

WINDSHIELD WIPERS AND WASHERS

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GENERAL INFORMATION

INTRODUCTION

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

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 has a range of 1/2 to 18 seconds. The wiper delay times will double to a range of 1 to 36 seconds when the vehicle speed is less than 10 mph. The delay is controlled by a variable resistor in the wiper switch and the Body Control Module (BCM). The BCM controls the timing for the wiper ON/OFF, as well as the wiper HI/LO relay.

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 scan tool (DRB), refer to the Body Chassis Diagnostic Manual for the procedures.

DESCRIPTION AND OPERATION

WINDSHIELD WASHERS

All models are equipped with electric operated windshield washer pumps.

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.

The electric pump assembly is mounted with a grommet directly to the reservoir. 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 wind-

DESCRIPTION AND OPERATION (Continued)

shield. 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

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 left wiper blade length is 600 mm. The right wiper blade length is 550 mm.

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. 1). 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 switch, first disconnect the switch wires from the body wiring in the steering column (Fig. 2). Using an ohmmeter, test for continuity between the terminals of the switch, as indicated in the following continuity table. The identity of each terminal is shown in (Fig. 3).

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.

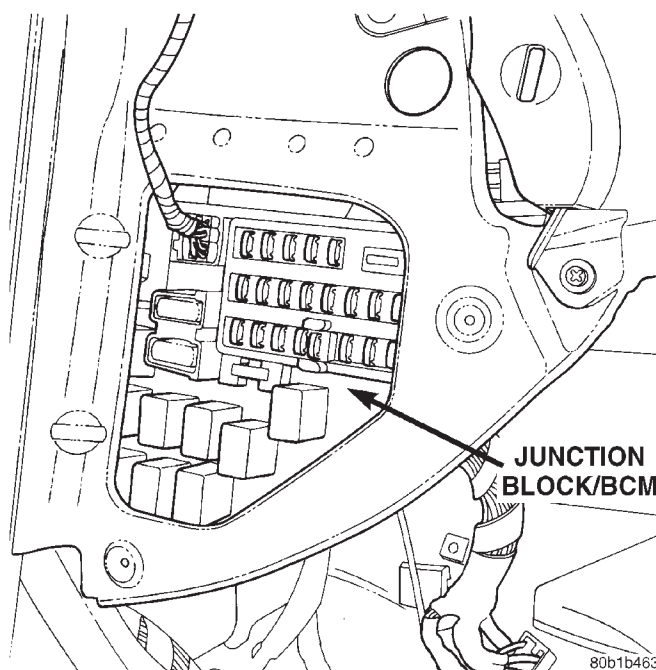


Fig. 1 Body Control Module Location

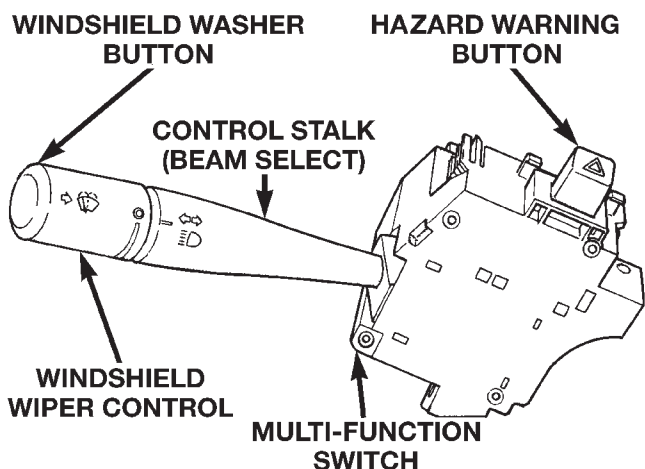
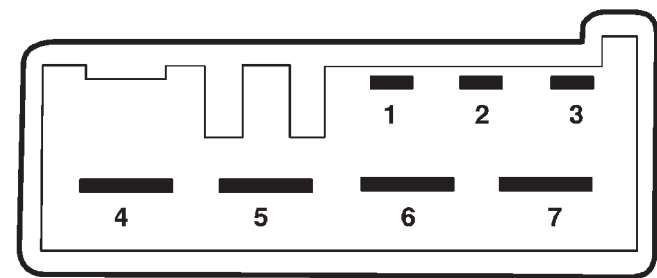


Fig. 2 Multi-Function Switch

DIAGNOSIS AND TESTING (Continued)



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Fig. 3 Multi-Function Switch Pin Call-Out
WINDSHIELD WIPER/WASHER SWITCH
RESISTANCE TEST

SWITCH POSITION		TERMINALS	RESISTANCE VALUE
OFF		PINS 1 TO 3	OPEN 300 K OHMS
DELAY LEVEL	1	PINS 1 TO 3	9.72 K OHMS
	2	PINS 1 TO 3	8.22 K OHMS
	3	PINS 1 TO 3	6.61 K OHMS
	4	PINS 1 TO 3	5.12K OHMS
	5	PINS 1 TO 3	3.67K OHMS
	6	PINS 1 TO 3	2.22K OHMS
LOW		PINS 1 TO 3	1.02 K OHMS
HIGH		PINS 1 TO 3	0.51K OHMS
WASH		PINS 1 TO 2	0 OHMS

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.

