DESCRIPTION AND OPERATION

WINDSHIELD WIPER SYSTEM

WARNING: VEHICLES ARE EQUIPPED WITH AN AIRBAG, REFER TO GROUP 8M, RESTRAINT SYSTEMS FOR STEERING WHEEL OR COLUMN SERVICE PROCEDURES.

DESCRIPTION

The windshield wiper system is controlled by a switch located on the multi-function switch stalk. The multi-function switch is located on the steering column behind the steering wheel.

OPERATION

The windshield wipers will operate when the ignition switch is in the ACCESSORY or IGNITION ON position. The windshield wipers will return to the parked position when the ignition switch is turned to the OFF position. Fuses, located in the Junction Block and Power Distribution Center protects the circuitry of the wiper system and the vehicle.

The wiper motor has permanent magnet fields. The speeds are determined by current flow to the appropriate set of brushes.

The intermittent wiper system, in addition to low and high speed, has a delay mode. The delay mode
The wiper system completes the wipe cycle when the switch is turned OFF. The blades park in the lowest portion of the wipe pattern.

When using the DRB III® scan tool, refer to the proper Body Diagnostic Procedures Manual for Diagnosis and Testing.

WINDSHIELD WASHER SYSTEM

DESCRIPTION

All models are equipped with electric operated windshield washer pumps. The electric pump assembly is mounted with a grommet directly to the reservoir.

The windshield washer system is controlled by a switch located on the multi-function switch stalk. The multi-function switch is located on the steering column behind the steering wheel.

OPERATION

The wash function can be accessed in the OFF position of the wiper control switch. Wash switch must be pressed for at least 0.5 second to get the wipe after wash. Holding the wash button depressed when the switch is in the OFF position will operate the wipers and washer motor pump continuously until the washer button is released. Releasing the button will stop the washer pump but the wipers will complete the current wipe cycle, followed by an average of two more wipe cycles (±1) before the wipers park and the module turns off. If the wash switch is pressed momentarily with the wipers in the OFF or INTERMITTENT position, a pulse wipe cycle consisting of two wipes will occur.

Fluid is gravity fed from the reservoir to the motor. The fluid is forced by the pump through rubber hoses to the hood mounted nozzles which direct the fluid streams to the windshield. The one way flow check valves are located in each hood nozzle. The purpose of the check valves is to improve fluid flow response time and to prevent excessive washer fluid staining the surface of the hood. The hood mounted nozzles distribute washer fluid on the surface of the windshield. The nozzles are adjustable, refer to the Washer Nozzle Adjusting Procedures. The pump and reservoir are serviced as separate assemblies.

WIPER BLADES

DESCRIPTION

The wiper blades are a rubber element with a steel vertebrae that are mounted on the end of the windshield wiper arm and sweep across the front windshield to clear it of water, snow, and debris.

OPERATION

When the wiper blade rubber element is exposed to the weather for a long period of time, it tends to lose wiping ability. Periodic cleaning of the wiper blade element is suggested to remove the accumulation of salt and road film. The wiper blades, arms, and windshield should be cleaned with a sponge or cloth and a mild detergent or non-abrasive cleaner. If the blades continue to streak or smear, they should be replaced. The driver blade element is 600 mm in length and the passenger blade element is 550 mm in length.

DIAGNOSIS AND TESTING

INTERMITTENT WIPER FUNCTION

WARNING: ON VEHICLES EQUIPPED WITH AIRBAGS, SEE GROUP 8M, RESTRAINT SYSTEMS FOR STEERING WHEEL OR COLUMN REMOVAL PROCEDURES.

The intermittent wiper function is controlled by the Body Control Module (BCM), located in the left side of the instrument panel, attached to the Junction Block (Fig. 3). If the Body Control Module is determined to be the problem, refer to Group 8E, Instrument Panels and Systems, for replacement procedures.

MULTI-FUNCTION/WIPER SWITCH

To test the multi-function/wiper switch, first disconnect the switch wires from the body wiring in the steering column (Fig. 4). Using an ohmmeter, test for continuity between the terminals of the switch, as
DIAGNOSIS AND TESTING (Continued)

indicated in the following continuity table. The identity of each terminal is shown in (Fig. 5).

For test purposes, the first position is the OFF position, the next six positions are for the DELAY wipe. LOW is the next detent position and HIGH is the full counterclockwise detent position.

In any wiper switch position, if the control stalk end cap is depressed, the washer circuit will be completed.

