Multicar M29 CM 2200

Service Training Diagnose



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	R754EU6 -c
2. Parameters acquisition	<u> </u>
3. Trip Recorder	
4. Diagnostic tests	
5. Engine Collect Data	
6. ECU Information	
7. Exit	

[Ethernet USB] Connected



• Selection and opening of parameter group 1. Particle filter

[2] - VM Service Tool - Parameters acquisition						- 6	ı X
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	~						



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) Pressur	e 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 Gr	aph 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				- 0	×
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	e 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 Gr	aph Log file	Print	Exit	t
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) Pressur	e sensor DPF B38 0.012	bar				
Simulated soot mass in particulate filter - (PFltLd_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 Gr	aph 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			_		\times
Parameter	Value	Measure unit	Notes		
Engine RPM - (Eng. nEng)	2004.00	rom			
Ratio between the maximum torque and the torque current - (10.03	%			
Differential pressure particulate filter - (Exh. pPFItDiff) Pressure s	ensor DPF B38 0.023	bar			
Simulated soot mass in particulate filter - (PFItLd mSotSim)	23.26	q			
Flow resistance of the particulate filter - (PFItLd resFlw)	0.00	bar/(m^3/h)			
Engine operating point - (PFItPOp_stEngPOp)	2.00	-			
	Acquisition Gra	aph Log file	Print	Exit	
Request 6/6					



2. Pressure channels

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

Parameter	Value	Measure unit	Notes	
ingine RPM - (Epm_nEng)	2814.00	rpm		
atio between the maximum torque and the torque current - (8.28	%		
Differential pressure particulate filter - (Exh_pPFItDiff) Pressure	sensor DPF B38 0.060	bar		٦
simulated soot mass in particulate filter - (PFItLd_mSotSim)	23.32	g		
low resistance of the particulate filter - (PFItLd_resFIw)	0.00	bar/(m^3/h)		
ngine operating point - (PFItPOp_stEngPOp)	2.00	-		
The differential pressure may not exc	ceed 0.3 bar at the	maximum engine s	speed	
The ameronial procedure may not exe		inaxinani origino e	pood.	



• Selection and opening of parameter group 2. Pressure channels

[2] - VM Servic	e Tool - Parameters acquisition					-	- 0 ×
	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	~					



2. Pressure channels

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

arameter		Value	Measure unit	Notes	
nvironment pressure - (EnvP p)		1.016	bar		
oost pessure - (Air pCACDs) Charge air + Charge air pressu	ire sensor B4	1.070	bar - actual value		
ail pressure setpoint - (Rail pSetPoint)		621.500	bar 🗲 set point		
ail pressure - (RailP_pFlt) Rail pressure sensor at rail pipe	e B3	612.900	bar ← actual value		
ifferential pressure particulate filter - (Exh_pPFItDiff) Pressure s	ensor DPF B38	0.010	bar		
ifferential pressure sensor DPF B38					
	Acquisition	Gra	aph Log file	Print	Exit



2. CM 2200 sweeping in ECO mode 1400 rpm

[2-2] - VM Service Tool - Parameters acquisition - Pressure channels					-		×
Deremeter		Value	Magaura unit	Notos			
		value		Notes			
Environment pressure - (EnvP_p)		1.016	bar				
Boost pessure - (Air_pCACDs) Charge all + Charge all pres	SSURE SENSOR B4	1.104	bar actual value				
Rail pressure setpoint - (Rail_pSetPoint)		855.300	bar - set point				
Rail pressure - (RailP_pFlt) Rall pressure sensor at rall p		857.000	bar - actual value				
Differential pressure particulate filter - (Exh_pPFItDiff) Pressure	e sensor DPF B38	0.010	bar				
Differential pressure sensor DPF B38							_
							_
	Acquisition	Gr	aph Log file	Print		Exit	
Request 3/5							



2. Pressure channels

3. CM 2200 sweeping in standard mode 1700 rpm

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

Parameter		Value	Measure unit	Notes		
nvironment pressure - (EnvP_p)		1.016	bar			
oost pessure - (Air_pCACDs) Charge air + Charge air	pressure sensor E	4 1.247	bar ← actual value			
ail pressure setpoint - (Rail_pSetPoint)		1005.400	bar 🔶 set point			
ail pressure - (RailP_pFIt) Rail pressure sensor at	rail pipe B3	1008.800	bar 🔶 actual value			
ifferential pressure particulate filter - (Exh_pPFltDiff) Press	sure sensor DPF E	338 0.018	bar			
ifferential pressure sensor DPF B38						
					 	_
				_	_	
	Acquisition	Gr	aph Log file	Print	Exit	



2. Pressure channels

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

Parameter	Value	Measure unit	Notes	
nvironment pressure - (EnvP_p)	1.016	bar		
oost pessure - (Air_pCACDs) Charge air + Charge	air pressure sensor B4 2.021	bar ← actual value)	
ail pressure setpoint - (Rail_pSetPoint)	1260.200	bar 🔶 set point		
ail pressure - (RailP_pFlt) Rail pressure sensor	r at rail pipe B3 1255.100	bar 🔶 actual value	3	
ifferential pressure particulate filter - (Exh_pPFItDiff) Pr	essure sensor DPF B38 0.071	bar		
ifferential pressure sensor DPF B38				
·				
			_	_
	Acquisition G	raph Log file	Print	Exit



