

Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

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

A: ELECTRICAL SPECIFICATION

To B134
7 6 5 4 3 2 1 17 16 15 14 13 12 11 10 9 8 27 26 25 24 23 22 21 20 19 18 34 33 32 31 30 29 28

To B135
7 6 5 4 3 2 1 19 18 17 16 15 14 13 12 11 10 9 8 27 26 25 24 23 22 21 20 19 18 35 34 33 32 31 30 29 28

To B136
6 5 4 3 2 1 16 15 14 13 12 11 10 9 8 7 27 26 25 24 23 22 21 20 19 18 17 35 34 33 32 31 30 29 28

To B137
7 6 5 4 3 2 1 17 16 15 14 13 12 11 10 9 8 25 24 23 22 21 20 19 18 31 30 29 28 27 26

EN-01812

Content		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON (Engine OFF)	Engine ON (Idling)	
Crankshaft position sensor	Signal (+)	B134	13	0	-7 — +7	Sensor output waveform
	Signal (-)	B134	14	0	0	—
	Shield	B134	24	0	0	—
Rear oxygen sensor	Signal	B135	4	0	0 — 0.9	—
	Shield	B135	1	0	0	—
	GND (sensor)	B134	29	0	0	—
Front oxygen (A/F) sensor heater	Signal 1	B136	3	10 — 13	1 — 14	Waveform
	Signal 2	B136	2	10 — 13	1 — 14	Waveform
Rear oxygen sensor heater signal		B136	4	10 — 13	1 — 14	Waveform
Engine coolant temperature sensor	Signal	B134	34	1.0 — 1.4	1.0 — 1.4	After warm-up the engine.
	GND (sensor)	B134	29	0	0	After warm-up the engine.
Vehicle speed signal		B136	12	0 or 5	0 or 5	"5" and "0" are repeatedly displayed when vehicle is driven.
Mass air flow sensor	Signal	B135	26	—	0.3 — 4.5	—
	Shield	B135	35	0	0	—
	GND	B135	34	0	0	—
Intake air temperature sensor signal		B135	18	0.3 — 4.6	0.3 — 4.6	—
Camshaft position sensor	Signal (+)	B134	12	0	-7 — +7	Sensor output waveform
	Signal (-)	B134	22	0	0	—
	Shield	B134	24	0	0	—
Starter switch		B136	32	0	0	Cranking: 8 — 14
A/C switch		B136	23	ON: 10 — 13 OFF: 0	ON: 12 — 14 OFF: 0	—
Ignition switch		B135	27	10 — 13	12 — 14	—

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			Ignition SW ON (Engine OFF)	Engine ON (Idling)	
Neutral position switch	B136	31	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	—
Test mode connector	B135	19	10 — 13	12 — 14	When connected: 0
Knock sensor	Signal	B134	2.5	2.5	—
	Shield	B134	0	0	—
Back-up power supply	B135	5	10 — 13	12 — 14	Ignition switch "OFF": 10 — 13
Control unit power supply	B134	7	10 — 13	12 — 14	—
	B135	2	10 — 13	12 — 14	—
Ignition control	1	B137	0	1 — 3.4	Waveform
	2	B137	0	1 — 3.4	Waveform
Fuel injector	#1	B137	10 — 13	1 — 14	Waveform
	#2	B137	10 — 13	1 — 14	Waveform
	#3	B137	10 — 13	1 — 14	Waveform
	#4	B137	10 — 13	1 — 14	Waveform
Fuel pump control relay	B136	13	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 12 — 14	—
A/C relay control	B136	9	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 12 — 14	—
Radiator fan relay 1 control	B136	18	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 12 — 14	—
Radiator fan relay 2 control	B136	29	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 12 — 14	Model with A/C only
Starter relay control	B136	20	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 12 — 14	—
Self shut relay control	B136	24	0.5 or less	0.5 or less	—
Malfunction indicator lamp	B136	11	—	—	Light "ON": 1 or less Light "OFF": 10 — 14
Engine speed output	B136	22	—	0 — 13	Waveform
Purge control solenoid valve	B137	29	ON: 1 or less OFF: 10 — 13	ON: 1 or less OFF: 12 — 14	Sensor output waveform
Manifold absolute pressure sensor	Signal	B134	3.4 — 3.8	1.4 — 1.8	—
	GND (sensor)	B134	0	0	
Fuel tank pressure sensor	Signal	B135	2.3 — 2.7	2.3 — 2.7	The valve operates when fuel filler cap is removed and reinstalled.
	GND (sensor)	B135	0	0	—
Pressure control solenoid valve	B136	28	ON: 1 or less OFF: 10 — 13	ON: 1 or less OFF: 12 — 14	—
Drain valve	B136	17	ON: 1 or less OFF: 10 — 13	ON: 1 or less OFF: 12 — 14	—
Fuel level sensor	B135	10	0.3 — 4.5	0.3 — 4.5	—
Fuel temperature sensor signal	B135	17	1 — 4	1 — 4	—
Small light switch	B135	15	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	—
Blower fan switch	B135	16	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	—
Rear defogger switch	B135	14	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	—
Power steering oil pressure switch	B134	33	ON: 1 or less OFF: 10 — 13	ON: 0 OFF: 12 — 14	—

