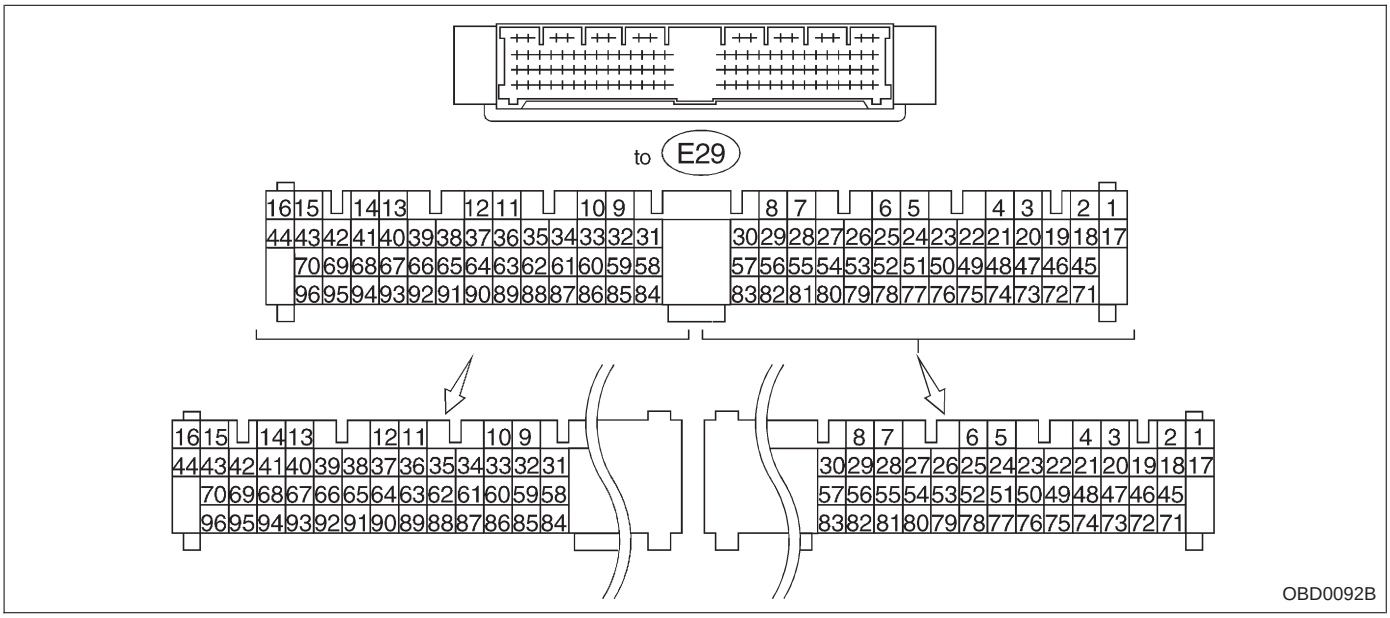
5. Specified Data

1. ENGINE CONTROL MODULE (ECM) I/O SIGNAL



Content		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON (Engine OFF)	Engine ON (Idling)	
Crankshaft position sensor	Signal (+)	E29	8	0	−7 — +7	Sensor output waveform
	Signal (−)	E29	7	0	0	—
	Shield	E29	52	0	0	—
Camshaft position sensor	Signal (+)	E29	6	0	−7 — +7	Sensor output waveform
	Signal (−)	E29	5	0	0	—
	Shield	E29	52	0	0	—
Mass air flow sensor	Signal	E29	26	0 — 0.3	0.8 — 1.2	—
	Shield	E29	54	0	0	—
	GND	E29	25	0	0	—
Throttle position sensor	Signal	E29	24	Fully closed: 0.2 — 1.0 Fully opened: 4.2 — 4.7		—
	Power supply	E29	22	5	5	—
	GND	E29	25	0	0	—
Front oxygen sensor	Signal	E29	28	0	0 — 0.9	—
	Shield	E29	56	0	0	—
Rear oxygen sensor	Signal	E29	27	0	0 — 0.9	—
	Shield	E29	56	0	0	—
Engine coolant temperature sensor		E29	29	1.0 — 1.4	1.0 — 1.4	After warm-up
Vehicle speed sensor 2		E29	57	0 or 5	0 or 5	“5” and “0” are repeatedly displayed when vehicle is driven.
Starter switch		E29	81	0	0	Cranking: 8 to 14
A/C switch		E29	80	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—
Ignition switch		E29	79	10 — 13	13 — 14	—

