

**01-40 CONTROL SYSTEM**

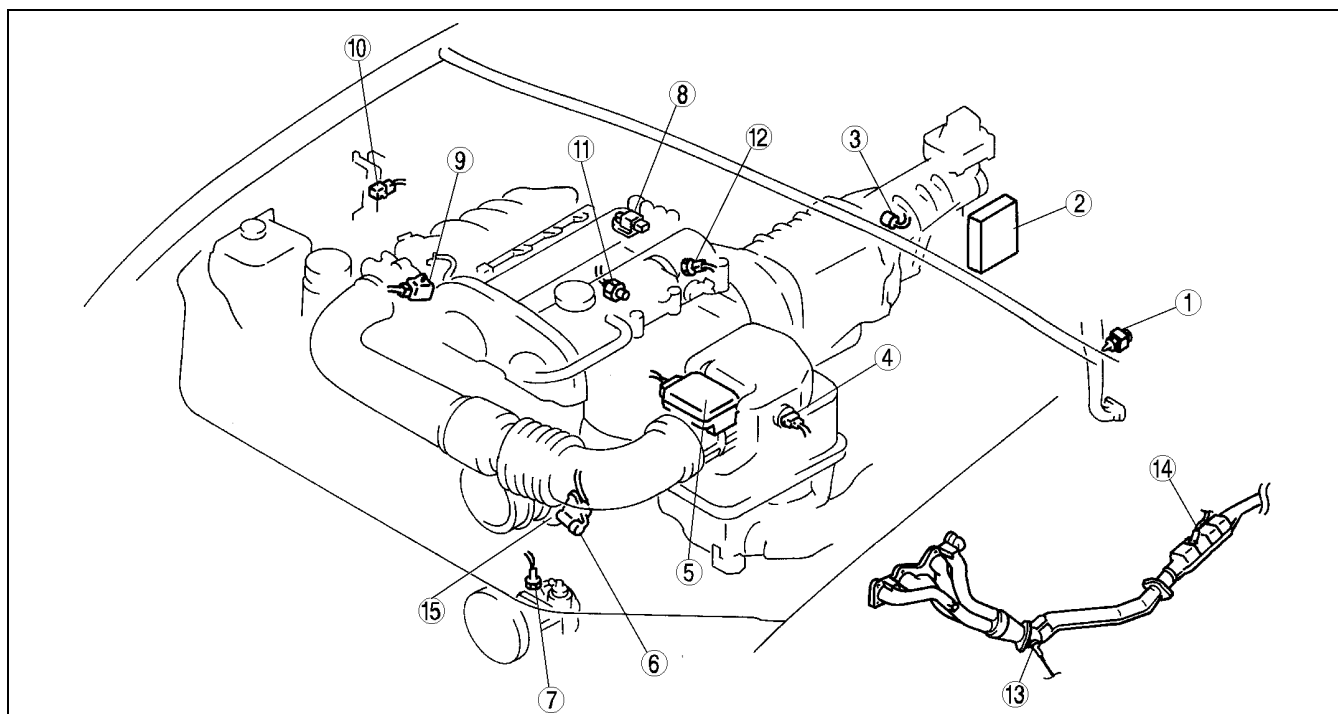
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# CONTROL SYSTEM

## CONTROL SYSTEM LOCATION INDEX

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Z5U140W101

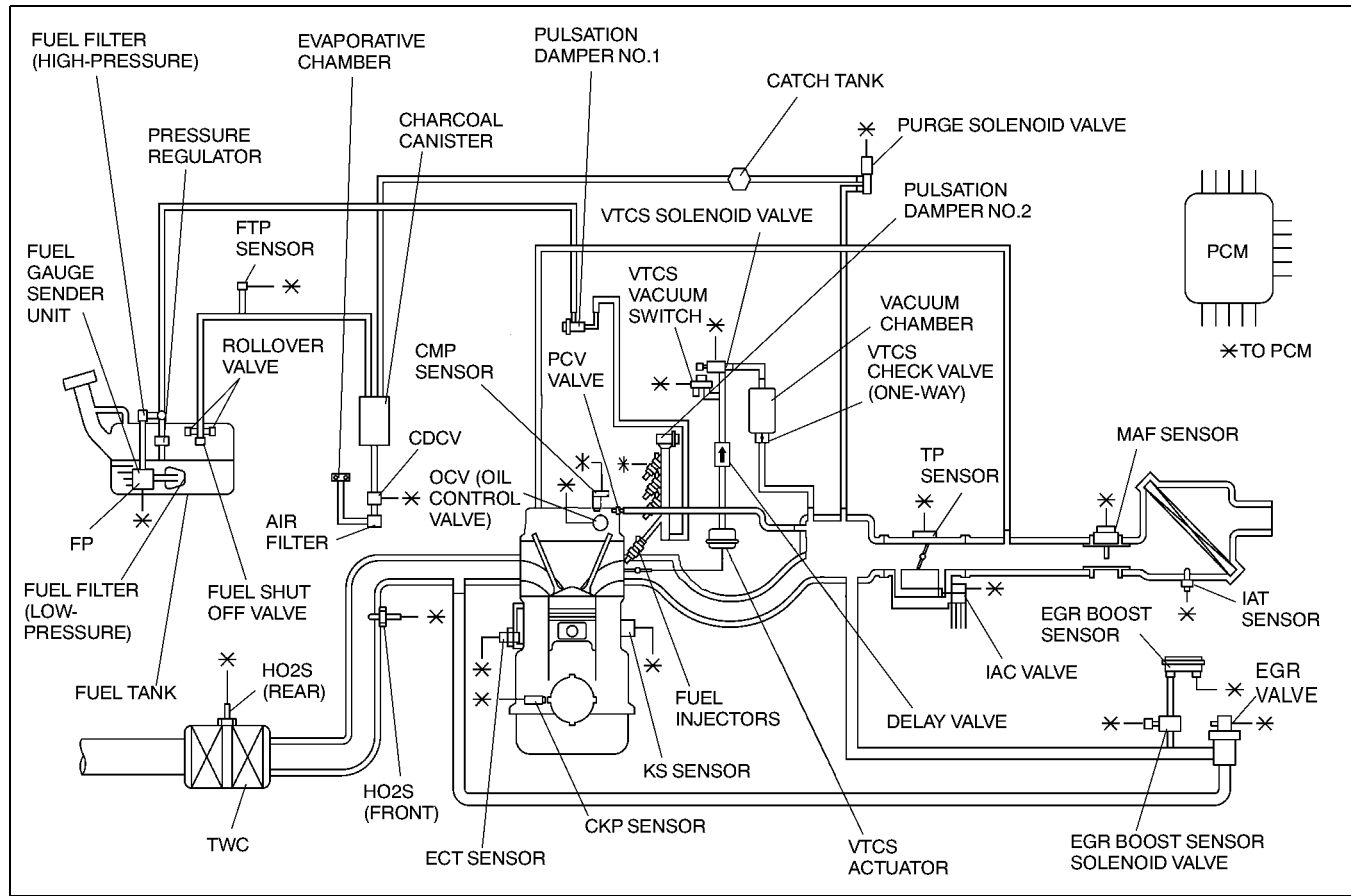
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| 1 | Clutch switch (MT)<br>(See 01-40-33 CLUTCH SWITCH INSPECTION)  |
| 2 | PCM<br>(See 01-40-6 PCM REMOVAL/INSTALLATION)<br>(See 01-40-6 PCM INSPECTION)  |
| 3 | Neutral switch (MT)<br>(See 01-40-34 NEUTRAL SWITCH INSPECTION)  |
| 4 | Intake air temperature (IAT) sensor<br>(See 01-40-22 INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION)   |
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## CONTROL SYSTEM DIAGRAM

A5U014018881W02

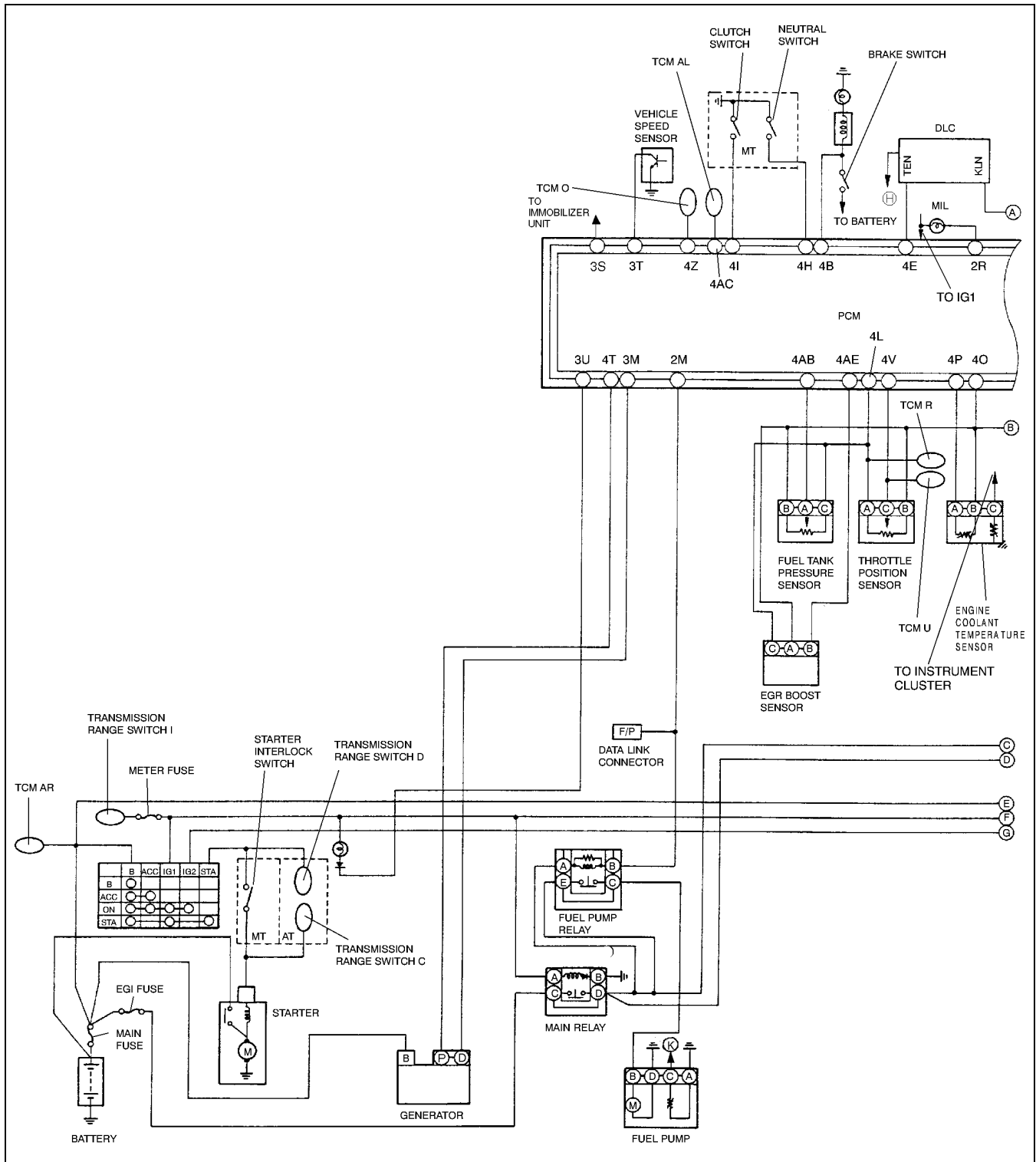


A5U0140W016

# CONTROL SYSTEM

## CONTROL SYSTEM WIRING DIAGRAM

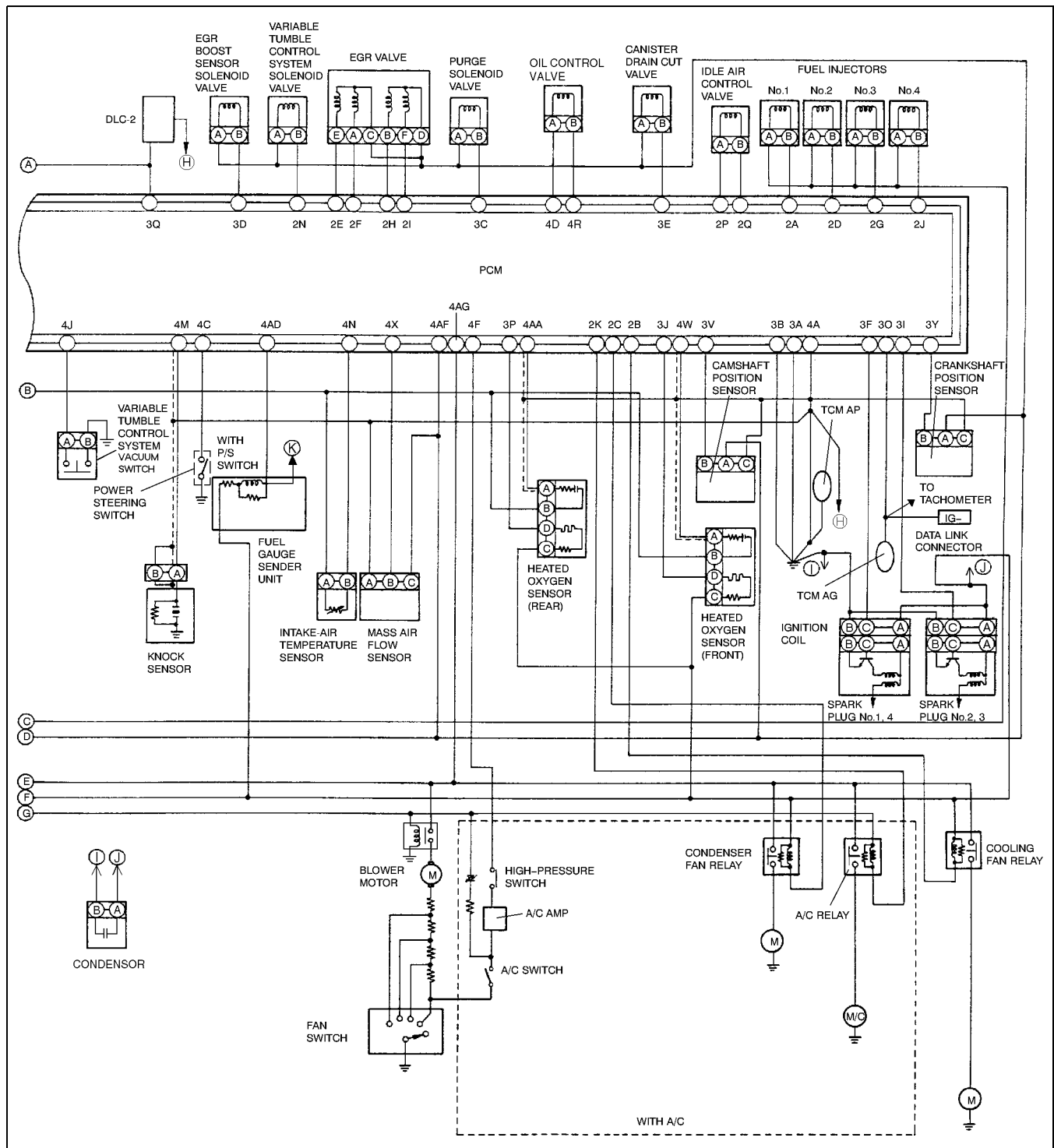
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A5U0102W001

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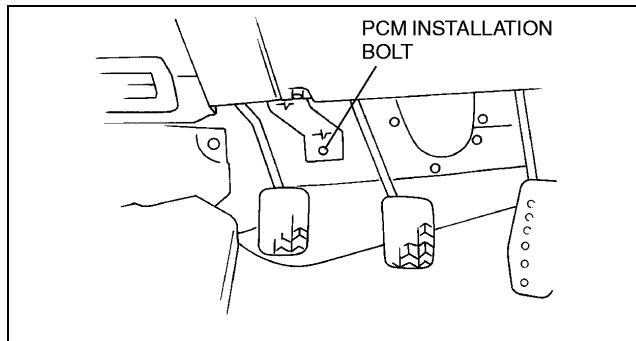
A5U0102W002

# CONTROL SYSTEM

## PCM REMOVAL/INSTALLATION

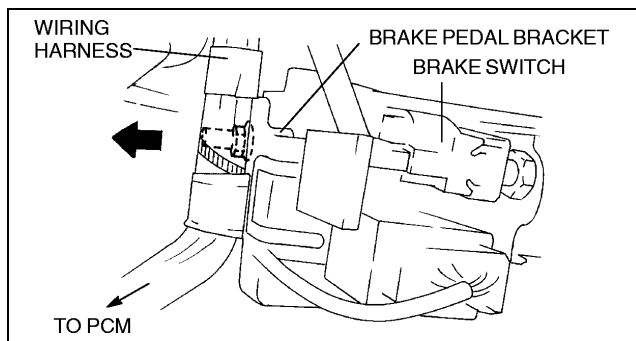
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1. Disconnect the negative battery cable.
2. Disconnect the connector from the PCM installed on the upper part of the brake pedal.
3. Remove the bolt and nut holding the PCM.



