

A/C microfilter, replacing

- 1. Remove glove compartment. See 513 Interior Trim.
- 2. Remove right footwell ventilation duct. See Fig. 51.

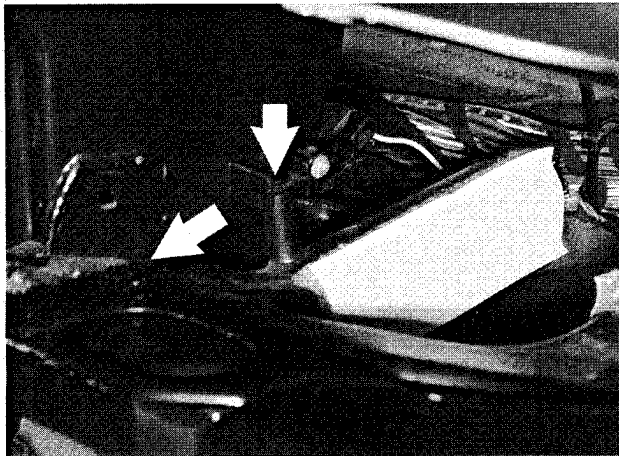


Fig. 51. Unfasten retaining rivets from right ventilation duct (arrows).

- 3. Remove right side control module carrier screws and tilt carrier down. See Fig. 52.

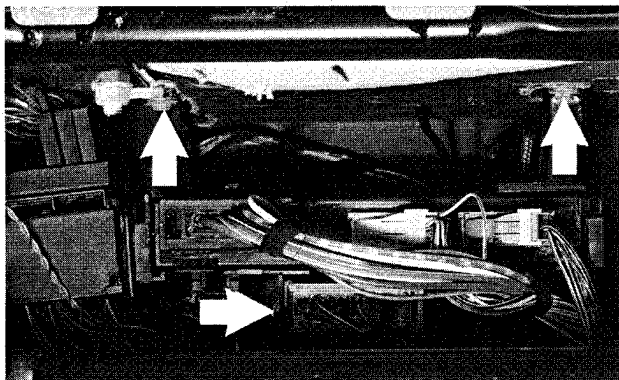


Fig. 52. Control module carrier retaining screws (arrows).

- 4. Rotate A/C microfilter housing release knob about 45° counterclockwise and remove filter housing cover. See Fig. 53.
- 5. Remove microfilter while moving module harnesses out of the way.
- 6. Installation is reverse of removal.

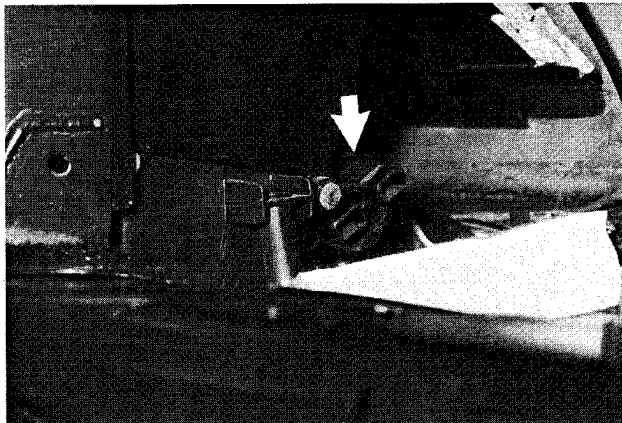


Fig. 53. A/C microfilter cover release knob (arrow) on passenger side of heater box.

Table d. A/C System Fluid Capacities (total)

Fluid	Quantity
R-12 refrigerant	1200g ± 25 g (2.65 lbs.± 0.05 lbs.)
R-134a refrigerant	1000 g ± 25 g (2.20 lbs.± 0.05 lbs.)
PAG oil SP-10 (R12 system)	200 ml ± 20 ml (6.8 oz. ± 0.7 oz.)
Refrigerant oil (R134a system)	Nippondeso 120ml Seiko Seiki 150ml



8. Installation is reverse of removal.

CAUTION —

Always replace O-rings when reconnecting refrigerant lines.

9. Before recharging, evacuate system for at least 30 min. Recharge system following equipment manufacturer's instructions. See **Table d. A/C System Refrigerant Capacities**.

A/C evaporator, removing and installing

1. Following manufacturer's instructions, connect an approved refrigerant recovery/recycling/recharging unit to A/C system and discharge system.
2. Remove complete heater box as described earlier.
3. Remove expansion valve as described earlier.
4. Unfasten evaporator sensor electrical harness connector and pull out sensor from left side of heater box. See Fig. 50.

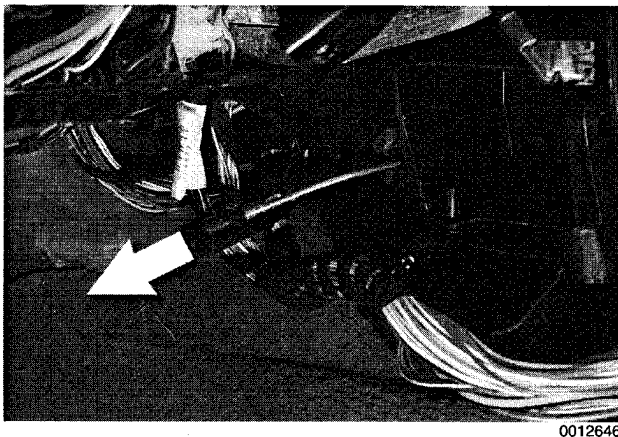


Fig. 49. Pull out evaporator sensor from housing in direction of arrow.

5. Remove rear heater box cover.
6. Remove clips retaining lower evaporator housing cover. Tilt out heater core, then pull evaporator out of housing.
7. Installation is reverse of removal.

CAUTION —

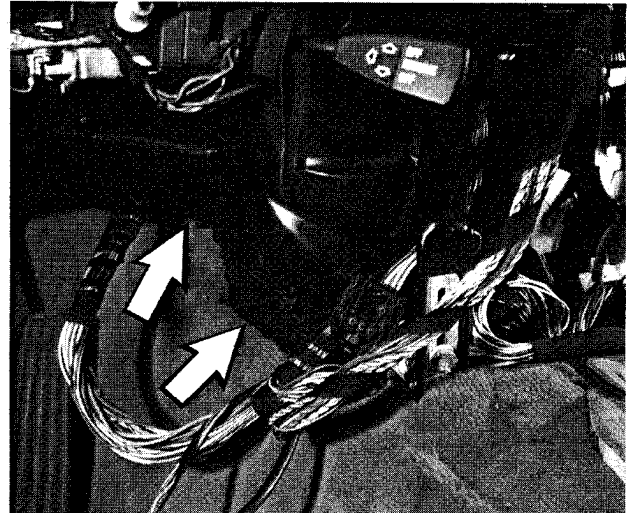
Always replace O-rings when reconnecting refrigerant lines.

8. Before recharging, evacuate system for at least 30 min. Recharge system following equipment manufacturer's instructions. See **Table d. A/C System Refrigerant Capacities**.

A/C evaporator temperature sensor, replacing

The evaporator temperature sensor is mounted in the left (driver) side of the heater box behind the center console.

1. Remove lower dash panel and knee bolster on driver side. See **513 Interior Trim**.
2. Remove left footwell ventilation duct by removing retaining rivet in bottom of duct. Pull it down and away from heater box. See Fig. 50.



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Fig. 50. Left footwell ventilation duct (arrow).

3. Disconnect sensor electrical connector from heater box. Pull sensor straight out of heater box. Refer to Fig. 49.
4. Installation is reverse of removal. **Table c.** lists evaporator temperature sensor test values.

Table c. Evaporator Temperature Sensor Test Values

Test temp.	Resistance
23°F (-5°C)	11.4 – 11.9 k ohms
32°F (0°C)	8.8 – 9.2 k ohms
41°F (5°C)	6.8 – 7.2 k ohms
50°F (10°C)	5.3 – 5.6 k ohms
59°F (15°C)	4.2 – 4.5 k ohms
68°F (20°C)	3.3 – 3.6 k ohms
77°F (25°C)	2.6 – 2.9 k ohms
86°F (30°C)	2.1 – 2.3 k ohms
95°F (35°C)	1.7 – 1.9 k ohms

A/C expansion valve, removing and installing

1. Following manufacturer's instructions, connect an approved refrigerant recovery/recycling/recharging unit to A/C system and discharge system.

WARNING —

Do not discharge/charge the A/C system without proper equipment and training. Damage to the vehicle and personal injury may result.

2. Remove glove compartment and glove compartment support frame. See 513 Interior Trim.
3. Remove right side footwell vents.
4. Remove right side control module carrier screws and tilt carrier down. See Fig. 46.

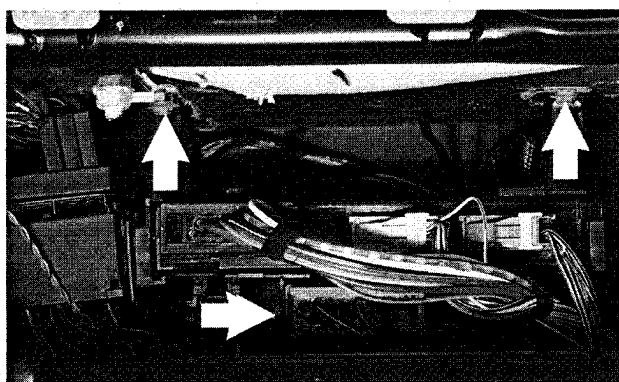


Fig. 45. Control module carrier retaining screws (arrows).

5. Remove expansion valve cover. See Fig. 46.

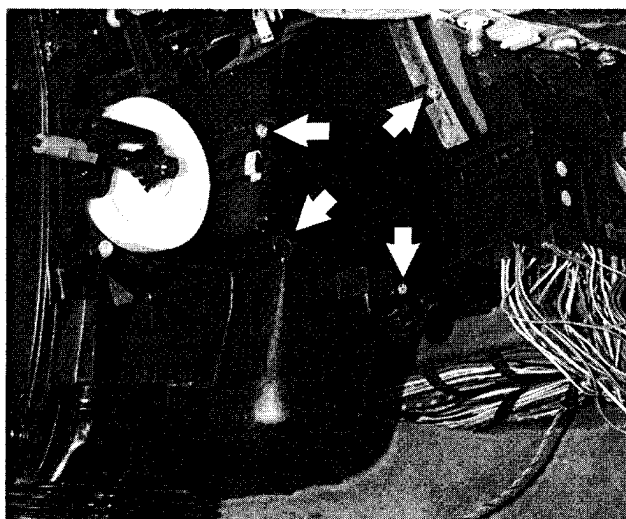


Fig. 46. Four screws retain expansion valve cover (arrows).

