

Reading out the
parameters Engine
control unit A1
M29-CM2200- CMAR

The parameters which are important for our vehicle are read and evaluated in this description.

The comparison values which are specified for the parameters are displayed in the following modes and speed ranges.

1. Idle speed 900 rpm without load in transport mode
2. CM 2200 – sweeping mode ECO mode 1400 rpm
3. CM 2200 – sweeping mode standard mode 1700 rpm
Turbine speed with potentiometer set to 100 % in position 10
4. CM 2200 – sweeping mode max. mode 2000 rpm
Turbine speed with potentiometer set to 100 % in position 10
5. M29 – engine speed with ADR set to 2800 rpm (nominal speed) under load

VM Service Tool - E.C.U. Diagnosis

1. Diagnostic codes

2. Parameters acquisition

3. Trip Recorder

4. Diagnostic tests

5. Engine Collect Data

6. ECU Information

7. Exit

R754EU6-c



[Ethernet USB] Connected

- Selection and opening of parameter group 1. Particle filter

[2] - VM Service Tool - Parameters acquisition

Parameters groups list

- 1. Particle filter
- 2. Pressure channels
- 3. Fueling setpoint
- 4. Application parameters
- 5. Temperature channels
- 6. Sensor signal voltage
- 7. Rail pressure check

Buttons: Add group, Edit group, Remove group, View acquisition, Exit

Explanation of particle filter parameter group (DPF)

The differential pressure may not exceed 0.3 bar at the maximum engine speed.

A differential pressure that is too high is an indication of a blocked diesel particle filter.

The maximum particle weight of the diesel particle filter is 38 grammes.

With a particle weight of 38 grammes, error P242F is stored as active in the engine control unit, and the engine power is reduced by 25 %.

Automatic regeneration of the particle filter is not possible in this condition, and particle filter regeneration can only be initiated by means of a service generation.

From a particle weight of 33 grammes and above, the DPF regeneration request indicator lamp (H50) illuminates. From a particle weight of 38 grammes, the DPF regeneration request indicator lamp (H50) and also the EOBD/MIL warning light (H49) illuminate.

If the vehicle is operated for a long period with a blocked diesel particle filter, consequential damage to the EGR valve and the turbocharger may occur, since the exhaust gas is unable to escape via the particle filter.

If the particle filter is blocked, problems may also occur when starting the engine.

It is also essential to check the load condition of the diesel particle filter in the event of error messages due to low charge pressure (lack of engine power). Because of the blocked particle filter, the turbocharger no longer reaches the required engine speed and the charge pressure is no longer achieved.

2. Particle filter DPF

1. Idle speed 900 rpm without load in transport mode

[2-1] - VM Service Tool - Parameters acquisition - Particle filter

| Parameter | Value | Measure unit | Notes |
|---|--------|-------------------------|-------|
| Engine RPM - (Epm_nEng) | 849.00 | rpm | |
| Ratio between the maximum torque and the torque current - (...) | 1.88 | % | |
| Differential pressure particulate filter - (Exh_pPFItDiff) Pressure sensor DPF B38 | 0.008 | bar | |
| Simulated soot mass in particulate filter - (PFItLd_mSotSim) | 23.08 | g | |
| Flow resistance of the particulate filter - (PFItLd_resFlw) | 0.00 | bar/(m ³ /h) | |
| Engine operating point - (PFItPOp_stEngPOp) | 1.00 | - | |

Acquisition Graph Log file Print Exit

Request 2/6

2. Particle filter DPF

2. CM 2200 – sweeping in ECO mode 1400 rpm

[2-1] - VM Service Tool - Parameters acquisition - Particle filter

| Parameter | Value | Measure unit | Notes |
|---|--------|-------------------------|-------|
| Engine RPM - (Epm_nEng) | 849.00 | rpm | |
| Ratio between the maximum torque and the torque current - (...) | 1.88 | % | |
| Differential pressure particulate filter - (Exh_pPFItDiff) Pressure sensor DPF B38 | 0.008 | bar | |
| Simulated soot mass in particulate filter - (PFItLd_mSotSim) | 23.08 | g | |
| Flow resistance of the particulate filter - (PFItLd_resFlw) | 0.00 | bar/(m ³ /h) | |
| Engine operating point - (PFItPOp_stEngPOp) | 1.00 | - | |

Acquisition Graph Log file Print Exit

Request 2/6

2. Particle filter DPF

- 3. CM 2200 – sweeping in standard mode 1700 rpm
Turbine speed with the potentiometer set to 100 % in position 10.

[2-1] - VM Service Tool - Parameters acquisition - Particle filter

| Parameter | Value | Measure unit | Notes |
|---|---------|-------------------------|-------|
| Engine RPM - (Epm_nEng) | 1700.00 | rpm | |
| Ratio between the maximum torque and the torque current - (...) | 7.67 | % | |
| Differential pressure particulate filter - (Exh_pPFItDiff) Pressure sensor DPF B38 | 0.012 | bar | |
| Simulated soot mass in particulate filter - (PFItLd_mSotSim) | 23.22 | g | |
| Flow resistance of the particulate filter - (PFItLd_resFlw) | 0.00 | bar/(m ³ /h) | |
| Engine operating point - (PFItPOp_stEngPOp) | 2.00 | - | |

Acquisition Graph Log file Print Exit

Request 1/6

2. Particle filter DPF

- 4. CM 2200 – sweeping in max mode 2000 rpm
Turbine speed with the potentiometer set to 100 % in position 10.

[2-1] - VM Service Tool - Parameters acquisition - Particle filter

| Parameter | Value | Measure unit | Notes |
|---|---------|-------------------------|-------|
| Engine RPM - (Epm_nEng) | 2004.00 | rpm | |
| Ratio between the maximum torque and the torque current - (...) | 10.03 | % | |
| Differential pressure particulate filter - (Exh_pPFItDiff) Pressure sensor DPF B38 | 0.023 | bar | |
| Simulated soot mass in particulate filter - (PFItLd_mSotSim) | 23.26 | g | |
| Flow resistance of the particulate filter - (PFItLd_resFlw) | 0.00 | bar/(m ³ /h) | |
| Engine operating point - (PFItPOp_stEngPOp) | 2.00 | - | |

Acquisition Graph Log file Print Exit

Request 6/6

2. Pressure channels

5. M29 – engine speed with ADR set to 2800 rpm (nominal speed) under load

[2-1] - VM Service Tool - Parameters acquisition - Particle filter

| Parameter | Value | Measure unit | Notes |
|--|---------|-------------------------|-------|
| Engine RPM - (Epm_nEng) | 2814.00 | rpm | |
| Ratio between the maximum torque and the torque current - (...) | 8.28 | % | |
| Differential pressure particulate filter - (Exh_pPFItDiff) Pressure sensor DPF B38 | 0.060 | bar | |
| Simulated soot mass in particulate filter - (PFItLd_mSotSim) | 23.32 | g | |
| Flow resistance of the particulate filter - (PFItLd_resFlw) | 0.00 | bar/(m ³ /h) | |
| Engine operating point - (PFItPOp_stEngPOp) | 2.00 | - | |

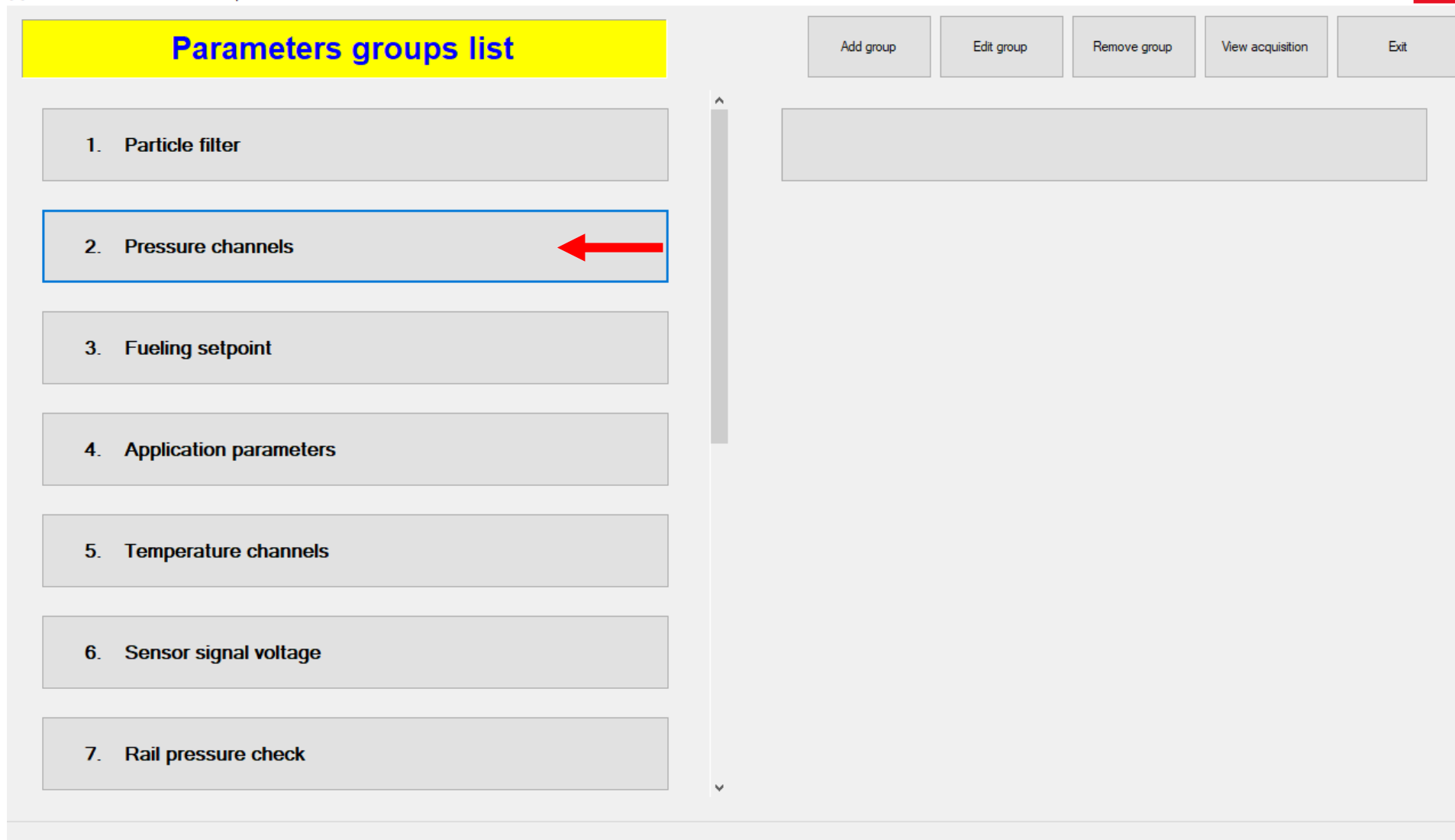
The differential pressure may not exceed 0.3 bar at the maximum engine speed.

