

## SECTION : 8B

# SUPPLEMENTAL INFLATABLE RESTRAINTS (SIR)

**CAUTION :** *Disconnect the negative battery cable before removing or installing any electrical unit or when a tool or equipment could easily come in contact with exposed electrical terminals. Disconnecting this cable will help prevent personal injury and damage to the vehicle. The ignition must also be in LOCK unless otherwise noted.*

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## 8B – 2 SUPPLEMENTAL INFLATABLE RESTRAINTS (SIR)

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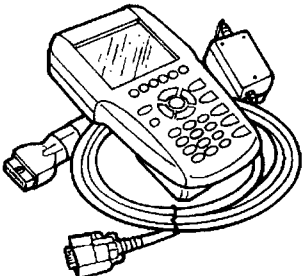
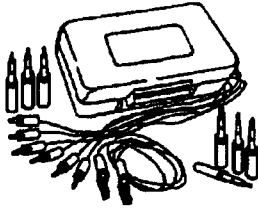

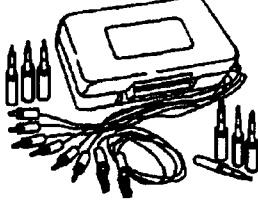
# SPECIFICATIONS

## FASTENER TIGHTENING SPECIFICATIONS

| Application                                  | N•m  | Lb–Ft | Lb–In |
|--|------|-------|-------|
| Clock Spring Mounting Screws                 | 1.25 | –     | 11    |
| Driver Airbag Module Mounting Bolts          | 4.6  | –     | 41    |
| Passenger Airbag Mounting Bolts              | 10   | –     | 89    |
| Sensing and Diagnostic Module Mounting Bolts | 10   | –     | 89    |