2. Pressure channels

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

arameter	Value	Measure unit	Notes		
nvironment pressure - (EnvP_p)	1.016	bar			
oost pessure - (Air_pCACDs) Charge air + Charge air	pressure sensor B4 2.021	bar ← actual value			
ail pressure setpoint - (Rail_pSetPoint)	1260.200	bar 🔶 set point			
ail pressure - (RailP_pFlt) Rail pressure sensor a	rail pipe B3 1255.100	bar 🔶 actual value			
ifferential pressure particulate filter - (Exh_pPFItDiff) Pres	sure sensor DPF B38 0.071	bar			
Differential pressure sensor DPF B38					
The charge pressure (boost sensor B4) must build up to m	ore than 2 bar at th	e		
ne charge precedie (beect concer b			~		
iominal speed under load.					
The DPF differential pressure (B38) m	ay not exceed 0.3 ba	ar at the maximum	engine		
speed					
				_	_



• Selection and opening of parameter group 3. Injection setpoint





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 mm^3/ 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 - (InjVIv_tiPil1ET)	275.60	μs				
Excitation time current Pilot 2 - (InjVIv_tiPil2ET)	0.00	μs				
	Acquisition Gra	aph Log file	Print		Exit	
Request 4/12						



3. Injection quantity

2. Sweeping in ECO mode 1400 rpm

arameter	Value	Measure unit	Notes		
ngine RPM - (Epm_nEng)	1416.00	rpm			
atio between the maximum torque and the torque current - (5.16	%			
esired MI1 injection quantity - (InjCrv_qMI1Des)	13.61	mm^3/hub			
esired Pil1 injection quantity - (InjCrv_qPil1Des)	1.76	mm^3/hub			
ost injection 1 setpoint quantity - (InjCrv_qPol1Des_mp)	0.00	mm^3/hub			
ost injection 2 setpoint quantity - (InjCrv_qPol2Des_mp)	1.51	mm^3/hub			
dvance angle main injection - (InjCrv_phiMI1Des)	-0.66	deg CrS			
dvance angle pilot injection 1 - (InjCrv_phiPil1Des)	13.58	deg CrS			
dvance angle pilot injection 2 - (InjCrv_phiPil2Des)	0.00	deg CrS			
ain injection duration - (InjCrv_tiMI1ET)	492.80	μs			
xcitation time current Pilot 1 - (InjVIv_tiPil1ET)	254.00	μs			
xcitation time current Pilot 2 - (InjVIv_tiPil2ET)	0.00	μs			
Ac	quisition Gr	aph 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 - (InjVIv_tiPil1ET)	242.00	μs				
Excitation time current Pilot 2 - (InjVIv_tiPil2ET)	0.00	μs				
	Acquisition Gra	aph Log file	Print		Exit	
2 anuart 10/12						



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 gMI1Des)	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 - (InjVIv_tiPil1ET)	244.00	μs		
Excitation time current Pilot 2 - (InjVIv_tiPil2ET)	0.00	μs		
	Acquisition Gra	aph Log file	Print	Exit
Request 11/12				



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 - (InjVIv_tiPil1ET)						
Excitation time current Pilot 2 - (InjVIv_tiPil2ET)	0.00	μs				
The "Quantity introduced by main injection millimetres per stroke) in the full load ran All of the other values in this parameter of	on" should be a max ge. Jroup are not releva	imum of 75 mm^3 , nt for our vehicle.	[/] stroke (cubi	С	
	Acquisition	aph Log file	Print		Exit	



• Selection and opening of parameter group 4. Application parameters

[2] - VM Service Tool - Parameters acquisition					-	- 0	\times
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	•						