6. Remove A/C refrigerant line flange bolt(s) from expansion valve. Plug lines immediately. See Fig. 47.

NOTE —

If necessary, remove air plenum grille from rear of engine compartment as described earlier in **Blower motor, removing and installing**. Remove wiring harness cover screws and then remove right side plenum screws. Reaching into the plenum chamber, remove A/C line flange bolt to allow expansion valve room for removal.

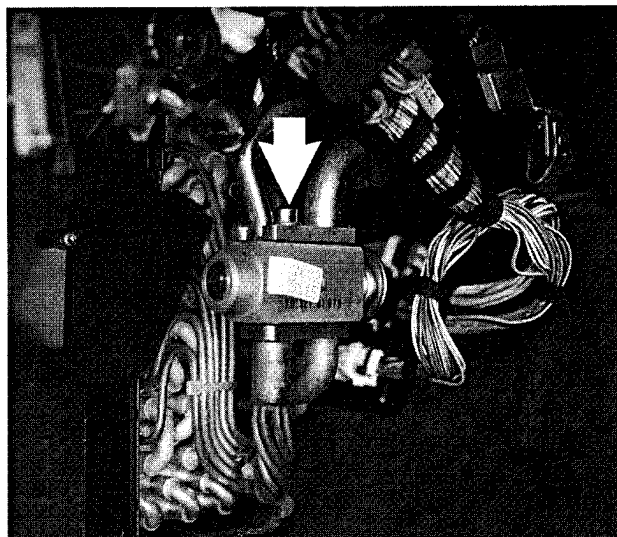


Fig. 47. Refrigerant line flange mounting bolt at expansion valve (arrow).

7. Remove screws from top of expansion valve and remove expansion valve from evaporator. See Fig. 48.

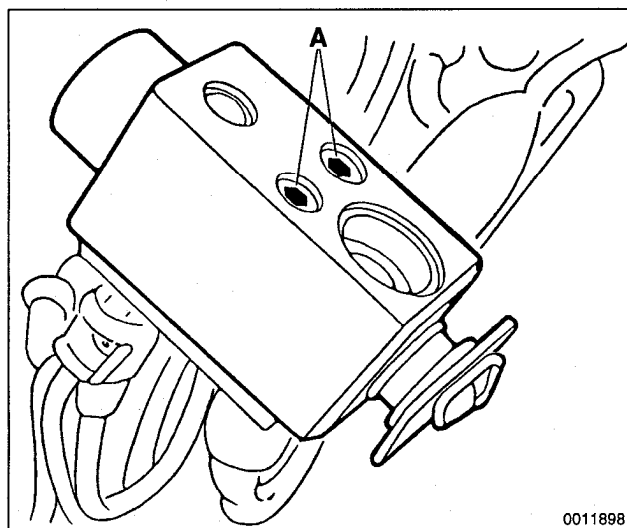
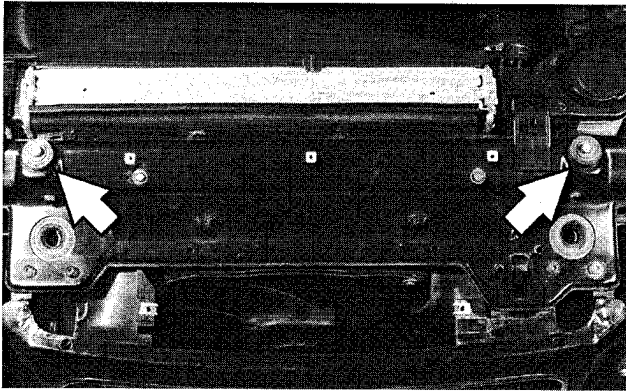


Fig. 48. Expansion valve mounting screws (A).

AIR CONDITIONING



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Fig. 42. Upper A/C condenser mounting bolts (arrows).

8. Before recharging, evacuate system for at least 30 min. Recharge system following equipment manufacturer's instructions. See **Table d. A/C System Refrigerant Capacities.**

A/C receiver/drier, replacing

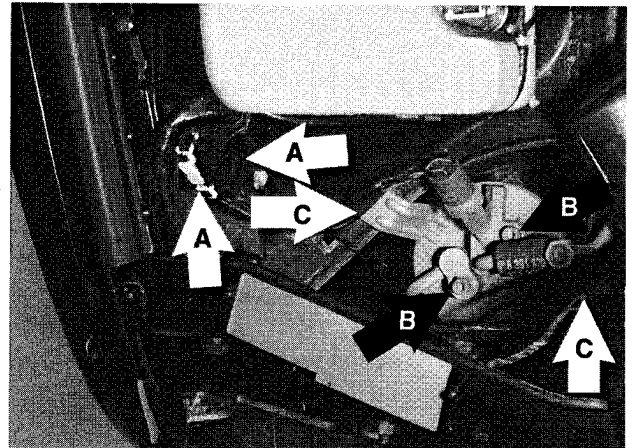
The A/C receiver/drier is mounted in the front right corner of the engine compartment behind the headlight assembly.

CAUTION —

The receiver/drier must be replaced when

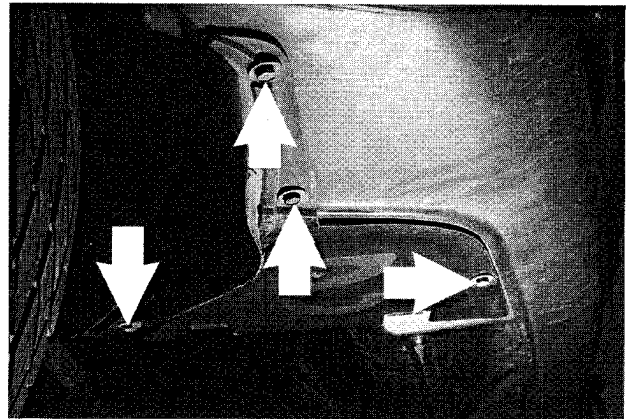
- There is dirt in the A/C system
- The compressor has seized or has been replaced for any reason
- The condenser or evaporator are replaced for any reason
- The A/C system is leaking and there is no more refrigerant
- The A/C system was open for 24 hours or more.

1. Following manufacturer's instructions, connect an approved refrigerant recovery/recycling/recharging unit to A/C system and discharge system.
2. Remove right headlight assembly. See **630 Exterior Lighting.**
3. Disconnect A/C electrical harness connectors. See Fig. 43.
4. Remove refrigerant pressure lines from receiver/drier. Plug lines immediately.
5. Remove receiver/drier mounting bolts.
6. Remove underbody splash shield on passenger side. See Fig. 44.
7. Remove passenger side brake cooling duct. Disconnect outside temperature sensor harness, if applicable.



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Fig. 43. A/C receiver/drier electrical harness connectors (A), pressure line retaining bolts (B), and mounting bolts (C).



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Fig. 44. Passenger side splash shield retaining screws (arrows).

8. Push receiver/drier down and remove from underneath car. Make sure that receiver/drier is clear of any electrical harnesses.
9. Installation is reverse of removal.

CAUTION —

Always replace O-rings when reconnecting refrigerant lines.

10. Before recharging, evacuate system for at least 30 min. Recharge system following equipment manufacturer's instructions. See **Table d. A/C System Refrigerant Capacities.**

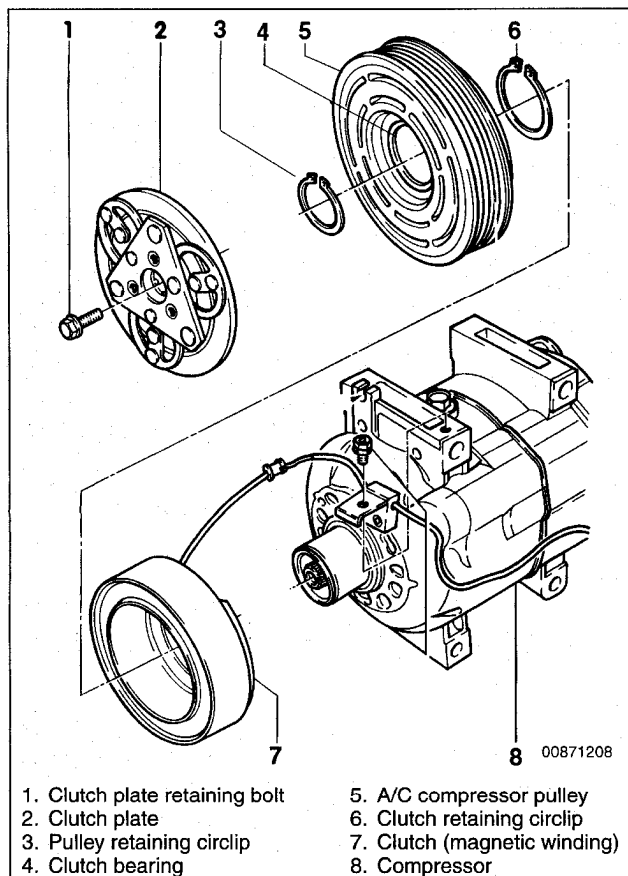


Fig. 39. A/C compressor and clutch components.

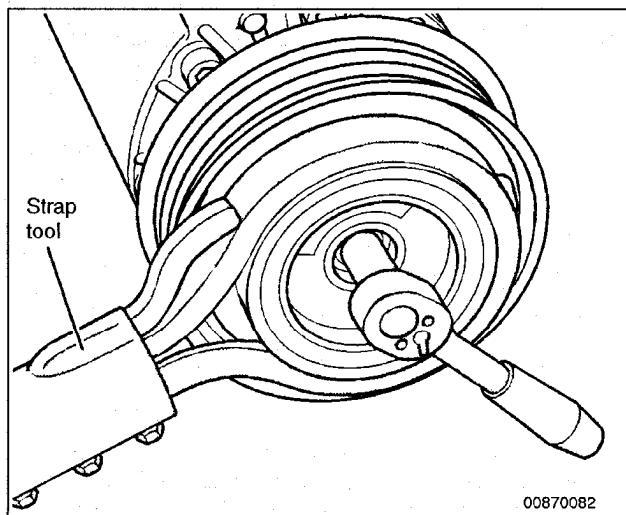


Fig. 40. A/C compressor drive plate can be held stationary with strap tool to allow removal of retaining bolt.