Acquisition Graph Log file Print Exit

Request 2/6

- Selection and opening of parameter group 2. Pressure channels

[2] - VM Service Tool - Parameters acquisition



The screenshot displays the 'Parameters groups list' window. The title bar reads '[2] - VM Service Tool - Parameters acquisition'. The window contains a list of seven parameter groups, with the second group, '2. Pressure channels', highlighted by a blue border and a red arrow. The list items are:

1. Particle filter
2. Pressure channels
3. Fueling setpoint
4. Application parameters
5. Temperature channels
6. Sensor signal voltage
7. Rail pressure check

At the top right of the window, there is a control panel with five buttons: 'Add group', 'Edit group', 'Remove group', 'View acquisition', and 'Exit'. The window also features standard window controls (minimize, maximize, close) in the top right corner.

2. Pressure channels

1. M29- CM 2200 idle speed 900 rpm without load in transport mode

[2-2] - VM Service Tool - Parameters acquisition - Pressure channels

| Parameter | Value | Measure unit | Notes |
|--|---------|--------------|----------------|
| Environment pressure - (EnvP_p) | 1.016 | bar | |
| Boost pressure - (Air_pCACDs) Charge air + Charge air pressure sensor B4 | 1.070 | bar | ← actual value |
| Rail pressure setpoint - (Rail_pSetPoint) | 621.500 | bar | ← set point |
| Rail pressure - (RailP_pFit) Rail pressure sensor at rail pipe B3 | 612.900 | bar | ← actual value |
| Differential pressure particulate filter - (Exh_pPFItDiff) Pressure sensor DPF B38 Differential pressure sensor DPF B38 | 0.010 | bar | |

Acquisition Graph Log file Print Exit

Request 2/5

2. Pressure channels

2. CM 2200 sweeping in ECO mode 1400 rpm

[2-2] - VM Service Tool - Parameters acquisition - Pressure channels

| Parameter | Value | Measure unit | Notes |
|--|---------|--------------|----------------|
| Environment pressure - (EnvP_p) | 1.016 | bar | |
| Boost pressure - (Air_pCACDs) Charge air + Charge air pressure sensor B4 | 1.104 | bar | ← actual value |
| Rail pressure setpoint - (Rail_pSetPoint) | 855.300 | bar | ← set point |
| Rail pressure - (RailP_pFit) Rail pressure sensor at rail pipe B3 | 857.000 | bar | ← actual value |
| Differential pressure particulate filter - (Exh_pPFItDiff) Pressure sensor DPF B38 | 0.010 | bar | |
| Differential pressure sensor DPF B38 | | | |

Request 3/5

Acquisition **Graph** Log file Print Exit

2. Pressure channels

- 3. CM 2200 sweeping in standard mode 1700 rpm
Turbine speed with the potentiometer set to 100 % in position 10.

[2-2] - VM Service Tool - Parameters acquisition - Pressure channels

| Parameter | Value | Measure unit | Notes |
|--|----------|--------------|----------------|
| Environment pressure - (EnvP_p) | 1.016 | bar | |
| Boost pessure - (Air_pCACDs) Charge air + Charge air pressure sensor B4 | 1.247 | bar | ← actual value |
| Rail pressure setpoint - (Rail_pSetPoint) | 1005.400 | bar | ← set point |
| Rail pressure - (RailP_pFlt) Rail pressure sensor at rail pipe B3 | 1008.800 | bar | ← actual value |
| Differential pressure particulate filter - (Exh_pPFItDiff) Pressure sensor DPF B38 | 0.018 | bar | |
| Differential pressure sensor DPF B38 | | | |
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Acquisition Graph Log file Print Exit

Request 4/5

2. Pressure channels

- 4. CM 2200 sweeping in max mode 2000 rpm
Turbine speed with the potentiometer set to 100 % in position 10.

[2-2] - VM Service Tool - Parameters acquisition - Pressure channels

| Parameter | Value | Measure unit | Notes |
|--|----------|--------------|----------------|
| Environment pressure - (EnvP_p) | 1.016 | bar | |
| Boost pessure - (Air_pCACDs) Charge air + Charge air pressure sensor B4 | 2.021 | bar | ← actual value |
| Rail pressure setpoint - (Rail_pSetPoint) | 1260.200 | bar | ← set point |
| Rail pressure - (RailP_pFlt) Rail pressure sensor at rail pipe B3 | 1255.100 | bar | ← actual value |
| Differential pressure particulate filter - (Exh_pPFItDiff) Pressure sensor DPF B38 | 0.071 | bar | |
| Differential pressure sensor DPF B38 | | | |

Acquisition Graph Log file Print Exit

Request 2/5

2. Pressure channels

5. M29 – engine speed with work speed control (ADR) set to 2800 rpm (nominal speed) under load.

[2-2] - VM Service Tool - Parameters acquisition - Pressure channels

| Parameter | Value | Measure unit | Notes |
|--|----------|--------------|----------------|
| Environment pressure - (EnvP_p) | 1.016 | bar | |
| Boost pressure - (Air_pCACDs) Charge air + Charge air pressure sensor B4 | 2.021 | bar | ← actual value |
| Rail pressure setpoint - (Rail_pSetPoint) | 1260.200 | bar | ← set point |
| Rail pressure - (RailP_pFit) Rail pressure sensor at rail pipe B3 | 1255.100 | bar | ← actual value |
| Differential pressure particulate filter - (Exh_pPFItDiff) Pressure sensor DPF B38 | 0.071 | bar | |
| Differential pressure sensor DPF B38 | | | |

The charge pressure (boost sensor B4) must build up to more than 2 bar at the nominal speed under load.

The DPF differential pressure (B38) may not exceed 0.3 bar at the maximum engine speed.

Acquisition Graph Log file Print Exit

Request 2/5

- Selection and opening of parameter group 3. Injection setpoint

[2] - VM Service Tool - Parameters acquisition

Parameters groups list

1. Particle filter
2. Pressure channels
3. Fueling setpoint
4. Application parameters
5. Temperature channels
6. Sensor signal voltage
7. Rail pressure check

Injection quantity

Buttons: Add group, Edit group, Remove group, View acquisition, Exit

Explanation concerning injection setpoint parameter group

With Common Rail diesel systems, the injection is subdivided into 3 groups.

1. Pre-injection for smooth engine running
2. Main injection for a good torque characteristic
3. Post-injection for a good Nox value

In this injection setpoint parameter group, the “Quantity introduced by main injection” measurements are evaluated depending on the engine speed.

The “Quantity introduced by main injection” should be 75 mm³/ stroke (cubic millimetres per stroke) in the full load range.

All other values in this parameter group are not relevant for the M29- CM 2200.

