

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 only operated when the ignition switch is in the ACCESSORY or IGNITION run 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 done by a variable resistor in the wiper switch and two relays. One relay turns the wipers ON/OFF and the other changes the speeds.

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.

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 windshield. The hose assembly has two one way flow check valves 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 evenly distribute washer fluid across 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.

DESCRIPTION AND OPERATION (Continued)

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 right and left wipers are the same blade lengths. The blade lengths are 600 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 passenger compartment behind the right side kick panel (Fig. 1). If the Body Control Module is determined to be the problem, refer to Group 8E, Instrument Panels and Systems, for replacement procedures.

Whatever the problem, disconnect motor wire harness and clean the terminals. Connect harness and test motor.

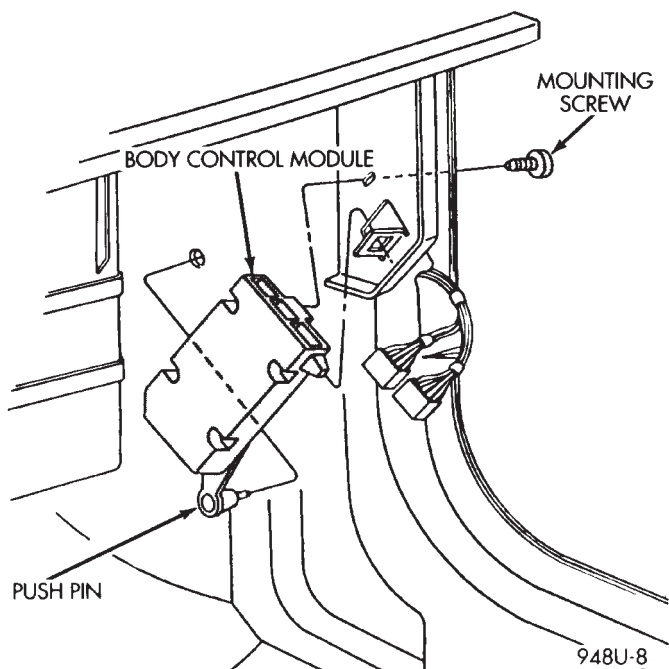


Fig. 1 Body Control Module Location

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 chart. 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 knob is pushed all the way in, the washer circuit will be completed.

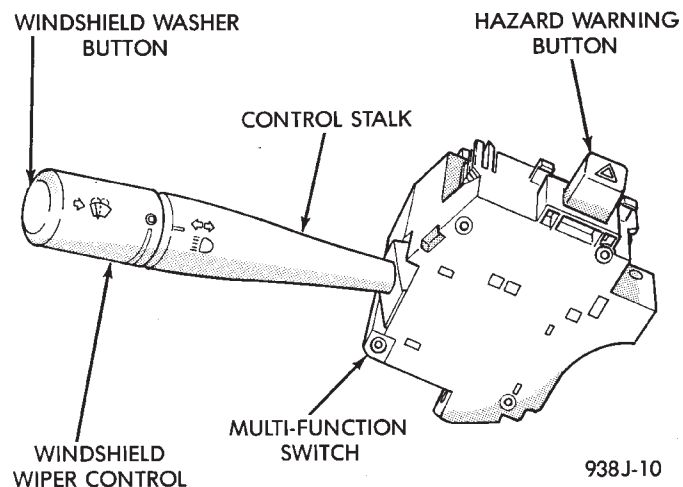
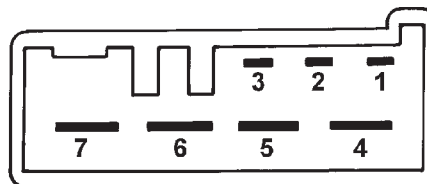


Fig. 2 Multi-Function Switch



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Fig. 3 Multi-Function Switch Terminals

RESISTANCE TEST		
SWITCH POSITION	TERMINALS	RESISTANCE VALUE
OFF	PINS 1 TO 3	OPEN > 300 K OHMS
	1	PINS 1 TO 3 9.72 K OHMS
DELAY	2	PINS 1 TO 3 8.22 K OHMS
LEVEL	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 3	OPEN
RESISTANCE AT MAXIMUM DELAY POSITION SHOULD BE		9,720 OHMS
RESISTANCE AT MINIMUM DELAY POSITION SHOULD BE		2,220 OHMS

DIAGNOSIS AND TESTING (Continued)

Condition	Possible Cause	Correction
Pump runs no fluid flowing.	(1) No fluid in the reservoir. (2) Nozzle plugged or frozen. (3) Broken, loose or pinched hose. (4) Faulty pump.	(1) Fill reservoir. (2) Thaw and check flow if blocked replace as necessary. (3) Check flow through hose connections. (4) Apply battery voltage to motor terminals, replace if pump does not run.
System operates intermittently.	(1) Loose wire connection. (2) Faulty switch.	(1) Check wire connections. (2) Disconnect wire harness use voltmeter to check switch.
System output is low.	(1) Pinched hose. (2) Hose blocked.	(1) Check flow through hose connection. (2) Disconnect hose at nozzle and Y connector check for flow. Replace as necessary.

Fig. 4 Windshield Washer Diagnosis**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 Diagnosis Chart (Fig. 4).

