

611 Wipers and Washers

GENERAL	611-1
Wiper and washer system operation	611-1
Wiper and washer system components (Sedan)	611-2
Wiper and washer system components (Sports Wagon)	611-2
Wiper and washer switch operation	611-3
WIPER BLADES AND ARMS	611-3
Wiper blade cleaning problems	611-3
Windshield wiper blade, replacing	611-4
Windshield wiper arms, removing and installing	611-4
Windshield wiper blades and arms, adjusting position	611-6
Rear wiper blade, replacing	611-8
Rear wiper arm, removing and installing	611-9

WIPER ASSEMBLIES	611-10
Windshield wiper assembly, removing and installing	611-10
Rear wiper assembly	611-13
Rear wiper motor, removing and installing	611-13
Rear window wiper pivot, removing and installing	611-14
WASHER SYSTEM	611-15
Windshield washer jet, removing and installing	611-16
Headlight washer jet, removing and installing	611-16
Rear window washer jet, removing and installing	611-17
Washer fluid reservoir components service	611-18

TABLES

a. Wiper blade position in PARK	611-6
b. Wiper blade contact angle	611-7

GENERAL

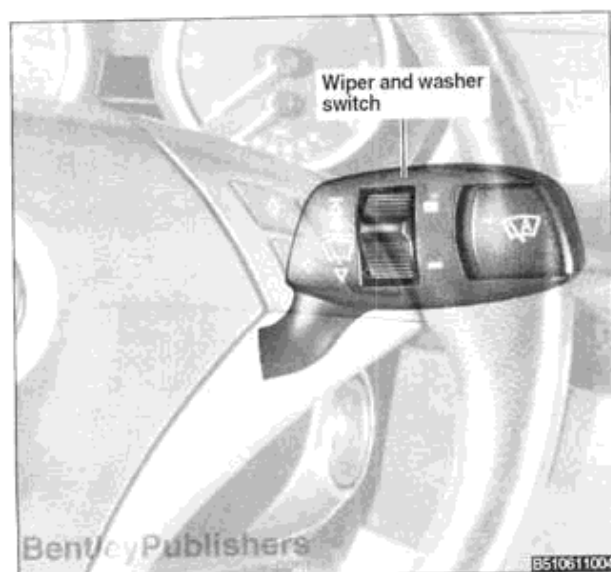
This repair group covers repair information for windshield, headlight and rear window wiper and washer systems.

See also:

- **020 Maintenance** for cabin microfilter housing removal
- **612 Switches** for steering column switch cluster replacement
- **ECL Electrical Component Locations** for wiper and washer system fuse and relay locations and applications
- **ELE Electrical Wiring Diagrams**

Wiper and washer system operation

- ◀ Driver input to wiper and washer system is via multi-function stalk switch to right of steering column. Wiper and washer system functions are capable of activation once ignition is switched ON.



611-2 Wipers and Washers

Wiper and washer system components (Sedan)

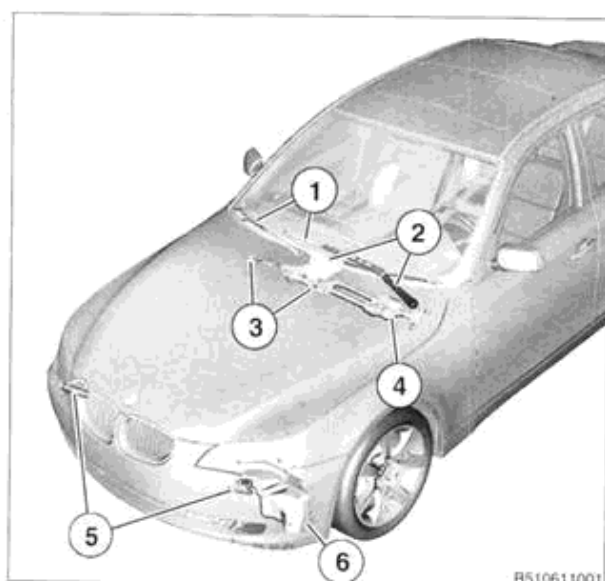
Body base module (KBM) is the control hub for wiper and washer operation. Based on driver input, rain and light sensor signals and vehicle speed, KBM activates the following components:

- Windshield wiper motor dual relay in E-box.
- Rear window wiper relay in spare tire well.
- Headlight washer relay.
- Washer pumps in washer reservoir behind left front wheel housing liner.

Windshield washer nozzle heating is activated by IHKA.

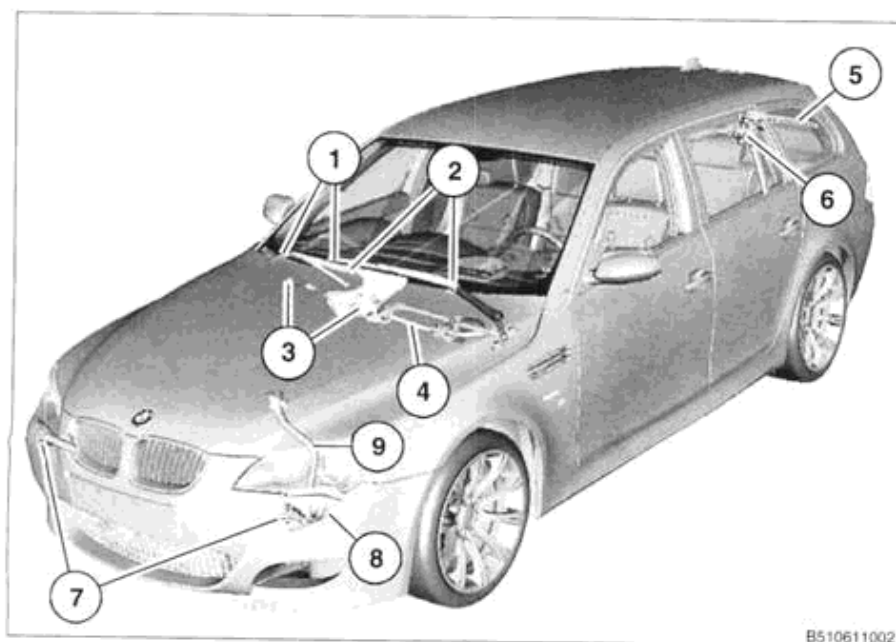
Wiper and washer system components (Sedan)

1. Wiper blades
2. Wiper arms
3. Heated windshield washer jets
4. Wiper motor assembly
5. Headlight washer jets
6. Washer fluid reservoir



Wiper and washer system components (Sports Wagon)

1. Windshield wiper blades
2. Windshield wiper arms
3. Heated windshield washer jets
4. Windshield wiper motor assembly
5. Rear wiper blade
6. Rear wiper motor assembly
7. Headlight washer jets
8. Washer fluid reservoir
9. Washer reservoir filler neck





Wiper and washer switch operation

1. Switch wipers ON.
 - Flick UP once for slow speed. Intermittent when vehicle stops.
 - Flick UP twice or push past detent for fast speed. Slows when vehicle stops.
2. Flick DOWN to switch wipers OFF or for single wipe.
3. Push IN to activate or deactivate rain sensor. Wiper operation controlled automatically by rain intensity.
4. PULL toward driver to activate windshield and headlight washers.
5. Sensitivity adjustment thumb wheel for interval control.
6. PUSH away from driver to activate rear wiper in intermittent mode. Continuous operation when in reverse gear.
7. PUSH past detent to activate rear window washer.

