2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
THREE WAY CATALYTIC CONVERTER (TWC)	P0420 (BANK 1) P0430 (BANK 2)	B	SECONDARY HO2S SIGNAL VARIANCE METHOD	CTAGE67 (BANK 1) 2) CTAGE68 (BANK 2) 2)	>140000(hex) >E0000(hex)	ECT IAT2 VEHICLE SPEED MAP ENGINE SPEED SHORT TERM FUEL TRIM STATUS CATALYST TEMPERATURE (ESTIMATED VALUE BY PCM) MAP DIFFERENCE FUEL SYSTEM STATUS SV DIFFERENCE 3) MONITOR PRECONDITION MONITORING PRIORITY ORDER	>69deg.C >-21.5deg.C >3mph 160<MAP<550mmHg 1150<RPM<2000rpm WITHIN SHORT TERM FUEL TRIM LIMITS ΔKACT<0.05 5) >500deg.C <32.2mmHg 6) SECONDARY HO2S FEED BACK IS ACTIVATED DISABLE CONDITION: <0.488 DURING 3sec. SECONDARY HO2S MONITOR PASS OR SENSOR SIGNAL PASSES ACROSS VOLTAGE ZONE FROM 0.605V TO 0.293V LEVEL C: P0133 7)	JUDGMENT PASS: (MIN): 50sec. 4) JUDGMENT FAULT: (MIN): 50sec. 4) MONITORING RUNS ONCE PER DRIVING CYCLE	2 D/C

Note: 1): Refer to section for logic flowchart.
2): CTAGE67/CTAGE68: Calculated value derived from averaging the variance of secondary HO2S signal.
3): SV: Predicted exhaust gas volume introduced into catalyst. The value of less than 0.488 is equivalent to vehicle cruise condition.
4): The monitor takes approximate 200sec. in a driving cycle after battery cancel.
5): ΔKACT: Difference in coefficient factor calculated based on A/F sensor signal per a specific time.
6): MAP difference: {MAP(n)-MAP(n-1)}+{MAP(n-2)-MAP(n-3)}+{MAP(n-4)-MAP(n-5)} < 32.23mmHg (n=50msec.)
7): Level C: This monitor is temporarily disabled when level C monitors start monitoring. After the check has completed, this monitor restarts if applicable enable conditions are met.

2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
HEATED AIR FUEL RATIO (A/F) SENSOR	P2297 (BANK 1) P2298 (BANK 2)	B	RATIONALITY CHECK A/F SENSOR OUTPUT CURRENT MONITORING METHOD	A/F SENSOR SIGNAL(ANALOG)	>4.50V OR <2.65V	FUEL SYSTEM STATUS ECT ENGINE SPEED IAT2 VEHICLE SPEED CUMULATIVE TIME AFTER HEATER ON HEATER OPERATING STATUS A/F SENSOR ELEMENT RESISTANCE A/F SENSOR VOLTAGE	FUEL CUT CONDITION >69deg.C <2200rpm >-21.5deg.C >30mph >60sec. ACTIVATING <110ohm >2.0V	JUDGMENT FAULT OR PASS: (MIN): 4.25sec. 2) (MAX): 3) MONITORING RUNS ONCE PER DRIVING CYCLE	2 D/C

Note: 1): Refer to section for logic flowchart.
2): Under A/F sensor stable output condition (A/F sensor output voltage difference <0.05V per 0.15sec.)
3): Maximum time to judgment fault or pass is not specified, because A/F sensor stable output condition is needed for monitoring.

2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
HEATED AIR FUEL RATIO (A/F) SENSOR	P0133 (BANK 1) P0153 (BANK 2)	B	RESPONSE RATE CHECK	A/F SENSOR SIGNAL (ANALOG)	Gair(sec.) Tcyl(sec.) 0.5 2.60 1.0 2.20 1.5 1.95 2.0 1.80 3.5 1.65 6)	ENGINE SPEED MAP ECT IAT2 VEHICLE SPEED FLUCTUATION OF MAP SENSOR OUTPUT DURING 1 ENGINE REV A/F SENSOR ELEMENT RESISTANCE CUMULATIVE TIME AFTER HEATER ON SHORT TERM FUEL TRIM STATUS FUEL SYSTEM STATUS MONITORING PRIORITY ORDER	1100<RPM<2000rpm RPM MAP(mmHg) 2100 200-510 1800 200-510 1500 210-510 1200 250-510 1100 350-510 >69degC >-21.5deg.C >30mph <19mmHg <110ohm >60sec. WITHIN SHORT TERM FUEL TRIM LIMITS STOICHIOMETRIC A/F CONDITION LEVEL C: P0171,P0172, P0420,P0442, P0456 4)	JUDGMENT FAULT OR PASS: (MAX): 14.5sec. MONITORING RUNS ONCE PER DRIVING CYCLE	2 D/C

Note: 1): Refer to section for logic flowchart.
2): Judgment counter is paused during any of enable conditions are unsatisfied. The counter resumes after delay time of 2sec. from the instance of fulfillment of the enable conditions. So, maximum judgment time is extended by the counter pause time.
3): Monitoring time depends on switching period of sensor signal and vehicle driving conditions.
4): Level C: This monitor is temporarily disabled when level C monitors start monitoring. After level C monitors have completed, this monitor restarts if applicable enable conditions are met.
5): Gair: Cumulative time of fuel injection during monitoring.
Tcyl: Averaged one cycle of A/F sensor signal

2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

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HEATED AIR FUEL RATIO (A/F) SENSOR	P2252 (BANK 1) P2255 (BANK 2)	F	A/F SENSOR SENSOR CELL CIRCUIT CHECK (SHORT)	VOLTAGE IN SENSOR CELL CIRCUIT	<0.3V	CUMULATIVE TIME AFTER ENGINE START VRPVS 2) SENSOR HEATER OPERATING STATUS ENGINE STATUS	>85sec. >3.2V AND <4.6V ACTIVATING RUNNING	JUDGEMENT FAULT :0.5sec MONITORING RUNS CONTINUOUSLY	1 D/C
	P2245 (BANK 1) P2249 (BANK 2)		A/F SENSOR REFERENCE VOLTAGE CIRCUIT CHECK (SHORT)	VOLTAGE IN PUMP CELL CIRCUIT	<1.5V				
	P2238 (BANK 1) P2241 (BANK 2)		A/F SENSOR PUMP CELL CIRCUIT CHECK (SHORT)	VOLTAGE IN PUMP CELL CIRCUIT	<1.0V				
	P2253 (BANK 1) P2256 (BANK 2)		A/F SENSOR SENSOR CELL CIRCUIT CHECK (OPEN)	VOLTAGE IN SENSOR CELL CIRCUIT	>6.0V	VRPVS 2) SENSOR HEATER OPERATING STATUS ENGINE STATUS	>4.6V ACTIVATING RUNNING	JUDGMENT FAULT :5sec MONITORING RUNS CONTINUOUSLY	
	P2243 (BANK 1) P2247 (BANK 2)		A/F SENSOR REFERENCE VOLTAGE CIRCUIT CHECK (OPEN)		<3.4V DETECTED 50 TIMES AND >4.8V DETECTED 50 TIMES 3)	SENSOR HEATER OPERATING STATUS ENGINE STATUS	ACTIVATING RUNNING	JUDGMENT FAULT : (MAX)7sec MONITORING RUNS CONTINUOUSLY	
	P2239 (BANK 1) P2242 (BANK 2)		A/F SENSOR PUMP CELL CIRCUIT CHECK (OPEN)	VOLTAGE IN PUMP CELL CIRCUIT	<2.0V OR >5.6V	VOLTAGE IN SENSOR CELL CIRCUIT VRPVS 2) SENSOR HEATER OPERATING STATUS ENGINE STATUS	3.4 < VOLTAGE <4.7V <4.6V ACTIVATING RUNNING	JUDGMENT FAULT :15sec MONITORING RUNS CONTINUOUSLY	
	P2627 (BANK 1) P2630 (BANK 2)		A/F SENSOR LABEL RESISTOR SIGNAL (HIGH)	A/F SENSOR VLBL SIGNAL (ANALOG)	>4.7V	SENSOR HEATER OPERATING STATUS	ACTIVATING	JUDGMENT FAULT :5sec MONITORING RUNS CONTINUOUSLY	
	P2628 (BANK 1) P2631 (BANK 2)		A/F SENSOR LABEL RESISTOR SIGNAL (LOW)	A/F SENSOR VLBL SIGNAL (ANALOG)	>0.29V				

Note: 1): Refer to section for logic flowchart.
2): VRPVS: Voltage in A/F element. In proper condition, VRPVS is in proportion to A/F element resistance. 3.2/4.6V at VRPVS is equivalent to 218/314ohm at A/F element resistance. In addition, VRPVS has the function of flag of particular malfunctions. In such a case, VRPVS becomes 4.98V.
3): If voltage in sensor cell circuit (VS) oscillates, reference voltage circuit is judged open.
VS is monitored every 0.01sec, and VS is judged oscillating when both VS more than 4.8V and VS less than 3.4V are detected 50 times or more.

