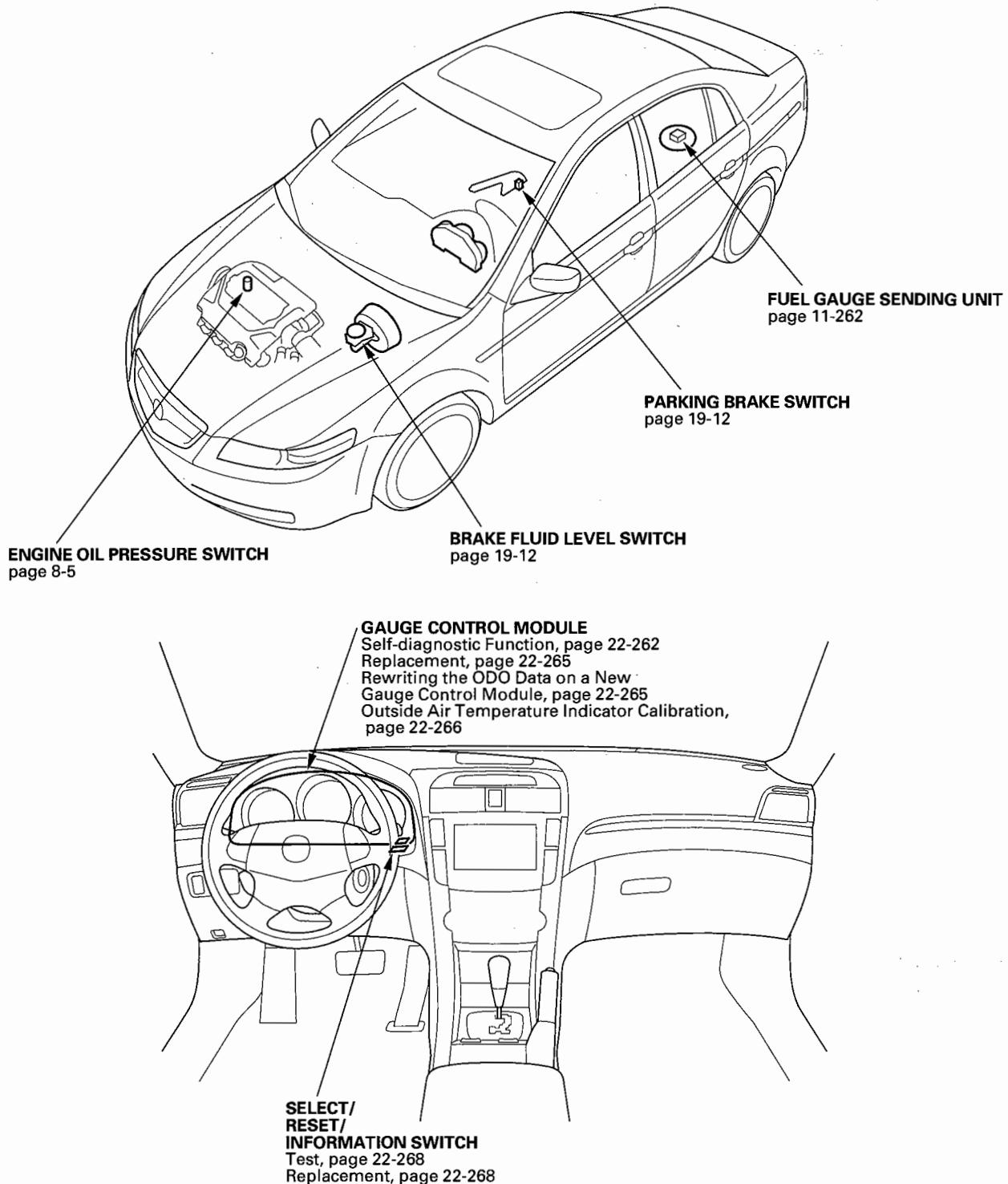


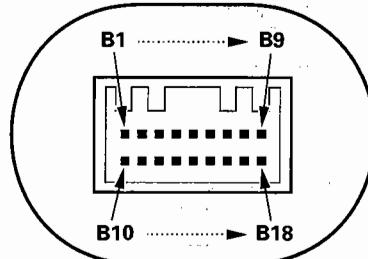
Gauges

Component Location Index

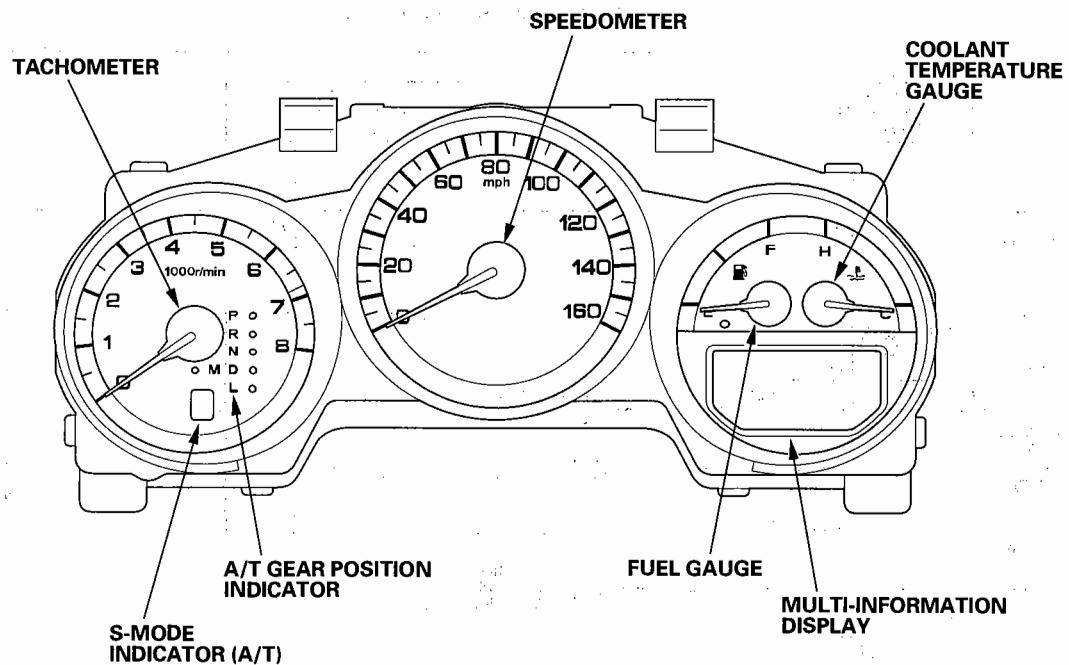
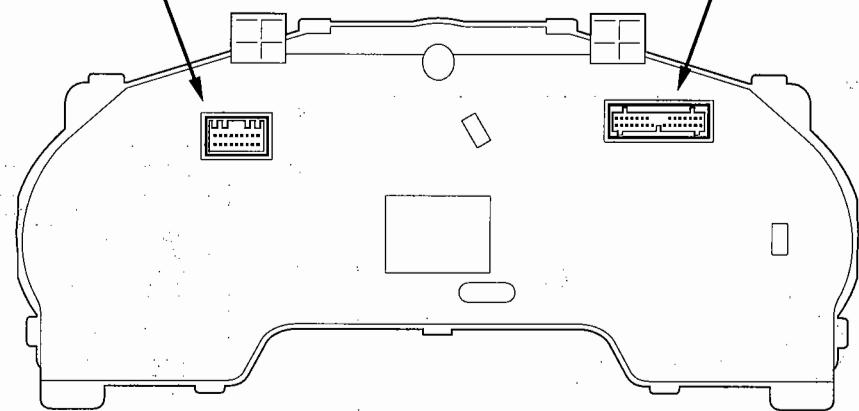
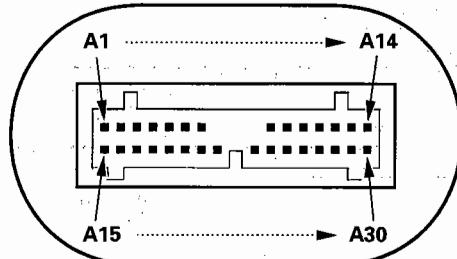