4. 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				
/ehicle speed - (VehV_v)	0.00	km/h				
heoretical Fuel consumption - (Com_dvolFlCons)	1.37	l/h				
Fotal time engine running - (EngDa_tiEngOn)	57265.00	S				
ECU ON time for the current driving cycle - (EngReg_tiECUOn	3478.00	s				_
diluted oil mass - (Lub_mOilDilEng)	59.90	9 Not relevant f	or M29- CM	2200		
Fuel-oil ratio in the engine - (Lub_rFIOil)	0.84	%		2200		
The quality of the engine oil with regard to	oil dilution is evaluat	ted in this parameter	aroup The	oro a	ron	0
The quality of the engine oil with regard to	oil dilution is evaluat	ted in this parameter	group. The	ere a	re n	0
The quality of the engine oil with regard to reference values for our vehicles which an	oil dilution is evaluat e an indication of exc	ted in this parameter cessive oil dilution.	group. The	ere a	re n	0
The quality of the engine oil with regard to reference values for our vehicles which an Excessive oil dilution is indicated with an	oil dilution is evaluat e an indication of exc error message, warnii	ted in this parameter cessive oil dilution. ng light EOBD/MIL F	group. The	ere ai on ai	re n nd is	0 S
The quality of the engine oil with regard to reference values for our vehicles which an Excessive oil dilution is indicated with an stored in the engine control unit with fault	oil dilution is evaluat e an indication of exc error message, warnii code P252F.	ted in this parameter cessive oil dilution. ng light EOBD/MIL F	group. The	ere ai on ai	re n nd is	0
The quality of the engine oil with regard to reference values for our vehicles which ar Excessive oil dilution is indicated with an stored in the engine control unit with fault	oil dilution is evaluat e an indication of exc error message, warnii code P252F.	ted in this parameter cessive oil dilution. ng light EOBD/MIL F	group. The	ere ai on ai	re n nd is	0 S
The quality of the engine oil with regard to reference values for our vehicles which an Excessive oil dilution is indicated with an stored in the engine control unit with fault	oil dilution is evaluat e an indication of exc error message, warnii code P252F.	ted in this parameter cessive oil dilution. ng light EOBD/MIL H	group. The	ere al on al	re n nd is	0 S
The quality of the engine oil with regard to reference values for our vehicles which ar Excessive oil dilution is indicated with an stored in the engine control unit with fault	oil dilution is evaluat e an indication of exc error message, warnii code P252F.	ted in this parameter cessive oil dilution. ng light EOBD/MIL F	group. The	ere ai on ai	re n nd is	0
The quality of the engine oil with regard to reference values for our vehicles which ar Excessive oil dilution is indicated with an stored in the engine control unit with fault	oil dilution is evaluat e an indication of exc error message, warnii code P252F.	ted in this parameter cessive oil dilution. ng light EOBD/MIL H	group. The	ere al on al	re n nd is	0
The quality of the engine oil with regard to reference values for our vehicles which ar Excessive oil dilution is indicated with an stored in the engine control unit with fault	oil dilution is evaluat e an indication of exc error message, warnii code P252F.	ted in this parameter cessive oil dilution. ng light EOBD/MIL F	group. The	on ai	re n nd is	0
The quality of the engine oil with regard to reference values for our vehicles which ar Excessive oil dilution is indicated with an stored in the engine control unit with fault	oil dilution is evaluat e an indication of exc error message, warnii code P252F.	ted in this parameter cessive oil dilution. ng light EOBD/MIL F	group. The	on ai	re n nd is	O S
The quality of the engine oil with regard to reference values for our vehicles which ar Excessive oil dilution is indicated with an stored in the engine control unit with fault	oil dilution is evaluat e an indication of exc error message, warnii code P252F.	ted in this parameter cessive oil dilution. ng light EOBD/MIL H	group. The	on ai	re n nd is	0
The quality of the engine oil with regard to reference values for our vehicles which ar Excessive oil dilution is indicated with an stored in the engine control unit with fault	oil dilution is evaluat e an indication of exc error message, warnii code P252F.	ted in this parameter cessive oil dilution. ng light EOBD/MIL F	group. The	on ai	re n nd is	O S



• Selection and opening of parameter group 5. Temperature channels

[2] - VM Service Tool - Parameters acquisition						- 0	×
Parameters groups list		Add group	Edit group	Remove group	View acquisition	Ex	it
1. Particle filter							
2. Pressure channels							
3. Fueling setpoint							
4. Application parameters							
5. Temperature channels							
6. Sensor signal voltage							
7. Rail pressure check	v						



5. Temperature channels

arameter			Value	Measure	unit	Notes		
ngine coolant temperature - (CEngDsT_t	_mp) Coolant temperatu	ure sensor B5	85.96	°C				
mperature air inside the inlet manifold	(Air_tCACDs)		49.26	°C				
uel temperature - (FuelT_t)	Fuel temperature ser	nsor B6	27.96	°C ←	max. fuel tempera	ature 75 °C		
OC in Temperature - (Exh_tOxiCatUs)	Temperature sensor I	DOC-IN B 44	173.36					
Prin Temperature - (Exh_tPFItUs)	Temperature sensor I	DPF-IN B 42	185.16	°C ←	max. temperature	e DPF- In 700 °	C	
At a fuel temperature of mo								
tored in engine control uni	ore than 75 °C, the t A1.	e power of the	engi	ne is r	educed and fa	ult code P0	168 is	
tored in engine control uni Regeneration of the diesel	ore than 75 °C, the t A1. particle filter is abo	e power of the orted at a DP	engi F inle	ne is r t temp	educed and fa erature of mor	ult code P0 re than 700	168 is °C.	
tored in engine control uni	ore than 75 °C, the t A1. particle filter is abo	e power of the	e engi F inle	ne is r t temp	educed and fa	ult code P0 re than 700	168 is °C.	
tored in engine control uni	ore than 75 °C, the t A1. particle filter is abo	e power of the	engi F inle	ne is r	educed and fa	ult code P0 re than 700	168 is °C.	
Regeneration of the diesel	ore than 75 °C, the t A1. particle filter is abo	e power of the	engi	ne is r	educed and fa	ult code P0 re than 700	168 is °C.	
stored in engine control uni Regeneration of the diesel	ore than 75 °C, the t A1. particle filter is abo	e power of the	engi	ne is r	educed and fa	ult code P0 re than 700	168 is °C.	



