2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
MASS AIR FLOW SYSTEM PERFORMANCE (RATIONALITY)	P0101	This DTC determines if the MAF sensor is stuck within the normal operating range	Calculated Flow – Measured Flow > cal (table) Table look up as a function of calculated flow	Engine running TP sensor DTC's not active MAP sensor DTC's not active Evap DTC's not active EGR DTC P0401 not active MAF sensor high/low DTC's not active Crank sensor DTC's not active IAT sensor DTC's not active EGR flow diagnostic not active Traction control not active System voltage > 11.5 but < 18V Canister Purge DC ≤ 100% TP Δ ≤ 5% EGR DC ≤ 100% EGR Pintle Position ≤ 100% Engine vacuum ≤ 80 kPa Throttle Position ≤ 95% The above must be present for a period of time greater than 2 seconds	50 test failures in a 100 test sample The Mass Air Flow reading and Mass Air Flow calculation are performed during the same cylinder event every 100 ms.	DTC Type B
MASS AIR FLOW SENSOR CIRCUIT LOW FREQUENCY	P0102	Detects a continuous short to low or a open in either the signal circuit or the MAF sensor	*LOW FREQUENCY TEST*: MAF ≤ 10 Hz	*LOW FREQUENCY TEST* Engine Running Engine Run Time ≥ 0.5 seconds Engine Speed ≥ 300 RPM System Voltage ≥ 8 volts The above must be present for a period of time greater than 0 seconds	*LOW FREQUENCY TEST*: 6 test failures in a 12 test sample. 1 sample per 100 ms Test is run at every reading of the Mass Air Flow sensor frequency	DTC Type B
MASS AIR FLOW SENSOR CIRCUIT HIGH FREQUENCY	P0103	Detects a continuous short to high in either the signal circuit or the MAF sensor	*HIGH FREQUENCY TEST:* MAF ≥ 13000 Hz	*HIGH FREQUENCY TEST:* Engine Running Engine Run Time ≥ 0.5 seconds Engine Speed ≥ 300 RPM System Voltage ≥ 8 volts The above must be present for a period of time greater than 0 seconds	*HIGH FREQUENCY TEST:* 12 test failures in a 24 test sample. 1 sample per 100 ms Test is run at every reading of the Mass Air Flow sensor frequency	DTC Type B

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
MAP SENSOR RANGE/ PERFORMANCE (RATIONALITY)	P0106	This DTC determines if the MAP sensor is stuck within the normal operation range	MAP (kPa) > or < predicted MAP (lookup table as a function of TPS and RPM)	Engine Running MAP sensor DTC's not active TP sensor DTC's not active MAF circuit DTC's not active Evap DTC's not active Traction Control not active Engine Speed Δ 500 RPM Throttle Position Δ < 100% Idle Air Δ 10 gr/sec EGR Position Max Δ < 20% Brake Switch State = no change Clutch Switch State = no change Power Steering = Stable PTO = not active AC Clutch State = no change Above stabilized for 1 second EGR DTC's not active Engine Speed ≥ 400 RPM Engine Speed ≤ 5000 RPM	15 test failures within a 60 test sample 1 sample/sec	DTC Type B
MANIFOLD ABSOLUTE PRESSURE SENSOR CIRCUIT LOW	P0107	This DTC detects a continuous short to low or open in either the signal circuit or the MAP sensor.	Raw MAP < .04 volts (3 counts)	TP sensor DTC's not active Engine Running Throttle Position is ≥ 0% when engine speed is ≤ 800 RPM or Throttle Position is ≥ 12.5 % when engine speed is > 800 RPM No 5v ref. DTC's	40 test failures in a 100 test sample. 1 sample/100 ms	DTC Type B
MANIFOLD ABSOLUTE PRESSURE SENSOR CIRCUIT HIGH	P0108	This DTC detects an open sensor ground or continuous short to high in either the signal circuit or the MAP sensor	Raw MAP > 4.4 Volts (222 counts)	Cold Start Run Time – Table value in seconds based on Powerup Coolant Temperature ***Run Test*** TP sensor DTC's not active Engine Running Throttle Position is ≤ 0.4 % when engine speed is ≤ 1200 RPM or Throttle Position is ≤ 20 % when engine speed is > 1200 RPM	40 test failures in a 100 test sample. 1 sample/100 ms	DTC Type B
INTAKE AIR TEMP SENSOR CIRCUIT LOW (HIGH TEMP)	P0112	This DTC detects a continuous short to ground in the IAT signal circuit or the IAT sensor	Raw IAT < .244 Volts	VS sensor DTC's not active Vehicle speed ≥ 25 mph Engine run time > 100 seconds	55 test failures in a 1000 test sample 1 sample/sec	DTC Type B

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18)
ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
INTAKE AIR TEMP SENSOR CIRCUIT HIGH (LOW TEMP)	P0113	This DTC detects a continuous open or short to high in the IAT signal circuit or the IAT sensor	Low Resistance Pull-up Raw IAT > 4.95 Volts High Resistance pull-up Raw IAT > 4.95 Volts	MAF sensor DTC's not active ECT sensor DTC's not active VS sensor DTC's not active Coolant Temperature > 135 °C Mass Air Flow < 15 g/sec Vehicle Speed < 7 mph Engine run time > 100 seconds	55 test failures in a 1000 test sample. 1 sample/sec	DTC Type B
ENGINE COOLANT TEMP SENSOR RATIONALITY (HIGH-SIDED)	P0116	Detects coolant temp sensor stuck in mid range	ECT – IAT > 10°C	Soak time > 10 hours IAT > -7°C	Immediate when enable conditions are met	DTC Type B
ENGINE COOLANT TEMP SENSOR CIRCUIT LOW (HIGH TEMP)	P0117	This DTC detects a continuous short to ground in the ECT signal circuit or the ECT sensor.	Low Resistance Pull-up Raw ECT < .234 Volts High Resistance Pull-up Raw ECT < .003 Volts	Engine run time > 10 seconds Or Engine run time < 10 seconds IAT < 50° C	45 test failures in a 50 test sample. 1 sample/sec	DTC Type B
ENGINE COOLANT TEMP SENSOR CIRCUIT HIGH (LOW TEMP)	P0118	Circuit Continuity This DTC detects a continuous short to high or open in the ECT signal circuit or the ECT sensor.	Low Resistance Pull-up Raw IAT > 4.93 Volts High Resistance pull-up Raw IAT > 4.95 Volts	Engine run time > 60 seconds Or Engine run time < 60 seconds IAT > 0° C	45 test failures in a 50 test sample. 1 sample/sec Continuous	DTC Type B
TP SENSOR CIRCUIT PERFORMANCE	P0121	The DTC determines if a TPS sensor is stuck within the normal operating range	***Stuck high test:*** The last throttle position value is > predicted throttle position based on engine RPM. ***Stuck low test:*** The last throttle position value is < predicted throttle position based on engine RPM	***Test Enable:*** Engine Coolant Temp > 70° C No TP sensor short DTC's active No IAC DTC's active No MAP DTC's active No MAF DTC's active Engine run time > 120 sec BARO not defaulted TP < 1.5% MAP stable time > 1 sec ***Stuck high test:*** MAP < 31.8 kPa ***Stuck low test:*** Stuck high test has passed MAP > 77.5 kPa IAC > 0 counts but < 255 counts	***Stuck high test:*** 150 test failures within a 200 test sample ***Stuck low test:*** 150 test failures within a 200 test sample 1 sample/100ms	DTC Type B

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
TP SENSOR CIRCUIT LOW	P0122	This DTC detects a continuous short to low or open in either the signal circuit or the TP sensor	TP sensor signal voltage < .149 volts (7.6 counts)	No 5v ref DTC's	90 test failures in a 100 test sample size. 1 sample/100ms	DTC Type B
TP SENSOR CIRCUIT HIGH	P0123	This DTC detects a continuous short to high in either the signal circuit or the TP sensor.	TP sensor signal voltage > 4.89 volts. (249.9 counts)	No 5v ref DTC's	90 test failures in a 100 test sample size. 1 sample/100ms	DTC Type B
CLOSED LOOP TEMPERATURE NOT ACHIEVED (ENGINE COOLANT TEMPERATURE RATIONALITY)	P0125	Under driving conditions, closed loop temperature should be achieved based on amount of cumulative air flow ingested and based on startup coolant temperature	A table defines cumulative airflow based on startup coolant temperature past which closed loop temperature is not achieved, at an acceptable rate	13 gps < airflow < 75 gps Engine runtime < 2000 seconds before test completes Engine runtime > 120 seconds IAT > -7°C Vehicle speed > 5 mpg for 0.5 miles ECT at startup < 35°C	Once per trip Time based on flow	DTC Type B
COOLANT TEMPERATURE BELOW STAT REGULATING TEMPERATURE	P0128	Under driving conditions, stat regulating temperature should be achieved based on amount of cumulative airflow ingested, and based on startup coolant temperature	A table defines maximum cumulative airflow based on startup coolant temperature, at which stat regulating temperature must have been achieved	13 gps < airflow < 75 gps Engine runtime < 2000 seconds before test completes Engine runtime > 120 seconds IAT > -7°C Vehicle speed > 5 mpg for 0.5 miles ECT at startup < 73°C	Once per trip Time based on flow	DTC Type B
(B1S1) HEATED OXYGEN SENSOR CIRCUIT LOW	P0131	Circuit Continuity Detects an HO2S voltage stationary lean (low signal voltage) condition.	Oxygen sensor voltage below 87 mv	Closed Loop Fuel Control. TPS: 3-100% Fuel > 10% Minimum system voltage: 9v No AIR, EGR, Catalyst diagnostic active No Throttle, MAT, ,Camel Mode Injector, EST Control, Coolant, Crank Sensor,Knock sensor or Air Flow Faults active	500 test failures in a 600 test sample and polling the rear HO2S sensor twice. 100 ms/test Continuous	DTC Type B
(B1S1) HEATED OXYGEN SENSOR CIRCUIT HIGH	P0132	Circuit Continuity Detects an HO2S voltage stationary rich (high signal voltage) condition.	Oxygen sensor voltage above 977 mv	Closed Loop Fuel Control. TPS: 3-50 % Fuel > 10% Minimum system voltage: 9v No AIR, EGR, Catalyst diagnostic active No Throttle, MAT, Camel Mode Injector, EST Control, Coolant, Crank Sensor,Knock Sensor or Air Flow Faults active	400 test failures in a 500 test sample and polling the rear HO2S sensor twice. 100 ms/test Continuous	DTC Type B