3. Injection quantity

1. Idle speed 900 rpm without load in transport mode

[2-3] - VM Service Tool - Parameters acquisition - Fueling setpoint

| Parameter | Value | Measure unit | Notes |
|---|--------|----------------------|-------|
| Engine RPM - (Epm_nEng) | 849.50 | rpm | |
| Ratio between the maximum torque and the torque current - (...) | 1.83 | % | |
| Desired MI1 injection quantity - (InjCrv_qMI1Des) | 12.02 | mm ³ /hub | |
| Desired Pil1 injection quantity - (InjCrv_qPil1Des) | 1.31 | mm ³ /hub | |
| Post injection 1 setpoint quantity - (InjCrv_qPol1Des_mp) | 0.00 | mm ³ /hub | |
| Post injection 2 setpoint quantity - (InjCrv_qPol2Des_mp) | 0.00 | mm ³ /hub | |
| advance angle main injection - (InjCrv_phiMI1Des) | 0.31 | deg CrS | |
| Advance angle pilot injection 1 - (InjCrv_phiPil1Des) | 6.00 | deg CrS | |
| Advance angle pilot injection 2 - (InjCrv_phiPil2Des) | 0.00 | deg CrS | |
| Main injection duration - (InjCrv_tiMI1ET) | 543.60 | µs | |
| Excitation time current Pilot 1 - (InjVlv_tiPil1ET) | 275.60 | µs | |
| Excitation time current Pilot 2 - (InjVlv_tiPil2ET) | 0.00 | µs | |

Request 4/12

3. Injection quantity

2. Sweeping in ECO mode 1400 rpm

[2-3] - VM Service Tool - Parameters acquisition - Fueling setpoint

| Parameter | Value | Measure unit | Notes |
|---|---------|----------------------|-------|
| Engine RPM - (Epm_nEng) | 1416.00 | rpm | |
| Ratio between the maximum torque and the torque current - (...) | 5.16 | % | |
| Desired MI1 injection quantity - (InjCrv_qMI1Des) | 13.61 | mm ³ /hub | |
| Desired Pil1 injection quantity - (InjCrv_qPil1Des) | 1.76 | mm ³ /hub | |
| Post injection 1 setpoint quantity - (InjCrv_qPol1Des_mp) | 0.00 | mm ³ /hub | |
| Post injection 2 setpoint quantity - (InjCrv_qPol2Des_mp) | 1.51 | mm ³ /hub | |
| advance angle main injection - (InjCrv_phiMI1Des) | -0.66 | deg CrS | |
| Advance angle pilot injection 1 - (InjCrv_phiPil1Des) | 13.58 | deg CrS | |
| Advance angle pilot injection 2 - (InjCrv_phiPil2Des) | 0.00 | deg CrS | |
| Main injection duration - (InjCrv_tiMI1ET) | 492.80 | µs | |
| Excitation time current Pilot 1 - (InjVlv_tiPil1ET) | 254.00 | µs | |
| Excitation time current Pilot 2 - (InjVlv_tiPil2ET) | 0.00 | µs | |

Request 8/12

Acquisition Graph Log file Print Exit

3. Injection quantity

3. Sweeping in standard mode 1700 rpm

Turbine speed with the potentiometer set to 100 % in position 10.

[2-3] - VM Service Tool - Parameters acquisition - Fueling setpoint

| Parameter | Value | Measure unit | Notes |
|---|---------|----------------------|-------|
| Engine RPM - (Epm_nEng) | 1708.00 | rpm | |
| Ratio between the maximum torque and the torque current - (...) | 8.84 | % | |
| Desired MI1 injection quantity - (InjCrv_qMI1Des) | 21.69 | mm ³ /hub | |
| Desired Pil1 injection quantity - (InjCrv_qPil1Des) | 2.00 | mm ³ /hub | |
| Post injection 1 setpoint quantity - (InjCrv_qPol1Des_mp) | 0.00 | mm ³ /hub | |
| Post injection 2 setpoint quantity - (InjCrv_qPol2Des_mp) | 1.83 | mm ³ /hub | |
| advance angle main injection - (InjCrv_phiMI1Des) | -1.87 | deg CrS | |
| Advance angle pilot injection 1 - (InjCrv_phiPil1Des) | 11.80 | deg CrS | |
| Advance angle pilot injection 2 - (InjCrv_phiPil2Des) | 0.00 | deg CrS | |
| Main injection duration - (InjCrv_tiMI1ET) | 574.40 | µs | |
| Excitation time current Pilot 1 - (InjVlv_tiPil1ET) | 242.00 | µs | |
| Excitation time current Pilot 2 - (InjVlv_tiPil2ET) | 0.00 | µs | |

Request 10/12

Acquisition Graph Log file Print Exit

3. Injection quantity

4. Sweeping in max mode 2000 rpm

Turbine speed with the potentiometer set to 100 % in position 10.

[2-3] - VM Service Tool - Parameters acquisition - Fueling setpoint

| Parameter | Value | Measure unit | Notes |
|---|---------|----------------------|-------|
| Engine RPM - (Epm_nEng) | 2000.50 | rpm | |
| Ratio between the maximum torque and the torque current - (...) | 11.40 | % | |
| Desired MI1 injection quantity - (InjCrv_qMI1Des) | 24.15 | mm ³ /hub | |
| Desired Pil1 injection quantity - (InjCrv_qPil1Des) | 2.00 | mm ³ /hub | |
| Post injection 1 setpoint quantity - (InjCrv_qPol1Des_mp) | 0.00 | mm ³ /hub | |
| Post injection 2 setpoint quantity - (InjCrv_qPol2Des_mp) | 1.33 | mm ³ /hub | |
| advance angle main injection - (InjCrv_phiMI1Des) | -1.01 | deg CrS | |
| Advance angle pilot injection 1 - (InjCrv_phiPil1Des) | 11.67 | deg CrS | |
| Advance angle pilot injection 2 - (InjCrv_phiPil2Des) | 0.00 | deg CrS | |
| Main injection duration - (InjCrv_tiMI1ET) | 575.20 | µs | |
| Excitation time current Pilot 1 - (InjVlv_tiPil1ET) | 244.00 | µs | |
| Excitation time current Pilot 2 - (InjVlv_tiPil2ET) | 0.00 | µs | |

Request 11/12

Acquisition Graph Log file Print Exit

3. Injection quantity

5. M29 - engine speed with ADR set to 2800 rpm (nominal speed) under load.

[2-3] - VM Service Tool - Parameters acquisition - Fueling setpoint

| Parameter | Value | Measure unit | Notes |
|---|---------|----------------------|-------|
| Engine RPM - (Epm_nEng) | 2808.00 | rpm | |
| Ratio between the maximum torque and the torque current - (...) | 10.68 | % | |
| Desired MI1 injection quantity - (InjCrv_qMI1Des) | 31.80 | mm ³ /hub | |
| Desired Pil1 injection quantity - (InjCrv_qPil1Des) | 2.00 | mm ³ /hub | |
| Post injection 1 setpoint quantity - (InjCrv_qPol1Des_mp) | 0.00 | mm ³ /hub | |
| Post injection 2 setpoint quantity - (InjCrv_qPol2Des_mp) | 0.00 | mm ³ /hub | |
| advance angle main injection - (InjCrv_phiMI1Des) | 2.53 | deg CrS | |
| Advance angle pilot injection 1 - (InjCrv_phiPil1Des) | 18.17 | deg CrS | |
| Advance angle pilot injection 2 - (InjCrv_phiPil2Des) | 0.00 | deg CrS | |
| Main injection duration - (InjCrv_tiMI1ET) | 631.60 | µs | |
| Excitation time current Pilot 1 - (InjVlv_tiPil1ET) | | | |
| Excitation time current Pilot 2 - (InjVlv_tiPil2ET) | 0.00 | µs | |

The “Quantity introduced by main injection” should be a maximum of 75 mm³ / stroke (cubic millimetres per stroke) in the full load range.
All of the other values in this parameter group are not relevant for our vehicle.

Acquisition Graph Log file Print Exit

Request 11/12

- Selection and opening of parameter group 4. Application parameters

[2] - VM Service Tool - Parameters acquisition

Parameters groups list

1. Particle filter

2. Pressure channels

3. Fueling setpoint

4. Application parameters

5. Temperature channels

6. Sensor signal voltage

7. Rail pressure check

Add group

Edit group

Remove group

View acquisition

Exit



4. Application parameters

[2-4] - VM Service Tool - Parameters acquisition - Application parameters

| Parameter | Value | Measure unit | Notes |
|--|----------|--------------|---------------------------------|
| Basic low idle setpoint speed (rpm) - (HLSDem_nSetPLoBas) | 800.00 | rpm | |
| Engine RPM - (Epm_nEng) | 849.50 | rpm | |
| Vehicle speed - (VehV_v) | 0.00 | km/h | |
| theoretical Fuel consumption - (Com_dvoIFICons) | 1.37 | l/h | |
| Total time engine running - (EngDa_tiEngOn) | 57265.00 | s | |
| ECU ON time for the current driving cycle - (EngReq_tiECUOn) | 3478.00 | s | |
| diluted oil mass - (Lub_mOilDilEng) | 59.90 | g | ← Not relevant for M29- CM 2200 |
| Fuel-oil ratio in the engine - (Lub_rFIOil) | 0.84 | % | |

The quality of the engine oil with regard to oil dilution is evaluated in this parameter group. There are no reference values for our vehicles which are an indication of excessive oil dilution. Excessive oil dilution is indicated with an error message, warning light EOBD/MIL H49 comes on and is stored in the engine control unit with fault code P252F.

