

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

Applicable System	Certification Standard	Enhanced Evap.	ORVR	
System E	LEV-II	yes	yes	

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 msecs. 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	>= 70 >= see Map 5 of page 03-E-3 <= 0.02 no failure	<-- <-- <-- <--	<-- <-- <-- <--	deg C g/rev	10 sec x 5 time	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	>= 70 >= see Map 5 of page 03-E-3 <= 0.02 <= 0.1 >= 20 >= 29884 no failure	<-- <-- <-- <-- <-- <--	<-- <-- <-- <-- <-- <--	deg C g/rev sec msec	10 sec x 5 time	
	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	>= 1	<--	<-- <-- sec	5 sec x 1 time	two driving cycles	
(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 operating	<-- <-- <-- <-- <--	<-- <-- <-- <-- <--	deg C KPa V	10000 msec	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 or rear oxygen sensor feed - back adjust or rear oxygen sensor feed - back adjust intake air change during 0.5 engine rev. impedance of front lambda sensor 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	>= -0.2 and < 0.1 on minimum limit on maximum limit < 0.02 >= 0 and < 50 >= 60000 >= 12.428 >= 6 >= 19.9 < 0.2 >= 4096 >= NA and < NA	<-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- and <--	<-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- and <--	V ohm ohm msec mph g/s sec msec		

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Applicable System ; System E

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	Impreza WRX	Legacy & Outback		
(4) Front lambda sensor -Output voltage	P0131	circuit continuity	input voltage or input current	battery voltage components listed on #4 of page 03-E-1	>= 10.9 no failure	<--	<--	<--	V	1000 msec
	P0132		input voltage or input current			<--	<--	<--		1000 msec
	P0134		impedance of front lambda sensor	battery voltage components listed on #4 of page 03-E-1 accumulated variation of front lambda sensor heater control duty per 128ms.	>= 10.9 no failure >= 36000 >= 70	<-- <--	<-- <--	<-- msec % %	V	5000 msec
(5) Front lambda sensor -Response rate	P0133	comparison measured and feed-back signal	parafca = td2faf/td2lmd where, td2faf(N) = td2faf(n-1) + d2faf(n) td2lmd(N) = td2lmd(n-1) + d2lmd(n) add up for a total of 300 secs. d2faf(n) = (faf(n)-faf(n-1)) - (faf(n-1)-faf(n-2)) d2lmd(n) = (lmd(n)-lmd(n-1)) - (lmd(n-1)-lmd(n-2)) faf = feed-back lambda coefficient every 64 msecs. lmd = output lambda every 64 msecs.	components listed on #4 of page 03-E-1 after engine starting engine speed vehicle speed amount of intake air atmospheric pressure battery voltage closed loop control with oxygen sensors impedance of front lambda sensor engine coolant temperature intake air change during 0.5 engine rev. learning value of EVAP conc. during purge total time of operating canister purge all secondary parameters to be in enable conditions	>= no failure >= 120000 >= 1000 and < 3200 >= 6.214 and < 74.568 >= 10 and < 31 >= 75.06029 >= 10.9 operating >= 0 and < 50 >= 70 =< 0.02 =< 0.2 >= 19.9 >= 1024	<-- <-- <-- and <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- msec rpm x 4 x 1640 time	210 sec 32 ms x 4 x 1640 time	two driving cycles		
(6) Front lambda sensor -Heater	P0031	circuit continuity	the level of output voltage	battery voltage components listed on #6 of page 03-E-1 front lambda sensor heater control duty	>= 10.9 no failure < 87.5	<--	<--	<--	V	1 secs. 4 ms x 250 time
	P0032		the level of output voltage			<--	<--	<--	%	
	P0030	rationality check	impedance of front lambda sensor	battery voltage components listed on #6 of page 03-E-1 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 experienced => 35 => 42000 => 20000	<-- <-- => <-- <-- => msec msec	<-- <-- => <-- <-- => msec msec	<-- <-- => <-- <-- => % msec msec	V	10000 msec

