) and lower (2, 4, 6) shift gate, respectively:
  - Driving under load > 90 Nm for > 1 second, with:
    - Clutch pedal NOT pressed
  - then driving in overrun mode for > 1 second, with:
    - Clutch pedal NOT pressed

Possible fault causes
- ♦ Neutral position sensor loose
- ♦ Neutral position sensor faulty
- ♦ Faults in the area of the shift lever on the transmission/shift module (loose, worn out, ...)

Fault setting condition(s)
- The detected angle of the neutral sensor (C014) is within the range of around 11.25° compared to the adapted neutral position mean value (C020),
and the DME control unit detects power transmission present (See Diagnostic conditions).

⇒ This means that the fault is detected when the neutral position is detected although there is clearly power transmission in the powertrain.

Fault effects
- ♦ Start/Stop system does not function

Diagnostic information - DME (DFI) control unit

Neutral position sensor: short circuit to ground or solenoid missing

Diagnostic conditions
- Ignition on
- Shift lever in upper shift gate (1, 3, 5, 7, R)

Possible fault causes
- Solenoid in transmission faulty, with PWM signal = 5% (See C010)
- Short circuit to ground in line(s)
- Neutral position sensor faulty, with PWM signal = 0% (See C010)

Fault setting condition(s)
- PWM signal 0% ⇒ Short circuit to ground

or
- PWM signal 5% ⇒ Solenoid in transmission is not recognized

(normal range 10 ... 90%)

Fault effects
- Start/Stop system does not function

Diagnostic information - valid for all control units

Communication with control unit

INFORMATION
Communication with the control unit designated in the fault text is/was not possible.

Possible fault causes

♦ The power supply for the designated control unit is not present or is present only to a limited extent.
♦ The CAN line CAN-High and/or CAN-Low is interrupted between the control unit connector of the designated control unit and the first splice behind the control unit.
♦ Control unit faulty

Fault effects

♦ Cross-vehicle functions are not available
♦ Existing substitute/emergency functions of the control units are active
♦ Functions in the control units are available only with restrictions
♦ Functions in the control units are not available

P1603

Diagnostic information - valid for all control units

Read out control unit fault memory content

INFORMATION
This fault code indicates one or more faults/notes in the fault memory of the designated control unit.
Existing faults/notes in the designated control unit must be processed first.

NOTE
Use the [F7] button to show/hide notes in the fault memory.

Possible fault causes

- Fault in the designated control unit
- Note in the designated control unit

Fault effects

- Functions in the control unit are available only with restrictions
- Functions in the control unit are not available

Diagnostic information - valid for all control units

Communication with control unit

INFORMATION
Communication with the control unit designated in the fault text is/was not possible.

Possible fault causes

♦ The power supply for the designated control unit is not present or is present only to a limited extent.
♦ The CAN line CAN-High and/or CAN-Low is interrupted between the control unit connector of the designated control unit and the first splice behind the control unit.
♦ Control unit faulty

Fault effects

♦ Cross-vehicle functions are not available
♦ Existing substitute/emergency functions of the control units are active
♦ Functions in the control units are available only with restrictions
♦ Functions in the control units are not available

Diagnostic information - DME (DFI) control unit

Crash signal monitoring

Diagnostic conditions
- Engine start

Possible fault causes
- Airbag drive link test
- Engine switch-off following:
  - Accident detection

P1626

Diagnostic information - valid for all control units

Communication with control unit

INFORMATION
Communication with the control unit designated in the fault text is/was not possible.

Possible fault causes

♦ The power supply for the designated control unit is not present or is present only to a limited extent.
♦ The CAN line CAN-High and/or CAN-Low is interrupted between the control unit connector of the designated control unit and the first splice behind the control unit.
♦ Control unit faulty

Fault effects

♦ Cross-vehicle functions are not available
♦ Existing substitute/emergency functions of the control units are active
♦ Functions in the control units are available only with restrictions
♦ Functions in the control units are not available

P1641

Diagnostic information - DME (DFI) control unit

Control unit faulty

Diagnostic conditions
- Ignition on > 10 second(s)
- then idling > 30 second(s)
- then engine speed > 1,000 rpm > 60 seconds with:
  - Vehicle standstill
- then driving > 60 second(s)

Possible fault causes
♦ DME (DFI) control unit faulty

P1642

Diagnostic information - DME (DFI) control unit

Control unit faulty

Diagnostic conditions
- Ignition on > 10 second(s)
- then idling > 30 second(s)
- then engine speed > 1,000 rpm > 60 seconds with:
  - Vehicle standstill
- then driving > 60 second(s)

Possible fault causes
♦ DME (DFI) control unit faulty

P1647

Diagnostic information - DME (DFI) control unit

Coolant run-on pump output stage

Diagnostic conditions
- Coolant run-on pump activated

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Coolant run-on pump faulty

ⓘ INFORMATION
The DME control unit activates the coolant run-on pump under the following conditions:
1. For diagnostics: 10 seconds after starting the engine, for a duration of 10 seconds.
2. If engine temperature (**T020**) > 111 °C (232 °F): The pump is activated continuously until the engine speed (A020) is 2,528 rpm. (Switch-off conditions < 107 °C (225 °F) or < 2,016 rpm).
3. After the ignition is switched off and depending on the engine stop temperature (**T080**), the pump is activated for 5 ... 20 minutes, depending also on engine oil temperature (**T030**) and exhaust gas temperature at the turbocharger (**T210/T220**).
The minimum switch-on conditions are:
- **T080** > 83.25 °C (181.85 °F)

or
- **T030** > 85 °C (185 °F)

or
- **T210/T220** > 600 °C (1,112 °F)

P1649

Diagnostic information - DME (DFI) control unit

Coolant run-on pump output stage

Diagnostic conditions
- Coolant run-on pump activated

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Coolant run-on pump faulty

ⓘ INFORMATION
The DME control unit activates the coolant run-on pump under the following conditions:
1. For diagnostics: 10 seconds after starting the engine, for a duration of 10 seconds.
2. If engine temperature (**T020**) > 111 °C (232 °F): The pump is activated continuously until the engine speed (A020) is 2,528 rpm. (Switch-off conditions < 107 °C (225 °F) or < 2,016 rpm).
3. After the ignition is switched off and depending on the engine stop temperature (**T080**), the pump is activated for 5 ... 20 minutes, depending also on engine oil temperature (**T030**) and exhaust gas temperature at the turbocharger (**T210/T220**).
The minimum switch-on conditions are:
- **T080** > 83.25 °C (181.85 °F)

or
- **T030** > 85 °C (185 °F)

or
- **T210/T220** > 600 °C (1,112 °F)

Diagnostic information - DME (DFI) control unit

Coolant run-on pump output stage

Diagnostic conditions
- Coolant run-on pump activated

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Coolant run-on pump faulty

ⓘ INFORMATION
The DME control unit activates the coolant run-on pump under the following conditions:
1. For diagnostics: 10 seconds after starting the engine, for a duration of 10 seconds.
2. If engine temperature (**T020**) > 111 °C (232 °F): The pump is activated continuously until the engine speed (A020) is 2,528 rpm. (Switch-off conditions < 107 °C (225 °F) or < 2,016 rpm).
3. After the ignition is switched off and depending on the engine stop temperature (**T080**), the pump is activated for 5 ... 20 minutes, depending also on engine oil temperature (**T030**) and exhaust gas temperature at the turbocharger (**T210/T220**).
The minimum switch-on conditions are:
- **T080** > 83.25 °C (181.85 °F)

or
- **T030** > 85 °C (185 °F)

or
- **T210/T220** > 600 °C (1,112 °F)

P1651

Diagnostic information - DME (DFI) control unit

Coolant switch-over valve driver for transmission oil

Diagnostic conditions
- Ignition on

Possible fault causes
- Short circuit to B+/ground/between lines or open circuit in the lines
- Coolant switch-over valve for transmission oil faulty

P1652

Diagnostic information - DME (DFI) control unit

Coolant switch-over valve driver for transmission oil

Diagnostic conditions
- Ignition on

Possible fault causes
- Short circuit to B+/ground/between lines or open circuit in the lines
- Coolant switch-over valve for transmission oil faulty

P1653

Diagnostic information - DME (DFI) control unit

Coolant switch-over valve driver for transmission oil

Diagnostic conditions
- Ignition on

Possible fault causes
- Short circuit to B+/ground/between lines or open circuit in the lines
- Coolant switch-over valve for transmission oil faulty

P1654

Diagnostic information - DME (DFI) control unit

Coolant switch-over valve driver for clutch oil (PDK)

Diagnostic conditions
- Ignition on

Possible fault causes
- Short circuit to B+/ground/between lines or open circuit in the lines
- Coolant switchover valve for ATF faulty

P1655

Diagnostic information - DME (DFI) control unit

Coolant switch-over valve driver for clutch oil (PDK)

Diagnostic conditions
- Ignition on

Possible fault causes
- Short circuit to B+/ground/between lines or open circuit in the lines
- Coolant switchover valve for ATF faulty

P1656

Diagnostic information - DME (DFI) control unit

Coolant switch-over valve driver for clutch oil (PDK)

Diagnostic conditions
- Ignition on

Possible fault causes
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Coolant switchover valve for ATF faulty

Diagnostic information - DME (DFI) control unit

Diverter solenoid valve

Diagnostic conditions
- Driving with 1 full-load acceleration and 1 overrun phase

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Diverter solenoid valve faulty

Diagnostic information - DME (DFI) control unit

Diverter solenoid valve

Diagnostic conditions
- Driving with 1 full-load acceleration and 1 overrun phase

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Diverter solenoid valve faulty

P1659

Diagnostic information - DME (DFI) control unit

Diverter solenoid valve

Diagnostic conditions
- Driving with 1 full-load acceleration and 1 overrun phase

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Diverter solenoid valve faulty

P1660

Diagnostic information - DME (DFI) control unit

Coolant switch-over valve driver for engine

Diagnostic conditions
- Ignition on

Possible fault causes
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Engine coolant switchover valve faulty

P1661

Diagnostic information - DME (DFI) control unit

Coolant switch-over valve driver for engine

Diagnostic conditions
- Ignition on

Possible fault causes
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Engine coolant switchover valve faulty

P1662

Diagnostic information - DME (DFI) control unit

Coolant switch-over valve driver for engine

Diagnostic conditions
- Ignition on

Possible fault causes
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Engine coolant switchover valve faulty

P1670

Diagnostic information - DME (DFI) control unit

Engine compartment purge fan 1: electrical fault

⚠WARNING

Exposed running fan blades!
Danger of limbs being severed!
Risk of serious injury due to ejected foreign bodies!

♦ **ALWAYS** keep hair or clothing out of the rotating range of the fan.
♦ DO NOT reach into the rotating fan.
♦ **DO NOT** place tools or other items in the rotating range of the fan.
♦ Perform work on the fan only after disconnecting the plug connection to the spoiler module first.

ⓘ INFORMATION

The run-on duration of the engine compartment purge fan AFTER ignition off depends on the engine compartment temperature.
♦ It is as follows for the following engine compartment temperatures:
  ♦ < 45 °C (113 °F) for approx. 50 seconds
  ♦ 45 ... 70 °C (113 … 158 °F) for approx. 200 seconds
  ♦ > 70 °C (158 °F) for up to 20 minutes

Diagnostic conditions

- Vehicle voltage 10 ... 15 V
- Ignition on or engine running or control unit run-on
- **LOW** stage activated for > 25 seconds (drive links)

Possible fault causes

♦ Short circuit to B+/ground/between lines or open circuit in the lines ▶ Engine compartment purge fan relay activation
♦ Engine compartment purge fan relay activation faulty
♦ Short circuit to B+/ground/between lines or open circuit in the lines ▶ Engine compartment purge fan 1
♦ Engine compartment purge fan 1 faulty
♦ Short circuit to B+/ground or open circuit in the line ▶ Diagnostic line to DME (DFI) control unit

Fault setting condition(s)

- Diagnostic voltage for engine compartment purge fan on DME control unit 10 ... 12 V, with:
  - Engine compartment purge fan activated at **LOW** stage (only engine compartment purge fan relay activation)

Fault effects

♦ Engine compartment purge fan activated at **HIGH** stage
♦ Resulting diagnostic voltage approx. 12 V

ⓘ **HIGH** stage is canceled only after an ignition change (off ▶ on), and as long as the fault is not active.

P1671

Diagnostic information - DME (DFI) control unit

Engine compartment purge fan 1: blocked

⚠WARNING

Exposed running fan blades!
Danger of limbs being severed!
Risk of serious injury due to ejected foreign bodies!

♦ **ALWAYS** keep hair or clothing out of the rotating range of the fan.
♦ DO NOT reach into the rotating fan.
♦ **DO NOT** place tools or other items in the rotating range of the fan.
♦ Perform work on the fan only after disconnecting the plug connection to the spoiler module first.

ⓘ INFORMATION

The run-on duration of the engine compartment purge fan AFTER ignition off depends on the engine compartment temperature.