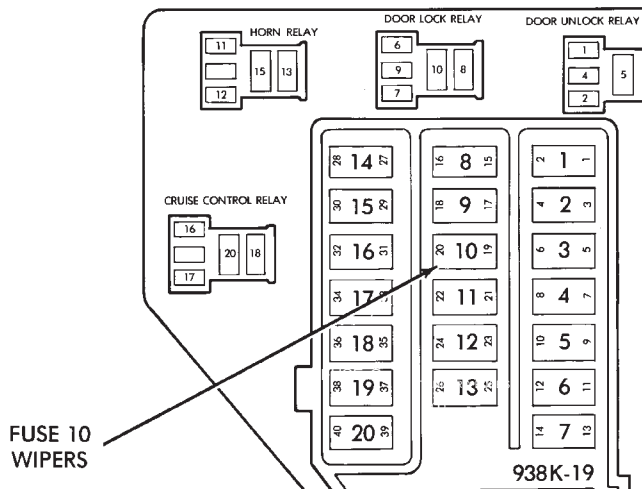
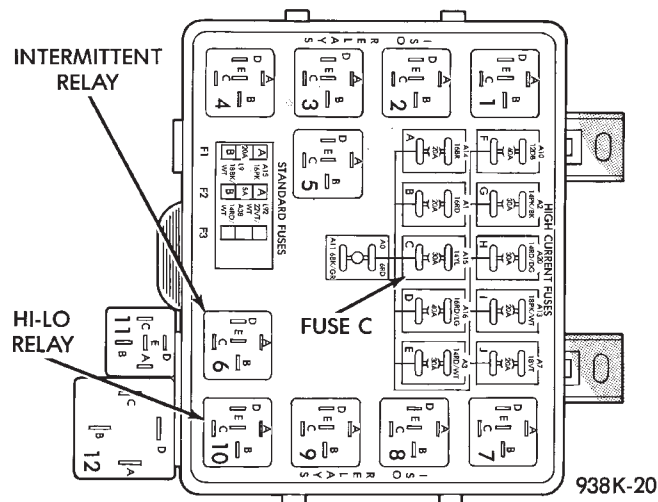
WINDSHIELD WIPER SYSTEM CONDITIONS

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. These tests will cover both two speed and intermittent wiper functions.

MOTOR WILL NOT RUN IN ANY SWITCH POSITION

(1) Check fuse 10, in the Junction Block and fuse C in the Power Distribution Center (Fig. 5) and (Fig. 6). Refer to Group 8W, Wiring Diagrams for pin call outs.

- If fuse(s) are good, go to Step 2.
 - If fuse(s) are defective, replace and check motor operation in all switch positions.
 - If motor is still inoperative and the fuse does not blow, go to Step 2.
 - If replacement fuse blows, go to Step 11.
- (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 3 on the wiper motor connector (Fig. 7). Connect the other jumper wire to ground and Pin 4 on the wiper motor connector (Fig. 8). Check the wiper motor high speed, connect the positive jumper wire to Pin 2 on the wiper motor connector. Connect the negative jumper wire to Pin 4 on the wiper motor connector.

**Fig. 5 Junction Block****Fig. 6 Power Distribution Center**

DIAGNOSIS AND TESTING (Continued)

- (a) If motor runs, go to Step 5.
- (b) If motor does not run, high or low speed replace the wiper motor Step 4.

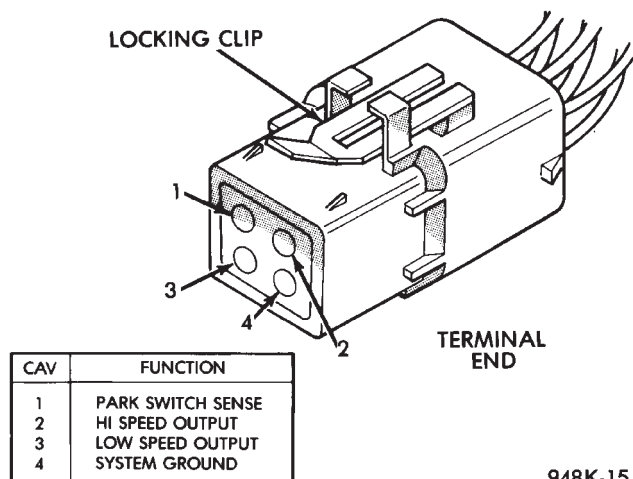


Fig. 7 Motor Wire Connector

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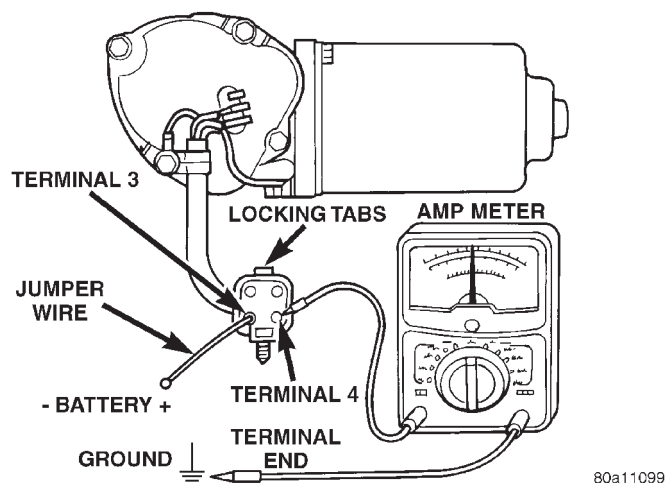


Fig. 8 Ammeter Test

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

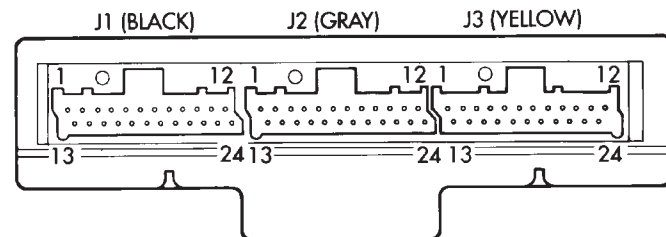
(5) The wiper switch in the ON position. Using an voltmeter, check for battery voltage at terminal D of the intermittent wiper relay in the Power Distribution Center. If no voltage check fuse C (Fig. 6). If OK, go to Step 6. If not OK, repair as necessary.