WIPER BLADES AND ARMS

Wiper blade cleaning problems

Common 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 blades using soapy water. If cleaning does not cure problem, replace blades.

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.

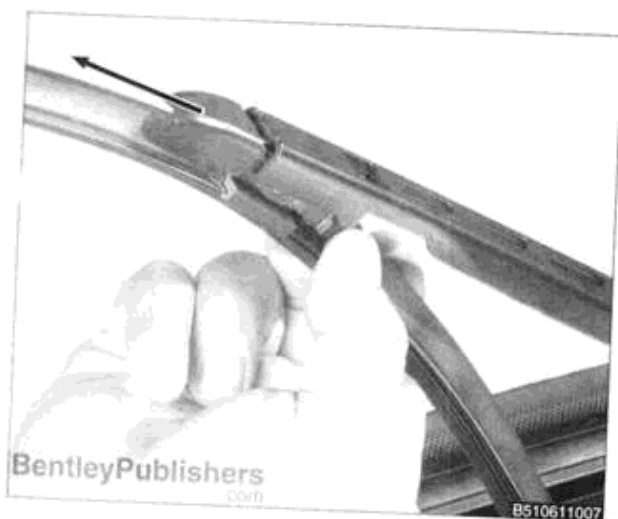
- Use an alcohol or ammonia solution or other non-abrasive cleaner to clean glass.

Chatter may be caused by dirty or worn blades or by incorrect wiper blade contact angle.

- Clean blades and glass as described above.
- Check and adjust wiper arm twist. See **Windshield wiper blades and arms, adjusting position** in this repair group.
- If problems persist, replace wiper blades and arms. See **Windshield wiper blade, replacing** and **Windshield wiper arms, removing and installing**, in this repair group.

611-4 Wipers and Washers

Windshield wiper blade, replacing



Windshield wiper blade, replacing

- Pivot wiper arm off windshield. Note that arm only pivots approx. 45°.

Working at wiper blade pivot:

- Press on locking clip to release wiper blade.
- Slide wiper blade forward (**arrow**) to detach from arm.

CAUTION—

- Do not allow wiper arm to snap back against windshield when wiper blade is off.

- Installation is reverse of removal.

Windshield wiper arms, removing and installing

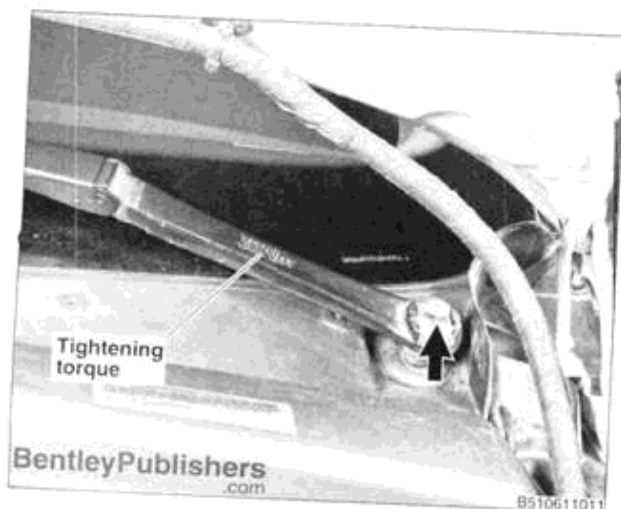
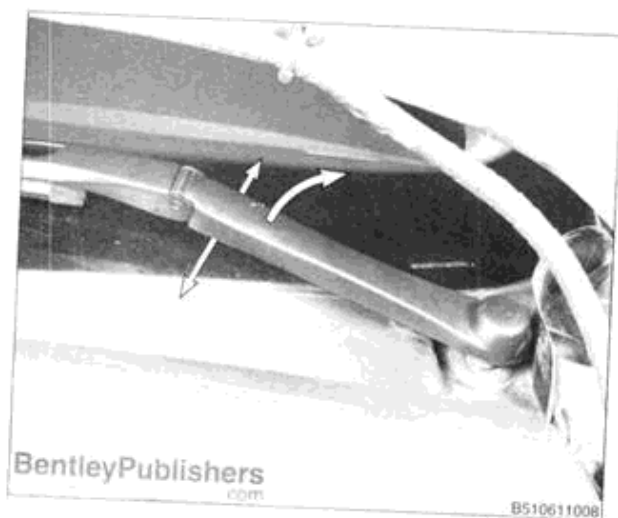
- Open engine hood.

Left wiper arm

- ◀ Spread retaining tabs (**arrows**) and lift off wiper pivot nut plastic cover (**curved arrow**).

CAUTION—

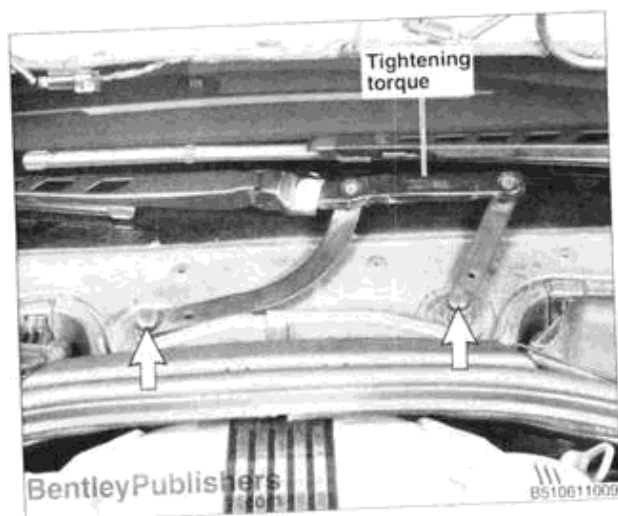
- Do not shear off or otherwise damage retaining tabs.



- ◀ Remove wiper arm pivot nut (**arrow**). Lift arm off pivot.
- Note that tightening torque is stamped on wiper arm.

Wipers and Washers 611-5

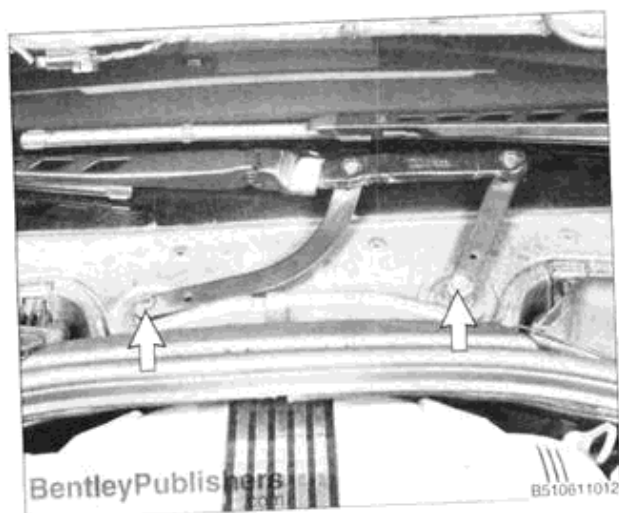
Windshield wiper arms, removing and installing



Right wiper arm

- ◀ Pry off wiper pivot nut plastic caps (arrows).

