# INSTRUMENT PANEL SYSTEMS

## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENERAL INFORMATION</td>
<td></td>
</tr>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>DESCRIPTION AND OPERATION</td>
<td></td>
</tr>
<tr>
<td>HEADLAMP SWITCH</td>
<td>2</td>
</tr>
<tr>
<td>INSTRUMENT CLUSTER</td>
<td>2</td>
</tr>
<tr>
<td>WARNING AND INDICATOR LAMPS</td>
<td>2</td>
</tr>
<tr>
<td>DIAGNOSIS AND TESTING</td>
<td></td>
</tr>
<tr>
<td>AIRBAG WARNING SYSTEM</td>
<td>2</td>
</tr>
<tr>
<td>BRAKE SYSTEM WARNING LAMP TEST</td>
<td>2</td>
</tr>
<tr>
<td>INSTRUMENT CLUSTER LAMPS</td>
<td>2</td>
</tr>
<tr>
<td>LOW OIL PRESSURE WARNING LAMP TEST</td>
<td>3</td>
</tr>
<tr>
<td>MULTIPLE/INDIVIDUAL GAUGES</td>
<td>4</td>
</tr>
<tr>
<td>INOPERATIVE</td>
<td>4</td>
</tr>
<tr>
<td>SERVICE PROCEDURES</td>
<td></td>
</tr>
<tr>
<td>INSTRUMENT CLUSTER SELF-DIAGNOSTICS</td>
<td>4</td>
</tr>
<tr>
<td>REMOVAL AND INSTALLATION</td>
<td></td>
</tr>
<tr>
<td>ACCESSORY SWITCH/POWER OUTLET BEZEL</td>
<td>4</td>
</tr>
<tr>
<td>CENTER CONSOLE FLOOD LAMP</td>
<td>5</td>
</tr>
<tr>
<td>CIGAR LIGHTER / POWER OUTLET ASSEMBLY</td>
<td>5</td>
</tr>
<tr>
<td>GLOVE BOX DOOR/BIN</td>
<td>6</td>
</tr>
<tr>
<td>GLOVE BOX DOOR/BIN</td>
<td>6</td>
</tr>
<tr>
<td>GLOVE BOX SWITCH/LAMP</td>
<td>6</td>
</tr>
<tr>
<td>INSTRUMENT CLUSTER</td>
<td>6</td>
</tr>
<tr>
<td>INSTRUMENT CLUSTER BEZEL</td>
<td>6</td>
</tr>
<tr>
<td>INSTRUMENT CLUSTER LAMPS</td>
<td>7</td>
</tr>
<tr>
<td>INSTRUMENT PANEL ASSEMBLY</td>
<td>7</td>
</tr>
<tr>
<td>INSTRUMENT PANEL CENTER BEZEL</td>
<td>10</td>
</tr>
<tr>
<td>INSTRUMENT PANEL END CAPS</td>
<td>10</td>
</tr>
<tr>
<td>INSTRUMENT PANEL TOP COVER</td>
<td>10</td>
</tr>
<tr>
<td>LOWER INSTRUMENT PANEL COVER</td>
<td>10</td>
</tr>
<tr>
<td>LOWER STORAGE BIN</td>
<td>10</td>
</tr>
<tr>
<td>STEERING COLUMN SHROUDS</td>
<td>11</td>
</tr>
</tbody>
</table>

## GENERAL INFORMATION

### INTRODUCTION

The purpose of the dash gauges and indicator lamps is to keep the driver informed about the operating condition of the vehicle. If an abnormal condition occurs, the driver is informed by indicator lamp. The driver can seek service before damage occurs.

Indicator lamps use ON/OFF switch functions for operation, while gauges use a sending unit or sensor.

The Instrument Panel can be removed as an assembly after a few parts are removed to allow access to the retaining bolts. There is one self-aligning bulkhead connector on the left underside of the instrument panel replacing most of the main harness connectors. Once removed, the instrument panel can be serviced for replacement. Most of the parts of the instrument panel can be replaced individually without removing the complete instrument panel assembly.