X5U140WA1

- (1) Push the harness (PCM harness) installed to the brake pedal bracket in the opposite direction of the brake pedal bracket.
- (2) While pushing the harness, push the stay until it comes apart from the stud with the PCM installation nut.

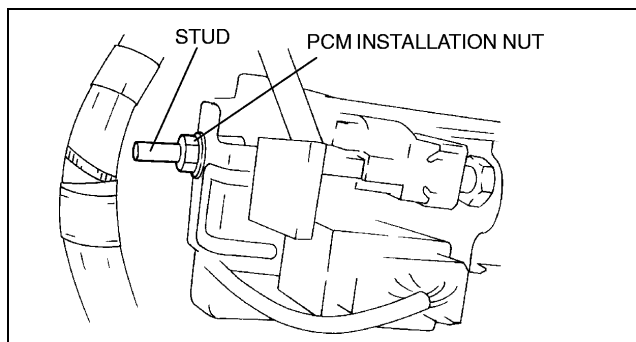


Y5U140WB7

- (3) Remove the PCM installation nut.
4. Install in the reverse order of removal.

### Tightening torque

Bolt, nut: 7.9—10.7 N·m {80—110 kgf·cm,  
70—95.4 in·lbf}



X5U140WA3

## PCM INSPECTION

A5U014018880W02

### Using SST (WDS or Equivalent) Procedure

#### Note

- PIDs for the following parts are not available on this model. Go to the appropriate part inspection page.
- ECT sensor (Water temperature sender unit). (See 01-40-26 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION.)
- Camshaft position sensor. (See 01-40-29 CAMSHAFT POSITION (CMP) SENSOR INSPECTION.)
- Main relay. (See 09-21-5 RELAY INSPECTION.)

1. Connect the WDS or equivalent to the DLC-2.
2. Turn the ignition switch to ON.
3. Measure the value.
  - If value is not within the specification, follow the instructions in ACTION column.

| Monitor item (Definition) | Unit/<br>Condition | Condition/Specification<br>(Reference)       | Action  | PCM<br>terminal |
|---------------------------|--------------------|--|---|-----------------|
| ACCS (A/C relay)          | ON/OFF             | A/C operating: ON<br>Ignition switch ON: OFF | <ul style="list-style-type: none"> <li>• Inspect following PIDs: RPM, TP, ECT, ACSW.</li> <li>• Inspect A/C relay (See 09-21-5 RELAY INSPECTION)</li> </ul> | 2K              |

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| Monitor item (Definition)                      | Unit/<br>Condition |    | Condition/Specification<br>(Reference)   | Action  | PCM<br>terminal |
|--|--------------------|----|--|---|-----------------|
| ACSW (Refrigerant pressure switch)             | ON/OFF             |    | Refrigerant pressure switch and fan switch ON: ON<br>Refrigerant pressure switch OFF: OFF  | <ul style="list-style-type: none"> <li>Inspect refrigerant pressure switch (See 07-40-7 REFRIGERANT PRESSURE SWITCH INSPECTION)</li> </ul>                | 4F              |
| ALTF (Generator field coil control duty value) | %                  |    | Ignition switch ON: 0%<br>Idle: 0—100%<br>Generator operating → E/L ON: Duty value rise  | <ul style="list-style-type: none"> <li>Inspect following PIDs: IAT, RPM, ALTT V.</li> <li>Inspect generator (See 01-17-4 GENERATOR INSPECTION)</li> </ul> | 3M              |
| ALTT V (Generator output voltage)              | V                  |    | Ignition switch ON: 0 V<br>Idle: B+ +1 V   | <ul style="list-style-type: none"> <li>Inspect following PIDs: IAT, RPM, ALTT.</li> <li>Inspect generator (See 01-17-4 GENERATOR INSPECTION)</li> </ul>   | 4T              |
| ARPMDES (Target engine speed)                  | RPM                |    | Idle (after warm up and no load): 750—850 rpm  | <ul style="list-style-type: none"> <li>Perform "ON-BOARD DIAGNOSTIC TEST" (See 01-02A-8 ON-BOARD DIAGNOSTIC TEST)</li> </ul>                              | —               |
| BARO (Barometric pressure)                     | kPa                | Hg | Below 400 m {0.25 mile} above sea level: 99—103 kPa {29—30 inHg}   | <ul style="list-style-type: none"> <li>Inspect EGR boost sensor (See 01-40-33 EGR BOOST SENSOR INSPECTION)</li> </ul>                                     | 4AE             |
|  | V                  |    | Below 400 m {0.25 mile} above sea level: 4.1—4.3 V<br>With pressure gauge: <ul style="list-style-type: none"> <li>Vacuum reading -26.6 kPa {-200 mmHg, -7.85 inHg}: 3.0—3.4 V</li> </ul> | <ul style="list-style-type: none"> <li>Inspect EGR boost sensor (See 01-40-33 EGR BOOST SENSOR INSPECTION)</li> </ul>                                     | 4AE             |
| BOO (Brake switch)                             | ON/OFF             |    | Brake pedal depressed: ON<br>Brake pedal released: OFF   | <ul style="list-style-type: none"> <li>Inspect brake switch (See 04-11-5 BRAKE SWITCH INSPECTION)</li> </ul>  | 4B              |
| CDCV (Canister drain cut valve)                | ON/OFF             |    | Ignition switch ON: OFF<br>Idle: OFF   | <ul style="list-style-type: none"> <li>Inspect CDCV (See 01-16-6 CANISTER DRAIN CUT VALVE (CDCV) INSPECTION)</li> </ul>                                   | 3E              |
| CHRG LP (Generator warning light)              | ON/OFF             |    | Ignition switch ON: ON<br>Idle: OFF  | <ul style="list-style-type: none"> <li>Inspect generator warning light (See 09-22-8 WARNING AND INDICATOR LIGHT BULB REMOVAL/INSTALLATION)</li> </ul>     | 3U              |
| CPP (Clutch switch)                            | ON/OFF             |    | Clutch pedal depressed: ON<br>Clutch pedal released: OFF   | <ul style="list-style-type: none"> <li>Inspect clutch switch (See 01-40-33 CLUTCH SWITCH INSPECTION)</li> </ul>   | 4I              |
| ECT (Engine coolant temperature)               | °C                 | °F | ECT 20°C {68°F}: 20°C {68°F}<br>ECT 60°C {140°F}: 60°C {140°F}   | <ul style="list-style-type: none"> <li>Inspect ECT sensor (See 01-40-26 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION)</li> </ul>                    | 4P              |
|  | V                  |    | ECT 20°C {68°F}: 3.0—3.1 V<br>After warm up: Below 1.0 V   | <ul style="list-style-type: none"> <li>Inspect ECT sensor (See 01-40-26 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION)</li> </ul>                    | 4P              |
| EGRCHK (EGR boost sensor solenoid valve)       | ON/OFF             |    | Ignition switch ON: OFF<br>Idle: OFF   | <ul style="list-style-type: none"> <li>Inspect EGR boost sensor solenoid valve (See 01-16-10 EGR BOOST SENSOR SOLENOID VALVE INSPECTION)</li> </ul>       | 3D              |

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| Monitor item (Definition)                | Unit/<br>Condition |    | Condition/Specification<br>(Reference)  | Action   | PCM<br>terminal |
|--|--------------------|----|---|--|-----------------|
| EVAPCP (Purge solenoid valve duty value) | %                  |    | Ignition switch ON: 0%  | <ul style="list-style-type: none"> <li>Inspect following PIDs: IAT, RPM, ECT, MAF, TP, BARO, O2S11.</li> <li>Inspect purge solenoid valve (See 01-16-8 PURGE SOLENOID VALVE INSPECTION)</li> </ul>     | 3C              |
| FAN2 (Condenser fan control)             | ON/OFF             |    | Condenser fan operating (ECT above 108°C {226°F}) or terminal TEN grounded and throttle valve open or A/C relay ON: ON<br>Others: OFF   | <ul style="list-style-type: none"> <li>Inspect following PIDs: RPM, TP, ECT, ACSW, TEST.</li> <li>Inspect condenser fan relay (See 09-21-5 RELAY INSPECTION)</li> </ul>                                | 2C              |
| FAN3 (Cooling fan control)               | ON/OFF             |    | Cooling fan operating (ECT above 97°C {207°F}) or terminal TEN grounded and throttle valve open or A/C relay ON: ON<br>Others: OFF  | <ul style="list-style-type: none"> <li>Inspect following PIDs: RPM, TP, ECT, ACSW.</li> <li>Inspect cooling fan relay (See 09-21-5 RELAY INSPECTION)</li> </ul>  | 2B              |
| FP (Fuel pump relay)                     | ON/OFF             |    | Ignition switch ON: OFF<br>Idle: ON<br>Cranking: ON   | <ul style="list-style-type: none"> <li>Inspect following PID: RPM.</li> <li>Inspect FP RLY (See 09-21-5 RELAY INSPECTION)</li> </ul>   | 2M              |
| FTL V (Fuel tank level signal voltage)   | V                  |    | Idle condition <ul style="list-style-type: none"> <li>Fuel tank full: 0.2—0.5 V</li> <li>Fuel tank empty: 3.4—4.4 V</li> <li>Fuel tank half: 1.8—2.8 V</li> </ul> <b>Note</b> <ul style="list-style-type: none"> <li>The voltages above will be measured when the battery voltage is between 12 V and 14 V.</li> </ul>  | <ul style="list-style-type: none"> <li>Inspect fuel gauge sender unit (See 09-22-8 FUEL GAUGE SENDER UNIT INSPECTION)</li> </ul>   | 4AD             |
| FTP (Fuel tank pressure)                 | kPa                | Hg | Ignition switch ON: 0—1.0 kPa {0—0.3 inHg}<br>Idle: 0—1.0 kPa {0—0.3 inHg} <b>Note</b> <ul style="list-style-type: none"> <li>The pressure and output voltage varies according to the fuel temperature.</li> </ul>  | <ul style="list-style-type: none"> <li>Inspect FTP sensor (See 01-40-25 FUEL TANK PRESSURE (FTP) SENSOR INSPECTION)</li> </ul>   | 4AB             |
|  | V                  |    | Ignition switch ON: 2.5—2.8 V<br>Idle: 2.5—2.8 V<br>FTP 0 kPa {0 mmHg}: 2.5 V<br>FTP 1 kPa {7.5 mmHg}: 2.8 V<br>With pressure gauge: <ul style="list-style-type: none"> <li>Vacuum reading -6.66 kPa {-50 mmHg, -1.97 inHg}: 0.45—0.55 V.</li> <li>Vacuum reading 0 kPa {0 mmHg, 0 inHg}: 2.25—2.75 V.</li> <li>Pressure reading 6.66 kPa {50 mmHg, 1.97 inHg}: 4.05—4.95 V.</li> </ul> <b>Note</b> <ul style="list-style-type: none"> <li>The pressure and output voltage vary according to the fuel temperature.</li> </ul> | <ul style="list-style-type: none"> <li>Inspect FTP sensor (See 01-40-25 FUEL TANK PRESSURE (FTP) SENSOR INSPECTION)</li> </ul>   | 4AB             |
| FUELPW1 (Fuel injection duration)        | ms                 |    | Ignition switch ON: 0 ms<br>Idle: 1.5—4.0 ms  | <ul style="list-style-type: none"> <li>Inspect following PIDs: MAF, IAT, RPM, TP, ECT, PNP, CPP, O2S11, PSP, BOO, ACSW, CMP sensor (See 01-40-29 CAMSHAFT POSITION (CMP) SENSOR INSPECTION)</li> </ul> | 2A, 2D, 2G, 2J  |



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| Monitor item (Definition)                        | Unit/<br>Condition |    | Condition/Specification<br>(Reference)                    | Action  | PCM<br>terminal |
|--|--------------------|----|---|---|-----------------|
| HTR11 (Heated oxygen sensor heater (Front))      | ON/OFF             |    | Always: ON  | <ul style="list-style-type: none"> <li>Inspect following PIDs: ECT, MAF.</li> <li>Inspect HO2S heater (See 01-40-31 HEATED OXYGEN SENSOR (HO2S) INSPECTION)</li> </ul>  | 3J              |
| HTR12 (Heated oxygen sensor heater (Rear))       | ON/OFF             |    | ECT above 70°C {158°F}: ON<br>ECT below 70°C {158°F}: OFF | <ul style="list-style-type: none"> <li>Inspect following PIDs: ECT, MAF.</li> <li>Inspect HO2S heater (See 01-40-32 HEATED OXYGEN SENSOR (HO2S) HEATER INSPECTION)</li> </ul>   | 3P              |
| IAC (Idle air control valve)                     | %                  |    | Ignition switch ON:<br>Idle:                              | <ul style="list-style-type: none"> <li>Inspect following PIDs: IAT, RPM, ECT, MAF, TP, PNP, CPP, PSP, ACSW, TEST.</li> <li>Inspect IAC valve (See 01-13-5 IDLE AIR CONTROL (IAC) VALVE INSPECTION)</li> </ul>   | 2P<br>2Q        |
| IAT (Intake air temperature)                     | °C                 | °F | IAT 20°C {68°F}: 20°C {68°F}                              | <ul style="list-style-type: none"> <li>Inspect IAT sensor (See 01-40-22 INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION)</li> </ul>  | 4N              |
|  | V                  |    | IAT 20°C {68°F}: 2.3—2.4 V<br>IAT 30°C {86°F}: 1.9 V      | <ul style="list-style-type: none"> <li>Inspect IAT sensor (See 01-40-22 INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION)</li> </ul>  | 4N              |
| IMRC (VTCS solenoid valve)                       | ON/OFF             |    | ECT below 60°C {140°F} while idling :ON                   | <ul style="list-style-type: none"> <li>Inspect following PIDs: RPM, TP, ECT.</li> <li>Inspect VTCS vacuum switch. (See 01-13-8 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) VACUUM SWITCH INSPECTION)</li> <li>Inspect the vacuum hose for improper routing, kinks or leaks</li> </ul> | 2N              |
| IMRCM (VTCS vacuum switch)                       | ON/OFF             |    | ECT below 60°C {140°F} while idling :ON                   | <ul style="list-style-type: none"> <li>Inspect following PIDs: RPM, TP, ECT.</li> <li>Inspect VTCS vacuum switch. (See 01-13-8 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) VACUUM SWITCH INSPECTION)</li> <li>Inspect the vacuum hose for improper routing, kinks or leaks</li> </ul> | 4J              |
| KNOCKR (Knocking retard)                         | °                  |    | Ignition switch ON: 0°<br>Idle: 0°                        | <ul style="list-style-type: none"> <li>Inspect KS (See 01-40-31 KNOCK SENSOR (KS) INSPECTION)</li> </ul>  | 4M              |
| LOAD (Calculated engine load)                    | %                  |    | Idle: 16.0—21.0% Indicator engine load                    | <ul style="list-style-type: none"> <li>Perform "ON-BOARD DIAGNOSTIC TEST" (See 01-02A-8 ON-BOARD DIAGNOSTIC TEST)</li> </ul>  | —               |
| LONGFT1 (Current long term fuel trim adjustment) | %                  |    | Idle: -20—20%   | <ul style="list-style-type: none"> <li>Perform "ON-BOARD DIAGNOSTIC TEST" (See 01-02A-8 ON-BOARD DIAGNOSTIC TEST)</li> </ul>  | —               |

