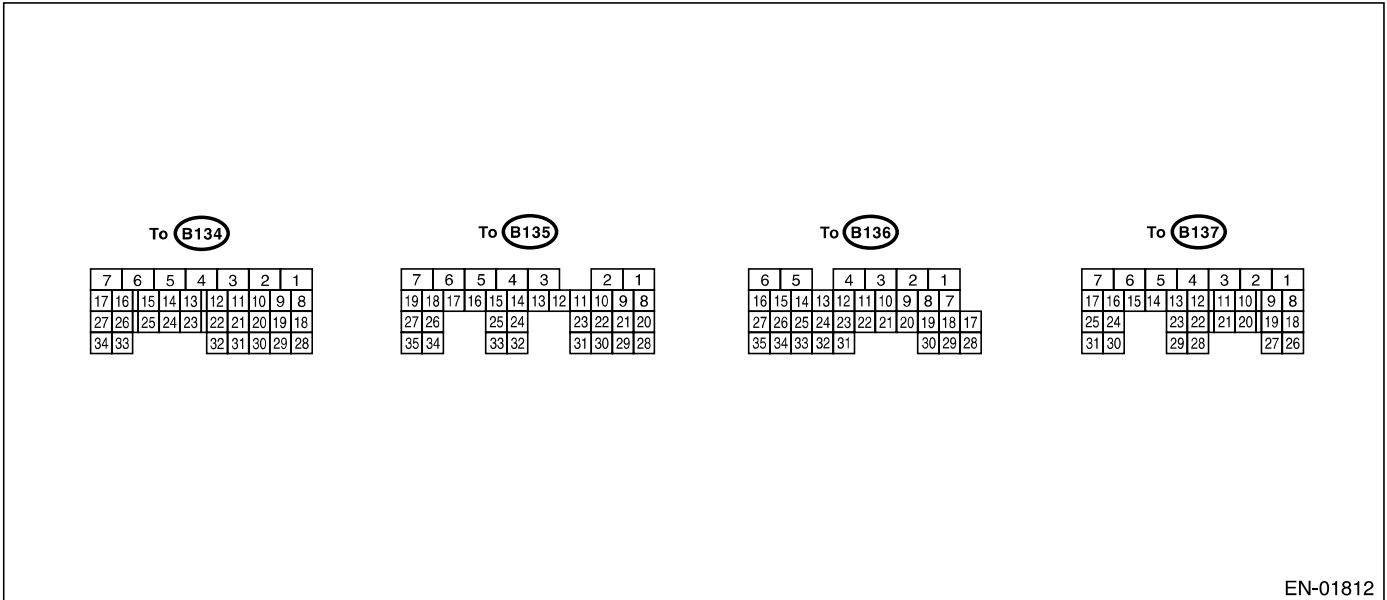


# ENGINE CONTROL MODULE (ECM) I/O SIGNAL

ENGINE (DIAGNOSTICS)

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

### A: ELECTRICAL SPECIFICATION



EN-01812

Content	Con- nector No.	Termi- nal No.	Signal (V)		Note	
			Ignition SW ON (Engine OFF)	Engine ON (Idling)		
Crank- shaft posi- tion sensor	Signal (+)	B135	10	0	-7 — +7	Sensor output waveform
	Signal (-)	B135	22	0	0	—
	Shield	B135	31	0	0	—
Rear oxy- gen sen- sor	Signal	B137	25	0	0 — 0.9	—
	Shield	B137	31	0	0	—
	GND (sen- sor)	B136	35	0	0	—
Front oxy- gen (A/F) sensor heater	Signal 1	B134	3	0 — 1.0	—	Sensor output waveform
	Signal 2	B134	2	0 — 1.0	—	Sensor output waveform
Rear oxygen sensor heater signal	B135	2	0 — 1.0	—	Sensor output waveform	
Engine coolant tempera- ture sen- sor	Signal	B136	14	1.0 — 1.4	1.0 — 1.4	After warm-up the engine.
	GND (sen- sor)	B136	35	0	0	After warm-up the engine.
Vehicle speed signal	B135	27	0 or 5	0 or 5	"5" and "0" are repeatedly dis- played when vehicle is driven.	
Mass air flow sen- sor	Signal	B136	23	—	0.3 — 4.5	—
	Shield	B136	32	0	0	—
	GND	B136	31	0	0	—
Intake air temperature sensor signal	B136	13	0.3 — 4.6	0.3 — 4.6	—	