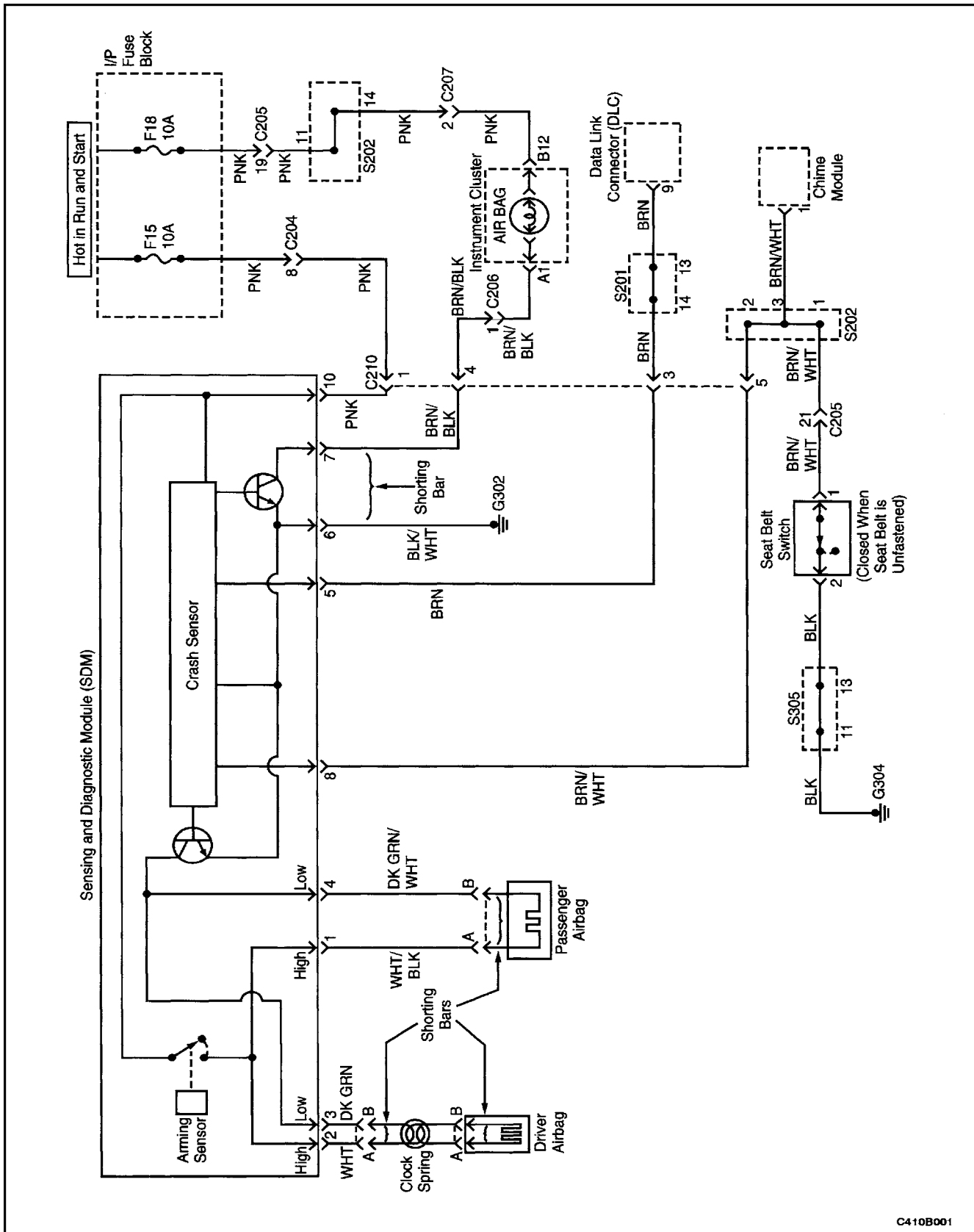
# SPECIAL TOOLS

## SPECIAL TOOLS TABLE

|   |                           |  |  |
|---|---------------------------|--|--|
|   | Deployment Tool           |    | J-38715<br>SIR Driver/Passenger<br>Load Tool |
|  | Scanner 100               |  | J-35616–Az<br>Connector Test<br>Adapter Kit  |
|  | Wiring Harness<br>Checker |  | J-35616–Az<br>Connector Test<br>Adapter Kit  |

