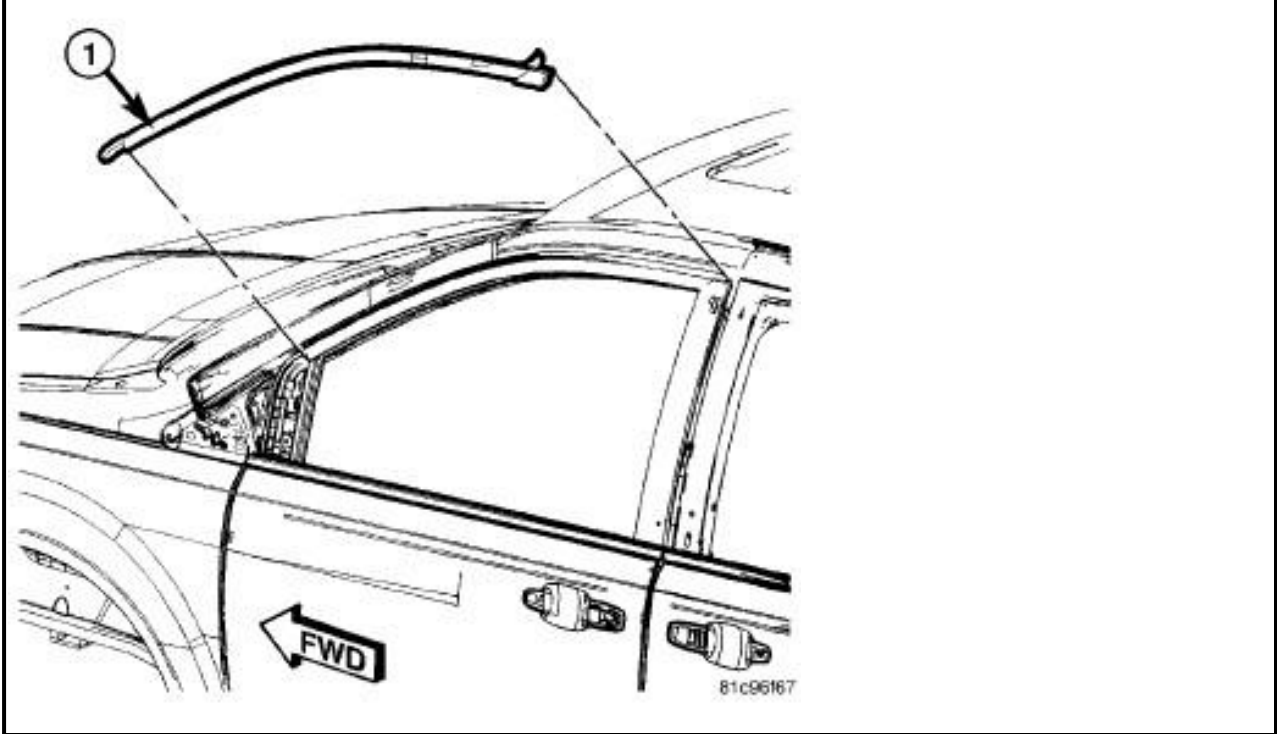


2017-2020 ACCESSORIES AND EQUIPMENT

Amplifier (AMP) - Electrical Diagnostics, Base - C/V Tradesman, Grand Caravan, Town & Country

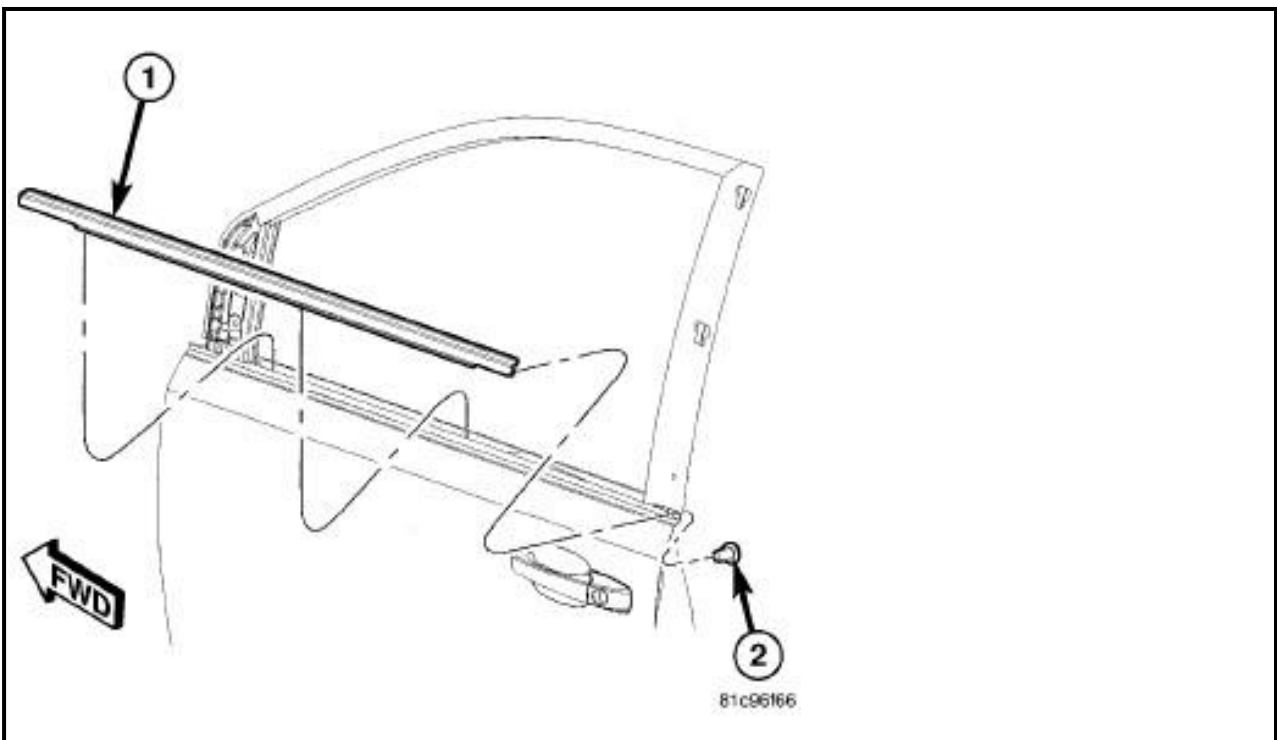
DIAGNOSTIC CODE INDEX**DIAGNOSTIC CODE INDEX**

