COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	FREQUENCY OF CHECKS	MIL ILLUM.
Catalytic Converter Monitoring	P0420	Time for Rear O2 sensor signal to go low. Catalyst monitoring performed at idle. Wait for throttle closed period, then a number of front O2 sensor oscillations to measure average fuel trim value. Then rich fueling to purge oxygen, wait for high rear O2 sensor value to indicate purged cat - or max time, then lean fueling and measure time for rear O2 sensor signal to fall. Time measurement in phase 3 begins when front O2 sensor output goes below 450 mV and stops when rear O2 sensor output goes below 450 mV	Time for rear O2 to go low. Value corrected to standard flow and catalyst temperature.	< 1600 msec	Delta load Vehicle speed Engine speed Load MAF Min time after engine start Fuel control Catalyst temperature Throttle Nr of Front O2 oscillations for averaged integrator value. Rich fuelling time Evaporative canister purge Rear O2 sensor voltage before switch to lean Lambda integrator Brake switch status changes No DTC set, pending or confirmed Battery voltage	-2 < delta load < 2 g/s < 15,5 mph 900 +200/-100 rpm 3,5 – 9 g/s > 230 s Closed loop - then rich - then lean 450 - 700 °C, modeled Closed 2 1,5 to 10 seconds Not active Time according to value in matrix, examples: 640 mV + 5 sec, 870 mV + 0 sec 0 ± 10% Max 3 Front O2 sensor P0131, P0132, P0133, P0134, P0030, P0031, P0032 Rear O2 sensor P0137, P0138, P0140, P0036, P0037, P0038 MAF sensor, P0101, P0102, P0103 11 to 18 V		13 - 30 sec, Once / DCY	Statistical treatment, up to 6 DCY, after limit is reached: immediate MIL illumination
Synchronization error	P0340	Rationality, Sync error, high due to soot	Ignition	Not synchronized	Engine speed Revolutions	Running >500 after start phase		600 revs Once / DCY	Two DCY
	P1340	Rationality, Sync error low	Ignition	Not synchronized	Engine speed Revolutions	Running >500 after start phase		600 revs Once / DCY	Two DCY
Misfire Detection	P0300 to P0304	Ionization detection At idle: combination of ionization- and crankshaft speed evaluation	Misfire counter 1000 revs Misfire counter 200 revs	> 3% See separate map	Engine speed Load change transient MAP (for Man Transmission) Torque Fuel cut Battery voltage Enabling delay when Coolant temp is below –7 °C at start	> idle rpm at warm engine – 150 rpm < ± 3,0 kPa/combustion > 0 and not in disable region Not active > 10.0 V Delayed until Coolant temp > 21 °C		1000 OR 200 revs Continuous	Two DCY MIL flashing
Misfire Detected With Low Fuel	P0313	Same as above	Misfire counter 200 revolutions	See separate map	Same as above Fuel level	Same as above < 8% (5 liters)		200 revolutions Continuous	MIL blink

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	FREQUENCY OF CHECKS	MIL ILLUM.
Detect signals	P1312	Signal high during fuel cut OR at start OR compared to defined window	Detect signal	High	Engine speed Engine synchronization	Engine started During or after		125 revolutions Continuous	Two DCY
	P1341 to P1344	Combustion signal cyl 1 OR 2 OR 3 OR 4 missing	Detect signal	Low	Engine speed Engine synchronization No DTC set, pending or confirmed	Engine started During or after Powertrain relay rationality, P0685		45 revolutions Continuous	Two DCY
Ion detection system error	P1315	Ion Detect Module connector disconnected	Combustion AND ignition signals	= 0 for more than 25 revs	Engine speed Fuel cut Load	Running > 400 rpm Not active > 10 mg/combustion		25 revolutions Continuous	Two DCY
Ion detect module ignition trig input	P1350 to P1354	All or single cylinder ignition trig input to ion detect module missing	Knock signal information	= 0 at combustion stroke	Engine speed Fuel cut Load	Running > 400 rpm Not active > 10 mg/combustion		8 revolutions Continuous	Two DCY
Knock signal	P0325	Faulty knock signal	Knock signal	No knock pulses	Accelerator pedal	Not released		8 revolutions	Two DCY
					Engine speed	Engine started		Continuous	
					Coolant temperature	> 60°°C			
Injector Circuit	P0201 to P0204	El. Check – Min, max, open circuit	Short cut OR open circuit	Short cut to ground, battery or not connected	Battery voltage Engine speed No DTC set, pending or confirmed	> 6.0 V Engine moving OR running Powertrain relay rationality, P0685		1 sec Continuous	Two DCY
Ignition coil trigs 1, 2, 3 & 4	P2300, P2303, P2306, P2309	Control circuit range check min	Short-cut	To ground or not connected	Engine speed Supply voltage	Engine running > 11 V		1 sec Continuous	Two DCY
	P2301, P2304, P2307, P2310	Control circuit range check max	Short-cut	To battery voltage	Engine speed Supply voltage	Engine running > 11 V		1 sec continuous Continuous	Two DCY
EVAP Canister Vent Valve	P0498	Circuit continuity check	Short-cut	To ground or not connected	Engine speed Battery voltage	Running > 11 V		6 sec, Continuous	Two DCY
	P0499		Short-cut	To battery voltage	Purge No DTC set, pending or confirmed	Not active Purge valve, P0441, P0444, P0445 Powertrain relay, P0685, P0686, P0687		At engine start	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	FREQUENCY OF CHECKS	MIL ILLUM.
	P0446	Rationality check	Fuel tank pressure raise after EVAP leak check	Not raised 400 Pa within 8 sec	Fuel tank pressure	< -800 Pa		Once per DCY	Two DCY
					EVAP test	Not active		Leak check time + 8 sec	
					Canister Vent Valve	Not active			
					Fuel tank pressure sensor	Adaption performed			
					Diagnostic ran and passed for	Canister Vent Valve circuit, P0498, P0499			
					IAT	> +4 °C			
					No DTC set, pending or confirmed	Purge valve, P0441, P0444, P0445			
						Fuel tank pressure sensor, P0451, P0452, P0453, P1451			
						Powertrain relay, P0685, P0686, P0687			
					Purge rationality diagnostic	Not active			
EVAP leak test General conditions						Enable	Disable		
					ECT & IAT	> +4 °C	< +4 °C		
					Ambient temperature	+ 35 deg C	+ 35 deg C		
					MAF D	-	±90 mg/comb		
					Fuel tank pressure	< 200 Pa	< 200 Pa		
					MAP	< -15 kPa	< -15 kPa (during pull-down)		
					Max number of vapor disables in DCY	2	2		
					Ramp 0: Slosh				
					Pressure change in expected direction		> 70 Pa		
					Pressure change in opposite direction		> 70 Pa		
					Ramp 0: ECT	> 40 °C			
					Ramp 1: Slosh				
					Pressure change in expected direction		> 300 Pa		
					Pressure change in opposite direction		> 160 Pa		
					Ramp 2: Slosh				
					Pressure change in expected direction		> 111 Pa		
					Pressure change in opposite direction		> 80 Pa		
					Battery voltage	10 - 16 Volts			
					Fuel cut	Not active			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	FREQUENCY OF CHECKS	MIL ILLUM.