### WINDSHIELD WASHERS

Whenever a windshield washer malfunction occurs, first verify that the windshield washer wire harness is properly connected to all connectors before starting normal diagnosis and repair procedures. Refer to Windshield Washer Test table.
<table>
<thead>
<tr>
<th>CONDITION</th>
<th>POSSIBLE CAUSE</th>
<th>CORRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>WASHER POWER FEED FUSE OPEN</td>
<td>1. JUNCTION BLOCK FUSE #5 BLOWN.</td>
<td>CHECK FUSE #5. REPLACE IF NOT OK.</td>
</tr>
</tbody>
</table>
| BLOWN FUSE WHEN WASHER SWITCH IS DEPRESSED | 1. SHORT IN WIPER / WASHER SWITCH.  
2. SHORT IN MOTOR POWER CIRCUIT.  
3. SHORT IN WASHER MOTOR. | 1. DEFECTIVE WASHER SWITCH. REFER TO WIPE / WASHER SWITCH DIAGNOSTIC PROCEDURES.  
2. SHORT OR DEFECTIVE CIRCUIT BETWEEN WIPER / WASHER SWITCH CONNECTOR TERMINAL #2 AND MOTOR CONNECTOR TERMINAL #1. IF NOT OK, REPAIR CIRCUIT.  
3. CONNECT AN OHMMETER ACROSS WASHER MOTOR TERMINALS #1 AND #2 AND CHECK FOR A SHORT CIRCUIT. IF NOT OK, REPLACE WASHER MOTOR. |
| WASHER SYSTEM WILL NOT FLOW WASHER FLUID | 1. NO WASHER FLUID IN RESERVOIR.  
2. JUNCTION BLOCK FUSE #5 BLOWN.  
3. WASHER HOSE NOT FLOWING FLUID.  
4. MOTOR CONNECTOR LOOSE.  
5. MOTOR CONNECTOR TERMINALS BENT.  
6. OPEN POWER CIRCUIT TO SWITCH.  
7. OPEN OR DEFECTIVE WIPER / WASHER SWITCH.  
8. OPEN POWER CIRCUIT TO MOTOR.  
9. OPEN OR DEFECTIVE MOTOR GROUND CIRCUIT.  
10. OPEN CIRCUIT IN MOTOR.  
11. SEIZED MOTOR BEARINGS. | 1. FILL RESERVOIR.  
2. SHORT CIRCUIT BETWEEN JUNCTION BLOCK FUSE #5 AND WIPER SWITCH TERMINAL #1. SHORT IN WIPER SWITCH. IF NOT OK, REPAIR CIRCUIT OR REFER TO WIPE / WASHER SWITCH DIAGNOSTIC PROCEDURES.  
3. ASSURE WASHER HOSE IS NOT PINCHED, LOOSE, BROKEN, OR DISCONNECTED. IF NOT OK, PROPERLY ROUTE OR REPAIR WASHER HOSE.  
4. PROPERLY SEAT CONNECTOR TO MOTOR.  
5. REPAIR TERMINALS AND PROPERLY SEAT CONNECTOR TO MOTOR.  
6. OPEN OR DEFECTIVE CIRCUIT BETWEEN JUNCTION BLOCK FUSE #5 AND WASHER SWITCH CONNECTOR TERMINAL #1. IF NOT OK, REPAIR CIRCUIT.  
7. CONNECT AN OHMMETER ACROSS WIPER / WASHER SWITCH TERMINAL #1 AND #2 AND DEPRESS WASHER BUTTON AND CHECK FOR CONTINUITY. IF NOT OK, REFER TO WIPE / WASHER SWITCH DIAGNOSTIC PROCEDURES.  
8. OPEN OR DEFECTIVE CIRCUIT BETWEEN WIPER / WASHER SWITCH CONNECTOR TERMINAL #2 AND MOTOR CONNECTOR TERMINAL #1. IF NOT OK, REPAIR CIRCUIT.  
9. OPEN OR DEFECTIVE CIRCUIT BETWEEN WASHER MOTOR CONNECTOR GROUND TERMINAL #2 AND LEFT HEADLAMP GROUND #5 OR ENGINE GROUND #1 OR 2.  
10. CHECK FOR AN OPEN CIRCUIT ON MOTOR BETWEEN POWER TERMINAL #1 AND GROUND TERMINAL #2. IF NOT OK, REPLACE WASHER MOTOR.  
11. APPLY DIRECT BATTERY VOLTAGE TO MOTOR TERMINALS. IF MOTOR DOES NOT RUN, REPLACE MOTOR. |
## CONDITION POSSIBLE CAUSE CORRECTION

### HOOD NOZZLE WILL NOT FLOW
1. FROZEN NOZZLE.
2. NOZZLE HOSE NOT FLOWING.
3. NOZZLE OR NOZZLE HOSE PLUGGED BY CONTAMINATION.
4. DEFECTIVE NOZZLE CHECK VALVE.

DEICE NOZZLE BY ALLOWING TIME FOR UNDERHOOD ENGINE HEAT TO THAW NOZZLE. IF NOT OK, MOVE VEHICLE INTO HEATED AREA. ASSURE WASHER FLUID IS PROPERLY BLENDED FOR AMBIENT OUTSIDE TEMPERATURES.
2. ASSURE NOZZLE HOSE IS NOT PINCHED, LOOSE, BROKEN, OR DISCONNECTED. IF NOT OK, PROPERLY ROUTE OR REPAIR NOZZLE HOSE.
3. CLEAN NOZZLE OR NOZZLE HOSE OF CONTAMINATION. DETERMINE SOURCE OF CONTAMINATION. INSPECT RESERVOIR FOR EXCESSIVE CONTAMINATION. CLEAN SYSTEM AS REQUIRED.
4. REPLACE HOOD NOZZLE.

### WASHER FLUID OUTPUT IS LOW
1. PARTIALLY PINCHED HOSE.
2. REVERSE POLARITY TO PUMP.

1. ASSURE WASHER HOSE IS NOT PARTIALLY PINCHED. IF NOT OK, PROPERLY ROUTE HOSE.
2. CHECK FOR CROSSED CIRCUIT TO PUMP. IF NOT OK, REPAIR CIRCUIT.

### HOOD NOZZLE STREAM OVERSHOOTS WINDSHIELD
1. NOZZLE NOT SEATED IN HOOD.
2. NOZZLE JET(S) OUT OF ADJUSTMENT.

1. ASSURE NOZZLE IS SNAPPED IN PLACE.
2. ADJUST NOZZLE JETS USING A SAFETY PIN.

### WIPER WILL NOT CYCLE WHEN WASHER SWITCH IS DEPRESSED
1. OPEN OR DEFECTIVE WASHER SYSTEM CONTROL CIRCUIT.
2. DEFECTIVE BODY CONTROL MODULE (BCM).

1. OPEN OR DEFECTIVE CIRCUIT BETWEEN WIPER / WASHER SWITCH CONNECTOR TERMINAL #2 AND BCM #C2 BLACK CONNECTOR TERMINAL #7. IF NOT OK REPAIR CIRCUIT.
2. REFER TO BCM DIAGNOSTIC PROCEDURES.
3. REPLACE WASHER MOTOR.