Content		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON (Engine OFF)	Engine ON (Idling)	
Neutral position switch		E29	78	ON: 0 OFF: 5.0±0.5		Switch is ON when shift is in "N" or "P" position.
Test mode connector		E29	75	5	5	When connected: 0
Knock sensor	Signal	E29	30	2.8	2.8	—
	Shield	E29	56	0	0	—
Back-up power supply		E29	42	10 — 13	13 — 14	Ignition switch "OFF": 10 — 13
Control unit power supply		E29	15	10 — 13	13 — 14	—
			16			
Ignition control	# 1, # 2	E29	14	0	1 — 3.4	—
	# 3, # 4	E29	13	0	1 — 3.4	—
Fuel injector	# 1	E29	2	10 — 13	1 — 14	Waveform
	# 2	E29	1	10 — 13	1 — 14	Waveform
	# 3	E29	18	10 — 13	1 — 14	Waveform
	# 4	E29	17	10 — 13	1 — 14	Waveform
Idle air control solenoid valve	OPEN end	E29	12	—	1 — 13	Waveform
	CLOSE end	E29	11	—	13 — 1	Waveform
Fuel pump relay control		E29	84	ON: 0.5, or less OFF: 10 — 13	0.5, or less	—
A/C relay control		E29	85	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	—
Radiator fan relay 1 control		E29	77	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	—
			88			
Radiator fan relay 2 control		E29	61	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	With A/C vehicles only
Self-shutoff control		E29	86	10 — 13	13 — 14	—
Malfunction indicator lamp		E29	31	—	—	Light "ON": 1, or less Light "OFF": 10 — 14
Engine speed output		E29	33	—	0 — 13, or more	Waveform
Torque control signal		E29	49	5	5	—
Torque control cut signal		E29	36	8	8	—
Mass air flow signal for AT		E29	35	0 — 0.3	0.8 — 1.2	—
Purge control solenoid valve		E29	59	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
Atmospheric pressure sensor		E29	23	3.9 — 4.1	2.0 — 2.3	—
Pressure sources switching solenoid valve		E29	58	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
EGR solenoid valve		E29	60	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
Front oxygen sensor heater signal		E29	44	0 — 1.0	0 — 1.0	—
Rear oxygen sensor heater signal		E29	43	0 — 1.0	0 — 1.0	—
AT diagnosis input signal		E29	48	Less than 1 ↔ More than 4	Less than 1 ↔ More than 4	Waveform
GND (sensors)		E29	25	0	0	—
GND (injectors)		E29	71	0	0	—
			72			
GND (ignition system)		E29	69	0	0	—