2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
HEATED AIR FUEL RATIO (A/F) SENSOR	P2414 (BANK 1) P2415 (BANK 2)	G	MONITOR OF LEAN A/F SENSOR OUTPUT	A/F SENSOR SIGNAL (ANALOG)	>2.3V	ENGINE OPERATING STATUS ECT A/F SENSOR ELEMENT RESISTANCE FUEL SYSTEM STATUS CUMULATIVE TIME AFTER FUEL CUT NO.OF TIMES WHEN SENSOR OUTPUT IS STORED IN BUFFER	NOT ENGINE STALL >-20deg.C <=200ohm NOT FUEL CUT >5sec >=23 2)	JUDGMENT FAULT: 7sec. MONITORING RUNS ONCE PER DRIVING CYCLE	1 D/C
HEATED AIR FUEL RATIO (A/F) SENSOR OR ITS HEATER	P0135 (BANK 1) P0155 (BANK 2)	F	MONITOR OF A/F SENSOR ACTIVITY	SENSOR ELEMENT RESISTANCE (ANALOG) OR VOLTAGE IN SENSOR CELL CIRCUIT (ANALOG)	>110ohm >=0.75V OR <=0.25V	ECT DELAY TIME AFTER FUEL CUT ENGINE OPERATION STATUS BATTERY VOLTAGE FUEL SYSTEM STATUS	>-20deg.C >15sec. RUNNING >10.5V NOT FUEL CUT	JUDGMENT FAULT: 90sec.(INITIAL CHECK) 15sec.(AFTER INITIAL CHECK) MONITORING RUNS CONTINUOUSLY	1 D/C
HEATED AIR FUEL RATIO (A/F) SENSOR HEATER	P0030 (BANK 1) P0050 (BANK 2)		CIRCUIT CHECK (OPEN/SHORT)	VOLTAGE IN HEATER CIRCUIT (ANALOG)	=0V =12V	A/F SENSOR HEATER OPERATING STATUS	OFF ON	JUDGMENT FAULT: 10sec. MONITORING RUNS CONTINUOUSLY	

Note: 1): Refer to section for logic flowchart.
2): It takes less than 1sec. to store sensor output 23times in buffer.

2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S)	P0137 (BANK 1) P0157 (BANK 2)	B	RANGE CHECK AND RESPONSE CHECK	SECONDARY HO2S SIGNAL -LOW (ANALOG)	<0.293V	FUEL SYSTEM STATUS ENGINE SPEED ECT IAT2 SUMSV CUMULATIVE TIME FROM ENGINE START	AT THE BEGINNING OF CLOSED LOOP CONDITION AFTER FUEL CUT <3500rpm >69deg.C >-21.5deg.C >1D4C00(HEX) 2) >120sec.	JUDGMENT TIME: (MAX): 50sec. MONITORING RUNS ONCE PER DRIVING CYCLE	2 D/C
	P0138 (BANK 1) P0158 (BANK 2)		RANGE CHECK AND RESPONSE CHECK	SECONDARY HO2S SIGNAL -HIGH (ANALOG)	>0.742V	FUEL SYSTEM STATUS ENGINE SPEED ECT IAT2 CUMULATIVE TIME FROM ENGINE START	AT THE BEGINNING OF FUEL CUT CONDITION <3500rpm >69deg.C >-21.5deg.C >120sec.	JUDGMENT TIME: (MAX): 3.0sec. MONITORING RUNS ONCE PER DRIVING CYCLE	
	P0139 (BANK 1) P0159 (BANK 2)		RANGE CHECK AND RESPONSE CHECK	SECONDARY HO2S SIGNAL -LOW (ANALOG)	0.293<VOLT.<0.742 V				
SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S) HEATER	P0141 (BANK 1) P0161 (BANK 2)	F	CURRENT CHECK	HEATER CURRENT (ANALOG)	<0.38A OR >3.33A	ECT BATTERY VOLTAGE 3) HEATER OPERATING STATUS	>5deg.C >10.50V ACTIVATED CONDITION	JUDGMENT TIME: 5.0sec. MONITORING RUNS CONTINUOUSLY	1 D/C
	P0036 (BANK 1) P0056 (BANK 2)		CIRCUIT CHECK (OPEN/SHORT)	VOLTAGE IN HEATER CIRCUIT (ANALOG)	=0V =12V	HO2S HEATER OPERATING STATUS	OFF ON	JUDGMENT TIME: (MAX): 10.0sec. MONITORING RUNS CONTINUOUSLY	

Note: 1): Refer to section for logic flowchart
2): SUMSV: Cumulative predicted exhaust gas volume introduced into catalyst. The value less than 1D4C00(HEX) is equivalent to engine idling. If engine idling continues after fuel cut, monitor will be disabled.
3): Read value by PCM.

2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
MISFIRE	P0301 (#1CYL) P0302 (#2CYL) P0303 (#3CYL) P0304 (#4CYL) P0305 (#5CYL) P0306 (#6CYL) P0300 (MULT.)	REFER TO SECTION FOR MONITORING DESCRIPTION	CRANKSHAFT SPEED FLUCTUATION METHOD	MISFIRE RATIO (CATALYST DAMAGE)	REFER TO SUPPORT DATA 1)	MISFIRE COUNTER STATUS ECT IAT2	RUNNING (MISFIRE COUNTER STARTS AFTER 1sec. FROM ENCOUNTERING THE ENABLE CONDITIONS) >-10deg.C (ECT AT ENGINE START>-10deg.C) >20deg.C (ECT AT ENGINE START<-10deg.C) >-10deg.C	JUDGMENT FAULT OR PASS: 200 ENGINE REVS MONITORING RUNS CONTINUOUSLY	REFER TO SECTION FOR MONITORING DESCRIPTION
				MISFIRE RATIO (FTP EMISSION)	1.4%	ENGINE SPEED MAP CUMULATIVE TIME FROM ENGINE START THROTTLE ANGLE DIFFERENCE VEHICLE OPERATING CONDITION	500<RPM<6500rpm POSITIVE TORQUE CONDITIONS WHICH ENGINE LOAD IS ABOVE THE ONES IN THE TABLES BELOW 3) 2) >10deg./10msec *MISFIRE COUNTER IS HELD *DISABLE CONDITION ROUGH LOAD *MISFIRE COUNTER IS RESET *DISABLE CONDITION	JUDGMENT FAULT OR PASS: 1000 ENGINE REVS MONITORING RUNS CONTINUOUSLY	

Note: 1): Refer to support data for misfire.
2): Before picking-up pulsar pitch error or when engine speed is more than 3000rpm, misfire counters are compensated for 10 engine revs after reaching the engine speed of 500 rpm when ignition is turned on. In another case, misfire counters are compensated for 2 engine revs after reaching the engine speed of 500 rpm when ignition is turned on.
3): Positive torque conditions are shown below:

-After compensating for pick-up pulsar pitch errors-

NO LOAD CONDITION (VEHICLE SPEED=0)		ROAD LOAD CONDITION (VEHICLE SPEED>0)			
		1ST OR 2ND GEAR POSITION		3RD OR HIGHER GEAR POSITION	
ENGINE SPEED (RPM)	MAP (mmHg)	ENGINE SPEED (RPM)	MAP (mmHg)	MAP (mmHg)	MAP (mmHg)
500	200	500	245	500	245
1000	158	1440	180	1080	205
2100	135	2090	180	1900	205
2500	148	2350	198	3500	335
3000	148	3950	198	4800	335
6500	330	6500	330	6500	600

-Before compensating for pick-up pulsar pitch errors-

NO LOAD CONDITION (VEHICLE SPEED=0)		ROAD LOAD CONDITION (VEHICLE SPEED>0)			
		1ST OR 2ND GEAR POSITION		3RD OR HIGHER GEAR POSITION	
ENGINE SPEED (RPM)	MAP (mmHg)	ENGINE SPEED (RPM)	MAP (mmHg)	MAP (mmHg)	MAP (mmHg)
900	200	1000	760	1000	760
920	500	1600	180	1600	205
2000	500	2090	180	1900	205
2200	148	2350	198	3500	335
3000	148	3950	198	4800	335
6500	330	6500	330	6500	600

2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
FUEL INJECTOR	P0201 (#1CYL) P0202 (#2CYL) P0203 (#3CYL) P0204 (#4CYL) P0205 (#5CYL) P0206 (#6CYL)	F	CIRCUIT CHECK (OPEN/SHORT)	VOLTAGE IN INJECTOR CONTROL CIRCUIT (ANALOG)	=0V	INJECTOR OPERATING STATUS	OFF (NO FUEL INJECTING)	JUDGMENT FAULT: (MAX): 10.0sec. MONITORING RUNS CONTNUOUSLY	1 D/C
					=12V		ON (FUEL INJECTING)		

Note: 1): Refer to section for logic flowchart.

