

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

A: ELECTRICAL SPECIFICATION

A: TO B134

|    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|
| 7  | 6  | 5  | 4  | 3  | 2  | 1  |
| 17 | 16 | 15 | 14 | 13 | 12 | 11 |
| 27 | 26 | 25 | 24 | 23 | 22 | 21 |
| 34 | 33 |    |    | 32 | 31 | 30 |

B: TO B135

|    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|
| 7  | 6  | 5  | 4  | 3  |    | 2  | 1  |
| 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 |
| 27 | 26 |    | 25 | 24 |    | 23 | 22 |
| 35 | 34 |    | 33 | 32 |    | 31 | 30 |

C: TO B136

|    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|
| 6  | 5  |    | 4  | 3  | 2  | 1  |
| 16 | 15 | 14 | 13 | 12 | 11 | 10 |
| 27 | 26 | 25 | 24 | 23 | 22 | 21 |
| 35 | 34 | 33 | 32 | 31 |    | 30 |

D: TO B137

|    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|
| 7  | 6  | 5  | 4  | 3  | 2  | 1  |
| 17 | 16 | 15 | 14 | 13 | 12 | 11 |
| 25 | 24 |    |    | 23 | 22 | 21 |
| 31 | 30 |    |    | 29 | 28 | 27 |

EN-05288

# Engine Control Module (ECM) I/O Signal

## ENGINE (DIAGNOSTICS)

### • U5 model

| Contents                             |            | 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                               | —                                                            |
| 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    |            | B134          | 34           | 1.0 — 1.4                       | 1.0 — 1.4                       | After engine is warmed-up.                                   |
| Vehicle speed signal                 |            | B136          | 12           | 0 or 5                          | 0 or 5                          | "5" and "0" are repeatedly displayed when vehicle is driven. |
| 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<br>OFF: 0           | ON: 12 — 14<br>OFF: 0           | —                                                            |
| A/C middle pressure switch           |            | B136          | 33           | ON: 0<br>OFF: 10 — 13           | ON: 0<br>OFF: 12 — 14           | —                                                            |
| Ignition switch                      |            | B135          | 27           | 10 — 13                         | 12 — 14                         | —                                                            |
| Neutral position switch              |            | B136          | 31           | ON: 0<br>OFF: 10 — 13           | ON: 0<br>OFF: 12 — 14           | —                                                            |
| Test mode connector                  |            | B135          | 19           | 10 — 13                         | 13 — 14                         | When connected: 0                                            |
| Knock sensor                         | Signal     | B134          | 15           | 2.5                             | 2.5                             | —                                                            |
|                                      | Shield     | B134          | 25           | 0                               | 0                               | —                                                            |
| Back-up power supply                 |            | B135          | 5            | 10 — 13                         | 12 — 14                         | Ignition switch "OFF":<br>10 — 13                            |
| Control module power supply          |            | B134          | 7            | 10 — 13                         | 12 — 14                         | —                                                            |
|                                      |            | B135          | 2            | 10 — 13                         | 12 — 14                         | —                                                            |
| Ignition control                     | #1, #2     | B137          | 18           | 0                               | 1 — 3.4                         | Waveform                                                     |
|                                      | #3, #4     | B137          | 19           | 0                               | 1 — 3.4                         | Waveform                                                     |
| Fuel injector                        | #1         | B137          | 8            | 10 — 13                         | 1 — 14                          | Waveform                                                     |
|                                      | #2         | B137          | 9            | 10 — 13                         | 1 — 14                          | Waveform                                                     |
|                                      | #3         | B137          | 10           | 10 — 13                         | 1 — 14                          | Waveform                                                     |
|                                      | #4         | B137          | 11           | 10 — 13                         | 1 — 14                          | Waveform                                                     |
| Fuel pump relay control              |            | B136          | 13           | ON: 0.5 or less<br>OFF: 10 — 13 | ON: 0.5 or less<br>OFF: 12 — 14 | —                                                            |
| A/C relay control                    |            | B136          | 9            | ON: 0.5 or less<br>OFF: 10 — 13 | ON: 0.5 or less<br>OFF: 12 — 14 | —                                                            |

# Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

| Contents                              |              | Connector No. | Terminal No. | Signal (V)                        |                                             | Note                                                                |
|---------------------------------------|--------------|---------------|--------------|-----------------------------------|---------------------------------------------|---------------------------------------------------------------------|
|                                       |              |               |              | Ignition SW ON (engine OFF)       | Engine ON (idling)                          |                                                                     |
| Radiator fan relay 1 control          |              | B136          | 18           | ON: 0.5 or less<br>OFF: 10 — 13   | ON: 0.5 or less<br>OFF: 12 — 14             | —                                                                   |
| Radiator fan relay 2 control          |              | B136          | 29           | ON: 0.5 or less<br>OFF: 10 — 13   | ON: 0.5 or less<br>OFF: 12 — 14             | Model with A/C only                                                 |
| Starter relay control                 |              | B136          | 20           | ON: 0.5 or less<br>OFF: 10 — 13   | ON: 0.5 or less<br>OFF: 12 — 14             | —                                                                   |
| Self-shutoff control                  |              | B136          | 24           | 0.5 or less                       | 0.5 or less                                 | —                                                                   |
| Malfunction indicator light           |              | B136          | 11           | —                                 | —                                           | Light "ON": 1 or less<br>Light "OFF": 10 — 14                       |
| Engine speed output                   |              | B136          | 22           | —                                 | 0 — 13                                      | Waveform                                                            |
| Purge control solenoid valve          |              | B137          | 29           | ON: 1 or less<br>OFF: 10 — 13     | ON: 1 or less<br>OFF: 12 — 14               | Sensor output waveform                                              |
| Manifold absolute pressure sensor     |              | B134          | 6            | 3.4 — 3.8                         | 1.4 — 1.8                                   | —                                                                   |
| Fuel tank pressure sensor             | Signal       | B135          | 32           | 2.3 — 2.7                         | 2.3 — 2.7                                   | The valve operates when fuel filler cap is removed and reinstalled. |
|                                       | GND (sensor) | B135          | 30           | 0                                 | 0                                           |                                                                     |
| Pressure control solenoid valve       |              | B136          | 28           | ON: 1 or less<br>OFF: 10 — 13     | ON: 1 or less<br>OFF: 12 — 14               | —                                                                   |
| Drain valve                           |              | B136          | 17           | ON: 1 or less<br>OFF: 10 — 13     | ON: 1 or less<br>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          | 33           | ON: 0<br>OFF: 10 — 13             | ON: 0<br>OFF: 12 — 14                       | —                                                                   |
| Blower fan switch                     |              | B135          | 11           | ON: 0<br>OFF: 10 — 13             | ON: 0<br>OFF: 12 — 14                       | —                                                                   |
| Rear defogger switch                  |              | B135          | 13           | ON: 0<br>OFF: 10 — 13             | ON: 0<br>OFF: 12 — 14                       | —                                                                   |
| Power steering oil pressure switch    |              | B134          | 33           | ON: 1 or less<br>OFF: 10 — 13     | ON: 0<br>OFF: 12 — 14                       | —                                                                   |
| Front oxygen (A/F) sensor             | Signal (+)   | B135          | 9            | —                                 | 2.7 — 2.9                                   | —                                                                   |
|                                       | Signal (—)   | B135          | 8            | —                                 | 2.35 — 2.55                                 | —                                                                   |
|                                       | Shield       | B135          | 1            | 0                                 | 0                                           | —                                                                   |
| SSM communication line                |              | B136          | 16           | 1 or less ↔ 4 or more             | 1 or less ↔ 4 or more                       | —                                                                   |
| Electronic throttle control           | Main         | B134          | 18           | 0.64 — 0.72<br>Fully opened: 3.96 | 0.64 — 0.72<br>(After engine is warmed-up.) | Fully closed: 0.6<br>Fully opened: 3.96                             |
|                                       | Sub          | B134          | 28           | 1.51 — 1.58<br>Fully opened: 4.17 | 1.51 — 1.58<br>(After engine is warmed-up.) | Fully closed: 1.48<br>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                               | Drive frequency: 500 Hz                                             |
| Electronic throttle control motor (—) |              | B137          | 4            | Duty waveform                     | Duty waveform                               | Drive frequency: 500 Hz                                             |