CONNECTOR B (18P)

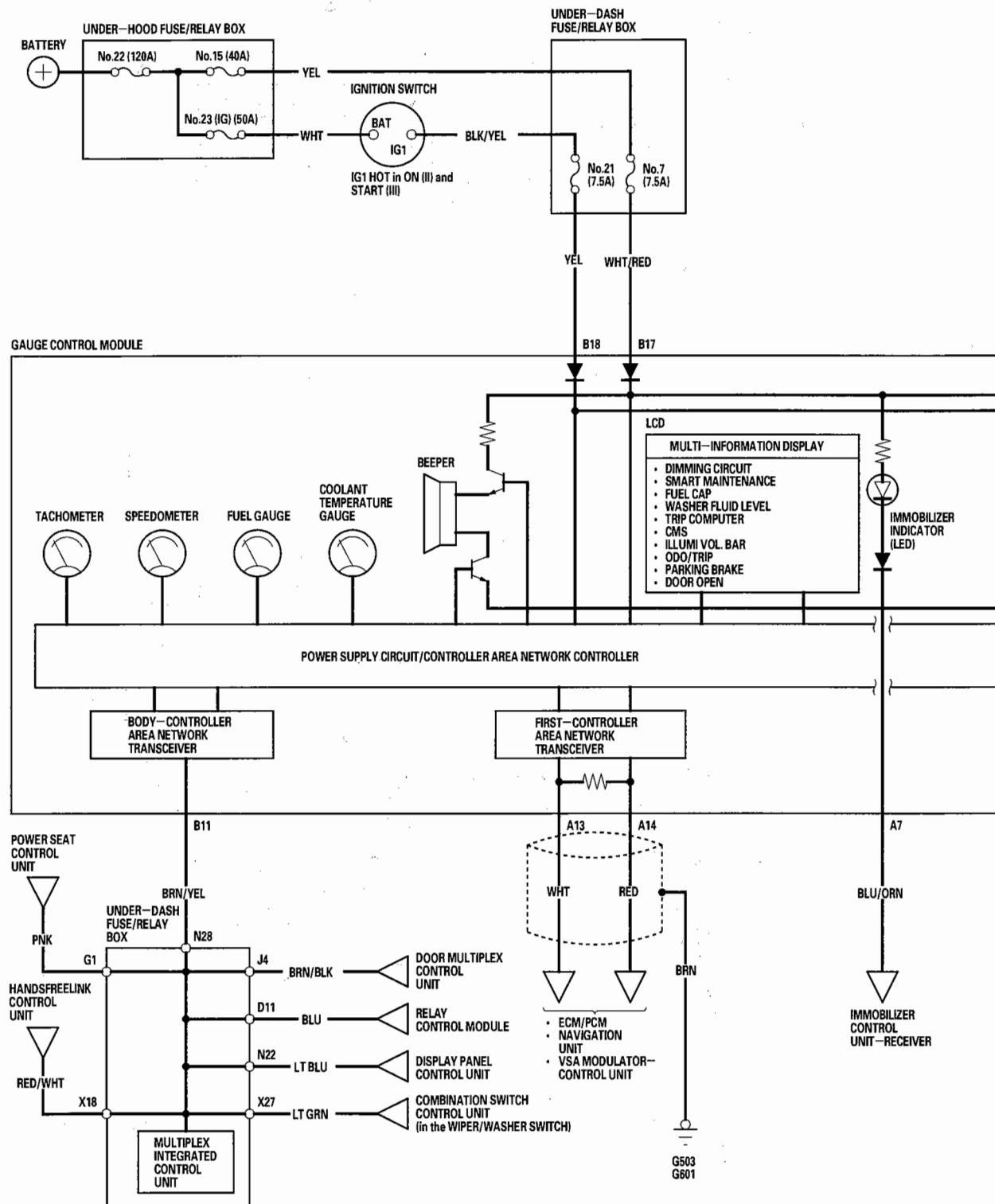


CONNECTOR A (30P)