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| Monitor item (Definition)                    | Unit/<br>Condition | Condition/Specification<br>(Reference)  | Action   | PCM<br>terminal |
|--|--------------------|---|--|-----------------|
| MAF (Intake MAF)                             | g/s<br>lb/min      | Idle: 2.2—3.2 g/s {0.3—0.4 lb/min}<br>(MT), 2.3—3.2g/s {0.3—0.4 lb/min}<br>(AT) Indicator intake air amount                                 | <ul style="list-style-type: none"> <li>Inspect MAF sensor (See 01-40-24 MASS AIR FLOW (MAF) SENSOR INSPECTION)</li> </ul>  | 4X              |
|  | V                  | Ignition switch ON: 0.9—2.0 V<br>Idle: 1.7—2.4 V  | <ul style="list-style-type: none"> <li>Inspect MAF sensor (See 01-40-24 MASS AIR FLOW (MAF) SENSOR INSPECTION)</li> </ul>  | —               |
| MIL (Malfunction indicator lamp)             | ON/OFF             | Ignition switch ON: ON<br>DTC output: ON<br>No DTC output: OFF  | <ul style="list-style-type: none"> <li>Inspect MIL (See 09-22-8 WARNING AND INDICATOR LIGHT BULB REMOVAL/ INSTALLATION)</li> </ul>   | 2R              |
| O2S11 (Heated oxygen sensor (Front))         | V                  | Ignition switch ON: 0—1.0 V<br>After warm up: 0—1.0 V<br>Acceleration: 0.5—1.0 V<br>Deceleration: 0—0.5 V                                   | <ul style="list-style-type: none"> <li>Inspect HO2S (See 01-40-31 HEATED OXYGEN SENSOR (HO2S) INSPECTION)</li> </ul>   | 4W              |
| O2S12 (Heated oxygen sensor (Rear))          | V                  | Ignition switch ON: 0—1.0 V<br>Idle (After warm up): 0—1.0 V<br>Idle (Engine cold): 0—0.5 V<br>Accelerate: 0.5—1.0 V<br>Decelerate: 0—0.5 V | <ul style="list-style-type: none"> <li>Inspect HO2S (Rear) (See 01-40-31 HEATED OXYGEN SENSOR (HO2S) INSPECTION)</li> </ul>  | 4AA             |
| PNP (MT) (Neutral switch)                    | ON/OFF             | Shift position at neutral: ON<br>Others: OFF  | <ul style="list-style-type: none"> <li>Inspect neutral switch (See 01-40-34 NEUTRAL SWITCH INSPECTION)</li> </ul>  | 4H              |
| PSP (PSP switch)                             | ON/OFF             | Steering wheel is at straight ahead position: OFF<br>Steering wheel is fully turned: ON   | <ul style="list-style-type: none"> <li>Inspect PSP switch (See 01-40-35 POWER STEERING PRESSURE (PSP) SWITCH INSPECTION)</li> </ul>  | 4C              |
| RFCFLAG (Fuel learning correction set flag)  | ON/OFF             | Adaptive memory exists: ON<br>No adaptive memory: OFF   | —  | —               |
| RPM (Engine speed)                           | RPM                | Idle (After warm up and no load): 750—850 rpm   | <ul style="list-style-type: none"> <li>Inspect CKP sensor (See 01-40-27 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION)</li> </ul>  | 3Y              |
| SEGRP (EGR valve (stepping motor) position)  | step               | Ignition switch ON: 0 step<br>Idle: 0 step<br>Cranking: 0—60 steps  | <ul style="list-style-type: none"> <li>Inspect following PIDs: ECT, TP.</li> <li>Inspect EGR valve (See 01-16-9 EGR VALVE INSPECTION)</li> </ul>   | 2E, 2F, 2H, 2I  |
| SHRTFT1 (Short term trim)                    | %                  | Idle: -25-25%   | <ul style="list-style-type: none"> <li>Perform "ON-BOARD DIAGNOSTIC TEST" (See 01-02A-8 ON-BOARD DIAGNOSTIC TEST)</li> </ul>   | —               |
| SPARKADV (Ignition timing)                   | °                  | Idle: BTDC 6—18°<br>Idle (Terminal TEN GND): BTDC 9—11°<br>Cranking: Approx. 6°   | <ul style="list-style-type: none"> <li>Inspect following PIDs: MAF, IAT, RPM, TP, ECT, PSP, PNP, CPP, ACSW, TEST, CMP sensor.</li> <li>Perform engine tune-up (See 01-10-27 ENGINE TUNE-UP)</li> </ul> | 3V              |
| TEST (TEN terminal (DLC))                    | ON/OFF             | Open terminal TEN: OFF<br>Shorted terminal TEN: ON  | <ul style="list-style-type: none"> <li>Inspect the DLC TEN terminal and PCM connector terminal 4E</li> </ul>   | 4E              |
| TP (Throttle position sensor signal voltage) | V                  | Closed TP: 0.1—1.1 V<br>WOT: 3.0—4.6 V  | <ul style="list-style-type: none"> <li>Inspect TP sensor (See 01-40-24 THROTTLE POSITION (TP) SENSOR INSPECTION)</li> </ul>  | 4V              |

# CONTROL SYSTEM

| Monitor item (Definition)       | Unit/<br>Condition |     | Condition/Specification<br>(Reference)   | Action  | PCM<br>terminal |
|---------------------------------|--------------------|-----|--|---|-----------------|
| VPWR (Battery positive voltage) | V                  |     | Ignition switch ON: B+   | <ul style="list-style-type: none"> <li>Inspect main relay (See 09-21-5 RELAY INSPECTION)</li> <li>Inspect battery (See 01-17-2 BATTERY INSPECTION)</li> </ul>   | 4AF             |
| VSS (Vehicle speed)             | KPH                | MPH | Vehicle speed 20 km/h {12.5 mph}: 20 km/h {12.5 mph}<br>Vehicle speed 40 km/h {25 mph}: 40 km/h {25 mph} | <ul style="list-style-type: none"> <li>Inspect VSS. (See 05-11A-4 VEHICLE SPEEDOMETER SENSOR INSPECTION [M15M-D])</li> </ul>  | 3T              |
| VT ACT (Actual valve timing)    | °                  |     | 4,500—5,000 rpm: 20° — 15°   | <ul style="list-style-type: none"> <li>Inspect CMP sensor. (See 01-40-29 CAMSHAFT POSITION (CMP) SENSOR INSPECTION)</li> <li>Inspect oil control valve (OCV). (See 01-10-8 OIL CONTROL VALVE (OCV) INSPECTION)</li> </ul> | 4D, 4R          |
| VT TGT (Target valve timing)    | °                  |     | 4,500—5,000 rpm: 20° — 15°   | <ul style="list-style-type: none"> <li>Inspect CMP sensor. (See 01-40-29 CAMSHAFT POSITION (CMP) SENSOR INSPECTION)</li> <li>Inspect oil control valve (OCV). (See 01-10-8 OIL CONTROL VALVE (OCV) INSPECTION)</li> </ul> | 4D, 4R          |

01-40

## FTP PID inspection procedure

- Confirm the ignition switch is turned to ON.
- Confirm that the following PIDs are within the specifications:

### BARO

**101.3 kPa {760 mmHg, 29.9 inHg} (Absolute pressure)**

### IAT

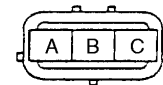
**30—100°C {86—212°F}**

- Disconnect the FTP sensor connector and measure the voltage at FTP sensor connector terminal C.

### Voltage

**5.0 V**

- Reconnect the connector.
- Disconnect the vacuum hose from the FTP sensor.
- Connect the vacuum pump to the fuel tank pressure sensor.
- Select FTP PID on the WDS or equivalent.
- Apply the vacuum and verify that the FTP is as specified on the table.



HARNESS SIDE CONNECTOR  
(VIEW FROM TERMINAL SIDE)

X5U140WCK

## BARO PID inspection procedure

- Confirm the ignition switch is turned to ON.
- Confirm that the following PIDs are within the specifications:

### BARO

**101.3 kPa {760 mmHg, 29.9 inHg} (Absolute pressure)**

### IAT

**10—50°C {50—122°F}**

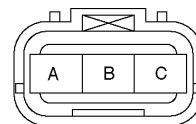
## CONTROL SYSTEM

3. Disconnect the EGR boost sensor connector and measure the voltage at EGR boost sensor connector terminal C.

### Voltage

**4.5—5.5 V**

4. Reconnect the connector.
5. Disconnect the vacuum hose from the EGR boost sensor.
6. Connect the vacuum pump to the EGR boost sensor.
7. Select BARO PID on the WDS or equivalent.
8. Apply the vacuum and verify that the BARO PID is as specified on the table.

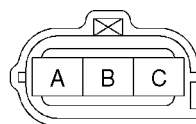


HARNESS SIDE CONNECTOR  
(VIEW FROM TERMINAL SIDE)

A5U0140W014

### Vref terminal circuit inspection

1. Turn the ignition switch to ON.
2. Measure the voltage between the TP sensor connector (vehicle side) terminal A and body GND using a voltmeter.
  - (1) Measurement voltage is 0 V.
    - 1) Turn the ignition switch to LOCK.
    - 2) Disconnect the TP sensor connector, EGR boost sensor connector, and FTP sensor connector (to which Vref is applied).
    - 3) Verify there is no continuity between the TP sensor connector (vehicle side) terminal A and body GND using an ohmmeter.
      - If there is continuity, repair the related harness for short to circuit.



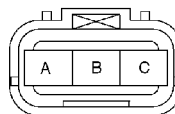
HARNESS SIDE CONNECTOR  
(VIEW FROM TERMINAL SIDE)

A5U0140W002

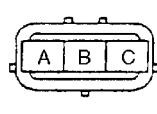
- 4) Inspect for continuity between the PCM connector (vehicle side) terminal 4L and each sensor connector (vehicle side) terminals to which Vref is applied using an ohmmeter.
  - If there is continuity, repair the related harnesses.

| PCM terminal | Connector (vehicle side) | Terminal |
|--------------|--------------------------|----------|
| 4L           | TP sensor                | A        |
|              | EGR boost sensor         | C        |
|              | FTP sensor               | C        |

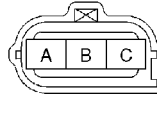
EGR BOOST SENSOR  
CONNECTOR



FTP SENSOR  
CONNECTOR



TP SENSOR  
CONNECTOR

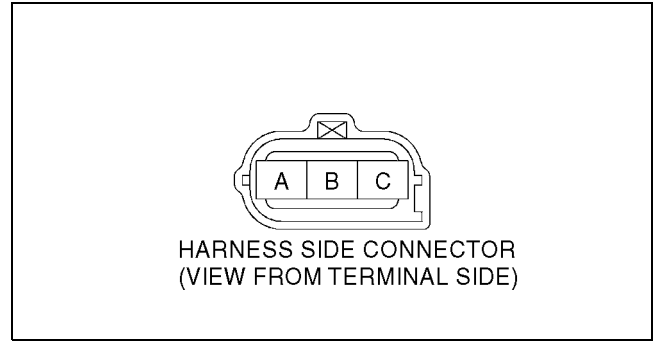


HARNESS SIDE CONNECTOR  
(VIEW FROM TERMINAL SIDE)

A5U0140W003

- (2) Measurement voltage is B+.
  - 1) Turn the ignition switch to LOCK.
  - 2) Disconnect the battery positive harness and battery negative harness.
  - 3) Verify there is no continuity between the TP sensor connector (vehicle side) terminal A and battery positive harness using an ohmmeter.
    - If there is continuity, repair the related harnesses for short to B+ circuit.

- (3) Measurement voltage is approx. 5 V.
- Vref terminal of PCM is okay.



A5U0140W002

01-40

## GND circuit inspection

1. Turn the ignition switch to LOCK.
2. Disconnect the PCM connectors.
3. Inspect for continuity between the PCM GND terminals and body GND using an ohmmeter.
  - If not as specified, repair the related harnesses for open circuit.

| PCM GND terminal |
|------------------|
| 3A               |
| 3B               |
| 4A               |

## Power supply circuit inspection

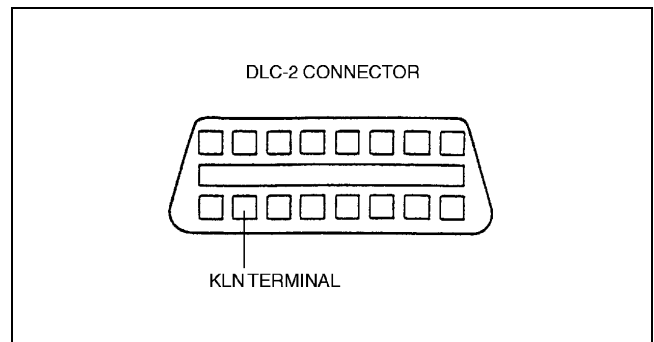
1. Turn the ignition switch to LOCK.
2. Disconnect the PCM connectors.
3. Measure the voltage between the PCM battery power terminal and body GND using a voltmeter.
  - If not as specified, repair the related harnesses and fuses.

| Power supply terminal     |
|---------------------------|
| 4AG                       |
| 4AF (Ignition switch: ON) |

## Power supply terminal voltage B+

## Serial communication terminal inspection

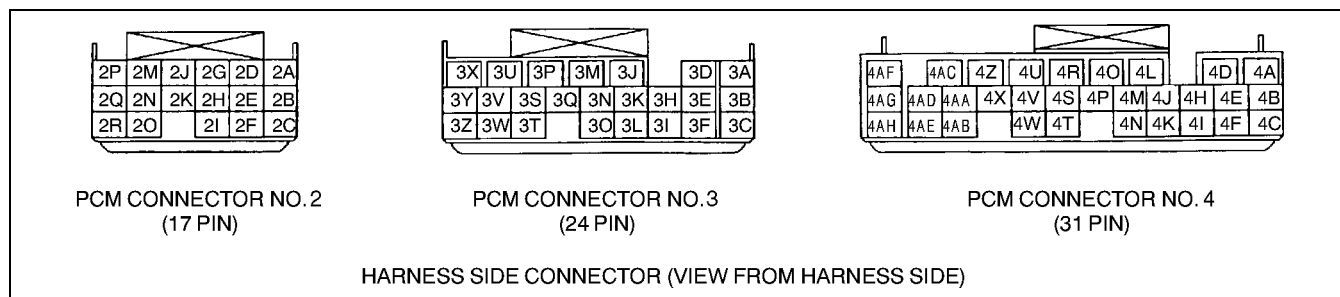
1. Turn the ignition switch to LOCK.
2. Disconnect PCM connectors.
3. Verify there is continuity between PCM connector terminal 3Q and DLC-2 KLN terminal.
  - If not as specified, repair the related harnesses.