Note that tightening torque is stamped on wiper arm link. (Plastic cover removed for illustration.)



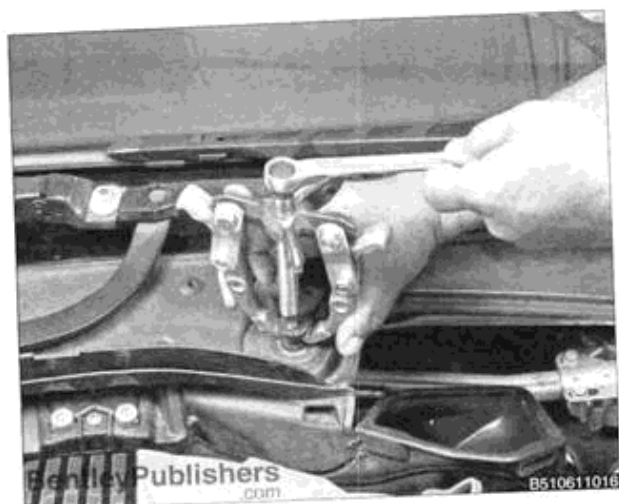
- ◀ Remove wiper arm pivot nuts (arrows). Lift linkage off pivots.

- ◀ If necessary, use puller to remove wiper arm from pivot.

CAUTION—

- Do not bend wiper arm while removing.

- Before installing wiper arms, make sure wipers are in PARK position:
 - Switch ignition ON.
 - Switch wipers ON and allow two cycles to complete.
 - Switch wipers OFF. Wait for wiper motor to come to rest, then switch ignition OFF.



611-6 Wipers and Washers

Windshield wiper blades and arms, adjusting position

- Attach wiper arms and tighten pivot nuts.
 - Left wiper arm: Temporarily tighten pivot nut, then check and adjust wiper blade position. See **Windshield wiper blades and arms, adjusting position** in this repair group.
 - Right wiper arm: Fully tighten pivot nuts.
 - If applicable, tighten pivot nuts to torques stamped on wiper arms.
 - After approximately 50 minutes settling time, recheck torques.

Tightening torque

Front wiper arm to wiper pivot	
• M8 nut	17 - 20 Nm (13 - 15 ft-lb)
• M10 nut	30 - 35 Nm (22 - 26 ft-lb)

- Right wiper arm: Check and adjust wiper blade position. See **Windshield wiper blades and arms, adjusting position** in this repair group.

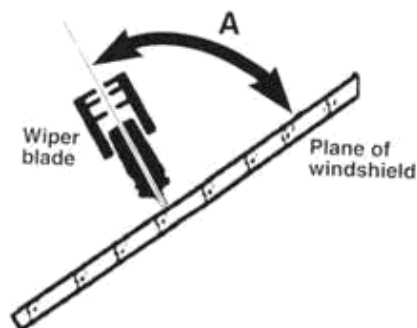
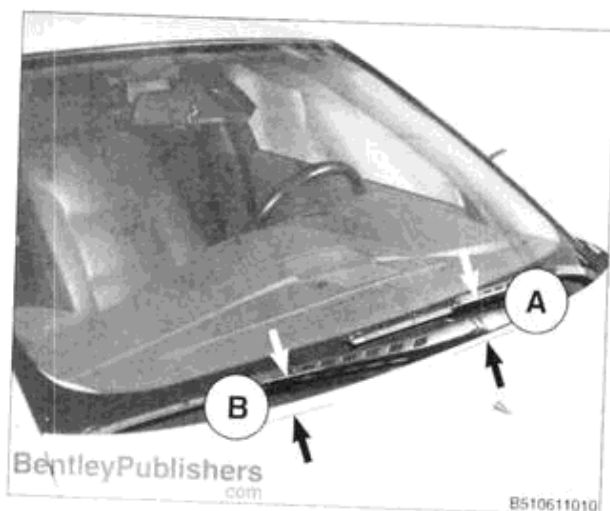
Windshield wiper blades and arms, adjusting position

- ◀ Wiper blade position is set in relation to top of cowl cover at base of windshield.

- Make sure wipers are in PARK position.
- Measure from bottom edge of wiper blade to base of windshield. See **Table a**.

Table a. Wiper blade position in PARK

Left side (A)	69 ± 3 mm (2.7 ± 0.1 in)
Right side (B)	87 ± 3 mm (3.4 ± 0.1 in)



- ◀ Wiping action is improved by correctly setting contact angle of wiper blade (A to plane of windshield). Both wiper arms are designed with a tilt adjustment for setting wiper blade contact angle.

Wipers and Washers 611-7

Windshield wiper blades and arms, adjusting position



- BMW special tool 61 6 100 or equivalent protractor may be used to measure wiper blade contact angle. Correct wiper blade contact angle is in **Table b**

Table b. Wiper blade contact angle

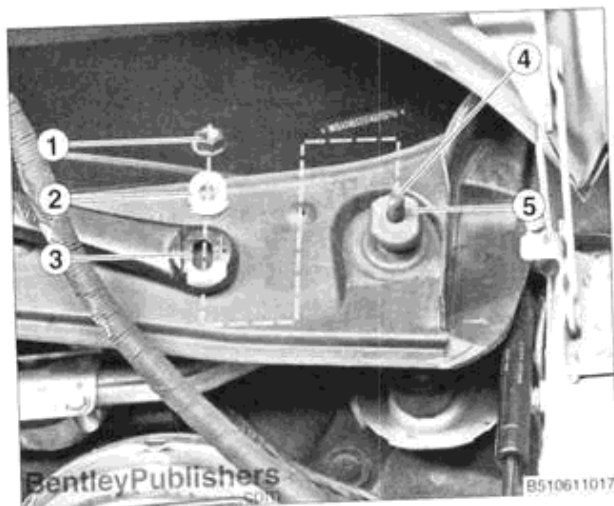
Wiper blade angle to windshield (left or right)	$86^{\circ} \pm 1^{\circ}$
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Left wiper arm, adjusting

- Left wiper arm attachment components:

1. Pivot nut, M10
 - Tighten to 30 - 35 Nm (22 - 26 ft-lb)
2. Eccentric washer
3. Wiper arm
 - Slide on slotted hole to adjust wiper blade angle
4. Wiper pivot
5. Domed adjusting disc
 - Use puller to remove from pivot

Curved bottom of wiper arm contact surface and domed adjusting disc allow wiper blade angle adjustment.



- With pivot nut finger tight, slide wiper arm up or down (arrow) until blade position and angle are correct. See **Table a** and **Table b**.

