

Brought to you by Eris Studios
NOT FOR RESALE

ON BOARD DIAGNOSTICS II INFO

System D

*1 Applicable Compo./Sys. #	13
Monitored component	
misfire	
fuel system	
front oxygen sensor	
rear oxygen sensor	
evaporative emission control sys.	
thermostat	
crankshaft position sensor	x
engine coolant temperature sensor	x
manifold absolute pressure sensor	x
intake air temperature sensor	
atmospheric pressure sensor	
vehicle speed sensor	
starter switch	
idle air control	x
fuel tank pressure sensor	
fuel temperature sensor	
fuel level sensor	
EVAP canister purge valve	
fuel tank pressure control valve	
EVAP canister vent valve	
fan control relay	
CAN system	
Mass air flow sensor	x*2
TAC(throttle actuator control valve)	x
active valve control system	x
engine oil temperature sensor	
direct variable valve lift	
Pressure control valve	

*1: number is corresponded to component/system on the summary sheet

*2: except applicable system within each component

SYSTEM E

*1 Applicable Compo./Sys. #	1	2	3	4	5	6	7	8	11	12	13	14	14'	18	19	23	40	49	49'	50	51	52	52'	53	60	62	72	80	82	83	84	95	96	99	
Monitored component																																			
misfire			x	x	x	x	x					x				x											x								
fuel system		x	x	x														x	x																
front oxygen sensor	x	x	x	x	x *2	x	x	x								x		x			x														
rear oxygen sensor	x			x			x *2	x *2																											
evaporative emission control sys.		x	x	x	x																x			x											
thermostat																																			
crankshaft position sensor		x							x *2	x	x																	x							
camshaft position sensor		x							x *2		x																	x							
engine coolant temperature sensor	x	x	x	x	x		x				x	x *2	x			x	x	x				x			x										
manifold absolute pressure sensor	x	x	x	x	x		x				x					x	x	x				x	x		x *2	x	x								
intake air temperature sensor	x	x	x	x	x		x											x				x	x		x										
atmospheric pressure sensor	x	x	x													x		x			x						x *2								
vehicle speed sensor	x			x	x							x			x	x	x	x			x		x				x	x							
neutral switch		x														x																			
starter switch		x							x					x																					
idle air control valve												x					x *2																		
fuel tank pressure sensor																	x				x *2		x												
fuel temperature sensor																					x	x	x *2												
fuel level sensor	x	x	x	x	x											x		x			x	x	x *2					x							
mass air flow sensor	x	x	x	x	x		x				x											x						x							
exhaust temperature sensor																																			
EVAP canister purge valve		x	x	x	x													x	x	x															
fuel tank pressure control valve																		x	x																
EVAP canister vent valve																		x	x					x											
fan control relay		x															x																		
solenoid valve for tank pressure sensor																																			
VVT cam position sensor																																			
oil control valve		x																																	
control area network (CAN)														x									x												

*1: number is corresponded to component/system on the summary sheet

*2: except applicable system within each component

Map 2 Enable condition for catalyst monitoring

FORESTER 2.5L Turbo & IMPREZA 2.5L Turbo

(AT)	Intake-manifold pressure (KPa)	0.0	33.3	40.0	53.3	66.7	80.0	93.3	106.7	133.3	160.0	186.7	213.3
	PM2SMP (deg C)	0	200	150	80	50	50	50	30	-200	-400	-600	-800

(MT)	Intake-manifold pressure (KPa)	0.0	26.7	40.0	53.3	66.7	80.0	93.3	106.7	133.3	160.0	186.7	213.3
	PM2SMP (deg C)	0	200	150	80	50	50	50	30	-200	-400	-600	-800

LEGACY & OUTBACK 2.5L Turbo

(AT)	Intake-manifold pressure (KPa)	0.0	26.7	40.0	53.3	66.7	80.0	93.3	106.7	133.3	160.0	186.7	213.3
	PM2SMP (deg C)	0	200	150	100	50	50	50	0	-200	-400	-600	-800

(MT)	Intake-manifold pressure (KPa)	0.0	26.7	33.3	53.3	66.7	80.0	93.3	106.7	133.3	160.0	186.7	213.3
	PM2SMP (deg C)	0	50	220	150	80	60	50	0	-200	-400	-600	-800

Estimated temperature in the catalyst (catt_n) is defined as below

Calculations : every 512ms

$$catt_n = ((pmsm + PM2SMP) - catt_{n-1}) * CATNAMASI + catt_{n-1} \text{ [deg C]}$$

pmsm : Intake-manifold pressure(mmHg)

PM2SMP is shown in the tables above.

CATNAMASI : 0.04(AT) 0.015(MT) (FORESTER 2.5L Turbo & IMPREZA 2.5L Turbo)

CATNAMASI : 0.04(AT) 0.02(MT) (LEGACY & OUTBACK 2.5L Turbo)

Map 3-1 Enable condition for misfire monitoring

FORESTER 2.5L Turbo & IMPREZA 2.5L Turbo

rpm	700	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	6700
AT	26.264	24.665	23.598	26.664	27.331	26.131	29.531	31.331	32.731	34.13	38.197	43.996	49.529	53.329
MT(V. Speed>= 40 mph)	25.065	24.798	25.598	38.263	39.33	38.93	38.53	37.597	39.73	44.263	44.263	44.263	46.996	51.062
MT (V. Speed< 40 mph)	25.065	24.798	23.331	24.665	23.998	25.598	28.798	29.997	31.597	32.531	37.064	41.863	46.929	51.062

(KPa)

LEGACY & OUTBACK 2.5L Turbo

rpm	700	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	6700
AT	29.33	26.66	26.66	26.66	27.33	28.00	29.53	31.33	32.73	34.13	38.20	44.00	49.53	53.33
MT(V. Speed>= 40 mph)	25.06	24.80	25.60	40.00	40.80	42.13	44.00	44.53	47.33	54.66	54.66	54.66	46.93	51.06
MT (V. Speed< 40 mph)	27.33	23.33	23.60	23.33	24.00	24.40	28.80	30.00	31.60	32.53	37.06	41.86	54.66	54.66

(KPa)

Map 5-1 Enable condition for intake air

FORESTER 2.5L Turbo & IMPREZA 2.5L Turbo & LEGACY & OUTBACK 2.5L Turbo

Engine speed (rpm)	idle	800	1200	1600	2000	2400	2800	3200	3600	4000	4400
MAP Value (g/rev)	Na	0.228	0.22	0.22	0.22	0.228	0.23	0.234	0.242	0.25	0.25

Map 10 Secondary parameter for change of fuel level

FORESTER 2.5L Turbo & IMPREZA 2.5L Turbo

Fuel level (%)	0.0	16.7	33.3	50.0	66.7	83.3	100.0
change of fuel level (%)	7.0	7.0	6.8	6.7	6.5	6.3	6.3

LEGACY & OUTBACK 2.5L Turbo

Fuel level (%)	0.0	15.6	31.3	46.9	62.5	78.1	93.8
change of fuel level (%)	7.8	7.8	7.8	7.8	7.8	7.8	7.8

System H

*1 Applicable Compo./Sys. #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	14'	18	19	23	40	46	49	49'	50	51	52	52'	53	60	61	62	72	92	94	95				
Monitored component																																						
misfire			x	x	x		x							x					x																			
fuel system		x		x																	x																	
front oxygen sensor	x	x	x	x *2	x *2		x	x											x		x		x													x		
rear oxygen sensor	x			x			x *2	x *2																														
EGR system		x	x																																			
evaporative emission control sys.		x	x	x	x																		x															
thermostat																																						
crankshaft position sensor		x								x	x *2	x	x																									
camshaft position sensor		x								x		x *2	x																									
engine coolant temperature sensor	x	x	x	x	x		x			x				x	x *2	x				x	x	x		x					x	x		x	x	x	x			
manifold absolute pressure sensor	x	x	x	x	x		x			x			x							x		x		x	x			x *2		x	x					x		
intake air temperature sensor	x	x	x	x	x		x														x			x	x			x	x *2		x	x	x					
atmospheric pressure sensor	x	x	x							x										x		x		x												x		
vehicle speed sensor	x			x	x					x				x						x	x	x	x	x		x	x										x	
neutral switch		x								x											x																x	
starter switch		x									x						x																					
idle air control valve										x			x																								x	
fuel tank pressure sensor																					x		x *2				x											
fuel temperature sensor																					x		x	x *2													x	
fuel level sensor	x	x	x	x	x															x		x	x	x	x *2	x												
EVAP canister purge valve		x	x	x	x																x		x															
fuel tank pressure control valve																					x																	
EVAP canister vent valve																												x *2										
fan control relay		x									x																											
Mass air flow sensor	x	x	x	x	x		x							x *2											x												x	
TAC(throttle actuator control valve)	x	x	x	x	x	x	x	x		x	x	x	x	x							x		x	x	x	x	x	x	x	x	x	x	x					
CAN system																																						
Engine oil temperature sensor																																						
Oil Switching Valve																																						
Direct Variable Valve Lift																																						

*1: number is corresponded to component/system on the summary sheet
 *2: except applicable system within each component
 *3: components listed on table 20

System H

*1 Applicable Compo./Sys. #	8	53	
Monitored component			
misfire			
fuel system			
front oxygen sensor	x		
rear oxygen sensor	x *2		
EGR system			
evaporative emission control sys.			
thermostat			
crankshaft position sensor			
camshaft position sensor			
engine coolant temperature sensor			
manifold absolute pressure sensor			
intake air temperature sensor			
atmospheric pressure sensor			
vehicle speed sensor			
neutral switch			
starter switch			
idle air control valve			
fuel tank pressure sensor		x	
fuel temperature sensor			
fuel level sensor			
EVAP canister purge valve			
fuel tank pressure control valve			
EVAP canister vent valve		x *2	
fan control relay			
Mass air flow sensor			
TAC(throttle actuator control valve)	x	x	
CAN system			
Engine oil temperature sensor			
Oil Switching Valve			
Direct Variable Valve Lift			

*1: number is corresponded to compo

*2: except applicable system within ex

*3: components listed on table 20

Map 2-1 Enable condition for catalyst monitoring

Forester PZEV Legacy and Outback PZEV

Catalyst warm-up counter

amount of intake air (g/s)	0	3.2	6.4	9.6	12.8	16	19.2	22.4	25.6	28.8	32.0	35.2
Additional warm-up value	-5	-5	15	31	46	62	77	92	108	123	127	127

Map 2-2 Enable condition for catalyst monitoring

Forester LEV2 Impreza Legacy and Outback LEV2

(AT)

Intake-manifold pressure (KPa)	0.0	33.3	40.0	53.3	66.7	80.0	93.3	106.7
PM2SMP (deg C)	300	250	250	250	220	200	150	50

(MT)

Intake-manifold pressure (KPa)	0.0	33.3	40.0	53.3	66.7	80.0	93.3	106.7
PM2SMP (deg C)	0	350	450	300	250	180	150	100

Estimated temperature in the catalyst ($catt_n$) is defined as below .

Calculations : every 512ms

$$catt_n = ((pmsm + PM2SMP) - catt_{n-1}) \times CATNAMASI + catt_{n-1} \text{ [deg C]}$$

pmsm : Intake-manifold pressure(mmHg)

PM2SMP : additional temperature as shown in the above tables.

CATNAMASI : 0.04(AT) 0.015(MT)

System H

Forester LEV2

Forester PZEV

Impreza

Legacy and Outback LEV2

Legacy and Outback PZEV

Map 3-1 Enable condition for misfire monitoring

Forester LEV2 Impreza Legacy and Outback LEV2

intake manifold pressure [KPa]

(MT / AT)

rpm	650 / 700	1000	1500	2000	2500	3000	3500
MT (V. Speed < 40 mph)	25.6	23.1	20.0	20.0	20.0	21.6	26.4
(V. Speed >= 40 mph)	31.6	31.6	31.6	31.1	31.3	33.1	33.9
AT	25.6	24.4	22.0	22.4	22.8	23.9	29.9

rpm	4000	4500	5000	5500	6000	6400
MT (V. Speed < 40 mph)	28.0	29.5	32.4	36.4	39.9	43.2
(V. Speed >= 40 mph)	28.8	30.1	33.3	36.9	40.1	43.2
AT	31.3	32.5	35.6	39.3	43.3	44.5

Map 3-2 Enable condition for misfire monitoring

Legacy and Outback PZEV

intake manifold pressure [KPa]

(MT / AT)

rpm	650 / 700	1000	1500	2000	2500	3000	3500
MT (V. Speed < 40 mph)	25.6	22.5	20.0	20.0	20.0	21.6	26.4
(V. Speed >= 40 mph)	31.6	31.6	31.6	31.1	31.3	33.1	33.9
AT	26.0	23.9	22.4	22.3	22.5	23.1	29.9

rpm	4000	4500	5000	5500	6000	6400
MT (V. Speed < 40 mph)	25.6	22.5	20.0	20.0	20.0	21.6
(V. Speed >= 40 mph)	28.8	30.1	33.3	36.9	40.1	43.2
AT	31.3	32.5	35.6	39.3	43.3	45.9

Forester LEV2
Forester PZEV
Impreza
Legacy and Outback LEV2
Legacy and Outback PZEV

Map 5 Enable condition for intake air

Engine speed (rpm)	idle	650	1000	1500	2000	2500	3000	3500	4000	4500
MAP Value (g/rev)	na	0.203	0.183	0.155	0.149	0.157	0.162	0.18	0.193	0.205

System H

3. - cont.

Forester LEV2
 Forester PZEV
 Impreza
 Legacy and Outback LEV2
 Legacy and Outback PZEV

Map 6 Secondary parameter for engine coolant temperature

Temp. (deg.C)	Vehicle speed (MPH)							
	0.0	5.0	9.9	14.9	19.9	24.9	29.8	34.8
-20	0 ms	32.076 ms	39.977 ms	47.879 ms	82.544 ms	117.209 ms	154.214 ms	185.260 ms
-10	0 ms	25.704ms	33.606 ms	41.508 ms	68.520 ms	95.532 ms	125.667 ms	155.802 ms
0	0 ms	17.646 ms	25.548 ms	33.450 ms	53.652 ms	73.855 ms	97.120 ms	120.386 ms
10	0 ms	7.901 ms	15.802 ms	23.704 ms	37.941 ms	52.177 ms	68.573 ms	82.538 ms

(A) Fault Criteria

$T_t \leq -20$ degree C

Where, T_t is an engine coolant temperature at t seconds on timer for diagnosis.

$$t = 573669 - 33924 \times T_i \quad (t \geq 176762)$$

T_i is a lowest coolant temperature after starting the engine.