					Canister vent valve rationality test	Not active			
					No DTC set, pending or confirmed	Fuel tank pressure sensor, P0451, P0452, P0453, P1451			
						Tank pressure adaption, P1452, P1453, P1492, P1493			
						Vehicle speed sensor, P0501			
						Canister Vent Valve, P0446, P0498, P0499			
						Purge valve, P0441, P0444, P0445			
						Brake light switch, P0719, P0724			
						ECT sensor, P0115, P0117, P0118, P0119			
						IAT sensor, P0111, P0112, P0113			
						ABS communication, P1625			
					Time between test attempts	30 sec			
					at Vehicle speed (hot test)	> 27,3 mph			
					System power-up	In present DCY, or no test in previous DCY			
					Purge	Not active			
					Purge ramp	Finished, not required for cold start DCY (<40 °C)			
					Purge vapor HC content	Max. 50% of engine's fuel via purge			
					Fuel volume	15 to 85 %			
					Fuel level	Updated			
					Lambda control	Closed Loop			
					Catalyst diagnostic	Not active			
					AIR diagnostic	Not active			
					O2 sensor diagnostic	Not active			

						Enable	Disable		
Idle test					Vehicle speed	0	> 0	Once / DCY	
					Brake activations	Max 2	max 2	25 sec	
					Purge adaption	> -5% FWD > - 4,5% AWD			
					Purge HC D vs. start		> 20% FWD > 4 % AWD		
					Lambda integrator D vs. start		> 12,5% FWD > 4 % AWD		
					Ambient pressure D	< 4kPa/3 min	> 4kPa/3 min		
					Fuel tank pressure	> -500 Pa	< -2100 Pa		
					Ramp 0 vapor generation		> 4 Pa/s		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	FREQUENCY OF CHECKS	MIL ILLUM.
Vehicle moving test Only active on FWD					Vehicle speed Vehicle speed D vs. start Brake activations Purge adaption Purge HC D vs. start Lambda integrator D vs. start Ambient pressure D Fuel tank pressure Ramp 0 vapor generation	43,5 – 80,8 mph Max 1 > -7% < 4kPa/3 min > -700 Pa	 < ± 5 mph Max 1 > 15,5% > 10% > 4kPa/3 min < -2750 Pa > 1,1 Pa/s	Once / DCY 35 s	
Filler cap test, big leak / high vapor generation					Vehicle speed Vehicle speed D vs. start Brake activations Purge adaption Purge HC D vs. start Lambda integrator D vs. start Ambient pressure D Fuel tank pressure Ramp 0 vapor generation	31,1 – 93,2 mph Max 1 > -24% < 5kPa/3 min FWD < 9 kPa/3 min AWD > -700 Pa	 > ±7,5 mph Max 1 > 30% FWD > 11% AWD > 25% FWD > 8% AWD < 5kPa/3 min FWD < 9 kPa/3 min AWD < -2500 Pa > 8 Pa/s FWD > 4 Pa/s AWD	Max 50 times /DCY	
EVAP large leak > 3 mm	P0455	Rationality check	Pressure does not reach specified level in specified time. See separate document						Two DCY
	P1455	When fuel level info is incorrect Only FWD							
EVAP small leak 1 mm < X < 3 mm	P0442	Rationality check	Pressure gradient check. See separate document	Leakage factor 4					Two DCY
	P1442	When fuel level info is incorrect Only FWD							
EVAP very small leak 0,5 < X < 1 mm	P0456	Rationality check	Pressure gradient check. See separate document	Average leak factor > 0 (valid values –3 to 3) 13 values in stack					Up to eight DCY
	P1456	When fuel level info is incorrect Only FWD							

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	FREQUENCY OF CHECKS	MIL ILLUM.
Fuel tank pressure sensor	P0452	Low end check	Short cut	To ground or not connected	Ignition on	>2 sec		3 sec	Two DCY
	P0453	High end check	Short cut	To battery	Engine speed	Running		Continuous	
					Battery voltage	>11,0 V			
	P0451	Rationality	Number of flank shifts (of 25 Pa)	> 15 times in 5 sec	Ignition on	>2 sec		5 sec	Two DCY
	P1451	When fuel level info is incorrect Only FWD	Same as above	Same as above	Engine speed	Running		Once / DCY	
					Battery voltage	>11,0 V			
					ECT & IAT	> +4°C			
					Fuel in tank	< 85% (53 liters)			
					No DTC set, pending or confirmed	Fuel tank pressure sensor circuit, P0452, P0453			
						Canister Vent Valve, P0446, P0498, P0499			
						Purge valve, P0441, P0444, P0445			
						Tank pressure adaption, P1452, P1453, P1492, P1493			
					Fuel level	Updated			
Fuel tank pressure sensor	Pressure adaption, general conditions				BARO pressure	75 to 106 kPa			
					Vehicle speed	0			
					Engine speed	0			
					ECT	< +40°C			
					Fuel tank volume	< 80,5% (50 liter)			
					IAT	> 0°C			
					No DTC set, pending or confirmed	Fuel tank pressure sensor, P0451, P0452, P0453, P1451			
					ECU	First time after Power Up			
	P1452	Sensor Offset	Min failure	Adaption value < -750 Pa	Engine speed	Running		Ignition on + 5s	Two DCY
	P1492	When fuel level info is incorrect Only FWD			Fuel tank pressure sensor adaption	Performed		Once / DCY	
					Fuel level	Updated			
					Battery voltage	> 11,0 V			
	P1453	Sensor Offset	Max failure	Adaption value >1000 Pa	Engine speed	Running		Ignition on + 5s	Two DCY
	P1493	When fuel level info is incorrect Only FWD			Fuel tank pressure sensor adaption	Performed		Once / DCY	
					Fuel level	Updated			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	FREQUENCY OF CHECKS	MIL ILLUM.