X5U140WCE

# CONTROL SYSTEM

**PCM Terminal Voltage Table (Reference)**



Z5U140W102

| Terminal | Signal                    | Connected to           | Test condition   |   | Voltage (V) | Action   |
|----------|---------------------------|------------------------|--|---|-------------|--|
| 2A       | Fuel injector control     | Fuel injector No.1     | Inspect using the wave profile.<br>(See 01–40–19 Inspection Using An Oscilloscope (Reference)) |   |             | <ul style="list-style-type: none"><li>Inspect fuel injector (See 01–14–17 FUEL INJECTOR INSPECTION)</li><li>Inspect related harness.</li></ul> |
| 2B       | Cooling fan control       | Cooling fan relay      | Idle   | ECT above 97°C {207°F}.<br>A/C operating.<br>Throttle valve fully open with terminal TEN (DLC) shorted to GND     | Below 1.0   | <ul style="list-style-type: none"><li>Inspect cooling fan relay. (See 09–21–5 RELAY INSPECTION)</li><li>Inspect related harness.</li></ul>     |
|          |                           |                        |  | Others  | B+          |  |
| 2C       | Condenser fan control     | Condenser fan relay    | Idle   | ECT above 108°C {226°F},<br>A/C operating,<br>Throttle valve fully open with terminal TEN (DLC) shorted to ground | Below 1.0   | <ul style="list-style-type: none"><li>Inspect condenser fan relay. (See 09–21–5 RELAY INSPECTION)</li><li>Inspect related harness.</li></ul>   |
|          |                           |                        |  | Others  | B+          |  |
| 2D       | Fuel injector control     | Fuel injector No.2     | Inspect using the wave profile.<br>(See 01–40–19 Inspection Using An Oscilloscope (Reference)) |   |             | <ul style="list-style-type: none"><li>Inspect fuel injector (See 01–14–17 FUEL INJECTOR INSPECTION)</li><li>Inspect related harness.</li></ul> |
| 2E       | EGR valve #1 coil control | EGR valve (terminal E) | Ignition switch on   |   | Below 1.0   | <ul style="list-style-type: none"><li>Inspect EGR valve. (See 01–16–9 EGR VALVE INSPECTION)</li><li>Inspect related harness.</li></ul>         |
|          |                           |                        | Idle   |   |             |  |
| 2F       | EGR valve #2 coil control | EGR valve (terminal A) | Ignition switch on   |   | B+          | <ul style="list-style-type: none"><li>Inspect EGR valve. (See 01–16–9 EGR VALVE INSPECTION)</li><li>Inspect related harness.</li></ul>         |
|          |                           |                        | Idle   |   |             |  |
| 2G       | Fuel injector control     | Fuel injector No.3     | Inspect using the wave profile.<br>(See 01–40–19 Inspection Using An Oscilloscope (Reference)) |   |             | <ul style="list-style-type: none"><li>Inspect fuel injector (See 01–14–17 FUEL INJECTOR INSPECTION)</li><li>Inspect related harness.</li></ul> |
| 2H       | EGR valve #3 coil control | EGR valve (terminal B) | Ignition switch on   |   | B+          | <ul style="list-style-type: none"><li>Inspect EGR valve. (See 01–16–9 EGR VALVE INSPECTION)</li><li>Inspect related harness.</li></ul>         |
|          |                           |                        | Idle   |   |             |  |
| 2I       | EGR valve #4 coil control | EGR valve (terminal F) | Ignition switch on   |   | Below 1.0   | <ul style="list-style-type: none"><li>Inspect EGR valve. (See 01–16–9 EGR VALVE INSPECTION)</li><li>Inspect related harness.</li></ul>         |
|          |                           |                        | Idle   |   |             |  |
| 2J       | Fuel injector control     | Fuel injector No.4     | Inspect using the wave profile.<br>(See 01–40–19 Inspection Using An Oscilloscope (Reference)) |   |             | <ul style="list-style-type: none"><li>Inspect fuel injector (See 01–14–17 FUEL INJECTOR INSPECTION)</li><li>Inspect related harness.</li></ul> |

# CONTROL SYSTEM

| Terminal | Signal                             | Connected to                    | Test condition  |                              | Voltage (V) | Action   |
|----------|------------------------------------|---------------------------------|---|------------------------------|-------------|--|
| 2K       | A/C control                        | A/C relay                       | Idle  | A/C and fan switches are on. | Below 1.0   | <ul style="list-style-type: none"><li>Inspect A/C relay. (See 09–21–5 RELAY INSPECTION)</li><li>Inspect related harness.</li></ul>   |
|          |                                    |                                 |   | Others                       | B+          |  |
| 2L       | —                                  | —                               | —   |                              | —           | —  |
| 2M       | FP control                         | FP RLY                          | Ignition switch on  |                              | B+          | <ul style="list-style-type: none"><li>Inspect FP RLY. (See 09–21–5 RELAY INSPECTION)</li><li>Inspect related harness.</li></ul>  |
|          |                                    |                                 | Cranking  |                              | Below 1.0   |  |
|          |                                    |                                 | Idle  |                              |             |  |
| 2N       | VTCS control                       | VTCS solenoid valve             | ECT above 60°C {140°F} while idling   |                              | B+          | <ul style="list-style-type: none"><li>Inspect VTCS solenoid valve (See 01–13–8 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) SOLENOID VALVE INSPECTION)</li><li>Inspect related harness.</li></ul> |
|          |                                    |                                 | ECT below 60°C {140°F} and engine speed at 3.500 rpm  |                              | Below 1.0   |  |
| 2O       | —                                  | —                               | —   |                              | —           | —  |
| 2P       | IAC (positive)                     | IAC valve                       | Inspect using the wave profile. (See 01–40–19 Inspection Using An Oscilloscope (Reference)) |                              |             | <ul style="list-style-type: none"><li>Inspect IAC valve inspection. (See 01–13–5 IDLE AIR CONTROL (IAC) VALVE INSPECTION)</li><li>Inspect related harness.</li></ul>                       |
| 2Q       | IAC (negative)                     | IAC valve                       | Inspect using the wave profile. (See 01–40–19 Inspection Using An Oscilloscope (Reference)) |                              |             | <ul style="list-style-type: none"><li>Inspect IAC valve inspection. (See 01–13–5 IDLE AIR CONTROL (IAC) VALVE INSPECTION)</li><li>Inspect related harness.</li></ul>                       |
| 2R       | MIL control                        | MIL (in instrument cluster)     | Ignition switch ON  |                              | Below 1.0   | <ul style="list-style-type: none"><li>Inspect MIL.</li><li>Inspect related harness.</li></ul>  |
|          |                                    |                                 | Idle (MIL OFF)  |                              | B+          |  |
| 3A       | Fuel injector GND                  | GND                             | Under any condition   |                              | Below 1.0   | <ul style="list-style-type: none"><li>Inspect EGR valve. (See 01–16–9 EGR VALVE INSPECTION)</li><li>Inspect related harness.</li></ul>   |
| 3B       | PCM GND                            | GND                             | Under any condition   |                              | Below 1.0   | <ul style="list-style-type: none"><li>Inspect related harness.</li></ul>   |
| 3C       | Purge control                      | Purge solenoid valve            | Inspect using the wave profile. (See 01–40–19 Inspection Using An Oscilloscope (Reference)) |                              |             | <ul style="list-style-type: none"><li>Inspect purge solenoid valve. (See 01–16–8 PURGE SOLENOID VALVE INSPECTION)</li><li>Inspect related harness.</li></ul>                               |
| 3D       | EGR boost sensor switching control | EGR boost sensor solenoid valve | Ignition switch on  |                              | B+          | <ul style="list-style-type: none"><li>Inspect EGR boost sensor solenoid valve. (See 01–16–10 EGR BOOST SENSOR SOLENOID VALVE INSPECTION)</li><li>Inspect related harness.</li></ul>        |
|          |                                    |                                 | Idle  |                              |             |  |
| 3E       | CDCV control                       | CDCV                            | Ignition switch on  |                              | B+          | <ul style="list-style-type: none"><li>Inspect related harness.</li></ul>   |
|          |                                    |                                 | Diagnosis exceeded  |                              | Below 1.0   |  |
| 3F       | IGT control (No.1, No.4 cylinders) | Ignition coil                   | Inspect using the wave profile. (See 01–40–19 Inspection Using An Oscilloscope (Reference)) |                              |             | <ul style="list-style-type: none"><li>Inspect ignition coil. (See 01–18–2 IGNITION COIL INSPECTION)</li><li>Inspect related harness.</li></ul>   |
| 3G       | —                                  | —                               | —   |                              | —           | —  |
| 3H       | —                                  | —                               | —   |                              | —           | —  |

## CONTROL SYSTEM

| Terminal | Signal                             | Connected to                                    | Test condition  | Voltage (V) | Action   |
|----------|------------------------------------|---|---|-------------|--|
| 3I       | IGT control (No.2, No.3 cylinders) | Ignition coil                                   | Inspect using the wave profile.<br>(See 01-40-19 Inspection Using An Oscilloscope (Reference))  |             | <ul style="list-style-type: none"> <li>Inspect ignition coil.<br/>(See 01-18-2 IGNITION COIL INSPECTION)</li> <li>Inspect related harness.</li> </ul>  |
| 3J       | HO2S heater (Front) control        | HO2S (Front)                                    | Ignition switch on  | Below 1.0   | <ul style="list-style-type: none"> <li>Inspect HO2S heater (Front).<br/>(See 01-40-32 HEATED OXYGEN SENSOR (HO2S) HEATER INSPECTION)</li> <li>Inspect related harness.</li> </ul>                        |
|          |                                    |   | Idle  |             |  |
| 3K       | —                                  | —   | —   | —           | —  |
| 3L       | —                                  | —   | —   | —           | —  |
| 3M       | Generator field coil control       | Generator (terminal D)                          | Inspect using the wave profile.<br>(See 01-40-19 Inspection Using An Oscilloscope (Reference))  |             | <ul style="list-style-type: none"> <li>Inspect generator.<br/>(See 01-17-4 GENERATOR INSPECTION)</li> <li>Inspect related harness.</li> </ul>  |
|          |                                    |   | Verify that voltage is raised when electrical load (headlight, A/C) is turned on at idle.   |             |  |
| 3N       | —                                  | —   | —   | —           | —  |
| 3O       | Engine speed                       | DLC terminal IG-TCM (AT), tachometer            | Inspect using the wave profile.<br>(See 01-40-19 Inspection Using An Oscilloscope (Reference))  |             | <ul style="list-style-type: none"> <li>Inspect related harness.</li> </ul>   |
| 3P       | HO2S heater (Rear) control         | HO2S (Rear)                                     | Ignition switch on  | B+          | <ul style="list-style-type: none"> <li>Inspect HO2S heater (Rear).<br/>(See 01-40-31 HEATED OXYGEN SENSOR (HO2S) INSPECTION)</li> <li>Inspect related harness.</li> </ul>                                |
|          |                                    |   | Idle (Heater operating)   | Below 1.0   |  |
| 3Q       | K-LINE (Serial communication)      | DLC terminal KLN DLC 2                          | Carry out inspection according to DTC<br>DTC output is a part of serial communication<br>Judgement by terminal voltage is not possible                                    | —           | <ul style="list-style-type: none"> <li>Inspect related harness.</li> </ul>   |
| 3R       | —                                  | —   | —   | —           | —  |
| 3S       | Immobilizer communication          | Immobilizer unit                                | Because of this terminal for serial communication, good/no good judgment by terminal voltage is not possible. Carry out inspection according to diagnostic trouble codes. |             | <ul style="list-style-type: none"> <li>Inspect Immobilizer unit.<br/>(See 09-14-19 IMMOBILIZER UNIT INSPECTION)</li> <li>Inspect related harness.</li> </ul>   |
| 3T       | Vehicle speed                      | VSS   | Inspect using the wave profile.<br>(See 01-40-19 Inspection Using An Oscilloscope (Reference))  |             | <ul style="list-style-type: none"> <li>Inspect vehicle speedometer sensor.<br/>(See 09-14-19 IMMOBILIZER UNIT INSPECTION)</li> <li>Inspect related harness.</li> </ul>                                   |
| 3U       | Generator warning light control    | Generator warning light (in instrument cluster) | Ignition switch on  | Below 1.0   | <ul style="list-style-type: none"> <li>Inspect generator warning light inspection.<br/>(See 09-22-8 WARNING AND INDICATOR LIGHT BULB REMOVAL/ INSTALLATION)</li> <li>Inspect related harness.</li> </ul> |
|          |                                    |   | Idle (DTC P0111, P0112, P1631, P1633 or P1634 is not stored.)   | B+          |  |
| 3V       | SGC                                | CMP sensor                                      | Inspect using the wave profile.<br>(See 01-40-19 Inspection Using An Oscilloscope (Reference))  |             | <ul style="list-style-type: none"> <li>Inspect CMP sensor.<br/>(See 01-40-29 CAMSHAFT POSITION (CMP) SENSOR INSPECTION)</li> <li>Inspect related harness.</li> </ul>                                     |
| 3W       | —                                  | —   | —   | —           | —  |



