

Washer fluid level sensor, replacing (models with check control)

The washer fluid level sensor is mounted in the fluid reservoir, near the bottom of the container.

NOTE —

Check wire leads at sensor for worn insulation and corrosion. Check electrical contacts in harness connector for corrosion.

1. Open hood and siphon out washer fluid reservoir.
2. Lift harness connector retaining lever and unplug harness connector to washer fluid level sensor. See Fig. 23.

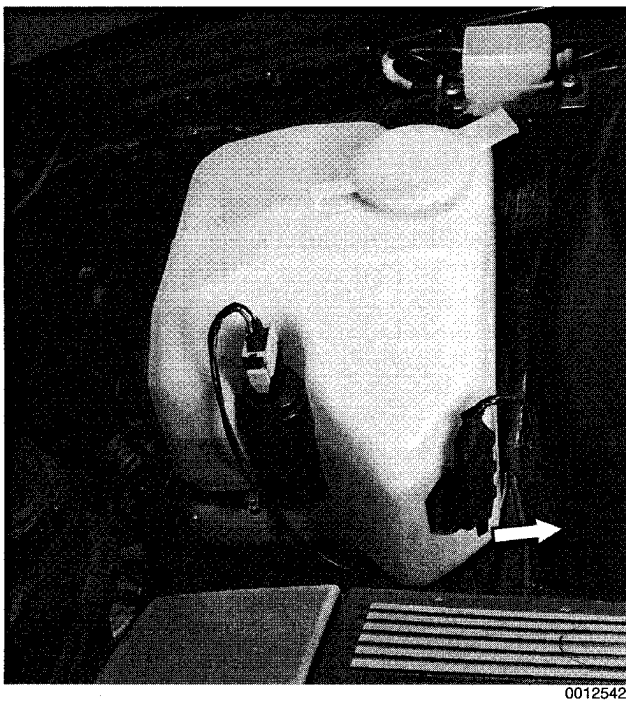


Fig. 23. Release electrical connector by pulling up on lever (**arrow**).

3. Pull fluid level sensor out from rubber grommet.
4. Install new sensor into reservoir. Check sealing grommet for correct fit. Replace if damaged.



WINDSHIELD CLEANING SYSTEM

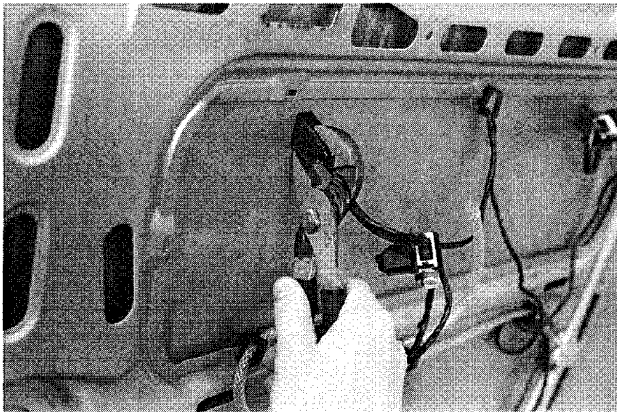
WINDSHIELD CLEANING SYSTEM

The windshield cleaning system includes the spray nozzles in the engine hood, the washer fluid pump, and the washer fluid reservoir in the front passenger side of the engine compartment.

The windshield spray nozzles can be aimed by using a sewing needle or a similar diameter stiff piece of wire.

Windshield spray nozzle, removing and installing

1. Open hood and remove hood insulating pad retaining clips until bottom of nozzle can be fully accessed. See **410 Fenders, Engine Hood**.
2. Carefully disconnect hose from nozzle. Disconnect harness connectors for nozzle heater.
3. Push nozzle out of hood. See Fig. 21.



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Fig. 21. First push nozzle forward then upward from underneath hood.

4. Installation is reverse of removal, noting the following:
 - Check that colors of harness and nozzle connector match.
 - Check and adjust nozzles before driving.

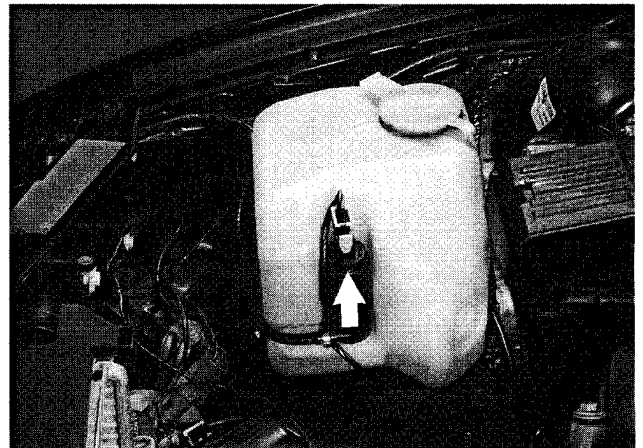
Washer fluid reservoir, replacing

1. Open hood and siphon out washer fluid reservoir.
2. Remove windshield washer pump and hose as described later.
3. Remove windshield washer fluid level sensor as described later.
4. Remove large plastic washer reservoir retainer at fender.
5. Remove reservoir.
6. Installation is reverse of removal, noting the following:
 - On installation check that washer fluid hose is not kinked.
 - Replace hose clamp.