2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
EXHAUST GAS RECIRCULATION (EGR) SYSTEM	P0404	E	LIFT FEEDBACK CONTROL METHOD WHICH COMPARES THE ACTUAL VALVE LIFT(LACT) TO THE LOGICAL VALVE LIFT(LCMD)	EGR VALVE LIFT SENSOR SIGNAL (ANALOG)	|LCMD- LACT| >1.02mm	LCMD ENGINE SPEED BATTERY VOLTAGE 2) MONITORING PRIORITY ORDER	>0.3mm <4000rpm >10.50V LEVEL C: P0406 3)	JUDGEMENT FAULT OR PASS: 5sec. MONITORING RUNS CONTINUOUSLY	2 D/C
	P2413	G	LIFT FEEDBACK CONTROL METHOD WHICH COMPARES THE ACTUAL VALVE LIFT(LACT) TO THE LOGICAL VALVE LIFT(LCMD)	EGR VALVE LIFT SENSOR SIGNAL (ANALOG)	LACT<0.15mm	LCMD ENGINE SPEED BATTERY VOLTAGE 2) MONITORING PRIORITY ORDER	>1.08mm <4000rpm >10.50V LEVEL C: P0401 3)	JUDGEMENT FAULT OR PASS: 3sec. MONITORING RUNS ONCE PER DRIVING CYCLE	2 D/C
	P0403	F	EGR CONTROL SOLENOID CIRCUIT RETURN SIGNAL CHECK	RETURN SIGNAL CHECK(ANALOG)	NO SIGNAL CHANGE	BATTERY VOLTAGE 2)	>10.50V	JUDGEMENT FAULT: 2sec. MONITORING RUNS CONTNUOUSLY	1 D/C
	P0406		RANGE CHECK	EGR VALVE LIFT SENSOR SIGNAL (ANALOG)	>4.88V			JUDGMENT FAULT: 2sec. MONITORING RUNS CONTINUOUSLY	1 D/C

Note: LCMD: EGR valve lift command signal
LACT: Actual EGR valve lift signal
1): Refer to section for logic flowchart.
2): Read value by PCM.
3): Level C: This monitor is temporarily disabled when level C monitors start monitoring. After level C monitors have completed, this monitor restarts if applicable enable conditions are met.

2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
EXHAUST GAS RECIRCULATION (EGR) SYSTEM	P0401	B	INTAKE AIR PRESSURE METHOD WHICH MEASURES THE VARIATION OF THE PRESSURE BETWEEN EGR VALVE CLOSE AND OPEN	REGRF 2)	<15%	FUEL SYSTEM STATUS ENGINE SPEED ECT MAP VEHICLE SPEED BATTERY VOLTAGE 2) ENGINE SPEED FLUCTUATION AFTER MONITORING START MONITORING PRIORITY ORDER	FUEL CUT CONDITION 1100<RPM<2200rpm >69deg.C >100mmHg >30mph >10.50V -800<ΔRPM<200rpm LEVEL A: P0404, P2413 3)	JUDGEMENT FAULT OR PASS: 3.5sec. MONITORING RUNS ONCE PER DRIVING CYCLE	2 D/C

Note: 1): Refer to section for logic flowchart.
2): REGRF: The ratio indicates the extent of EGR valve clogging. REGRF = DPBBF / DPBST
DPBBF: Actual difference of intake air pressure between EGR valve close and open
DPBST: Predicted difference of intake air pressure between EGR valve close and open when EGR has no clogging
DPBST values are shown below

BARO = 460mmHg	
ENGINE SPEED (rpm)	DPBST (mmHg)
1100	72.20
1400	54.60
1700	42.90
2000	35.60
2300	30.50

BARO = 760mmHg	
ENGINE SPEED (rpm)	DPBST (mmHg)
1100	110.7
1400	89.60
1700	71.20
2000	61.10
2300	54.30

3): Level A: This monitor is disabled until level A monitors have had pass judgment.

2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT / SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
FUEL SYSTEM	P0172 (BANK 1) P0175 (BANK 2)	C	LONG TERM FUEL TRIMMETHOD - RICH	LONG TERM FUEL TRIM VALUE CALCULATED BY A/F SENSOR AND SECONDARY HO2S (DIGITAL)	<0.844 (NORMAL) <0.852 (PURGE CUT)	ECT IAT2 MAP ENGINE SPEED LONG TERM FUEL TRIM VALUE (P0172 ONLY)	>69deg.C >0deg.C 180mmHg 640<RPM<4000rpm IF THE INFLUENCE OF EVAP PURGE IS FOUND BY PAUSING PURGE, MONITORING IS DISABLED UNTIL EVAP VAPOR IS PURGED TO PREDETERIMINED LEVEL 2) CLOSED LOOP CONDITION LEVEL D: P0455 3)	JUDGMENT FAULT: 5sec.INTERVAL MONITORING RUNS CONTINUOUSLY	2 D/C
	P0171 (BANK 1) P0174 (BANK 2)		LONG TERM FUEL TRIMMETHOD - LEAN		>1.172	FEEDBACK CONTROL SYSTEM STATUS MONITORING PRIORITY ORDER			

Note: 1): Refer to section for logic flowchart.
2): Monitoring disable time depends on EVAP vapor amount, but the monitoring forces to restart after 5 minutes disablement even if the influence of EVAP vapor still remains.
3): This monitor is held only when decompression mode of P0455 monitor is performed. And after the decompression mode has completed, this monitor continues monitoring again.

2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
ENGINE COOLANT TEMPERATURE (ECT) SENSOR	P0125	B	ACHIEVING TIME METHOD WHICH MEASURES THE TIME INTERVAL UNTIL ECT ACHIEVES ABOVE 30 deg.C AFTER ENGINE START	TIME INTERVAL (DIGITAL)	AT LOW ENGINE LOAD INCLUDING IDLE: 2) TEMP 3) deg.C) / TIME (sec.) -6.7 / >=360 10 / >=180 30 / >= 60	IAT2 AT ENGINE START ECT AT ENGINE START FUEL SYSTEM STATUS	>-7deg.C >-7deg.C EXCEPT FUEL CUT CONDITIONS	JUDGMENT FAULT OR PASS : ACCORDING TO THRESHOLD MONITORING RUNS ONCE PER DRIVING CYCLE	2 D/C
					AT NORMAL ENGINE LOAD: 2) TEMP 3) deg.C) / TIME (sec.) -6.7 / >=300 10 / >=120 30 / >= 60				
					AT HIGH ENGINE LOAD: 2) >1200sec.	IAT2 OR ECT AT ENGINE START 3) FUEL SYSTEM STATUS	EITHER OF FOLLOWING CONDITIONS: a) -7<ECT<30deg.C AND IAT2<-7deg.C b) ECT<-7deg.C EXCEPT FUEL CUT CONDITIONS		
	P0116		ACHIEVING TIME METHOD WHICH MEASURES THE TIME WHILE ECT IS STUCK	CUMULATIVE TIME OF CONTINUOUS ECT STUCK CONDITION (DIGITAL)	<2deg.C/1200sec.	IAT2 OR ECT AT ENGINE START 3) FUEL SYSTEM STATUS	EITHER OF FOLLOWING CONDITIONS: a) 30<ECT<50.0deg.C b) -7<ECT<30deg.C AND IAT2<-7deg.C c) ECT<-7deg.C EXCEPT FUEL CUT CONDITIONS	JUDGMENT FAULT : ACCORDING TO THERSHOLD MONITORING RUNS ONCE PER DRIVING CYCLE	
	P0117	F	RANGE CHECK-LOW	ECT SENSOR SIGNAL(ANALOG)	<0.08V			JUDGMENT FAULT: 2sec. MONITORING RUNS CONTINUOUSLY	1 D/C
	P0118		RANGE CHECK-HIGH		>4.92V				

Note: 1): Refer to section for logic flowchart.