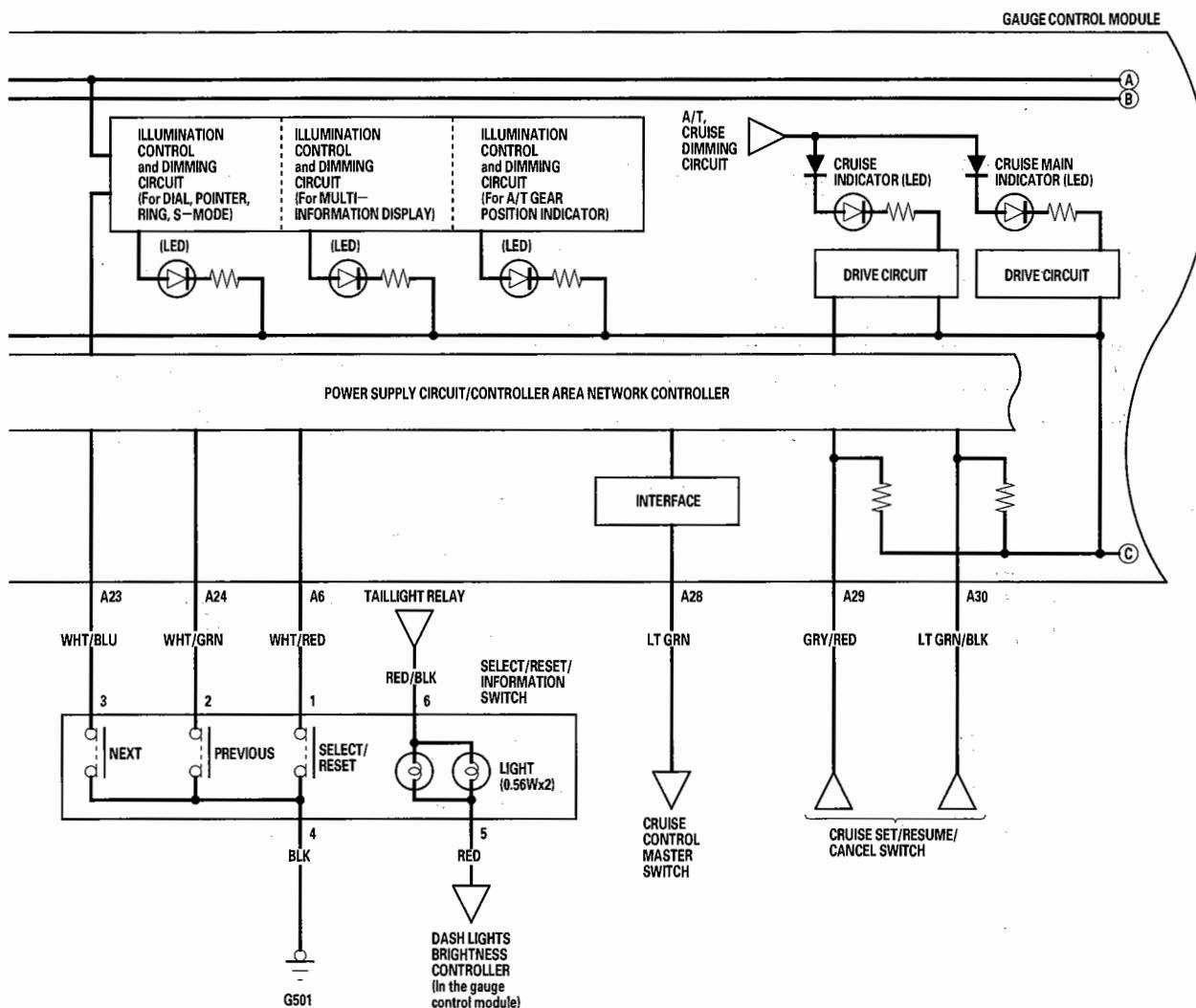
Gauges

Circuit Diagram





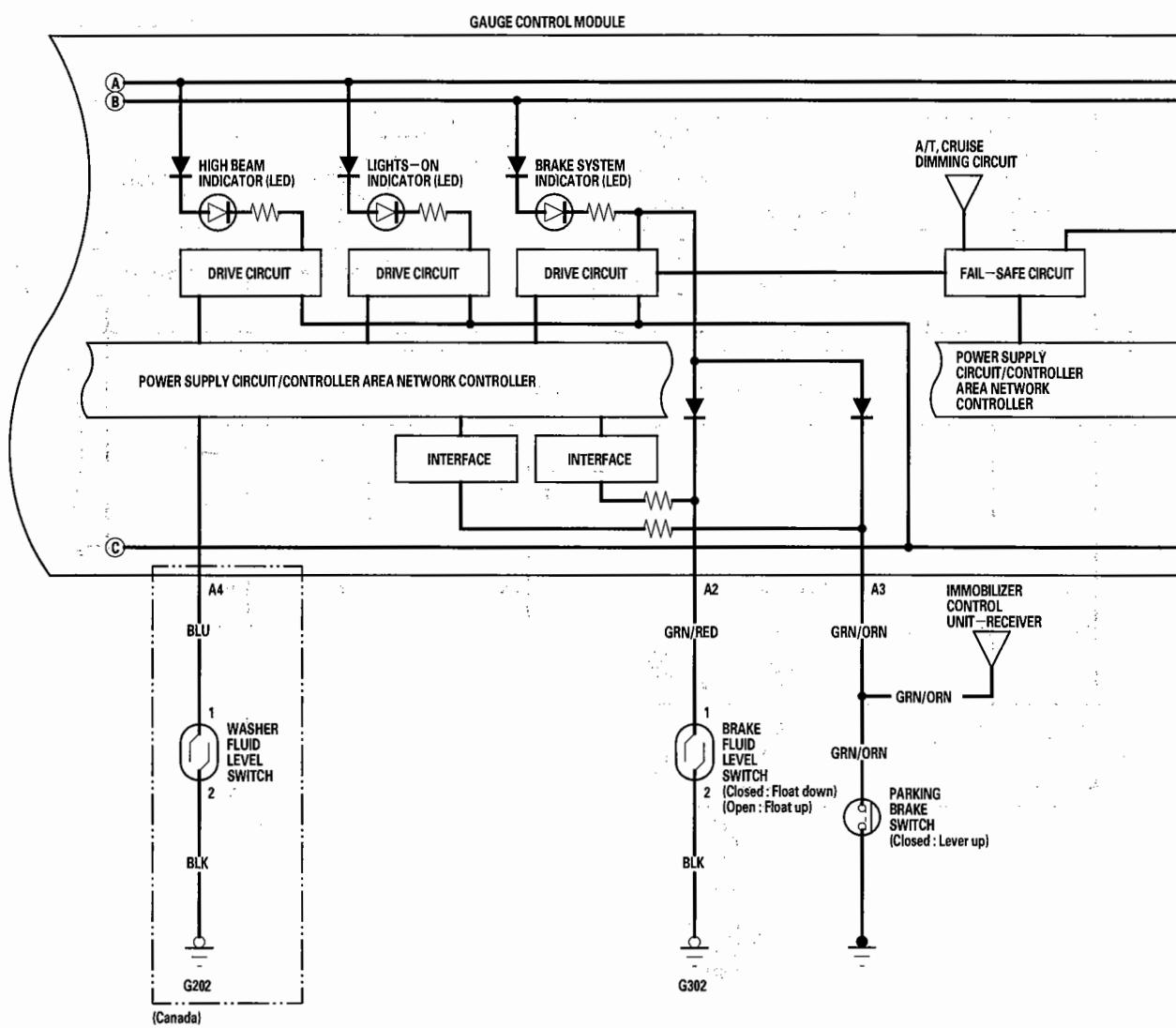
-----: Shielding



(cont'd)