# CONTROL SYSTEM

| Terminal | Signal                                     | Connected to                            | Test condition   |  | Voltage (V) | Action  |
|----------|--|---|--|--|-------------|---|
| 3X       | —  | —                                       | —  |  | —           | —   |
| 3Y       | NE   | CKP sensor                              | Inspect using the wave profile.<br>(See 01–40–19 Inspection Using An Oscilloscope (Reference))   |  |             | <ul style="list-style-type: none"> <li>Inspect CKP sensor.<br/>(See 01–40–27 CRANKSHAFT POSITION (CKP) SENSOR INSPECTION)</li> <li>Inspect related harness.</li> </ul>                          |
| 3Z       | —  | —                                       | —  |  | —           | —   |
| 4A       | Device GND                                 | GND                                     | Under any condition  |  | Below 1.0   | <ul style="list-style-type: none"> <li>Inspect related harness.</li> </ul>  |
| 4B       | Brake                                      | Brake switch                            | Brake pedal released   |  | Below 1.0   | <ul style="list-style-type: none"> <li>Inspect brake switch.<br/>(See 04–11–5 BRAKE SWITCH INSPECTION)</li> <li>Inspect related harness.</li> </ul>   |
|          |  |   | Brake pedal depressed  |  | B+          |   |
| 4C       | PSP  | PSP switch                              | Idle   | Steering wheel straight ahead position | B+          | <ul style="list-style-type: none"> <li>Inspect PSP switch.<br/>(See 01–40–35 POWER STEERING PRESSURE (PSP) SWITCH INSPECTION)</li> <li>Inspect related harness.</li> </ul>                      |
|          |  |   |  | Steering wheel fully turned            | Below 1.0   |   |
| 4D       | Oil control valve (OCV) control (positive) | Oil control valve (OCV)                 | Inspect using the wave profile.<br>(See 01–40–19 Inspection Using An Oscilloscope (Reference))   |  |             | <ul style="list-style-type: none"> <li>Inspect oil control valve (OCV).<br/>(See 01–10–8 OIL CONTROL VALVE (OCV) INSPECTION)</li> <li>Inspect related harness.</li> </ul>                       |
| 4E       | DTM switching                              | DLC terminal TEN                        | Ignition switch on   | Open terminal TEN                      | B+          | <ul style="list-style-type: none"> <li>Inspect related harness.</li> </ul>  |
|          |  |   |  | Short to GND terminal TEN              | Below       |   |
| 4F       | A/C  | Refrigerant pressure switch             | Ignition switch ON   | A/C and fan switches are on.           | Below 1.0   | <ul style="list-style-type: none"> <li>Inspect refrigerant pressure switch.<br/>(See 07–40–7 REFRIGERANT PRESSURE SWITCH INSPECTION)</li> <li>Inspect related harness.</li> </ul>               |
|          |  |   |  | Others                                 | B+          |   |
| 4G       | —  | —                                       | —  |  | —           | —   |
| 4H       | Load/no load distinction                   | Neutral switch (MT)                     | Ignition switch on   | Transmission in neutral position       | Below 1.0   | <ul style="list-style-type: none"> <li>Inspect neutral switch.<br/>(See 01–40–34 NEUTRAL SWITCH INSPECTION)</li> <li>Inspect related harness.</li> </ul>  |
|          |  |   |  | Others                                 | B+          |   |
| 4I       | Load/no load distinction                   | Clutch switch (MT)                      | Ignition switch on   | Clutch pedal released                  | B+          | <ul style="list-style-type: none"> <li>Inspect clutch switch<br/>(See 01–40–33 CLUTCH SWITCH INSPECTION)</li> <li>Inspect related harness.</li> </ul>   |
|          |  |   |  | Clutch pedal depressed                 | Below 1.0   |   |
| 4J       | VTCS vacuum switch                         | VTCS vacuum switch                      | Ignition switch on   |  | B+          | <ul style="list-style-type: none"> <li>Inspect VTCS vacuum switch<br/>(See 01–13–8 VARIABLE TUMBLE CONTROL SYSTEM (VTCS) VACUUM SWITCH INSPECTION)</li> <li>Inspect related harness.</li> </ul> |
|          |  |   | ECT above 60°C {140°F} while idling  |  | B+          |   |
|          |  |   | ECT below 60°C {140°F} and engine speed at 3.500 rpm   |  | Below 1.0   |   |
| 4K       | —  | —                                       | —  |  | —           | —   |
| 4L       | Constant voltage (Vref)                    | TP sensor, EGR boost sensor, FTP sensor | Ignition switch on   |  | Approx. 5.0 | <ul style="list-style-type: none"> <li>Inspect related harness.</li> </ul>  |
| 4M       | Knocking                                   | KS                                      | Ignition switch on (Using digital type voltmeter, because measurement voltage is less than true voltage when using analog type voltmeter.) |  | Approx. 2.4 | <ul style="list-style-type: none"> <li>Inspect KS.<br/>(See 01–40–31 KNOCK SENSOR (KS) INSPECTION)</li> <li>Inspect related harness.</li> </ul>   |

## CONTROL SYSTEM

| Terminal | Signal                                       | Connected to            | Test condition   |                                   | Voltage (V) | Action  |
|----------|--|-------------------------|--|-----------------------------------|-------------|---|
| 4N       | IAT  | IAT sensor              | Ignition switch on   | IAT 20°C {68°F}                   | 2.3—2.4     | <ul style="list-style-type: none"> <li>Inspect IAT sensor. (See 01–40–22 INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION)</li> <li>Inspect related harness.</li> </ul>     |
|          |  |                         |  | IAT 30°C {86°F}                   | 1.9         |   |
| 4O       | Analogue sensor GND                          | GND                     | Under any condition  |                                   | Below 1.0   | <ul style="list-style-type: none"> <li>Inspect related harness.</li> </ul>  |
| 4P       | ECT  | ECT sensor              | Ignition switch on   | ECT 20°C {68°F}                   | Approx. 3.0 | <ul style="list-style-type: none"> <li>Inspect ECT sensor. (See 01–40–26 ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION)</li> <li>Inspect related harness.</li> </ul> |
|          |  |                         |  | ECT 80°C {176°F}                  | Approx. 0.9 |   |
| 4Q       | —  | —                       | —  |                                   | —           | —   |
| 4R       | Oil control valve (OCV) control (negative)   | Oil control valve (OCV) | Inspect using the wave profile. (See 01–40–19 Inspection Using An Oscilloscope (Reference))  |                                   |             | <ul style="list-style-type: none"> <li>Inspect oil control valve (OCV). (See 01–10–8 OIL CONTROL VALVE (OCV) INSPECTION)</li> <li>Inspect related harness.</li> </ul>     |
| 4S       | —  | —                       | —  |                                   | —           | —   |
| 4T       | Generator output voltage                     | Generator (terminal P)  | Ignition switch on   |                                   | Below 1.0   | <ul style="list-style-type: none"> <li>Inspect generator. (See 01–17–4 GENERATOR INSPECTION)</li> <li>Inspect related harness.</li> </ul>                                 |
|          |  |                         | Idle (No electrical load)  |                                   | 3—8         |   |
| 4U       | —  | —                       | —  |                                   | —           | —   |
| 4V       | TP   | TP sensor               | Ignition switch on   | Closed TP (AP released)           | 0.1—1.1     | <ul style="list-style-type: none"> <li>Inspect TP sensor. (See 01–40–24 THROTTLE POSITION (TP) SENSOR INSPECTION)</li> <li>Inspect related harness.</li> </ul>            |
|          |  |                         |  | WOT (AP fully depressed)          | 3.0—4.6     |   |
| 4W       | HO2S (Front)                                 | HO2S (Front)            | Inspect using the wave profile. (See 01–40–19 Inspection Using An Oscilloscope (Reference))  |                                   |             | <ul style="list-style-type: none"> <li>Inspect HO2S (Front). (See 01–40–31 HEATED OXYGEN SENSOR (HO2S) INSPECTION)</li> <li>Inspect related harness.</li> </ul>           |
| 4X       | MAF  | MAF sensor              | Ignition switch on   |                                   | 0.9—2.0     | <ul style="list-style-type: none"> <li>Inspect MAF sensor. (See 01–40–24 MASS AIR FLOW (MAF) SENSOR INSPECTION)</li> <li>Inspect related harness.</li> </ul>              |
|          |  |                         | Idle (After warm up)   |                                   | 1.7—2.4     |   |
| 4Y       | —  | —                       | —  |                                   | —           | —   |
| 4Z       | PCM—TCM communication (From PCM to TCM) (AT) | TCM (terminal O)        | Because this terminal is for serial communication, good/no good judgement by terminal voltage is not possible. Carry out inspection according to DTC.<br><br><b>Note</b> <ul style="list-style-type: none"> <li>If PCM/TCM communication is not correct, DTC P1601 is stored.</li> </ul> |                                   |             | <ul style="list-style-type: none"> <li>Inspect related harness.</li> </ul>  |
| 4AA      | HO2S (Rear)                                  | HO2S (Rear)             | Ignition switch on   |                                   | 0—1.0       | <ul style="list-style-type: none"> <li>Inspect HO2S heater (Rear). (See 01–40–31 HEATED OXYGEN SENSOR (HO2S) INSPECTION)</li> <li>Inspect related harness.</li> </ul>     |
|          |  |                         | Idle   | Engine cold                       | 0—0.5       |   |
|          |  |                         |  | After warm up                     | 0—1.0       |   |
|          |  |                         | Acceleration   |                                   | 0.5—1.0     |   |
| 4AB      | FTP  | FTP sensor              | Ignition switch on   | FTP 0 kPa {0 mmHg, 0 inHg} (BARO) | Approx. 2.5 | <ul style="list-style-type: none"> <li>Inspect FTP sensor. (See 01–40–25 FUEL TANK PRESSURE (FTP) SENSOR INSPECTION)</li> <li>Inspect related harness.</li> </ul>         |
|          |  |                         |  |                                   |             |   |

# CONTROL SYSTEM

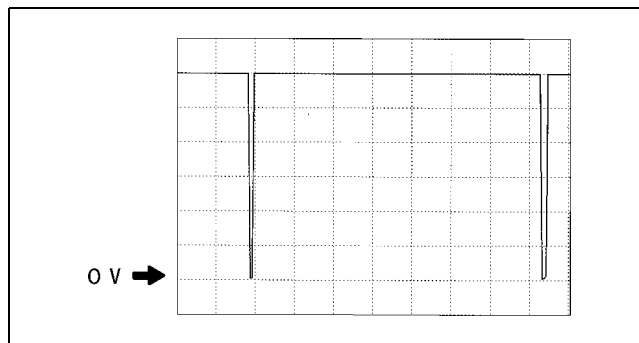
| Terminal | Signal                                       | Connected to           | Test condition  |   | Voltage (V) | Action  |
|----------|--|------------------------|---|---|-------------|---|
| 4AC      | PCM—TCM communication (From TCM to PCM) (AT) | TCM (terminal AL)      | Because this terminal is for serial communication, good/no good judgement by terminal voltage is not possible. Carry out inspection according to DTC. |   |             | <ul style="list-style-type: none"> <li>Inspect related harness.</li> </ul>  |
| 4AD      | Fuel tank level                              | Fuel gauge sender unit | Ignition switch on  | Fuel tank full  | 0.2—0.5*    | <ul style="list-style-type: none"> <li>Inspect fuel gauge sender unit. (See 09–22–8 FUEL GAUGE SENDER UNIT INSPECTION)</li> <li>Inspect related harness.</li> </ul> |
|          |  |                        |   | Fuel tank empty   | 3.4—4.4*    |   |
|          |  |                        |   | Fuel tank half  | 1.8—2.8*    |   |
| 4AE      | BARO/EGR boost                               | EGR boost sensor       | Ignition switch on, Idle  | Below 400 m {0.25 mile} above sea level                               | 4.1—4.3     | <ul style="list-style-type: none"> <li>Inspect EGR boost sensor. (See 01–40–33 EGR BOOST SENSOR INSPECTION)</li> <li>Inspect related harness.</li> </ul>            |
|          |  |                        |   | With pressure gauge: Vacuum reading –26.6 kPa {–200 mmHg, –7.85 inHg} | 3.0—3.4     |   |
| 4AF      | Power supply                                 | Main relay             | Ignition switch on  |   | B+          | <ul style="list-style-type: none"> <li>Inspect main relay. (See 09–21–5 RELAY INSPECTION)</li> <li>Inspect related harness.</li> </ul>                              |
|          |  |                        | Ignition switch off   |   | Below 1.0   |   |
| 4AG      | Back-up power supply                         | Battery                | Under any condition   |   | B+          | <ul style="list-style-type: none"> <li>Inspect related harness.</li> </ul>  |
| 4AH      | —  | —                      | —   |   | —           | —   |

\* : The voltages above will be measured when the battery voltage is 12—14 V.

## Inspection Using An Oscilloscope (Reference)

### Fuel injection control signal

- PCM terminal
  - No.1: 2A (+) ⇔ 3A (–)
  - No.2: 2D (+) ⇔ 3A (–)
  - No.3: 2G (+) ⇔ 3A (–)
  - No.4: 2J (+) ⇔ 3A (–)
- Oscilloscope setting: 2.0 V/DIV (Y), 20 ms/DIV (X), DC range
- Vehicle condition: Idling after warm-up

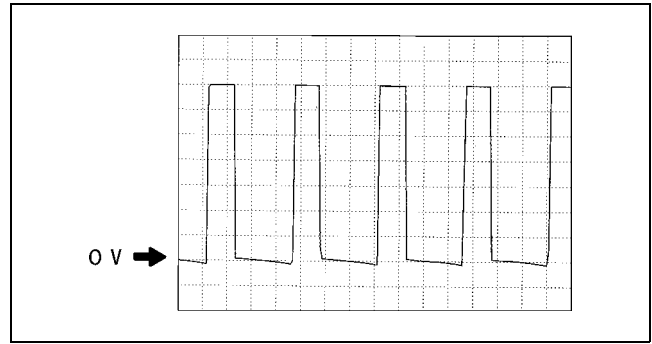


Y5J3940W117

## CONTROL SYSTEM

### IAC control signal

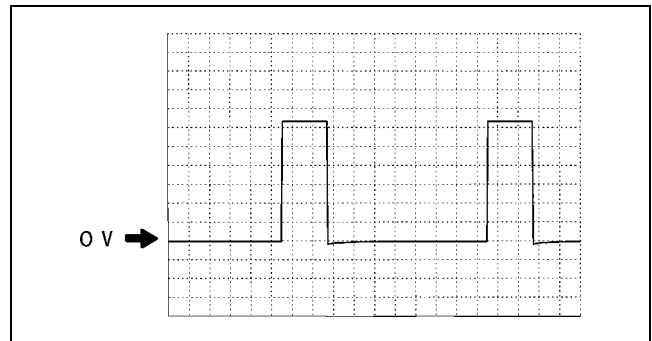
- PCM terminal: 2P(+)  $\leftrightarrow$  2Q(-)
- Oscilloscope setting: 2.0 V/DIV (Y), 25 ms/DIV (X), DC range
- Vehicle condition: Idling after warm-up (no electrical load)



Y5J3940W118

### Purge control signal

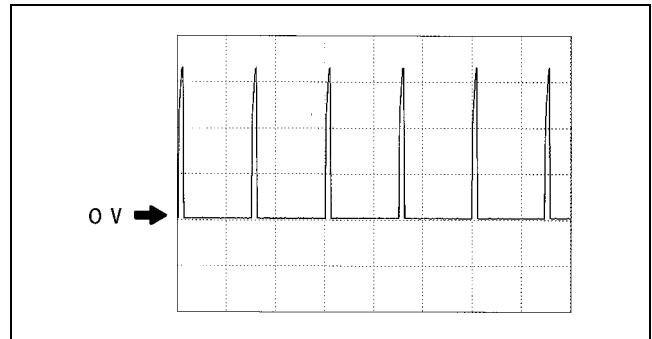
- PCM terminal: 3C(+)  $\leftrightarrow$  4A(-)
- Oscilloscope setting: 2.0 V/DIV (Y), 10 ms/DIV (X), DC range
- Vehicle condition:
  - ECT: above 80°C {176°F}
  - D range and 7.5 km/h {5 mph} or below



Y5J3940W119

### IGT control signal

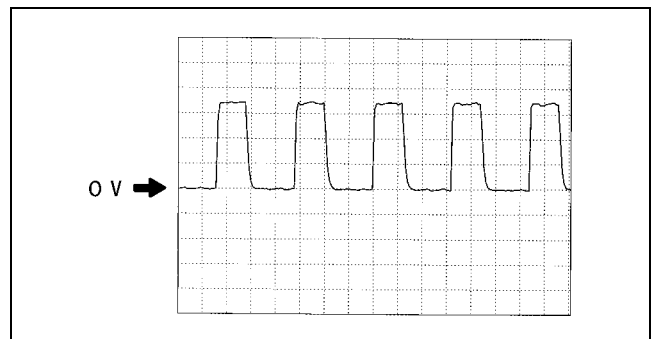
- PCM terminal:
  - 3F(+)  $\leftrightarrow$  4A(-)
  - 3I(+)  $\leftrightarrow$  4A(-)
- Oscilloscope setting: 1.0 V/DIV (Y), 50 ms/DIV (X), DC range
- Vehicle condition: Idling after warm-up



Y5J3940W120

### Generator field coil signal

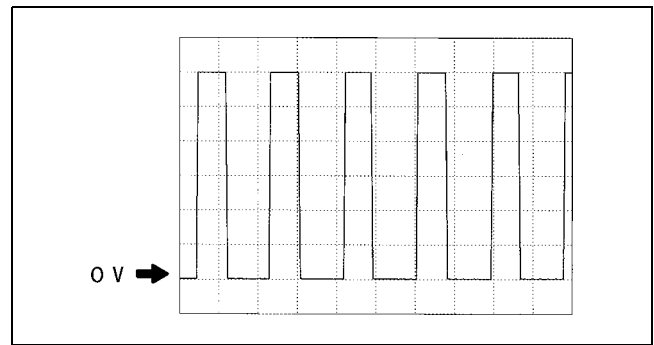
- PCM terminal: 3M(+)  $\leftrightarrow$  4A(-)
- Oscilloscope setting: 0.5 V/DIV (Y), 2.5 ms/DIV (X), DC range
- Vehicle condition: Idling after warm-up (no electrical load)



