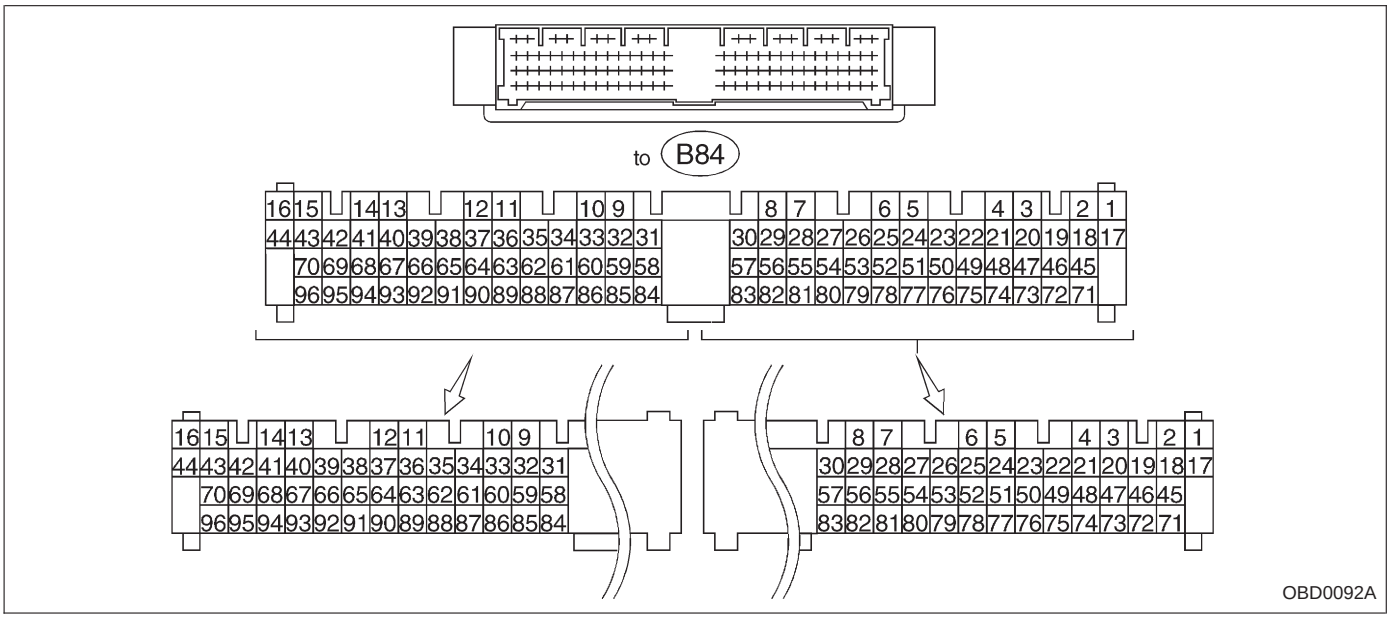
5. Specified Data

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 (+)	B84	8	0	−7 — +7	Sensor output waveform
	Signal (−)	B84	29	0	0	—
	Shield	B84	54	0	0	—
Camshaft position sensor	Signal (+)	B84	7	0	−7 — +7	Sensor output waveform
	Signal (−)	B84	28	0	0	—
	Shield	B84	54	0	0	—
Mass air flow sensor	Signal	B84	5	0 — 0.3	0.8 — 1.2	—
	Shield	B84	57	0	0	—
	GND	B84	53	0	0	—
Throttle position sensor	Signal	B84	6	Fully closed: 0.2 — 1.0 Fully opened: 4.2 — 4.7		—
	Power supply	B84	21	5	5	—
	GND	B84	20	0	0	—
Front oxygen sensor	Signal	B84	23	0	0 — 0.9	—
	Shield	B84	56	0	0	—
Rear oxygen sensor	Signal	B84	24	0	0 — 0.9	—
	Shield	B84	56	0	0	—
Engine coolant temperature sensor		B84	22	1.0 — 1.4	1.0 — 1.4	After warm-up
Vehicle speed sensor 2		B84	83	0 or 5	0 or 5	“5” and “0” are repeatedly displayed when vehicle is driven.