					Battery voltage	> 11,0 V			
EVAP Purge Valve	P0441	Valve leaking	Tank pressure drop when valve is commanded closed	> 30 Pa/sec	Vehicle speed	0		3 sec	Two DCY
					Fuel volume	15 - 85 %		Once / DCY	
					Engine speed	Running			
					Purge	Not active			
					IAT & ECT at engine start	+4 to +40 °C			
					Battery voltage	11 to 16 Volts			
					MAP	< -15 kPa			
					No DTC set, pending or confirmed	Canister Vent Valve, P0446, P0498, P0499			
						ECT sensor, P0115, P0117, P0118, P0119			
						Vehicle speed sensor, P0501			
						Tank pressure adaption, P1452, P1453, P1492, P1493			
						ABS communication, P1625			
						Powertrain relay, P0685, P0686, P0687			
					Diagnostic ran and passed for ECU	Purge Valve circuit, P0444, P0445 First time after Power Up			
	P0444	Circuit continuity check	Short-cut	Short cut to ground or not connected	Engine speed	Running		1 sec	Two DCY
	P0445		Short-cut	Short cut to battery voltage	Battery voltage	> 11,0 V		Continuous	
					Purge valve	Active (ECT > 40°C)			
					No DTC set, pending or confirmed	Powertrain relay, P0685, P0686, P0687			
Fuel level FWD only	P0462	Min signal	AD value	< 2000	Engine speed	Running		1 sec	No MIL, will set alternate DTC for EVAP rationalities Sets fuel volume to default: 64,5 % (40 liters)
	P0463	Max signal	AD value	> 25000	Battery voltage	> 11,0 V			
	P0460	Rationality, no activity	Fuel level info change	< 1,6% (1 liter)	Engine speed	Running		15,5 miles	
					Battery voltage	> 11,0 V			
					No DTC set, pending or confirmed	Fuel level circuit, P0462, P0463			
					If the volume increases with more than 16% (10 liters) during DCY, refueling is assumed, and a new reference will be taken.	When volume reference > 85% (53 liters) OR < 3,2% (2 liters), driving distance for evaluation is increased to 93,2 miles.			
	P0461	Rationality, fuel consumption	Fuel level change	Fuel consumption less than 0,8% (0,5 liters). 5 checks done for fault	Reference volume updated when Vehicle speed	> 24,9 mph		5 X 21,7 miles	No MIL, will set alternate DTC for EVAP rationalities
					Evaluation distance	21,7 miles			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	FREQUENCY OF CHECKS	MIL ILLUM.
				setting. Results saved in buffer, also between DCY:s.	Evaluation distance when fuel level >90% Diagnostic ran and passed for	43,5 miles Fuel tank level sensor, P0460, P0462, P0463			Sets fuel volume to default: 64,5 % (40 liters)
Fuel level AWD only Primary sensor	P0462	Min signal	AD value	< 50	Engine speed	Running		1 sec	Two DCY
	P0463	Max signal	AD value	> 626	Battery voltage	> 11,0 V			
	P0460	Rationality, no activity	Fuel level info change	< 2 liters	Engine speed	Running		37,3 miles	
			In distance Distance accumulated over DCYs. Reset at refueling and after State change	37,3 miles	Battery voltage No DTC set, pending or confirmed State 3 Primary fuel sensor reading AND Secondary fuel sensor reading	> 11,0 V Fuel level circuit, P0462, P0463 In measurement range, 0,3 - 24 liters In measurement range, 3 - 24 liters			
					State 4 Primary fuel sensor reading AND Secondary fuel sensor reading	In measurement range, 0,3 - 24 liters Empty, < 3 liters			
Fuel level AWD only Secondary sensor	P2067	Min signal	AD value	> 814	Engine speed	Running		1 sec	Two DCY
	P2068	Max signal	AD value	< 50	Battery voltage	> 11,0 V			
	P2065	Rationality, no activity	Fuel level info change In distance Distance accumulated over DCYs. Reset at refueling and after State change	< 2 liters 37,3 miles, State 1 & 3 248,6 miles, State 5	Engine speed Battery voltage No DTC set, pending or confirmed State 1 Primary fuel sensor reading AND Secondary fuel sensor reading State 3 Primary fuel sensor reading AND Secondary fuel sensor reading State 5 Primary fuel sensor reading AND Secondary fuel sensor reading	Running > 11,0 V Fuel level circuit, P2067, P2068 Full, > 24 liters In measurement range, 3 - 24 liters In measurement range, 0,3 - 24 liters In measurement range, 3 - 24 liters Full, > 24 liters Full, > 24 liters		37,3 miles / 248,6 miles	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	FREQUENCY OF CHECKS	MIL ILLUM.
Fuel level AWD only Primary AND Secondary Sensors	P0460 AND P2065	Illogical sensor information, monitor cannot isolate faulty sensor, two DCYs will be set	Stuck at State 2		Engine speed	Running		31 miles	Two DCY
			For distance	31 miles	Battery voltage	> 11,0 V			
					No DTC set, pending or confirmed	Fuel level circuit P0462, P0463, P2067, P2068			
					State 2 Primary fuel sensor reading AND Secondary fuel sensor reading	Full, > 24 liter Empty, < 3 liters			
Fuel transfer pump AWD only	P2636	Rationality, fuel volume	Secondary fuel sensor reading subtracted by Primary fuel sensor reading	> 3 liters	Engine speed	Running		1 200 sec	Two DCY
					Vehichle speed	> 30 km/h, (18.75 miles/h)			
					Battery voltage	> 11,0 V			
					No DTC set, pending or confirmed	Fuel level circuit P0462, P0463, P2067, P2068			
					Total fuel volume	< 25 liters			
					Secondary fuel sensor reading subtracted by Primary fuel sensor reading	> 3,0 liters			
Fuel trim, long term	P0171	System lean	Long term	<-24,6%	Engine speed	Running		1 sec	Two DCY
	P0172	System rich	Long term	>+24,6%	Lambda control	Active		Continuous	
		Fuel trim matrix with 20 load/rpm cells. Diagnostic will fail if the trim value in present cell is above threshold		<-24% AWD	Fuel trim	6 updates in actual load/rpm cell (100 msec cycle time)			
				>+24% AWD	Coolant temperature	> 71 deg C			
					Diagnostic ran and passed for	MAF, P0101, P0102, P0103 ECT sensor, P0115, P0117, P0118, P0119 Front O2 sensor, P0131, P0132, P0134			
Front O2 sensor	P0132	Range check high	Voltage	>1200 mV	Engine speed	Running		5 sec	Two DCY
					Battery voltage	11,0 < U < 18,0V		Continuous	
					Front O2 sensor heater	Active - sensor warmed up			
					Closed-loop fueling	Active			
	P0131	Range check low	Voltage	< 100 mV in 30 sec	Engine speed	Running		30 sec	Two DCY
					Rear sensor signal	> 700 mV		Continuous	
					Front O2 sensor heater	Active - sensor warmed up			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	FREQUENCY OF CHECKS	MIL ILLUM.