- Tighten pivot nut and recheck wiper blade position.
 - If applicable, tighten pivot nut to torque stamped on wiper arm.
 - After approximately 50 minutes settling time, recheck torque.

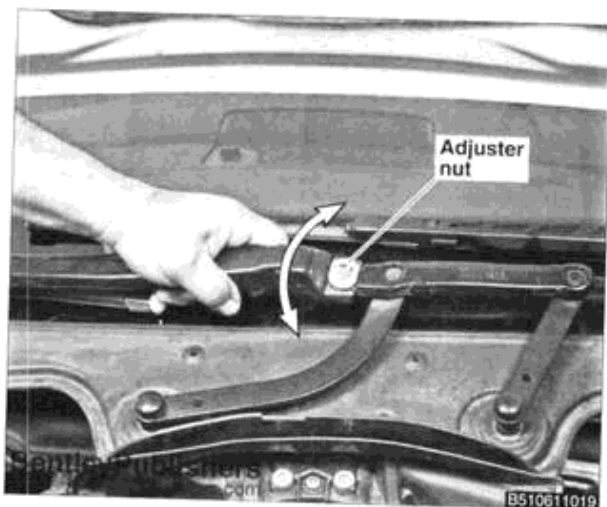
Tightening torque

Front wiper arm to wiper pivot (M10 nut)	30 - 35 Nm (22 - 26 ft-lb)
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611-8 Wipers and Washers

Rear wiper blade, replacing



Right wiper arm, adjusting

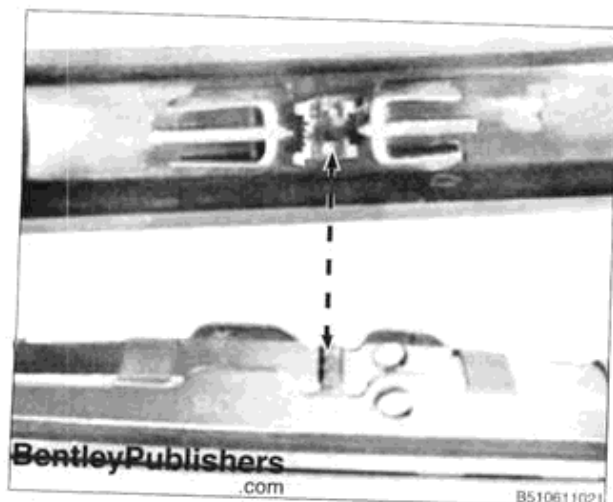
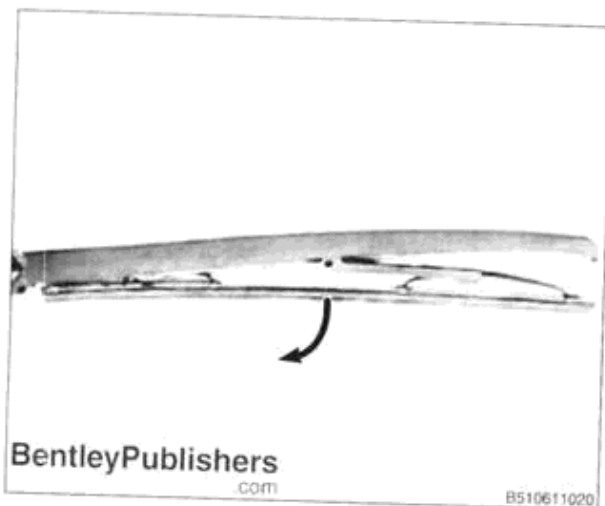
- ◀ With right wiper arm pivot nuts fully tightened:
 - Remove right wiper arm plastic trim.
 - Loosen adjuster nut.
 - With adjuster nut finger tight, slide wiper arm up or down (arrow) until blade position and angle are correct. See **Table a** and **Table b**.
- Tighten adjuster nut and recheck wiper blade position.

Tightening torque

Right wiper arm adjusting nut	20 Nm (15 ft-lb)
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Rear wiper blade, replacing

- Pivot wiper arm off rear window.
- ◀ Pull wiper blade off wiper arm (arrows).



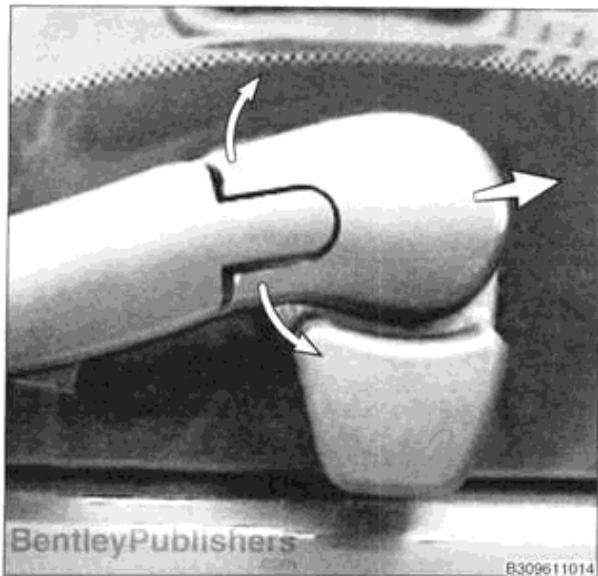
- ◀ When installing, make sure wiper blade mounting tab clips firmly in wiper arm slot (arrow).

Wipers and Washers 611-9

Rear wiper arm, removing and installing

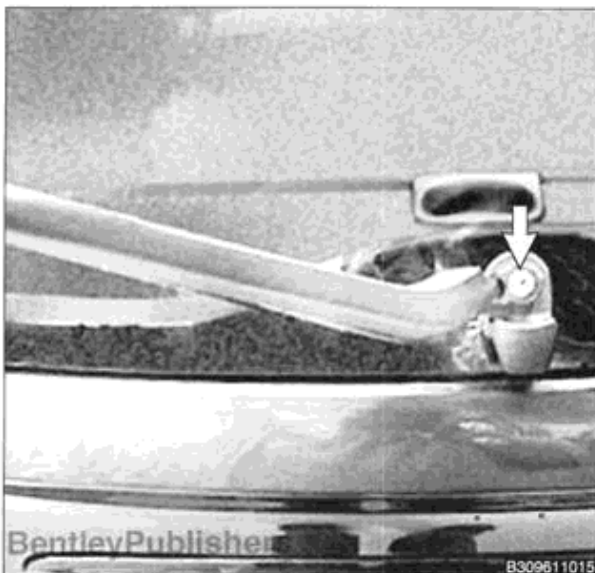
Rear wiper arm, removing and installing

- Spread wiper pivot plastic cap catches (**curved arrows**) and remove cap (**flared arrow**).



- Pivot wiper arm off rear window, then remove mounting nut (**arrow**).

- Remove wiper arm off pivot. If necessary, use puller to remove wiper arm from pivot.
- Before installing wiper arm, make sure wiper assembly is in PARK position:
 - Switch ignition ON.
 - Switch rear wiper ON and allow two cycles to complete.
 - Switch wiper OFF. Wait for wiper motor to come to rest, then switch ignition OFF.