![Fig. 1 Instrument Panel](image)

1 – DEMISTER OUTLET
2 – INSTRUMENT CLUSTER
3 – CENTER AIR OUTLET
4 – INSTRUMENT PANEL SPEAKERS
5 – GLOVE BOX
6 – HVAC CONTROL HEAD
7 – RADIO
8 – CIGAR LIGHTER/AUXILIARY POWER OUTLET
9 – TRACTION CONTROL SWITCH
10 – REAR WINDOW DEFOGGER SWITCH
DESCRIPTION AND OPERATION

HEADLAMP SWITCH
The headlamp switch is part of the Multi-Function Switch. Refer to Group 8J, Turn Signal and Flasher for the Multi-Function Switch Test, Removal and Installation procedures.

INSTRUMENT CLUSTER
There are two conventional instrument cluster assemblies available. The clusters electronically drive the speedometer, odometer, gauges, and tachometer (if equipped). Refer to (Fig. 2) and (Fig. 3).

The instrument cluster controls the courtesy lamps, it receives and sends messages to other modules via the PCI bus circuit, it controls all the instrument illumination and the chime is also an integral part of the cluster. The front turn signals are wired through the cluster and then go to the front lamps. The reason being that the DRL module is built into the cluster (if equipped).

All gauges in the electronic clusters are the analog type gauges. When the ignition switch is moved to the OFF position, the cluster drives each gauge to its lowest position. The individual gauges are not servicable and require complete replacement of the cluster if one or more gauges are inoperable.

One button is used to switch the display from trip to total mileage. Holding the button when the display is in the trip mode will reset the trip mileage. This button is also used to put the cluster in self-diagnostic mode. Refer to Service Procedures, Cluster Self-Diagnostics in this section. Most of the indicators will come on briefly for a bulb check when the ignition is turned from OFF to ON. All of the LED’s are replaceable.

In the event that the instrument cluster loses communication with all other modules on the PCI bus, the cluster will display “nobus” in the VF display. The VF display also displays “Door”, “Cruise”, “Trac”, and odometer trip or total.

If the cluster does not detect voltage on the courtesy lamp circuit, the message “FUSE” will alternate with the odometer/trip odometer for 30 seconds after the ignition is turned on and for 15 seconds after the vehicle is first moved. The lack of voltage can be due to the M1 Fused B(+)(IOD) fuse being open, a bad or missing courtesy lamp bulb, or a circuit problem.

WARNING AND INDICATOR LAMPS
The instrument cluster has warning lamps and indicators for the following systems:
- Airbag
- Anti-lock Brakes (ABS) if equipped
- Brake warning
- Charging System
- Front fog lamps (if equipped)
- High beam indicator
- Low fuel (premium cluster only)
- Low oil pressure
- Malfunction indicator (service engine soon) lamp
- Right and left turn signals
- Seat belt warning
- Security system
- Trac-Off (ABS equipped vehicles only)

The instrument cluster has a Vacuum Fluorescent (VF) display for the following systems:
- Cruise
- Door (ajar)
- Odometer
- Set (cruise)
- Trac
- Trip

DIAGNOSIS AND TESTING

AIRBAG WARNING SYSTEM
For testing of this system refer to Group 8M, Passive Restraint Systems.

BRAKE SYSTEM WARNING LAMP TEST
The brake warning lamp illuminates when the parking brake is applied with ignition switch turned to the ON position. The same lamp will also illuminate if one of the two service brake systems fail the when brake pedal is applied.

To test the system:
- As the ignition switch is turned to the start position the lamp should light.
- Turn ignition switch to the ON position and apply the parking brake. The lamp should light.

If lamp fails to light inspect for:
- A burned out lamp
- Loose, corroded or damaged socket
- A damaged circuit board
- A broken or disconnected wire at the switch
- Defective switch

To test the service brake warning system, refer to Group 5, Brakes, Hydraulic System Control Valves.

INSTRUMENT CLUSTER LAMPS
Every time the vehicle is switched to the START/RUN position, the cluster goes through a BULB CHECK. This tests most of the indicator lamps and Vacuum Fluorescent (VF) displays. If only one lamp is out, remove the instrument cluster and replace the defective bulb or Light Emitting Diode (LED). If some or all of the lamps fail to light, refer to the proper Body Diagnostics Procedures Manual.
To diagnose the cluster lamps first place the cluster in self-diagnostic mode. With the ignition switch in the off position, press the trip odometer reset button down. Simultaneously turn the ignition key to the ON position and release the trip reset button. All the indicator lamps and VF displays should illuminate except for the fog lamp, turn signal, and high beam select indicators. Refer to Fig. 2, Fig. 3, and the Cluster Identification table.