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ENGINE (DIAGNOSTICS)

Content		Con- nector No.	Termi- nal No.	Signal (V)		Note
				Ignition SW ON (Engine OFF)	Engine ON (Idling)	
Tumble generator valve posi- tion sensor RH	Signal	B136	27	Fully closed: 3.8 — 4.9 Fully opened: 0.2 — 0.9		—
	Power supply	B136	16	5	5	—
	GND (sensor)	B136	35	0	0	—
Tumble generator valve posi- tion sensor LH	Signal	B136	26	Fully closed: 3.8 — 4.9 Fully opened: 0.2 — 0.9		—
	Power supply	B136	16	5	5	—
	GND (sensor)	B136	35	0	0	—
Tumble generator valve RH (open)		B134	9	0 or 10 — 13	0 or 13 — 14	Sensor output waveform
Tumble generator valve RH (close)		B134	8	0 or 10 — 13	0 or 13 — 14	Sensor output waveform
Tumble generator valve LH (open)		B134	11	0 or 10 — 13	0 or 13 — 14	Sensor output waveform
Tumble generator valve LH (close)		B134	10	0 or 10 — 13	0 or 13 — 14	Sensor output waveform
Wastegate control sole- noid valve		B134	32	0 or 10 — 13	0 or 13 — 14	Sensor output waveform
Starter switch		B137	8	0	0	Cranking: 8 — 14
A/C switch		B137	16	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—
Ignition switch		B137	15	10 — 13	13 — 14	—
Neutral position switch		B137	9	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—
Test mode connector		B137	14	5	5	When connected: 0
Knock sensor	Signal	B136	25	2.8	2.8	—
	Shield	B136	33	0	0	—
Back-up power supply		B135	19	10 — 13	13 — 14	Ignition switch "OFF": 10 — 13
Control unit power sup- ply		B135	5	10 — 13	13 — 14	—
		B135	6	10 — 13	13 — 14	—
Sensor power supply		B136	16	5	5	—
Ignition control	#1	B135	18	0	13 — 14	Waveform
	#2	B135	17	0	13 — 14	Waveform
	#3	B135	16	0	13 — 14	Waveform
	#4	B135	16	0	13 — 14	Waveform
Fuel injec- tor	#1	B136	6	10 — 13	1 — 14	Waveform
	#2	B136	5	10 — 13	1 — 14	Waveform
	#3	B136	4	10 — 13	1 — 14	Waveform
	#4	B136	3	10 — 13	1 — 14	Waveform
Fuel pump control unit	Signal 1	B135	26	0 or 5	0 or 5	Sensor output waveform
	Signal 2	B137	28	10 — 13	13 — 14	—
A/C relay control		B133	33	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 13 — 14	—
Radiator fan relay 1 control		B135	25	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 13 — 14	—
Radiator fan relay 2 control		B135	24	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 13 — 14	Model with A/C only

