OBDII Monitor Run Process

The following procedure has been established to assist Technicians in the field with enabling and running OBDII Monitors. The order listed in the following procedure is intended to allow the technician to effectively complete each monitor and to set the CARB Readiness Status in the least time possible.

NOTE

A. Once the monitor run process has begun, do not turn off the ignition. By turning the ignition key off, monitor enabling conditions will be lost. NVLD Monitor runs after key off.
B. By performing a Battery Disconnect, or Selecting Erase DTCs, the CARB Readiness and all additional OBDII information will be cleared.

Monitor Preliminary Checks:

1. Plug a DRBIII® into the vehicle's DLC.
2. Turn the ignition, KEY ON–ENGINE OFF. Watch for MIL lamp illumination during the bulb check. MIL lamp must have illuminated, if not, repair MIL lamp.
3. On the DRB III® Select #1 DRB III Standalone.
4. Select #1 1998-2002 Diagnostics
5. Select #1 Engine
6. Select #2 DTCs and Related Functions
7. Select #1 Read DTCs
   *Verify that No Emissions Related DTCs are Present.
   *If an Emissions DTC is Present, the OBD II Monitors may not run and the CARB Readiness will not update.
   *The Emissions related DTC, will need to be repaired, then cleared. By clearing DTCs, the OBD Monitors will need to be run and completed to set the CARB Readiness Status.
8. Return to Engine Select Function Menu and Select #9, OBD II Monitors.
9. Select #3 CARB Readiness Status.

Do all the CARB Readiness Status Locations read **YES**?

*__YES__, then all monitors have been completed and this vehicle is ready to be I/M or Emission Tested.
*__NO__, then the following procedure needs to be followed to run/complete all available monitors.

NOTE

A. Only the monitors, which are **not** YES in the CARB Readiness Status, need to be completed.
B. Specific criteria need to be met for each monitor. Each monitor has a Pre-Test screen to assist in running the monitor.
   For additional information, refer to the Chrysler Corporation Technical Training Workbook titled On Board Diagnostics: OBDII/EOBD, part number 81-699-01050.

The most efficient order to run the monitors has been outlined below, including suggestions to aid the process.

A. NATURAL VACUUM LEAK DETECTION WITH PURGE MONITOR

This monitor requires a cool down cycle, usually an overnight soak for at least 8 hours without the engine running. The ambient temperature must decrease overnight – parking the vehicle outside is advised. To run this test the fuel level must be between 15-85% full. For the monitor run conditions select the EVAP MON PRE-TEST in the DRB III®, OBD II Monitors Menu. The Purge monitor will run if the small leak test reports a pass. Criteria for NVLD monitor.

1. Engine off time greater than @ one hour
2. Fuel Level between 15% and 85%
3. Start Up ECT and IAT within 10°C (18°F).
4. Vehicle started and run until Purge Monitor reports a result.

NOTE: If the vehicle does not report a result and the conditions were correct. It may take up to two weeks to fail the small leak monitor. DO NOT use this test to attempt to determine a fault. Use the appropriate service information procedure for finding a small leak. If there are no faults and the conditions are correct this test will run and report a pass. Note the Small leak test can find leaks less than 10 thousandths of an inch. If a small leak is present it takes approximately one week of normal driving to report a failure.

B. CATALYST/O2 MONITOR

With NGC, Catalyst and O2 Monitor information are acquired and processed at the same time. Most vehicles will need to be driven at highway speed (<50 mph) for a few minutes. Some trucks run the monitor at idle in drive. If the vehicle is equipped with a manual transmission, using 4th gear may assist in meeting the monitor running criteria. For the monitor run conditions, select the BANK 1 CAT MON PRE-TEST in the DRB III®, OBD II Monitors Menu.

C. EGR MONITOR

The EGR monitor now runs in a closed throttle decel or at idle on a warm vehicle. However, it is necessary to maintain the TPS, Map and RPM ranges to allow the monitor to complete itself. For

pre-test screens will help with this for MONITOR DTC's), this is called a TRIP. All OBDII/Euro Stage III OBD DTCs will be set after one or in some cases two trip failures, and the MIL will be turned on. These DTC's require three successful, no failures, TRIPS to extinguish the MIL, followed by 40 warm-up cycles to erase the DTC. For further explanation of TRIPS, Pre-test screens, Warm-up cycles, and the use of the DRBIII®, refer to the On Board Diagnostic training booklet #81-699-97094.

3.3.2 INTERMITTENT CODE

A diagnostic trouble code that is not there every time the PCM checks the circuit is an intermittent DTC. Most intermittent DTC's are caused by wiring or connector problems. Defects that come and go like this are the most difficult to diagnose; they must be looked for under specific conditions that cause them. The following checks may assist you in identifying a possible intermittent problem:

- Visually inspect related wire harness connectors. Look for broken, bent, pushed out, or corroded terminals.
- Visually inspect the related harnesses. Look for chafed, pierced, or partially broken wire.
- Refer to any technical service bulletins that may apply.
- Use the DRBIII® data recorder or co-pilot.

3.3.3 STARTS SINCE SET COUNTER

The start since set counter counts the number of times the vehicle has been started since codes were last set, erased, or the battery was disconnected. The reset counter will count up to 255 start counts.

The number of starts helps determine when the trouble code actually happened. This is recorded by the PCM and can be viewed on the DRBIII® as STARTS since set.

When there are no trouble codes stored in memory, the DRBIII® will display NO DTC's Detected and the reset counter will show STARTS since clear = XXX.