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			Ignition SW ON (Engine OFF)	Engine ON (Idling)	
Front oxygen (A/F) sensor signal (+)	B135	9	—	2.7 — 2.9	—
Front oxygen (A/F) sensor signal (-)	B135	8	—	2.35 — 2.55	—
Front oxygen (A/F) sensor shield	B135	1	0	0	—
SSM/GST communication line	B136	16	Less than 1 ↔ More than 4	Less than 1 ↔ More than 4	—
Ground	Engine 1	B134	5	0	0
	Engine 2	B137	7	0	0
	Engine 3	B137	2	0	0
	Engine 4	B137	1	0	0
	Engine 5	B137	3	0	0
	Ignition 1	B137	26	0	0
	Ignition 2	B137	6	0	0
	Body	B136	6	0	0
Electronic throttle control	Main	B134	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	B134	28	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	B134	19	5	5
	GND (sensor)	B134	29	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	B136	1	10 — 13	12 — 14	—
Electronic throttle control motor relay	B136	21	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	When ignition switch is ON: ON
Accelerator pedal position sensor	Main sensor signal	B135	23	Fully closed: 0.7 Fully opened: 3.0	Fully closed: 0.7 Fully opened: 3.0
	Main power supply	B135	21	5	5
	GND (Main sensor)	B135	29	0	0
	Sub sensor signal	B135	31	Fully closed: 0.7 Fully opened: 3.0	Fully closed: 0.7 Fully opened: 3.0
	Sub power supply	B135	22	5	5
	GND (Sub sensor)	B135	30	0	0
Cruise control set light	B135	3	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	—
Main light	B135	6	ON: 1 or less OFF: 10 — 13	ON: 0 OFF: 12 — 14	—
Clutch switch	B136	25	When clutch pedal is depressed: 0 When clutch pedal is released: 10 — 13	When clutch pedal is depressed: 0 When clutch pedal is released: 12 — 14	—

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			Ignition SW ON (Engine OFF)	Engine ON (Idling)	
SET/COAST switch	B135	24	ON: 10 — 13 OFF: 0	ON: 12 — 14 OFF: 0	—
Brake switch 1	B135	20	When brake pedal is depressed: 0 When brake pedal is released: 10 — 13	When brake pedal is depressed: 0 When brake pedal is released: 12 — 14	—
Brake switch 2	B135	28	When brake pedal is depressed: 10 — 13 When brake pedal is released: 0	When brake pedal is depressed: 12 — 14 When brake pedal is released: 0	—
RESUME/ACCEL switch	B135	13	ON: 10 — 13 OFF: 0	ON: 12 — 14 OFF: 0	—
Main switch	B135	12	ON: 10 — 13 OFF: 0	ON: 12 — 14 OFF: 0	—
CAN communication	Signal (+)	B136	27	Pulse signal	—
	Signal (-)	B136	35	Pulse signal	—
EGR solenoid valve	Signal 1	B134	8	0 or 10 — 13	0 or 12 — 14
	Signal 2	B134	9	0 or 10 — 13	0 or 12 — 14
	Signal 3	B134	10	0 or 10 — 13	0 or 12 — 14
	Signal 4	B134	20	0 or 10 — 13	0 or 12 — 14
Oil switching solenoid valve RH	Signal (+)	B137	25	0	Duty waveform Driving frequency: 300 Hz
	Signal (-)	B137	24	0	0 —
Oil switching solenoid valve LH	Signal (+)	B137	31	0	Duty waveform Driving frequency: 300 Hz
	Signal (-)	B137	30	0	0 —
Oil temperature sensor signal	B134	23	1.0 — 1.4	1.0 — 1.4	After warm-up the engine.
Variable valve lift diagnosis oil pressure switch RH	B134	31	0	0	—
Variable valve lift diagnosis oil pressure switch LH	B134	32	0	0	—