(B) Timer for diagnosis

a) Timer stop at fuel cut mode.

b) During the driving conditions except a) above, timer count up by

64ms + TWCNT ms at every 64ms.

Where, TWCNT is determined as follows,

TWCNT = 0 at idle switch on,

TWCNT show on the following table at idle switch off.

Map 9 Secondary parameter for engine oil temperature

Temp. (deg.C)	Vehicle speed (MPH)							
	0	5	10	15	20	25	30	35
-30	64 ms	73.2 ms	83.9 ms	96.3 ms	113.2 ms	133.9 ms	160.2 ms	194.6 ms
-20	64 ms	73.3 ms	84 ms	96.6 ms	113.7 ms	135 ms	162 ms	197.4 ms
-10	64 ms	73.4 ms	84.2 ms	96.9 ms	114.5 ms	136.4 ms	164.4 ms	201.5 ms
0	64 ms	73.5 ms	84.5 ms	97.4 ms	115.6 ms	138.5 ms	168 ms	207.6 ms
10	102.2 ms	114.8 ms	129.4 ms	146.7 ms	171.7 ms	203.4 ms	245.1 ms	302.1 ms

(A) Fault Criteria

$T_t \leq -15$ degree C

Where, T_t is an engine oil temperature at t seconds on timer for diagnosis.

$$t = 1882940 - 43302 \times T_i \quad (t \geq 1882940)$$

T_i is a lowest oil temperature after starting the engine.

(B) Timer for diagnosis

a) Timer stop at fuel cut mode.

b) During the driving conditions except a) above, timer count up by

64ms + TOILCNT ms at every 64ms.

Where, TOILCNT is determined as follows,

TOILCNT = 0 at idle switch on,

TOILCNT show on the following table at idle switch off.

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E

2007 MY Summary Sheet for OBD Strategy (2)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions			Time Required	MIL Illum.	
					FORESTER	Impreza WRX	Legacy & Outback			
(3) Fuel system	P0171	fuel trim limits exceeded (based on a primary oxygen sensor) /Method 3 on page 02-5	$fsobd = (sglmd - tglmda) + faf + flaf$ where, sglmd = measured lambda tglmda = target lambda faf = feed-back lambda coefficient every 64 msec. flaf = learning lambda	fuel learning system engine coolant temperature intake air intake air change during 0.5 engine rev. components listed on #3 of page 03-E-1	in operation ≥ 70 \geq see Map 5 of page 03-E-3 ≤ 0.02 no failure	<--	<--	deg C	10sec x 5time	two driving cycles
	P0172			fuel learning system engine coolant temperature intake air intake air change during 0.5 engine rev. learning value of EVAP conc. during purge accumulative time of canister purge after engine start continuous period after canister purge starting components listed on #3 of page 03-H-1	in operation ≥ 70 \geq see Map 5 of page 03-E-3 ≤ 0.02 ≤ 0.1 ≥ 20 ≥ 29884 no failure	<--	<--	deg C g/rev sec msec	10sec x 5time	
	P2096 P2097	fuel trim limits exceeded (based on a secondary oxygen sensor)	Secondary learning lambda (LTFT of secondary O2 sensor)	Sub feed back learning condition all secondary parameters to be in enable conditions	in enable condition ≥ 1	<--	<--	sec	5sec x 1time	
(4) Front lambda sensor -Output voltage	P1152	output range check /Method 4 on page 02-7	output lambda when rear oxygen sensor feedback value being at low limit	engine coolant temperature atmospheric pressure battery voltage components listed on #4 of page 03-E-1	≥ 70 > 75.06029 > 10.9 no failure	<--	<--	deg C KPa V	10000msec	two driving cycles
	P1153		output lambda when rear oxygen sensor feedback value being at high limit	closed loop control with oxygen sensors rear oxygen sensor output voltage - feed-back target and < 0.1 or rear oxygen sensor feed - back adjust or rear oxygen sensor feed - back adjust on minimum limit on maximum limit intake air change during 0.5 engine rev. impedance of front lambda sensor and < 50 after engine starting vehicle speed amount of intake air accumulative time of canister purge after engine start learning value of EVAP conc. during purge all secondary parameters to be in enable conditions Target lambda load correction coefficient	operating ≥ -0.2 and < 0.1 on minimum limit on maximum limit < 0.02 ≥ 0 and < 50 after engine starting vehicle speed amount of intake air accumulative time of canister purge after engine start learning value of EVAP conc. during purge all secondary parameters to be in enable conditions Target lambda load correction coefficient ≥ 4096 $\geq NA$ and $< NA$	<--	<--	V V g/rev ohm ohm msec mph g/s sec msec		

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E

2007 MY Summary Sheet for OBD Strategy (4)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions				Time Required	MIL Illum.
					FORESTER	Impreza WRX	Legacy & Outback			
(7) Secondary oxygen sensor -Output voltage	P0140	output range check /Method 7 on page 02-13	maximum output voltage	components listed on #7 of page 03-E-1	no failure	<--	<--		200000 msec	two driving cycles
			minimum output voltage	coolant temperature target output voltage of rear oxygen sensor	>= 70 >= 0.6	<-- <--	<-- <--	deg C V		
(7)Secondary oxygen sensor - A lack of circuit continuity	P0138	output range check /Method 7 on page 02-13	maximum output voltage caused by a lack of circuit continuity	secondary air system closed loop control with oxygen sensors misfire detection during 200 engine revs. compensation factor for front lambda sensor battery voltage	not in operation in operation < 5 not in limit value	<-- <-- <-- <--	<-- <-- <-- <--	times V	2500 msec	two driving cycles
			minimum output voltage caused by a lack of circuit continuity	secondary air system closed loop control with oxygen sensors misfire detection during 200 engine revs. compensation factor for front lambda sensor battery voltage amount of intake air	not in operation in operation < 5 not in limit value > 10.9 >= 10	<-- <-- <-- <-- <--	<-- <-- <-- <-- <--	times V g/s		
(7)Secondary oxygen sensor - A lack of circuit continuity	P0137	output range check /Method 7 on page 02-13	maximum output voltage caused by a lack of circuit continuity	secondary air system closed loop control with oxygen sensors misfire detection during 200 engine revs. compensation factor for front lambda sensor battery voltage amount of intake air	not in operation in operation < 5 not in limit value	<-- <-- <-- <--	<-- <-- <-- <--	times V	20000 msec 20000 msec	two driving cycles
			minimum output voltage caused by a lack of circuit continuity	secondary air system closed loop control with oxygen sensors misfire detection during 200 engine revs. compensation factor for front lambda sensor battery voltage amount of intake air continuous time of rear O2 sensor heating fuel shut-off	not in operation in operation < 5 not in limit value > 10.9 < 10 >= 25000 no experienced	<-- <-- <-- <-- <-- <--	<-- <-- <-- <-- <-- <--	times V g/s msec	40000 msec 150000 msec	
(7)Secondary oxygen sensor - A lack of circuit continuity	P0137	output range check /Method 7 on page 02-13	maximum output voltage caused by a lack of circuit continuity	secondary air system closed loop control with oxygen sensors misfire detection during 200 engine revs. compensation factor for front lambda sensor battery voltage amount of intake air continuous time of rear O2 sensor heating fuel shut-off	not in operation in operation < 5 not in limit value	<-- <-- <-- <--	<-- <-- <-- <--	times V	* see table	two driving cycles
			minimum output voltage caused by a lack of circuit continuity	secondary air system closed loop control with oxygen sensors misfire detection during 200 engine revs. compensation factor for front lambda sensor battery voltage amount of intake air continuous time of rear O2 sensor heating fuel shut-off	not in operation in operation < 5 not in limit value > 10.9 < 10 >= 25000 experienced	<-- <-- <-- <-- <-- <--	<-- <-- <-- <-- <-- <--	times V g/s msec		

fuel shut-off time (ms)	RO2KVNG F1	RO2KVNG F1
0	40000	150000
2000	40000	150000
10000	60000	150000

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E

2007 MY Summary Sheet for OBD Strategy (5)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions			Time Required	MIL Illum.		
					FORESTER	Impreza WRX	Legacy & Outback				
(8) Secondary oxygen sensor -Response rate	P0139	changing speed	shortest time change from rich(500 mV O2 output) to lean(200 mV) if voltage reduces from 550 mV to 150mV or the time of oxygen sensor output voltage >=kFSLDH1	components listed on #8 of page 03-E-1 battery voltage closed loop control with secondary oxygen sensor 5 sec. or more fuel shut-off in decel. after fuel shut-off accumulative time of rear O2 sensor heater operation continuous time of rear O2 sensor heater operation Estimated temperature in the catalyst number of the fuel shut-off in decel	> => 2000 => 60000 => 30000 => 400 => 1	no failure 10.9 in operation experienced => => => =>	<-- => => => => =>	<-- => => => => =>	V msec msec msec deg C time	1 time	two driving cycles
			shortest time change from lean(300 mV O2 output) to rich(500 mV) if voltage reduces from 250 mV to 550 mV. or the time of oxygen sensor output voltage <kFSLDL1	components listed on #8 of page 03-H-1 battery voltage closed loop control with secondary oxygen sensor 5 sec. or more fuel shut-off in decel. after fuel shut-off accumulative time of rear O2 sensor heater operation continuous time of rear O2 sensor heater operation Estimated temperature in the catalyst number of the fuel shut-off in decel	> => 2000 => 60000 => 30000 => 0 => 1	no failure 10.9 in operation experienced => => => => =>	<-- => => => => =>	<-- => => => => =>	V msec msec msec deg C time	1 time	two driving cycles
(9) Secondary oxygen sensor -Heater	P0037	circuit continuity	the level of output voltage	battery voltage components listed on #9 of page 03-E-1 after engine starting rear oxygen sensor heater control duty	>= => => =>	10.9 no failure 1 75	<-- => => =>	<-- => => =>	V secs. %	2.56 secs. 8ms x 320 time 320 time	two driving cycles
	P0038		the level of output voltage	battery voltage components listed on #9 of page 03-E-1 after engine starting rear oxygen sensor heater control duty	>= => => =>	10.9 no failure 1 25	<-- => => =>	<-- => => =>	V secs. %		
(11) Crankshaft position sensor	P0335	circuit continuity	crankshaft position sensor signal	components listed on #11 of page 03-E-1 battery voltage starter switch	>= =>	no failure 8 on	<-- => =>	<-- => =>	V	3000 msec	immediately
	P0336	rationality check	amount of crank sensor signal during 1 rev.	components listed on #11 of page 03-E-1 engine speed battery voltage cylinder number distinction	< =>	no failure 3000 8 completed	<-- => => =>	<-- => => =>	rpm V	10 eng. revs. 10 time	two driving cycles
(13) Mass air flow sensor	P0102 P0103	range check	output voltage							500 msec 500 msec	immediately
	P0101	rationality check	output voltage	engine speed throttle angle coolant temperature intake manifold pressure component listed on #13 of page 03-E-1 engine speed throttle angle coolant temperature intake manifold pressure component listed on #13 of page 03-E-1	>= => => => => => => => => => =>	600 and 900 4.1 70 52.66219 no failure 2500 15 70 53.3288 no failure	<-- => => => => => => => => =>	<-- => => => => => => => =>	rpm rpm deg deg C KPa rpm deg deg C KPa	10000 msec 3000 msec	two driving cycles
(14) Engine coolant temperature sensor	P0117 P0118	range check	output voltage							0.5 sec	immediately
	P0125	rationality check	engine coolant temperature	battery voltage engine speed components listed on #14 of page 03-E-1 timer count up by temp./vehicle speed	>= => =>	10.9 500 no failure see map 6 on page 03-E-4	<-- => =>	<-- => =>	V rpm	not determined	two driving cycles

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E

2007 MY Summary Sheet for OBD Strategy (6)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions			Time Required	MIL Illum.			
					FORESTER	Impreza WRX	Legacy & Outback					
(14) Engine coolant temperature sensor (stuck)	P0126		twoff-twmin where; twoff : Engine coolant temperature at the end of the last driving cycle twmin : Engine coolant temperature(min) after engine starting	component listed on #14' of page 03-E-1	>=	no failure	<--	<--	2500msec	two driving cycles		
				battery voltage	>=	10.9	<--	<--			V	
(17) Knock sensor	P0327 P0328	range check	output voltage	ignition switch		on	<--	<--	1000msec	immediately		
									1000msec			
	P0500	range check	vehicle speed(from ABS)	battery voltage	>=	NA	NA	10.9	V	512msec	immediately	
				after engine starting	>=	NA	<--	2000	msec			
				components listed on #18 of page 03-E-1		NA	<--	no failure				
	P0502	functional check	number of signal in 1377 msec.	fuel shut-off in decel.		operating	<--	NA		4000msec	immediately	
				battery voltage	>=	10.9	<--	NA	V			
	P0503			engine speed	<	4000	<--	NA	rpm			
				components listed on #18 of page 03-E-1		no failure	<--	NA				
	(19) Starter switch	P0512	functional check	starter 'off' signal	>=	500	<--	<--	rpm	180000msec	two driving cycles	
				battery voltage	>=	8	<--	<--	V			
	P1518			starter 'on' signal	>=	500	500	<--	rpm	800msec		
				engine speed after continuous 0.8 sec. or more of < 500 rpm engine speed	<	0.6214	<--	<--	mph			
	(23) Idle speed control (ISC)	P0506	functional check	actual - target eng. speed	components listed on #23 of page 03-E-1		no failure	<--	<--	10sec x 3	two driving cycles	
					closed control in ISC		in operation	<--	<--			
					feedback value for ISC		limits reached	<--	<--			
					vehicle speed	=	0	<--	<--			km/h
engine coolant temperature					>=	70	<--	<--	deg C			
atmospheric pressure					>=	75.06029	<--	<--	KPa			
P0507				actual - target eng. speed	fuel level	>=	15	<--	<--	%		
					after engine starting	>=	10.49	<--	<--	sec		
					measured lambda	>=	0.9	<--	<--			
					and	<	1.1	<--	<--			
					after air condition switching on-off, off-on	>=	5.1	<--	<--	sec		
					battery voltage	>=	10.9	<--	<--	V		
P0519	functional check		actual - target eng. speed	after in-manifold pressure change more than 30 mmHg	>	5.1	<--	<--	sec	2000msec	immediately	
				after neutral switch on - off event	>	5.1	<--	<--	sec			
				battery voltage	>=	10.9	<--	<--	V			
				after engine starting	>=	1000	<--	<--	msec			
				closed control in ISC		in operation	<--	<--				
				components listed on #23 of page 03-E-1		no failure	<--	<--				
P0458	circuit continuity		drain voltage of FET	vehicle speed	<	2.4856	<--	<--	mph	2500msec	two driving cycles	
				feedback value for ISC	<=	0	0	<--	%			
				engine speed change every 180 degree engine rev.	>=	-5	-5	<--	rpm			
				battery voltage	>=	10.9	<--	<--	V			
				after engine starting	>=	1	<--	<--	secs.			
				ignition switch	>=	on	<--	<--				
P0459			drain voltage of FET	duty ratio of 'on'	<	75	<--	<--	%	2500msec		
				battery voltage	>=	10.9	10.9	<--	V			
				after engine starting	>=	1	1	<--	secs.			
				duty ratio of 'on'	>=	25	25	<--	%			