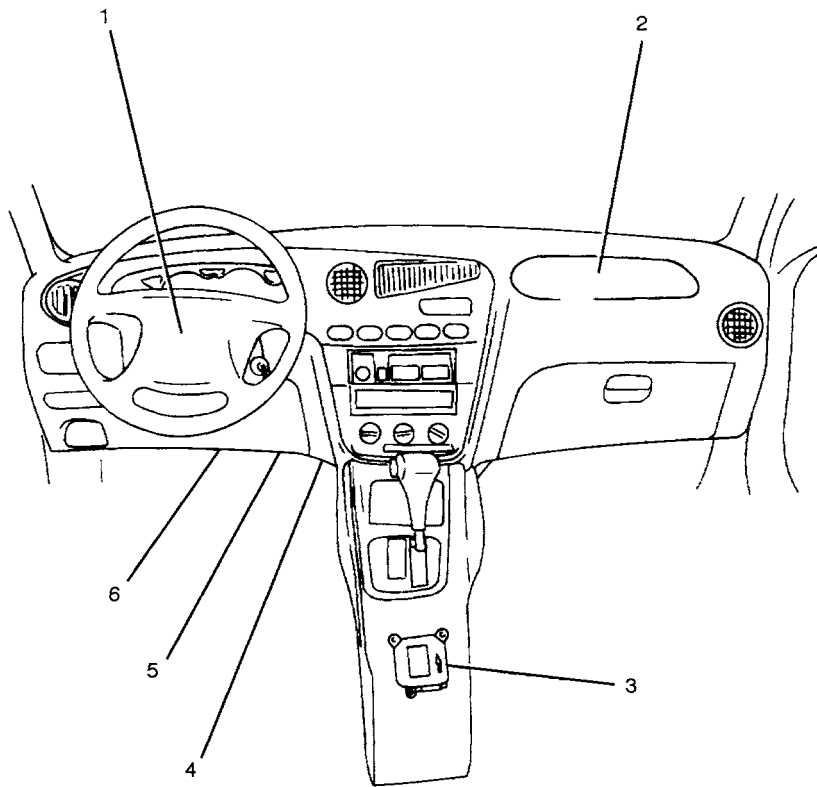
# SCHEMATIC AND ROUTING DIAGRAMS

## SUPPLEMENTAL INFLATABLE RESTRAINT SYSTEM



## COMPONENT LOCATOR

### SIR COMPONENT LOCATION VIEW



C110B003

- |  |                              |
|--|------------------------------|
| 1. Driver Airbag                       | 4. Data Link Connector (DLC) |
| 2. Passenger Airbag                    | 5. Connector C210            |
| 3. Sensing and Diagnostic Module (SDM) | 6. Clock Spring Connector    |

## DIAGNOSIS

### DIAGNOSTIC TROUBLE CODES (DTC)

The supplemental inflatable restraints (SIR) Diagnostic System Check must always be the starting point for any SIR system diagnosis. The Diagnostic System Check reveals diagnostic trouble codes (DTCs) through the use of a scan tool. It also checks for proper AIRBAG warning indicator operation.

The two types of DTCs that may be recorded are as follows:

1. Current DTCs represent malfunctions currently being detected. Current DTCs are stored in random access memory (RAM).
2. Historic DTCs represent all malfunctions detected since the last time the historic memory was cleared. Historic DTCs are stored in the electronically erasable programmable read-only memory (EEPROM).

### SCAN TOOL DIAGNOSTICS

A scan tool can read serial data from terminal 9 of the data link connector (DLC). A specific replaceable cartridge must be attached to the scan tool before the scan tool can communicate with the sensing and diagnostic module (SDM) for the purpose of diagnostics. The scan tool is used to read diagnostic trouble codes (DTCs), and to clear some DTCs after a repair is completed. By design, certain codes cannot be cleared. To use the scan tool, turn the ignition OFF, connect the scan tool to the DLC, and turn the ignition switch to ON. Follow the instructions in the scan tool manual. The SDM sends serial data from terminal 5 of the SDM to terminal 9 of the DLC.

### USE OF SPECIAL TOOLS

Use a scan tool to read and clear diagnostic trouble codes (DTCs). A connector adapter kit provides jumper wires and terminal adapters to make it easier to test small terminals. In diagnostic testing, use a load tool to substitute for the airbag modules. A wiring harness checker and a deployment tool are under development. Service bulletins will be issued if these tools become operational.

### SIR DIAGNOSTIC SYSTEM CHECK

**Notice :** If the vehicle interior has been exposed to extensive water intrusion such as waterleaks, driving through high water, flooding, or other causes, the sensing and diagnostic module (SDM) and the SDM connector may need to be replaced. With the ignition OFF, inspect the

area around the SDM, including the carpet. If any significant soaking or evidence of previous soaking is detected, the water must be removed, water damage repaired, and the SDM and SDM connector must be replaced. Before attempting any of these repairs, the supplemental inflatable restraints (SIR) system must be disabled. Refer to "Disabling the SIR System" and "Sensing and Diagnostic Module (SDM)" in this section.

The diagnostic procedures used in this section are designed to find and repair SIR system conditions. To get the best results, it is important to use the diagnostic charts and follow the sequence listed below.

1. Perform the SIR Diagnostic System Check which reveals diagnostic trouble codes (DTCs) through the use of a scan tool. It also checks for proper AIRBAG indicator operation.
2. Refer to the proper diagnostic chart as directed by the SIR Diagnostic System Check. Bypassing these procedures may result in extended diagnostic time, incorrect diagnosis, and incorrect parts placement.
3. Repeat the SIR Diagnostic System Check after any repair or diagnostic procedures have been performed to ensure that the repair has been made correctly and that no other malfunctions exist.

### Circuit Description

When the ignition switch is first turned to ON, Ignition 1 voltage is applied from the airbag fuse to the SDM at input terminal 10. The SDM responds by flashing the AIRBAG indicator seven times and then turning it off while the SDM performs tests on the SIR system.