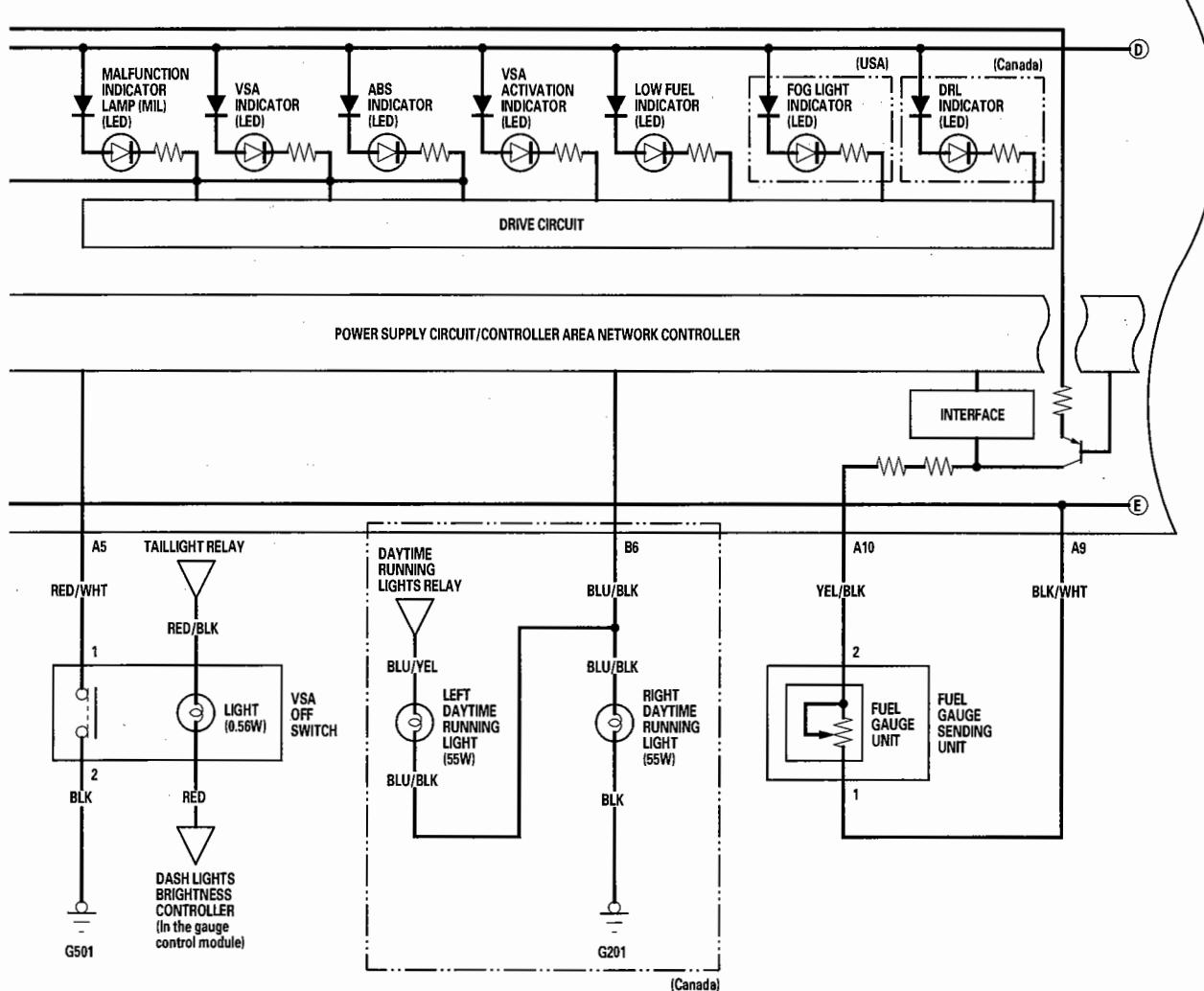
Gauges

Circuit Diagram (cont'd)





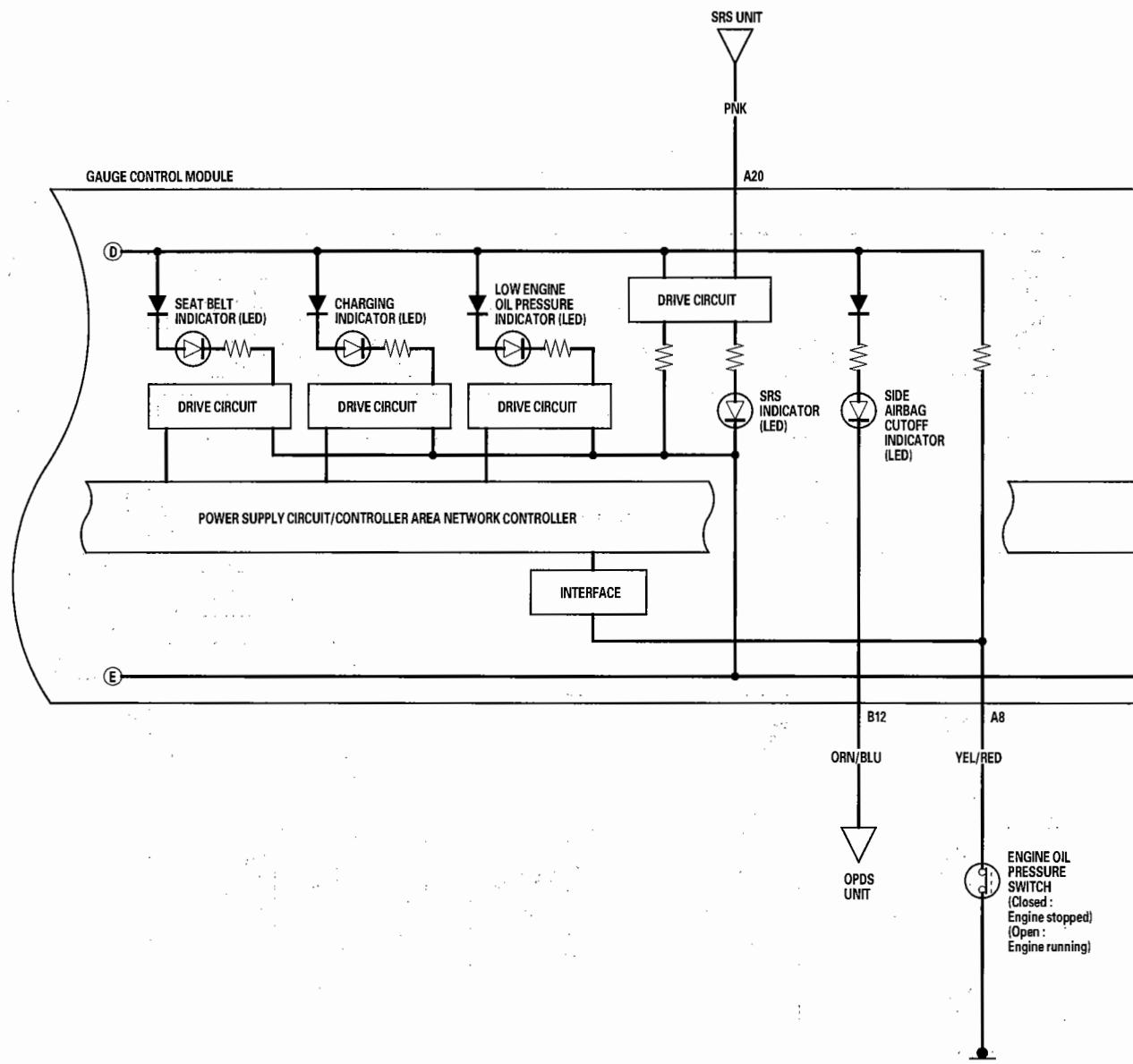
GAUGE CONTROL MODULE



(cont'd)

Gauges

Circuit Diagram (cont'd)



Gauges

Self-diagnostic Function

Before troubleshooting the gauge system, refer to multiplex integrated control system B-CAN System Diagnosis Test Mode A (see page 22-108).

The gauge control module has a self-diagnosis function.

- The beeper drive circuit check.
- The indicator drive circuit check.
- The switch input test.
- The LCD segments check.
- The gauges drive circuit check (Speedometer, Tachometer, Fuel gauge, Coolant temperature gauge).
- The communication line check (of the body-controller area network (B-CAN) communication line and the fast-controller area network (F-CAN) communication line between the gauges).

NOTE: Indicators are also controlled via the communication line.

