A/C-HEATER SYSTEM - MANUAL

1995 Volvo 850

1995-96 Manual A/C-Heater Systems

Volvo 850

* PLEASE READ THIS FIRST *

WARNING: To avoid injury from accidental air bag deployment, read and carefully follow all SERVICE PRECAUTIONS and DISABLING & ACTIVATING AIR BAG SYSTEM procedures in the AIR BAG RESTRAINT SYSTEM article in the ACCESSORIES/SAFETY EQUIPMENT section.

CAUTION: When battery or radio is disconnected, radio will go into anti-theft protection mode. Obtain radio code anti-theft protection code from owner prior to servicing vehicle.

A/C SYSTEM SPECIFICATIONS

SPECIFICATIONS

Application	Specification
Compressor Type	Zexel DKS-15CH 6-cyl.
Compressor Belt Tension (1)	
System Oil Capacity	(2) 6.8 ozs.
Refrigerant Capacity (R-134a)	26.4 ozs.
System Operating Pressures (3)	
High Side	406-450 psi (28.5-31.6 kg/cm²)
Low Side	25-33 psi (1.8-2.3 kg/cm²)

(1) - Belt tension is maintained by automatic belt tensioner.
(2) - Use PAG Oil (Part No. 11 61 407-0)
(3) - Pressure switch cut-out points.

DESCRIPTION & OPERATION

System is equipped with a cycling clutch system that uses an expansion valve in refrigerant line between condenser and evaporator, near condenser. System is engaged when A/C switch on control panel is pressed. See Fig. 1. Pressure switch on accumulator cycles compressor clutch on and off. Blower fan speed is controlled by sliding switch on lower left of A/C-heater control panel.

Airflow modes are controlled by center knob on A/C-heater control panel. Mode doors are controlled by cables on left side of climate control unit. See Fig. 2. Temperature blend (air mix) doors, located on driver and passenger side respectively, is selected by left or right knob on A/C-heater control panel. Doors are controlled by cables on left side and center of climate control unit.

Fresh/recirculated air is selected by switch to lower right of mode knob on A/C-heater control panel. Door is controlled by recirculation motor on upper half of climate control unit. Air conditioning system will only operate above 32°F (0°C). Blower switch must be in position "1" or higher to engage compressor.

A/C compressor is connected in series with the low-pressure switch, high-pressure switch, and safety switch. The high-pressure and safety switch cut power to the A/C compressor if pressure in the A/C high-pressure circuit becomes excessive, supplying a signal to ECM to

start cooling fan. Low-pressure switch (pressostat) turns A/C compressor on and off to maintain pressure within limits.