# Engine Control Module (ECM) I/O Signal

## ENGINE (DIAGNOSTICS)

| Contents                                             |                    | Connector No. | Terminal No. | Signal (V)                                                                                                                                      |                                                                                                                                                 | Note                                     |
|------------------------------------------------------|--------------------|---------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
|                                                      |                    |               |              | Ignition SW ON (engine OFF)                                                                                                                     | Engine ON (idling)                                                                                                                              |                                          |
| Electronic throttle control motor power supply       |                    | B136          | 1            | 10 — 13                                                                                                                                         | 12 — 14                                                                                                                                         | —                                        |
| Electronic throttle control motor relay              |                    | B136          | 21           | 0                                                                                                                                               | 0                                                                                                                                               | When ignition switch is turned to ON: ON |
| Accelerator pedal position sensor                    | Main sensor signal | B135          | 23           | Fully closed: 0.7<br>Fully opened: 3.0                                                                                                          | Fully closed: 0.7<br>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<br>Fully opened: 3.0                                                                                                          | Fully closed: 0.7<br>Fully opened: 3.0                                                                                                          | —                                        |
|                                                      | Sub power supply   | B135          | 22           | 5                                                                                                                                               | 5                                                                                                                                               | —                                        |
|                                                      | GND (Sub sensor)   | B135          | 30           | 0                                                                                                                                               | 0                                                                                                                                               | —                                        |
| Cruise control set light                             |                    | B136          | 19           | ON: 0<br>OFF: 10 — 13                                                                                                                           | ON: 0<br>OFF: 12 — 14                                                                                                                           | —                                        |
| Main light                                           |                    | B135          | 3            | ON: 0<br>OFF: 10 — 13                                                                                                                           | ON: 0<br>OFF: 12 — 14                                                                                                                           | —                                        |
| Clutch switch                                        |                    | B136          | 25           | When clutch pedal is depressed: 0<br>When brake pedal is released: 10 — 13                                                                      | When clutch pedal is depressed: 0<br>When brake pedal is released: 12 — 14                                                                      | —                                        |
| Brake switch 1                                       |                    | B135          | 20           | When brake pedal is depressed: 0<br>When brake pedal is released: 10 — 13                                                                       | When brake pedal is depressed: 0<br>When brake pedal is released: 12 — 14                                                                       | —                                        |
| Brake switch 2                                       |                    | B135          | 28           | When brake pedal is depressed: 10 — 13<br>When brake pedal is released: 0                                                                       | When brake pedal is depressed: 12 — 14<br>When brake pedal is released: 0                                                                       | —                                        |
| Cruise control command switch                        |                    | B135          | 24           | When operating nothing: 3.5 — 4.5<br>When operating RES/ACC: 2.5 — 3.5<br>When operating SET/COAST: 0.5 — 1.5<br>When operating cancel: 0 — 0.5 | When operating nothing: 3.5 — 4.5<br>When operating RES/ACC: 2.5 — 3.5<br>When operating SET/COAST: 0.5 — 1.5<br>When operating cancel: 0 — 0.5 | —                                        |
| Cruise control main switch                           |                    | B135          | 12           | ON: 0<br>OFF: 5                                                                                                                                 | ON: 0<br>OFF: 5                                                                                                                                 | —                                        |
| Oil temperature sensor signal                        |                    | B134          | 23           | 1.0 — 1.4                                                                                                                                       | 1.0 — 1.4                                                                                                                                       | After engine is warmed-up.               |
| Variable valve lift diagnosis Oil pressure switch RH |                    | B134          | 31           | 0                                                                                                                                               | 0                                                                                                                                               | —                                        |
| Variable valve lift diagnosis Oil pressure switch LH |                    | B134          | 32           | 0                                                                                                                                               | 0                                                                                                                                               | —                                        |
| Oil switching solenoid valve RH                      | Signal (+)         | B137          | 25           | 0                                                                                                                                               | Duty waveform                                                                                                                                   | Drive frequency: 300 Hz                  |
|                                                      | Signal (—)         | B137          | 24           | 0                                                                                                                                               | 0                                                                                                                                               | —                                        |
| Oil switching solenoid valve LH                      | Signal (+)         | B137          | 31           | 0                                                                                                                                               | Duty waveform                                                                                                                                   | Drive frequency: 300 Hz                  |
|                                                      | Signal (—)         | B137          | 30           | 0                                                                                                                                               | 0                                                                                                                                               | —                                        |

# Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

| Contents                      |              | Connector No. | Terminal No. | Signal (V)                  |                    | Note                                                 |
|-------------------------------|--------------|---------------|--------------|-----------------------------|--------------------|------------------------------------------------------|
|                               |              |               |              | Ignition SW ON (engine OFF) | Engine ON (idling) |                                                      |
| Blow-by leak diagnosis signal |              | B134          | 30           | 0                           | 0                  | When there is an open circuit (malfunction): 10 — 14 |
| Serial Communication Link     | Signal (+)   | B136          | 27           | Pulse signal                |                    | —                                                    |
|                               | Signal (–)   | B136          | 35           | Pulse signal                |                    | —                                                    |
| EGR valve                     | Signal 1     | B134          | 8            | 10 — 13                     | 0 or 12 — 14       | —                                                    |
|                               | Signal 2     | B134          | 9            | 10 — 13                     | 0 or 12 — 14       | —                                                    |
|                               | Signal 3     | B134          | 10           | 10 — 13                     | 0 or 12 — 14       | —                                                    |
|                               | Signal 4     | B134          | 20           | 10 — 13                     | 0 or 12 — 14       | —                                                    |
| GND                           | (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                  | —                                                    |