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E

2007 MY Summary Sheet for OBD Strategy (7)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions			Time Required	MIL Illum.	
					FORESTER	Impreza WRX	Legacy & Outback			
(40) Radiator fan	P0691	circuit continuity	drain voltage of FET & signal from ECM for relays	engine speed battery voltage	>= 500 >= 10.9	<-- <--	<-- <--	rpm V	2500 msec	two driving cycles
	P0692		drain voltage of FET & signal from ECM for relays	after engine starting ignition switch	>= 1 >= on	<-- <--	<-- <--	secs.	2500 msec	
	P0483	functional check	coolant temperature	components listed on #40 of page 03-E-1 engine speed idle switch vehicle speed radiator fan signal change coolant temperature battery voltage	>= no failure >= 550 < and < 950 = on = 0 = "off" to "on" >= 95 >= 10.9	<-- <-- <-- <-- <-- <-- <-- <-- <--	<-- <-- <-- <-- <-- <-- <-- <--	rpm rpm km/h degC V	300000 msec	two driving cycles
(46) Neutral switch	P0851	circuit continuity for AT	switch signal when park/ neutral="on" & any other switches="off" on AT	components listed on #46 of page 03-E-1 ignition switch after engine starting	no failure on >= 2	<-- <-- <--	<-- <-- <--	secs.	6.5 secs. 64 ms x 100/time	two driving cycles
			P0852	switch signal when park/ neutral="off" & any other switches="on" on AT	starter switch battery voltage range switch on AT TCM	turn off >= 10.9 no failure	<-- <-- <--	<-- <-- <--	V	
	P0851	circuit continuity for MT	switch signal for MT	components listed on #46 of page 03-E-1 ignition switch after engine starting	no failure on >= 2	<-- <-- <--	<-- <-- <--	secs.	3 time	two driving cycles
				P0852	starter switch battery voltage driving condition change a) vehicle speed & engine speed	turn off >= 10.9 <= 0 >= 600 <= and <= 900 >= 39.7696 >= 1600 and <= 2550	<-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <--	<-- <-- <-- <-- <-- <-- <-- <-- <-- <--		

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E

2007 MY Summary Sheet for OBD Strategy (9)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions			Time Required	MIL Illum.		
					FORESTER	Impreza WRX	Legacy & Outback				
(49) Evaporative emission control system for 0.02 inches leak	P0456 (0.02-leak)	functional check	P1 P1: tank pressure increase above -5mmHg during the period that is decided time for changing pressure from -15mmHg to -5 mmHg when Evap. system sealed	components listed on #49' of page 03-H-1	no failure	<<	<<	65 - 516	sec	two driving cycles	
				closed air fuel ratio control (at starting a diagnosis)	in operation	<<	<<				
				fuel temperature	>= -10	<<	<<	deg C			
				or	< 55	<<	<<	deg C			
				after engine start with coolant temperature of 40 deg C or below	< 2400	<<	<<	sec			
				after engine starting	>= 120	<<	<<	sec			
				fuel level	>= 15	<<	<<	%			
					>= 85	<<	<<	%			
				fuel tank pressure	>= -666.61	<<	-426.6304	Pa			
					< 1426.545	<<	<<	Pa			
				intake manifold vacuum (relative pressure)	< -13.3322	<<	<<	KPa			
				Continuous two minutes of vehicle speed (at starting a diagnosis)	>= 31.07	<<	<<	mph			
				vehicle speed	>= 18.642	<<	<<	mph			
				atmospheric pressure	>= 75.06029	<<	<<	KPa			
				battery voltage	>= 10.9	<<	<<	V			
				total time of canister purge operation since last incomplete diagnosis event of 0.02 inches leak	>= 120000	<<	<<	msec			
					>= 120000	<<	<<	msec			
					>= 600000	<<	<<	msec			
				engine speed	>= 1050	<<	<<	rpm			
					< 6000	<<	<<	rpm			
				(during diagnosis)							
				pressure change per sec. compare to previous sec.	< 58.66168	<<	<<	KPa			
				min-pressure change per sec.							
				- max-pressure change per sec. during monitoring	< 67.99422	<<	<<	Pa			
				tank pressure change per sec.	<= 99.9915	<<	<<	Pa			
				change of fuel level	<= see Map 10 on page 03-E-8	<<	<<	liters/ms			
				change of atmospheric pressure(modeD)	> -0.4799592	<<	<<	KPa			
					<= 0.3199728	<<	<<	KPa			
				change of atmospheric pressure(modeE)	> -0.3199728	<<	<<	KPa			
					<= 0.3199728	<<	<<	KPa			
(50) Tank pressure sensor	P0453	range check	fuel tank pressure	vehicle speed	>= 1.2428	<<	<<	mph	15000	msec	immediately
				battery voltage	>= 10.9	<<	<<	V			
				components listed on #50 of page 03-E-1	no failure	<<	<<				
				all conditions for EVAP canister purge learning value of EVAP conc. during purge	<= 0.08	<<	<<				
				feed-back lambda coefficient	>= 0.9	<<	<<				
				fuel temperature	< 35	<<	<<	deg C			
				atmospheric pressure	> 75.06029	<<	<<	KPa			
				battery voltage	>= 10.9	<<	<<	V			
				components listed on #50 of page 03-E-1	no failure	<<	<<				
(51) Fuel temperature sensor	P0182	range check	output voltage	battery voltage	> 10.9	<<	<<	V	2500	msec	immediately
					> 10.9	<<	<<	V			
(51) Fuel temperature sensor	P0183	rationality check	fuel temperature - coolant temperature	components listed on #51 of page 03-E-1	no failure	<<	<<		120	sec	two driving cycles
				fuel level	>= 15	<<	<<	%			
				battery voltage	> 10.9	<<	<<	V			
				coolant temp. - coolant temp. at engine start after engine starting	>= 20	<<	<<	deg C			
				fuel temperature difference between max. and min.	> 550	<<	<<	kg			
				accumulated amount of intake air after engine starting	>= 20000	<<	<<	msec			
				components listed on #51 of page 03-E-1	no failure	<<	<<				
				battery voltage	> 10.9	<<	<<	V			
(52) Fuel level sensor	P0462 P0463	range check	output voltage	battery voltage	>= 10.9	<<	<<	V	2500	msec	two driving cycles
				ignition switch	on	<<	<<				
				after engine starting	>= 3000	<<	<<	msec			
				accumulated amount of intake air after engine starting	> 330957	<<	<<	g	not determined		
				battery voltage	>= 10.9	10.9	<<	V			
				components listed on #52 of page 03-E-1	>= 5000	<<	<<	msec			
					no failure	<<	<<				

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E

2007 MY Summary Sheet for OBD Strategy (10)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions			Time Required	MIL Illum.	
					FORESTER	Impreza WRX	Legacy & Outback			
(52) Fuel level sensor - slosh	P0464	rationality check	integrated times of the condition reaching follows, DVFLMAX >= Threshold or SUMVFL >= Threshold where, - DVFLMAX is max. deviation of sensor output during 12.2 secs. - SUMVFL is integrated value of sensor output deviation during 12.2 secs.	engine speed battery voltage after engine starting ignition switch idle switch fuel level vehicle speed = 0 km/h components listed on #52' of page 03-E-1 Max - Min of tank pressure during 12.2 secs. Max - Min of battery voltage during 12.2 secs.	>= 500 > 10.9 >= 1 on on >= 15 and < 85 >= 10000 no failure < 49.99575 < 0.465	<-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <--	<-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <--	rpm V secs. % % msec Pa V	12288 msec x 4 time	two driving cycles
(53) Solenoid valve for canister vent control	P0447	circuit continuity	drain voltage of FET and signal from ECM	battery voltage after engine starting	>= 10.9 >= 1	<-- <--	<-- <--	secs.	2500 msec	immediately
	P0448		drain voltage of FET and signal from ECM	ignition switch	on	<--	<--	secs.	2500 msec	
	P1443	functional check	fuel tank pressure	components listed on #53 of page 03-H-1 battery voltage barometric pressure solenoid valve for canister vent control fuel tank pressure at engine start	no failure >= 10.9 >= 75.06029 open >= -666.61 and < 1426.545	<-- <-- <-- <-- <--	<-- <-- <-- <-- <--	V KPa Pa Pa	3000 msec	
(54) Pressure control valve	P1400	circuit continuity	drain voltage of FET and signal from ECM	battery voltage after engine starting	>= 10.9 >= 1	<-- <--	<-- <--	V secs.	2500 msec	two driving cycles
	P1420		drain voltage of FET and signal from ECM	ignition switch	on	<--	<--	secs.	2500 msec	
(60) Manifold absolute pressure (MAP) sensor	P0107	range check	output voltage	components listed on #60 of page 03-E-1	no failure	<--	<--		500 msec	immediately
	P0108		output voltage	components listed on #60 of page 03-E-1	no failure	<--	<--		500 msec	
	P0068	rationality check	output voltage	engine coolant temperature engine speed intake air every half engine revs. throttle position components listed on #60 of page 03-E-1	>= 70 <= 2500 > 1.356 >= 10 no failure	<-- <-- <-- <-- <--	<-- <-- <-- <-- <--	deg C rpm g/rev deg	3000 msec	two driving cycles
(61) Intake air temperature sensor	P0111	rationality check	output voltage	engine coolant temperature engine speed	>= 70 >= 600 and < 900	<-- <-- <-- <--	<-- <-- <-- <--	deg C rpm rpm	3000 msec	two driving cycles
			output voltage	engine coolant temperature engine speed intake air every half engine revs. throttle position components listed on #60 of page 03-E-1	>= 70 >= 600 and < 900 <= 0.4 <= 2.75 no failure	<-- <-- <-- <-- <-- <--	<-- <-- <-- <-- <-- <--	deg C rpm rpm g/rev deg	3000 msec	
	P0112 P0113	range check	output voltage	ignition switch	on	<--	<--		500 msec 500 msec	immediately
(64) Back-up power supply for memory of ECM	P1560	functional check	voltage of back-up power	engine speed battery voltage	>= 500 >= 10.9	<-- <--	<-- <--	rpm V	2500 msec	immediately

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E

2007 MY Summary Sheet for OBD Strategy (11)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions			Time Required	MIL Illum.	
					FORESTER	Impreza WRX	Legacy & Outback			
(72) Thermostat	P0128	functional check	(estimated - measured) coolant temperature	engine coolant temperature engine coolant temperature at engine starting battery voltage vehicle speed components listed on #72 of page 03-E-1 estimated coolant temperature estimated ambient air temperature	< 70 < 55 >= 10.9 >= 18.642 no failure >= 70 >= -7	<-- <-- <-- <-- <-- <-- <--	deg C deg C V mph deg C deg C	not determined	two driving cycles	
(74) Fuel pump control module	P0230	Functional/ check	fuel controller output diagnostic signal	battery voltage fuel level after engine starting fuel pump control	>= 8 >= 16.6667 >= 180000 on	8 <-- <-- <--	<-- 15.625 <-- <--	V % msec	2500 msec	two driving cycles
(76) Tumble generator valve (TGV)	P2008(RH) P2011(LH)	circuit continuity (for open circuit)	diagnostic input - open diagnostic input - short	battery voltage output signal from ECM	>= 10.9 at before change "on" to "off"	10.9 <--	<-- <--	V	2 sec 20 time x 98 ms	immediately
	P2009(RH) P2012(LH)	circuit continuity (for short circuit)	diagnostic input - open diagnostic input - short					1 sec 10 time x 98 ms		
	P2004(RH) P2005(LH)	functional check (for open stuck)	TGV angle	the time of TGV "close" signal output coolant temperature ambient temperature battery voltage components listed on #76 of page 03-E-1	>= 2200 >= 0 >= 0 >= 10.9 no failure	<-- <-- <-- <-- <--	3200 -30 -30 <-- <--	msec deg C deg C V	3000 msec	
	P2006(RH) P2007(LH)	functional check (for closed stuck)		the time of TGV "open" signal output coolant temperature ambient temperature battery voltage components listed on #76 of page 03-E-1	>= 1432 >= 0 >= 0 >= 10.9 no failure	<-- <-- <-- <-- <--	4600 -30 -30 <-- <--	msec deg C deg C V		
(77) TGV position sensor	P2016(RH) P2021(LH)	range check	output voltage						500 msec	immediately
	P2017(RH) P2022(LH)								500 msec	
(78) Turbocharger pressure control solenoid	P0245	circuit continuity	ECM output signal	battery voltage after engine starting duty ratio for turbocharged pressure control	> 10.9 >= 1 < 75	<-- <-- <--	<-- <-- <--	V secs. %	640 ms 4 ms x 160 time	immediately
				battery voltage after engine starting duty ratio for turbocharged pressure control	> 10.9 >= 1 > 25	<-- <-- <--	<-- <-- <--	V secs. %	640 ms 4 ms x 160 time	
	P0244	functional check	intake manifold pressure						1 sec	