Windshield washer fluid pump, replacing

The windshield washer fluid pump is mounted in the washer fluid reservoir.

1. Open hood and siphon out washer fluid reservoir.
2. Depress retaining tabs on electrical connector and unplug harness connector from pump.
3. Loosen hose clamp and remove washer fluid line from washer pump.
4. Pull pump out of tank. See Fig. 22.



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Fig. 22. Pull windshield washer pump up to remove (arrow).

5. Installation is reverse of removal. Check pump to tank sealing grommet for damage and correct fit. Replace hose clamp. Check that washer fluid hose is free of kinks.

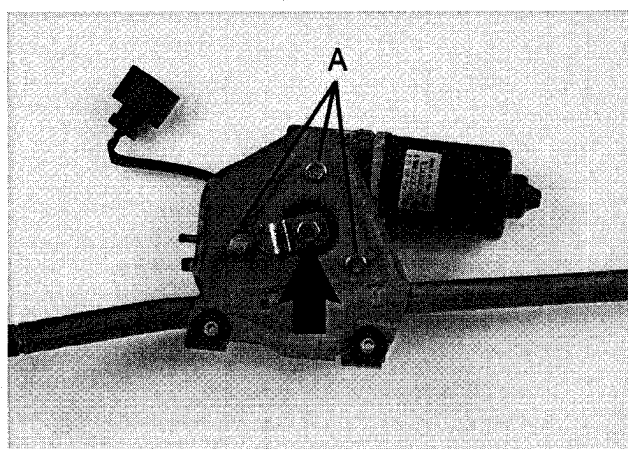
Windshield wiper motor, removing and installing

1. Disconnect negative (–) cable from battery.

CAUTION —

- Prior to disconnecting the battery, read the battery disconnection cautions given at the front of this manual on page viii.
- Use fender cover to protect windshield.

2. Remove wiper assembly as described earlier.
3. Remove nut on wiper motor linkage crank and remove linkage crank from motor. See Fig. 19.



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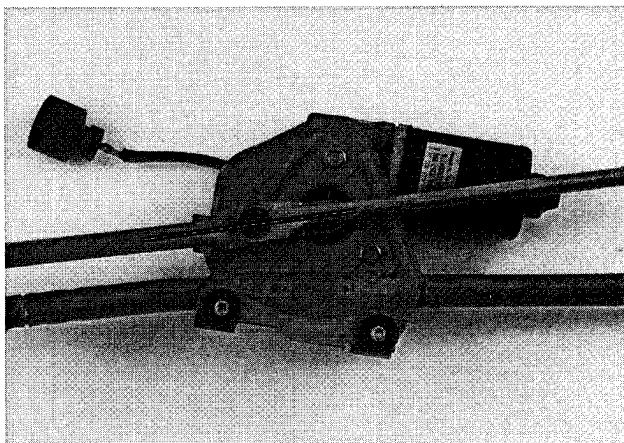
Fig. 19. Wiper linkage crank nut (arrow) and wiper motor mounting bolts (A).

4. Unscrew three motor to assembly mounting bolts and remove motor. Refer to Fig. 19.
5. Install new motor to wiper assembly. Do not install crank.
6. Connect motor to electrical harness. If necessary, re-connect battery temporarily.

7. Operate motor, then turn off switch. Motor will stop in “park” position.
8. Install wiper arm crank in straight line with linkage. See Fig. 20.

NOTE —

When installing wiper crank onto wiper motor, brace crank with a drift pin through the hole on crank into hole on wiper assembly.



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Fig. 20. Align wiper crank with linkage, as illustrated.

9. Remainder of installation is reverse of removal.

Tightening Torques

- Wiper motor to wiper assembly (use new bolts) 10 Nm (89 in-lb)
- Wiper motor crank to wiper motor (M8 nut) 27 Nm (20 ft-lb)



Fig. 16. Engine control unit (ECM) compartment cover screws (arrows).