DIAGNOSIS AND TESTING (Continued)

WINDSHIELD WASHER TEST

CONDITION	POSSIBLE CAUSE	CORRECTION
WASHER POWER FEED FUSE OPEN	1. JUNCTION BLOCK FUSE #5 BLOWN.	CHECK FUSE #5. REPLACE IF NOT OK.
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 WIPER / 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 WIPER / 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.

DIAGNOSIS AND TESTING (Continued)

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.	1. 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.
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)

CONDITION	POSSIBLE CAUSE	CORRECTION
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.

WINDSHIELD WIPER SYSTEM CONDITIONS

The following is a list of general wiper motor system problems and tests that are to be performed to locate the faulty part, and the corrective action to be taken. When installing harness connector to motor connector on vehicle, assure motor terminals are not bent causing an open circuit to motor.

MOTOR WILL NOT RUN IN ANY SWITCH POSITION

(1) Check fuse 5, in the Junction Block and fuse M in the Power Distribution Center and. Refer to Group 8W, Wiring Diagrams for pin call outs.

(a) If fuse(s) are good, go to Step 3.

(b) If fuse(s) are defective replace, and check motor operation in all switch positions.

(c) If motor is still inoperative and the fuse does not blow, go to Step 3.

(d) If replacement fuse blows, go to Step 12.

(2) Disconnect motor wire harness connector.

(3) Check the wiper motor low speed. Using two jumper wires, connect one jumper wire between the battery positive jump start terminal and Pin 2 on the wiper motor connector. Connect the other jumper wire to ground and Pin 5 on the wiper motor connector. Check the wiper motor high speed, connect the positive jumper wire to Pin 1 on the wiper motor con-

connector. Connect the negative jumper wire to Pin 5 on the wiper motor connector.

(a) If motor runs, go to Step 5.

(b) If motor does not run, high or low speed replace the wiper motor.

(4) Using an ohmmeter, check for good ground at Pin 5 of the wiper motor wire harness connector. If not OK, repair the ground circuit as necessary. If OK, go to Step 6.

(5) Place the wiper switch in the ON position. Using a voltmeter, check for battery voltage at terminal D and A of the intermittent wiper relay in the Power Distribution Center. If no voltage check fuse M. If OK, go to Step 7. If not OK, repair as necessary.

(6) Using an ohmmeter, check from terminal D of the HI-LO wiper relay to Pin 1 of the motor wire connector for continuity. Check from terminal E of the HI-LO wiper relay to Pin 2 of the motor wire connector for continuity. If OK, go to Step 8. If not repair as necessary.

(7) Using an ohmmeter, check for continuity between the HI-LO wiper relay and the intermittent wiper relay. Check from terminal B of the HI- LO wiper relay to terminal B of the intermittent wiper relay. If OK, check for faulty relays and go to Step 9. If not repair as necessary.

DIAGNOSIS AND TESTING (Continued)

(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 11. 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) 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) 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 3.

(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 3.

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

MOTOR WILL RUN AT HIGH SPEED, BUT NOT MOVE AT LOW SPEED. MOTOR WILL RUN AT LOW SPEED, BUT WILL NOT MOVE AT HIGH SPEED

(1) Disconnect motor connector.

(2) If motor will not run on low speed, connect a jumper wire between battery positive jump start terminal and Pin 2 on the wiper motor connector. Con-

nect a second jumper wire between ground and Pin 5 on the wiper motor wire harness connector.

(a) If motor runs, go to Step 4.

(b) If motor does not run, replace the motor.

(3) If motor will not run on high speed, connect a jumper wire between battery positive terminal and Pin 1. Connect a second jumper wire between ground and Pin 5 of the motor connector.

(a) If motor runs, go to Step 5.

(b) If motor does not run, replace the motor.

(4) If wipers will not run at low speed, using an ohmmeter, check for open circuit. Check between terminal E of the HI-LO wiper relay to Pin 2 of the wiper motor wire harness connector for continuity. If OK, go to Step 6. If not repair circuit as necessary.

(5) If wiper will not run at the high speed, using an ohmmeter, check for an open circuit. Check between terminal D of the HI-LO wiper relay and Pin 2 of the wiper motor wire harness connector for continuity. If OK, go to Step 7. If not repair circuit as necessary.

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

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 4. 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 4. If not OK, repair as necessary.

(3) Check wiper switch.

(4) Check for binding linkage.

(5) Refer to MOTOR RUNS SLOWLY AT ALL SPEEDS.

DIAGNOSIS AND TESTING (Continued)

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) Check circuit from terminal 3 of C3 bone 12-way connector to Pin 4 of the wiper motor harness connector for an open. If open circuit, repair as necessary.

(6) Using a voltmeter, connect positive lead to terminal 8 of the C3 black 12-way connector. Connect negative lead to ground. If voltmeter reads greater than 0 volts, check wiper switch and wiring.

(7) Using a voltmeter, 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.