♦ It is as follows for the following engine compartment temperatures:
  ♦ < 45 °C (113 °F) for approx. 50 seconds
  ♦ 45 ... 70 °C (113 … 158 °F) for approx. 200 seconds
  ♦ > 70 °C (158 °F) for up to 20 minutes

Diagnostic conditions

- Vehicle voltage 10 ... 15 V
- Ignition on or engine running or control unit run-on
- **LOW** stage activated for > 25 seconds (drive links)

Possible fault causes

♦ Engine compartment purge fan 1 mechanically blocked
♦ Short circuit to B+/ground or open circuit in the line ▶ Diagnostic line to DME (DFI) control unit

Fault setting condition(s)

- Diagnostic voltage for engine compartment purge fan on DME control unit 8 ... 10 V, with:
  - Engine compartment purge fan activated at **LOW** stage (only engine compartment purge fan relay activation)

P1672

Diagnostic information - DME (DFI) control unit

Engine compartment purge fan 2: electrical fault

⚠WARNING

Exposed running fan blades!
Danger of limbs being severed!
Risk of serious injury due to ejected foreign bodies!

♦ **ALWAYS** keep hair or clothing out of the rotating range of the fan.
♦ DO NOT reach into the rotating fan.
♦ **DO NOT** place tools or other items in the rotating range of the fan.
♦ Perform work on the fan only after disconnecting the plug connection to the spoiler module first.

ⓘ INFORMATION

The run-on duration of the engine compartment purge fan AFTER ignition off depends on the engine compartment temperature.
♦ It is as follows for the following engine compartment temperatures:
  ♦ < 45 °C (113 °F) for approx. 50 seconds
  ♦ 45 ... 70 °C (113 … 158 °F) for approx. 200 seconds
  ♦ > 70 °C (158 °F) for up to 20 minutes

Diagnostic conditions

- Vehicle voltage 10 ... 15 V
- Ignition on or engine running or control unit run-on
- **LOW** stage activated for > 25 seconds (drive links)

Possible fault causes

♦ Short circuit to B+/ground/between lines or open circuit in the lines ▶ Engine compartment purge fan relay activation
♦ Engine compartment purge fan relay activation faulty
♦ Short circuit to B+/ground/between lines or open circuit in the lines ▶ Engine compartment purge fan 2
♦ Engine compartment purge fan 2 faulty
♦ Short circuit to B+/ground or open circuit in the line ▶ Diagnostic line to DME (DFI) control unit

Fault setting condition(s)

- Diagnostic voltage for engine compartment purge fan on DME control unit 2 ... 0 V, with:
  - Engine compartment purge fan activated at **LOW** stage (only engine compartment purge fan relay activation)

Fault effects

♦ Engine compartment purge fan activated at **HIGH** stage
♦ Resulting diagnostic voltage approx. 12 V

ⓘ **HIGH** stage is canceled only after an ignition change (off ▶ on), and as long as the fault is not active.

P1673

Diagnostic information - DME (DFI) control unit

Engine compartment purge fan 2: blocked

⚠WARNING

Exposed running fan blades!
Danger of limbs being severed!
Risk of serious injury due to ejected foreign bodies!

♦ **ALWAYS** keep hair or clothing out of the rotating range of the fan.
♦ DO NOT reach into the rotating fan.
♦ **DO NOT** place tools or other items in the rotating range of the fan.
♦ Perform work on the fan only after disconnecting the plug connection to the spoiler module first.

ⓘ INFORMATION

The run-on duration of the engine compartment purge fan AFTER ignition off depends on the engine compartment temperature.

♦ It is as follows for the following engine compartment temperatures:
  ♦ < 45 °C (113 °F) for approx. 50 seconds
  ♦ 45 ... 70 °C (113 … 158 °F) for approx. 200 seconds
  ♦ > 70 °C (158 °F) for up to 20 minutes

Diagnostic conditions

- Vehicle voltage 10 ... 15 V
- Ignition on or engine running or control unit run-on
- **LOW** stage activated for > 25 seconds (drive links)

Possible fault causes

♦ Engine compartment purge fan 2 mechanically blocked
♦ Short circuit to B+/ground or open circuit in the line ▶ Diagnostic line to DME (DFI) control unit

Fault setting condition(s)

- Diagnostic voltage for engine compartment purge fan on DME control unit 4 ... 2 V, with:
  - Engine compartment purge fan activated at **LOW** stage (only engine compartment purge fan relay activation)

P1674

Diagnostic information - DME (DFI) control unit

Driver for engine compartment purge fan HIGH

⚠WARNING

Exposed running fan blades!
Danger of limbs being severed!
Risk of serious injury due to ejected foreign bodies!

♦ **ALWAYS** keep hair or clothing out of the rotating range of the fan.
♦ DO NOT reach into the rotating fan.
♦ **DO NOT** place tools or other items in the rotating range of the fan.
♦ Perform work on the fan only after disconnecting the plug connection to the spoiler module first.

ⓘ INFORMATION

The run-on duration of the engine compartment purge fan AFTER ignition off depends on the engine compartment temperature.
♦ It is as follows for the following engine compartment temperatures:
  ♦ < 45 °C (113 °F) for approx. 50 seconds
  ♦ 45 ... 70 °C (113 … 158 °F) for approx. 200 seconds
  ♦ > 70 °C (158 °F) for up to 20 minutes

Diagnostic conditions

● Ignition on or engine running
● LOW **and** HIGH stages activated successively (drive links)

Possible fault causes

● **NO P1686** in fault memory
  ♦ Relay for engine compartment purge fan 2 faulty
  ♦ Open circuit/short circuit to B+ ▶ Control line for DME (DFI) control unit to relay for engine compartment purge fan 2
  ♦ Short circuit to B+/ground/between lines or open circuit in the lines ▶ Relay for engine compartment purge fan 2

● **P1686 AND P1674** in fault memory
  ♦ Relay for engine compartment purge fan 1 faulty
  ♦ Relay for engine compartment purge fan 2 faulty
  ♦ Short circuit to B+/ground or open circuit in the line ▶ Diagnostic line to DME (DFI) control unit
  ♦ Short circuit to B+/ground/between lines or open circuit in the lines ▶ Relay for engine compartment purge fan 2

Fault setting condition(s)

● Diagnostic voltage for engine compartment purge fan on DME control unit < 11.5 V, with:
  ● Engine compartment purge fan activated at HIGH stage (Relay for engine compartment purge fan 1 + relay for engine compartment purge fan 2)

P1675

Diagnostic information - DME (DFI) control unit

Engine compartment purge fan: function

⚠WARNING

Exposed running fan blades!
Danger of limbs being severed!
Risk of serious injury due to ejected foreign bodies!

♦ **ALWAYS** keep hair or clothing out of the rotating range of the fan.
♦ DO NOT reach into the rotating fan.
♦ **DO NOT** place tools or other items in the rotating range of the fan.
♦ Perform work on the fan only after disconnecting the plug connection to the spoiler module first.

ⓘ INFORMATION

The run-on duration of the engine compartment purge fan AFTER ignition off depends on the engine compartment temperature.
♦ It is as follows for the following engine compartment temperatures:
  ♦ < 45 °C (113 °F) for approx. 50 seconds
  ♦ 45 ... 70 °C (113 … 158 °F) for approx. 200 seconds
  ♦ > 70 °C (158 °F) for up to 20 minutes

Diagnostic conditions

● Engine compartment purge fan activated > 200 second(s)

Possible fault causes

♦ Air intake covered or blocked (vehicle tarp)
♦ Engine compartment temperature sensor has fallen out of holder (sensor is lying on engine)
♦ Engine compartment purge fan faulty (electrical fault, stiff, blocked)
♦ Engine compartment purge fan relay faulty (mechanical or electrical fault)
♦ Short circuit to B+/ground/between lines or open circuit in the lines
♦ Engine compartment temperature sensor faulty

Fault setting condition(s)

● Engine compartment temperature > 110 °C (230 °F), with:
  ● Engine compartment purge fan activated > 200 second(s)

Diagnostic information - DME (DFI) control unit

Engine compartment purge fan relay switchover HIGH/ LOW

ⓘ INFORMATION

The run-on duration of the engine compartment purge fan AFTER ignition off depends on the engine compartment temperature.

♦ It is as follows for the following engine compartment temperatures:
- ♦ < 45 °C (113 °F) for approx. 50 seconds
- ♦ 45 ... 70 °C (113 … 158 °F) for approx. 200 seconds
- ♦ > 70 °C (158 °F) for up to 20 minutes

Diagnostic conditions

- Vehicle voltage 10 ... 15 V
- Ignition on or engine running or control unit run-on
- **HIGH** stage activated for > 25 seconds (drive links)

Possible fault causes

♦ Short circuit to B+/ground/between lines or open circuit in the lines ▶ Engine compartment purge fan relay switchover HIGH/ LOW

♦ Engine compartment purge fan relay switchover HIGH/LOW faulty

Diagnostic information - DME (DFI) control unit

Engine compartment purge fan relay switchover HIGH/ LOW

ⓘ INFORMATION

The run-on duration of the engine compartment purge fan AFTER ignition off depends on the engine compartment temperature.

♦ It is as follows for the following engine compartment temperatures:
- ♦ < 45 °C (113 °F) for approx. 50 seconds
- ♦ 45 ... 70 °C (113 … 158 °F) for approx. 200 seconds
- ♦ > 70 °C (158 °F) for up to 20 minutes

Diagnostic conditions

- Vehicle voltage 10 ... 15 V
- Ignition on or engine running or control unit run-on
- **HIGH** stage activated for > 25 seconds (drive links)

Possible fault causes

♦ Short circuit to B+/ground/between lines or open circuit in the lines ▶ Engine compartment purge fan relay switchover HIGH/ LOW

♦ Engine compartment purge fan relay switchover HIGH/LOW faulty

P1678

Diagnostic information - DME (DFI) control unit

Engine compartment purge fan - runs without activation

⚠WARNING

Exposed running fan blades!
Danger of limbs being severed!
Risk of serious injury due to ejected foreign bodies!

♦ **ALWAYS** keep hair or clothing out of the rotating range of the fan.
♦ DO NOT reach into the rotating fan.
♦ **DO NOT** place tools or other items in the rotating range of the fan.
♦ Perform work on the fan only after disconnecting the plug connection to the spoiler module first.

ⓘ INFORMATION

The run-on duration of the engine compartment purge fan AFTER ignition off depends on the engine compartment temperature.

♦ It is as follows for the following engine compartment temperatures:
  ♦ < 45 °C (113 °F) for approx. 50 seconds
  ♦ 45 ... 70 °C (113 … 158 °F) for approx. 200 seconds
  ♦ > 70 °C (158 °F) for up to 20 minutes

Diagnostic conditions

- Vehicle voltage 10 ... 15 V
- Ignition on or engine running or control unit run-on
- Vehicle speed < 120 km/h (75 mph)
- Engine compartment purge fan NOT activated

Possible fault causes

♦ Engine compartment purge fan relay activation faulty
♦ Short circuit to B+/ground/between lines or open circuit in the lines ▶ Engine compartment purge fan 2
♦ Short circuit to B+/ground or open circuit in the line ▶ Diagnostic line to DME (DFI) control unit

Fault setting condition(s)

- Diagnostic voltage for engine compartment purge fan on DME control unit > 11 V, with engine compartment purge fan **NOT** activated

P1686

Diagnostic information - DME (DFI) control unit

Driver for engine compartment purge fan LOW

⚠WARNING

Exposed running fan blades!
Danger of limbs being severed!
Risk of serious injury due to ejected foreign bodies!

♦ **ALWAYS** keep hair or clothing out of the rotating range of the fan.
♦ DO NOT reach into the rotating fan.
♦ **DO NOT** place tools or other items in the rotating range of the fan.
♦ Perform work on the fan only after disconnecting the plug connection to the spoiler module first.

ⓘ INFORMATION

The run-on duration of the engine compartment purge fan AFTER ignition off depends on the engine compartment temperature.
♦ It is as follows for the following engine compartment temperatures:
  ♦ < 45 °C (113 °F) for approx. 50 seconds
  ♦ 45 ... 70 °C (113 … 158 °F) for approx. 200 seconds
  ♦ > 70 °C (158 °F) for up to 20 minutes

Diagnostic conditions

● Ignition on or engine running
● LOW **and** HIGH stages activated successively (drive links)

Possible fault causes

● **NO P1674** in fault memory
  ♦ Engine compartment purge fan 1 and/or 2 NOT connected
  ♦ Engine compartment purge fan 1 mechanically sluggish/blocked with engine running
  ♦ Open circuit/short circuit to B+ ▶ Control line for DME (DFI) control unit to relay for engine compartment purge fan 1
  ♦ Short circuit to B+/ground/between lines or open circuit in the lines ▶ Relay for engine compartment purge fan 1

● **P1686 AND P1674** in fault memory
♦ Relay for engine compartment purge fan 1 faulty
♦ Relay for engine compartment purge fan 2 faulty
♦ Short circuit to B+/ground or open circuit in the line ▶ Diagnostic line to DME (DFI) control unit
♦ Short circuit to B+/ground/between lines or open circuit in the lines ▶ Relay for engine compartment purge fan 2

Fault setting condition(s)

● Diagnostic voltage for engine compartment purge fan on DME control unit < 5.5 V or > 12.0 V, with:
  ● Engine compartment purge fan activated at LOW stage (Relay for engine compartment purge fan 1)

Diagnostic information - DME (DFI) control unit

Engine compartment purge fan relay activation

ⓘ INFORMATION

The run-on duration of the engine compartment purge fan AFTER ignition off depends on the engine compartment temperature.