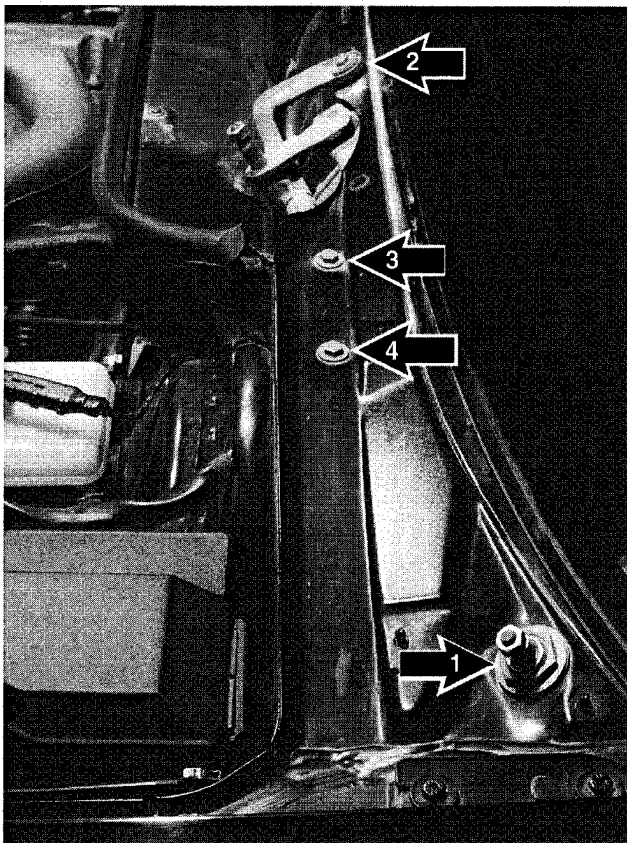


Fig. 17. Wiper assembly mounting fasteners (arrows).

11. Remove wiper assembly support. Refer to Fig. 10.
12. Separate harness at bulkhead connector. See Fig. 18.

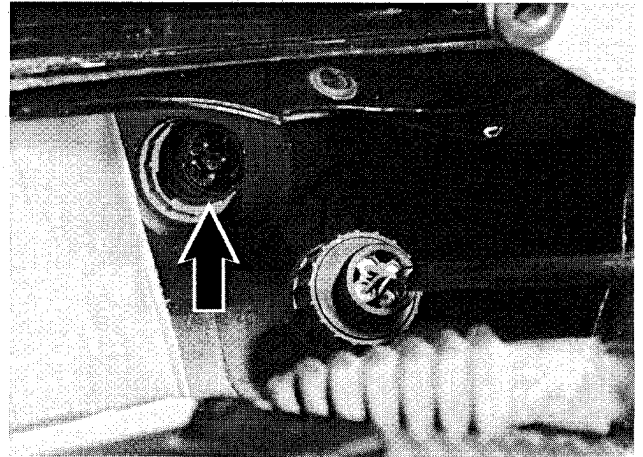


Fig. 18. Wiper assembly electrical plug (arrow).

13. Cover inside edges of cowl panel sheet metal with thick tape to prevent damaging it during wiper assembly removal.
14. Wrap protective tape around wiper shaft on driver side to prevent damaging sheet metal during removal.
15. Push wiper arm shaft down into cowl area and maneuver wiper assembly out of cowl.
16. Installation is reverse of removal, keeping in mind:
 - Install all fasteners finger tight first.
 - Torque top fasteners in sequence indicated in Fig. 17. Then tighten wiper assembly support bolts inside air plenum.
 - Wire tie wiper harness to wiper assembly support inside plenum.
 - Once installed, wiper motor should first be run to parked position and switched off.
 - Next, install wiper arms but not blades.
 - Close hood and fit wiper blades.
 - Check all electrical harness fittings and sealing grommets for correct reinstallation. Replace all wire ties cut during removal.

CAUTION —

The gaskets and sealing grommets at the ECM compartment cover (passenger side of bulkhead) must be installed correctly to keep moisture out of critical electrical components.

Tightening Torques

- Wiper shaft nut at cowl 12 Nm (9 ft-lb)
- Wiper support to wiper assembly or to body 10 Nm (89 in-lb)
- Wiper arm to wiper shaft 25 Nm (18 ft-lb)

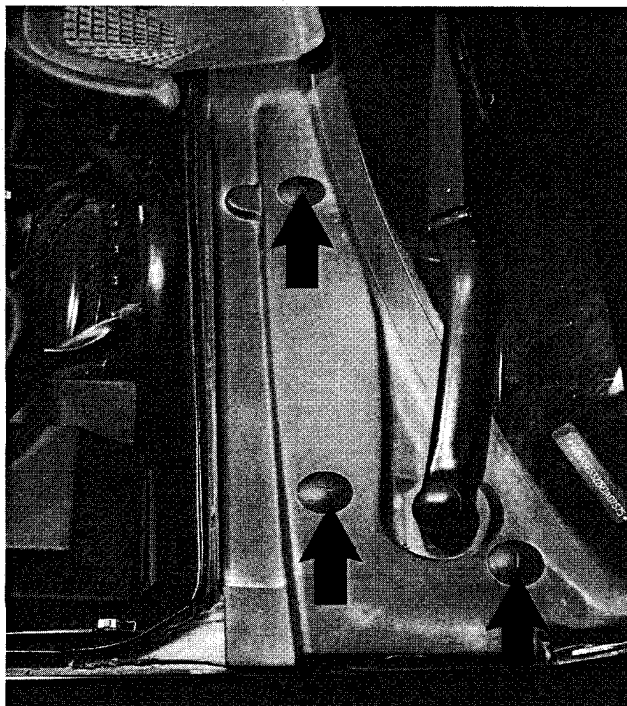


Fig. 12. Left side air plenum grill trim retainers (arrows).