3.3.4 DISTANCE SINCE MI SET

The Euro Stage III OBD directive requires that the distance traveled by the vehicle while the MI is activated must be available at any instant through the serial port on the standard data link connector. This feature works as follows:

1. If the MI is illuminated due to a fault, the distance count is updated (i.e. it is counting).
2. If there is a stale MI fault (i.e. the fault is still frozen in memory but the MI has been extinguished due to 3 good trips), the distance count is held (i.e. frozen).
3. If the distance count is being held due to (Item 2.) and the fault is cleared, the distance is cleared (set to zero).
4. If the distance count is being held due to (Item 2.) and another MI occurs, the distance count is reset (to) and begins updating anew.
5. If a fault occurs while the MI is already illuminated due to a previous fault (the distance count is updating), then the distance count continues to update w/out interruption.
6. If the MI is flashing due to active misfire and there is an active fault (i.e. matured fault for which 3 good trips have not occurred), the distance count behaves as the MI in ON.
7. If the MI is flashing due to active misfire and there is no active fault (i.e. the MI is flashing for a 1 malf.), the distance count behaves as if the MI is off (because it is not yet a matured fault).
8. The distance count is cleared whenever the fault is cleared. (Via 40 warm up cycles, or via scan tool).

3.4 USING THE DRBIII®

Refer to the DRBIII® user's guide for instructions and assistance with reading DTC's, erasing DTC's, and other DRBIII® functions.

3.5 DRBIII® ERROR MESSAGES AND BLANK SCREEN

Under normal operation, the DRBIII® will display one of only two error messages:

– User-Requested WARM Boot or User-Requested COLD Boot

If the DRBIII® should display any other error message, record the entire display and call the Star Center for information and assistance. This is a sample of such an error message display:

```
ver: 2.14
date: 26 Jul93
file: key_itf.cc
date: Jul 26 1993
line: 548
err: 0x1
User-Requested COLD Boot

Press MORE to switch between this display
  and the application screen.
Press F4 when done noting information.
```

3.5.1 DRBIII® DOES NOT POWER UP

If the LED's do not light or no sound is emitted at start up, check for loose cable connections or a bad cable. Check the vehicle battery voltage (data link

Symptom:

P0630-VIN NOT PROGRAMMED IN PCM

When Monitored and Set Condition:

P0630-VIN NOT PROGRAMMED IN PCM

When Monitored: Ignition on.

Set Condition: The VIN has not been programmed into the PCM.

POSSIBLE CAUSES
PROGRAMMING VIN INTO PCM
VERIFY PCM PROGRAMMING
PCM

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, erase DTCs. Using the DRBIII®, program VIN into the PCM. Start the engine. **NOTE: If the engine will not start, crank the engine over for 15 seconds. Crank at least 2 times with the ignition switch returning to the off position each time.** Allow the engine to reach normal operating temperature. With the DRBIII®, read DTCs. Does the DTC reset? Yes → Go To 2 No → The VIN has been successfully programmed into the PCM. Test is complete. Perform POWERTRAIN VERIFICATION TEST VER - 1 - NGC.	All
2	**NOTE: The ignition switch must be left in the off position for a minimum of 10 seconds.** Cycle the ignition switch to the off position and then back to run. Attempt to program the PCM with the applicable information. Start the vehicle and allow it to reach normal operating temperatures. With the DRBIII®, read DTCs. Does the DTC reset? Yes → Replace and program the Powertrain Control Module in accordance with the Service Information. Perform POWERTRAIN VERIFICATION TEST VER - 1 - NGC. No → The VIN has been successfully programmed into the PCM. Test is complete. Perform POWERTRAIN VERIFICATION TEST VER - 1 - NGC.	All

Symptom List:

A/C SWITCH FAULT (STORED) - MTC
BACKLIGHT DIMMING RX FAILURE (STORED) - MTC
BLEND OVERCURRENT (STORED) - MTC
CHECKSUM FAILURE (STORED) - MTC
DEFOG SWITCH FAULT (STORED) - MTC
EVAPORATOR TEMPERATURE SENSOR CIRCUIT OPEN (STORED) - MTC
EVAPORATOR TEMPERATURE SENSOR CIRCUIT SHORT (STORED) - MTC
LOOPBACK TEST FAILURE (STORED) - MTC
MODE OVERCURRENT (STORED) - MTC
NO FUEL LEVEL MESSAGE RECEIVED (STORED) - MTC
PCM COMMUNICATION FAILURE (STORED) - MTC
POWER SWITCH FAULT (STORED) - MTC
REAR BLEND OVERCURRENT (STORED) - MTC
REAR BLEND POT CIRCUIT OPEN (STORED) - MTC
REAR BLEND POT CIRCUIT SHORT (STORED) - MTC
REAR MODE OVERCURRENT (STORED) - MTC
REAR WIPER WASHER SWITCH FAULT (STORED) - MTC
RECIRC OVERCURRENT (STORED) - MTC
RECIRC SWITCH FAULT (STORED) - MTC
TX FAILURE (STORED) - MTC
VEHICLE ODOMETER FAILURE (STORED) - MTC
ZONE OVERCURRENT (STORED) - MTC

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be A/C SWITCH FAULT (STORED) - MTC.

When Monitored and Set Condition:

A/C SWITCH FAULT (STORED) - MTC

When Monitored: With the ignition on.

Set Condition: This DTC will set if the A/C switch stays closed for 10 minutes.

BACKLIGHT DIMMING RX FAILURE (STORED) - MTC

When Monitored: With the ignition on.

Set Condition: If the A/C - Heater Control Module does not receive the dimming function message from the BCM for more than 5 seconds, then the A/C - Heater Control Module LEDs will default to full brightness and the DTC will set.

Symptom:
INCOMPLETE LATCH CINCH - OVERCURRENT

When Monitored and Set Condition:

INCOMPLETE LATCH CINCH - OVERCURRENT

When Monitored: Whenever the power sliding door is operating in the closing direction.

Set Condition: The latch motor stall current of 6.2 amps has been detected, with no pawl or ratchet failure. This code is set during the first stage of the power cinching operation.