DTC	Description
<u>B1460</u>	CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE
<u>B1461</u>	CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B1462</u>	CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B1463</u>	CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1464</u>	CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER
<u>B1465</u>	CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE
<u>B1466</u>	CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B1467</u>	CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B1468</u>	CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1469</u>	CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER
<u>B146A</u>	CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE
<u>B146B</u>	CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B146C</u>	CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B146D</u>	CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B146E</u>	CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER
<u>B146F</u>	CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE
<u>B1470</u>	CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B1471</u>	CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B1472</u>	CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1473</u>	CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER
<u>B1474</u>	CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE
<u>B1475</u>	CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B1476</u>	CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B1477</u>	CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1478</u>	CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER
<u>B1479</u>	CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE
<u>B147A</u>	CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B147B</u>	CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B147C</u>	CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B147D</u>	CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER
<u>B147E</u>	CHANNEL 7 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE
<u>B147F</u>	CHANNEL 7 AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B1480</u>	CHANNEL 7 AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B1481</u>	CHANNEL 7 AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1482</u>	CHANNEL 7 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER
<u>B1483</u>	CHANNEL 8 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE

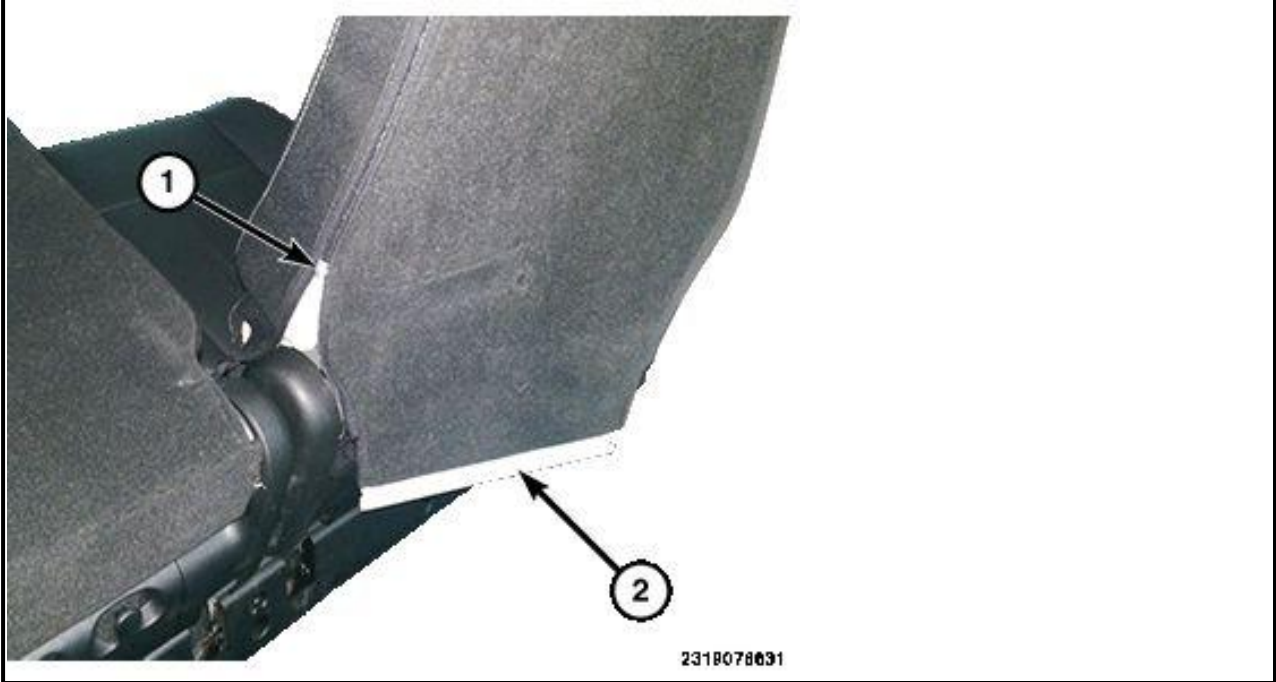


1. Remove the outside rear view mirror. Refer to [MIRROR, OUTSIDE REARVIEW, GLASS, REMOVAL](#).
2. Remove the door applique. Refer to [APPLIQUE, REMOVAL](#).
3. Lower the door glass to the down position.
4. Lower the window weatherstrip from the upper door frame.
5. Starting at an edge, peel the front door header tape (1), adhesive type sticker, from the upper door frame.
6. Use adhesive remover per manufacturer recommendations, to remove any remaining adhesive.

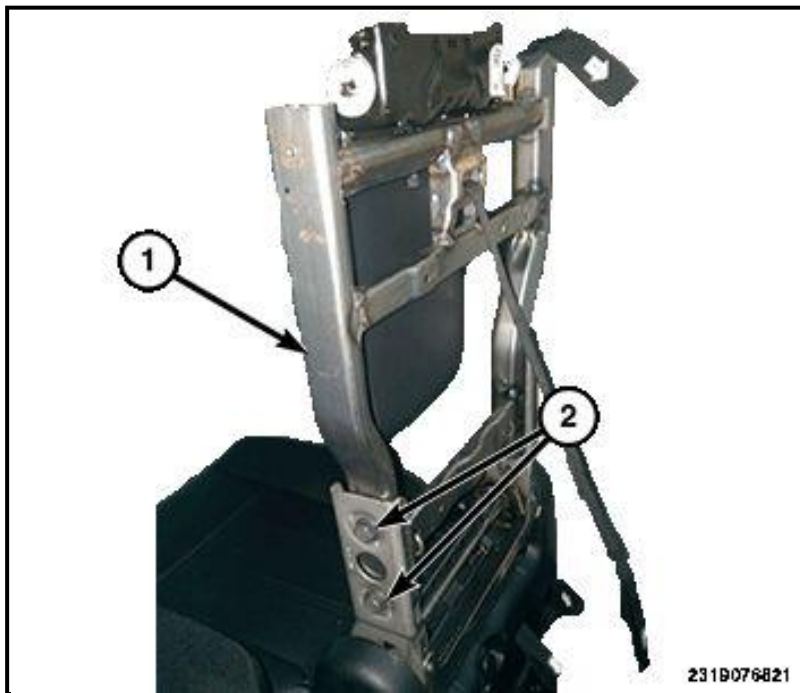
LOWER



1. Remove the outside rear view mirror. Refer to [MIRROR, OUTSIDE REARVIEW, GLASS, REMOVAL](#).
2. Remove the screw (2) that secures the lower door frame closeout molding (1) to the inside of the front door.
3. With the door glass in the down position, remove the lower door frame closeout molding from the top of the outer door panel.