NOTE —

BMW's are equipped with compressors from various manufacturers. Special tools may be required to remove driveplate or pulley.

Tightening Torque

- Compressor clutch bolt to compressor shaft 20 Nm (15 ft-lb)

A/C condenser, replacing

- Following manufacturer's instructions, connect an approved refrigerant recovery/recycling/recharging unit to A/C system and discharge system.

WARNING —

Do not discharge/charge the A/C system without proper equipment and training. Damage to the vehicle and personal injury may result.

- Remove front bumper and radiator grilles. See **510 Exterior Trim, Bumpers**.
- Remove auxiliary electric radiator fan. See **170 Cooling System**.
- Detach A/C lines from lower right corner of condenser. Plug lines immediately. See Fig. 41.

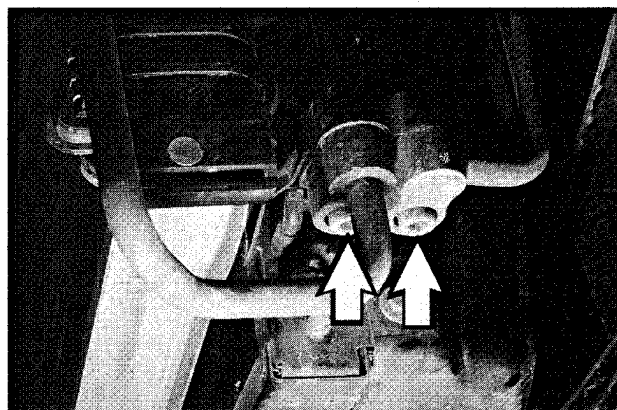


Fig. 41. A/C flange bolts at condenser (arrows).

- Remove condenser mounting bolts from front radiator support. See Fig. 42.
- Lift up condenser to disengage from lower mounts and remove from below.
- Installation is reverse of removal.

CAUTION —

- Always replace O-rings when reconnecting refrigerant lines.
- When installing a new condenser always replace receiver/drier unit.

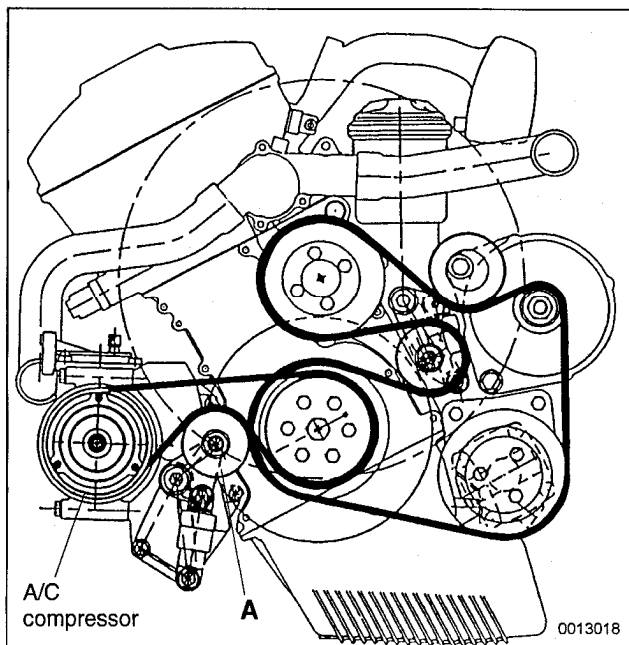


Fig. 36. 6-cylinder engine belt diagram: To remove A/C belt, lever tensioner (A) in clockwise direction using long-handled wrench or breaker-bar.

6. Disconnect electrical harness connector from compressor.

7. Remove A/C pressure hose and suction hose flange bolts from compressor. Plug hoses immediately. See Fig. 37.

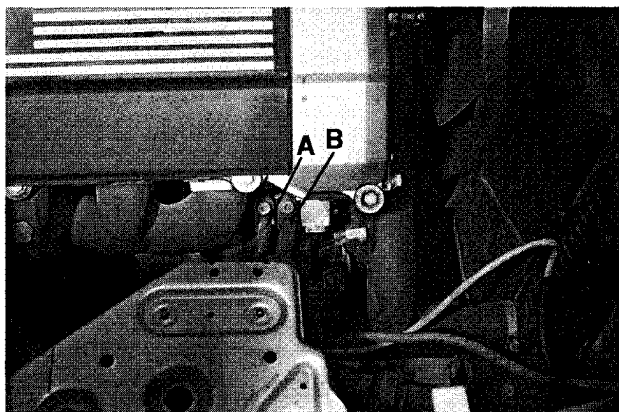


Fig. 37. A/C compressor pressure hose (A) and suction hose (B). (6-cylinder engine shown. 4-cylinder engine is similar.)

8. Remove compressor mounting bolts. See Fig. 38. Remove compressor by pulling downward from underneath car.

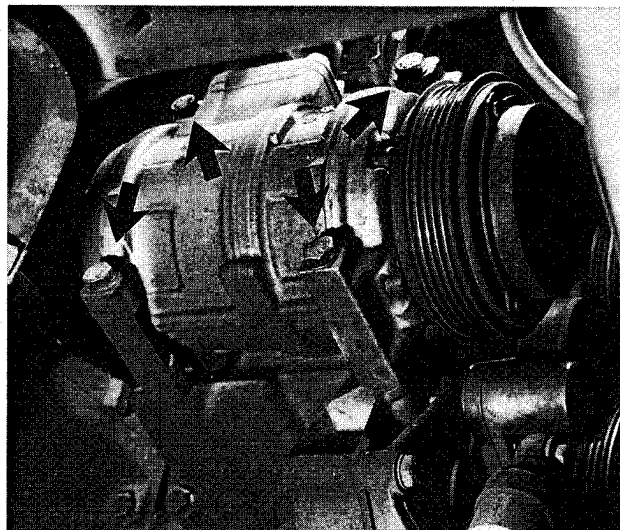


Fig. 38. A/C compressor mounting bolts (arrows).

9. Installation is reverse of removal.

CAUTION —

- Always replace O-rings when reconnecting refrigerant lines.
- When installing a new compressor always replace receiver/drier unit.

10. Before recharging, evacuate system for at least 30 min. Recharge system following equipment manufacturer's instructions. See **Table d. A/C System Refrigerant Capacities.**

Tightening Torques

- A/C compressor to engine block 22 Nm (17 ft-lb)
- A/C line flange to A/C compressor
 - 5/8 in. line 20 Nm (15 ft-lb)
 - 3/4 in. line 39 Nm (29 ft-lb)
 - 7/8 in. line 42 Nm (31 ft-lb)
 - 1 1/16 in. line 48 Nm (35 ft-lb)

A/C Compressor Clutch

The compressor clutch can be replaced without disturbing the sealed refrigerant system, although clearances in the six-cylinder cars may be very tight. Detach the compressor from the compressor bracket to gain extra clearance.

Typical A/C compressor and clutch is shown in Fig. 39.

Remove drive plate and pulley to access clutch magnetic winding. See Fig. 40.

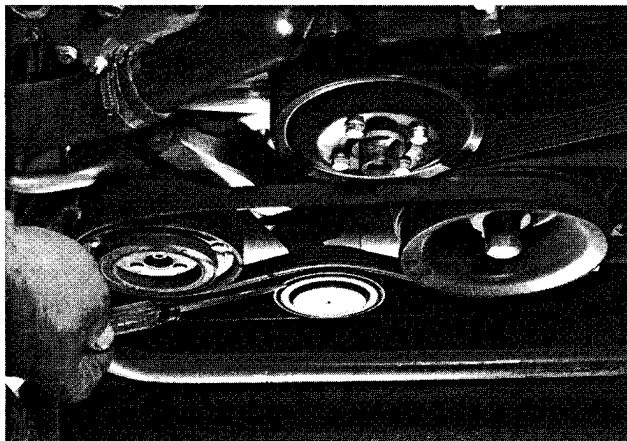
A/C Compressor, replacing

1. Following manufacturer's instructions, connect an approved refrigerant recovery/recycling/recharging unit to A/C system and discharge system.

WARNING —

Do not discharge/charge the A/C system without proper equipment and training. Damage to the vehicle and personal injury may result.

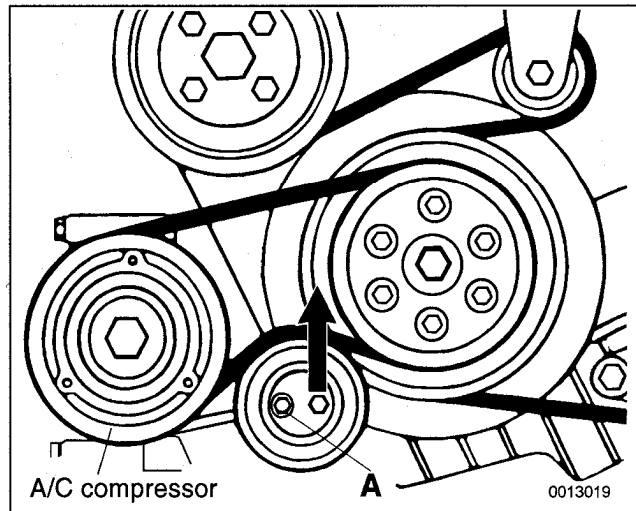
2. Remove splash shield from under engine.
3. Mark A/C drive belt with direction of rotation. Remove A/C belt tensioner trim cap. See Fig. 34.



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Fig. 34. To access tensioner retaining bolt, remove trim cap from drive-belt tensioner.

4. On 4-cylinder engines: Loosen A/C belt tensioner bolt under trim cap, then remove belt from A/C compressor. See Fig. 35.



