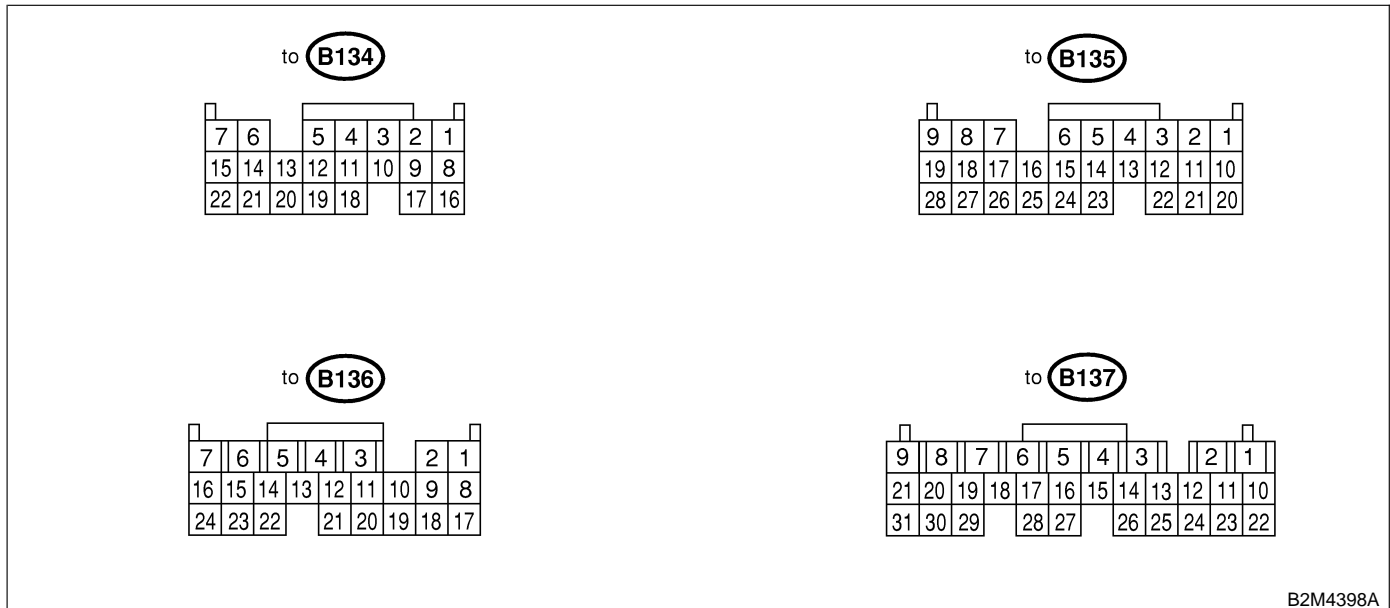


ENGINE CONTROL MODULE (ECM) I/O SIGNAL

Engine (DIAGNOSTICS)

5. Engine Control Module (ECM) I/O Signal S048526

A: ELECTRICAL SPECIFICATION S048526A08



B2M4398A

| Content | | Connector No. | Terminal No. | Signal (V) | | Note |
|----------------------------------|--------------|---------------|--------------|--|--------------------|---|
| | | | | Ignition SW ON (Engine OFF) | Engine ON (Idling) | |
| Crankshaft position sensor | Signal (+) | B135 | 2 | 0 | — | Sensor output waveform <Ref. to EN(H6)-29, WAVEFORM, MEASUREMENT, Control Module I/O Signal.> |
| | Signal (-) | B135 | 11 | 0 | 0 | |
| | Shield | B135 | 21 | 0 | 0 | |
| Camshaft position sensor | Signal (+) | B135 | 1 | 0 | — | Sensor output waveform <Ref. to EN(H6)-29, WAVEFORM, MEASUREMENT, Control Module I/O Signal.> |
| | Signal (-) | B135 | 10 | 0 | 0 | |
| Throttle position sensor | Signal | B135 | 7 | Fully closed: 0.3 — 0.8 Fully open: 4.2 — 4.7 | 0.3 — 0.8 | — |
| | Power supply | B135 | 9 | 5 | 5 | — |
| | GND (sensor) | B135 | 19 | 0 | 0 | — |
| Rear oxygen sensor | Signal | B135 | 17 | 0 — 0.5 | 0 — 0.9 | — |
| | Shield | B135 | 26 | 0 | 0 | — |
| Front oxygen (A/F) sensor heater | Signal | LH1 | B137 | 7 | — | — |
| | | LH2 | B137 | 6 | — | — |
| | | RH1 | B137 | 5 | — | — |
| | | RH2 | B137 | 4 | — | — |
| Rear oxygen sensor heater signal | | B136 | 13 | — | — | — |
| Vehicle speed signal | | B134 | 1 | 0 or 5 | 0 or 5 | "5" and "0" are repeatedly displayed when vehicle is driven. |