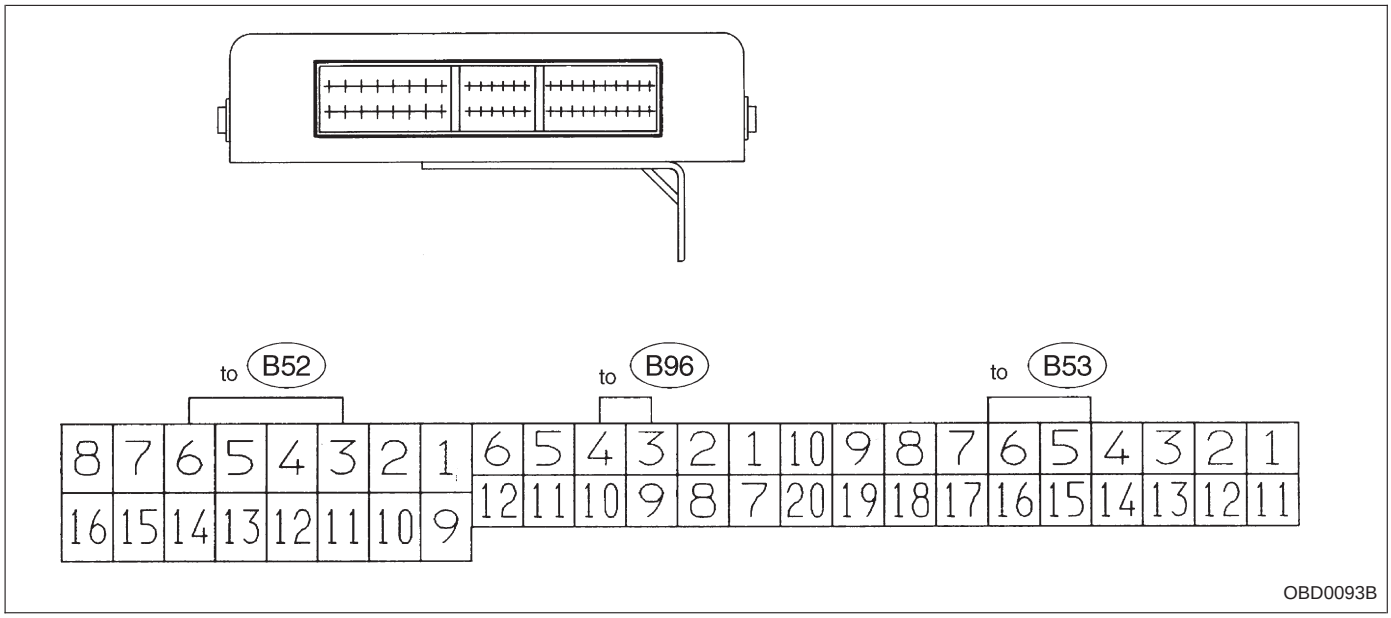
Content	Connector No.	Terminal No.	Signal (V)		Note
			Ignition SW ON (Engine OFF)	Engine ON (Idling)	
GND (power supply)	E29	95	0	0	—
		96			
GND (control systems)	E29	45	0	0	—
		46			
GND (oxygen sensor heater)	E29	70	0	0	—

2. ENGINE CONDITION DATA

Content	Specified data
Mass air flow	1.9 — 3.6 (g/sec): Idling
	7.0 — 14.8 (g/sec): 2,500 rpm racing
Engine load	1.9 — 3.6 (%): Idling
	7.0 — 14.8 (%): 2,500 rpm racing

Measuring condition:
- Gear position is in “N” or “P” position.
- A/C is turned OFF.
- All accessory switches are turned OFF.

3. TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL



Check with ignition switch ON.

Content		Connector No.	Terminal No.	Measuring conditions	Voltage (V)
Back-up power supply		B53	14	Ignition switch OFF	10 — 16
Ignition power supply		B96	6	Ignition switch ON (with engine OFF)	10 — 16
		B52	1		
Inhibitor switch	“P” range switch	B53	9	Selector lever in “P” range	Less than 1
				Selector lever in any other than “P” range	More than 8
	“N” range switch	B53	8	Selector lever in “N” range	Less than 1
				Selector lever in any other than “N” range	More than 8
	“R” range switch	B53	10	Selector lever in “R” range	Less than 1
				Selector lever in any other than “R” range	More than 6
	“D” range switch	B96	1	Selector lever in “D” range	Less than 1
				Selector lever in any other than “D” range	More than 6
	“3” range switch	B96	2	Selector lever in “3” range	Less than 1
				Selector lever in any other than “3” range	More than 6
	“2” range switch	B96	3	Selector lever in “2” range	Less than 1
				Selector lever in any other than “2” range	More than 6
	“1” range switch	B96	4	Selector lever in “1” range	Less than 1
				Selector lever in any other than “1” range	More than 6
Brake switch		B53	7	Brake pedal depressed	More than 10.5
				Brake pedal released	Less than 1
ABS signal		B53	5	ABS switch ON	Less than 1
				ABS switch OFF	More than 6.5
AT diagnostics signal		B52	12	Ignition switch ON (with engine OFF)	Less than 1
				Ignition switch ON (with engine ON)	More than 10
Diagnosis switch		B53	6	Diagnosis connector connected.	Less than 1
				Diagnosis connector disconnected.	More than 6