2): Engine load ranges are shown below;

LOW	NORMAL		HIGH	
LOWER THAN NORMAL RANGE	RPM	MAP(mmHg)	RPM	MAP(mmHg)
	500	>600	800	>760
	1000	>410	1000	>360
	2000	>230	1500	>234
	2500	>160		

3): Either ECT or IAT2 whichever lower at engine start.

2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
THROTTLE POSITION (TP) SENSOR 1 (TPS1)	P0122	F	RANGE CHECK-LOW	TP SENSOR SIGNAL (ANALOG)	<0.28V			JUDGMENT FAULT: 0.1sec. MONITORING RUNS CONTINUOUSLY	1 D/C
	P0123		RANGE CHECK-HIGH		>4.747V				
THROTTLE POSITION (TP) SENSOR 2 (TPS2)	P0222		RANGE CHECK-LOW		<0.182V				
	P0223		RANGE CHECK-HIGH		>4.843V				
THROTTLE POSITION (TP) SENSORS	P2135		COMPARISON CHECK	DIFFERENCE OF SIGNALS BETWEEN TPS1 AND TPS2	|TPS1-TPS2| > 5deg.				
			SHORT CIRCUIT BETWEEN TPS1 AND TPS2 CHECK	DIFFERENCE OF SIGNALS BETWEEN TPS1 AND TPS2	|TPS1-TPS2| < 0.05V	CIRCUIT VOLTAGE OF TPS2	= 0V 2)	JUDGMENT FAULT: 10sec. MONITORING RUNS CONTINUOUSLY	
ACCELERATOR POSITION (AP) SENSOR 1 (APS1)	P2122	F	RANGE CHECK-LOW	AP SENSOR SIGNAL (ANALOG)	<0.2V			JUDGMENT FAULT: 0.2sec. MONITORING RUNS CONTINUOUSLY	1 D/C
	P2123		RANGE CHECK-HIGH		>4.85V				
ACCELERATOR POSITION (AP) SENSOR 2 (APS2)	P2127		RANGE CHECK-LOW		<0.2V				
	P2128		RANGE CHECK-HIGH		>4.85V				
ACCELERATOR POSITION (AP) SENSORS	P2138		COMPARISON CHECK	DIFFERENCE OF SIGNALS BETWEEN APS1 AND APS2	APS1/2-0.12V>APS2 OR APS1/2+0.12V<APS2			JUDGMENT FAULT: 0.3sec. MONITORING RUNS CONTINUOUSLY	
SERIAL DATA LINK	U0107	F	SIGNAL EXISTANCE CHECK	SERIAL DATA LINK SIGNAL (DIGITAL)	NO SIGNAL	BATTERY VOLTAGE CPU INITIAL DELAY	>7.0V 3) >1sec	JUDGMENT FAULT: 0.25sec. MONITORING RUNS CONTINUOUSLY	1 D/C

Note: 1): Refer to section for logic flowchart.
2): Power supply in TPS2 is compulsorily cut for 0.0045 seconds every 1 second in order to monitor short circuit between TPS1 and TPS2.
3): Read value by PCM.

2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
THROTTLE VALVE CONTROL	P2100	F	CURRENT CHECK	MOTOR CURRENT (ANALOG)	>8A			JUDGMENT FAULT: 0.5sec. MONITORING RUNS CONTINUOUSLY	1 D/C
	P2101		FUNCTION CHECK	DIFFERENCE OF VALUE BETWEEN ESTIMATED (THHT) THROTTLE ANGLE AND ACTUAL TROTTLE (TH) ANGLE DTHE=|THHT-TH|	DTHE > 5deg.			JUDGMENT FAULT: 0.3sec. MONITORING RUNS CONTINUOUSLY	
					DTHE > 5deg.	|TTH(n) - TTH(n-1)|	> 5deg.	JUDGMENT FAULT: 0.2sec. MONITORING RUNS CONTINUOUSLY	
					DTHE > 2deg.	|TTH(n) - TTH(n-1)|	> 2deg.	JUDGMENT FAULT: 0.5sec. MONITORING RUNS CONTINUOUSLY	
					DTHE > 2deg. 2)	|TTH(n) - TTH(n-1)|	< 0.25deg.	JUDGMENT FAULT: (MIN) 0.2sec. 2) (MAX) 2) MONITORING RUNS CONTINUOUSLY	
	P2176	G	RANGE CHECK (FULL CLOSE POINT)	THROTTLE POSITION SENSOR 1 (TPS1) SIGNAL	>ITPS1 + 0.151V OR <ITPS1 - 0.108V	BATTERY VOLTAGE KEY POSITION	>7.0V 3) THE INSTANCE OF IGINITION ON	JUDGMENT FAULT: 0.5sec. MONITORING RUNS ONCE PER DRIVING CYCLE	
					|TPS1 - LFCTPS1| > 0.5deg.				
				THROTTLE POSITION SENSOR 2 (TPS2) SIGNAL	>ITPS2 + 0.151V OR <ITPS2 - 0.108V				
					|TPS2 - LFCTPS2| > 0.5deg.				

Note: THHT : Estimated throttle value calculated from target throttle value.
TTH(n) : Target throttle value.
TTH(n-1) : Target throttle value of 0.01seconds ago.
ITPS1/2 : Full close point value set at the throttle body assembling.
LFCTPS1/2 : Full close point value set at last D/C.
1): Refer to section for logic flowchart.
2): This monitoring checks oscillation of actual throttle angle. The monitoring carries out every 0.0015seconds. The counter is increased by 2 when the criteria is exceeded, and the counter is decreased when the criteria is not exceeded. When the counter exceeds 267, the throttle valve control is regarded to oscillate fail. Judgment time is according to oscillating condition.
3): Read value by PCM.

2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
THROTTLE VALVE CONTROL (contd.)	P2108	F	COMPARISON CHECK (CPU) 2)	MARK BIT(INCLUDE SERIAL LINK DATA)	NOT EQUAL			JUDGMENT FAULT: 0.2sec. MONITORING RUNS CONTINUOUSLY	1 D/C
	P2553	G	FUNCTION CHECK (RELAY) 3)	SERIAL DATA LINK SIGNAL (DIGITAL)	NORMAL SIGNAL	BATTERY VOLTAGE KEY POSITION	>7.0V 4) IGNITION OFF	JUDGMENT FAULT: 0.25sec. MONITORING RUNS ONCE PER DRIVING CYCLE 5)	
	P2554	F	RANGE CHECK (LOW)	THROTTLE INHIBIT CIRCUIT (ANALOG)	<0.498V	PCM STATUS	PROCESSING	JUDGMENT FAULT: 0.2sec. MONITORING RUNS CONTINUOUSLY	
	P2555		RANGE CHECK (HIGH)		>10V (IGNITION ON) >4.5V (IGNITION OFF)				
	P2112	G	FUNCTION CHECK (DEFAULT POSITION SPRING) 4)	THROTTLE POSITION SENSOR SIGNAL (ANALOG)	<3.7deg.	KEY POSITION ECT	IGNITION OFF >=69.5deg.C	JUDGMENT FAULT: 4sec.	
	P2111		FUNCTION CHECK (RETURN SPRING) 4)	THROTTLE POSITION SENSOR SIGNAL (ANALOG)	>9.1deg.			MONITORING RUNS ONCE PER DRIVING CYCLE 5)	

Note: 1): Refer to section for logic flowchart.
2): Two units(FI,ETCS) check each other including RAM and ROM SUM checks.
3): If relay is normal, no serial data.
4): Read value by PCM.
5): The monitor carries out after ignition OFF timing. (MIL is illuminated at the next driving cycle.)

2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
THROTTLE VALVE CONTROL (contd.)	P0507 (HIGH) P0506 (LOW)	E	FUNCTIONAL CHECK	CKP SENSOR SIGNAL (PULSE)	RPM>TARGET+200rpm OR RPM<TARGET-100rpm	ECT IAT2 BATTERY VOLTAGE 2) THROTTLE ANGLE SHORT TERM FUEL TRIM STATUS FUEL SYSTEM STATUS CUMULATIVE TIME AFTER ENGINE START	>69deg.C >0deg.C >10.50V <0.3deg. WITHIN SHORT TERM FUEL TRIM LIMITS CLOSED LOOP CONDITION >15sec.	JUDGMENT FAULT OR PASS: 20sec. MONITORING RUNS CONTINUOUSLY 3)	2 D/C

Note: 1): Refer to section for logic flowchart.
2): Read value by PCM.
3): This monitor runs whenever enable conditions are met until fail is detected. If fail is detected, temporary fault code is stored and the monitoring is disabled for the reminder of the D/C. If fail is detected at initial monitoring event of 2nd D/C, fault code is stored and MIL is illuminated. Otherwise, temporary fault code is erased unless fail is detected again for the reminder of the 2nd D/C.