### WASHER OPERATES INTERMITTENTLY
1. INTERMITTENT OPEN OR DEFECTIVE WASHER MOTOR POWER CIRCUIT.
2. INTERMITTENT OPEN TO MOTOR GROUND.
3. INTERMITTENT OPEN IN WASHER SWITCH.
4. DEFECTIVE WASHER MOTOR.

1. INTERMITTENT OPEN OR DEFECTIVE CIRCUIT BETWEEN WIPER / WASHER SWITCH CONNECTOR TERMINAL #2 AND MOTOR CONNECTOR TERMINAL #1. IF NOT OK, REPAIR CIRCUIT.
2. INTERMITTENT OPEN BETWEEN MOTOR CONNECTOR TERMINAL #2 AND LEFT HEADLAMP GROUND #5 OR ENGINE GROUND #1 OR 2.
3. REFER TO WIPER / WASHER SWITCH DIAGNOSTIC PROCEDURES.
4. REPLACE WASHER MOTOR.
### DIAGNOSIS AND TESTING (Continued)

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>POSSIBLE CAUSE</th>
<th>CORRECTION</th>
</tr>
</thead>
</table>
| WASHER FLUID LEVEL INDICATOR INOPERATIVE | 1. LOOSE FLUID LEVEL SENSOR CONNECTOR.  
2. OPEN POWER CIRCUIT TO SWITCH.  
3. OPEN GROUND CIRCUIT.  
4. DEFECTIVE INSTRUMENT CLUSTER  
5. FLUID LEVEL SENSOR SWITCH OPEN OR DEFECTIVE. | 1. PROPERLY SEAT CONNECTOR TO SWITCH.  
2. OPEN OR DEFECTIVE CIRCUIT BETWEEN INSTRUMENT CLUSTER CONNECTOR TERMINAL #B4 AND LOW FLUID LEVEL SENSOR CONNECTOR TERMINAL. IF NOT OK, REPAIR CIRCUIT.  
3. OPEN OR DEFECTIVE CIRCUIT BETWEEN FLUID LEVEL SENSOR CONNECTOR AND LEFT HEADLAMP GROUND #5 OR ENGINE GROUND #1 OR 2.  
4. REFER TO INSTRUMENT CLUSTER DIAGNOSTIC PROCEDURES.  
5. CONNECT AND OHMMETER TO SWITCH TERMINALS TO CHECK FOR COMPLETE CIRCUIT. CYCLE SWITCH FLOAT BACK AND FORTH BY FILLING AND DEPLETING RESERVOIR OF WASHER FLUID TO CHECK FOR PROPER SWITCH FUNCTION. IF NOT OK, REPLACE SWITCH. |
| LEAKING WASHER FLUID             | 1. FILLER TUBE LEAKING.  
2. FILLER TUBE OUT OR DAMAGED.  
3. PUMP OR SENSOR GROMMET DEFECTIVE.  
4. LEAKING OR DEFECTIVE RESERVOIR BODY. | 1. ASSURE FILLER TUBE IS NOT LOOSE OR DISCONNECTED. IF NOT OK, PROPERLY SEAT FILLER TUBE.  
2. REPLACE FILLER TUBE.  
3. REPLACE PUMP OR SENSOR GROMMET.  
4. REPLACE RESERVOIR BODY. |
relay. If OK, check for faulty relays and go to Step 8. If not repair as necessary.

(8) Disconnect the C3 bone 12-way connector from the BCM.

(9) Using an ohmmeter, check for continuity from terminal 4 of the BCM C3 24-way, black connector to the terminal C of the intermittent wiper relay. If OK, go to Step 10. If not repair as necessary.

(10) Using a voltmeter, connect positive lead to terminal 8 of the BCM C2 black 24-way connector and negative lead to ground. Turn ignition switch to the ON position. Slowly move the wiper switch from OFF position through each position to HIGH.

(a) If voltage increases from zero to approximately 10 volts in the HIGH position, replace BCM. If no voltage, go to Step b.

(b) Using an ohmmeter, check for continuity from terminal 3 of wiper switch connector to terminal 8 of the BCM C2 black 24-way connector. If no continuity, repair circuit. If OK, go to Step c.

(c) Using a voltmeter, connect positive lead to terminal 1 of the wiper switch connector. If ignition voltage is present, replace the wiper switch. If no voltage, check continuity from fuse 5 to terminal 1 of the wiper switch connector. Repair circuit as necessary.

(11) Disconnect motor connector and replace fuse 5 from the Junction Block.

(a) If fuse does not blow, go to Step 2.

(b) If fuse blows, wiper control circuit is at fault, repair as necessary, refer to Group 8W, Wiring Diagrams.

MOTOR RUNS SLOWLY AT ALL SPEEDS

(1) Disconnect the wire harness from the wiper motor. Remove wiper arms and blades. Disconnect motor drive link from motor. Connect an ammeter between battery negative jump start terminal and Pin 5 on the wiper motor connector. Connect battery positive wire to Pin 2 on the wiper motor connector. When replacing motor, crank nut tighten to 15-20 N·m (130-177 in. lbs.) torque.

(a) If average ammeter reading is more than 10 amps with a hot motor and dry windshield, replace motor.

(b) If motor runs and average ammeter reading is less than 10 amps, go to Step 2.

(2) Check to see if wiper linkage or pivots are binding or caught.

WIPERS RUN AT HIGH SPEED WITH SWITCH IN LOW SPEED POSITION. WIPERS OPERATE IN INTERMITTENT MODE, BUT EACH WIPE IS AT HIGH SPEED.

(1) Disconnect motor connector.