- Attach wiper arm and tighten down mounting nut temporarily, then check and adjust wiper blade position.

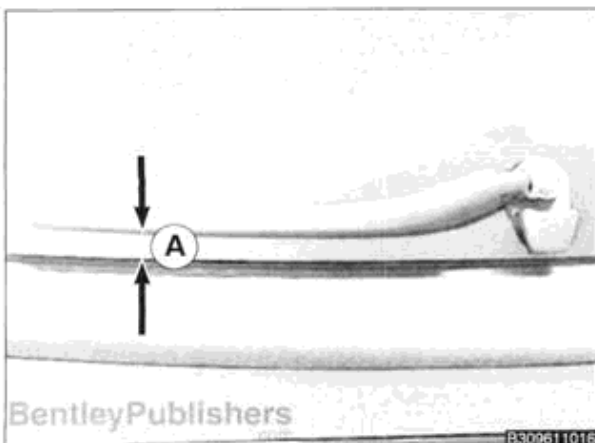
Rear wiper blade position

Measurement A (distance between bottom of wiper arm and rear window lower edge)	30 mm (1.2 in)
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- Tighten arm to final torque.

Tightening torque

Rear wiper arm to wiper pivot (M8)	13 Nm (10 ft-lb)
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611-10 Wipers and Washers

Windshield wiper assembly, removing and installing

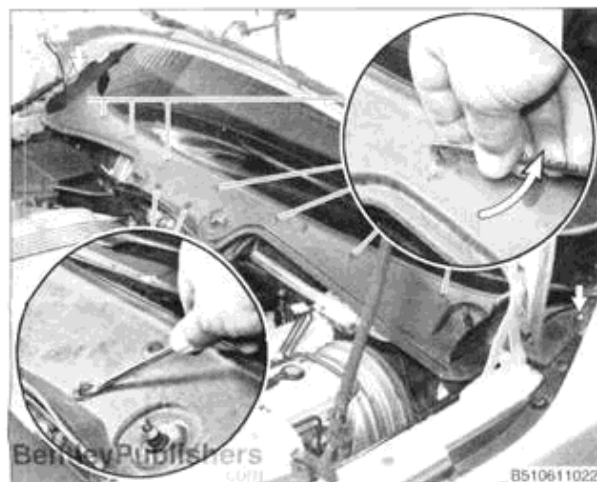
WIPER ASSEMBLIES

Windshield wiper assembly, removing and installing

CAUTION—

- Make sure wipers are parked (stalk switch in OFF position) and the ignition is also OFF.
- Use fender cover to protect windshield.
- To avoid damaging the wiper arms and pivots, do not manually slide or force the wiper arms across the windshield.

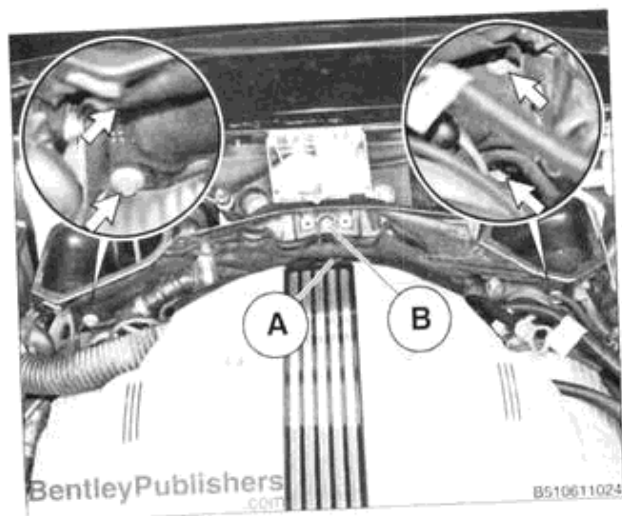
- Remove wiper arms. See **Windshield wiper arms, removing and installing** in this repair group.
- Remove cabin microfilter housings on left and right. See **020 Maintenance**.
- Remove front strut tower brace. See **310 Front Suspension**.
- ◀ Use suitable puller to remove domed adjusting disc from left wiper pivot.



- ◀ Remove cowl cover panel:
 - Pry out plastic rivets (**lower inset**).
 - Use 5 mm Allen wrench to rotate plastic retainers 90° (**upper inset**), thus detaching panel from base of windshield.
 - Remove plastic fasteners (**arrows**) at corners of panel.
 - Lift panel off base of windshield.

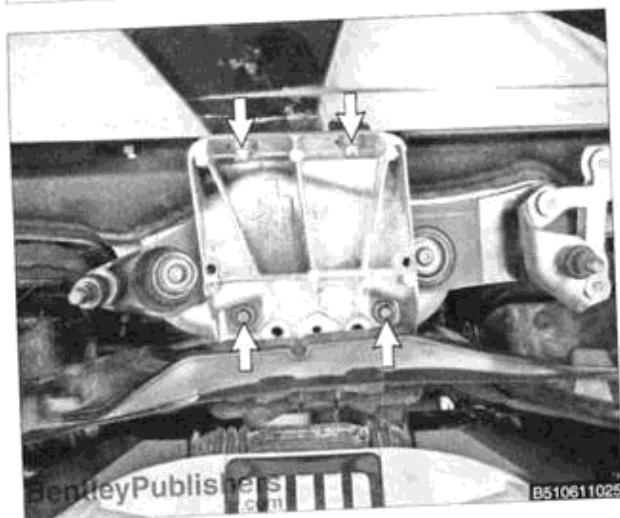
Wipers and Washers 611-11

Windshield wiper assembly, removing and installing

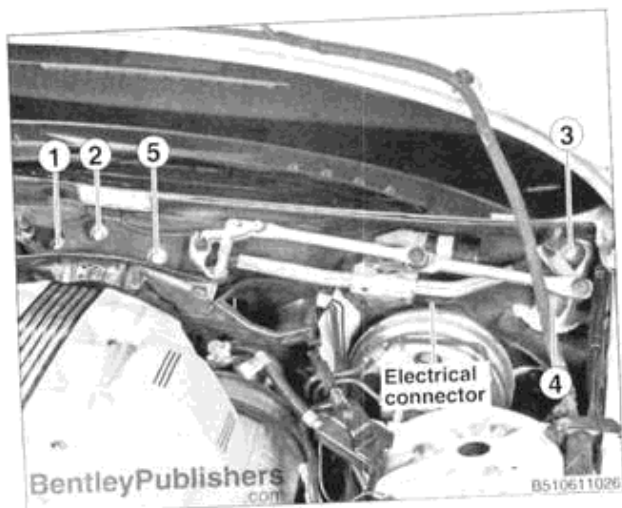


Working at front air duct:

- Remove 4 side duct mounting screws (arrows).
- Rotate center quick-release plastic fastener (A) approx. 90°.
- Remove Torx screw (B) at strut tower brace center anchor.
- Push air duct forward to expose strut tower brace mounting bracket bolts.