### Diagnostic Aids

The order in which DTCs are diagnosed is very important. Failure to diagnose the DTCs in the order specified may result in extended diagnostic time, incorrect diagnosis, and incorrect parts replacement.

### Test Description

The numbers below refer to steps on the diagnostic table.

3. This test will identify the stored DTCs and whether they are current or historic. A historic DTC indicates that the malfunction has been repaired or is intermittent.
6. This test differentiates between an indicator that will not come on and an indicator that stays on when it should be off.
7. Refer to the first caution below.
9. Refer to the cautions below.
10. This test will determine whether historic DTCs to are stored and will identify them.
11. A historic DTC indicates that the malfunction has been repaired or is intermittent.

**SIR Diagnostic System Check**

**CAUTION :** The sensing and diagnostic module (SDM) can maintain sufficient voltage to deploy the airbags for 10 minutes after the ignition is OFF and the fuse has been removed. If the airbags are not disconnected, do not begin service until 10 minutes have passed after disconnecting power to the SDM. Otherwise, injury could result.

**CAUTION :** During service procedures, be very careful when handling the SDM. Never strike or jar the

SDM. Never power the supplemental inflatable restraints (SIR) system when the SDM is not rigidly attached to the vehicle. All SDM mounting bolts must be carefully tightened, and the SDM arrow must be pointing toward the front of the vehicle to ensure proper operation of the SIR system. The SDM could be activated if it is powered when it is not rigidly attached to the vehicle, resulting in unexpected deployment and possible injury.

| Step | Action  | Value(s) | Yes  | No  |
|------|---|----------|--|---|
| 1    | 1. Turn the ignition switch ON.<br>2. Observe the AIRBAG indicator as the ignition is being turned ON.<br>Does the indicator flash seven times?   |          | Go to Step 2   | Go to Step 6  |
| 2    | Observe the AIRBAG indicator after it flashes seven times.<br>Does the indicator turn OFF?  |          | Go to Step 10  | Go to Step 3  |
| 3    | 1. Turn the ignition to LOCK.<br>2. Remove the key.<br>3. Connect the scan tool to the data link connector (DLC). Follow the directions given in the scan tool manual.<br>4. Turn the ignition ON.<br>5. Request the SIR DTC display with the scan tool.<br>6. Record all DTCs, indicating each as either a current or a historic DTC.<br>Are only historic DTCs shown? |          | Refer to the DTC chart for any DTC that is set, and refer to the Diagnostic Aids for that specific DTC | Go to Step 4  |
| 4    | Check the recorded DTCs.<br>Are current DTCs 18, 24, or 51 set?   |          | Go to the DTC chart indicated by any of these three codes  | Go to Step 5  |
| 5    | Check the recorded DTCs.<br>Are there any other current DTCs shown?   |          | Diagnose the remaining current DTCs from lowest number to highest                                      | Refer to the DTC chart for any history DTC that was set, and refer to the Diagnostic Aids for that specific DTC |
| 6    | Observe the AIRBAG indicator after the ignition has been turned ON.<br>Does the AIRBAG indicator stay on?   |          | Go to "AIRBAG Warning Lamp Stays On With Ignition Switch ON"   | Go to Step 7  |
| 7    | 1. Turn the ignition to LOCK.<br>2. Remove the key.<br>3. Temporarily disconnect the passenger's airbag and the yellow clock spring connector on the steering column.<br>4. Check the AIRBAG indicator bulb and the bulb circuit.<br>Are the bulb and the bulb circuit in good condition?   |          | Go to Step 9   | Go to Step 8  |