♦ It is as follows for the following engine compartment temperatures:
- ♦ < 45 °C (113 °F) for approx. 50 seconds
- ♦ 45 ... 70 °C (113 … 158 °F) for approx. 200 seconds
- ♦ > 70 °C (158 °F) for up to 20 minutes

Diagnostic conditions

- Vehicle voltage 10 ... 15 V
- Ignition on or engine running or control unit run-on
- **LOW** stage activated for > 25 seconds (drive links)

Possible fault causes

♦ Short circuit to B+/ground/between lines or open circuit in the lines ▶ Engine compartment purge fan relay activation

♦ Engine compartment purge fan relay activation faulty

Diagnostic information - DME (DFI) control unit

Engine compartment purge fan relay activation

ⓘ INFORMATION

The run-on duration of the engine compartment purge fan AFTER ignition off depends on the engine compartment temperature.

♦ It is as follows for the following engine compartment temperatures:
- ♦ < 45 °C (113 °F) for approx. 50 seconds
- ♦ 45 ... 70 °C (113 … 158 °F) for approx. 200 seconds
- ♦ > 70 °C (158 °F) for up to 20 minutes

Diagnostic conditions

- Vehicle voltage 10 ... 15 V
- Ignition on or engine running or control unit run-on
- **LOW** stage activated for > 25 seconds (drive links)

Possible fault causes

♦ Short circuit to B+/ground/between lines or open circuit in the lines ▶ Engine compartment purge fan relay activation

♦ Engine compartment purge fan relay activation faulty

P169B

Diagnostic information - DME (DFI) control unit

Transmission oil temperature sensor implausible

Diagnostic conditions
- Time since ignition off > 8

Possible fault causes
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Transmission oil temperature sensor faulty

Fault setting condition(s)
- The temperature measured by the transmission oil temperature sensor (T145) deviates too much from the mean value of the engine coolant, engine oil, intake air and ambient air temperatures (T160).

Fault effects
- ♦ Substitute value from model

Temperature sensor setpoints

Temperature		Resistance [Ohm]
♦ 0 °C	(32 °F)	13,968
♦ 20 °C	(68 °F)	6,068
♦ 25 °C	(77 °F)	5,000
♦ 40 °C	(104 °F)	2,887
♦ 50 °C	(122 °F)	2,051
♦ 60 °C	(140 °F)	1,484
♦ 80 °C	(176 °F)	814
♦ 100 °C	(212 °F)	473
♦ 120 °C	(248 °F)	289
♦ 140 °C	(284 °F)	184

P169C

Diagnostic information - DME (DFI) control unit

Transmission oil temperature too high

Diagnostic conditions
- Engine running

Fault setting condition(s)
- Transmission oil temperature > 150 °C (302 °F) (T145)

Fault effects
- ♦ Warning in instrument cluster
- ♦ Operating restrictions

P169D

Diagnostic information - DME (DFI) control unit

Transmission oil temperature too high

Diagnostic conditions
- Engine running

Fault setting condition(s)
- Transmission oil temperature > 150 °C (302 °F) (T145)

Fault effects
- ♦ Warning in instrument cluster
- ♦ Operating restrictions

Diagnostic information - DME (DFI) control unit

Transmission oil temperature sensor: electrical fault

Diagnostic conditions
- Ignition on

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Transmission oil temperature sensor faulty

P16A0

Diagnostic information - DME (DFI) control unit

Transmission oil temperature sensor: electrical fault

Diagnostic conditions
- Ignition on

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines
- Transmission oil temperature sensor faulty

Diagnostic information - DME (DFI) control unit

Tank leakage diagnosis module: signal line

Diagnostic conditions
- Engine running

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Open circuit in signal line for DME (DFI) control unit ▶ NVLD evaluation unit (electronic part)
- ♦ Power supply or ground supply faulty ▶ NVLD evaluation unit (electronic part)
- ♦ NVLD evaluation unit (electronic part) faulty

P2025

Diagnostic information - DME (DFI) control unit

Tank leakage diagnosis module: NVLD evaluation unit (electronic part) **faulty**

Diagnostic conditions
- No fault entered for: Engine temperature, intake air temperature, tank leakage diagnosis module
- Engine running
  - then ignition off for > 8 hours
    - then start the engine

Possible fault causes
♦ NVLD evaluation unit (electronic part) faulty

Diagnostic information - DME (DFI) control unit

Tank leakage diagnosis module: signal line

Diagnostic conditions
- Engine running

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Open circuit in signal line for DME (DFI) control unit ▶ NVLD evaluation unit (electronic part)
- ♦ Power supply or ground supply faulty ▶ NVLD evaluation unit (electronic part)
- ♦ NVLD evaluation unit (electronic part) faulty

P2027

Diagnostic information - DME (DFI) control unit

Tank leakage diagnosis module: signal line

Diagnostic conditions
- Engine running

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Open circuit in signal line for DME (DFI) control unit ▶ NVLD evaluation unit (electronic part)
- ♦ Power supply or ground supply faulty ▶ NVLD evaluation unit (electronic part)
- ♦ NVLD evaluation unit (electronic part) faulty

Diagnostic information - DME (DFI) control unit

Exhaust temperature sensor, bank 1

Diagnostic conditions
- Cold start, with:
  - Switch-off time (ignition off) > 6 hour(s)
  - Engine temperature < 30 °C (86 °F)
  - Intake air temperature < 50 °C (122 °F)
  - Engine temperature max. 20 °C (68 °F) > intake air temperature
  - Engine temperature max. 30 °C (86 °F) > ambient temperature
- Engine running > 10 minute(s)
- None of the following faults stored: Switch-off time, ambient temperature, engine temperature or intake air temperature

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Exhaust temperature sensor faulty

Fault setting condition(s)
- Exhaust gas temperature <> intake air temperature and engine temperature ⇒ Deviation too high, during cold start (See Diagnostic conditions)

or
- Exhaust gas temperature after cold start ⇒ Increase too low

or
- Exhaust gas temperature (measured) <> exhaust gas temperature (model) ⇒ Deviation too high

or
- Exhaust gas temperature: Actual-value jumps > 10 °C (50 °F)/10 ms

Fault effects
- If 1 exhaust temperature sensor is faulty, then substitute value = bank 2 exhaust gas temperature (measured value) + safety reserve
- If 2 exhaust temperature sensors are faulty, then substitute value = exhaust gas temperature (model) + safety reserve

P2081

Diagnostic information - DME (DFI) control unit

Exhaust temperature sensor, bank 1

Diagnostic conditions
- Ignition on

Possible fault causes
♦ Exhaust temperature sensor control unit faulty

Fault effects
- If 1 exhaust temperature sensor is faulty, then substitute value = bank 2 exhaust gas temperature (measured value) + safety reserve
- If 2 exhaust temperature sensors are faulty, then substitute value = exhaust gas temperature (model) + safety reserve

Diagnostic information - DME (DFI) control unit

Exhaust temperature sensor, bank 2

Diagnostic conditions
- Cold start, with:
  - Switch-off time (ignition off) > 6 hour(s)
  - Engine temperature < 30 °C (86 °F)
  - Intake air temperature < 50 °C (122 °F)
  - Engine temperature max. 20 °C (68 °F) > intake air temperature
  - Engine temperature max. 30 °C (86 °F) > ambient temperature
- Engine running > 10 minute(s)
- None of the following faults stored: Switch-off time, ambient temperature, engine temperature or **intake air temperature**

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Exhaust temperature sensor faulty

Fault setting condition(s)
- Exhaust gas temperature <> intake air temperature and engine temperature ⇒ Deviation too high, at:
  - Cold start (See Diagnostic conditions)

or
- Exhaust gas temperature after cold start ⇒ Increase too low

or
- Exhaust gas temperature (measured) <> exhaust gas temperature (model) ⇒ Deviation too high

or
- Exhaust gas temperature: Actual-value jumps > 10 °C (50 °F)/10 ms

Fault effects
- If 1 exhaust temperature sensor is faulty, then substitute value = bank 2 exhaust gas temperature (measured value) + safety reserve
- If 2 exhaust temperature sensors are faulty, then substitute value = exhaust gas temperature (model) + safety reserve

Diagnostic information - DME (DFI) control unit

Exhaust temperature sensor, bank 2

Diagnostic conditions
- Ignition on

Possible fault causes
♦ Exhaust temperature sensor control unit faulty

Fault effects
- If 1 exhaust temperature sensor is faulty, then substitute value = bank 2 exhaust gas temperature (measured value) + safety reserve
- If 2 exhaust temperature sensors are faulty, then substitute value = exhaust gas temperature (model) + safety reserve

P2088

Diagnostic information - DME (DFI) control unit

Intake camshaft adjustment output stage, bank 1

Diagnostic conditions
- Time since engine start > 10 second(s)
- None of the following faults stored: P1556, P1557, P1558

Possible fault causes
- Short circuit to B+/ground or open circuit in the line (activation)
- Short circuit to ground or open circuit in the lines (power supply)
- Fuse faulty
- Solenoid valve for hydraulic camshaft adjustment faulty

P2089

Diagnostic information - DME (DFI) control unit

Intake camshaft adjustment output stage, bank 1

Diagnostic conditions
- Time since engine start > 10 second(s)
- None of the following faults stored: P1556, P1557, P1558

Possible fault causes
- Short circuit to B+/ground or open circuit in the line (activation)
- Short circuit to ground or open circuit in the lines (power supply)
- Fuse faulty
- Solenoid valve for hydraulic camshaft adjustment faulty

P2092

Diagnostic information - DME (DFI) control unit

Intake camshaft adjustment output stage, bank 2

Diagnostic conditions
- Time since engine start > 10 second(s)
- None of the following faults stored: P1556, P1557, P1558

Possible fault causes
- Short circuit to B+/ground or open circuit in the line (activation)
- Short circuit to ground or open circuit in the lines (power supply)
- Fuse faulty
- Solenoid valve for hydraulic camshaft adjustment faulty

P2093

Diagnostic information - DME (DFI) control unit

Intake camshaft adjustment output stage, bank 2

Diagnostic conditions
- Time since engine start > 10 second(s)
- None of the following faults stored: P1556, P1557, P1558

Possible fault causes
- Short circuit to B+/ground or open circuit in the line (activation)
- Short circuit to ground or open circuit in the lines (power supply)
- Fuse faulty
- Solenoid valve for hydraulic camshaft adjustment faulty

P2096

Diagnostic information - DME (DFI) control unit

Lambda correction behind catalytic converter bank 1 - control limit exceeded (too lean)

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Perform all short tests in sequence (without tank leak test).

or

- Steady driving > 20 minute(s) at:
  - approx. 80 km/h (50 mph)
  - in the highest gear
  - Lambda control (behind catalytic converter) active
- None of the following faults stored: P2270, P2271, P0041

Possible fault causes

♦ Leak in exhaust system between oxygen sensor upstream of catalytic converter and oxygen sensor downstream of catalytic converter, bank 1

♦ Camshaft adjustment fault

♦ Valve lift control fault

♦ Mechanical fault in valve drive

♦ Oxygen sensor upstream of catalytic converter bank 1 faulty (aged)

Fault setting condition(s)

♦ Adaptation limit (4%) exceeded

P2097

Diagnostic information - DME (DFI) control unit

Lambda correction behind catalytic converter bank 1 - control limit exceeded (too rich)

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Perform all short tests in sequence (without tank leak test).

or

- Steady driving > 20 minute(s) at:
  - approx. 80 km/h (50 mph)
  - in the highest gear
  - Lambda control (behind catalytic converter) active
- None of the following faults stored: P2270, P2271, P0041

Possible fault causes

♦ Leak in exhaust system between oxygen sensor upstream of catalytic converter and oxygen sensor downstream of catalytic converter, bank 1

♦ Camshaft adjustment fault

♦ Valve lift control fault

♦ Mechanical fault in valve drive

♦ Oxygen sensor upstream of catalytic converter bank 1 faulty (aged)

Fault setting condition(s)

♦ Adaptation limit (4%) exceeded

P2098

Diagnostic information - DME (DFI) control unit

Lambda correction behind catalytic converter bank 2 - control limit exceeded (too lean)

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Perform all short tests in sequence (without tank leak test).

or

- Steady driving > 20 minute(s) at:
  - approx. 80 km/h (50 mph)
  - in the highest gear
  - Lambda control (behind catalytic converter) active
- None of the following faults stored: P2272, P2273, P0041

Possible fault causes

♦ Leak in exhaust system between oxygen sensor upstream of catalytic converter and oxygen sensor downstream of catalytic converter, bank 2

♦ Camshaft adjustment fault

♦ Valve lift control fault

♦ Mechanical fault in valve drive

♦ Oxygen sensor upstream of catalytic converter bank 2 faulty (aged)

Fault setting condition(s)

♦ Adaptation limit (4%) exceeded

P2099

Diagnostic information - DME (DFI) control unit

Lambda correction behind catalytic converter bank 2 - control limit exceeded (too rich)

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Perform all short tests in sequence (without tank leak test).

or

- Steady driving > 20 minute(s) at:
  - approx. 80 km/h (50 mph)
  - in the highest gear
  - Lambda control (behind catalytic converter) active
- None of the following faults stored: P2272, P2273, P0041

Possible fault causes

♦ Leak in exhaust system between oxygen sensor upstream of catalytic converter and oxygen sensor downstream of catalytic converter, bank 2

♦ Camshaft adjustment fault

♦ Valve lift control fault

♦ Mechanical fault in valve drive

♦ Oxygen sensor upstream of catalytic converter bank 2 faulty (aged)

Fault setting condition(s)

♦ Adaptation limit (4%) exceeded

Diagnostic information - DME (DFI) control unit

Throttle valve adjusting unit driver

Diagnostic conditions
- Ignition on

Possible fault causes
- Ground pin for DME control unit supply loose/painted/corroded
- Short circuit between lines (servo motor)
- Throttle valve adjusting unit faulty

Fault effects
The vehicle is in limp-home mode, i.e. the engine is running at 1,200 to 1,800 rpm.