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
(B1S1) HEATED OXYGEN SENSOR CIRCUIT SLOW RESPONSE	P0133	Detects slow rich to lean and lean to rich HO2S signal transition rates.	The oxygen sensor transitions between rich and lean states. HO2S sensor average transition time: L/R > 255 ms R/L > 255 ms	Closed Loop Fuel Control. 1100 < RPM < 3000 15 < Air Flow < 55g/sec. Minimum system voltage: 9v TPS > 5% Fuel > 10% ECT > 57 ° C CCP>0 Engine Run > 75 sec No Throttle, MAT, Camel mode Injector, EST Control, Coolant, Crank Sensor, Knock Sensor or Air Flow Faults active	100 sec Once per trip.	DTC Type B
(B1S1) HEATED OXYGEN SENSOR CIRCUIT NO ACTIVITY	P0134	Circuit Continuity Detects an HO2S circuit open.	Oxygen sensor voltage remains between 300-600 mv	Closed Loop Fuel Control. Minimum system voltage: 9v No AIR, EGR, Catalyst diagnostic active No Throttle, MAT ,Camel Mode Injector, EST Control, Coolant, Crank Sensor, Knock sensor or Air Flow Faults active Engine Run > 240 sec	800 test failures in a 1000test sample 100 ms/test Continuous.	DTC Type B
(B1S1) HEATED OXYGEN SENSOR HEATER CIRCUIT	P0135	Detects a malfunctioning HO2S heater circuit by comparing time to HO2S activity to a calibrated threshold.	Oxygen sensor time to activity exceeds a lookup table value as a function of average flow rate.	Cold Start (IAT & ECT <50 C and less than 8 degrees difference ABS(ECT-IAT)) Valid mid bias calculated 18 v > System Voltage >11 v. Avg Flow < 25 g/sec No AIR, EGR, Catalyst diagnostic active No Throttle, MAT ,Camel Mode Injector, EST Control, Coolant, Crank Sensor,Knock sensor, or Air Flow Faults active	Once per cold start trip.	DTC Type B

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
(B1S2) HEATED OXYGEN SENSOR CIRCUIT LOW	P0137	Circuit Continuity Detects an HO2S voltage stationary lean (low signal voltage) condition.	Oxygen sensor voltage remains below 26 mv <OR> Oxygen sensor voltage below 399 mv	Closed Loop Fuel Control. TPS: 3-100% Fuel > 10% Minimum system voltage: 9v No AIR, EGR, Catalyst diagnostic active No Throttle, MAT ,Camel Mode Injector, EST Control, Coolant, Crank Sensor Knock Sensor or Air Flow Faults active Power Enrichment active 2 sec Fuel > 10% Minimum system voltage: 9v No AIR, EGR, Catalyst diagnostic active No Throttle, MAT ,Camel Mode Injector, EST Control, Coolant, Crank Sensor,Knock Sensor or Air Flow Faults active	1100 test failures in a 1300 test sample and polling the front HO2S sensor twice. 100 ms/test Continuous 400 test failures in a 500test sample 100 ms/test Continuous	DTC Type B
(B1S2) HEATED OXYGEN SENSOR CIRCUIT HIGH	P0138	Circuit Continuity Detects an HO2S voltage stationary rich (high signal voltage) condition.	Oxygen sensor voltage above 994 mv <OR> Oxygen sensor voltage above 469 mv	Closed Loop Fuel Control. TPS: 3-50 % Fuel > 10% Minimum system voltage: 9v No AIR, EGR, Catalyst diagnostic active No Throttle, MAT, Camel Mode Injector, EST Control, Coolant, Crank Sensor,Knock Sensor or Air Flow Faults active Decel Fuel Cut Off active 2 sec Fuel > 10% Minimum system voltage: 9v No AIR, EGR, Catalyst diagnostic active No Throttle, MAT-,Camel Mode Injector, EST Control, Coolant, Crank Sensor, Knock Sensor or Air Flow Faults active	1100 test failures in a 1500 test sample and polling the front HO2S sensor twice. 100 ms/test Continuous 400 test failures in a 500 test sample 100 ms/test Continuous	DTC Type B

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
(B1S2) HEATED OXYGEN SENSOR CIRCUIT NO ACTIVITY	P0140	Circuit Continuity Detects an HO2S circuit open.	400v < B1S2 voltage < 473v	Closed Loop Fuel Control. Minimum system voltage: 9v Fuel >10% No AIR, EGR, Catalyst diagnostic active No Throttle, MAT ,Camel Mode Injector, EST Control, Coolant, Crank Sensor, Knock sensor or Air Flow Faults active Engine Run > 240 sec	950 test failures in a 1200 test sample 100 ms/test Once per trip	DTC Type B
(B1S2) HEATED OXYGEN SENSOR HEATER CIRCUIT	P0141	Detects a malfunctioning HO2S heater circuit by comparing time to HO2S activity to a calibrated threshold.	Oxygen sensor time to activity exceeds a lookup table value as a function of average flow rate.	Cold Start (IAT & ECT <50 C and less than 8 degrees difference ABS(ECT-IAT)) Valid mid bias calculated 18 v > System Voltage >11 v. Avg Flow < 25 g/sec No AIR, EGR, Catalyst diagnostic active No Throttle, MAT, Camel Mode Injector, EST Control, Coolant, Crank Sensor,Knock Sensor or Air Flow Faults active	Once per cold start trip.	DTC Type B
(B2S1) HEATED OXYGEN SENSOR CIRCUIT LOW	P0151	Circuit Continuity Detects an HO2S voltage stationary lean (low signal voltage) condition.	Oxygen sensor voltage below 87 mv	Closed Loop Fuel Control. TPS: 3-100% Fuel > 10% Minimum system voltage: 9v No AIR, EGR, Catalyst diagnostic active No Throttle, MAT ,Camel Mode Injector, EST Control, Coolant, Crank Sensor, Knock Sensor or Air Flow Faults active	500 test failures in a 600test sample and polling the rear HO2S sensor twice. 100 ms/test Continuous	DTC Type B
(B2S1) HEATED OXYGEN SENSOR CIRCUIT HIGH	P0152	Circuit Continuity Detects an HO2S voltage stationary rich (high signal voltage) condition.	Oxygen sensor voltage above 977 mv	Closed Loop Fuel Control. TPS: 3-50 % Fuel > 10% Minimum system voltage: 9v No AIR, EGR, Catalyst diagnostic active No Throttle, MAT , Camel Mode Injector, EST Control, Coolant, Crank Sensor, Knock Sensor or Air Flow Faults active	400 test failures in a 500 test sample and polling the rear HO2S sensor twice. 100 ms/test Continuous	DTC Type B

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
(B2S1) HEATED OXYGEN SENSOR CIRCUIT SLOW RESPONSE	P0153	Detects slow rich to lean and lean to rich HO2S signal transition rates.	The oxygen sensor transitions between rich and lean states. HO2S sensor average transition time: L/R > 255 ms R/L > 255 ms	Closed Loop Fuel Control. 1100 < RPM <3000 15 < Air Flow < 55 g/sec. Minimum system voltage: 9v Fuel > 10% ECT > 57 ° C CCP>0 Engine Run > 75 sec No Throttle, MAT , Camel Mode Injector, EST Control, Coolant, Crank Sensor, Knock Sensor or Air Flow Faults active	100 sec Once per trip.	DTC Type B
(B2S1) HEATED OXYGEN SENSOR CIRCUIT NO ACTIVITY	P0154	Circuit Continuity Detects an HO2S circuit open.	Oxygen sensor voltage remains between 300-600 mv	Closed Loop Fuel Control. Minimum system voltage: 9v Fuel > 10% No AIR, EGR, Catalyst diagnostic active No Throttle, MAT, Camel Mode, Injector, EST Control, Coolant, Crank Sensor, Knock Sensor or Air Flow Faults active Engine Run > 240 sec	800 test failures in a 1000 test sample 100 ms/test Continuous	DTC Type B
(B2S1) HEATED OXYGEN SENSOR HEATER CIRCUIT	P0155	Detects a malfunctioning HO2S heater circuit by comparing time to HO2S activity to a calibrated threshold.	Oxygen sensor time to activity exceeds a lookup table value as a function of average flow rate.	Cold Start (IAT & ECT <50 C and less than 8 degrees difference) Valid mid bias calculated 18 v > System Voltage >11 v. Avg flow < 25 g/sec No AIR, EGR, Catalyst diagnostic active No Throttle, MAT, Camel Mode, Injector, EST Control, Coolant, Crank Sensor, Knock Sensor or Air Flow Faults active	Once per cold start trip.	DTC Type B