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

[2] - VM Service Tool - Parameters acquisition						- 0	×
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	Ŷ						
 4. Application parameters 5. Temperature channels 6. Sensor signal voltage 7. Rail pressure check 	ř						



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				1		-	×
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 - (FueIT_uRaw)	B6	3.15	V				
Rail pressure sensore voltage - (RailP_uRawMax)	B 3	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 temperture
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



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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 - (FueIT_uRaw)	B6	3.15	v	
Rail pressure sensore voltage - (RailP_uRawMax)	B 3	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 temperture
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 signa	al voltage						-		×
	Parameter			Value	Measu	re unit	Notes			
	Acceleration Pedal potentiometer voltage 1 - (API	P_uRaw1)		0.01	۷					
	Acceleration Pedal potentiometer voltage 2 - (AP	P_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_uRawTCA0	CDs)	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_iSe	et)	Y25	1189.00	mA					
	DPF differential pressure sensor voltage - (Exh_uF	RawPPFItDiff)	B38	0.47	v					
	Parameter		Senso	or		Values (V+ mA)		Resita	nce	
	Ambient sensor voltage	A	mbient-Ser	nsor B64		5 Volt		No va	alue	
			- 1 () (۲		05		-+ 050	0

Water temp. sensor voltage	Water (Coolant) temprature sensor B5	5 Volt	coolant temperture
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



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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	Mea	sure unit	Notes
Acceleration Pedal potentiometer voltage 1 - (APF	P_uRaw1)		0.01	V		
Acceleration Pedal potentiometer voltage 2 - (API	P_uRaw2)	Det	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_uRawTCAC	:Ds)	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_iSe	t)	Y25	1189.00	mA		
DPF differential pressure sensor voltage - (Exh_uk	(awPPFItDiff)	B38	0.47	V		
Parameter		Sensor			Values (V+ mA)	Resitance
Ambient sensor voltage	A	mbient-Sensor	[.] B64		5 Volt	No value
Water temp. sensor voltage	Water (C	Coolant) tempra B5	ature senso	r	5 Volt	2500 Ohm at 25° C coolant temperture
BOOST temperature sens. voltage	Charge	air + charge a sensor B 4	ir pressure		5 Volt	No value
Fuel temperature sensor voltage	Fuel tem i	perature senso in the fuel filter)	or (integrate) B6	ed	5 Volt	2050 Ohm at 25 ° C fuel temperature
Rail pressure sensor voltage	Rail pres	sure sensor at B3	the rail pip	е	5 Volt	No value
Setpoint current for meetering unit	Fuel m	netering unit Y2 pump))	25 (at HP-		1800 mA	2 Ohm
DPF differential pressure voltage	Differentia	al pressure sen	sor DPF B	38	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	l voltage						-		×
Parameter			Value	Measure u	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_uRawTCAC	Ds)	B4	1.25	V					
fuel temperature sensor voltage - (FueIT_uRaw)		B6	3.15	V					
Rail pressure sensore voltage - (RailP_uRawMax)		B 3	3.13	V					
Setpoint current for the metering unit - (MeUn_iSet	t)	Y25	1166.00	mA					
DPF differential pressure sensor voltage - (Exh_uR	awPPFItDiff)	B38	0.67	V					
Parameter		Senso	or	Va	alues (V+ mA)		Resita	nce	
Ambient sensor voltage	A	mbient-Ser	isor B64		5 Volt		No va	lue	
Water temp. sensor voltage	Water (Co	olant) temp	rature sensor B	5	5 Volt	250 coo	0 Ohm a lant tem	at 25° (perture	C Ə
BOOST temperature sens. voltage	Charge	air + charg sensor l	e air pressure B 4		5 Volt		No val	ue	
Fuel temperature sensor voltage	Fuel temp	perature ser the fuel filt	nsor (integrated er) B6	in	5 Volt	2050 fue	0 Ohm a el tempe	at 25 ° (erature	С
Rail pressure sensor voltage	Rail press	ure sensor a	at the rail pipe B	3	5 Volt		No val	ue	
Setpoint current for meetering unit	Fuel mete	ring unit Y2	5 (at HP- pump))	1800 mA		2 Ohr	n	
DPF differential pressure voltage	Differentia	al pressure :	sensor DPF B38	3	5 Volt		No val	ue	



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

[2] - VM Service Tool - Parameters acquisition					-	- 0	×
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	J						



7. Rail pressure check

• M29- CM 2200 ignition switched on; engine is off.

[2-7] - VM Service Tool - Parameters ac	quisition - Rail pressure check							-		×
Parameter				Value	Measure unit	:	Notes			
Engine RPM - (Epm_nEng)				0.00	rpm					
Fuel temperature - (FuelT_t)				29.86	°C					
Rail pressure sensore voltage	- (RailP_uRawMax)			0.51	v					
Setpoint current for the meteri	ng unit - (MeUn_iSet)			007.00	mA					
Duty cycle setpoint for the met	ering unit - (MeUn_rSet_mp)			21.57	%					
fuel flow to the rail - (Rail_dvo	ISetPoint_mp)			0.00	mm^3/s					
Rail pressure setpoint - (Rail_p	SetPoint)		1	15.400	bar					
Rail pressure - (RailP_pFlt)	Rail pressure sensor at rail p	ipe B3		3.600	bar					
						1 01			F *	
		A	cquisition	Gra	apn	Log file	Print		Exit	



