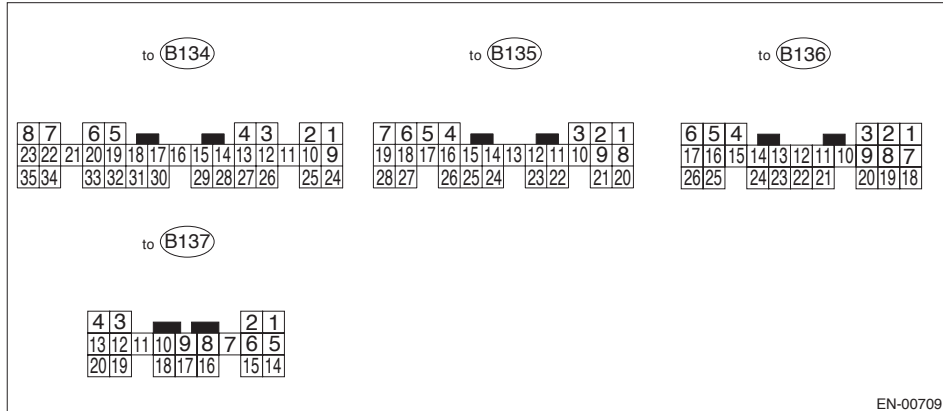


ENGINE CONTROL MODULE (ECM) I/O SIGNAL
ENGINE (DIAGNOSTICS)

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	7	0	-7 — +7	Sensor output waveform
	Signal (-)	B135	17	0	0	—
	Shield	B135	28	0	0	—
Camshaft position sensor	Signal (+)	B135	6	0	-7 — +7	Sensor output waveform
	Signal (-)	B135	18	0	0	—
	Shield	B135	20	0	0	—
Throttle position sensor	Signal	B135	13	Fully closed: 0.2 — 1.0 Fully opened: 4.2 — 4.7		—
	Power supply	B135	3	5	5	—
	GND (sensor)	B135	19	0	0	—
Rear oxygen sensor	Signal	B135	14	0	0 — 0.9	—
	Shield	B137	15	0	0	—
	GND (sensor)	B135	19	0	0	—
Front oxygen (A/F) sensor heater	Signal 1	B136	6	0 — 1.0	0 — 1.0	—
	Signal 2	B136	17	0 — 1.0	0 — 1.0	—
Rear oxygen sensor heater signal		B136	4	0 — 1.0	0 — 1.0	—
Engine coolant temperature sensor	Signal	B135	12	1.0 — 1.4	1.0 — 1.4	After warm-up the engine.
	GND (sensor)	B135	19	0	0	After warm-up the engine.
Vehicle speed signal	B137	10	0 or 5	0 or 5	"5" and "0" are repeatedly displayed when vehicle is driven.	
Starter switch	B136	20	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	B136	11	ON: 10 – 13 OFF: 0	ON: 13 – 14 OFF: 0	—	
Ignition switch	B136	10	10 – 13	13 – 14	—	
Neutral position switch (MT)	B136	21	ON: 12±0.5 OFF: 0		Switch is ON when gear is in neutral position.	
Neutral position switch (AT)	B136	21	ON: 0 OFF: 12±0.5		Switch is ON when shift is in "N" or "P" position.	
Test mode connector	B136	3	5	5	When connected: 0	
Knock sensor	Signal	B135	16	2.8	—	
	Shield	B135	27	0	—	
Back-up power supply	B135	9	10 – 13	13 – 14	Ignition switch "OFF": 10 – 13	
Control unit power supply	B135	1	10 – 13	13 – 14	—	
	B135	2	10 – 13	13 – 14	—	
Sensor power supply	B135	3	5	5	—	
Ignition control	#1, #2	B134	33	0	1 – 3.4	Waveform
	#3, #4	B134	32	0	1 – 3.4	Waveform
Fuel injector	#1	B134	34	10 – 13	1 – 14	Waveform
	#2	B134	23	10 – 13	1 – 14	Waveform
	#3	B134	22	10 – 13	1 – 14	Waveform
	#4	B134	8	10 – 13	1 – 14	Waveform
Idle air control solenoid valve	Signal 1	B134	20	—	1 – 13	Waveform
	Signal 2	B134	6	—	1 – 13	Waveform
	Signal 3	B134	5	—	1 – 13	Waveform
	Signal 4	B134	19	—	1 – 13	Waveform
Fuel pump relay control	B134	11	ON: 0.5, or less OFF: 10 – 13	0.5, or less	—	
A/C relay control	B134	9	ON: 0.5, or less OFF: 10 – 13	ON: 0.5, or less OFF: 13 – 14	—	
Radiator fan relay 1 control	B134	14	ON: 0.5, or less OFF: 10 – 13	ON: 0.5, or less OFF: 13 – 14	—	
Radiator fan relay 2 control	B134	13	ON: 0.5, or less OFF: 10 – 13	ON: 0.5, or less OFF: 13 – 14	With A/C vehicles only	
Self-shutoff control	B136	12	10 – 13	13 – 14	—	
Malfunction indicator lamp	B134	28	—	—	Light "ON": 1, or less Light "OFF": 10 – 14	
Engine speed output	B134	10	—	0 – 13, or more	Waveform	
Torque control 1 signal	B136	1	5	5	—	
Torque control 2 signal	B136	18	5	5	—	
Torque control cut signal	B136	15	8	8	—	
Purge control solenoid valve	B134	29	ON: 1, or less OFF: 10 – 13	ON: 1, or less OFF: 13 – 14	—	
Fuel temperature sensor	B137	5	2.5 – 3.8	2.5 – 3.8	Ambient temperature: 25°C (75°F)	
Fuel level sensor	B135	25	0.12 – 4.75	0.12 – 4.75	—	
Fuel tank pressure sensor	Signal	B135	26	2.3 – 2.7	2.3 – 2.7	The value obtained after the fuel filler cap was removed once and recapped.
	Power supply	B135	3	5	5	—
	GND (sensor)	B135	19	0	0	—