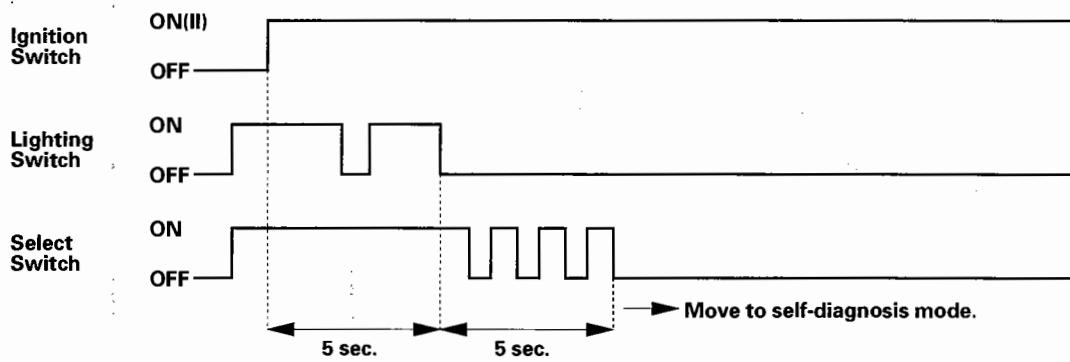
Entering the self-diagnosis function

Before doing the self-diagnosis function, check the No. 7 (7.5A) fuse and the No. 21 (7.5A) fuse in the under-dash fuse/relay box.

1. Push and hold the SELECT button.
2. Turn the headlights ON.
3. Turn the ignition switch ON (II).
4. Within 5 sec., turn the headlights OFF, then ON and OFF again.
5. Within 5 sec., release the SELECT button, and then push and release the button three times repeatedly.

NOTE:

- While in the self-diagnosis mode, the dash lights brightness controller operates normally.
- While in the self-diagnosis mode, the SELECT button is used to start the Beeper Drive Circuit Test and the Gauge Drive Circuit Check.
- If the vehicle speed exceeds 1.2 mph (2 km/h) or the ignition switch is turned OFF, the self-diagnosis mode ends.





The Indicator Drive Circuit Check

When entering the self-diagnosis mode, the following indicators blink:

Seat belt indicator, charging system indicator, low fuel indicator, oil pressure indicator, high beam indicator, DRL indicator (Canada), VSA indicator, VSA activation indicator, brake system indicator, fog light indicator, lights on indicator, malfunction indicator lamp (MIL), A/T gear position indicator, ABS indicator, cruise main indicator and cruise set indicator.

Switch Input Check

After the intermittent beeper sounds at the initial stage of self-diagnosis, a beeper sounds continuously while any of the following switch inputs are switched from OFF to ON:

Parking brake switch, VSA OFF switch, cruise control master, SET, RESUME switches, select, previous, next switches, and dash lights brightness controller (cancel, VOL(+), VOL(-))

The Beeper Drive Circuit Check

When entering the self-diagnosis mode, the beeper sounds five times.

The LCD [Sport shift and multi-information display (MID)] Segment Check

When entering the self-diagnosis mode, the all segments blink five times.

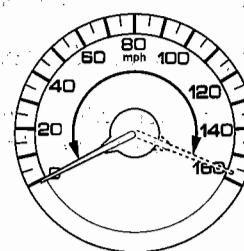
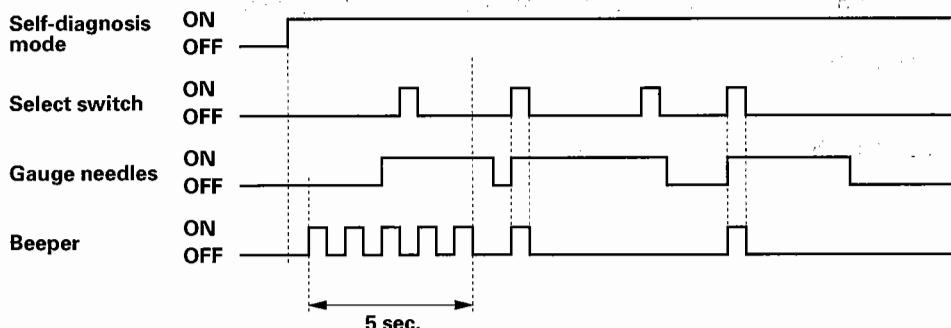
The Gauge Drive Circuit Check

When entering the self-diagnosis mode, the speedometer, the tachometer, the fuel gauge, and the coolant temperature gauge needles sweep from the minimum position to maximum position, then return to the minimum position.

NOTE:

After the beeper stops sounding and the gauge needles return to the minimum position, pushing the select/reset button starts the Beeper Drive Circuit Check (one beep) and the Gauge Drive Circuit Check again.

The check cannot be started again until the gauge needles return to the minimum position.



The needles sweep from the minimum position to the maximum position, then return to the minimum position.

If a needle fails to sweep or the beeper does not sound, replace the gauge control module.

(cont'd)

Gauges

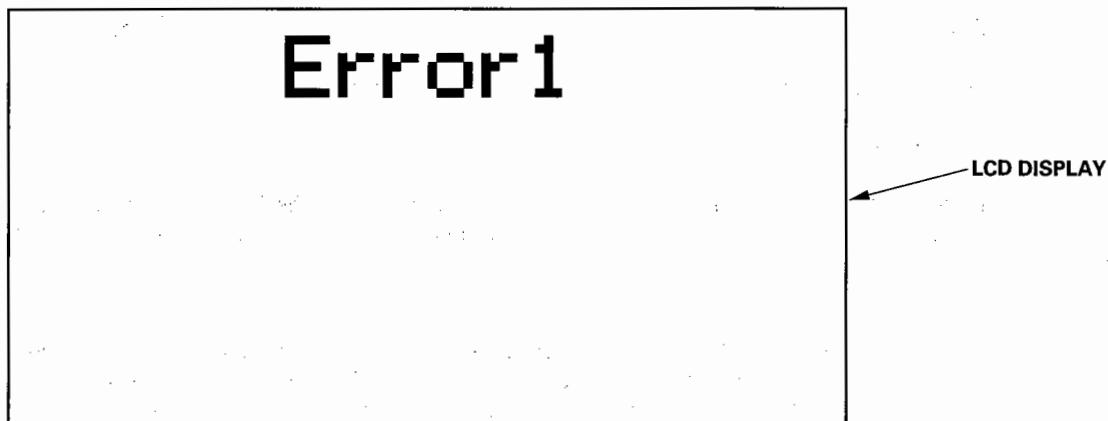
Self-diagnostic Function (cont'd)

The Communication Line Check

While in the self-diagnosis mode, the Communication Line Check starts after the LCD Segments Check. If all segments come on, the communication line is OK. If there is a communication line error, the word "Error" will be indicated on the multi-information display followed by a number.

- If the word "Error 1" is indicated, there is a malfunction in the communication line between the gauge control module and the fast-controller area network (F-CAN). Check for DTCs in the ECM/PCM and troubleshoot any DTCs found. If no DTCs are found, go to B-CAN System Diagnosis Test Mode A (see page 22-108).
- If the word "Error 2" is indicated, there is a malfunction in the communication line between the gauge control module and the body-controller area network (B-CAN). Go to B-CAN System Diagnosis Test Mode A (see page 22-108). (B1155 or B1161 set).
- If the word "Error 3" is indicated, there is a malfunction in the communication line between the gauge control module and the body-controller area network (B-CAN) and the fast-controller area network (F-CAN). Check for DTCs in the ECM/PCM and troubleshoot any DTCs found. If no DTCs are found, go to B-CAN System Diagnosis Test Mode A (see page 22-108).

Faulty (example Error 1):

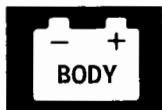


If any communication line errors are found, go to B-CAN System Diagnosis Test Mode A (see page 22-108).