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
(B2S2) HEATED OXYGEN SENSOR CIRCUIT LOW	*P0157	Circuit Continuity Detects an HO2S voltage stationary lean (low signal voltage) condition.	Oxygen sensor voltage remains below 26 mv <OR> Oxygen sensor voltage below 399 mv	Closed Loop Fuel Control. TPS: 3-100% Fuel > 10% Minimum system voltage: 9v No AIR, EGR, Catalyst diagnostic active No Throttle, MAT ,Camel Mode Injector, EST Control, Coolant, Crank Sensor Knock Sensor or Air Flow Faults active Power Enrichment active 2 sec Fuel > 10% Minimum system voltage: 9v No AIR, EGR, Catalyst diagnostic active No Throttle, MAT ,Camel Mode Injector, EST Control, Coolant, Crank Sensor,Knock Sensor or Air Flow Faults active	1100 test failures in a 1300 test sample and polling the front HO2S sensor twice. 100 ms/test Continuous 400 test failures in a 500test sample 100 ms/test Continuous	DTC Type B For use on vehicles with 4 sensors
(B2S2) HEATED OXYGEN SENSOR CIRCUIT HIGH	*P0158	Circuit Continuity Detects an HO2S voltage stationary rich (high signal voltage) condition.	Oxygen sensor voltage above 994 mv <OR> Oxygen sensor voltage above 469 mv	Closed Loop Fuel Control. TPS: 3-50 % Fuel > 10% Minimum system voltage: 9v No AIR, EGR, Catalyst diagnostic active No Throttle, MAT, Camel Mode Injector, EST Control, Coolant, Crank Sensor,Knock Sensor or Air Flow Faults active Decel Fuel Cut Off active 2 sec Fuel > 10% Minimum system voltage: 9v No AIR, EGR, Catalyst diagnostic active No Throttle, MAT-,Camel Mode Injector, EST Control, Coolant, Crank Sensor, Knock Sensor or Air Flow Faults active	1100 test failures in a 1500 test sample and polling the front HO2S sensor twice. 100 ms/test Continuous 400 test failures in a 500 test sample 100 ms/test Continuous	DTC Type B For use on vehicles with 4 sensors

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
(B2S2) HEATED OXYGEN SENSOR CIRCUIT NO ACTIVITY	*P0160	Circuit Continuity Detects an HO2S circuit open.	400v < B1S2 voltage < 473v	Closed Loop Fuel Control. Minimum system voltage: 9v Fuel >10% No AIR, EGR, Catalyst diagnostic active No Throttle, MAT ,Camel Mode Injector, EST Control, Coolant, Crank Sensor, Knock sensor or Air Flow Faults active Engine Run > 240 sec	950 test failures in a 1200 test sample 100 ms/test Once per trip	DTC Type B For use on vehicles with 4 sensors
(B2S2) HEATED OXYGEN SENSOR HEATER CIRCUIT	*P0161	Detects a malfunctioning HO2S heater circuit by comparing time to HO2S activity to a calibrated threshold.	Oxygen sensor time to activity exceeds a lookup table value as a function of average flow rate.	Cold Start (IAT & ECT <50 C and less than 8 degrees difference ABS(ECT-IAT)) Valid mid bias calculated 18 v > System Voltage >11 v. Avg Flow < 25 g/sec No AIR, EGR, Catalyst diagnostic active No Throttle, MAT, Camel Mode Injector, EST Control, Coolant, Crank Sensor,Knock Sensor or Air Flow Faults active	Once per cold start trip.	DTC Type B For use on vehicles with 4 sensors
BANK 1 FUEL TRIM SYSTEM LEAN	P0171	Determines if the fuel control system is in a lean condition	The normalized weighted long term fuel trim parameter > + 23.5%	No VSS, Throttle, Purge control, Misfire, MAT, MAP, - Camel Mode, Injector, EST Control, EGR Sensor, Coolant, Crank sensor, Air flow, AIR DTC's BARO > 74 KPa 115°C > ECT > 50°C 90 g/s > MAF > 5 g/s 90 Kpa > MAP > 26 KPa 90°C > IAT > -20°C 3000 rpm > Engine speed > 400 rpm TP < 90% VS < 85 mph Fuel Level > 10%	Continuous	DTC Type B

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
BANK 1 FUEL TRIM SYSTEM RICH	P0172	Determines if the fuel control system is in a rich condition	The normalized weighted long term fuel trim parameter < -15% and no excessive purge vapors present	No VSS, Throttle, Purge control, Misfire, MAT, MAP, - Camel Mode Injector, EST Control, EGR Sensor, Coolant, Crank sensor, Air flow, Knock Sensor or AIR DTC's BARO > 74 KPa 115°C > ECT > 50°C 90 g/s > MAF > 5 g/s 90 Kpa > MAP > 26 KPa 90°C > IAT > -20°C 3000 rpm > Engine speed > 400 rpm TP < 90% VS < 85 mph Excess Purge Test: 40 g/s > MAF > 12 g/s Purge Duty Cycle > 20% RPM > 800	Continuous Purge test 4 seconds	DTC Type B
BANK 2 FUEL TRIM SYSTEM LEAN	P0174	Determines if the fuel control system is in a lean condition	The normalized weighted long term fuel trim parameter > + 23.5 %	No VSS, Throttle, Purge control, Misfire, MAT, MAP, - Camel Mode, Injector, EST Control, EGR Sensor, Coolant, Crank sensor, Air flow, Knock Sensor or AIR DTC's BARO > 74 KPa 115°C > ECT > 50°C 90 g/s > MAF > 5 g/s 90 Kpa > MAP > 26 KPa 90°C > IAT > -20°C 3000 rpm > Engine speed > 400 rpm TP < 90% VS < 85 mph Fuel Level > 10%	Continuous	DTC Type B

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
BANK 2 FUEL TRIM SYSTEM RICH	P0175	Determines if the fuel control system is in a rich condition	The normalized weighted long term fuel trim parameter < -15% and no excessive purge vapors present	No VSS, Throttle, Purge control, Misfire, MAT, MAP, - Camel Mode, Injector, EST Control, EGR Sensor, Coolant, Crank sensor, Air flow, Knock Sensor or AIR DTC's BARO > 74 KPa 115°C > ECT > 50°C 90 g/s > MAF > 5 g/s 90 Kpa > MAP > 26 KPa 90°C > IAT > -20°C 3000 rpm > Engine speed > 400 rpm TP < 90% VS < 85 mph Excess Purge Test: 40 g/s > MAF > 12 g/s Purge Duty Cycle > 20% RPM > 800	Continuous Purge test 4 seconds	DTC Type B
Injector Control Circuit (ODM)	P0200	Circuit Continuity Control circuit voltage is monitored during operation. It should be low during operation and near B+ when "off".	The PCM detects that the commanded state of the driver and the actual state of the control circuit do not match.	Engine speed > 400 rpm. Ignition voltage > 6.0 volts, but < 18 volts	5 seconds Continuous.	DTC Type B
FUEL PUMP CONTROL CIRCUIT (ODM)	P0230	Circuit Continuity Control circuit voltage is monitored during operation. It should be high during operation and near 0 volts when "off".	The PCM detects that the commanded state of the driver and the actual state of the control circuit do not match.	Engine speed > 400 rpm. Ignition voltage > 6.0 volts, but < 18 volts	2.5 seconds Continuous.	DTC Type B

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
ENGINE MISFIRE DETECTED	P0300	These DTC's will determine if a multiple or a cylinder specific misfire is occurring by monitoring crankshaft velocity.	Deceleration index vs Engine speed vs Load with Engine position FTP Threshold - 1.31% I/M Threshold - 1.31% Fuel level > 10% (Does not disable if a Fuel System DTC is active.) Fuel Delay when below minimum level = 500 cycles Catalyst Damage – see Speed/Load chart	No MAF DTC's No Cam Position Sensor DTC's No Crank Position Sensor DTC's No Vehicle Speed Sensor DTC's No Engine Coolant Sensor DTC's No Throttle Position Sensor DTC's Engine speed > 450 RPM but ≤ 5000 RPM System voltage > 11 volts but < 18 volts + Throttle position D < 2.0% / 100 ms - Throttle position D < 2.0% / 100 ms ECT > -7C but < 130C If start up ECT below -7C then delayed until ECT is above 21C. Not a Rough Road - ABS Not an abusive engine speed condition Abusive engine speed = 6100 RPM Abusive engine speed delay = 1000 cycles	Emission Level: 5 failed 200 revolution blocks out of 16 or four (5 of 16) 100-engine cycle test after the first 16 tests Catalyst Damaging Level: 3 failed 200 revolution blocks out of 16 and the engine speed and load is inside the FTP region, or if the engine speed and load are outside the FTP region – 1 failed 200 revolution block Continuous	DTC Type B Catalyst Damaging DTC Type A (Flashes) DTC Type B Emission
KNOCK SENSOR CIRCUIT	P0325	Check knock detector integrated circuit.	Instant noise level greater than a defined value or instantaneous knock signal greater than a defined value for a defined time.	To run test: Engine run time > 10 sec	24 failed tests within 30 tests. Each test is 100 msec.	Lt Duty=DTC Type B Federal Hvy Duty=DTC Type B No MIL
KNOCK SENSOR 1 CIRCUIT LOW	P0327	Check knock sensor filtered noise level - front knock sensor	Delta filtered noise level outside of defined range. Filtered noise counts < 20 or > 254	To run test: 1800 < engine rpm < 3000 Coolant temp > 60° C Engine run time > 10 sec MAP < 44 kPa.	24 failed tests within 30 tests. Each test is 100 msec.	Lt Duty=DTC Type B Federal Hvy Duty=DTC Type B No MIL
KNOCK SENSOR 2 CIRCUIT LOW	*P0332	Check knock sensor filtered noise level - rear knock sensor	Delta filtered noise level outside of defined range. Filtered noise counts < 20 or > 254	To run test: 1800 < engine rpm < 3000 Coolant temp > 60° C Engine run time > 10 sec MAP < 44 kPa.	24 failed tests within 30 tests. Each test is 100 msec.	Lt Duty=DTC Type B Federal Hvy Duty=DTC Type B No MIL For use on 2 sensor applications