POSSIBLE CAUSES
DTC PRESENT
BINDING DOOR
CINCH/RELEASE MOTOR LATCH DRIVER WIRE OPEN
CINCH/RELEASE MOTOR UNLATCH DRIVER WIRE OPEN
CINCH/RELEASE MOTOR LATCH DRIVER WIRE SHORT TO GROUND
CINCH/RELEASE MOTOR UNLATCH DRIVER WIRE SHORT TO GROUND
LATCH ASSEMBLY

TEST	ACTION	APPLICABILITY
1	With the DRBIII®, record and erase DTC's. Turn the ignition off, wait 10 seconds, then turn the ignition on. Operate the power sliding door several times if possible. With the DRBIII®, read ACTIVE DTCs. Does the DRBIII® display INCOMPLETE LATCH CINCH-OVERCURRENT? Yes → Go To 2 No → Using the wiring diagram/schematic as a guide, inspect the wiring and connectors for an intermittent condition. Operate the door several times and check for any binding or other obstructions. Perform BODY VERIFICATION TEST - VER 1.	All
2	Examine the door for proper fit and alignment, loose/ hard or torn seals, worn teeth on the rack and gear (lower drive unit) or anything that would cause an obstruction to proper operation. Manually operate the other sliding door or of a known good vehicle and notice the effort needed to open and close. Compare the effort needed on the disabled door. Does it take more effort to operate the door than it should? Yes → Refer to Service information for the related symptom(s). Perform BODY VERIFICATION TEST - VER 1. No → Go To 3	All

P0870-OD HYDRAULIC PRESSURE TEST FAILURE — Continued

TEST	ACTION	APPLICABILITY
5	Turn the ignition off to the lock position. Remove the Starter Relay. **CAUTION: Removal of the Starter Relay is to prevent a Transmission, NO RESPONSE, condition and disable the starter.** Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A. **Note: Check connectors - Clean/repair as necessary.** With the Transmission Simulator select the OD Pressure Switch. With the DRBIII®, monitor the OD Pressure Switch state in the following step: Wiggle the wiring and connectors pertaining to this circuit while pressing the Pressure Switch Test button on the Transmission Simulator. Did the OD Pressure Switch state change to closed and remain closed while wiggling the wires? Yes → Go To 6 No → Go To 7	All
6	If there are no possible causes remaining, view repair. Repair Disassemble and inspect the Valve Body per the Service Information and repair or replace as necessary. If no problems are found in the Valve Body, replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information. Perform 40/41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1.	All
7	Turn the ignition off to the lock position. Disconnect the PCM harness connector. Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector. **Note: Check connectors - Clean/repair as necessary.** **CAUTION: DO NOT PROBE THE PCM HARNESS CONNECTORS. PROBING THE PCM HARNESS CONNECTORS WILL DAMAGE THE PCM TERMINALS RESULTING IN POOR TERMINAL TO PIN CONNECTION. INSTALL MILLER SPECIAL TOOL #8815 TO PERFORM DIAGNOSIS.** Measure the resistance of the OD Pressure Switch Sense circuit from the appropriate terminal of special tool #8815 to the Transmission Solenoid/Pressure Switch Assembly harness connector. Is the resistance above 5.0 ohms? Yes → Repair the OD Pressure Switch Sense circuit for an open. Perform 40/41TE (NGC) TRANSMISSION VERIFICATION TEST - VER 1. No → Go To 8	All

CLUTCH (Continued)

SERVICE DIAGNOSIS - CLUTCH GRAB/CHATTER

CONDITION	POSSIBLE CAUSES	CORRECTION
CLUTCH DISC FACING COVERED WITH OIL OR GREASE	Oil leak at engine rear main or transaxle input shaft seal.	Correct leak and replace modular clutch assembly (2.4L Gas) or clutch cover and disc (2.5L TD).
	Too much grease applied to splines of disc and input shaft.	Apply lighter coating of grease to splines.
NO FAULT FOUND WITH CLUTCH COMPONENTS	Problem actually related to suspension or driveline component.	Further diagnosis required. Check engine/ transmission mounts, suspension attaching parts and other driveline components as needed.
	Engine related problems.	Check EFI and ignition systems.
PARTIAL ENGAGEMENT OF CLUTCH DISC	Clutch cover, spring, or release fingers bent, distorted (rough handling, improper assembly).	Replace modular clutch assembly (2.4L Gas) or clutch cover and disc (2.5L TD).
	Clutch disc damaged or distorted.	Replace modular clutch assembly (2.4L Gas) or clutch cover and disc (2.5L TD).
	Clutch misalignment.	Verify modular clutch pilot plate alignment to crankshaft. Replace the modular clutch assembly (2.4L Gas) or clutch cover and disc (2.5L TD) if the pilot plate is loose or bent.
	Improper transaxle-to-engine installation.	Verify transaxle is properly installed to engine.

SERVICE DIAGNOSIS - CLUTCH SLIPS

CONDITION	POSSIBLE CAUSES	CORRECTION
DISC FACING WORN OUT	Normal wear.	Replace modular clutch assembly (2.4L Gas) or clutch cover and disc (2.5L TD).
	Driver frequently rides (slips) clutch, results in rapid wear, overheating.	Replace modular clutch assembly (2.4L Gas) or clutch cover and disc (2.5L TD).
	Insufficient clutch cover diaphragm spring tension	Replace modular clutch assembly (2.4L Gas) or clutch cover and disc (2.5L TD).
CLUTCH DISC FACING CONTAMINATED WITH OIL OR GREASE	Leak at rear main oil seal or transaxle input shaft seal	Replace leaking seals. Replace modular clutch assembly (2.4L Gas) or clutch cover and disc (2.5L TD).
	Excessive amount of grease applied to input shaft splines	Apply less grease to input shaft. Replace modular clutch assembly (2.4L Gas) or clutch cover and disc (2.5L TD).
	Road splash, water entering housing	Seal housing. Inspect clutch assembly.
CLUTCH IS RUNNING PARTIALLY DISENGAGED	Release bearing sticking or binding, does not return to normal running position.	Verify that bearing is actually binding. Then, replace bearing and transmission front bearing retainer if sleeve surface is damaged.
	Clutch pedal not returning to static position.	Inspect pedal assembly for damage and/or obstructions. Replace componnents as necessary.
	Clutch master cylinder or pushrod damaged causing high preload.	Replace clutch master cylinder assembly.
	Slave cylinder binding or stuck.	Replace slave cylinder.

BATTERY (Continued)

CAUTION: The battery should not be hot to the touch. If the battery feels hot to the touch, turn off the charger and let the battery cool before continuing the charging operation. Damage to the battery may result.