P2101

Diagnostic information - DME (DFI) control unit

Throttle valve adjusting unit - position deviation/control range

Diagnostic conditions
- Throttle valve adjusting unit adapted
- Ignition on

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit between lines (servo motor)
- Throttle valve adjusting unit faulty

Fault effects
The vehicle is in limp-home mode, i.e. the engine is running at 1,200 to 1,800 rpm.

P2103

Diagnostic information - DME (DFI) control unit

Throttle valve adjusting unit - position deviation/control range

Diagnostic conditions
- Throttle valve adjusting unit adapted
- Ignition on

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit between lines (servo motor)
- Throttle valve adjusting unit faulty

Fault effects
The vehicle is in limp-home mode, i.e. the engine is running at 1,200 to 1,800 rpm.

Diagnostic information - DME (DFI) control unit

Throttle valve potentiometer 1 implausible

Diagnostic conditions
- Engine running
- None of the following faults stored: P2127 or P2128 (throttle valve potentiometer 2)

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines (potentiometer)
- ♦ Throttle valve adjusting unit faulty

Fault setting condition(s)
- Throttle valve potentiometer 1 (measured) - mass air flow (calculated)
  ⇒ Deviation too high

Fault effects
The vehicle is in limp-home mode, i.e. the engine is running at 1,200 to 1,800 rpm.

Diagnostic information - DME (DFI) control unit

Throttle potentiometer 1

Diagnostic conditions
- Ignition on > 5 second(s)
- then engine running

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines (**potentiometer**)
- ♦ **Throttle valve adjusting unit** faulty

Fault effects
- ♦ No acceleration initially + increased idle speed (approx. 800 rpm)
  - ▶ until the accelerator pedal is released fully.
  - ♦ Then acceleration, with
    - ♦ significantly reduced engine torque (max. approx.100 ... 180 Nm)
    - ♦ and limited engine speed (max. approx. 5,000 rpm).
  - ♦ If the accelerator and brake are pressed at the same time, the engine will run at idle speed.

Diagnostic information - DME (DFI) control unit

Throttle potentiometer 1

Diagnostic conditions
- Ignition on > 5 second(s)
- then engine running

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines (**potentiometer**)
- ♦ **Throttle valve adjusting unit** faulty

Fault effects
- ♦ No acceleration initially + increased idle speed (approx. 800 rpm)
  - ▶ until the accelerator pedal is released fully.
  - ♦ Then acceleration, with
    - ♦ significantly reduced engine torque (max. approx.100 ... 180 Nm)
    - ♦ and limited engine speed (max. approx. 5,000 rpm).
  - ♦ If the accelerator and brake are pressed at the same time, the engine will run at idle speed.

Diagnostic information - DME (DFI) control unit

Throttle valve potentiometer 2 implausible

Diagnostic conditions
- Engine running
- None of the following faults stored: P2122 or P2123 (throttle valve potentiometer 1)

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to B+/ground/between lines or open circuit in the lines (potentiometer)
- Throttle valve adjusting unit faulty

Fault setting condition(s)
- Throttle valve potentiometer 2 (measured) - mass air flow (calculated)
  ⇒ Deviation too high

Fault effects
The vehicle is in limp-home mode, i.e. the engine is running at 1,200 to 1,800 rpm.

Diagnostic information - DME (DFI) control unit

Throttle potentiometer 2

Diagnostic conditions
- Ignition on > 5 second(s)
- then engine running

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines (**potentiometer**)
- ♦ **Throttle valve adjusting unit** faulty

Fault effects
- ♦ No acceleration initially + increased idle speed (approx. 800 rpm)
  - ▶ until the accelerator pedal is released fully.
  - ♦ Then acceleration, with
    - ♦ significantly reduced engine torque (max. approx.100 ... 180 Nm)
    - ♦ and limited engine speed (max. approx. 5,000 rpm).
  - ♦ If the accelerator and brake are pressed at the same time, the engine will run at idle speed.

Diagnostic information - DME (DFI) control unit

Throttle potentiometer 2

Diagnostic conditions
- Ignition on > 5 second(s)
- then engine running

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines (**potentiometer**)
- ♦ **Throttle valve adjusting unit** faulty

Fault effects
- ♦ No acceleration initially + increased idle speed (approx. 800 rpm)
  - ▶ until the accelerator pedal is released fully.
  - ♦ Then acceleration, with
    - ♦ significantly reduced engine torque (max. approx.100 ... 180 Nm)
    - ♦ and limited engine speed (max. approx. 5,000 rpm).
  - ♦ If the accelerator and brake are pressed at the same time, the engine will run at idle speed.

Diagnostic information - DME (DFI) control unit

Throttle valve adjusting unit - channel comparison

Diagnostic conditions
- Throttle valve adjusting unit adapted
- Idling and short acceleration
- then driving with different operating conditions

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Throttle valve adjusting unit faulty

Fault setting condition(s)
- The two potentiometer values differ too greatly from each other.
- It is not clear which value is incorrect.

Fault effects
- No throttle response
- Increased idle speed (approx. 1,000 .... 1,600 rpm)
- Electronic throttle emergency mode (see ⓘ)

ⓘ INFORMATION

Electronic throttle emergency mode

During electronic throttle emergency mode, no power is supplied to the throttle valve, which then drops to emergency air position.
- Idle speed increases to approx. 1,000 .... 1,200 rpm.
- If the accelerator pedal is pressed, the engine will run at max. 1,600 rpm (set via ignition, injection, ...). ▶ **Limp home**.
- If the accelerator and brake are pressed at the same time, the engine will run at idle speed.
- If the engine speed exceeds 1,600 rpm, cylinders will be deactivated.
- If cylinder deactivation is not sufficient, the DME control unit performs a reset and fault code **P1559** is stored in the fault memory (the original faults were previously stored as reset-resistant faults in the fault memory).

P2148

Diagnostic information - DME (DFI) control unit

Power supply for fuel injectors for cylinders 1+4

ⓘ INFORMATION
The power supply for the fuel injectors is switched in pairs in the control unit.

Diagnostic conditions
- Engine running

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines (power supply)
- ♦ Fuel injector faulty

P2151

Diagnostic information - DME (DFI) control unit

Power supply for fuel injectors for cylinders 2+5

ⓘ INFORMATION
The power supply for the fuel injectors is switched in pairs in the control unit.

Diagnostic conditions
- Engine running

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines (power supply)
- ♦ Fuel injector faulty

P2154

Diagnostic information - DME (DFI) control unit

Power supply for fuel injectors for cylinders 3+6

ⓘ INFORMATION
The power supply for the fuel injectors is switched in pairs in the control unit.

Diagnostic conditions
- Engine running

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines (power supply)
- ♦ Fuel injector faulty

Diagnostic information - DME (DFI) control unit

Thermostat stuck open

Diagnostic conditions
- Drive > 10 minute(s) with:
  - Engine start temperature < 60 °C (140 °F)
  - Average vehicle speed 30 ... 60 km/h (18 … 37 mph)
  - Max. vehicle speed 100 km/h (62 mph)
  - Overrun phase(s) < 100 second(s) in total
  - Average mass air flow > 20 kg/h
  - With heating until engine coolant temperature > 75 °C (167 °F)

Possible fault causes
- ♦ Combination valve for bleeding the cooling system not closed (service bow is up)
- ♦ Combination valve for bleeding the cooling system leaking
- ♦ Thermostat faulty
- ♦ Seal in thermostat housing faulty
- ♦ Thermostat housing faulty

Fault setting condition(s)
- Engine coolant temperature > setpoint value 60 ... 75 °C (140 … 167 °F) (See ⓘ 1), at:
  - End of diagnostics, diagnostic conditions met (See ⓘ 2)

ⓘ INFORMATION

1. Setpoint value, depending on ambient temperature
2. The diagnostic function ends under the following conditions:
   - Total mass air flow since engine start > 6.6 ... > 13.5 kg (15 … 30 lbs), depending on:
     - ♦ Engine start temperature
     - ♦ Ambient temperature
   - ♦ The air throughput is used to estimate the amount of heat released during combustion of the fuel mixture.
   - ♦ The diagnosis is evaluated only if the diagnostic conditions were met.

Diagnostic information - DME (DFI) control unit

Coolant temperature at radiator outlet implausible

Diagnostic conditions
- Engine start at coolant temperature < 70 °C (158 °F)
- None of the following faults stored: P0116, P0117, P0118, P0119, P3081, P3082

Possible fault causes
- ♦ Engine coolant temperature sensor
- ♦ Radiator air intake covered
- ♦ Radiator outlet coolant temperature sensor faulty

Fault setting condition(s)
- Coolant temperature at radiator outlet > 25 °C (77 °F) warmer than engine temperature at engine start.

Diagnostic information - DME (DFI) control unit

Radiator outlet coolant temperature sensor: electrical fault

Diagnostic conditions
- Ignition on

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Radiator outlet coolant temperature sensor faulty

Fault setting condition(s)
- Coolant temperature at radiator outlet (measured) < -40 °C (-40 °F) (P2184), with:
  - Ignition on or engine running

  and
  - Intake air temperature > -30 °C (-22 °F)

  or
  - Engine running > 31 minute(s)

or
- Coolant temperature at radiator outlet (measured) > +140 °C (284 °F) (P2185), with:
  - Ignition on or engine running

Diagnostic information - DME (DFI) control unit

Radiator outlet coolant temperature sensor: electrical fault

Diagnostic conditions
- Ignition on

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Radiator outlet coolant temperature sensor faulty

Fault setting condition(s)
- Coolant temperature at radiator outlet (measured) < -40 °C (-40 °F) (P2184), with:
  - Ignition on or engine running
  - and
  - Intake air temperature > -30 °C (-22 °F)
  - or
  - Engine running > 31 minute(s)

or
- Coolant temperature at radiator outlet (measured) > +140 °C (284 °F) (P2185), with:
  - Ignition on or engine running

Diagnostic information - DME (DFI) control unit

Radiator outlet coolant temperature sensor: loose contact

Diagnostic conditions
- Ignition on
- None of the following faults stored: P2184, P2185

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Radiator outlet coolant temperature sensor faulty

Fault setting condition(s)
Coolant temperature at radiator outlet: actual-value jumps > 3 °C (37 °F)

Fault effects
- ♦ Substitute value = last actual value that was detected as OK, with:
  - Actual-value jumps > 9.75 °C (49.5 °F)

P2195

Diagnostic information - DME (DFI) control unit

Oxygen sensor upstream of catalytic converter, bank 1 - signal too lean/too rich

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Perform all short tests in sequence (without tank leak test).

or

- Engine running > 3 minute(s) with:
  - No overrun phase(s)
  - All oxygen sensor(s) ready for operation
  - Lambda control active
  - Engine speed 640 .... 4,000 rpm
  - Load 15 ... 70%
  - Catalytic converter temperature > 400 °C (752 °F)
  - Mass air flow 10 ... 520 kg/h
- None of the following faults stored: P2270, P2271, P0041

Possible fault causes

♦ Short circuit to B+/ground/between lines or open circuit in the lines

♦ Oxygen sensor upstream of catalytic converter bank 1 faulty

Fault setting condition(s)

The oxygen sensor signal deviates by a certain value from the control value (rich/lean mixture) within a certain time. (Significant deviation occurs suddenly)

P2196

Diagnostic information - DME (DFI) control unit

Oxygen sensor upstream of catalytic converter, bank 1 - signal too lean/too rich

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Perform all short tests in sequence (without tank leak test).

or

- Engine running > 3 minute(s) with:
  - No overrun phase(s)
  - All oxygen sensor(s) ready for operation
  - Lambda control active
  - Engine speed 640 .... 4,000 rpm
  - Load 15 ... 70%
  - Catalytic converter temperature > 400 °C (752 °F)
  - Mass air flow 10 ... 520 kg/h
- None of the following faults stored: P2270, P2271, P0041

Possible fault causes

♦ Short circuit to B+/ground/between lines or open circuit in the lines

♦ Oxygen sensor upstream of catalytic converter bank 1 faulty

Fault setting condition(s)

The oxygen sensor signal deviates by a certain value from the control value (rich/lean mixture) within a certain time. (Significant deviation occurs suddenly)

Diagnostic information - DME (DFI) control unit

Oxygen sensor upstream of catalytic converter, bank 2 - signal too lean/too rich

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Engine running > 3 minute(s) with:
  - No overrun phase(s)
  - All oxygen sensor(s) ready for operation
  - Lambda control active
  - Engine speed 640 .... 4,000 rpm
  - Load 15 ... 70%
  - Catalytic converter temperature > 400 °C (752 °F)
  - Mass air flow 10 ... 520 kg/h
- None of the following faults stored: P2272, P2273, P0041

Possible fault causes

♦ Short circuit to B+/ground/between lines or open circuit in the lines

♦ Oxygen sensor upstream of catalytic converter bank 1 faulty

Fault setting condition(s)

The oxygen sensor signal deviates by a certain value from the control value (rich/lean mixture) within a certain time. (Significant deviation occurs suddenly)

P2198

Diagnostic information - DME (DFI) control unit

Oxygen sensor upstream of catalytic converter, bank 2 - signal too lean/too rich

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Engine running > 3 minute(s) with:
  - No overrun phase(s)
  - All oxygen sensor(s) ready for operation
  - Lambda control active
  - Engine speed 640 .... 4,000 rpm
  - Load 15 ... 70%
  - Catalytic converter temperature > 400 °C (752 °F)
  - Mass air flow 10 ... 520 kg/h
- None of the following faults stored: P2272, P2273, P0041