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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 minimum output voltage	components listed on #7 of page 03-E-1 coolant temperature target output voltage of rear oxygen sensor amount of intake air battery voltage closed loop control with oxygen sensors the driving condition as below the time of fuel shut off in decel from engine speed misfire detection during 200 engine revs. compensation factor for front lambda sensor	>= 70 >= 0.6 >= 10 > 10.9 in operation experienced >= 5000 >= 1700 < 5 not in limit value	<-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <--	<-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <--	<-- deg C V	200000 msec	two driving cycles
(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 > 10.9	<-- <-- <-- <-- <-- <-- <-- <-- <--	<-- times V	2500 msec	two driving cycles	
	P0137		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 >= 25000 no experienced	<-- <-- <-- <-- <-- <-- <-- <--	<-- times V g/s msec	Forester,Impreza Legacy&Outback 40000 msec 150000 msec	L e	
				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	* see table		
									fuel shut-off time (ms) RO2KVNG F1 RO2KVNG F1	
									0 40000 150000	
									2000 40000 150000	
									10000 60000 150000	

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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 $\geq kFSLDH1$	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	>	no failure 10.9 in operation experienced	<-- <-- <-- <--	<-- <-- <-- <--	V	1 time	two driving cycles
					\geq 2000 \geq 60000 \geq 30000 \geq 400 \geq 1	\geq 2000 \geq 60000 \geq 30000 \geq 0 \geq 1	\geq 2000 \geq 60000 \geq 30000 \geq 0 \geq 1	\geq 2000 \geq 60000 \geq 30000 \geq 0 \geq 1	msec msec msec deg C time		
(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	\geq 10.9 no failure	<--	<--	V	2.56 secs. 8 ms x 320 time	two driving cycles	
	P0038				\geq 1 $<$ 75	\geq 1 $<$ 75	\geq 1 $<$ 75	secs. % 320 time 320 time			
(11) Crankshaft position sensor	P0335	circuit continuity	crankshaft position sensor signal	components listed on #11 of page 03-E-1 battery voltage starter switch	\geq 8 on	no failure 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	$<$ 3000 \geq 8 completed	no failure on 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	\geq 600 and $<$ 900 $<$ 4.1 \geq 70 $<$ 52.66219 no failure	\geq 2500 \geq 15 \geq 70 \geq 53.3288 no failure	\geq 2500 \geq 15 \geq 70 \geq 53.3288 no failure	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	\geq \geq no failure see map 6 on page 03-E-4	10.9 500 no failure see map 6 on page 03-E-4	<-- <-- <-- <--	V rpm	not determined	two driving cycles	