7. Rail pressure check

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

arameter	Value	Measure un	it	Notes			
ngine RPM - (Epm_nEng)	110.50	rpm					
uel temperature - (FuelT_t)	30.66	°C					
ail pressure sensore voltage - (RailP_uRawMax)	0.79	V					
etpoint current for the metering unit - (MeUn_iSet) Fuel n	etering unit Y29 1024.00	mA					
outy cycle setpoint for the metering unit - (MeUn_rSet_mp) Fu	el metering unit Y29 21.94	%					
<pre>uel flow to the rail - (Rail_dvolSetPoint_mp)</pre>	0.00	mm^3/s					
ail pressure setpoint - (Rail_pSetPoint)	671.100	bar 🔶	Set point				
ail 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 s	sensor E	3 is evalua	ted by the	e eng	gine	
The actual value and the target value	of the rail pressure s	sensor E e is not	3 is evalua	ted by the	e eng ns th	gine	
The actual value and the target value control unit during the starting proced	of the rail pressure s ure. The rail pressur	sensor E e is not	3 is evalua monitored.	ted by the This mea	e eng ns th	gine lat	
The actual value and the target value control unit during the starting proced no active fault (e.g. P0087) is set duri	of the rail pressure s ure. The rail pressur ng the starting proce	sensor E e is not edure.	3 is evalua monitored.	ted by the This mea	e eng ns th	gine lat	
The actual value and the target value control unit during the starting proced no active fault (e.g. P0087) is set duri	of the rail pressure s ure. The rail pressur ng the starting proce	sensor E e is not edure.	3 is evalua monitored.	ted by the This mea	e eng ns th	gine lat	
The actual value and the target value control unit during the starting proced no active fault (e.g. P0087) is set duri	of the rail pressure s ure. The rail pressur ng the starting proce	sensor E e is not edure.	3 is evalua monitored.	ted by the This mea	e eng ns th	gine at	
The actual value and the target value control unit during the starting proced no active fault (e.g. P0087) is set duri At the end of the starting procedure, t	of the rail pressure s ure. The rail pressur ng the starting proce ne target value and	sensor E e is not edure. the actua	3 is evalua monitored.	ted by the This mea	e eng ns th e or le	gine at	
The actual value and the target value control unit during the starting proced no active fault (e.g. P0087) is set duri At the end of the starting procedure, t correspond.	of the rail pressure s ure. The rail pressur ng the starting proce ne target value and	sensor E e is not dure. the actua	3 is evalua monitored. al value sho	ted by the This mea	e eng ns th e or le	gine at	
The actual value and the target value control unit during the starting proced no active fault (e.g. P0087) is set duri At the end of the starting procedure, t correspond.	of the rail pressure s ure. The rail pressur ng the starting proce ne target value and	sensor E e is not edure. the actua	3 is evalua monitored. al value sho	ted by the This mea	e eng ns th e or le	gine at	
The actual value and the target value control unit during the starting proced no active fault (e.g. P0087) is set duri At the end of the starting procedure, t correspond.	of the rail pressure s ure. The rail pressur ng the starting proce ne target value and	sensor E e is not edure. the actua	3 is evalua monitored. al value sho	ted by the This mea	e eng ns th e or le	gine at	
The actual value and the target value control unit during the starting proced no active fault (e.g. P0087) is set duri At the end of the starting procedure, t correspond.	of the rail pressure s ure. The rail pressur ng the starting proce ne target value and	sensor E e is not dure. the actua	3 is evalua monitored. al value sho	ted by the This mea	e eng ns th e or le	gine lat	
The actual value and the target value control unit during the starting proced no active fault (e.g. P0087) is set duri At the end of the starting procedure, t correspond.	of the rail pressure s ure. The rail pressur ng the starting proce ne target value and	sensor E e is not edure. the actua	3 is evalua monitored.	ted by the This mea	e eng ns th e or le	gine at	



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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 meter	ering unit Y29 1230.00	mA	
Duty cycle setpoint for the metering unit - (MeUn_rSet_mp) Fue	el 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_pFlt) Rail pressure sensor at rail p	pipe B3 945.000	bar - Actual value	
If the actual value does not correspond with	n the target value, fau	IIt P0087 or P0088 is	stored in the
engine control unit.			
5			
	As a visition	and Loofin	Deat Fra
	Acquisition G	Log file	Phrit Exit
lequest 7/8			



7. Rail pressure check

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

Parameter			Value	Measure unit	t	Notes		
Engine RPM - (Epm_nEng)			1701.00	rpm				
uel temperature - (FuelT_t)			29.76	°C				
ail pressure sensore voltage	(RailP_uRawMax)		2.97	v				
Setpoint current for the meterin	g unit - (MeUn_iSet) Fuel mete	ring unit Y29	1192.00	mA				
outy cycle setpoint for the meter	ring unit - (MeUn_rSet_mp) Fue	I metering unit Y29	25.54	%				
uel flow to the rail - (Rail_dvolS	SetPoint_mp)		0.00	mm^3/s	0			
ail pressure setpoint - (Rail_pS	etPoint)		1098.400	bar 🛑	Set point			
all pressure - (RailP_pFIt)	Rail pressure sensor at rail	ріре ВЗ	1112.200	bar 🚽	Actual value			
				K Decem				
f the actual value do	es not correspond wit	h the target va	alue, fau	ult P0087	or P0088 is	s stored	in the	
f the actual value do engine control unit.	es not correspond wit	h the target va	alue, fau	ult P0087	or P0088 is	s stored	in the	
f the actual value do engine control unit.	es not correspond wit	h the target va	alue, fau	ult P0087	or P0088 is	s stored	in the	
f the actual value do ingine control unit.	es not correspond wit	h the target va	alue, fau	ult P0087	or P0088 is	s stored	in the	
f the actual value do ingine control unit.	es not correspond wit	h the target va	alue, fau	ult P0087	or P0088 is	s stored	in the	
f the actual value do engine control unit.	es not correspond wit	h the target va	alue, fau	ult P0087	or P0088 is	s stored	in the	
f the actual value doe engine control unit.	es not correspond wit	h the target va	alue, fau	ult P0087	or P0088 is	s stored	in the	
f the actual value do engine control unit.	es not correspond wit	h the target va	alue, fau	ult P0087	or P0088 is	s stored	in the	
f the actual value doe engine control unit.	es not correspond wit	h the target va	alue, fau	ult P0087	or P0088 is	s stored	in the	
f the actual value doe	es not correspond wit	h the target va	alue, fau	ult P0087	or P0088 is	s stored	in the	
f the actual value do engine control unit.	es not correspond wit	h the target va	alue, fau	ult P0087	or P0088 is	sstored	in the	



