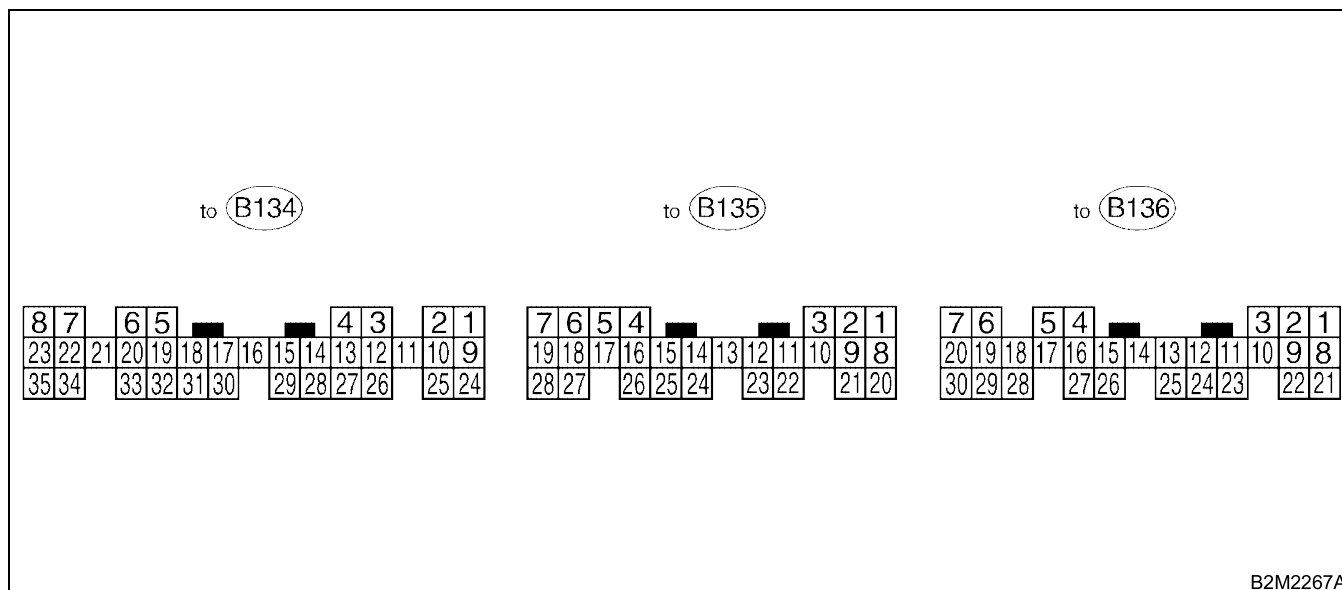


ENGINE CONTROL MODULE (ECM) I/O SIGNAL

ENGINE (DIAGNOSTICS)

5. Engine Control Module (ECM) I/O Signal

A: ELECTRICAL SPECIFICATION



Content		Connector No.	Terminal No.		Signal (V)		Note
					Ignition SW ON (Engine OFF)	Engine ON (Idling)	
Crankshaft position sensor	Signal (+)	B135	2*	1	0	-7 — +7	Sensor output waveform
	Signal (-)	B135	9		0	0	—
	Shield	B135	10		0	0	—
Camshaft position sensor	Signal (+)	B135	1*	2	0	-7 — +7	Sensor output waveform
	Signal (-)	B135	8		0	0	—
	Shield	B135	10		0	0	—
Throttle position sensor	Signal	B136	17		Fully closed: 0.2 — 1.0 Fully opened: 4.2 — 4.7		—
	Power supply	B136	15		5	5	—
	GND (sensor)	B136	16		0	0	—
Rear oxygen sensor	Signal	B136	18		0	0 — 0.9	—
	Shield	B136	24		0	0	—
	GND (sensor)	B136	16		0	0	—
Front oxygen (A/F) sensor heater	Signal 1	B134	22		0 — 1.0	0 — 1.0	—
	Signal 2	B134	23		0 — 1.0	0 — 1.0	—
Rear oxygen sensor heater signal		B134	21		0 — 1.0	0 — 1.0	—
Engine coolant temperature sensor	Signal	B136	14		1.0 — 1.4	1.0 — 1.4	After warm-up the engine.
	GND (sensor)	B136	16		0	0	After warm-up the engine.
Vehicle speed signal		B135	24		0 or 5	0 or 5	"5" and "0" are repeatedly displayed when vehicle is driven.
Starter switch		B135	28		0	0	Cranking: 8 — 14

ENGINE CONTROL MODULE (ECM) I/O SIGNAL

ENGINE (DIAGNOSTICS)