Acquisition **Graph** Log file Print Exit

- Selection and opening of parameter group 5. Temperature channels

[2] - VM Service Tool - Parameters acquisition



Parameters groups list

Add group

Edit group

Remove group

View acquisition

Exit

1. Particle filter

2. Pressure channels

3. Fueling setpoint

4. Application parameters

5. Temperature channels

6. Sensor signal voltage

7. Rail pressure check



5. Temperature channels

[2-5] - VM Service Tool - Parameters acquisition - Temperature channels

| Parameter | | Value | Measure unit | Notes |
|--|--------------------------------|--------|--------------|-----------------------------------|
| Engine coolant temperature - (CEngDsT_t_mp) | Coolant temperature sensor B5 | 85.96 | °C | |
| temperature air inside the inlet manifold - (Air_tCACDs) | | 49.26 | °C | |
| Fuel temperature - (FueIT_t) | Fuel temperature sensor B6 | 27.96 | °C | ← max. fuel temperature 75 °C |
| DOC in Temperature - (Exh_tOxiCatUs) | Temperature sensor DOC-IN B 44 | 173.36 | | |
| DPF in Temperature - (Exh_tPFItUs) | Temperature sensor DPF-IN B 42 | 185.16 | °C | ← max. temperature DPF- In 700 °C |

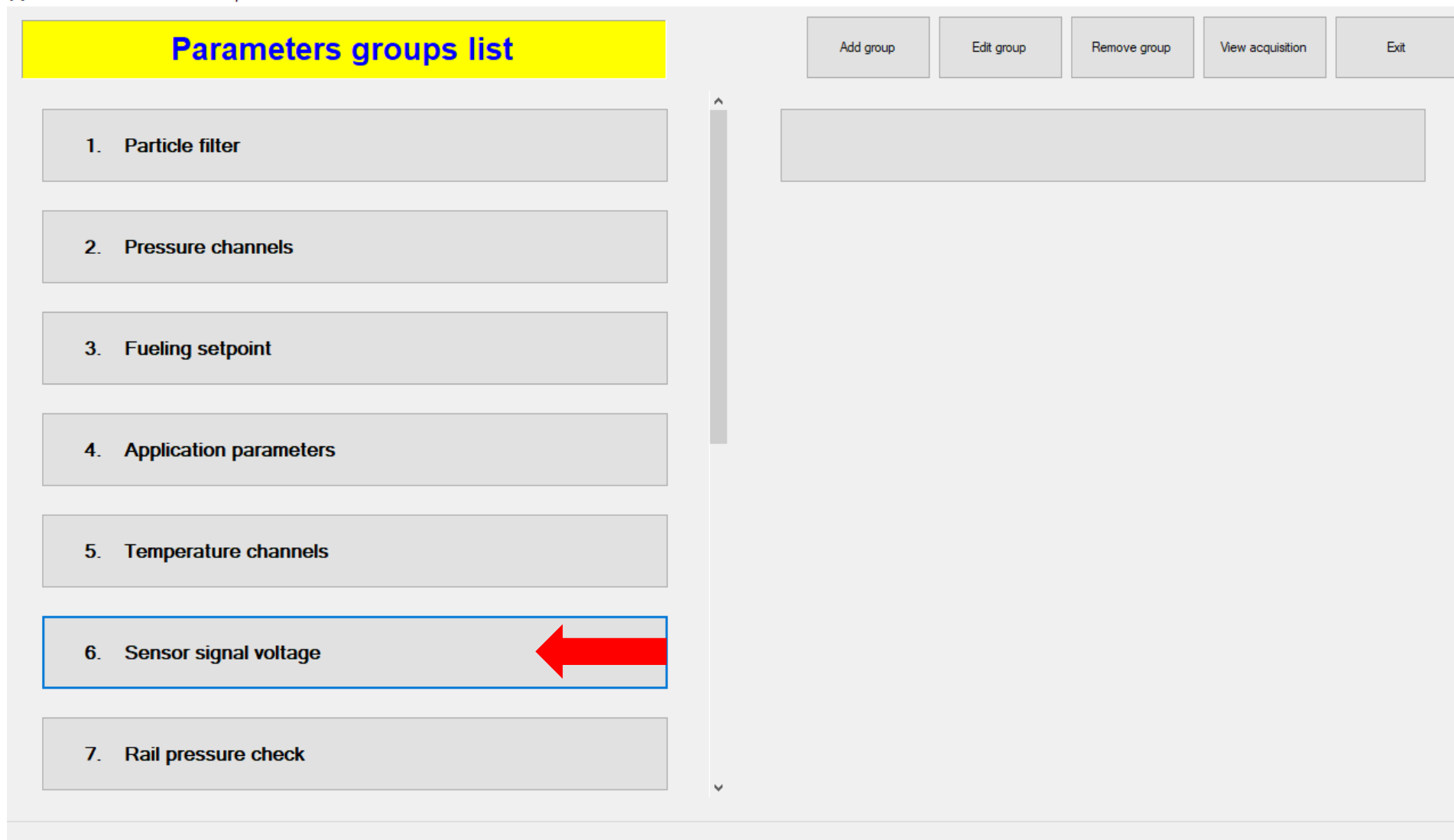
At a fuel temperature of more than 75 °C, the power of the engine is reduced and fault code P0168 is stored in engine control unit A1.
Regeneration of the diesel particle filter is aborted at a DPF inlet temperature of more than 700 °C.

Acquisition Graph Log file Print Exit

Request 4/5

- Selection and opening of parameter group 6. Sensor signal voltage

[2] - VM Service Tool - Parameters acquisition



The screenshot shows a software window titled "[2] - VM Service Tool - Parameters acquisition". The window has a yellow header bar with the text "Parameters groups list". Below the header, there is a list of seven parameter groups, each in a grey rectangular box:

1. Particle filter
2. Pressure channels
3. Fueling setpoint
4. Application parameters
5. Temperature channels
6. Sensor signal voltage
7. Rail pressure check

The sixth item, "6. Sensor signal voltage", is highlighted with a blue border and a red arrow pointing to it from the right. To the right of the list, there is a control panel with five buttons: "Add group", "Edit group", "Remove group", "View acquisition", and "Exit". Below these buttons is a large empty grey rectangular area. The window also features standard window controls (minimize, maximize, close) in the top right corner.

6. Sensor signal voltage

Pedal value transmitter B40 (accelerator) is evaluated by the Hydrostat control unit A12. Evaluation via Bodas/ process parameters/ group 13.3 +13.4

1. Idle speed 900 rpm without load in transport mode

[2-6] - VM Service Tool - Parameters acquisition - Sensor signal voltage

| Parameter | | Value | Measure unit | Notes |
|--|-----|---------|--------------|-------|
| Acceleration Pedal potentiometer voltage 1 - (APP_uRaw1) | | 0.01 | V | |
| Acceleration Pedal potentiometer voltage 2 - (APP_uRaw2) | | 0.00 | V | |
| Ambient pressure sensore voltage - (PEnv_u) | B64 | 4.01 | V | |
| water temp. sensor voltage - (CEngDsT_uRaw) | B5 | 1.36 | V | |
| Battery voltage - (BattU_u) | | 14.16 | V | |
| Boost temperature sens. Voltage - (Air_uRawTCACDs) | B4 | 1.90 | V | |
| fuel temperature sensor voltage - (FuelT_uRaw) | B6 | 3.15 | V | |
| Rail pressure sensore voltage - (RailP_uRawMax) | B3 | 1.86 | V | |
| Setpoint current for the metering unit - (MeUn_iSet) | Y23 | 1313.00 | mA | |
| DPF differential pressure sensor voltage - (Exh_uRawPPFitDiff) | B38 | 0.49 | V | |

| Parameter | Sensor | Values (V+ mA) | Resitance |
|-------------------------------------|--|----------------|--------------------------------------|
| Ambient sensor voltage | Ambient-Sensor B64 | 5 Volt | No value |
| Water temp. sensor voltage | Water (Coolant) temprature sensor B5 | 5 Volt | 2500 Ohm at 25° C coolant temprature |
| BOOST temperature sens. voltage | Charge air + charge air pressure sensor B4 | 5 Volt | No value |
| Fuel temperature sensor voltage | Fuel temperature sensor (integrated in the fuel filter) B6 | 5 Volt | 2050 Ohm at 25 ° C fuel temperature |
| Rail pressure sensor voltage | Rail pressure sensor at the rail pipe B3 | 5 Volt | No value |
| Setpoint current for meetering unit | Fuel metering unit Y25 (at HP- pump)) | 1800 mA | 2 Ohm |
| DPF differential pressure voltage | Differential pressure sensor DPF B38 | 5 Volt | No value |