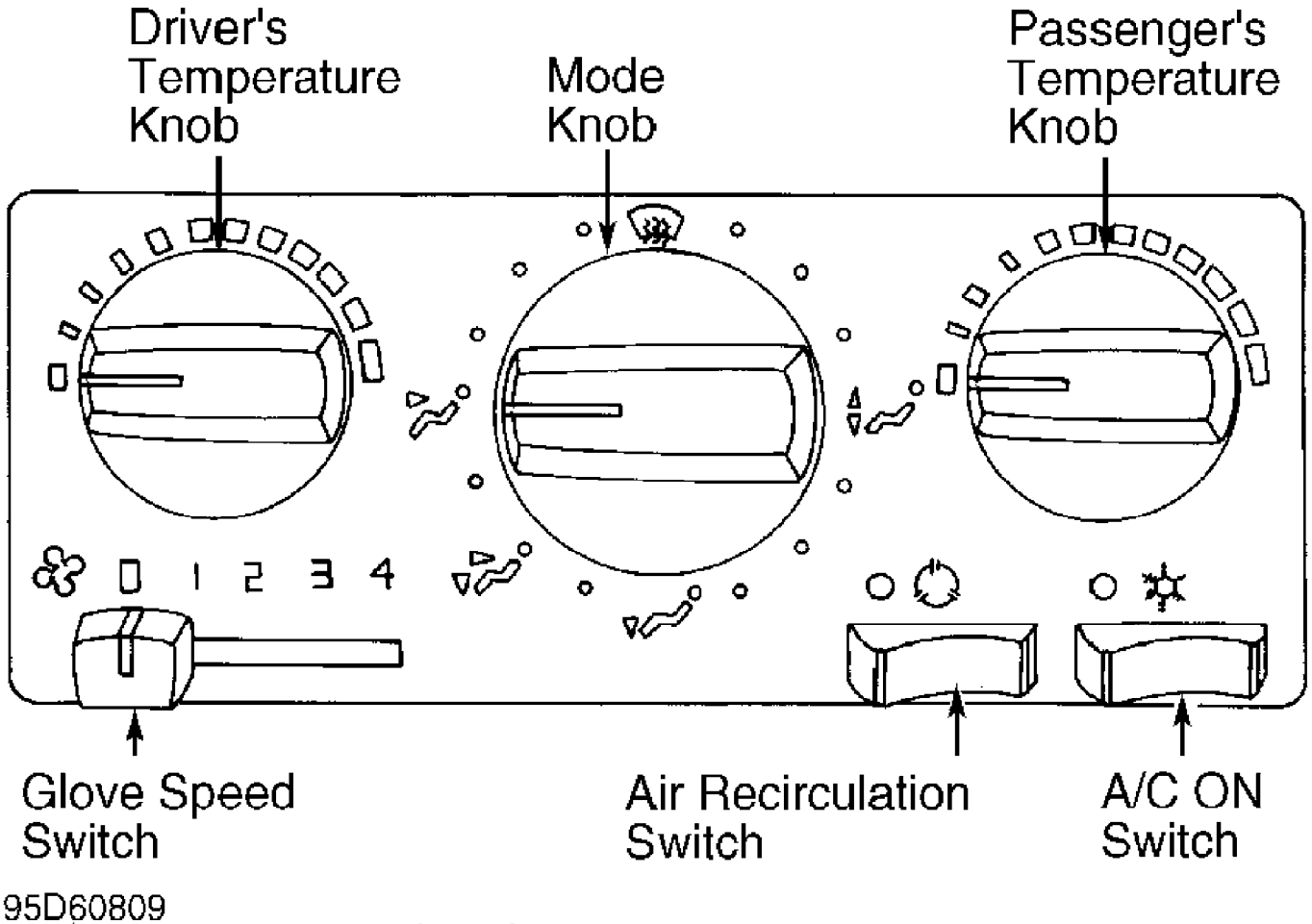

Fig. 1: A/C-Heater System Control Panel
Courtesy of Volvo Cars of North America.

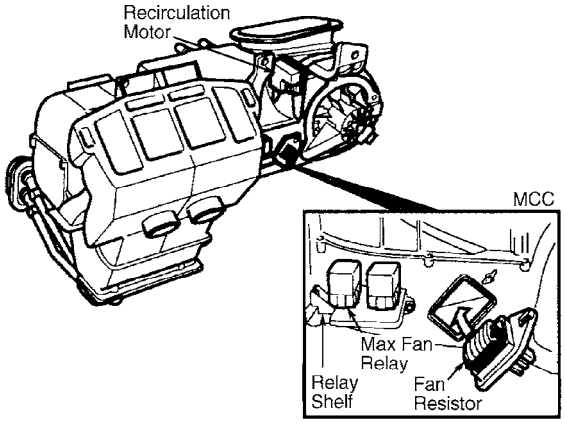

Fig. 2: Exploded View Of Climate Control Unit
Courtesy of Volvo Cars of North America.

ADJUSTMENTS

NOTE: Adjust all cables at climate control unit first.

CLIMATE CONTROL UNIT CABLES

Remove lower dash panels. Disconnect cable sleeve (pop out) from appropriate cable at climate control unit.

Left & Right Temperature Control

Adjust temperature control knobs to zero. Push appropriate temperature damper down to end of travel. Push temperature damper cable into sleeve. See Fig. 3. If this adjustment is not satisfactory, see A/C-HEATER CONTROL PANEL CABLES.

Ventilation & Floor/Defrost Cable Adjustment

Set mode switch to defrost position. Push ventilation and floor/defrost damper levers back to end of travel. Push temperature damper cable into sleeve. See Fig. 3. If this adjustment is not satisfactory, see A/C-HEATER CONTROL PANEL CABLES.

A/C-HEATER CONTROL PANEL CABLES

1) Remove lower dash panels. Disconnect all cable sleeves (pop out) from cables at climate control unit. See Fig. 3. Remove 4 cables from damper levers.

2) Remove control knobs and blower fan switch button from A/C-heater control panel. Remove 2 screws and A/C-heater control panel front. Remove A/C-heater control panel. Disconnect light connector.

