Component	Fault code	Monitoring Strategy	Fault detection Criteria	MI activation criteria	Secondary Parameters	Precondition	Demo. test
Supply pump Suction control Valve	P0003	Circuit continuity: Shorted-low	Voltage	1st cycle	Battery voltage Engine running	-	Type1
	P0004	Circuit continuity: Open/Shorted-low	Voltage	1st cycle	Battery voltage Engine running	-	Type1
	P0089	Plausibility of Fuel pressure	Fuel pressure	1st cycle	Battery voltage Ignition on Pump initial learning Fuel pressure pump status Injection amount	-	Type1
Crankshaft position sensor and Camshaft position sensor	P0016	Position sensor Phase problem	Angle difference	1st cycle	Time after Ignition on Battery voltage Camshaft sensor status Crankshaft sensor status Engine speed	-	Type1
Turbocharger control solenoid	P0047	Circuit continuity: Shorted-low	Voltage	1st cycle	Battery voltage Engine running	-	Type1
	P0048	Circuit continuity: Shorted-high	Voltage	1st cycle	Battery voltage Engine running	-	Type1
Air temperature Sensor (integrated Mass air flow sensor)	P0072	Circuit continuity: Shorted-low	Voltage	2nd cycle	Battery voltage Engine running	One Type1 Cycle	Type1
	P0073	Circuit continuity: Shorted-high	Voltage	2nd cycle	Battery voltage Engine running	One Type1 Cycle	Type1
Common Rail	P0088	Plausibility (high pressure)	Fuel pressure	1st cycle	Battery voltage	-	Type1
Mass Air Flow Sensor	P0102	Circuit continuity: Shorted-low	Voltage	2nd cycle	Battery voltage Engine running	One Type1 Cycle	Type1
	P0103	Circuit continuity: Shorted-high	Voltage	2nd cycle	Battery voltage Engine running	One Type1 Cycle	Type1
Manifold absolute Pressure sensor	P0106	Plausibility	Signal dependency on engine condition	1st cycle	Battery voltage Time after engine start-up Injection amount Engine speed	-	Type1
	P0107	Range check-min	Pressure	1st cycle	Battery voltage Engine running	-	Type1
	P0108	Range check-max	Pressure	1st cycle	Battery voltage Engine running	-	Type1
Intake air Temperature Sensor	P0112	Range check-min	Voltage	2nd cycle	Battery voltage Engine running	One Type1 Cycle	Type1
	P0113	Range check-max	Voltage	2nd cycle	Battery voltage Engine running	One Type1 Cycle	Type1

Component	Fault code	Monitoring Strategy	Fault detection Criteria	MI activation criteria	Secondary Parameters	Precondition	Demo. test
Engine coolant Temperature Sensor	P0117	Range check-min	Voltage	2nd cycle	Battery voltage Engine running	One Type1 Cycle	Type1
	P0118	Range check-max	Voltage	2nd cycle	Battery voltage Engine running	One Type1 Cycle	Type1
Throttle Position Sensor	P0122	Range check-min	Voltage	2nd cycle	Battery voltage Engine running	One Type1 Cycle	Type1
	P0123	Range check-max	Voltage	2nd cycle	Battery voltage Engine running	One Type1 Cycle	Type1
Fuel Temperature Sensor	P0182	Range check-min	Voltage	2nd cycle	Battery voltage Engine running	One Type1 Cycle	Type1
	P0183	Range check-max	Voltage	2nd cycle	Battery voltage Engine running	One Type1 Cycle	Type1
Fuel pressure Sensor	P0191	Plausibility	Deviation of actual and target pressure Voltage	1st cycle	Ignition on Target fuel pressure Injection amount Fuel temp Pump initial learning	-	Type1
	P0192	Range check-min	Voltage	1st cycle	Battery voltage Engine running	-	Type1
	P0193	Range check-max	Voltage	1st cycle	Battery voltage Engine running	-	Type1
Turbocharger	P0299	Abusolute boost pressure monitor	Intake air pressure	1st cycle	Engine running Accel-pedal	-	Type1
	P1298	Positive deviation	Intake air pressure	1st cycle	Engine running Injection amount Engine speed Gear position Vehicle speed Intake air temperature Atmosphere pressure Turbocharger control status EGR valve position	-	Type1
	P1299	negative deviation	Intake air pressure	1st cycle	Engine running Injection amount Engine speed Gear position Vehicle speed Intake air temperature Atmosphere pressure Turbocharger control status EGR valve position	-	Type1