6. Sensor signal voltage

2. Sweeping in ECO mode rpm

[2-6] - VM Service Tool - Parameters acquisition - Sensor signal voltage

| Parameter | | Value | Measure unit | Notes |
|--|------------|---------|--------------|-------|
| Acceleration Pedal potentiometer voltage 1 - (APP_uRaw1) | | 0.01 | V | |
| Acceleration Pedal potentiometer voltage 2 - (APP_uRaw2) | | 0.00 | V | |
| Ambient pressure sensore voltage - (PEnv_u) | B64 | 4.01 | V | |
| water temp. sensor voltage - (CEngDsT_uRaw) | B5 | 1.31 | V | |
| Battery voltage - (BattU_u) | | 14.12 | V | |
| Boost temperature sens. Voltage - (Air_uRawTCACDs) | B4 | 1.35 | V | |
| fuel temperature sensor voltage - (FuelT_uRaw) | B6 | 3.15 | V | |
| Rail pressure sensore voltage - (RailP_uRawMax) | B3 | 2.64 | V | |
| Setpoint current for the metering unit - (MeUn_iSet) | Y25 | 1228.00 | mA | |
| DPF differential pressure sensor voltage - (Exh_uRawPPFItDiff) | B38 | 0.53 | V | |

| Parameter | Sensor | Values (V+ mA) | Resitance |
|-------------------------------------|--|----------------|--------------------------------------|
| Ambient sensor voltage | Ambient-Sensor B64 | 5 Volt | No value |
| Water temp. sensor voltage | Water (Coolant) temprature sensor B5 | 5 Volt | 2500 Ohm at 25° C coolant temprature |
| BOOST temperature sens. voltage | Charge air + charge air pressure sensor B 4 | 5 Volt | No value |
| Fuel temperature sensor voltage | Fuel temperature sensor (integrated in the fuel filter) B6 | 5 Volt | 2050 Ohm at 25 ° C fuel temperature |
| Rail pressure sensor voltage | Rail pressure sensor at the rail pipe B3 | 5 Volt | No value |
| Setpoint current for meetering unit | Fuel metering unit Y25 (at HP- pump)) | 1800 mA | 2 Ohm |
| DPF differential pressure voltage | Differential pressure sensor DPF B38 | 5 Volt | No value |

6. Sensor signal voltage

3. Sweeping in standard mode 1700 rpm

Turbine speed with the potentiometer set to 100 % in position 10.

[2-6] - VM Service Tool - Parameters acquisition - Sensor signal voltage

| Parameter | | Value | Measure unit | Notes |
|--|------------|---------|--------------|-------|
| Acceleration Pedal potentiometer voltage 1 - (APP_uRaw1) | | 0.01 | V | |
| Acceleration Pedal potentiometer voltage 2 - (APP_uRaw2) | | 0.00 | V | |
| Ambient pressure sensore voltage - (PEnv_u) | B64 | 4.01 | V | |
| water temp. sensor voltage - (CEngDsT_uRaw) | B5 | 1.30 | V | |
| Battery voltage - (BattU_u) | | 14.14 | V | |
| Boost temperature sens. Voltage - (Air_uRawTCACDs) | B4 | 1.22 | V | |
| fuel temperature sensor voltage - (FuelT_uRaw) | B6 | 3.16 | V | |
| Rail pressure sensore voltage - (RailP_uRawMax) | B3 | 2.99 | V | |
| Setpoint current for the metering unit - (MeUn_iSet) | Y25 | 1189.00 | mA | |
| DPF differential pressure sensor voltage - (Exh_uRawPPFitDiff) | B38 | 0.47 | V | |

| Parameter | Sensor | Values (V+ mA) | Resitance |
|-------------------------------------|--|----------------|--------------------------------------|
| Ambient sensor voltage | Ambient-Sensor B64 | 5 Volt | No value |
| Water temp. sensor voltage | Water (Coolant) temprature sensor B5 | 5 Volt | 2500 Ohm at 25° C coolant temprature |
| BOOST temperature sens. voltage | Charge air + charge air pressure sensor B 4 | 5 Volt | No value |
| Fuel temperature sensor voltage | Fuel temperature sensor (integrated in the fuel filter) B6 | 5 Volt | 2050 Ohm at 25 ° C fuel temperature |
| Rail pressure sensor voltage | Rail pressure sensor at the rail pipe B3 | 5 Volt | No value |
| Setpoint current for meetering unit | Fuel metering unit Y25 (at HP- pump)) | 1800 mA | 2 Ohm |
| DPF differential pressure voltage | Differential pressure sensor DPF B38 | 5 Volt | No value |

6. Sensor signal voltage

4. Sweeping in max mode 2000 rpm

Turbine speed with the potentiometer set to 100 % in position 10.

[2-6] - VM Service Tool - Parameters acquisition - Sensor signal voltage

| Parameter | | Value | Measure unit | Notes |
|--|------------|---------|--------------|-------|
| Acceleration Pedal potentiometer voltage 1 - (APP_uRaw1) | | 0.01 | V | |
| Acceleration Pedal potentiometer voltage 2 - (APP_uRaw2) | | 0.00 | V | |
| Ambient pressure sensore voltage - (PEnv_u) | B64 | 4.01 | V | |
| water temp. sensor voltage - (CEngDsT_uRaw) | B5 | 1.30 | V | |
| Battery voltage - (BattU_u) | | 14.14 | V | |
| Boost temperature sens. Voltage - (Air_uRawTCACDs) | B4 | 1.22 | V | |
| fuel temperature sensor voltage - (FuelT_uRaw) | B6 | 3.16 | V | |
| Rail pressure sensore voltage - (RailP_uRawMax) | B3 | 2.99 | V | |
| Setpoint current for the metering unit - (MeUn_iSet) | Y25 | 1189.00 | mA | |
| DPF differential pressure sensor voltage - (Exh_uRawPPFItDiff) | B38 | 0.47 | V | |

| Parameter | Sensor | Values (V+ mA) | Resitance |
|-------------------------------------|--|----------------|--------------------------------------|
| Ambient sensor voltage | Ambient-Sensor B64 | 5 Volt | No value |
| Water temp. sensor voltage | Water (Coolant) temprature sensor B5 | 5 Volt | 2500 Ohm at 25° C coolant temprature |
| BOOST temperature sens. voltage | Charge air + charge air pressure sensor B 4 | 5 Volt | No value |
| Fuel temperature sensor voltage | Fuel temperature sensor (integrated in the fuel filter) B6 | 5 Volt | 2050 Ohm at 25 ° C fuel temprature |
| Rail pressure sensor voltage | Rail pressure sensor at the rail pipe B3 | 5 Volt | No value |
| Setpoint current for meetering unit | Fuel metering unit Y25 (at HP-pump)) | 1800 mA | 2 Ohm |
| DPF differential pressure voltage | Differential pressure sensor DPF B38 | 5 Volt | No value |

6. Sensor signal voltage

5. M29 – engine speed with ADR set to 2800 rpm (nominal speed) under load.

[2-6] - VM Service Tool - Parameters acquisition - Sensor signal voltage

| Parameter | | Value | Measure unit | Notes |
|--|------------|---------|--------------|-------|
| Acceleration Pedal potentiometer voltage 1 - (APP_uRaw1) | | 0.01 | V | |
| Acceleration Pedal potentiometer voltage 2 - (APP_uRaw2) | | 0.00 | V | |
| Ambient pressure sensore voltage - (PEnv_u) | B64 | 4.01 | V | |
| water temp. sensor voltage - (CEngDsT_uRaw) | B5 | 1.31 | V | |
| Battery voltage - (BattU_u) | | 14.16 | V | |
| Boost temperature sens. Voltage - (Air_uRawTCACDs) | B4 | 1.25 | V | |
| fuel temperature sensor voltage - (FuelT_uRaw) | B6 | 3.15 | V | |
| Rail pressure sensore voltage - (RailP_uRawMax) | B3 | 3.13 | V | |
| Setpoint current for the metering unit - (MeUn_iSet) | Y25 | 1166.00 | mA | |
| DPF differential pressure sensor voltage - (Exh_uRawPPFItdiff) | B38 | 0.67 | V | |

| Parameter | Sensor | Values (V+ mA) | Resitance |
|-------------------------------------|--|----------------|--------------------------------------|
| Ambient sensor voltage | Ambient-Sensor B64 | 5 Volt | No value |
| Water temp. sensor voltage | Water (Coolant) temprature sensor B5 | 5 Volt | 2500 Ohm at 25° C coolant temprature |
| BOOST temperature sens. voltage | Charge air + charge air pressure sensor B 4 | 5 Volt | No value |
| Fuel temperature sensor voltage | Fuel temperature sensor (integrated in the fuel filter) B6 | 5 Volt | 2050 Ohm at 25 ° C fuel temperature |
| Rail pressure sensor voltage | Rail pressure sensor at the rail pipe B3 | 5 Volt | No value |
| Setpoint current for meetering unit | Fuel metering unit Y25 (at HP- pump)) | 1800 mA | 2 Ohm |
| DPF differential pressure voltage | Differential pressure sensor DPF B38 | 5 Volt | No value |

- Selection and opening of parameter group 7. Rail pressure check

[2] - VM Service Tool - Parameters acquisition

Parameters groups list

1. Particle filter

2. Pressure channels

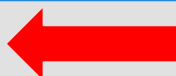
3. Fueling setpoint

4. Application parameters

5. Temperature channels

6. Sensor signal voltage

7. Rail pressure check



Add group

Edit group

Remove group

View acquisition

Exit

7. Rail pressure check

- M29- CM 2200 ignition switched on; engine starts.