| Step | Action  | Value(s) | Yes                                 | No  |
|------|---|----------|-------------------------------------|---|
| 8    | 1. Replace the bulb or repair the bulb circuit.<br>2. Connect all the SIR system components.<br>3. Make sure all the components are properly mounted.<br>Is the repair complete?  |          | Go to <i>Step 1</i>                 |   |
| 9    | 1. Turn the ignition to LOCK.<br>2. Remove the key.<br>3. Disconnect the passenger's airbag and the yellow clock spring connector on the steering column.<br>4. Replace the SDM. The arrow must be pointing toward the front of the vehicle.<br>5. Reconnect all the SIR system components.<br>6. Make sure all the components are properly mounted.<br>Is the repair complete? |          | Go to <i>Step 1</i>                 |   |
| 10   | 1. Turn the ignition to LOCK.<br>2. Remove the key.<br>3. Connect the scan tool to the DLC, following the directions given in the scan tool manual.<br>4. Turn the ignition ON.<br>5. Request the SIR DTC display with the scan tool.<br>6. Record all historic DTCs.<br>Are any SIR DTCs displayed?  |          | Go to <i>Step 11</i>                | System OK   |
| 11   | Turn the ignition OFF.<br>Is DTC 71 set?  |          | Go to "DTC 71 Internal SDM Failure" | Refer to the DTC chart for any history DTC that was set, and refer to the Diagnostic Aids for that specific DTC |

## SENSING AND DIAGNOSTIC MODULE (SDM) INTEGRITY CHECK

The following diagnostic chart must be used when all circuitry outside the sensing and diagnostic module (SDM) has been found to operate properly, as indicated by following the appropriate diagnostic trouble code (DTC) chart. This chart verifies the need for SDM replacement.

### Circuit Description

When the SDM recognizes Ignition 1 voltage greater than 8.2 volts at terminal 10 of the SDM, the AIRBAG indicator flashes seven times to verify operation. The SDM then performs turn-on tests followed by resistance measurement tests and continuous monitoring tests.

When a malfunction is detected, the SDM sets a current DTC and illuminates the AIRBAG indicator. When the malfunction is no longer detected and/or the ignition switch is

cycled, the SDM will clear current DTCs and move them to a historic file, except for DTCs 18, 24, 51, 53, and sometimes 71. DTCs 18, 24, 51, and 53 will not clear using a scan tool because these codes require replacement of the SDM. The SDM must be replaced only after the malfunction that set the DTC has been repaired.

### Test Description

1. This test confirms a current malfunction. If no current malfunction is occurring, refer to Diagnostic Aids for the appropriate DTC. The SDM should not be replaced for a historic DTC except when directed.
2. This test checks for a malfunction introduced into the SIR system during the diagnostic process. It is extremely unlikely that a malfunctioning SDM would cause a new malfunction to occur during the diagnostic process.
4. Refer to the cautions below.