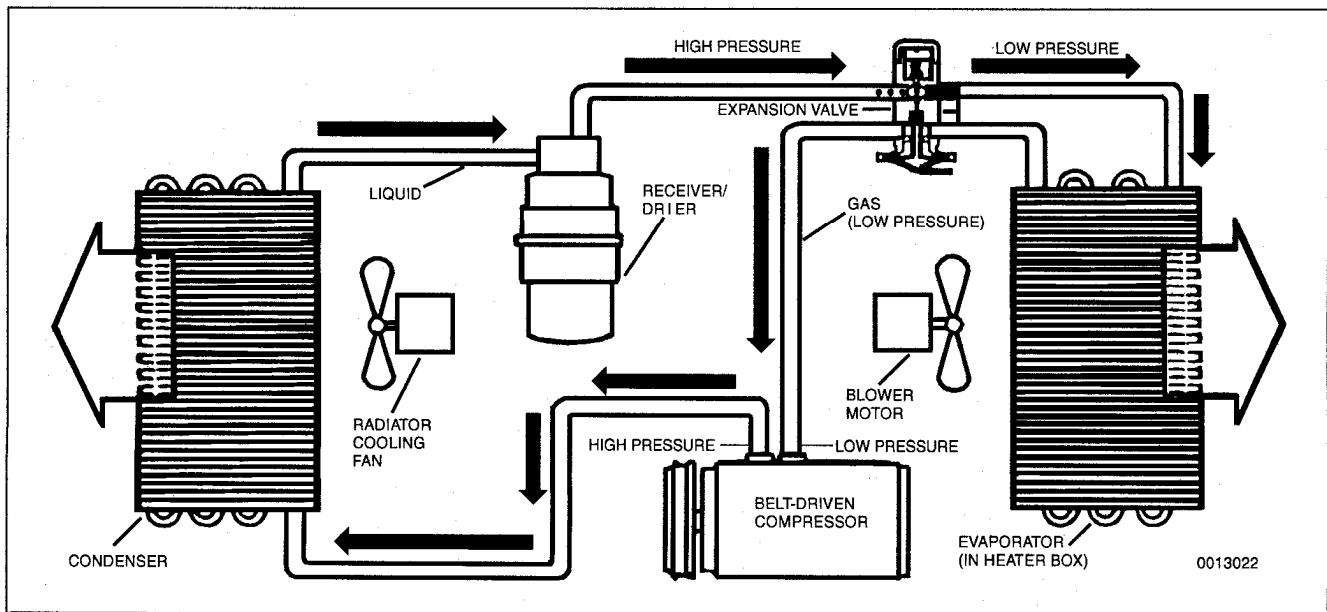
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Fig. 35. 4-cylinder engines: Loosen retaining bolt **A** on tensioner to release drive-belt tension. To increase tension, rotate pulley in direction of arrow, then tighten bolt **A**.

5. On 6-cylinder engines: Release tension on A/C belt by turning tensioner pulley clockwise (against spring tension). See Fig. 36.

NOTE —

Detailed instructions for drive-belt removal and installation can be found in **020 Maintenance Program**.



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Fig. 33. A/C components. Arrows indicate direction of refrigerant flow.

To access the rear window blower relay, remove the glove compartment. See Fig. 32.

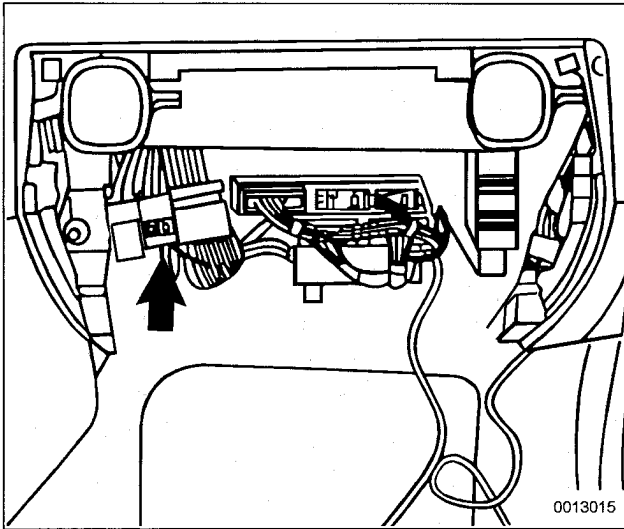


Fig. 32. Rear window blower relay located in front of glove compartment (arrow).

AIR CONDITIONING

This section covers removal and installation of air conditioning refrigerant components. A/C testing and diagnosis, refrigerant discharge, evacuation and recharge are not covered here.

The subassemblies and lines of the air conditioner are filled with either refrigerant R12 (1992 cars) or R-134a (1993 and later cars). The major components of the A/C system are shown in Fig. 33.

A/C System Warnings and Cautions

WARNING —

- Always be careful that refrigerant does not come in contact with your skin. Always wear hand and eye protection (gloves and goggles) when working around the A/C system. If refrigerant does come in contact with your skin or eyes:
 - Do not rub skin or eyes;
 - Immediately flush skin or eyes with cool water for 15 minutes;
 - Rush to a doctor or hospital;
 - Do not attempt to treat yourself.
- Work in a well ventilated area. Avoid breathing refrigerant vapors. Exposure may irritate eyes, nose, and throat. Switch on exhaust/ventilation systems when working on the refrigerant system.
- Do not expose any component of the A/C system to high temperatures (Above 80°C/176°F) or open flames. Excessive heat will cause a pressure increase which could burst the system.

WARNING —

- Keep refrigerant away from open flames. Poisonous gas will be produced if it burns. Do not smoke near refrigerant gases for the same reason.
- The A/C system is filled with refrigerant gas which is under pressure. Pressurized refrigerant in the presence of oxygen may form a combustible mixture. Never introduce compressed air into any refrigerant container (full or empty), capped off A/C component, or piece of service equipment.
- Refrigerant gases are heavier than air, displace oxygen and may cause suffocation in areas of poor circulation, for example under a car. Switch on exhaust/ventilation systems when working on the refrigerant system.
- State and local governments may have additional requirements regarding air conditioning servicing. Always comply with state and local laws.
- Electric welding near refrigerant hoses causes R-134a to decompose. Discharge system before welding.

CAUTION —

- As of January 1, 1992, any person who services a motor vehicle air conditioner must, by law, be properly trained and certified, and use approved refrigerant recycling equipment. Technicians must complete an EPA-approved recycling course to be certified.
- It is recommended that all system refrigerant A/C refrigerant be left to an authorized BMW dealer or other qualified A/C service facility.
- Do not top off a partially charged refrigerant system. Discharge system, evacuate and then recharge system.
- R-134a and R-12 refrigerants and refrigerant oils and system components, including hoses and sealing O-rings, are NOT compatible. Component damage and/or system contamination will result.
- The mixture of refrigerant oil (PAG oil) and refrigerant R-134a attacks some metals and alloys (for example, copper) and breaks down certain hose materials. Use only hoses and lines that are identified with a green mark (stripe) or the lettering "R-134a".
- Immediately plug open connections on A/C components to prevent dirt and moisture contamination.
- Do not steam clean condensers or evaporators. Use only cold water or compressed air.

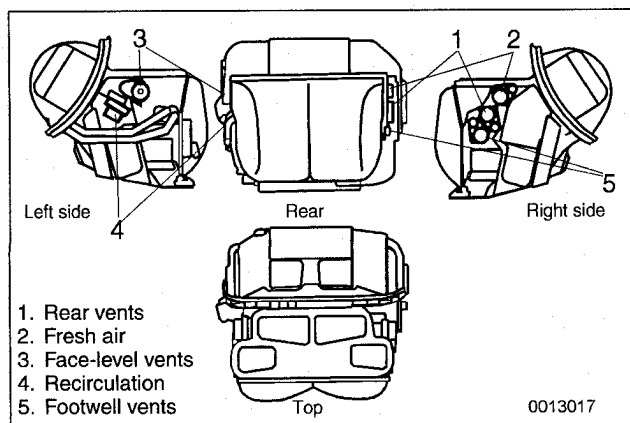


Fig. 28. Location of late production air distribution motors in heater box (shown in rear, side and top views).

Heater and A/C air distribution motor, replacing (rotary-knob)

1. To access left side motors (dash vent mixing or recirculation flap), remove lower dash panel and knee bolster on driver side. See **513 Interior Trim**.
2. To access right side motor (fresh air flap), remove glove compartment. See **513 Interior Trim**.
3. Each motor can be removed after its electrical wiring harness connector has been removed. Squeeze plastic clip to release motor. See Fig. 29.

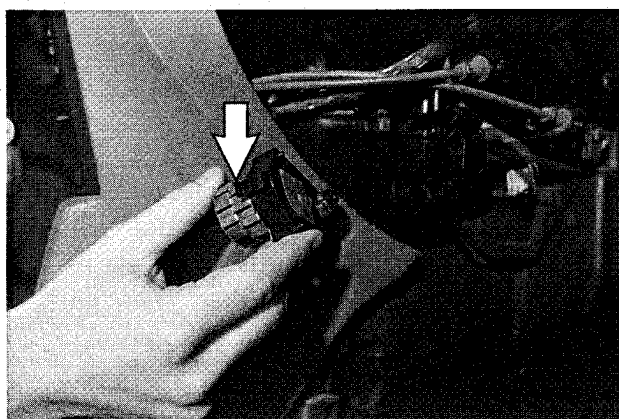


Fig. 29. A/C air distribution motor plastic retaining clip (arrow). Release clip and tilt motor out of housing.

Rear Window Defogger

The electric rear window defogger is integrated with the radio antenna. See Fig. 30.

The rear window defogger switch is integrated with the heating and A/C control head.

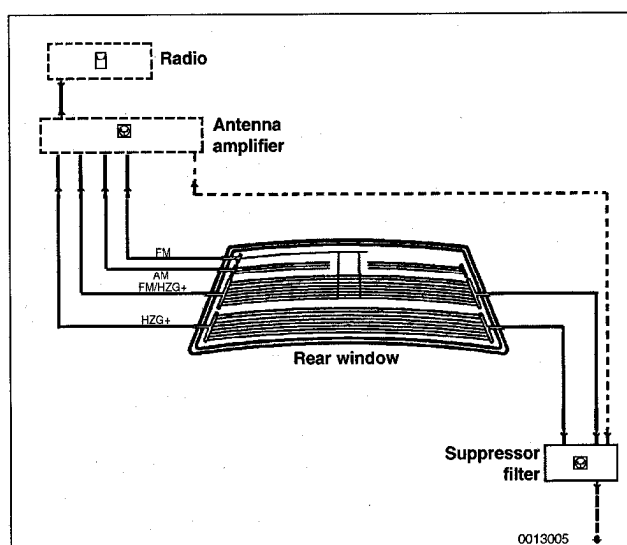


Fig. 30. Wiring diagram of rear window defogger and radio antenna.