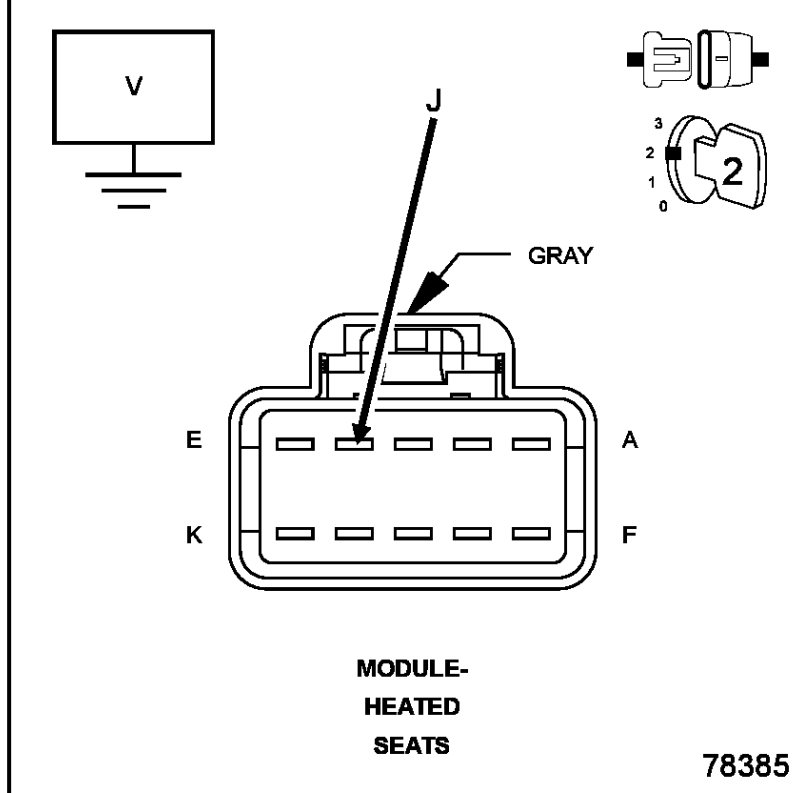
1. Using trim stick (special tool #C-4755, Trim Stick) or equivalent, separate the retaining clips (2) and release the side zippers (1).



2. Remove the bolts (2) and remove the seat back (1).

INSTALLATION





1. Measure the voltage of the (D506) LIN BUS circuit between the Heated Seats Module connector and ground.

Is the voltage above 5.0 volts?

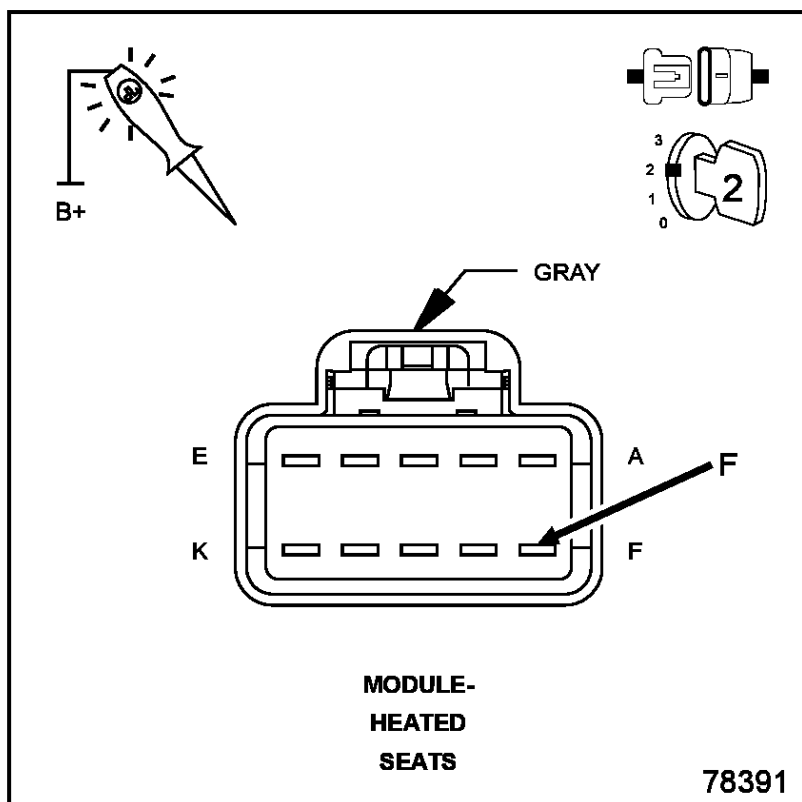
Yes

- Go To [10](#)

No

- Go To [11](#)

10. CHECK (Z908/Z909) GROUND CIRCUIT FOR AN OPEN



1. Using a 12-volt test light connected to 12 volts, check the (Z908/Z909) Ground circuit at the Heated Seats Module connector.

- Go To [10](#)

4. CHECK THE (P297) RIGHT SEAT BACK FORWARD DRIVER CIRCUIT VOLTAGE AT IN-LINE

1. Using a 12-volt test light connect one lead to the (P297) Right Seat Back Motor Forward Driver circuit at the in-line harness connector and the other lead to ground.
2. With the right seat selected at the folding seat switch, depress any folding seat button twice then alternate to a different button and depress it twice.

NOTE: Light should flash On with second button press.

Does the test light flash On momentarily?

Yes

- Go To [5](#)

No

- Go To [12](#)

5. CHECK THE (P298) RIGHT SEAT BACK REARWARD DRIVER CIRCUIT VOLTAGE AT IN-LINE

1. Using a 12-volt test light connect one lead to the (P298) Right Seat Back Motor Rearward Driver circuit at the in-line harness connector and the other lead to ground.
2. With the right seat selected at the folding seat switch, depress any folding seat button twice then alternate to a different button and depress it twice.

Does the test light flash On momentarily?

Yes

- Go To [6](#)

No

- Go To [13](#)

6. CHECK THE (P297) RIGHT SEAT BACK FORWARD DRIVER CIRCUIT VOLTAGE AT MOTOR

1. Reconnect the in-line connector.
2. Disconnect the Right Power Rear Folding Seat Back Motor connector.
3. Using a 12-volt test light connect one lead to the (P297) Right Seat Back Motor Forward Driver circuit at the motor connector and the other lead to ground.
4. With the right seat selected at the folding seat switch, depress any folding seat button twice then alternate to a different button and depress it twice.

Does the test light flash On momentarily?

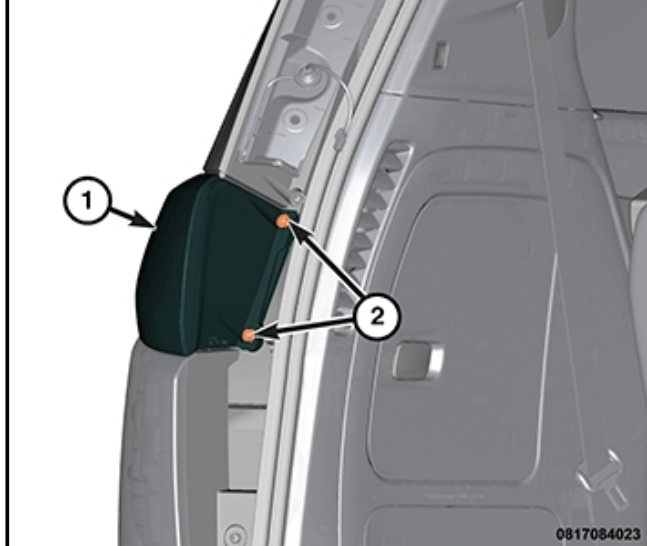
Yes

- Go To [7](#)

No

- Repair the open (P297) Right Seat Back Motor Forward Driver circuit back to the in-line connector.
- Perform POWER FOLDING SEAT SYSTEM VERIFICATION TEST. Refer to **POWER FOLDING SEAT SYSTEM VERIFICATION TEST**.