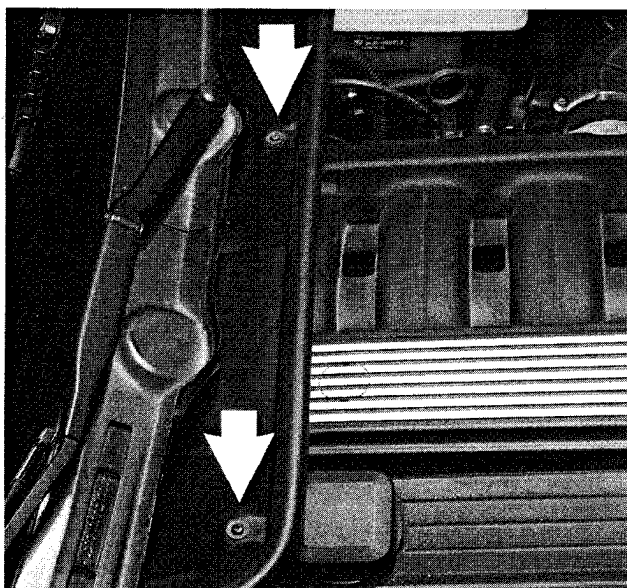


Fig. 13. Engine bulkhead wiring harness cover screws (arrows).

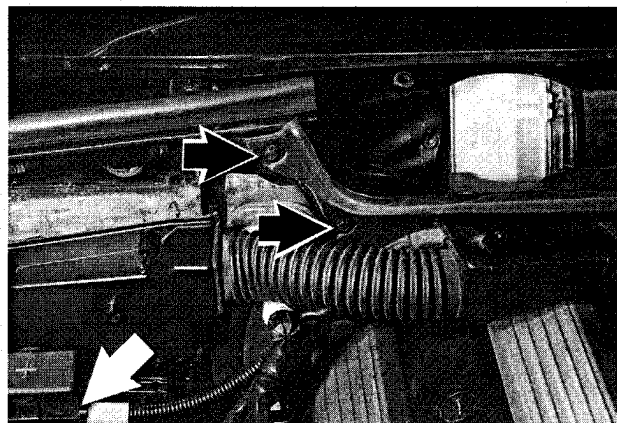


Fig. 14. Right side plenum retaining screws (black arrows). Note positive leads to main (+) connector (white arrow).

7. On driver's side of air plenum, push aside wiring harness and remove screw retaining plenum. Pull plenum up and remove from engine bay. See Fig. 15.

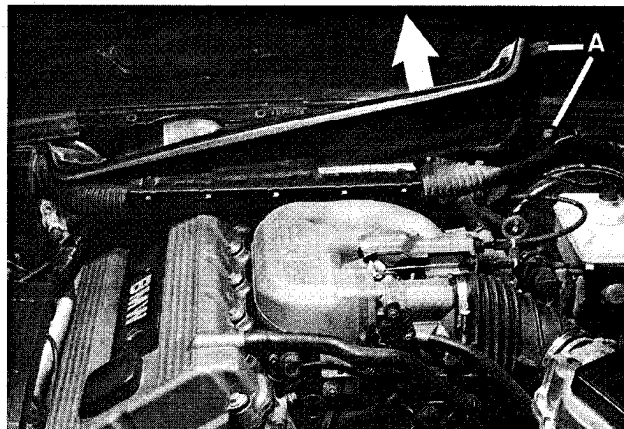


Fig. 15. Remove screw at A and pull plenum upward.

8. On passenger side of engine compartment bulkhead, remove engine control module (ECM) compartment cover. See Fig. 16.
9. Disconnect harness connector(s) from ECM and automatic transmission control module (if applicable). Carefully pull harness and wire loom as far forward as possible. If necessary, disconnect positive leads at main (+) connector.
10. Remove wiper assembly mounting fasteners. See Fig. 17.

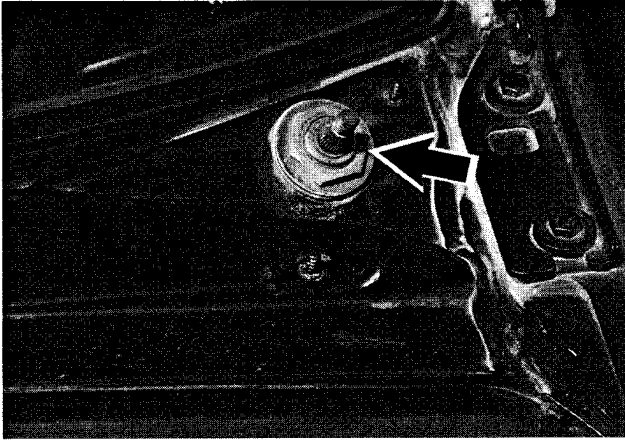


Fig. 9. Wiper shaft nut at cowl (arrow).