Y5J3940W121

## Engine speed signal

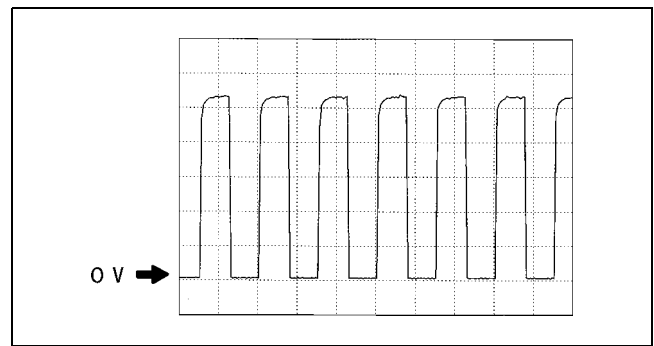
- PCM terminal: 3O(+)  $\Leftrightarrow$  4A(-)
- Oscilloscope setting: 2.0 V/DIV (Y), 20 ms/DIV (X), DC range
- Vehicle condition: Idling



01-40

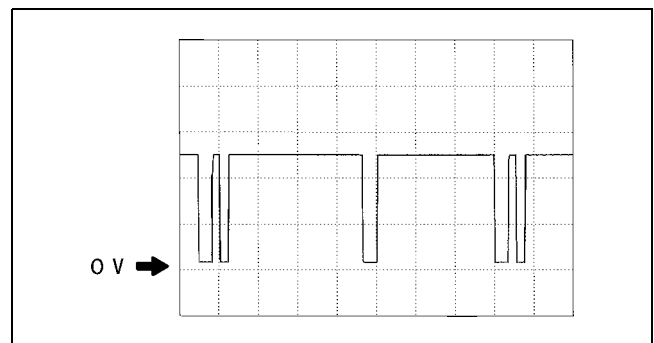
## Vehicle speed signal

- PCM terminal: 3T(+)  $\Leftrightarrow$  4A(-)
- Oscilloscope setting: 1.0 V/DIV (Y), 10 ms/DIV (X), DC range
- Vehicle condition: Driving 50 km/h [31 mph]



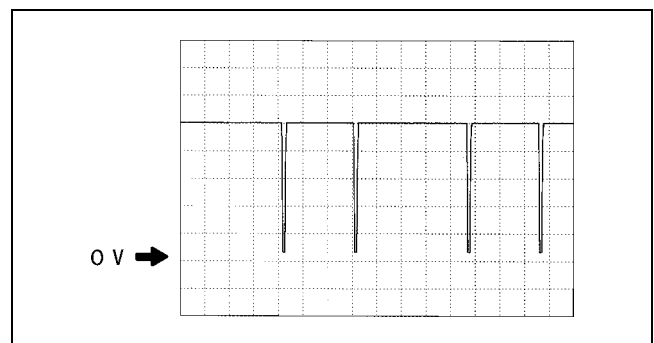
## SGC signal

- PCM terminal: 3V(+)  $\Leftrightarrow$  4A(-)
- Oscilloscope setting: 2.0 V/DIV (Y), 20 ms/DIV (X), DC range
- Vehicle condition: Idling



## NE signal

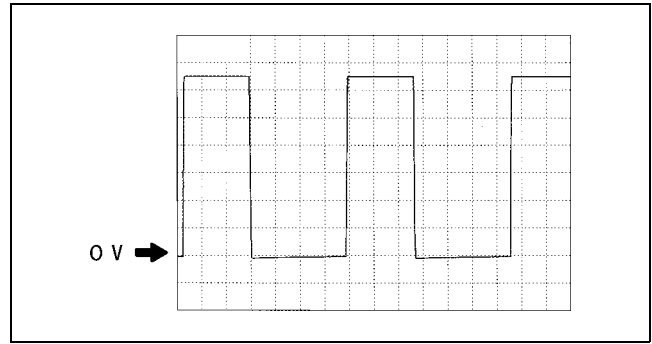
- PCM terminal: 3Y(+)  $\Leftrightarrow$  4A(-)
- Oscilloscope setting: 1.0 V/DIV (Y), 5.0 ms/DIV (X), DC range
- Vehicle condition: Idling



## CONTROL SYSTEM

### Oil control valve (OCV) signal

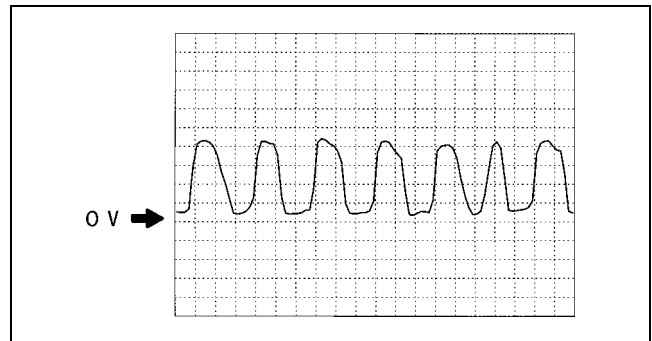
- PCM terminal: 4D(+)  $\leftrightarrow$  4A(-)
- Oscilloscope setting: 2.0 V/DIV (Y), 0.5 ms/DIV (X), DC range
- Vehicle condition: Idling after warm-up (no electrical load)



Y5J3940W126

### HO2S (front) signal

- PCM terminal: 4W(+)  $\leftrightarrow$  4A(-)
- Oscilloscope setting: 0.2 V/DIV (Y), 2.0 ms/DIV (X), DC range
- Vehicle condition: Idling after warm-up



Y5J3940W127

## INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION

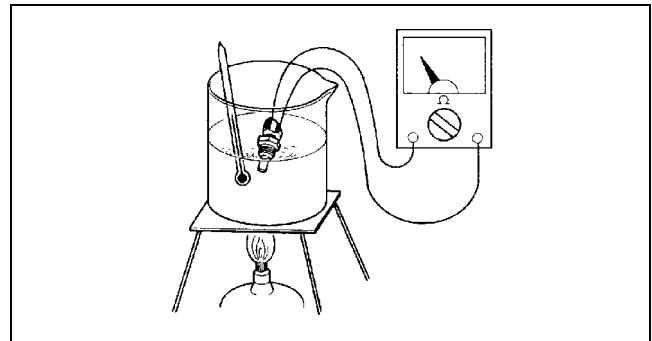
### Inspection of Resistance

A5U014018845W01

#### Note

- Perform the following test only when directed.

1. Disconnect the IAT sensor connector.
2. Remove the IAT sensor.
3. Place the IAT sensor in water with a thermometer, and heat the water gradually.



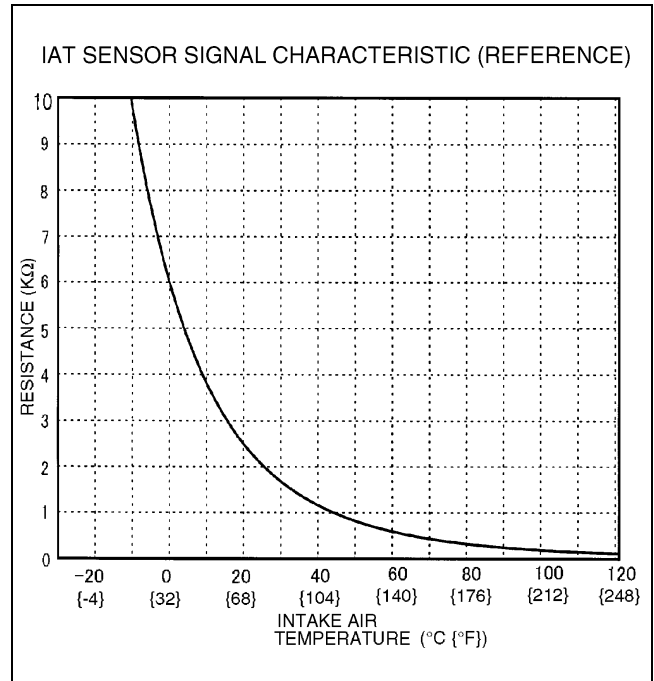
W5U140WZC

4. Measure the resistance of the IAT sensor using an ohmmeter.
  - If IAT sensor is okay, but PID value is out of specification, perform the "Circuit Open/Short Inspection".
  - If not as specified, replace the IAT sensor.

## Specification

| Water temperature (°C {°F}) | Resistance (kilohm) |
|-----------------------------|---------------------|
| 20 {68}                     | 2.21—2.69           |
| 80 {176}                    | 0.29—0.354          |

5. Reconnect the IAT sensor connector.



Z5U140Z09

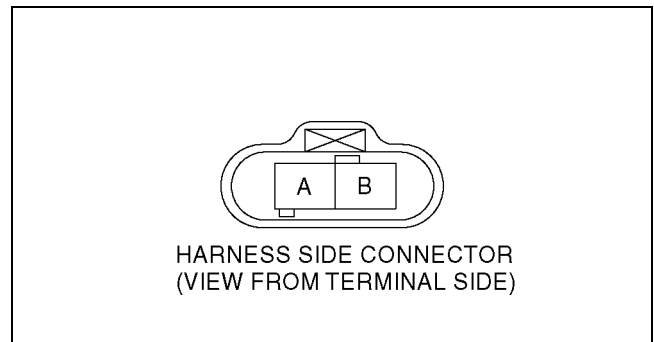
## Circuit Open/Short Inspection

### Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
  - Reference voltage circuit (IAT sensor connector terminal B and PCM connector terminal 4N.)
  - GND circuit (IAT sensor connector terminal A and PCM connector terminal 4O.)

### Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
  - IAT sensor connector terminal B and PCM connector terminal 4N to GND.



A5U0140W004

# CONTROL SYSTEM

## MASS AIR FLOW (MAF) SENSOR INSPECTION

A5U014013210W01

### Note

- Perform the following test only when directed.

1. Visually check for the following on the MAF sensor.
  - Damage
  - Cracks
  - Terminal bends
  - Terminal rust
  - If any of the above are found, replace the MAF sensor.
  - If the above are found okay, but PID value is out of specification, perform the “Circuit Open/Short Inspection”.
2. Reconnect the MAF sensor connector.

### Note

- The scan tool shows the MAF rate and load value.

### Specification

|                          | Intake MAF (g/s) |         | Engine load calculated value (%) |           |
|--------------------------|------------------|---------|----------------------------------|-----------|
|                          | MT               | AT      | MT                               | AT        |
| Idle*1                   | 2.2—3.2          | 2.3—3.2 | 15.0—23.0                        | 14.0—23.0 |
| Engine speed 2,500 rpm*2 | 6.5—8.5          |         | 14.0—21.0                        |           |

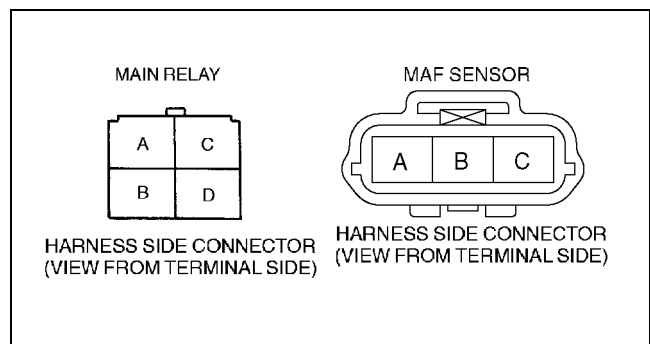
\*1. 750—850 rpm

\*2. No load, neutral or P position

### Circuit Open/Short Inspection

#### Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
  - MAF circuit (MAF sensor connector terminal B and PCM connector terminal 4X.)
  - Power circuit (MAF sensor connector terminal C and main relay terminal D through common connector.)
  - GND circuit (MAF sensor connector terminal A and PCM connector terminal 4A through common connector.)



A5U0140W005

#### Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
  - MAF sensor connector terminal B and PCM connector terminal 4X to GND.
  - MAF sensor connector terminal C and main relay terminal D through common connector to GND.

## THROTTLE POSITION (TP) SENSOR INSPECTION

A5U014018910W01

### Note

- The TP sensor on this type of vehicle is maintenance-free.
- Perform the following test only when directed.

1. Measure the PID value.
  - If PID value is not as specified, inspect as follows:
    - Verify that the throttle valve is fully closed.
    - Accelerator cable free play (See 01-13-9 ACCELERATOR CABLE INSPECTION/ADJUSTMENT)
    - Throttle cable free play (See 01-13-9 ACCELERATOR CABLE INSPECTION/ADJUSTMENT)
  - If the above are okay, but PID value is out of specification, perform the “Circuit Open/Short Inspection”.
2. Reconnect the TP sensor connector.
  - If the above open or short circuit are correct, replace TP sensor.



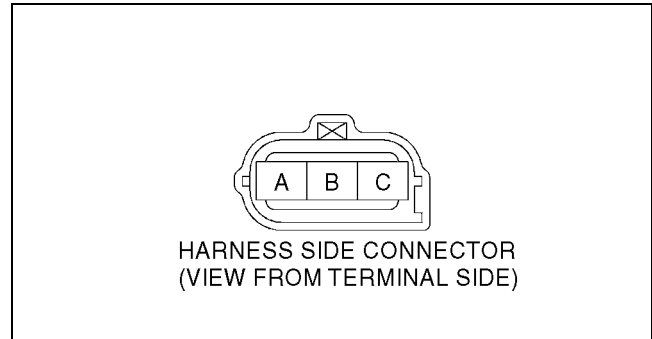
## Circuit Open/Short Inspection

### Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
  - Reference voltage circuit (TP sensor connector terminal A and PCM connector terminal 4L.)
  - TP circuit (TP sensor connector terminal C and PCM connector terminal 4V.)
  - GND circuit (TP sensor connector terminal B and PCM connector terminal 4O.)

### Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
  - TP sensor connector terminal A and PCM connector terminal 4L to GND.
  - TP sensor connector terminal C and PCM connector terminal 4V to GND.



A5U0140W002

01-40

## THROTTLE POSITION (TP) SENSOR REPLACEMENT

A5U014018910W02

1. Disconnect the TP sensor connector.
2. Remove the attaching screws.
3. Remove the TP sensor.
4. Verify that the throttle valve is fully closed.
5. Catch the tang of the TB on the TP sensor plastic rotor.
6. Position the TP sensor on the TB so that the mounting holes align.
7. Install the attaching screws.

### Tightening torque

1.6—2.3 N·m {16—24 kgf·cm, 14—20 in·lbf}

8. Release the throttle.
9. Verify the TP sensor PID value. (See 01-40-6 PCM INSPECTION.)
  - If the PID value is not as specified, inspect the TP sensor. (See 01-40-24 THROTTLE POSITION (TP) SENSOR INSPECTION.)
    - If the PID (TP V) condition is not as specified, replace the TB.

## FUEL TANK PRESSURE (FTP) SENSOR INSPECTION

A5U014018212W01

### Note

- Perform the following test only when directed.
1. Inspect the FTP sensor for damage and cracks.
  2. Inspect the vacuum hose for improper routing, kinks or leaks.
    - If the above are okay, perform the "Circuit Open/Short Inspection".
  3. Reconnect the FTP sensor connector.
    - If the above open or short circuit are correct, replace FTP sensor.