After the battery has been charged to an open-circuit voltage reading of 12.4 volts or greater, retest the battery with the Micro 420 tester or perform a load test to determine the battery cranking capacity. Refer to Standard Procedures for the proper battery load test procedures. If the battery will pass a load test, return the battery to service. If the battery will not pass a load test, it is faulty and must be replaced.

Clean and inspect the battery hold downs, tray, terminals, posts, and top before completing battery service. Refer to Battery System Cleaning for the proper battery system cleaning procedures, and Battery System Inspection for the proper battery system inspection procedures.

CHARGING A COMPLETELY DISCHARGED CONVENTIONAL BATTERY

The following procedure should be used to recharge a completely discharged battery. Unless this procedure is properly followed, a good battery may be needlessly replaced.

(1) Measure the voltage at the battery posts with a voltmeter, accurate to 1/10 (0.10) volt (Fig. 8). If the reading is below ten volts, the battery charging current will be low. It could take some time before the battery accepts a current greater than a few milliamperes. Such low current may not be detectable on the ammeters built into many battery chargers.

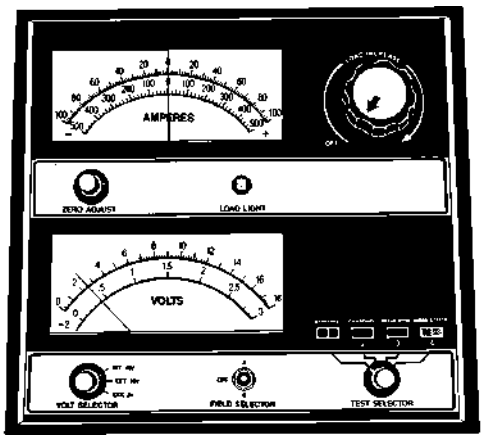


Fig. 8 Voltmeter - Typical

(2) Disconnect and isolate the battery negative cable. Connect the battery charger leads. Some battery chargers are equipped with polarity-sensing circuitry. This circuitry protects the battery charger and the battery from being damaged if they are improperly connected. If the battery state-of-charge is too low for the polarity-sensing circuitry to detect, the battery charger will not operate. This makes it appear that the battery will not accept charging current. See the instructions provided by the manufacturer of the battery charger for details on how to bypass the polarity-sensing circuitry.

(3) Battery chargers vary in the amount of voltage and current they provide. The amount of time required for a battery to accept measurable charging current at various voltages is shown in the Charge Rate Table. If the charging current is still not measurable at the end of the charging time, the battery is faulty and must be replaced. If the charging current is measurable during the charging time, the battery may be good and the charging should be completed in the normal manner.

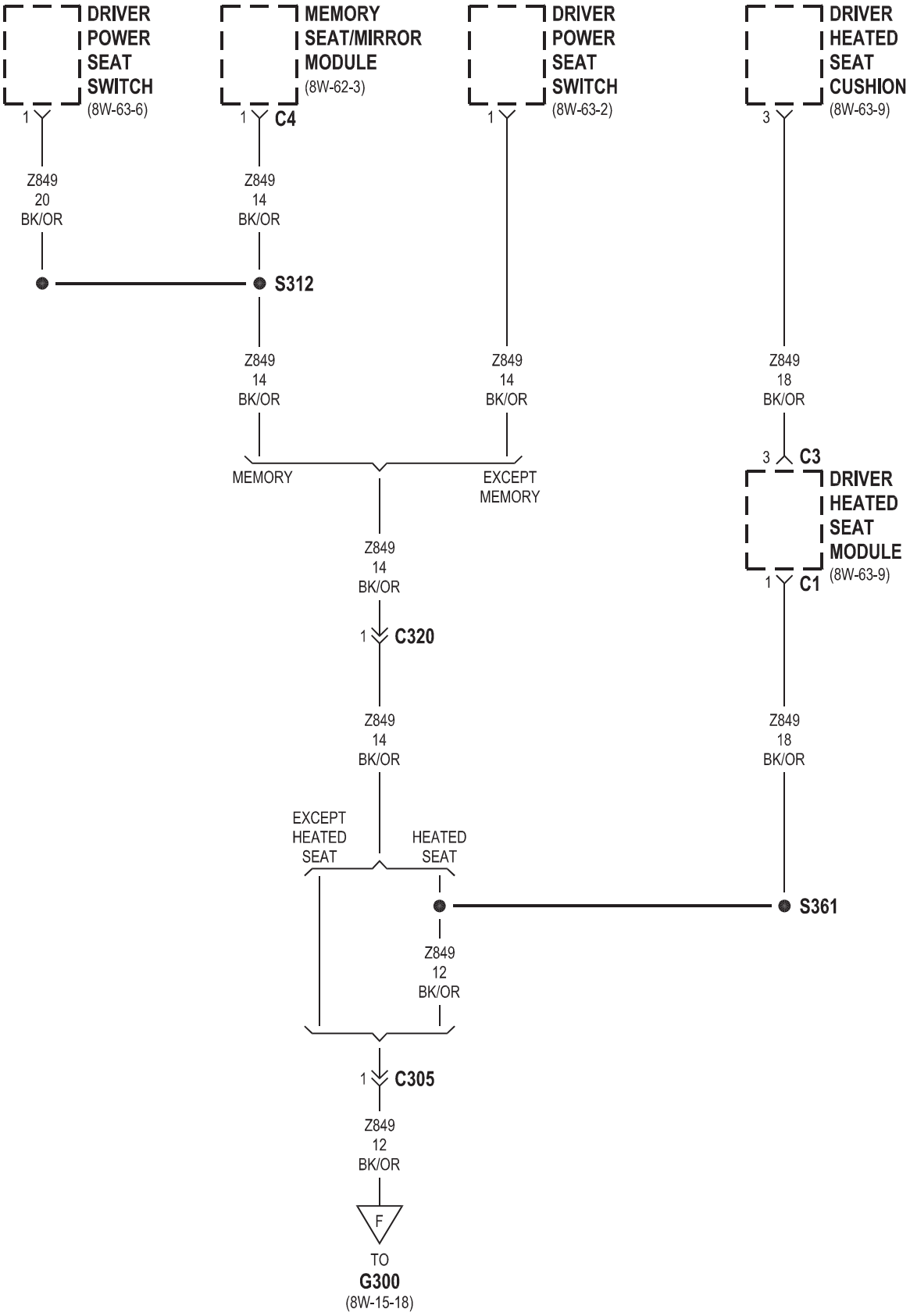
CONVENTIONAL BATTERY CHARGE RATE TABLE	
Voltage	Minutes
16.0 volts maximum	up to 10 min.
14.0 to 15.9 volts	up to 20 min.
13.9 volts or less	up to 30 min.