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
CRANKSHAFT POSITION SENSOR CIRCUIT	P0335	3X signal This diagnostic will detect if there is no output from the crankshaft position sensor.	No output (~0 volts) from the crankshaft position sensor.	Cam is transitioning Sensed mass airflow ≥ 2.8984 No Cam Position Sensor DTC's No Airflow DTC's PCM state = READY or CRANK	30 test failures in a 40 test sample. 100 ms/test Continuous	DTC Type B
CRANKSHAFT POSITION SENSOR CIRCUIT RANGE/PERF.	P0336	3X signal This diagnostic will detect occurrences when engine position is no longer known.	Crank position sensor signal missing for a time ≥ .5 seconds	PCM state = CRANK or RUN	50 test failures in a 3120 test sample. 50 ms/test Continuous	DTC Type B
CAMSHAFT POSITION SENSOR CIRCUIT RANGE/PERF.	P0341	Monitor for cam position state change when expected at crank-shaft sync.	Evaluated at crankshaft position synchronization.	Engine Running	15 Failures out of 100 100 ms/test Continuous	DTC Type B
CAMSHAFT POSITION SENSOR CIRCUIT LOW	P0342	Monitor for continuous low state when state should be high.	Evaluated at crankshaft position synchronization	Engine Running	15 Failures out of 50 100 msec / test Continuous	DTC Type B
CAMSHAFT POSITION SENSOR CIRCUIT HIGH	P0343	Monitor for continuous high state when state should be low.	Evaluated at crankshaft position synchronization	Engine Running	15 Failures out of 50 100 msec / test Continuous	DTC Type B
IGNITION CONTROL #1 CIRCUIT	P0351	Monitor EST channel A (Cylinder 1)	EST line is Stuck Low, is open, or is Stuck High. If engine speed is ≥ 1500 RPM test failures and samples count as 2.	10 Volts < Ignition Voltage < 18 Volts	30 Failures out of 100 12.5 msec / test Continuous	DTC Type B
IGNITION CONTROL #2 CIRCUIT	P0352	Monitor EST channel B (Cylinder 2)	EST line is Stuck Low, is open, or is Stuck High. If engine speed is ≥ 1500 RPM test failures and samples count as 2.	10 Volts < Ignition Voltage < 18 Volts	30 Failures out of 100 12.5 msec / test Continuous	DTC Type B Used on LS1/LS6/LR4/ LM7/LQ4/L18
IGNITION CONTROL #3 CIRCUIT	P0353	Monitor EST channel C (Cylinder 3)	EST line is Stuck Low, is open, or is Stuck High. If engine speed is ≥ 1500 RPM test failures and samples count as 2.	10 Volts < Ignition Voltage < 18 Volts	30 Failures out of 100 12.5 msec / test Continuous	DTC Type B Used on LS1/LS6/LR4/ LM7/LQ4/L18

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
IGNITION CONTROL #4 CIRCUIT	P0354	Monitor EST channel D (Cylinder 4)	EST line is Stuck Low, is open, or is Stuck High. If engine speed is ≥ 1500 RPM test failures and samples count as 2.	10 Volts < Ignition Voltage < 18 Volts	30 Failures out of 100 12.5 msec / test Continuous	DTC Type B Used on LS1/LS6/LR4/ LM7/LQ4/L18
IGNITION CONTROL #5 CIRCUIT	P0355	Monitor EST channel E (Cylinder 5)	EST line is Stuck Low, is open, or is Stuck High. If engine speed is ≥ 1500 RPM test failures and samples count as 2.	10 Volts < Ignition Voltage < 18 Volts	30 Failures out of 100 12.5 msec / test Continuous	DTC Type B Used on LS1/LS6/LR4/ LM7/LQ4/L18
IGNITION CONTROL #6 CIRCUIT	P0356	Monitor EST channel F (Cylinder 6)	EST line is Stuck Low, is open, or is Stuck High. If engine speed is ≥ 1500 RPM test failures and samples count as 2.	10 Volts < Ignition Voltage < 18 Volts	30 Failures out of 100 12.5 msec / test Continuous	DTC Type B Used on LS1/LS6/LR4/ LM7/LQ4/L18
IGNITION CONTROL #7 CIRCUIT	*P0357	Monitor EST channel G (Cylinder 7)	EST line is Stuck Low, is open, or is Stuck High. If engine speed is ≥ 1500 RPM test failures and samples count as 2.	10 Volts < Ignition Voltage < 18 Volts	30 Failures out of 100 12.5 msec / test Continuous	DTC Type B Used on V8 applications
IGNITION CONTROL #8 CIRCUIT	*P0358	Monitor EST channel H (Cylinder 8)	EST line is Stuck Low, is open, or is Stuck High. If engine speed is ≥ 1500 RPM test failures and samples count as 2.	10 Volts < Ignition Voltage < 18 Volts	30 Failures out of 100 12.5 msec / test Continuous	DTC Type B Used on V8 applications

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
EGR FLOW LOW	P0401	This DTC detects if EGR flow is insufficient.	Actual delta MAP change is less than a table lookup delta MAP change as a function of an EGR valve commanded position during a decel.	No TP DTCs set No MAP DTCs set No VSS DTCs set No IAT DTCs set No EGR Pintle DTCs set No System voltage DTCs set ECT between 60 ° C and 118 ° C IAT < 75 ° C System voltage between 11.7 volts and 18 volts Vehicle speed between 25 MPH and 70 MPH RPM between 800 RPM and 2000 RPM IAC not moving more than 2 steps BARO > 70 kpa MAP not changing more than .5 kpa TP < 1.1% VSS change < 4 MPH Not in DFCO	2 seconds Once per trip.	DTC Type A
EGR VALVE OPEN PINTLE POSITION ERROR	P0404	This DTC detects if the EGR desired vs actual pintle position error is too large.	The desired vs actual pintle position error > 10%. Position error counter > 125 counts.	System voltage 11.7 volts or greater. EGR flow test not in progress. Desired EGR position >0%. .	Continuous every 100 ms.	DTC Type B
EGR VALVE POSITION SENSOR CIRCUIT LOW VOLTAGE	P0405	This DTC detects if the pintle position feedback circuit is open or shorted to ground.	Pintle Position < 6 A/D counts for 10 seconds	System voltage 11.7 volts or greater.	0.10 seconds. Continuous every 100 ms.	DTC Type B

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
AIR INJECTION SYSTEM	P0410	HO2S sensors indicate lean condition present when AIR pump is turned on with 8% additional offset fuel being added during closed loop operation	Fails when: HO2S sensors are not < 222 mv for ≥ 1.3 seconds AND fuel integrator deltas are not ≥ 20% for each respective bank when pump turns on during closed loop operation	No MAF, MAP, MAT, ECT, TPS, HO2S, Purge, Engine Protection, Fuel Trim, Fuel Injector, EST, Crank sensor or Misfire DTCs set. Engine run > 2 sec Veh Speed ≥ 15 mph Baro ≥ 75kPa Air flow < 20 g/s A/F Ratio = 14.7:1 Engine Load < 33.25% of full engine load Ignition voltage > 11.7 PE, DFCO, COT not active Engine run ≥ 15 sec after closed loop operation Fuel integrator >.965% & < 1.035% Powerup Coolant Temp < 80°C RPM > 750 ECT ≥ 2°C ECT < 110 ° C IAT > 2 ° C and IAT < 100°C In BLM cells 4 & 5	4.0 seconds Up to 3 times	DTC Type B
AIR INJECTION SYSTEM SOLENOID CONTROL CIRCUIT MALF (ODM)	*P0412	Circuit Continuity Control circuit voltage is monitored during operation. It should be low during operation and near B+ when "off"	The PCM detects that the commanded state of the driver and the actual state of the control circuit do not match	Engine speed > 400 rpm Ignition voltage > 6.0 volts, but < 18 volts	5 seconds Continuous	DTC Type B For use on passenger cars
AIR INJECTION SYSTEM RELAY CONTROL CIRCUIT MALF (ODM)	P0418	Circuit Continuity Control circuit voltage is monitored during operation. It should be low during operation and near B+ when "off".	The PCM detects that the commanded state of the driver and the actual state of the control circuit do not match.	Engine speed > 400 rpm. Ignition voltage > 6.0 volts, but < 18 volts	5 seconds Continuous.	DTC Type B

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
CATALYTIC CONVERTER LOW OXYGEN STORAGE	P0420	Oxygen Storage.	OSC Time Difference 4.3L auto&man ≥ 0.15 sec OSC Time Difference = OSC Worst Pass Thresh - OSC Compensation Factor * (Post Cat O2 Resp Time - Pre Cat O2 Resp Time) OSC Worst Pass Thresh 4.3L auto&man= 1.0 sec	Trip Enable Criteria No VSS, EGR Control, PRNDL Switch, Transmission, Throttle, Purge control, Oxygen sensor, Misfire, MAT, MAP, Camel Mode, Injector, EST Control, EGR Sensor, Coolant, Crank sensor, Cam sensor, Air flow, AIR, IAC, or Fuel trim DTC's failing Valid Idle Period Criteria Engine Speed ≥ 1300 rpm for minimum of 9 sec since end of last idle period. Min engine runtime for stable BLM & PLM ≥ 600 sec Test Enable Conditions Predicted Catalyst Temperature ≥ 357°C Barometric Pressure ≥ 74 kPa -15 ≤ IAT ≤ 75°C 71°C ≤ ECT ≤ 120°C 0 < Idle Period ≤ 60 sec Tests Attempted this trip ≤ 6 Tests Attempted this idle period < 1 -100 rpm ≤ (Engine Speed - Desired Speed) ≤ +200 rpm Rapid Step Response Enable Criteria OSC Time Difference Step ≥ 0.2 OSC Time Difference ≥ 0.000 sec	1 test attempted per valid idle period Minimum of 1 test per trip. Maximum of 6 tests per trip. Maximum of 6 trips to detect failure when Rapid Step Response is enabled frequency: 12.5 ms continuous	Lt duty only DTC Type A
CATALYTIC CONVERTER LOW OXYGEN STORAGE	*P0430	Oxygen Storage.	OSC Time Difference 5.7L auto ≥ 0.05 sec OSC Time Difference = OSC Worst Pass Thresh - OSC Compensation Factor * (Post Cat O2 Resp Time - Pre Cat O2 Resp Time) OSC Worst Pass Thresh 5.7L auto = 0.76 sec	Trip Enable Criteria No VSS, EGR Control, PRNDL Switch, Transmission, Throttle, Purge control, Oxygen sensor, Misfire, MAT, MAP, Camel Mode, Injector, EST Control, EGR Sensor, Coolant, Crank sensor, Cam sensor, Air flow, AIR, IAC, or Fuel trim DTC's failing Valid Idle Period Criteria Engine Speed ≥ 900 rpm for minimum of 30 sec since end of last idle period. Min engine runtime for stable BLM & PLM ≥ 600 sec Test Enable Conditions Predicted Catalyst Temperature ≥ 450°C Barometric Pressure ≥ 74 kPa -15 ≤ IAT ≤ 75°C 71°C ≤ ECT ≤ 120°C 0 < Idle Period ≤ 60 sec Tests Attempted this trip ≤ 6 Tests Attempted this idle period < 1 -100 rpm ≤ (Engine Speed - Desired Speed) ≤ +200 rpm Rapid Step Response Enable Criteria OSC Time Difference Step ≥ 0.16 sec OSC Time Difference ≥ 0.000 sec	1 test attempted per valid idle period Minimum of 1 test per trip. Maximum of 6 tests per trip. Maximum of 6 trips to detect failure when Rapid Step Response is enabled frequency: 12.5 ms continuous	Lt duty only DTC Type A For use on Dual Converter applications

