Component	Fault code	Description of DTC	Description
Crankshaft Position Sensor	P 0335	Crankshaft Position Sensor "A" Circuit	Engine Power loss
	P 2301	Ignition Coil "A" Primary Control Circuit High	
Ignition Coil 1 Cylinder	P 2300	Ignition Coil "A" Primary Control Circuit Low / Open Circuit	Engine Power loss
	P 0123	Throttle Position Sensor/Switch "A" Circuit High	
Throttle Position Sensor	P 0122	Throttle Position Sensor/Switch "A" Circuit Low / Open Circuit	Default value of TPS, Engine Torque reduction or stall
	P 0232	Fuel Pump circuit short High	
Fuel Pump	P 0231	Fuel Pump circuit short Low / Open Circuit	Engine Power loss
ECM	P 0601	Internal Control Module Memory Checksum Error	No fuel injection,Engine Power loss
	P 0262	Cylinder 1 Fuel Injector "A" Circuit High	
	P 0261	Cylinder 1 Fuel Injector "A" Circuit Low / Open Circuit	
Fuel Injector 1 Cylinder	P 0264	Cylinder 1 Fuel Injector "B" Circuit Low / Open Circuit	No fuel injection,Engine Power loss

## Service 01

PID Description  1 Monitor status since DTCs cleared  MIL, # of DTC's Number of Emission D.T.C.(s)  MII. Status  Continuous Diagnostic Test Supported  Misfire Monitoring Fuel System Monitoring Comprehensive Component Monitoring Reserved/J1979  Misfire Monitoring Tests Complete = 0 Fuel System Monitoring Tests Complete = 0 Comprehensive Component Monitoring Tests Complete = 0 Reserved/J1979  Non-Continuous Test Supported Enhanced Evaporative Purge System Oxygen Sensor Oxygen Sensor Oxygen Sensor Heater Non-Continuous Test Results Enhanced Evaporative Purge System Test Complete Oxygen Sensor Heater Non-Continuous Test Complete Oxygen Sensor Heater Test Complete Oxygen Sensor Heater Test Complete Oxygen Sensor Heater Test Complete  Oxygen Sensor Heater Test Complete  Oxygen Sensor Heater Test Complete  Oxygen Sensor Heater Test Complete  Oxygen Sensor Heater Test Complete  Oxygen Sensor Heater Test Complete  Oxygen Sensor Heater Test Complete  Oxygen Sensor Heater Test Complete  Oxygen Sensor Heater Test Complete  Oxygen Sensor Heater Test Complete  Oxygen Sensor Heater Test Complete  Oxygen Sensor Heater Test Complete  Oxygen Sensor Heater Test Complete  Oxygen Sensor Heater Test Complete  Oxygen Sensor Heater Test Complete  Oxygen Sensor Heater Test Complete  Oxygen Sensor Heater Test Complete  Oxygen Sensor Heater Test Complete  Oxygen Sensor Heater Test Complete  Oxygen Sensor Heater Heat Sensor Heater Heater Hea	rvice 01	
MIL, # of DTC's Number of Emission D.T.C.(s) MIL Status Continuous Diagnostic Test Supported Misfire Monitoring Fuel System Monitoring Comprehensive Component Monitoring Reserved/J1979 Misfire Monitoring Tests Complete = 0 Fuel System Monitoring Tests Complete = 0 Comprehensive Component Monitoring Tests Complete = 0 Reserved/J1979 Non-Continuous Test Supported Enhanced Evaporative Purge System Oxygen Sensor Oxygen Sensor Oxygen Sensor Heater Non-Continuous Test Results Enhanced Evaporative Purge System Test Complete Oxygen Sensor Test Complete Oxygen Sensor Test Complete Oxygen Sensor Test Complete Oxygen Sensor Heater Test Complete Oxygen Sensor Heater Test Complete Oxygen Sensor Heater Test Complete Oxygen Sensor Heater Test Complete Oxygen Sensor Heater Test Complete Oxygen Sensor Test Complete Oxygen Sensor Test Test Complete Oxygen Sensor Test Test Status (Fuel System 1) Current Fuel System Status (Fuel System 2)  44 Current Calculated Load value  05 Current Undefaulted Coolant Temperature  06 Current Short Term Fuel Trim (Bank 1)  07 Current Long Term Fuel Trim (Bank 1)  08 Current Undefaulted Manifold Absolute Pressure  0C Current Undefaulted Manifold Absolute Pressure  0C Current Undefaulted Manifold Absolute Pressure  0C Current Undefaulted Manifold Absolute Pressure  11 Current Undefaulted Intake Air Temperature  12 Current Undefaulted Absolute Throttle Position A  13 Location of Manufacturer equipped O2 sensors  14 (B1-S1) Undefaulted O2 Voltage (B2-S1) Undefaulted O2 Voltage (B2-S1) Undefaulted O2 Voltage (B3-S1) Short Term Fuel Trim  10 Con-board Diagnostic System type	PID	Description
