

JUMP STARTING, TOWING, AND HOISTING

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SERVICE PROCEDURES

JUMP STARTING PROCEDURE

WARNING: REVIEW ALL SAFETY PRECAUTIONS AND WARNINGS IN GROUP 8A, BATTERY.

DO NOT JUMP START A FROZEN BATTERY, PERSONAL INJURY CAN RESULT.

DO NOT JUMP START WHEN MAINTENANCE FREE BATTERY INDICATOR DOT IS YELLOW OR BRIGHT COLOR.

A BATTERY GENERATES HYDROGEN GAS WHICH IS FLAMMABLE AND EXPLOSIVE. KEEP OPEN FLAME OR SPARKS AWAY FROM THE BATTERY.

DO NOT ALLOW JUMPER CABLE CLAMPS TO TOUCH EACH OTHER WHEN CONNECTED TO A BOOSTER SOURCE.,

DO NOT ALLOW BATTERY VOLTAGE TO EXCEED 16 VOLTS.

TAKE CARE TO AVOID THE RADIATOR COOLING FAN WHENEVER THE HOOD IS RAISED. THE FAN CAN START AT ANYTIME THE IGNITION SWITCH IS ON. YOU CAN BE HURT BY THE FAN.

BATTERY FLUID IS A CORROSIVE ACID SOLUTION: DO NOT ALLOW BATTERY FLUID TO CONTACT EYES, SKIN, OR CLOTHING. IF ACID SPLASHES IN EYES OR ON SKIN, FLUSH THE CONTAMINATED AREA IMMEDIATELY WITH LARGE QUANTITIES OF WATER.

CAUTION: Do not attempt to push or tow the vehicle to start it. The vehicle cannot be started this way. Pushing with another vehicle may damage the transaxle or the rear of the vehicle.

If the vehicle has a discharged battery, booster cables may be used to obtain a start from another vehicle. This type of start can be dangerous if done improperly, so follow the procedure carefully.

NOTE: The battery is stored in a compartment in front of the tire in the right front fender and is accessible through the engine compartment.

TO JUMP START A DISABLED VEHICLE:

If the indicator is dark or shows a green dot, proceed as follows:

(1) Wear eye protection and remove metallic jewelry worn on hands or wrists to avoid injury by accidental arcing of battery current.

(2) When using another vehicle as a booster source, park the booster vehicle within cable reach without allow vehicles to touch.

(3) Turn off all accessories, set the parking brake, place the automatic transmission in PARK, and turn the ignition OFF in both vehicles.

(4) Connect one end of the positive jumper cable to the positive jump start attachment of the booster battery. Connect the other end of the cable to the positive jump start attachment of the discharged battery (Fig. 1).

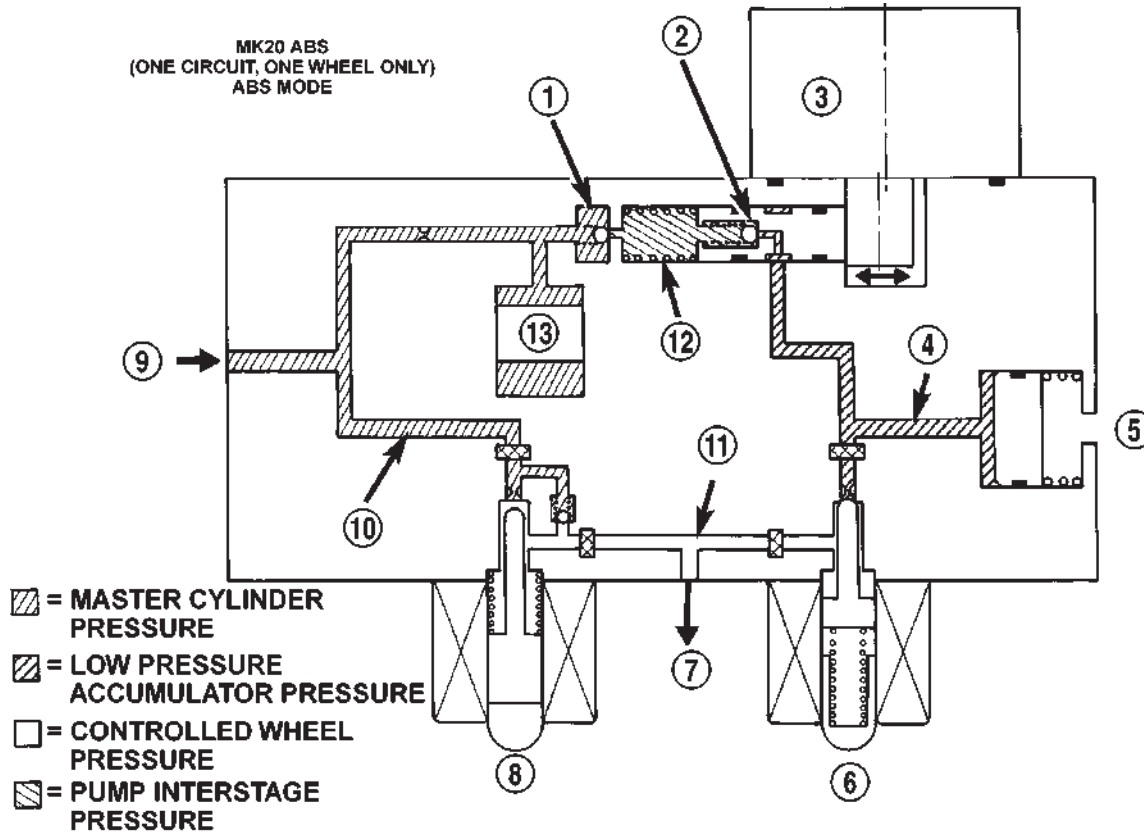
(5) Connect one end of the negative jumper cable to the negative jump start attachment of the booster battery. Connect the other end of the cable to the negative jump start attachment of the discharged battery (Fig. 2). Ensure that the jump cable clamps have good connections.

(6) Start the engine in the vehicle which has the booster battery, let the engine idle a few minutes, then start the engine in the vehicle with the discharged battery.

CAUTION: Do not crank starter motor on disabled vehicle for more than 15 seconds, starter will overheat and could fail.

- (7) When removing the jumper cables:
- Disconnect jumper cable negative clamp from the disabled vehicle.
 - Disconnect the jumper cable negative clamp from the booster battery start attachment.
 - Disconnect jumper cable positive clamp from disabled battery start attachment.
 - Disconnect jumper cable positive clamp from booster battery start attachment.

DESCRIPTION AND OPERATION (Continued)



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Fig. 7 ABS Without Traction Control - ABS Mode Hydraulic Circuit

- | | |
|--|--------------------------------------|
| 1 - OUTLET VALVE | 8 - NORMALLY OPEN VALVE (MODULATING) |
| 2 - PUMP PISTON | 9 - FROM MASTER CYLINDER |
| 3 - PUMP MOTOR (ON) | 10 - MASTER CYLINDER PRESSURE |
| 4 - LOW PRESSURE ACCUMULATOR PRESSURE | 11 - CONTROLLED WHEEL PRESSURE |
| 5 - LOW PRESSURE ACCUMULATOR | 12 - PUMP INTERSTAGE PRESSURE |
| 6 - NORMALLY CLOSED VALVE (MODULATING) | 13 - NOISE DAMPER CHAMBER |
| 7 - TO RIGHT FRONT WHEEL | |

with every brake pedal application so pressure is not created at the inlet to the pump/motor.