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
EVAP. Emission Control System Malfunction	P0440	This DTC will detect a weak vacuum condition (large leak or restriction) in the EVAP. system.	***WEAK VACUUM TEST- STAGE I (Cold Test):*** Tank Vacuum ≥ 9 or 13 in. H_2O within a value (30-80 integral seconds) depending on application. ***WEAK VACUUM TEST- STAGE II (Warm Test):*** Stage I test failed previous trip and this trip. Tank Vac. < 11 in. H_2O	***TEST ENABLE :*** MAP DTC's not active Volt-DTC's not active TP Sensor DTC's not active VS Sensor DTC's not active O2 Sensor DTC's not active Coolant Sensor DTC's not active IAT Sensor DTC's not active Fuel Level >15.0% but < 85.0% Power-up Vacuum Test Fail = False PLM > .89 System Voltage > 10V but < 18V ***COLD START TEST:*** ECT > 3.75°C but < 30° C IAT > 3.75°C but < 30° C Cold Temperature Δ (ECT - IAT): ° < 8.25 °C if ECT > IAT BARO > 75.0 kPa ***FUEL SLOSH TEST:*** Tank Vacuum Δ ≤ value and Fuel Level Δ ≤ value based on fuel level.	***WEAK VACUUM TEST- STAGE I (Cold Test):*** Fault present for an integral time ≥ 50, or 70sec. depending on application. Test must complete within 360, 420 ,460, 525, or 600 seconds from when purge is enabled, Depending on application ***WEAK VACUUM TEST- STAGE II (Warm Test):*** Fault present for a time ≥ 1400 sec. Once per cold start	Lt duty only DTC Type A (Behaves as a Type B)

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
EVAP SYSTEM SMALL LEAK DETECTED	P0442	This DTC will detect a small leak in the EVAP. system between the fuel fill cap and up to but not including the purge solenoid.	***SMALL LEAK TEST FAIL:*** Vacuum < 7 or 11" H_2O for a time < based on fuel level depending on application. Vacuum Decay (determined by fuel level and intake temperature) ≥ a value determined by Start Vacuum minus Tank Vacuum for a period ≥ 15 or 12 seconds. Vacuum decays must fail 3 or 4 pull downs depending on application, 360 sec cold test timer = 3 pull downs and 420 , 460,525, and 600 sec cold test timer = 4 pull downs Vacuum > 1.0 or 1.5 in. H_2O for a time ≤ 30, 40 , 55, 100 or 120 seconds. Depending on application	***TEST ENABLE :*** MAP DTC's not active Volt-DTC's not active TP Sensor DTC's not active VS Sensor DTC's not active O2 Sensor DTC's not active Coolant Sensor DTC's not active IAT Sensor DTC's not active Fuel Level >15.0% but < 85.0% PLM > .89 System Voltage > 10V but < 18V ***COLD START TEST:*** ECT > 3.75°C but < 30° C IAT > 3.75°C but < 30° C Cold Temperature Δ (ECT - IAT): ° < 8.25 °C if ECT > IAT BARO > 75.0 kPa ***.020" LEAK:*** Fuel level > value based on application. Tank Vacuum Δ ≤ value and Fuel Level Δ ≤ value based on fuel ***FUEL SLOSH TEST:*** Tank Vacuum Δ ≤ value and Fuel Level Δ ≤ value based on fuel level. ***WEAK VACUUM TEST (Stage I)*** : Throttle position < 75% Vehicle speed < 65 mph Tank Vacuum ≥ 9 or 13 in. H_2O within a value (30-80 integral seconds) depending on application.	Once per cold start Test must complete within 360, 420 ,460, 525, or 600 seconds from when purge is enabled, Depending on application	Lt duty only DTC Type A (Behaves as a Type B)
EVAP CANISTER PURGE SOLENOID VALVE CIRCUIT (ODM)	P0443	Circuit Continuity Control circuit voltage is monitored during operation. It should be low during operation and near B+ when "off".	The PCM detects that the commanded state of the driver and the actual state of the control circuit do not match.	Engine speed > 400 rpm. Ignition voltage > 6.0 volts, but < 18 volts	5 seconds. continuous.	DTC Type B

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
EVAP CANISTER VENT BLOCKED	P0446	This DTC will determine if a restriction is present in the vent solenoid, vent filter, vent hose or canister.	***EXCESS VACUUM TEST - STAGE I :*** Vent solenoid **commanded** OPEN Fuel Tank Vacuum ≥ 7 in. H_2O for 2 seconds(monitored during initial purge ramp) **OR** ***EXCESS VACUUM TEST - STAGE II :*** Vent solenoid **commanded** OPEN during normal purge. Fuel Tank Vacuum ≥ 12.9 in. H_2O for a time ≥ 4 seconds	***TEST ENABLE :*** MAP DTC's not active Volt-DTC's not active TP Sensor DTC's not active VS Sensor DTC's not active Coolant Sensor DTC's not active O2 Sensor DTC's not active IAT Sensor DTC's not active Fuel Level >15.0% but < 85.0% PLM > .89 System Voltage > 10V but < 18V ***COLD START TEST:*** ECT > 3.75°C but < 30° C IAT > 3.75°C but < 30° C Cold Temperature Δ (ECT - IAT): ° < 8.25 °C if ECT > IAT BARO > 75.0 kPa ***FUEL SLOSH TEST:*** Tank Vacuum Δ ≤ value and Fuel Level Δ ≤ value based on fuel level ***WEAK VACUUM TEST -Stage I***: Tank Vacuum ≥ 9 or 13 in. H_2O within a value (30-80 integral seconds) depending on application.	***EXCESS VACUUM TEST - STAGE II :*** 180 seconds Once per cold start at: • Power-up • Excess Vac. Stage I • Excess Vac. Stage II Test must complete within 360, 420 ,460, 525, or 600 seconds from when purge is enabled, Depending on application	Lt duty only DTC Type A
EVAP VENT SOLENOID CONTROL CIRCUIT (ODM)	P0449	Circuit Continuity Control circuit voltage is monitored during operation. It should be low during operation and near B+ when "off".	The PCM detects that the commanded state of the driver and the actual state of the control circuit do not match.	Engine speed > 400 rpm. Ignition voltage > 6.0 volts, but < 18 volts	5 seconds Continuous.	DTC Type B
EVAP SYSTEM PRESSURE LOW	P0452	This DTC will detect a vacuum sensor stuck low	tank vacuum raw voltage < 0.1 volt for 5 seconds	***runs continuously after a 1 second delay for sensor warm-up***		Lt duty only DTC Type B
EVAP SYSTEM PRESSURE HIGH	P0453	This DTC will detect a vacuum sensor stuck hi	tank vacuum raw voltage >4.90 volt for 5 seconds	***runs continuously after a 1 second delay for sensor warm-up***		Lt duty only DTC Type B

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Fuel Level No Change, Stuck in Range	P0461	This DTC will detect a fuel sender stuck in range .	IF Delta Fuel Volume change less than 3 liters over a accumulated 105 miles. OR IF Transfer pump ON and at Idle delay =20 seconds then IF timer > 120 sec. AND Primary tank not increase by 4 liters. AND Secondary did Decrease > 4 liters OR If Primary is FULL and Secondary is EMPTY for > 275 miles.	runs continuously		DTC Type C No Light
Fuel Level Stuck Low	P0462	This DTC will detect a fuel sender stuck out of range low	Fuel level A/D counts less than 20 A/D counts for 100 seconds	runs continuously		DTC Type C No Light
Fuel Level Stuck High	P0463	This DTC will detect a fuel sender stuck out of	Fuel level A/D counts more than 150 A/D counts for 100 seconds	runs continuously		DTC Type C No Light
PRIMARY COOLING FAN RELAY CONTROL CIRCUIT MALF (ODM)	*P0480	Control circuit voltage is monitored during operation. It should be low during operation and near B+ when “off”	The PCM detects that the commanded state of the driver and th actual state of the control circuit do not match	Engine speed greater than 400 rpm Ignition voltage > 6.0 volts, but < 18 volts	5 seconds Continuous	DTC Type B For use on vehicles with electric fan
SECONDARY COOLING FAN RELAY CONTROL CIRCUIT MALF (ODM)	*P0481	Control circuit voltage is monitored during operation. It should be low during operation and near B+ when “off”.	The PCM detects that the commanded state of the driver and th actual state of the control circuit do not match	Engine speed greater than 400 rpm Ignition voltage > 6.0 volts, but < 18 volts	5 seconds Continuous	DTC Type B For use on vehicles with electric fan
VEHICLE SPEED SENSOR SYSTEM PERFORMANCE (MANUAL TRANS)	P0500	This DTC detects a missing signal from the vehicle speed sensor in a manual transmission vehicle.	Vehicle speed = 0 when enable conditions met	Manual VSS diagnostic enabled No MAP DTC’s set No TPS DTC’s set No ECT DTC’s set No idle system DTC’s set No IAC valve DTC’s set Coolant ≥ 35 °. C Engine speed > 1000 rpm 5 % < throttle position < 100 % A/C off: 40 kpa < MAP < 100 kpa A/C on: 45 kpa < MAP < 100 kpa Above conditions met > 2 seconds to enable diagnostic	500 test failures in a 1000 test sample 100 ms/test Continuous	DTC Type B Manual Transmission Only