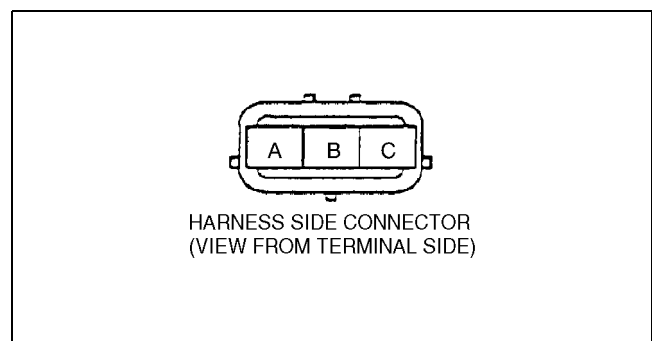
## Circuit Open/Short Inspection

### Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
  - FTP sensor connector terminal A and PCM connector 4AB through common connector.
  - Reference voltage circuit (FTP sensor connector terminal C and PCM connector terminal 4L through common connector.)
  - GND circuit (FTP sensor connector terminal B and PCM connector terminal 4O through common connector.)

### Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
  - FTP sensor connector terminal A and PCM connector terminal 4AB through common connector to GND.
  - FTP sensor connector terminal C and PCM connector terminal 4L through common connector to GND.



Z5U0140W001

## ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION

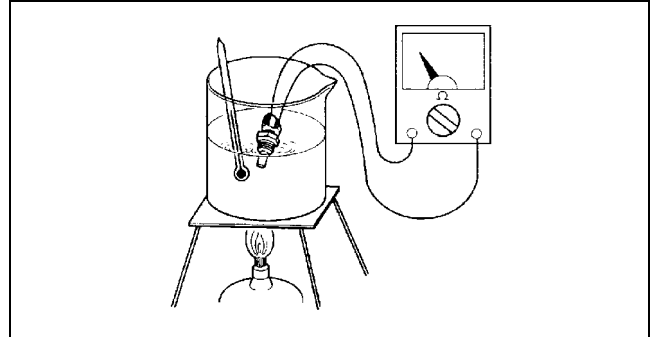
A5U014018840W01

### Inspection of Resistance

#### Note

- Perform the following test only when directed.

1. Drain the engine coolant. (See 01–12–2 COOLING SYSTEM SERVICE WARNINGS.) (See 01–12–2 ENGINE COOLANT REPLACEMENT.)
2. Disconnect the ECT sensor connector.
3. Remove the ECT sensor.
4. Place the sensor in water with a thermometer, and heat the water gradually.

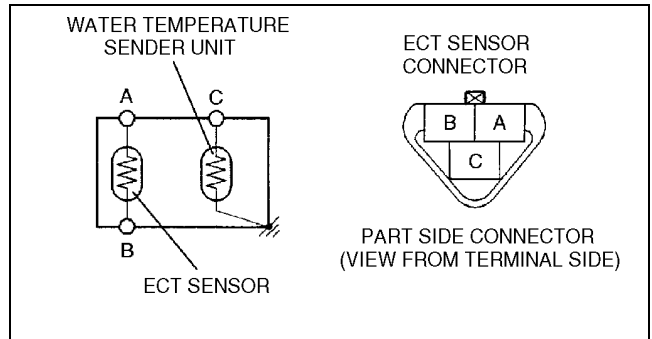


W5U140WZC

5. Measure the resistance between the ECT sensor terminals using an ohmmeter.
  - If not as specified, replace the ECT sensor.
  - If ECT sensor is okay, but PID value is out of specification, perform the “Circuit Open/Short Inspection”.

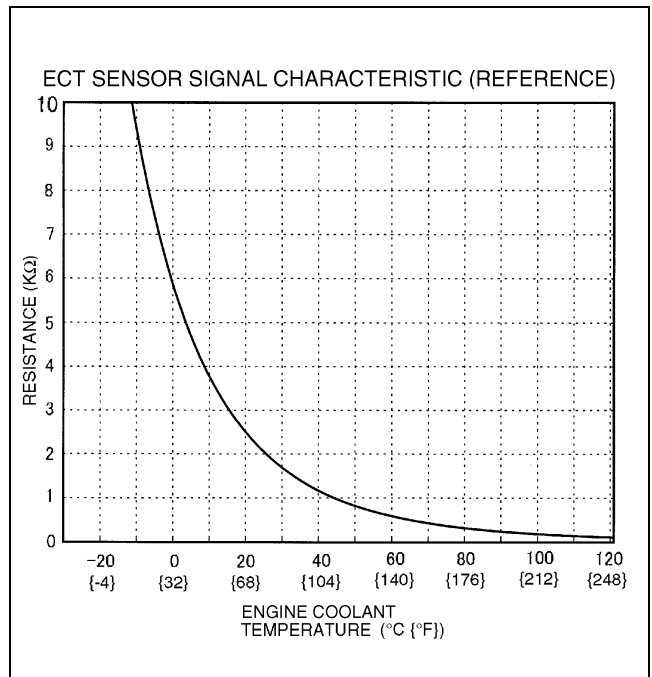
#### Specification

| Temperature (°C {°F}) | Resistance (kilohm) |
|-----------------------|---------------------|
| 20 {68}               | 2.27—2.74           |
| 80 {176}              | 0.29—0.34           |



Z5U0140W005

6. Reconnect the ECT sensor connector.



Z5U140WZ5

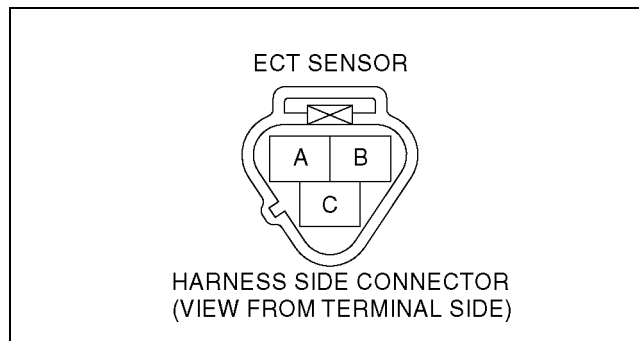
## Circuit Open/Short Inspection

### Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
  - Reference voltage circuit (ECT sensor connector terminal A and PCM connector terminal 4P through common connector.)
  - GND circuit (ECT sensor connector terminal B and PCM connector terminal 4O through common connector.)

### Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
  - ECT sensor connector terminal A and PCM connector terminal 4P through common connector to GND.



A5U0140W006

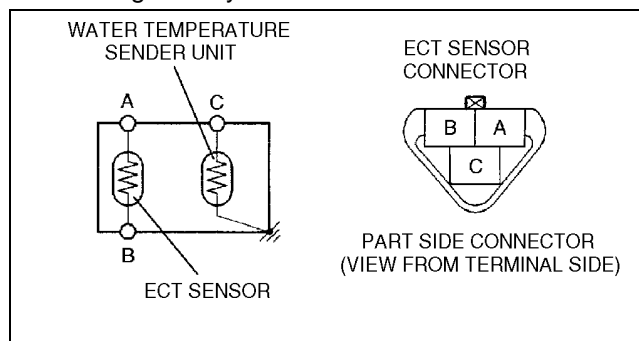
01-40

## Water Temperature Sender Unit Inspection

1. Drain the engine coolant. (See 01-12-2 COOLING SYSTEM SERVICE WARNINGS.) (See 01-12-2 ENGINE COOLANT REPLACEMENT.)
2. Remove the ECT sensor.
3. Place the sensor in water with a thermometer, and heat the water gradually.
4. Measure the resistance between ECT sensor terminal C and body GND using an ohmmeter.
  - If not as specified, replace the ECT sensor.

### Specification

| Water temperature (°C {°F}) | Resistance (ohm) |
|-----------------------------|------------------|
| 50 {122}                    | 160—230          |



Z5U0140W005

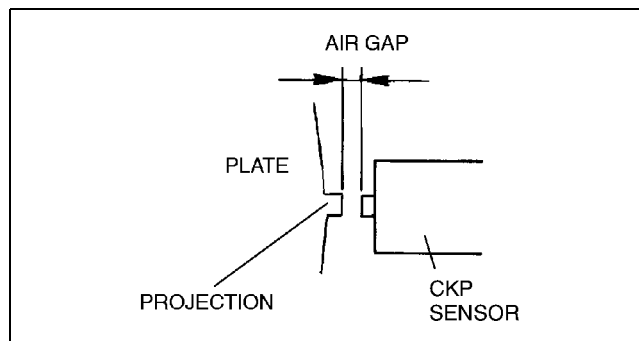
## CRANKSHAFT POSITION (CKP) SENSOR INSPECTION

### Inspection of Air Gap

#### Note

- Perform the following test only when directed.

1. Measure the air gap between each four projections of the plate behind the crankshaft pulley and the CKP sensor using a feeler gauge.
  - If not as specified, adjust the CKP sensor air gap and inspect as follows:
    - Is any of the four projections of the plate behind the crankshaft pulley twisted or bent.
      - If not adjusted, replace the plate behind the crankshaft pulley (See 01-40-29 PLATE REMOVAL/INSTALLATION.) or CKP sensor. (See 01-40-28 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION.)
    - If CKP sensor PID value is out of specification, perform the "Circuit Open/Short Inspection".



Z5U140W105

### Specification

0.5—1.5 mm {0.020—0.059 in}

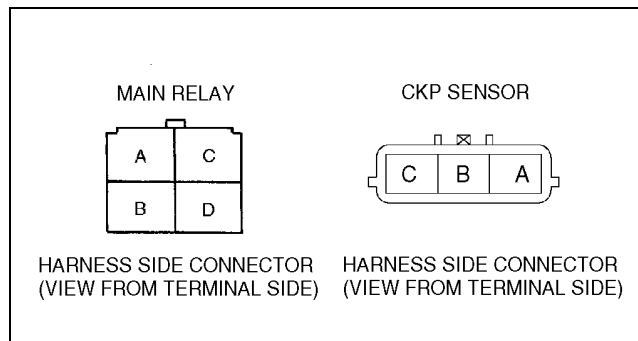
2. Reconnect the CKP sensor connector.

## CONTROL SYSTEM

### Circuit Open/Short Inspection

#### Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
  - CKP circuit (CKP sensor connector terminal B and PCM connector terminal 3Y.)
  - Power circuit (CKP sensor connector terminal A and main relay terminal D through common connector.)
  - GND circuit (CKP sensor connector terminal C and PCM connector terminal 4A through common connector.)



A5U0140W007

#### Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
  - CKP sensor connector terminal B and PCM connector terminal 3Y circuit through common connector to GND.
  - CKP sensor connector terminal A and main relay terminal D through common connector to GND.

### CRANKSHAFT POSITION (CKP) SENSOR ADJUSTMENT

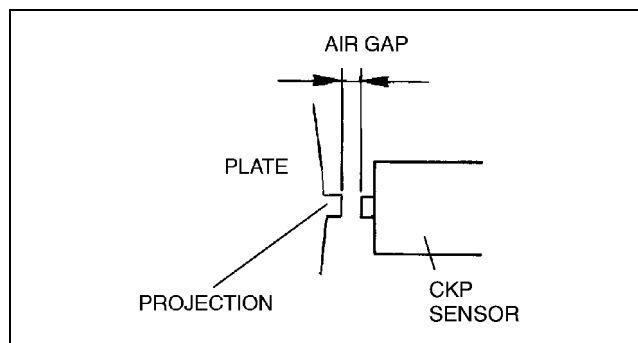
A5U014018230W02

1. Loosen the CKP sensor installation bolt.
2. While moving the CKP sensor, adjust the air gap between the CKP sensor and the four projections on the plate using a feeler gauge.

#### Specification

0.5—1.5 mm {0.020—0.059 in}

3. Tighten the CKP sensor installation bolt.
  - If not adjusted, replace the plate behind the crankshaft pulley or the CKP sensor. (See 01-40-29 PLATE REMOVAL/INSTALLATION.) (See 01-40-28 CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION.)



Z5U140W105

#### Tightening torque

7.9—10.7 N·m {80—110 kgf·cm, 69.5—95.4 in·lbf}

### CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION

A5U014018230W03

1. Disconnect the CKP sensor connector.
2. Remove the undercover.
3. Remove the CKP sensor installation bolt.
4. Install in the reverse order of removal.

#### Tightening torque

7.9—10.7 N·m {80—110 kgf·cm, 69.5—95.4 in·lbf}

5. Reconnect the CKP sensor connector.

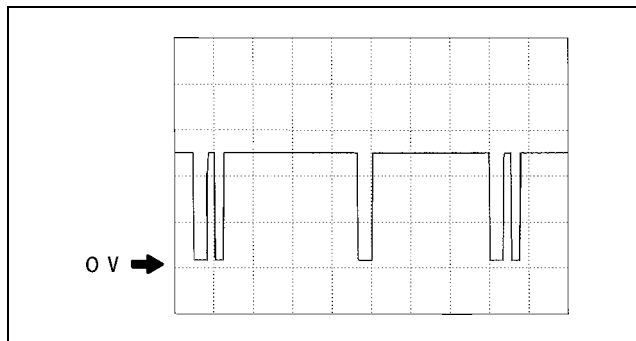
#### Note

- Do not forcefully pull the wiring harness of the CKP sensor.
6. Adjust the air gap. (See 01-40-28 CRANKSHAFT POSITION (CKP) SENSOR ADJUSTMENT.)



## CONTROL SYSTEM

6. Inspect wave profile when idling engine.
  - If wave profile or voltage are out of specifications, carry out the "Circuit Open/Short Inspection".
    - PCM terminal: 3V(+)  $\leftrightarrow$  4A(-)
    - Oscilloscope setting: 2.0V/DIV(Y), 20ms/DIV(X), DC range
    - Vehicle condition: Idling



A5U0140W015

### Circuit Open/Short Inspection

1. Remove the PCM. (See 01-40-6 PCM REMOVAL/INSTALLATION.)
2. Inspect the following wiring harnesses for an open or short circuit by probing the applicable sensor and PCM terminals with ohmmeter leads.
  - If there is an open or short circuit, repair or replace wiring harnesses.
  - If there is no open or short circuit, replace the CMP sensor.

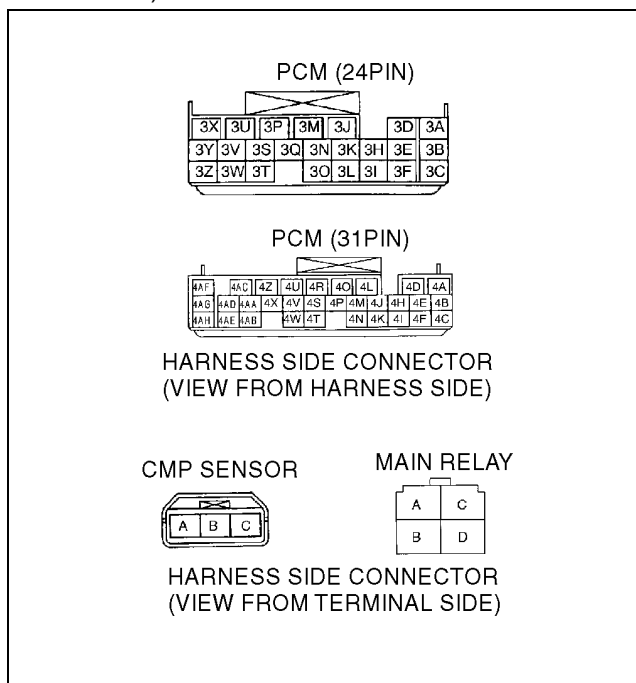
#### Open circuit

- CMP signal circuit (CMP sensor connector terminal B and PCM connector terminal 3V)
- Power circuit (CMP sensor connector terminal A and main relay terminal D through common connector)
- GND circuit (CMP sensor connector terminal C and PCM connector terminal 4A)

#### Short circuit

- CMP signal circuit (CMP sensor connector terminal B and PCM connector terminal 3V to GND)
- Power circuit (CMP sensor connector terminal A and main relay terminal D through common connector to GND)

3. Reconnect the CMP sensor connector.
4. Inspect the protrusion of camshaft (intake side) for damage and cracks.



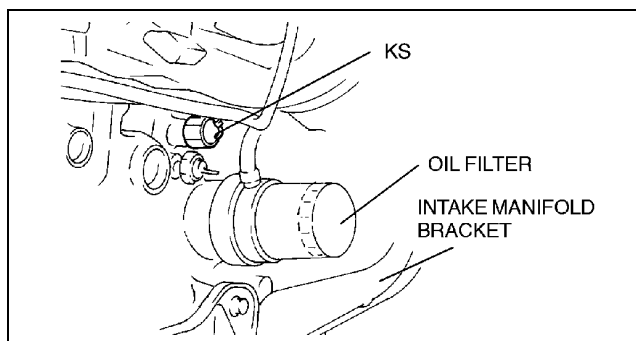
A5U0140W013

### KNOCK SENSOR (KS) REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Remove the intake manifold bracket.
3. Remove the KS using the **SST** (49 H018 001).
4. Install in the reverse order of removal.