7. Rail pressure check

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

arameter			Value	Measure	unit	Notes		
ngine RPM - (Epm_nEng)			2001.50	rpm				
uel temperature - (FueIT_t)			29.76	°C				
ail pressure sensore voltage	(RaiIP_uRawMax)		3.13	V				
etpoint current for the metering	g unit - (MeUn_iSet) Fuel meter	ring unit Y29	1169.00	mA				
uty cycle setpoint for the meter	ring unit - (MeUn_rSet_mp)	metering unit Y29	25.02	%				
iel flow to the rail - (Rail_dvolS	etPoint_mp)	_	0.00	mm^3/s				
ail pressure setpoint - (Rail_pS	etPoint)		1176.600	bar 🔸	Set point			
ail pressure - (RailP_pFlt)	Rail pressure sensor at rail	pipe B3	1167.100	bar 🔸	 Actual value 			
t the actual value doe	es not correspond with	n the target va	lue, tai	lt P00	87 or P0088 is	s set in the	engine	
control unit.								
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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

			1		
Parameter		Value	Measure unit		Notes
Engine RPM - (Epm_nEng)	20	001.50	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)	etering unit Y29 1	169.00	mA		
Duty cycle setpoint for the metering unit - (MeUn_rSet_mp)	-uel metering unit Y29	25.02	%		
fuel flow to the rail - (Rail_dvolSetPoint_mp)		0.00	mm^3/s		
Rail pressure setpoint - (Rail_pSetPoint)	117	76.600	bar 🗧	Set point	
Rail pressure - (RailP_pFlt) Rail pressure sensor a	rail pipe B3 116	67.100	bar 🗧	Actual value	

Acquisition

Graph

Log file

Exit

Print



7. Rail pressure check

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

2-7] - VM Service Tool - Parameters acquis	ition - Rail pressure check					-		×
Parameter			Value	Meas	sure unit	Notes		
Engine RPM - (Epm_nEng)			2802.50	rpm				
Fuel temperature - (FuelT_t)			30.06	°C				
Rail pressure sensore voltage - (R	tailP_uRawMax)		3.28	V				
Setpoint current for the metering	unit - (MeUn_iSet) Fuel mete	ring unit Y29	1080.00	mA	max. 1800 mA			
Duty cycle setpoint for the meterin	ng unit - (MeUn_rSet_mp) Fue	metering unit Y29	23.16	%				
fuel flow to the rail - (Rail_dvolSet	tPoint_mp)		0.00	mm^	3/s			
Rail pressure setpoint - (Rail_pSet	Point)		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	s not correspond with	n the target val	ue, tau	ilt P	0087 or P0088 is	set in the en	gine	
control unit								
		Acquisition	G	raph	Log file	Print	Exit	



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



Multicar M29 CM 2200

Service Training Diagnose



8. Engine torque/ speed request check

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

arameter	Value	Measure unit	Notes			
ngine RPM - (Epm_nEng)	848.50	rpm				
asic low idle setpoint speed (rpm) - (HLSDem_nSetPLoBas)	800.00	rpm				
ngine set-point speed required by the ECU - (EISGov_nSetPLo)	850.00	rpm				
ower limit of the speed interval (setpoint speed) of the EISGo	850.00	rpm				
equest rpm via CAN - (CoETS_nTSEASpdReq_mp)	850.00	rpm				
orque delivered in case of limitations - (EngPrt_trqLim)	412.30	Nm				
imiting torque smoke limit - (EngReq_trqInrLimSmk)	290.70	Nm				
orque reduction for the gearbox - (Gbx_trqTSCIntv)	0.00	Nm				
Evaluation of speed between the Hydrostat	control unit A12 and	the engine cont	rol unit A1 in	the no	n-loa	d
condition, e.g. idle speed 900 rpm without l	oad.					u -
The "Engine RPM" must correspond with "F	Request rpm via CAN					



• Selection and opening of parameter group 9. 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 - P	arameter-Aufzeichnung - EGR Kontrolle		10 K	
Decemeter		Most	Maaaainhait	Pomorkungon
Motordrohzahl	Engine rpm	901 00	messemnen	bemerkungen
Posizione valvola EG	P Y41 Position-EGR- Valve	59 9900	*	
Temperatur Austrittso	as aus FGR B36 Temp Sensor EGR	Radiator OUT 119.26	°C	
T3 - Abgastemperatur	vor turbo B65 Temp Sensor Turboc	harger OUT 245.16	°C	
Temperatur Einlasskri	ümmer B4 Charge air temp. + pressu	are sensor 77.06	°C	
	<u> </u>			
The EGR va	lve Y41 is fully closed with	-0 % and fully open	with -100 %	
The EGR va	lve Y41 is controlled via the	CAN BUS		
	of a fault at the ECD value	or the ECD actuation		104 io
In the event	of a fault at the EGR valve	or the EGR actuation	on, error P402 or $P402$	404 IS
stored in the	engine control unit.			
			Aufzeichnungsdat	
		Aufzeichnung Gr	afik ei	Drucken Verlassen
Anfrage 5/5				