Ending the self-diagnosis function

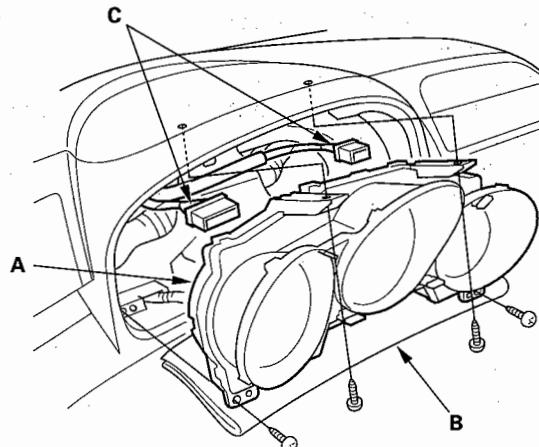
Turn the ignition switch OFF.

NOTE: If the vehicle speed exceeds 1.2 mph (2 km/h), the self-diagnosis function ends.



Gauge Control Module Replacement

1. Remove the instrument panel (see page 20-82).
2. Remove the screws from the gauge control module (A), and spread a protective cloth (B) on the upper column cover.



3. Disconnect the connectors (C), and remove the gauge control module.
4. Install the gauge in the reverse order or removal.

Rewriting the ODO Data on a New Gauge Control Module

NOTE:

- If the HDS retrieves the ODO data from the gauge control module, the ODO value on the multi-information display will appear as "— — —", making the ODO function unusable, and the HDS will be unable to retrieve additional ODO values.
- Rewriting is not possible on a gauge control module that does not communicate.
- Obtain a new gauge control module before starting the rewriting process.

1. Before replacing the gauge control module, connect the HDS to the data link connector.
2. Select GAUGES from the BODY ELECTRICAL SYSTEM SELECT MENU display.
3. Select "Gauge Control Module Replacement (ODO rewrite)" from the ADJUSTMENT MENU, and follow the instructions on the display to retrieve the ODO value.
4. Replace the gauge control module.
5. Follow the instructions on the display to write the new ODO value to the new gauge control module.

Gauges

Outside Air Temperature Indicator Calibration

NOTE: To test the outside air temperature sensor (see page 21-64).

Description

The outside temperature sensor is located behind the center of the front bumper. The gauge control module uses measurements from this sensor to display the outside air temperature.

Because of the location of the sensor, it may be affected by heat reflection from the road, engine and radiator heat or hot exhaust from surrounding traffic.

These conditions can heat soak the outside air temperature sensor and cause inaccurate readings.

Logic has been written into the gauge control module to help prevent abnormal or fluctuating outside air temperature indicator readings.

Outside Air Temperature Indicator Logic

Initial outside air temperature indication after the ignition switch is turned ON (II).

If the engine coolant temperature is 110°F (60°C) or higher when the ignition switch is turned ON (II), the outside air temperature indicated the last time the key was turned off will be displayed regardless of the current temperature measured by the outside air temperature sensor.

If the engine coolant temperature is 139°F (59°C) or lower when the ignition switch is turned ON (II), the current temperature measured by the outside air temperature sensor will be indicated.

Update to the outside air temperature indicator while driving

If the temperature measured by the outside air temperature sensor is greater than the temperature on the outside air temperature indicator, the outside temperature indicator will increase by 1°F (1°C) per minute after the vehicle speed is greater than 19 mph (30 km/h) for more than 30 seconds. It will continue to increase until the current outside air temperature is indicated. So, the first change to the outside air temperature indicator is 1 minute and 30 seconds after the vehicle speed is greater than 19 mph (30 km/h). If the vehicle speed drops below 19 mph (30 km/h), the indicator will not update again until the vehicle speed is increased to 19 mph (30 km/h) or more for more than 1 minute and 30 seconds again.

If the outside air temperature is less than the indicated temperature, the temperature will decrease 1°F (1°C) every 2 seconds until the current outside air temperature is indicated regardless of vehicle speed.

Troubleshooting

If the indicator displays "— ——" for more than 2 seconds after selecting the outside air temperature display mode, check the climate control system or multiplex-integrated control system for DTCs (see B-CAN System Diagnosis Test Mode A) (see page 22-108).



Calibration

The outside air temperature indicator's displayed temperature can be recalibrated $\pm 3^\circ$ to meet the customer's expectations.

1. Turn the ignition switch ON (II).
2. Select the outside air temperature display and press and hold the SELECT/RESET button for 10 seconds. While you continue to hold the button, the display will scroll through temperature settings from $+3^{\circ}$ to -3° as shown.

0.1.2.3.-3.-2.-1

- When the desired correction value appears on the display, release the button, and the recalibrated outside air temperature will be displayed. Each time a desired correction value is entered, it replaces the previous value.

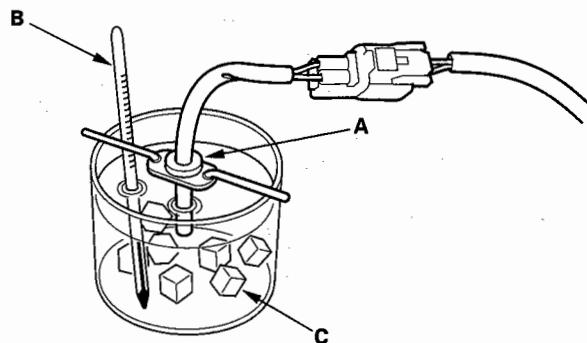
Example:

Incorrect value = 68°F (20°C)

Desired correction valve = +2°F (+1°C)
Correct valve = 70°F (21°C)

Desired correction valve = -2°F (-1°C)
Correct valve = 66°F (19°C)

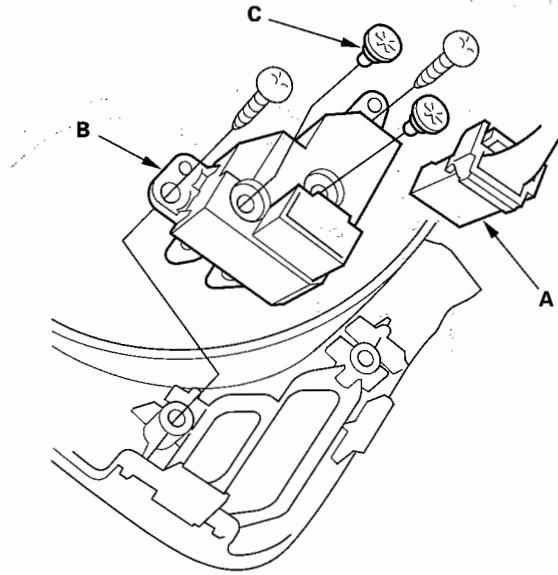
NOTE: To recalibrate the display to the true temperature, remove the outside air temperature sensor (A), but leave it connected. Submerge the sensor and a thermometer (B) in a container of ice water (C). Select the calibration mode as described above, then recalibrate the display to the true temperature.



Gauges

Select/Reset/Information Switch Test/Replacement

1. Remove the instrument panel (see page 20-82).
2. Disconnect the 6P connector (A) from the select/reset/information switch (B).