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions			Time Required	MIL Illum.	
					FORESTER	Impreza WRX	Legacy & Outback			
(81) Positive crankcase ventilation system	P1491	circuit continuity	Positive crankcase ventilation diagnostic. signal	battery voltage engine speed	> 10.9 ≥ 500	<-- <--	<-- <--	V rpm	2500 msec	immediately
(82) Active Valve Control System (AVCS)	P0340 (RH) P0345 (LH)	circuit continuity for cam position sensor	amount of cam sensor signal during 2 rev.	battery voltage components listed on #82 of page 03-E-1	> 8 no failure	<-- <--	<-- <--	V	100 revs 50	immediately
			cam sensor signal	starter switch	on	<--	<--		3000 msec	
	P2088 (RH) P2092 (LH)	circuit continuity for Oil control valve (OCV)	OCV control actual current	battery voltage components listed on #82 of page 03-E-1	> 10.9 no failure	<-- <--	<-- <--	V	2000 msec	immediately
			OCV control duty	OCV control duty	> 99.61	<--	<--	%		
	P2089 (RH) P2093 (LH)	circuit continuity for Oil control valve (OCV)	OCV control actual current	battery voltage components listed on #82 of page 03-E-1	> 10.9 no failure	<-- <--	<-- <--	V	2000 msec	
			OCV control duty	OCV control duty	< 0.39	<--	<--	%		
P0011 (RH) P0021 (LH)	functional check for AVCS system									
		vtd > 0 $\sum vtd_n $ R bank vtd < 0 $\sum vtd_n $ L bank R bank L bank where, vtd= target position- actual position	battery voltage components listed on #82 of page 03-E-1 engine speed coolant temperature AVCS target position change during 64msec. AVCS target position all secondary parameters to be in enable conditions	> 10.9 no failure > 1300 > 60 operating < 1.07 > 0 > 3000	<-- <-- <-- <-- <-- <-- <--	<-- <-- <-- <-- <-- <--	V rpm deg C °CA °CA msec	30000 msec	two driving cycles	
P0016 (Bank1) P0018 (Bank2)		Camshaft position		battery voltage components listed on #82 of page 03-E-1 engine speed coolant temperature AVCS	> 10.9 no failure > 500 > 60 not operating	<-- <-- <-- <--	<-- <-- <-- <--	V rpm deg C	20000 msec	two driving cycles
(83) CAN system	P0600	functional check	bus off flag or error warning flag or communication ID from TCU or ECU or VDC/ABS ECU not received (LEGACY) communication ID from TCM not received (FORESTER, IMPREZA) or the data from ECU does not be updated (LEGACY) the data from AT does not be updated (FORESTER, IMPREZA)	battery voltage components listed on #83 of page 03-E-1 starter switch engine	> 10.9 no failure off run	<-- <-- <-- <--	<-- <-- <-- <--	V	1 sec	immediately
(84) Transmission control system	P0700	functional check /Method 11 on page 02-20	MIL request flag from TCM	battery voltage components listed on #84 of page 03-E-1	> 10.9 no failure	<-- <--	<-- <--	V	2500 msec	immediately
(95) Cold start emission reduction strategy	P1602	amount of intake air	Estimated exhaust gas temperature after 14 seconds at cold start	atmospheric pressure battery voltage	> 75.06029 > 10.9	<-- <--	<-- <--	KPa V	14 sec	two driving cycles
			Duration to satisfy "nefbgd - ne" Duration to satisfy "Ignition timing retard"	components listed on #95 of page 03-E-1 engine vehicle speed Misfire detection during 200 engine rev. (Because of catalyst damages) Time after engine starting	no failure run <= 1.2428 < 5 = 14	<-- <-- <-- <-- <--	<-- <-- <-- <-- <--	mph sec	14	

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions			Time Required	MIL Illum.	
					FORESTER	Impreza WRX	Legacy & Outback			
(201) Throttle actuator control	P0638	functional check	motor control Duty	ignition switch	on	<-	<-	V	5000msec	immediately
				motor supply voltage	>= 6.2	<-	<-			
			motor relay	on	<-	<-	rpm			
			CPU communication	no failure	<-	<-				
			previous diagnosis result	no failure	<-	<-				
engine speed	< 500	<-	<-							
			target throttle position -	ignition switch	on	<-	<-	V	2msec	
				motor supply voltage	>= 6.2	<-	<-			
				motor relay	on	<-	<-	rpm		
				CPU communication	no failure	<-	<-			
				previous diagnosis result	no failure	<-	<-			
				engine speed	>= 500	<-	<-			
				battery voltage	>= 6.2	<-	<-	V	see table 21-2 table 21-2	
				throttle position sensor 1	>= target throttle position	<-	<-			
				motor supply voltage	>= 6.2	<-	<-	deg	throttle position sensor1 (deg)	time msecs.
				throttle position sensor 1 circuit diagnosis	complete	<-	<-		5.5	1000
				throttle position sensor 2 circuit diagnosis	complete	<-	<-	9.0	400	
				throttle position sensor rationality diagnosis	complete	<-	<-	13.0	300	
				ignition switch	on	<-	<-	V	1000msec	
				motor relay	on	<-	<-			
				previous diagnosis result	no failure	<-	<-	rpm		
				motor supply voltage	>= 6.2	<-	<-			
				engine speed	>= 500	<-	<-	V		
				battery voltage	>= 6.2	<-	<-			
				throttle position sensor 1	< target throttle position	<-	<-	deg		
				throttle position sensor 1 circuit diagnosis	complete	<-	<-			
				throttle position sensor 2 circuit diagnosis	complete	<-	<-	rpm		
				throttle position sensor rationality diagnosis	complete	<-	<-			
				ignition switch	on	<-	<-	V	5000msec	
				motor relay	on	<-	<-			
				previous diagnosis result	no failure	<-	<-	rpm		
				motor supply voltage	>= 6.2	<-	<-			
				engine speed	< 500	<-	<-	V		
				battery voltage	>= 6.2	<-	<-			
				throttle position sensor 1 circuit diagnosis	complete	<-	<-	rpm		
				throttle position sensor 2 circuit diagnosis	complete	<-	<-			
				throttle position sensor rationality diagnosis	complete	<-	<-	V		
				ignition switch	on	<-	<-			
				motor relay	on	<-	<-	rpm		
				previous diagnosis result	no failure	<-	<-			
				motor supply voltage	>= 6.2	<-	<-	V		
				engine speed	< 500	<-	<-			
				battery voltage	>= 6.2	<-	<-	rpm		
				throttle position sensor 1 circuit diagnosis	complete	<-	<-			
				throttle position sensor 2 circuit diagnosis	complete	<-	<-	V		
				throttle position sensor rationality diagnosis	complete	<-	<-			
(202) Throttle actuator control motor	P2101	circuit continuity	malfunction flag from motor operation IC	ignition switch	on	<-	<-	V	500msec	immediately
				motor relay	on	<-	<-			
				CPU communication	no failure	<-	<-			
				previous diagnosis result	no failure	<-	<-	V		
				battery voltage	>= 6.2	<-	<-			
				motor supply voltage	>= 6.2	<-	<-	V		
				motor supply voltage	>= 6.2	<-	<-			
	P2102		motor supply voltage	motor relay	on	<-	<-	V	400msec	
				battery voltage	>= 11	<-	<-			
				CPU communication	no failure	<-	<-	V		
				previous diagnosis result	no failure	<-	<-			
	P2103		motor supply voltage	motor relay	off	<-	<-	V	600msec	
				battery voltage	>= 6	<-	<-			
				CPU communication	no failure	<-	<-	V		
				ignition switch	off	<-	<-			
(203) Throttle return spring	P1160	functional check	throttle position sensor 1 at diagnosis start - throttle position sensor 1	the time after ignition switch off	= 992	<-	<-	msecs.	600msec	immediately
					CPU communication	no failure	<-			
				throttle position sensor 1 circuit diagnosis	complete	<-	<-	V		
				throttle position sensor 2 circuit diagnosis	complete	<-	<-			
				throttle position sensor rationality diagnosis	complete	<-	<-	V		
				motor supply voltage	>= 6	<-	<-			
				battery voltage	>= 6	<-	<-	V		
				target throttle position at diagnosis start - throttle position sensor 1 at diagnosis start	< 2	<-	<-			
				ignition switch	off	<-	<-	deg		
				motor supply voltage	>= 6	<-	<-			
(204) Throttle position sensor minimum stop	P2109	rationality check	minimum stop position	battery voltage	>= 6	<-	<-	V	8msec	immediately
					previous diagnosis result	no failure	<-			
			throttle position at ignition switch off to on - throttle minimum stop position	battery voltage	>= 6	<-	<-	V	80msec	
				previous diagnosis result	no failure	<-	<-			

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E

2007 MY Summary Sheet for OBD Strategy (14)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions			Time Required	MIL Illum.	
					FORESTER	Impreza WRX	Legacy & Outback			
(205) Throttle position sensor	P0122 (sensor1) P0222 (sensor2)	circuit continuity	output voltage (sensor2)	ignition switch motor supply voltage previous diagnosis result	on >=6 no failure	<-- <-- <--	<-- <-- <--	V	24 msec	immediately
	P0123 (sensor1) P0223 (sensor2)								(sensor1) (sensor2)	
	P2135	rationality check	throttle position sensor 1(deg) - throttle position sensor 2(deg)	ignition switch motor supply voltage previous diagnosis result throttle position sensor 1 circuit diagnosis throttle position sensor 2 circuit diagnosis	on >=6 no failure complete complete	<-- <-- <-- <-- <--	<-- <-- <-- <-- <--	V	212 msec	
(206) Pedal position sensor	P2122 (sensor1) P2127 (sensor2)	circuit continuity	output voltage (sensor1) (sensor2)	ignition switch motor relay previous diagnosis result battery voltage	on on no failure >=6	<-- <-- <-- <--	<-- <-- <-- <--	V	100 msec	immediately
	P2123 (sensor1) P2128 (sensor2)								(sensor1) (sensor2)	
	P2138	rationality check	pedal position sensor 1 (deg) - pedal position sensor 2 (deg)	ignition switch previous diagnosis result battery voltage pedal position sensor 1 circuit diagnosis pedal position sensor 2 circuit diagnosis	on no failure >=6 complete complete	<-- <-- <-- <-- <--	<-- <-- <-- <-- <--	V	116 msec	

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E

2007 MY Summary Sheet for OBD Strategy (15)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions			Time Required	MIL Illum.					
					FORESTER	Impreza WRX	Legacy & Outback							
(207) ECM performance	P0607	circuit continuity (inside ECM)	input voltage of throttle position sensor 1 main CPU - sub CPU	ignition switch previous diagnosis result battery voltage CPU communication starter switch the time after sub CPU reset	on	<--	<--	V msec	600	immediately				
					no failure	<--	<--		400					
					>= 6	<--	<--		350					
					no failure	<--	<--		300					
					off	<--	<--		250					
	circuit continuity (inside ECM)	input voltage of pedal position sensor 1 main CPU - sub CPU	ignition switch previous diagnosis result CPU communication battery voltage starter switch	on	<--	<--	V	Forester, I 750 msec moreza 830	immediately					
				no failure	<--	<--		Forester, I 550 msec moreza 720						
				>= 6	<--	<--		Forester, I 400 msec moreza 610						
				off	<--	<--		Forester, I 300 msec moreza 415						
	functional check (Sub CPU)	Watch dog signal from Sub CPU	ignition switch previous diagnosis result starter sw battery voltage the time after sub CPU reset	on	<--	<--	V msec	200	immediately					
no failure	<--	<--												
functional check (CPU communication)	(Main CPU) sum check error, key word error, data writing error or communication error from sub CPU data	ignition switch previous diagnosis result starter switch battery voltage the time after sub CPU reset	on	<--	<--	V msec	200	immediately						
			no failure	<--	<--									
	(Sub CPU) sum check error, key word error, or communication error from main CPU data	ignition switch previous diagnosis result battery voltage	on	<--	<--	V	200	immediately						
no failure	<--	<--												
functional check (AMP circuit in ECM)	throttle position sensor 1 - (amplified throttle position sensor 1) / 4	ignition switch previous diagnosis result battery voltage throttle position sensor 1	on	<--	<--	V deg	24	immediately						
			no failure	<--	<--									
	(amplified throttle position sensor 1) / 4	ignition switch previous diagnosis result battery voltage throttle position sensor 1	on	<--	<--	V deg		immediately						
no failure	<--	<--												
		Map24	<table border="1"> <thead> <tr> <th>battery voltage (V)</th> <th>TAAD (deg.)</th> </tr> </thead> <tbody> <tr> <td>7.5</td> <td>27.5</td> </tr> <tr> <td>8.0</td> <td>31</td> </tr> </tbody> </table>		battery voltage (V)	TAAD (deg.)	7.5	27.5	8.0	31				
battery voltage (V)	TAAD (deg.)													
7.5	27.5													
8.0	31													
functional check (cruise control)	cruise control	brake switch ignition switch motor relay battery voltage Sub CPU ETC activation previous diagnosis result CPU communication	on	<--	<--	V	250	immediately						
on	<--	<--												
		brake switch of main CPU brake switch of sub CPU	on	<--	<--	V	200	immediately						
no failure	<--	<--												
		brake switch of main CPU brake switch of sub CPU	>= 10.9	<--	<--									
		previous diagnosis result CPU communication	no failure	<--	<--									
			no failure	<--	<--									

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E

2007 MY Summary Sheet for OBD Strategy (16)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions			Time Required	MIL Illum.
					FORESTER	Impreza WRX	Legacy & Outback		
(207) ECM performance	P0607	functional check (instruction check)	(Main CPU) instruction error	ignition switch	off to on CPU reset	<-- <--	<-- <--	2 time	immediately
			calculated data through CPU and FPU compare with expectation	ignition switch throttle position sensor 1 circuit diagnosis	on complete	<-- <--	<-- <--	512 msec	
			(Sub CPU) calculated data from Main CPU compare with expectation	CPU communication the time after sub CPU reset	no failure ≥200	<-- <--	<-- <--	240 msec 40 msec * 6 time msec	
		functional check (software flow check)	(Main CPU) software flow error	ignition switch	on	<--	<--	504 msec	
			(Sub CPU) calculated data from Main CPU compare with expectation	CPU communication the time after sub CPU reset	no failure ≥200	<-- <--	<-- <--	240 msec 40 msec * 6 time msec	
			functional check (software monitor check)	software monitor error	CPU communication the time after sub CPU reset	no failure ≥200	<-- <--	<-- <--	
(208)RAM in ECM	P0604	functional check	(Main CPU) Setting value can be written in all RAM area, and the values can be read correctly	ignition switch	off to on (CPU reset)	<--	<--	not determined	immediately
			(Sub CPU) check sum data on RAM , calculated sum data compare	CPU communication ignition switch the time after sub CPU reset	no failure off to on ≥200	<-- <-- <--	<-- <-- <--		
(209)ROM in ECM	P0605	functional check	check sum data on ROM , calculated sum data compare	(Main CPU) ignition switch	off to on (CPU reset)	<--	<--	not determined	immediately
			(Sub CPU) ignition switch motor supply voltage previous diagnosis result CPU communication the time after sub CPU reset	on ≥6 no failure no failure ≥200	<-- <-- <-- <--	<-- <-- <-- <--	V msec		