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

2. Sweeping in ECO mode 1400 rpm.

-9] - VM Diagnose-Tool - Pa	rameter-Aufzeichnung - EGR Kontrolle	a 👘 👘		
Parameter	Engine rom	We	rt Messeinheit	Bemerkungen
Motordrehzahl	Engine ipin	1394 5		Demerkungen
Posizione valvola EGR	Y41 Position- EGR Valve	-52.110	0 %	
Temperatur Austrittsga	aus EGR B36 Temp Sensor EGF	Radiator OUT 137.8	6 °C	
T3 - Abgastemperatur	vor turbo B65 Temp Sensor Turb	ocharger OUT 351.9	6 °C	
Temperatur Einlasskrü	mmer B4 Charge air temp. + press	sure sensor 75.9	6 °C	
The EGR va	alve Y41 is fully closed with	n -0 % and fully op	en with -100 %	
The EGR va	alve V/1 is controlled via th	CAN BUS		
	af a fault at the EOD walks			
In the event	of a fault at the EGR valve	e or the EGR actua	ation, error P40	2 or P404 Is
stored in the	engine control unit.			
		Aufzeichnung	Grafik Autzeichnung ei	gsdat Drucken Verlassen
ofrage 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		10 M	
Engine rom	101	Managalah ak	Development
	Wert	Messeinheit	Bemerkungen
Motordrehzahl	1698.50	rpm	
Posizione valvola EGR 141 Position-EGR Valve	-44./500	% • C	
T3 Abgestemporatur ver turbe B65 Temp - Sensor Turb	ocharger OLIT 437.56	د د	
Temperatur Finlasskrijimmer B4 Charge air temp + press	re sensor 73.06	د ۹۲	
Temperatar Emassiranmer D4 Onarge an temp. + presst		0	
The ECP velve V41 is fully closed with	0.% and fully and	n with 100 %	
The EGR valve 141 is fully closed with	-0 % and fully ope	11 WILIT - 100 %	
The EGR valve Y41 is controlled via the	e CAN BUS.		
In the event of a fault at the EGR valve	or the EGR actual	tion, error P402 or	P404 is stored in
the opgine control unit			
	Aufzeichnung Gr	afik Aufzeichnungsdat ei	Drucken Verlassen
Anfrage 5/5 💼			.:

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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	100	100	
[Parameter Engine rpm	Wert	Messeinheit	Bemerkungen
	Motordrehzahl	2000.00	rpm	, i i i i i i i i i i i i i i i i i i i
	Posizione valvola EGR Y41 Position- EGR- Valve	-45.4700	%	
	Temperatur Austrittsgas aus EGR B36 Temp Sensor EGR Radiator OL	JT 170.06	°C	
	T3 - Abgastemperatur vor turbo B65 Temp Sensor Turbocharger OU	T 427.86	°C	
	Temperatur Einlasskrümmer B4 Charge air temp. + pressure sensor	76.86	°C	
	The ECD value V/11 is fully closed with 0.0/ and	fully on on	with 100.0/	
	The EGR valve 141 is fully closed with -0 % and	runy open	with - 100 %	
	The EGR valve Y41 is controlled via the CAN BL	JS.		
	In the event of a fault at the EGR valve or the EG	GR actuation	on, error P402	or P404 is stored in
	the engine control unit	on a dotta dati		
	the engine control unit.			
	Aufzeich	nung Gr	afik Autzeichnungs ei	Drucken Verlassen
Δ	nfrage 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 - Param	eter-Aufzeichnung - EGR Kontrolle	Autom in the		
Deservator	Engine mm	10/	Maaaalahait	Demeduran
Parameter		2004 EQ	Messeinneit	Bemerkungen
Motordrenzani Desiziene velvele ECD	V41 Position ECR Value	2804.30	rpm v	
	FCP B36 Tomp - Sonsor ECP	Padiator OLIT 89.86	70 °C	
T3 - Abgastemperatur vor	turbo B65 Temp - Sensor Turb	ocharger OLIT 440 86	د د	
Temperatur Finlasskrümn	ner B4 Charge air temp, + press	ure sensor 72.66	°C	
			_	
The EGR valve	(Exhaust gas recirculation	on valve) Y41 is fully	closed at -0 % and	fully open at
-100 %		, , ,		
	V41 is controlled via the			
The EGR valve	141 is controlled via the	CAN BUS.		
In the event of a	a fault at the EGR valve o	or the EGR actuation	n, error P402 or P40	4 is stored in the
engine control u	init.			
		Aufzeichnung Gr	afik Aurzeichnungsdat ei	Drucken Verlassen
Anfrage 5/5				

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



Anfrage 8/8



10. Switch/ actuator check

arameter	Wert	Messeinheit	Bemerkungen		
erminal 15 Status nach Filterung	1.00	-			
atus Bremse	0.00	-			
atus redundanter Bremsschalter	0.00	-			
gitaler Ausgang für Stellglied nach der Diagnose	0.0	-			
euer Plugs	0.00	-			
L Statusanzeige	0.00	-			
hrzeug bereit zur Abfahrt, cut-off	2.00	-			
uise control ON / OFF Taste über ComRx_RxCCVS	3.00	-			
The status parameters are displ	laved in this nar	ameter aroun			
The status parameters are disp	layed in this para	ameter group.			
The status of the broke and the	status of broke	light quitch COA	are not dian		
The status of the brake and the	status of brake	light switch 524	are not displ	layed in	
he engine control unit A1 but in	the Hydrostat c	ontrol unit A12	Evaluation ta	kes	
place via Bodas/ process param	neters/group 11	.3 +11.4			
1	0 1				
				Aufzeichnungsdat	

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



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Service Training Diagnose



11. Engine start check

Ignition switched on, engine is off.