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Content	Con- nector No.	Termi- nal No.	Signal (V)		Note	
			Ignition SW ON (Engine OFF)	Engine ON (Idling)		
Malfunction indicator lamp	B134	17	—	—	Light "ON": 1 or less Light "OFF": 10 — 14	
Engine speed output	B134	23	—	0 — 13 or more	Waveform	
Purge control solenoid valve	B134	14	ON: 1 or less OFF: 10 — 13	ON: 1 or less OFF: 13 — 14	Sensor output waveform	
Manifold absolute pressure sensor	Signal	B136	22	1.7 — 2.4	1.1 — 1.6	—
	Power supply	B136	16	5	5	
	GND (sensor)	B136	35	0	0	
Fuel tank pressure sensor	Signal	B136	21	2.3 — 2.7	2.3 — 2.7	The valve operates when fuel filler cap is removed and reinstalled.
	GND (sensor)	B136	35	0	0	—
Fuel tank pressure control solenoid valve	B134	12	ON: 1 or less OFF: 10 — 13	ON: 1 or less OFF: 13 — 14	—	
Drain valve	B134	13	ON: 1 or less OFF: 10 — 13	ON: 1 or less OFF: 13 — 14	—	
Fuel tank sensor control valve	B134	24	ON: 1 or less OFF: 10 — 13	ON: 1 or less OFF: 13 — 14	—	
Fuel level sensor	B136	20	0.12 — 4.75	0.12 — 4.75	—	
Fuel temperature sensor signal	B136	12	2.5 — 3.8	2.5 — 3.8	Ambient temperature: 25°C (75°F)	
Blow-by leak diagnosis signal	B137	24	0	0	When disconnection (malfunction): 5	
Small light switch	B137	12	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	11	ON: 0 OFF: 10 — 13	ON: 0 OFF: 13 — 14	—	
Power steering oil pressure switch	B137	10	10 — 13	ON: 0 OFF: 13 — 14	—	
Front oxygen (A/F) sensor signal (+)	B134	33	2.8 — 3.2	2.8 — 3.2	—	
Front oxygen (A/F) sensor signal (-)	B134	26	2.4 — 2.7	2.4 — 2.7	—	
Front oxygen (A/F) sensor shield	B134	25	0	0	—	
SSM/GST communication line	B137	20	Less than 1 ↔ More than 4	Less than 1 ↔ More than 4	—	
GND (injectors)	B137	7	0	0	—	
GND (ignition system)	B135	12	0	0	—	
GND (power supply)	B135	4	0	0	—	
	B135	1	0	0	—	
GND (control systems)	B137	1	0	0	—	
	B137	2	0	0	—	
GND (front oxygen (A/F) sensor heater 1)	B134	7	0	0	—	
GND (front oxygen (A/F) sensor heater 2)	B134	6	0	0	—	

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ENGINE (DIAGNOSTICS)

Content	Con- nector No.	Termi- nal No.	Signal (V)		Note	
			Ignition SW ON (Engine OFF)	Engine ON (Idling)		
Camshaft position sensor (LH)	B135	8	0 — 0.9	ON: 0 OFF: 4.7 — 5.3	Sensor output waveform	
Camshaft position sensor (RH)	B135	9	0 — 0.9	ON: 0 OFF: 4.7 — 5.3	Sensor output waveform	
Electric throttle	Main	B136	18	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	29	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	B136	16	5	5	—
	GND (sensor)	B137	3	0	0	—
Electric throttle motor (+)	B137	5	Duty waveform	Duty waveform	Driving frequency: 500Hz	
Electric throttle motor (-)	B137	4	Duty waveform	Duty waveform	Driving frequency: 500Hz	
Electric throttle motor power supply	B137	6	10 — 13	13 — 14	—	
Electric throttle motor relay	B135	35	ON: 0 OFF: 10 — 13	ON: 0 OFF: 13 — 14	When ignition switch is ON: ON	
Variable valve timing solenoid valve (LH)	Signal (+)	B134	19	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—
	Signal (-)	B134	29	0	0	—
Variable valve timing solenoid valve (RH)	Signal (+)	B134	18	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—
	Signal (-)	B134	28	0	0	—
Accelerator position sensor	Main	B136	17	Fully closed: 1 Fully opened: 3.5	Fully closed: 1 Fully opened: 3.5	—
	Power supply	B136	15	5	5	—
	GND (sensor)	B136	34	0	0	—
	Sub	B136	28	Fully closed: 1 Fully opened: 3.5	Fully closed: 1 Fully opened: 3.5	—
Cruise control set light	B134	16	ON: 0 OFF: 10 — 13	ON: 0 OFF: 13 — 14	—	
Main light	B134	15	ON: 0 OFF: 10 — 13	ON: 0 OFF: 13 — 14	—	
Clutch switch	B134	1	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	B136	11	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—	
Brake switch 1	B136	9	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	—	

# ENGINE CONTROL MODULE (ECM) I/O SIGNAL

## ENGINE (DIAGNOSTICS)

Content	Con- nector No.	Termi- nal No.	Signal (V)		Note
			Ignition SW ON (Engine OFF)	Engine ON (Idling)	
Brake switch 2	B136	8	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	B136	10	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—
Main switch	B136	7	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—