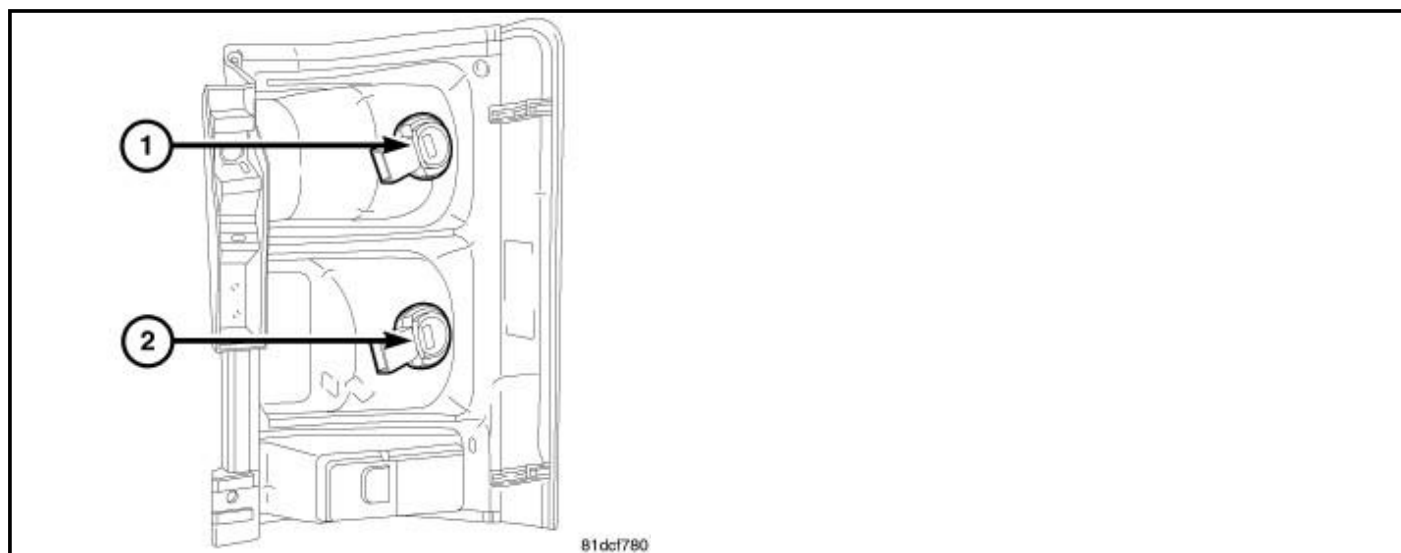
7. CHECK THE (P298) RIGHT SEAT BACK REARWARD DRIVER CIRCUIT VOLTAGE AT MOTOR



3. Remove the two retaining screws (2).
4. Insert a trim stick or equivalent to gently pry the lamp unit away from the body and rotate the lamp (1) away from the vehicle body to disengage pin from the grommet in the quarter panel opening.
5. Disconnect the two wiring harness connectors from tail lamp assembly.

INSTALLATION

BULBS



There are a total of two possible bulbs in the tail lamp unit:

- Back-Up Lamp (1) Dodge.
- Tail, Stop and Turn signal (2) (Dodge).

NOTE: On the Chrysler model vehicles, the Tail, Stop and Turn signal lamp is in position (1) position and the Back Up lamp is in position (2),

1. Push bulb into the bulb socket.
2. Install bulb socket into tail lamp assembly. Rotate the socket clockwise 1/4 turn until fully seated.
3. Install the tail lamp unit. Refer to [LAMP, TAIL, INSTALLATION](#), [LAMP, TAIL, EXPORT, INSTALLATION](#).
4. Connect the battery negative cable.

INSTALLATION - OUTER



Possible Causes
TIPM NOT CONFIGURED CORRECTLY
RIGHT FRONT DOOR MODULE
CONTROL MODULE THAT SET THE DTC

DIAGNOSTIC TEST

VERIFY DTC IS ACTIVE

NOTE: Make sure the IOD fuse is installed and the battery is fully charged before proceeding.

1. Turn the ignition on.
2. With the scan tool, read active DTCs.

Is this DTC active?

Yes

- Refer to **DTC INDEX** and perform the U0204-Lost Communication with Door Module Front Right diagnostic procedure.

No

- Refer to **STORED LOST COMMUNICATION DTCS** and perform the Stored Lost Communication DTCs diagnostic procedure.

U0259-LOST COMMUNICATION WITH WHEEL CHAIR RAMP MODULE

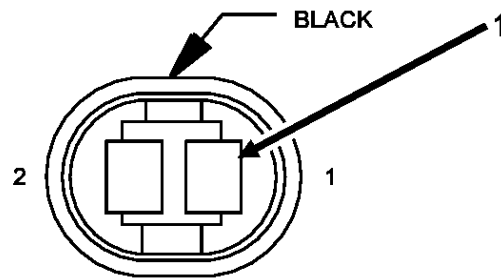
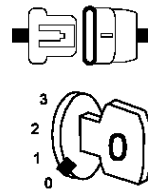
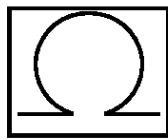
For a complete wiring diagram, refer to appropriate **SYSTEM WIRING DIAGRAMS** article .

THEORY OF OPERATION

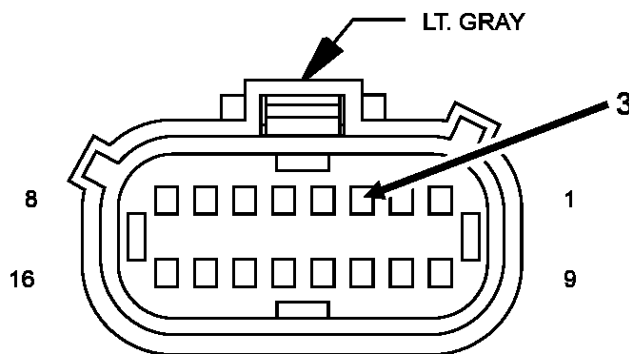
The primary communication network between electronic control modules on this vehicle is the Controller Area Network (CAN) data bus system. The Controller Area Network (CAN) data bus allows all electronic modules connected to the bus to share information with each other. Regardless of whether a message originates from a module on the higher speed CAN C (500K) Bus or on the lower speed CAN Interior High Speed (IHS) (125K) Bus the message structure and layout is similar, which allows the Totally Integrated Power Module/Central GateWay (TIPM or TIPMCGW) to process and transfer messages between the CAN buses. The TIPM also stores Diagnostic Trouble Codes (DTCs) for certain bus network faults.