3) To adjust, pry appropriate cable from clip. Insert temperature control cable into clip where cable exits from cover. Insert ventilation and floor/defrost cables .670" (17 mm) from where cable exits from cover. See Fig. 4.

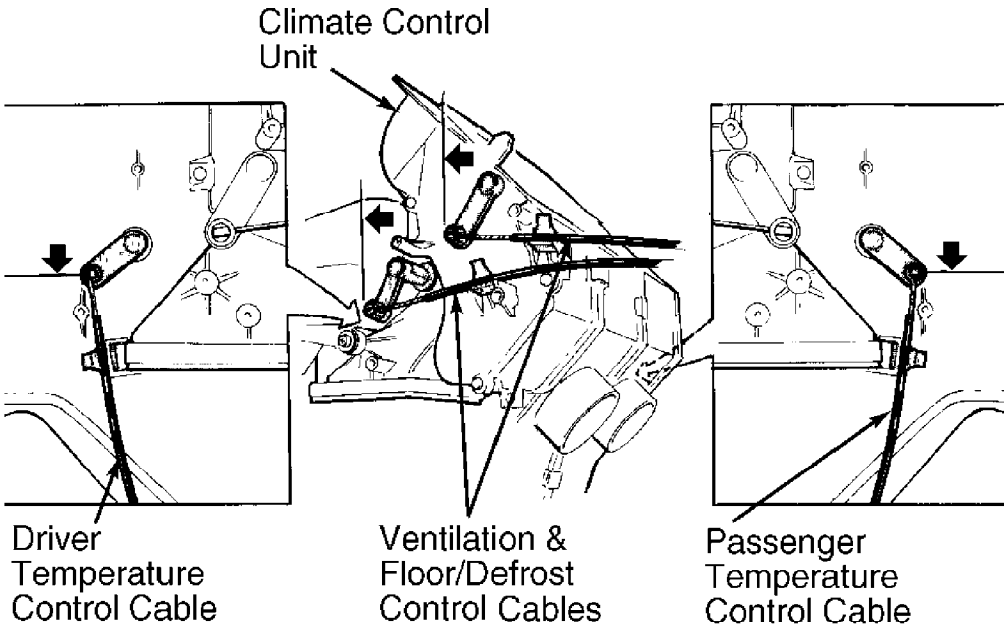

Fig. 3: Identifying Climate Control Unit Cables
Courtesy of Volvo Cars of North America.