Remove strut tower brace mounting bracket bolts (arrows) and lift out bracket.



Working at wiper motor assembly:

- Detach wiper motor electrical connector
- Loosen and remove Torx screws in order 1 - 5.
- Lift wiper motor out of cowl opening.

When installing:

- Install mounting screws hand tight at first.
- Tighten screws in order 5 - 1.
- If wiper linkage interferes with installation of screw 4, attach electrical connector, switch ignition ON, then switch wipers ON long enough to move linkage to right. Switch ignition OFF midway through wipe cycle.

Tightening torque

Wiper motor assembly to body (M6 Torx bolts)	10 Nm (7 ft-lb)
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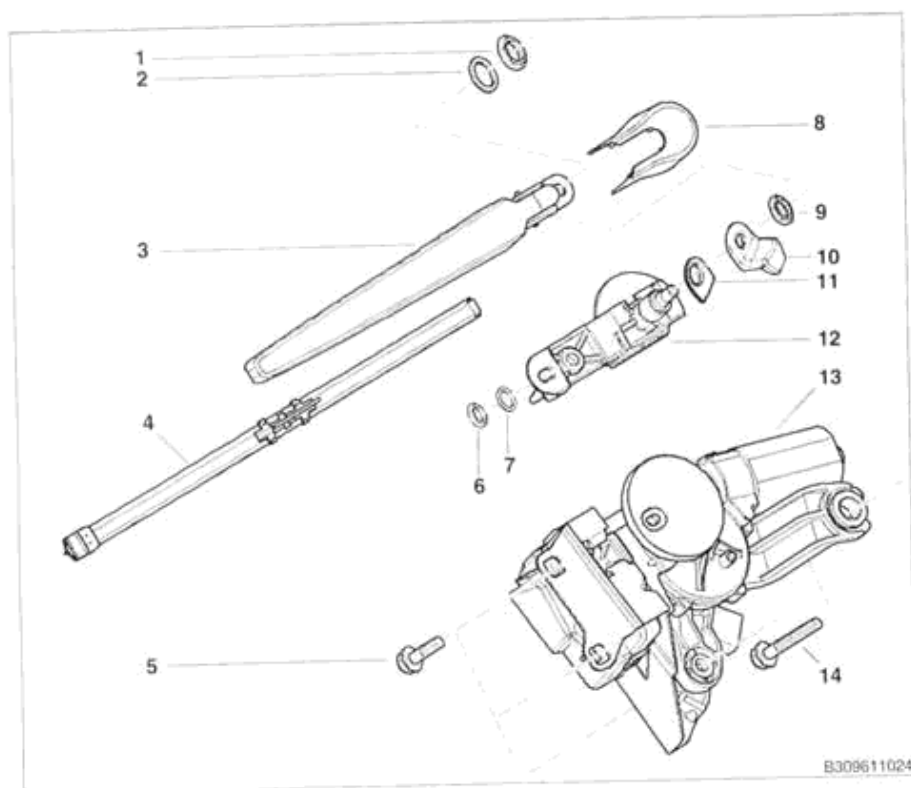
611-12 Wipers and Washers

Windshield wiper assembly, removing and installing

- Remainder of installation is reverse of removal. Before installing wiper arms, make sure wipers are in PARK position:
 - Switch ignition ON.
 - Switch wipers ON and allow two cycles to complete.
 - Switch wipers OFF. Wait for wiper motor to come to rest, then switch ignition OFF.
 - Left wiper arm: Install domed adjusting disc and wiper arm. Temporarily tighten pivot nut, then check and adjust wiper blade position. See **Windshield wiper blades and arms, adjusting position** in this repair group.
 - Right wiper arm: Install wiper arm and fully tighten pivot nuts.
 - If applicable, tighten pivot nuts to torques stamped on wiper arms.
 - When reinstalling microfilter housings, to avoid water leaks into cabin, check that seals are intact and seat correctly.
 - After approximately 50 minutes settling time, recheck wiper arm torques.

Tightening torque	
Air duct to side mountings (M6 bolts)	4.5 Nm (40 in-lb)
Air duct to strut tower brace center anchor (Torx screw)	3.5 Nm (31 in-lb)
Brace to strut tower or bulkhead bracket (use new M8 Torx bolts)	30.5 Nm (22 ft-lb)
Front wiper arm to wiper pivot • M8 nut • M10 nut	17 - 20 Nm (13 - 15 ft-lb) 30 - 35 Nm (22 - 26 ft-lb)
Strut tower brace mounting bracket to bulkhead (Torx bolts)	24 Nm (18 ft-lb)

Rear wiper assembly



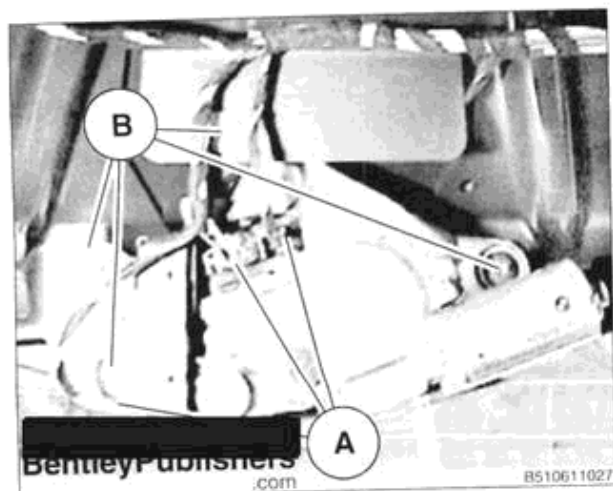
1. Wiper arm nut (M8)
• Tighten to 10 Nm (7 ft-lb)
2. Wave washer
3. Wiper arm
4. Wiper blade
5. Torx bolt (M6 x 9 mm)
• Tighten to 10 Nm (7 ft-lb)
6. Wiper pivot nut (M6)
• Tighten to 8 Nm (6 ft-lb)
7. Gasket
8. Cover
9. Lock nut
10. Rear window lock release button
11. Gasket
12. Wiper pivot assembly
13. Wiper motor assembly
14. Torx bolt (M6 x 22 mm)
• Tighten to 10 Nm (7 ft-lb)

Rear wiper motor, removing and installing

The rear wiper motor is bolted to the Sports Wagon tailgate. The wiper arm and blade are mounted to the rear window which is hinged at the top. The motor drives the rear wiper arm via a pivot assembly mounted on the rear window. For the window to close correctly and rear wiper to operate, align the pivot assembly on the glass with the drive on the wiper motor using BMW special tool 61 1 330.