Possible fault causes

♦ Short circuit to B+/ground/between lines or open circuit in the lines

♦ Oxygen sensor upstream of catalytic converter bank 1 faulty

Fault setting condition(s)

The oxygen sensor signal deviates by a certain value from the control value (rich/lean mixture) within a certain time. (Significant deviation occurs suddenly)

Diagnostic information - DME (DFI) control unit

Ambient pressure sensor implausible

Diagnostic conditions
- Ignition on > 10 second(s)
- then: Acceleration with wide-open throttle for as long as possible, immediately followed by an overrun phase lasting as long as possible
- None of the following faults stored: P1638, P1639, P0107, P0108, P2228, P2229, P1183, P1184, P1187, P1188, P1189, P1190

Possible fault causes
- Fault P0069 also entered:
  - ♦ Intake manifold pressure sensor fault

- No fault P0069 entered:
  - ♦ DME (DFI) control unit faulty

Fault effects
- ♦ Substitute value from model

P2228

Diagnostic information - DME (DFI) control unit

Ambient pressure sensor: electrical fault

Diagnostic conditions
- Ignition on or engine running

Possible fault causes
- DME (DFI) control unit faulty

Fault effects
- Substitute value from model

P2229

Diagnostic information - DME (DFI) control unit

Ambient pressure sensor: electrical fault

Diagnostic conditions
- Ignition on or engine running

Possible fault causes
- DME (DFI) control unit faulty

Fault effects
- Substitute value from model

Diagnostic information - DME (DFI) control unit

Oxygen sensor upstream of catalytic converter, bank 1: open circuit in pumping current (APE)

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Drive > 10 minute(s) with:
  - Engine at operating temperature
  - at least 1 overrun phase(s) > 6 second(s)
- then idling > 40 second(s)

Possible fault causes

♦ Open circuit in pumping current line (APE - contact 1)

♦ Oxygen sensor upstream of catalytic converter bank 1 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor upstream of catalytic converter, bank 2: open circuit in pumping current (APE)

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Drive > 10 minute(s) with:
  - Engine at operating temperature
  - at least 1 overrun phase(s) > 6 second(s)
- then idling > 40 second(s)

Possible fault causes

♦ Open circuit in pumping current line (APE - contact 1)

♦ Oxygen sensor upstream of catalytic converter bank 2 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor upstream of catalytic converter, bank 1: open circuit in signal (RE+/IPN)

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Drive > 10 minute(s) with:
  - Engine at operating temperature
  - at least 1 overrun phase(s) > 6 second(s)
- then idling > 40 second(s)

Possible fault causes

♦ Open circuit in signal line (RE+/IPN - contact 6/contact 2)

♦ Oxygen sensor upstream of catalytic converter bank 1 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor upstream of catalytic converter, bank 2: open circuit in signal (RE+/IPN)

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Drive > 10 minute(s) with:
  - Engine at operating temperature
  - at least 1 overrun phase(s) > 6 second(s)
- then idling > 40 second(s)

Possible fault causes

♦ Open circuit in line (RE+/IPN - contact 6/contact 2)

♦ Oxygen sensor upstream of catalytic converter bank 2 faulty

P2257

Diagnostic information - DME (DFI) control unit

Secondary-air pump relay driver

Diagnostic conditions
- Ignition on

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in lines for secondary-air pump relay activation
- ♦ Secondary-air pump relay faulty

P2258

Diagnostic information - DME (DFI) control unit

Secondary-air pump relay driver

Diagnostic conditions
- Ignition on

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in lines for secondary-air pump relay activation
- ♦ Secondary-air pump relay faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor downstream of catalytic converter, bank 1 - signal too lean/too rich

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Perform all short tests in sequence (without tank leak test).

or

- Steady driving > 20 minute(s) at:
  - approx. 80 km/h (50 mph)
  - in the highest gear
  - Lambda control (behind catalytic converter) active

Possible fault causes

♦ Leak in exhaust system between oxygen sensor upstream of catalytic converter and oxygen sensor downstream of catalytic converter, bank 1

♦ Short circuit to B+/ground/between lines or open circuit in the lines

♦ Oxygen sensor downstream of catalytic converter, bank 1 faulty

Fault setting condition(s)

♦ The oxygen sensor signal deviates by a certain value from the control value (rich/lean mixture) within a certain time.

Diagnostic information - DME (DFI) control unit

Oxygen sensor downstream of catalytic converter, bank 1 - signal too lean/too rich

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Perform all short tests in sequence (without tank leak test).

or

- Steady driving > 20 minute(s) at:
  - approx. 80 km/h (50 mph)
  - in the highest gear
  - Lambda control (behind catalytic converter) active

Possible fault causes

♦ Leak in exhaust system between oxygen sensor upstream of catalytic converter and oxygen sensor downstream of catalytic converter, bank 1

♦ Short circuit to B+/ground/between lines or open circuit in the lines

♦ Oxygen sensor downstream of catalytic converter, bank 1 faulty

Fault setting condition(s)

♦ The oxygen sensor signal deviates by a certain value from the control value (rich/lean mixture) within a certain time.

Diagnostic information - DME (DFI) control unit

Oxygen sensor downstream of catalytic converter, bank 2 - signal too lean/too rich

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Perform all short tests in sequence (without tank leak test).

or

- Steady driving > 20 minute(s) at:
  - approx. 80 km/h (50 mph)
  - in the highest gear
  - Lambda control (behind catalytic converter) active

Possible fault causes

♦ Leak in exhaust system between oxygen sensor upstream of catalytic converter and oxygen sensor downstream of catalytic converter, bank 2

♦ Short circuit to B+/ground/between lines or open circuit in the lines

♦ Oxygen sensor downstream of catalytic converter, bank 2 faulty

Fault setting condition(s)

♦ The oxygen sensor signal deviates by a certain value from the control value (rich/lean mixture) within a certain time.

P2273

Diagnostic information - DME (DFI) control unit

Oxygen sensor downstream of catalytic converter, bank 2 - signal too lean/too rich

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Perform all short tests in sequence (without tank leak test).

or

- Steady driving > 20 minute(s) at:
  - approx. 80 km/h (50 mph)
  - in the highest gear
  - Lambda control (behind catalytic converter) active

Possible fault causes

♦ Leak in exhaust system between oxygen sensor upstream of catalytic converter and oxygen sensor downstream of catalytic converter, bank 2

♦ Short circuit to B+/ground/between lines or open circuit in the lines

♦ Oxygen sensor downstream of catalytic converter, bank 2 faulty

Fault setting condition(s)

♦ The oxygen sensor signal deviates by a certain value from the control value (rich/lean mixture) within a certain time.

P2294

Diagnostic information - DME (DFI) control unit

Quantity control valve driver

Diagnostic conditions
- Ignition on > 5 second(s)

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Quantity control valve faulty (in fuel high-pressure pump)

P2295

Diagnostic information - DME (DFI) control unit

Quantity control valve driver

Diagnostic conditions
- Ignition on > 5 second(s)

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Quantity control valve faulty (in fuel high-pressure pump)

P2296

Diagnostic information - DME (DFI) control unit

Quantity control valve driver

Diagnostic conditions
- Ignition on > 5 second(s)

Possible fault causes
- ♦ Loose contact or corrosion on connectors or lines
- ♦ Short circuit to B+/ground/between lines or open circuit in the lines
- ♦ Quantity control valve faulty (in fuel high-pressure pump)

Diagnostic information - DME (DFI) control unit

Implausible signal for oxygen sensor ahead of bank 1 catalytic converter (during overrun shutoff)

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor ahead of the catalytic converter with the sensor behind the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Driving with:
  - Exhaust temperature > 200 °C (392 °F)
  - Overrun phase(s) > 8 second(s)

Possible fault causes

♦ Unintentional fuel supply, e.g. due to:
  ♦ dripping fuel injector
  ♦ high fuel content in engine oil
  ♦ large quantity of evaporating engine oil

♦ Short circuit to B+/ground/between lines or open circuit in the lines

♦ Oxygen sensor ahead of bank 1 catalytic converter faulty (aged)

Diagnostic information - DME (DFI) control unit

Implausible signal for oxygen sensor ahead of bank 1 catalytic converter (during overrun shutoff)

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor ahead of the catalytic converter with the sensor behind the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Driving with:
  - Exhaust temperature > 200 °C (392 °F)
  - Overrun phase(s) > 8 second(s)

Possible fault causes

♦ Unintentional fuel supply, e.g. due to:
  ♦ dripping fuel injector
  ♦ high fuel content in engine oil
  ♦ large quantity of evaporating engine oil

♦ Short circuit to B+/ground/between lines or open circuit in the lines

♦ Oxygen sensor ahead of bank 2 catalytic converter faulty (aged)

P2300

Diagnostic information - DME (DFI) control unit

Bar ignition module on cylinder 1

⚠WARNING
High voltage !
Risk of death or serious injury due to high voltage or high current!
♦ Start engine only if all the bar ignition modules have been installed and connected.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.
♦ Check ground supply.

Diagnostic conditions
- Time since engine start > 2 second(s)
- Engine temperature > -30 °C (-22 °F)

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Short circuit to B+ or open circuit in the lines (ground supply)
♦ Short circuit to ground or open circuit in the lines (power supply)
♦ Short circuit to B+/ground or open circuit in the line (activation)
♦ Bar ignition module on cylinder 1 faulty

P2301

Diagnostic information - DME (DFI) control unit

Bar ignition module on cylinder 1

⚠WARNING
High voltage !
Risk of death or serious injury due to high voltage or high current!
♦ Start engine only if all the bar ignition modules have been installed and connected.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.
♦ Check ground supply.

Diagnostic conditions
- Time since engine start > 2 second(s)
- Engine temperature > -30 °C (-22 °F)

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Short circuit to B+ or open circuit in the lines (ground supply)
♦ Short circuit to ground or open circuit in the lines (power supply)
♦ Short circuit to B+/ground or open circuit in the line (activation)
♦ Bar ignition module on cylinder 1 faulty

Diagnostic information - DME (DFI) control unit

Bar ignition module on cylinder 1 - SoftShutDown

⚠WARNING
High voltage!
Risk of death or serious injury due to high voltage or high current!
♦ Start engine only if all the bar ignition modules have been installed and connected.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.
♦ Check ground supply.

Diagnostic conditions
- Time since engine start > 2 second(s)
- Engine temperature > -30 °C (-22 °F)
- None of the following faults stored: P0351, P2300, P2301

Possible fault causes
- Only P2302:
  - ♦ Bar ignition module on cylinder 1 faulty

- P2302 + P0351 or P2300 or P2301:
  - ♦ Loose contact or corrosion on connectors or lines
  - ♦ Short circuit to B+ or open circuit in the lines (ground supply)
  - ♦ Short circuit to ground or open circuit in the lines (power supply)
  - ♦ Short circuit to B+/ground or open circuit in the line (activation)
  - ♦ Bar ignition module on cylinder 1 faulty

P2303

Diagnostic information - DME (DFI) control unit

Bar ignition module on cylinder 2

⚠WARNING
High voltage !
Risk of death or serious injury due to high voltage or high current!
♦ Start engine only if all the bar ignition modules have been installed and connected.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.
♦ Check ground supply.

Diagnostic conditions
- Time since engine start > 2 second(s)
- Engine temperature > -30 °C (-22 °F)

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Short circuit to B+ or open circuit in the lines (ground supply)
♦ Short circuit to ground or open circuit in the lines (power supply)
♦ Short circuit to B+/ground or open circuit in the line (activation)
♦ Bar ignition module on cylinder 2 faulty

P2304

Diagnostic information - DME (DFI) control unit

Bar ignition module on cylinder 2

⚠WARNING
High voltage !
Risk of death or serious injury due to high voltage or high current!
♦ Start engine only if all the bar ignition modules have been installed and connected.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.
♦ Check ground supply.

Diagnostic conditions
- Time since engine start > 2 second(s)
- Engine temperature > -30 °C (-22 °F)

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Short circuit to B+ or open circuit in the lines (ground supply)
♦ Short circuit to ground or open circuit in the lines (power supply)
♦ Short circuit to B+/ground or open circuit in the line (activation)
♦ Bar ignition module on cylinder 2 faulty

P2305

Diagnostic information - DME (DFI) control unit

Bar ignition module on cylinder 2 - SoftShutDown

⚠WARNING
High voltage!
Risk of death or serious injury due to high voltage or high current!
♦ Start engine only if all the bar ignition modules have been installed and connected.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.
♦ Check ground supply.

Diagnostic conditions
- Time since engine start > 2 second(s)
- Engine temperature > -30 °C (-22 °F)
- None of the following faults stored: P0351, P2300, P2301

Possible fault causes
- Only P2305:
  - ♦ Bar ignition module on cylinder 2 faulty

- P2305 + P0352 or P2303 or P2304:
  - ♦ Loose contact or corrosion on connectors or lines
  - ♦ Short circuit to B+ or open circuit in the lines (ground supply)
  - ♦ Short circuit to ground or open circuit in the lines (power supply)
  - ♦ Short circuit to B+/ground or open circuit in the line (activation)
  - ♦ Bar ignition module on cylinder 2 faulty

P2306

Diagnostic information - DME (DFI) control unit

Bar ignition module on cylinder 3

⚠WARNING
High voltage !
Risk of death or serious injury due to high voltage or high current!
♦ Start engine only if all the bar ignition modules have been installed and connected.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.
♦ Check ground supply.