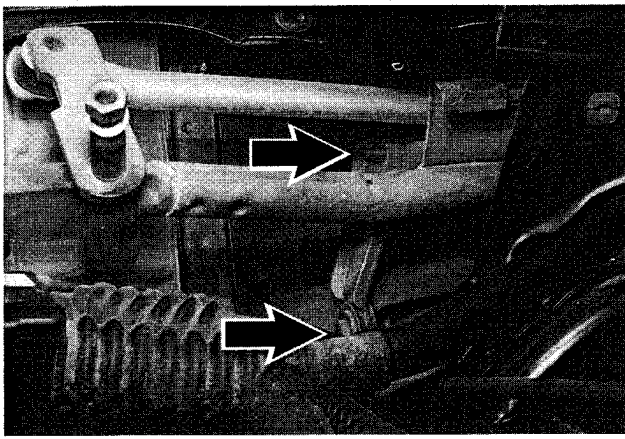


Fig. 10. Wiper assembly support bolts (arrows).

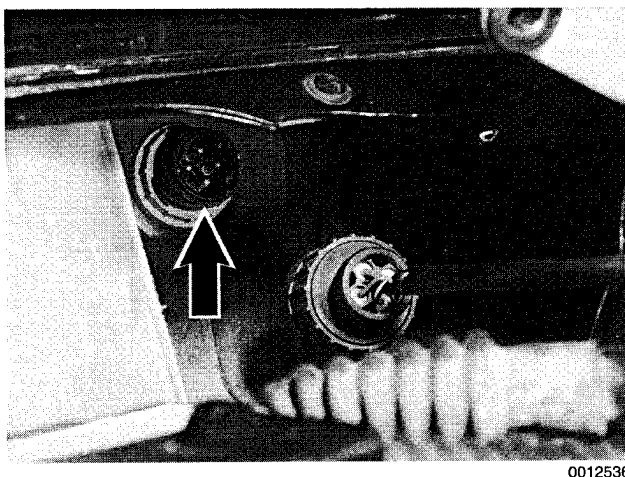


Fig. 11. Wiper assembly electrical connector (arrow).

13. Push wiper arm shaft down into cowl area and maneuver wiper assembly out of cowl.

14. Installation is reverse of removal, noting the following:

- Install all fasteners finger-tight first.
- Once installed, wiper motor should first be run to parked position and switched off.
- Next, install wiper arms but not blades.
- Close hood and fit wiper blades.
- Check all electrical harness fittings and sealing grommets for correct reinstallation. Replace any wire ties cut off during removal.

Tightening Torques

- Wiper shaft nut at cowl 12 Nm (9 ft-lb)
- Wiper support to wiper assembly or to body 10 Nm (89 in-lb)
- Wiper arm to wiper shaft 25 Nm (18 ft-lb)

Windshield wiper assembly, removing and installing (2-door models)

NOTE —

The wiper arms should be in the parked position before removing the wiper assembly. To avoid damaging the wiper arms and pivots, do not manually slide or force the wiper arm across the windshield.

1. Disconnect negative (–) cable from battery.

CAUTION —

• Prior to disconnecting the battery, read the battery disconnection cautions given at the front of this manual on page viii.

• Use fender cover to protect windshield.

2. Remove wiper arms as described earlier.
3. Place engine hood in service position. See **410 Fenders, Engine Hood**.
4. Remove trim retainers at left and right side and remove air plenum grill. See Fig. 12.
5. Remove screws retaining wiring harness protective cover. See Fig. 13.
6. On passenger side of air plenum, push aside wiring harness and remove two screws retaining plenum housing. See Fig. 14.

611-4 WIPERS AND WASHERS

2. Remove wiper arms as described earlier.
3. Place engine hood in service position. See **410 Fenders, Engine Hood**.
4. Unclip engine bulkhead plenum grille at base of windshield and pull it away from rubber gasket. See Fig. 5.

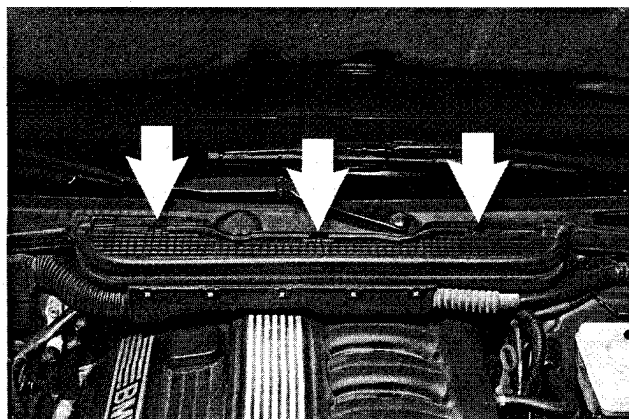


Fig. 5. Detach grill clips (arrows) and pull upward.

5. Remove wiring harness retaining clip from bulkhead in rear of engine bay. Remove screws retaining wiring harness protective cover. See Fig. 6.