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) | | |
| Engine coolant temperature sensor | Signal | B135 | 18 | — | — | After warm-up the engine. | |
| | GND (sensor) | B134 | 7 15 | 0 | 0 | After warm-up the engine. | |
| Generator signal | | B137 | 12 | 4 — 5 | 4 — 5 | | |
| Starter switch | | B134 | 16 | 0 | 0 | Cranking: 9 — 12 | |
| A/C switch | | B134 | 2 | ON: 10 — 13 OFF: 0 | ON: 13 — 14 OFF: 0 | — | |
| Ignition switch | | B134 | 5 | 10 — 13 | 13 — 14 | — | |
| Neutral position switch | | B134 | 8 | ON: 0 OFF: 5 | | Switch is ON when shift is in "N" or "P" position. | |
| Test mode connector | | B134 | 14 | 5 | 5 | When connected: 0 | |
| Knock sensor | Signal | B135 | 1 | 4 | 2.5 | 2.5 | — |
| | | | 2 | 13 | 2.5 | 2.5 | — |
| | Shield | B135 | 22 | 0 | 0 | — | |
| Back-up power supply | | B137 | 10 | 10 — 13 | 13 — 14 | Ignition switch "OFF": 10 — 13 | |
| Control unit power supply | | B137 | 2 | 10 — 13 | 13 — 14 | — | |
| | | | 3 | 10 — 13 | 13 — 14 | — | |
| Sensor power supply | | B135 | 9 | 5 | 5 | — | |
| Line end check 1 | | B134 | 10 | 0 | 0 | — | |
| Ignition control | #1 | B136 | 24 | 0 | — | Waveform | |
| | #2 | B136 | 23 | 0 | — | Waveform | |
| | #3 | B136 | 22 | 0 | — | Waveform | |
| | #4 | B136 | 21 | 0 | — | Waveform | |
| | #5 | B136 | 20 | 0 | — | Waveform | |
| | #6 | B136 | 19 | 0 | — | Waveform | |
| Fuel injector | #1 | B137 | 1 | 10 — 13 | 1 — 14 | Waveform | |
| | #2 | B136 | 6 | 10 — 13 | 1 — 14 | Waveform | |
| | #3 | B136 | 5 | 10 — 13 | 1 — 14 | Waveform | |
| | #4 | B136 | 4 | 10 — 13 | 1 — 14 | Waveform | |
| | #5 | B136 | 3 | 10 — 13 | 1 — 14 | Waveform | |
| | #6 | B136 | 1 | 10 — 13 | 1 — 14 | Waveform | |
| Idle air control solenoid valve | Signal | B136 | 10 | 10 — 13 | — | Waveform | |
| Fuel pump relay control | | B136 | 15 | ON: 0.5, or less OFF: 10 — 13 | 0.5, or less | — | |
| A/C relay control | | B137 | 27 | ON: 0.5, or less OFF: 10 — 13 | ON: 0.5, or less OFF: 13 — 14 | — | |
| Radiator fan relay 1 control | | B137 | 17 | ON: 0.5, or less OFF: 10 — 13 | ON: 0.5, or less OFF: 13 — 14 | — | |
| Radiator fan relay 2 control | | B137 | 28 | ON: 0.5, or less OFF: 10 — 13 | ON: 0.5, or less OFF: 13 — 14 | With A/C vehicles only | |
| Radiator fan relay 3 control | | B137 | 24 | ON: 0.5, or less OFF: 10 — 13 | ON: 0.5, or less OFF: 13 — 14 | — | |
| Self-shutoff control | | B134 | 6 | 10 — 13 | 13 — 14 | — | |
| Malfunction indicator lamp | | B137 | 15 | — | — | Light "ON": 1, or less Light "OFF": 10 — 14 | |
| Engine speed output | | B136 | 9 | — | 0 — 13, or more | Waveform | |
| Torque control 1 signal | | B134 | 19 | 5 | 5 | — | |

