

S. No	Component/ System	Fault Path	Fault Type	Fault Code	Fault Class	CARB description	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Enable Cond. Value	Time Required	MIL Illum.
1	Engine coolant temperature sensor	circuit Hi/Open circuit	P 0118	Engine Coolant Temperature Sensor Circuit High / Open Circuit	Circuit check	Voltage of Manifold absolute pressure sensor is higher than 4.9V.	Higher than 98%	None	Key on	None	larger than 10Min	5sec. after Fault	Vehicle Soak over 5Min	Idle
		circuit Lo	P 0117	Engine Coolant Temperature Sensor Circuit Low	Circuit check	Voltage of Manifold absolute pressure sensor is lower than 0.1V	Lower than 2%	None	Key on	None	larger than 10Min	5sec. after Fault	Vehicle Soak over 5Min	Idle
		Performance	P 0116	Engine Coolant Temperature Sensor signal performance	Circuit check	Signal value change is no larger than 20 degrees centigrade when engine is fully warmed up compared to the startup temperature	Lower than 20°C	Engine speed Fuel Mass	1. Vehicle soaktime 2.Engine is running 3. Accumulated Fuel mass mets the require	1.soaktime is larger than 240Min 2.Fuel Mass larger than 300g	larger than 260Min	5sec. after Fault	Vehicle Soak over 240Min	Driving cycle
		Out of Range	P 1116	Engine Coolant Temperature Sensor signal out of range	Circuit check	Startup coolant temperature is higher than 60 degrees centigrade compared to the ambient temperature	Higher than 60°C	Engine speed	1. Vehicle soaktime is larger than 240Min 2.Engine is running	soaktime is larger than 240Min	larger than 260Min	5sec. after Fault	Vehicle Soak over 240Min	Driving cycle
2	Crankshaft position sensor	Device not present	P 0335	Crankshaft Position Sensor "A" Circuit	Circuit check	the corresponding feedback is different from the command	/	None	Engine is turning	None	larger than 10S	5sec. after Fault	None	Engine Running
3	Ignition Coil "A" Primary Control Circuit	circuit Lo/Open circuit	P 2300	Ignition Coil "A" Primary Control Circuit Low / Open Circuit	Circuit check	the corresponding feedback is different from the command	/	None	Key on/Engine is turning	None	larger than 10S	5sec. after Fault	None	Key ON
4	Throttle position sensor	Short Hi	P 0123	Throttle Position Sensor/Switch "A" Circuit High	Circuit check	Voltage of throttle position sensor is higher than 4.75V.	/	None	Key on	None	larger than 10S	5sec. after Fault	None	Engine Running
		Short Lo/Open	P 0122	Throttle Position Sensor/Switch "A" Circuit Low / Open Circuit	Circuit check	Voltage of throttle position sensor is lower than 0.25V.	/	None	Key on	None	larger than 10S	5sec. after Fault	None	Key ON
5	Fuel Pump	circuit Hi	P 0232	Fuel Pump circuit short High	Circuit check	the corresponding feedback is different from the command	/	None	Engine is turning	None	larger than 10S	5sec. after Fault	None	Engine Running
		circuit Lo/Open circuit	P 0231	Fuel Pump circuit short Low / Open Circuit	Circuit check	the corresponding feedback is different from the command	/	None	Key on	None	larger than 10S	5sec. after Fault	None	Key ON
6	ECM	Memory Checksum	P 0601	Internal Control Module Memory Checksum Error	Software Check	CVN check	/	None	Key on	None	larger than 10S	5sec. after Fault	None	Key ON
7	Cylinder 1 Fuel Injector	circuit Hi	P 0262	Cylinder 1 Fuel Injector "A" Circuit High	Circuit check	the corresponding feedback is different from the command	/	None	Engine is turning	None	larger than 10S	5sec. after Fault	None	Engine Running
		circuit Lo/Open circuit	P 0261	Cylinder 1 Fuel Injector "A" Circuit Low / Open Circuit	Circuit check	the corresponding feedback is different from the command	/	None	Key on	None	larger than 10S	5sec. after Fault	None	Key ON