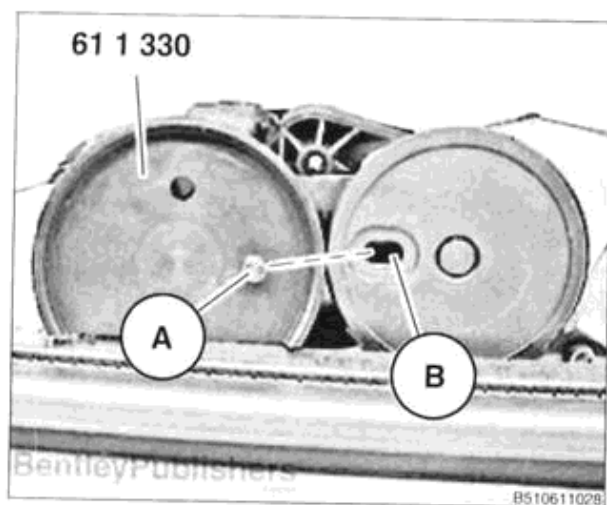
The rear window lock is bolted to the rear wiper motor assembly.

- Remove tailgate inner trim panel. See **513 Interior Trim**.
- ◀ Working at rear wiper motor:
 - Detach electrical connectors (A).
 - Remove mounting screws (B).
 - Lift off wiper motor.
- If replacing motor: Separate rear window lock from rear wiper motor assembly and bolt to new unit.
- Reinstall wiper motor but tighten mounting bolts finger tight at first.
- Attach wiper motor electrical harness. Switch ignition ON. Cycle rear wiper twice to make sure wiper motor is in PARK position. Switch ignition OFF.

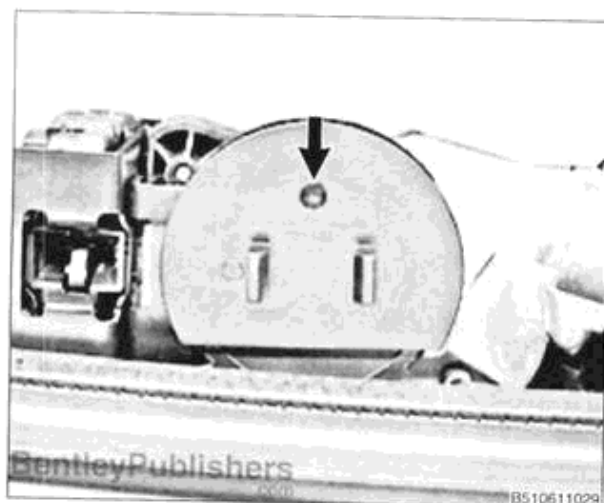


611-14 Wipers and Washers

Rear window wiper pivot, removing and installing



- Align assembly using BMW special tool 61 1 330: Position special tool so that pin (A) on tool inserts into slot (B) in wiper motor drive.



- With rear wiper arm vertical to glass, close rear window and allow journal of wiper pivot assembly to snap into bore (arrow). Close window completely.

- Tighten rear wiper motor mounting bolts.

Tightening torque

Rear wiper motor to tailgate	10 Nm (7 ft-lb)
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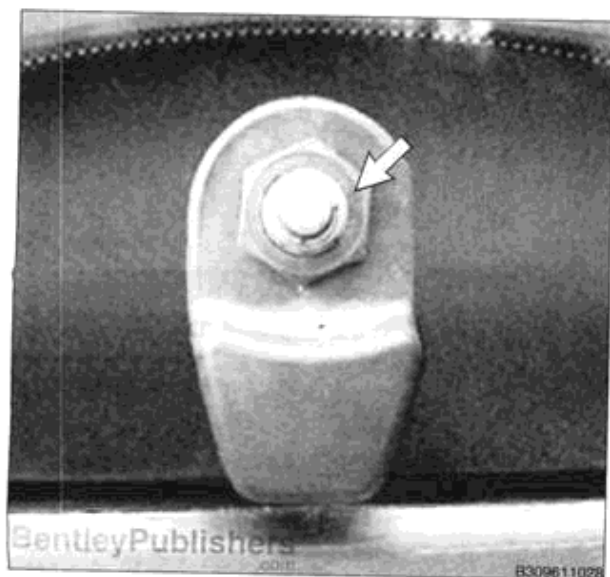
- Open window and remove special tool.
- Reinstall tailgate trim.

Rear window wiper pivot, removing and installing

- Remove rear wiper arm. See **Rear wiper arm, removing and installing** in this repair group.

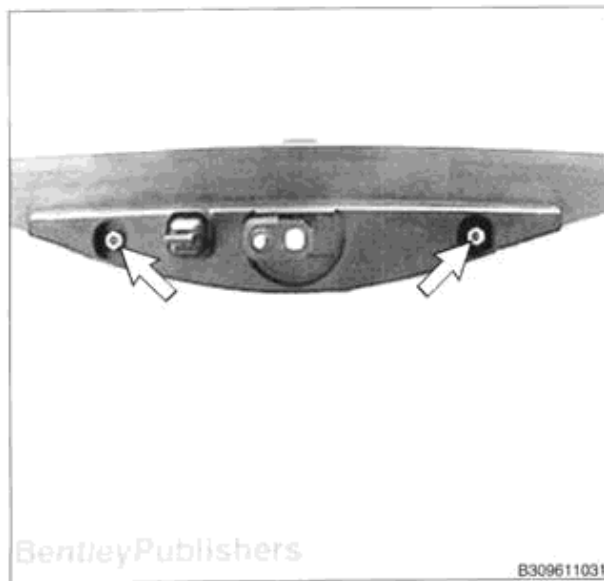
- Use duct tape to hold window lock release button in place.

- Remove nut (arrow) securing pivot to window lock release button.



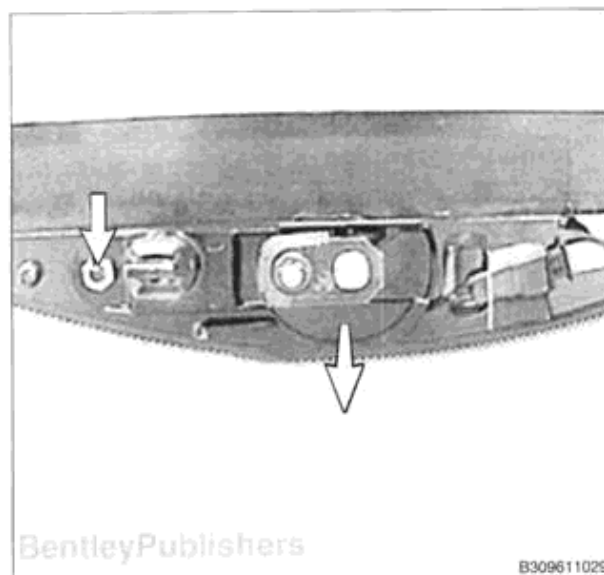
Wipers and Washers 611-15

Rear window wiper pivot, removing and installing



With window open:

- Carefully pry out wiper pivot assembly trim covers.
- Remove trim cover mounting nuts (**arrows**) and pull off cover.



With window open:

- Detach window lock release button electrical connector.
- Remove pivot assembly mounting nut (**arrow**) and remove pivot (**flared arrow**).

— Installation is reverse of removal.

Tightening torques

Window lock release button to glass	10 Nm (7 ft-lb)
Wiper pivot to glass (M6)	8 Nm (6 ft-lb)

- Synchronize wiper pivot and wiper motor drive. See **Rear wiper motor, removing and installing** in this repair group.