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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 battery voltage fuel level after engine starting vehicle speed Fuel level of the current driving cycle - Fuel level at the end of the last driving cycle Engine coolant temperature at the end of the last driving cycle fuel temperature Fuel temperature at the end of the last driving cycle - fuel temperature intake air temperature - fuel temperature	>= 10.9 >= 25 >= 5 = 0 < 5 => 70 < 95 < 35 > 5 < 2.5	<-- <-- <-- 0 <-- <-- <-- <-- <-- <-- <-- <--	<-- 23.4375 <-- sec 0 km/h 4.6875 % <-- deg C <-- deg C <-- deg C <-- deg C <-- deg C	2500 msec	two driving cycles
(17) Knock sensor	P0327 P0328	range check	output voltage	ignition switch	on	<-- <--	<--	1000 msec 1000 msec	immediately
(18) Vehicle speed sensor	P0500	range check	vehicle speed(from ABS)	battery voltage after engine starting components listed on #18 of page 03-E-1	>= NA >= NA >= NA	NA <-- <--	10.9 2000 no failure	V msec	512 msec
	P0502	functional check	number of signal in 1377 msec.	fuel shut-off in decel. battery voltage engine speed components listed on #18 of page 03-E-1	operating 10.9 < 4000 no failure	<-- <-- <--	NA NA rpm NA	V	4000 msec
	P0503								
(19) Starter switch	P0512	functional check	starter 'off' signal	engine speed battery voltage components listed on #19 of page 03-E-1	>= 500 >= 8 no failure	<-- <-- <--	<-- rpm V	180000 msec	two driving cycles
	P1518		starter 'on' signal	engine speed after continuous 0.8 sec. or more of < 500 rpm engine speed vehicle speed components listed on #19 of page 03-E-1	>= 500 < 0.6214 no failure	500 <-- <--	<-- rpm mph	800 msec	
(23) Idle speed control (ISC)	P0506	functional check	actual - target eng. speed	components listed on #23 of page 03-E-1 closed control in ISC feedback value for ISC vehicle speed engine coolant temperature atmospheric pressure fuel level after engine starting measured lambda	no failure in operation limits reached = 0 >= 70 >= 75.06029 >= 15 >= 10.49 >= 0.9 < 1.1 >= 5.1 >= 10.9 >= 5.1 >= 5.1	<-- <-- <-- 0 <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <--	<-- <-- <-- km/h deg C KPa % sec	10 sec x 3	two driving cycles
	P0507		actual - target eng. speed						
	P0519	functional check	actual - target eng. speed	battery voltage after engine starting closed control in ISC components listed on #23 of page 03-E-1 vehicle speed feedback value for ISC engine speed change every 180 degree engine rev.	>= 10.9 >= 1000 in operation no failure < 2.4856 < 7.4568 <= 0 >= -5	<-- <-- <-- <-- <-- mph <-- mph 0 -5	<-- V msec <-- 2.4856 mph 2.4856 mph % rpm	2000 msec	immediately
(24) Solenoid valve for purge control	P0458	circuit continuity	drain voltage of FET	battery voltage after engine starting ignition switch duty ratio of 'on'	>= 10.9 >= 1 on < 75	<-- <-- <-- <--	<-- V secs. secs.	2500 msec	two driving cycles
	P0459		drain voltage of FET	battery voltage after engine starting ignition switch duty ratio of 'on'	>= 10.9 >= 1 on >= 25	10.9 1 on 25	<-- V secs. secs. % %	2500 msec	

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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 WRX	Impreza	Legacy & Outback			
(40) Radiator fan	P0691	circuit continuity	drain voltage of FET & signal from ECM for relays	engine speed battery voltage after engine starting ignition switch	= 500	<--	<--	rpm	2500 msec	
	P0692		drain voltage of FET & signal from ECM for relays		= 10.9	<--	<--	V		
	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	= 1 on	<--	<--	secs.	2500 msec	
(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 starter switch battery voltage range switch on AT TCM	= 550 and < 950 on	<--	<--	rpm	300000 msec	
	P0852		switch signal when park/ neutral="off" & any other switches="on" on AT		= 0 "off" to "on"	<--	<--	km/h		
	P0851	circuit continuity for MT	switch signal for MT	components listed on #46 of page 03-E-1 ignition switch after engine starting starter switch battery voltage driving condition change a) vehicle speed & engine speed b) vehicle speed & engine speed	= 95	<--	<--	degC		
	P0852				= 10.9 no failure	<--	<--	V		
					= 2 on	<--	<--		6.5 secs.	
					= 2 turn off	<--	<--	secs.	64 ms	
					= 10.9	<--	<--	V	100 time	
					= no failure	<--	<--			
					= on 2 turn off 10.9 a) to b) = 0 = 600 ≤ and 900 ≥ 39.7696 ≥ 1600 and ≤ 2550	<--	<--	secs. V mph rpm rpm mph rpm rpm rpm	3 time	two driving cycles

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2007 MY Summary Sheet for OBD Strategy (8)

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2007 MY Summary Sheet for OBD Strategy (9)