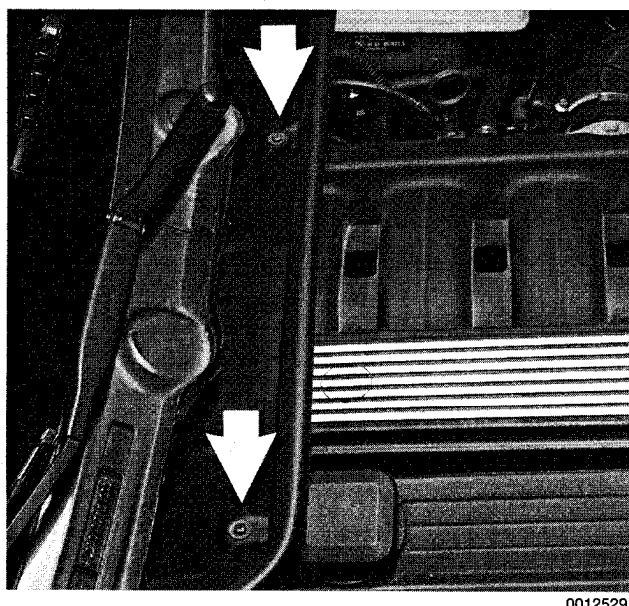


Fig. 6. Engine bulkhead wiring harness cover screws (arrows).

6. On passenger side of air plenum, push aside wiring harness and remove two screws retaining plenum housing. See Fig. 7.

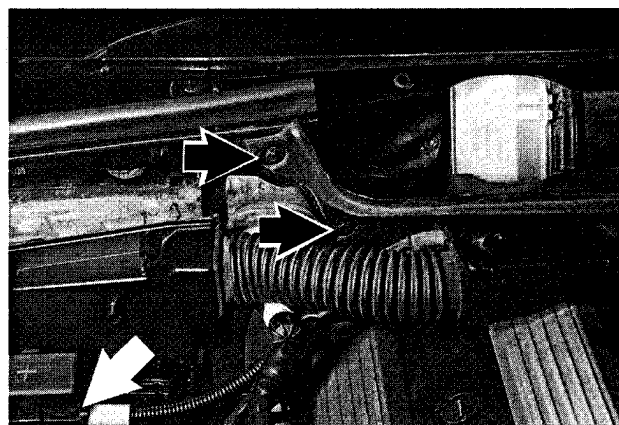


Fig. 7. Right side plenum retaining screws (arrows).

7. On driver's side of air plenum, push aside wiring harness and remove screw retaining plenum. Pull plenum up and remove from engine compartment. See Fig. 8.

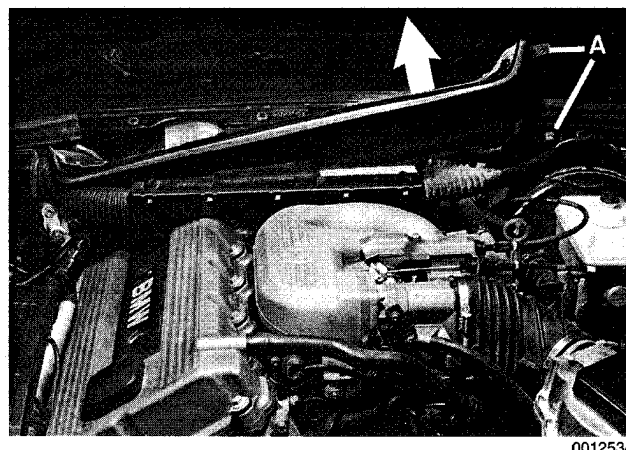


Fig. 8. Remove screw at A and pull plenum housing upward.

8. On 6-cylinder models: Remove plastic top engine covers. See **110 Engine Removal and Installation**.

NOTE —

Cover inside edges of cowl panel sheet metal with thick tape to prevent damage during wiper assembly removal.

9. Remove large nut and washer at base of wiper arm shafts cowl panel. See Fig. 9.
10. Remove wiper assembly support. See Fig. 10.
11. Separate harness at bulkhead connector. See Fig. 11.
12. Wrap protective tape around wiper shaft on driver's side to prevent damaging painted metal during removal.

4. Installation is reverse of removal. Recheck wiper arm tightening torque after waiting 15 minutes.

Tightening Torque

- Wiper arm to wiper shaft 25 Nm (18 ft-lb)

Windshield wiper assembly, removing and installing (4-door models)

NOTE —

The wiper arms should be in the parked position before removing the wiper assembly. To avoid damaging the wiper arms and pivots, do not manually slide or force the wiper arms across the windshield.

1. Disconnect negative (–) cable from battery.

CAUTION —

- Prior to disconnecting the battery, read the battery disconnection cautions given at the front of this manual on page viii.

WINDSHIELD WIPER ASSEMBLY

The windshield wiper assembly (linkage and motor) is removed as a single unit. Once the assembly is removed, the wiper motor and other linkage parts can be repaired or replaced. For an illustration of wiper assembly components, see Fig. 4.