					Battery voltage	> 11,0V			
					Lambda control	Active > 5 sec			
					Load	> 0			
					AIR	Not active			
					EVAP leak test	Not active			
					Fuel cut	Not active			
	P0134	Circuit Continuity check	Voltage For time OR Short term fuel trim AND Rear O2 sensor signal For time	300 to 600 mV 30 sec Rich, corrects -24,5 % < 200 mV 3 sec	Engine speed	Running		30 sec	Two DCY
					Battery voltage	> 11,0V		Continuous	
					Sensor heater	Active			
					Sensor heater active time from engine starting, depending on IAT or ECT at start.	<-9°C for 570 sec -8 to 8°C for 270 sec >8°C for 80 sec			
					EVAP leak test	Not active			
					No DCT set, pending or confirmed	IAT sensor, P0111, P0112, P0113			
					Lambda control	Closed loop			
	P0133	Response rate	Signal switches, O2 sensor passing integrator switch voltage in either direction	< 4 in 130 revolutions	Engine speed	1000 – 3000 rpm		135 revolutions	Two DCY
			OR		Lambda control	Closed loop		Once / DCY	
			Revolutions	> 100 for 4 switches	Battery voltage	> 11,0 V			
					Engine load	140 - 400 mg/combustion			
					Delta load	-10 to 15 g/s			
					Lambda Integrator	Within ±15%			
					ECT	> 70°C			
					Time from engine starting	> 120 sec			
					Purge fuel factor	> -10%			
					Stable for	4s			
					No DTC set, pending or confirmed	MAF, P0101, P0102, P0103 Crankshaft position sensor, P0337, P0339 SAI, P2431, P2432, P2433 Purge valve, P0441, P0444, P0445 CCV, P0446, P0498, P0499 EVAP,			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	FREQUENCY OF CHECKS	MIL ILLUM.
O2 Sensor Switch Point	P1131	Switch point trim delays short term shift based on O2 sensor switch point drift. DTC sets when emissions correlated limit is reached	Lean AWD	> 12,5 revolutions	Engine speed	1400 - 2800 rpm		15 revolutions	Two DCY
	P1132		Lean FWD	> 11,5 revolutions	Coolant temp	> 71ºC		Continuous	
			Rich AWD	> 15 revolutions	Delta load	< 50 mg/combustion/250 msec			
			Rich FWD	> 11,5 revolutions	Load	125 - 475 mg/combustion			
					Fuel control	Closed loop			
					Rear sensor voltage for trim activation	> 635 mV or < 575 mV			
					Stable time	15 sec			
					Additional stable time if after fuel-cut	60 sec			
					Time between adaptions	30 sec			
					No DTC set, pending or confirmed	MAF, P0101, P0102, P0103			
					Diagnostic ran and passed for	Rear O2 Sensor, P0137, P0138, P0140			
Front O2 sensor heater	P0031	Range check min	Short cut	To ground or not connected	Engine speed	Running		6 sec	Two DCY
					Battery voltage	> 11,0 V		Continuous	
					O2 heater frequency	10 % < PWM < 85 %			
	P0032	Range check max	Short cut	To battery voltage	Engine speed	Running		6 sec	Two DCY
					Battery voltage	> 11,0 V		Continuous	
					O2 heater frequency	10 % < PWM < 85 %			
	P0030	Rationality	Heater current	< 300 mA for > 10	Engine speed	Running		10 sec	Two DCY
				> 2300 mA for > 10 sec	Battery voltage	> 11,0 V		Continuous	
					PWM Duty Cycle	10 to 85 %			
					No DTC set, pending or confirmed	Front O2 sensor heater circuit, P0031, P0032			
						Fuel pump relay, P0628, P0629			
Rear 02 sensor	P0137	Signal low	Voltage	< 100 mV for > 30	Engine speed	Running		6 sec	Two DCY
					Battery voltage	> 11,0 V		Continuous	
					Rear O2 sensor heater	Active - sensor warmed up			
					Lambda closed loop	> 5 sec			
					Lambda integrator	Within -20 to +20 %			
					Load	> 170 mg			
						No EVAP leak test			
						AIR not active			
						No Fuel Cut			
					No DTC set, pending or confirmed	MAF, P0101, P0102, P0103			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	FREQUENCY OF CHECKS	MIL ILLUM.
	P0138	Signal high	Voltage	>1200 mV	Engine speed Battery voltage Rear O2 sensor heater	Running > 11,0 V Active - sensor warmed up		5 sec Continuous	Two DCY
	P0140	Activity	Sensor voltage	Signal is between 445 mV - 475mV for 600s.	Engine speed Rear O2 sensor heater Battery voltage Lambda Integrator Lambda control	Running > 4s > 11,0 V -20 - 20 % >20s		600s Once/DCY	Two DCY
	P0139	Response check	Time for rear O2 sensor voltage during rich to lean, within the Catalystic diagnose.	Time 1: 600 to 400 mv Time 2: 600 to 150 mV	Engine speed Battery voltage Coolant temperature Rear O2 sensor heater Test not done this cycle Catalyst diagnose is active No DTC set, pending or confirmed	Running > 11,0 V > 60 deg C > 4s O2S Pre <= 450mV MAF sensor, P0101, P0102, P0103 O2 sens pre heat, P0030, P0031, P0032 O2 sens pre, P0131, 0132, P0133, P0134+G50 O2 sens post heat, P0036, P0037, P0038 O2 sens post, P0137, P0138, P0140 ECT sensor, P0115, P0117, P0118, P0119 AIR Purge valve, P0441, P0444, P0445 Canister Vent Valve, P0446, P0498, P0499 EVAP		Time 1: >350ms Time 2: >3000ms Once / DCY	Two DCY
Rear O2 sensor heater	P0037	Range check min	Short cut	To ground or not connected	Engine speed Battery voltage Sensor heater O2 heater frequency	Running > 11,0 V Active 10 % < PWM < 85 %		6 sec Continuous	Two DCY

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	FREQUENCY OF CHECKS	MIL ILLUM.