Rear Window Blower (Convertible Models)

A blower fan, fitted into the rear seat back, defogs the rear window. It will only operate with the engine running and the top raised. A microswitch behind the rear seats provides the signal that the top is raised.

To access the blower fan motor, it is necessary to remove four screws from the center seat back. Remove the wiring harness connector and motor mounting bolts, then remove motor by pulling it down and forward. See Fig. 31.

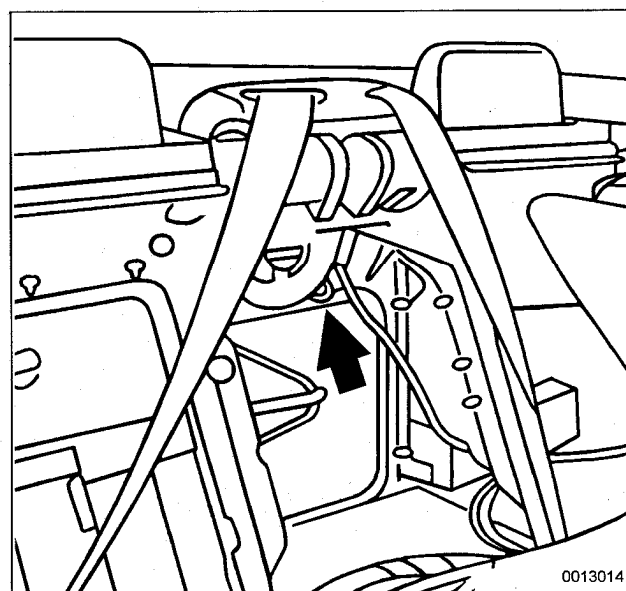


Fig. 31. Rear window blower in center of rear seat back (arrow).

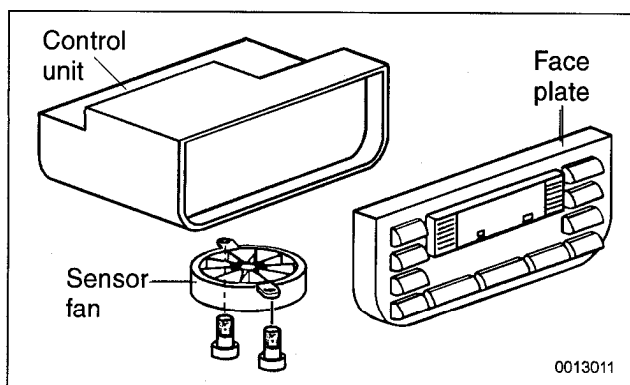


Fig. 25. Digital display A/C control head components.

2. Unscrew left and right screws retaining control head to control module. Press retaining clips and release front plate from control head. Remove A/C control module from control head housing.

Sensor fan for interior temperature, replacing

A small electric fan, installed in the A/C control head, draws cabin air past the climate control temperature sensor.

1. Remove A/C control head as described earlier.
2. Rotary-knob control head: Disconnect electrical connector from top of control head housing. Pry open plastic housing and remove sensor fan. See Fig. 26.

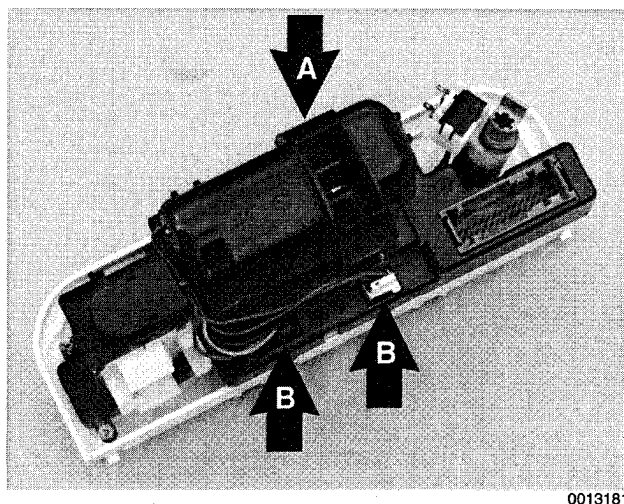


Fig. 26. Sensor fan (A) and harness (B) in back of A/C control head (rotary-knob control head shown).

3. Digital display models: Disconnect electrical harness connector from control head housing. Remove screws holding sensor fan to bottom of control module and remove. Refer to Fig. 25.
4. Installation is reverse of removal.

Heater and A/C Air Distribution Motors

The recirculation, fresh air and other vent-duct flaps are controlled electrically via a series of air distribution actuating motors. Cars with the rotary-knob control head use three electromechanical motors, each held in place via a small plastic clip. See Fig. 27.

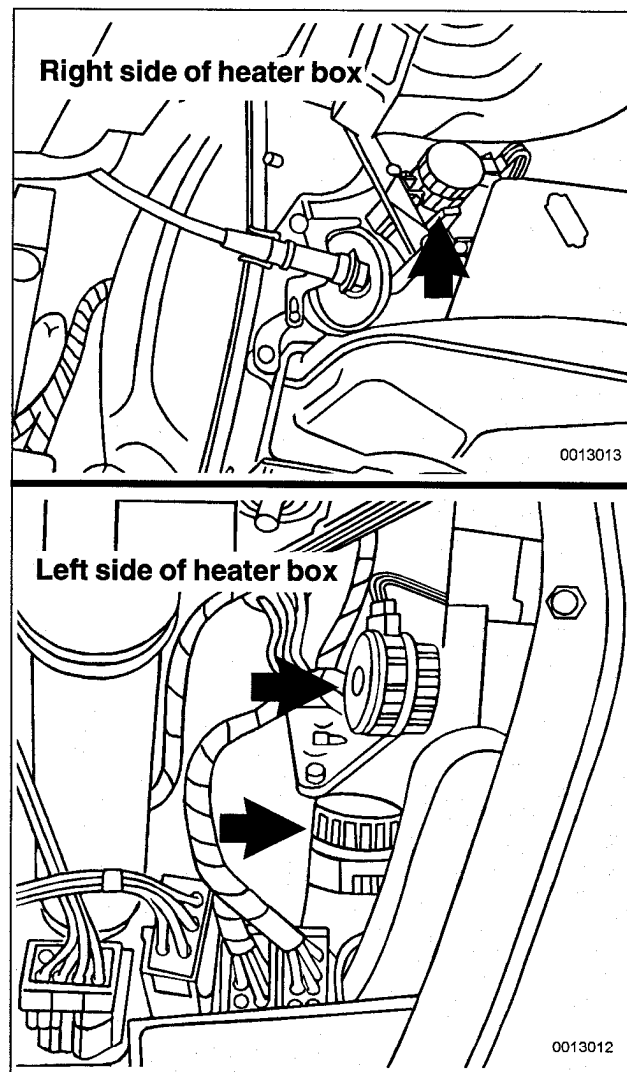


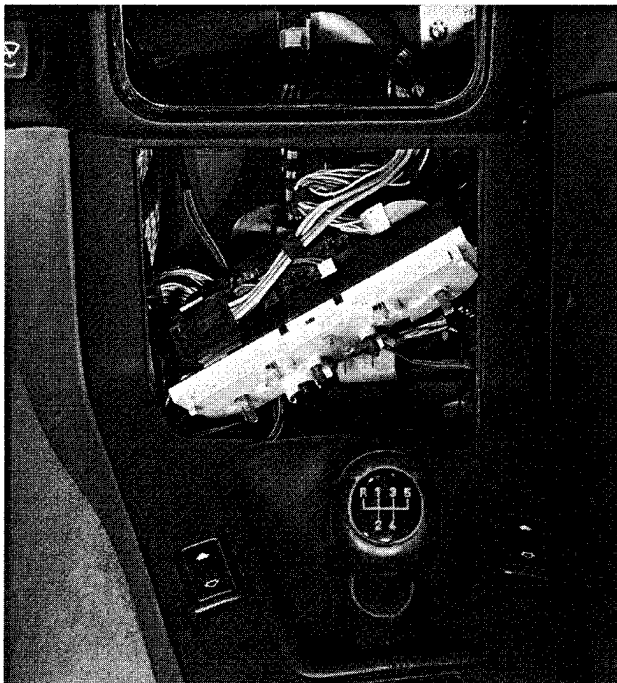
Fig. 27. Location of early production air distribution motors (arrows).

Later systems (with the digital display control head) use five distribution motors, four of which are digitally controlled. See Fig. 28.



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Fig. 22. A/C control head faceplate screws on rotary knob version (arrows). Once screws are removed, faceplate must be unclipped from control head.



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Fig. 23. Push control panel out of center console.

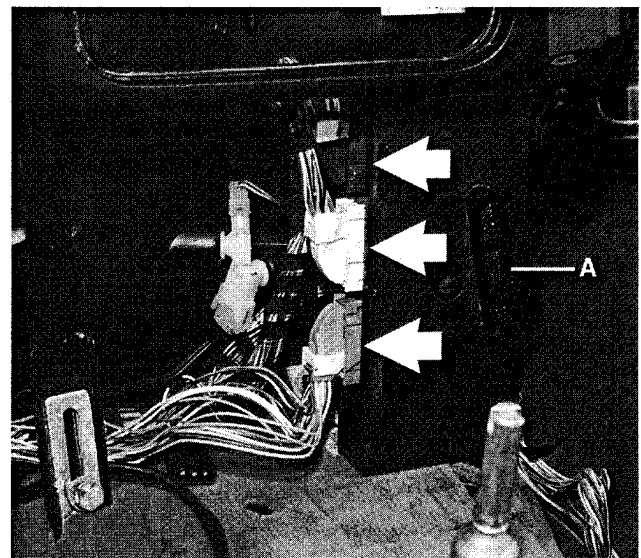
4. Remove harness connectors. Unfasten heater duct control flex-shaft on right side of control head by squeezing retaining tab. Pull shaft out of coupling in control head and remove head.
5. Installation is reverse of removal.

Heater and A/C control head, removing and installing (digital-display)

1. Remove Multi-Information Display (MID) module from center of dash. See 620 Instruments.
2. Reach into dash through MID opening and push A/C control head outwards.
3. Disconnect harness connector and remove control head.
4. Installation is reverse of removal

Heater and A/C control module, removing and installing (rotary-knob)

1. Remove Multi-Information Display (MID) module from center of dash. See 620 Instruments.
2. Remove center console. See 513 Interior Trim.
3. Disconnect wiring harness connectors to A/C control module in center console and remove module. See Fig. 24.