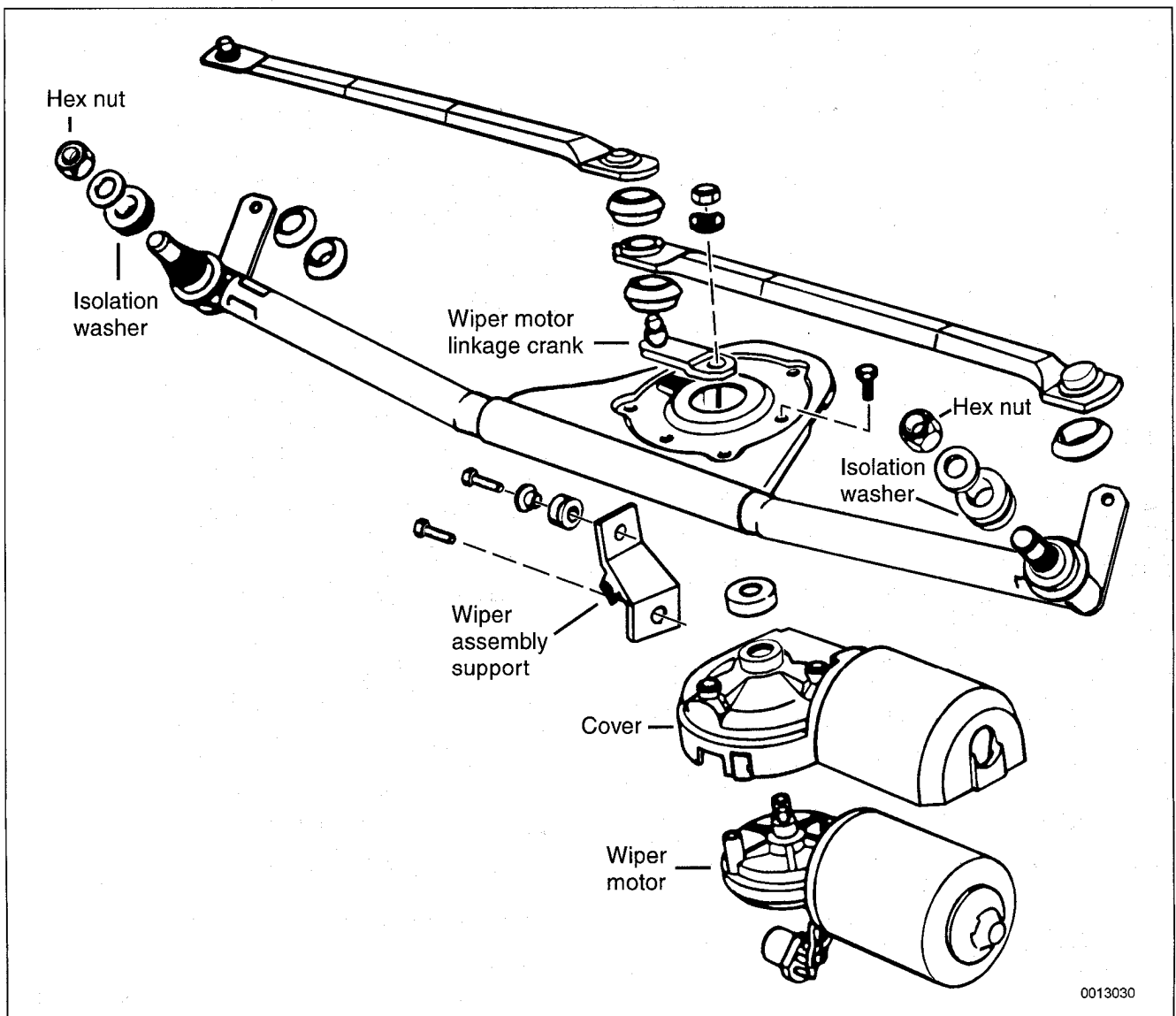


Fig. 4. Windshield wiper motor assembly and related parts.

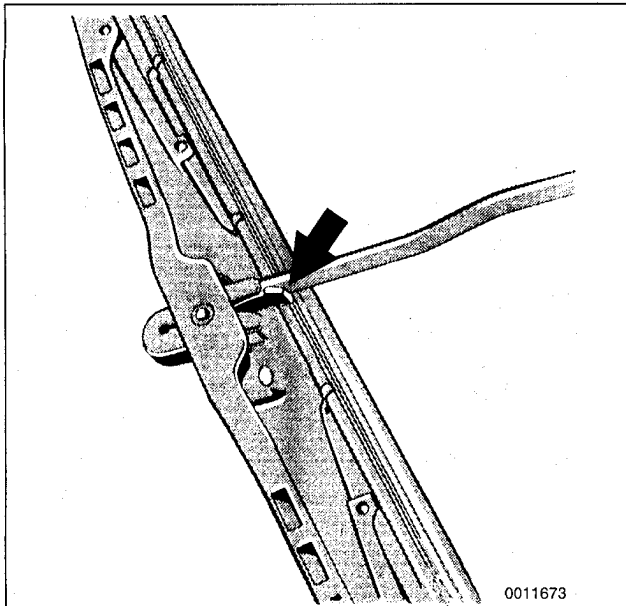


Fig. 1. Windshield wiper blade retaining tab. Press in on tab (arrow) to release blade from arm.

4. Installation is reverse of removal. Install wiper blade to wiper arm until retaining tab can be heard to click into position.