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
IDLE SYSTEM - LOW ENGINE SPEED	P0506	Determines if a low idle is a result of an engine mechanical problem. Low RPM is 100 RPM below desired	Idle > 100 RPM low from desired	**Passive:** No MAF, MAP, IAT, ECT, TP, Injector, Fuel System, Misfire, EGR, VSS or Purge DTC Engine Run > 60 sec. ECT ≥ 60 ° C BARO > 65 kPa IGN. voltage > 9 & < 18 volts IAT > -10 ° C TP < 1% VS ≤ 1 MPH Time > 5 seconds to fail. > 8 seconds to pass	**Passive:** Must be outside the fail criteria continuously for 5 seconds. Must be within pass criteria for 8 seconds continuously.	DTC Type B
IDLE SYSTEM - HIGH ENGINE SPEED	P0507	Determines if a high idle is a result of an engine mechanical problem. High RPM is 200 RPM above desired	**Passive:** Idle > 200 RPM high from desired	**Passive:** No MAF, MAP, IAT, ECT, TP, Injector, Fuel System, Misfire, EGR, VSS or Purge DTC Engine Run > 60 sec. ECT ≥ 60 ° C BARO > 65 kPa IGN. voltage > 9 & < 18 volts IAT > -10 ° C TP < 1% VS ≤ 1 MPH Time > 5 seconds to fail. > 8 seconds to pass	**Passive:** Must be outside the fail criteria continuously for 5 seconds. Must be within pass criteria for 8 seconds continuously.	DTC Type B
PCM - FLASH EEPROM CHECKSUM ERROR	P0601	Indicates that PCM is unable to correctly read data from the flash memory.	Calculated checksum does not match expected checksum for the program.	Ignition in Run or Crank.	One occurrence. Check is performed at power-up and every 60 seconds thereafter.	DTC Type A
PCM - PROGRAMMING ERROR	P0602	Indicates that the PCM is not flashed.	PCM not flashed.	Ignition on.	1 test failure 100 ms after PCM powered-up	DTC Type A
PCM RAM FAILURE	P0604	Indicates that PCM is unable to correctly write and read data to and from RAM	Data read does not match data written	Ignition in Run or Crank	One occurrence. Check is performed at power-up and every 60 seconds thereafter.	DTC Type A

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Malfunction Indicator Lamp Control Circuit MALF (ODM)	P0650	Control circuit voltage is monitored during operation. It should be low during operation and near B+ when "off".	The PCM detects that the commanded state of the driver and the actual state of the control circuit do not match.	Engine speed greater than 400 rpm. Ignition voltage > 6.0 volts, but < 18 volts	5 seconds. Continuous.	DTC Type B NO MIL
CLUTCH SWITCH CIRCUIT	P0704	Clutch switch state is monitored during vehicle operation.	The PCM detects that a clutch switch state transition has not occurred when the vehicle speed has gone from 0 MPH above a threshold value and back to 0 MPH.	No VSS codes present VSS > 24 MPH	7 test failures in a 8 test sample size 100ms Continuous	DTC Type C (Manual Only)
PRNDL SWITCH	P0706	Check for PRNDL switch malfunction	Start run is achieved if reverse or drive is indicated; or if in park or neutral if: TPS > 5% Torque > 50 ftlbs VSS > 20 mph Failcounts: 100/150 samples	Ignition voltage >6 and < 18 V Gear > 3	Stuck in drive immediately upon start Stuck in PN 10 seconds Continuous Monitor	DTC Type B
2ND AND 3RD GEAR BLOCK-OUT RELAY CIRCUIT MALF (ODM)	P0803	Control circuit voltage is monitored during operation. It should be low during operation and near B+ when "off".	The PCM detects that the commanded state of the driver and the actual state of the control circuit do not match.	Engine speed greater than 400 rpm. Ignition voltage > 6.0 volts, but < 18 volts	5 seconds. Continuous	DTC Type B
THROTTLE POSITION SENSOR 1 CIRCUIT	*P1120	1) TACM indicates a continuous or intermittent short or open in either the signal circuit or the TP sensor #1. OR 2) TACM indicates an invalid minimum mechanical position for the TP sensor #1.	1) Raw TP sensor signal < 0.13 V or > 4.87 V. OR 2)TP sensor minimum mechanical stop voltage < 0.33 V or > 0.67 V.	Ignition in Run or Crank. Ignition voltage > 5.23 V. Valid TACM - PCM serial data. No TACM processor DTC.	1) Counter increments by 4 for every error, decrements by 1 for every pass; threshold is 122. Check runs every 3 ms. 2) One occurrence. Check runs at power-up.	DTC Type A For use on vehicles with ETC
THROTTLE POSITION SENSOR CIRCUIT INTERMITTENT HIGH	P1121	This DTC detects a intermittent short to high or open in either the signal circuit or the TP sensor	TPS (V) > 4.89 v (250 counts)	No 5V Ref. DTC's	101 test failures in a 2000 test sample size. 1 sample/100 ms	DTC Type B

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
THROTTLE POSITION SENSOR CIRCUIT INTERMITTENT LOW	P1122	This DTC detects a intermittent short to low or open in either the signal circuit or the TP sensor	TPS (V) < .149v (7.6 counts)	No 5V Ref. DTC's	101 test failures in a 2000 test sample size. 1 sampel/100 ms	DTC Type B
ACCELERATOR PEDAL POSITION SYSTEM	P1125	PCM determines a limp home mode of operation due to multiple accelerator pedal sensor faults.	This DTC is set when: 1) 2 or more APP sensors are out of range, OR 2) all 3 APP sensors disagree, OR 3) one APP sensor is out of range AND the other 2 APP sensors disagree.	Ignition in Run or Crank. Ignition voltage > 5.23 V. Valid TACM - PCM serial data. No TACM processor DTC.	One occurrence. Check runs every 18.75 ms.	DTC Type A
HO2S SYSTEM -TOO FEW HO2S R/L AND L/R SWITCHES (BANK 1, SENSOR 1)	P1133	The DTC determines if the HO2S sensor is functioning property by monitoring the number of L/R and R/L switches.	Number of switches in 100 seconds: L/R switches < 1 (Delphi Sensors) R/L switches < 1 (Delphi Sensors)	Closed Loop Fuel Control. 1100 < RPM < 3000 15 < Air Flow < 55 g/sec. Minimum system voltage: 9v ECT > 57 ° C CCP>0 Engine Run > 75 sec No Throttle, MAT, - Camel Mode, Injector, EST Control, Coolant, Crank Sensor,Knock sensor or Air Flow Faults active	100 sec Once per trip.	DTC Type A
HO2S TRANSITION TIME RATIO (BANK 1, SENSOR 1)	P1134	Monitors the ratio between rich to lean and lean to rich transition times	The ratio of rich to lean and lean to rich oxygen sensor transitions. Ratio < .5 Ratio > 8.0	Closed Loop Fuel Control. 1100 < RPM < 3000 15 < Air Flow < 55 g/sec. Minimum system voltage: 9v ECT > 57 ° C CCP>0 Engine Run > 75 sec No Throttle, MAT, - Camel Mode, Injector, EST Control, Coolant, Crank Sensor,Knock Sensor or Air Flow Faults active	100 sec Once per trip.	DTC Type B
HO2S SYSTEM -TOO FEW HO2S R/L AND L/R SWITCHES (BANK 2, SENSOR 1)	P1153	The DTC determines if the HO2S sensor is functioning properly by monitoring the number of L/R and R/L switches.	Number of switches in 100 seconds: L/R switches < 1 (Delphi Sensors) R/L switches < 1 (Delphi Sensors)	Closed Loop Fuel Control. 1100 < RPM < 3000 15 < Air Flow < 55 g/sec. Minimum system voltage: 9v ECT > 57 ° C CCP>0 Engine Run > 75 sec No Throttle, MAT, - Camel Mode, Injector, EST Control, Coolant, Crank Sensor,Knock Sensor or Air Flow Faults active	100 sec Once per trip.	DTC Type B