# Engine Control Module (ECM) I/O Signal

## ENGINE (DIAGNOSTICS)

### • U6 model

| Contents                             |            | 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                               | —                                                            |
| 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    |            | B134          | 34           | 1.0 — 1.4                       | 1.0 — 1.4                       | After engine is warmed-up.                                   |
| Vehicle speed signal                 |            | B136          | 12           | 0 or 5                          | 0 or 5                          | "5" and "0" are repeatedly displayed when vehicle is driven. |
| 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<br>OFF: 0           | ON: 12 — 14<br>OFF: 0           | —                                                            |
| A/C middle pressure switch           |            | B136          | 33           | ON: 0<br>OFF: 10 — 13           | ON: 0<br>OFF: 12 — 14           | —                                                            |
| Ignition switch                      |            | B135          | 27           | 10 — 13                         | 12 — 14                         | —                                                            |
| Neutral position switch              |            | B136          | 31           | ON: 0<br>OFF: 10 — 13           | ON: 0<br>OFF: 12 — 14           | —                                                            |
| Test mode connector                  |            | B135          | 19           | 10 — 13                         | 13 — 14                         | When connected: 0                                            |
| Knock sensor                         | Signal     | B134          | 15           | 2.5                             | 2.5                             | —                                                            |
|                                      | Shield     | B134          | 25           | 0                               | 0                               | —                                                            |
| Back-up power supply                 |            | B135          | 5            | 10 — 13                         | 12 — 14                         | Ignition switch "OFF": 10 — 13                               |
| Control module power supply          |            | B134          | 7            | 10 — 13                         | 12 — 14                         | —                                                            |
|                                      |            | B135          | 2            | 10 — 13                         | 12 — 14                         | —                                                            |
| Ignition control                     | #1, #2     | B137          | 18           | 0                               | 1 — 3.4                         | Waveform                                                     |
|                                      | #3, #4     | B137          | 19           | 0                               | 1 — 3.4                         | Waveform                                                     |
| Fuel injector                        | #1         | B137          | 8            | 10 — 13                         | 1 — 14                          | Waveform                                                     |
|                                      | #2         | B137          | 9            | 10 — 13                         | 1 — 14                          | Waveform                                                     |
|                                      | #3         | B137          | 10           | 10 — 13                         | 1 — 14                          | Waveform                                                     |
|                                      | #4         | B137          | 11           | 10 — 13                         | 1 — 14                          | Waveform                                                     |
| Fuel pump relay control              |            | B136          | 13           | ON: 0.5 or less<br>OFF: 10 — 13 | ON: 0.5 or less<br>OFF: 12 — 14 | —                                                            |
| A/C relay control                    |            | B136          | 9            | ON: 0.5 or less<br>OFF: 10 — 13 | ON: 0.5 or less<br>OFF: 12 — 14 | —                                                            |

# Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

| Contents                              |              | Connector No. | Terminal No. | Signal (V)                        |                                             | Note                                                                |
|---------------------------------------|--------------|---------------|--------------|-----------------------------------|---------------------------------------------|---------------------------------------------------------------------|
|                                       |              |               |              | Ignition SW ON (engine OFF)       | Engine ON (idling)                          |                                                                     |
| Radiator fan relay 1 control          |              | B136          | 18           | ON: 0.5 or less<br>OFF: 10 — 13   | ON: 0.5 or less<br>OFF: 12 — 14             | —                                                                   |
| Radiator fan relay 2 control          |              | B136          | 29           | ON: 0.5 or less<br>OFF: 10 — 13   | ON: 0.5 or less<br>OFF: 12 — 14             | Model with A/C only                                                 |
| Starter relay control                 |              | B136          | 20           | ON: 0.5 or less<br>OFF: 10 — 13   | ON: 0.5 or less<br>OFF: 12 — 14             | —                                                                   |
| Self-shutoff control                  |              | B136          | 24           | 0.5 or less                       | 0.5 or less                                 | —                                                                   |
| Malfunction indicator light           |              | B136          | 11           | —                                 | —                                           | Light "ON": 1 or less<br>Light "OFF": 10 — 14                       |
| Engine speed output                   |              | B136          | 22           | —                                 | 0 — 13                                      | Waveform                                                            |
| Purge control solenoid valve          |              | B137          | 29           | ON: 1 or less<br>OFF: 10 — 13     | ON: 1 or less<br>OFF: 12 — 14               | Sensor output waveform                                              |
| Manifold absolute pressure sensor     |              | B134          | 6            | 3.4 — 3.8                         | 1.4 — 1.8                                   | —                                                                   |
| Fuel tank pressure sensor             | Signal       | B135          | 32           | 2.3 — 2.7                         | 2.3 — 2.7                                   | The valve operates when fuel filler cap is removed and reinstalled. |
|                                       | GND (sensor) | B135          | 30           | 0                                 | 0                                           |                                                                     |
| Pressure control solenoid valve       |              | B136          | 28           | ON: 1 or less<br>OFF: 10 — 13     | ON: 1 or less<br>OFF: 12 — 14               | —                                                                   |
| Drain valve                           |              | B136          | 17           | ON: 1 or less<br>OFF: 10 — 13     | ON: 1 or less<br>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<br>OFF: 10 — 13             | ON: 0<br>OFF: 12 — 14                       | —                                                                   |
| Blower fan switch                     |              | B135          | 16           | ON: 0<br>OFF: 10 — 13             | ON: 0<br>OFF: 12 — 14                       | —                                                                   |
| Rear defogger switch                  |              | B135          | 14           | ON: 0<br>OFF: 10 — 13             | ON: 0<br>OFF: 12 — 14                       | —                                                                   |
| Power steering oil pressure switch    |              | B134          | 33           | ON: 1 or less<br>OFF: 10 — 13     | ON: 0<br>OFF: 12 — 14                       | —                                                                   |
| Front oxygen (A/F) sensor             | Signal (+)   | B135          | 9            | —                                 | 2.7 — 2.9                                   | —                                                                   |
|                                       | Signal (—)   | B135          | 8            | —                                 | 2.35 — 2.55                                 | —                                                                   |
|                                       | Shield       | B135          | 1            | 0                                 | 0                                           | —                                                                   |
| SSM communication line                |              | B136          | 16           | 1 or less ↔ 4 or more             | 1 or less ↔ 4 or more                       | —                                                                   |
| Electronic throttle control           | Main         | B134          | 18           | 0.64 — 0.72<br>Fully opened: 3.96 | 0.64 — 0.72<br>(After engine is warmed-up.) | Fully closed: 0.6<br>Fully opened: 3.96                             |
|                                       | Sub          | B134          | 28           | 1.51 — 1.58<br>Fully opened: 4.17 | 1.51 — 1.58<br>(After engine is warmed-up.) | Fully closed: 1.48<br>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                               | Drive frequency: 500 Hz                                             |
| Electronic throttle control motor (—) |              | B137          | 4            | Duty waveform                     | Duty waveform                               | Drive frequency: 500 Hz                                             |