ABS BRAKING HYDRAULIC CIRCUIT, SOLENOID VALVE, AND SHUTTLE VALVE FUNCTION (ABS WITH TRACTION CONTROL)

The hydraulic diagram (Fig. 9) shows the vehicle in the ABS braking mode. The diagram shows one wheel is slipping because the driver is attempting to stop the vehicle at a faster rate than is allowed by the surface on which the tires are riding.

- The hydraulic shuttle valve closes upon brake application so that the pump/motor cannot siphon brake fluid from the master cylinder.

- The normally open and normally closed valves modulate (build/decay) the brake hydraulic pressure as required.

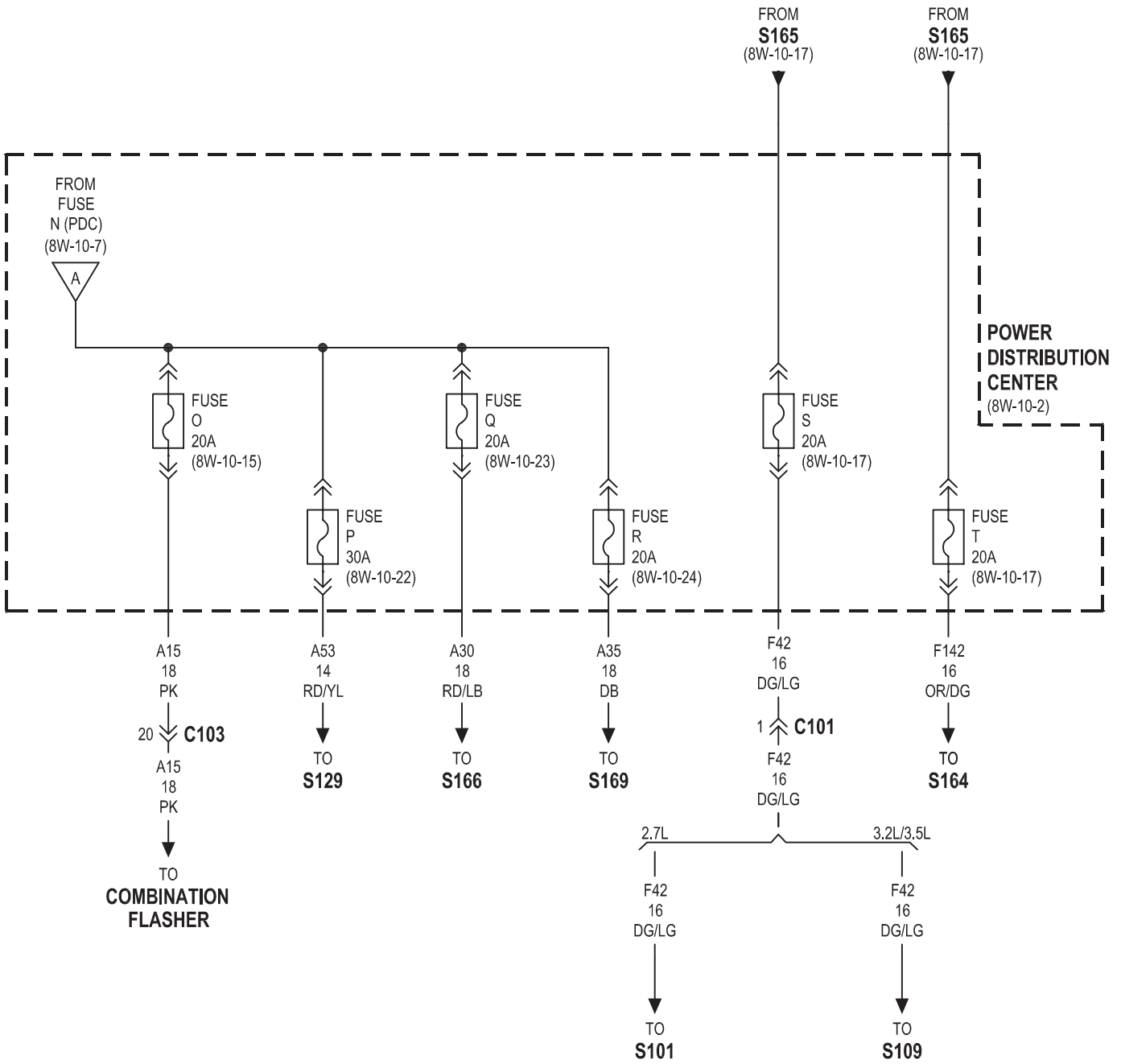
- The pump/motor is switched on so that the brake fluid from the low pressure accumulators is returned to the master cylinder circuits.

- The brake fluid is routed to either the master cylinder or the wheel brake depending on the position of the normally open valve.

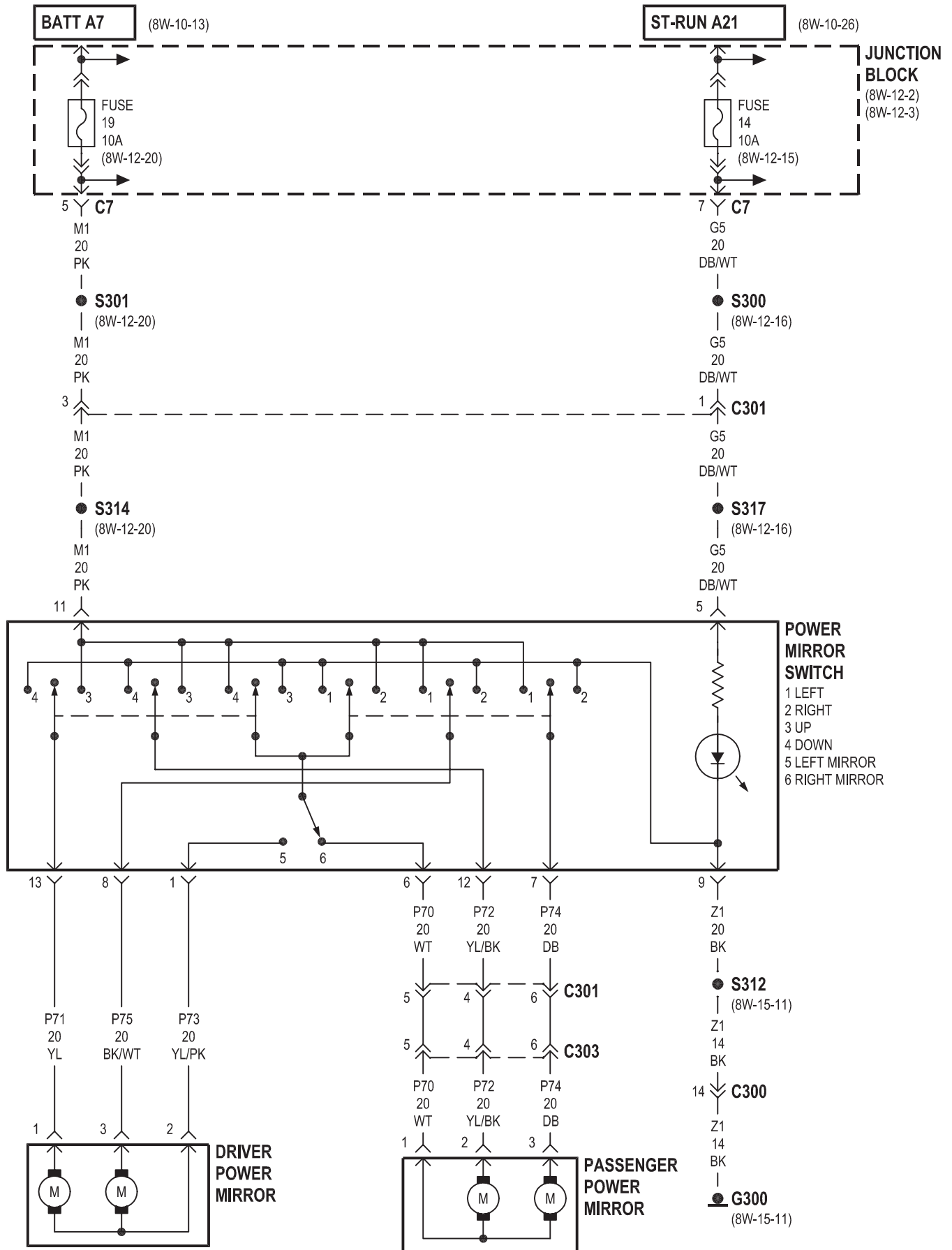
ABS TRACTION CONTROL HYDRAULIC CIRCUIT, SOLENOID VALVE, AND SHUTTLE VALVE FUNCTION (ABS WITH TRACTION CONTROL)