8	Manifold Absolute Pressure Sensor	circuit Hi	P 0108	Manifold Absolute Pressure Sensor Circuit High	Circuit check	Voltage of Manifold absolute pressure sensor is higher than 4.9V.	Higher than 98%	None	Key on	None	larger than 10S	5sec. after Fault	None	Key ON
		circuit Lo/Open circuit	P 0107	Manifold Absolute Pressure Sensor Circuit Low/Open Circuit	Circuit check	Voltage of Manifold absolute pressure sensor is lower than 0.1V	Lower than 2%	None	Key on	None	larger than 10S	5sec. after Fault	None	Key ON
		Performance	P 3106	Manifold Absolute Pressure Sensor rationality at low TPS	Circuit check	MAP Signal value is lower than some threshold during stable Running situation	Lower than 30KPA	Engine Speed	Engine is running	None	larger than 10S	5sec. after Fault	None	Driving cycle

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8	Manifold Absolute Pressure Sensor	Signal Stuck	P 0105	Manifold Absolute Pressure Sensor signal stuck	Circuit check	MAP Signal change is lower than 10kpa during Crank to Run and Running situation	Delta Change lower than 10KPA	None	Engine is running	None	larger than 10S	5sec. after Fault	Vehicle Soak over 5Min	Engine Running
9	Intake Air Temperature Sensor	circuit Hi/Open circuit	P 0113	Intake Air Temperature Sensor Circuit High / Open Circuit	Circuit check	Voltage of Manifold absolute pressure sensor is higher than 4.9V.	Higher than 98%	None	Key on	None	larger than 10S	5sec. after Fault	None	Key ON
		circuit Lo	P 0112	Intake Air Temperature Sensor Circuit Low	Circuit check	Voltage of Manifold absolute pressure sensor is lower than 0.1V	Lower than 2%	None	Key on	None	larger than 10S	5sec. after Fault	None	Key ON
		Signal Stuck	P 0111	Intake Air Temperature Sensor signal stuck	Circuit check	Intake Air Temperature value change is no larger than 2 degrees centigrade when engine is fully warmed up compared to the startup temperature	Lower than 2°C	Engine speed Air Mass	Engine is running Air Mass	Air Mass larger than 2000g	larger than 260Min	5sec. after Fault	Vehicle Soak over 240Min	Driving cycle
		Performance	P 0114	Intake Air Temperature Sensor Circuit Intermittent	Circuit check	Intake Air temperature Sensor signal erratic change rate is larger than 3.2degrees centigrade	Delta Change Higher than 2°C	None	Key on	None	3Min	5sec. after Fault	None	Key ON
10	O2 sensor 1 cylinder	circuit Hi	P 0132	O2 Sensor Circuit High Voltage Bank 1 Sensor 1	Circuit check	O2 voltage Higher than 1000mv	Higher than 1000mv	Engine speed, engine temperature	Engine is running	None	larger than 2Min	5sec. after Fault	None	Idle
		circuit Lo/Open circuit	P 0131	O2 Sensor Circuit Low Voltage Bank 1 Sensor 1 / Open Circuit	Circuit check	O2 voltage Lower than 30mv	Lower than 30mv	Engine speed, engine temperature	Engine is running	None	larger than 6Min	5sec. after Fault	None	Idle
		Out of Range	P 2195	O2 Sensor Signal Lean at PE Bank 1 Sensor 1	Circuit check	O2 signal is constantly lower than 400mv when PE mode is enabled	Lower than 400mv	Engine speed, TPS	1.Engine is running 2.PE mode is enabled	None	3Min	5sec. after Fault	None	Driving cycle
		Performance	P 014D	O2 Sensor Slow Response - Lean to Rich Bank 1 Sensor 1	Circuit check	O2 signal switching from lean state to rich state response rate time is longer than some calibrated value	Higher than 500ms	Engine speed, engine temperature	1.Engine is running 2.fuel closeloop control is enabled	None	larger than 15Min	5sec. after Fault	2 WMTC Stage 3 test	WMTC Stage 3 test
		Performance	P 014C	O2 Sensor Slow Response - Rich to Lean Bank 1 Sensor 1	Circuit check	O2 signal switching from Rich state to Lean state response rate time is longer than some calibrated value	Higher than 500ms	Engine speed, engine temperature	1.Engine is running 2.fuel closeloop control is enabled	None	larger than 15Min	5sec. after Fault	2 WMTC Stage 3 test	WMTC Stage 3 test