Fig. 2 Base Instrument Cluster Without Tachometer
1 – FOG LAMP
2 – BRAKE**
3 – TRAC OFF**
4 – ABS**
5 – SPEEDOMETER
6 – LEFT/RIGHT TURN SIGNAL
7 – HIGH BEAM
8 – TACHOMETER
9 – OIL PRESSURE**
10 – SEAT BELT**
11 – BATTERY**
12 – AIR BAG**
13 – SECURITY*
14 – FUEL FILLER DOOR LOCATOR
15 – FUEL GAUGE
16 – LOW FUEL*
17 – MALFUNCTION INDICATOR LAMP (MIL)**
18 – TRIP RESET BUTTON
19 – TRAC**
20 – ODOMETER**
21 – DOOR (AJAR)**
22 – SET CRUISE*
23 – TRIP**
24 – CRUISE*
25 – TEMPERATURE GAUGE
*ILLUMINATE DURING SELF-DIAGNOSTICS
**ILLUMINATE DURING BULB CHECK AND SELF-DIAGNOSTICS

Fig. 3 Premium Instrument Cluster With Tachometer
1 – FOG LAMP
2 – BRAKE**
3 – TRAC OFF**
4 – ABS**
5 – SPEEDOMETER
6 – LEFT/RIGHT TURN SIGNAL
7 – HIGH BEAM
8 – TACHOMETER
9 – OIL PRESSURE**
10 – SEAT BELT**
11 – BATTERY**
12 – AIR BAG**
13 – SECURITY*
14 – FUEL FILLER DOOR LOCATOR
15 – FUEL GAUGE
16 – LOW FUEL*
17 – MALFUNCTION INDICATOR LAMP (MIL)**
18 – TRIP RESET BUTTON
19 – TRAC**
20 – ODOMETER**
21 – DOOR (AJAR)**
22 – SET CRUISE*
23 – TRIP**
24 – CRUISE*
25 – TEMPERATURE GAUGE
*ILLUMINATE DURING SELF-DIAGNOSTICS
**ILLUMINATE DURING BULB CHECK AND SELF-DIAGNOSTICS

LOW OIL PRESSURE WARNING LAMP TEST
The low oil pressure warning lamp will illuminate when the ignition switch is turned to the ON position without engine running. The lamp also illuminates if the engine oil pressure drops below a safe oil pressure level.
MULTIPLE/INDIVIDUAL GAUGES INOPERATIVE

Test speedometer, tachometer and other gauges for malfunction:

1. Remove the cluster. Refer to Cluster Removal and Installation.
2. Check for ignition voltage at Pin 15 of the cluster wire harness connector (Fig. 5). Check for battery voltage at Pin 21 of the connector. If no voltage, repair as necessary.
3. Check Pin 10 of the connector for continuity to ground. If no ground, repair as necessary.
4. If the voltage and ground are OK, and the pins or the connectors are not distorted, replace the instrument cluster.
5. Install cluster. Refer to Instrument Cluster Removal and Installation in this section.

SERVICE PROCEDURES

INSTRUMENT CLUSTER SELF-DIAGNOSTICS

To put the cluster in self-diagnostics mode press the trip reset button down and then turn the ignition to the RUN position simultaneously, then release the button. The gauges will increment to selected stoops and all indicators will light with the exception of the turn signals, high beam, and fog lamp indicators. The oil lamp will come on when the ignition is turned ON and the engine is OFF.