Component	Fault code	Monitoring Strategy	Fault detection Criteria	MI activation criteria	Secondary Parameters	Precondition	Demo. test
Injector	P0201	Circuit continuity (Cylinder #1)	Voltage	1st cycle	Ignition on Battery voltage Injector activation	-	Type1
	P0202	Circuit continuity (Cylinder #2)	Voltage	1st cycle	Ignition on Battery voltage Injector activation	-	Type1
	P0203	Circuit continuity (Cylinder #3)	Voltage	1st cycle	Ignition on Battery voltage Injector activation	-	Type1
	P0204	Circuit continuity (Cylinder #4)	Voltage	1st cycle	Ignition on Battery voltage Injector activation	-	Type1
	P0301	Engine speed monitor	Engine speed	1st cycle	Battery voltage Time after engine start-up Fuel balancing Engine coolant temp.	-	Type1
	P0302	Engine speed monitor	Engine speed	1st cycle	Battery voltage Time after engine start-up Fuel balancing Engine coolant temp.	-	Type1
	P0303	Engine speed monitor	Engine speed	1st cycle	Battery voltage Time after engine start-up Fuel balancing Engine coolant temp.	-	Type1
	P0304	Engine speed monitor	Engine speed	1st cycle	Battery voltage Time after engine start-up Fuel balancing Engine coolant temp.	-	Type1
Crankshaft Positio Sensor	P0335	No pulse	Alignment to camshaft	1st cycle	Battery voltage Engine running	-	Type1
	P0336	Plausibility	Alignment to camshaft	1st cycle	Engine speed Battery voltage	-	Type1
Camshaft Position Sensor	P0340	No pulse	Alignment to crankshaft	1st cycle	Battery voltage Engine running	-	Type1
	P0341	Plausibility	Alignment to crankshaft	1st cycle	Engine speed Battery voltage	-	Type1
Glow plug Control module	P0381	Glow plug open or short	Glow module status signal	2nd cycle	Engine running Glow duty	One Type1 Cycle	Type1
	P064C	Self check of Glow plug module	Glow module status signal	2nd cycle	Engine running Glow duty	One Type1 Cycle	Type1
	P0683	No signal of Glow plug module	Glow module status signal	2nd cycle	Engine running Glow duty	One Type1 Cycle	Type1
EGR system	P0401	Plausibility	Intake air pressure	2nd cycle	Engine speed Atmosphere pressure Injection amount Gear position Vehicle speed intake temp target air-fuel ratio DPF regeneration status	One Type1 Cycle	Type1

Component	Fault code	Monitoring Strategy	Fault detection Criteria	MI activation criteria	Secondary Parameters	Precondition	Demo. test
EGR valve	P0403	Self check of Driver IC	Motor current	2nd cycle	Ignition on	One Type1 Cycle	Type1
	P2413	EGR position Comparison to Target value	EGR position	2nd cycle	Ignition on	One Type1 Cycle	Type1
Exhaust gas temperature sensor (Aft.DOC)	P0427	Range check-min	Voltage	1st cycle	Battery voltage Engine running	-	Type1
	P0428	Range check-max	Voltage	1st cycle	Battery voltage Engine running Engine coolant temp. Vehicle speed Injection amount Intake temp Engine speed	-	Type1
EGR valve Lift sensor	P0489	Range check-min	Voltage	2nd cycle	Battery voltage Engine running	One Type1 Cycle	Type1
	P0490	Range check-max	Voltage	2nd cycle	Battery voltage Engine running	One Type1 Cycle	Type1
vehicle speed sensor	P0500	Plausibility	vehicle speed	2nd cycle	CAN network status Engine running Engine coolant temp Battery voltage Engine speed Injection amount Clutch SW status	One Type1 Cycle	Type1
Exhaust gas temperature sensor (Bef.DOC)	P0545	Range check-min	Voltage	1st cycle	Battery voltage Engine running	-	Type1
	P0546	Range check-max	Voltage	1st cycle	Battery voltage Engine running Engine coolant temp. Vehicle speed Injection amount Intake temp Engine speed	-	Type1
EEPROM	P0602	self check of code (Variant code not done / EOL not programmed)	coded counter	1st cycle	Ignition on	-	Type1
	P062F	Read/write to EEPROM	EEPROM data	2nd cycle	Ignition on	One Type1 Cycle	Type1
	P0630	self check (VIN not programmed)	VIN data	1st cycle	Ignition on	-	Type1
	P1625	self check of injection quantity compensation value	Stored data	1st cycle	Ignition on	-	Type1
	P1626	self check of injection quantity compensation value is coded	Stored data	1st cycle	Ignition on	-	Type1
RAM	P0604	self check	Internal check	2nd cycle	Ignition on	One Type1 Cycle	Type1
ROM	P0605	Calculate check sum and compare with stored value	Check sum	1st cycle	Ignition on	-	Type1