(6) Using an ohmmeter, check from terminal D of the HI-LO wiper relay to Pin 2 of the motor wire connector for continuity. Check from terminal E of the HI-LO wiper relay to Pin 3 of the motor wire connector for continuity. If OK, go to Step 7. 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 8. If not repair as necessary.

(8) Disconnect the J3 24-way (bone/yellow) connector from the BCM (Fig. 9).



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Fig. 9 Body Control Module Connectors

(9) Using an ohmmeter, check for continuity from terminal 1 of the BCM J3 24-way 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 16 of the BCM J3 24-way connector and negative lead to ground (Fig. 9). 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 2.

(b) Using an ohmmeter, check for continuity from terminal 1 of wiper switch connector to terminal 16 of the BCM J3 24-way connector. If no continuity, repair circuit. If OK, go to Step 11.

(c) Using a voltmeter, connect positive lead to terminal 3 of the wiper switch connector. If ignition voltage is present, replace the wiper switch. If no voltage, check continuity from fuse 10 to terminal 3 of the wiper switch connector. Repair circuit as necessary.

(11) Disconnect motor connector and replace fuse 10 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 4 on the wiper motor connector (Fig. 8). Connect battery positive wire to Pin 3 on the wiper motor connector. When replacing drive link nut tighten to 11 to 12 N·m (98 to 106 in. lbs.) torque.

DIAGNOSIS AND TESTING (Continued)

(a) If average ammeter reading is more than 6 amps, replace motor.

(b) If motor runs and average ammeter reading is less than 6 amps, go to Step 2.

(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 3 on the wiper motor connector. Connect a second jumper wire between ground and Pin 4 on the wiper motor wire harness connector (Fig. 8).

(a) If motor runs, go to Step 3.

(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 2. Connect a second jumper wire between ground and Pin 4 of the motor connector.

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

(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 3 of the wiper motor wire harness connector for continuity. If OK, go to Step 5. If not repair 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 6. If not repair 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 3 on the wiper motor connector. Connect the second lead between ground and Pin 4 on the wiper motor connector (Fig. 8). 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 J3 24-way connector from the BCM and remove the intermittent wiper relay.

(5) Using an ohmmeter, check terminal 8 of the J3 24-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 18 of the BCM J3 14-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 3 or high speed motor feed terminal 2 and battery or ignition.

(2) Check for faulty wiper intermittent or Hi/Lo relay.

(3) Check circuit from intermittent relay terminal C to Hi/Low relay terminal B for short to battery or ignition.

(4) Disconnect the J3 24-way connector from the BCM. Check circuit from terminal 1 of J3 24-way connector to terminal C of the intermittent wiper relay for short to ground.

(5) Check circuit from terminal 2 of J3 24-way connector to Pin 1 of the wiper motor harness connector for a short to ground.

(6) Using a voltmeter, connect positive lead to terminal 16 of the J3 24-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 10 of the J3 24-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 1 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 1 and Pin 4 on the wiper motor connector. If continuous continuity, go to Step 3. If not OK, replace motor.

DIAGNOSIS AND TESTING (Continued)

(3) Disconnect the wiper motor wire harness connector and the BCM J3 24-way connector. Check for continuity between Pin 1 of the wiper motor wire harness connector and terminal 2 of the BCM J3 24-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 J3 24-way connector from the BCM.

(2) Using a voltmeter, connect positive lead to terminal 10 of the J3 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 motor 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 AIR-BAGS, 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 (Fig. 10).

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
WIPER BLADES DO NOT PARK PROPERLY	1. Wiper arms improperly parked. 2. Wiper arms are loose on pivot shaft. 3. Motor crank loose at output shaft.	1. Remove wiper arms and run wiper motor to park position. Refer to Wiper Arm Removal and Installation. 2. Remove wiper arm and run wiper motor to park position. Refer to Wiper Arm Removal and Installation. 3. Remove wiper arm. Run wiper motor to park position and remove the module. Without rotating the motor output shaft, remove the crank and clean the motor shaft of metal filings. Mount the motor crank on the motor shaft toward the motor can side with the linkage in the full reversal position. Tighten to 11 to 14 N·m (89 to 124 in. lbs.) torque, without rotating the motor output shaft. Install wiper system. Refer to Wiper Motor Removal and Installation.
MOTOR STOPS IN ANY POSITION WHEN THE SWITCH IS TURNED OFF	1. Open park circuit.	1. Check park switch by disconnecting wire connector and apply battery voltage to pin 2. Place a jumper wire from pin 3 to pin 4, then to an external ground. Replace motor if it does not park.
MOTOR WILL NOT STOP WHEN SWITCH IS TURNED OFF	1. Faulty switch. 2. Faulty relay. 3. Grounded park switch.	1. Check switch in low, high and intermittent position. 2. Replace if necessary. 3. Repair as necessary.
WIPER BLADES SLAP AGAINST COWL SCREEN OR WINDOW MOLDINGS	1. Wiper arms are parked incorrectly.	1. Repark wiper arms. Refer to Wiper Arm Removal and Installation.
BLADES CHATTER	1. Foreign substance such as polish on glass or blades. 2. Arms twisted, blade at wrong angle on glass. 3. Blade structure bent. 4. Blade element has permanent set.	1. Clean glass and blade element with non-abrasive cleaner. 2. Replace arm. 3. Replace blade. 4. Replace blade element.
WIPER KNOCK AT REVERSAL	1. Linkage bushings worn. 2. Armature endplay in motor.	1. Replace worn link. Refer to Wiper Linkage Removal and Installation. 2. Replace wiper motor. Refer to Wiper Motor Removal and Installation.
WIPER MOTOR WILL NOT RUN	1. Blown fuse. 2. New fuse blows again. 3. New fuse blows again. 4. No voltage at motor. 5. Poor ground.	1. Replace fuse, run system. 2. Check for short in wiring or switch. 3. Replace fuse, remove motor connector, turn switch on, fuse does not blow, replace motor. 4. Check switch and wiring. 5. Clean ground wire connection from corrosion.