	P0038	Range check max	Short cut	To battery voltage	Engine speed Battery voltage Sensor heater O2 heater frequency	Running > 11,0 V Active 10 % < PWM < 85 %		6 sec Continuous	Two DCY
	P0036	Rationality	Heater current	< 200 mA for > 10 sec > 2300 mA for > 10 sec	Engine speed Battery voltage Sensor heater No DTC set, pending or confirmed	Running > 11,0 V Active Rear O2 sensor heater circuit, P0037, P0038 Fuel pump relay, P0628, P0629		10 sec Continuous	Two DCY
MAP sensor	P0106	Rationality	MAP	> 50 kPa for 400	Engine speed Accelerator pedal Load No DTC set, pending or confirmed	Running > 1300 rpm Released for > 400 msec < 110 mg/combustion MAP circuit, P0107, P0108 Crankshaft position sensor, P0337, P0339		5 readings Once / DCY	Two DCY
	P0106	Rationality, comparison of system pressure sensor readings before engine cranking	MAP - turbocharger boost pressure OR MAP - AIR pressure AND AIR - turbocharger boost pressure OR Turbocharger boost - AIR pressure AND MAP - turbocharger boost pressure AND MAP - AIR pressure	> 12 kPa > 12 kPa < 8 kPa > 12 kPa > 12 kPa > 12 kPa	Vehicle speed Engine speed Ignition No DTC set, pending or confirmed	0 0 On AIR pressure sensor circuit, P2432, P2433 Turbo boost pressure circuit, P0237, P0238 MAP circuit, P0107, P0108		3 readings, 25 msec cycle time	Two DCY
	P0109	Rationality	MAP	<10 kPa or >140 kPa for 2,0 sec	Engine speed	Cranking		Once / DCY	Two DCY
	P0107	Range check min	Short-cut	To ground or not connected	Ignition	On (Engine not moving OR engine moving OR engine running)		1 sec Continuous	Two DCY
	P0108	Range check max	Short-cut	To sensor supply voltage	Ignition	On (Engine not moving OR engine moving OR engine running)		1 sec Continuous	Two DCY

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	FREQUENCY OF CHECKS	MIL ILLUM.
Turbo boost pressure sensor	P0237	Range check min	Short-cut	To ground or not connected	Ignition	On (Engine not moving OR engine moving OR engine running)		1 sec Continuous	Two DCY
	P0238	Range check max	Short-cut	To sensor supply voltage	Ignition	On (Engine not moving OR engine moving OR engine running)		1 sec Continuous	Two DCY
	P0236	Rationality, comparison of system pressure sensor readings before engine cranking	Turbocharger boost - AIR pressure OR Turbocharger boost - MAP pressure AND MAP - AIR pressure OR Turbocharger boost - AIR pressure AND Turbocharger boost - MAP pressure AND MAP - AIR pressure	> 12 kPa > 12 kPa < 8 kPa > 12 kPa > 12 kPa > 12 kPa	Vehicle speed Engine speed Ignition No DTC set, pending or confirmed	0 0 On AIR pressure sensor circuit, P2432, P2433 Turbo boost pressure circuit, P0237, P0238 MAP circuit, P0107, P0108		3 readings, 25 msec cycle time	Two DCY
MAF sensor	P0102	Range check, low signal	Short-cut	To ground or not connected	Engine speed No DTC set, pending or confirmed	Running OR Moving Powertrain relay, P0685, P0686, P0687		Continuous	Two DCY
	P0103	Range check, high signal	Short-cut	To sensor supply voltage	Engine speed No DTC set, pending or confirmed	Running OR Moving Powertrain relay, P0685, P0686, P0687		Continuous	Two DCY
MAF sensor, rationality	P0101	Comparison of measured MAF sensor signal with mass air flow calculated from throttle area, BARO, MAP and Turbo Boost sensors. Samples are taken in two load windows, below and above 15 g air/sec. To report fault, the average deviation in one of the windows has to be above the limit after 500 samples. To report pass, 500 samples have to be taken in both load windows with less deviation than the fault limit.	MAF deviation AND Fuel Trim OR MAF deviation AND Fuel Trim OR MAF deviation	> -22% > -20% > 23% > 20% > ±30%	Engine speed Battery Voltage Coolant Temperature Engine Speed Pressure quote, MAP vs. pressure before throttle MAP deviation between samples Calculated Mass Air Flow (from MAP) Boost by-pass status change Vehicle speed to enable test Fuel cut	Running > 11 Volts 67 - 115 °C 1400 – 4000 rpm 0,39 - 0,70 < ±2,5 kPa in 1500 msec > 7 g/s No change for 500 ms > 18,6 mph for 60 sec Inactive		500 samples or more Continuous	Two DCY

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	FREQUENCY OF CHECKS	MIL ILLUM.
					Ambient pressure, modeled	> 72 kPa			
					ECT at start	> -7°C			
					Diagnostic ran and passed for	MAP sensor, P0106, P0107, P0108			
						IAT sensor, P0111, P0112, P0113			
						Turbo boost pressure sensor, P0237, P0238, P0236			
IAT sensor	P0112	Range check min	Device driver detects min error	Circuit low	Ignition	On (Engine not moving OR engine moving OR engine running)		1 sec Continuous	Two DCY
	P0113	Range check max	Device driver detects max error	Circuit high	Ignition	On (Engine not moving OR engine moving OR engine running)		1 sec Continuous	Two DCY
	P0111	Rationality, no activity	IAT sensor output change	< 1 °C	Soak time	> 600 min		900 sec	Two DCY
					Run time	> 900 sec		Once / DCY	
					Engine	Running			
					Load	> 270 mg/comb			
					For time	150 sec cumulative			
					ECM reset	Not allowed			
ECT sensor	P0115	Rationality, No activity	Temp. change	< 2 °C	Engine speed	Running		Load condition depandant	Two DCY
					Load < 150 mg/combustion FWD < 180 mg/combustion AWD	180 sec		Once / DCY	
					AND > 270 mg/combustion	150 sec			
					ECT at start	=< 71 °C			
					Vehicle speed	> 0 mph			
					No DTC set, pending or confirmed	ECT circuit, P0117, P0118			
Thermostat / ECT rationality	P0128	Rationality	Sample period of 200 sec starts when modeled ECT reaches 80 °C. Comparison at end of sample period: Mean value of difference between ECT reading and modeled coolant temperature. Measured engine coolant temp must reach at least 71 °C for function OK report	> 30 °C above modeled ECT OR > Calculated limit below modeled ECT	Engine speed	Running		300 to 700 sec	Two DCY
					ECT at start-up	< 52 °C		Once / DCY	
					Calculated coolant temp	> 80 °C			
					Idle portion of DCY	< 50 %			
					Fuel cut portion of DCY	< 20 %			
					Ambient pressure, modeled	> 72 kPa			
					ECT at start	> -7°C			
					Time after start	< 750 sec			
					Diagnostic ran and passed for	ECT sensor, P0115, P0117, P0118, P0119			
						IAT sensor, P0111, P0112, P0113			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	FREQUENCY OF CHECKS	MIL ILLUM.