2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR	P0107	F	RANGE CHECK-LOW	MAP SENSOR SIGNAL (ANALOG)	<0.23V			JUDGMENT FAULT: 2sec.	1 D/C
	P0108		RANGE CHECK-HIGH		>4.49V			MONITORING RUNS CONTINUOUSLY	
	P1128	B	RATIONALITY-LOW		BARO (mmHg) / VOLT.(V): 776 <1.61; 460 <1.14	ENGINE SPEED VEHICLE SPEED ECT THROTTLE ANGLE	1150<RPM<6100rpm >15mph >69deg.C RPM / TH-ANGLE(deg.): 1000 >11.8; 2000 >19.0; 3000 >25.0; 4000 >31.5; 5500 >40.5	JUDGMENT FAULT OR PASS: 2sec. MONITORING RUNS ONCE PER DRIVING CYCLE	2 D/C
	P1129		RATIONALITY-HIGH		>1.14V	ENGINE SPEED VEHICLE SPEED ECT FUEL SYSTEM STATUS	1150<RPM<6100rpm >15mph >69deg.C FUEL CUT CONDITION		

Note: 1): Refer to section for logic flowchart.

2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
BAROMETRIC PRESSURE (BARO) SENSOR	P2228	F	RANGE CHECK-LOW	BARO SENSOR SIGNAL(ANALOG)	<1.58V			JUDGMENT FAULT: 2sec.	1 D/C
	P2229		RANGE CHECK-HIGH		>4.49			MONITORING RUNS CONTINUOUSLY	
	P2227	H	RATIONALITY CHECK	JUDGMENT A: DIFFERENCE OF SIGNALS BETWEEN BARO SENSOR AND MAP SENSOR WHEN KEY IS ON BUT ENGINE IS NOT RUNNING (ANALOG)	|BARO-MAP| >150mmHg(0.55V)	ENGINE OPERATING CONDITION	STOP (WHILE KEY SWITCH IS TURNED FROM ON TO CRANKING POSITION)	JUDGMENT FAULT OR PASS (MIN): 0.63sec. MONITORING RUNS ONCE PER DRIVING CYCLE	2 D/C 2)
						BARO	1.58<BARO<4.49V		
						MAP	0.23<MAP<4.49V		
						FLUCTUATION OF MAP SENSOR OUTPUT	<20mmHg/210msec.		
						FLUCTUATION OF BARO SENSOR OUTPUT	<20mmHg/210msec.		
						IMMOBILIZER SYSTEM STATUS	OK		
				JUDGMENT B: 2) DEFFERENCE OF SIGNALS BETWEEN BARO SENSOR AND MAP SENSOR	|BARO-MAP| >190mmHg(0.69V)	THROTTLE ANGLE	RPM TH-ANGLE(deg.) 1000 >13.31 2000 >20.70 3000 >26.86 4000 >33.53 5500 >42.77	JUDGMENT FAULT OR PASS: 2.5sec. MONITORING RUNS ONCE PER DRIVING CYCLE	
						FLUCTUATION OF MAP SENSOR OUTPUT AFTER ENGINE START	>43mmHg		
						FLUCTUATION OF TP SENSOR OUTPUT AFTER ENGINE START	>2deg.		

Note: 1): Refer to section for logic flowchart.
2): Judgment B runs if judgment A does not completed.

2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
CAMSHAFT POSITION SENSOR (CMP)	P0340 (SHORT /OPEN)	F	COMPARISON CHECK (BETWEEN CMP1 SIGNAL AND CKP SIGNAL)	CMP SENSOR SIGNAL (PULSE)	NO SIGNAL	ENGINE STATUS	RUNNING	JUDGMENT FAULT: 17 ENGINE REVS 2) MONITORING RUNS CONTINUOUSLY	1 D/C
	P0341 (NOISE)			COUNTER OF IMPROPER CMP SIGNAL 3)	=30	ENGINE SPEED	>400rpm	JUDGMENT FAULT: 2.2 sec. 4) MONITORING RUNS CONTINUOUSLY	
CRANKSHAFT POSITION SENSOR A (CKP1)	P0335 (SHORT /OPEN)		COMPARISON CHECK (BETWEEN CKP1 SIGNAL AND CKP2 SIGNAL)	CKP1 SENSOR SIGNAL (PULSE)	NO SIGNAL	ENGINE STATUS	RUNNING	JUDGMENT FAULT: 5 ENGINE REVS 5) MONITORING RUNS CONTINUOUSLY	
	P0336 (NOISE)			COUNTER OF IMPROPER CKP1 SIGNAL 6)	=30	ENGINE SPEED	>400rpm	JUDGMENT FAULT: 2.2sec. 4) MONITORING RUNS CONTINUOUSLY	
CRANKSHAFT POSITION SENSOR B (CKP2)	P0385 (SHORT /OPEN)		COMPARISON CHECK (BETWEEN CKP2 SIGNAL AND CKP1 SIGNAL)	CKP2 SENSOR SIGNAL (PULSE)	NO SIGNAL	ENGINE STATUS	RUNNING	JUDGMENT FAULT: 17 ENGINE REVS 5) MONITORING RUNS CONTINUOUSLY	
	P0386 (NOISE)			COUNTER OF IMPROPER CKP2 SIGNAL 6)	=30	ENGINE SPEED	>400rpm	JUDGMENT FAULT: 2.2sec. 4) MONITORING RUNS CONTINUOUSLY	

Note: 1): Refer to section for logic flowchart.
2): Engine rev is based on CKP1 signal. 22CKP1 signals are regarded as 1 engine rev.
3): Proper rate means 3CMP signals per 44CKP signals. Signal check is done every half a engine rev. When improper number of CMP signals is detected, the counter counts 1 up. The counter goes 1 back every 10sec.
4): Monitoring time at engine idling.
5): Engine rev is based on CMP signal. 3CMP signals are regarded as 2engine rev.
6): Proper rate means 44CKP signals per 3CMP signal. Signal check is done every half a engine rev. When improper number of CKP signals is detected, the counter counts 1 up. The counter goes 1 back every 10sec.

2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION 2)	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
THERMOSTAT	P0128	B	COMPARISON OF : (a) TIME INTERVAL UNTIL COMPUTER PREDICTED ECT FOR NORMAL THERMOSTAT REACHES 75deg.C (T1), (b) TIME INTERVAL UNTIL COMPUTER PREDICTED ECT FOR FULL OPEN-STUCK THERMOSTAT REACHES 70deg.C (T2), AND (c) TIME INTERVAL UNTIL ECT SENSOR READING VALUE REACHES 70deg.C (T0)	TIME INTERVAL	T0>T1 3)	IAT2 AT ENGINE START ECT AT ENGINE START ECT AT ENGINE START -IAT2 AT ENGINE START IAT2 AT ENGINE START -IAT2 4) ENGINE SPEED	-7<=IAT2<=35deg.C -7<=ECT<=35deg.C <=6deg.C <=2deg.C <5000rpm	ONCE PER DRIVING CYCLE 5)	2 D/C
			METHOD WHICH CHECKS THE DIFFERENCE BETWEEN ECT SENSOR READING AND COMPUTER PREDICTED TEMPERATURES	ECT DIFFERENCE	>15deg.C				

Note: 1): Refer to section for logic flowchart.
2): For detail explanation, see section 16.09.02.08(System description of thermostat monitoring).
3): If T0 is shorter than T1, & T2, the monitoring is completed with pass judgment.
If T0 is shorter than T1 but longer than T2, the monitoring is suspended without any judgment.
4): If engine start IAT2-engine start ECT>=6deg.C, this condition is cancelled to avoid unnecessary disablement after complete soak.
5): For example, fail is judged at approximately 230sec. when driven in LA-4 at ambient temperature of 77deg.F using vehicle speed proportional cooling fan.