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E (Forester AT)

2007 MY Summary Sheet for OBD Strategy (17)

Component/ System	Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
(301) Range switch	P0705	functional check	"D" signal continuously	shifted vehicle speed	"N" to "3" >= 60 km/h	3.0 secs.	two driving cycles
			simultaneous signals	engine speed engine speed signal	> 3000 rpm not failure	3.0 secs.	
(302) Brake switch for AT	P0719	functional check	"on" signal	vehicle speed change	30 to 0 km/h	10 times	two driving cycles
	P0724	functional check	"off" signal	vehicle speed change	0 to 30 km/h	10 times	two driving cycles
(303) ATF temperature sensor	P0712	range check	output voltage	vehicle speed	>= 10 km/h	60.0 secs.	immediately
	P0713	range check	output voltage	vehicle speed	>= 10 km/h	60.0 secs.	immediately
(304) Turbine shaft speed sensor	P0715	range check	turbine shaft speed	engine speed output shaft speed range switch	>= 3000 rpm >= 1600 rpm "D", "3", "2" or "1"	3.0 secs.	immediately
(305) Vehicle speed sensor	P0720	range check	output shaft speed	determined output shaft speed determined output shaft speed	>= 800 rpm not failure	3.0 secs.	immediately
(306) Engine speed signal for AT	P0725	range check	engine speed	turbine shaft speed turbine shaft speed sensor vehicle speed vehicle speed sensor	>= 1000 rpm not failure >= 10 km/h not failure	3.0 secs.	immediately
(307) Automatic transmission gear ratio	P0731	functional check	GR/(1st gear ratio)	upshift or downshift events output shaft speed turbine shaft speed range switch throttle angle (at 1st gear) throttle angle (at not 1st gear) range switch turbine shaft speed sensor vehicle speed sensor	not in operation >= 300 rpm >= 300 rpm "D", "3", "2" or "1" >= 30 deg >= 6 deg not failure not failure not failure	3.0 secs.	immediately
	P0732		GR/(2nd gear ratio)				
	P0733		GR/(3rd gear ratio)				
	P0734		GR/(4th gear ratio)				
			where, GR = (turbine shaft speed) / (output shaft speed)				
(308) Lock-up clutch	P0741	functional check	engine speed - turbine shaft speed >= 40 + vehicle speed /2	duty ratio for duty solenoid valve engine speed signal turbine shaft speed sensor	>= 90 % not failure not failure	10.0 secs.	two driving cycles
(309) Lock-up clutch duty solenoid	P0743	functional check	drain level of FET for solenoid valve is not change in one duty cycle	on duty ratio for duty solenoid valve	>= 5 %	200 msecs.	immediately
			drain level of FET for solenoid valve	on duty ratio for duty solenoid valve	= 0 %	200 msecs.	
(310) AT line pressure linear solenoid	P0748	functional check	cur_mon cur_mon or cur_tgt - cur_mon	cur_tgt cur_tgt	>= 100 mA >= 100 mA	0.10 secs. 0.06secs.	immediately
			where, cur_mon=monitor current for solenoid cur_tgt=target current for solenoid				
(311) Low clutch duty solenoid	P0753	functional check	drain level of FET for solenoid valve is not change in one duty cycle	on duty ratio for duty solenoid valve	>= 5 %	200 msecs.	immediately
			drain level of FET for solenoid valve	on duty ratio for duty solenoid valve	= 0 %	200 msecs.	
(312) 2-4th brake duty solenoid	P0758	functional check	drain level of FET for solenoid valve is not change in one duty cycle	on duty ratio for duty solenoid valve	>= 5 %	200 msecs.	immediately
			drain level of FET for solenoid valve	on duty ratio for duty solenoid valve	= 0 %	200 msecs.	
(313) High clutch duty solenoid	P0763	functional check	drain level of FET for solenoid valve is not change in one duty cycle	on duty ratio for duty solenoid valve	>= 5 %	200 msecs.	immediately
			drain level of FET for solenoid valve	on duty ratio for duty solenoid valve	= 0 %	200 msecs.	
(314) Low&Reverse brake duty solenoid	P0768	functional check	drain level of FET for solenoid valve is not change in one duty cycle	on duty ratio for duty solenoid valve	>= 5 %	200 msecs.	immediately
			drain level of FET for solenoid valve	on duty ratio for duty solenoid valve	= 0 %	200 msecs.	
(317) CAN communication	P1718	functional check	CAN bus condition fail counter from ECM is not change	turbine shaft speed range switch	> 0 rpm "D", "3", "2" or "1"	500 msecs.	immediately

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions FORESTER	ble Conditions		Time Required	MIL Illum.
						Impreza WRX	Legacy & Outback		
(96)-1 Secondary Air System (at operating)				=lowest temperature among *,*,and* at engine starting battery voltage battery voltage atmospheric pressure engine operated	>= 4.4 >= 10.9 >= 7 >= 75.06029 operating	<-- <-- <-- <--	<-- <-- <-- <--	deg C V V KPa	10 sec
	P0410	secondary air flow is not detected (based on pressure sensor in piping)	<Monitoring for pressure of pump supplying> secondary air pressure in the pipe (after corrected by atmospheric pressure)	amount of intake air (ga) pump of secondary air comb. valve	>= 2 operating One comb. valve is opening (except both comb. valves are closing)	<-- <-- <--	<-- <-- <--	g/s	
	P2443	Control valve closed stick (Bank2)	<Monitoring for pulsation when one comb. valve closing> accumulated pulsation value when RH comb.valve is closing	area where monitoring is able to be executed see MAP 23 on page 03-E-10	>= 1	<-- <--	---		
	P2441	Control valve closed stick (Bank1)	accumulated pulsation value when RH comb.valve is closing	after fuel shut-off	>= 0	<-- <--	---	msec	
	P2440	Control valve opened stick (Bank1)	<Monitoring for pulsation when both comb. valves closing> accumulated pulsation value when RH and LH comb. valve are closing. flow when RH comb. valve is closing (dsaicflpr)	engine load (gn) after fuel shut-off	>= 0.2 >= 500	<-- <--	<-- 1000	g/rev msec	
	P2442	Control valve opened stick (Bank2)	accumulated pulsation value when RH and LH comb. valve are closing. flow when LH comb. valve is closing (dsaicflpl)						
	P2443	Control valve closed stick (Bank2)	<Monitoring for pressure when comb. valves switching> pressure change when LH comb. valve switches	amount of intake air (ga)	> 2 and	<-- <--	<-- <--	g/s	
	P2441	Control valve closed stick (Bank1)	pressure change when RH comb. valve switches	engine speed (ne) after fuel shut-off	< 20 < 4000 >= 500	<-- <-- <--	25 <-- 1000	g/s rpm msec	
P0411	secondary air flow increase unusual	<Monitoring for excessive flow> flow when RH comb. valve is closing (dsaicflestaivr) or flow when LH comb. valve is closing (dsaicflestafl) dsaicflp0r1vb – dsaicflp0rvb dsaicflp0r1vb – dsaicflp0lvb							

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA, FORESTER, LEGACY, OUTBACK with Turbo Charged Engine System

Applicable System ; System E

2007 MY Summary Sheet for OBD Strategy (23)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions			Time Required	MIL Illum.	
					FORESTER	Impreza WRX	Legacy & Outback			
(96)-2 Secondary Air System (at disable)	P1410	Control valve open stick	difference between maximum value and minimum value of pressure in piping and accumulation change of pressure in piping every 4ms. and Change of atmosphere	engine speed after engine starting after secondary air system disable amount of intake air battery voltage	>= 500 >= 9000 >= 9000 >= 2 and < 400 >= 10.9	<-- <-- <-- <-- <-- <--	<-- <-- <-- <-- <-- <--	rpm msec msec g/s g/s V	2000 msec x 20 time	immediately
	P2444	Pump "ON" stick	secondary air pressure in the pipe - secondary air pressure in the pipe (before the secondary air system operating)	battery voltage engine running ignition switch secondary air pressure in the pipe calculation completion (before the secondary air system operating) progress time after the control secondary air systems end Pump "ON" stick no failure	>= 3000 <= 8000	<-- <--	<-- <--	msec msec	8 sec	
(97) Secondary Air Control valve relay	P0413 (bank1) P0416 (bank2) P0414 (bank1) P0417 (bank2)	Circuit Continuity	drain voltage of FET & signal from ECM for relays drain voltage of FET & signal from ECM for relays	ignition switch battery voltage	>= on 10.9	<-- <--	<-- <--	V	2500 msec 2500 msec	immediately
(98) Secondary Air Pump relay	P0418	Circuit Continuity	drain voltage of FET & signal from ECM for relays	ignition switch battery voltage	>= on 10.9	<-- <--	<-- <--	V	2500 msec 2500 msec	immediately
	P1418		drain voltage of FET & signal from ECM for relays	Secondary Air Pump relay "low" no failure						
(99) Secondary Air Pressure Sensor	P2131	rationality check	pressure in piping - MAP	engine speed at engine starting vehicle speed in-mani press. at eng. start - MAP after secondary air system disable components listed on #62 of page 03-E-1	< 300 < 0.6214 < 1.331887 >= 2976 no failure	<-- <-- <-- <-- <--	<-- <-- <-- <-- <--	rpm mph KPa msec	328 msec	two driving cycles
	P2432 P2433	range check	output voltage	ignition switch	on	<--	<--		500 msec	immediately
(100) Solenoid valve for purge control 2	P2419	circuit continuity	drain voltage of FET and signal from ECM	battery voltage after engine starting	>= 10.9 >= 1	<-- <--	<-- <--	secs.	2500 msec	two driving cycles
	P2420		drain voltage of FET and signal from ECM	ignition switch	on	<--	<--		2500 msec	
	P0441	rationality check	fuel tank pressure difference between at the end of EVAP sys. diagnosis & 3.5 secs. later	EVAP emission control sys. amount of intake air fuel tank pressure at the end of EVAP system diagnosis	no failure < 45 < -1.29989	<-- <-- <--	<-- <-- <--	g/s KPa	3500 msec	two driving cycles

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA 2.5L NA (LEV2), FORESTER 2.5L NA (LEV2), LEGACY 2.5L NA (LEV2), OUTBACK 2.5L NA (LEV2), FORESTER 2.5L NA (PZEV), LEGACY 2.5L NA (PZEV) & OUTBACK 2.5L NA (PZEV)

Applicable System ; System H

2007 MY Summary Sheet for OBD Strategy (3)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions					Time Required	MIL Illum.	
					FORESTER LEV2	FORESTER P-ZEV	LEGACY LEV2	LEGACY P-ZEV	IMPREZA			
(6) Front lambda sensor -Heater	P0031(Bank1)	circuit continuity	the level of output voltage	battery voltage front lambda sensor heater control duty	>= 10.9 < 87.5	<- <-	<- <-	<- <-	<- <-	V %	1 secs. 4 ms × 250 time	immediately
	P0032(Bank1)		the level of output voltage	battery voltage front lambda sensor heater control duty	>= 10.9 > 12.5	<- <-	<- <-	<- <-	<- <-	V %	2 secs. 4 ms × 500 time	
	P0030(Bank1)	rationality check	impedance of a oxygen sensor	battery voltage components listed on #6 of page 03-H-1 heater continuity the condition as below front lambda sensor heater duty all secondary parameters to be in enable conditions after fuel shut-off	> 10.9 no failure in operation experienced >= 35 >= 42000 >= 20000	<- <- <- <- <- <- <-	<- <- <- <- <- <- <-	<- <- <- <- <- <- <-	<- <- <- <- <- <- <-	V %	10000 msec	two driving cycles
(7) Secondary oxygen sensor -Output voltage	P0140(Bank1)	output range check	maximum output voltage	components listed on #7 of page 03-H-1 coolant temperature target output voltage of secondary O2 sensor	no failure >= 75 >= 0.6	<- <- <-	<- <- <-	<- <- <-	<- <- <-	deg C V	200000 msec	two driving cycles
			minimum output voltage	amount of intake air battery voltage closed loop control with O2 sensors the driving condition as below the time of fuel shut of in decel from engine speed misfire detection during 200 engine revs. compensation factor for front lambda sensor	>= 10 > 10.9 in operation experienced >= 6000 >= 1700 <= 5 not in limit value	<- <- <- <- <- <- <-	<- <- <- <- <- <- <-	<- <- <- <- <- <- <-	<- <- <- <- <- <- <-	g/s V msec rpm time		
(7) Secondary oxygen sensor - A lack of circuit continuity	P0138(Bank1)	output range check	maximum output voltage caused by a lack of circuit continuity	secondary air system closed loop control with oxygen sensors misfire detection during 200 engine revs. compensation factor for front lambda sensor battery voltage	not in operation in operation < 5 not in limit value > 10.9	<- <- <- <- <-	<- <- <- <- <-	<- <- <- <- <-	<- <- <- <- <-	times V	2500 msec	two driving cycles
	P0137(Bank1)		minimum output voltage caused by a lack of circuit continuity	secondary air system closed loop control with oxygen sensors misfire detection during 200 engine revs. compensation factor for front lambda sensor battery voltage amount of intake air	not in operation in operation < 5 not in limit value > 10.9 >= 10	<- <- <- <- <- <-	<- <- <- <- <- <-	<- <- <- <- <- <-	<- <- <- <- <- <-	times V g/s	20000 msec 20000 msec	
			secondary air system closed loop control with oxygen sensors misfire detection during 200 engine revs. compensation factor for front lambda sensor battery voltage amount of intake air continuous time of rear O2 sensor heating fuel shut-off	not in operation in operation < 5 not in limit value > 10.9 < 10 >= 30000	<- <- <- <- <- <- <-	<- <- <- <- <- <- <-	<- <- <- <- <- <- <-	<- <- <- <- <- <- <-	times V g/s msec	40000 msec		
			secondary air system closed loop control with oxygen sensors misfire detection during 200 engine revs. compensation factor for front lambda sensor battery voltage amount of intake air continuous time of rear O2 sensor heating fuel shut-off	not in operation in operation < 5 not in limit value > 10.9 < 10 >= 30000 experienced	<- <- <- <- <- <- <-	<- <- <- <- <- <- <-	<- <- <- <- <- <- <-	<- <- <- <- <- <- <-	times V g/s msec	* see table fuel shut-off time (ms) 0 2000 10000		
(8) Secondary oxygen sensor -Response rate	P0139(Bank1)	changing speed	shortest time change from rich(500 mV O2 output) to lean(200 mV) if voltage reduces from 550 mV to 150mV or the time of oxygen sensor output voltage	components listed on #8 of page 03-H-1 battery voltage closed loop control with rear O2 sensor 6 sec. or more fuel shut-off in decel. after fuel shut-off accumulative time of rear O2 sensor heater operation continuous time of rear O2 sensor heater operation Estimated temperature in the catalyst (the other vehicles in System H except PZEV) catalyst warm-up counter (Only System H PZEV) number of the fuel shut-off in decel	no failure > 10.9 in operation experienced 2000 >= 60000 >= 30000 >= 400 >= 9000 >= 1	<- <- <- <- <- <- <- <- <-	<- <- <- <- <- <- <- <- <-	<- <- <- <- <- <- <- <- <-	<- <- <- <- <- <- <- <- <-	V msec msec msec deg C time	1 time	two driving cycles
			shortest time change from lean(300 mV O2 output) to rich(500 mV) if voltage reduces from 250 mV to 550 mV. or the time of oxygen sensor output voltage	components listed on #8 of page 03-H-1 battery voltage closed loop control with rear O2 sensor 6 sec. or more fuel shut-off in decel. after fuel shut-off accumulative time of rear O2 sensor heater operation continuous time of rear O2 sensor heater operation Estimated temperature in the catalyst number of the fuel shut-off in decel	no failure > 10.9 in operation experienced >= 2000 >= 0 >= 0 >= 0 >= 1	<- <- <- <- <- <- <- <- <-	<- <- <- <- <- <- <- <- <-	<- <- <- <- <- <- <- <- <-	<- <- <- <- <- <- <- <- <-	V msec msec msec deg C time	1 time	