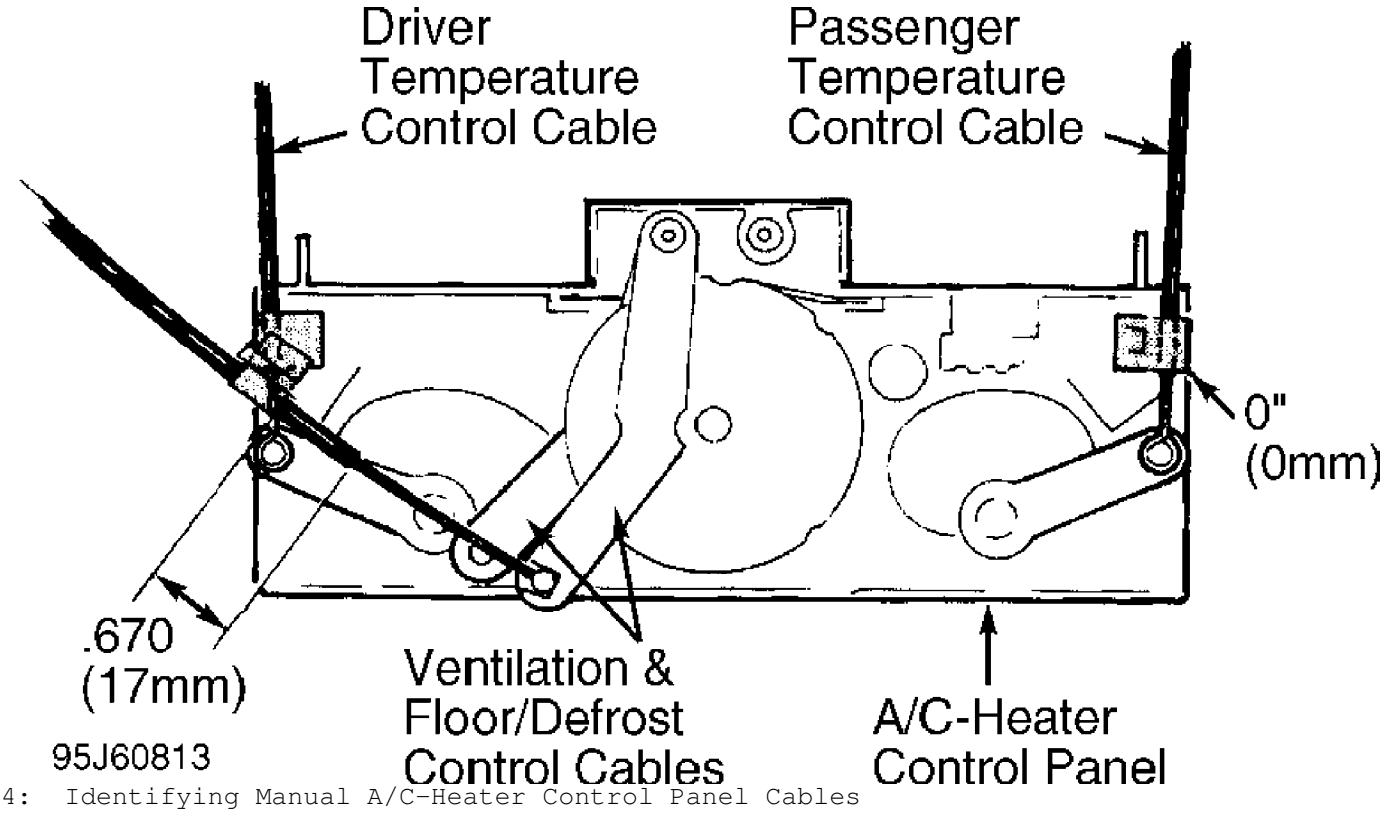

Fig. 4: Identifying Manual A/C-Heater Control Panel Cables
Courtesy of Volvo Cars of North America.

TESTING

A/C SYSTEM PERFORMANCE

1) Close hood and front doors. Operate engine at 2000 RPM. Turn blower on third speed. Set temperature knob to cool setting. Select panel vent position on airflow mode control knob. Select recirculated air (button pressed).

2) Open panel vents. Turn on A/C. After 8 minutes, ensure compressor cycles on and off. Place thermometer in center vent. Ensure duct temperature is 41-46°F (5-8°C) when ambient temperature is 68-86°F (20-30°C), or 46-54°F (8-12°C) when ambient temperature is 104°F (40°C).

REMOVAL & INSTALLATION

WARNING: To avoid injury from accidental air bag deployment, read and carefully follow all SERVICE PRECAUTIONS and DISABLING & ACTIVATING AIR BAG SYSTEM procedures in the AIR BAG RESTRAINT SYSTEM article in the ACCESSORIES/SAFETY EQUIPMENT section.

A/C HEATER CONTROL PANEL

Removal & Installation

1) Disconnect negative battery cable. Remove lower dash panels. Disconnect all cable sleeves (pop out) from cables at climate control unit. See Fig. 3. Remove 4 cables from damper levers.

2) Remove control knobs and blower fan switch button from

A/C-heater control panel. Remove 2 screws and A/C-heater control panel front. Remove A/C-heater control panel. Disconnect light connector. To install, reverse removal procedure.

CLIMATE CONTROL UNIT

Removal & Installation

1) Disconnect negative battery cable. Remove dashboard assembly. See DASHBOARD. Discharge A/C system, using approved refrigerant recovery/recycling equipment. Disconnect evaporator inlet and outlet pipes, and cap both ends. Remove evaporator cover plate and gasket from firewall. See Fig. 5.

2) Disconnect heater hose quick-disconnect couplings. Remove heater hose cover plate and gasket from firewall. Inside vehicle, disconnect A/C-heater control cables and all electrical connectors from climate control unit. Remove relay shelf. See Fig. 2.

3) Remove tunnel console. Remove kick panels next to tunnel. Remove rear floor ducts connection hose. Remove radio amplifier bracket. Disconnect cruise control vacuum cylinder, if equipped. Remove climate control unit. To install, reverse removal procedure. Lubricate NEW "O" rings with compressor oil. Evacuate and charge system.