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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)		
Fuel tank sensor control solenoid valve	B134	4	ON: 1, or less OFF: 10 – 13	ON: 1, or less OFF: 13 – 14	—	
Drain valve	B134	3	ON: 1, or less OFF: 10 – 13	ON: 1, or less OFF: 13 – 14	—	
EGR solenoid valve	Signal 1	B134	18	0 or 10 – 13	0 or 10 – 13	—
	Signal 2	B134	17	0 or 10 – 13	0 or 10 – 13	—
	Signal 3	B134	16	0 or 10 – 13	0 or 10 – 13	—
	Signal 4	B134	15	0 or 10 – 13	0 or 10 – 13	—
AT diagnosis input signal	B137	19	Less than 1 ↔ More than 4	Less than 1 ↔ More than 4	Waveform	
Small light switch	B137	20	ON: 0 OFF: 10 – 13	ON: 0 OFF: 13 – 14	—	
Blower fan switch	B137	13	ON: 0 OFF: 10 – 13	ON: 0 OFF: 13 – 14	—	
Rear defogger switch	B137	4	ON: 0 OFF: 10 – 13	ON: 0 OFF: 13 – 14	—	
Front oxygen (A/F) sensor signal 1	B136	13	—	2.05 – 2.25	—	
Front oxygen (A/F) sensor signal 2	B136	22	—	1.75 – 1.95	—	
Pressure sensor	B135	15	4.0 – 4.8	1.1 – 1.9	—	
Intake air temperature sensor	B137	6	3.15 – 3.33	3.15 – 3.33	Intake air temperature: 25°C (75°F)	
SSM/GST communication line	B137	16	Less than 1 ↔ More than 4	Less than 1 ↔ More than 4	—	
GND (sensors)	B135	19	0	0	—	
GND (injectors)	B134	35	0	0	—	
GND (ignition system)	B136	26	0	0	—	
GND (power supply)	B134	7	0	0	—	
GND (control systems)	B137	14	0	0	—	
	B135	21	0	0	—	
GND (oxygen sensor heater 1)	B136	5	0	0	—	
GND (oxygen sensor heater 2)	B136	16	0	0	—	