All modules transmit and receive messages over one of these buses. Data exchange between the modules is achieved by serial transmission of encoded data messages (a form of transmission in which data bits are sent sequentially, one at a time, over a single line). Each module can both send and receive serial data simultaneously. Each data bit of a CAN Bus message is carried over the bus as a voltage differential between the two bus circuits which, when strung together, form a message. Each module uses arbitration to sort the message priority if two competing messages are attempting to be broadcast at the same time. Corruption of a single bit within a message will corrupt the entire message. Each message contains a Cyclic Redundancy Check (CRC) which specifies the message size exactly. If the message detected conflicts with the CRC the ECU receiving it will determine the message to be an error and consider that communication has not been possible. Diagnosis of this condition using a lab scope may reveal activity that appears to be Bus data messages even if no actual communication is possible. Communication problems that affect the whole bus, as a result of opens and terminal push outs are more likely to occur on data busses that operate at a high speed than a data bus that operates at a lower speed.

When an open circuit or terminal push out occurs one or more modules can become isolated from the remainder of the bus. The isolated module will attempt to communicate, but will not be able to receive messages or determine arbitration from other modules. Each time the isolated module attempts to communicate it alters the bus voltage on the intact bus circuit. Without functioning arbitration the isolated module alters the bus voltage while other bus messages are being sent thereby corrupting the messages on the remainder of the bus.



**SWITCH-
HOOD
AJAR**



**MODULE-
TOTALLY
INTEGRATED
POWER C4**

106497

1. Turn the ignition off.
2. Measure the resistance of the (G70) Hood Ajar Switch Sense circuit between the TIPM C4 harness connector and the Hood Ajar Switch harness connector.

Is the resistance below 5.0 Ohms?

Yes

- Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.
- Perform the BODY VERIFICATION TEST. Refer to [BODY VERIFICATION TEST](#).

No

- Repair the open in the (G70) Hood Ajar Switch Sense circuit.
- Perform the BODY VERIFICATION TEST. Refer to [BODY VERIFICATION TEST](#).

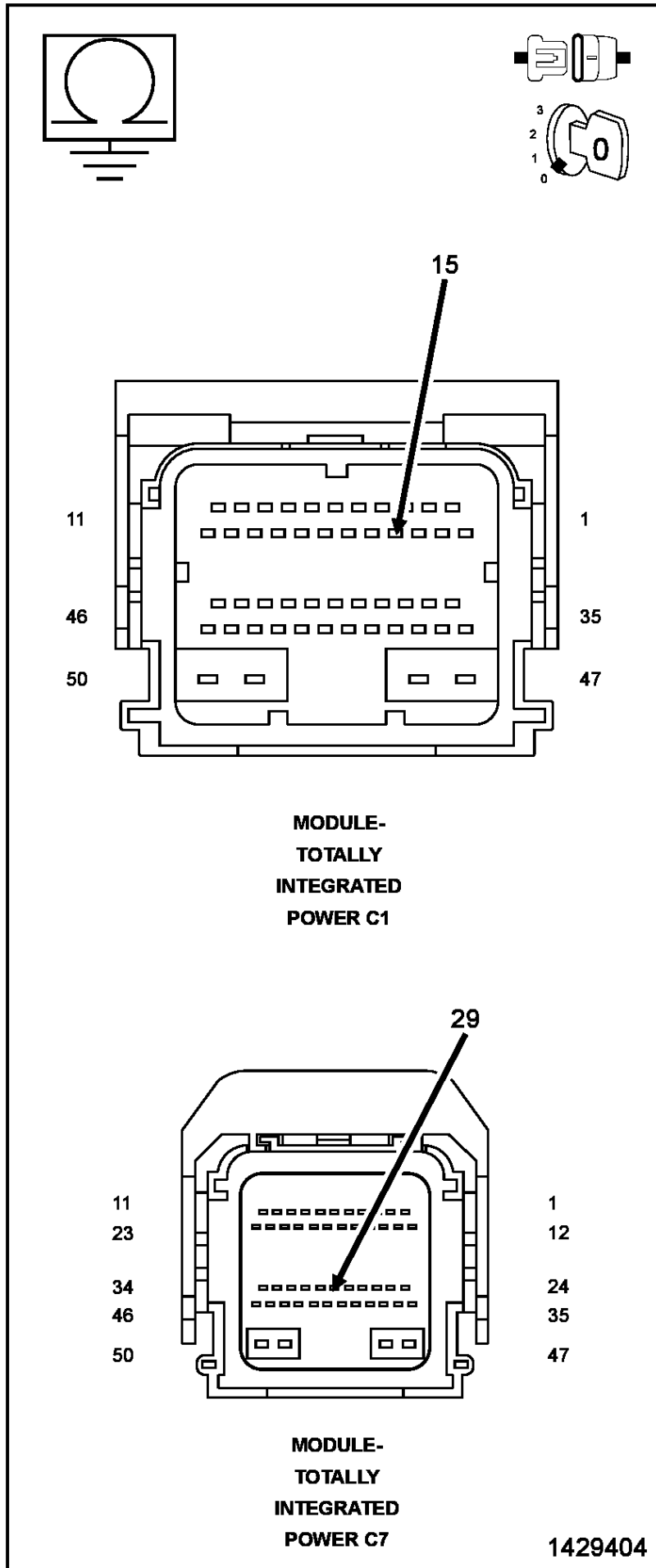
B186F-ALL DOOR SECONDARY LOCK CONTROL CIRCUIT LOW

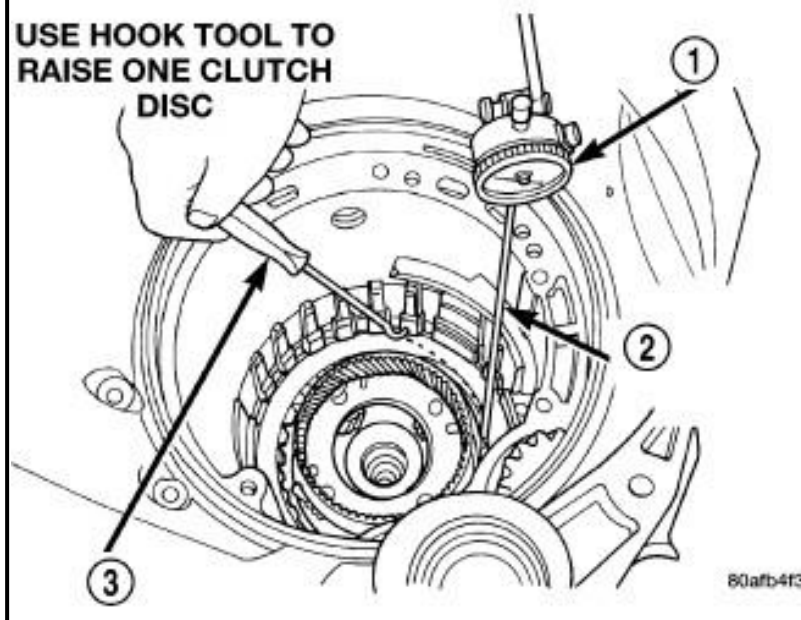
- Perform the BODY VERIFICATION TEST. Refer to **BODY VERIFICATION TEST**.