[2-7] - VM Service Tool - Parameters acquisition - Rail pressure check

| Parameter | Value | Measure unit | Notes |
|---|---------|--------------------|----------------|
| Engine RPM - (Epm_nEng) | 110.50 | rpm | |
| Fuel temperature - (FuelT_t) | 30.66 | °C | |
| Rail pressure sensore voltage - (RailP_uRawMax) | 0.79 | V | |
| Setpoint current for the metering unit - (MeUn_iSet) Fuel metering unit Y29 | 1024.00 | mA | |
| Duty cycle setpoint for the metering unit - (MeUn_rSet_mp) Fuel metering unit Y29 | 21.94 | % | |
| fuel flow to the rail - (Rail_dvolSetPoint_mp) | 0.00 | mm ³ /s | |
| Rail pressure setpoint - (Rail_pSetPoint) | 671.100 | bar | ← Set point |
| Rail pressure - (RailP_pFlt) Rail pressure sensor at rail pipe B3 | 296.100 | bar | ← Actual value |

The actual value and the target value of the rail pressure sensor B3 is evaluated by the engine control unit during the starting procedure. The rail pressure is not monitored. This means that no active fault (e.g. P0087) is set during the starting procedure.

At the end of the starting procedure, the target value and the actual value should more or less correspond.

Acquisition Graph Log file Print Exit

Request 1/8

7. Rail pressure check

2. CM 2200 sweeping in ECO mode 1400 rpm

[2-7] - VM Service Tool - Parameters acquisition - Rail pressure check

| Parameter | Value | Measure unit | Notes |
|---|---------|--------------------|----------------|
| Engine RPM - (Epm_nEng) | 1402.50 | rpm | |
| Fuel temperature - (FuelT_t) | 29.96 | °C | |
| Rail pressure sensore voltage - (RailP_uRawMax) | 2.61 | V | |
| Setpoint current for the metering unit - (MeUn_iSet) Fuel metering unit Y29 | 1230.00 | mA | |
| Duty cycle setpoint for the metering unit - (MeUn_rSet_mp) Fuel metering unit Y29 | 26.20 | % | |
| fuel flow to the rail - (Rail_dvolSetPoint_mp) | 0.00 | mm ³ /s | |
| Rail pressure setpoint - (Rail_pSetPoint) | 947.900 | bar | ← Set point |
| Rail pressure - (RailP_pFit) Rail pressure sensor at rail pipe B3 | 945.000 | bar | ← Actual value |

If the actual value does not correspond with the target value, fault P0087 or P0088 is stored in the engine control unit.

Acquisition

Graph

Log file

Print

Exit

7. Rail pressure check

3. CM 2200 sweeping in standard mode 1700 rpm

Turbine speed with the potentiometer set to 100 % in position 10.

[2-7] - VM Service Tool - Parameters acquisition - Rail pressure check

| Parameter | | Value | Measure unit | Notes |
|--|--------------------------------------|----------|--------------------|----------------|
| Engine RPM - (Epm_nEng) | | 1701.00 | rpm | |
| Fuel temperature - (FuelT_t) | | 29.76 | °C | |
| Rail pressure sensore voltage - (RailP_uRawMax) | | 2.97 | V | |
| Setpoint current for the metering unit - (MeUn_iSet) | Fuel metering unit Y29 | 1192.00 | mA | |
| Duty cycle setpoint for the metering unit - (MeUn_rSet_mp) | Fuel metering unit Y29 | 25.54 | % | |
| fuel flow to the rail - (Rail_dvolSetPoint_mp) | | 0.00 | mm ³ /s | |
| Rail pressure setpoint - (Rail_pSetPoint) | | 1098.400 | bar | ← Set point |
| Rail pressure - (RailP_pFlt) | Rail pressure sensor at rail pipe B3 | 1112.200 | bar | ← Actual value |

If the actual value does not correspond with the target value, fault P0087 or P0088 is stored in the engine control unit.

Acquisition Graph Log file Print Exit

7. Rail pressure check

- 4. CM 2200 sweeping in max mode 2000 rpm
Turbine speed with the potentiometer set to 100 % in position 10.

[2-7] - VM Service Tool - Parameters acquisition - Rail pressure check

| Parameter | | Value | Measure unit | Notes |
|--|--------------------------------------|----------|--------------------|----------------|
| Engine RPM - (Epm_nEng) | | 2001.50 | rpm | |
| Fuel temperature - (FuelT_t) | | 29.76 | °C | |
| Rail pressure sensore voltage - (RailP_uRawMax) | | 3.13 | V | |
| Setpoint current for the metering unit - (MeUn_iSet) | Fuel metering unit Y29 | 1169.00 | mA | |
| Duty cycle setpoint for the metering unit - (MeUn_rSet_mp) | Fuel metering unit Y29 | 25.02 | % | |
| fuel flow to the rail - (Rail_dvolSetPoint_mp) | | 0.00 | mm ³ /s | |
| Rail pressure setpoint - (Rail_pSetPoint) | | 1176.600 | bar | ← Set point |
| Rail pressure - (RailP_pFit) | Rail pressure sensor at rail pipe B3 | 1167.100 | bar | ← Actual value |

If the actual value does not correspond with the target value, fault P0087 or P0088 is set in the engine control unit.

Request 8/8

Acquisition Graph Log file Print Exit

7. Rail pressure check

- 4. CM 2200 sweeping in max mode 2000 rpm
Turbine speed with the potentiometer set to 100 % in position 10.

[2-7] - VM Service Tool - Parameters acquisition - Rail pressure check

| Parameter | | Value | Measure unit | Notes |
|--|--------------------------------------|----------|--------------------|----------------|
| Engine RPM - (Epm_nEng) | | 2001.50 | rpm | |
| Fuel temperature - (FuelT_t) | | 29.76 | °C | |
| Rail pressure sensore voltage - (RailP_uRawMax) | | 3.13 | V | |
| Setpoint current for the metering unit - (MeUn_iSet) | Fuel metering unit Y29 | 1169.00 | mA | |
| Duty cycle setpoint for the metering unit - (MeUn_rSet_mp) | Fuel metering unit Y29 | 25.02 | % | |
| fuel flow to the rail - (Rail_dvolSetPoint_mp) | | 0.00 | mm ³ /s | |
| Rail pressure setpoint - (Rail_pSetPoint) | | 1176.600 | bar | ← Set point |
| Rail pressure - (RailP_pFIt) | Rail pressure sensor at rail pipe B3 | 1167.100 | bar | ← Actual value |

Acquisition Graph Log file Print Exit

7. Rail pressure check

5. M29 – engine speed with ADR set to 2800 rpm (nominal speed) under load.

[2-7] - VM Service Tool - Parameters acquisition - Rail pressure check

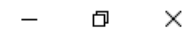
| Parameter | | Value | Measure unit | Notes |
|--|--------------------------------------|----------|--------------------|----------------|
| Engine RPM - (Epm_nEng) | | 2802.50 | rpm | |
| Fuel temperature - (FuelT_t) | | 30.06 | °C | |
| Rail pressure sensore voltage - (RailP_uRawMax) | | 3.28 | V | |
| Setpoint current for the metering unit - (MeUn_iSet) | Fuel metering unit Y29 | 1080.00 | mA | max. 1800 mA |
| Duty cycle setpoint for the metering unit - (MeUn_rSet_mp) | Fuel metering unit Y29 | 23.16 | % | |
| fuel flow to the rail - (Rail_dvolSetPoint_mp) | | 0.00 | mm ³ /s | |
| Rail pressure setpoint - (Rail_pSetPoint) | | 1261.100 | bar | ← Set point |
| Rail pressure - (RailP_pFlt) | Rail pressure sensor at rail pipe B3 | 1272.600 | bar | ← Actual value |

If the actual value does not correspond with the target value, fault P0087 or P0088 is set in the engine control unit.

Acquisition Graph Log file Print Exit

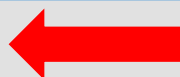
- Selection and opening of parameter group 8. Engine torque/speed request check

[2] - VM Service Tool - Parameters acquisition



Parameters groups list

8. Engine torque/speed request check



9. EGR check

10. Switch/actuator check

11. Engine start check

12. DEF quality

13. NOX in Check

14. TVA / EGR Check

Add group

Edit group

Remove group

View acquisition

Exit

8. Engine torque/ speed request check

1. Idle speed 900 rpm without load in transport mode.

[2-8] - VM Service Tool - Parameters acquisition - Engine torque/speed request check

| Parameter | Value | Measure unit | Notes |
|--|--------|--------------|-------|
| Engine RPM - (Epm_nEng) | 848.50 | rpm | |
| Basic low idle setpoint speed (rpm) - (HLSDem_nSetPLoBas) | 800.00 | rpm | |
| engine set-point speed required by the ECU - (EISGov_nSetPLo) | 850.00 | rpm | |
| Lower limit of the speed interval (setpoint speed) of the EISGo... | 850.00 | rpm | |
| Request rpm via CAN - (CoETS_nTSEASpdReq_mp) | 850.00 | rpm | |
| Torque delivered in case of limitations - (EngPrt_trqLim) | 412.30 | Nm | |
| Limiting torque smoke limit - (EngReq_trqInrLimSmk) | 290.70 | Nm | |
| Torque reduction for the gearbox - (Gbx_trqTSCIntv) | 0.00 | Nm | |

Evaluation of speed between the Hydrostat control unit A12 and the engine control unit A1 in the no-load condition, e.g. idle speed 900 rpm without load.