Component	Fault code	Monitoring Strategy	Fault detection Criteria	MI activation criteria	Secondary Parameters	Precondition	Demo. test
CPU (MAIN)	P0606	Check with SUB-CPU run pulse	Run pulse signal change	1st cycle	Ignition on	-	Type1
CPU (SUB)	P0607	Check with CPU run pulse	Run pulse signal change	1st cycle	Battery voltage Engine running	-	Type1
Throttle actuator Control	P0638	Throttle valve position comparison To target value	Throttle valve position	2nd cycle	Ignition on Battery voltage Injection amount Engine speed target intake-valve position	One Type1 Cycle	Type1
	P2118	Self check of driver IC	Motor current	2nd cycle	Ignition on	One Type1 Cycle	Type1
Analog sensor Reference voltage #1	P0642	Range check-min	Voltage	1st cycle	Battery voltage Engine running	-	Type1
	P0643	Range check-max	Voltage	1st cycle	Battery voltage Engine running	-	Type1
Analog sensor Reference voltage #2	P0652	Range check-min	Voltage	1st cycle	Battery voltage Engine running	-	Type1
	P0653	Range check-max	Voltage	1st cycle	Battery voltage Engine running	-	Type1
Injector driver #1 and #2	P1203	Range check-min	Voltage	1st cycle	Battery voltage Time after engine start-up Injector activation	-	Type1
	P1204	Range check-max	Voltage	1st cycle	Battery voltage Time after engine start-up Injector activation	-	Type1
	P2146	Circuit continuity: Open (driver1)	Voltage	1st cycle	starter off Ignition on Battery voltage Injector activation	-	Type1
	P2147	Circuit continuity: Open/Shorted-low (driver1)	Voltage	1st cycle	starter off Ignition on Battery voltage Injector activation	-	Type1
	P2148	Circuit continuity: Shorted-high (driver1)	Voltage	1st cycle	starter off Ignition on Battery voltage Injector activation	-	Type1
	P2149	Circuit continuity: Open(driver2)	Voltage	1st cycle	starter off Ignition on Battery voltage Injector activation	-	Type1
	P2150	Circuit continuity: Open/Shorted-low (driver2)	Voltage	1st cycle	starter off Ignition on Battery voltage Injector activation	-	Type1
	P2151	Circuit continuity: Shorted-high (driver2)	Voltage	1st cycle	Starter off Ignition on Battery voltage Injector activation	-	Type1

Component	Fault code	Monitoring Strategy	Fault detection Criteria	MI activation criteria	Secondary Parameters	Precondition	Demo. test
Pressure limiter	P1272	Fuel pressure	Fuel pressure	2nd cycle	Battery voltage Ignition on Engine speed Fuel pressure sensor status	One Type1 Cycle	Type1
Supply pump	P1273	Injection amount monitor	Injection amount	1st cycle	Fuel pressure pump status Fuel pressure Injection amount	-	Type1
	P1274	High pressure Occurrence for protection	Counter of High pressure Occurrence	1st cycle	Engine running	-	Type1
	P1275	Fuel pressure	Pressure	1st cycle	Fuel pressure sensor status Ignition on	-	Type1
DPF	P1499	Temperature chec	Temperature	1st cycle	Battery voltage Engine running Regeneration mode	-	Type1
Exhaust gas temperature sensor (Aft.DPF)	P1427	Range check-min	Voltage	1st cycle	Battery voltage Engine running	-	Type1
	P1428	Range check-max	Voltage	1st cycle	Battery voltage Ignition on Engine running Engine coolant temp. Vehicle speed Injection amount intake temp Engine speed	-	Type1
Accelerator Positio Sensor(APS)	P2122	Range check-min	APS(main) voltage	1st cycle	Ignition on APS(sub) status	-	Type1
	P2123	Range check-max	APS(main) voltage	1st cycle	Ignition on APS(sub) status	-	Type1
	P2127	Range check-min	APS(sub) voltage	1st cycle	Ignition on APS(main) status	-	Type1
	P2128	Range check-max	APS(sub) voltage	1st cycle	Ignition on APS(main) status	-	Type1
	P2138	Rationality	Relation between main and sub	1st cycle	Ignition on Battery voltage starter off Engine speed	-	Type1
Barometric Pressure Sensor	P2228	Range check-min	Pressure	2nd cycle	Ignition on Battery voltage	One Type1 Cycle	Type1
	P2229	Range check-max	Pressure	2nd cycle	Ignition on Battery voltage	One Type1 Cycle	Type1
EGR cooler bypass valve	P2426	Range check-min	Voltage	2nd cycle	Battery voltage Engine running	One Type1 Cycle	Type1
	P2427	Range check-max	Voltage	2nd cycle	Battery voltage Engine running	One Type1 Cycle	Type1