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA 2.5L NA (LEV2), FORESTER 2.5L NA (LEV2), LEGACY 2.5L NA (LEV2), OUTBACK 2.5L NA (LEV2), FORESTER 2.5L NA (PZEV), LEGACY 2.5L NA (PZEV) & OUTBACK 2.5L NA (PZEV)

Applicable System ; System H

2007 MY Summary Sheet for OBD Strategy (6)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions					Time Required	MIL Illum.	
					FORESTER LEV2	FORESTER P-ZEV	LEGACY LEV2	LEGACY P-ZEV	IMPREZA			
(40) Radiator fan	P0691	functional check	drain voltage of FET & signal from ECM for relays	engine speed battery voltage	>= 500 >= 10.9	<-- <--	<-- <--	<-- <--	<-- <--	rpm V	2500msec	two driving cycles
	P0692		drain voltage of FET & signal from ECM for relays	after engine starting ignition switch	>= 1 on	<-- <--	<-- <--	<-- <--	<-- <--	sec. <--	2500msec	
	P0483		coolant temperature	components listed on #40 of page 03-H-1 engine speed idle switch vehicle speed radiator fan signal change coolant temperature battery voltage	no failure >= 560 and < 900 on < 1.2 "off" to "on" >= 100 >= 10.9	<-- <-- <-- <-- <-- <-- <-- <--	<-- <-- <-- <-- <-- <-- <-- <--	<-- <-- <-- <-- <-- <-- <-- <--	<-- <-- <-- <-- <-- <-- <-- <--	rpm rpm MPH deg C V	300024msec	
(46) Neutral switch	P0851	circuit continuity	switch signal when park/ neutral="off" & any other switches="on" on AT	components listed on #46 of page 03-H-1 ignition switch after engine starting	no failure on >= 2	<-- <-- <--	<-- <-- <--	<-- <-- <--	<-- <-- <--		6.4sec 64ms ×	two driving cycles
	P0852		switch signal when park/ neutral="on" & any other switches="off" on AT	starter switch battery voltage range switch on AT TCM	turn off >= 10.9 no failure	<-- <-- <--	<-- <-- <--	<-- <-- <--	<-- <-- <--	secs. V	100time	
	P0851	circuit continuity	switch signal for MT	components listed on #46 of page 03-H-1 ignition switch after engine starting	no failure on >= 2	<-- <-- <--	<-- <-- <--	<-- <-- <--	<-- <-- <--		3time	two driving cycles
	P0852		starter switch battery voltage driving condition change a) vehicle speed & engine speed b) vehicle speed & engine speed	turn off >= 10.9 a) to b) <= 0 & >= 600 <= and 900 >= 39.7696 >= 1600 and <= 2550	<-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <--	<-- <-- <-- <-- <-- <-- <-- <-- <-- <--	<-- <-- <-- <-- <-- <-- <-- <-- <-- <--	<-- <-- <-- <-- <-- <-- <-- <-- <-- <--	sec. V mph rpm rpm mph rpm rpm			

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA 2.5L NA (LEV2), FORESTER 2.5L NA (LEV2), LEGACY 2.5L NA (LEV2), OUTBACK 2.5L NA (LEV2), FORESTER 2.5L NA (PZEV), LEGACY 2.5L NA (PZEV) & OUTBACK 2.5L NA (PZEV)

Applicable System ; System H

2007 MY Summary Sheet for OBD Strategy (8)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions					Time Required	MIL Illum.	
					FORESTER LEV2	FORESTER P-ZEV	LEGACY LEV2	LEGACY P-ZEV	IMPREZA			
(50) Tank pressure sensor	P0453	range check	fuel tank pressure	vehicle speed battery voltage components listed on #50 of page 03-H-1 all conditions for EVAP canister purge learning value of EVAP conc. during purge feed-back lambda coefficient fuel temperature atmospheric pressure	>= 1.2428 >= 10.9 no failure to be in enable <= 0.08 >= 0.9 < 35 > 75.06029	<- <- <- <- <- <- <- <-	<- <- <- <- <- <- <- <-	<- <- <- <- <- <- <- <-	<- <- <- <- <- <- <- <-	mph V deg C KPa	15000 msec	immediately
	P0452			battery voltage components listed on #50 of page 03-H-1	>= 10.9 no failure	<- <-	<- <-	<- <-	<- <-	V		
	P0451	rationality check	max. - min. tank pressure	change of fuel temperature count of detecting fuel level change above 3.3% during 1min fuel level fuel temperature atmospheric pressure after engine starting battery voltage fuel temp. & level sensor	>= 7 16 >= 15 < 35 > 75.06029 >= 60 >= 10.9 no failure	<- <- <- <- <- <- <- <-	<- <- <- <- <- <- <- <-	<- <- <- <- <- <- <- <-	<- <- <- <- <- <- <- <-	deg C time % deg C KPa sec V	1 sec.	two driving cycles
(51) Fuel temperature sensor	P0182	range check	output voltage	battery voltage	> 10.9	<-	<-	<-	<-	V	2500 msec	immediately
	P0183										2500 msec	
	P0181	rationality check	fuel temperature - coolant temperature	components listed on #51 of page 03-H-1 fuel level battery voltage after engine starting coolant temp. diff. from engine start	no failure >= 15 > 10.9 >= 20 > 10	<- <- <- <- <-	<- <- <- <- <-	<- <- <- <- <-	<- <- <- <- <-	% V sec deg C	120 sec	two driving cycles
		fuel temperature difference between max. and min.	accumulated amount of intake air after engine starting components listed on #51 of page 03-H-1 battery voltage	> 551043 >= 20000 no failure > 10.9	<- <- <- <-	<- <- <- <-	<- <- <- <-	<- <- <- <-	g msec V			
(52) Fuel level sensor	P0462	range check	output voltage	battery voltage	>= 10.9	<-	<-	<-	<-	V	2500 msec	two driving cycles
	P0463			ignition switch after engine starting	on >= 3000	<- <-	<- <-	<- <-	<- <-	msec	1000 msec	
	P0461	rationality check	max. - min. fuel level output	accumulated amount of intake air battery voltage after engine starting components listed on #52 of page 03-H-1	>= 330957 >= 10.9 >= 5000 no failure	<- <- <- <-	<- <- <- <-	<- <- <- <-	<- <- <- <-	g V msec	not determined	
(52') Fuel level sensor - slosh	P0464	rationality check	integrated times of the condition reaching follows, DVFLMAX >= Threshold or SUMVFL >= Threshold where, - DVFLMAX is max. deviation of sensor output during 12.2 secs. - SUMVFL is integrated value of sensor output deviation during 12.2 secs.	engine speed battery voltage after engine starting ignition switch idle switch fuel level	>= 500 >= 10.9 >= 1 on on >= 15	<- <- <- <- <- <-	<- <- <- <- <- <-	<- <- <- <- <- <-	<- <- <- <- <- <-	rpm V sec %	12288 msec x 4 time	two driving cycles
				vehicle speed = 0 MPH components listed on #52' of page 03-H-1 Max - Min of tank pressure during 12.2 secs. Max - Min of battery voltage during 12.2 secs.	>= 10000 >= no failure < 49.99575 < 1.65	<- <- <- <-	<- <- <- <-	<- <- <- <-	<- <- <- <-	<- <- <- <-	<- <- <- <-	msec Pa V
(53) Solenoid valve for canister vent control	P0447	circuit continuity	drain voltage of FET and signal from ECM	battery voltage after engine starting	>= 10.9 >= 1	<- <-	<- <-	<- <-	<- <-	V sec.	2500 msec	immediately
	P0448		drain voltage of FET and signal from ECM	ignition switch	on	<-	<-	<-	<-		2500 msec	
	P1443	functional check	fuel tank pressure	components listed on #53' of page 03-H-1 battery voltage barometric pressure solenoid valve for canister vent control fuel tank pressure at engine start	no failure >= 10.9 >= 75.06029 open >= -666.61 and < 1426.545	<- <- <- <- <- <-	<- <- <- <- <- <-	<- <- <- <- <- <-	<- <- <- <- <- <-	V KPa Pa Pa	3000 sec	
(54) Pressure control valve	P1400	functional check	drain voltage of FET and signal from ECM	battery voltage after engine starting	>= 10.9 >= 1	<- <-	<- <-	<- <-	<- <-	V sec.	2500 msec	two driving cycles
	P1420		drain voltage of FET and signal from ECM	ignition switch	on	<-	<-	<-	<-		2500 msec	

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA 2.5L NA (LEV2), FORESTER 2.5L NA (LEV2), LEGACY 2.5L NA (LEV2), OUTBACK 2.5L NA (LEV2), FORESTER 2.5L NA (PZEV), LEGACY 2.5L NA (PZEV) & OUTBACK 2.5L NA (PZEV)

Applicable System ; System H

2007 MY Summary Sheet for OBD Strategy (9)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions					Time Required	MIL Illum.	
					FORESTER LEV2	FORESTER P-ZEV	LEGACY LEV2	LEGACY P-ZEV	IMPREZA			
(60) Manifold absolute pressure (MAP)sensor	P0107	range check	output voltage	components listed on #60 of page 03-H-1	no failure	<--	<--	<--	<--		500msec	immediately
	P0108	rationality check	output voltage	engine coolant temperature engine speed intake air every half engine revs. throttle position components listed on #60 of page 03-H-1	>=75	<--	<--	<--	<--	deg C	3000msec	two driving cycles
	<2500				<--	<--	<--	<--	rpm			
					>0.55	<--	<--	<--	<--	g/rev		
					>=12	<--	<--	<--	<--	deg		
			output voltage	engine coolant temperature engine speed	>=75	<--	<--	<--	<--	deg C	7000msec	
					>=600	<--	<--	<--	<--	rpm		
					and	<--	<--	<--	<--			
					<900	<--	<--	<--	<--	rpm		
					intake air every half engine revs.	<0.4	<--	<--	<--	g/rev		
					throttle position	<=2.44	<--	<--	<--	deg		
				components listed on #60 of page 03-H-1	no failure	<--	<--	<--	<--			
(61) Intake air temperature sensor	P0111	rationality check	output voltage difference between max. and min.	coolant temp. before engine start coolant temperature battery voltage driving below 37 MPH coolant temperature sensor	<30	<--	<--	<--	<--	deg C	1secs.	two driving cycles
					>100	<--	<--	<--	<--	deg C		
					>=10.9	<--	<--	<--	<--	V		
					>=600	<--	<--	<--	<--	sec		
				coolant temperature sensor	no failure	<--	<--	<--	<--			
	P0112	range check	output voltage	ignition switch	on	<--	<--	<--	<--		500msec	immediately
	P0113					<--	<--	<--	<--		500msec	
(62) Atmospheric pressure sensor	P2227	rationality check	atmospheric - MAP	engine speed at engine starting vehicle speed in-mani press. at eng. start - MAP components listed on #62 of page 03-H-1	<300	<--	<--	<--	<--	rpm	328msec	two driving cycles
					<0.6214	<--	<--	<--	<--	mph		
					<1.331887	<--	<--	<--	<--	KPa		
					no failure	<--	<--	<--	<--			
	P2228	range check	output voltage	ignition switch	on	<--	<--	<--	<--		500msec	immediately
	P2229					<--	<--	<--	<--			
(64)Back-up power supply for memory of ECM	P1560	functional check	voltage of back-up power	engine speed battery voltage	>=500	<--	<--	<--	<--	rpm	2500msec	immediately
					>=10.9	<--	<--	<--	<--	V		
(72) Thermostat	P0128	functional check	(estimated - measured) coolant temperature	engine coolant temperature	<75	<--	<--	<--	<--	deg C	not determined	two driving cycles
				engine coolant temperature at engine starting	<55	<--	<--	<--	<--	deg C		
				battery voltage	>=10.9	<--	<--	<--	<--	V		
				vehicle speed	>=18.642	<--	<--	<--	<--	mph		
				components listed on #72 of page 03-H-1	no failure	<--	<--	<--	<--			
				estimated coolant temperature	>=75	<--	<--	<--	<--	deg C		
estimated ambient air temperature	>=-7	<--	<--	<--	<--	deg C						

