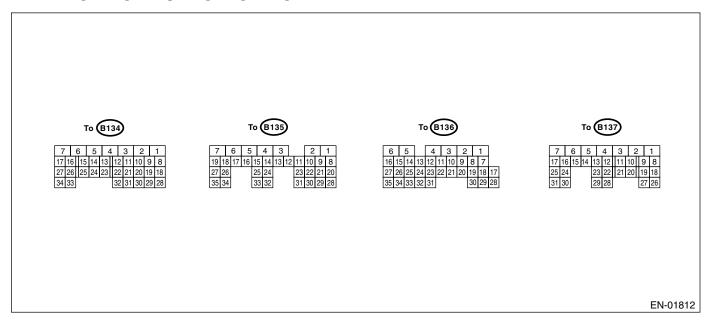
5. Engine Control Module (ECM) I/O Signal

A: ELECTRICAL SPECIFICATION



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

Content		Con-	Termi-	Signa	al (V)	Note
		nector No.	nal No.	Ignition SW ON (Engine OFF)	Engine ON (Idling)	Note
Tumble Signal		B136	27	Fully closed: 3.8 — 4.9 Fully opened: 0.2 — 0.9		
generator valve posi- tion sensor	Power supply	B136	16	5	5	
RH	GND (sensor)	B136	35	0	0	_
Tumble	Signal	B136	26	Fully closed: 3.8 — 4.9 Fully opened: 0.2 — 0.9		
generator valve posi- tion sensor	Power supply	B136	16	5	5	_
LH	GND (sensor)	B136	35	0	0	_
Tumble gene RH (open)		B134	9	0 or 10 — 13	0 or 13 — 14	Sensor output waveform
Tumble gene RH (close)		B134	8	0 or 10 — 13	0 or 13 — 14	Sensor output waveform
Tumble gene LH (open)		B134	11	0 or 10 — 13	0 or 13 — 14	Sensor output waveform
Tumble gene LH (close)	erator valve	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	A/C switch		16	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	_
Ignition swite	ch	B137	15	10 — 13	13 — 14	_
Neutral posi	tion switch	B137	9	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	_
Test mode of	connector	B137	14	5	5	When connected: 0
Knock	Signal	B136	25	2.8	2.8	_
sensor	Shield	B136	33	0	0	_
Back-up pov	wer supply	B135	19	10 — 13	13 — 14	Ignition switch "OFF": 10 — 13
Control unit		B135	5	10 — 13	13 — 14	_
ply	porror oup	B135	6	10 — 13	13 — 14	_
Sensor pow	er supply	B136	16	5	5	_
	#1	B135	18	0	13 — 14	Waveform
Ignition	#2	B135	17	0	13 — 14	Waveform
control	#3	B135	16	0	13 — 14	Waveform
	#4	B135	16	0	13 — 14	Waveform
	#1	B136	6	10 — 13	1 — 14	Waveform
Fuel injector	#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	Signal 1	B135	26	0 or 5	0 or 5	Sensor output waveform
control unit	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