Diagnostic conditions
- Time since engine start > 2 second(s)
- Engine temperature > -30 °C (-22 °F)

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Short circuit to B+ or open circuit in the lines (ground supply)
♦ Short circuit to ground or open circuit in the lines (power supply)
♦ Short circuit to B+/ground or open circuit in the line (activation)
♦ Bar ignition module on cylinder 3 faulty

P2307

Diagnostic information - DME (DFI) control unit

Bar ignition module on cylinder 3

⚠WARNING
High voltage !
Risk of death or serious injury due to high voltage or high current!
♦ Start engine only if all the bar ignition modules have been installed and connected.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.
♦ Check ground supply.

Diagnostic conditions
- Time since engine start > 2 second(s)
- Engine temperature > -30 °C (-22 °F)

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Short circuit to B+ or open circuit in the lines (ground supply)
♦ Short circuit to ground or open circuit in the lines (power supply)
♦ Short circuit to B+/ground or open circuit in the line (activation)
♦ Bar ignition module on cylinder 3 faulty

P2308

Diagnostic information - DME (DFI) control unit

Bar ignition module on cylinder 3 - SoftShutDown

⚠WARNING
High voltage!
Risk of death or serious injury due to high voltage or high current!
♦ Start engine only if all the bar ignition modules have been installed and connected.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.
♦ Check ground supply.

Diagnostic conditions
- Time since engine start > 2 second(s)
- Engine temperature > -30 °C (-22 °F)
- None of the following faults stored: P0351, P2300, P2301

Possible fault causes
- Only P2308:
  - ♦ Bar ignition module on cylinder 3 faulty

- P2308 + P0353 or P2306 or P2307:
  - ♦ Loose contact or corrosion on connectors or lines
  - ♦ Short circuit to B+ or open circuit in the lines (ground supply)
  - ♦ Short circuit to ground or open circuit in the lines (power supply)
  - ♦ Short circuit to B+/ground or open circuit in the line (activation)
  - ♦ Bar ignition module on cylinder 3 faulty

P2309

Diagnostic information - DME (DFI) control unit

Bar ignition module on cylinder 4

⚠WARNING
High voltage !
Risk of death or serious injury due to high voltage or high current!
♦ Start engine only if all the bar ignition modules have been installed and connected.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.
♦ Check ground supply.

Diagnostic conditions
- Time since engine start > 2 second(s)
- Engine temperature > -30 °C (-22 °F)

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Short circuit to B+ or open circuit in the lines (ground supply)
♦ Short circuit to ground or open circuit in the lines (power supply)
♦ Short circuit to B+/ground or open circuit in the line (activation)
♦ Bar ignition module on cylinder 4 faulty

P2310

Diagnostic information - DME (DFI) control unit

Bar ignition module on cylinder 4

⚠WARNING
High voltage !
Risk of death or serious injury due to high voltage or high current!
♦ Start engine only if all the bar ignition modules have been installed and connected.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.
♦ Check ground supply.

Diagnostic conditions
- Time since engine start > 2 second(s)
- Engine temperature > -30 °C (-22 °F)

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Short circuit to B+ or open circuit in the lines (ground supply)
♦ Short circuit to ground or open circuit in the lines (power supply)
♦ Short circuit to B+/ground or open circuit in the line (activation)
♦ Bar ignition module on cylinder 4 faulty

Diagnostic information - DME (DFI) control unit

Bar ignition module on cylinder 4 - SoftShutDown

⚠WARNING
High voltage!
Risk of death or serious injury due to high voltage or high current!
♦ Start engine only if all the bar ignition modules have been installed and connected.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.
♦ Check ground supply.

Diagnostic conditions
- Time since engine start > 2 second(s)
- Engine temperature > -30 °C (-22 °F)
- None of the following faults stored: P0351, P2300, P2301

Possible fault causes
- Only P2311:
  - ♦ Bar ignition module on cylinder 4 faulty

- P2311 + P0354 or P2309 or P2310:
  - ♦ Loose contact or corrosion on connectors or lines
  - ♦ Short circuit to B+ or open circuit in the lines (ground supply)
  - ♦ Short circuit to ground or open circuit in the lines (power supply)
  - ♦ Short circuit to B+/ground or open circuit in the line (activation)
  - ♦ Bar ignition module on cylinder 4 faulty

P2312

Diagnostic information - DME (DFI) control unit

Bar ignition module on cylinder 5

⚠WARNING
High voltage !
Risk of death or serious injury due to high voltage or high current!
♦ Start engine only if all the bar ignition modules have been installed and connected.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.
♦ Check ground supply.

Diagnostic conditions
- Time since engine start > 2 second(s)
- Engine temperature > -30 °C (-22 °F)

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Short circuit to B+ or open circuit in the lines (ground supply)
♦ Short circuit to ground or open circuit in the lines (power supply)
♦ Short circuit to B+/ground or open circuit in the line (activation)
♦ Bar ignition module on cylinder 5 faulty

P2313

Diagnostic information - DME (DFI) control unit

Bar ignition module on cylinder 5

⚠WARNING
High voltage !
Risk of death or serious injury due to high voltage or high current!
♦ Start engine only if all the bar ignition modules have been installed and connected.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.
♦ Check ground supply.

Diagnostic conditions
- Time since engine start > 2 second(s)
- Engine temperature > -30 °C (-22 °F)

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Short circuit to B+ or open circuit in the lines (ground supply)
♦ Short circuit to ground or open circuit in the lines (power supply)
♦ Short circuit to B+/ground or open circuit in the line (activation)
♦ Bar ignition module on cylinder 5 faulty

P2314

Diagnostic information - DME (DFI) control unit

Bar ignition module on cylinder 5 - SoftShutDown

⚠WARNING
High voltage!
Risk of death or serious injury due to high voltage or high current!
♦ Start engine only if all the bar ignition modules have been installed and connected.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.
♦ Check ground supply.

Diagnostic conditions
- Time since engine start > 2 second(s)
- Engine temperature > -30 °C (-22 °F)
- None of the following faults stored: P0351, P2300, P2301

Possible fault causes
- Only P2314:
  - ♦ Bar ignition module on cylinder 5 faulty

- P2314 + P0355 or P2312 or P2313:
  - ♦ Loose contact or corrosion on connectors or lines
  - ♦ Short circuit to B+ or open circuit in the lines (ground supply)
  - ♦ Short circuit to ground or open circuit in the lines (power supply)
  - ♦ Short circuit to B+/ground or open circuit in the line (activation)
  - ♦ Bar ignition module on cylinder 5 faulty

P2315

Diagnostic information - DME (DFI) control unit

Bar ignition module on cylinder 6

⚠WARNING
High voltage !
Risk of death or serious injury due to high voltage or high current!
♦ Start engine only if all the bar ignition modules have been installed and connected.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.
♦ Check ground supply.

Diagnostic conditions
- Time since engine start > 2 second(s)
- Engine temperature > -30 °C (-22 °F)

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Short circuit to B+ or open circuit in the lines (ground supply)
♦ Short circuit to ground or open circuit in the lines (power supply)
♦ Short circuit to B+/ground or open circuit in the line (activation)
♦ Bar ignition module on cylinder 6 faulty

P2316

Diagnostic information - DME (DFI) control unit

Bar ignition module on cylinder 6

⚠WARNING
High voltage !
Risk of death or serious injury due to high voltage or high current!
♦ Start engine only if all the bar ignition modules have been installed and connected.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.
♦ Check ground supply.

Diagnostic conditions
● Time since engine start > 2 second(s)
● Engine temperature > -30 °C (-22 °F)

Possible fault causes
♦ Loose contact or corrosion on connectors or lines
♦ Short circuit to B+ or open circuit in the lines (ground supply)
♦ Short circuit to ground or open circuit in the lines (power supply)
♦ Short circuit to B+/ground or open circuit in the line (activation)
♦ Bar ignition module on cylinder 6 faulty

Diagnostic information - DME (DFI) control unit

Bar ignition module on cylinder 6 - SoftShutDown

⚠WARNING
High voltage!
Risk of death or serious injury due to high voltage or high current!
♦ Start engine only if all the bar ignition modules have been installed and connected.

NOTE
Sensitive electronics!
Risk of irreparable damage to electronic components!
♦ **DO NOT** carry out electrical tests.
♦ **DO NOT** connect external power sources.
♦ Check ground supply.

Diagnostic conditions
- Time since engine start > 2 second(s)
- Engine temperature > -30 °C (-22 °F)
- None of the following faults stored: P0351, P2300, P2301

Possible fault causes
- Only P2317:
  - ♦ Bar ignition module on cylinder 6 faulty

- P2317 + P0356 or P2315 or P2316:
  - ♦ Loose contact or corrosion on connectors or lines
  - ♦ Short circuit to B+ or open circuit in the lines (ground supply)
  - ♦ Short circuit to ground or open circuit in the lines (power supply)
  - ♦ Short circuit to B+/ground or open circuit in the line (activation)
  - ♦ Bar ignition module on cylinder 6 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor upstream of catalytic converter, bank 1 - sensor in air

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Lambda control active
- Driving > 10 second(s) with:
  - No overrun phase(s)
- No fault entered for: oxygen sensor(s) or mixture preparation

Possible fault causes

♦ Fuel injector mechanical fault/blocked
(e.g. due to chip in the fuel rail)

♦ Oxygen sensor upstream of catalytic converter bank 1 not installed (only electrically connected)

♦ Oxygen sensor upstream of catalytic converter bank 1 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor upstream of catalytic converter, bank 2 - sensor in air

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Lambda control active
- Driving > 10 second(s) with:
  - No overrun phase(s)
- No fault entered for: oxygen sensor(s) or mixture preparation

Possible fault causes

♦ Fuel injector mechanical fault/blocked
(e.g. due to chip in the fuel rail)

♦ Oxygen sensor upstream of catalytic converter bank 2 not installed (only electrically connected)

♦ Oxygen sensor upstream of catalytic converter bank 2 faulty

Diagnostic information - DME (DFI) control unit

Oil level sensor

Diagnostic conditions
- Ignition on

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to ground or open circuit in the lines
- Oil level sensor faulty

Diagnostic information - DME (DFI) control unit

Oil level sensor

Diagnostic conditions
- Ignition on

Possible fault causes
- Loose contact or corrosion on connectors or lines
- Short circuit to ground or open circuit in the lines
- Oil level sensor faulty

P2525

Diagnostic information - DME (DFI) control unit

Power supply interrupted during diagnostics

Diagnostic conditions

- Tank leakage diagnostics performed
  ▶ See function description

Possible fault causes

♦ Starter battery was disconnected from the vehicle electrical system
♦ Loose contact or corrosion on connectors or lines
♦ Power or ground supply faulty ▶ **NVLD evaluation unit** (electronic part)

Fault setting condition(s)

● The **NVLD evaluation unit** (electronic part) was disconnected from its power supply during tank leakage diagnostics.

Diagnostic information - DME (DFI) control unit

Power supply, terminal 15 or 87

Diagnostic conditions
- Ignition on

or
- Engine running

Possible fault causes
- Vehicle electrical system supply voltage too high (e.g. jump-lead starting)
- Vehicle electrical system supply voltage too low
- Contact resistance, loose contact or corrosion on connectors or lines (DME (DFI) control unit)

Fault setting condition(s)
- Deviation of supply voltage at terminal 15 or 87:
  - < 10 V (P0658/P2531)

  or
  - > 16 V (P0659/P2532)

at:
- DME (DFI) control unit - connector [A], contact 34 ⇒ Terminal 15
- DME (DFI) control unit - connector [A], contact 3/5/6 ⇒ Terminal 87

Diagnostic information - DME (DFI) control unit

Power supply, terminal 15 or 87

Diagnostic conditions
- Ignition on

or
- Engine running

Possible fault causes
- Vehicle electrical system supply voltage too high (e.g. jump-lead starting)
- Vehicle electrical system supply voltage too low
- Contact resistance, loose contact or corrosion on connectors or lines (DME (DFI) control unit)

Fault setting condition(s)
- Deviation of supply voltage at terminal 15 or 87:
  - < 10 V (P0658/P2531)

  or
  - > 16 V (P0659/P2532)

at:
- DME (DFI) control unit - connector [A], contact 34 ⇒ Terminal 15
- DME (DFI) control unit - connector [A], contact 3/5/6 ⇒ Terminal 87

Diagnostic information - DME (DFI) control unit

Oxygen sensor upstream of catalytic converter, bank 1: open circuit in compensating current (RT)

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Drive > 10 minute(s) with:
  - Engine at operating temperature
  - Exhaust temperature > 200 °C (392 °F)
  - at least 1 overrun phase(s) > 6 second(s)
- then idling > 40 second(s)

Possible fault causes

♦ Open circuit in compensating current line (RT - contact 5)

♦ Oxygen sensor upstream of catalytic converter bank 1 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor upstream of catalytic converter, bank 2: open circuit in compensating current (RT)

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Drive > 10 minute(s) with:
  - Engine at operating temperature
  - Exhaust temperature > 200 °C (392 °F)
  - at least 1 overrun phase(s) > 6 second(s)
- then idling > 40 second(s)

Possible fault causes

♦ Open circuit in line (RT - contact 5)

♦ Oxygen sensor upstream of catalytic converter bank 2 faulty

Diagnostic information - DME (DFI) control unit

Oxygen sensor upstream of catalytic converter, bank 1 - electrical fault

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Engine running > 30 second(s), at:
  - Exhaust temperature > 100 °C (212 °F)
  - Oxygen sensor upstream of catalytic converter ready for operation
  - No overrun phase(s)

Possible fault causes

♦ Fault in oxygen sensor upstream of catalytic converter, bank 1 area

Fault setting condition(s)

♦ Temperature implausible (oxygen sensor upstream of catalytic converter)

Fault effects

♦ Since oxygen sensing is interrupted the moment a fault is detected, the DME (DFI) control unit stores this fault as information.