Fig. 10 Wiper Motor Test

REMOVAL AND INSTALLATION

MULTI-FUNCTION WIPER SWITCH

REMOVAL

- (1) Tilt the column up and remove the six screws holding the lower column shroud.
- (2) Tilt the column down and remove the upper shroud (Fig. 11).
- (3) Tilt the column up and remove the one steering

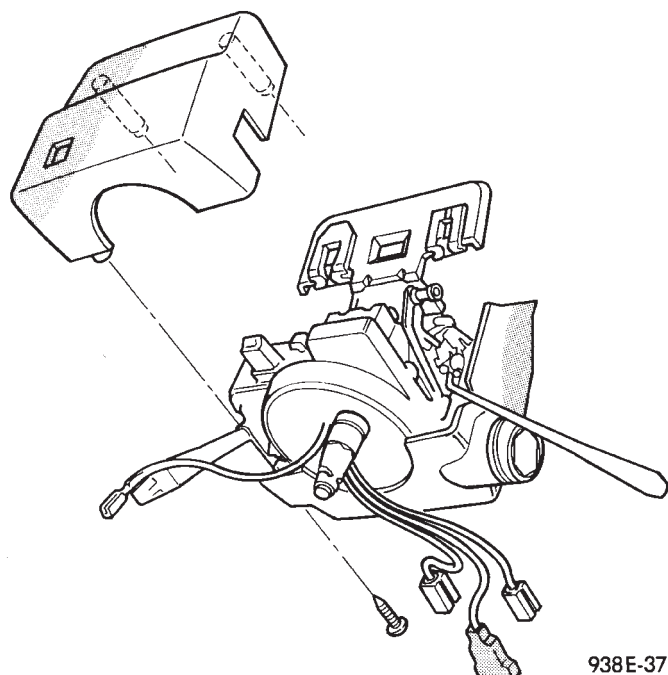


Fig. 11 Upper Shroud Removal

column tilt lever screw at base of lever. Remove tilt lever and lower shroud.

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

WINDSHIELD WASHERS NOZZLES

To replace nozzle, disconnect washer fluid hose. Using a needle nose pliers, squeeze together the locking tabs on the nozzle (Fig. 12). When installing make sure that both locking tabs are securely snapped into position. Connect washer fluid hose. If no washer spray, check fluid hoses kinks or leaks (Fig. 13).