						Vehicle speed			
					Disables for remainder of DCY if Vehicle speed	> 87 mph for > 30 sec (accumulated time)			
					Soak Time before test allowed	0 minutes			
					Block heater start	Not allowed			
Low sided ECT rationality	P0126	Rationality	Sample period of 60 sec starts when modeled ECT reaches 10 °C. Comparison at end of sample period: Mean value of ECT reading is compared with threshold	ECT < 5 ° C	Engine speed	Running		150 to 300 sec	Two DCY
					ECT at start-up	< 0 °C		Once / DCY	
					IAT or ECT sensor	Below -7 deg C			
					Idle portion of DCY	< 50 %			
					Fuel cut portion of DCY	< 50 %			
					Ambient pressure, modeled	> 72 kPa			
					Time after start	< 800 sec			
					No DTC set, pending or confirmed	ECT sensor circuit, P0117, P0118			
					Diagnostic ran and passed for	IAT sensor, P0112, P0113 ABS communication, P1625 Vehicle speed, P0501 ECT sensor rationality, P0115 P0119 IAT sensor rationality P0111			
					Disables for remainder of DCY if Vehicle speed	> 87 mph for > 30 sec (accumulated)			
					Block heater start	Not allowed			
ECT sensor	P0117	Range check min	Device driver detects min error	Circuit low	Engine speed	Not moving OR running		1 sec Continuous	Two DCY
	P0118	Range check max	Device driver detects max error	Circuit high	Engine speed	Not moving OR running		1 sec Continuous	Two DCY
	P0119	Too quick change	Mean value in stack (of 5 values)	> 10 °C	Engine speed	Running		5 readings, time base 100 msec	Two DCY
					Comparison of each ECT reading, insert into stack when diff. from previous reading	> 5 °C		Continuous	
	P0119	Too quick change	Difference between consecutive values When the threshold has been exceeded, the monitor waits for 2 secs before setting to allow for a possible circuit fault to set	> 60 °C	Engine speed	Running		Continuous	Two DCY
					No DTC set, pending or confirmed	ECT sensor circuit, P0117, P0118			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	FREQUENCY OF CHECKS	MIL ILLUM.
ECT sensor stuck above lowest maximum enable / ECT vs. IAT comparison	P011B	Rationality	ECT vs IAT reading at engine start	Case 1: ECT > 35 deg C above IAT Case 2: ECT > 20 deg C above IAT OR	Engine speed	Running		45 sec	Two DCY
				Case 1: IAT > 45 deg C above ECT Case 2: IAT > 30 deg C above ECT	Engine off time	Case 1: > 300 min Case 2: > 480 min		Once / DCY	
					Engine run time	45 sec			
					ECT drop after 45 sec	< 2 deg C			
					Block heater start	Not allowed			
					ECM reset	Not allowed			
Turbocharger bypass valve	P0034	Control circuit Low	Device driver detects valve error	Circuit low	Engine speed Turbo bypass valve	Running Active		Continuous	Two DCY
	P0035	Control circuit High	Device driver detects valve error	Circuit high	Engine speed Turbo bypass valve	Running Active		Continuous	Two DCY
	P0033	Rationality	Mean value of 50 MAF pulsations at Accelerator released	> 1.90 mg/sec	Engine speed	Running < 3500 rpm		600 msec,	Two DCY
					Turbo bypass valve	Commanded Open		> 1 time	
					Turbo boost pressure	> Ambient pressure + 35 kPa		Continuous	
			AND		Ambient pressure model	Updated			
			Mean value of 50 Turbo Boost Pressure pulsations at Accelerator released	> 1.1kPa	Ambient pressure, modeled	> 72 kPa			
					ECT at start	> -7°C			
					No DTC set, pending or confirmed	MAP sensor, P0106, P0107, P0108			
						Powertrain relay, P0685, P0686, P0687			
					Mean value of Throttle during pulsation period	< 2,6 %			
Turbocharger wastegate solenoid	P0245	Control circuit Low	Device driver detects min error	Circuit low	Engine speed No DTC set, pending or confirmed	Running Powertrain relay functional test, P0685		Continuous	Two DCY
	P0246	Control circuit High	Device driver detects	Circuit high	Engine speed	Running		Continuous	Two DCY
	P0244	Functional test	Turbo boost pressure decrease slope	+ 12 to - 10 kPa/sec	Engine speed	> 2200 rpm & < 5000 rpm		1,0 sec	Two DCY
					Turbo boost pressure	> Ambient pressure + 39 kPa		Continuous	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	FREQUENCY OF CHECKS	MIL ILLUM.
			AND Mean pressure diff over throttle	> 23 kPa > 30 kPa when BARO > 85 kPa	Ambient pressure model Ambient pressure, modeled ECT	Updated > 72 kPa > 71°C			
					Accelerator position	5 - 50%			
					Max throttle change during sample period vs. start value	< 10%			
					ECT at start (out of limits)	> -7°C			
					Boost adaption	Done (also in earlier DCY)			
					No DTC set, pending or confirmed	Wastegate circuit, P0245, P0246			
					Diagnostic ran and passed for	Turbo boost pressure sensor, P0237, P0238, P0236 MAP sensor, P0106, P0107, P0108			
		Functional test	Pressure difference over throttle	< -300 mg/comb	Same as above			500 msec Continuous	
Time to closed loop	P0125	Rationality	Time before entering closed loop	> 600 sec	Engine speed Start Temperature, lowest of ECT/IAT	Running < -7°C		600 sec Once / DCY	Two DCY
			Time before entering closed loop	>150 sec	Engine speed Start Temperature, lowest of ECT/IAT	Running -7°C < T < 10°C		300 sec Once / DCY	Two DCY
			Time before entering closed loop	> 60 sec	Engine speed Start Temperature, lowest of ECT/IAT	Running >10°C		120 sec Once / DCY	Two DCY
Crankshaft position sensor	P0337	Sensor circuit low	Engine speed at cranking	< 100 rpm	Cranking defined by			3,5 sec Once / DCY	Immediately
					Battery voltage AND MAP vs. Ambient pressure diff.	D > 0,6 V > 2 kPa			
					IF above conditions not met: THEN Close throttle MAP vs. Ambient pressure diff. AND check engine speed	For 2 sec For 1,5 sec > 5 kPa			
	P0339	Rationality	Lost position in same DCY	Position found then lost during 10 msec, > 7 times	Vehicle speed Engine speed Ignition	= 0 mph Cranking OR Running < 3 sec On		3 sec Continuous	Two DCY

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	FREQUENCY OF CHECKS	MIL ILLUM.