Starter switch		B84	86	0	0	Cranking: 8 to 14
A/C switch		B84	60	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—
Ignition switch		B84	85	10 — 13	13 — 14	—
Neutral position switch (MT)		B84	82	ON: 5.0±0.5 OFF: 0		● On MT model; switch is ON when gear is in neutral position.
Neutral position switch (AT)				ON: 0 OFF: 5.0±0.5		● On AT model; switch is ON when shift is in “N” or “P” position.
Test mode connector		B84	84	5	5	When connected: 0

Content		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON (Engine OFF)	Engine ON (Idling)	
Knock sensor	Signal	B84	3	2.8	2.8	—
	Shield	B84	56	0	0	—
AT/MT identification		B84	81	(AT) 5 (MT) 0	(AT) 5 (MT) 0	When measuring voltage between ECM and body.
Back-up power supply		B84	39	10 — 13	13 — 14	Ignition switch “OFF”: 10 — 13
Control unit power supply		B84	1	10 — 13	13 — 14	—
			2			
Ignition control	# 1, # 2	B84	41	0	1 — 3.4	—
	# 3, # 4	B84	40	0	1 — 3.4	—
Fuel injector	# 1	B84	96	10 — 13	1 — 14	Waveform
	# 2	B84	70	10 — 13	1 — 14	Waveform
	# 3	B84	44	10 — 13	1 — 14	Waveform
	# 4	B84	16	10 — 13	1 — 14	Waveform
Idle air control solenoid valve	OPEN end	B84	14	—	1 — 13	Waveform
	CLOSE end	B84	13	—	13 — 1	Waveform
Fuel pump relay control		B84	32	ON: 0.5, or less OFF: 10 — 13	0.5, or less	—
A/C relay control		B84	31	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	—
Radiator fan relay 1 control		B84	74	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	—
Radiator fan relay 2 control		B84	73	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	With A/C vehicles only
Self-shutoff control		B84	63	10 — 13	13 — 14	—
Malfunction indicator lamp		B84	58	—	—	Light “ON”: 1, or less Light “OFF”: 10 — 14
Engine speed output		B84	64	—	0 — 13, or more	Waveform
Torque control signal		B84	79	5	5	—
Mass air flow signal for AT		B84	47	0 — 0.3	0.8 — 1.2	—
Purge control solenoid valve		B84	72	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
Atmospheric pressure sensor		B84	26	3.9 — 4.1	2.0 — 2.3	—
Pressure sources switching solenoid valve		B84	15	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
EGR solenoid valve		B84	71	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
Front oxygen sensor heater signal		B84	38	0 — 1.0	0 — 1.0	—
Rear oxygen sensor heater signal		B84	37	0 — 1.0	0 — 1.0	—
Fuel temperature sensor		B84	25	2.5 — 3.8	2.5 — 3.8	● 2200 cc AWD except Taiwan spec. vehicles ● Ambient temperature: 25°C (77°F)
Fuel level sensor		B84	27	0.12 — 4.75	0.12 — 4.75	2200 cc AWD except Taiwan model
Fuel tank pressure sensor	Signal	B84	4	2.3 — 2.7	2.3 — 2.7	● 2200 cc AWD except Taiwan spec. vehicles ● The value obtained after the fuel filler cap was removed once and recapped.