2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
INTAKE AIR TEMPERATURE 1 SENSOR (IAT1)	P0112	F	RANGE CHECK-LOW	IAT1 SENSOR SIGNAL (ANALOG)	<0.078V			JUDGMENT FAULT: 2.0sec.	1 D/C
	P0113		RANGE CHECK-HIGH		>4.922V			MONITORING RUNS CONTINUOUSLY	
INTAKE AIR TEMPERATURE 2 SENSOR (IAT2)	P0097		RANGE CHECK-LOW	IAT2 SENSOR SIGNAL (ANALOG)	<0.078V			JUDGMENT FAULT: 2.0sec.	
	P0098		RANGE CHECK-HIGH		>4.922V			MONITORING RUNS CONTINUOUSLY	
IAT2 SENSOR OR IAT1 SENSOR	P2199	B	CHECK OF TEMPERATURE DIFFERENCE BETWEEN IAT1 AND IAT2 AT COLD ENGINE START	IAT1 SENSOR OUTPUT SIGNAL(ANALOG) AND IAT2 SENSOR OUTPUT SIGNAL |IAT2-IAT1|	>25deg.C	SOAK TIME CUMULATIVE TIME AFTER IGNITION ON	>8hours >5sec.	JUDGMENT FAULT: 200msec. MONITORING RUNS ONCE PER DRIVING CYCLE	2 D/C
KNOCK SENSOR (KS)	P0325	F	EXISTENCE OF KS SIGNAL	KS SIGNAL (ANALOG)	NO SIGNAL	ECT ENGINE SPEED	>60deg.C >2000rpm	JUDGMENT FAULT: 5sec. MONITORING RUNS CONTINUOUSLY	1 D/C
VARIABLE VALVE TIMING ELECTRIC CONTROL (VTEC) SYSTEM	P2647		VTEC OIL PRESSURE HIGH STUCK	VTEC PRESSURE SWITCH SIGNAL	VTEC PRESSURE SWITCH OFF SIGNAL	VTEC SOLENOID COMMAND SIGNAL BATTERY VOLTAGE 2)	OFF (LOW VALVE TIMING) >10.50V	JUDGMENT FAULT: 5sec. MONITORING RUNS CONTINUOUSLY	
	P2646		VTEC OIL PRESSURE LOW STUCK	VTEC PRESSURE SWITCH SIGNAL	VTEC PRESSURE SWITCH ON SIGNAL	VTEC SOLENOID COMMAND SIGNAL BATTERY VOLTAGE 2)	ON (HIGH VALVE TIMING) >10.50V		
	P2649		RETURN SIGNAL CHECK	RETURN SIGNAL VOLTAGE	=12V	VTEC SOLENOID COMMAND SIGNAL BATTERY VOLTAGE 2)	OFF (LOW VALVE TIMING) >10.00V	JUDGMENT FAULT: 2.0sec. MONITORINTG RUNS CONTINUOUSLY	
	P2648			RETURN SIGNAL VOLTAGE	=0V	VTEC SOLENOID COMMAND SIGNAL BATTERY VOLTAGE 2)	ON (HIGH VALVE TIMING) >10.00V	JUDGMENT FAULT: 2.0sec. MONITORINTG RUNS CONTINUOUSLY	

Note: 1): Refer to section for logic flowchart.
2): Read value by PCM.

2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C& MIL ILLUM.
POSITIVE CRANKCASE VENTILATION (PCV) VALVE	P2282	B	FUNCTIONAL CHECK BY ESTIMATING AIR LEAK FROM PCV DISCONNECTION	CALCULATED AIR QUANTITY	MAP-BARO (mmHg) / Qpcv 2) (liter/min.) -500 / >165 -400 / >150 -300 / >120 -250 / >100 -180 / > 38	CUMULATIVE TIME AFTER ENGINE START ECT IAT BATTERY VOLTAGE MAP-BARO THROTTLE ANGLE FUEL SYSTEM STATUS	>15.0sec. >69deg.C >-6.7deg.C >10.50V <-180mmHg <0.3deg. CLOSED LOOP CONDITIONS	JUDGMENT FAULT OR PASS: (MIN): 22.0sec. (MAX): 37.0sec. ONCE PER DRIVING CYCLE	2 D/C

Note: 1): Refer to section for logic flowchart.
2): Qpcv means the amount of air quantity that return to the intake manifold from PCV valve.

2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C& MIL ILLUM.
POWERTRAIN CONTROL MODULE (PCM)	P1621	F	CHECK SUM-CHECK OF E2PROM	E2PROM DATA	CHECK SUM ERROR (5 TIMES)			JUDGMENT FAULT: 2) MONITORING RUNS CONTINUOUSLY	1 D/C
	NO CODE	N/A	CHECK SUM-CHECK OF ROM	ROM DATA	CHECK SUM ERROR (1 TIME)				
	P2610	F	INTERNAL ENGINE OFF TIMER PERFORMANCE	GAP BETWEEN EONV TIMER AND PCM TIMER 3)	<-500sec. OR >500sec.	EONV TIMER KEY POSITION	<51 hours IG ON	JUDGMENT FAULT: 360sec. MONITORING RUNS CONTINUOUSLY	
	P0685		POWER SUPPLY CHECK	POWER SUPPLY	FAILURE	KEY POSITION PCM STATUS ENGINE SPEED AT THE MOMENT KEY POSITION CHANGED TO IG OFF AT THE LAST D/C	IG OFF PROCESSING >400rpm	JUDGMENT FAULT: 1sec. MONITORING RUNS CONTINUOUSLY	
SENSOR REFERENCE VOLTAGE A	P0641	F	CIRCUIT CHECK	REFERENCE VOLTAGE (ANALOG)	<0.5V OR >1.5V			JUDGMENT FAULT: 5.0sec. MONITORING RUNS CONTINUOUSLY	
SENSOR REFERENCE VOLTAGE B	P0651								

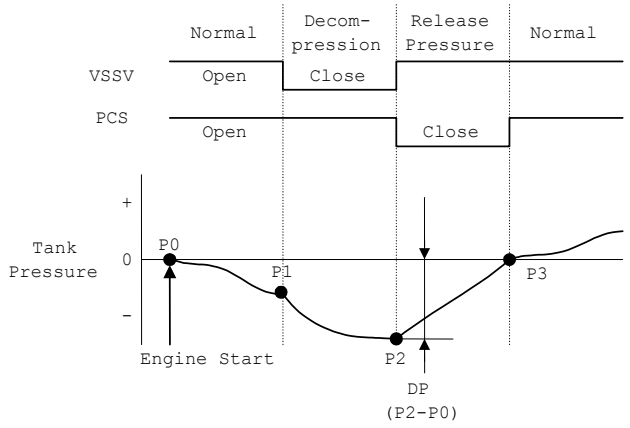
Note: 1): Refer to section for logic flowchart.
2): Approximately 30 to 60 seconds depending on operating condition.
3): EONV timer is reset and started when the key position becomes IG on or IG off. PCM timer is started when the key position becomes IG on and reset when the key position becomes IG off.

COMPONENT / SYSTEM	FAULT CODE	FLOW CHART TYPE 2)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.

2004file13.doc

EVAPORATIVE SYSTEM -LEAK CHECK	P0455 (0.09")	B	JUDGMENT A: 2) 0.09" LEAK CHECK BY DECOMPRESSION METHOD	CHANGE OF FUEL TANK PRESSURE (FTP) SENSOR SIGNAL WHILE DECOMPRESSION (ANALOG) NUMBER OF OCCURENCE	DP>-16mmHg 4) TWICE	ECT AT ENGINE START IAT1 AT ENGINE START DIFFERENCE OF ECT AND IAT1 AT ENGINE START BATTERY VOLTAGE ECT MAP ENGINE SPEED VEHICLE SPEED BARO SHORT TERM FUEL TRIM STATUS (APPLIED ONLY FOR DECOMPRESSION MODE) DP 4) DELTA VEHICLE SPEED MONITORING PRIORITY ORDER	4<ECT<30deg.C 4<IAT1<30deg.C ECT-IAT1<10deg.C >10.5V >68.8deg.C RPM / MAP(mmHg) 1000 >225 1500 >200 2000 >177 3000 >150 4000 >135 >1000rpm >6.2mph >562mmHg NOT RICH LIMIT <5mmHg < 0.87MPH / 0.08sec. LEVEL A: P0496 3)	JUDGMENT PASS: 18sec. JUDGMENT FAULT: 30sec. MONITORING RUNS ONCE PER DRIVING CYCLE	2 D/C 2)

Note: 1): Refer to section for logic flowchart.
2): This judgment doesn't fail until the second occurence in 1 D/C. After second failure of judgment A, judgment B is executed. (See the next page)
3): Level A: This monitor is disabled until level A monitors have had pass judgment.
4): Refer to the following figure.