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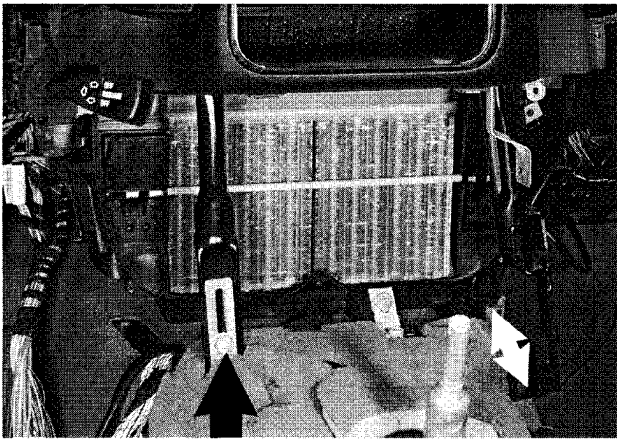
Fig. 24. A/C control module (A) in center console. Arrows point to electrical harness connectors at A/C module.

Heater and A/C control module, removing and installing (digital-display)

The A/C control module for cars with the digital display is mounted on the back of the control head. See Fig. 25.

1. Remove control head as described earlier and place on an anti-static mat.

10. Pull heater core up and backward, away from heater box. If necessary, remove left and right reinforcing bracket bolts. See Fig. 20.



0012660

Fig. 20. Pull heater core up and toward back of car. Lower mounting bolts for steering column brace and glove compartment support frame may have to be removed (arrows).

11. Installation is reverse of removal. Fill and bleed cooling system. See **170 Radiator and Cooling System**.

CAUTION —

Replace coolant flange O-rings and tighten fasteners to specified torques.

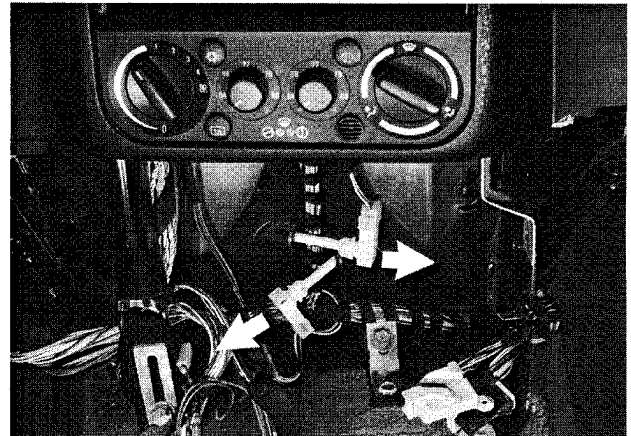
Tightening Torques

- Coolant flange to heater core 3 Nm (27 in-lb)

Heater core temperature sensor, replacing

The automatic heating and air conditioning system uses several sensors to control interior air temperature. Use the following procedure and the data in **Table b** to pinpoint problems with the heater core sensors.

1. Remove center console. See **513 Interior trim**.
2. Remove Multi-Information Display (MID) module. See **620 Instruments**.
3. Pull temperature sensors from heater box and disconnect harness connectors. See Fig. 21.
4. Installation is reverse of removal.



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Fig. 21. Remove heater core temperature sensors in direction shown (arrow).

Table b. Heater Core Temperature Sensor Test Values

Test temperature	Resistance
4°F (-20°C)	84.39 - 109.61 k ohms
14°F (-10°C)	48.58 - 62.09 k ohms
32°F (0°C)	28.89 - 36.40 k ohms
68°F (20°C)	11.13 - 13.83 k ohms
140°F (60°C)	2.19 - 2.78 k ohms
212°F (100°C)	0.58 - 0.77 k ohms

Heater and A/C Control Head

Two types of heater and air conditioning control heads were installed in E36 cars. Early models have control heads with four rotary knobs and a separate control module. A flexible shaft, clipped to the right side of the control head, controls the heater flaps.

Later model E36 cars, starting in approximately mid-1995, have digital display control heads with buttons. The A/C control module is integrated with the digital control head.

Heater and A/C control head, removing and installing (rotary-knob)

1. Remove Multi-Information Display (MID) module from center of dash. See **620 Instruments**.
2. Pull off outer rotary knobs from A/C control head. Remove two screws on knob bezels. Remove control panel face plate by prying it off control head gently. See Fig. 22.
3. Carefully push control head back into dash and downward through MID opening. See Fig. 23.

Heater core, replacing

1. Drain engine coolant. See **170 Radiator and Cooling System**.

WARNING —

Allow the cooling system to cool before opening or draining the cooling system.

2. Remove center console. See **513 Interior Trim**.
3. Remove Multi-Information Display (MID) module. See **620 Instruments**.
4. Remove lower dash panel and knee bolster on driver side. See **513 Interior Trim**.
5. Working under driver side of dash, remove coolant flange from heater core. See Fig. 16.

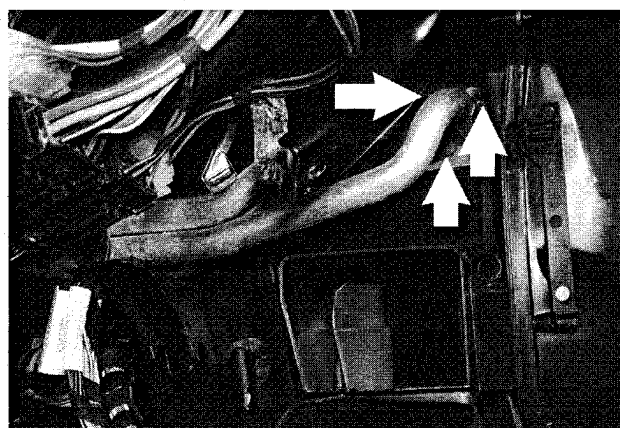


Fig. 16. Bolts at 3-way coolant flange under driver's side of dash (arrows).

NOTE —

Residual coolant in heater core will spill. Protect the carpet.

6. Working at front of driveshaft tunnel, unclip wire harnesses and move to one side in front of heater box. See Fig. 17.
7. Remove heater core temperature sensors as described later in this repair group.
8. Remove front heater box cover. See Fig. 18.
9. On right side of heater box, unclip heater air duct actuating lever. Remove cross-rod (with flaps) from front of heater core. See Fig. 19.

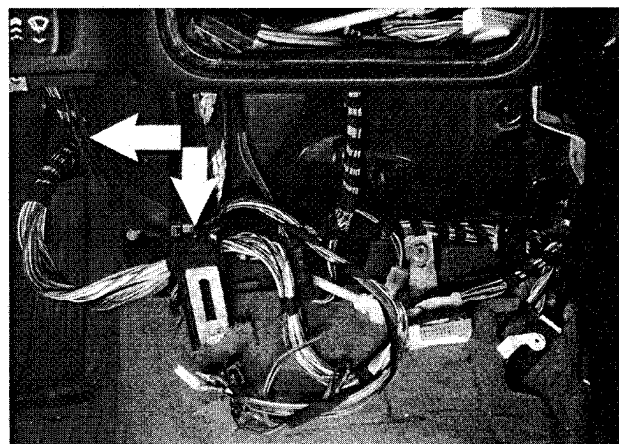


Fig. 17. Wire harness retaining clips and wire ties at heater box cover (arrows).

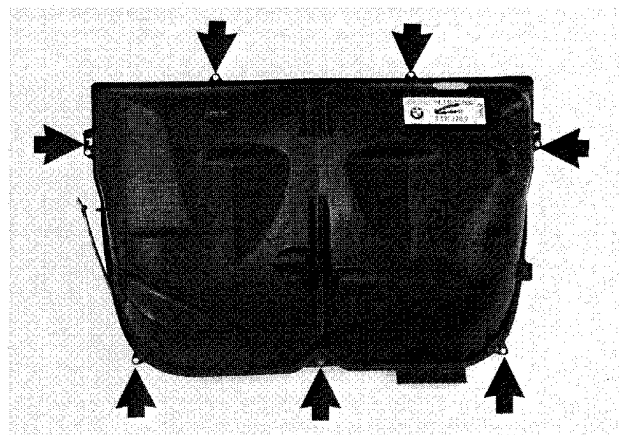


Fig. 18. Screws retaining front heater box cover (shown removed) to heater box (arrows).

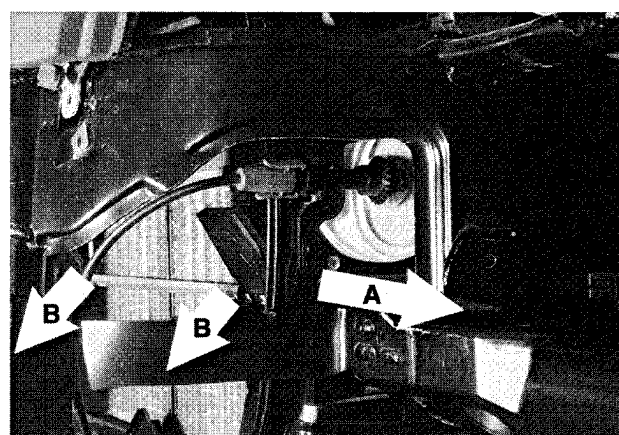
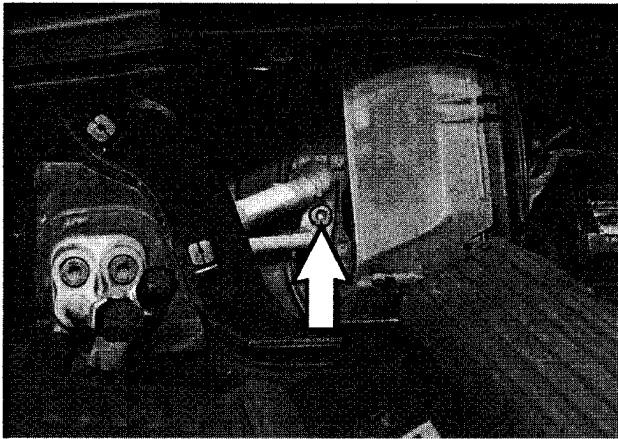


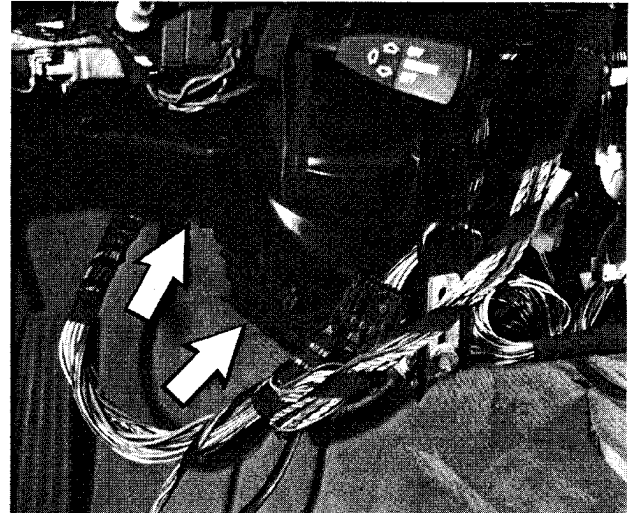
Fig. 19. Pry heater flap actuating lever in direction **A**. Pull off air flap cross-rod in direction **B**.