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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	<-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- 0.27	<-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- <-- Pa V	rpm V secs. time	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 on	<-- <-- <--	<-- <-- <--	secs.	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 msec		
(54) Pressure control valve	P1400	circuit continuity	drain voltage of FET and signal from ECM	battery voltage after engine starting	>= 10.9 >= 1 on	<-- <-- <--	<-- V secs.	2500 msec	two driving cycles	
	P1420		drain voltage of FET and signal from ECM	ignition switch	on	<--	<--	2500 msec		
(60) Manifold absolute pressure (MAP) sensor	P0107 P0108	range check	output voltage	components listed on #60 of page 03-E-1	no failure	<--	<--	500 msec 500 msec	immediately	
	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	
			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 g/rev deg	3000 msec		
(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 blow 50 km/h coolant temperature sensor	< 30 > 95 >= 10.9 no failure	<-- <-- <-- <--	<-- deg C deg C V	1 sec	two driving cycles	
	P0112 P0113	range check	output voltage	ignition switch	on	<--	<--	500 msec 500 msec	immediately	
	P1560	functional check	voltage of back-up power	engine speed battery voltage	>= 500 >= 10.9	<-- <--	<-- rpm V	2500 msec	immediately	

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 => 16.66667 => 180000 on	8 15.625 % msec	<-- <-- <-- <--	V %	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	<--	V	2 sec 20 time x 98 ms	immediately
	P2009(RH) P2012(LH)	circuit continuity (for short circuit)	diagnostic input - open diagnostic input - short							
	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 -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 -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)									
(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
	P0246			battery voltage after engine starting duty ratio for turbocharged pressure control	> 10.9 => 1 > 25	<-- <-- <--	<-- <-- <--	V secs. %		
	P0244	functional check	intake manifold pressure						1 sec	immediately

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	
(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	
	P2088 (RH) P2092 (LH)	cam sensor signal	starter switch	on	<- <-	<- <-		3000 msec	immediately	
	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 OCV control duty	>= 10.9 no failure >= 99.61	<- <- <-	<- <- <-	V %	2000 msec	
	P0011 (RH) P0021 (LH)	functional check for AVCS system	OCV control actual current	battery voltage components listed on #82 of page 03-E-1 OCV control duty	>= 10.9 no failure < 0.39	<- <- <-	<- <- <-	V %	2000 msec	
	P0016 (Bank1) P0018 (Bank2)	vtd > 0 $\Sigma vtd_n $	R bank L bank	battery voltage components listed on #82 of page 03-E-1 engine speed coolant temperature AVCS	>= 10.9 no failure >= 1300 > 60 operating < 1.07 > 0 > 3000	<- <- <- <- <- <-	<- <- <- <- <- <-	V rpm deg C °CA °CA msec	30000 msec	two driving cycles
		vtd < 0 $\Sigma vtd_n $	R bank L bank	target position change during 64msec. AVCS target position all secondary parameters to be in enable conditions						
		where, vtd = target position- actual position								
	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)	battery voltage components listed on #83 of page 03-E-1 starter switch engine	>= 10.9 no failure off run	<- <- <- <-	<- <- <- <-	V	1 sec	immediately
		or the data from ECU does not be updated (LEGACY) the data from AT does not be updated (FORESTER, IMPREZA)								
(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 Duration to satisfy "nefbgd – ne" Duration to satisfy "Ignition timing retard"	atmospheric pressure battery voltage 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	> 75.06029 > 10.9 no failure run <= 1.2428 < 5 = 14	<- <- <- <- <- <-	<- <- <- <- <- <-	KPa V mph sec	14 sec	two driving cycles