			Lost position in same DCY	Position found then lost during 10 msec, > 3 times	Vehicle speed Brake Engine speed Ignition	> 18,6 mph Not active Running > 3 sec On		Error occurs 3 times Continuous	Two DCY
Vehicle speed	P0501	Fault reported from ABS	Wheel Angular Velocity Front Left Validity bit AND Wheel Angular Velocity Front Right Validity bit	Not received within 1 sec	Ignition Battery voltage Nodes on HS CAN No DTC set, pending or confirmed	On for > 3 sec 6.0 V to 16.0 V Not in sleep mode OR programming mode Lost communication with ABS module, P1625		1 sec, continuous	Two DCY
Brake light switch	P0719	Rationality - low	Vehicle speed	4 times decreases from 24,9 to 1,9 mph within 2 to 12 sec	Engine speed Brake	Running Not active		Once / DCY	Two DCY
	P0724	Rationality - high	Vehicle speed	4 times increases from 1,9 to 24,9 mph within 2 to 12 sec	Engine speed Brake	Running Active		Once / DCY	Two DCY
Accelerator position sensor 1	P2122	Range check min	Short cut	To ground OR open circuit (< 10%)	Ignition	Off OR On		100 msec	Immediately
	P2123	Range check max	Short cut	To battery (> 93%)	Engine speed	Moving, not moving, running, stopping		Continuous	
	P2121	Rationality check	Detected by MCP if Main processor faulty	Signal out of range (< 10%, > 93%) Min or max fault not possible to determine	Ignition Engine speed No DTC set, pending or confirmed	Off OR On Moving, not moving, running, stopping Accel. pos 1 circuit, P2122, P2123		100 msec Continuous	Immediately
Accelerator position sensor 2	P2127	Range check min	Short cut	To ground OR open circuit (< 5%)	Ignition	Off OR On		100 msec	Immediately
	P2128	Range check max	Short cut	To battery (> 50%)	Engine speed	Moving, not moving, running, stopping		Continuous	
	P2126	Rationality check	Detected by MCP if Main processor faulty	Signal out of range (< 5%, > 50%) Min or max fault not possible to determine	Ignition Engine speed No DTC set, pending or confirmed	Off OR On Moving, not moving, running, stopping Accel. pos 2 circuit, P2127, P2128		100 msec Continuous	Immediately

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	FREQUENCY OF CHECKS	MIL ILLUM.
Accelerator position sensors 1 & 2	P2138	Rationality check, correlation fault	Difference between 1 & 2	> 5,2%	Ignition	Off OR On		200 msec	Immediately
			OR difference between adaptation values of 1 & 2	> 3,4% for 192 msec	Engine speed	Moving, not moving, running, stopping		Continuous	
Throttle position sensor 1	P0122	Range check min	Short cut	To ground OR open circuit (< 5,5%)	Ignition	Off OR On		100 msec	Immediately
	P0123	Range check max	Short cut	To battery (> 94,5%)	Engine speed	Moving, not moving, running, stopping		Continuous	
	P0121	Rationality check	Detected by MCP if Main processor faulty	Signal out of range (< 5,5%, > 94,5%)	Ignition	Off OR On		100 msec	Immediately
				Min or max fault not possible to determine	Engine speed	Moving, not moving, running, stopping		Continuous	
					No DTC set, pending or confirmed	Throttle pos 1 circuit, P0122, P0123			
Throttle position sensor 2	P0222	Range check min	Short cut	To ground OR open circuit (< 5,5%)	Ignition	Off OR On		100 msec	Immediately
	P0223	Range check max	Short cut	To battery (> 94,5%)	Engine speed	Moving, not moving, running, stopping		Continuous	
	P0221	Rationality check	Detected by MCP if Main processor faulty	Signal out of range (< 5,5%, > 94,5%)	Ignition	Off OR On		100 msec	Immediately
				Min or max fault not possible to determine	Engine speed	Moving, not moving, running, stopping		Continuous	
					No DTC set, pending or confirmed	Throttle pos 2 circuit, P0222, P0223			
Throttle position sensors 1 & 2	P2135	Rationality check, correlation fault	Difference between 1 & 2	> 4%	Ignition	Off OR On		200 msec	Immediately
			OR difference between adaptation values of 1 & 2	> 4% for 192 msec	Engine speed	Moving, not moving, running, stopping		Continuous	
Throttle motor	P2176	Rationality check, throttle min pos learning fault	Throttle movement	No movement after 10 alternations	Ignition	Off OR On		1,5 sec	Immediately
					Engine speed	Moving, not moving, running, stopping		Continuous	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	FREQUENCY OF CHECKS	MIL ILLUM.
	P0638	Rationality check, throttle position fault	Throttle movement	In wrong direction OR	Ignition	Off OR On		400 msec	Immediately
				Does not follow calculated movement test pattern OR	Engine speed	Moving, not moving, running, stopping		Continuous	
				> Calculated limit in Bowden cable mode					
	P1523	Rationality check, throttle default position fault	Throttle position	> 41% detected by Main OR	Ignition	Off OR On		1 sec	Immediately
				Not within 27% to 41% detected by MCP OR	Engine speed	Moving, not moving, running, stopping		Continuous	
			MAF Air flow	> 23 g/s	Throttle motor power	Disabled			
	P1681	Sensor switching fault	Transistor to pull one throttle sensor to ground does not toggle within OR	700 msec	Engine speed	Not moving, moving, running, stopping		700 msec	Immediately
			TPS1 is grounded like TPS2	TPS1 changes > 20% when grounding TPS2	Ignition	On		Continuous	
			TPS2 is not grounded like it should be	TPS2 > 25%					
ECM int ROM	P0601	ROM checksum control	Checksum	Faulty for 200 msec	Ignition	On		200 msec	Immediately
					Engine speed	Running, moving, not moving, stopping		Continuous	
ECM int RAM	P0604	RAM check	RAM	Faulty for 200 msec	Ignition	On		200 msec	Immediately
					Engine speed	Running, moving, not moving, stopping		Continuous	
ECM int comm	P0606	Internal communication supervision	ECM CPU Internal serial communication	Faulty for 200 msec	Ignition	On		200 msec	Immediately
					Engine speed	Running, moving, not moving, stopping		Continuous	
ECM CPU fault	P0607	CPU control	CPU	Faulty for 200 msec	Engine speed	Ignition off, not moving, moving, running, stopping		200 msec	Immediately
End Of Line programming fault	P0602	ECU programming supervision	CAN vehicle configuration	Unprogrammed	Ignition	On		Continuous	Two DCY
	P0610		Variant data	Unprogrammed				200 msec	
	P0630		VIN	Unprogrammed					

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	FREQUENCY OF CHECKS	MIL ILLUM.