The hydraulic diagram (Fig. 10) shows the vehicle in the traction control (TC) mode. The diagram shows a drive wheel is spinning and brake pressure is required to reduce its speed.

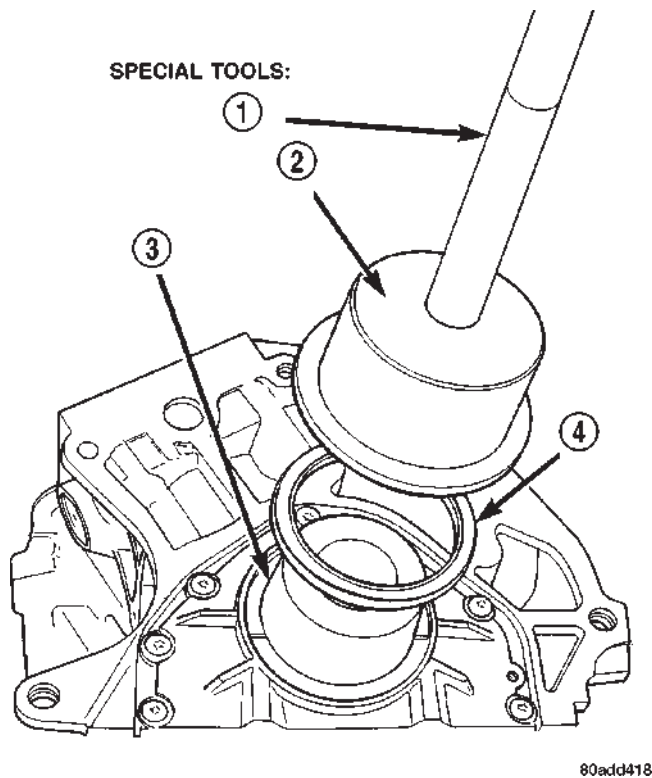
- The normally open TC (ASR) valve is energized to isolate the brake fluid being pumped from the master cylinder and to isolate the driven wheel.



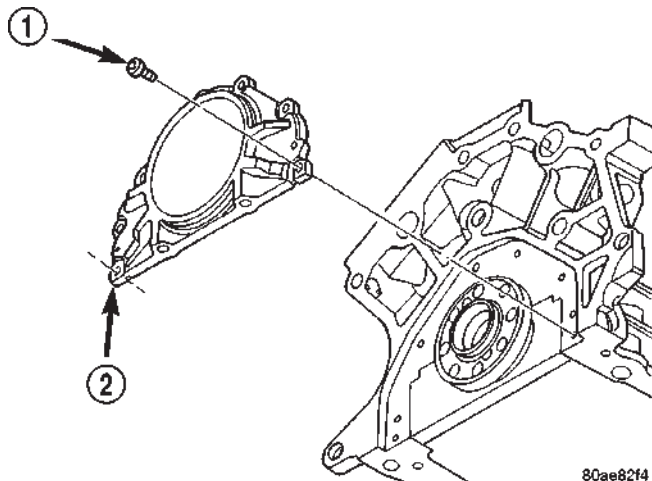
BASE



REMOVAL AND INSTALLATION (Continued)

**Fig. 110 Crankshaft Rear Seal—Installation**

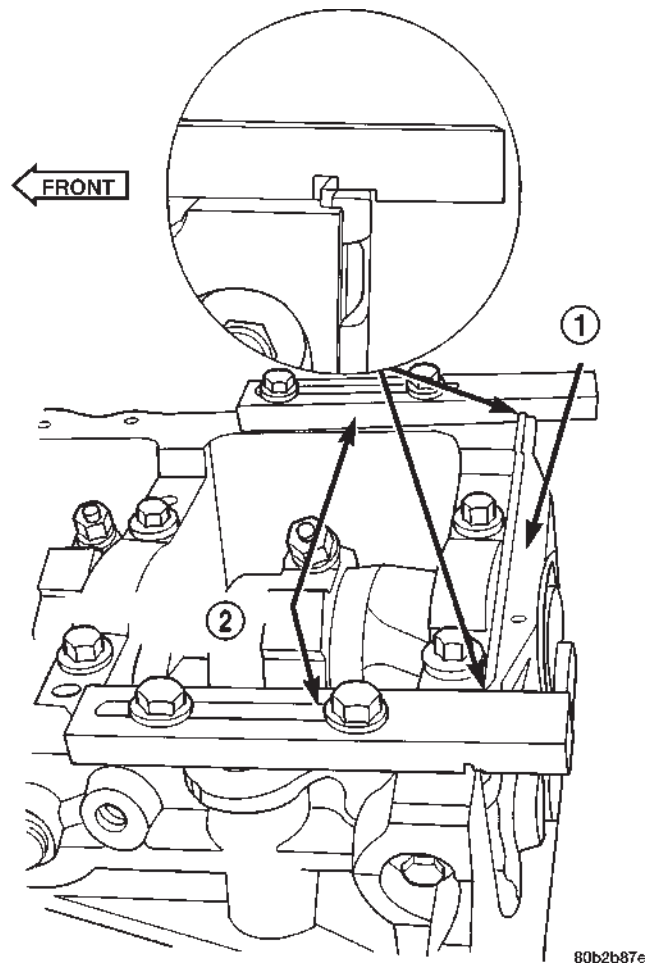
- 1 - C-4171 HANDLE
- 2 - 6926-2 INSTALLER
- 3 - 6926-1 GUIDE
- 4 - SEAL

**Fig. 111 Oil Seal Retainer**

- 1 - SCREWS (7)
- 2 - SEAL RETAINER

NOTE: Make sure the marking "3.2/3.5L" on Special Tools 8225, is facing towards the cylinder block pan rail surface (notch on tool is towards the seal retainer).