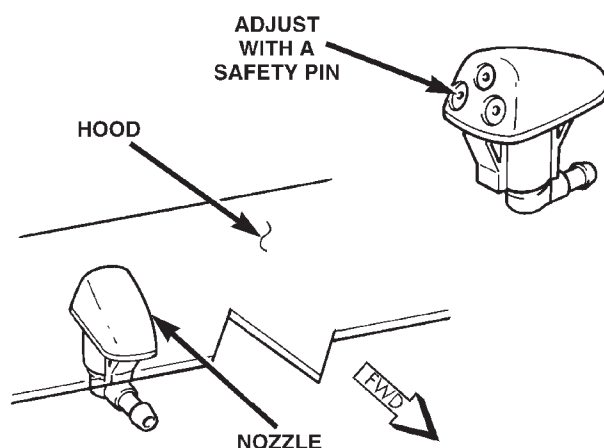


Fig. 12 Windshield Washer Nozzle

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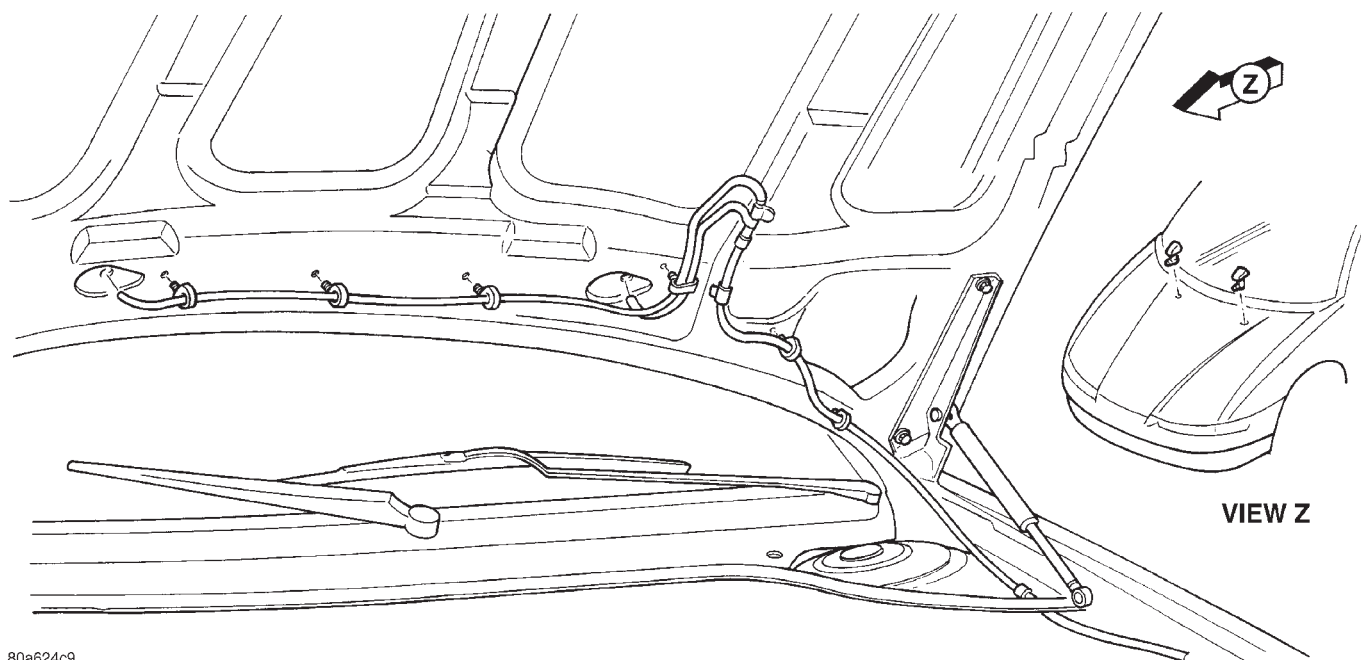


Fig. 13 Washer Fluid Hose Location

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REMOVAL AND INSTALLATION (Continued)

WASHER RESERVOIRS

REMOVAL

- (1) Disconnect the battery terminals. Remove battery and battery tray (Fig. 14).
- (2) Remove two reservoir retaining nuts and screw then remove reservoir (Fig. 15).
- (3) Disconnect the wire connector from the reservoir pump and float sensor.
- (4) Disconnect the washer hose and block the liquid outlet to prevent the liquid from running out of the reservoir.

INSTALLATION

- (1) Connect washer hose and install the reservoir.
- (2) Connect the wire connectors.
- (3) Install reservoir retaining nuts and screw. Tighten to 9 to 14 N·m (80 to 124 in. lbs.) torque.
- (4) Install battery tray and battery. Connect battery terminals.

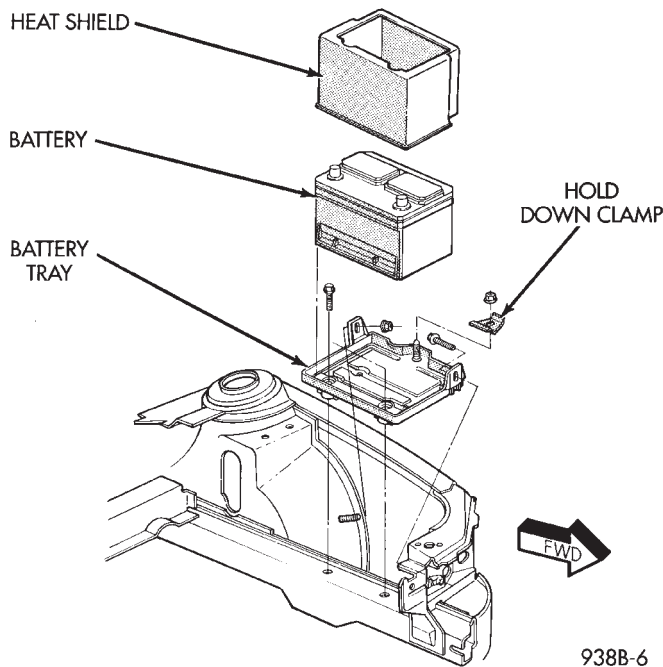


Fig. 14 Battery Removal

WASHER RESERVOIR PUMP

REMOVAL

- (1) Remove liquid from reservoir.
- (2) Disconnect battery terminals. Remove battery and tray.
- (3) Disconnect electrical lead and rubber hose from bottom of pump.
- (4) Remove two reservoir retaining nuts and screw, then remove reservoir.
- (5) Gently pry pump away from reservoir and out of grommet. Care must be taken not to puncture reservoir (Fig. 16).

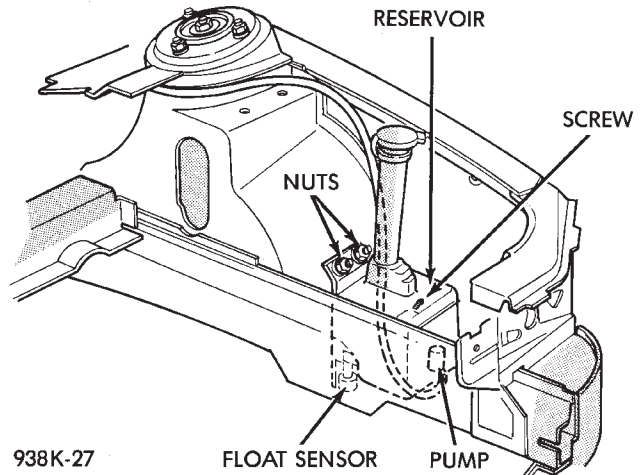


Fig. 15 Reservoir Removal

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

INSTALLATION

For installation, reverse the above procedures. Tighten the reservoir nuts and screw to 9 to 14 N·m (80 to 124 in. lbs.) torque. Fill reservoir.

