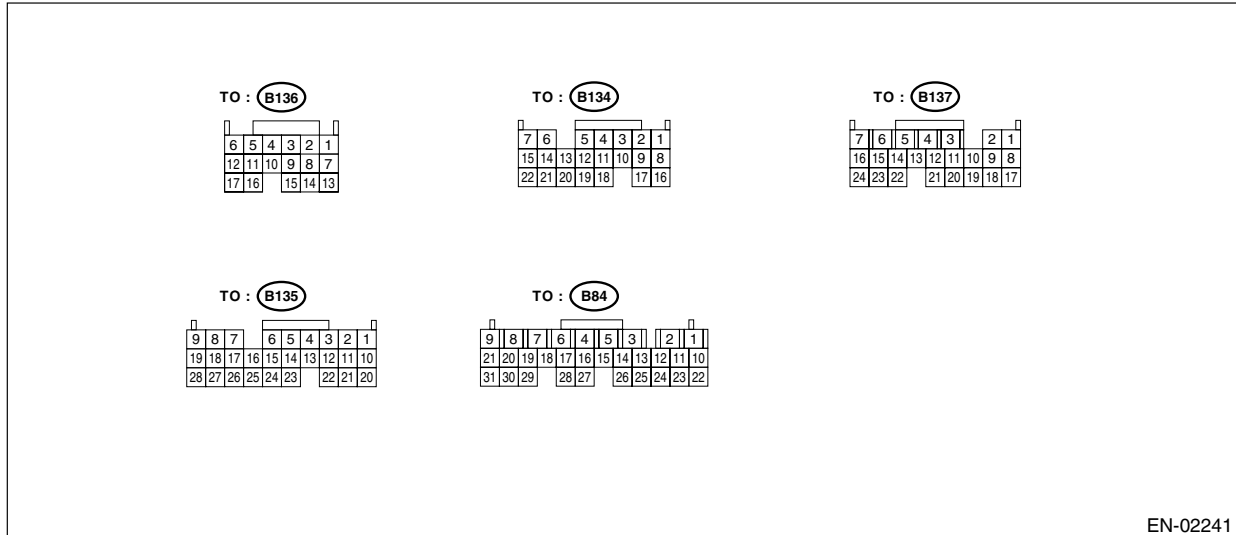


ENGINE CONTROL MODULE (ECM) I/O SIGNAL

ENGINE (DIAGNOSTICS)

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

A: ELECTRICAL SPECIFICATION



EN-02241

Content	Con- nector No.	Terminal No.	Signal (V)		Note	
			Ignition SW ON (Engine OFF)	Engine ON (Idling)		
Crank- shaft posi- tion sensor	Signal (+)	B135	1	0	-7 to +7	Sensor output waveform
	Signal (-)	B135	10	0	0	—
	Shield	B135	20	0	0	—
Camshaft position sensor	Signal (+)	B135	2	0	-7 to +7	Sensor output waveform
	Signal (-)	B135	11	0	0	—
	Shield	B135	20	0	0	—
Electric throttle	Main	B136	3	0.64 — 0.72 Fully opened: 3.96	0.64 — 0.72 (After engine warm- up)	Fully closed: 0.6 Fully opened: 3.96
	Sub	B136	9	1.51 — 1.58 Fully opened: 4.17	1.51 — 1.58 (After engine warm- up)	Fully closed: 1.48 Fully opened: 4.17
	Power supply	B135	9	5	5	—
	GND	B135	9	0	0	—
Electric throttle motor (+)	B134	15	Duty waveform	Duty waveform	Driving frequency: 500Hz	
Electric throttle motor (-)	B134	22	Duty waveform	Duty waveform	Driving frequency: 500Hz	
Electric throttle motor power supply	B134	1	10 — 13	13 — 14	—	
Electric throttle motor relay	B137	24	ON: 010 OFF: — 13	ON: 0 OFF: 13 — 14	When ignition switch is ON: ON	
Accelerator position sensor	Main	B136	2	Fully closed: 1 Fully opened: 3.5	Fully closed: 1 Fully opened: 3.5	—
	Sub	B136	8	Fully closed: 1 Fully opened: 3.5	Fully closed: 1 Fully opened: 3.5	—
	Power supply	B135	8	5	5	—
	GND	B135	18	0	0	—