REMOVAL AND INSTALLATION

ACCESSORY SWITCH/POWER OUTLET BEZEL

REMOVAL

1. Disconnect and isolate the battery negative cable (Fig. 6).
2. Remove the instrument panel center bezel. Refer to Instrument Panel Center Bezel Removal and Installation in this section.
3. Remove four screws retaining accessory switch/power outlet bezel (Fig. 7).
4. Disconnect the harness connectors to the following:
   - Rear Window Defogger Switch (if equipped)
   - Traction Control Switch (if equipped)
   - Cigar Lighter/Power Outlet

---

**Fig. 4 Oil Pressure Switch**

**Fig. 5 Cluster Wire Harness Connector**

**INSTRUMENT CLUSTER CONNECTOR PIN CALL-OUT**

<table>
<thead>
<tr>
<th>PIN</th>
<th>DESCRIPTION</th>
<th>PIN</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>REAR FOG LAMP FEED</td>
<td>14</td>
<td>PARK LAMP SWITCH OUTPUT</td>
</tr>
<tr>
<td>2</td>
<td>PCI BUS</td>
<td>15</td>
<td>FUSED IGNITION SWITCH OUTPUT (RUN-START)</td>
</tr>
<tr>
<td>3</td>
<td>COURTESY LAMPS DRIVER</td>
<td>16</td>
<td>DAYTIME RUNNING LAMPS</td>
</tr>
<tr>
<td>4</td>
<td>FOG LAMP SWITCH OUTPUT</td>
<td>17</td>
<td>DAYTIME RUNNING LAMPS</td>
</tr>
<tr>
<td>5</td>
<td>VTSS INDICATOR DRIVER</td>
<td>18</td>
<td>LEFT TURN SIGNAL</td>
</tr>
<tr>
<td>6</td>
<td>PANEL LAMPS DIMMER SIGNAL</td>
<td>19</td>
<td>RIGHT TURN SIGNAL</td>
</tr>
<tr>
<td>7</td>
<td>FUEL LEVEL SENSOR SIGNAL</td>
<td>20</td>
<td>DIMMER SWITCH LOW BEAM OUTPUT</td>
</tr>
<tr>
<td>8</td>
<td>NOT USED</td>
<td>21</td>
<td>FUSED B+</td>
</tr>
<tr>
<td>9</td>
<td>NOT USED</td>
<td>22</td>
<td>RED BRAKE WARNING INDICATOR DRIVER</td>
</tr>
<tr>
<td>10</td>
<td>GROUND</td>
<td>23</td>
<td>KEY-IN IGNITION SWITCH SENSE</td>
</tr>
<tr>
<td>11</td>
<td>NOT USED</td>
<td>24</td>
<td>DRIVER DOOR AJAR SWITCH SENSE</td>
</tr>
<tr>
<td>12</td>
<td>PANEL LAMPS DRIVER</td>
<td>25</td>
<td>SEAT BELT SWITCH SENSE</td>
</tr>
<tr>
<td>13</td>
<td>KEYLESS ENTRY SIGNAL</td>
<td>26</td>
<td>DIMMER SWITCH HIGH BEAM OUTPUT</td>
</tr>
</tbody>
</table>
The accessory switches are not serviced separately, but the cigar lighter/power outlet is and must be transferred to the new bezel. Refer to Cigar Lighter/Power Outlet Removal and Installation in this section.

**INSTALLATION**

For installation reverse the above procedures.

**CENTER CONSOLE FLOOD LAMP**

**REMOVAL**

1. Insert a small screwdriver into notch by lens and gently pry out unit. Refer to (Fig. 7).
2. Slide back rear cover to expose bulb.
3. Replace bulb.

**INSTALLATION**

For installation reverse the above procedures. When installing the retainer ensure that the forward tabs are inserted properly into the slots in the instrument panel.

**CIGAR LIGHTER / POWER OUTLET ASSEMBLY**

**REMOVAL**

1. Disconnect and isolate the battery negative cable (Fig. 6).
2. Look inside and note position of the retaining bosses (Fig. 8).
3. Using external snap ring pliers with 90 degree tips. Insert pliers with tips against bosses and squeeze forcing bosses out of base.
4. Pull out the base through mounting ring by gently rocking pliers. A tool can be made to do the same. Refer to (Fig. 9).
5. Disconnect the base wires.
REMOVAL AND INSTALLATION (Continued)

(6) Set base aside and remove base mount ring.

INSTALLATION

(1) Position mount ring to the instrument panel and feed the wires through ring. Index the cap and the mount ring with the index tab at 9 o'clock to the key in the instrument panel. Install the ring.