WIPER WILL RUN CONTINUOUSLY WITH SWITCH IN THE INTERMITTENT POSITION. WHEN COLUMN SWITCH IS TURNED OFF, WIPERS STOP WHEREVER THEY ARE, WITHOUT RETURNING TO PARK POSITION.

(1) Using an ohmmeter, check for ground at Pin 4 on the wiper motor connector. If grounded, replace motor.

(2) Using an ohmmeter, with the wiper motor in the PARK position, check for continuity between Pin 5 and Pin 4 on the wiper motor connector. If continuous continuity, go to Step 4. If not OK, replace motor.

(3) Disconnect the wiper motor wire harness connector and the BCM C3 bone 12-way connector. Check for continuity between Pin 1 of the wiper motor wire harness connector and terminal 3 of the BCM C3 bone 12-way connector. If no continuity, repair as necessary. If continuity is OK, test the wiper motor.

WIPERS DO NOT RUN WHEN WASHER MOTOR IS ENGAGED

(1) Disconnect the C2 black 12-way connector from the BCM.

(2) Using a voltmeter, connect positive lead to terminal 7 of the C2 black 12-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.

DIAGNOSIS AND TESTING (Continued)

WIPER MOTOR TEST

CONDITION	POSSIBLE CAUSE	CORRECTION
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.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSE	CORRECTION
WIPER WILL NOT PARK	1. OPEN WIPER MOTOR PARK CIRCUIT. 2. DEFECTIVE BCM. 3. DEFECTIVE WIPER MOTOR.	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.
WIPER WILL NOT RUM TO PARK AFTER IGNITION OFF	1. DEFECTIVE BCM.	1. REFER TO BCM DIAGNOSTIC PROCEDURES.
WIPER RUNS THRU PARK POSITION ON WINDSHIELD	1. DEFECTIVE ON / OFF RELAY. 2. OPEN ON / OFF RELAY GROUND CIRCUIT.	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.
WIPER RUNS CONTINUOUSLY OR INTERMITTENTLY IN LOW SPEED WITH IGNITION OR ACCESSORY ON AND WIPER SWITCH OFF	1. DEFECTIVE ON / OFF RELAY. 2. DEFECTIVE CONTROL CIRCUIT TO BCM. 3. DEFECTIVE BCM.	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.
WIPER MOTOR POWER FEED FUSE OPEN	1. POWER DISTRIBUTION CENTER (PDC) FUSE "M" DEFECTIVE.	1. CHECK FUSE "M". IF NOT OK, REPLACE FUSE.
WIPER SWITCH POWER FEED FUSE OPEN	1. JUNCTION BLOCK FUSE #5 DEFECTIVE.	1. CHECK FUSE #5. IF NOT OK, REPLACE FUSE.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSE	CORRECTION
WIPER SYSTEM WILL NOT RUN	1. PDC FUSE "M" BLOWN. 2. JUNCTION BLOCK FUSE #5 BLOWN. 3. ON / OFF RELAY DEFECTIVE. 4. MOTOR CONNECTOR DEFECTIVE (LOOSE, BENT OR CORRODED). 5. OPEN POWER CIRCUIT TO MOTOR. 6. BCM CONNECTORS "B" AND "C" (LOOSE, BENT OR CORRODED). 7. OPEN OR DEFECTIVE CONTROL CIRCUIT TO BCM. 8. OPEN OR DEFECTIVE MOTOR GROUND CIRCUIT. 9. OPEN CIRCUIT IN MOTOR. 10. STRIPPED GEARS IN MOTOR. 11. SEIZED MOTOR BEARINGS.	1. SHORT CIRCUIT BETWEEN PDC FUSE "M" AND ON / OFF RELAY CAVITY "A" OR "D" OR HI / LO RELAY CAVITY "A". SHORT CIRCUIT IN ON / OFF RELAY OR HI / LO RELAY. SHORT CIRCUIT BETWEEN ON / OFF RELAY CAVITY "B" AND HI / LO RELAY CAVITY "B". IF NOT OK, REPLACE ON / OFF RELAY OR REPAIR CIRCUIT(S). 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. 3. CHECK WITH A KNOWN GOOD RELAY. IF NOT OK, REPLACE RELAY. 4. CHECK MOTOR CONNECTOR FOR BENT, LOOSE, OR CORRODED CONNECTOR. 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). 6. CHECK BCM CONNECTORS "B" AND "C" FOR BENT, LOOSE, OR CORRODED CONNECTORS. 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. 8. OPEN OR DEFECTIVE CIRCUIT BETWEEN WIPER MOTOR CONNECTOR GROUND TERMINAL #5 AND LEFT HEADLAMP GROUND #5 OR ENGINE GROUND #1 OR 2. 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. 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. 11. APPLY BATTERY VOLTAGE TO MOTOR HI SPEED OR LO SPEED CIRCUIT. IF MOTOR DOES NOT RUN, REPLACE MOTOR.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSE	CORRECTION
WIPER SYSTEM MAKES REVERSAL NOISE	1. LOOSE ARM TO BLADE CONNECTION. 2. LOOSE MASTER LINK. 3. LOOSE SLAVE LINK. 4. LOOSE LINKAGE PIVOT(S). 5. LOOSE MOTOR CRANK. 6. EXCESSIVE MOTOR GEARBOX "BACKLASH" OR LOOSE ARMATURE.	1. INSPECT CONNECTION FOR DAMAGE, BENDING, EXCESSIVE WEAR. REPLACE ARM OR BLADE IF NOT OK. 2. REPLACE MASTER LINK IF NOT OK. 3. REPLACE SLAVE LINK IF NOT OK. 4. REPLACE LINKAGE FRAME IF NOT OK. 5. TIGHTEN CRANK NUT TO SPECIFICATION. 6. REPLACE WIPER MOTOR.
WIPER ARM(S) CHATTER ON WINDSHIELD	1. PERMANENT HI OR LO TEMPERATURE SET OF BLADE ELEMENT EDGE. 2. BENT OR DAMAGED BLADE STRUCTURE. 3. BENT OR DAMAGED ARM.	1. INSPECT RUBBER ELEMENT FOR PERMANENT SET. IF NOT OK, REPLACE RUBBER ELEMENT. 2. INSPECT BLADE. IF NOT OK, REPLACE BLADE. 3. INSPECT ARM. IF NOT OK, REPLACE ARM.
DRIVER AND / OR PASSENGER ARM WILL NOT CYCLE (OPERATE)	1. LOOSE ARM TO PIVOT SHAFT. 2. STRIPPED ARM TO PIVOT SHAFT.	1. CHECK ARM TO PIVOT SHAFT CONNECTION FOR LOOSENESS. TORQUE NUT TO SPECIFICATION. 2. CHECK ARM TO PIVOT SHAFT FOR STRIPPING. TORQUE NUT TO SPECIFICATION. IF NOT OK, REPLACE ARM.
DRIVER AND / OR PASSENGER ARM OR BLADE HITS COWL SCREEN OR WINDSHIELD MOLDINGS	1. ARM(S) OUT OF POSITION.	1. REMOVE ARM OFF PIVOT SHAFT, CYCLE MODULE TO PARK. REPOSITION ARM / BLADE TO LOCATION MARKS ON WINDSHIELD. SECURE ARM TO PIVOT SHAFT AND TORQUE TO SPECIFICATION.
WIPER BLADE(S) STREAK	1. CONTAMINATION ON BLADE ELEMENT OR WINDSHIELD. 2. BLADE ELEMENT DAMAGED.	1. CLEAN BLADE ELEMENT EDGE WITH MILD SOAP OR ALCOHOL AND WATER. CLEAN WINDSHIELD WITH MILD SOAP OR NON-ABRASIVE CLEANSER AND WATER. CHECK FOR PROPER WIPE QUALITY. IF NOT OK, REPLACE BLADE ELEMENT. 2. REPLACE BLADE ELEMENT.
POOR COLD TEMPERATURE WIPE QUALITY	1. NO WASHER FLUID FOR WASH / WIPE CYCLE. 2. POOR WINDSHIELD DEFROST PERFORMANCE. 3. PERMANENT HI OR LO TEMPERATURE SET OF BLADE ELEMENT EDGE. 4. LOW ARM FORCE	1. ADD WASHER FLUID TO RESERVOIR. 2. CHECK WINDSHIELD DEFROSTER FOR PROPER FUNCTION AND PERFORMANCE. 3. INSPECT RUBBER ELEMENT FOR PERMANENT SET. IF NOT OK, REPLACE RUBBER ELEMENT. 4. CHECK FOR PROPER ARM FORCE. IF NOT OK, REPLACE ARM.