HEATER AND CONTROLS



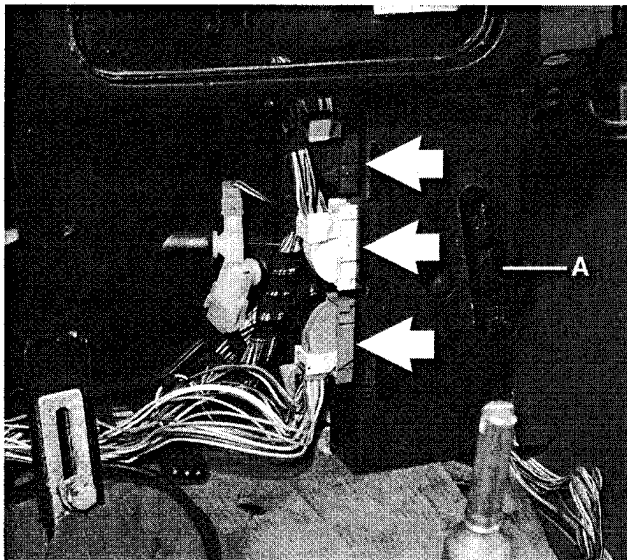
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Fig. 12. Mounting bolt for A/C refrigerant line flange (arrow).



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Fig. 14. Heating and ventilation ducts on left side of heater box (arrows). Right side ducts are similar.



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Fig. 13. A/C control module (A) behind center console. Arrows point to electrical harness connectors to be disconnected.



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Fig. 15. Heater box retaining bracket in center console (arrow).

10. Unclip and remove heating and ventilation ducts on sides of heater box. See Fig. 14.
11. Remove heater box retaining bracket on center tunnel and remove heater box. See Fig. 15.
12. Installation is reverse of removal. Evacuate and re-charge A/C system using specialized equipment. Fill and bleed cooling system. See **170 Radiator and Cooling System**.

CAUTION —

Replace heater and A/C flange O-rings and tighten fasteners to specified torques.

Tightening Torques

- A/C refrigerant lines flange to bulkhead 3.5 Nm (31 in-lb)
- Water hose flange to bulkhead (M6 nut) 3.5 Nm (31 in-lb)
- Heater box retaining bracket to tunnel 4.5 Nm (40 in-lb)

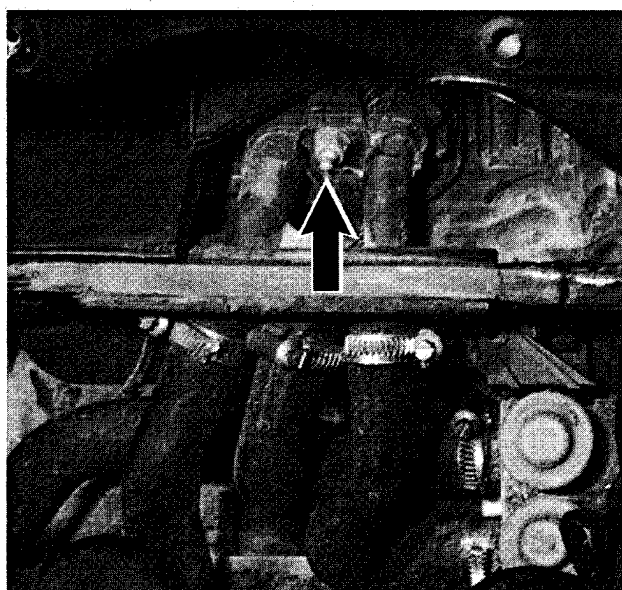
Heater box, removing and installing

The heater box, located underneath the center of the dashboard, houses the heater core, the A/C evaporator, and associated sensors and actuators. Removal of the heater box requires that the A/C refrigerant be discharged.

CAUTION —

- Removing the heater box requires evacuating the A/C system. DO NOT attempt this procedure without proper tools and training.
- Any person who services a motor vehicle air conditioner must, by law, be properly trained and certified, and use approved refrigerant recycling equipment. Technicians must complete an EPA-approved recycling course to be certified

1. Drain engine coolant. See **170 Radiator and Cooling System**.
2. Remove complete dashboard. See **513 Interior Trim**.
3. Remove blower motor as described earlier.
4. Remove nut retaining water hose flange to rear bulkhead. Push flange to one side. See Fig. 9.



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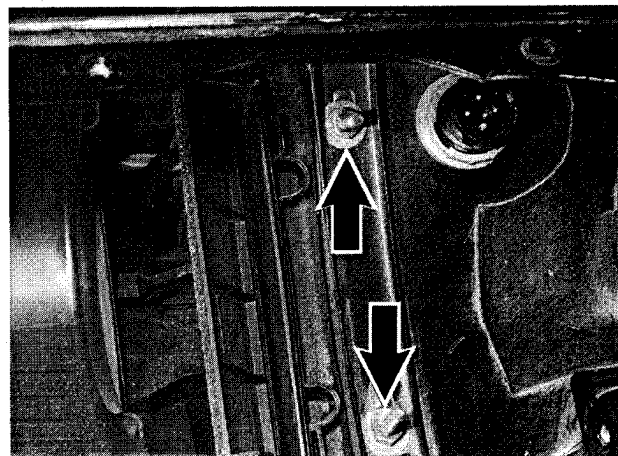
Fig. 9. Nut retaining coolant hose flange at bulkhead (arrow).

NOTE —

Clear any remaining coolant from the heater core by blowing compressed air into the coolant feed hose.

5. Remove nuts from heater box retaining bracket on engine bulkhead left side. See Fig. 10. Repeat procedure for right side nuts.

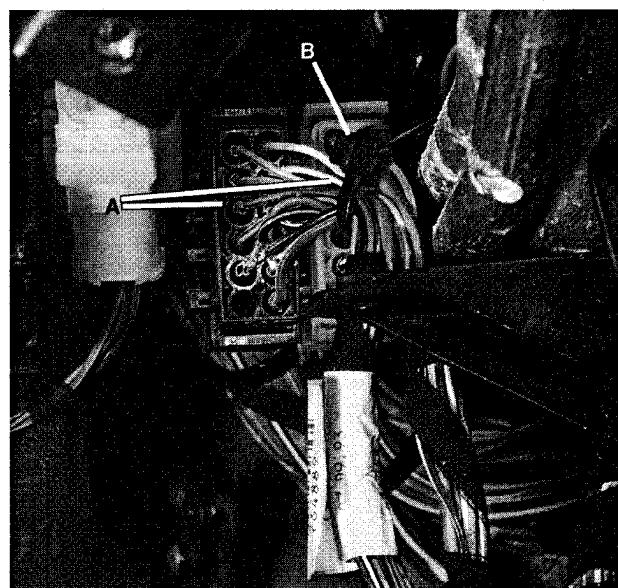
HEATER AND CONTROLS



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Fig. 10. Heater core mounting nuts at left side of bulkhead (arrow). Wiper assembly shown removed for clarity.

6. Cut wire tie holding wire harness to heater box and disconnect cable harness connector from heater box. See Fig. 11.



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Fig. 11. Harness connectors (A) and cable tie (B) at heater box, under driver side dash.

7. Following manufacturer's instructions, connect approved refrigerant recovery/recycling/recharging unit to A/C system and discharge system.
8. Unbolt A/C refrigerant lines flange from engine bay bulkhead. See Fig. 12.
9. On models with rotary-knob A/C control head: Disconnect wiring harness connectors to A/C control module in center console and remove module. See Fig. 13.

- Release blower motor retaining strap and remove blower motor and fans from cowl opening.

NOTE —

Twist and rotate blower motor assembly to facilitate removal from opening. If the blower motor is to be reinstalled, use care not to damage fan wheels during removal. If the blower motor is to be replaced, cut off fan wheels at center to aid in removal.

- Installation is reverse of removal. When installing a replacement blower motor, install motor into cowl area before installing fan wheels. Blower motor test specifications are listed in **Table a**.

NOTE —

On replacement blower motors from BMW, the fan wheels come unattached to aid in installation. Locate arrow on blower motor and install fan wheels at this position. Be sure color coding matches. Retain fan wheels using the new clips. See an authorized BMW parts department for the latest parts information.

Table a. Blower Motor Test Values

Testing voltage	13 VDC
Operating voltage	9–15 VDC
Max. current consumption (approx.)	12 amps
Maximum speed	3,600–4,000 rpm
Axial play (max. allowable)	1.0 mm (0.04 in.)

Blower motor resistor pack, replacing

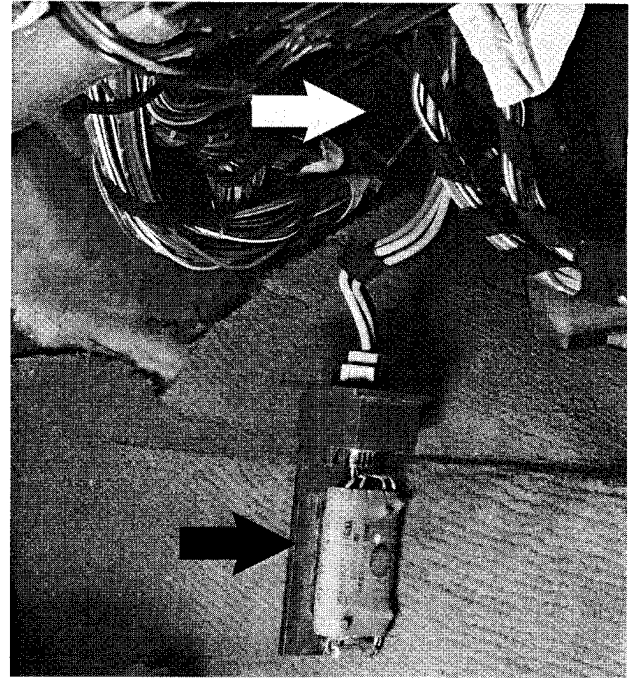
The blower resistor pack is clipped into the upper left side of the heater box.