Content Note Not				I	Ciama	-1 (\(\(\) \(\)	7
Mailtunction indicator Mailtunction indicator Mailtunction indicator Mailtunction indicator Mailtunction indicator Mailtunction indicator Mailtunction Mai	Contont		Con-	Termi-	Signal (V)		Note
Eargine speed output B134 23				nal No.		Engine ON (Idling)	
Purge control solenoid valve			B134	17	_	_	
Valve	Engine spec	ed output	B134	23		0 — 13 or more	Waveform
Manifold absolute pressure supply		ol solenoid	B134	14			Sensor output waveform
absolute Prower Supply Supply		Signal	B136	22	1.7 — 2.4	1.1 — 1.6	
Sensor GND (sensor) Signal B136 35 0 0 0	absolute		B136	16	5	5	_
Fuel tank pressure sensor	•		B136	35	0	0	
Sor) B180 S3		-	B136	21	2.3 — 2.7	2.3 — 2.7	The valve operates when fuel filler cap is removed and reinstalled.
trol solenoid valve Drain valve B134 12 OFF: 10 — 13 OFF: 13 — 14 —	sensor		B136	35	0	0	_
Drain valve B134 13			B134	12			_
valve B134 Page 1 24 OFF: 10 − 13 OFF: 13 − 14 OFF: 13 − 14 − Fuel level sensor B136 Page 20 O.12 − 4.75 O	Drain valve		B134	13			_
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 OFF: 13 — 14 — Blower fan switch B137 13 ON: 0 OFF: 10 — 13 OFF: 13 — 14 — Rear defogger switch B137 11 ON: 0 OFF: 10 — 13 OFF: 13 — 14 — Power steering oil presure switch B137 10 ON: 0 OFF: 13 — 14 — Front oxygen (A/F) sensor signal (+) B134 33 OFF: 13 — 14 — Front oxygen (A/F) sensor signal (+) B134 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 sield B137 20 Less than 1 ← More than 4 — — SSM/GST communication line B137 7 0 0 — — GND (ignition system) B135 12 0 0 — <td></td> <td>ensor control</td> <td>B134</td> <td>24</td> <td></td> <td></td> <td>_</td>		ensor control	B134	24			_
Sor signal B100 12 2.3 - 3.8 25°C (75°F) Blow-by leak diagnosis signal B137 24 0 0 0 When disconnection (malfunction): 5 Small light switch B137 12 ON: 0 OFF: 10 - 13 OFF: 13 - 14 - Blower fan switch B137 13 ON: 0 OFF: 13 - 14 - Rear defogger switch B137 11 ON: 0 OFF: 13 - 14 - Power steering oil pressure switch B137 10 10 - 13 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 25 0 0 - SSM/GST communication line B137 7 0 0 0 - GND (injectors) B135 12 0 0 0 - GND (power supply) B135 12 0 0 0 - GND (control systems) B137 7 0 0 0 - GND (front oxygen (A/F) sensor heater 1) B134 7 0 0 0 -	Fuel level s	ensor	B136	20	0.12 — 4.75	0.12 — 4.75	_
signal B137 24 0 0 (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 OFF: 13 — 14 — Rear defogger switch B137 11 ON: 0 OFF: 10 — 13 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 shield 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 — GND (injectors) B137 7 0 0 — GND (gower supply) B135 12 0 0 — GND (control systems) B137 1 0 0		rature sen-	B136	12	2.5 — 3.8	2.5 — 3.8	
Small light switch B137 12 OFF: 10 — 13 OFF: 13 — 14 —			B137	24	0	0	
Blower fan switch Bl37 13 OFF: 10 — 13 OFF: 13 — 14 —	Small light switch		B137	12	OFF: 10 — 13	OFF: 13 — 14	_
Rear derogger switch	Blower fan switch		B137	13	OFF: 10 — 13	OFF: 13 — 14	_
sure switch B137 10 10—13 OFF: 13—14 — Front oxygen (A/F) sensing 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 — — GND (injectors) B137 7 0 0 — — GND (ignition system) B135 12 0 0 — — GND (power supply) B135 4 0 0 — — GND (control systems) B137 1 0 0 — GND (front oxygen (A/F) sensor heater 1) B134 7 0 0 —	Rear defogger switch		B137	11			_
sor 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 - GND (control systems) B137 1 0 0 - GND (front oxygen (A/F) sensor heater 1) B134 7 0 0 -		•	B137	10	10 — 13		_
sor 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 — — GND (injectors) B137 7 0 0 — — GND (injectors) B135 12 0 0 — — GND (power supply) B135 4 0 0 — — GND (control systems) B137 1 0 0 — — GND (front oxygen (A/F) sensor heater 1) B134 7 0 0 — —			B134	33	2.8 — 3.2	2.8 — 3.2	_
sor shield B134 25 0 0 — SSM/GST communication line B137 20 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 — GND (control systems) B137 1 0 0 — GND (front oxygen (A/F) sensor heater 1) B134 7 0 0 —		. ,	B134	26	2.4 — 2.7	2.4 — 2.7	_
tion line B137 20 than 4 than 4			B134	25	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 — GND (front oxygen (A/F) sensor heater 1) B134 7 0 0 —			B137	20			_
GND (power supply) B135 4 0 0 — B135 1 0 0 — GND (control systems) B137 1 0 0 — GND (front oxygen (A/F) sensor heater 1) B134 7 0 0 —							_
GND (power supply) B135 1 0 0	GND (ignition system)				-	-	_
GND (control systems) B135 1 0 0 0 — GND (front oxygen (A/F) sensor heater 1) B134 7 0 0 0 —	GND (power supply)					-	
GND (control systems) B137 2 0 0 —	z (powe	11 37			-		_
GND (front oxygen (A/F) sensor heater 1) B134 7 0 —	GND (control systems)				-		_
	, , , , , , , , , , , , , , , , , , , ,						
GND (front oxygen (A/F) sensor heater 2) B134 6 0 —	GND (front	GND (front oxygen (A/		6	0	0	_

Content		Con-	Termi-	Signa	al (V)	
		nector No.	nal No.	Ignition SW ON (Engine OFF)	Engine ON (Idling)	Note
Camshaft position sensor (LH)		B135	8	0 — 0.9	ON: 0 OFF: 4.7 — 5.3	Sensor output waveform
Camshaft posor (RH)	osition sen-	B135	9	0 — 0.9	ON: 0 OFF: 4.7 — 5.3	Sensor output waveform
	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
Electric	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
throttle	Power supply	B136	16	5	5	_
	GND (sen- sor)	B137	3	0	0	_
Electric thro	ttle motor	B137	5	Duty waveform	Duty waveform	Driving frequeney: 500Hz
Electric thro	ttle motor	B137	4	Duty waveform	Duty waveform	Driving frequeney: 500Hz
Electric thro		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 tim-	Signal (+)	B134	19	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	_
ing sole- noid valve (LH)	Signal (-)	B134	29	0	0	_
Variable valve tim-	Signal (+)	B134	18	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	_
ing sole- noid valve (RH)	Signal (-)	B134	28	0	0	_
,	Main	B136	17	Fully closed: 1 Fully opened: 3.5	Fully closed: 1 Fully opened: 3.5	_
Accelera-	Power supply	B136	15	5	5	_
torposition sensor	GND (sen- sor)	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)

	Con-	Termi-	Signal (V)		
Content	nector No.	nal No.	Ignition SW ON (Engine OFF)	Engine ON (Idling)	Note
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	_