(2) Using two jumper wires, connect one between the battery positive jump start terminal and Pin 2 on the wiper motor connector. Connect the second lead between ground and Pin 5 on the wiper motor connector. If motor runs at low speed, go to Step 3. If motor runs at high speed, replace the motor.

(3) Check for faulty HI-LO wiper relay. Check for crossed wires in harness from HI-LO relay to motor.

(4) Disconnect C3 bone 12-way connector from the BCM and remove the HI/LO wiper relay.

(5) Using an ohmmeter, check terminal 12 of the C3 bone 12-way connector for short to ground.

(6) If continuity to ground is present, repair as necessary. If no continuity to ground, replace the BCM.

WIPERS RUN AT LOW SPEED WITH SWITCH IN HIGH SPEED POSITION

(1) Check for faulty HI-LO wiper relay.

(2) Using an ohmmeter, check for open circuit between terminal C of the HI-LO wiper relay and terminal 12 of the BCM 33 bone 12-way connector. If OK, go to Step 3. If not OK, repair as necessary.

(3) Check wiper switch.

(4) Check for binding linkage.
(5) Refer to MOTOR RUNS SLOWLY AT ALL SPEEDS.

MOTOR WILL KEEP RUNNING WITH SWITCH IN OFF POSITION.

(1) Check wiper motor wiring harness for shorts between the low speed motor feed terminal 2 or high speed motor feed terminal 1 and battery or ignition.

(2) Check for faulty wiper ON/OFF or HI/LO relay.

(3) Check circuit from ON/OFF relay terminal C to HI/LO relay terminal B for short to battery or ignition.

(4) Disconnect the C3 bone 12-way connector from the BCM. Check circuit from terminal 4 of C3 bone 12-way connector to terminal C of the ON/OFF wiper relay for short to ground.

(5) Disconnect from terminal 3 of C2 bone 24-way connector to Pin 4 of the wiper motor harness connector for an open. If open circuit, repair as necessary.

(6) Using an ohmmeter, connect positive lead to terminal 8 of the C2 black 24-way connector. Connect negative lead to ground. If voltmeter reads greater than 0 volts, check wiper switch and wiring.

(7) Using an ohmmeter, connect positive lead to terminal 8 of the C3 black 12-way connector.

(a) If voltmeter reads 10 to 15 volts, check the circuit for short to battery or ignition.

(b) If the voltmeter reads 0 volts, replace the BCM.

WIPERS DO NOT RUN WHEN WASHER MOTOR IS ENGAGED

(1) Disconnect the C2 black 24-way connector from the BCM.

(2) Using a voltmeter, connect positive lead to terminal 7 of the C2 black 24-way connector and the negative lead to ground.

(3) Engage the washer switch so that the washer motor runs continuously.

(a) If the voltage is zero, check the wiring between the washer switch terminal 2 and the BCM and repair as necessary.

(b) If the battery voltage is shown, replace the BCM.

WIPER MOTOR SYSTEM

WARNING: ON VEHICLES EQUIPPED WITH AIRBAGS, SEE GROUP 8M, RESTRAINT SYSTEMS FOR STEERING WHEEL OR COLUMN REMOVAL PROCEDURES.

Whenever a wiper motor malfunction occurs, disconnect motor wire harness and clean the terminals. Ensure the wire harness is properly connected before starting diagnosis and repair procedures. Refer to Wiper Motor Test table.
## WIPER MOTOR TEST