	P0632		Wheel circumference	Unprogrammed					
Vref 1	P0641	Voltage supply 1 out of range	Voltage supply 1	Not within 87,75 to 92,25%	Ignition Engine speed	On Running, moving, not moving, stopping		100 msec Continuous	Immediately
Vref 2	P0651	Voltage supply 2 out of range	Voltage supply 2	Not within 87,75 to 92,25%	Ignition Engine speed	On Running, moving, not moving, stopping		100 msec Continuous	Immediately
ECM int A/D	P1680	Comparison A/D conversion of Pedal Position sensor	Main processor vs. MCP A/D conversion difference of Pedal position sensor	> 3%	Ignition Engine speed	On Running, moving, not moving, stopping		200 msec Continuous	Immediately
TCM CAN data	P1623	Transmission controller data missing on CAN BUS	Message TCM general status	Not received within 1 sec	Ignition Battery voltage Communication Gear box Recover from a reset, over or under voltage condition	On (3 sec since power up) 6 – 18 V Normal Communication not disabled with diagnostic service (SID $28) Automatic		1 sec Continuous	Two DCY
TCS/ABS CAN data	P1625	TCS/ABS controller data missing on CAN BUS	Message ABS general status OR message response to Wheel Angular Velocity Front Right Validity bit check	Not received within 1 sec Not received within 1 sec	Ignition Battery voltage HS CAN	On for more than 3 sec 6 – 18 V All nodes not in sleep mode		3 sec Continuous	Two DCY
Fuel pump relay	P0628	Circuit continuity check	Short-cut	To ground or not connected	Engine speed Battery voltage	Not moving OR Running > 11,0 V		1 sec Continuous	Two DCY
	P0629		Short-cut	To battery voltage	Ignition	On			
Powertrain relay	P0686	Circuit continuity check	Short-cut	To ground or not connected	Engine speed Battery voltage	Not moving OR Running > 11,0 V		0,5 sec Continuous	Two DCY
	P0687		Short-cut	To battery voltage	Ignition	On			
	P0685	Functional test	Powertrain relay AND BoostControl AND PurgeValve Injector 1 Injector 2 Injector 3	Activated Reports low fault Reports low fault Reports low fault Reports low fault Reports low fault	Engine speed	Not moving OR Running		0,5 sec Continuous	Two DCY

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	FREQUENCY OF CHECKS	MIL ILLUM.
			Injector 4 Combustion detect signals	Reports low fault 0					
Idle Rpm Control	P0506		Engine idle AND Load AND Air to raise idle rpm AND all of the above during	Nominal – 100 rpm < 225 mg/comb Reached maximum 10 sec	Vehicle speed Battery voltage Accelerator pedal Throttle limphome, P0606, P0638, P1681, P0121, P0641, P0221, P0651, P2138 Ambient pressure, modeled	0 > 11,0 V Released Not active > 72 kPa		10 sec Continuous	Two DCY
	P0507		Engine idle AND Air to raise idle rpm AND all of the above during	Nominal + 200 rpm Reached minimum 10 sec	Vehicle speed Battery voltage Accelerator pedal Throttle limphome, P0606, P0638, P1681, P0121, P0641, P0221, P0651, P2138 Ambient pressure, modeled	0 > 11,0 V Released Not active > 72 kPa		10 sec Continuous	Two DCY
Cold start emission reduction strategy diagnostic	P1400		Timing retard or Idle speed increase	< 5 degrees < 75 rpm	Cold start strategy Load Load stable	Enabled < 380 mg/comb < 10 mg/comb/100 msec change, after this 1,5 sec before reenablement		10 sec cumulative Once / DCY	Two DCY
Ignition off timer diagnostic	P2610	Verification of ignition off timer. 1. Checks that timer starts at igntion off with a test after 60 secs and 2. That it measures correctly for 600 secs	Comparison of ECM clock timer with ignition off timer after 60 secs ignition off time Comparison of monitor timer and ignition off timer. Check done att 600 secs on monitor timer	Diff more than 6 secs Diff more than 60 se	ECM reset Ignition off time Engine	No 60 secs Has run in this driving cycle		660 secs Once / DCY	Two DCY
Secondary air injection relay	P2257	Circuit continuity check	Short-cut	To ground or not connected	Engine speed Battery voltage	Not moving OR Running > 11,0 V		1 sec Continuous	Two DCY
	P2258		Short-cut	To battery voltage	Ignition	On			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	FREQUENCY OF CHECKS	MIL ILLUM.
					No DTC set, pending or confirmed	Powertrain relay, P0685, P0686, P0687			
Secondary air injection pressure sensor	P2432	Circuit continuity check	Low voltage	< 0,3 V	Engine speed	Not moving, moving OR running		1 sec	Two DCY
	P2433		High voltage	> 4,7 V	Battery voltage	> 11,0 V		Continuous	
					Ignition	On			
	P2431	Rationality, comparison of system pressure sensor readings before engine cranking	AIR - turbocharger boost pressure	> 12 kPa	Vehicle speed	0		3 readings, 25 msec cycle time	Two DCY
			OR		Engine speed	0			
			AIR - MAP pressure	> 12 kPa	Ignition	On			
			AND		No DTC set, pending or confirmed	AIR pressure sensor circuit, P2432, P2433			
			MAP - turbocharger boost pressure	< 8 kPa		Turbo boost pressure circuit, P0237, P0238			
						MAP circuit, P0107, P0108			
			OR						
			AIR - turbocharger boost pressure	> 12 kPa					
			AND						
			MAP - turbocharger boost pressure	> 12 kPa					
			AND						
			AIR - MAP pressure	> 12 kPa					
Secondary air injection flow	Flow fault P0411 Valve stuck closed P2443 Pump stuck on P2444	Verification of secondary air pressure at normal AIR operation. Comparison of modeled and measured pressure	Flow restriction vs emission threshold, pressure ratio	> 1,4	AIR status	Active		15 secs	Two DCY
					Load MAF	1 - 20 g/second		Once / DCY	
			System leakage, one of three pipes disconnected at exhaust manifold, pressure ratio	< 0,8	Engine speed	Running			
					Time after engine start	> 8 sec			
					No DTC set, pending or confirmed	MAF sensor, P0101, P0102, P0103			
						AIR pressure sensor, P2431, P2432, P2433			
						IAT sensor, P0111, P0112, P0113			
						ECT sensor, P0115, P0117, P0118, P0119			
						Vehicle speed sensor, P0501			
						Air relay, P2257, P2258			