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	FORESTER	Enable Conditions	Legacy & Outback	Time Required	MIL Illum.	
(201) Throttle actuator control	P0638	functional check	motor control Duty	ignition switch motor supply voltage motor relay CPU communication previous diagnosis result engine speed	on =>6.2 on no failure no failure <500	<-- <-- <-- <-- <-- <--	<-- <-- <-- <-- <-- <--	5000 msec	immediately	
				ignition switch motor supply voltage motor relay CPU communication previous diagnosis result engine speed	on =>6.2 on no failure no failure =>500	<-- <-- <-- <-- <-- <--	<-- <-- <-- <-- <-- <--	2 sec		
				target throttle position -	ignition switch motor relay previous diagnosis result engine speed battery voltage throttle position sensor 1 motor supply voltage throttle position sensor 1 circuit diagnosis throttle position sensor 2 circuit diagnosis throttle position sensor rationality diagnosis	on on no failure =>500 =>6.2 =>target throttle position =>6.2 complete complete complete	<-- <-- <-- <-- <-- <-- <-- <-- <-- <--	see table 21-2 table 21-2		
					ignition switch motor relay previous diagnosis result motor supply voltage engine speed battery voltage throttle position sensor 1 throttle position sensor 1 circuit diagnosis throttle position sensor 2 circuit diagnosis throttle position sensor rationality diagnosis	on on no failure =>6.2 =>500 =>6.2 <target throttle position complete complete complete	<-- <-- <-- <-- <-- <-- <-- <-- <-- <--	throttle position sensor1 (deg) time msecs. 5.5 1000 9.0 400 13.0 300 22.0 250		
					ignition switch motor relay previous diagnosis result motor supply voltage engine speed battery voltage throttle position sensor 1 throttle position sensor 1 circuit diagnosis throttle position sensor 2 circuit diagnosis throttle position sensor rationality diagnosis	on on no failure =>6.2 =>500 =>6.2 <target throttle position complete complete complete	<-- <-- <-- <-- <-- <-- <-- <-- <-- <--	1000 msec		
					ignition switch motor relay previous diagnosis result motor supply voltage engine speed battery voltage throttle position sensor 1 throttle position sensor 1 circuit diagnosis throttle position sensor 2 circuit diagnosis throttle position sensor rationality diagnosis	on on no failure =>6.2 <500 =>6.2 complete complete complete	<-- <-- <-- <-- 300 <-- <-- <-- <--	5000 msec		
					ignition switch motor relay previous diagnosis result motor supply voltage engine speed battery voltage throttle position sensor 1 throttle position sensor 1 circuit diagnosis throttle position sensor 2 circuit diagnosis throttle position sensor rationality diagnosis	on on no failure =>6.2 =>500 =>6.2 off =>6 no failure	<-- <-- <-- <-- 300 <-- <-- <-- <--	400 msec		
				P2101	malfunction flag from motor operation IC	ignition switch motor relay CPU communication previous diagnosis result battery voltage motor supply voltage	on on no failure no failure =>6.2 =>6.2	<-- <-- <-- <-- <-- <--	600 msec	immediately
					motor supply voltage	motor relay battery voltage CPU communication previous diagnosis result	on =>11 no failure no failure	<-- <-- <-- <--	400 msec	
				P2102	motor supply voltage	motor relay battery voltage CPU communication previous diagnosis result	off =>6 no failure	<-- <-- <-- <--	600 msec	
				P2103	motor supply voltage	motor relay battery voltage CPU communication	<--	<-- <-- <--	600 msec	
(203) Throttle return spring	P1160	functional check	throttle position sensor 1 at diagnosis start - throttle position sensor 1	ignition switch the time after ignition switch off CPU communication throttle position sensor 1 circuit diagnosis throttle position sensor 2 circuit diagnosis throttle position sensor rationality diagnosis motor supply voltage battery voltage target throttle position at diagnosis start - throttle position sensor 1 at diagnosis start	off =>992 no failure complete complete complete =>6 =>6 <2	<-- <-- <-- <-- <-- <-- <-- <-- <-- <--	<-- <-- <-- <-- <-- <-- <-- <-- <-- <--	600 msec	immediately	
(204) Throttle position sensor minimum stop	P2109	rationality check	minimum stop position	battery voltage previous diagnosis result	on =>6 no failure	<-- <--	<-- <--	8 msec	immediately	
			throttle position at ignition switch off to on - throttle minimum stop position	battery voltage previous diagnosis result	on =>6 no failure	<-- <--	<-- <--	80 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 (14)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	FORESTER	Enable Conditions		Time Required	MIL Illum.
						Impreza	Legacy & Outback		
(205) Throttle position sensor	P0122 (sensor1) P0222 (sensor2)	circuit continuity	output voltage (sensor2)	ignition switch motor supply voltage previous diagnosis result	on no failure	<-- <-- <--	<-- <-- <--	24 msec 24 msec	immediately
	P0123 (sensor1) P0223 (sensor2)			(sensor1) (sensor2)				24 msec 24 msec	
	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 no failure complete complete	<-- <-- <-- <--	<-- <-- <-- <--	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	<-- <-- <--	<-- <-- <--	100 msec 100 msec	immediately
	P2123 (sensor1) P2128 (sensor2)			(sensor1) (sensor2)				32 msec 100 msec	
	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 complete complete	<-- <-- <-- <--	<-- <-- <-- <--	116 msec	