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA 2.5L NA (LEV2), FORESTER 2.5L NA (LEV2), LEGACY 2.5L NA (LEV2), OUTBACK 2.5L NA (LEV2), FORESTER 2.5L NA (PZEV), LEGACY 2.5L NA (PZEV) & OUTBACK 2.5L NA (PZEV)

Applicable System : System H												
2007 MY Summary Sheet for OBD Strategy (10)												
Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions					Time Required	MIL Illum.	
					FORESTER LEV2	FORESTER P-ZEV	LEGACY LEV2	LEGACY P-ZEV	IMPREZA			
(81) Positive crankcase ventilation system	P1491	circuit continuity	Positive crankcase ventilation diagnostic. signal	battery voltage engine speed	> 10.9 >= 500	<- <-	<- <-	<- <-	<- <-	V rpm	2500msec	immediately
(83) CAN system	P0600	functional check	bus off flag or error warning flag communication ID from TCU or ECU or VDC/ABS ECU not received (LEGACY) communication ID from TCM not received (FORESTER, IMPREZA) the data from ECU does not be updated (LEGACY) the data from TCU does not be updated (FORESTER, IMPREZA)	battery voltage components listed on #83 of page 03-H-1 starter switch engine	>= 10.9 no failure off run	<- <- <- <-	<- <- <- <-	<- <- <- <-	<- <- <- <-	V	1 sec	immediately
(84) Transmission control system (MIL request)	P0700	functional check	MIL request flag from TCM	battery voltage components listed on #84 of page 03-E-1	>= 10.9 no failure	<- <-	<- <-	<- <-	<- <-	V	2500msec	immediately
(92) Engine oil temperature sensor	P0197	range check	output voltage								0.5secs.	immediately
	P0198										0.5secs.	
	P0196	rationality check	engine oil temperature	battery voltage engine speed components listed on #92 of page 03-H-1 timer count up by temp./vehicle speed	>= 10.9 >= 500 no failure see Map 9 on page 03-H-7	<- <- <- <-	<- <- <- <-	<- <- <- <-	<- <- <- <-	V rpm	not determined	two driving cycles
(93) Oil Switching Valve	P0076(RH) P0082(LH)	range check (for open circuit)	control current	battery voltage duty ratio of 'on'	>= 10.9 >= 30	<- <-	<- <-	<- <-	<- <-	V %	2000msec	immediately
	P0077(RH) P0083(LH)	range check (for short circuit)	control current	battery voltage duty ratio of 'on'	>= 10.9 < 7	<- <-	<- <-	<- <-	<- <-	V %		
	(94) Direct Variable Valve Lift (DVVL)	P0026(RH) P0028(LH)	functional check	oil pressure switch and control duty	battery voltage after engine starting engine oil temperature	>= 10.9 >= 6000 >= 15	<- <- <-	<- <- <-	<- <- <-	<- <- <-		
oil pressure switch and control duty				DVVL components listed on #94 of page 03-H-1	<- <- no failure	<- <- <-	<- <- <-	<- <- <-	<- <- <-	<- <- <-		3000msec
(95) Cold start emission reduction strategy	P1602	amount of intake air	Average amount of intake air when controlling ignition timing retard for warming up catalyst (gaobdav) average value of retard ignition timing under all condition (acldobdav). Transmission:MT and neutral switch:ON Transmission:AT and neutral switch:ON Transmission:AT and neutral switch:OFF gaobdav = sgmgabd / cdcldstm sgmgabd= accumulated amount of intake air when controlling ignition timing retard for warming up catalyst cdcldstm=counter when controlling ignition timing retard for warming up catalyst	atmospheric pressure	> -	-	-	563	-	KPa	6 sec	two driving cycles
				battery voltage	> -	-	-	10.9	-	V		
				components listed on #95 of page 03-H-1 engine vehicle speed After closed control in ISC Counter of minimum engine speed.	- - =< - >= - < - > -	- - - - - -	- - - - - -	no failure run 1.8642 1500 2000	- - - - -	- - mph msec count		
after neutral switch on - off event	> -	-	-	3000	-	msec						
Continuous period of cold start emission reduction strategy 1	-	-	-	in operation	-							
Execute Warming up catalyst	-	-	-	in operation	-							
After load input switch operation(air conditioner, power steering, lights, rear defroster, heater fan and radiator fan)	>= -	-	-	3500	-	msec						
Misfire detection during 200 engine rev. (Because of catalyst damages)	< -	-	-	5	-							
Execute Cold start strategy when both conditions as below are satisfied	-	-	-	-	-							
ECT - intake air temperature	<= -	-	-	5	-	deg C						
ECT - fuel temperature	<= -	-	-	2	-	deg C						
Time after changing warming up mode	>= -	-	-	6000	-	msec						
target engine speed - actual engine speed	> -	-	-	563	-	mmHg						
battery voltage	> -	-	-	10.9	-	V						
components listed on #95 of page 03-H-1 engine vehicle speed After closed control in ISC Counter of minimum engine speed. after neutral switch on - off event	- - =< - >= - < - > -	- - - - - -	- - - - - -	no failure run 3 1500 2000 3000	- - - - -	- - km/h msec count msec						
Continuous period of cold start emission reduction strategy 1	>= -	-	-	experienced	-							
Execute Warming up catalyst	-	-	-	in operation	-							
After load input switch operation(air conditioner, power steering, lights, rear defroster, heater fan and radiator fan)	>= -	-	-	3500	-	msec						
Misfire detection during 200 engine rev. (Because of catalyst damages)	< -	-	-	5	-	time						
Execute Cold start strategy when both conditions as below are satisfied	-	-	-	-	-							
ECT - intake air temperature	<= -	-	-	5	-	deg C						
ECT - fuel temperature	<= -	-	-	2	-	deg C						
Time after changing warming up mode	>= -	-	-	6000	-	msec						
P1602	amount of intake air	Estimated exhaust gas temperature after 14 seconds at cold start	atmospheric pressure	> 75	<-	<-	-	75	KPa	14 sec	two driving cycles	
			battery voltage	> 10.9 no failure run	<- <- <-	<- <- <-	- - -	10.9 no failure run	V			
			vehicle speed	<= 1.2428	<-	<-	-	1.2428	mph			
Duration to satisfy "nefbgd - ne"			Misfire detection during 200 engine rev. (Because of catalyst damages)	< 5	<-	<-	-	5				
			Time after engine starting	= 14	<-	<-	-	14	sec			

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA 2.5L NA (LEV2), FORESTER 2.5L NA (LEV2), LEGACY 2.5L NA (LEV2), OUTBACK 2.5L NA (LEV2), FORESTER 2.5L NA (PZEV), LEGACY 2.5L NA (PZEV) & OUTBACK 2.5L NA (PZEV)

Applicable System ; System H

2007 MY Summary Sheet for OBD Strategy (11)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions						Time Required	MIL Illum.	
					FORESTER LEV2	FORESTER P-ZEV	LEGACY LEV2	LEGACY P-ZEV	IMPREZA				
(201) Throttle actuator control	P0638	functional check	motor control Duty	ignition switch	on	<=	<=	<=	<=	<=	V	5000msec	immediately
				motor supply voltage	>= 6.2	<=	<=	<=	<=				
			motor relay	on	<=	<=	<=	<=	rpm	2sec			
			CPU communication	no failure	<=	<=	<=	<=					
			previous diagnosis result	no failure	<=	<=	<=	<=	rpm	2sec			
engine speed	< 500	<=	<=	<=	<=								
target throttle position -	ignition switch	on	<=	<=	<=	<=	rpm	see table 21-2					
	motor relay	on	<=	<=	<=	<=							
throttle position sensor 1	previous diagnosis result	no failure	<=	<=	<=	<=	V	deg	table 21-2				
	engine speed	>= 500	<=	<=	<=	<=							
	battery voltage	>= 6.2	<=	<=	<=	<=							
	throttle position sensor 1	>= target throttle position	<=	<=	<=	<=							
motor supply voltage	throttle position sensor 1 circuit diagnosis	complete	<=	<=	<=	<=	V	deg					
	throttle position sensor 2 circuit diagnosis	complete	<=	<=	<=	<=							
throttle position sensor rationality diagnosis	throttle position sensor 1 circuit diagnosis	complete	<=	<=	<=	<=	V	deg					
	throttle position sensor 2 circuit diagnosis	complete	<=	<=	<=	<=							
throttle position sensor rationality diagnosis	throttle position sensor 2 circuit diagnosis	complete	<=	<=	<=	<=	V	rpm	1000msec				
	throttle position sensor rationality diagnosis	complete	<=	<=	<=	<=							
throttle position sensor rationality diagnosis	ignition switch	on	<=	<=	<=	<=	V	rpm	5000msec				
	motor relay	on	<=	<=	<=	<=							
previous diagnosis result	no failure	<=	<=	<=	<=	<=	V	rpm					
	motor supply voltage	>= 6.2	<=	<=	<=	<=							
engine speed	>= 500	<=	<=	<=	<=	<=	V	rpm					
battery voltage	>= 6.2	<=	<=	<=	<=								
throttle position sensor 1	< target throttle position	<=	<=	<=	<=	<=	V	rpm					
	throttle position sensor 1 circuit diagnosis	complete	<=	<=	<=	<=							
throttle position sensor 2 circuit diagnosis	complete	<=	<=	<=	<=	<=	V	rpm					
throttle position sensor rationality diagnosis	complete	<=	<=	<=	<=								
throttle position sensor rationality diagnosis	ignition switch	on	<=	<=	<=	<=	V	rpm	5000msec				
	motor relay	on	<=	<=	<=	<=							
previous diagnosis result	no failure	<=	<=	<=	<=	<=	V	rpm					
motor supply voltage	>= 6.2	<=	<=	<=	<=								
engine speed	< 500	<=	<=	<=	<=	<=	V	rpm					
battery voltage	>= 6.2	<=	<=	<=	<=								
throttle position sensor 1 circuit diagnosis	complete	<=	<=	<=	<=	<=	V	rpm					
	throttle position sensor 2 circuit diagnosis	complete	<=	<=	<=	<=							
throttle position sensor rationality diagnosis	complete	<=	<=	<=	<=	<=	V	rpm					
throttle position sensor rationality diagnosis	complete	<=	<=	<=	<=								
(202) Throttle actuator control motor	P2101	circuit continuity	malfunction flag from motor operation IC	ignition switch	on	<=	<=	<=	<=	<=	V	500msec	immediately
	P2102			motor relay	on	<=	<=	<=	<=	<=			
				motor supply voltage	>= 6.2	<=	<=	<=	<=	<=			
P2103	motor relay	on	<=	<=	<=	<=	<=	<=	V	400msec			
	battery voltage	>= 11	<=	<=	<=	<=	<=						
P2103	motor supply voltage	no failure	<=	<=	<=	<=	<=	<=	V	600msec			
	previous diagnosis result	no failure	<=	<=	<=	<=	<=						
P2103	motor relay	off	<=	<=	<=	<=	<=	<=	V	600msec			
	battery voltage	>= 6	<=	<=	<=	<=	<=						
P2103	CPU communication	no failure	<=	<=	<=	<=	<=	<=	V	600msec			
	no failure	<=	<=	<=	<=	<=	<=						
(203) Throttle return spring	P1160	functional check	throttle position sensor 1 at diagnosis start - throttle position sensor 1	ignition switch	off	<=	<=	<=	<=	<=	msecs.	1880msec	immediately
				the time after ignition switch off	= 992	<=	<=	<=	<=				
CPU communication	no failure	<=	<=	<=	<=	<=	<=	<=	V				
	throttle position sensor 1 circuit diagnosis	complete	<=	<=	<=	<=	<=						
throttle position sensor 2 circuit diagnosis	complete	<=	<=	<=	<=	<=	<=	V					
throttle position sensor rationality diagnosis	complete	<=	<=	<=	<=	<=	<=						
motor supply voltage	>= 6	<=	<=	<=	<=	<=	<=	V					
battery voltage	>= 6	<=	<=	<=	<=	<=	<=						
target throttle position at diagnosis start - throttle position sensor 1 at diagnosis start	< 2	<=	<=	<=	<=	<=	<=	deg					
	no failure	<=	<=	<=	<=	<=	<=						
(204) Throttle position sensor minimum stop	P2109	rationality check	minimum stop position	battery voltage	>= 6	<=	<=	<=	<=	<=	V	8msec	immediately
				previous diagnosis result	no failure	<=	<=	<=	<=				
throttle position at ignition switch off to or - throttle minimum stop position	>= 6	<=	<=	<=	<=	<=	<=	V	80msec				
	previous diagnosis result	no failure	<=	<=	<=	<=	<=						

throttle position sensor1 (deg)	time msecs.
5.5	1000
9.0	400
13.0	300
22.0	250

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA 2.5L NA (LEV2), FORESTER 2.5L NA (LEV2), LEGACY 2.5L NA (LEV2), OUTBACK 2.5L NA (LEV2), FORESTER 2.5L NA (PZEV), LEGACY 2.5L NA (PZEV) & OUTBACK 2.5L NA (PZEV)

Applicable System ; System H

2007 MY Summary Sheet for OBD Strategy (12)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions					Time Required	MIL Illum.	
					FORESTER LEV2	FORESTER P-ZEV	LEGACY LEV2	LEGACY P-ZEV	IMPREZA			
(205) Throttle position sensor	P0122 (sensor1) P0222 (sensor2)	circuit continuity	output voltage (sensor2)	ignition switch motor supply voltage previous diagnosis result	on	on	<--	<--	<--	V	24 msec	immediately
	>= 6				<--	<--	<--	<--	24 msec			
	P0123 (sensor1) P0223 (sensor2)	rationality check	throttle position sensor 1(deg) - throttle position sensor 2(deg)	ignition switch motor supply voltage previous diagnosis result throttle position sensor 1 circuit diagnosis throttle position sensor 2 circuit diagnosis	no failure	no failure	<--	<--	<--	24 msec		
>= 6	<--				<--	<--	<--	212 msec				
(206) Pedal position sensor	P2122 (sensor1) P2127 (sensor2)	circuit continuity	output voltage (sensor1) (sensor2)	ignition switch motor relay previous diagnosis result battery voltage	on	on	<--	<--	<--	V	100 msec	immediately
	>= 6				<--	<--	<--	<--	100 msec			
	P2123 (sensor1) P2128 (sensor2)	rationality check	pedal position sensor 1 (deg) - pedal position sensor 2 (deg)	previous diagnosis result battery voltage pedal position sensor 1 circuit diagnosis pedal position sensor 2 circuit diagnosis	no failure	no failure	<--	<--	<--	100 msec		
>= 6	<--				<--	<--	<--	116 msec				
P2138					on	on	<--	<--	<--	V		