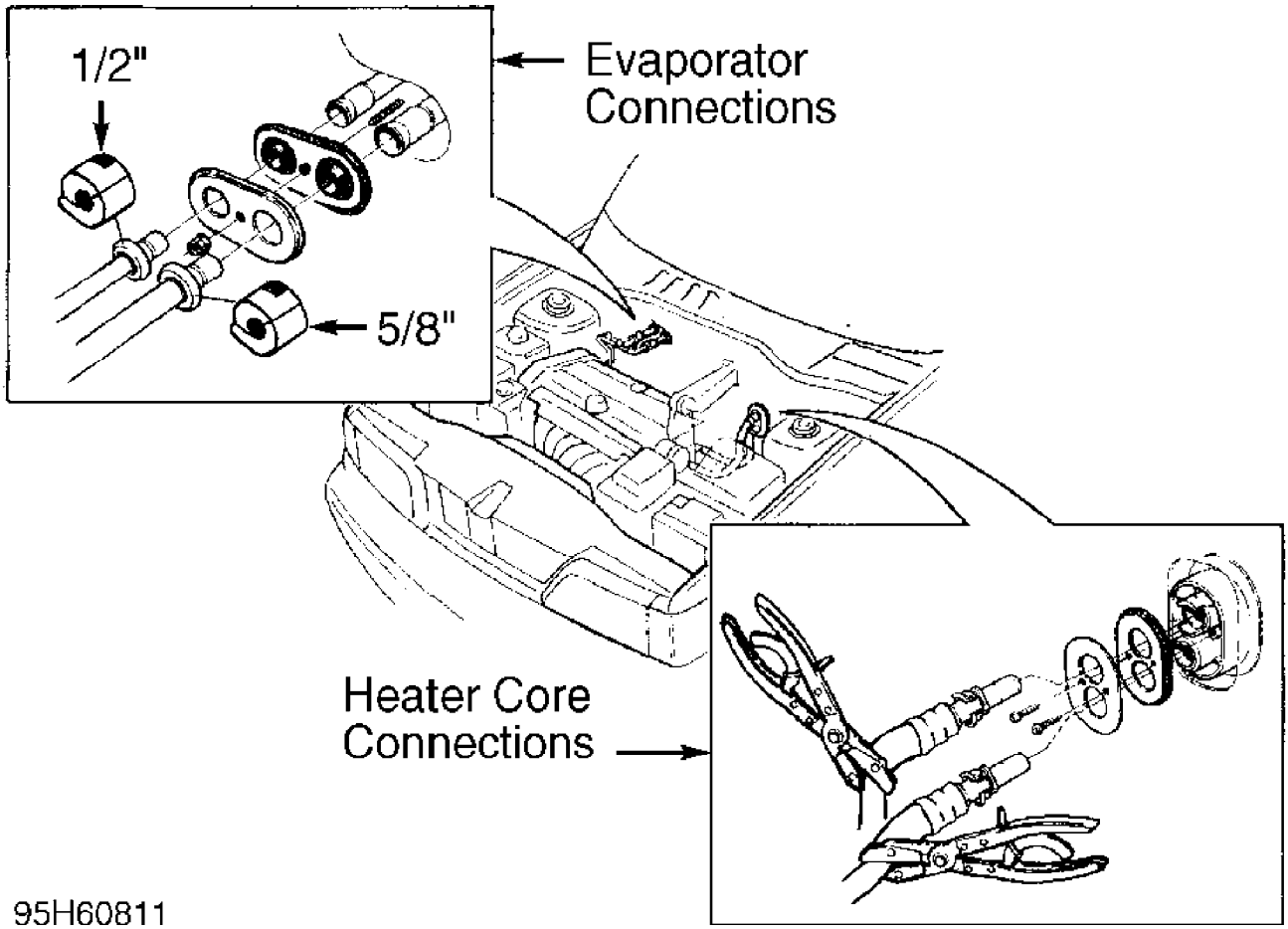

Fig. 5: Identifying Evaporator & Heater Core Connections
Courtesy of Volvo Cars of North America.

COMPRESSOR

Removal & Installation

1) Disconnect negative battery cable. Discharge A/C system, using approved refrigerant recovery/recycling equipment. Remove air intake hose and hose connection to fan cover. Remove control box air intake hoses and Electronic Control Units (ECUs) from control box.

2) Remove control box air intake hoses and disconnect inlet hose connector to fan cover. Remove fan cover. Disconnect relays and cables from fan cover (2 tie straps).

3) Remove 4 screws and fan cover. Remove relay shelf and spacers. Disconnect 2-pin connector from fan relay and connector from fan motor. Remove fan cover. See Fig. 6.