- Remove lower left dash trim panel. See **513 Interior Trim**.
- Working under left (driver's) side of dash, unclip and pull out resistor pack from side of heater box. Remove harness connector from resistor pack. See Fig. 7.
- Installation is reverse of removal.

Heater valve, replacing

The two-way heater valve is located in the rear of the engine compartment on the driver side. The solenoid operated valves control the coolant flow through the dual-chamber heater core.

- Drain engine coolant. See **170 Radiator and Cooling System**.



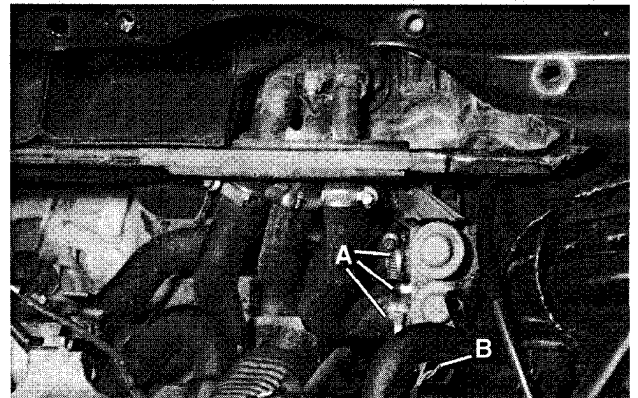
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Fig. 7. Blower fan resistor pack (black arrow) and resistor pack receptacle (white arrow) below left side of dash.

WARNING —

Allow the cooling system to cool before opening or draining the cooling system.

- Disconnect hoses and harness connector at heater valve. See Fig. 8.



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Fig. 8. Hoses (A) and harness connector (B) at heater valve.

- Carefully pull heater valve out of rubber mounting and pull up and out of engine compartment.
- Installation is reverse of removal. Use new hose clamps. Inspect hoses and replace as necessary.

3. Remove wiring harness retaining clip at bulkhead. Remove screws retaining wiring harness cover and pull cover forward. See Fig. 2.

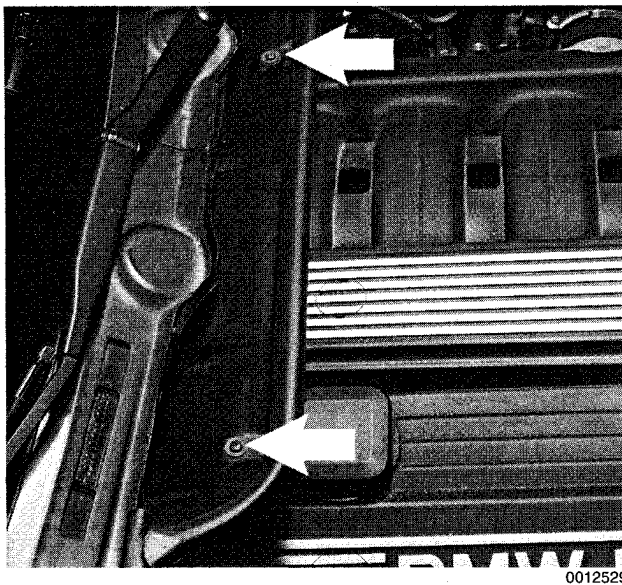


Fig. 2. Wiring harness cover screws at base of windshield (arrows).

4. On passenger side, push aside wiring harness and remove two screws retaining plenum housing. See Fig. 3.

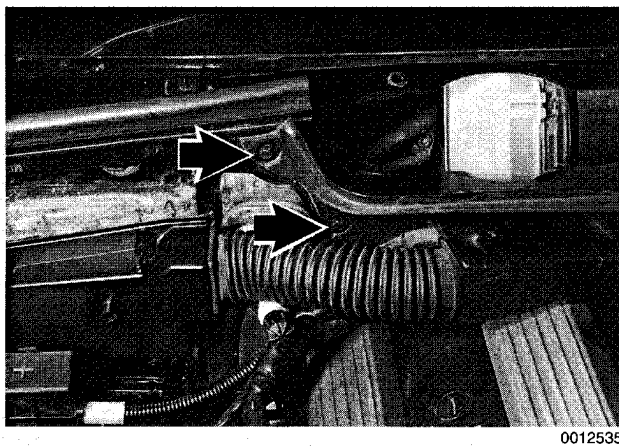


Fig. 3. Right side plenum retaining screws (arrows).

5. On driver side, push aside wiring harness and remove screw retaining plenum. Pull plenum up and remove from engine bay. See Fig. 4.
6. Unclip blower motor housing cover, disconnect control cable, and turn center retainer $\frac{1}{4}$ turn to remove cover. See Fig. 5.
7. Disconnect electrical connectors from blower motor.
8. Remove left upper section of blower housing by detaching spring clips at edge of housing. See Fig. 6.

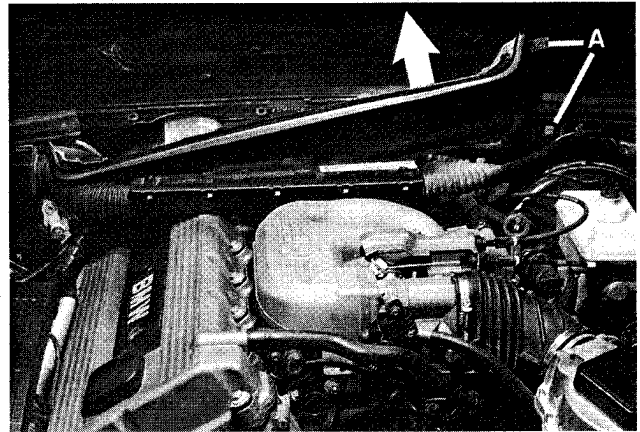


Fig. 4. Remove screw at A and pull air plenum upward.

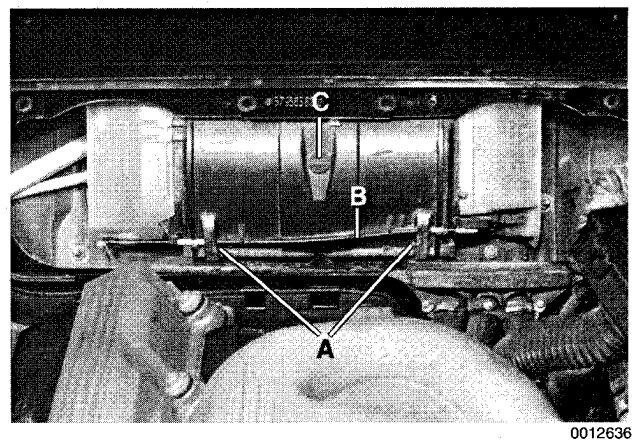


Fig. 5. Blower motor housing clips (A); control cable (B); and center retainer (C).

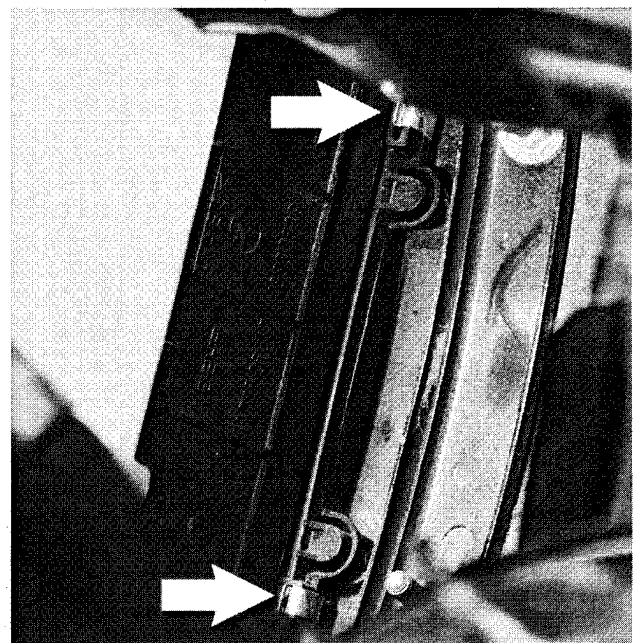


Fig. 6. Spring clips (arrows) on driver side of blower housing.

640 Heating and Air Conditioning

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GENERAL

E36 cars are equipped with integrated automatic heating and air conditioning systems. Many of the procedures given in this repair group require that the A/C refrigerant charge be evacuated using specialized equipment. See **A/C System Warnings and Cautions** later in this repair group.

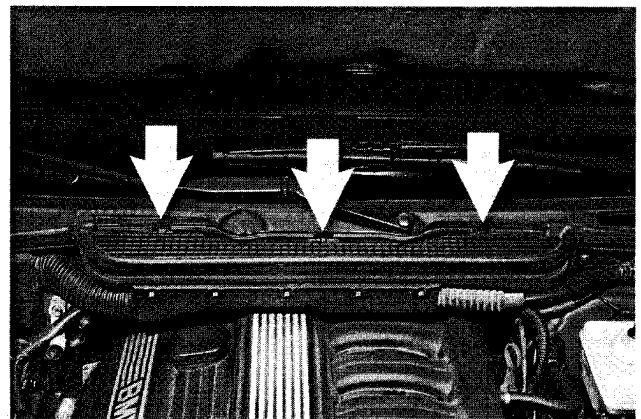
HEATER AND CONTROLS

Blower motor, removing and installing

NOTE —

On 6-cylinder cars, the plastic top engine cover and fuel rail cover must be removed. The fuel injector harness retaining screws must be removed and the harness set aside. The engine control module (ECM) cover must be removed, the control unit connectors unplugged and the harness pulled out of the way. See 130 Fuel Injection.

1. Disconnect negative (–) cable from battery.
2. Open hood. Unclip engine bulkhead plenum grille at base of windshield and remove grille. See Fig. 1.



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Fig. 1. Detach grille retaining clips (arrows) and pull grille upward and out of rubber gasket.

CAUTION —

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

HEATER AND CONTROLS