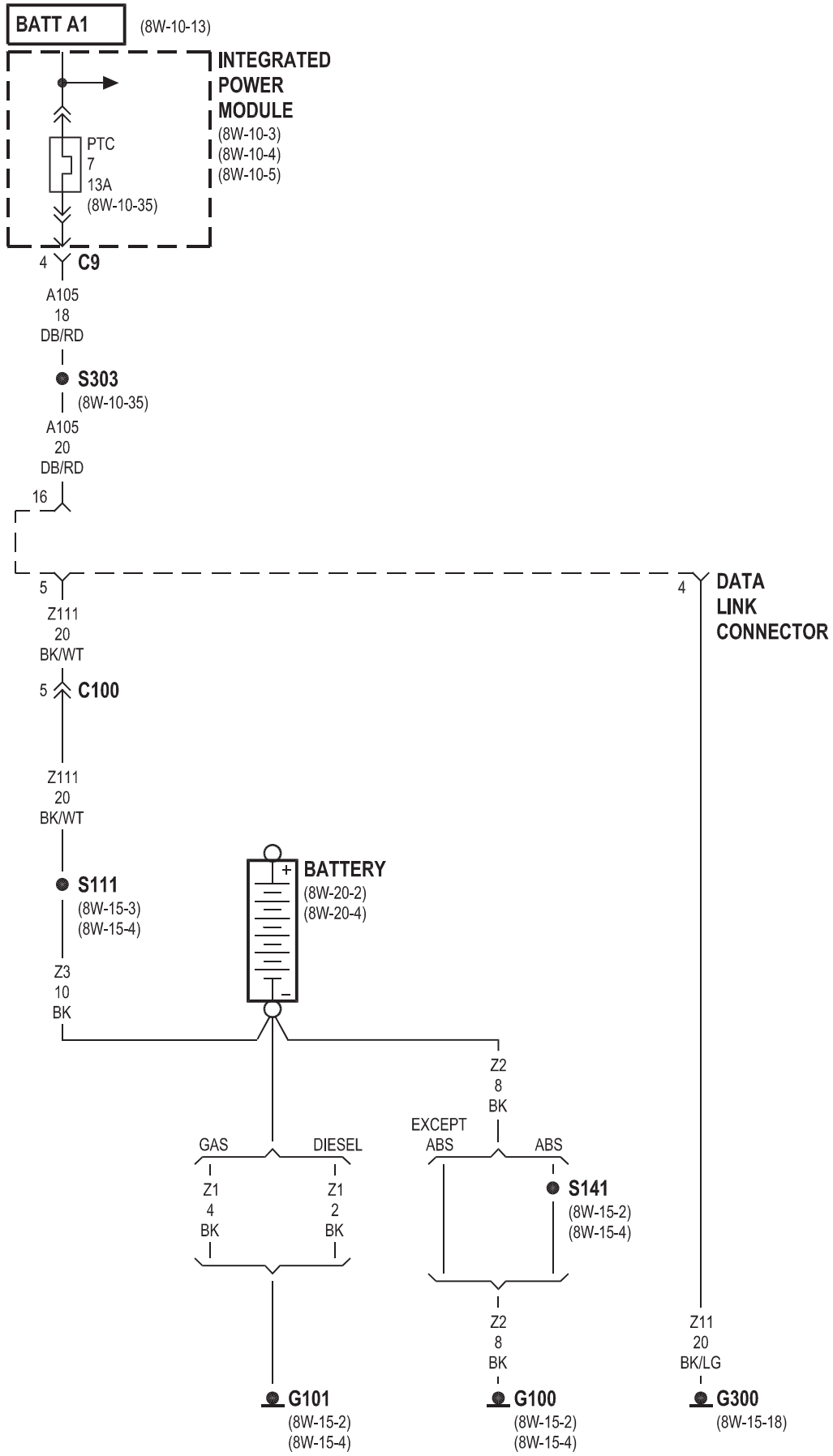
CHARGING TIME REQUIRED

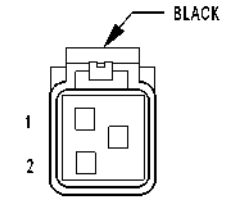
The time required to charge a battery will vary, depending upon the following factors:

- **Battery Capacity** - A completely discharged heavy-duty battery requires twice the charging time of a small capacity battery.
- **Temperature** - A longer time will be needed to charge a battery at -18° C (0° F) than at 27° C (80° F). When a fast battery charger is connected to a cold battery, the current accepted by the battery will be very low at first. As the battery warms, it will accept a higher charging current rate (amperage).
- **Charger Capacity** - A battery charger that supplies only five amperes will require a longer charging time. A battery charger that supplies twenty amperes or more will require a shorter charging time.
- **State-Of-Charge** - A completely discharged battery requires more charging time than a partially discharged battery. Electrolyte is nearly pure water in a completely discharged battery. At first, the charging current (amperage) will be low. As the battery charges, the specific gravity of the electrolyte will gradually rise.

The Conventional Battery Charging Time Table gives an indication of the time required to charge a typical battery at room temperature based upon the battery state-of-charge and the charger capacity.