(4) While applying firm pressure to the seal retainer against Special Tools 8225 (Fig. 112), tighten seal retainer screws to 12 N·m (105 in. lbs.).

**Fig. 112 Rear Crankshaft Seal Retainer Alignment**

- 1 - SEAL RETAINER
- 2 - SPECIAL TOOLS 8225

(5) Install crankshaft rear oil seal and oil pan. Refer to procedures in this section.

CRANKSHAFT MAIN BEARINGS

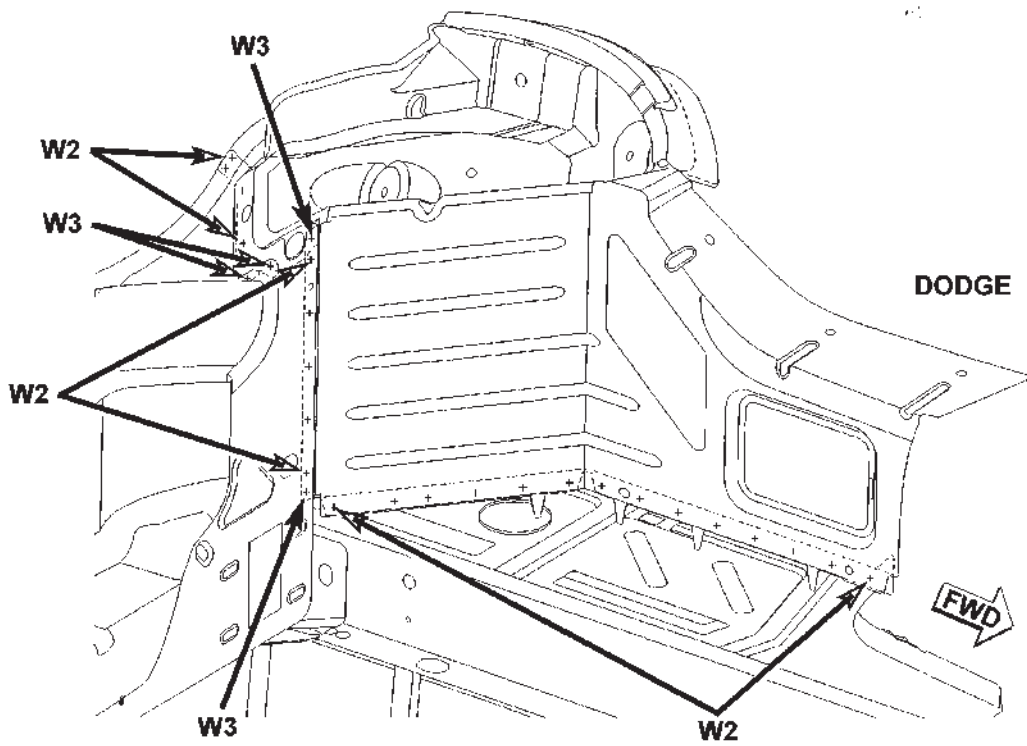
Bearing caps are not interchangeable and are marked to insure correct assembly (Fig. 113). Upper and lower bearing halves are NOT interchangeable.

CRANKSHAFT MAIN JOURNALS

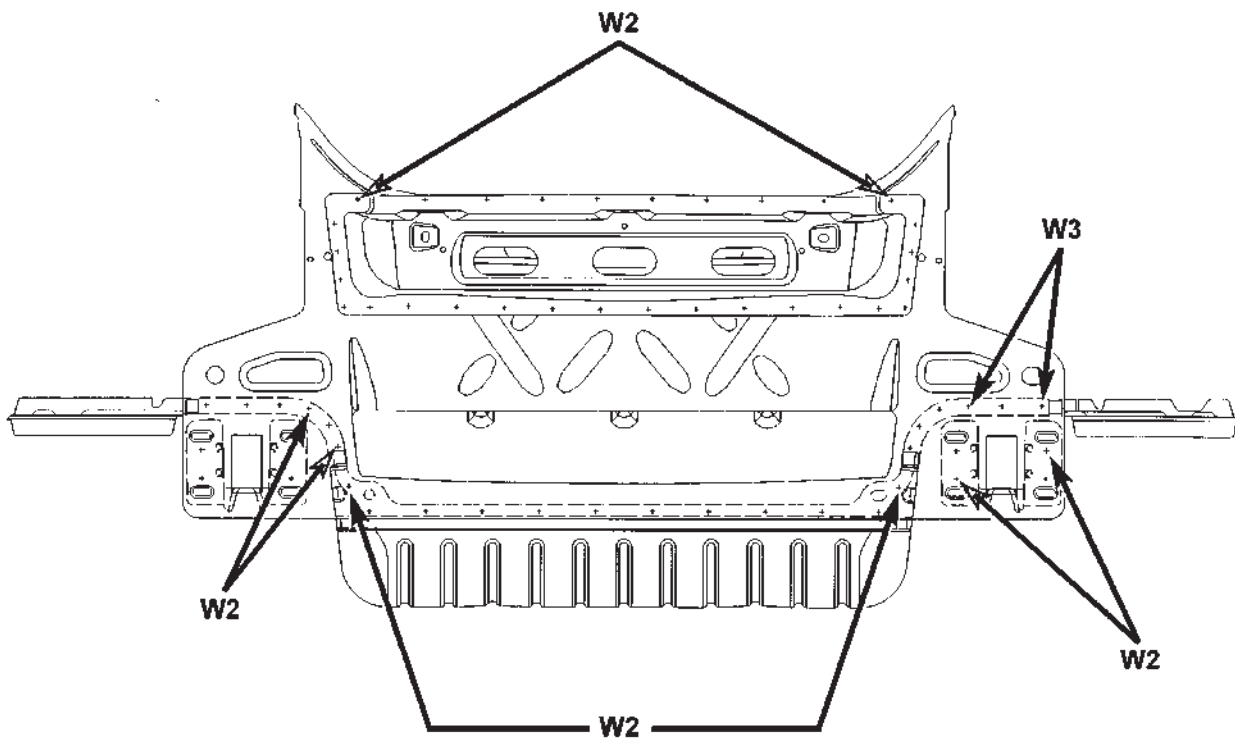
The crankshaft journals should be checked for excessive wear, taper and scoring. Limits of taper or out-of-round on any crankshaft journals should be held to 0.015 mm (0.0006 in.). Journal grinding should not exceed 0.305 mm (0.012 inch.) under the standard journal diameter. DO NOT grind thrust faces of Number 2 main bearing. DO NOT nick crank pin or bearing fillets. After grinding, remove rough

SPECIFICATIONS (Continued)

FLOOR PAN



W2 - WELDING OF 2 PARTS
W3 - WELDING OF 3 PARTS
W4 - WELDING OF 4 PARTS



CHRYSLER

DESCRIPTION AND OPERATION (Continued)

In Closed Loop operation the PCM monitors the O₂S input (along with other inputs) and adjusts the injector pulse width accordingly. During Open Loop operation the PCM ignores the O₂ sensor input. The PCM adjusts injector pulse width based on preprogrammed (fixed) values and inputs from other sensors.