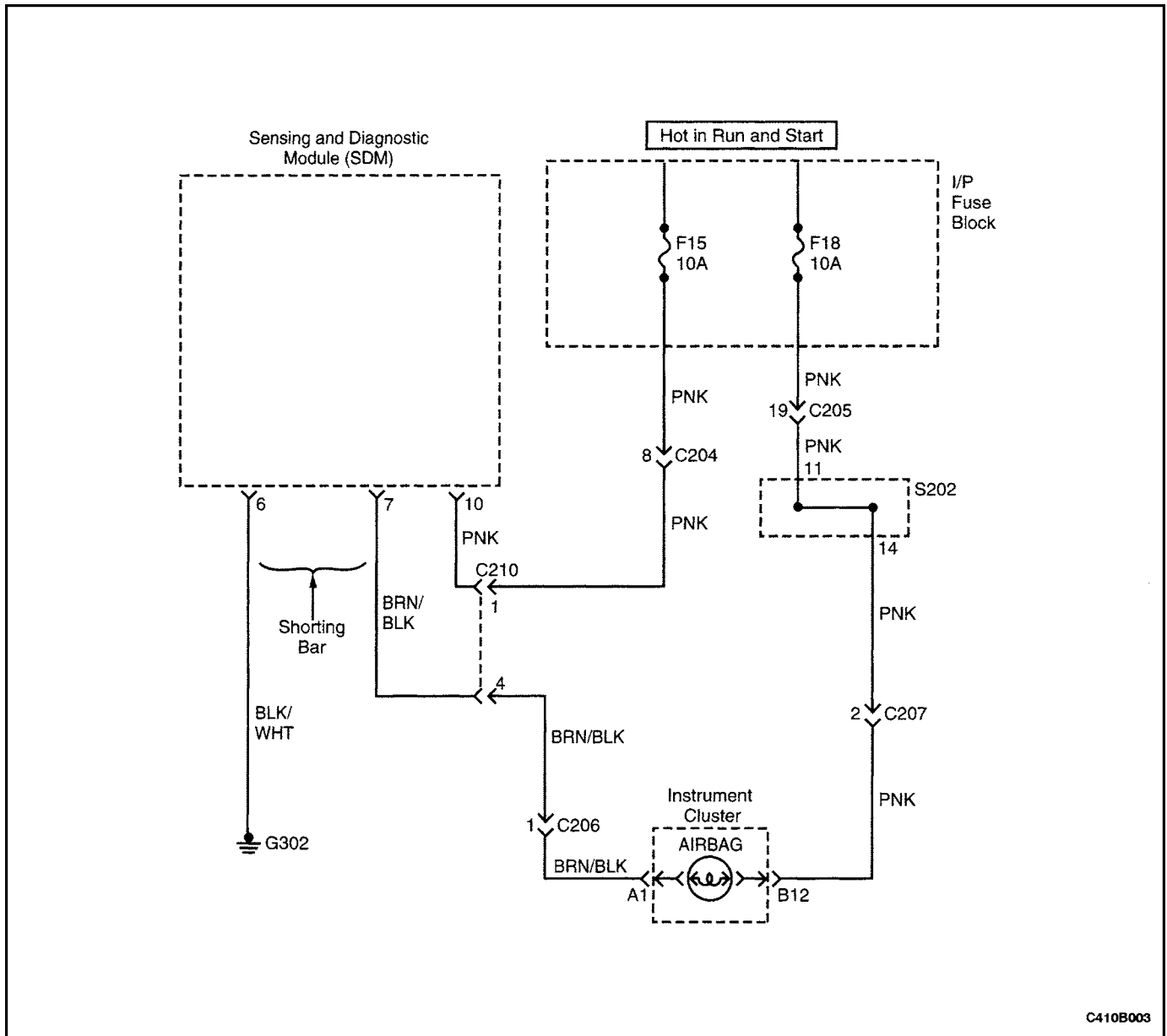
### Sensing and Diagnostic Module (SDM) Integrity Check

**CAUTION :** The sensing and diagnostic module (SDM) can maintain sufficient voltage to deploy the airbags for 10 minutes after the ignition is OFF and the fuse has been removed. If the airbags are not disconnected, do not begin service until 10 minutes have passed after disconnecting power to the SDM. Otherwise, injury could result.

**CAUTION :** During service procedures, be very careful when handling the SDM. Never strike or jar the

SDM. Never power the supplemental inflatable restraints (SIR) system when the SDM is not rigidly attached to the vehicle. All SDM mounting bolts must be carefully tightened, and the SDM arrow must be pointing toward the front of the vehicle to ensure proper operation of the SIR system. The SDM could be activated if it is powered when it is not rigidly attached to the vehicle, resulting in unexpected deployment and possible injury.