REMOVAL AND INSTALLATION

MULTI-FUNCTION WIPER SWITCH

REMOVAL

(1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post (Fig. 4).

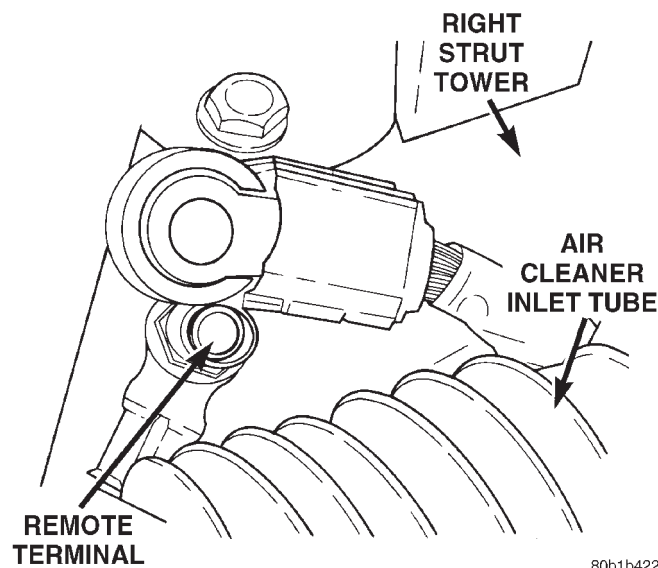
(2) Tilt the column up and remove the lower column shroud by unsnapping it from the upper shroud.