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	FORESTER	Enable Conditions			Time Required	MIL Illum.				
						Impreza	WRX							
(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	>=6 on no failure <-- V msec	>=6 on no failure <-- V msec	<-- <-- <-- <-- <-- <-- <-- <-- <--	V msec	600 msec	immediately				
						>=200 off <-- V msec	<-- <-- <-- <-- <-- <-- <-- <-- <--		400 msec					
						>=200 on no failure <-- V msec	<-- <-- <-- <-- <-- <-- <-- <-- <--		350 msec					
		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	>=6 on no failure <-- V msec	>=6 on no failure <-- V msec	<-- <-- <-- <-- <-- <-- <-- <-- <--	V msec	Forester, I moreza 750 msec 830					
						>=200 off <-- V msec	<-- <-- <-- <-- <-- <-- <-- <-- <--		Forester, I moreza 550 msec 720					
						>=200 on no failure <-- V msec	<-- <-- <-- <-- <-- <-- <-- <-- <--		Forester, I moreza 400 msec 610					
		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	>=6 on no failure <-- V msec	>=200 on no failure <-- V msec	<-- <-- <-- <-- <-- <-- <-- <-- <--	V msec	Forester, I moreza 300 msec 415					
						>=200 off <-- V msec	<-- <-- <-- <-- <-- <-- <-- <-- <--		250 msec					
		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	>=6 on no failure OFF <-- V msec	>=6 on no failure OFF <-- V msec	<-- <-- <-- <-- <-- <-- <-- <-- <--	V msec	200 msec	immediately				
						>=200 on no failure <-- V msec	<-- <-- <-- <-- <-- <-- <-- <-- <--		200 msec					
		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 Map24 <table border="1"><tr><td>battery voltage (V)</td><td>TAAD (deg.)</td></tr><tr><td>7.5</td><td>27.5</td></tr><tr><td>8.0</td><td>31</td></tr></table>	battery voltage (V)	TAAD (deg.)	7.5	27.5	8.0	31	>=6 on no failure <-- V deg	>=6 on no failure <-- V deg	<-- <-- <-- <-- <-- <-- <-- <-- <--	V deg
battery voltage (V)	TAAD (deg.)													
7.5	27.5													
8.0	31													
>=6 on no failure <-- V deg	<-- <-- <-- <-- <-- <-- <-- <-- <--	24 msec												
>=6 on no failure <-- V deg	<-- <-- <-- <-- <-- <-- <-- <-- <--	24 msec												
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 on on on no available no failure no failure	>=6.2 on on on no available no failure no failure	<-- <-- <-- <-- <-- <-- <-- <-- <--	V	250 msec	immediately						
rationality check (brake switch circuit)	brake switch of main CPU brake switch of sub CPU	ignition switch battery voltage previous diagnosis result CPU communication	>=10.9 on no failure no failure	>=10.9 on no failure no failure	<-- <-- <-- <-- <-- <-- <-- <-- <--	V	200 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 (16)