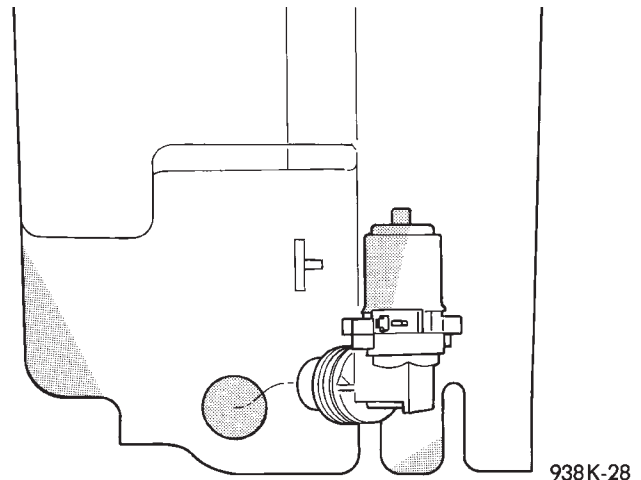


Fig. 16 Washer Pump

WIPER ARM AND BLADE

REMOVAL

- (1) Place the wiper arm/blades in the PARK position and turn ignition OFF.
- (2) Lift wiper arm to raise blade off glass and move retainer tab to hold the arm up.
- (3) Remove the arm from the pivot using a rocking motion.
- (4) Disconnect the washer hose at the plastic in-line connector. Be sure that the in-line connector is saved.

INSTALLATION

For installation reverse the above procedures.

REMOVAL AND INSTALLATION (Continued)

WIPER BLADE

REMOVAL

(1) Turn wiper switch ON, position blades to a convenient place by turning the ignition switch ON and OFF. When in position turn ignition switch OFF.

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

(3) Remove blade assembly from arm by pushing release tab under arm tip and slide blade away from arm tip (Fig. 17) and (Fig. 18). The vertebra is curved on the right blade only. Install with the curve matching the shape of the windshield.

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

INSTALLATION

For installation reverse the above procedures. When complete turn ignition switch ON. Turn wiper switch OFF allowing the wiper blades PARK, then turn ignition switch OFF.

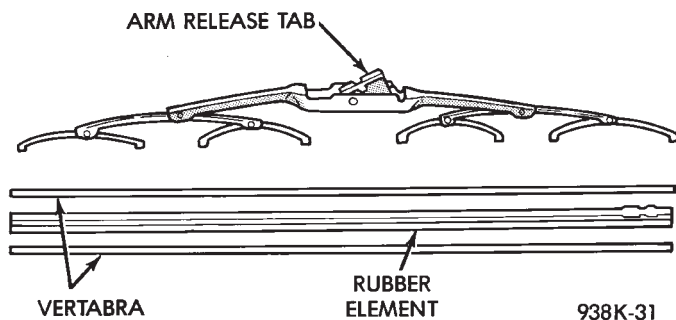


Fig. 17 Wiper Blade and Element

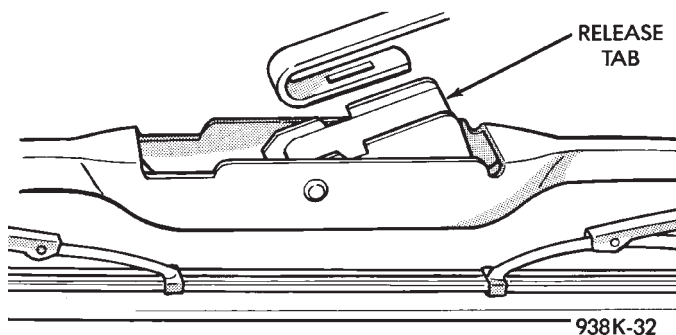


Fig. 18 Remove Blade from Arm

WIPER BLADE ELEMENT

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. 17) and (Fig. 18). Gently place wiper arm tip on glass surface.

(3) To remove wiping element from blade assembly:

- Pull stopper, of the rubber element, out of the end claw together with vertebra (metal rails) (Fig. 19).

- Remove wiper element and vertebra by sliding them out of the claws.

INSTALLATION

For installation reverse the above procedures. Check that the element and vertebra is through all claws and the final claw is locked in the stopper. The right blade, the vertebra is curved to match the shape of the windshield. Install the vertebra with the curve down.

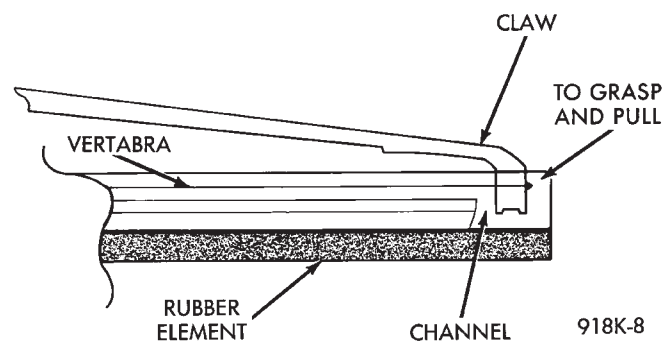


Fig. 19 Wiper Blade and Element

LINKAGE OR CAP

REMOVAL

(1) Remove wiper arms and blades, disconnect hoses from in-line connectors. Be sure that the in-line connector is saved.

(2) Remove the rear hood seal with the cowl top plastic screen and disconnect the washer hose at in-line connector. Save in-line connector.