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
HO2S TRANSITION TIME RATIO (BANK 2, SENSOR 1)	P1154	Monitors the ratio between rich to lean and lean to rich transition times	The ratio of rich to lean and lean to rich oxygen sensor transitions. Ratio < .5 Ratio > 8.0	Closed Loop Fuel Control. 1100 < RPM < 3000 15 < Air Flow < 55 g/sec. Minimum system voltage: 9v ECT > 57 ° C CCP>0 Engine Run > 75 sec No Throttle, MAT, - Camel Mode, Injector, EST Control, Coolant, Crank Sensor,Knock Sensor or Air Flow Faults active	100 sec Once per trip.	DTC Type B
Fuel Pump No Flow Seconadry	*P1172	This DTC will detect a Transfer Pump Failure	IF Transfer pump ON and at Idle delay =20 seconds then IF timer > 120 sec. AND Primary tank not increase by 4 liters. AND Secondary tank NOT Decrease by 4 liters. IF P1172 Fails then which ever tank takes longer to change by > 4 liters then the associated Pcode will set (P0461,or P1431)	Transfer pump Commanded on. At idle for 20 seconds		DTC Type C No Light For use on vehicles with dual fuel tank
THROTTLE POSITION SENSOR 2 CIRCUIT	*P1220	1) TACM indicates a continuous or intermittent short or open in either the signal circuit or the TP sensor #2. OR 2) TACM indicates an invalid minimum mechanical position for the TP sensor #2.	1) Raw TP sensor signal < 0.13 V or > 4.87 V. OR 2) TP sensor minimum mechanical stop voltage < 4.31 V or > 4.69 V.	Ignition in Run or Crank. Ignition voltage > 5.23 V. Valid TACM - PCM serial data. No TACM processor DTC.	1) Counter increments by 4 for every error, decrements by 1 for every pass; threshold is 122. Check runs every 3 ms. 2) One occurrence. Check runs at power-up.	DTC Type A For use on vehicles with ETC
THROTTLE POSITION SENSOR 1, 2 RANGE/PERF.	*P1221	1) TACM indicates a continuous or intermittent correlation fault between TP sensors #1 and #2. OR 2) TACM indicates an invalid minimum mechanical position correlation between TP sensor #1 and #2.	ABS(5 V - raw TP sensor #2 voltage - raw TP sensor #1 voltage) > 0.29 V.	Ignition in Run or Crank. Ignition voltage > 5.23 V. Valid TACM - PCM serial data. No TACM processor DTC.	1) Counter increments by 4 for every error, decrements by 1 for every pass; threshold is 126. Check runs every 3 ms. 2) One occurrence. Check runs at power-up.	DTC Type A For use on vehicles with ETC

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
APP SENSOR 1 CIRCUIT	*P1275	1) TACM indicates a continuous or intermittent short or open in either the signal circuit or the APP sensor #1. OR 2) TACM indicates an invalid minimum mechanical position for the APP sensor #1.	1) Raw APP sensor signal < 0.25 V or > 4.22 V. OR 2) APP sensor minimum mechanical stop voltage < 0.19 V.	'Ignition in Run or Crank. Ignition voltage > 5.23 V. Valid TACM - PCM serial data. No TACM processor DTC.	1) & 2) Counter increments by 4 for every error, decrements by 1 for every pass; threshold is 106. Check runs every 3 ms.	DTC Type C For use on vehicles with ETC
APP SENSOR 1 PERFORMANCE	*P1276	1) TACM indicates a continuous or intermittent correlation fault between APP sensors #1 and #2 AND #1 and #3. OR 2) TACM indicates an invalid minimum mechanical position correlation between APP sensor #1 and #2 AND #1 and #3.	ABS(5 V - raw APP sensor #2 voltage - raw APP sensor #1 voltage) > 0.20 V. AND ABS{5 V - [(raw APP sensor #3 voltage - 0.61 V) * 53 / 32] - raw APP sensor #1 voltage} > 0.26 V.	Ignition in Run or Crank. Ignition voltage > 5.23 V. Valid TACM - PCM serial data. No TACM processor DTC.	1) Counter increments by 1 for every error, decrements by 1 for every pass; threshold is 167 Check runs every 3 ms.	DTC Type C For use on vehicles with ETC
APP SENSOR 2 CIRCUIT	*P1280	1) TACM indicates a continuous or intermittent short or open in either the signal circuit or the APP sensor #2. OR 2) TACM indicates an invalid minimum mechanical position for the APP sensor #2.	1) Raw APP sensor signal < 0.83 V or > 4.84 V. OR 2) APP sensor minimum mechanical stop voltage > 4.81 V.	Ignition in Run or Crank. Ignition voltage > 5.23 V. Valid TACM - PCM serial data. No TACM processor DTC.	1) & 2) Counter increments by 4 for every error, decrements by 1 for every pass; threshold is 106. Check runs every 3 ms.	DTC Type C For use on vehicles with ETC

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
APP SENSOR 2 PERFORMANCE	*P1281	1) TACM indicates a continuous or intermittent correlation fault between APP sensors #1 and #2 AND #2 and #3. OR 2) TACM indicates an invalid minimum mechanical position correlation between APP sensor #1 and #2 AND #2 and #3.	ABS(5 V - raw APP sensor #2 voltage - raw APP sensor #1 voltage) > 0.20 V. AND ABS{5 V - [(raw APP sensor #3 voltage - 0.61 V) * 53 / 32] - (5 V - raw APP sensor #2 voltage)} > 0.26 V.	Ignition in Run or Crank. Ignition voltage > 5.23 V. Valid TACM - PCM serial data. No TACM processor DTC.	1) Counter increments by 1 for every error, decrements by 1 for every pass; threshold is 167. Check runs every 3 ms.	DTC Type C For use on vehicles with ETC
APP SENSOR 3 CIRCUIT	*P1285	1) TACM indicates a continuous or intermittent short or open in either the signal circuit or the APP sensor #3. OR 2) TACM indicates an invalid minimum mechanical position for the APP sensor #3.	1) Raw APP sensor signal < 1.63 V or > 4.38 V. OR 2) APP sensor minimum mechanical stop voltage > 4.28 V.	Ignition in Run or Crank. Ignition voltage > 5.23 V. Valid TACM - PCM serial data. No TACM processor DTC.	1) & 2) Counter increments by 4 for every error, decrements by 1 for every pass; threshold is 106. Check runs every 3 ms.	DTC Type C For use on vehicles with ETC
APP SENSOR 3 PERFORMANCE	*P1286	1) TACM indicates a continuous or intermittent correlation fault between APP sensors #1 and #3 AND #2 and #3. OR 2) TACM indicates an invalid minimum mechanical position correlation between APP sensor #1 and #3 AND #2 and #3.	ABS{5 V - [(raw APP sensor #3 voltage - 0.61 V) * 53 / 32] - raw APP sensor #1 voltage} > 0.26 V. AND ABS{5 V - [(raw APP sensor #3 voltage - 0.61 V) * 53 / 32] - (5 V - raw APP sensor #2 voltage)} > 0.26 V.	Ignition in Run or Crank. Ignition voltage > 5.23 V. Valid TACM - PCM serial data. No TACM processor DTC.	1) Counter increments by 1 for every error, decrements by 1 for every pass; threshold is 167. Check runs every 3 ms.	DTC Type C For use on vehicles with ETC
CRANKSHAFT POSITION SYSTEM VARIATION NOT LEARNED	P1336	Monitor for valid crankshaft error compensation factors	Engine Running Factors are considered NOT valid if the factor sum is greater than 3.001 or less than 2.9989	OBD Manufacturer Enable Counter = 0 ECT > 60°C	100 ms/test	DTC Type A

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Camshaft Sensor Misinstalled	P1345	1X Signal This diagnostic will determine if the Cam sensor and high voltage switch have been installed correctly.	Cam signal falling edge out of phase ±27 degrees from crank falling edge.	Engine is running – run flag is true No crank position sensor not valid DTC	30 test failures within a 50 test sample size. Time necessary to complete sample: Varies with engine speed Every crank fall	DTC Type B
EGR VALVE CIRCUIT PERFORMANCE Actual Position Commanded Position.	P1404	This DTC determines if the EGR valve pintle is stuck open when the valve is commanded closed.	Pintle Position > 10 A/D counts from learned closed poistion for 10 seconds for 3 subroutines	System voltage 11.7 volts or greater. EGR valve strokes to 100% duty cycle between subroutines. Enable parameters for stroke: 80°C < ECT < 120°C IAT < 100°C Desired EGR > 15%	3 failures for 10 seconds each test (with 100% pintle movement for .7 seconds between tests). Continuous every 100 ms.	DTC Type A
AIR INJECTION SYSTEM BANK 1	P1415	HO2S sensors indicate lean condition present when AIR pump is turned on with 8% additional offset fuel being added during closed loop operation	Fails when: Bank 1 HO2S sensor is not < 222 mv for ≥ 1.3 seconds AND Bank 1 fuel integrator delta is not ≥ 20% while a passing value occurs for bank 2 when pump turns on during closed loop operation	No MAF, MAP, MAT, ECT, TPS, HO2S, Purge, Engine Protection, Fuel Trim, Fuel Injector, EST, Crank sensor or Misfire DTCs set. Veh Speed ≥ 15 mph Baro ≥ 75 kPa Engine run > 2 sec Air flow < 20 g/s A/F Ratio = 14.7:1 Engine Load < 33.25% of full engine load Ignition voltage > 11.7 V PE, DFCO, COT not active Engine run ≥ 15 sec after closed loop operation Fuel integrator >.965% & < 1.035% Powerup Coolant temp < 80°C RPM > 750 ECT ≥ 2 ° C ECT < 110 ° C IAT >-10 ⊆ C and IAT < 100°C In BLM cells 4 & 5	4.0 seconds Up to 3 times	DTC Type B