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>POSSIBLE CAUSE</th>
<th>CORRECTION</th>
</tr>
</thead>
</table>
| WIPER OPERATES IN LOW SPEED OR INTERMITTENT ONLY | 1. HI / LO RELAY DEFECTIVE.  
2. OPEN OR DEFECTIVE CONTROL CIRCUIT IN BCM.  
3. DEFECTIVE WIPER SWITCH.  
4. OPEN HIGH SPEED CIRCUIT.  
5. DEFECTIVE MOTOR. | 1. CHECK HI / LO RELAY WITH KNOWN GOOD RELAY. IF NOT OK, REPLACE HI / LO RELAY.  
2. OPEN OR DEFECTIVE CIRCUIT BETWEEN HI / LO RELAY CAVITY “C” AND BCM CONNECTOR TERMINAL #12C. DEFECTIVE BCM. IF NOT OK, REPAIR CIRCUIT OR REFER TO BCM DIAGNOSTIC PROCEDURES.  
3. REFER TO WIPER SWITCH DIAGNOSTIC PROCEDURES.  
4. OPEN OR DEFECTIVE CIRCUIT BETWEEN HI / LO RELAY CAVITY “D” AND WIPER MOTOR CONNECTOR TERMINAL #1. IF NOT OK, REPAIR CIRCUIT.  
5. APPLY BATTERY JUMPER OVER TO WIPER TERMINAL #1 AND GROUND TERMINAL #5. IF NOT OK, REPLACE MOTOR. |
| WIPER OPERATES IN INTERMITTENT MODE ONLY | 1. DEFECTIVE WIPER SWITCH. | 1. REFER TO WIPER SWITCH DIAGNOSTIC PROCEDURES. |
| WIPER OPERATES IN HIGH SPEED ONLY | 1. DEFECTIVE HI / LO RELAY.  
2. DEFECTIVE CONTROL CIRCUIT TO BCM.  
3. DEFECTIVE BCM.  
4. OPEN LOW SPEED CIRCUIT.  
5. DEFECTIVE MOTOR. | 1. CHECK WIPER HI / LO RELAY WITH KNOWN GOOD RELAY. REPLACE IF NOT OK.  
2. CONTINUOUS SHORT BETWEEN HI / LO RELAY CAVITY “C” AND BCM CONNECTOR TERMINAL #12C. IF NOT OK, REPAIR CIRCUIT.  
3. REFER TO BCM DIAGNOSTIC PROCEDURES.  
4. OPEN OR DEFECTIVE CIRCUIT BETWEEN HI / LO RELAY CAVITY “E” AND WIPER MOTOR CONNECTOR TERMINAL #2. IF NOT OK, REPAIR CIRCUIT.  
5. APPLY BATTERY JUMPER POWER TO WIPER TERMINAL #2 AND GROUND TERMINAL #5. IF NOT OK, REPLACE MOTOR. |
| WIPER OPERATION SWITCHES BETWEEN LOW AND HIGH SPEED OPERATION | 1. DEFECTIVE CONTROL CIRCUIT TO BCM.  
2. DEFECTIVE BCM. | 1. INTERMITTENT SHORT BETWEEN HI / LO RELAY CAVITY “C” AND BCM CONNECTOR TERMINAL #12C, IF NOT OK, REPAIR CIRCUIT.  
2. REFER TO BCM DIAGNOSTIC PROCEDURES. |
<table>
<thead>
<tr>
<th>CONDITION</th>
<th>POSSIBLE CAUSE</th>
<th>CORRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIPER WILL NOT PARK</td>
<td>1. OPEN WIPER MOTOR PARK CIRCUIT. 2. DEFECTIVE BCM. 3. DEFECTIVE WIPER MOTOR.</td>
<td>1. OPEN OR DEFECTIVE CIRCUIT BETWEEN WIPER MOTOR CONNECTOR TERMINAL #4 AND BCM TERMINAL #3C. IF NOT OK, REPAIR CIRCUIT. 2. REFER TO BCM DIAGNOSTIC PROCEDURES. 3. APPLY BATTERY JUMPER POWER TO WIPER TERMINAL #2 (LOW SPEED) AND GROUND TERMINAL #5 (COMMON GROUND). POSITION AN OHMMETER ACROSS MOTOR PARK TERMINAL #4 AND COMMON GROUND. THE OHMMETER MUST INDICATE ONE SHORT, ONCE EVERY MOTOR REVOLUTION. OR WITH MOTOR IN “PARK” POSITION, CHECK FOR CONTINUITY BETWEEN MOTOR TERMINAL #4 AND 5. IF NOT OK, REPLACE MOTOR.</td>
</tr>
<tr>
<td>WIPER WILL NOT RUN TO PARK AFTER IGNITION OFF</td>
<td>1. DEFECTIVE BCM.</td>
<td>1. REFER TO BCM DIAGNOSTIC PROCEDURES.</td>
</tr>
<tr>
<td>WIPER RUNS THRU PARK POSITION ON WINDSHIELD</td>
<td>1. DEFECTIVE ON / OFF RELAY. 2. OPEN ON / OFF RELAY GROUND CIRCUIT.</td>
<td>1. CHECK WIPER ON / OFF RELAY WITH KNOWN GOOD RELAY. IF NOT OK, REPLACE RELAY. 2. OPEN OR DEFECTIVE CIRCUIT BETWEEN ON / OFF RELAY CAVITY “E” AND LEFT HEADLAMP GROUND #5 OR ENGINE GROUND #1 OR 2.</td>
</tr>
<tr>
<td>WIPER RUNS CONTINUOUSLY OR INTERVALTENTLY IN LOW SPEED WITH IGNITION OR ACCESSORY ON AND WIPER SWITCH OFF</td>
<td>1. DEFECTIVE ON / OFF RELAY. 2. DEFECTIVE CONTROL CIRCUIT TO BCM. 3. DEFECTIVE BCM.</td>
<td>1. CHECK WIPER ON / OFF RELAY WITH KNOWN GOOD RELAY. IF NOT OK, REPLACE RELAY. 2. INTERMITTENT OR CONTINUOUS SHORT BETWEEN ON / OFF RELAY CAVITY “C” AND BCM CONNECTOR TERMINAL #4C. IF NOT OK, REPAIR CIRCUIT. 3. REFER TO BCM DIAGNOSTIC PROCEDURES.</td>
</tr>
<tr>
<td>WIPER MOTOR POWER FEED FUSE OPEN</td>
<td>1. POWER DISTRIBUTION CENTER (PDC) FUSE “M” DEFECTIVE.</td>
<td>1. CHECK FUSE “M”. IF NOT OK, REPLACE FUSE.</td>
</tr>
<tr>
<td>WIPER SWITCH POWER FEED FUSE OPEN</td>
<td>1. JUNCTION BLOCK FUSE #5 DEFECTIVE.</td>
<td>1. CHECK FUSE #5. IF NOT OK, REPLACE FUSE.</td>
</tr>
<tr>
<td>CONDITION</td>
<td>POSSIBLE CAUSE</td>
<td>CORRECTION</td>
</tr>
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<tr>
<td></td>
<td>2. JUNCTION BLOCK FUSE #5 BLOWN.</td>
<td>2. SHORT CIRCUIT BETWEEN JUNCTION BLOCK FUSE #5 AND WIPER SWITCH TERMINAL #1. SHORT IN WIPER SWITCH. IF NOT OK, REPAIR CIRCUIT OR REFER TO WIPER SWITCH DIAGNOSTIC PROCEDURES.</td>
</tr>
<tr>
<td></td>
<td>3. ON / OFF RELAY DEFECTIVE.</td>
<td>3. CHECK WITH A KNOWN GOOD RELAY. IF NOT OK, REPLACE RELAY.</td>
</tr>
<tr>
<td></td>
<td>4. MOTOR CONNECTOR DEFECTIVE (LOOSE, BENT OR CORRODED).</td>
<td>4. CHECK MOTOR CONNECTOR FOR BENT, LOOSE, OR CORRODED CONNECTOR.</td>
</tr>
<tr>
<td></td>
<td>5. OPEN POWER CIRCUIT TO MOTOR.</td>
<td>5. OPEN OR DEFECTIVE CIRCUIT BETWEEN PDC FUSE “M” AND ON / OFF RELAY CAVITY “A” OR “D”. OPEN OR DEFECTIVE CIRCUIT BETWEEN ON / OFF RELAY CAVITY “B” AND HI / LO RELAY CAVITY “B”. IF NOT OK, REPLACE ON / OFF RELAY OR REPAIR CIRCUIT(S).</td>
</tr>
<tr>
<td></td>
<td>6. BCM CONNECTORS “B” AND “C” (LOOSE, BENT OR CORRODED).</td>
<td>6. CHECK BCM CONNECTORS “B” AND “C” FOR BENT, LOOSE, OR CORRODED CONNECTORS.</td>
</tr>
<tr>
<td></td>
<td>7. OPEN OR DEFECTIVE CONTROL CIRCUIT TO BCM.</td>
<td>7. OPEN OR DEFECTIVE CIRCUIT BETWEEN ON / OFF RELAY CAVITY “C” AND BCM CONNECTOR TERMINAL #4C. OPEN OR DEFECTIVE CIRCUIT BETWEEN WIPER SWITCH TERMINAL #5 AND BCM CONNECTOR TERMINAL #5B. DEFECTIVE BCM. IF NOT OK, REPAIR CIRCUIT(S) OR REFER TO BCM DIAGNOSTIC PROCEDURES.</td>
</tr>
<tr>
<td></td>
<td>8. OPEN OR DEFECTIVE MOTOR GROUND CIRCUIT.</td>
<td>8. OPEN OR DEFECTIVE CIRCUIT BETWEEN WIPER MOTOR CONNECTOR GROUND TERMINAL #5 AND LEFT HEADLAMP GROUND #5 OR ENGINE GROUND #1 OR 2.</td>
</tr>
<tr>
<td></td>
<td>9. OPEN CIRCUIT IN MOTOR.</td>
<td>9. CHECK FOR OPEN CIRCUIT IN MOTOR BETWEEN LO SPEED TERMINAL #2 AND GROUND TERMINAL #5 OR BETWEEN HI SPEED TERMINAL #1 AND GROUND TERMINAL #5. IF NOT OK, REPLACE WIPER MOTOR.</td>
</tr>
<tr>
<td></td>
<td>10. STRIPPED GEARS IN MOTOR.</td>
<td>10. APPLY BATTERY VOLTAGE TO MOTOR HI SPEED OR LO SPEED CIRCUIT. IF MOTOR RUNS AND OUTPUT CRANK RUNS INTERMITTENTLY OR DOES NOT RUN, REPLACE MOTOR.</td>
</tr>
<tr>
<td></td>
<td>11. SEIZED MOTOR BEARINGS.</td>
<td>11. APPLY BATTERY VOLTAGE TO MOTOR HI SPEED OR LO SPEED CIRCUIT. IF MOTOR DOES NOT RUN, REPLACE MOTOR.</td>
</tr>
</tbody>
</table>
### REMOVAL AND INSTALLATION