♦ Further faults are entered

ⓘ The vehicle must be driven in the same driving cycle (without ignition reset) for this purpose.

P2A03

Diagnostic information - DME (DFI) control unit

Oxygen sensor upstream of catalytic converter, bank 2 - electrical fault

NOTE

Plug connection disconnected = reference-air duct open!

Damage to oxygen sensor!

♦ **DO NOT** use spray, grease, fluid or similar products on the oxygen sensor plug connections.

ⓘ INFORMATION

♦ Do not interchange the oxygen sensor upstream of the catalytic converter with the sensor downstream of the catalytic converter as this will result in implausible fault entries.

♦ The connectors themselves are coded and cannot be interchanged.

Diagnostic conditions

- Engine running > 30 second(s), at:
  - Exhaust temperature > 100 °C (212 °F)
  - Oxygen sensor upstream of catalytic converter ready for operation
  - No overrun phase(s)

Possible fault causes

♦ Fault in oxygen sensor upstream of catalytic converter, bank 2 area

Fault setting condition(s)

♦ Temperature implausible (oxygen sensor upstream of catalytic converter)

Fault effects

♦ Since oxygen sensing is interrupted the moment a fault is detected, the DME (DFI) control unit stores this fault as information.

♦ Further faults are entered

ⓘ The vehicle must be driven in the same driving cycle (without ignition reset) for this purpose.

Diagnostic information - DME (DFI) control unit

Starter relay activation

Diagnostic conditions
- **PDK only**: Brake pressed + selector-lever position P or N
- **Manual transmission only**: Clutch pressed down fully
- Ignition on > 3 second(s)
- then start the engine

Possible fault causes
- Short circuit to B+
- Starter relay faulty

Fault effects
- Starter does not turn

Diagnostic information - DME (DFI) control unit

Starter relay activation

at:

- Starter turns during start attempt ► See ⓘ **1**
- Starter does NOT turn during start attempt ► See ⓘ **2**

ⓘ INFORMATION 1

Diagnostic conditions

- Ignition on > 3 second(s)
- then start the engine

Possible fault causes

♦ Short circuit to ground in starter relay activation (DME (DFI) control unit)
♦ Starter relay faulty

Fault effects

- **Manual transmission only**:
  - ♦ Engine start possible, with:
    - Clutch pedal not pressed
- **PDK only**:
  - ♦ Engine start possible, with:
    - Brake pedal not pressed

    or
    - Selector-lever position R or D or M

ⓘ INFORMATION 2

Diagnostic conditions

- **PDK only**: Brake pressed + selector-lever position P or N
- **Manual transmission only**: Clutch pressed down fully
- Ignition on > 3 second(s)
- then start the engine

Possible fault causes

♦ Open circuit in starter relay activation (DME (DFI) control unit)
♦ Starter relay faulty

Fault effects

♦ Starter does NOT turn during start attempt

Diagnostic information - DME (DFI) control unit

Engine coolant temperature implausible

Diagnostic conditions
- Intake air temperature at engine start < 60 °C (140 °F) or coolant temperature at engine start < 60 °C (140 °F) (See ⓘ 1)
- Engine running > 7 ... > 20 minute(s) (with no overrun phase(s))
  ⇒ Depending on the engine start temperature (+60 ... -40 °C/140 ... -40 °F)
- None of the following faults stored: Coolant temperature sensor or intake air temperature sensor

Possible fault causes
- ♦ Combination valve for bleeding the cooling system not closed (service bow is up)
- ♦ Combination valve for bleeding the cooling system leaking
- ♦ Thermostat faulty
- ♦ Seal in thermostat housing faulty
- ♦ Thermostat housing faulty
- ♦ Air in the cooling system

Fault setting condition(s)
- Engine coolant temperature < 60°C (140 °F), at:
  - End of diagnostics (See ⓘ 2)

Fault effects
- ♦ Engine temperature = temperature model (as substitute value for engine coolant temperature)
- ♦ The fault can be healed only if the thermostat has been tested and found to be OK.

ⓘ INFORMATION

1. The diagnostic function starts under the following conditions:
   - If the system was free of faults before
     - Engine coolant temperature at engine start < 60 °C (140 °F)
   - If fault has been previously detected in the system
     - Intake air temperature at engine start < 60 °C (140 °F) (engine temperature substitute value only for engine start)
2. Diagnostics is ended,
   - After engine running > 7 ... > 20 minute(s) (with no overrun phase(s))
   ⇒ Depending on the engine start temperature (+60 ... -40 °C/140 ... -40 °F)

and if:
- the calculated temperature model reaches 60 °C (140 °F) before the measured coolant temperature has reached 60 °C (140 °F) (fault entry),

or
- if the measured coolant temperature reaches 60 °C (140 °F) before the calculated temperature model has reached 60 °C (140 °F) (NO fault entry).

P3082

Diagnostic information - DME (DFI) control unit

Engine coolant temperature stuck

Diagnostic conditions
- Time since ignition off > 8 hours, then:
  - Drive > 25 km/h (16 mph) > 45 s within the first 6 minutes after engine start
  - NO drop in temperatures (e.g. due to drive from a garage into a cooler environment)

Possible fault causes
- Short circuit to B+/ground/between lines or open circuit in the lines
- Engine coolant temperature sensor faulty

Fault setting condition(s)
- The temperature measured by the engine coolant temperature sensor (T020) deviates too much from the mean value of the engine, engine oil, intake air and ambient air temperatures (T160).

(See ⓘ)

Fault effects
- Substitute value from model

ⓘ INFORMATION

Step 1
- When the engine is started after the ignition has been switched off for more than 8 hours, the engine coolant, engine oil, intake air and ambient air temperatures are compared with each other.
- They may deviate from the calculated mean value (T160) by only a certain amount (depending on the switch-off time).
- A suspected fault is set if the deviation is too large. However, the fault must still be confirmed in the second step.

Step 2
- Within the first six minutes after ignition on, a check is performed to determine whether the following conditions were met:
  - Drive > 25 km/h (16 mph) for longer than 45 seconds in total
  - None of the four temperatures decreased too much (e.g. due to drive from a garage into a cooler environment)
- If all conditions were met, the fault is entered in the fault memory.
- If one of the conditions was NOT met, the diagnostic result is rejected and NO fault is entered in the fault memory.
- If the vehicle is NOT driven within 6 minutes after starting and the aforementioned conditions are met, the suspected fault is rejected and NO fault is entered in the fault memory.

U0073

Diagnostic information - valid for all control units

Communication with CAN bus

INFORMATION
Communication with the CAN bus designated in the fault text is/was not possible.

Possible fault causes

♦ Short circuit of the CAN-High line to ground
♦ Short circuit of the CAN-High line to B+
♦ Short circuit of the CAN-High line to interference signal
♦ Open circuit in the CAN-High line

♦ Short circuit of the CAN-Low line to ground
♦ Short circuit of the CAN-Low line to B+
♦ Short circuit of the CAN-Low line to interference signal
♦ Open circuit in the CAN-Low line

♦ Defective control unit in combination with the designated CAN bus

Fault effects

♦ Cross-vehicle functions are not available
♦ Existing substitute/emergency functions in the control units are active
♦ Functions in the control units are available only with restrictions
♦ Functions in the control units are not available

U0101

Diagnostic information - valid for all control units

Communication with control unit

INFORMATION
Communication with the control unit designated in the fault text is/was not possible.

Possible fault causes

♦ The power supply for the designated control unit is not present or is present only to a limited extent.
♦ The CAN line CAN-High and/or CAN-Low is interrupted between the control unit connector of the designated control unit and the first splice behind the control unit.
♦ Control unit faulty

Fault effects

♦ Cross-vehicle functions are not available
♦ Existing substitute/emergency functions of the control units are active
♦ Functions in the control units are available only with restrictions
♦ Functions in the control units are not available

U0111

Diagnostic information - valid for all control units

Communication with control unit

INFORMATION
Communication with the control unit designated in the fault text is/was not possible.

Possible fault causes

♦ The power supply for the designated control unit is not present or is present only to a limited extent.
♦ The CAN line CAN-High and/or CAN-Low is interrupted between the control unit connector of the designated control unit and the first splice behind the control unit.
♦ Control unit faulty

Fault effects

♦ Cross-vehicle functions are not available
♦ Existing substitute/emergency functions of the control units are active
♦ Functions in the control units are available only with restrictions
♦ Functions in the control units are not available

U0114

Diagnostic information - valid for all control units

Communication with control unit

INFORMATION
Communication with the control unit designated in the fault text is/was not possible.

Possible fault causes

♦ The power supply for the designated control unit is not present or is present only to a limited extent.
♦ The CAN line CAN-High and/or CAN-Low is interrupted between the control unit connector of the designated control unit and the first splice behind the control unit.
♦ Control unit faulty

Fault effects

♦ Cross-vehicle functions are not available
♦ Existing substitute/emergency functions of the control units are active
♦ Functions in the control units are available only with restrictions
♦ Functions in the control units are not available

U0126

Diagnostic information - valid for all control units

Communication with control unit

INFORMATION
Communication with the control unit designated in the fault text is/was not possible.

Possible fault causes

♦ The power supply for the designated control unit is not present or is present only to a limited extent.
♦ The CAN line CAN-High and/or CAN-Low is interrupted between the control unit connector of the designated control unit and the first splice behind the control unit.
♦ Control unit faulty

Fault effects

♦ Cross-vehicle functions are not available
♦ Existing substitute/emergency functions of the control units are active
♦ Functions in the control units are available only with restrictions
♦ Functions in the control units are not available

U0128

Diagnostic information - valid for all control units

Communication with control unit

INFORMATION
Communication with the control unit designated in the fault text is/was not possible.

Possible fault causes

♦ The power supply for the designated control unit is not present or is present only to a limited extent.
♦ The CAN line CAN-High and/or CAN-Low is interrupted between the control unit connector of the designated control unit and the first splice behind the control unit.
♦ Control unit faulty

Fault effects

♦ Cross-vehicle functions are not available
♦ Existing substitute/emergency functions of the control units are active
♦ Functions in the control units are available only with restrictions
♦ Functions in the control units are not available

U0129

Diagnostic information - valid for all control units

Communication with control unit

INFORMATION
Communication with the control unit designated in the fault text is/was not possible.

Possible fault causes

♦ The power supply for the designated control unit is not present or is present only to a limited extent.
♦ The CAN line CAN-High and/or CAN-Low is interrupted between the control unit connector of the designated control unit and the first splice behind the control unit.
♦ Control unit faulty

Fault effects

♦ Cross-vehicle functions are not available
♦ Existing substitute/emergency functions of the control units are active
♦ Functions in the control units are available only with restrictions
♦ Functions in the control units are not available

U0131

Diagnostic information - valid for all control units

Communication with control unit

INFORMATION
Communication with the control unit designated in the fault text is/was not possible.

Possible fault causes

♦ The power supply for the designated control unit is not present or is present only to a limited extent.
♦ The CAN line CAN-High and/or CAN-Low is interrupted between the control unit connector of the designated control unit and the first splice behind the control unit.
♦ Control unit faulty

Fault effects

♦ Cross-vehicle functions are not available
♦ Existing substitute/emergency functions of the control units are active
♦ Functions in the control units are available only with restrictions
♦ Functions in the control units are not available

U0133

Diagnostic information - valid for all control units

Communication with control unit

INFORMATION
Communication with the control unit designated in the fault text is/was not possible.

Possible fault causes

♦ The power supply for the designated control unit is not present or is present only to a limited extent.
♦ The CAN line CAN-High and/or CAN-Low is interrupted between the control unit connector of the designated control unit and the first splice behind the control unit.
♦ Control unit faulty

Fault effects

♦ Cross-vehicle functions are not available
♦ Existing substitute/emergency functions of the control units are active
♦ Functions in the control units are available only with restrictions
♦ Functions in the control units are not available

U0141

Diagnostic information - valid for all control units

Communication with control unit

INFORMATION
Communication with the control unit designated in the fault text is/was not possible.

Possible fault causes

♦ The power supply for the designated control unit is not present or is present only to a limited extent.
♦ The CAN line CAN-High and/or CAN-Low is interrupted between the control unit connector of the designated control unit and the first splice behind the control unit.
♦ Control unit faulty

Fault effects

♦ Cross-vehicle functions are not available
♦ Existing substitute/emergency functions of the control units are active
♦ Functions in the control units are available only with restrictions
♦ Functions in the control units are not available

U0142

Diagnostic information - valid for all control units

Communication with control unit

INFORMATION
Communication with the control unit designated in the fault text is/was not possible.

Possible fault causes

♦ The power supply for the designated control unit is not present or is present only to a limited extent.
♦ The CAN line CAN-High and/or CAN-Low is interrupted between the control unit connector of the designated control unit and the first splice behind the control unit.
♦ Control unit faulty

Fault effects

♦ Cross-vehicle functions are not available
♦ Existing substitute/emergency functions of the control units are active
♦ Functions in the control units are available only with restrictions
♦ Functions in the control units are not available

U0146

Diagnostic information - valid for all control units

Communication with control unit

INFORMATION
Communication with the control unit designated in the fault text is/was not possible.