No

- Go To [9](#)

9. CHECK THE (D51) OR (D64) CAN C BUS (-) CIRCUIT FOR A SHORT TO GROUND



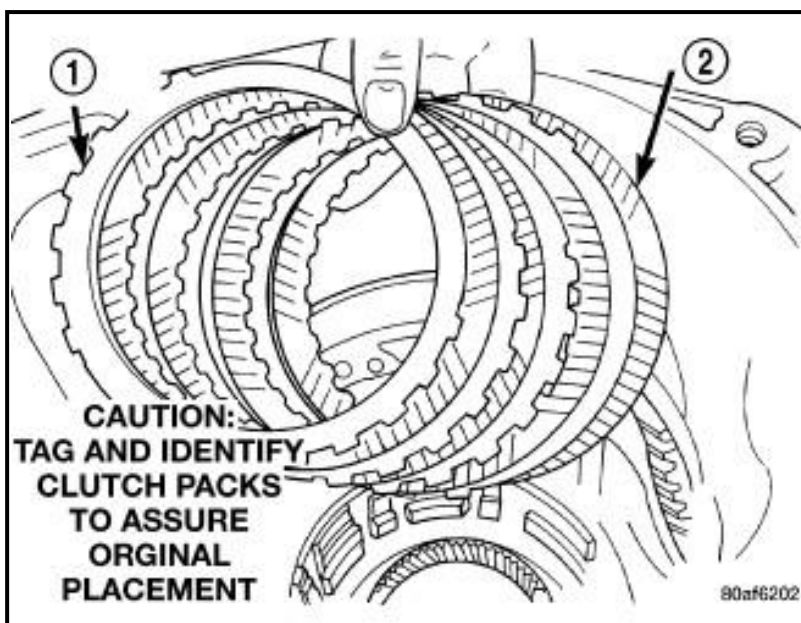


- 1 - DIAL INDICATOR
2 - DIAL INDICATOR TIP TOOL 6268
3 - HOOK TOOL

27. Set up dial indicator (1) to measure low/reverse clutch clearance. Press down on clutch pack with finger and zero dial indicator. **Low/Reverse clutch pack clearance is 0.89-1.47 mm (0.035-0.058 in.)**. Set up indicator and record measurement in four places. Take average of readings and select the proper low/reverse reaction plate to achieve specifications.

LOW/REVERSE REACTION PLATE CHART

PART NUMBER	THICKNESS
05078829AA	5.88 mm (0.232 in.)
05078830AA	6.14 mm (0.242 in.)
05078831AA	6.40 mm (0.252 in.)
05078832AA	6.66 mm (0.262 in.)
05078833AA	6.92 mm (0.273 in.)



- 1 - CLUTCH PLATE (4)
2 - CLUTCH DISC (4)

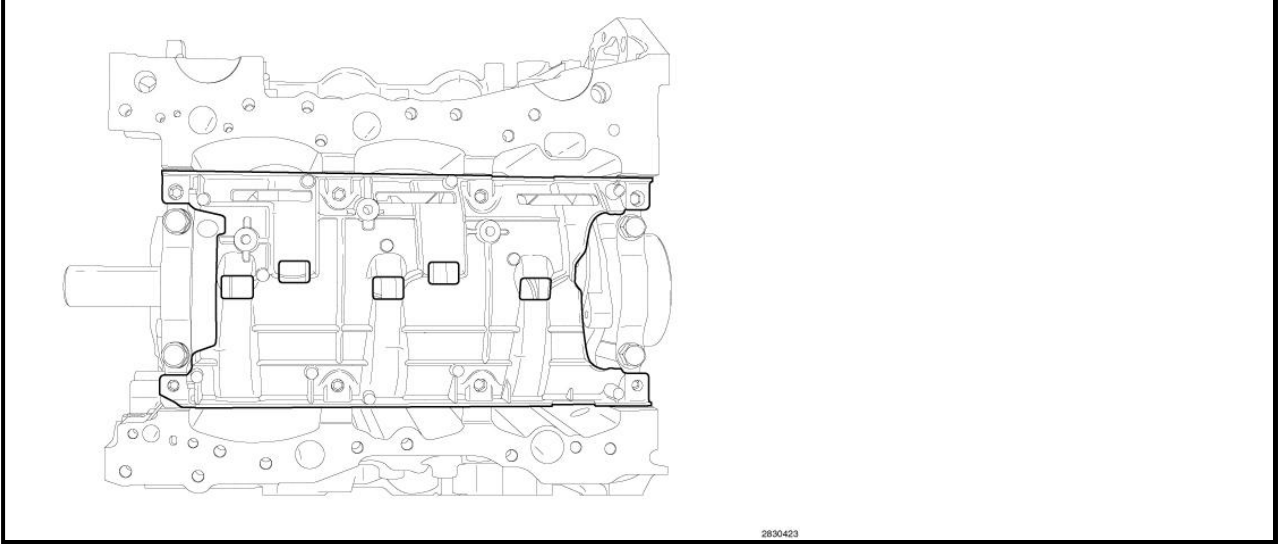
28. Install 2/4 clutch pack (1, 2).