**MULTI-FUNCTION SWITCH**

**REMOVAL**

1. Open hood and disconnect the negative battery cable remote terminal from the remote battery post (Fig. 6).
2. Remove tilt lever.
3. Remove both upper and lower steering column shrouds.
4. Remove multi-function switch mounting screws and connectors (Fig. 7).

**INSTALLATION**

For installation, reverse the above procedures.
(1) Tighten multi-function switch retaining screws to 17 in. lbs. (2 N·m) torque.

**WASHER FLUID LEVEL SENSOR**

**REMOVAL**

(1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post (Fig. 6).

(2) Hoist vehicle.

(3) Remove front fascia as necessary (left side only and use a 2x4 to prop left edge of fascia away from body). Refer to Group 23, Body for Removal and Installation procedures.

(4) Disconnect the wire connector from the reservoir fluid level sensor.

(5) Gently pry sensor away from reservoir and out of grommet. Care must be taken not to puncture reservoir (Fig. 10).

(6) Remove rubber grommet from reservoir and throw away.

**INSTALLATION**

For installation, reverse the above procedures.

**NOTE:** Use a new mounting grommet when installing a new sensor assembly.

Assure “flat” of sensor is aligned under the “ridge” of reservoir and that sensor connector is facing down in the fully seated position.

**WASHER FLUID LEVEL SENSOR (INTREPID)**

**REMOVAL**

(1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post.

(2) Remove the Washer Reservoir. Refer to Washer Reservoir Removal and Installation in this section.

(3) Gently pry sensor away from reservoir and out of grommet. Care must be taken not to puncture reservoir (Fig. 10).

(4) Remove rubber grommet from reservoir and throw away.

**INSTALLATION**

For installation, reverse the above procedures.

**NOTE:** Use a new mounting grommet when installing a new sensor assembly.

Assure “flat” of sensor is aligned under the “ridge” of reservoir and that sensor connector is facing down in the fully seated position.

**WASHER HOSE**

**REMOVAL**

(1) Remove left headlamp module. Refer to Group 8L, Lamps for Removal and Installation procedures.

(2) Remove underhood silencer pad clips only along left rear of hood.

(3) Carefully pull silencer pad away from hood.

(4) Disconnect “Y” connector from hood.

(5) Disconnect right and left hood nozzle hoses at “Y” connector.
REMOVAL AND INSTALLATION (Continued)

(6) Disconnect hose clips from hood, tower to tower beam, and fender beam.
(7) Disconnect washer hose from top of reservoir and from washer pump discharge port.
(8) Carefully pull washer hose up through engine compartment.

INSTALLATION

For installation, reverse the above procedures. Be sure to test and check system for leaks and pinched or kinked hoses.