Component	Fault code	Monitoring Strategy	Fault detection Criteria	MI activation criteria	Secondary Parameters	Precondition	Demo. test
DPF Differential Pressure Sensor	P2454	Range check-min	Voltage	1st cycle	Battery voltage Engine running	-	Type1
	P2455	Range check-max	Voltage	1st cycle	Battery voltage Engine running	-	Type1
DPF	P1498	Time of regenerati exceeded limit	Regeneration timer	1st cycle	Ignition on	-	Type1
	P1497	Regeneration occurrence	Regeneration counter	1st cycle	Regeneration mode	-	Type1

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※1 The OBDMIDs definition is based on SAE J1979(May 2007).

OBDMID※1	Test ID	Unit and Scaling ID
OBDMID $00 OBD Monitor Ids suppoted($01-$20)		
OBDMID $01 Exhaust Gas Sensor Monitor Bank1-Sensor1		
OBDMID $02 Exhaust Gas Sensor Monitor Bank1-Sensor2		
OBDMID $03 Exhaust Gas Sensor Monitor Bank1-Sensor3		
OBDMID $04 Exhaust Gas Sensor Monitor Bank1-Sensor4		
OBDMID $05 Exhaust Gas Sensor Monitor Bank2-Sensor1		
OBDMID $06 Exhaust Gas Sensor Monitor Bank2-Sensor2		
OBDMID $07 Exhaust Gas Sensor Monitor Bank2-Sensor3		
OBDMID $08 Exhaust Gas Sensor Monitor Bank2-Sensor4		
OBDMID $09 Exhaust Gas Sensor Monitor Bank3-Sensor1		
OBDMID $0A Exhaust Gas Sensor Monitor Bank3-Sensor2		
OBDMID $0B Exhaust Gas Sensor Monitor Bank3-Sensor3		
OBDMID $0C Exhaust Gas Sensor Monitor Bank3-Sensor4		
OBDMID $0D Exhaust Gas Sensor Monitor Bank4-Sensor1		
OBDMID $0E Exhaust Gas Sensor Monitor Bank4-Sensor2		
OBDMID $0F Exhaust Gas Sensor Monitor Bank4-Sensor3		
OBDMID $10 Exhaust Gas Sensor Monitor Bank4-Sensor4		
OBDMID $11-$1F ISO/SAE reserved		
OBDMID $20 OBD Monitor Id suppoted($21-$40)		
OBDMID $21 Catalyst Monitor Bank1		
OBDMID $22 Catalyst Monitor Bank2		
OBDMID $23 Catalyst Monitor Bank3		
OBDMID $24 Catalyst Monitor Bank4		
OBDMID $25-$30 ISO/SAE reserved		
OBDMID $31 EGR Monitor Bank1	S/MD TID $81 EGR Pressure (MMC)	$2D mg/stroke per bit
OBDMID $32 EGR Monitor Bank2		
OBDMID $33 EGR Monitor Bank3		
OBDMID $34 EGR Monitor Bank4		
OBDMID $35 VVT Monitor Bank1		
OBDMID $36 VVT Monitor Bank2		
OBDMID $37 VVT Monitor Bank3		
OBDMID $38 VVT Monitor Bank4		
OBDMID $39 EVAP Monitor(Cap Off / 0.150")		
OBDMID $3A EVAP Monitor(0.09")		
OBDMID $3B EVAP Monitor(0.04")		
OBDMID $3C EVAP Monitor(0.02")		
OBDMID $3D Purge Flow Monitor		
OBDMID $3E-$3F ISO/SAE reserved		
OBDMID $40 OBD Monitor Ids suppoted($41-$60)		
OBDMID $41 Exhaust Gas Sensor Heater Monitor Bank1-Sensor1		
OBDMID $42 Exhaust Gas Sensor Heater Monitor Bank1-Sensor2		
OBDMID $43 Exhaust Gas Sensor Heater Monitor Bank1-Sensor3		
OBDMID $44 Exhaust Gas Sensor Heater Monitor Bank1-Sensor4		
OBDMID $45 Exhaust Gas Sensor Heater Monitor Bank2-Sensor1		
OBDMID $46 Exhaust Gas Sensor Heater Monitor Bank2-Sensor2		
OBDMID $47 Exhaust Gas Sensor Heater Monitor Bank2-Sensor3		
OBDMID $48 Exhaust Gas Sensor Heater Monitor Bank2-Sensor4		
OBDMID $49 Exhaust Gas Sensor Heater Monitor Bank3-Sensor1		
OBDMID $4A Exhaust Gas Sensor Heater Monitor Bank3-Sensor2		
OBDMID $4B Exhaust Gas Sensor Heater Monitor Bank3-Sensor3		
OBDMID $4C Exhaust Gas Sensor Heater Monitor Bank3-Sensor4		
OBDMID $4D Exhaust Gas Sensor Heater Monitor Bank4-Sensor1		
OBDMID $4E Exhaust Gas Sensor Heater Monitor Bank4-Sensor2		
OBDMID $4F Exhaust Gas Sensor Heater Monitor Bank4-Sensor3		