Content	Connector No.	Terminal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)
Throttle position sensor	B96	8	Throttle fully closed.	0.3 — 0.7	—
			Throttle fully open.	4.3 — 4.9	
Throttle position sensor power supply	B53	19	Ignition switch ON (with engine OFF)	4.8 — 5.3	—
ATF temperature sensor	B96	10	ATF temperature 20°C (68°F)	2.9 — 4.0	2.1 k — 2.9 k
			ATF temperature 80°C (176°F)	1.0 — 1.4	275 — 375
Vehicle speed sensor 1	B96	12	Vehicle stopped.	0	450 — 720
			Vehicle speed at least 20 km/h (12 MPH)	More than 1 (AC range)	
Vehicle speed sensor 2	B53	11	When vehicle is slowly moved at least 2 meters (7ft).	Less than 1 ↔ More than 4	—
Engine speed signal	B96	5	Ignition switch ON (with engine OFF).	More than 10.5	—
			Ignition switch ON (with engine ON).	8 — 11	
Cruise set signal	B53	3	When cruise control is set (SET lamp ON).	Less than 1	—
			When cruise control is not set (SET lamp OFF).	More than 6.5	
Torque control signal	B52	16	Ignition switch ON	4 — 6	—
Torque control cut signal	B53	16	Ignition switch ON	6 — 9	—
Mass air flow signal	B96	9	Engine idling after warm-up	0.5 — 1.2	—
Shift solenoid 1	B52	14	1st or 4th gear	More than 9	20 — 32
			2nd or 3rd gear	Less than 1	
Shift solenoid 2	B52	13	1st or 2nd gear	More than 9	20 — 32
			3rd or 4th gear	Less than 1	
Shift solenoid 3	B52	15	Selector lever in “N” range (with throttle fully closed).	Less than 1	20 — 32
			Selector lever in “D” range (with throttle fully closed).	More than 9	
Duty solenoid A	B52	8	Throttle fully closed (with engine OFF) after warm-up.	1.5 — 4.0	1.5 — 4.5
			Throttle fully open (with engine OFF) after warm-up.	Less than 1	
Dropping resistor	B52	7	Throttle fully closed (with engine OFF) after warm-up.	5 — 14	12 — 18
			Throttle fully open (with engine OFF) after warm-up.	Less than 0.5	
Duty solenoid B	B52	5	When lock up occurs.	More than 8.5	9 — 17
			When lock up is released.	Less than 0.5	
Duty solenoid C	B52	3	Fuse on FWD switch	More than 8.5	9 — 17
			Fuse removed from FWD switch (with throttle fully open and with select lever in 1st gear).	Less than 0.5	
Sensor ground line 1	B96	7	—	0	Less than 1
Sensor ground line 2	B53	20	—	0	Less than 1
System ground line	B53	1	—	0	Less than 1
Power system ground line	B52	10	—	0	Less than 1
FWD switch	B53	2	Fuse removed.	6 — 9.1	—
			Fuse installed.	Less than 1	
Data link signal (Subaru select monitor)	B53	12	—	—	—
		13	—	—	
AT diagnosis signal	B53	11	Ignition switch ON	Less than 1 ↔ More than 4	—