CONDITION	POSSIBLE CAUSES	CORRECTION
CLICK OR SQUAWK ON PEDAL APPLICATION	1. Brake brake pedal position sensor. 2. Brake Transmission Shift Interlock Linkage (BTSI). 3. Pedal pivot bushings.	1. Replace the brake pedal position sensor. Refer to <u>REMOVAL</u> . 2. Lubricate BTSI linkage. 3. Replace the brake pedal. Refer to <u>REMOVAL</u> .
DISC BRAKE CHIRP	1. Excessive brake rotor runout. 2. Lack of lubricant on brake caliper slides. 3. Caliper/shoes not fully seated. 4. Inspect linings for contamination. 5. Coating worn on abutment.	1. Diagnose and correct as necessary. Refer to <u>ROTOR, BRAKE, DIAGNOSIS AND TESTING</u> . 2. Lubricate brake caliper slides. 3. Reseat caliper/shoes. 4. Remove source of contamination. 5. Replace abutment clips.
DISC BRAKE RATTLE OR CLUNK	1. Broken or missing anti-rattle spring clips. 2. Caliper guide pin bolts loose.	1. Replace anti-rattle spring clips/shims and brake pads. 2. Tighten guide pin bolts.
SQUEAK/SQUEAL	1. Brake shoe/pad linings.	1. Replace brake shoes/pads.
SCRAPING (METAL-TO-METAL).	1. Foreign object interference with brakes. 2. Brake shoes/pads worn out. 3. Rock caught between splash shield and rotor.	1. Inspect brakes and remove foreign object. 2. Replace brake shoes/pads. Inspect rotors. Reface or replace as necessary. 3. Remove trapped rock(s).
SCRAPING OR WHIRRING	1. Wheel speed sensor hitting tone wheel.	1. Inspect, correct or replace faulty component(s).

OTHER BRAKE CONDITIONS

CONDITION	POSSIBLE CAUSES	CORRECTION
BRAKES CHATTER OR VIBRATION	1. Disc brake rotor has excessive thickness variation. 2. Uneven tire wear/wheel - tire imbalance.	1. Isolate condition as rear or front. Reface or replace brake rotors as necessary. 2. Inspect tires & wheels. Balance wheel weights.
BRAKES DRAG (FRONT OR ALL)	1. Contaminated brake fluid.	1. Check for swollen seals. Replace all system components containing rubber.
	2. Binding caliper pins or bushings.	2. Replace pins and bushings
	3. Binding master cylinder (not fully returning).	3. Inspect and Replace master cylinder as necessary.
	4. Binding brake pedal.	4. Replace brake pedal/bushings.
	5. Brake lamp switch not adjusted properly and mounting bracket is bent.	5. Straighten mounting bracket and replace brake lamp switch. Refer to <u>SWITCH, STOP LAMP, REMOVAL</u> .
	6. Damaged caliper abutment clips.	6. Replace abutment clips.
	7. Long booster output rod (out of spec).	7. Replace power brake booster.

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Left Engine Mount Bracket Side Bolts to Transaxle	30 + 120°	22 + 120°	-
Left Engine Mount Bracket upper Bolt to Transaxle	63	46	-
Left Engine Mount to Bracket	250	184	-
Left Engine Mount to Frame	95	70	-
Lower Oil Pan to Upper Oil Pan - M6 Bolts	10.5	-	93
Lower Transmission Mount Bracket to Transaxle	173	128	-
Lower Transmission Strut Isolator to Transaxle Mount Bracket and Crossmember	290	214	-
Right Engine Mount Bracket to Engine Cover - M8 Bolts	25	18	-
Right Engine Mount Bracket to Engine Cover - M10 Bolts	55	41	-
Right Engine Mount Isolator to Engine Mount Bracket	80 + 45°	59 + 45°	-
Right Engine Mount Isolator to Frame	95	70	-
Generator - M8 Bolts	25	18	-
Heater Core Supply Tube to Cylinder Head - M8 Bolt	12	-	106
Idle Pulley to Engine Timing Cover - Accessory Drive M8 Bolt	25	18	-
Ignition Capacitor to Cylinder Head - M6 Bolts	10	-	89
Ignition Coil to Cylinder Head Cover - M6 Bolts	8	-	71
Intake Manifold (Upper) - M6 Bolts	10	-	89
Intake Manifold (Lower) - M6 Bolts	12	-	106
Knock Sensor to Engine Block - M8 T40	21	16	-
Negative Battery Cable to Battery	5	-	45
Oil Control Valve - Cam Phaser M18	160	118	-
Upper Oil Pan to Engine Block - M8 Bolts	23	17	-
Transaxle to Upper Oil Pan - M10 Bolts	50	37	-
Transaxle to Starter - M10 Bolts	47	35	-
Oil Cooler to Oil Filter Housing Screws	12	-	106
Upper Oil Pan to Rear Seal Retainer - M6 Bolts	10	-	89
Oil Pan Drain - Plug M14	27	20	-
Oil Pressure Sensor to Oil Filter Housing	20	-	177
Oil Temperature Sensor to Oil Filter Housing	20	-	177
Piston Oil Cooler Jet to Engine Block - M5	6	-	53
Oil Filter Housing/Oil Cooler to Engine Block - M6 Bolts	12	-	106
Oil Filter Housing Cap	25	18	-
Oil Pump to Engine Block - M6 Bolts	12	-	106
Oil Level Indicator to Engine Block - M10 Bolt	35	26	-



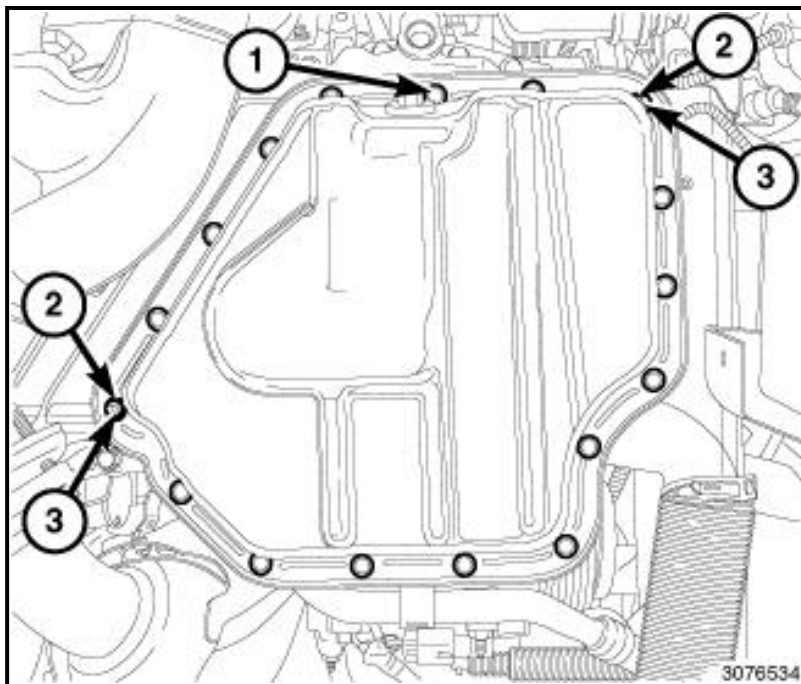
The high pressure die cast aluminum windage tray is mounted to the main bearing caps and is designed to keep oil off of the connecting rods as the crankshaft rotates. When the oil is kept off the connecting rods, the engine rotates easier and oil foaming decreases. Like the oil pan, the windage tray is designed to stiffen the lower end of the engine. The tray is directional and the main bearing cap bolts hold it in place.