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
AIR INJECTION SYSTEM Bank 2	P1416	HO2S sensors indicate lean condition present when AIR pump is turned on with 8% additional offset fuel being added during closed loop operation	Fails when: Bank 2 HO2S sensor is not < 222 mv for ≥ 1.3 seconds AND bank 2 fuel integrator delta is not ≥ 20% while a passing value occurs for bank 1 when pump turns on during closed loop operation	No MAF, MAP, MAT, ECT, TPS, HO2S, Purge, Engine Protection, Fuel Trim, Fuel Injector, EST, Crank sensor or Misfire DTCs set. Veh Speed ≥ 15 mph Baro ≥ 75 kPa Engine run > 2 sec Air flow < 20 g/s A/F Ratio = 14.7:1 Engine Load < 33.25% of full engine load Ignition voltage > 11.7 V PE, DFCO, COT not active Engine run ≥ 15 sec after closed loop operation Fuel integrator >.965% & < 1.035% Powerup Coolant Temp < 80°C RPM > 750 ECT ≥ 2 ° C ECT < 110 ° C IAT >-10 ° C and IAT < 100°C In BLM cells 4 & 5	4.0 seconds Up to 3 times	DTC Type B
Fuel Level No Change, Stuck in Range Secondary Tank	*P1431	This DTC will detect a fuel sender stuck in range	IF Delta Fuel Volume change less than 3 liters over a accumulated 65 miles. OR IF Transfer pump ON and at Idle delay =20 seconds then IF timer > 120 sec. AND Secondary tank not decrease by 4 liters AND Primary DID Increase > 4 liters. OR If Primary is FULL and Secondary is EMPTY for > 275 miles.	Fuel level greater than 30 liters		DTC Type C No Light For use on vehicles with duel fuel tank
Fuel Level Stuck Low Secondary Tank	*P1432	This DTC will detect a fuel sender stuck out of range low	Fuel level A/D counts less than 20 A/D counts for 100 seconds	runs continuously		DTC Type C No Light For use on vehicles with duel fuel tank
Fuel Level Stuck High Secondary Tank	*P1433	This DTC will detect a fuel sender stuck out of range high	Fuel level A/D counts more than 150 A/D counts for 100 seconds	runs continuously		DTC Type C No Light For use on vehicles with duel fuel tank

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
EVAP SYSTEM FLOW DURING NON-PURGE	P1441	This DTC will determine if the purge solenoid is leaking.	***PURGE VALVE LEAK TEST:*** Purge Valve closed TP > 0% but < 99.6% Vacuum ≥ 10 KPa Tank Vacuum ≥ 12 in. H_2O for2 sec within ≤ 37.5 seconds after 30 second delay.	***TEST ENABLE :*** MAP DTC's not active Volt-DTC's not active TP Sensor DTC's not active VS Sensor DTC's not active O2 Sensor DTC's not active Coolant Sensor DTC's not active IAT Sensor DTC's not active Fuel Level >15.0% but < 85.0% PLM > .89 System Voltage > 10V but < 18V ***COLD START TEST:*** ECT > 3.75°C but < 30° C IAT > 3.75°C but < 30° C Cold Temperature Δ (ECT - IAT): ° < 8.25 °C if ECT > IAT BARO >75.0 kPa ***FUEL SLOSH TEST:*** Tank Vacuum Δ ≤ value and Fuel Level Δ ≤ value based on fuel level and application. ***EXCESS VACUUM TEST -STAGE I :*** Vent solenoid **commanded** OPEN Fuel Tank Vacuum < 7 in. H_2O ***WEAK VACUUM TEST -Stage I*** : Throttle position < 75% Vehicle speed < 65 mph Tank Vacuum ≥ 9 or 13 in. H_2O within a value (30-80 integral seconds) depending on application..	***PURGE VALVE LEAK TEST:*** 180 seconds Max. Once per cold start	Lt duty only DTC Type B
TAC SYSTEM MAF PERFORMANCE	*P1514	Indicates that measured engine airflow does not match estimated engine airflow as established by the TPS.	MAP based airflow - estimated airflow > 150 mg/cyl AND MAF based airflow - estimated airflow > 150 mg/cyl	Engine running = true. Ignition on > 1 sec. RPM > 500. No Throttle Actuation DTC's. No PCM-TACM Serial Data DTC. Both TPS Circuit DTC's are not set. No PCM Processor DTC's No TACM Processor DTC	Both counters are incremented by 2 for every error and decrement by 1 for every pass; both thresholds are 20; both counters must exceed threshold to set DTC. Check runs every 18.75 ms.	DTC Type A For use on vehicles with ETC

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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COMMAND vs ACTUAL THROTTLE PERF. (PCM)	*P1515	Indicates that the PCM has detected a throttle positioning error	ABS (throttle error) > 5%. [Throttle error = Measured throttle position - modeled throttle position]	Ignition in Run or Crank TACM determines PCM Desired Throttle Position is valid. Not in battery saver mode. No Airflow Actuation DTC. (Engine Running = true) OR (Ignition Voltage > 8.5 volts). No Throttle Actuation DTC. No PCM-TACM Serial Data DTC. Both TPS Circuit DTC's are not set. No PCM Processor DTC's. No TACM Processor DTC.	High counter increments by 2 for every throttle error > 5%; decrements by 1 if %<t.e.<5%; decrements by 5 if -5%<t.e.<0%; clears if t.e. < -5%. Check runs every 18.75 ms with TACM - PCM valid message received. Low counter increments by 2 for every throttle error < -5%; decrements by 1 if -5%<t.e.<0%; decrements by 5 if 0%<t.e.<5%; clears if t.e. > 5%. Check runs every 18.75 ms with TACM - PCM valid message received.	DTC Type A For use on vehicles with ETC

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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COMMAND vs ACTUAL THROTTLE PERF. (TAC MODULE)	*P1516	Indicates that the TAC Module has detected a throttle positioning error OR Either Processor cannot determine throttle positioning OR Both TP Sensors are invalid	ABS (throttle error): a) ≥2 degrees for >200 ms with no change in error sign. OR b) ≥2 degrees for >500 ms for throttle command changes ≥ 2 degrees. OR c) ≥ 5 degrees for >200 ms for throttle command changes ≥ 5 degrees. OR d) ≥ 5 degrees for > 300 ms with no change in error sign. OR 2) PCM processor DTC's. OR 3) TACM processor DTC. OR 4) both TPS Circuit DTC's are set. OR 5) PCM-TACM Serial Data DTC w/ any APP Sensor DTC or TP Sensor DTC. [Throttle error = Measured throttle position - commanded throttle position]	Ignition in Run or Crank. Ignition voltage > 5.23 V. Valid TACM - PCM serial data. Not in battery saver mode.	One occurrence. Check runs every 3 ms.	DTC Type A For use on vehicles with ETC

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
TAC MODULE PROCESSOR	*P1517	Indicates that TAC Module is unable to correctly read data from the flash memory. Indicates that TAC Module is unable to correctly write and read data to and from RAM. Indicates that the TAC Module has detected an internal processor integrity fault.	1) Power-up test fails to read/write data OR 2) Max. allowed Running Resets exceeded OR 3) ROM checksum does not match expected checksum OR 4) RAM data read does not match data written OR 5) Failure of Interrupt process flag to match expected value. OR 6) Program is not executed in the proper order OR 7) Primary and Redundant RAM variables disagree OR 8) Primary and Redundant Indicated Pedal Position calculation difference > 7.1%. OR 9) Math/Logic test fails to equate to a predetermined value. OR 10) Internal Register data read does not match data written. OR 11) Internal Timer fails to increment OR 12) Watchdog Timer fails to increment OR 13) Failure of Processor Stack pointer to zero at Main Loop.	Ignition in Run or Crank. Ignition voltage > 5.23 V. Valid TACM - PCM serial data.	1) One occurrence Check runs at Reset initialization 2) 12 occurrences during ignition cycle Check runs at Reset initialization 3) One occurrence. Check runs at power up and every 24 seconds thereafter. 4) One occurrence. Check runs at power up and every 153 milliseconds thereafter 5) - 13) One occurrence. Check runs every 3 milliseconds	DTC Type A For use on vehicles with ETC

2001 4.3L (L35), 4.8L (LR4), 5.0L (L30), 5.3L (LM7), 5.7L (L31), 5.7L (LS1), 5.7L (LS6), 6.0L (LQ4), 8.1L (L18) ENGINE DIAGNOSTIC PARAMETERS

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SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
PCM TO TAC MODULE SERIAL DATA CIRCUIT	*P1518	Indicates that the serial data line between the PCM and TACM has intermittently or continuously failed.	PCM: No message for 18.75 ms. Corrupted data in the message. Invalid message protocol. PCM processor DTC's. TACM processor DTC. TAC Module: No message for 25 ms. Corrupted data in the message. Invalid message protocol. PCM processor DTC's. TACM processor DTC.	(Ignition in Run or Crank) AND engine not in crank state. Time since power-up > 0. Ignition in Run or Crank. Ignition voltage > 5.23 V. Valid TACM - PCM serial data.	PCM and TACM continuous No valid message received for 500 ms. PCM Intermittent: Invalid or missing message increments counter by 10; valid message received decrements counter by 1; threshold is 254. TACM Intermittent: Invalid or missing message increments counter by 10; valid message received decrements counter by 4; threshold is 254. Check for invalid messages runs every 18.75 ms. Check for missing messages runs every 25 ms.	DTC Type A For use on vehicles with ETC
5 VOLT REFERENCE A CIRCUIT	P1635	Determines if the supply voltage for the 5 volt reference is within an acceptable limit.	Compares the ratio of the 5 volt reference circuit voltage to the 5 volt supply voltage.	5 volt reference circuit voltage differs from 5 volt supply voltage by plus or minus approximately .01 volt. PCM is powered up	Condition present > 2 seconds Continuous.	DTC Type B
5 VOLT REFERENCE B CIRCUIT	P1639	Determines if the supply voltage for the 5 volt reference is within an acceptable limit	Compares the ratio of the 5 volt reference circuit voltage to the 5 volt supply voltage.	5 volt reference circuit voltage differs from 5 volt supply voltage by plus or minus approximately .01 volt. PCM is powered up	Condition present > 2 seconds Continuous.	DTC Type B
SOAK TIMER (IGNITION OFF TIMER)	P1683	Monitor soak timer for proper increments in positive time at correct rate	Initial soak time < 2 sec Soak time second > 1.2 seconds or < .80 seconds	PCM is powered down DTC sets on next key cycle if failure detected	Every key down	DTC Type B