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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)	
Front oxy- gen (A/F) sensor RH	Signal (+)	B84	29	2.8 — 3.2	2.8 — 3.2	—
	Signal (-)	B84	19	2.4 — 2.7	2.4 — 2.7	—
	Shield	B84	18	0	0	—
Front oxy- gen (A/F) sensor heater RH	Signal 1	B84	5	0 — 1.0	—	Sensor output waveform
	Signal 2	B84	4	0 — 1.0	—	Sensor output waveform
Front oxy- gen (A/F) sensor LH	Signal (+)	B84	30	2.8 — 3.2	2.8 — 3.2	—
	Signal (-)	B84	20	2.4 — 2.7	2.4 — 2.7	—
	Shield	B84	18	0	0	—
Front oxy- gen (A/F) sensor heater LH	Signal 1	B84	7	0 — 1.0	—	Sensor output waveform
	Signal 2	B84	6	0 — 1.0	—	Sensor output waveform
Front oxy- gen sen- sor RH	Signal	B135	7	0	0 — 0.9	—
	Shield	B135	25	0	0	—
Front oxygen sensor heater RH signal		B136	17	0 — 1.0	—	Sensor output waveform
Front oxy- gen sen- sor LH	Signal	B135	17	0	0 — 0.9	—
	Shield	B135	25	0	0	—
Front oxygen sensor heater LH signal		B136	16	0 — 1.0	—	Sensor output waveform
Rear oxy- gen sen- sor	Signal	B135	26	0	0 — 0.9	—
	Shield	B135	25	0	0	—
Rear oxygen sensor heater signal		B136	4	0 — 1.0	—	Sensor output waveform
GND (Front oxygen (A/ F) sensor heater RH 1)		B84	9	0	0	—
GND (Front oxygen (A/ F) sensor heater RH 2)		B84	8	0	0	—
GND (Front oxygen (A/ F) sensor heater LH 1)		B84	31	0	0	—
GND (Front oxygen (A/ F) sensor heater LH 2)		B84	21	0	0	—
Engine coolant temper- ature sensor		B135	28	1.0 — 1.4	1.0 — 1.4	After warm-up the engine.
Mass air flow sen- sor	Signal	B136	1	—	0.3 — 4.5	—
	Shield	B136	13	0	0	—
	GND	B136	7	0	0	—
Intake air temperature sensor signal		B135	27	0.3 — 4.6	0.3 — 4.6	—
EGR sole- noid valve	Signal 1	B136	5	0 or 10 — 13	0 or 10 — 13	—
	Signal 2	B136	6	0 or 10 — 13	0 or 10 — 13	—
	Signal 3	B136	11	0 or 10 — 13	0 or 10 — 13	—
	Signal 4	B136	12	0 or 10 — 13	0 or 10 — 13	—
Tumble generator valve position sensor		B135	3	Fully closed: 3.8 — 4.9 Fully opened: 0.2 — 0.9		—
Tumble generator valve (open)		B137	20	0 or 10 — 13	0 or 13 — 14	Sensor output waveform