The Automatic Shutdown (ASD) relay supplies battery voltage to both the upstream and downstream heated oxygen sensors. The oxygen sensors are equipped with a heating element. The heating elements reduce the time required for the sensors to reach operating temperature.

UPSTREAM OXYGEN SENSOR 1/1

The input from the upstream heated oxygen sensor tells the PCM the oxygen content of the exhaust gas. Based on this input, the PCM fine tunes the air-fuel ratio by adjusting injector pulse width.

The sensor input switches from 0 to 1 volt, depending upon the oxygen content of the exhaust gas in the exhaust manifold. When a large amount of oxygen is present (caused by a lean air-fuel mixture), the sensor produces voltage as low as 0.1 volt. When there is a lesser amount of oxygen present (rich air-fuel mixture) the sensor produces a voltage as high as 1.0 volt. By monitoring the oxygen content and converting it to electrical voltage, the sensor acts as a rich-lean switch.

The heating element in the sensor provides heat to the sensor ceramic element. Heating the sensor allows the system to enter into closed loop operation sooner. Also, it allows the system to remain in closed loop operation during periods of extended idle.

In Closed Loop, the PCM adjusts injector pulse width based on the upstream heated oxygen sensor input along with other inputs. In Open Loop, the PCM adjusts injector pulse width based on preprogrammed (fixed) values and inputs from other sensors.

DOWNSTREAM OXYGEN SENSOR 1/2

The downstream heated oxygen sensor input is used to detect catalytic convertor deterioration. As the convertor deteriorates, the input from the downstream sensor begins to match the upstream sensor input except for a slight time delay. By comparing the downstream heated oxygen sensor input to the input from the upstream sensor, the PCM calculates catalytic convertor efficiency.

IGNITION SENSE—PCM INPUT**OPERATION**

The ignition sense input informs the Powertrain Control Module (PCM) that the ignition switch is in the crank or run position.

MANIFOLD ABSOLUTE PRESSURE SENSOR—PCM INPUT**DESCRIPTION**

The MAP sensor mounts to the driver side of the intake manifold plenum (Fig. 7) or (Fig. 8).

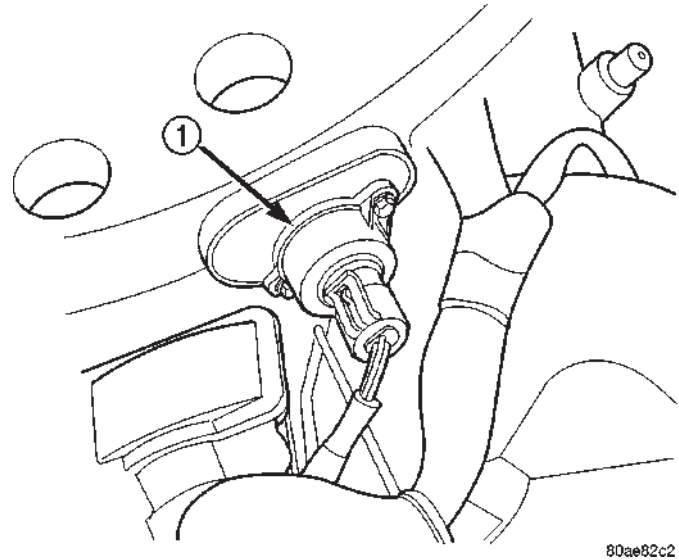


Fig. 7 MAP Sensor—2.7L Engine

1 - MAP SENSOR

OPERATION

The MAP serves as a PCM input, using a silicon based sensing unit, to provide data on the manifold vacuum that draws the air/fuel mixture into the combustion chamber. The PCM requires this information to determine injector pulse width and spark advance. When MAP equals Barometric pressure, the pulse width will be at maximum.

Also like the cam and crank sensors, a 5 volt reference is supplied from the PCM and returns a voltage signal to the PCM that reflects manifold pressure. The zero pressure reading is 0.5V and full scale is 4.5V. For a pressure swing of 0 — 15 psi the voltage changes 4.0V. The sensor is supplied a regulated 4.8 to 5.1 volts to operate the sensor. Like the cam and crank sensors ground is provided through the sensor return circuit.

The MAP sensor input is the number one contributor to pulse width. The most important function of the MAP sensor is to determine barometric pressure. The PCM needs to know if the vehicle is at sea level

REMOVAL AND INSTALLATION (Continued)

INSTALLATION

(1) Ensure that the glass panel is in the fully closed position before mounting the motor. If motor fails with the window in the open position the sunroof glass panel timing will have to be timed. The new motor comes in the fully closed position and with a gage for setting cable timing. Refer to Sunroof Glass Panel Timing.

(2) Place drive motor into position on the sunroof housing and install fasteners.

(3) Set headliner into position.

(4) Connect express module, drive motor, and control switch wire connectors.

(5) Test sunroof operation, adjust as necessary.

(6) Finish installing the headliner.

(7) Connect the control switch wire connector.

(8) Install A-pillar trim, sun visors, and map lamps/mini console.

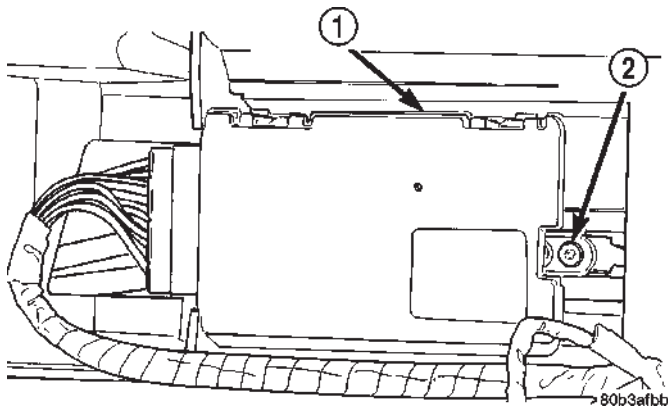


Fig. 3 Sunroof Drive Motor and Express Module

- 1 - EXPRESS MODULE
2 - SCREW

SUNROOF WIND DEFLECTOR**REMOVAL**

- (1) Open sunroof glass panel.
- (2) Push down one corner of the wind deflector and let the other corner rise up (Fig. 4).
- (3) Push the low corner towards the opposite side of the vehicle until tab on sunshade clears the body. Then raise the corner up.
- (4) Repeat the procedure to the other corner.
- (5) Lift wind deflector to 90% of the way.
- (6) Push the attaching ends of the deflector to the rear of the vehicle to disengage the deflector.

INSTALLATION

- (1) Place wind deflector at 90% in the vertical position to the sunroof. With the sunroof open.
- (2) Push ends of the deflector towards the front of the vehicle to engage ends.
- (3) Lower wind deflector to normal position.

(4) Push one corner to the opposite side of the vehicle until tab clears vehicle body and lower deflector for that corner.

(5) Push the side that was just installed completely down.

(6) Push the opposite corner cross vehicle until tab clears the body. Then lower deflector to position.

(7) Test sunroof operation.