Applicable Model Year: 2007; Applicable Vehicle Line: IMPREZA 2.5L NA (LEV2), FORESTER 2.5L NA (LEV2), LEGACY 2.5L NA (LEV2), OUTBACK 2.5L NA (LEV2), FORESTER 2.5L NA (PZEV), LEGACY 2.5L NA (PZEV) & OUTBACK 2.5L NA (PZEV)

Applicable System ; System H

2007 MY Summary Sheet for OBD Strategy (13)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions					Time Required	MIL Illum.	
					FORESTER LEV2	FORESTER P-ZEV	LEGACY LEV2	LEGACY P-ZEV	IMPREZA			
(207) ECM performance	P0607	circuit continuity (inside ECM)	input voltage of throttle position sensor 1 main CPU - sub CPU	ignition switch previous diagnosis result battery voltage CPU communication starter switch the time after sub CPU reset	on	<-	<-	<-	<-	V msec	600	immediately
					no failure	<-	<-	<-	<-		400	
					>= 6	<-	<-	<-	<-		350	
					no failure	<-	<-	<-	<-		300	
					off	<-	<-	<-	<-		250	
	circuit continuity (inside ECM)	input voltage of pedal position sensor 1 main CPU - sub CPU	ignition switch previous diagnosis result CPU communication battery voltage starter switch	on	<-	<-	<-	<-	V	FORESTER, IMPREZA 750	immediately	
				no failure	<-	<-	<-	<-		LEGACY 830		
				>= 6	<-	<-	<-	<-		FORESTER, IMPREZA 550		
				off	<-	<-	<-	<-		LEGACY 720		
	functional check (Sub CPU)	Watch dog signal from Sub CPU	ignition switch previous diagnosis result starter sw battery voltage the time after sub CPU reset	on	<-	<-	<-	<-	V msec	200	immediately	
no failure				<-	<-	<-	<-	200				
functional check (CPU communication)	(Main CPU) sum check error, key word error, data writing error or communication error from sub CPU data	ignition switch previous diagnosis result starter switch battery voltage the time after sub CPU reset	on	<-	<-	<-	<-	V msec	200	immediately		
			no failure	<-	<-	<-	<-		200			
functional check (Sub CPU)	(Sub CPU) sum check error, key word error, or communication error from main CPU data	ignition switch previous diagnosis result battery voltage	on	<-	<-	<-	<-	V	200	immediately		
			no failure	<-	<-	<-	<-		200			
functional check (AMP circuit in ECM)	throttle position sensor 1 - (amplified throttle position sensor 1) / 4 (amplified throttle position sensor 1) / 4	ignition switch previous diagnosis result battery voltage throttle position sensor 1	on	<-	<-	<-	<-	V deg	24	immediately		
			no failure	<-	<-	<-	<-		03-H-12			
functional check (cruise control)	cruise control	brake switch ignition switch motor relay battery voltage Sub CPU ETC activation previous diagnosis result CPU communication	>= 6.2	<-	<-	<-	<-	V	250	immediately		
			available	<-	<-	<-	<-		250			
rationality check (brake switch circuit)	brake switch of main CPU brake switch of sub CPU	ignition switch battery voltage previous diagnosis result CPU communication	on	<-	<-	<-	<-	V	200	immediately		
			>= 10.9	<-	<-	<-	<-		200			
rationality check (brake switch circuit)	brake switch of main CPU brake switch of sub CPU	ignition switch battery voltage previous diagnosis result CPU communication	no failure	<-	<-	<-	<-	V	200	immediately		
			no failure	<-	<-	<-	<-		200			

battery voltage (V)	TAAD (deg)
7.5	27.5
8.0	31

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
(301) Range switch	P0705	functional check	"D" signal continuously	shifted vehicle speed	"N" to "3" >= 60 km/h	3.0 secs.	two driving cycles
			simultaneous signals	engine speed engine speed signal	> 3000 rpm not failure	3.0 secs.	
(302) Brake switch for AT	P0719	functional check	"on" signal	vehicle speed change	30 to 0 km/h	10 times	two driving cycles
	P0724	functional check	"off" signal	vehicle speed change	0 to 30 km/h	10 times	two driving cycles
(303) ATF temperature sensor	P0712	range check	output voltage	vehicle speed	>= 10 km/h	60.0 secs.	immediately
	P0713	range check	output voltage	vehicle speed	>= 10 km/h	60.0 secs.	immediately
(304) Turbine shaft speed sensor	P0715	range check	turbine shaft speed	engine speed output shaft speed range switch	>= 3000 rpm >= 1600 rpm "D", "3", "2" or "1"	3.0 secs.	immediately
(305) Vehicle speed sensor	P0720	range check	output shaft speed	determined output shaft speed determined output shaft speed	>= 800 rpm not failure	3.0 secs.	immediately
(306) Engine speed signal for AT	P0725	range check	engine speed	turbine shaft speed turbine shaft speed sensor vehicle speed vehicle speed sensor	>= 1000 rpm not failure >= 10 km/h not failure	3.0 secs.	immediately
(307) Automatic transmission gear ratio	P0731	functional check	GR/(1st gear ratio)	upshift or downshift events	not in operation	3.0 secs.	immediately
	P0732		GR/(2nd gear ratio)	output shaft speed	>= 300 rpm		
	P0733		GR/(3rd gear ratio)	turbine shaft speed	>= 300 rpm		
	P0734		GR/(4th gear ratio)	range switch	"D", "3", "2" or "1"		
			where, GR = (turbine shaft speed) / (output shaft speed)	throttle angle (at 1st gear) throttle angle (at not 1st gear) range switch turbine shaft speed sensor vehicle speed sensor	>= 30 deg >= 6 deg not failure not failure not failure		
(308) Lock-up clutch	P0741	functional check	engine speed - turbine shaft speed >= 40 + vehicle speed /2	duty ratio for duty solenoid valve engine speed signal turbine shaft speed sensor	>= 90 % not failure not failure	10.0 secs.	two driving cycles
(309) Lock-up clutch duty solenoid	P0743	functional check	drain level of FET for solenoid valve is not change in one duty cycle	on duty ratio for duty solenoid valve	>= 5 %	200 msecs.	immediately
			drain level of FET for solenoid valve	on duty ratio for duty solenoid valve	= 0 %	200 msecs.	
(310) AT line pressure linear solenoid	P0748	functional check	cur_mon	cur_tgt	>= 100 mA	0.10 secs.	immediately
			cur_mon or cur_tgt - cur_mon	cur_tgt	>= 100 mA	0.06secs.	
			where, cur_mon=monitor current for solenoid cur_tgt=target current for solenoid				
(311) Low clutch duty solenoid	P0753	functional check	drain level of FET for solenoid valve is not change in one duty cycle	on duty ratio for duty solenoid valve	>= 5 %	200 msecs.	immediately
			drain level of FET for solenoid valve	on duty ratio for duty solenoid valve	= 0 %	200 msecs.	
(312) 2-4th brake duty solenoid	P0758	functional check	drain level of FET for solenoid valve is not change in one duty cycle	on duty ratio for duty solenoid valve	>= 5 %	200 msecs.	immediately
			drain level of FET for solenoid valve	on duty ratio for duty solenoid valve	= 0 %	200 msecs.	
(313) High clutch duty solenoid	P0763	functional check	drain level of FET for solenoid valve is not change in one duty cycle	on duty ratio for duty solenoid valve	>= 5 %	200 msecs.	immediately
			drain level of FET for solenoid valve	on duty ratio for duty solenoid valve	= 0 %	200 msecs.	
(314) Low&Reverse brake duty solenoid	P0768	functional check	drain level of FET for solenoid valve is not change in one duty cycle	on duty ratio for duty solenoid valve	>= 5 %	200 msecs.	immediately
			drain level of FET for solenoid valve	on duty ratio for duty solenoid valve	= 0 %	200 msecs.	
(317) CAN communication	P1718	functional check	CAN bus condition	turbine shaft speed range switch	> 0 rpm "D", "3", "2" or "1"	500 msecs.	immediately
			fail counter from ECM is not change				

Mode \$06 definition of SUBARU 2.5L NA ENGINE

TEST ID	Type of Test Limit and Comp.ID	Description	Decimal range	HEX Range
O2 Sensor Circuit(B1S2)				
\$41	\$81	Maximum output voltage	0 - 1.275 V	00 - FF
\$41	\$02	Minimum output voltage	0 - 1.275 V	00 - FF
O2 sensor curcuit(B1S1)				
\$44	\$01	output value		0000 - FFFF
\$44	\$82	output value		0000 - FFFF
Catalyst System Efficiency Below Threshold				
\$81	\$01	Ratio of lambda cumulative value	0 - 256	0000 - FFFF
EGR SYSTEM				
\$82	\$81	The intake manifold pressure value when nealy full open	0 - 273019 Pa	0000 - FFFF
\$82	\$02	The intake manifold pressure value when close	0 - 273019 Pa	0000 - FFFF
Evaporative Emission Control System Leak Detected (small leak)				
\$83	\$81	Tank pressure in mode-Z	0 - 2	0000 - FFFF
\$83	\$02	Tank pressure varidation in the tank in mode-D	0 - 819 kPa	0000 - FFFF
\$83	\$03	Tank pressure in mode-C	-409.6 - 410 kPa	0000 - FFFF
\$83	\$04	Tank pressure in mode-B	-409.6 - 410 kPa	0000 - FFFF
\$83	\$05	Tank pressure in mode-C	-409.6 - 410 kPa	0000 - FFFF
\$83	\$06	Tank pressure varidation in the tank in mode-D	0 - 819 kPa	0000 - FFFF
O2 Sensor Circuit Slow Response(B1S1)				
\$84	\$01	Time from lean to rich	0 - 65535 ms	0000 - FFFF
\$84	\$02	Time from rich to lean	0 - 65535 ms	0000 - FFFF
O2 Sensor Circuit Slow Response(B1S2)				
\$85	\$01	Response time	0 - 655 s	0000 - FFFF
\$85	\$02	Response time	0 - 655 s	0000 - FFFF
Heater control curcuit				
\$89	\$81	electoric power	0 - 51.5 W	0000 - FFFF
\$89	\$02	electoric power	0 - 51.5 W	0000 - FFFF

Mode \$06 definition of SUBARU - 3.0L H6, 2.0L&2.5L TURBO, 2.5L PZEV&LEV2 ENGINE

TEST ID	Type of Test Limit and Comp.ID	Description	Decimal range	HEX Range
O2 Sensor Circuit(B1S2)				
\$41	\$81	Maximum output voltage	0 - 1.275 Volt	00 - FF
\$41	\$02	Minimum output voltage	0 - 1.275 Volt	00 - FF
O2 Sensor Circuit(B1S3)				
\$42	\$81	Maximum output voltage	0 - 1.275 Volt	00 - FF
\$42	\$02	Minimum output voltage	0 - 1.275 Volt	00 - FF
O2 Sensor Circuit(B2S2)				
\$43	\$81	Maximum output voltage	0 - 1.275 Volt	00 - FF
\$43	\$02	Minimum output voltage	0 - 1.275 Volt	00 - FF
Catalyst System Efficiency Below Threshold				
\$81	\$01	Ratio of lambda cumulative value	0 - 312	0000 - FFFF
Exhaust Gas Recirculation Flow Malfunction				
\$82	\$81	The intake manifold pressure value when nearly full open	-150 - 1250 mmHg	0000 - FFFF
\$82	\$02	The intake manifold pressure value when close	-150 - 1250 mmHg	0000 - FFFF
Evaporative Emission Control System Leak Detected (small leak)				
\$83	\$01	Tank pressure in mode Z	-62.5 - 125 mmHg	0000 - FFFF
\$83	\$02	Negative pressure in the intake manifold to tank	-62.5 - 125 mmHg	0000 - FFFF
\$83	\$03	Tank pressure when starting calculation	-62.5 - 125 mmHg	0000 - FFFF
\$83	\$04	amount of negative pressure change	-62.5 - 125 mmHg	0000 - FFFF
\$83	\$05	tank pressure in mode D	-62.5 - 125 mmHg	0000 - FFFF
\$83	\$86	The change of tank pressure in mode E	-62.5 - 125 mmHg	0000 - FFFF
O2 Sensor Circuit Slow Response(B1S1)				
\$84	\$01	Ratio of faf difference to lambda value difference	0 - 8	0000 - FFFF
O2 Sensor Circuit Slow Response(B1S2)				
\$85	\$01	Shortest time change from rich to lean	0 - 2097120 ms	0000 - FFFF
\$85	\$02	Time at over 0.55V	0 - 2097120 ms	0000 - FFFF
O2 Sensor Circuit Slow Response(B1S3)				
\$86	\$01	Response time	0 - 2097120 ms	0000 - FFFF
O2 Sensor Circuit Slow Response(B2S1)				
\$87	\$01	ratio of faf difference to lambda value difference	0 - 8	0000 - FFFF
O2 Sensor Circuit Slow Response(B2S2)				
\$88	\$01	Shortest time change from rich to lean	0 - 2097120 ms	0000 - FFFF
\$88	\$02	Time at over 0.55V	0 - 2097120 ms	0000 - FFFF
\$89	\$81	Secondary air supply pipe pressure	0 - 1250 mmHg	0000 - FFFF
\$89	\$82	Integrated value of pulse when the left combination valve is closed	0 - 50 Volt	0000 - FFFF
\$89	\$83	Supply piping pressure when the right combination valve is switched	0 - 5 Volt	0000 - FFFF
\$89	\$84	Integrated value of pulse when the right combination valve is closed	0 - 50 Volt	0000 - FFFF
\$89	\$85	Supply piping pressure when the left combination valve is switched	0 - 5 Volt	0000 - FFFF
\$89	\$06	Supply piping pressure when both left and right combination valves are closed	0 - 50 Volt	0000 - FFFF
\$89	\$07	Flow rate when the right bank is closed	0 - 20 L/sec	0000 - FFFF
\$89	\$08	Flow rate when the left bank is closed	0 - 20 L/sec	0000 - FFFF
Purge control solenoid valve 2 stuck close diagnosis				
\$8A	\$81	variation gap between tank pressure at the end of mode C and after mode C	-62.5 - 62.5 mmHg	0000 - FFFF