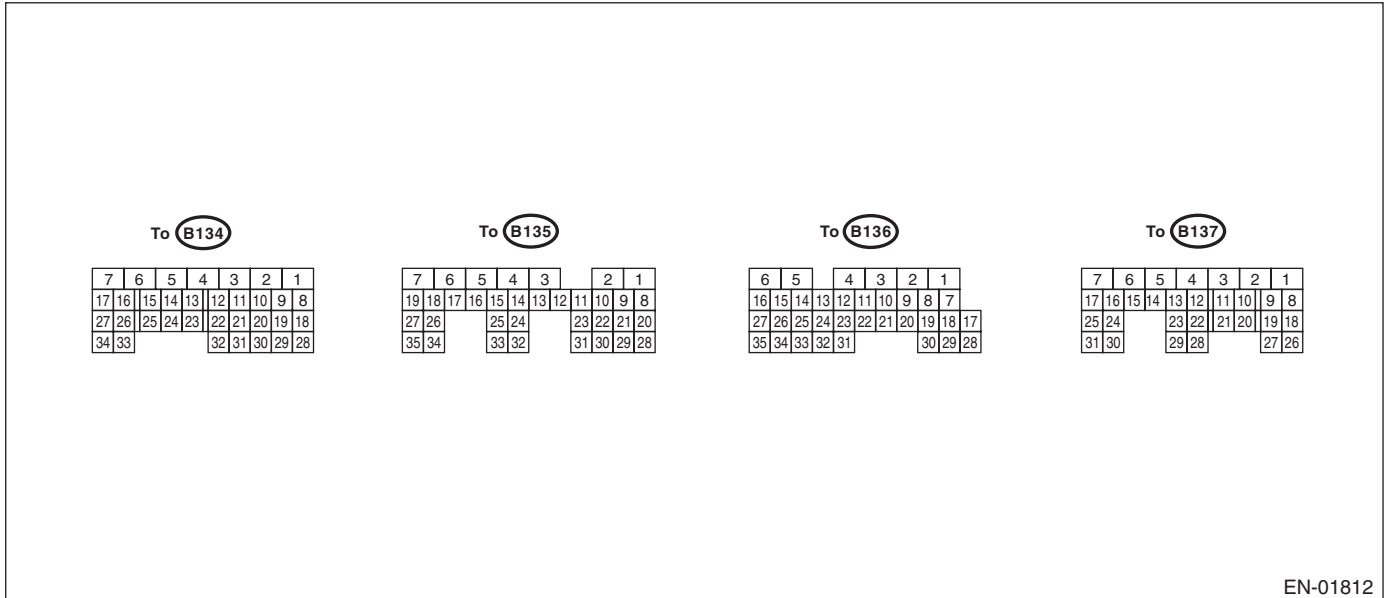


5. Engine Control Module (ECM) I/O Signal

A: ELECTRICAL SPECIFICATION



Content		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON (Engine OFF)	Engine ON (Idling)	
Crankshaft position sensor	Signal (+)	B135	10	0	-7 — +7	Sensor output waveform
	Signal (-)	B135	22	0	0	—
	Shield	B135	31	0	0	—
Rear oxygen sensor	Signal	B137	24	0	0 — 0.9	—
	Shield	B137	31	0	0	—
	GND (sensor)	B136	35	0	0	—
Front oxygen (A/F) sensor heater	Signal 1	B134	3	10 — 13	1 — 14	Waveform
	Signal 2	B134	2	10 — 13	1 — 14	Waveform
Rear oxygen sensor heater signal		B135	2	10 — 13	1 — 14	Waveform
Engine coolant temperature sensor	Signal	B136	14	1.0 — 1.4	1.0 — 1.4	After warm-up the engine.
	GND (sensor)	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 displayed when vehicle is driven.
Mass air flow sensor	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	—
Camshaft position sensor	Signal (+)	B135	11	0	-7 — +7	Sensor output waveform
	Signal (-)	B135	23	0	0	—
	Shield	B135	31	0	0	—
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	—

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)	
Neutral position switch		B137	9	ON: 0 OFF: 10 — 13	ON: 0 OFF: 13 — 14	—
Check connector		B137	14	10 — 13	13 — 14	When connected: 0
Knock sensor	Signal	B136	25	2.5	2.5	—
	Shield	B136	33	0	0	—
Back-up power supply		B135	19	10 — 13	13 — 14	Ignition switch "OFF": 10 — 13
Control unit power supply		B135	5	10 — 13	13 — 14	—
		B135	6	10 — 13	13 — 14	—
Ignition control	1	B135	18	0	1 — 3.4	Waveform
	2	B135	17	0	1 — 3.4	Waveform
Fuel injector	#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 relay		B135	26	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 13 — 14	—
A/C relay control		B135	33	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 13 — 14	—
Radiator fan relay 1 control		B134	31	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 13 — 14	—
Radiator fan relay 2 control		B135	34	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 13 — 14	Model with A/C only
Starter relay control		B135	32	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 13 — 14	—
Self shut relay control		B137	17	0.5 or less	0.5 or less	—
Malfunction indicator lamp		B134	17	—	—	Light "ON": 1 or less Light "OFF": 10 — 14
Engine speed output		B134	23	—	0 — 13	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	3.4 — 3.8	1.4 — 1.8	—
	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	0.3 — 4.5	0.3 — 4.5	—
Fuel temperature sensor signal		B136	12	1 — 4	1 — 4	—
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	—

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)		
Power steering oil pressure switch	B137	10	10 — 13	ON: 0 OFF: 13 — 14	—	
Front oxygen (A/F) sensor signal (+)	B134	33	—	2.7 — 2.9	—	
Front oxygen (A/F) sensor signal (-)	B134	26	—	2.35 — 2.55	—	
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	—	
GND (Electronic throttle control motor)	B137	3	0	0	—	
Electronic throttle control	Main	B136	18	0.64 — 0.72 Fully opened: 3.96	0.64 — 0.72 (After engine warm-up) Fully opened: 3.96	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 opened: 4.17	Fully closed: 1.48 Fully opened: 4.17
	Power supply	B136	16	5	5	—
	GND (sensor)	B136	35	0	0	—
Electronic throttle control motor (+)	B137	5	Duty waveform	Duty waveform	Driving frequency: 500 Hz	
Electronic throttle control motor (-)	B137	4	Duty waveform	Duty waveform	Driving frequent: 500 Hz	
Electronic throttle control motor power supply	B137	6	10 — 13	13 — 14	—	
Electronic throttle control motor relay	B135	35	ON: 0 OFF: 10 — 13	ON: 0 OFF: 13 — 14	When ignition switch is ON: ON	
Accelerator pedal 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	B136	10	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	—	

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)		
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	—	
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	1	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—	
Main switch	B136	7	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—	
CAN communication	Signal (+)	B137	18	Pulse signal		—
	Signal (-)	B137	26	Pulse signal		—
EGR solenoid valve	Signal 1	B134	11	0 or 10 — 13	0 or 10 — 14	—
	Signal 2	B134	10	0 or 10 — 13	0 or 10 — 14	—
	Signal 3	B134	9	0 or 10 — 13	0 or 10 — 14	—
	Signal 4	B134	8	0 or 10 — 13	0 or 10 — 14	—