	Power supply	B84	21	5	5	—
	GND	B84	20	0	0	—
Fuel tank pressure control solenoid valve		B84	10	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	2200 cc AWD except Taiwan spec. vehicles
Vent control solenoid valve		B84	35	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	2200 cc AWD except Taiwan spec. vehicles
TCS signal		B84	61	0 — 7	0 — 7	Waveform

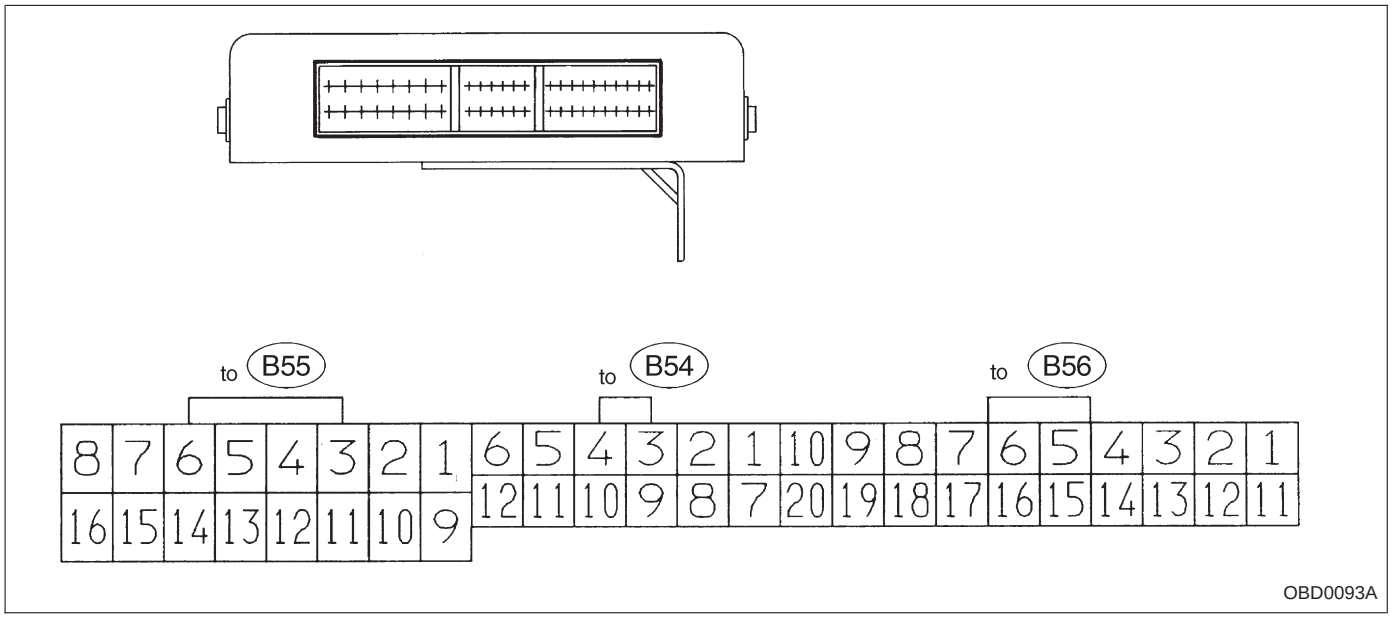
Content	Connector No.	Terminal No.	Signal (V)		Note
			Ignition SW ON (Engine OFF)	Engine ON (Idling)	
AT diagnosis input signal	B84	80	Less than 1 ↔ More than 4	Less than 1 ↔ More than 4	Waveform
GND (sensors)	B84	20	0	0	—
GND (injectors)	B84	69	0	0	—
		95			
GND (ignition system)	B84	94	0	0	—
GND (power supply)	B84	19	0	0	—
		46			
GND (control systems)	B84	17	0	0	—
		18			
GND (oxygen sensor heater)	B84	42	0	0	—

2. ENGINE CONDITION DATA

Content	Model	Specified data
Mass air flow	2200 cc	1.7 — 3.3 (g/sec): Idling
		7.1 — 14.2 (g/sec): 2,500 rpm racing
	2500 cc	2.2 — 4.2 (g/sec): Idling
		8.6 — 14.5 (g/sec): 2,500 rpm racing
Engine load	2200 cc	1.6 — 2.9 (%): Idling
		6.4 — 12.8 (%): 2,500 rpm racing
	2500 cc	1.9 — 3.5 (%): Idling
		7.2 — 12.1 (%): 2,500 rpm racing

Measuring condition:
- After warm-up the engine.