(2) Connect wires to base. Orient base alignment rib at 11 o'clock to mate the groove in mount ring at the same location.

(3) Push base into the bezel till it locks.

(4) Install cigar lighter cap and check operation of element.

(5) Separate glove box door from bin and remove.

INSTALLATION

For installation, reverse the above procedures.

GLOVE BOX SWITCH/LAMP

REMOVAL

(1) Disconnect and isolate the battery negative cable (Fig. 6).

(2) Open the glove box and push the glove box sides inward allowing the door bumpers to clear and the box to tip forward.

(3) Reach inside the opening and squeeze the lamp/switch retainers until they are disengage.

(4) Pull the switch/lamp rearward and remove it. Replace the lamp. To replace the switch disconnect wire and replace the switch.

INSTALLATION

For installation, reverse the above procedures.

INSTRUMENT CLUSTER

CAUTION: The Instrument Cluster MUST be stored in a face up position or damage will occur to the gauge operation.

REMOVAL

(1) Disconnect and isolate the battery negative cable (Fig. 6).

(2) Remove both left and right A-Pillar trim covers.

(3) Remove the instrument panel top cover.

(4) Remove cluster bezel.

(5) Remove the four screws attaching cluster housing to the base panel.

(6) Pull the cluster rearward to disconnect from base panel.

(7) Remove the cluster assembly.

INSTALLATION

For installation, reverse the above procedures.

INSTRUMENT CLUSTER BEZEL

REMOVAL

(1) Remove instrument panel top cover. Refer to Instrument Panel Top Cover Removal and Installation in this section.

(2) Using a trim stick (special tool #C-4755), gently pry up on the cluster bezel and remove from vehicle.

INSTALLATION

For installation, reverse the above procedures.
REMOVAL AND INSTALLATION (Continued)

INSTRUMENT CLUSTER LAMPS

WARNINGS/INDICATORS
The instrument cluster warning/indicator lamps are all serviceable Light Emitting Diodes (LED’s). The instrument cluster must first be removed, refer to Instrument Cluster Removal and Installation in this section, and then the defective LED just turns out with needle nose pliers.

ILLUMINATION LAMPS
The high beam indicator, turn signals, and illumination bulbs are also serviceable. The instrument cluster must first be removed, refer to Instrument Cluster Removal and Installation in this section, and then the defective bulb and socket turns out. The bulb locations are printed on the back cover of the instrument cluster.

INSTRUMENT PANEL ASSEMBLY

REMOVAL
(1) Disconnect and isolate the battery negative cable (Fig. 6).
(2) Push seats back to their full back position.
(3) Using a trim stick (special tool #C-4755), gently pry out left and right A-pillar trim moldings and remove.
(4) Remove top cover. Refer to Top Cover Removal and Installation in this section.
(5) Gently pull up on cluster bezel and remove from vehicle.
(6) Gently pull rearward on left lower instrument panel cover and remove from vehicle.

CAUTION: Lock the steering wheel in the straight ahead position. This will prevent clockspring damage when the steering wheel rotates freely.

(7) Remove steering column. Refer to Group 19 Steering, Steering Column Removal and Installation.
(8) Remove left and right instrument panel endcaps.
(9) Remove left and right cowl side panels.
(10) Remove center console. Refer to Group 23 Body, Center Console Removal and Installation.
(11) Depress the sides of the Data Link Connector (DLC) and remove from instrument panel reinforcement.
(12) Remove four bulkhead instrument panel retaining screws.
(13) Remove two bolts on top of the brake pedal support bracket.
(14) Remove two center support mounting bolts.
(15) Remove left and right A-pillar mounting bolts, two on each side.
(16) Disconnect right side antenna connector.
(17) Remove left and right A-pillar door harness connectors (Fig. 10).

Fig. 10 A-Pillar Door Harness Connector
1 – INSTRUMENT PANEL HARNESS CONNECTOR
2 – DOOR CHECK STRAP
3 – DOOR HARNESS CONNECTOR

(18) Disconnect two harness connectors to HVAC at right top instrument panel (Fig. 11).