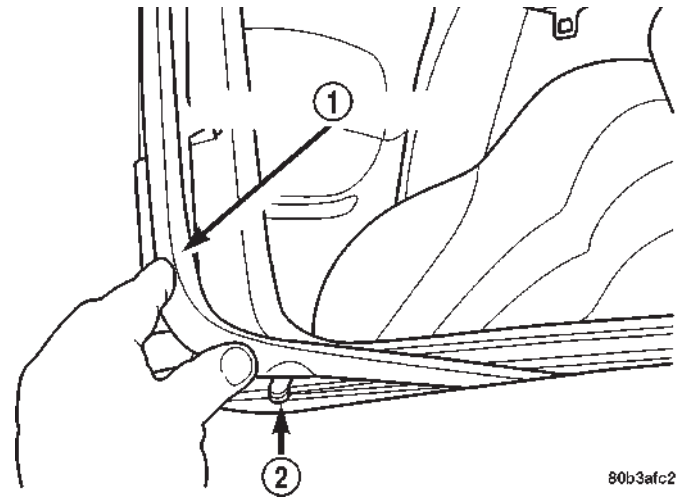
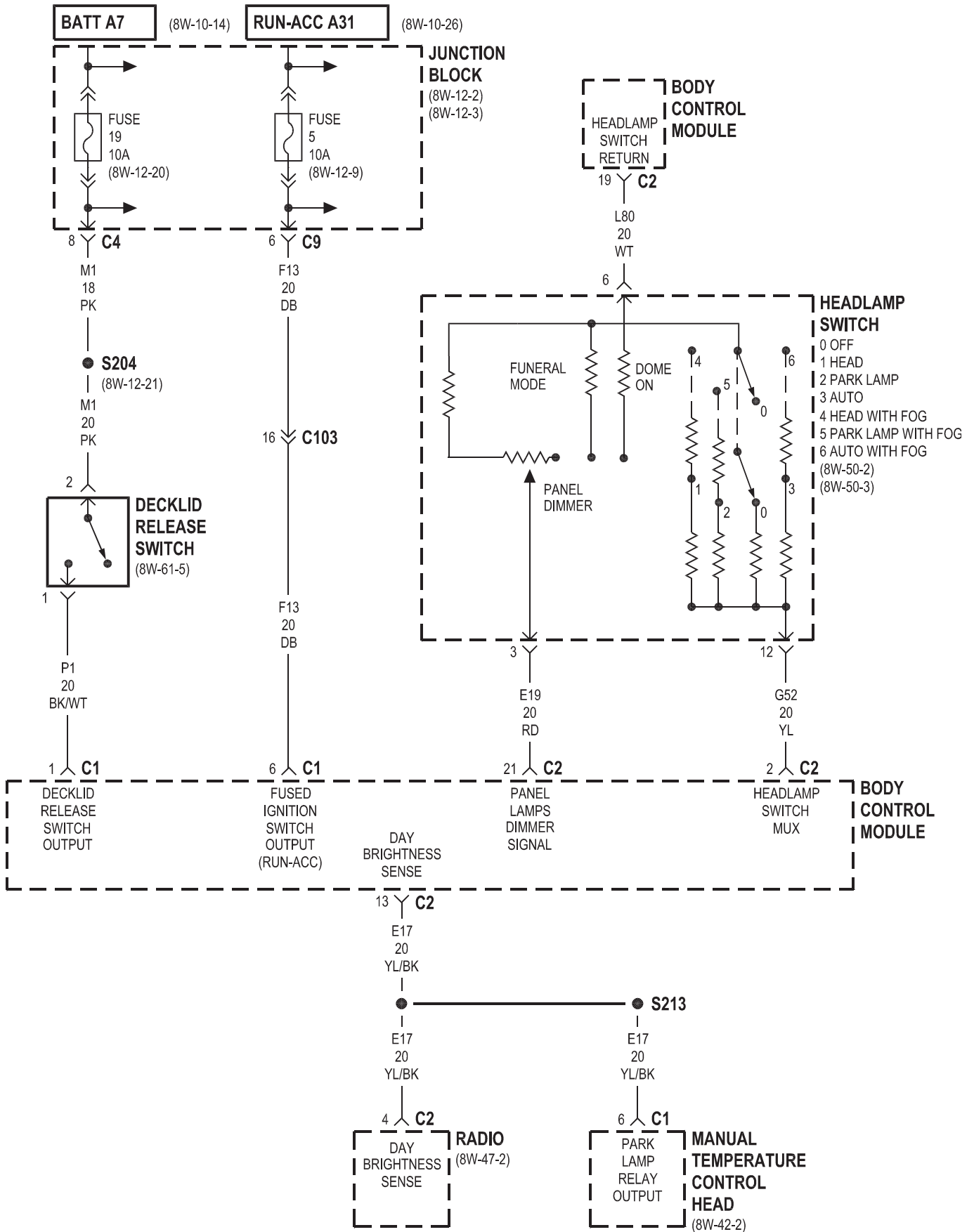


Fig. 4 Wind Deflector

- 1 - WIND DEFLECTOR
2 - TAB

SUNROOF HOUSING ASSEMBLY**REMOVAL**

- (1) Move glass panel to the fully closed position.
- (2) Remove instrument panel end caps right and left side.
- (3) Remove right and left A-post trim panels.
- (4) Remove right and left sun visors, and sun visors retainers.
- (5) Remove over head console let hang from headliner.
- (6) Remove front passenger grab handle.
- (7) Remove right and left upper B-post trim panels.
- (8) Remove rear right and left grab handle/lamps and let hang from headliner.
- (9) Remove right and left C-post trim panels partially.
- (10) Recline both front seats.
- (11) Disconnect battery negative cable.
- (12) Disconnect wire harness connector along A-post to fuse panel.
- (13) Disconnect mirror wiring connector.
- (14) Disconnect sunroof harness connector at the C-post.
- (15) Disengage headliner rear locating clip.
- (16) Remove headliner through the rear door.



HORIZONTAL SENSOR OUT OF RANGE LOW — Continued

TEST	ACTION	APPLICABILITY
3	Disconnect the Driver Power Seat Horizontal Position Sensor connector. Disconnect the Memory Heated Seat Mirror Module C2 connector. Turn ignition off. Measure the resistance of the Seat Sensor 5 Volt Supply circuit between the Sensor connector and the MHSMM connector. Is the resistance below 5.0 ohms? Yes → Go To 4 No → Repair the open Seat Sensor 5 Volt Supply circuit. Perform MEMORY HEATED SYSTEM VERIFICATION TEST - VER 1.	All
4	If there are no possible causes remaining, view repair. Repair Replace the Memory Heated Seat Mirror Module. Perform MEMORY HEATED SYSTEM VERIFICATION TEST - VER 1.	All
5	Turn ignition off. Disconnect the Driver Power Seat Horizontal Sensor connector. Connect a jumper wire between Seat Sensor 5 Volt Supply and Seat Horizontal Position Signal circuits. Ensure the Memory Seat Module is fully connected before proceeding. With the DRB III select: Body Memory Seat Sensors Turn ignition on. Read the Horizontal Position Sensor voltage Is the voltage above 4.5 volts? Yes → Replace the Seat Track Assembly. Perform MEMORY HEATED SYSTEM VERIFICATION TEST - VER 1. No → Go To 6	All
6	Turn ignition off. Disconnect the Memory Heated Seat Mirror Module C1 connector. Disconnect the Driver Power Seat Horizontal Sensor connector. Measure the resistance of the Seat Horizontal Position Signal circuit to ground. Is the resistance below 1000 (1 K) ohms? Yes → Repair the Seat Horizontal Position Signal Circuit for a short to ground. Perform MEMORY HEATED SYSTEM VERIFICATION TEST - VER 1. No → Go To 7	All
7	Turn ignition off. Disconnect the Memory Heated Seat Mirror Module C1 connector. Disconnect the Driver Power Seat Horizontal Sensor connector. Measure the resistance of the Seat Horizontal Position Signal circuit between the Sensor connector and the Module connector. Is the resistance below 5.0 ohms? Yes → Go To 8 No → Repair the open Seat Horizontal Position Signal circuit. Perform MEMORY HEATED SYSTEM VERIFICATION TEST - VER 1.	All