Number of Emission D.T.C.(s) MIL Status Continuous Diagnostic Test Supported Misfire Monitoring Fuel System Monitoring Comprehensive Component Monitoring Reserved/J1979 Misfire Monitoring Tests Complete = 0 Fuel System Monitoring Tests Complete = 0 Fuel System Monitoring Tests Complete = 0 Comprehensive Component Monitoring Tests Complete = 0 Reserved/J1979 Non-Continuous Test Supported Enhanced Evaporative Purge System Oxygen Sensor Oxygen Sensor Heater Non-Continuous Test Results Enhanced Evaporative Purge System Test Complete Oxygen Sensor Heater Non-Continuous Test Results Enhanced Evaporative Purge System Test Complete Oxygen Sensor Heater Non-Continuous Test Complete Oxygen Sensor Heater Test Sensor	01	Monitor status since DTCs cleared
MIL Status Continuous Diagnostic Test Supported Misfire Monitoring Fuel System Monitoring Comprehensive Component Monitoring Reserved/J1979 Misfire Monitoring Tests Complete = 0 Fuel System Monitoring Tests Complete = 0 Comprehensive Component Monitoring Tests Complete = 0 Reserved/J1979 Non-Continuous Test Supported Enhanced Evaporative Purge System Oxygen Sensor Oxygen Sensor Heater Non-Continuous Test Results Enhanced Evaporative Purge System Test Complete Oxygen Sensor Test Complete Oxygen Sensor Test Complete Oxygen Sensor Heater Test Occupated Oxygen Sensor Heater Test Complete Oxygen Sensor Heater Test Occupated System 1) Current Fuel System Status (Fuel System 1) Current Fuel System Status (Fuel System 2)  4 Current Fuel System Status (Fuel System 2)  5 Current Undefaulted Coalant Temperature  6 Current Undefaulted Trim (Bank 1)  7 Current Long Term Fuel Trim (Bank 2)  6 Current Undefaulted Manifold Absolute Pressure  6 Current Undefaulted Manifold Absolute Pressure  7 Current Undefaulted Manifold Absolute Pressure  8 Current Undefaulted Manifold Absolute Tertine Testure  9 Current Undefaulted Manifold Absolute Tertine Testure  11 Current Undefaulted Intake Air Temperature  12 Current Undefaulted Vehicle Speed  8 Current Undefaulted Ox Voltage (B1-S1) Undefaulted Ox Voltage (B2-S1) Undefaulted Ox Voltage (B2-S1) Short Term Fuel Trim  16 On-board Diagnostic System type		MIL, # of DTC's
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Non-Continuous Test Results Enhanced Evaporative Purge System Test Complete Oxygen Sensor Test Complete Oxygen Sensor Heater Test Complete  03		
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Oxygen Sensor Heater Test Complete  03		
Current Fuel System Status (Fuel System. 1) Current Fuel System Status (Fuel System 2)  04		
Current Fuel System Status (Fuel System 2)  04		
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09 Current Long Term Fuel Trim (Bank2) 0B Current Undefaulted Manifold Absolute Pressure 0C Current Undefaulted Engine RPM 0D Current Undefaulted Vehicle Speed 0E Current Commanded Ignition timing advance Cyl#1 0F Current Undefaulted Intake Air Temperature 11 Current Undefaulted Absolute Throttle Position A 13 Location of Manufacturer equipped O2 sensors 14 (B1-S1) Undefaulted O2 Voltage (B1-S1) Short Term Fuel Trim 18 (B2-S1) Undefaulted O2 Voltage (B2-S1) Short Term Fuel Trim 1C On-board Diagnostic System type		
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(B1-S1) Short Term Fuel Trim  18 (B2-S1) Undefaulted O2 Voltage (B2-S1) Short Term Fuel Trim  1C On-board Diagnostic System type		
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(B2-S1) Short Term Fuel Trim 1C On-board Diagnostic System type	10	
1C On-board Diagnostic System type	18	
8 7 71	10	
I III I Tima Sinca Engina Start		9 7 71
	1F	Time Since Engine Start
20 Supported Mode 1 PIDS \$21- \$40		
21 MIL On Odometer		
2F Fuel Level Input	2F	Fuel Level Input
33 Barometric Pressure	33	
40 Supported Mode 1 PIDS \$41- \$60	40	
4D Time run by the engine while MIL is activated	4D	
51 Type of fuel currently being	51	
utilized by the vehicle		
60 Supported Mode 1 PIDS \$61- \$80	60	
7F Support of Engine Run Time	7F	
Total Engine Run Time		
Total Idle Run Time		
Total Run Time With PTO Active		Total Run Time With PTO Active