3. Remove the two screws and the select/reset/information switch.
4. Check for continuity between the terminal in each switch position according to the table.

| Terminal Position | 1 | 2 | 3 | 4 | 5 | 6 |
|-------------------|---|---|---|---|---|---|
| Select/Reset | ○ | | | ○ | ○ | ○ |
| Next (→) | | | ○ | ○ | ○ | ○ |
| Previous (←) | | ○ | ○ | ○ | ○ | ○ |

5. If the continuity is not as specified, replace the bulbs (C) or the switch.

DTC Troubleshooting

DTC B1152: Gauge Control Module EEPROM Error

NOTE: If you are troubleshooting multiple DTCs, be sure to follow the instructions in B-CAN system diagnosis test mode A (see page 22-108).

1. Clear the DTCs with the HDS.
2. Start the engine.
3. Check for DTCs with the HDS.

Is DTC B1152 indicated?

YES – Faulty gauge control module; replace the gauge control module (see page 22-265). ■

NO – Intermittent failure, the gauge control module is OK at this time. Check pinfits and connections. If the connections are good, check the battery condition (see page 22-74), and the charging system (see page 4-25). ■



DTC B1155: Gauge Control Module Lost Communication with the Combination Switch Control Unit (Headlight Switch Message)

NOTE: If you are troubleshooting multiple DTCs, be sure to follow the instructions in B-CAN system diagnosis test mode A (see page 22-108).

1. Clear the DTCs with the HDS.
2. Turn the ignition switch OFF, and then back ON (II).
3. Check for DTCs with the HDS.

Is DTC B1155 indicated?

YES—Go to step 4.

NO—Intermittent failure. The gauge control system is OK at this time. Check pinfits and connections. ■

4. Check for DTCs with the HDS.

Is DTC B1007 or B1062 indicated?

YES—Go to Combination Switch Control Unit Input Test (see page 22-136). ■

NO—Go to Gauge Control Module Input Test (see page 22-134). ■

DTC B1156: Gauge Control Module Lost Communication with the Combination Switch Control Unit (Wiper Switch Message)

NOTE: If you are troubleshooting multiple DTCs, be sure to follow the instructions in B-CAN system diagnosis test mode A (see page 22-108).

1. Clear the DTCs with the HDS.
2. Turn the ignition switch OFF, and then back ON (II).
3. Check for DTCs with the HDS.

Is DTC B1156 indicated?

YES—Go to step 4.

NO—Intermittent failure. The gauge control system is OK at this time. Check pinfits and connections. ■

4. Check for DTCs with the HDS.

Is DTC B1063 indicated?

YES—Go to Combination Switch Control Unit Input Test (see page 22-136). ■

NO—Go to Gauge Control Module Input Test (see page 22-134). ■

Gauges

DTC Troubleshooting (cont'd)

DTC B1157: Gauge Control Module Lost Communication with Multiplex Integrated Control Unit (MICU)

NOTE: If you are troubleshooting multiple DTCs, be sure to follow the instructions in B-CAN system diagnosis test mode A (see page 22-108).

1. Clear the DTCs with the HDS.
2. Turn the ignition switch OFF, and then back ON (II).
3. Check for DTCs with the HDS.

Is DTC B1157 indicated?

YES—Go to step 4.

NO—Intermittent failure. The gauge control system is OK at this time. Check pinfits and connections. ■

4. Check for DTCs with the HDS.

Is DTC B1055, B1255 and B1806 indicated?

YES—Go to Multiplex Integrated Control Unit Input Test (see page 22-130).

NO—Go to Gauge Control Module Input Test (see page 22-134).

DTC B1158: Gauge Control Module Lost Communication with Relay Control Module

NOTE: If you are troubleshooting multiple DTCs, be sure to follow the instructions in B-CAN system diagnosis test mode A (see page 22-108).

1. Clear the DTCs with the HDS.
2. Turn the ignition switch OFF, and then back ON (II).
3. Check for DTCs with the HDS.

Is DTC B1158 indicated?

YES—Go to step 4.

NO—Intermittent failure. The gauge control system is OK at this time. Check pinfits and connections. ■

4. Check for DTCs with the HDS.

Is DTC B1005 indicated?

YES—Go to Relay Control Module Input Test (see page 22-137).

NO—Go to Gauge Control Module Input Test (see page 22-134).



Body Control Module, Gauge Control System

DTC B1159: Gauge Control Module Lost Communication with the Multiplex Integrated Control Unit (MICU) (Door Switch Message)

NOTE: If you are troubleshooting multiple DTCs, be sure to follow the instructions in B-CAN system diagnosis test mode A (see page 22-108).

1. Clear the DTCs with the HDS.
2. Turn the ignition switch OFF, and then back ON (II).
3. Check for DTCs with the HDS.

Is DTC B1159 indicated?

YES—Go to step 4.

NO—Intermittent failure. The gauge control system is OK at this time. Check pinfits and connections. ■

4. Check for DTCs with the HDS.

Is DTC B1057 or B1807 indicated?

YES—Go to Multiplex Integrated Control Unit Input Test (see page 22-130).

NO—Go to Gauge Control Module Input Test (see page 22-134).

DTC B1160: Gauge Control Module Lost Communication with the Door Multiplex Control Unit (Door Lock Switch Message)

NOTE: If you are troubleshooting multiple DTCs, be sure to follow the instructions in B-CAN system diagnosis test mode A (see page 22-108).

1. Clear the DTCs with the HDS.
2. Turn the ignition switch OFF, and then back ON (II).
3. Check for DTCs with the HDS.

Is DTC B1160 indicated?

YES—Go to step 4.

NO—Intermittent failure. The gauge control system is OK at this time. Check pinfits and connections. ■

4. Check for DTCs with the HDS.

Is DTC B1006 or B1058 indicated?

YES—Go to Door Multiplex Control Unit Input Test (see page 22-135).

NO—Go to Gauge Control Module Input Test (see page 22-134).

Gauges

DTC Troubleshooting (cont'd)

DTC B1168: Gauge Control Module Lost Communication with ECM/PCM (Engine Messages)

NOTE: If you are troubleshooting multiple DTCs, be sure to follow the instructions in B-CAN system diagnosis test mode A (see page 22-108).

1. Clear the DTCs with the HDS.
2. Turn the ignition switch OFF, and then back ON (II).
3. Start and run the engine for at least 5 seconds then turn the engine off.
4. Check for DTCs with the HDS.

Is DTC B1168 indicated?

YES—Go to step 5.

NO—Intermittent failure, the F-CAN communication line is OK at this time. Check for loose or poor connections. If the connections are good, check the battery condition (see page 22-74) and the charging system (see page 4-25). ■

5. Check for DTCs in the ECM/PCM with the HDS.

Are any DTCs indicated?

YES—Go to the indicated DTCs troubleshooting.

NO—Go to step 6.

6. Do the Gauge Control Module Input Test (see page 22-134).

Are all inputs OK?

YES—Go to step 7.

NO—Repair the faulty input, then recheck the DTCs. ■

7. Substitute a known-good gauge control module.
8. Clear the DTCs with the HDS.
9. Turn the ignition switch OFF, and then back ON (II).
10. Start and run the engine for at least 5 seconds then turn the engine off.
11. Check for DTCs with the HDS.

Is DTC B1168 indicated?

YES—Replace the ECM/PCM. ■

NO—The original gauge control module is faulty; replace it (see page 22-265). ■



DTC B1169: Gauge Control Module Lost Communication with ECM/PCM (A/T Messages)

NOTE: If you are troubleshooting multiple DTCs, be sure to follow the instructions in B-CAN system diagnosis test mode A (see page 22-108).