	O2 sensor Heater 1 cylinder	circuit Hi	P 0032	O2 Sensor Heater Control Circuit High Bank 1 Sensor 1	Circuit check	the corresponding feedback is different from the command	/	Engine speed	Engine is running	None	larger than 10S	5sec. after Fault	None	Key ON
		circuit Lo/Open circuit	P 0031	O2 Sensor Heater Control Circuit Low Bank 1 Sensor 1 / Open Circuit	Circuit check	the corresponding feedback is different from the command	/	None	Key on	None	larger than 10S	5sec. after Fault	None	Idle
		performance	P 00D1	O2 Sensor Heater current low Bank 1 Sensor 1	Circuit check	Low O2 heater current input	0.1A	Engine speed	Engine is running	None	larger than 4Min	5sec. after Fault	None	Idle
11	Misfire detection	performance	P 0301	Cylinder 1 Misfire Detected	Circuit check	Misfire incident creation	Misfire ratio determined by Emission	Engine speed, TPS	Engine is running	None	larger than 15Min	5sec. after Fault	2 WMTC Stage 3 test	WMTC Stage 3 test
12	Vehicle Speed Sensor detection	performance	P 0500	Vehicle Speed Sensor "A" Circuit	Circuit check	Vehicle speed plus signal input	/	Engine speed	Engine is running	None	2 Min	5sec. after Fault	None	Driving cycle
13	Catalyst Efficiency detection	performance	P 0420	Catalyst System Efficiency Below Threshold Bank 1	Circuit check	oxygen storage capacity	4.3S	Engine speed TPS	Engine is running	None	larger than 15Min	5sec. after Fault	2 WMTC Stage 3 test	WMTC Stage 3 test

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14	Rear O2 sensor 1 cylinder	circuit Hi	P 1138	O2S Heater Control Circuit Low Bank 1 Sensor 2	Circuit check	O2 voltage Higher than 1000mv	Higher than 1000mv	Engine speed, engine temperature	Engine is running	None	larger than 2Min	5sec. after Fault	None	Idle
		circuit Lo/Open circuit	P 1137	O2S Heater Control Circuit High Bank 1 Sensor 2	Circuit check	O2 voltage Lower than 30mv	Lower than 30mv	Engine speed, engine temperature	Engine is running	None	larger than 6Min	5sec. after Fault	None	Idle
		Performance	P 2A01	O2 Sensor Circuit Range/Performance Bank 1 Sensor 2	Circuit check	the average response time of the rear O2 reaches a maximum limit during DFCO	Higher than 0.7S	Engine speed, TPS	1.Engine is running 2.DFCO mode is enabled	None	3Min	5sec. after Fault	None	Driving cycle
		Performance	P 013B	O2 Sensor Slow Response - Lean to Rich Bank 1 Sensor 2	Circuit check	the Rear O2 Sensor's response From Lean to Rich to a Power Enrichment event	Higher than 3.0S	Engine speed, engine temperature	1.Engine is running 2.PE mode is enabled	None	larger than 15Min	5sec. after Fault	None	Driving cycle
	Rear O2 sensor Heater 1 cylinder	circuit Hi	P 1037	O2S Heater Control Circuit High Bank 1 Sensor 2	Circuit check	the corresponding feedback is different from the command	/	Engine speed	Engine is running	None	larger than 10S	5sec. after Fault	None	Key ON
		circuit Lo/Open circuit	P 1038	O2S Heater Control Circuit Low Bank 1 Sensor 2	Circuit check	the corresponding feedback is different from the command	/	None	Key on	None	larger than 10S	5sec. after Fault	None	Idle
		performance	P 00D2	HO2S Heater Control Circuit Range/Performance Bank 1 Sensor 2	Circuit check	Low O2 heater current input	0.1A	Engine speed	Engine is running	None	larger than 4Min	5sec. after Fault	None	Idle
15	Idle air control system	performance	P 0505	Idle air control system error	Circuit check	Engine Speed higher than 500rpm comparing to the target warmed up engine speed	Idle speed higher than 500rpm to the target	Engine speed	Engine is running in idle mode	None	larger than 6Min	5sec. after Fault	None	Idle