WINDSHIELD WASHER NOZZLES

REMOVAL

(1) Using a plastic body filler spreader or equivalent (credit card), gently place it underneath the front of the washer nozzle. Be careful not to damage the hood seal underneath the nozzle.
(2) Rock the nozzle back and forth slightly to release it from the hood panel.
(3) Pull the nozzle out of the hood panel far enough to disconnect the hose.

INSTALLATION

(1) For installation, reverse the above procedures.
(2) After connecting hose, check for proper system function and to assure leak free connections by actuating the washer system switch from inside of vehicle.

WASHER RESERVOIR

REMOVAL

(1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post.
(2) Hoist vehicle.
(3) Remove front fascia as necessary (left side only and use a 2x4 to prop left edge of fascia away from body). Refer to Group 23, Body for Removal and Installation procedures.
(4) Disconnect the wire connectors from the reservoir pump and float sensor.
(5) Disconnect the washer hose and block the liquid outlet to prevent the liquid from running out of the reservoir.
(6) Reach up behind the washer reservoir and pull the filler tube off the rear of the reservoir.
(7) Remove four mounting bolts to washer reservoir (Fig. 9).

INSTALLATION

(1) Connect washer hose, filler tube, and wire connectors to reservoir.
(2) Install reservoir retaining bolts. Torque bolts to 80 to 124 in. lbs. (9 to 14 N·m).
(3) Reconnect the negative battery cable remote terminal.

WASHER RESERVOIR (INTREPID)

REMOVAL

(1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post.
WASHER RESERVOIR FILLER TUBE

REMOVAL
1. Open hood and disconnect the negative battery cable remote terminal from the remote battery post.
2. Hoist vehicle.
3. Remove the four retaining bolts to the washer reservoir (Fig. 9).
4. Disconnect the pump and sensor wire connectors.
5. Disconnect the washer hose.
6. Disconnect the washer filler hose.
7. Pivot the inboard side of the reservoir forward and lift out of vehicle.
8. If replacing the reservoir, you must transfer the pump and sensor to the new reservoir (Fig. 10).

NOTE: When transferring pump and sensor, make sure to use a new grommet for proper sealing and to avoid leaks.

INSTALLATION
For installation, reverse the above procedures.

NOTE: Replace/refill washer fluid after filler tube replacement.

WASHER RESERVOIR PUMP

REMOVAL
1. Open hood and disconnect the negative battery cable remote terminal from the remote battery post.
2. Hoist vehicle.

INSTALLATION

(1) Connect washer hose, filler tube, and wire connectors to reservoir.
(2) Install reservoir retaining bolts. Torque bolts to 80 to 124 in. lbs. (9 to 14 N·m).
(3) Reconnect the negative battery cable remote terminal.
REMOVAL AND INSTALLATION (Continued)

(3) Remove front fascia as necessary (left side only and use a 2x4 to prop left edge of fascia away from body). Refer to Group 23, Body for Removal and Installation procedures.

(4) Disconnect the wire connectors from the reservoir pump.

(5) Gently pry pump away from reservoir and out of grommet. Care must be taken not to puncture reservoir (Fig. 10).

(6) Remove rubber grommet from reservoir and throw away.

INSTALLATION

For installation, reverse the above procedures. Use new rubber grommet with new pump. Assure pump is fully seated into reservoir.

NOTE: Replace/refill washer fluid after reservoir pump replacement.

WIPER ARM AND BLADE

REMOVAL

(1) Cycle the wiper arm/blades into PARK position and turn ignition OFF.

(2) Using a trim stick (special tool #C-4755), gently pry up on the wiper arm retaining nut cap and remove.

(3) Remove the retaining nut from the wiper arm pivot.

(4) Lift wiper arm to raise blade off glass and remove the arm from the pivot using a rocking motion and remove from vehicle.

INSTALLATION

For installation, reverse the above procedures. Refer to Wiper Arm Adjustment in this section for adjustment procedures.

WIPER BLADE

REMOVAL

(1) Lift wiper arm to raise blade off glass.

(2) Remove blade assembly from arm by pushing release tab under arm tip and slide blade away from arm tip (Fig. 12) and (Fig. 13). The vertebra is curved on the right blade only. Install with the curve matching the shape of the windshield.

(3) Gently place wiper arm tip on glass surface.

INSTALLATION

For installation reverse the above procedures.

NOTE: The vertebra is curved on right side only. Install with curve matching shape of windshield.

WIPER BLADE ELEMENT

REMOVAL

(1) Remove wiping element from blade assembly by grasping and pulling stopper of blade element out of end claw together with vertebra (metal rails).

(2) Remove wiping element and vertebra by sliding them out of claws.

(3) Remove vertebra from wiping element.

INSTALLATION

For installation reverse the above procedures.

(2) Install right blade element vertebra to match the shape of the windshield. Install vertebra with curve down.

(3) Install left blade element vertebra flat.

(4) Check that blade element and vertebra are through all the claws and the final claw is locked in the stopper. Assure element locked end is closest to wiper system pivot.
REMOVAL AND INSTALLATION (Continued)

WIPER FRAME ASSEMBLY

REMOVAL

(1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post.
(2) Remove driver and passenger side wiper arms. Refer to Wiper Arm Removal and Installation procedures in this section.
(3) Remove nine screws to cowl screen panel. Refer to Group 23, Body for Removal and Installation procedures.
(4) Remove wiper module mounting bolt located on top of the tower to tower beam.
(5) Remove eight bolts to Tower to Tower (crosscar) support (Fig. 15). Refer to Group 23, Body for Removal and Installation procedures.
(6) Remove three retaining bolts to windshield wiper module (Fig. 16).
(7) Lift wiper module away from vehicle body.