AUDIO SYSTEM (Continued)

- Two 2.5 inch, coaxial speakers in the lower corners of the front door windows.
- Two 6.5 inch, round single-cone speakers in the front doors.
- Two 6 x 9-inch, single-cone speakers mounted in the rear shelf panel.
- Two 2.5 inch, round speakers mounted in the rear doors.

OPERATION

For operation of the factory installed standard and optional radios with cassette or compact disc player, refer to the Sound Systems Operating Instructions in the Owners Manual supplied with the vehicle.

The vehicles are shipped with fuse 13 removed from the junction block. The fuse replaces the ignition-off draw (IOD) connector. Fuse 13 is a ten amp fuse. When removed, it prevents the battery from discharging during storage. For specific wiring and location, refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

DIAGNOSIS AND TESTING - AUDIO SYSTEM

CAUTION: The CD player will only operate between approximate temperatures of -23°C and +65°C (-10°F and +145°F).

Whenever a radio malfunction occurs;

- (1) First check FUSES in the Junction Block:
 - (a) Radio power
 - (b) Ignition feed
 - (c) Power Amplifier
 - (d) Illumination
 - (e) Memory feed

Any diagnosis of the Audio system should begin with the use of the DRB diagnostic tool. For information on the use of the DRB, refer to the appropriate Diagnostic Service Manual.

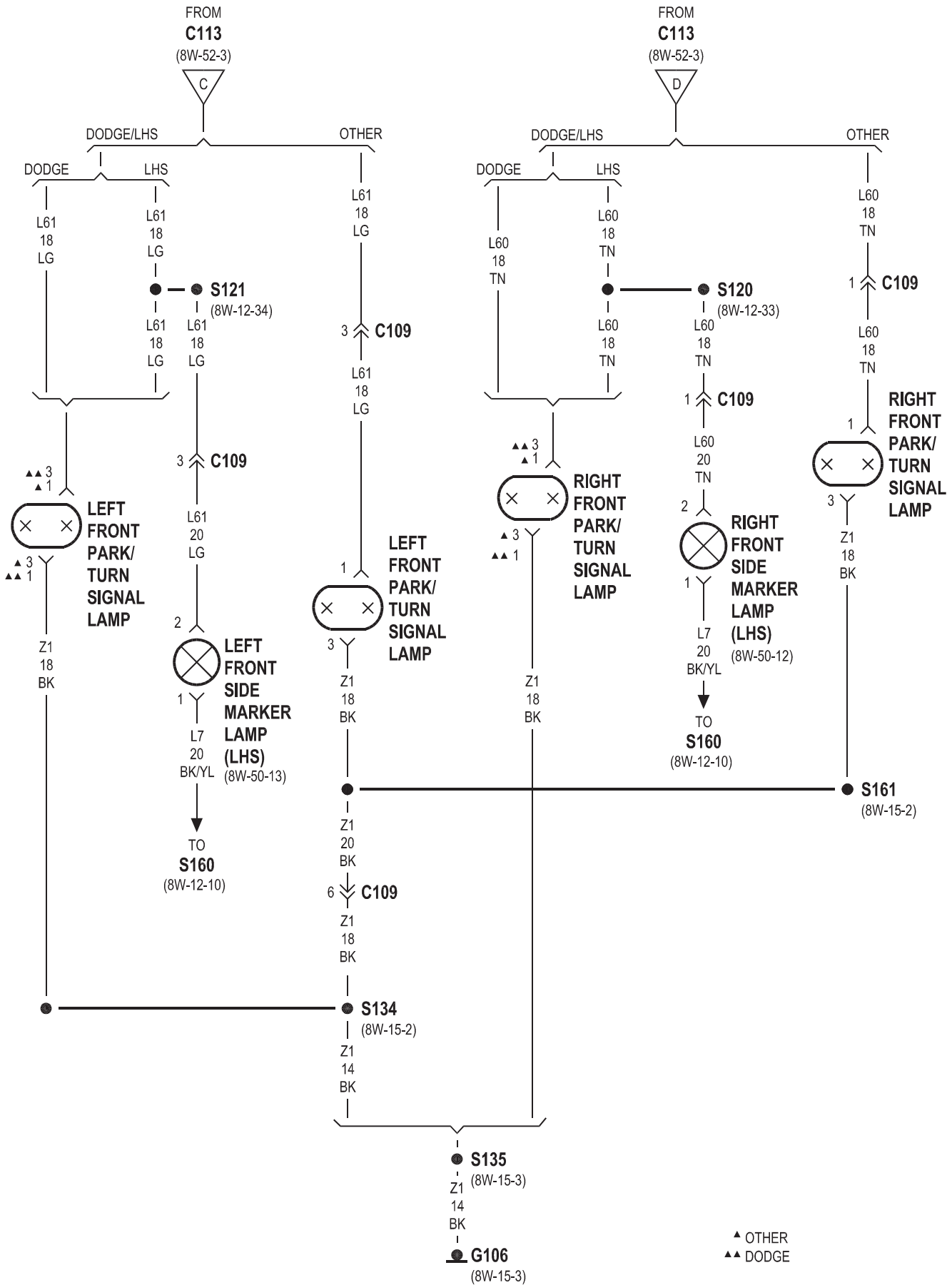
Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

WARNING: DISABLE THE AIRBAG SYSTEM BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, SEAT BELT TENSIONER, SIDE AIRBAG, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (GROUND) CABLE, THEN WAIT TWO MINUTES FOR THE AIRBAG SYSTEM CAPACITOR TO DISCHARGE BEFORE PERFORMING FURTHER DIAGNOSIS OR SERVICE. THIS IS THE ONLY SURE WAY TO DISABLE THE AIRBAG SYSTEM. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