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	FORESTER	Enable Conditions			Time Required	MIL Illum.
						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	<-- <--	<-- <--	<-- msec	240 msec 40 msec * 6 time	
		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	<-- <--	<-- <--	<-- msec	240 msec 40 msec * 6 time	
		functional check (software monitor check)	software monitor error	CPU communication the time after sub CPU reset	no failure >= 200	<-- <--	<-- <--	<-- msec	248 msec	
	(208)RAM in ECM	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	<-- <-- <--	<-- <-- <--	<-- msec		
(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	<-- <-- <-- <--	<-- <-- <-- <--	<-- 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 simultaneous signals	shifted vehicle speed engine speed engine speed signal	"N" to "3" >= 60 km/h > 3000 rpm not failure	3.0 secs.	two driving cycles
(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 P0732 P0733 P0734	functional check	GR/(1st gear ratio) GR/(2nd gear ratio) GR/(3rd gear ratio) GR/(4th gear ratio) where, GR = (turbine shaft speed) / (output shaft speed)	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
(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 drain level of FET for solenoid valve	on duty ratio for duty solenoid valve on duty ratio for duty solenoid valve	= 5 % = 0 %	200 msec. 200 msec.	immediately
(310) AT line pressure linear solenoid	P0748	functional check	cur_mon cur_mon or cur_tgt - cur_mon where, cur_mon=monitor current for solenoid cur_tgt=target current for solenoid	cur_tgt cur_tgt	= 100 mA = 100 mA	0.10 secs. 0.06secs.	immediately
(311) Low clutch duty solenoid	P0753	functional check	drain level of FET for solenoid valve is not change in one duty cycle drain level of FET for solenoid valve	on duty ratio for duty solenoid valve on duty ratio for duty solenoid valve	= 5 % = 0 %	200 msec. 200 msec.	immediately
(312) 2-4th brake duty solenoid	P0758	functional check	drain level of FET for solenoid valve is not change in one duty cycle drain level of FET for solenoid valve	on duty ratio for duty solenoid valve on duty ratio for duty solenoid valve	= 5 % = 0 %	200 msec. 200 msec.	immediately
(313) High clutch duty solenoid	P0763	functional check	drain level of FET for solenoid valve is not change in one duty cycle drain level of FET for solenoid valve	on duty ratio for duty solenoid valve on duty ratio for duty solenoid valve	= 5 % = 0 %	200 msec. 200 msec.	immediately
(314) Low&Reverse brake duty solenoid	P0768	functional check	drain level of FET for solenoid valve is not change in one duty cycle drain level of FET for solenoid valve	on duty ratio for duty solenoid valve on duty ratio for duty solenoid valve	= 5 % = 0 %	200 msec. 200 msec.	immediately
(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 msec.	immediately

Component/ System	Fault Code	Monitor Strategy Description/Method	Malfunction Criteria	Secondary Parameters	Enable Conditions FORESTER	ible Conditions		Time Required	MIL Illum.	
						Impreza	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	<--	---	msec		
	P2441	Control valve closed stick (Bank1)	accumulated pulsation value when RH comb.valve is closing	after fuel shut-off	>= 0	<--	---			
	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 (dsaicflopr)	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 (dsaicflop)							
	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	g/s rpm msec		
	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			
	P0411	secondary air flow increase unusual	<Monitoring for excessive flow> flow when RH comb. valve is closing (dsaicflestafvr) or flow when LH comb. valve is closing (dsaicflestafvl) dsaicflp0rlvb – dsaicflp0rvb dsaicflp0rlvb – dsaicflp0lvb							

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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 msec msec 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	<-- V	2500 msec 2500 msec	immediately	
(98) Secondary Air Pump relay	P0418 P1418	Circuit Continuity	drain voltage of FET & signal from ECM for relays drain voltage of FET & signal from ECM for relays	ignition switch battery voltage Secondary Air Pump relay "low" no failure	>= on 10.9	<-- <-- <-- V	<-- V	2500 msec 2500 msec	immediately	
(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	<-- <-- <-- <-- <-- <-- V	<-- V	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 ignition switch	>= 10.9 >= 1 on	<-- <-- <-- secs.	<-- secs.	2500 msec	two driving cycles	
	P2420		drain voltage of FET and signal from ECM					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	<-- <-- <-- V	<-- V	3500 msec	two driving cycles	