TRANSFER PARTS

(1) Transfer wiper module grommets to new module assembly (Fig. 17).
(2) Remove one nut to crank arm and remove from motor (Fig. 19).
(3) Remove three retaining bolts from wiper motor (Fig. 19).
(4) Remove wiper motor from wiper module assembly. Install onto new wiper module assembly. Refer to Wiper Motor Removal and Installation procedures in this section.

INSTALLATION

For installation, reverse the above procedures.
(1) Start rear outboard screw first, rear inboard screw second, and forward outboard screw last.
(2) Start all module mounting screws and bolt by hand before torquing to specifications.
(3) Assur wiper module pivots are in “PARK” position cycling the switch “ON” and “OFF” with engine off prior to installing arms and blades.
REMOVAL AND INSTALLATION (Continued)

CAUTION: KEEP HANDS CLEAR OF CYCLING WIPER MODULE LINKAGE.

WIPER LINK ARMS

There are two servicable link assemblies in the wiper module. The Master Link connects the motor output crank to the driver side pivot. The Slave link connects the driver side pivot to the passenger side pivot. To service these links, remove the wiper module from the vehicle.

The wiper module mounting grommets can be serviced anytime the module is removed from the vehicle. Replace module mounting grommets if they are broken, cracked, deteriorated, or defective.

REMOVAL

(1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post.
(2) Remove wiper module from vehicle. Refer to Wiper Module Removal and Installation in this section.
(3) Disconnect wiper module slave link from pivot levers by carefully using a ball and socket wedge. Do not damage ball and socket or seal when using wedge.
(4) Disconnect wiper module master link from pivot lever and motor crank by carefully using a ball and socket wedge. Do not damage ball and socket or seal when using wedge.
(5) Remove module linkage mounting grommets.

NOTE: Grommet eyelet may need to be removed from rubber isolator on rear inboard and forward outboard mounting grommets only during disassembly.
(6) Remove “U” nut from body (if necessary).

INSTALLATION

For installation, reverse the above procedures.

NOTE: When assembling master link or slave link to module frame, use channel locks wrapped in cloth to prevent damage to ball and socket joint. Apply light pressure to assemble socket to ball.

WIPER MOTOR

The Wiper Module Assembly must be removed to service the wiper motor.

REMOVAL

(1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post.
(2) Remove wiper module assembly. Refer to Wiper Module Assembly Removal and Installation in this section.
(3) Disconnect wiper module master link from motor crank by carefully using a ball and socket wedge. Do not damage ball and socket or seal when using wedge.
(4) Remove three retaining bolts from wiper motor (Fig. 19).

INSTALLATION

For installation, reverse the above procedures.

Fig. 18 Wiper Link Arms
1 – MASTER LINK ARM
2 – SLAVE LINK ARM
3 – WINDSHIELD WIPER FRAME ASSEMBLY

Fig. 19 Wiper Motor Retaining Bolts
1 – CRANK ARM NUT
2 – WIPER MOTOR RETAINING BOLTS

(5) Remove wiper motor from wiper module assembly.

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CLEANING AND INSPECTION

WIPER BLADES
Wiper blades exposed to the weather for a long period of time tend to lose their wiping effectiveness. Periodic cleaning of the wiper blade is recommended to remove the accumulation of salt and road grime. The wiper blades, arms and windshield should be cleaned with a sponge or cloth and a mild detergent or nonabrasive cleaner. If the wiper blades continue to streak or smear, they should be replaced. The wiper blade should run smoothly across the windshield in both directions. The wiper blade should slightly roll over center when the blade reverses direction. A wiper blade element that has lost flexibility will not roll over properly. Or a wiper arm that has lost spring tension will cause the blade to skip or chatter across the windshield. If the wiper blades are new and the wiper arm spring tension is OK and a chattering sound is emitted from the wiper(s), the wiper blade is not rolling over center. If this condition exists, refer to the Wiper Arm Adjustment procedure in this section.

ADJUSTMENTS

WASHER NOZZLE
Right and left nozzles have three adjustable spray juts each.

CAUTION: DURING ADJUSTMENT, BE CAREFUL NOT TO DAMAGE INSIDE OPENING OF JET. ASSURE PROPER VENTILATION OF ENGINE EXHAUST.

(1) Using a safety pin, adjust each nozzle jet as required to windshield washer spray pattern.
(2) Each adjustment of the jet should be checked by actuating the washer system switch from inside of vehicle.
(3) After adjustment, a final check of the spray pattern should be done by actuating the washer system switch from inside the vehicle with engine idling.

This model is equipped with two hood mounted washer nozzles. Each nozzle emits three streams into the wiper sweep pattern. If nozzle performance is unsatisfactory they can be adjusted. To adjust it is recommended to use a safety pin. Insert a safety pin into the nozzle ball and adjust the spray pattern on the windshield as shown in (Fig. 20). The right and left nozzles are identical.

WIPER ARM ADJUSTMENT

The wiper system does not have an indexing feature designed into the arm and blade assembly. The arms and blades are positioned to “tic” marks on the windshield and secured. This design allows for a tighter fit between wiper arm and pivot shaft.

(1) Cycle the wiper motor into the PARK position.

CAUTION: AFTER CYCLING, TURN WIPER SWITCH AND IGNITION SWITCH TO OFF.

(2) Check drivers side blade tip position is on or between two “tic” marks on the windshield. Check that passenger side blade edge is on or near one “tic” mark on windshield.
(3) If requirements are not met, check for and repair as necessary:
   • bent arm or blades
   • loose or worn wiper module links
   • loose wiper module
   • defective module mounting grommets
   • defective wiper parking system
   • etc
(4) Position arm and blade to “tic” marks on windshield as described above and secure the wiper arm retaining nuts.
(5) Operate system and verify proper operation. If problem still exists, refer to Wiper System Test in this section.