4) Shield radiator. Disconnect harness connectors from compressor. Disconnect snap-on connectors on receiver-drier. Remove right side headlight casing. Remove receiver-drier bracket screw.

5) Remove air guide. With bracket hooked onto side member, lift receiver/drier out. Plug receiver-drier pipe ends. Disconnect drive belt.

6) Disconnect compressor connector and temperature sensor. Remove compressor. To install, reverse removal procedure. Lubricate NEW "O" rings with compressor oil. Evacuate and charge system.

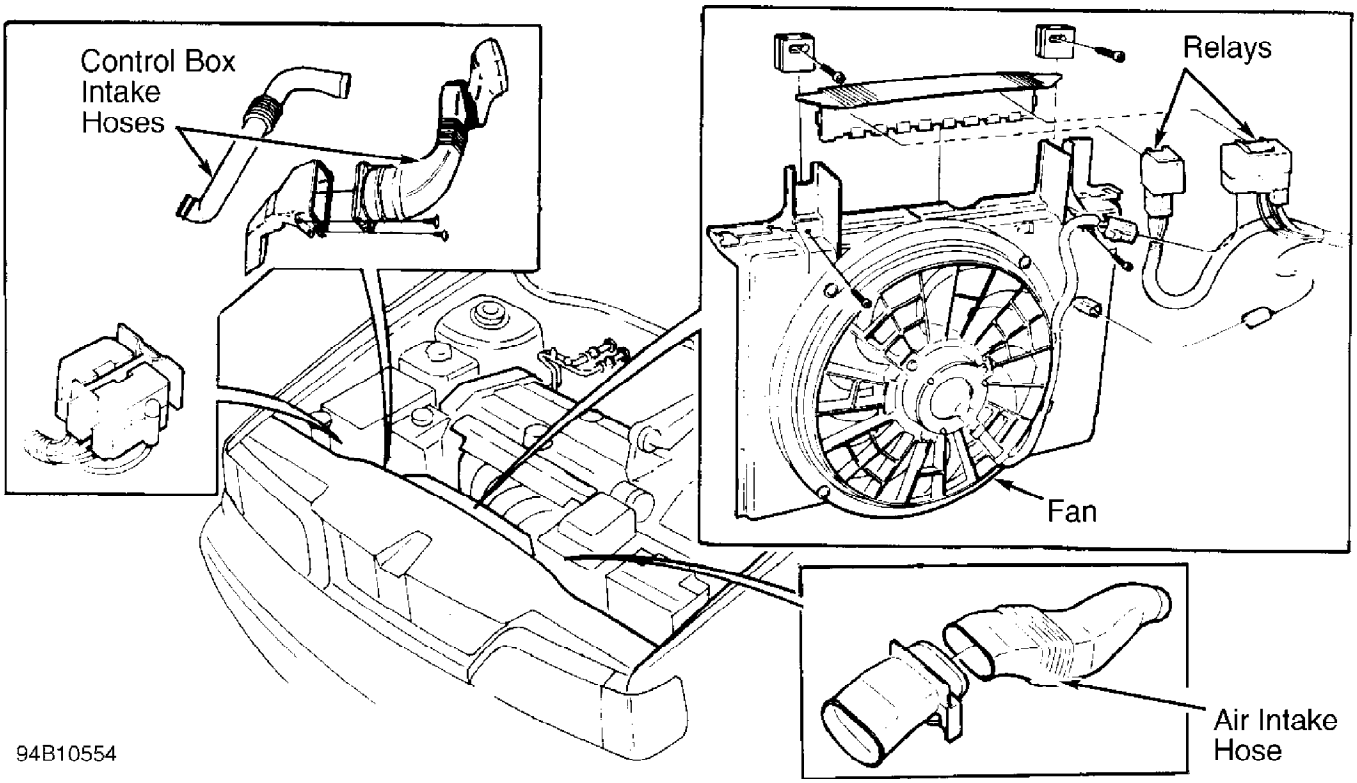

Fig. 6: Removing Cooling Fan Components
Courtesy of Volvo Cars of North America.

CONDENSER

NOTE: When replacing condenser, always replace "O" rings and snap-on connections.

Removal & Installation

1) Disconnect negative battery cable. Discharge A/C system, using approved refrigerant recovery/recycling equipment. Disconnect air intake hose. Remove hose connector to fan cover.