DRIVER POWER SEAT SWITCH
(8W-63-6)
1
Z849
20
BK/OR
MEMORY SEAT/MIRROR MODULE
(8W-62-3)
1
C4
Z849
14
BK/OR
S312
DRIVER POWER SEAT SWITCH
(8W-63-2)
1
Z849
14
BK/OR
DRIVER HEATED SEAT CUSHION
(8W-63-9)
3
Z849
18
BK/OR
3
C3
DRIVER HEATED SEAT MODULE
(8W-63-9)
1
C1
MEMORY
EXCEPT MEMORY
Z849
14
BK/OR
1
C320
Z849
14
BK/OR
EXCEPT HEATED SEAT
HEATED SEAT
Z849
18
BK/OR
S361
Z849
12
BK/OR
1
C305
Z849
12
BK/OR
F
TO
G300
(8W-15-18)

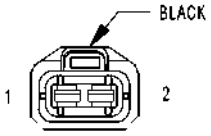

BATT A1
(8W-10-13)
INTEGRATED POWER MODULE
(8W-10-3)
(8W-10-4)
(8W-10-5)
PTC
7
13A
(8W-10-35)
4
C9
A105
18
DB/RD
S303
(8W-10-35)
A105
20
DB/RD
16
5
Z111
20
BK/WT
5
C100
Z111
20
BK/WT
S111
(8W-15-3)
(8W-15-4)
Z3
10
BK
BATTERY
(8W-20-2)
(8W-20-4)
4
DATA LINK CONNECTOR
Z2
8
BK
EXCEPT ABS
ABS
GAS
DIESEL
Z1
4
BK
Z1
2
BK
S141
(8W-15-2)
(8W-15-4)
Z2
8
BK
Z11
20
BK/LG
G101
(8W-15-2)
(8W-15-4)
G100
(8W-15-2)
(8W-15-4)
G300
(8W-15-18)



FUEL
INJECTOR
NO. 2
(2.4L/3.3L/3.8L)

FUEL INJECTOR NO. 2 (2.4L/3.3L/3.8L) - BLACK 2 WAY

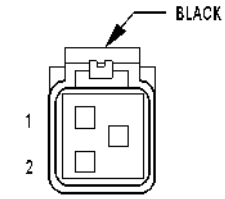
CAV	CIRCUIT	FUNCTION
1	K342 16BR/WT	ASD RELAY OUTPUT
2	K12 16BR/DB	INJECTOR CONTROL NO. 2



FUEL
INJECTOR
NO. 2
(DIESEL)

FUEL INJECTOR NO. 2 (DIESEL) - BLACK 2 WAY

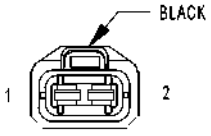
CAV	CIRCUIT	FUNCTION
1	K111 14DB/LB	COMMON INJECTOR DRIVER
2	K12 14TN	FUEL INJECTOR NO. 2 CONTROL



FUEL
INJECTOR
NO. 3
(2.4L/3.3L/3.8L)

FUEL INJECTOR NO. 3 (2.4L/3.3L/3.8L) - BLACK 2 WAY

CAV	CIRCUIT	FUNCTION
1	K342 16BR/WT	ASD RELAY OUTPUT
2	K13 16BR/LB	INJECTOR CONTROL NO. 3



FUEL
INJECTOR
NO. 3
(DIESEL)

FUEL INJECTOR NO. 3 (DIESEL) - BLACK 2 WAY

CAV	CIRCUIT	FUNCTION
1	K111 14DB/LB	COMMON INJECTOR DRIVER
2	K13 14BR/LB	FUEL INJECTOR NO. 3 CONTROL

TORQUE CONVERTER (Continued)

TORQUE CONVERTER CLUTCH (TCC)

In a standard torque converter, the impeller and turbine are rotating at about the same speed and the stator is freewheeling, providing no torque multiplication. By applying the turbine's piston to the front cover's friction material, a total converter engagement can be obtained. The result of this engagement is a direct 1:1 mechanical link between the engine and the transmission.

The engagement and disengagement of the TCC are automatic and controlled by the Powertrain Control Module (PCM). The engagement cannot be activated in the lower gears because it eliminates the torque multiplication effect of the torque converter necessary for acceleration. Inputs that determine clutch engagement are: coolant temperature, vehicle speed and throttle position. The torque converter clutch is engaged by the clutch solenoid on the valve body. The clutch will engage at approximately 56 km/h (35 mph) with light throttle, after the shift to third gear.

REMOVAL

(1) Remove transmission and torque converter from vehicle. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 41TE - REMOVAL)

(2) Place a suitable drain pan under the converter housing end of the transmission.

CAUTION: Verify that transmission is secure on the lifting device or work surface, the center of gravity of the transmission will shift when the torque converter is removed creating an unstable condition. The torque converter is a heavy unit. Use caution when separating the torque converter from the transmission.

(3) Pull the torque converter forward until the center hub clears the oil pump seal.

(4) Separate the torque converter from the transmission.

INSTALLATION

Check converter hub and drive notches for sharp edges, burrs, scratches, or nicks. Polish the hub and notches with 320/400 grit paper or crocus cloth if necessary. The hub must be smooth to avoid damaging the pump seal at installation.

(1) Lubricate converter hub and oil pump seal lip with transmission fluid.

(2) Place torque converter in position on transmission.

CAUTION: Do not damage oil pump seal or bushing while inserting torque converter into the front of the transmission.

(3) Align torque converter to oil pump seal opening.

(4) Insert torque converter hub into oil pump.

(5) While pushing torque converter inward, rotate converter until converter is fully seated in the oil pump gears.

(6) Check converter seating with a scale and straightedge (Fig. 326). Surface of converter lugs should be 1/2 in. to rear of straightedge when converter is fully seated.

(7) If necessary, temporarily secure converter with C-clamp attached to the converter housing.