OBDMID※1	Test ID	Unit and Scaling ID
OBDMID $50 Exhaust Gas Sensor Heater Monitor Bank4-Sensor4		
OBDMID $51-$5F ISO/SAE reserved		
OBDMID $60 OBD Monitor Ids suppoted($61-$80)		
OBDMID $61 Heated Catalyst Monitor Bank1		
OBDMID $62 Heated Catalyst Monitor Bank2		
OBDMID $63 Heated Catalyst Monitor Bank3		
OBDMID $64 Heated Catalyst Monitor Bank4		
OBDMID $65-$70 ISO/SAE reserved		
OBDMID $71 Secondary Air Monitor 1		
OBDMID $72 Secondary Air Monitor 2		
OBDMID $73 Secondary Air Monitor 3		
OBDMID $74 Secondary Air Monitor 4		
OBDMID $75-$7F ISO/SAE reserved		
OBDMID $80 OBD Monitor Ids suppoted($81-$A0)		
OBDMID $81 Fuel System Monitor Bank1		
OBDMID $82 Fuel System Monitor Bank2		
OBDMID $83 Fuel System Monitor Bank3		
OBDMID $84 Fuel System Monitor Bank4		
OBDMID $85 Boost Pressure Control Monitor Bank1		
OBDMID $86 Boost Pressure Control Monitor Bank2		
OBDMID $87-$8F ISO/SAE reserved		
OBDMID $90 NOx Adsorber Monitor Bank1		
OBDMID $91 NOx Adsorber Monitor Bank2		
OBDMID $92-$97 ISO/SAE reserved		
OBDMID $98 NOx Catalyst Monitor Bank1		
OBDMID $99 NOx Catalyst Monitor Bank2		
OBDMID $9A-$9F ISO/SAE reserved		
OBDMID $A0 OBD Monitor Ids suppoted($A1-$C0)		
OBDMID $A1 Misfire General Data		
OBDMID $A2 Misfire Cylinder1 Data		
OBDMID $A3 Misfire Cylinder2 Data		
OBDMID $A4 Misfire Cylinder3 Data		
OBDMID $A5 Misfire Cylinder4 Data		
OBDMID $A6 Misfire Cylinder5 Data		
OBDMID $A7 Misfire Cylinder6 Data		
OBDMID $A8 Misfire Cylinder7 Data		
OBDMID $A9 Misfire Cylinder8 Data		
OBDMID $AA Misfire Cylinder9 Data		
OBDMID $AB Misfire Cylinder10 Data		
OBDMID $AC Misfire Cylinder11 Data		
OBDMID $AD Misfire Cylinder12 Data		
OBDMID $AE Misfire Cylinder13 Data		
OBDMID $AF Misfire Cylinder14 Data		
OBDMID $B0 Misfire Cylinder15 Data		
OBDMID $B1 Misfire Cylinder16 Data		
OBDMID $B2 PM Filter Monitor Bank1		
OBDMID $B3 PM Filter Monitor Bank2		
OBDMID $B4-$BF ISO/SAE reserved		
OBDMID $C0 OBD Monitor Ids suppoted($C1-$E0)		
OBDMID $C1-$DF ISO/SAE reserved		
OBDMID $C0 OBD Monitor Ids suppoted($E1-$FF)		
OBDMID $E1-$FFVehicle manufacturer defined OBDMIDs		