## Service 02

Outputs	Description
02	Failure ID
03	Current Fuel System Status (Fuel System. 1)
	Current Fuel System Status (Fuel System 2)
04	Current Calculated Load value
05	Current Undefaulted Coolant Temperature
07	Current Long Term Fuel Trim - (Bank 1)
09	Current Long Term Fuel Trim - (Bank 2)
0B	Current Undefaulted Manifold Absolute Pressure
0C	Current Undefaulted Engine RPM
0D	Current Undefaulted Vehicle Speed
11	Current Undefaulted Absolute Throttle Position A
7F	Support of Engine Run Time
	Total Engine Run Time
	Total Idle Run Time
	Total Run Time With PTO Active

Fault code	Description of DTC	Fault Class	Active MIL
P 0118	Engine Coolant Temperature Sensor Circuit High / Open Circuit	1	√
P 0117	Engine Coolant Temperature Sensor Circuit Low	1	√
P 0116	Engine Coolant Temperature Sensor signal performance	2	√
P 1116	Engine Coolant Temperature Sensor signal out of range	2	√
P 0335	Crankshaft Position Sensor "A" Circuit	1	√
P 2301	Ignition Coil "A" Primary Control Circuit High	1	1
P 2300	Ignition Coil "A" Primary Control Circuit Low / Open Circuit	1	√
P 0123	Throttle Position Sensor/Switch "A" Circuit High	1	√
P 0122	Throttle Position Sensor/Switch "A" Circuit Low / Open Circuit	1	√
P 0232	Fuel Pump circuit short High	1	√
P 0231	Fuel Pump circuit short Low / Open Circuit	1	√
P 0601	Internal Control Module Memory Checksum Error	1	√
P 0262	Cylinder 1 Fuel Injector "A" Circuit High	1	√
	Cylinder 1 Fuel Injector "A" Circuit Low / Open Circuit	1	√
	Manifold Absolute Pressure Sensor Circuit High	1	√
P 0107	Manifold Absolute Pressure Sensor Circuit Low/Open Circuit	1	<b>√</b>
P 3106	Manifold Absolute Pressure Sensor rationality at low TPS	2	✓
P 0105	Manifold Absolute Pressure Sensor signal stuck	2	√
P 0113	Intake Air Temperature Sensor Circuit High / Open Circuit	1	√
P 0112	Intake Air Temperature Sensor Circuit Low	1	√
P 0111	Intake Air Temperature Sensor signal stuck	2	√
P 0114	Intake Air Temperature Sensor Circuit Intermittent	2	√
P 0132	O2 Sensor Circuit High Voltage Bank 1 Sensor 1	1	√
	O2 Sensor Circuit Low Voltage Bank 1 Sensor 1 / Open Circuit	1	√
	O2 Sensor Signal Lean at PE Bank 1 Sensor 1	2	√
	O2 Sensor Slow Response - Lean to Rich Bank 1 Sensor 1	3	√
P 014C	O2 Sensor Slow Response - Rich to Lean Bank 1 Sensor 1	3	√
P 0031	O2 Sensor Heater Control Circuit Low Bank 1 Sensor 1 / Open Circuit	1	√
P 0032	O2 Sensor Heater Control Circuit High Bank 1 Sensor 1	1	√
P 00D1	O2 Sensor Heater current low Bank 1 Sensor 1	2	√
	O2 Sensor Heater current low Bank 2 Sensor 1	2	√
P 0301	Cylinder 1 Misfire Detected	3	√
P 0500	Vehicle Speed Sensor "A" Circuit	2	√
P 0505	Idle air control system error	2	√
P 0562	System Voltage Low	1	√
	System Voltage High	1	√
	Catalyst System Efficiency Below Threshold Bank 1	3	√
	O2 Sensor Slow Response - Lean to Rich Bank 1 Sensor 2	2	√
	O2 Sensor Circuit Range/Performance Bank 1 Sensor 2	2	√
	HO2S Heater Control Circuit Range/Performance Bank 1 Sensor 2	2	√
P 1037	O2 Sensor Circuit High Voltage Bank 1 Sensor 2	1	√
	O2 Sensor Circuit Low Voltage Bank 1 Sensor 2	1	<b>√</b>
P 1137	HO2S Heater Control Circuit Low Bank 1 Sensor 2	1	√
P 1138	HO2S Heater Control Circuit Low Bank 1 Sensor 2	1	✓