# Engine Control Module (ECM) I/O Signal

## ENGINE (DIAGNOSTICS)

| Contents                                                |                    | Connector No. | Terminal No. | Signal (V)                                                                                                                                      |                                                                                                                                                 | Note                                     |
|---------------------------------------------------------|--------------------|---------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
|                                                         |                    |               |              | Ignition SW ON (engine OFF)                                                                                                                     | Engine ON (idling)                                                                                                                              |                                          |
| Electronic throttle control motor power supply          |                    | B136          | 1            | 10 — 13                                                                                                                                         | 12 — 14                                                                                                                                         | —                                        |
| Electronic throttle control motor relay                 |                    | B136          | 21           | 0                                                                                                                                               | 0                                                                                                                                               | When ignition switch is turned to ON: ON |
| Accelerator pedal position sensor                       | Main sensor signal | B135          | 23           | Fully closed: 0.7<br>Fully opened: 3.0                                                                                                          | Fully closed: 0.7<br>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<br>Fully opened: 3.0                                                                                                          | Fully closed: 0.7<br>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<br>OFF: 10 — 13                                                                                                                           | ON: 0<br>OFF: 12 — 14                                                                                                                           | —                                        |
| Main light                                              |                    | B135          | 6            | ON: 0<br>OFF: 10 — 13                                                                                                                           | ON: 0<br>OFF: 12 — 14                                                                                                                           | —                                        |
| Clutch switch                                           |                    | B136          | 25           | When clutch pedal is depressed: 0<br>When brake pedal is released: 10 — 13                                                                      | When clutch pedal is depressed: 0<br>When brake pedal is released: 12 — 14                                                                      | —                                        |
| Brake switch 1                                          |                    | B135          | 20           | When brake pedal is depressed: 0<br>When brake pedal is released: 10 — 13                                                                       | When brake pedal is depressed: 0<br>When brake pedal is released: 12 — 14                                                                       | —                                        |
| Brake switch 2                                          |                    | B135          | 28           | When brake pedal is depressed: 10 — 13<br>When brake pedal is released: 0                                                                       | When brake pedal is depressed: 12 — 14<br>When brake pedal is released: 0                                                                       | —                                        |
| Cruise control command switch                           |                    | B135          | 24           | When operating nothing: 3.5 — 4.5<br>When operating RES/ACC: 2.5 — 3.5<br>When operating SET/COAST: 0.5 — 1.5<br>When operating cancel: 0 — 0.5 | When operating nothing: 3.5 — 4.5<br>When operating RES/ACC: 2.5 — 3.5<br>When operating SET/COAST: 0.5 — 1.5<br>When operating cancel: 0 — 0.5 | —                                        |
| Cruise control main switch                              |                    | B135          | 12           | ON: 0<br>OFF: 5                                                                                                                                 | ON: 0<br>OFF: 5                                                                                                                                 | —                                        |
| Oil temperature sensor signal                           |                    | B134          | 23           | 1.0 — 1.4                                                                                                                                       | 1.0 — 1.4                                                                                                                                       | After engine is warmed-up.               |
| Variable valve lift diagnosis<br>Oil pressure switch RH |                    | B134          | 31           | 0                                                                                                                                               | 0                                                                                                                                               | —                                        |

# Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

| Contents                                                |              | Connector No. | Terminal No. | Signal (V)                  |                    | Note                                                    |
|---------------------------------------------------------|--------------|---------------|--------------|-----------------------------|--------------------|---------------------------------------------------------|
|                                                         |              |               |              | Ignition SW ON (engine OFF) | Engine ON (idling) |                                                         |
| Variable valve lift diagnosis<br>Oil pressure switch LH |              | B134          | 32           | 0                           | 0                  | —                                                       |
| Oil switching solenoid valve RH                         | Signal (+)   | B137          | 25           | 0                           | Duty waveform      | Drive frequency: 300 Hz                                 |
|                                                         | Signal (–)   | B137          | 24           | 0                           | 0                  | —                                                       |
| Oil switching solenoid valve LH                         | Signal (+)   | B137          | 31           | 0                           | Duty waveform      | Drive frequency: 300 Hz                                 |
|                                                         | Signal (–)   | B137          | 30           | 0                           | 0                  | —                                                       |
| Blow-by leak diagnosis signal                           |              | B134          | 30           | 0                           | 0                  | When there is an open circuit (malfunction):<br>10 — 14 |
| Serial Communication Link                               | Signal (+)   | B136          | 27           | Pulse signal                |                    | —                                                       |
|                                                         | Signal (–)   | B136          | 35           | Pulse signal                |                    | —                                                       |
| EGR valve                                               | Signal 1     | B134          | 8            | 10 — 13                     | 0 or 12 — 14       | —                                                       |
|                                                         | Signal 2     | B134          | 9            | 10 — 13                     | 0 or 12 — 14       | —                                                       |
|                                                         | Signal 3     | B134          | 10           | 10 — 13                     | 0 or 12 — 14       | —                                                       |
|                                                         | Signal 4     | B134          | 20           | 10 — 13                     | 0 or 12 — 14       | —                                                       |
| GND                                                     | (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                  | —                                                       |

# Engine Control Module (ECM) I/O Signal

## ENGINE (DIAGNOSTICS)

### • C0 model

| Contents                             |            | 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                               | —                                                            |
| 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    |            | B134          | 34           | 1.0 — 1.4                       | 1.0 — 1.4                       | After engine is warmed-up.                                   |
| Vehicle speed signal                 |            | B136          | 13           | 0 or 5                          | 0 or 5                          | "5" and "0" are repeatedly displayed when vehicle is driven. |
| 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          | 24           | ON: 10 — 13<br>OFF: 0           | ON: 12 — 14<br>OFF: 0           | —                                                            |
| A/C middle pressure switch           |            | B136          | 33           | ON: 0<br>OFF: 10 — 13           | ON: 0<br>OFF: 12 — 14           | —                                                            |
| Ignition switch                      |            | B135          | 19           | 10 — 13                         | 12 — 14                         | —                                                            |
| Neutral position switch              |            | B136          | 31           | ON: 0<br>OFF: 10 — 13           | ON: 0<br>OFF: 12 — 14           | —                                                            |
| Test mode connector                  |            | B135          | 27           | 10 — 13                         | 13 — 14                         | When connected: 0                                            |
| Knock sensor                         | Signal     | B134          | 15           | 2.5                             | 2.5                             | —                                                            |
|                                      | Shield     | B134          | 25           | 0                               | 0                               | —                                                            |
| Back-up power supply                 |            | B135          | 5            | 10 — 13                         | 12 — 14                         | Ignition switch "OFF": 10 — 13                               |
| Control module power supply          |            | B134          | 7            | 10 — 13                         | 12 — 14                         | —                                                            |
|                                      |            | B135          | 2            | 10 — 13                         | 12 — 14                         | —                                                            |
| Ignition control                     | #1, #2     | B137          | 18           | 0                               | 1 — 3.4                         | Waveform                                                     |
|                                      | #3, #4     | B137          | 19           | 0                               | 1 — 3.4                         | Waveform                                                     |
| Fuel injector                        | #1         | B137          | 8            | 10 — 13                         | 1 — 14                          | Waveform                                                     |
|                                      | #2         | B137          | 9            | 10 — 13                         | 1 — 14                          | Waveform                                                     |
|                                      | #3         | B137          | 10           | 10 — 13                         | 1 — 14                          | Waveform                                                     |
|                                      | #4         | B137          | 11           | 10 — 13                         | 1 — 14                          | Waveform                                                     |
| Fuel pump relay control              |            | B136          | 12           | ON: 0.5 or less<br>OFF: 10 — 13 | ON: 0.5 or less<br>OFF: 12 — 14 | —                                                            |
| A/C relay control                    |            | B136          | 9            | ON: 0.5 or less<br>OFF: 10 — 13 | ON: 0.5 or less<br>OFF: 12 — 14 | —                                                            |

# Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

| Contents                              |              | Connector No. | Terminal No. | Signal (V)                        |                                             | Note                                                                |
|---------------------------------------|--------------|---------------|--------------|-----------------------------------|---------------------------------------------|---------------------------------------------------------------------|
|                                       |              |               |              | Ignition SW ON (engine OFF)       | Engine ON (idling)                          |                                                                     |
| Radiator fan relay 1 control          |              | B136          | 18           | ON: 0.5 or less<br>OFF: 10 — 13   | ON: 0.5 or less<br>OFF: 12 — 14             | —                                                                   |
| Radiator fan relay 2 control          |              | B136          | 29           | ON: 0.5 or less<br>OFF: 10 — 13   | ON: 0.5 or less<br>OFF: 12 — 14             | Model with A/C only                                                 |
| Starter relay control                 |              | B136          | 20           | ON: 0.5 or less<br>OFF: 10 — 13   | ON: 0.5 or less<br>OFF: 12 — 14             | —                                                                   |
| Self-shutoff control                  |              | B136          | 23           | 0.5 or less                       | 0.5 or less                                 | —                                                                   |
| Malfunction indicator light           |              | B136          | 11           | —                                 | —                                           | Light "ON": 1 or less<br>Light "OFF": 10 — 14                       |
| Engine speed output                   |              | B136          | 22           | —                                 | 0 — 13                                      | Waveform                                                            |
| Purge control solenoid valve          |              | B137          | 29           | ON: 1 or less<br>OFF: 10 — 13     | ON: 1 or less<br>OFF: 12 — 14               | Sensor output waveform                                              |
| Manifold absolute pressure sensor     |              | B134          | 6            | 3.4 — 3.8                         | 1.4 — 1.8                                   | —                                                                   |
| Fuel tank pressure sensor             | Signal       | B135          | 32           | 2.3 — 2.7                         | 2.3 — 2.7                                   | The valve operates when fuel filler cap is removed and reinstalled. |
|                                       | GND (sensor) | B135          | 30           | 0                                 | 0                                           |                                                                     |
| Pressure control solenoid valve       |              | B136          | 28           | ON: 1 or less<br>OFF: 10 — 13     | ON: 1 or less<br>OFF: 12 — 14               | —                                                                   |
| Drain valve                           |              | B136          | 17           | ON: 1 or less<br>OFF: 10 — 13     | ON: 1 or less<br>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<br>OFF: 10 — 13             | ON: 0<br>OFF: 12 — 14                       | —                                                                   |
| Blower fan switch                     |              | B135          | 16           | ON: 0<br>OFF: 10 — 13             | ON: 0<br>OFF: 12 — 14                       | —                                                                   |
| Rear defogger switch                  |              | B135          | 14           | ON: 0<br>OFF: 10 — 13             | ON: 0<br>OFF: 12 — 14                       | —                                                                   |
| Power steering oil pressure switch    |              | B134          | 33           | ON: 1 or less<br>OFF: 10 — 13     | ON: 0<br>OFF: 12 — 14                       | —                                                                   |
| Front oxygen (A/F) sensor             | Signal (+)   | B135          | 9            | —                                 | 2.7 — 2.9                                   | —                                                                   |
|                                       | Signal (—)   | B135          | 8            | —                                 | 2.35 — 2.55                                 | —                                                                   |
|                                       | Shield       | B135          | 1            | 0                                 | 0                                           | —                                                                   |
| SSM communication line                |              | B136          | 16           | 1 or less ↔ 4 or more             | 1 or less ↔ 4 or more                       | —                                                                   |
| Electronic throttle control           | Main         | B134          | 18           | 0.64 — 0.72<br>Fully opened: 3.96 | 0.64 — 0.72<br>(After engine is warmed-up.) | Fully closed: 0.6<br>Fully opened: 3.96                             |
|                                       | Sub          | B134          | 28           | 1.51 — 1.58<br>Fully opened: 4.17 | 1.51 — 1.58<br>(After engine is warmed-up.) | Fully closed: 1.48<br>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                               | Drive frequency: 500 Hz                                             |
| Electronic throttle control motor (—) |              | B137          | 4            | Duty waveform                     | Duty waveform                               | Drive frequency: 500 Hz                                             |

# Engine Control Module (ECM) I/O Signal

## ENGINE (DIAGNOSTICS)

| Contents                                                |                    | Connector No. | Terminal No. | Signal (V)                                                                                                                                      |                                                                                                                                                 | Note                                     |
|---------------------------------------------------------|--------------------|---------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
|                                                         |                    |               |              | Ignition SW ON (engine OFF)                                                                                                                     | Engine ON (idling)                                                                                                                              |                                          |
| Electronic throttle control motor power supply          |                    | B136          | 1            | 10 — 13                                                                                                                                         | 12 — 14                                                                                                                                         | —                                        |
| Electronic throttle control motor relay                 |                    | B136          | 21           | 0                                                                                                                                               | 0                                                                                                                                               | When ignition switch is turned to ON: ON |
| Accelerator pedal position sensor                       | Main sensor signal | B135          | 23           | Fully closed: 0.7<br>Fully opened: 3.0                                                                                                          | Fully closed: 0.7<br>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<br>Fully opened: 3.0                                                                                                          | Fully closed: 0.7<br>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<br>OFF: 10 — 13                                                                                                                           | ON: 0<br>OFF: 12 — 14                                                                                                                           | —                                        |
| Main light                                              |                    | B135          | 6            | ON: 0<br>OFF: 10 — 13                                                                                                                           | ON: 0<br>OFF: 12 — 14                                                                                                                           | —                                        |
| Clutch switch                                           |                    | B136          | 25           | When clutch pedal is depressed: 0<br>When brake pedal is released: 10 — 13                                                                      | When clutch pedal is depressed: 0<br>When brake pedal is released: 12 — 14                                                                      | —                                        |
| Brake switch 1                                          |                    | B135          | 20           | When brake pedal is depressed: 0<br>When brake pedal is released: 10 — 13                                                                       | When brake pedal is depressed: 0<br>When brake pedal is released: 12 — 14                                                                       | —                                        |
| Brake switch 2                                          |                    | B135          | 28           | When brake pedal is depressed: 10 — 13<br>When brake pedal is released: 0                                                                       | When brake pedal is depressed: 12 — 14<br>When brake pedal is released: 0                                                                       | —                                        |
| Cruise control command switch                           |                    | B135          | 24           | When operating nothing: 3.5 — 4.5<br>When operating RES/ACC: 2.5 — 3.5<br>When operating SET/COAST: 0.5 — 1.5<br>When operating cancel: 0 — 0.5 | When operating nothing: 3.5 — 4.5<br>When operating RES/ACC: 2.5 — 3.5<br>When operating SET/COAST: 0.5 — 1.5<br>When operating cancel: 0 — 0.5 | —                                        |
| Cruise control main switch                              |                    | B135          | 12           | ON: 0<br>OFF: 5                                                                                                                                 | ON: 0<br>OFF: 5                                                                                                                                 | —                                        |
| Oil temperature sensor signal                           |                    | B134          | 23           | 1.0 — 1.4                                                                                                                                       | 1.0 — 1.4                                                                                                                                       | After engine is warmed-up.               |
| Variable valve lift diagnosis<br>Oil pressure switch RH |                    | B134          | 31           | 0                                                                                                                                               | 0                                                                                                                                               | —                                        |
| Variable valve lift diagnosis<br>Oil pressure switch LH |                    | B134          | 32           | 0                                                                                                                                               | 0                                                                                                                                               | —                                        |

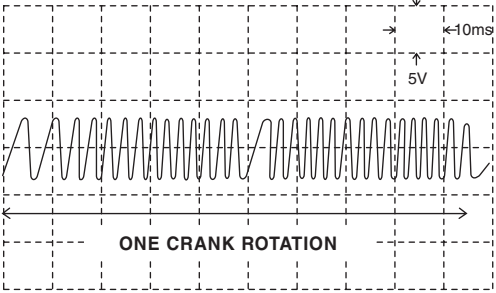
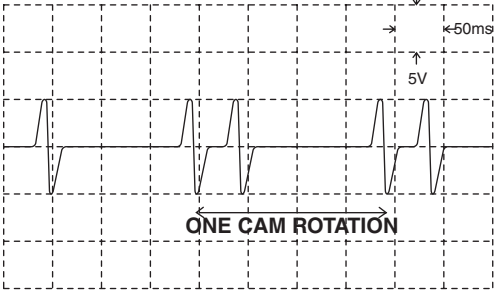
# Engine Control Module (ECM) I/O Signal