'arameter		Wert	Messe	nheit	Bemerkungen
lotordrehzahl	Engine rpm	0.00	rpm		
Kühlflüssigkeitstempei	atur	86.56	°C		
aildruck Sollwert		415.400	bar		
laildruck	Rail pressure	8.100	bar		
synchronisierungsstat	JS	EPM_NO_SYNC			
etriebsstatus des Mot	ors	COENG_READY			
	the rail pressure and the encentric $\Delta D Y = ignition on engine$	gine speed.			
COENG_RE	ADY = Ignition on, engine	e ready to start.			
FPM NO S	YNC = synchronisation no	ot vet initiated.			
		, , , , , , , , , , , , , , , , , , ,			
The primary fue switched on. Pr of fuel or air in	el pressure should be approxir imary fuel pressure that is too the fuel lines.	nately 8 bar just after t low is usually the res	he en ult of	gine is switched insufficient feed	off with the ignition pump capacity, lack
1. If the primary fu Foreign bodies in 2. Check fuel filter 3. Check fuel tank 4. Check fuel tank	tel pressure is not reached, the main the manual feed pump could preve for soiling and replace if necessar for dirt, clean if necessary. intake lines for leaks (air in the fue	nual feed pump should be ent the diaphragm from clo ry. el lines).	check sing.	ed first.	



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		
Betriedsstatus des Motors	COENG_CRANKING		
COENG CRANKING = engine is in	starting procedure	Э	
EPM_NO_SYNC = synchronisation	not yet achieved		
	Aufzeichnung Gr	Ai	ufzeichnungsdat ei Drucken Verlassen
Anfrage 6/6 💼			



11. Engine start check

[2-11] - VM Diagnose-Tool - Parameter-Aufzeichnung - Motor Start Kontrolle	Andrew C. The	-	
Parameter	Wert	Messeinheit	Bemerkungen
Motordrehzahl Engine rpm	393.00	rpm	
Kühlflüssigkeitstemperatur	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 i	n starting proced	ure	
EPM_FULL_SYNC = synchronisat	tion has been acl	nieved	
The actual value and the target value of control unit during the starting procedure no active fault (e.g. P0087) is set during	f the rail pressure s e. The rail pressure g the starting proce	sensor B3 is e is not moi dure.	s evaluated by the engine nitored. This means that
At the end of the starting procedure, the approximately the same.	e target value and t	he actual v	alue should be
	Aufzeichnung Gr	afik Aufzeich	nungsdat ei Drucken Verlassen
Anfrage 6/6 💼			



11. Engine start check

• Starting procedure complete, engine is running

2-11] - VM Diagnose-Tool - Parameter-Aufzeichnung - Motor Start Kontro	ile e		
Parameter	Wert	Messeinheit	Bemerkungen
Motordrehzahl Engine rpm	900.50	rpm	
Kühlflüssigkeitstemperatur	86.66	°C	
Raildruck Sollwert	695.400	bar	
Raildruck Rail pressure	725.000	bar	
Synchronisierungsstatus	EPM_FULL_SYNC		
Betriebsstatus des Motors	COENG_RUNNING		
EPM_FULL_SYNC = synchronisa	tion has been achie	ved	
If the starting procedure is complete a running, synchronisation is also complete	nd the engine is lete.		
	Aufzeichnung G	rafik Aufzeid	chnungsdat ei Drucken Verlassen
Anfrage 3/6			







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

- VM Diagnose-Tool - Parameter-Aufzeichnung						- 0 ×
Parameter-Gruppenliste		Gruppe hinzufügen	Gruppe bearbeiten	Gruppe entfemen	Aufzeichnung anschauen	Verlassen
8. Motor Drehmoment/Drehzahl Anfragungskontrolle	*					
9. EGR Kontrolle						
10. Schalt/Stellglied Kontrolle						
11. Motor Start Kontrolle						
12. IUMPR						
13. Test PTO	E					
14. Test PTO Switc	-					



14. Test PTO Switc

aw input voltage value for PTO switch The input voltage for the PTO switch is not Hydrostat control unit A12.	2.88 V a the engine co	ontrol unit A1	but via the
The input voltage for the PTO switch is not Hydrostat control unit A12.	a the engine co	ontrol unit A1	but via tha
The input voltage for the PTO switch is not Hydrostat control unit A12.	a the engine co	ontrol unit A1	but via tha
The input voltage for the PTO switch is not Hydrostat control unit A12.	a the engine co	ontrol unit A1	but via tha
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The input voltage for the PTO switch is not Hydrostat control unit A12.	a the engine co	ontrol unit A1	but via tha
The input voltage for the PTO switch is not Hydrostat control unit A12.	a the engine co	ontrol unit A1	but via tha
Hydrostat control unit A12.			
	Ŭ		