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) | |
| Torque control 2 signal | B134 | 18 | 5 | 5 | — |
| Torque control cut signal | B136 | 14 | 8 | 8 | — |
| EGR solenoid valve (A-) | B137 | 26 | 10 — 13 | 13 — 14 | — |
| EGR solenoid valve (B-) | B137 | 25 | 10 — 13 | 13 — 14 | — |
| EGR solenoid valve (A+) | B137 | 14 | 10 — 13 | 13 — 14 | — |
| EGR solenoid valve (B+) | B137 | 13 | 10 — 13 | 13 — 14 | — |
| Induction control solenoid valve | B137 | 23 | 0 | ON: 0 OFF: 13 — 14 | — |
| Purge control solenoid valve | B137 | 16 | ON: 1, or less OFF: 10 — 13 | ON: 1, or less OFF: 13 — 14 | — |
| Fuel temperature sensor | B135 | 6 | 2.5 — 3.8 | 2.5 — 3.8 | Ambient temperature: 25°C (75°F) |
| Fuel level sensor | B135 | 25 | 0.12 — 4.75 | 0.12 — 4.75 | — |
| Fuel tank pressure sensor | Signal | B135 | 2.3 — 2.7 | 2.3 — 2.7 | The value obtained after the fuel filler cap was removed once and recapped. |
| | GND (sensor) | B134 | 15 | 0 | — |
| Fuel tank pressure control solenoid valve | B137 | 22 | ON: 1, or less OFF: 10 — 13 | ON: 1, or less OFF: 13 — 14 | — |
| Drain valve | B137 | 11 | ON: 1, or less OFF: 10 — 13 | ON: 1, or less OFF: 13 — 14 | — |
| A/C compressor switch | B134 | 13 | — | — | — |
| A/C pressure switch | B135 | 23 | — | — | — |
| AT diagnosis input signal | B135 | 20 | Less than 1 ↔ More than 4 | Less than 1 ↔ More than 4 | Waveform |
| AT load signal | B135 | 28 | 4.3 — 4.4 | 0.9 — 1.4 | — |
| Small light switch | B134 | 17 | ON: 0 OFF: 10 — 13 | ON: 0 OFF: 13 — 14 | — |
| Blower fan switch | B134 | 9 | ON: 0 OFF: 10 — 13 | ON: 0 OFF: 13 — 14 | — |
| Rear defogger switch | B134 | 3 | ON: 0 OFF: 10 — 13 | ON: 0 OFF: 13 — 14 | — |
| Front oxygen (A/F) sensor signal RH (+) | B137 | 29 | 3.7 — 3.9 | 3.7 — 3.9 | — |
| Front oxygen (A/F) sensor signal RH (-) | B137 | 19 | 2.6 — 4.4 | 3.4 — 3.6 | — |
| Front oxygen (A/F) sensor signal LH (+) | B137 | 30 | 3.7 — 3.9 | 3.7 — 3.9 | — |
| Front oxygen (A/F) sensor signal LH (-) | B137 | 20 | 2.6 — 4.4 | 3.4 — 3.6 | — |
| Front oxygen (A/F) sensor shield | B137 | 18 | 0 | 0 | — |
| Pressure sensor | B135 | 8 | 3.0 — 4.2 | 1.0 — 2.6 | — |
| Flash check switch | B134 | 20 | — | — | — |
| Intake air temperature sensor | B135 | 27 | — | — | — |
| Power steering switch | B137 | 24 | ON: 0 OFF: 5 | ON: 0 OFF: 5 | — |
| SSM/GST communication line | B134 | 21 | Less than 1 ↔ More than 4 | Less than 1 ↔ More than 4 | — |
| GND (sensors) | B134 | 15 | 0 | 0 | — |
| GND (injectors) | B136 | 8 | 0 | 0 | — |
| GND (ignition system) | B136 | 18 | 0 | 0 | — |

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) | |
| GND (power supply) | B134 | 22 | 0 | 0 | — |
| | B136 | 17 | 0 | 0 | — |
| GND (control systems) | B134 | 7 | 0 | 0 | — |
| | | 15 | 0 | 0 | — |
| GND (oxygen sensor heater LH) | 1 | B137 | 0 | 0 | — |
| | 2 | B137 | | | |
| GND (oxygen sensor heater RH) | 1 | B137 | 0 | 0 | — |
| | 2 | B137 | | | |

B: MEASUREMENT

S048526A14

Measure input/output signal voltage.

1. WAVEFORM

S048526A1401