WASHER SYSTEM

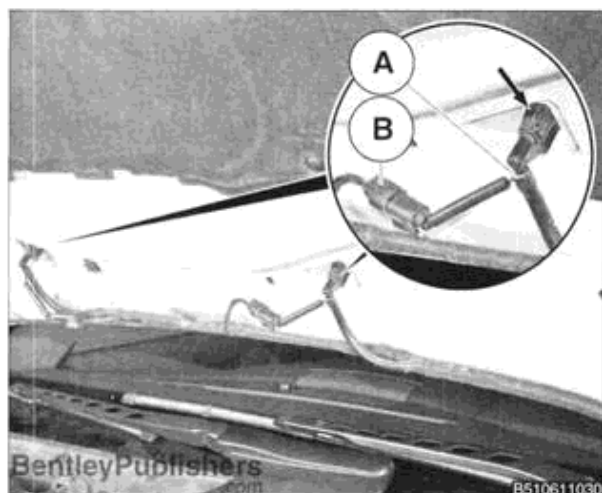
The windshield washer system includes electrically heated spray jets under the engine hood, the washer fluid pump, and washer fluid reservoir in front of the left front wheel housing.

The headlight washer system (optional) consists of front washer fluid reservoir (shared with windshield washer system), a separate washer pump, and washer jets in the front bumper.

The rear window washer consists of the fluid reservoir (shared with windshield washer system), a separate washer pump, and a washer jet at the top of the rear window.

611-16 Wipers and Washers

Windshield washer jet, removing and installing

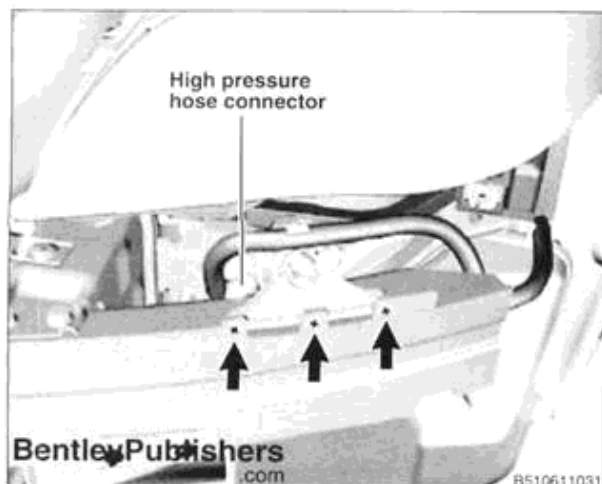
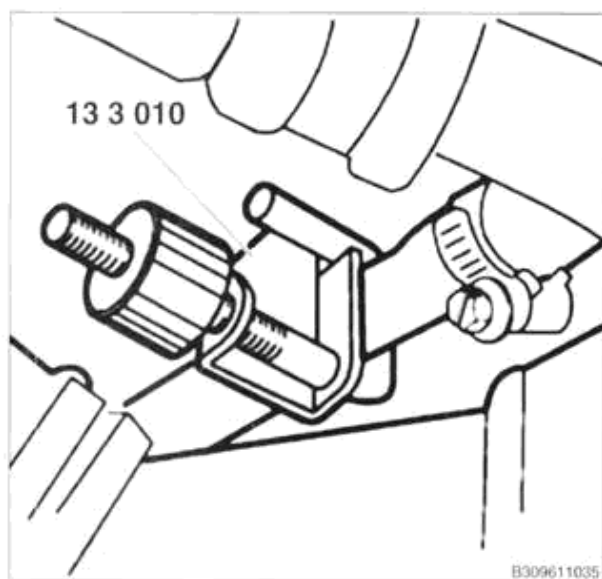


Windshield washer jet, removing and installing

- Open engine hood.
- Working on underside of hood:
 - Pinch off washer hose, then detach washer fluid hose (A) from jet.
 - Press on lock clip (B) and separate washer jet electrical connector.
 - Press on washer jet locking clip (arrow) and push jet up through hood to remove.
- When installing, check that washer jet snaps in place firmly. Route washer hose without kinks.
- Check windshield washer function. Washer jet nozzle aim is set at factory and cannot be adjusted.

Headlight washer jet, removing and installing

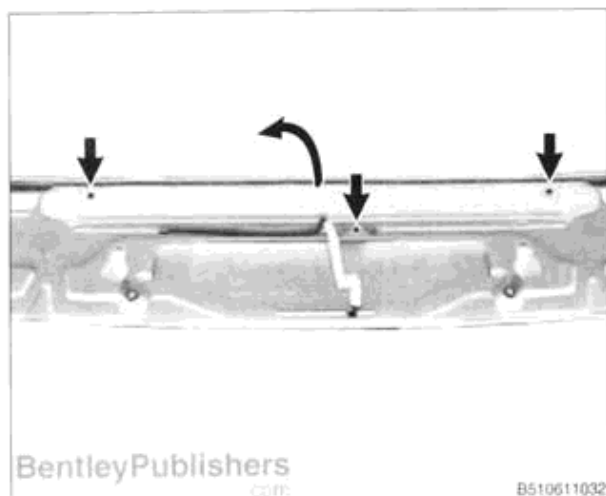
- Remove front bumper cover. See 510 Exterior Trim, Bumpers.
- To avoid washer fluid spillage, pinch off washer hose with hose pinch tool 13 3 010 or equivalent.



- Working at headlight washer jet:
 - Detach high pressure hose connector.
 - Remove washer jet mounting screws (arrow). Lift washer jet out of bumper opening.
- Installation is reverse of removal. Check headlight washer function. Nozzle aim is set at factory and cannot be adjusted.

Wipers and Washers 611-17

Rear window washer jet, removing and installing



Rear window washer jet, removing and installing

- Remove rear spoiler. See **412 Trunk Lid, Tailgate**.
- Remove center brake light screws (**arrows**) and pull brake light unit and rear window washer nozzle away (**curved arrow**) from spoiler.



- Unhook washer hose from catch and pull nozzle away from center brake light assembly (**arrow**).
- Installation is reverse of removal. Route washer hose as before, making sure it is not kinked.

611-18 Wipers and Washers

Washer fluid reservoir components service



Washer fluid reservoir components service

- Washer fluid reservoir is behind left front wheel housing liner. See **410 Fenders, Engine Hood** for wheel housing liner removal.

➤ Depending on model, washer reservoir components are as follows:

1. Headlight washer pump
2. Rear window washer pump (Sports Wagon)
3. Windshield washer pump
4. Washer fluid level switch

- To replace any component:

- Detach electrical connector.
- Separate high pressure fluid hose, if applicable.
- Rotate component clockwise and pry out of reservoir. Be prepared to catch dripping fluid.

- Installation is reverse of removal, noting the following:

- Replace strainers on washer pumps.
- Coat grommet at base of pump or sensor with anti-friction agent.
- Use new hose clamps, if applicable.
- After installation, check that fluid hoses are not kinked.

- Fill reservoir and check for leaks.