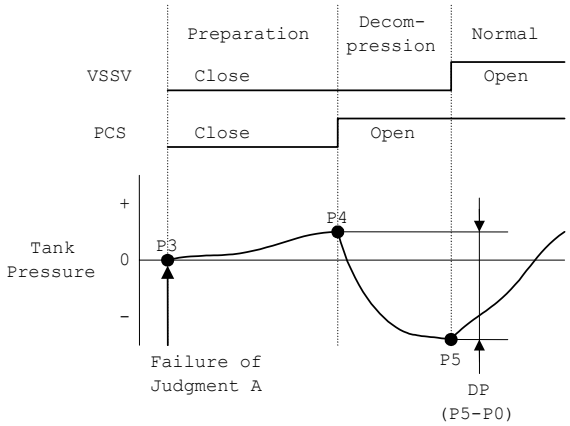


2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT / SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
EVAPORATIVE SYSTEM -LEAK CHECK	P0455 (0.09")	B	JUDGMENT B: 2) 0.09" LEAK CHECK BY DECOMPRESSION METHOD	CHANGE OF FUEL TANK PRESSURE (FTP) SENSOR SIGNAL WHILE DECOMPRESSION (ANALOG)	DP>-16mmHg 7)	CUMULATIVE TIME AFTER JUDGMENT A FAILS ECT AT ENGINE START IAT1 AT ENGINE START DIFFERENCE OF ECT AND IAT1 AT ENGINE START ECT SEQUENCIAL TIME WHICH VEHICLE SPEED IS HIGHER THAN 5mph DP 7) MONITORING PRIORITY ORDER	500sec. 3) 4<ECT<30deg.C 4<IAT1<30deg.C ECT-IAT1<10deg.C >68.8deg.C >100sec. 4) <5.6mmHg 6) LEVEL A: P0496 5)	JUDGMENT PASS : 50sec. JUDGMENT FAULT: 500sec. MONITORING RUNS ONCE PER DRIVING CYCLE 2)	1 D/C 2)

Note: 1): Refer to section for logic flowchart.
2): If judgment B does not finish during current D/C, MIL is illuminated.
3): Before judgment B starts, the monitoring finishes with no judgment if (P4-P0) becomes higher than 5mmHg.
4): When this condition is met, the monitoring is paused.
5): Level A: This monitor is disabled until level A monitors have had pass judgment.
6): In case this condition is not met, the monitoring finishes with no judgment.
7): Refer to the following figure.

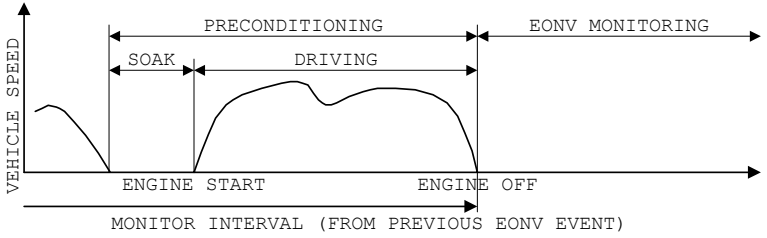


2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
EVAPORATIVE SYSTEM -LEAK CHECK	P0442	L	0.02" LEAK CHECK BY ENGINE OFF NATURAL VACUUM (EONV) METHOD 2)	FUEL TANK PRESS.(FTP) SENSOR	FAIL THRESHOLD: EWMA VALUE 3) >0.133 PASS THRESHOLD: EWMA VALUE 3) <=0.133 PASS THRESHOLD 4): EWMA VALUE 3) <=0.065	MONITORING PRECONDITIONS: MONITOR INTERVAL for PASSING SYSTEM MONITOR INTERVAL for FAILING SYSTEM SOAK TIME ECT AT ENGINE START IAT1 AT ENGINE START DIFFERENCE OF ECT AND IAT1 AT ENGINE START REFUELING STATUS IN DRIVING DRIVING TIME FUEL CONSUMPTION DRIVING DISTANCE ECT AT ENGINE OFF ESTIMATED AMBIENT TEMP AT ENGINE OFF MONITORING PRIORITY ORDER	 >17hours 5) >10hours 5) >8hours ECT<30deg.C 4<IAT1<30deg.C ECT-IAT1<10deg.C NO REFUELING 6) >SET VALUE 7) >SET VALUE 8) >2000meters ECT>68.8deg.C 4<TEMP<30deg.C LEVEL A: P2199, P0112, P0113, P0455 9)	JUDGMENT FAULT: (MAX): 60min. (MIN): 35min. JUDGMENT PASS: (MAX): 60min. (MIN): 35min. MONITORING RUNS ONCE IN 24hours.	MAX 6 MONITORING EVENTS

Note: 1): Refer to section for logic flowchart.
2): Overall monitoring sequence

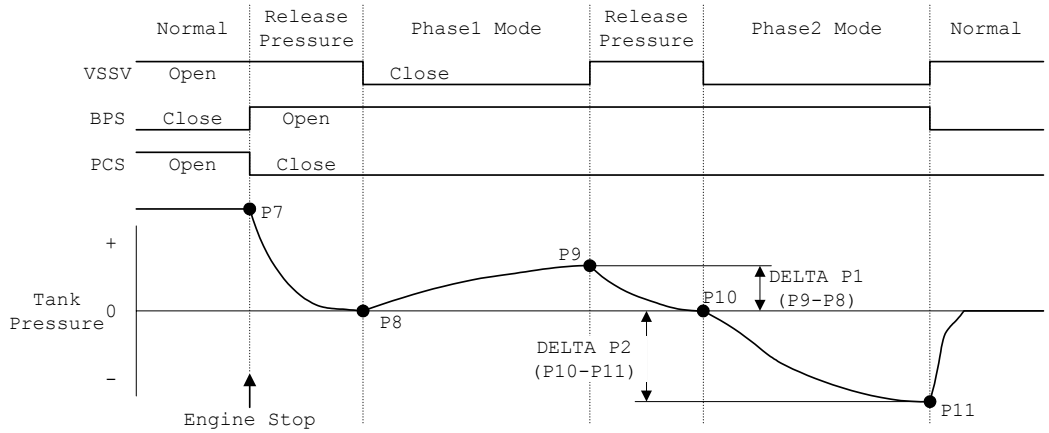


2004file13.doc

Note: 3): EWMA : Exponentially Weighted Moving Average, EWMA_Value(n) = Raw_value x C_filter + EWMA_value(n-1) x (1-C_filter)

Raw_Value : 1 – (DELTA_P1+DELTA_P2) / K
K : Coefficient factor according to fuel level

EONV monitoring sequence



4): This pass threshold is used only when a confirmed fault code for 0.02" leak is stored
5): If EONV monitoring starts to run but isn't completed, this disable condition is cancelled up to two EONV monitoring events.
6): Regarded as refueling if fuel level increases by 10% when vehicle is stopped.
7): Driving time (min.)

ESTIMATED AMBIENT TEMPERATURE(deg.C) / FUEL LEVEL (%)	0	10	25	35
15	20	20	10	10
40	25	25	20	15
60	25	25	20	15
85	25	25	20	20

8): Fuel consumption (liter)

ESTIMATED AMBIENT TEMPERATURE(deg.C) / FUEL LEVEL (%)	0	10	25	35
15	0.84	0.84	0.48	0.48
40	1.14	1.14	0.84	0.66
60	1.14	1.14	0.84	0.66
85	1.14	1.14	0.84	0.84

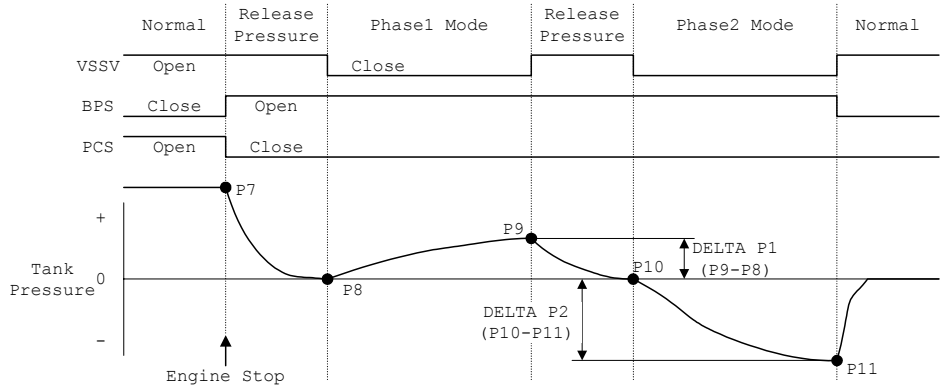
9): Level A: This monitor is disabled until level A monitors have had pass judgment.