(3) Tilt the column down and remove the upper shroud (Fig. 5).

(4) Tilt the column up and remove the one steering column tilt lever screw at base of lever. Remove tilt lever and lower shroud.

(5) Using a screwdriver in place of the lever, tilt the column down. Remove the two mounting screws

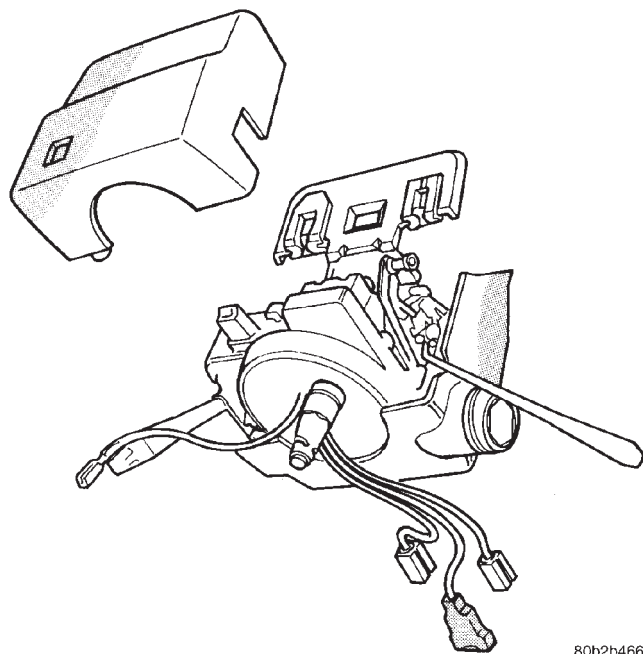
REMOVAL AND INSTALLATION (Continued)

**Fig. 4 Negative Battery Cable Remote Terminal**

on the switch and remove the switch. Remove the wiring from the hooks and disconnect the two electrical connections on the multi-function switch. Remove the multi-function switch.

INSTALLATION

For installation, reverse the above procedures. Torque the multifunction switch mounting screws to 17 in lbs. (2 N·m).

**Fig. 5 Upper Shroud Removal****WASHER FLUID LEVEL SENSOR****REMOVAL**

(1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post (Fig. 4).

(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. 8).

(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 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.

(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.

REMOVAL AND INSTALLATION (Continued)

WINDSHIELD WASHERS NOZZLES

RIGHT HOOD NOZZLE

REMOVAL

- (1) Remove the underhood silencer pad clips (only along the rear of hood).
- (2) Carefully pull silencer pad away from the hood.
- (3) Disconnect the right nozzle hose at the "Y" connector.
- (4) Disconnect hose from the two hose clips.
- (5) Using a long and narrow straight screwdriver, position tip against nozzle retention tab and apply sufficient force to disconnect nozzle from hood.
- (6) Pull nozzle and hose away from outside of hood.
- (7) Disconnect right hose clips from hood (if required).

INSTALLATION

- (1) For installation, reverse the above procedures.
- (2) During assembly of nozzle and hose to hood, gently pull on hose to assure hose is not kinked and nozzle body is securely snapped into position.
- (3) After connecting hose to "Y" connector, check for proper system function and to assure leak free connections by actuating the washer system switch from inside of vehicle.

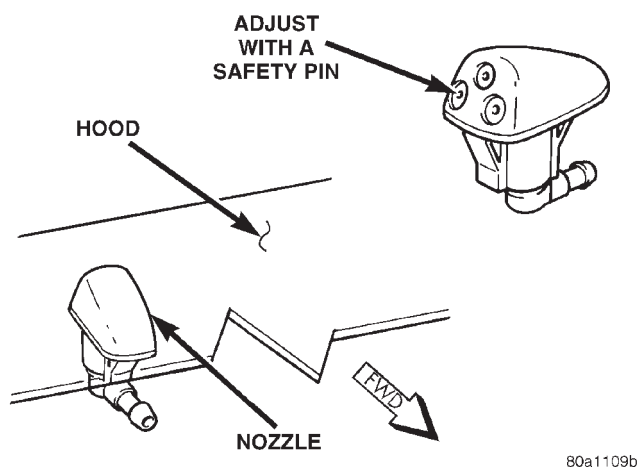


Fig. 6 Windshield Washer Nozzle

LEFT HOOD NOZZLE

REMOVAL

- (1) Remove underhood silencer pad clips only along left rear of hood.
- (2) Carefully pull silencer pad away from hood.
- (3) Disconnect left nozzle hose at "Y" connector.
- (4) Using a long and narrow straight screwdriver, position tip against nozzle retention tab and apply sufficient force to disconnect nozzle from hood.

- (5) Pull nozzle and hose away from outside of hood.

INSTALLATION

- (1) For installation, reverse the above procedures.
- (2) During assembly of nozzle and hose to hood, gently pull on hose to assure hose is not kinked and nozzle body is securely snapped into position.
- (3) After connecting hose to "Y" connector, 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 (Fig. 4).
- (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. 7).