| Step | Action  | Value(s) | Yes   | No                                    |
|------|---|----------|---|---------------------------------------|
| 1    | 1. Turn the ignition to LOCK.<br>2. Remove the key.<br>3. Connect all the SIR system components.<br>4. Make sure that all components are properly mounted.<br>5. Make sure the ignition switch has been OFF for at least 30 seconds.<br>6. Observe the AIRBAG indicator as the ignition is turned ON.<br><br>Does the indicator lamp flash seven times and then turn off? |          | Clear the SIR system DTCs and go to SIR "Diagnostic System Check" | Go to Step 2                          |
| 2    | Using a scan tool, request the DTC display.<br>Is the same DTC displayed that was previously occurring when the SIR Diagnostic System Check was previously performed?   |          | Go to Step 3  | Go to the table for the DTC indicated |
| 3    | 1. Clear the SIR DTCs.<br>2. Turn the ignition OFF for at least 30 seconds.<br>3. Observe the AIRBAG indicator as the ignition is turned ON.<br><br>Does the AIRBAG indicator flash seven times and then turn off?  |          | System OK   | Go to Step 4                          |
| 4    | 1. Turn the ignition to LOCK.<br>2. Remove the key.<br>3. Double the SIR system. Refer to "Disabling the SIR System" in this section.<br>4. Replace the SDM. The arrow must be pointing toward the front of the vehicle.<br>5. Connect all the SIR system components.<br>6. Make sure all components are properly mounted.<br><br>Is the repair complete?                 |          | Go to SIR "Disabling the SIR System"                              |                                       |



## AIRBAG WARNING LAMP STAYS ON WITH IGNITION SWITCH ON

### Circuit Description

The AIRBAG indicator will stay on if the sensing and diagnostic module (SDM) connector is not securely attached to the SDM. There is a shorting bar in the SDM connector which completes the circuit between the indicator lamp circuit and ground. The shorting bar is disengaged when the connector is properly attached.

When the ignition switch is first turned ON, Ignition 1 voltage is applied to the instrument fuse for the indicator lamp and also to the AIRBAG fuse for the SDM input terminal 10. If Ignition 1 is outside the range of 8.2–16 volts, the AIRBAG indicator will come on and stay on with no DTCs set.

A short to ground between the SDM and the indicator lamp can also cause the AIRBAG indicator to stay on.

## Test Description

The number below refers to Step 8 on the diagnostic table.

8. Refer to the caution below.

**AIRBAG Warning Lamp Stays on with Ignition Switch ON**

**CAUTION :** The sensing and diagnostic module (SDM) can maintain sufficient voltage to deploy the airbags for 10 minutes after the ignition is OFF and the fuse has been removed. If the airbags are not dis-

connected, do not begin service until 10 minutes have passed after disconnecting power to the SDM. Otherwise, injury could result.

| Step | Action   | Value(s) | Yes                         | No            |
|------|--|----------|-----------------------------|---------------|
| 1    | Check the SDM connector to verify that it is properly connected to the SDM.<br>Is the SDM connector properly connected?  |          | Go to Step 3                | Go to Step 2  |
| 2    | Connect the SDM connector.<br>Is the repair complete?  |          | System OK                   |               |
| 3    | 1. Turn the ignition OFF.<br>2. Disconnect the SDM connector.<br>3. Turn the ignition ON.<br>4. Check the voltage at the SDM connector terminal 10.<br>Is the ignition voltage greater than the specified value? | 8.2 v    | Go to "SDM Integrity Check" | Go to Step 4  |
| 4    | 1. Turn the ignition ON.<br>2. Check the voltage supply to the airbag fuse F15.<br>Is the voltage within the specified value?  | 8.2–16 v | Go to Step 6                | Go to Step 5  |
| 5    | Repair the power supply to the airbag fuse.<br>Is the repair complete?   |          | System OK                   |               |
| 6    | Check the airbag fuse.<br>Is the fuse in good condition?   |          | Go to Step 8                | Go to Step 7  |
| 7    | Replace the airbag fuse.<br>Is the repair complete?  |          | System OK                   |               |
| 8    | 1. Disable the SIR system. Refer to "Disabling the SIR System" in this section.<br>2. Check for an open circuit between terminal 10 of the SDM and the airbag fuse F15.<br>Is there an open circuit?             |          | Go to Step 9                | Go to Step 10 |
| 9    | Repair the open circuit between the SDM and the airbag fuse F15.<br>Is the repair complete?  |          | System OK                   |               |
| 10   | Repair the short circuit to ground between the AIRBAG indicator lamp and terminal 7 of the SDM.<br>Is the repair complete?   |          | System OK                   |               |