2) Remove Electronic Control Units (ECUs) from control unit

box. Disconnect control unit box air intake hoses. Remove inlet hose connector to fan cover. Disconnect relays from relay casing. Remove 4 screws to disconnect fan cover, and fold cover back towards engine. Remove relay shelf and spacers. See Fig. 6.

3) Disconnect pipes from condenser and cap. Disconnect high-pressure sensor connector. Remove high pressure sensor. Disconnect condenser screws. Lift condenser out.

4) To install, reverse removal procedure. Transfer high-pressure sensor and rubber gasket to NEW condenser. Lubricate NEW "O" rings with compressor oil. Evacuate and charge system.

DASHBOARD

NOTE: Dashboard consists of 5 main sections: upper frame, lower frame (left and right), defroster duct and dashboard cover. Except for dashboard cover, all the main sections are glued together and cannot be separated.

Removal & Installation

1) Disconnect negative battery cable. Disable air bag system. See AIR BAG RESTRAINT SYSTEM article in the ACCESSORIES/SAFETY EQUIPMENT section. From engine compartment, remove windshield wiper nuts, windshield wiper well cover panel screws and wiper well. Remove wiper motor mountings.

2) From passenger compartment, remove air bag module. Mark steering wheel position relative to steering wheel shaft. Remove steering wheel nuts and steering wheel. Remove steering wheel stalks.

3) Remove steering wheel stalk connector. Remove left and right side sound proofing, side defroster, left and right side speaker covers, and speakers.

4) Remove dashboard mounting screws and glove box. Remove radio. Remove A/C-heater control panel knobs and retaining screws. Disconnect connectors and remove A/C-heater control panel from dashboard. Remove cigarette lighter connector. Lift off dashboard. To install, reverse removal procedure.

EVAPORATOR

Removal & Installation

Disconnect negative battery cable. Remove dashboard assembly. See DASHBOARD. Remove climate control unit. See CLIMATE CONTROL UNIT. Remove evaporator cover screws and clips. Lift out evaporator. See Fig. 7. To install, reverse removal procedure. Lubricate NEW "O" rings with compressor oil. Evacuate and charge system.

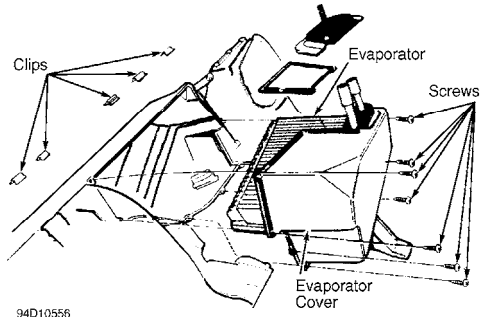

Fig. 7: Removing Evaporator
Courtesy of Volvo Cars of North America.

HEATER CORE

Removal & Installation

1) Clamp off hoses to heater core in engine compartment at firewall. Remove center console kick panels. Remove underdash trim panels. Remove radio amplifier bracket.

2) Remove drain hose. See Fig. 8. Remove heater core case screws. Disconnect heater hose pipes. Remove heater core and heater core case as an assembly by pulling towards rear of vehicle. Remove heater core from heater core case. To install, reverse removal procedure.