Possible fault causes

♦ The power supply for the designated control unit is not present or is present only to a limited extent.
♦ The CAN line CAN-High and/or CAN-Low is interrupted between the control unit connector of the designated control unit and the first splice behind the control unit.
♦ Control unit faulty

Fault effects

♦ Cross-vehicle functions are not available
♦ Existing substitute/emergency functions of the control units are active
♦ Functions in the control units are available only with restrictions
♦ Functions in the control units are not available

U0155

Diagnostic information - valid for all control units

Communication with control unit

INFORMATION
Communication with the control unit designated in the fault text is/was not possible.

Possible fault causes

♦ The power supply for the designated control unit is not present or is present only to a limited extent.
♦ The CAN line CAN-High and/or CAN-Low is interrupted between the control unit connector of the designated control unit and the first splice behind the control unit.
♦ Control unit faulty

Fault effects

♦ Cross-vehicle functions are not available
♦ Existing substitute/emergency functions of the control units are active
♦ Functions in the control units are available only with restrictions
♦ Functions in the control units are not available

U0159

Diagnostic information - valid for all control units

Communication with control unit

INFORMATION
Communication with the control unit designated in the fault text is/was not possible.

Possible fault causes

♦ The power supply for the designated control unit is not present or is present only to a limited extent.
♦ The CAN line CAN-High and/or CAN-Low is interrupted between the control unit connector of the designated control unit and the first splice behind the control unit.
♦ Control unit faulty

Fault effects

♦ Cross-vehicle functions are not available
♦ Existing substitute/emergency functions of the control units are active
♦ Functions in the control units are available only with restrictions
♦ Functions in the control units are not available

U0164

Diagnostic information - valid for all control units

Communication with control unit

INFORMATION
Communication with the control unit designated in the fault text is/was not possible.

Possible fault causes

♦ The power supply for the designated control unit is not present or is present only to a limited extent.
♦ The CAN line CAN-High and/or CAN-Low is interrupted between the control unit connector of the designated control unit and the first splice behind the control unit.
♦ Control unit faulty

Fault effects

♦ Cross-vehicle functions are not available
♦ Existing substitute/emergency functions of the control units are active
♦ Functions in the control units are available only with restrictions
♦ Functions in the control units are not available

U0199

Diagnostic information - valid for all control units

Communication with control unit

INFORMATION
Communication with the control unit designated in the fault text is/was not possible.

Possible fault causes

♦ The power supply for the designated control unit is not present or is present only to a limited extent.
♦ The CAN line CAN-High and/or CAN-Low is interrupted between the control unit connector of the designated control unit and the first splice behind the control unit.
♦ Control unit faulty

Fault effects

♦ Cross-vehicle functions are not available
♦ Existing substitute/emergency functions of the control units are active
♦ Functions in the control units are available only with restrictions
♦ Functions in the control units are not available

U0200

Diagnostic information - valid for all control units

Communication with control unit

INFORMATION
Communication with the control unit designated in the fault text is/was not possible.

Possible fault causes

♦ The power supply for the designated control unit is not present or is present only to a limited extent.
♦ The CAN line CAN-High and/or CAN-Low is interrupted between the control unit connector of the designated control unit and the first splice behind the control unit.
♦ Control unit faulty

Fault effects

♦ Cross-vehicle functions are not available
♦ Existing substitute/emergency functions of the control units are active
♦ Functions in the control units are available only with restrictions
♦ Functions in the control units are not available

U0201

Diagnostic information - valid for all control units

Communication with control unit

INFORMATION
Communication with the control unit designated in the fault text is/was not possible.

Possible fault causes

♦ The power supply for the designated control unit is not present or is present only to a limited extent.
♦ The CAN line CAN-High and/or CAN-Low is interrupted between the control unit connector of the designated control unit and the first splice behind the control unit.
♦ Control unit faulty

Fault effects

♦ Cross-vehicle functions are not available
♦ Existing substitute/emergency functions of the control units are active
♦ Functions in the control units are available only with restrictions
♦ Functions in the control units are not available

U0202

Diagnostic information - valid for all control units

Communication with control unit

INFORMATION
Communication with the control unit designated in the fault text is/was not possible.

Possible fault causes

♦ The power supply for the designated control unit is not present or is present only to a limited extent.
♦ The CAN line CAN-High and/or CAN-Low is interrupted between the control unit connector of the designated control unit and the first splice behind the control unit.
♦ Control unit faulty

Fault effects

♦ Cross-vehicle functions are not available
♦ Existing substitute/emergency functions of the control units are active
♦ Functions in the control units are available only with restrictions
♦ Functions in the control units are not available

U0212

Diagnostic information - valid for all control units

Communication with control unit

INFORMATION
Communication with the control unit designated in the fault text is/was not possible.

Possible fault causes

♦ The power supply for the designated control unit is not present or is present only to a limited extent.
♦ The CAN line CAN-High and/or CAN-Low is interrupted between the control unit connector of the designated control unit and the first splice behind the control unit.
♦ Control unit faulty

Fault effects

♦ Cross-vehicle functions are not available
♦ Existing substitute/emergency functions of the control units are active
♦ Functions in the control units are available only with restrictions
♦ Functions in the control units are not available

U0235

Diagnostic information - valid for all control units

Communication with control unit

INFORMATION
Communication with the control unit designated in the fault text is/was not possible.

Possible fault causes

♦ The power supply for the designated control unit is not present or is present only to a limited extent.
♦ The CAN line CAN-High and/or CAN-Low is interrupted between the control unit connector of the designated control unit and the first splice behind the control unit.
♦ Control unit faulty

Fault effects

♦ Cross-vehicle functions are not available
♦ Existing substitute/emergency functions of the control units are active
♦ Functions in the control units are available only with restrictions
♦ Functions in the control units are not available

U0302

Diagnostic information - DME (DFI) control unit

Coding incorrect

Diagnostic conditions
- Ignition on

Possible fault causes
- Vehicle data incorrect
  (See PIWIS Tester II ▶ Additional menu [F7] ▶ Maintenance of vehicle data)
- Vehicle equipment wrong
- DME (DFI) control unit coded incorrectly - The data record does not match the vehicle.
- Specified control unit coded incorrectly

U0314

Diagnostic information - DME (DFI) control unit

Coding incorrect

Diagnostic conditions
- Ignition on

Possible fault causes
- Vehicle data incorrect
  (See PIWIS Tester II ▶ Additional menu [F7] ▶ Maintenance of vehicle data)
- Vehicle equipment wrong
- DME (DFI) control unit coded incorrectly - The data record does not match the vehicle.
- Specified control unit coded incorrectly

U0318

Diagnostic information - valid for all control units

Communication with control unit

INFORMATION
Communication with the control unit designated in the fault text is/was not possible.

Possible fault causes

♦ The power supply for the designated control unit is not present or is present only to a limited extent.
♦ The CAN line CAN-High and/or CAN-Low is interrupted between the control unit connector of the designated control unit and the first splice behind the control unit.
♦ Control unit faulty

Fault effects

♦ Cross-vehicle functions are not available
♦ Existing substitute/emergency functions of the control units are active
♦ Functions in the control units are available only with restrictions
♦ Functions in the control units are not available

U0402

Diagnostic information - valid for all control units

Read out control unit fault memory content

INFORMATION
This fault code indicates one or more faults/notes in the fault memory of the designated control unit.
Existing faults/notes in the designated control unit must be processed first.

NOTE
Use the [F7] button to show/hide notes in the fault memory.

Possible fault causes

- Fault in the designated control unit
- Note in the designated control unit

Fault effects

- Functions in the control unit are available only with restrictions
- Functions in the control unit are not available

U0412

Diagnostic information - valid for all control units

Read out control unit fault memory content

INFORMATION
This fault code indicates one or more faults/notes in the fault memory of the designated control unit.
Existing faults/notes in the designated control unit must be processed first.

NOTE
Use the [F7] button to show/hide notes in the fault memory.

Possible fault causes

- Fault in the designated control unit
- Note in the designated control unit

Fault effects

- Functions in the control unit are available only with restrictions
- Functions in the control unit are not available

U0414

Diagnostic information - valid for all control units

Read out control unit fault memory content

INFORMATION
This fault code indicates one or more faults/notes in the fault memory of the designated control unit.
Existing faults/notes in the designated control unit must be processed first.

NOTE
Use the [F7] button to show/hide notes in the fault memory.

Possible fault causes

- Fault in the designated control unit
- Note in the designated control unit

Fault effects

- Functions in the control unit are available only with restrictions
- Functions in the control unit are not available

U0417

Diagnostic information - valid for all control units

Read out control unit fault memory content

INFORMATION
This fault code indicates one or more faults/notes in the fault memory of the designated control unit.
Existing faults/notes in the designated control unit must be processed first.

NOTE
Use the [F7] button to show/hide notes in the fault memory.

Possible fault causes

- Fault in the designated control unit
- Note in the designated control unit

Fault effects

- Functions in the control unit are available only with restrictions
- Functions in the control unit are not available

U0418

Diagnostic information - valid for all control units

Read out control unit fault memory content

INFORMATION
This fault code indicates one or more faults/notes in the fault memory of the designated control unit.
Existing faults/notes in the designated control unit must be processed first.

NOTE
Use the [F7] button to show/hide notes in the fault memory.

Possible fault causes

- Fault in the designated control unit
- Note in the designated control unit

Fault effects

- Functions in the control unit are available only with restrictions
- Functions in the control unit are not available

U0423

Diagnostic information - valid for all control units

Read out control unit fault memory content

INFORMATION
This fault code indicates one or more faults/notes in the fault memory of the designated control unit.
Existing faults/notes in the designated control unit must be processed first.

NOTE
Use the [F7] button to show/hide notes in the fault memory.

Possible fault causes

- Fault in the designated control unit
- Note in the designated control unit

Fault effects

- Functions in the control unit are available only with restrictions
- Functions in the control unit are not available

U0424

Diagnostic information - valid for all control units

Read out control unit fault memory content

INFORMATION
This fault code indicates one or more faults/notes in the fault memory of the designated control unit.
Existing faults/notes in the designated control unit must be processed first.

NOTE
Use the [F7] button to show/hide notes in the fault memory.

Possible fault causes

- Fault in the designated control unit
- Note in the designated control unit

Fault effects

- Functions in the control unit are available only with restrictions
- Functions in the control unit are not available

U0428

Diagnostic information - valid for all control units

Read out control unit fault memory content

INFORMATION
This fault code indicates one or more faults/notes in the fault memory of the designated control unit.
Existing faults/notes in the designated control unit must be processed first.

NOTE
Use the [F7] button to show/hide notes in the fault memory.

Possible fault causes

- Fault in the designated control unit
- Note in the designated control unit

Fault effects

- Functions in the control unit are available only with restrictions
- Functions in the control unit are not available

U0429

Diagnostic information - valid for all control units

Read out control unit fault memory content

INFORMATION
This fault code indicates one or more faults/notes in the fault memory of the designated control unit.
Existing faults/notes in the designated control unit must be processed first.

NOTE
Use the [F7] button to show/hide notes in the fault memory.

Possible fault causes

- Fault in the designated control unit
- Note in the designated control unit

Fault effects

- Functions in the control unit are available only with restrictions
- Functions in the control unit are not available

U0431

Diagnostic information - valid for all control units

Read out control unit fault memory content

INFORMATION
This fault code indicates one or more faults/notes in the fault memory of the designated control unit.
Existing faults/notes in the designated control unit must be processed first.

NOTE
Use the [F7] button to show/hide notes in the fault memory.

Possible fault causes

- Fault in the designated control unit
- Note in the designated control unit

Fault effects

- Functions in the control unit are available only with restrictions
- Functions in the control unit are not available

U0433

Diagnostic information - valid for all control units

Read out control unit fault memory content

INFORMATION
This fault code indicates one or more faults/notes in the fault memory of the designated control unit.
Existing faults/notes in the designated control unit must be processed first.

NOTE
Use the [F7] button to show/hide notes in the fault memory.

Possible fault causes

- Fault in the designated control unit
- Note in the designated control unit

Fault effects

- Functions in the control unit are available only with restrictions
- Functions in the control unit are not available

U0434

Diagnostic information - valid for all control units

Read out control unit fault memory content

INFORMATION
This fault code indicates one or more faults/notes in the fault memory of the designated control unit.
Existing faults/notes in the designated control unit must be processed first.

NOTE
Use the [F7] button to show/hide notes in the fault memory.

Possible fault causes

- Fault in the designated control unit
- Note in the designated control unit

Fault effects

- Functions in the control unit are available only with restrictions
- Functions in the control unit are not available

U0443

Diagnostic information - valid for all control units

Read out control unit fault memory content

INFORMATION
This fault code indicates one or more faults/notes in the fault memory of the designated control unit.
Existing faults/notes in the designated control unit must be processed first.

NOTE
Use the [F7] button to show/hide notes in the fault memory.

Possible fault causes

- Fault in the designated control unit
- Note in the designated control unit

Fault effects

- Functions in the control unit are available only with restrictions
- Functions in the control unit are not available

U0447

Diagnostic information - valid for all control units

Read out control unit fault memory content

INFORMATION
This fault code indicates one or more faults/notes in the fault memory of the designated control unit.
Existing faults/notes in the designated control unit must be processed first.

NOTE
Use the [F7] button to show/hide notes in the fault memory.

Possible fault causes

- Fault in the designated control unit
- Note in the designated control unit

Fault effects

- Functions in the control unit are available only with restrictions
- Functions in the control unit are not available