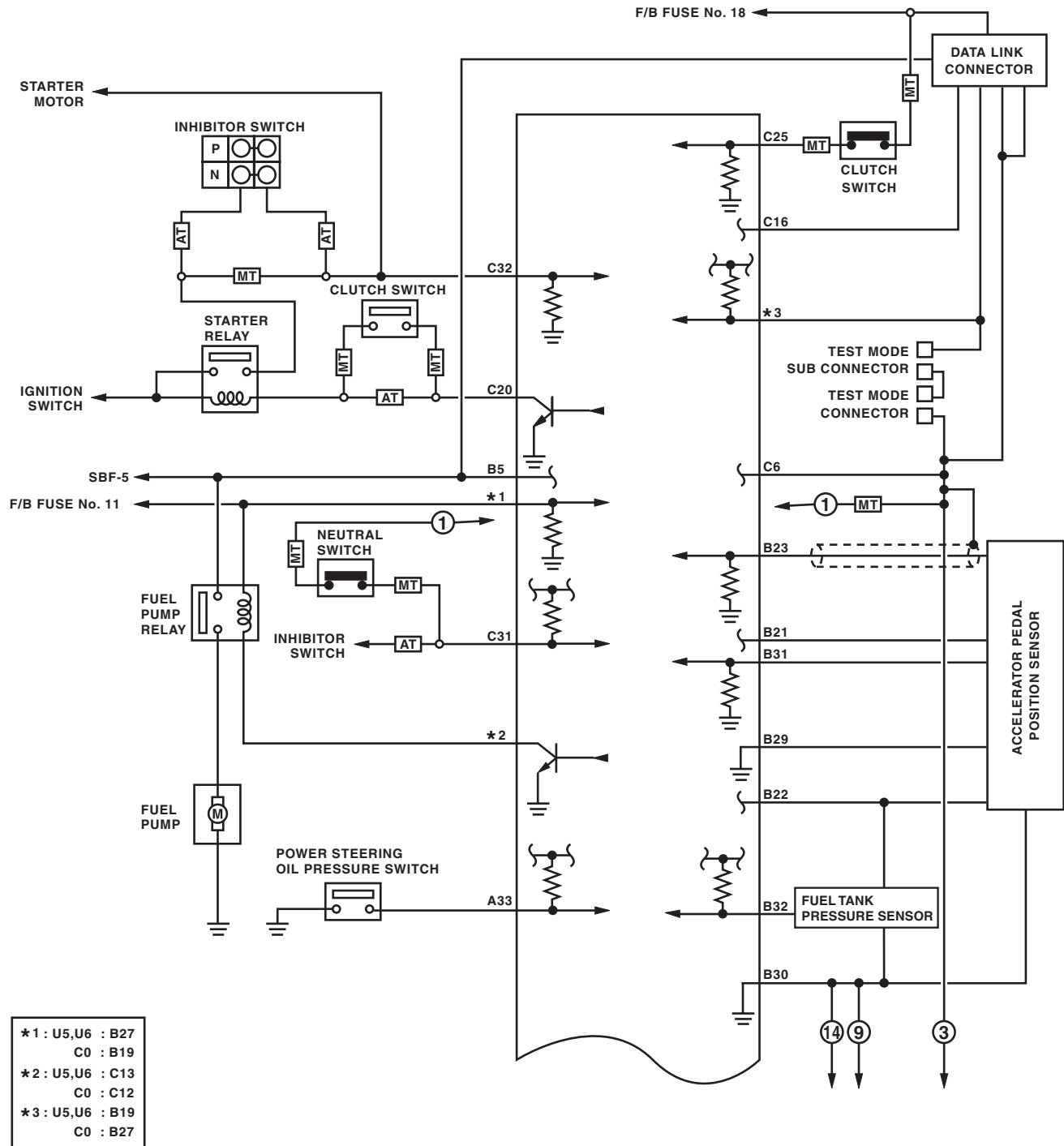
ENGINE (DIAGNOSTICS)

| Contents                        |              | Connector No. | Terminal No. | Signal (V)                  |                    | Note                                                    |
|---------------------------------|--------------|---------------|--------------|-----------------------------|--------------------|---------------------------------------------------------|
|                                 |              |               |              | Ignition SW ON (engine OFF) | Engine ON (idling) |                                                         |
| Oil switching solenoid valve RH | Signal (+)   | B137          | 25           | 0                           | Duty waveform      | Drive frequency: 300 Hz                                 |
|                                 | Signal (-)   | B137          | 24           | 0                           | 0                  | —                                                       |
| Oil switching solenoid valve LH | Signal (+)   | B137          | 31           | 0                           | Duty waveform      | Drive frequency: 300 Hz                                 |
|                                 | Signal (-)   | B137          | 30           | 0                           | 0                  | —                                                       |
| Blow-by leak diagnosis signal   |              | B134          | 30           | 0                           | 0                  | When there is an open circuit (malfunction):<br>10 — 14 |
| Serial Communication Link       | Signal (+)   | B136          | 27           | Pulse signal                |                    | —                                                       |
|                                 | Signal (-)   | B136          | 35           | Pulse signal                |                    | —                                                       |
| EGR valve                       | Signal 1     | B134          | 8            | 10 — 13                     | 0 or 12 — 14       | —                                                       |
|                                 | Signal 2     | B134          | 9            | 10 — 13                     | 0 or 12 — 14       | —                                                       |
|                                 | Signal 3     | B134          | 10           | 10 — 13                     | 0 or 12 — 14       | —                                                       |
|                                 | Signal 4     | B134          | 20           | 10 — 13                     | 0 or 12 — 14       | —                                                       |
| GND                             | (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                  | —                                                       |