2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
EVAPORATIVE SYSTEM -LEAK CHECK (contd.)	P0442		0.02" LEAK CHECK BY ENGINE OFF NATURAL VACUUM (EONV)			ENABLE CONDITIONS FOR EONV MONITORING: KEY POSITION REFUELING STATUS IN EONV MONITORING BARO FTP IN PHASE2 MODE (P11) FUEL LEVEL BATTERY VOLTAGE VEHICLE SPEED FTP AT THE END OF RELEASE PRESSURE MODE RATIONALITY CHECK FOR FTP OR FUEL LEVEL SENSORS	 OFF NO REFUELING 2) >562mmHg DOES NOT EXCEED SET VALUE THREE TIMES SET VALUE FLEVEL(%) PTANK(mmHg) 15 3 40 3 60 2 85 1.5 15<FLEVEL<85 % >10.5V =0mph 3) -5mmHg<P8<5mmHg 4) PASS 4)5)		MAX 6 MONITORING EVENTS

Note: 1): Refer to section for logic flowchart..
2): Regarded as refueling if fuel level increases by 10% during EONV monitoring or change in FTP exceeds 2.5mmHg/2sec.
3): Read by PCM. This condition is equivalent to that the actual vehicle speed is less than about 2mph.
4): Monitoring is disabled if this condition isn't met, and "1.00" is taken as Raw value.
5): See the next page about rationality check for FTP or fuel level sensors.



2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
FTP SENSOR OR FUEL LEVEL SENSOR (FLEVEL)	NO CODE	F	RATIONALITY CHECK WHILE FAST REFUELING	FLEVEL OUTPUT - FLEVEL OUTPUT WHEN EONV STARTS	<10% 2)	EONV STATUS MAX DELTA FTP SENSOR OUTPUT	MONITORING >2.5mmHg/2sec	JUDGMENT FAULT: 45sec. MONITORING RUNS CONTINUOUSLY	MIL IS NOT ILLUMINATED 4)
				FLEVEL OUTPUT - FLEVEL OUTPUT WHEN FAST REFUELING IS DETECTED	<0%	EONV STATUS FAST RUFUELING JUDGMENT	MONITORING FAST REFUELING	JUDGMENT FAULT: 15sec. MONITORING RUNS CONTINUOUSLY	
FUEL LEVEL SENSOR (FLEVEL)	NO CODE	F	RATIONALITY CHECK WHILE SLOW REFUELING	FLEVEL OUTPUT - FLEVEL OUTPUT WHEN SLOW REFUELING IS DETECTED	<0%	EONV STATUS EVAP CANISTER VENT SHUT VALVE COMMAND STATUS SLOW RUFUELING JUDGMENT 3)	MONITORING CLOSE SLOW REFUELING	JUDGMENT FAULT: 15sec. JUDGMENT PASS : 60sec. MONITORING RUNS CONTINUOUSLY	

Note: 1): Refer to section for logic flowchart..
2): When this judgment passes, fast refueling is detected.
3): Slow refueling is detected at the case below:
(FLEVEL output) - (FLEVEL when EONV starts) > 10%
4): MIL is not illuminated when the judgment fails. "1.00" is taken as EWMA value at current D/C.

2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
EVAP CANISTER PURGE VALVE	P0496	B	MONITOR OF PURGE VALVE STUCK OPENED	FAIL THREDHOLD: FTP – FTP@ENG START (ANALOG) PASS THREDHOLD: FTP – FTP@ENG START (ANALOG)	<-10mmHg >=-10mmHg WHEN BARO – MAP >100mmHg	ENGINE OPERATION STATUS ECT AT ENGINE START IAT1 AT ENGINE START DIFFERENCE OF ECT AND IAT1 AT ENGINE START FUEL LEVEL BATTERY VOLTAGE 3)	RUNNING 4<ECT<30deg.C 4<IAT1<30deg.C ECT-IAT1<10deg.C 15<FLEVEL<85% >10.5V	JUDGMENT TIME: (PASS) : 2sec. (FAULT): 1sec. MONITORING RUNS ONCE PER DRIVING CYCLE	2D/C
	P0443	F	RETURN SIGNAL CHECK	PURGE VALVE RETURN SIGNAL (ANALOG)	NO SIGNAL CHANGE	BATTERY VOLTAGE 3)	>10.05V	JUDGMENT FAULT: 5sec. MONITORINTG RUNS CONTINUOUSLY	1 D/C
EVAP CANISTER VENT SHUT VALVE	P0446	B	CHECK OF VENT SHUT VALVE STUCK CLOSED	FAIL THREDHOLD: FTP – FTP@ENG START (ANALOG) PASS THREDHOLD: FTP – FTP@ENG START (ANALOG)	<-10mmHg >=-10mmHg WHEN CUMULATIVE PURGE VOLUME >4L	ENGINE OPERATION STATUS FUEL LEVEL BATTERY VOLTAGE 3) MONITORING PRIORITY ORDER	RUNNING 15<FLEVEL<85 % >10.5V LEVEL A: P0455 4)	JUDGMENT FAULT: 5.0sec. 5) MONITORING RUNS ONCE PER DRIVING CYCLE	2 D/C
	P0498	F	RETURN SIGNAL CHECK(LOW)	VENT SHUT VALVE RETURN SIGNAL(ANALOG)	=0V	VENT SHUT VALVE OPERATING STATUS	OPEN	JUDGMENT FAULT: 5.0sec.	1 D/C
	P0499		RETURN SIGNAL CHECK(HIGH)		=12V	VENT SHUT VALVE OPERATING STATUS	CLOSE	MONITORINTG RUNS CONTINUOUSLY	
FUEL TANK PRESSURE (FTP) SENSOR	P0452	B	RANGE CHECK (LOW)	FTP SENSOR SIGNAL DURING 4sec. AFTER ENGINE START (ANALOG)	<-28mmHg			JUDGMENT FAULT: 7sec. MONITORING RUNS ONCE PER DRIVING CYCLE	2 D/C
	P0453		RANGE CHECK (HIGH)		>9.4mmHg				

Note: 1): Refer to section for logic flowchart..
2): If engine start IAT1 – engine start ECT > 6deg.C, this disablement is cancelled to avoid unnecessary disablement after complete soak.
3): Read by PCM
4): Level A: This monitor is disabled until level A monitors have had pass judgment.
5): Pass judgment time cannot be specified because it depends on cumulative purge volume.

2004 3.5L (L66) Saturn Vue - Redline
ENGINE DIAGNOSTIC PARAMETERS

2004file13.doc

COMPONENT/ SYSTEM	FAULT CODE	FLOW CHART TYPE 1)	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	STORING F/C & MIL ILLUM.
FUEL LEVEL SENSOR	P0461	F	RATIONALITY CHECK	DECREASE OF FUEL LEVEL SENSOR OUTPUT (ANALOG)	<1.6% (0.31 gallons)	CUMULATIVE TRAVELING DISTANCE 2) BATTERY VOLTAGE 3)	>120 miles (193km) >10.5V	JUDGMENT FAULT: 0.1 sec. MONITORING RUNS CONTINUOUSLY	1 D/C MIL ISN'T ILLUMINATED 4)5)
	P0462		RANGE CHECK-LOW	FUEL LEVEL SENSOR OUTPUT SIGNAL (ANALOG)	<0.49V	BATTERY VOLTAGE 3)	>10.5V	JUDGMENT FAULT: 2.0sec.	
	P0463		RANGE CHECK-HIGH	FUEL LEVEL SENSOR OUTPUT SIGNAL (ANALOG)	>4.50V			MONITORING RUNS CONTINUOUSLY	

Note: 1): Refer to section for logic flowchart..
2): When the vehicle is coasting in fuel cut deceleration, cumulative distance isn't increased.
Cumulative distance is reset in cases shown below:
Judging P0461(this monitoring) pass (including refueling) or fault, battery cancel or PCM memory cleared
3): Read by PCM
4): If malfunction is detected, default value is taken instead of actual fuel level sensor output so that the EVAP leak check is capable to run without a significant reduction in the monitoring performance.
5): The confirmed fault code for fuel level sensor is stored only when the confirmed fault code for EVAP leak check is stored.