The “Engine RPM” must correspond with “Request rpm via CAN”.

Acquisition Graph Log file Print Exit

- Selection and opening of parameter group 9. EGR check

[2] - VM Service Tool - Parameters acquisition

Parameters groups list

Add group

Edit group

Remove group

View acquisition

Exit

8. Engine torque/speed request check

9. EGR check



EGR= Exhaust gas recirculation system

10. Switch/actuator check

11. Engine start check

12. DEF quality

13. NOX in Check

14. TVA / EGR Check

9. EGR check (EGR= Exhaust gas recirculation system)

1. Idle speed 900 rpm without load in transport mode.

[2-9] - VM Diagnose-Tool - Parameter-Aufzeichnung - EGR Kontrolle

| Parameter | Engine rpm | Wert | Messeinheit | Bemerkungen |
|---------------------------------|---------------------------------------|----------|-------------|-------------|
| Motordrehzahl | | 901.00 | rpm | |
| Posizione valvola EGR | Y41 Position-EGR- Valve | -59.9900 | % | |
| Temperatur Austrittsgas aus EGR | B36 Temp.- Sensor EGR Radiator OUT | 119.26 | °C | |
| T3 - Abgastemperatur vor turbo | B65 Temp.- Sensor Turbocharger OUT | 245.16 | °C | |
| Temperatur Einlasskrümmer | B4 Charge air temp. + pressure sensor | 77.06 | °C | |

The EGR valve Y41 is fully closed with -0 % and fully open with -100 %
The EGR valve Y41 is controlled via the CAN BUS.
In the event of a fault at the EGR valve or the EGR actuation, error P402 or P404 is stored in the engine control unit.

Aufzeichnung Grafik Aufzeichnungsdatei Drucken Verlassen

Anfrage 5/5

9. EGR check (EGR= Exhaust gas recirculation system)

2. Sweeping in ECO mode 1400 rpm.

[2-9] - VM Diagnose-Tool - Parameter-Aufzeichnung - EGR Kontrolle

| Parameter | Engine rpm | Wert | Messeinheit | Bemerkungen |
|---------------------------------|---------------------------------------|----------|-------------|-------------|
| Motordrehzahl | | 1394.50 | rpm | |
| Posizione valvola EGR | Y41 Position- EGR Valve | -52.1100 | % | |
| Temperatur Austrittsgas aus EGR | B36 Temp.- Sensor EGR Radiator OUT | 137.86 | °C | |
| T3 - Abgastemperatur vor turbo | B65 Temp.- Sensor Turbocharger OUT | 351.96 | °C | |
| Temperatur Einlasskrümmer | B4 Charge air temp. + pressure sensor | 75.96 | °C | |

The EGR valve Y41 is fully closed with -0 % and fully open with -100 %
The EGR valve Y41 is controlled via the CAN BUS.
In the event of a fault at the EGR valve or the EGR actuation, error P402 or P404 is stored in the engine control unit.

Aufzeichnung Grafik Aufzeichnungsdatei Drucken Verlassen

Anfrage 5/5

9. EGR check (EGR= Exhaust gas recirculation system)

3. Sweeping in standard mode 1700 rpm

Turbine speed with the potentiometer set to 100 % in position 10.

[2-9] - VM Diagnose-Tool - Parameter-Aufzeichnung - EGR Kontrolle

| Parameter | Engine rpm | Wert | Messeinheit | Bemerkungen |
|---------------------------------|---------------------------------------|----------|-------------|-------------|
| Motordrehzahl | | 1698.50 | rpm | |
| Posizione valvola EGR | Y41 Position-EGR Valve | -44.7500 | % | |
| Temperatur Austrittsgas aus EGR | B36 Temp.- Sensor EGR Radiator OUT | 155.06 | °C | |
| T3 - Abgastemperatur vor turbo | B65 Temp.- Sensor Turbocharger OUT | 437.56 | °C | |
| Temperatur Einlasskrümmer | B4 Charge air temp. + pressure sensor | 73.06 | °C | |

The EGR valve Y41 is fully closed with -0 % and fully open with -100 %
The EGR valve Y41 is controlled via the CAN BUS.
In the event of a fault at the EGR valve or the EGR actuation, error P402 or P404 is stored in the engine control unit.

Aufzeichnung Grafik Aufzeichnungsdatei Drucken Verlassen

Anfrage 5/5

9. EGR check (EGR= Exhaust gas recirculation system)

4. Sweeping in max mode 2000 rpm

Turbine speed with the potentiometer set to 100 % in position 10.

[2-9] - VM Diagnose-Tool - Parameter-Aufzeichnung - EGR Kontrolle

| Parameter | Engine rpm | Wert | Messeinheit | Bemerkungen |
|---------------------------------|---------------------------------------|----------|-------------|-------------|
| Motordrehzahl | | 2000.00 | rpm | |
| Posizione valvola EGR | Y41 Position- EGR- Valve | -45.4700 | % | |
| Temperatur Austrittsgas aus EGR | B36 Temp.- Sensor EGR Radiator OUT | 170.06 | °C | |
| T3 - Abgastemperatur vor turbo | B65 Temp.- Sensor Turbocharger OUT | 427.86 | °C | |
| Temperatur Einlasskrümmer | B4 Charge air temp. + pressure sensor | 76.86 | °C | |

The EGR valve Y41 is fully closed with -0 % and fully open with -100 %
 The EGR valve Y41 is controlled via the CAN BUS.
 In the event of a fault at the EGR valve or the EGR actuation, error P402 or P404 is stored in the engine control unit.

Aufzeichnung Grafik Aufzeichnungsdatei Drucken Verlassen

Anfrage 4/5

9. EGR check (EGR= Exhaust gas recirculation system)

5. M29 – engine speed with ADR set to 2800 rpm (nominal speed) under load.

[2-9] - VM Diagnose-Tool - Parameter-Aufzeichnung - EGR Kontrolle

| Parameter | Engine rpm | Wert | Messeinheit | Bemerkungen |
|---------------------------------|---------------------------------------|---------|-------------|-------------|
| Motordrehzahl | | 2804.50 | rpm | |
| Posizione valvola EGR | Y41 Position- EGR- Valve | 0.0000 | % | |
| Temperatur Austrittsgas aus EGR | B36 Temp.- Sensor EGR Radiator OUT | 89.86 | °C | |
| T3 - Abgastemperatur vor turbo | B65 Temp.- Sensor Turbocharger OUT | 440.86 | °C | |
| Temperatur Einlasskrümmer | B4 Charge air temp. + pressure sensor | 72.66 | °C | |

The EGR valve (Exhaust gas recirculation valve) Y41 is fully closed at -0 % and fully open at -100 %

The EGR valve Y41 is controlled via the CAN BUS.

In the event of a fault at the EGR valve or the EGR actuation, error P402 or P404 is stored in the engine control unit.

Aufzeichnung Grafik Aufzeichnungsdatei Drucken Verlassen

Anfrage 5/5

- Selection and opening of parameter group 10. Switch/actuator check

[2] - VM Service Tool - Parameters acquisition



Parameters groups list

Add group

Edit group

Remove group

View acquisition

Exit

8. Engine torque/speed request check

9. EGR check

10. Switch/actuator check

11. Engine start check

12. DEF quality

13. NOX in Check

14. TVA / EGR Check



10. Switch/ actuator check

[2-10] - VM Diagnose-Tool - Parameter-Aufzeichnung - Schalt/Stellglied Kontrolle

| Parameter | Wert | Messeinheit | Bemerkungen |
|--|------|-------------|-------------|
| Terminal 15 Status nach Filterung | 1.00 | - | |
| Status Bremse | 0.00 | - | |
| Status redundanter Bremschalter | 0.00 | - | |
| Digitaler Ausgang für Stellglied nach der Diagnose | 0.0 | - | |
| Steuer Plugs | 0.00 | - | |
| MIL Statusanzeige | 0.00 | - | |
| Fahrzeug bereit zur Abfahrt, cut-off | 2.00 | - | |
| Cruise control ON / OFF Taste über ComRx_RxCCVS | 3.00 | - | |

The status parameters are displayed in this parameter group.