# Engine Control Module (ECM) I/O Signal

## ENGINE (DIAGNOSTICS)

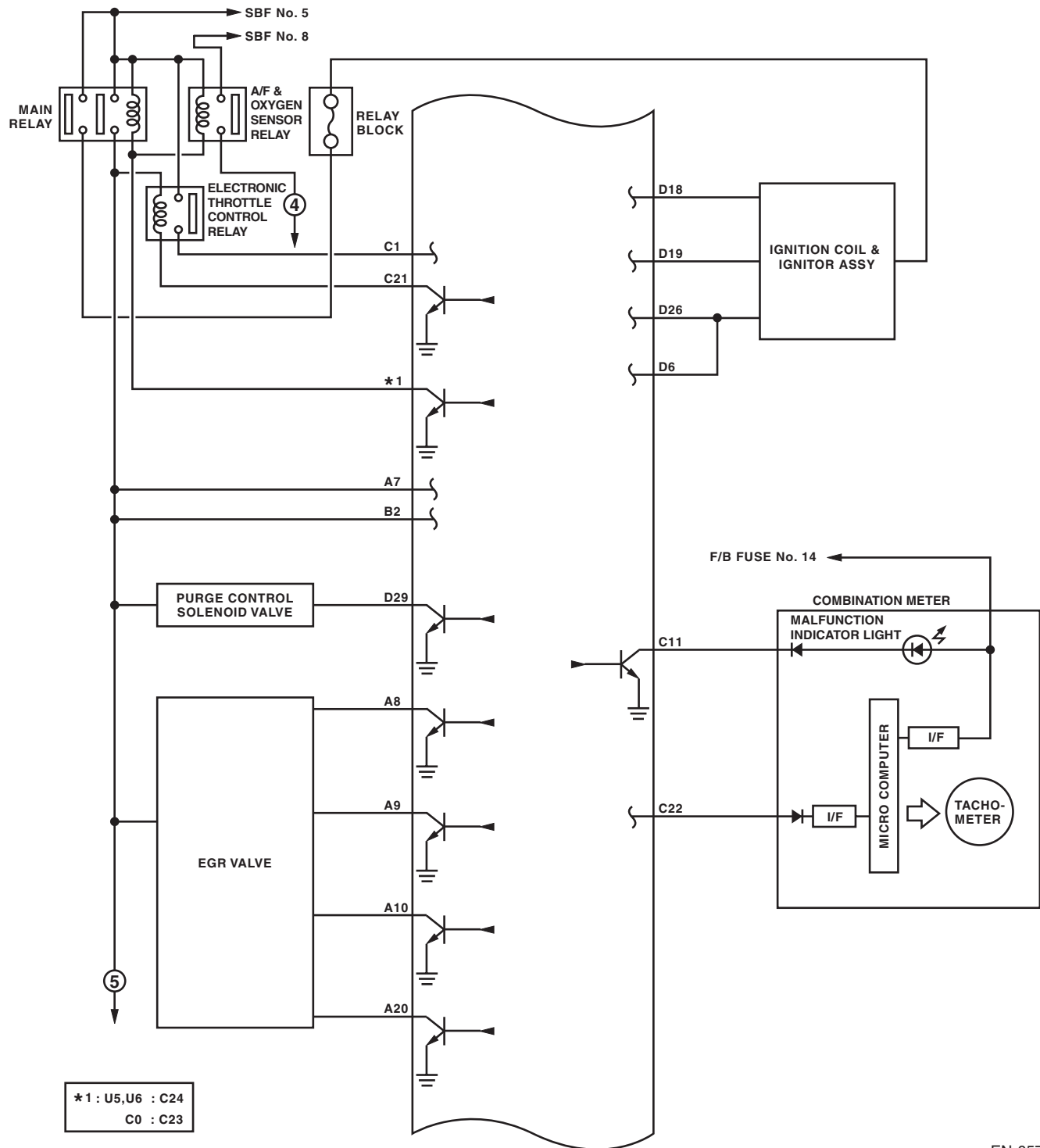
| Input/output name             | Measuring condition | Waveform                                                                                           |
|-------------------------------|---------------------|----------------------------------------------------------------------------------------------------|
| 1. Crankshaft position sensor | During idling       |  <p>EN-05322</p> |
| 2. Camshaft position sensor   | During idling       |  <p>EN-05323</p> |