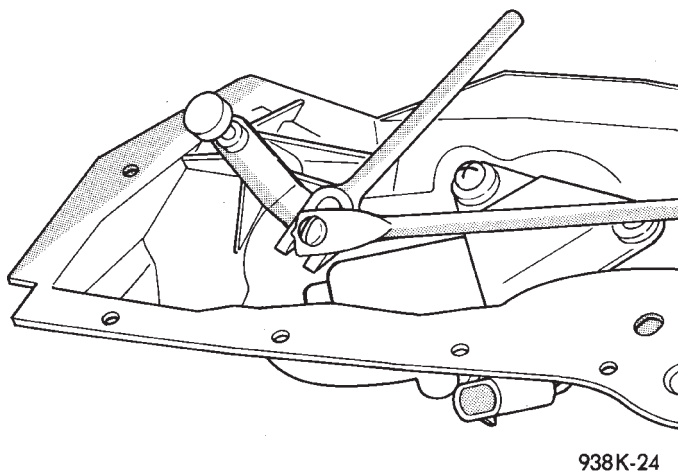
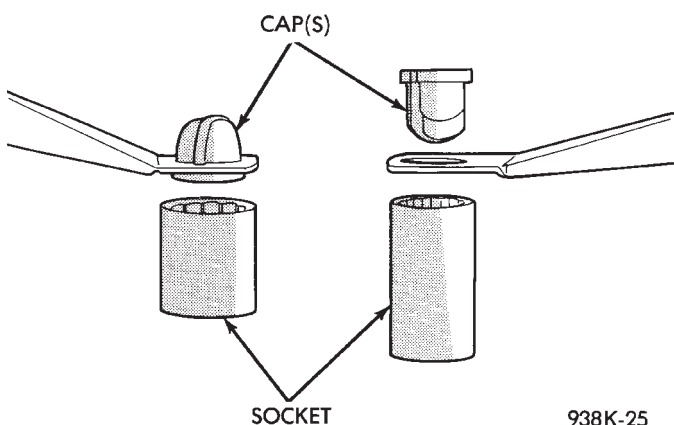
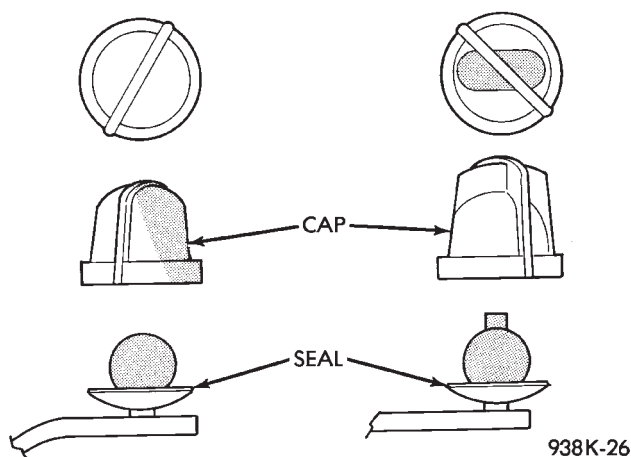
(3) Disconnect wiper arm linkage, by using a ball joint/tie rod separator, separate the ball cap from the ball (Fig. 20).

(4) To remove cap(s), place the cap shoulder over a socket larger than shoulder and tap on the cap into the socket to remove. To replace cap use a socket larger than the cap. Place linkage on the socket, install cap into position over socket and tap on shoulder of cap to lock into position (Fig. 21) and (Fig. 22). There are two types of caps, one for the round ball and the other round ball with a pin on top.

INSTALLATION

For installation, reverse the above procedures.

REMOVAL AND INSTALLATION (Continued)

**Fig. 20 Linkage Removal****Fig. 21 Cap Removal****Fig. 22 Caps and Seals****WIPER MOTOR****REMOVAL**

(1) Remove wiper arms and blades, disconnect hoses from in-line connectors (Fig. 23). Be sure that the in-line connector is saved.

(2) Remove the rear hood seal with the cowl top plastic screen and disconnect the washer hose at in-line connector. Save in-line connector.

(3) Disconnect motor connector at back side of housing.

(4) Remove four wiper housing module mounting screws then remove housing.

(5) Remove nut and disconnect wiper drive link from motor crank.