#### Tightening torque

19.6—34.3 N·m {2.0—3.5 kgf·m, 14.5—25.3 ft·lbf}



Z5U0140W110

## KNOCK SENSOR (KS) INSPECTION

A5U014018921W02

### Inspection of Resistance

#### Note

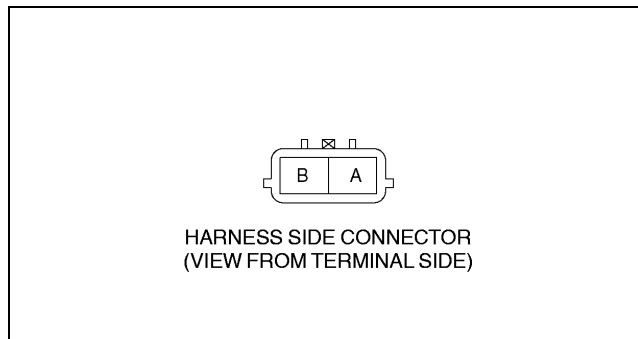
- Perform the following test only when directed.

1. Verify that the ignition switch is at LOCK.
2. Disconnect KS connector.
3. Measure the resistance between KS terminal A and the KS body using an ohmmeter.
  - If not as specified, replace the KS.
  - If knock sensor is okay, but PID value is out of specification, perform the "Circuit Open/Short Inspection". (See 01-40-30 KNOCK SENSOR (KS) REMOVAL/INSTALLATION.)

#### Specification

**Approx. 560 kilohms [20°C {68°F}]**

4. Reconnect the KS connector.



A5U0140W008

### Circuit Open/Short Inspection

#### Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
  - KS circuit (KS connector terminal A and PCM connector terminal 4M through common connector.)

#### Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
  - KS connector terminal A and PCM connector terminal 4M through common connector to GND.

## HEATED OXYGEN SENSOR (HO2S) INSPECTION

A5U014018861W01

### Inspection of Voltage

#### Note

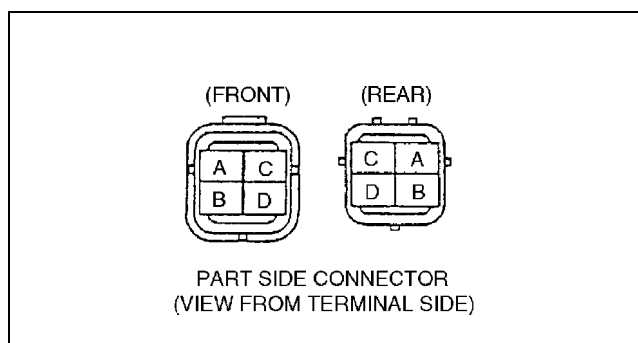
- Perform the following test only when directed.

1. Warm up the engine and idle it.
2. Disconnect the HO2S connector.
3. Connect a voltmeter between the HO2S connector terminal A and a GND.
4. Run the engine at **3,000 rpm** until the voltmeter indicates **0—1.0 V**.
5. Verify the voltage when engine speed is suddenly increased and decreased several times.
  - If HO2S is okay, but PID value is out of specification, perform the "Circuit Open/Short Inspection."
  - If not as specified, replace the HO2S.

#### Specification

| Engine condition | Voltage (V) |
|------------------|-------------|
| Increased        | 0.5—1.0     |
| Decreased        | 0—0.5       |

6. Reconnect the HO2S connector.



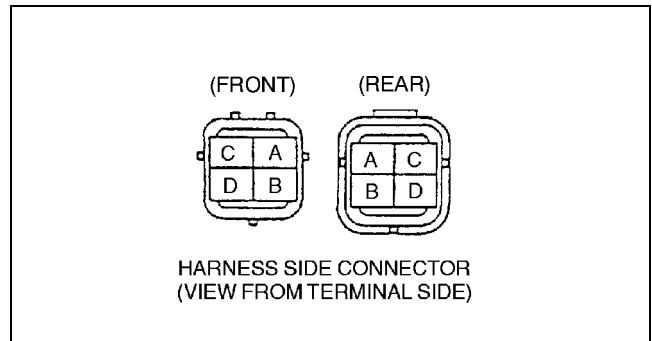
A5U0140W010

## CONTROL SYSTEM

### Circuit Open/Short Inspection

#### Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
  - Heated oxygen circuit (HO2S connector terminal A and PCM connector terminal 4W (Front).)
  - GND circuit (HO2S connector terminal B and PCM connector terminal 4O through common connector (Front).)
  - Heated oxygen circuit (HO2S connector terminal A and PCM connector terminal 4AA (Rear).)
  - GND circuit (HO2S connector terminal B and PCM connector terminal 4O through common connector (Rear).)



A5U0140W009

#### Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
  - HO2S connector terminal A and PCM connector terminal 4W to GND (Front).
  - HO2S connector terminal A and PCM connector terminal 4AA to GND (Rear).

### HEATED OXYGEN SENSOR (HO2S) HEATER INSPECTION

#### Inspection of Resistance

A5U014018861W02

#### Note

- Perform the following test only when directed.

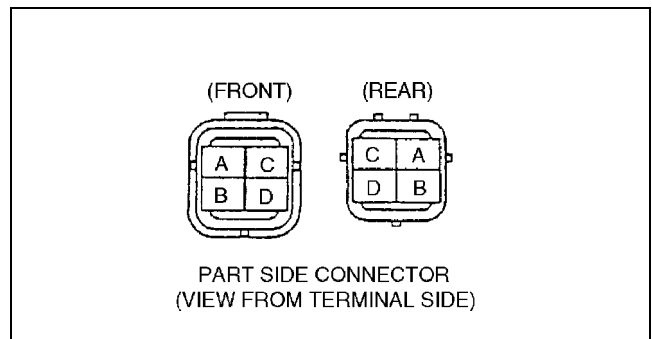
1. Disconnect the HO2S connector.
2. Measure the resistance between HO2S terminals C and D using an ohmmeter.
  - If not as specified, replace the HO2S.
  - If HO2S heater is okay, but PID value is out of specification, perform the "Circuit Open/Short Inspection".

#### Specification

**Approx. 5.6 ohms (Front)**

**Approx. 15.7 ohms (Rear)**

3. Reconnect the HO2S connector.

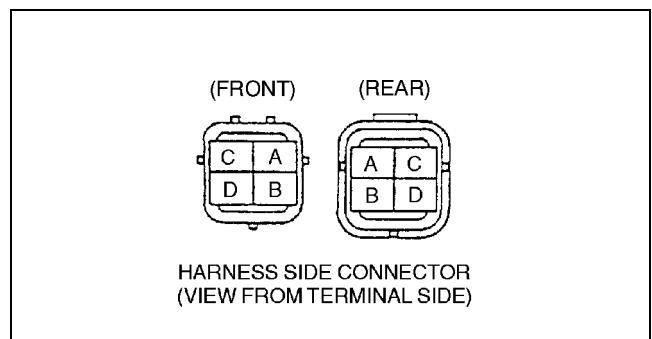


A5U0140W010

### Circuit Open/Short Inspection

#### Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
  - GND circuit (HO2S connector D and PCM connector terminal 3J through common connector (Front).)
  - Power circuit (HO2S connector terminal C and ignition switch (IG1) circuit through common connector (Front).)
  - GND circuit (HO2S connector terminal D and PCM connector terminal 3P (Rear).)
  - Power circuit (HO2S connector terminal C and ignition switch (IG1) circuit through common connector (Rear).)



A5U0140W009

#### Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
  - HO2S connector terminal C and ignition switch (IG1) through common connector to GND (Front).
  - HO2S connector terminal D and PCM connector terminal 3J through common connector to GND (Front).
  - HO2S connector terminal D and PCM connector terminal 3P to GND (Rear).



## EGR BOOST SENSOR INSPECTION

A5U014018211W01

### Note

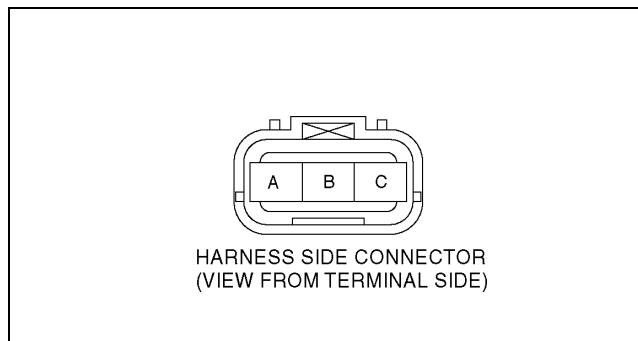
- Perform the following test only when directed.
1. Inspect the EGR boost sensor for damage and cracks.
  2. Inspect the vacuum hose for improper routing, kinks or leaks.
    - If the above are okay, perform the "Circuit Open/Short Inspection."
  3. Reconnect the EGR boost sensor connector.
    - If the above open or short circuit are correct, replace EGR boost sensor.

01-40

### Circuit Open/Short Inspection

#### Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
  - EGR boost circuit (EGR boost sensor connector terminal B and PCM connector terminal 4AE.)
  - Reference voltage circuit (EGR boost sensor connector terminal C and PCM connector terminal 4L.)
  - GND circuit (EGR boost sensor connector terminal A and PCM connector terminal 4O through common connector.)



A5U0140W014

#### Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
  - EGR boost sensor connector terminal C and PCM connector terminal 4L through common connector to GND.
  - EGR boost sensor connector terminal B and PCM connector 4AE through common connector to GND.

## CLUTCH SWITCH INSPECTION

A5U014018660W01

### Inspection of Continuity

#### Note

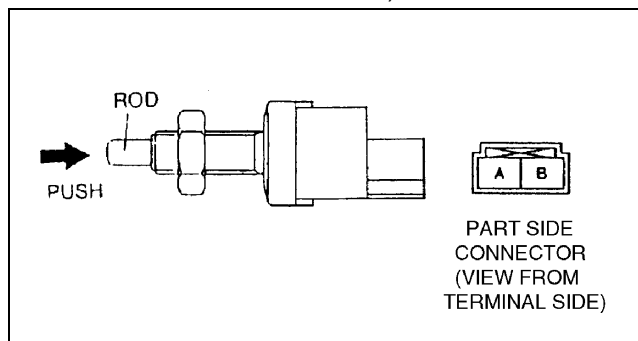
- Perform the following test only when directed.

1. Verify that the clutch switch is installed properly. (See 05-10-6 CLUTCH PEDAL REMOVAL/INSTALLATION.)
2. Disconnect the negative battery cable.
3. Remove the clutch switch. (See 05-10-6 CLUTCH PEDAL REMOVAL/INSTALLATION.)
4. Inspect continuity between the clutch switch terminals using an ohmmeter.
  - If not as specified, replace the clutch switch.
  - If clutch switch is okay, but PID value is out of specification, perform the "Circuit Open/Short Inspection".

### Specification

○—○ : Continuity

| Condition    | Terminal |     |
|--------------|----------|-----|
|              | A        | B   |
| Push the rod |          |     |
| Except above | ○—○      | ○—○ |



Y5U140WB3

Z5U140W701

5. Reconnect the clutch switch connector.

# CONTROL SYSTEM

## Circuit Open/Short Inspection

### Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
  - Power circuit (Clutch switch connector terminal A and PCM connector terminal 4I through common connector.)
  - GND circuit (Clutch switch connector terminal B and GND.)

### Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
  - Clutch switch connector terminal A and PCM connector terminal 4I through common connector to GND.

## NEUTRAL SWITCH INSPECTION

### Inspection of Continuity

A5U014017640W01

#### Note

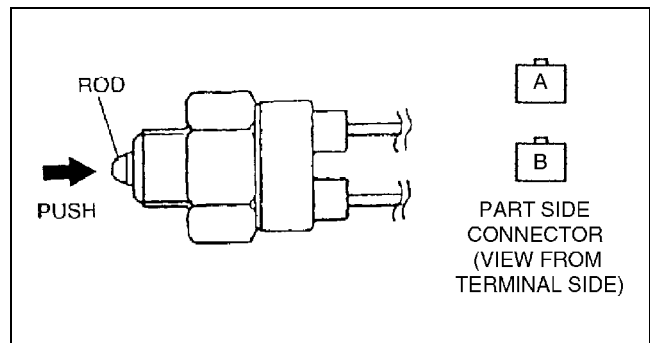
- Perform the following test only when directed.

1. Disconnect the negative battery cable.
2. Remove the neutral switch.
3. Inspect for continuity between the neutral switch terminals using an ohmmeter.
  - If not as specified, replace the neutral switch.
  - If neutral switch is okay but PID value is out of specification, perform the "Circuit Open/Short Inspection".

### Specification

○—○ : Continuity

| Measuring Condition | Terminal |     |
|---------------------|----------|-----|
|                     | A        | B   |
| Push the rod        | ○—○      | ○—○ |
| Except above        |          |     |



Z5U140W111

X5U140WB7

4. Reconnect the neutral switch connector.

## Circuit Open/Short Inspection

### Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
  - Power circuit (Neutral switch connector terminal A and PCM connector terminal 4H through common connector.)
  - GND circuit (Neutral switch connector terminal B and GND through common connector.)

### Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
  - Neutral switch connector terminal A and PCM connector terminal 4H through common connector to GND.

## POWER STEERING PRESSURE (PSP) SWITCH INSPECTION

A5U014032230W01

### Inspection of Continuity

#### Note

- Perform the following test only when directed.

1. Inspect as follows if power steering is inoperative:
  - POWER STEERING FLUID INSPECTION (See 06–12–3 POWER STEERING FLUID INSPECTION)
2. Disconnect the PSP switch connector.
3. Start the engine.
4. Inspect for continuity between PSP switch terminal and GND using an ohmmeter.
  - If not as specified, replace the PSP switch.
  - If PSP switch is okay but PID value is out of specification, perform the “Circuit Open/Short Inspection.”

01–40

### Specification

○—○ : Continuity

| Condition                   | Terminal |        |
|-----------------------------|----------|--------|
|                             | A        | Ground |
| Steering wheel not turned   |          |        |
| Steering wheel being turned | ○—○      | ○—○    |

X5U140WB8

5. Reconnect the PSP switch connector.

### Circuit Open/Short Inspection

#### Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
  - Power circuit (PSP switch connector terminal and PCM connector terminal 4C through common connector.)
  - GND circuit (PSP switch GND circuit.)

#### Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the harness.
  - PSP switch connector terminal and PCM connector terminal 4C through common connector to GND.