(8) Install the transmission in the vehicle. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 41TE - INSTALLATION)

(9) Fill the transmission with the recommended fluid. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 41TE/FLUID - STANDARD PROCEDURE)

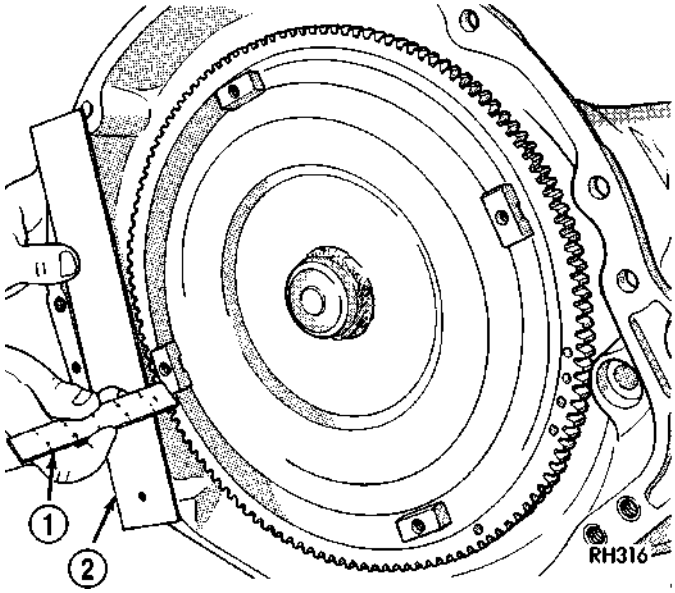


Fig. 326 Checking Torque Converter Seating

1 - SCALE
2 - STRAIGHTEDGE

TRANSMISSION CONTROL RELAY

DESCRIPTION

The transmission control relay (Fig. 327) is located in the Intelligent Power Module (IPM), which is located on the left side of the engine compartment between the battery and left fender.

WELD LOCATIONS (Continued)

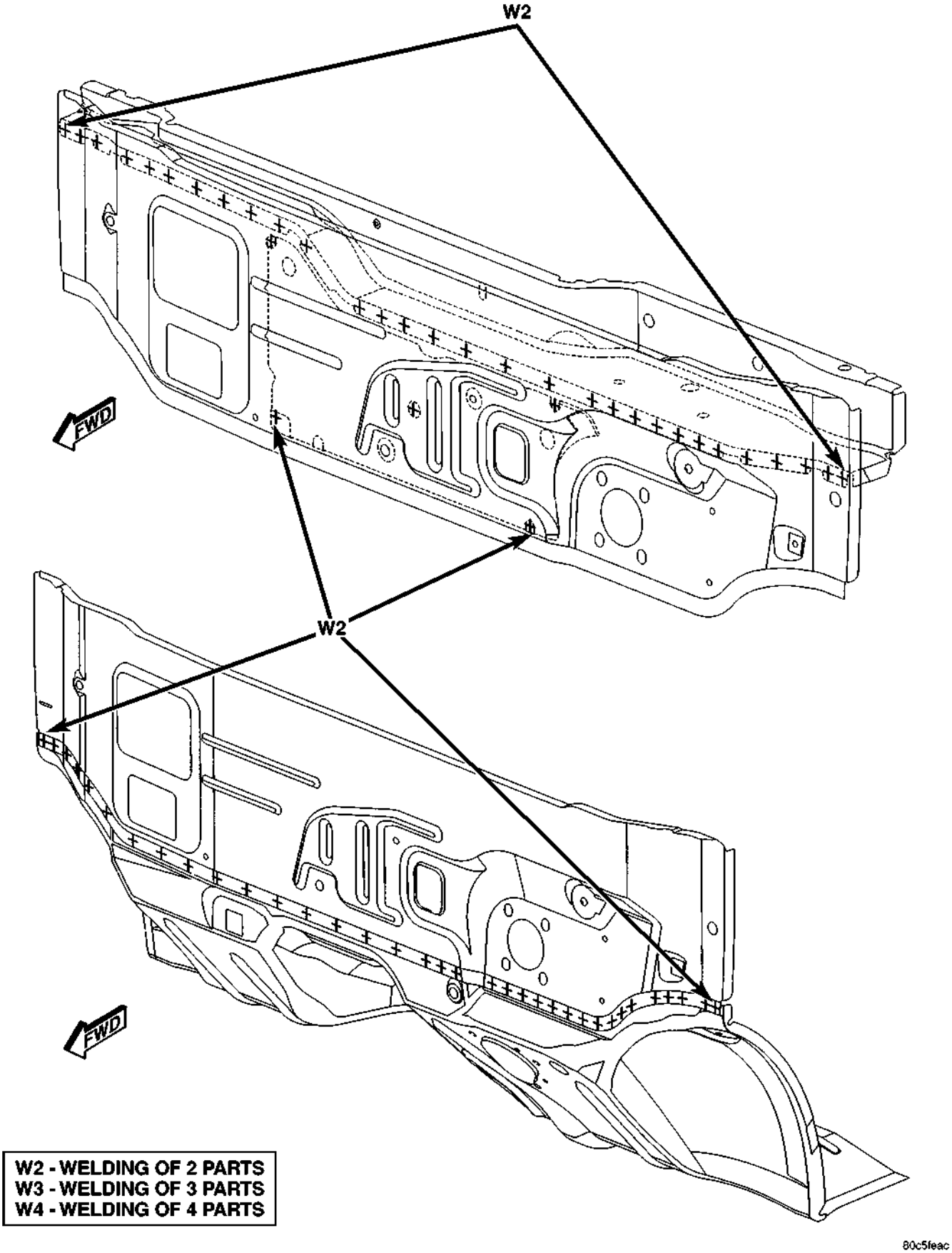


Fig. 108 DASH PANEL REINFORCEMENT

RADIATOR PRESSURE CAP (Continued)

DIAGNOSIS AND TESTING

DIAGNOSIS AND TESTING - COOLING SYSTEM PRESSURE CAP

Dip the pressure cap in water. Clean any deposits off the vent valve or its seat and apply cap to end of the Pressure Cap Test Adaptor that is included with the Cooling System Tester 7700. Working the plunger, bring the pressure to 104 kPa (15 psi) on the gauge. If the pressure cap fails to hold pressure of at least 97 kPa (14 psi), replace the pressure cap.

CAUTION: The Cooling System Tester Tool is very sensitive to small air leaks that will not cause cooling system problems. A pressure cap that does not have a history of coolant loss should not be replaced just because it leaks slowly when tested with this tool. Add water to the tool. Turn tool upside down and recheck pressure cap to confirm that cap is bad.

If the pressure cap tests properly while positioned on Cooling System Tester (Fig. 20), but will not hold pressure or vacuum when positioned on the filler neck. Inspect the filler neck and cap top gasket for irregularities that may prevent the cap from sealing properly.