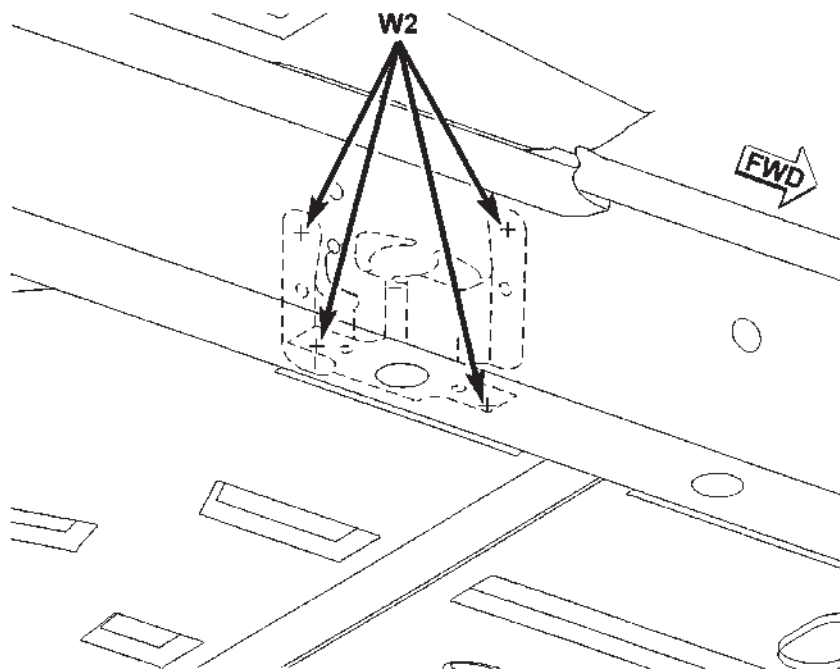
AUDIO SYSTEM DIAGNOSIS TABLE

CONDITION	POSSIBLE CAUSES	CORRECTION
NO AUDIO	1. Fuse faulty.	1. Check radio fuse and Ignition-Off Draw (IOD) fuse in Junction Block (JB). Replace fuses, if required.
	2. Radio connector faulty.	2. Check for loose or corroded radio connector. Repair, if required.
	3. Wiring faulty.	3. Check for shorted or open wires. Repair wiring, if required.
	4. Radio ground faulty.	4. Check for continuity between radio chassis and a known good ground. There should be continuity. Repair ground, if required.
	5. Radio faulty.	5. Refer to appropriate Diagnostic Service Manual.
	6. Speakers faulty.	6. Replace speaker as necessary.

LH 8W-52 TURN SIGNALS 8W - 52 - 5
 EXCEPT BUILT-UP-EXPORT



WELD LOCATIONS (Continued)



W2 - WELDING OF 2 PARTS
W3 - WELDING OF 3 PARTS
W4 - WELDING OF 4 PARTS

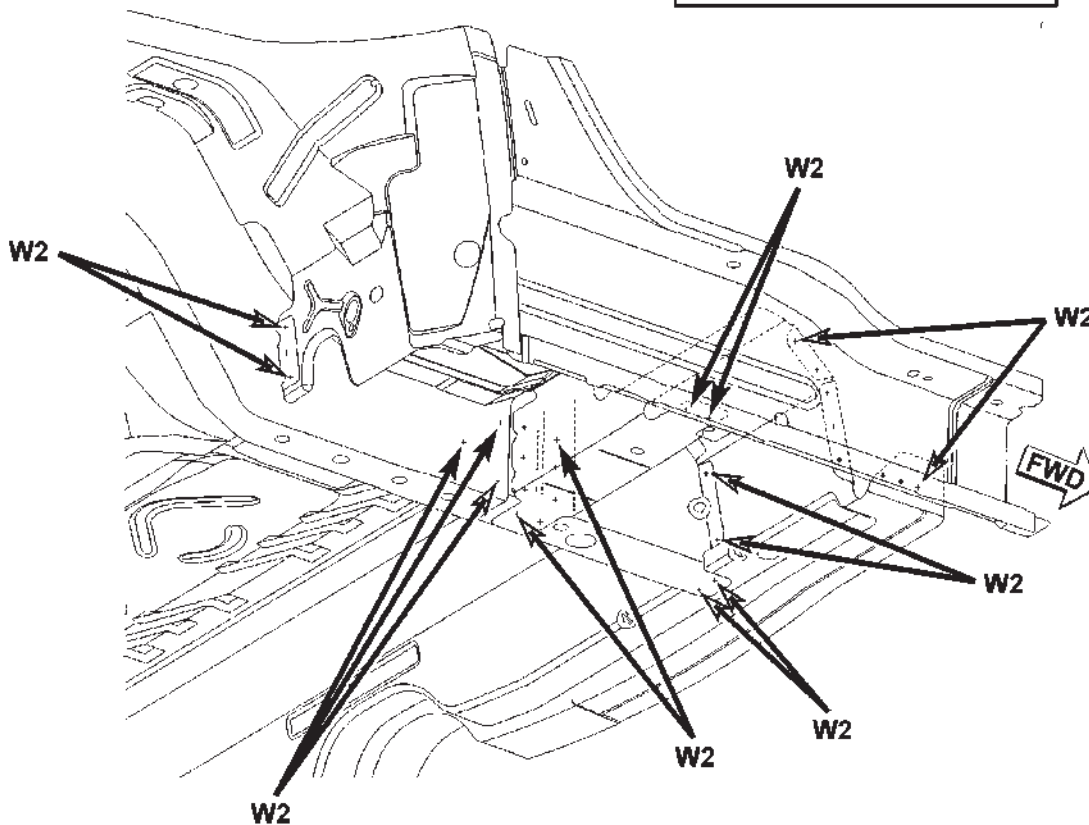


Fig. 76 FLOOR PAN

Symptom:
P0890-SWITCHED BATTERY

When Monitored and Set Condition:

P0890-SWITCHED BATTERY

When Monitored: When the ignition is turned from the "off" position to the "run" position and/or the ignition is turned from the "crank" position to the "run" position.

Set Condition: This DTC is set if the Transmission Control Module (TCM) senses voltage on any of the pressure switch inputs prior to the TCM energizing the relay. Note: Due to the integration of the Powertrain and Transmission Control Modules, the transmission part of the PCM has its own specific power and ground circuits.

POSSIBLE CAUSES
INTERMITTENT WIRING AND CONNECTORS 2/4 PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE OD PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE PCM - SWITCHED BATTERY

TEST	ACTION	APPLICABILITY
1	<p>NOTE: Low fluid level can be the cause of many transmission problems. If the fluid level is low locate and repair the leak then check and adjust the fluid level per the Service Information.</p> <p>NOTE: Always perform diagnostics with a fully charged battery to avoid false symptoms.</p> <p>With the DRBIII®, read Engine DTC's. Check and repair all Engine DTC's prior to performing any transmission symptom diagnostics.</p> <p>With the DRBIII®, read Transmission DTC's. Record all DTC's and 1 Trip Failures.</p> <p>NOTE: Diagnose 1 Trip Failures as a fully matured DTC.</p> <p>Using the wiring diagram/schematic as a guide, inspect the wiring and connectors. Repair as necessary.</p> <p>Perform the Shift Lever Position Test. If the test does not pass, refer to Symptom test for P0706 Check Shifter Signal.</p> <p>For Gear Ratio DTC's, check and record all CVI's.</p> <p>Most DTC's set on start up but some must be set by driving the vehicle such that all diagnostic monitors have run.</p> <p>NOTE: Verify flash level of Transmission Control Module. Some problems are corrected by software upgrades to the Transmission Control Module.</p> <p>NOTE: Check for applicable TSB's related to the problem.</p> <p>Perform this procedure prior to Symptom diagnosis.</p> <p style="text-align: center;">Continue Go To 2</p>	All