Fig. 11 Instrument Panel to HVAC Harness Connectors
1 – HVAC HARNESS CONNECTORS
REMOVAL AND INSTALLATION (Continued)

(19) Disconnect one left side harness connector at top left of instrument panel for vanity and rear view mirrors.
(20) Pull off the hvac control head knobs.
(21) Remove two screws retaining the top front of the center bezel.
(22) Using a trim stick, gently pry out on the instrument panel center bezel and remove.
(23) Remove the two retaining screws to the hvac control head.
(24) Disconnect the one instrument panel wire harness connector.
(25) Disconnect the one vacuum harness connector.
(26) Pull hvac control head out of instrument panel, twist 90° and push back through the opening (Fig. 12). Do not disconnect the control cables.
(27) Disconnect the center console wiring:
  • Airbag Control Module (ACM)
  • Parking Brake Warning Lamp Switch
  • Transmission Range Indicator Lamp
(28) With help on an assistant, pull rearward on instrument panel assembly and remove from vehicle.
  If replacing instrument panel, transfer parts as necessary.

INSTALLATION

For installation, reverse the above procedures.
Fig. 13 Instrument Panel Assembly

1 – INSTRUMENT PANEL ASSEMBLY
2 – UPPER COVER INSTRUMENT PANEL
3 – MODULE, PASSENGER SIDE AIRBAG
4 – END CAP, RIGHT
5 – DEMISTER GRILLE, RIGHT
6 – LOUVER, AIR OUTLET, RIGHT
7 – DOOR, GLOVE BOX
8 – LOUVER, AIR OUTLET, CENTER
9 – BEZEL INSTRUMENT PANEL, CENTER
10 – BIN, LOWER STORAGE
11 – COVER, LOWER INSTRUMENT PANEL
12 – CLUSTER BEZEL
13 – LOUVER, AIR OUTLET, LEFT
14 – END CAP, LEFT
15 – DEMISTER GRILLE, LEFT
INSTRUMENT PANEL CENTER BEZEL

REMOVAL
(1) Remove HVAC control knobs from control head.
(2) Remove both center A/C outlet louvers (Fig. 14) by rolling downward and pulling out.
(3) Remove two screws retaining the top front of the center bezel up inside the center A/C outlet duct.
(4) Using a trim stick (special tool #C-4755), gently pry out on instrument panel center bezel.
(5) Remove bezel from vehicle.

INSTALLATION
For installation, reverse the above procedures.

INSTRUMENT PANEL TOP COVER

REMOVAL
(1) Using a trim stick (special tool #C-4755), gently pry out on both the left and right A-pillar trim panels and remove.
(2) Use care not to scratch the panel. Lift up on the bottom outer areas of the cluster bezel and along the rearward edge of the top cover to disengage the clips.
(3) Pull the top cover rearward until the forward pins disengage from the instrument panel.

INSTALLATION
For installation, reverse the above procedures. Position spring clips to instrument panel and push firmly until seated.

LOWER INSTRUMENT PANEL COVER

REMOVAL
(1) Remove instrument cluster bezel, Refer to Instrument Cluster Bezel Removal and Installation in this section.
(2) Grasp left lower instrument panel cover from the bottom and pull firmly rearward.
(3) Remove lower instrument panel cover from vehicle.

INSTALLATION
For installation, reverse the above procedures.

LOWER STORAGE BIN

REMOVAL
(1) Using a trim stick (special tool #C-4755), gently pry out on the side of the lower storage bin Refer to (Fig. 7).
(2) Disconnect the center console flood lamp.
(3) Transfer the center console flood lamp housing to new bin (if replacing).

INSTALLATION
For installation, reverse the above procedures.
REMOVAL AND INSTALLATION (Continued)

STEERING COLUMN SHROUDS

REMOVAL
(1) Remove lower instrument panel cover. Refer to Lower Instrument Panel Cover Removal and Installation in this section.
(2) Remove instrument cluster bezel. Refer to Instrument Cluster Bezel Removal and Installation in this section.
(3) Remove two column shroud retaining screws.
(4) Separate upper and lower steering column shrouds (Fig. 15) and remove from vehicle.

INSTALLATION
For installation, reverse the above procedures.

Fig. 15 Steering Column Shrouds
1 – UPPER SHROUD
2 – LOWER SHROUD
3 – MOUNTING SCREWS