Wiper blade inserts, replacing

1. Remove wiper blade as described earlier.
2. Unhook end of wiper blade insert from wiper arm guides. See Fig. 2.

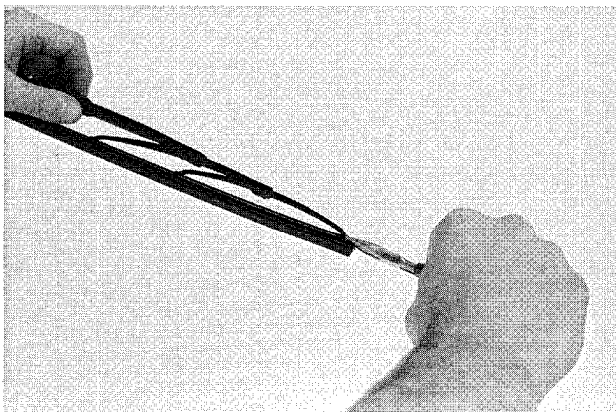


Fig. 2. Unhook wiper blade insert from wiper arm guide. If necessary, guide slightly using needle nose pliers.

3. Pull old insert from wiper arm guides, noting installation position.
4. Remove metal support strips from old insert and install into slots in new insert, noting installation direction of cutouts in support strips.

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NOTE —

The notched cutouts in the retaining strips should engage the molded notches in the inserts.

5. Slide new insert through wiper blade guides. Lock insert in place at end guides.

Wiper arms, removing and installing

NOTE —

On 2-door models it may be necessary to raise the hood to the service position. See 410 Fenders, Engine Hood.

CAUTION —

- Use fender cover to protect windshield.
- Remove windshield wiper fuse to prevent accidents.

1. With engine hood in closed position, remove both wiper blades.
2. Open hood. Remove cap covering wiper arm retaining nuts by inserting a narrow screwdriver blade in slot below cap and prying upward.

NOTE —

Marking position of wiper arm on shaft will aid installation.

3. Using a 13 mm socket, remove wiper arm retaining nut and remove wiper arm. See Fig. 3.

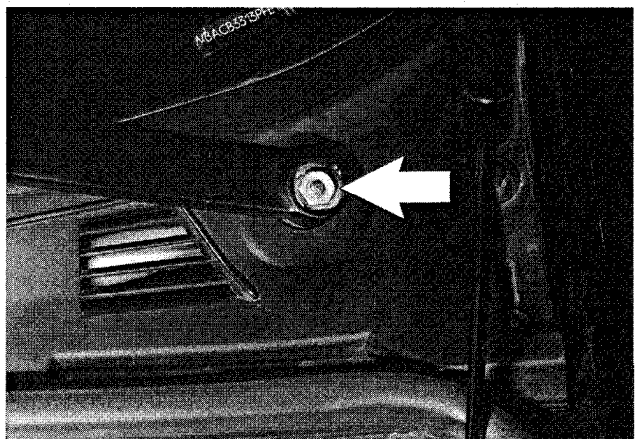


Fig. 3. Wiper arm retaining nut. (arrow).

NOTE —

It may be necessary to gently rock wiper arm back and forth to loosen arm from shaft.

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GENERAL

This repair group covers windshield wiper and washer system repair information. Please note that some procedures are different for 2- and 4-door models.

The windshield wiper/washer stalk switch assembly is covered in **612 Switches and Electrical Accessories**. Electrical wiring diagrams and relays for the wiper/washer system are covered in **Electrical Wiring Diagrams**.

WIPER BLADES

CAUTION —

Never turn on the wiper blades while the hood is open. Damage to the wiper system and hood may occur. To ensure safety during wiper blade system procedures, remove the windshield wiper fuse. See 610 Electrical Component Locations.

Wiper Blade Cleaning Problems

Common cleaning problems with the wipers include streaking or sheeting, water drops after wiping, and blade chatter.

Streaking is usually caused when wiper blades are coated with road film or car wash wax. Clean the blades using soapy water. If cleaning does not cure the problem, the blades should be replaced. BMW recommends replacing the wiper blades twice a year, before and after the cold season.

Drops that remain behind after wiping are usually caused by oil, road film, or diesel exhaust residue on the glass. Use an alcohol or ammonia solution or a non-abrasive cleaner (such as Bon-Ami®) to clean the windshield.

Wiper blade chatter may be caused by dirty or worn blades, or by wiper arms that are out of alignment. Clean the blades and windshield as described above. Adjust the wiper arm so that there is even pressure along the blade, and so that the blade at rest is perpendicular to the windshield. If problems persist, the blades and wiper arms should be replaced.

NOTE —

BMW has available a special tool/gauge (BMW special tool no. 00 9 210) to align the angle of the wiper arm to the windshield glass.

The wiper blades can be renewed in one of two ways: either by replacing the complete blade or by replacing just the rubber insert.

Insert replacement is the most economical method, although over time the wiper blade itself will become worn. One rule of thumb would be to replace just the inserts every second time.

Wiper blades, replacing

1. Pivot wiper arm off windshield.
2. Position wiper blade approximately perpendicular to wiper arm.
3. Remove wiper blade from wiper arm by depressing retaining tab and sliding blade out of arm. See Fig. 1.

NOTE —

Some wiper blade versions may have two retaining tabs.

GENERAL