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)		
Tumble generator valve (close)	B137	11	0 or 10 — 13	0 or 13 — 14	Sensor output waveform	
Vehicle speed signal	B134	14	0 or 5	0 or 5	"5" and "0" are repeatedly displayed when vehicle is driven.	
Starter switch	B134	2	0	0	Cranking: 8 — 14	
A/C switch	B134	9	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—	
Ignition switch	B134	13	10 — 13	13 — 14	—	
Neutral position switch	MT	B134	ON: 12±0.5 OFF: 0		Switch is ON when gear is in neutral position.	
	AT	B134	ON: 0 OFF: 12±0.5		Switch is ON when shift is in "N" or "P" position.	
Test mode connector	B135	22	10 — 13	13 — 14	When connected: 0	
Knock sensor	Signal	B135	4	2.8	—	
	Shield	B135	13	0	—	
Back-up power supply	B84	10	10 — 13	13 — 14	Ignition switch "OFF": 10 — 13	
Control unit power supply	B84	3	10 — 13	13 — 14	—	
	B84	2	10 — 13	13 — 14	—	
Sensor power supply	B135	9	5	5	—	
Ignition control	#1, #2	B137	15	0	1 — 3.4	Waveform
	#3, #4	B137	13	0	1 — 3.4	Waveform
	GND	B137	18	0	0	—
Fuel injector	#1	B137	6	10 — 13	1 — 14	Waveform
	#2	B137	5	10 — 13	1 — 14	Waveform
	#3	B137	4	10 — 13	1 — 14	Waveform
	#4	B137	3	10 — 13	1 — 14	Waveform
	GND	B137	8	0	0	—
Fuel pump relay control	B137	7	ON: 0.5 or less OFF: 10 — 13	0.5 or less	—	
A/C relay control	B137	23	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 13 — 14	—	
Starter relay control	B137	16	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 13 — 14	—	
Fan control 1	B84	17	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 13 — 14	—	
Fan control 2	B84	28	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 13 — 14	Models with A/C	
Self-shutoff control	B137	2	10 — 13	13 — 14	—	
Malfunction indicator light	B137	22	—	—	Light "ON": 1 or less Light "OFF": 10 — 14	
Purge control solenoid valve	B84	16	ON: 1 or less OFF: 10 — 13	ON: 1 or less OFF: 13 — 14	—	
Power steering switch	B135	24	ON: 1 or less OFF: 10 — 13	ON: 1 or less OFF: 13 — 14	—	
Fuel tank sensor control valve	B137	21	ON: 1 or less OFF: 10 — 13	ON: 1 or less OFF: 10 — 13	—	
Fuel temperature sensor	B135	6	2.5 — 3.8	2.5 — 3.8	Ambient temperature: 25°C (75°F)	
Fuel level sensor	B135	15	0.12 — 4.75	0.12 — 4.75	—	
Fuel tank pressure sensor	B135	14	2.3 — 2.7	2.3 — 2.7	The valve obtained after the fuel filler cap was removed once and recapped.	

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)	
Pressure control solenoid valve	B84	22	ON: 1 or less OFF: 10 — 13	ON: 1 or less OFF: 13 — 14	—
Drain valve	B84	11	ON: 1 or less OFF: 10 — 13	ON: 1 or less OFF: 13 — 14	—
Cruise control set light	B84	27	ON: 0 OFF: 10 — 13	ON: 0 OFF: 13 — 14	—
Main light	B84	15	ON: 0 OFF: 10 — 13	ON: 0 OFF: 13 — 14	—
Clutch switch	B134	12	When clutch pedal is depressed: 0 When clutch pedal is released: 10 — 13	When clutch pedal is depressed: 0 When clutch pedal is released: 13 — 14	—
SET/COAST switch	B84	14	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—
Brake switch 1	B84	25	When brake pedal is depressed: 0 When brake pedal is released: 10 — 13	When brake pedal is depressed: 0 When brake pedal is released: 13 — 14	—
Brake switch 2	B84	24	When brake pedal is depressed: 10 — 13 When brake pedal is released: 0	When brake pedal is depressed: 13 — 14 When brake pedal is released: 0	—
RESUME/ACCEL switch	B84	26	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—
Main switch	B84	13	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—
AT diagnosis input signal	B134	4	Less than 1 ↔ More than 4	Less than 1 ↔ More than 4	Waveform
Small light switch	B134	20	ON: 0 OFF: 10 — 13	ON: 0 OFF: 13 — 14	—
Blower fan switch	B134	17	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	—
Manifold absolute pressure sensor	B135	23	4.0 — 4.8	1.1 — 1.9	—
SSM/GST communication line	B134	19	Less than 1 ↔ More than 4	Less than 1 ↔ More than 4	—
GND (sensors)	B135	19	0	0	—
GND (power supply)	B84	1	0	0	—
	B137	17	0	0	—
GND (control systems)	B137	1	0	0	—
	B134	7	0	0	—