- 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		B56	14	Ignition switch OFF	10 — 16
Ignition power supply		B54	6	Ignition switch ON (with engine OFF)	10 — 16
		B55	1		
Inhibitor switch	“P” range switch	B56	9	Selector lever in “P” range	Less than 1
				Selector lever in any other than “P” range	More than 8
	“N” range switch	B56	8	Selector lever in “N” range	Less than 1
				Selector lever in any other than “N” range	More than 8
	“R” range switch	B56	10	Selector lever in “R” range	Less than 1
				Selector lever in any other than “R” range	More than 6
	“D” range switch	B54	1	Selector lever in “D” range	Less than 1
				Selector lever in any other than “D” range	More than 6
	“3” range switch	B54	2	Selector lever in “3” range	Less than 1
				Selector lever in any other than “3” range	More than 6
	“2” range switch	B54	3	Selector lever in “2” range	Less than 1
				Selector lever in any other than “2” range	More than 6
	“1” range switch	B54	4	Selector lever in “1” range	Less than 1
				Selector lever in any other than “1” range	More than 6
Brake switch		B56	7	Brake pedal depressed	More than 10.5
				Brake pedal released	Less than 1
ABS signal		B56	5	ABS switch ON	Less than 1
				ABS switch OFF	More than 6.5
AT diagnostics signal		B55	12	Ignition switch ON (with engine OFF)	Less than 1
				Ignition switch ON (with engine ON)	More than 10
Diagnosis switch		B56	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	B54	8	Throttle fully closed.	0.3 — 0.7	—
			Throttle fully open.	4.3 — 4.9	
Throttle position sensor power supply	B56	19	Ignition switch ON (with engine OFF)	4.8 — 5.3	—
ATF temperature sensor	B54	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	B54	12	Vehicle stopped.	0	450 — 720
			Vehicle speed at least 20 km/h (12 MPH)	More than 1 (AC range)	
Vehicle speed sensor 2	B56	11	When vehicle is slowly moved at least 2 meters (7ft).	Less than 1↔More than 9	—
Engine speed signal	B54	5	Ignition switch ON (with engine OFF).	More than 10.5	—
			Ignition switch ON (with engine ON).	8 — 11	
Cruise set signal	B56	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	B55	16	Ignition switch ON	4 — 6	—
Mass air flow signal	B54	9	Engine idling after warm-up	0.5 — 1.2	—
Shift solenoid 1	B55	14	1st or 4th gear	More than 9	20 — 32
			2nd or 3rd gear	Less than 1	
Shift solenoid 2	B55	13	1st or 2nd gear	More than 9	20 — 32
			3rd or 4th gear	Less than 1	
Shift solenoid 3	B55	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	B55	8	Throttle fully closed (with engine OFF) after warm-up.	2.0 — 4.0	2.0 — 4.5
			Throttle fully open (with engine OFF) after warm-up.	Less than 1	
Dropping resistor	B55	7	Throttle fully closed (with engine OFF) after warm-up.	More than 8.5	12 — 18
			Throttle fully open (with engine OFF) after warm-up.	Less than 1	
Duty solenoid B	B55	5	When lock up occurs.	More than 8.5	9 — 17
			When lock up is released.	Less than 0.5	
Duty solenoid C (AWD model only)	B55	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	B54	7	—	0	Less than 1
Sensor ground line 2	B56	20	—	0	Less than 1
System ground line	B56	1	—	0	Less than 1
Power system ground line	B55	10	—	0	Less than 1
FWD switch (AWD model only)	B56	2	Fuse removed.	6 — 9.1	—
			Fuse installed.	Less than 1	
Data link signal (Subaru select monitor)	B56	12	—	—	—
		13	—	—	
AT diagnosis signal	B56	11	Ignition switch ON	Less than 1 ↔ More than 4	—