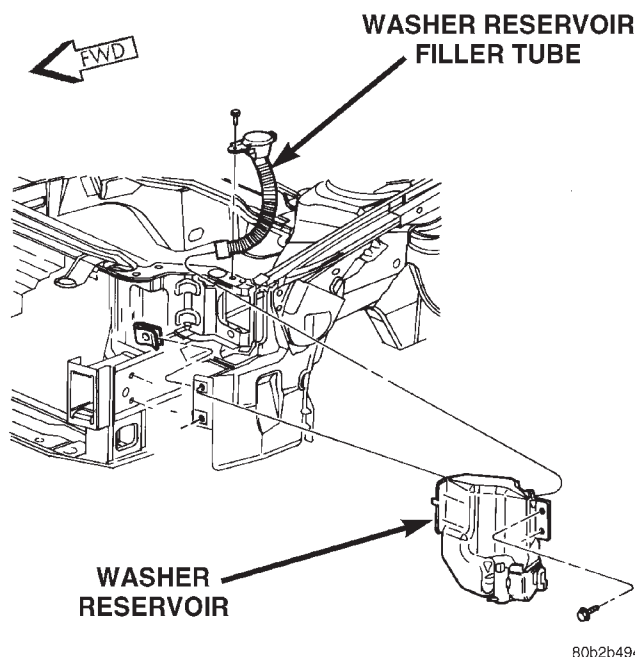
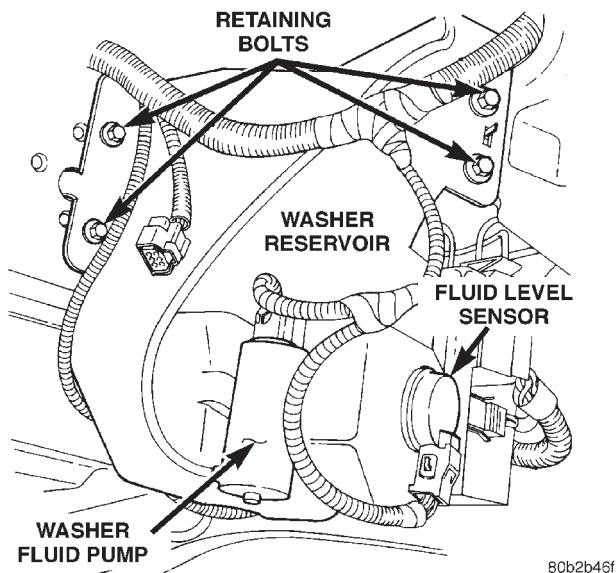


Fig. 7 Washer Reservoir Removal

REMOVAL AND INSTALLATION (Continued)

- (8) Remove washer reservoir from vehicle.
- (9) Transfer fluid level sensor, pump, and washer fluid to new reservoir (Fig. 8).

**Fig. 8 Washer Reservoir****INSTALLATION**

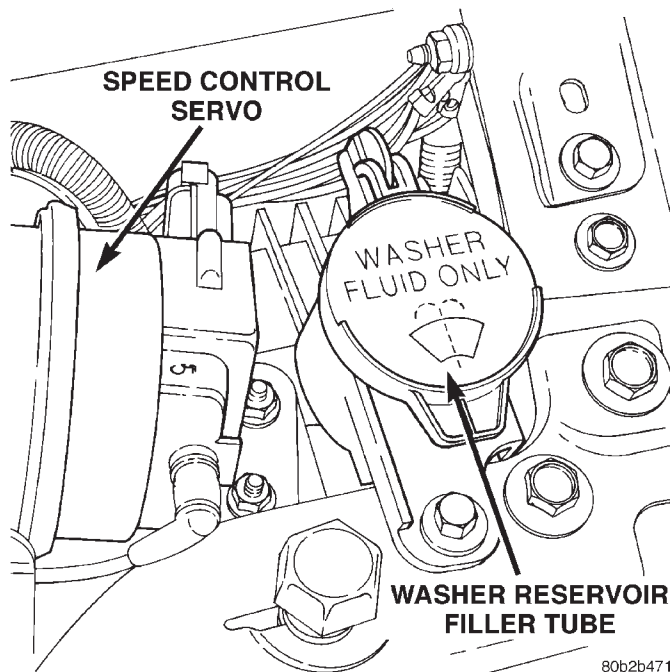
- (1) Connect washer hose, filler tube, and wire connectors to reservoir.
- (2) Install reservoir retaining bolts. Torque bolts to 80 to 124 in. lbs. (9 to 14 N·m).
- (3) Reconnect the negative battery cable remote terminal.

WASHER RESERVOIR FILLER TUBE**REMOVAL**

- (1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post (Fig. 4).
- (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) Reach up behind the washer reservoir and pull the filler tube off the rear of the reservoir.
- (5) Remove one screw attaching washer reservoir filler tube to upper radiator support (Fig. 9).
- (6) Pull filler tube and hose up through left fender and remove.

INSTALLATION

For installation, reverse the above procedures.

