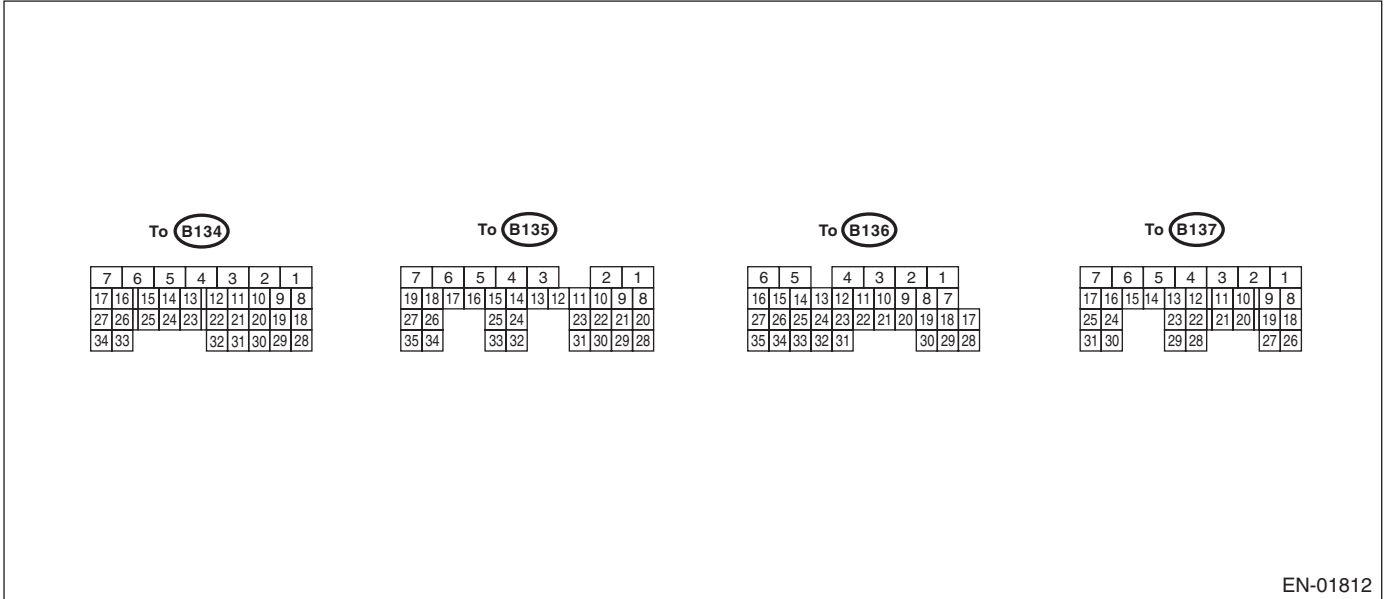


Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

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

A: ELECTRICAL SPECIFICATION



EN-01812

| 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 | — | |
| A/C middle pressure switch | B136 | 30 | 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) | | |
| Ignition switch | B137 | 15 | 10 — 13 | 13 — 14 | — | |
| Neutral position switch | B137 | 9 | ON: 0 OFF: 10 — 13 | ON: 0 OFF: 13 — 14 | — | |
| Line end check connector | B137 | 14 | 10 — 13 | 13 — 14 | When connected: 0 | |
| Knock sensor | Signal | B136 | 25 | 2.5 | — | |
| | Shield | B136 | 33 | 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 light | 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 | — |
| 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 | — |