1. Clear the DTCs with the HDS.
2. Turn the ignition switch OFF, and then back ON (II).
3. Start and run the engine for at least 5 seconds then turn the engine off.
4. Check for DTCs with the HDS.

Is DTC B1169 indicated?

YES—Go to step 5.

NO—Intermittent failure, the F-CAN communication line is OK at this time. Check for loose or poor connections. If the connections are good, check the battery condition (see page 22-74) and the charging system (see page 4-25). ■

5. Check for DTCs in the ECM/PCM with the HDS.

Are any DTCs indicated?

YES—Go to the ECM/PCM indicated DTCs troubleshooting.

NO—Go to step 6.

6. Do the Gauge Control Module Input Test (see page 22-134).

Are all inputs OK?

YES—Go to step 7.

NO—Repair the faulty input, then recheck the DTCs. ■

7. Substitute a known-good gauge control module.
8. Clear the DTCs with the HDS.
9. Turn the ignition switch OFF, and then back ON (II).
10. Start and run the engine for at least 5 seconds then turn the engine off.
11. Check for DTCs with the HDS.

Is DTC B1169 indicated?

YES—Replace the ECM/PCM. ■

NO—The original gauge control module is faulty; replace it (see page 22-265). ■

Gauges

DTC Troubleshooting (cont'd)

DTC B1175: Fuel Level Sensor (Fuel Gauge Sending Unit) Signals Input Error

NOTE: If you are troubleshooting multiple DTCs, be sure to follow the instructions in B-CAN system diagnosis test mode A (see page 22-108).

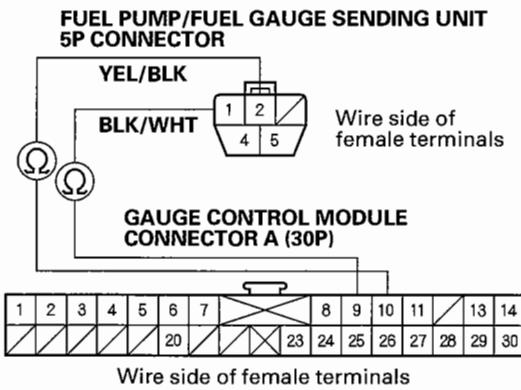
1. Do the fuel gauge sending unit test (see page 11-262).

Is the fuel gauge sending unit OK?

YES—Go to step 2.

NO—Replace the fuel gauge sending unit.■

2. Disconnect the fuel pump/fuel gauge sending unit 5P connector and the gauge control module connector A (30P).
3. Check for continuity between the No. 9 and No. 10 terminals of gauge control module connector A (30P) and No. 1 and No. 2 terminals of the fuel pump/fuel gauge sending unit 5P connector.



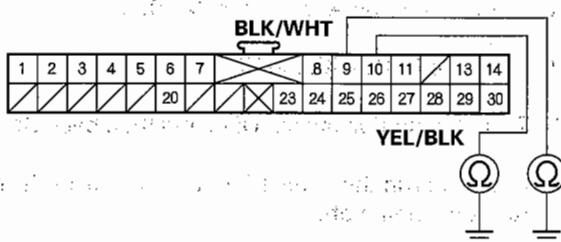
Is there continuity?

YES—Go to step 4.

NO—Repair an open in the BLK/WHT or YEL/BLK wire between the gauge control module and fuel gauge sending unit.■

4. Check for continuity between the No. 9 and No. 10 terminals of gauge control module connector A (30P) and body ground.

GAUGE CONTROL MODULE CONNECTOR A (30P)



Is there continuity?

YES—Repair a short to ground in the BLK/WHT or YEL/BLK wire.■

NO—Replace the gauge control module (see page 22-265).■



DTC B1177: Abnormal Battery Voltage (7.5 V)

NOTE: If you are troubleshooting multiple DTCs, be sure to follow the instructions in B-CAN system diagnosis test mode A (see page 22-108).

1. Clear the DTCs with the HDS.
2. Turn the ignition switch OFF, and then back ON.
3. Check for DTCs with the HDS.

Is DTC B1177 indicated?

YES—Go to step 5.

NO—Go to step 4.

4. Crank the engine.

Is DTC B1177 indicated?

YES—Go to step 5.

NO—Intermittent failure. The gauge control module and power supply voltage (IG1) that is supplied to the gauge control module are OK at this time. The battery may have been discharged, and recovered.■

5. Check the battery (see page 22-74) and the charging system (see page 4-25).

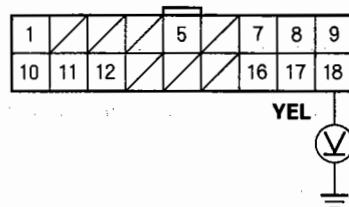
Is the battery condition normal and the charging system OK?

YES—Go to step 6.

NO—Abnormal battery condition which needs a recharge or replacement, or a charging system repair.■

6. With gauge control module connector B (18P) still connected, check for voltage between the No. 18 terminal and body ground.

GAUGE CONTROL MODULE CONNECTOR B (18P)



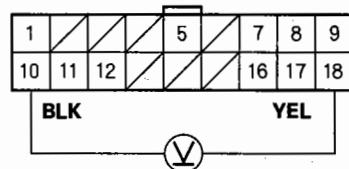
Is there battery voltage?

YES—Go to step 7.

NO—Repair an open or high resistance in the YEL wire between the gauge control module and under-dash fuse/relay box.■

7. Check for voltage between the No. 10 and No. 18 terminals.

GAUGE CONTROL MODULE CONNECTOR B (18P)



Is there battery voltage?

YES—Faulty gauge control module; replace the gauge control module (see page 22-265).

NO—Repair an open or high resistance in the BLK wire between the gauge control module and ground (G501).■

Gauges

DTC Troubleshooting (cont'd)

DTC B1178: F-CAN Communication Line Error

NOTE: If you are troubleshooting multiple DTCs, be sure to follow the instructions in B-CAN system diagnosis test mode A (see page 22-108).

1. Clear the DTCs with the HDS.
2. Turn the ignition switch OFF, and then back ON (II).
3. Start and run the engine for at least 5 seconds then turn the engine off.
4. Check for DTCs with the HDS.

Is DTC B1178 indicated?

YES—Go to step 5.

NO—Intermittent failure, the F-CAN communication line is OK at this time. Check for loose or poor connections. If the connections are good, check the battery condition (see page 22-74) and the charging system (see page 4-25). ■

5. Check for DTCs in the ECM/PCM with the HDS.

Are any DTCs indicated?

YES—Go to the indicated ECM/PCM DTCs troubleshooting.

NO—Go to step 6.

6. Do the Gauge Control Module Input Test (see page 22-134).

Are all inputs OK?

YES—Go to step 7.

NO—Repair the faulty input, then recheck the DTCs. ■

7. Substitute a known-good gauge control module.
8. Clear the DTCs with the HDS.
9. Turn the ignition switch OFF, and then back ON (II).
10. Start and run the engine for at least 5 seconds then turn the engine off.
11. Check for DTCs with the HDS.

Is DTC B1178 indicated?

YES—Replace the ECM/PCM. ■

NO—The original gauge control module is faulty; replace it (see page 22-265). ■