**Fig. 9 Washer Reservoir Filler Tube**

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 (Fig. 4).
- (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.
- (5) Gently pry pump away from reservoir and out of grommet. Care must be taken not to puncture reservoir (Fig. 8).
- (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.

REMOVAL AND INSTALLATION (Continued)

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. 10) and (Fig. 11). 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.

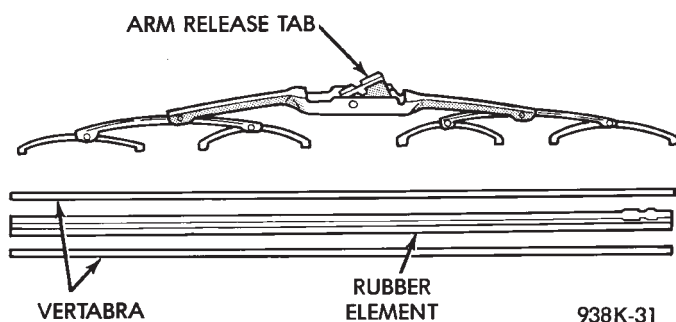


Fig. 10 Wiper Blade and Element

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.

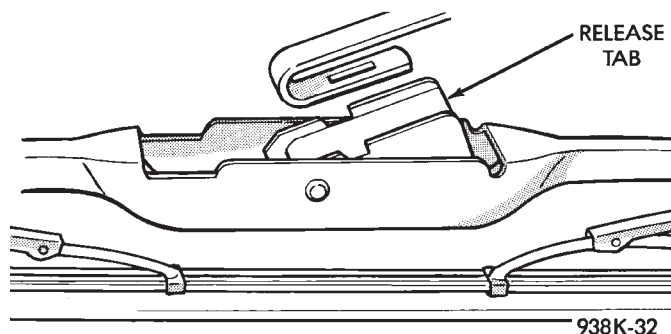


Fig. 11 Remove Blade from Arm

INSTALLATION

For installation reverse the above procedures.

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

(2) Install left blade element vertebra flat.

(3) 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.

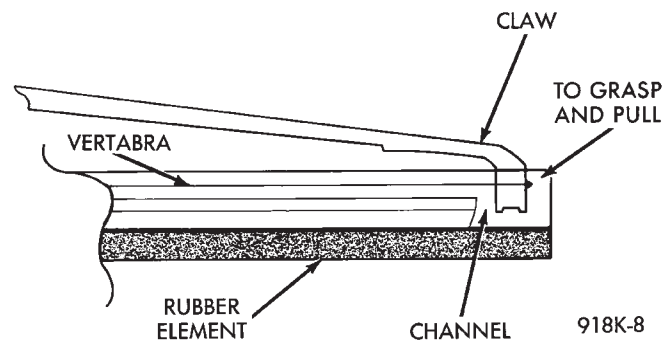


Fig. 12 Wiper Blade and Element

WIPER FRAME ASSEMBLY

REMOVAL

(1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post (Fig. 4).

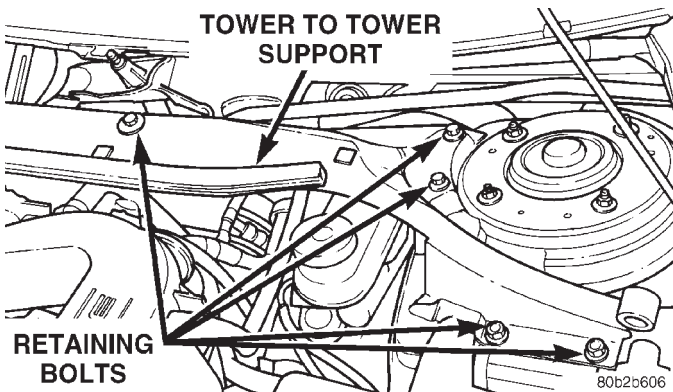
(2) Remove driver and passenger side wiper arms. Refer to Wiper Arm Removal and Installation procedures in this section.

(3) Remove nine screws to cowl screen panel. Refer to Group 23, Body for Removal and Installation procedures.

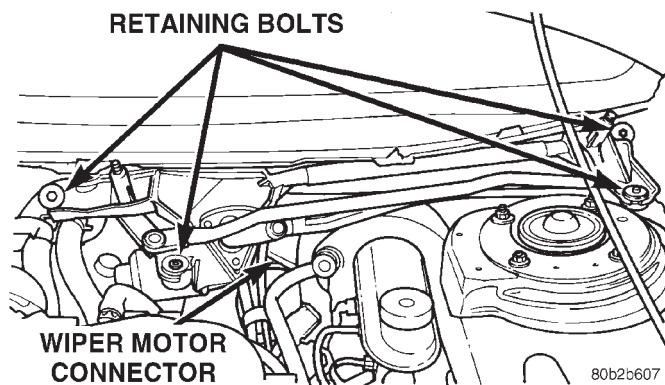
(4) Remove wiper module mounting bolt located on top of the tower to tower beam.

(5) Remove eight bolts to Tower to Tower (crosscar) support (Fig. 13). Refer to Group 23, Body for Removal and Installation procedures.