REMOVAL

LOWER

1. Raise and support the vehicle. Refer to [HOISTING, STANDARD PROCEDURE](#) .
2. Drain the engine oil. Refer to [OIL, STANDARD PROCEDURE](#).
3. Remove the belly pan. Refer to [REMOVAL](#) .
4. Remove inner splash shield.

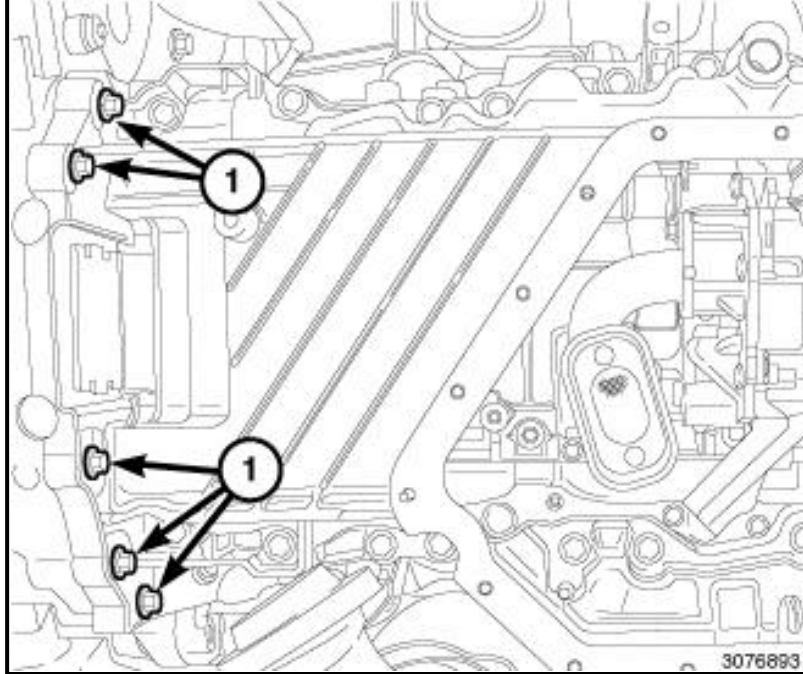
NOTE: The lower oil pan must be removed to access all of the upper oil pan retaining bolts.



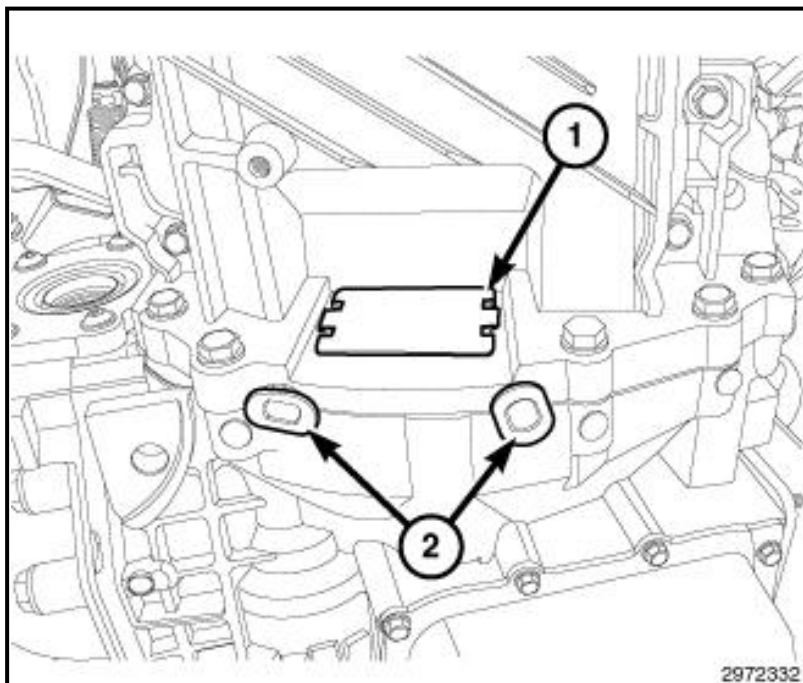
5. Remove fifteen bolts (1), two nuts (2) and two studs (3) from the flange of the lower oil pan.

CAUTION: Do not pry on the lower oil pan flange. There are no designated pry points for lower oil pan removal. Prying on only one or a few locations could bend the flange and damage the pan.

6. Using a gasket scraper or equivalent, loosen the seal around the lower oil pan in order to shear the sealant bond and remove the pan.



11. Remove the five oil pan to transmission bolts (1).



12. Remove the torque converter bolt access cover (1).

13. Remove two rubber plugs (2) covering the rear oil seal retainer flange bolts.



- Go To [2](#)

No

- Perform the INTERMITTENT CONDITION diagnostic procedure. Refer to **DIAGNOSTIC TEST** .

2. CHECKING THE EXHAUST SYSTEM FOR LEAKS

1. Perform the CHECKING THE EXHAUST SYSTEM FOR LEAKS test procedure. Refer to **DIAGNOSIS AND TESTING** .

Were any exhaust leaks found?

Yes

- Perform the appropriate repairs.
- Perform the POWERTRAIN VERIFICATION TEST. Refer to **POWERTRAIN VERIFICATION TEST** .

No

- Go To [3](#)

3. CHECK THE (K141) O2 SENSOR 1/2 SIGNAL CIRCUIT

1. Turn the ignition off
2. Disconnect the O2 Sensor 1/2 harness connector.
3. Turn the ignition on.
4. Measure the voltage on the (K141) O2 Sensor 1/2 Signal circuit in the O2 Sensor 1/2 harness connector.

Is the voltage between 4.1 and 5.0 volts?

Yes

- Go To [4](#)

No

- Check the (K141) O2 Sensor 1/2 Signal circuit for a short to ground, open or short to voltage. If OK, replace and program the PCM in accordance with the Service Information. Refer to **MODULE, POWERTRAIN CONTROL (PCM), REMOVAL** .
- Perform the POWERTRAIN VERIFICATION TEST. Refer to **POWERTRAIN VERIFICATION TEST** .

4. CHECK THE (K904) O2 SENSOR 1/2 RETURN CIRCUIT

1. Measure the voltage on the (K904) O2 Sensor 1/2 Return circuit in the O2 Sensor 1/2 harness connector.

Is the voltage at 2.5 volts?

Yes

- Go To [5](#)

No

- Check the (K904) O2 Sensor 1/2 Return circuit for a short to ground, open or short to voltage. If OK, replace and program the PCM in accordance with the Service Information. Refer to **MODULE, POWERTRAIN CONTROL (PCM), REMOVAL** .
- Perform the POWERTRAIN VERIFICATION TEST. Refer to **POWERTRAIN VERIFICATION TEST** .