The status of the brake and the status of brake light switch S24 are not displayed in the engine control unit A1 but in the Hydrostat control unit A12. Evaluation takes place via Bodas/ process parameters/ group 11.3 +11.4

Aufzeichnung Grafik Aufzeichnungsdatei Drucken Verlassen

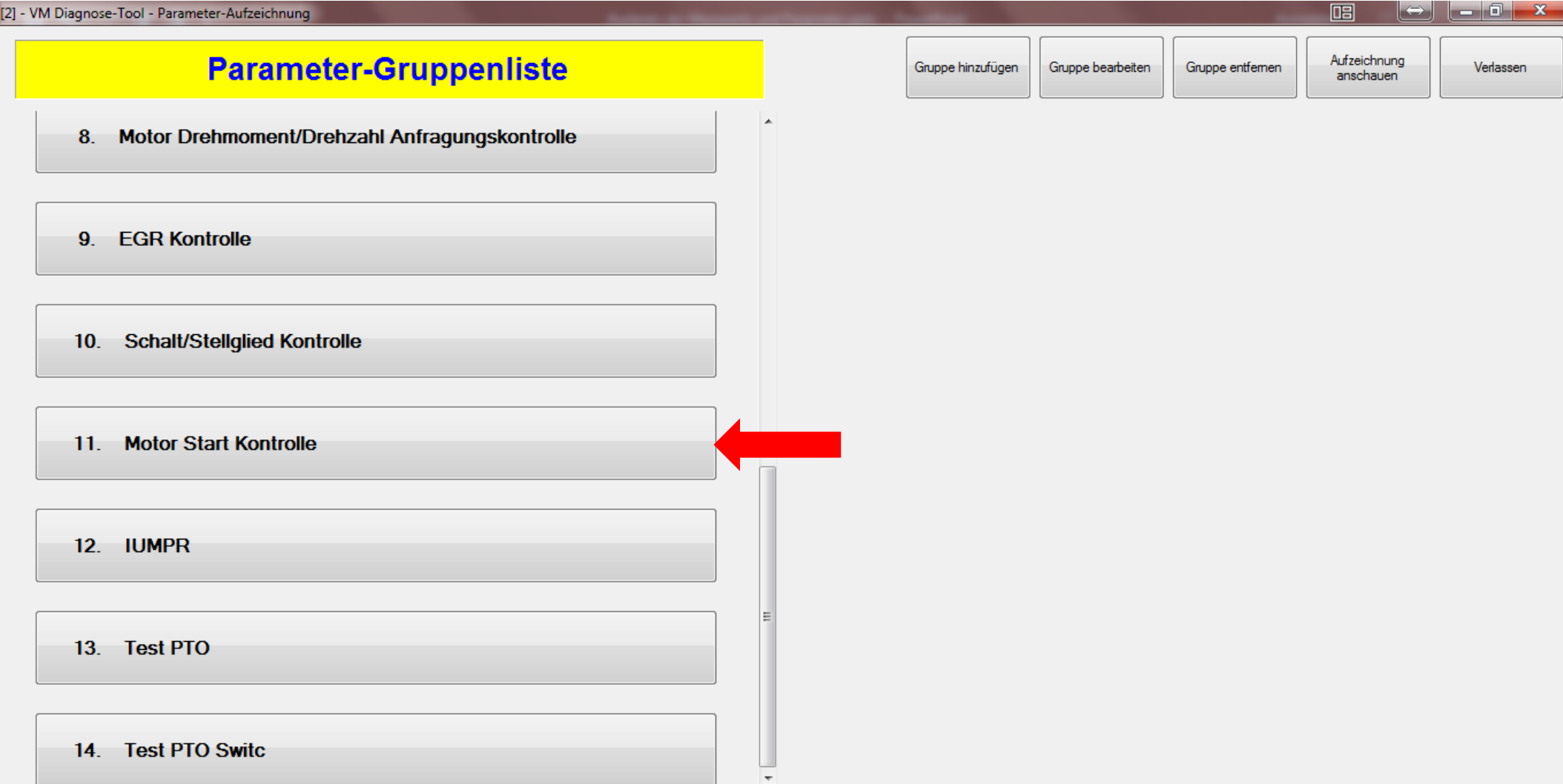
- Selection and opening of parameter group 11. Engine start check

[2] - VM Diagnose-Tool - Parameter-Aufzeichnung

Parameter-Gruppenliste

Gruppe hinzufügen Gruppe bearbeiten Gruppe entfernen Aufzeichnung anschauen Verlassen

- 8. Motor Drehmoment/Drehzahl Anfragekontrolle
- 9. EGR Kontrolle
- 10. Schalt/Stellglied Kontrolle
- 11. Motor Start Kontrolle**
- 12. IUMPR
- 13. Test PTO
- 14. Test PTO Switc



11. Engine start check

- Ignition switched on, engine is off.

[2-11] - VM Diagnose-Tool - Parameter-Aufzeichnung - Motor Start Kontrolle

| Parameter | Wert | Messeinheit | Bemerkungen |
|---|-------------|-------------|-------------|
| Motordrehzahl Engine rpm | 0.00 | rpm | |
| Kühlflüssigkeitstemperatur | 86.56 | °C | |
| Raildruck Sollwert | 415.400 | bar | |
| Raildruck Rail pressure | 8.100 | bar | |
| Synchronisierungsstatus | EPM_NO_SYNC | | |
| Betriebsstatus des Motors | COENG_READY | | |

The synchronisation status and the operating status of the engine are displayed in this parameter group, depending on the rail pressure and the engine speed.

COENG_READY = ignition on, engine ready to start.

EPM_NO_SYNC = synchronisation not yet initiated.

The primary fuel pressure should be approximately 8 bar just after the engine is switched off with the ignition switched on. Primary fuel pressure that is too low is usually the result of insufficient feed pump capacity, lack of fuel or air in the fuel lines.

1. If the primary fuel pressure is not reached, the manual feed pump should be checked first. Foreign bodies in the manual feed pump could prevent the diaphragm from closing.
2. Check fuel filter for soiling and replace if necessary.
3. Check fuel tank for dirt, clean if necessary.
4. Check fuel tank intake lines for leaks (air in the fuel lines).

11. Engine start check

- Engine during starting procedure

[2-11] - VM Diagnose-Tool - Parameter-Aufzeichnung - Motor Start Kontrolle

| Parameter | Wert | Messeinheit | Bemerkungen |
|---------------------------------|----------------|-------------|-------------|
| Motordrehzahl Engine rpm | 106.00 | rpm | |
| Kühlflüssigkeitstemperatur | 86.46 | °C | |
| Raildruck Sollwert | 415.400 | bar | |
| Raildruck Rail pressure | 36.600 | bar | |
| Synchronisierungsstatus | EPM_NO_SYNC | | |
| Betriebsstatus des Motors | COENG_CRANKING | | |

COENG_CRANKING = engine is in starting procedure
EPM_NO_SYNC = synchronisation not yet achieved

Aufzeichnung Grafik Aufzeichnungsdatei Drucken Verlassen

Anfrage 6/6

11. Engine start check

[2-11] - VM Diagnose-Tool - Parameter-Aufzeichnung - Motor Start Kontrolle

| Parameter | Wert | Messeinheit | Bemerkungen |
|---------------------------------|----------------|-------------|-------------|
| Motordrehzahl Engine rpm | 393.00 | rpm | |
| Kühflüssigkeitstemperatur | 86.86 | °C | |
| Raildruck Sollwert | 658.700 | bar | |
| Raildruck Rail pressure | 584.200 | bar | |
| Synchronisierungsstatus | EPM_FULL_SYNC | | |
| Betriebsstatus des Motors | COENG_CRANKING | | |

COENG_CRANKING = engine is in starting procedure

EPM_FULL_SYNC = synchronisation has been achieved

The actual value and the target value of the rail pressure sensor B3 is evaluated by the engine control unit during the starting procedure. The rail pressure is not monitored. This means that no active fault (e.g. P0087) is set during the starting procedure.

At the end of the starting procedure, the target value and the actual value should be approximately the same.

Aufzeichnung Grafik Aufzeichnungsdatei Drucken Verlassen

Anfrage 6/6

11. Engine start check

- Starting procedure complete, engine is running

[2-11] - VM Diagnose-Tool - Parameter-Aufzeichnung - Motor Start Kontrolle

| Parameter | Wert | Messeinheit | Bemerkungen |
|---------------------------------|---------------|-------------|-------------|
| Motordrehzahl Engine rpm | 900.50 | rpm | |
| Kühflüssigkeitstemperatur | 86.66 | °C | |
| Raildruck Sollwert | 695.400 | bar | |
| Raildruck Rail pressure | 725.000 | bar | |
| Synchronisierungsstatus | EPM_FULL_SYNC | | |
| Betriebsstatus des Motors | COENG_RUNNING | | |

COENG_RUNNING = engine running
EPM_FULL_SYNC = synchronisation has been achieved

If the starting procedure is complete and the engine is running, synchronisation is also complete.

Aufzeichnung Grafik Aufzeichnungsdatei Drucken Verlassen

Anfrage 3/6

Parameter-Gruppenliste

Gruppe hinzufügen

Gruppe bearbeiten

Gruppe entfernen

Aufzeichnung
anschauen

Verlassen

8. Motor Drehmoment/Drehzahl Anfragungskontrolle

9. EGR Kontrolle

10. Schalt/Stellglied Kontrolle

11. Motor Start Kontrolle

12. IUMPR

13. Test PTO

14. Test PTO Switc

This page is not relevant for the M29-
CM 2200.

This page is not relevant for the M29- CM 2200.

- Selection and opening of parameter group 14. Test PTO Switch

[2] - VM Diagnose-Tool - Parameter-Aufzeichnung

Parameter-Gruppenliste

Gruppe hinzufügen Gruppe bearbeiten Gruppe entfernen Aufzeichnung anschauen Verlassen

- 8. Motor Drehmoment/Drehzahl Anfragungskontrolle
- 9. EGR Kontrolle
- 10. Schalt/Stellglied Kontrolle
- 11. Motor Start Kontrolle
- 12. IUMPR
- 13. Test PTO
- 14. Test PTO Switc