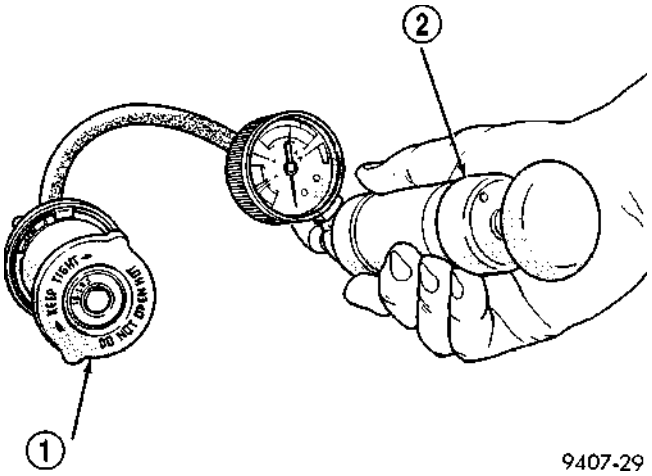


Fig. 20 Testing Cooling System Pressure Cap

1 - PRESSURE CAP
2 - PRESSURE TESTER

DIAGNOSIS AND TESTING - PRESSURE RELIEF TEST

The pressure cap upper gasket (seal) pressure relief can be checked by removing the overflow hose at the radiator filler neck nipple (Fig. 21). Attach the Radiator Pressure Tool to the filler neck nipple and pump air into the radiator. Pressure cap upper gasket should relieve at 69-124 kPa (10-18 psi) and hold pressure at 55 kPa (8 psi) minimum.

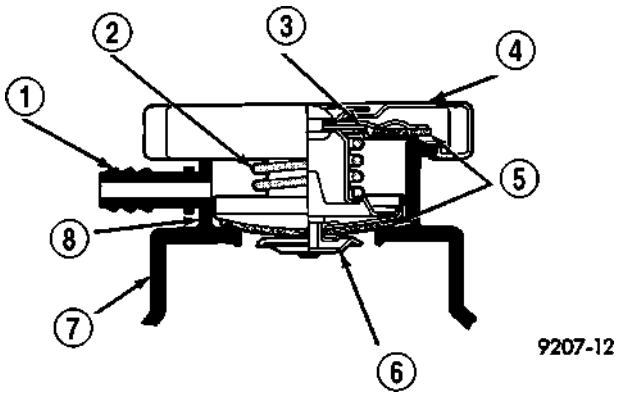


Fig. 21 Radiator Pressure Cap Filler Neck

1 - OVERFLOW NIPPLE
2 - MAIN SPRING
3 - GASKET RETAINER
4 - STAINLESS-STEEL SWIVEL TOP
5 - RUBBER SEALS
6 - VENT VALVE
7 - PRESSURE BOTTLE
8 - FILLER NECK

WARNING: THE WARNING WORDS "DO NOT OPEN HOT" ON THE RADIATOR PRESSURE CAP IS A SAFETY PRECAUTION. WHEN HOT, PRESSURE BUILDS UP IN COOLING SYSTEM. TO PREVENT SCALDING OR INJURY, THE RADIATOR CAP SHOULD NOT BE REMOVED WHILE THE SYSTEM IS HOT OR UNDER PRESSURE.

There is no need to remove the radiator cap at any time **except** for the following purposes:

(1) Check and adjust coolant freeze point.
(2) Refill system with new coolant.
(3) Conducting service procedures.
(4) Checking for vacuum leaks.

WARNING: IF VEHICLE HAS BEEN RUN RECENTLY, WAIT 15 MINUTES BEFORE REMOVING CAP. THEN PLACE A SHOP TOWEL OVER THE CAP AND WITHOUT PUSHING DOWN ROTATE COUNTERCLOCKWISE TO THE FIRST STOP. ALLOW FLUIDS TO ESCAPE THROUGH THE OVERFLOW TUBE AND WHEN THE SYSTEM STOPS PUSHING COOLANT AND STEAM INTO THE CRS TANK AND PRESSURE DROPS PUSH DOWN AND REMOVE THE CAP COMPLETELY. SQUEEZING THE RADIATOR INLET HOSE WITH A SHOP TOWEL (TO CHECK PRESSURE) BEFORE AND AFTER TURNING TO THE FIRST STOP IS RECOMMENDED.

CLEANING

Use only a mild soap to clean the pressure cap.

Symptom:

P0560-SYSTEM VOLTAGE TOO HIGH

When Monitored and Set Condition:

P0560-SYSTEM VOLTAGE TOO HIGH

When Monitored: With the engine running.

Set Condition: The ECM detects battery voltage is above 16.5 volts.

POSSIBLE CAUSES
GROUND CIRCUIT HIGH RESISTANCE
BATTERY SUPPLY OR ECM/PCM RELAY OUTPUT CIRCUIT HIGH RESISTANCE
GENERATOR FIELD CONTROL CIRCUIT SHORTED TO GROUND
GENERATOR INTERNALLY SHORTED TO GROUND
ENGINE CONTROL MODULE

TEST	ACTION	APPLICABILITY
1	**NOTE: If DTC P1511 or P1512 is present with this DTC, diagnose DTCs P1511 and P1512 before diagnosing this DTC.** **NOTE: If the ECM detects and stores a DTC, the ECM also stores the engine/vehicle operating conditions under which the DTC was set. Some of these conditions are displayed on the DRB at the same time the DTC is displayed.** **NOTE: Before erasing stored DTCs, record these conditions. Attempting to duplicate these conditions may assist when checking for an active DTC.** **NOTE: The battery must be fully charged and the generator belt must be in good condition and tensioned properly before continuing.** Turn the ignition off. Disconnect the ECM harness connectors. Using a 12-volt test light connected to 12-volts, check all of the ECM Ground circuits including the Battery(-) Sense circuit. Does the test light illuminate brightly for each circuit? Yes → Go To 2 No → Repair the Ground circuit(s) for high resistance. Perform CHARGING VERIFICATION - VER-3.	All