Content	Connector No.	Terminal No.	Signal (V)		Note	
			Ignition SW ON (Engine OFF)	Engine ON (Idling)		
A/C switch	B135	27	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—	
Ignition switch	B135	7	10 — 13	13 — 14	—	
Neutral position switch	MT	B135	26	ON: 12±0.5 OFF: 0		On MT vehicle; Switch is ON when gear is in neutral position.
	AT	B135	26	ON: 0 OFF: 12±0.5		ON AT vehicle; Switch is ON when shift is in "N" or "P" position.
Test mode connector	B135	14	5	5	When connected: 0	
Knock sensor	Signal	B136	4	2.8	2.8	—
	Shield	B136	25	0	0	—
Back-up power supply	B136	9	10 — 13	13 — 14	Ignition switch "OFF": 10 — 13	
Control unit power supply	B136	1	10 — 13	13 — 14	—	
	B136	2	10 — 13	13 — 14	—	
Sensor power supply	B136	15	5	5	—	
Line end check 1	B135	20	0	0	—	
Ignition control	#1, #2	B134	25	0	1 — 3.4	Waveform
	#3, #4	B134	26	0	1 — 3.4	Waveform
Fuel injector	#1	B134	4	10 — 13	1 — 14	Waveform
	#2	B134	13	10 — 13	1 — 14	Waveform
	#3	B134	14	10 — 13	1 — 14	Waveform
	#4	B134	15	10 — 13	1 — 14	Waveform
Idle air control solenoid valve	Signal 1	B134	5	—	1 — 13	Waveform
	Signal 2	B134	6	—	1 — 13	Waveform
	Signal 3	B134	19	—	1 — 13	Waveform
	Signal 4	B134	20	—	1 — 13	Waveform
	Power supply	B136	2	10 — 13	13 — 14	—
Fuel pump relay control	B134	29*	16	ON: 0.5, or less OFF: 10 — 13	0.5, or less	—
A/C relay control	B134	17		ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	—
Radiator fan relay 1 control	B134	3		ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	—
Radiator fan relay 2 control	B134	12		ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	With A/C vehicles only
Malfunction indicator lamp	B134	11		—	—	Light "ON": 1, or less Light "OFF": 10 — 14
Engine speed output	B134	30		—	0 — 13, or more	Waveform
Torque control 1 signal	B135	16		5	5	—
Torque control 2 signal	B135	17		5	5	—
Torque control cut signal	B134	31		8	8	—
Purge control solenoid valve	B134	2		ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
Atmospheric pressure sensor	Signal	B136	29	3.9 — 4.1	2.0 — 2.3	—
	Power supply	B136	15	5	5	
	GND (sensor)	B136	16	0	0	
Fuel level sensor	B136	27		0.12 — 4.75	0.12 — 4.75	—

*: with immobilizer

ENGINE CONTROL MODULE (ECM) I/O SIGNAL

ENGINE (DIAGNOSTICS)

Content	Con- nector No.	Terminal No.	Signal (V)		Note
			Ignition SW ON (Engine OFF)	Engine ON (Idling)	
AT diagnosis input sig- nal	B135	4	Less than 1 ↔ More than 4	Less than 1 ↔ More than 4	Waveform
Small light switch	B136	3	ON: 0 OFF: 10 — 13	ON: 0 OFF: 13 — 14	—
Blower fan switch	B136	30	ON: 0 OFF: 10 — 13	ON: 0 OFF: 13 — 14	—
Rear defogger switch	B135	21	ON: 0 OFF: 10 — 13	ON: 0 OFF: 13 — 14	—
Front oxygen (A/F) sen- sor signal 1	B136	19	2.8 — 3.2	2.8 — 3.2	—
Front oxygen (A/F) sen- sor signal 2	B136	6	2.4 — 2.7	2.4 — 2.7	—
Front oxygen (A/F) sen- sor signal 3	B136	7	0.2 — 4.9	0.2 — 4.9	—
Front oxygen (A/F) sen- sor signal 4	B136	20	0.2 — 4.9	0.2 — 4.9	—
Pressure sensor	B136	5	2.4 — 4.8	0.4 — 1.8	—
Intake air temperature sensor	B136	13	2.3 — 2.5	1.4 — 1.6	—
SSM/GST communica- tion line	B135	3	Less than 1 ↔ More than 4	Less than 1 ↔ More than 4	—
GND (sensors)	B136	16	0	0	—
GND (injectors)	B134	7	0	0	—
GND (ignition system)	B134	27	0	0	—
GND (power supply)	B134	8	0	0	—
GND (control systems)	B136	21	0	0	—
	B136	22	0	0	—
GND (oxygen sensor heater 1)	B134	35	0	0	—
GND (oxygen sensor heater 2)	B134	34	0	0	—