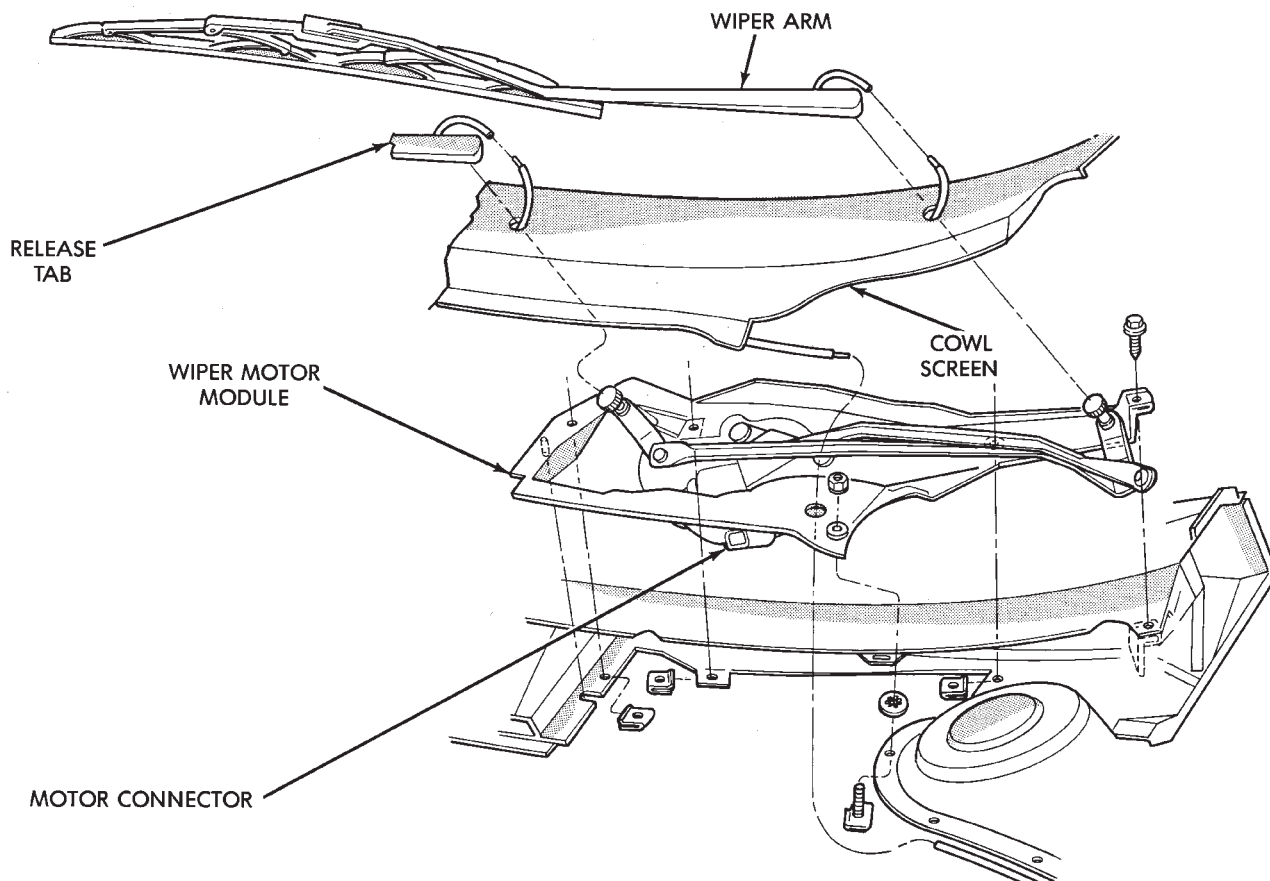
(6) Remove three motor mounting screws.

(7) Lift motor and mounting plate out of housing.

(8) Disconnect motor harness grommet from housing.

INSTALLATION

For installation, reverse the above procedures. Tighten the motor crank nut to 11 to 14 N·m (89 to 124 in. lbs.) torque. Tighten the motor mounting screws to 11 to 12 N·m (89 to 106 in. lbs.) torque.



938K-23

Fig. 23 Wiper Motor and Linkage Module**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 insert that has lost flexibility 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 Alignment paragraph of this group.

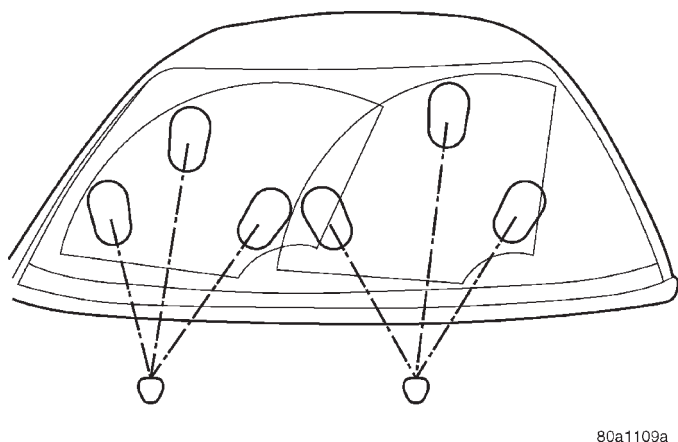
ADJUSTMENTS**WASHER NOZZLE**

This model is equipped with two hood mounted washer nozzles. Each nozzle emits three streams into the wiper pattern (Fig. 12). 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. 24). The right and left nozzles are identical.

WIPER ARM ADJUSTMENT

- (1) Cycle the wiper motor into the PARK position.
- (2) Check the tips of the blades in blackout area. From the bottom edge of the windshield to the blade should be no closer than 24 mm (1 in.) (Fig. 25).
- (3) Operate the wipers if the requirements are not met, check linkage and pivot assembly for worn parts.
- (4) During high speed wet glass operation, the right hand blade tip may override the cowl screen slightly. This is normal and should not affect the wiper system's performance.
- (5) The wiper arm is supplied with a plastic key insert that aligns with a slot in the pivot.

ADJUSTMENTS (Continued)



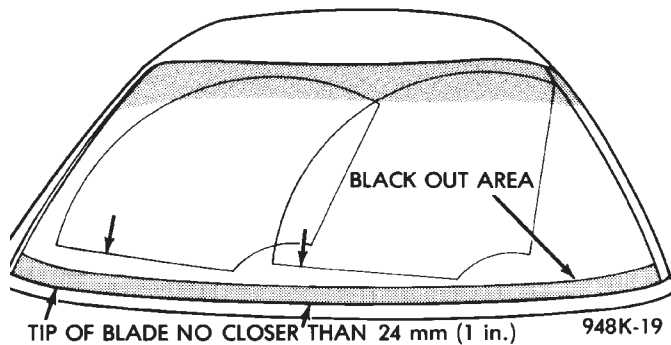
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Fig. 24 Windshield Washer Spray Pattern

(6) In the event that the wiper blade tip excessively strikes:

- Glass molding
- Cowl screen

(7) Due to long term normal wear, remove the plastic key from wiper arm and reposition the arm on the pivot with the wipers in the PARK position only.

**Fig. 25 Arm Adjustment**