## Service 06-CAN

MID	TID	Component	Parameter	Parameter	Test Value	Min/Max Test	Description
				Scalling ID		limit	
\$01	\$05	O2 Bank-1 Sensor-1	Rich to Lean sensor Switch Time (calculated)	\$10 1ms/bit	Calculated	Min: 0 Max: 65535	average switch-time from Rich to Lean
\$01	\$06	O2 Bank-1 Sensor-1	Lean to Rich sensor Switch Time (calculated)	\$10 1ms/bit	Calculated	Min: 0 Max: 65535	average switch-time from Lean to Rich
\$41	\$B3	O2 Bank-1 Sensor-1	O2 Under Heat Resistance	\$14 1 Ohm/bit	Calculated	Min: 0 Max: 65535	O2 Resistance
\$A2	\$0C	Misfire Cylinder-1	Misfire Counts (calculated)	\$24 1count/bit	Calculated	Min: 0 Max: 65535	Misfire Counts for last/current driving cycle

## Service 09

Info Type	Description	Size in bytes	Applicable
04	Calibration ID's Calibration characters are ASCII	16	Y
06	Calibration Verification Number of calibration area	4	Y
	<b>OBD Monitoring Conditions Encountered Counts</b>	2	Y
	Ignition Cycle Counter	2	Y
	Catalyst Monitor Completion Counts Bank 1	2	Y
	Catalyst Monitor Conditions Encountered Counts Bank 1	2	Y
	<b>Catalyst Monitor Completion Counts Bank 2</b>	2	N
	Catalyst Monitor Conditions Encountered Counts Bank 2	2	N
	O2 Sensor Monitor Completion Counts Bank 1	2	Y
08	O2 Sensor Monitor Conditions Encountered Counts Bank 1	2	Y
	O2 Sensor Monitor Completion Counts Bank 2	2	N
	O2 Sensor Monitor Conditions Encountered Counts Bank 2	2	N
	EGR and/or VVT Monitor Completion Condition Counts	2	N
	EGR and/or VVT Monitor Conditions Encountered Counts	2	N
	AIR Monitor Completion Condition Counts(Secondary Air)	2	N
	AIR Monitor Conditions Encountered Counts(Secondary Air)	2	N
	Secondary O2 Sensor Monitor Completion Counts Bank 1	2	Y
	Secondary O2 Sensor Monitor Conditions Encountered Counts Bank 1	2	Y
	Secondary O2 Sensor Monitor Completion Counts Bank 2	2	N
	Secondary O2 Sensor Monitor Conditions Encountered Counts Bank 2	2	N