REMOVAL AND INSTALLATION (Continued)

**Fig. 13 Tower to Tower Support Removal**

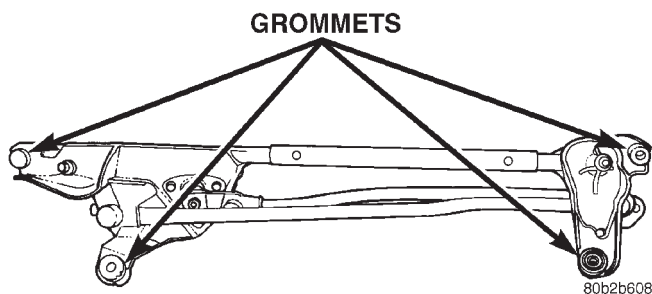
(6) Remove three retaining bolts to windshield wiper module (Fig. 14).

**Fig. 14 Wiper Module Retaining Bolts**

- (7) Lift wiper module away from vehicle body.
- (8) Disconnect one wire connector.
- (9) Remove windshield wiper module from vehicle.

TRANSFER PARTS

(1) Transfer wiper module grommets to new module assembly (Fig. 15).

**Fig. 15 Wiper Frame Grommets**

- (2) Remove one nut to crank arm and remove from motor (Fig. 17).
- (3) Remove three retaining bolts from wiper motor (Fig. 17).
- (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.

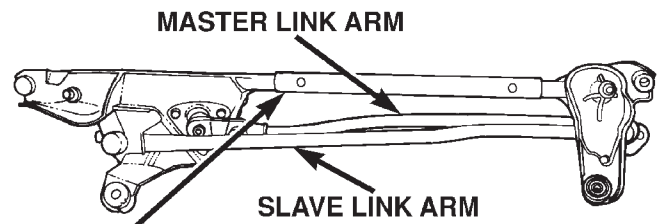
- (1) Start rear outboard screw first, rear inboard screw second, and forward outboard screw last.
- (2) Start all module mounting screws and bolt by hand before torquing to specifications.
- (3) Assure wiper module pivots are in "PARK" position cycling the switch "ON" and "OFF" with engine off prior to installing arms and blades.

CAUTION: KEEP HANDS CLEAR OF CYCLING WIPER MODULE LINKAGE.

WIPER LINK ARMS

There are two serviceable link assemblies in the wiper module. The Master Link connects the motor output crank to the driver's side pivot. The Slave link connects the driver's 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.

**WINDSHIELD WIPER FRAME ASSEMBLY****Fig. 16 Wiper Link Arms****REMOVAL**

- (1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post (Fig. 4).
- (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.

REMOVAL AND INSTALLATION (Continued)

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.

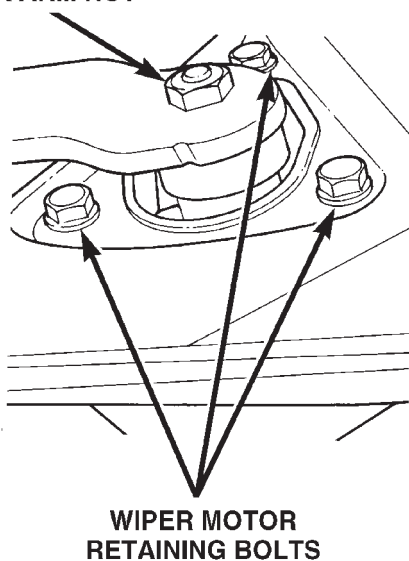
REMOVAL

(1) Open hood and disconnect the negative battery cable remote terminal from the remote battery post (Fig. 4).

(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. 17).

CRANK ARM NUT

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Fig. 17 Wiper Motor Retaining Bolts

- (5) Remove wiper motor from wiper module assembly.

INSTALLATION

For installation, reverse the above procedures.

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 jets 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.

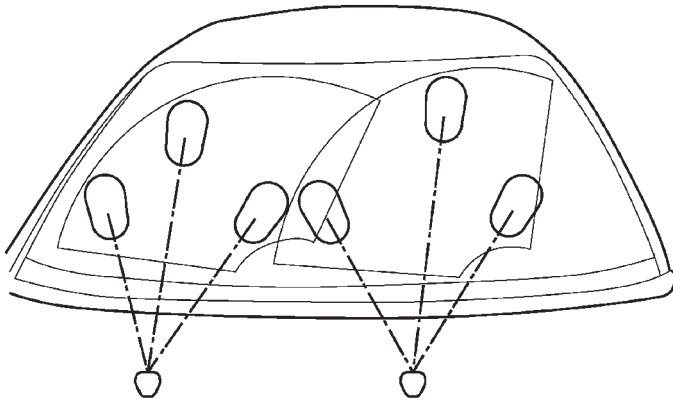
(2) Each adjustment of the jet should be checked by actuating the washer system switch from inside of vehicle.

(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

ADJUSTMENTS (Continued)

the windshield as shown in (Fig. 18). The right and left nozzles are identical.



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Fig. 18 Windshield Washer Spray Pattern

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.