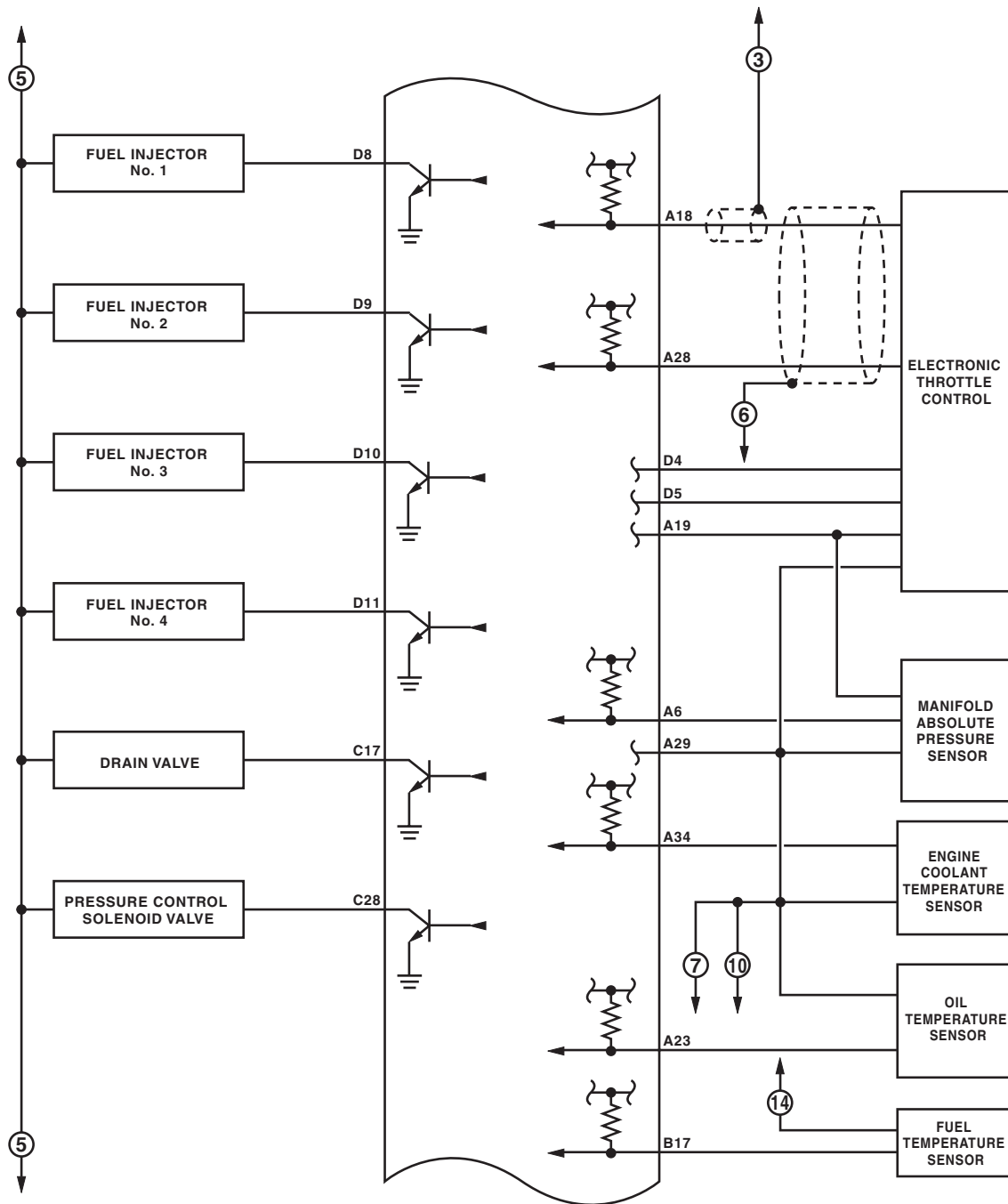
EN-05737

# Engine Control Module (ECM) I/O Signal

## ENGINE (DIAGNOSTICS)



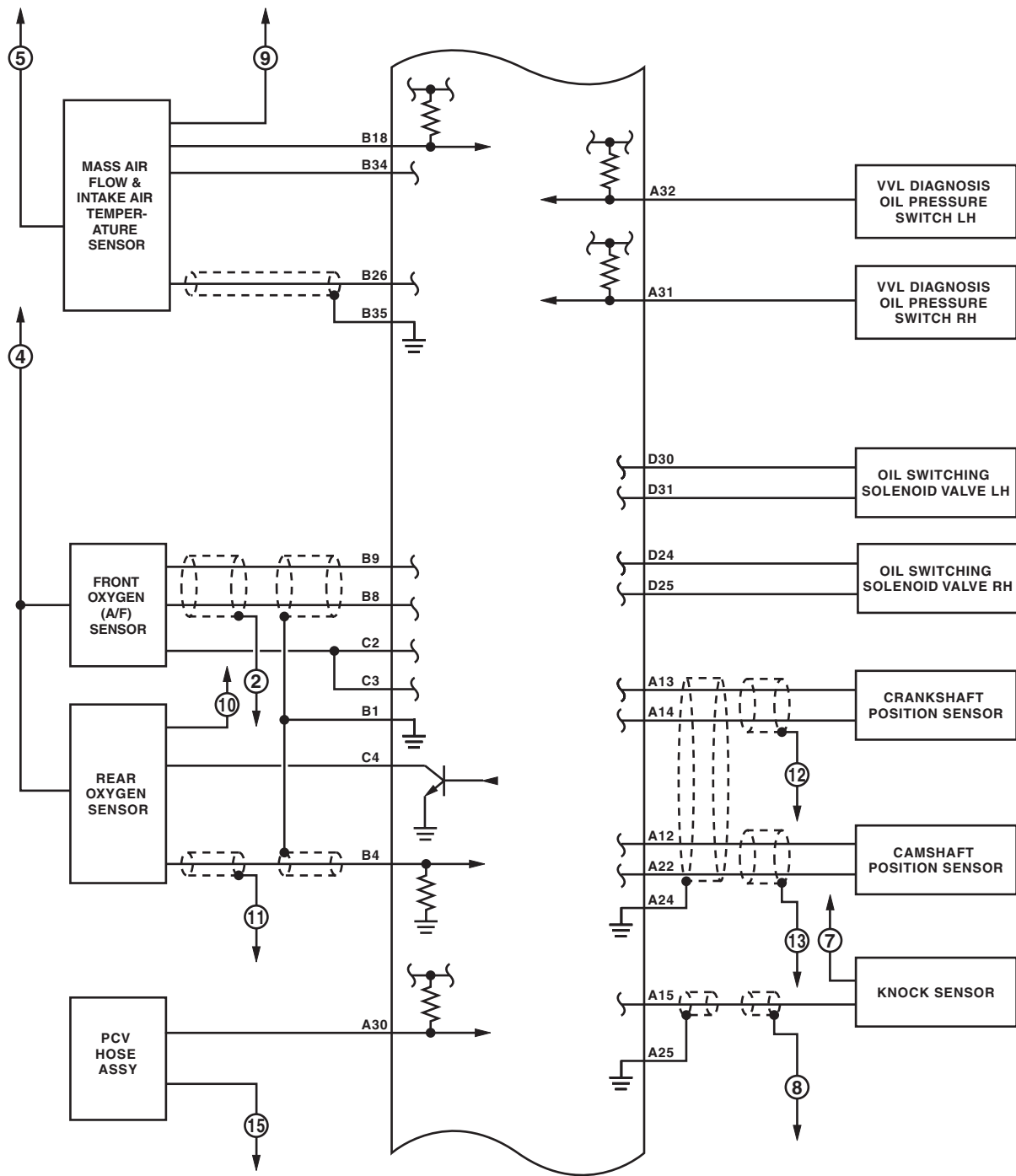
EN-05738



EN-05382

# Engine Control Module (ECM) I/O Signal

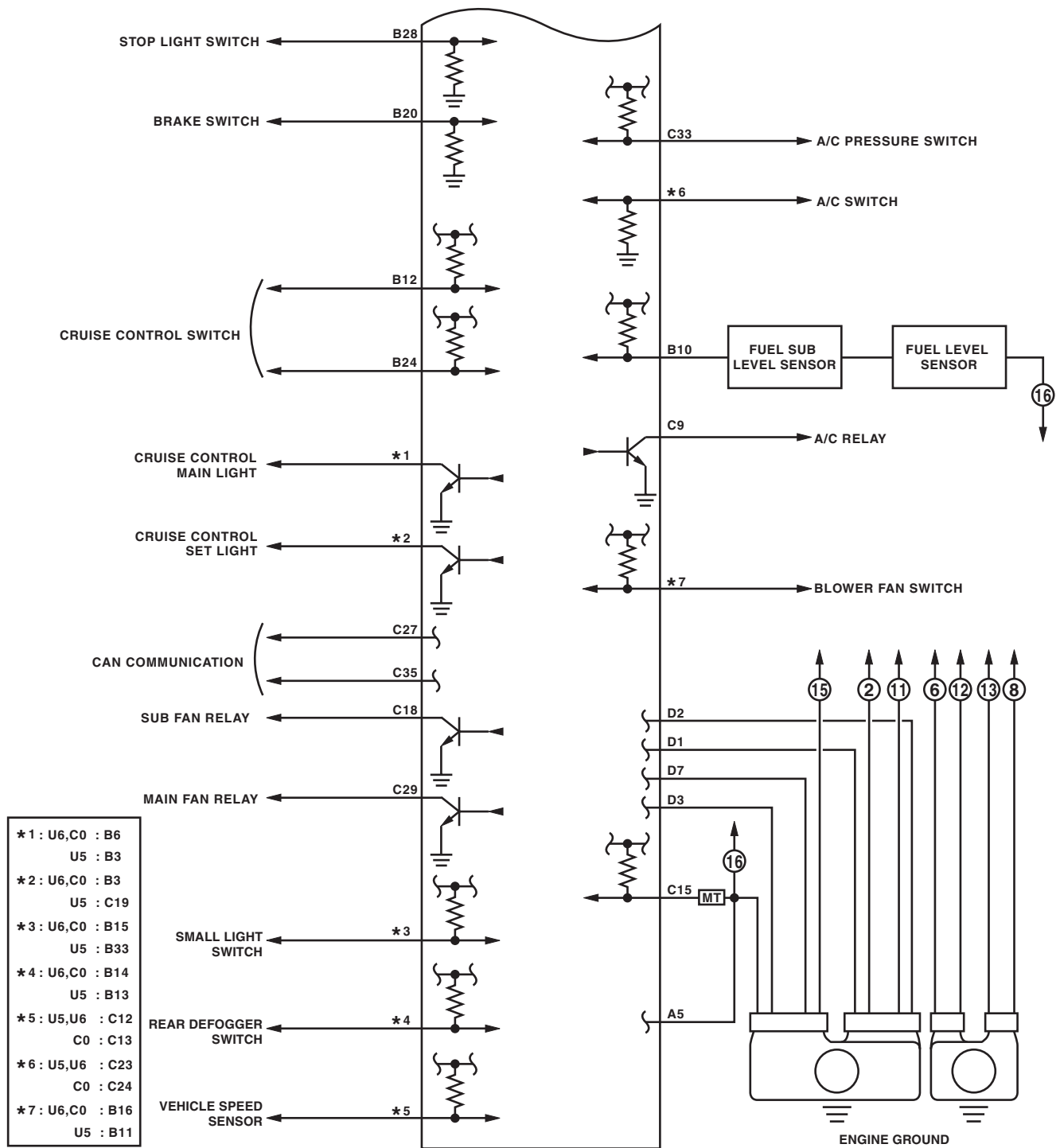
ENGINE (DIAGNOSTICS)



EN-05739

# Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)



EN-05740