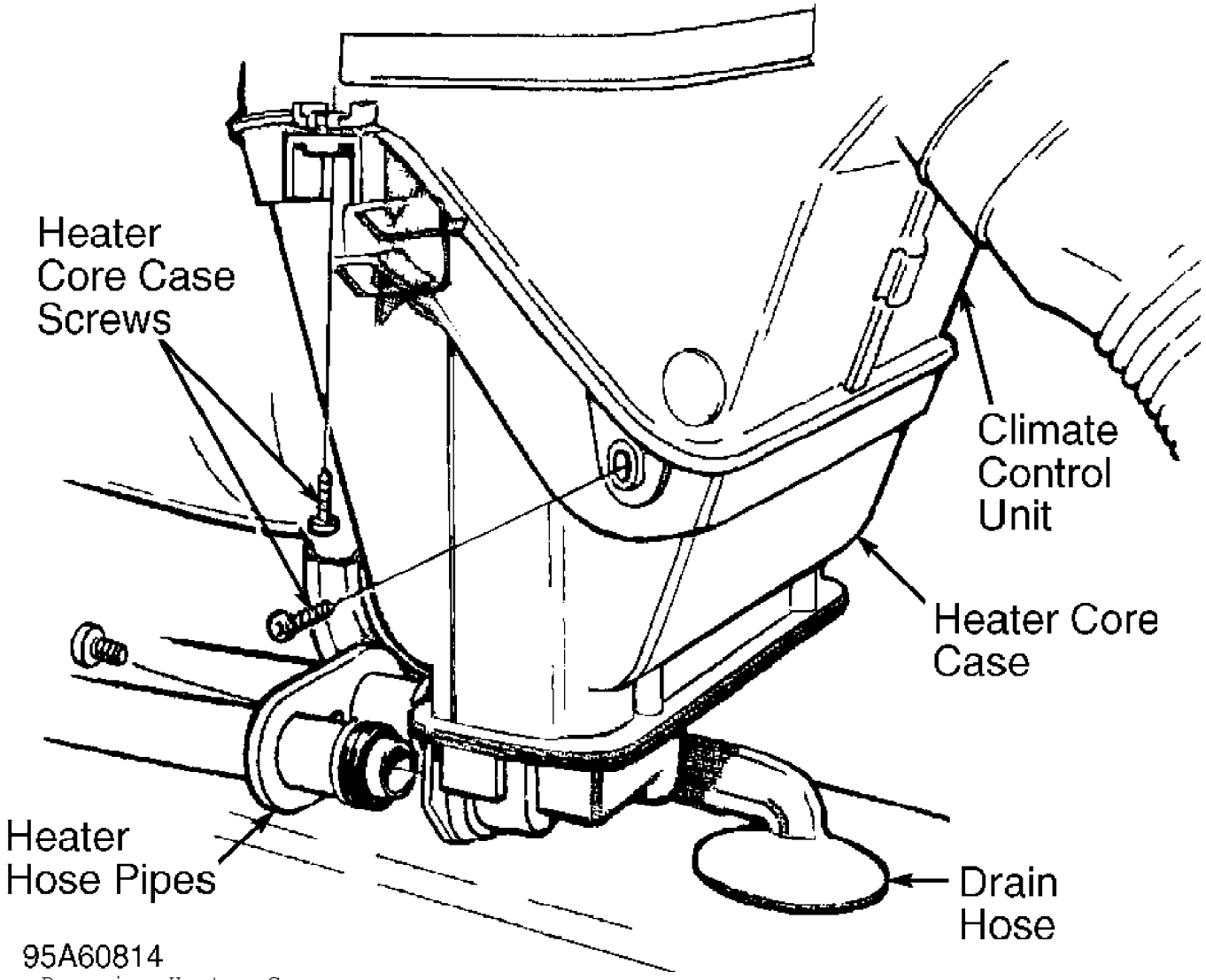

Fig. 8: Removing Heater Core
Courtesy of Volvo Cars of North America.

RECEIVER-DRIER

Removal & Installation

1) Disconnect negative battery cable. Discharge A/C system, using approved refrigerant recovery/recycling equipment. Disconnect air intake hose and remove hose connector to fan cover. Remove control unit air intake hoses and Electronic Control Units (ECUs) from control unit box.

2) Remove control unit box air intake hoses and remove inlet

hose connector to fan cover. Remove fan cover. Disconnect relays and wires from fan cover. Remove 4 screws and fan cover. Remove relay casing and spacers. Disconnect 2-pin connector from fan relay and connector from fan motor. Remove fan cover. See Fig. 6.

3) Shield radiator. Disconnect suction pipe from compressor. Disconnect snap-on connectors from receiver-drier. Remove right side headlight cover. Remove screw from receiver-drier bracket.

4) Remove air guide. Remove receiver-drier and bracket. With bracket suspended from side member, lift receiver/drier out. Remove receiver-drier from bracket.

5) To install, reverse removal procedure. When replacing receiver-drier, fill NEW receiver-drier with 3 ozs. of oil. Lubricate NEW "O" rings with compressor oil. Evacuate and charge system.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Compressor Bracket Bolt	30 (40)
Compressor Bracket-To-Compressor	30 (40)
Compressor Bracket-To-Frame	15 (20)
Compressor Inlet Fitting	15 (20)
Compressor Outlet Fitting	33 (45)
Compressor Pipe Flange Bolt	18 (24)
Condenser Inlet & Outlet	15 (20)
Expansion Valve	22 (30)
Receiver-Drier Connection	22 (30)
	INCH Lbs. (N.m)
High Pressure Sensor Connection	7 (10)

WIRING DIAGRAMS

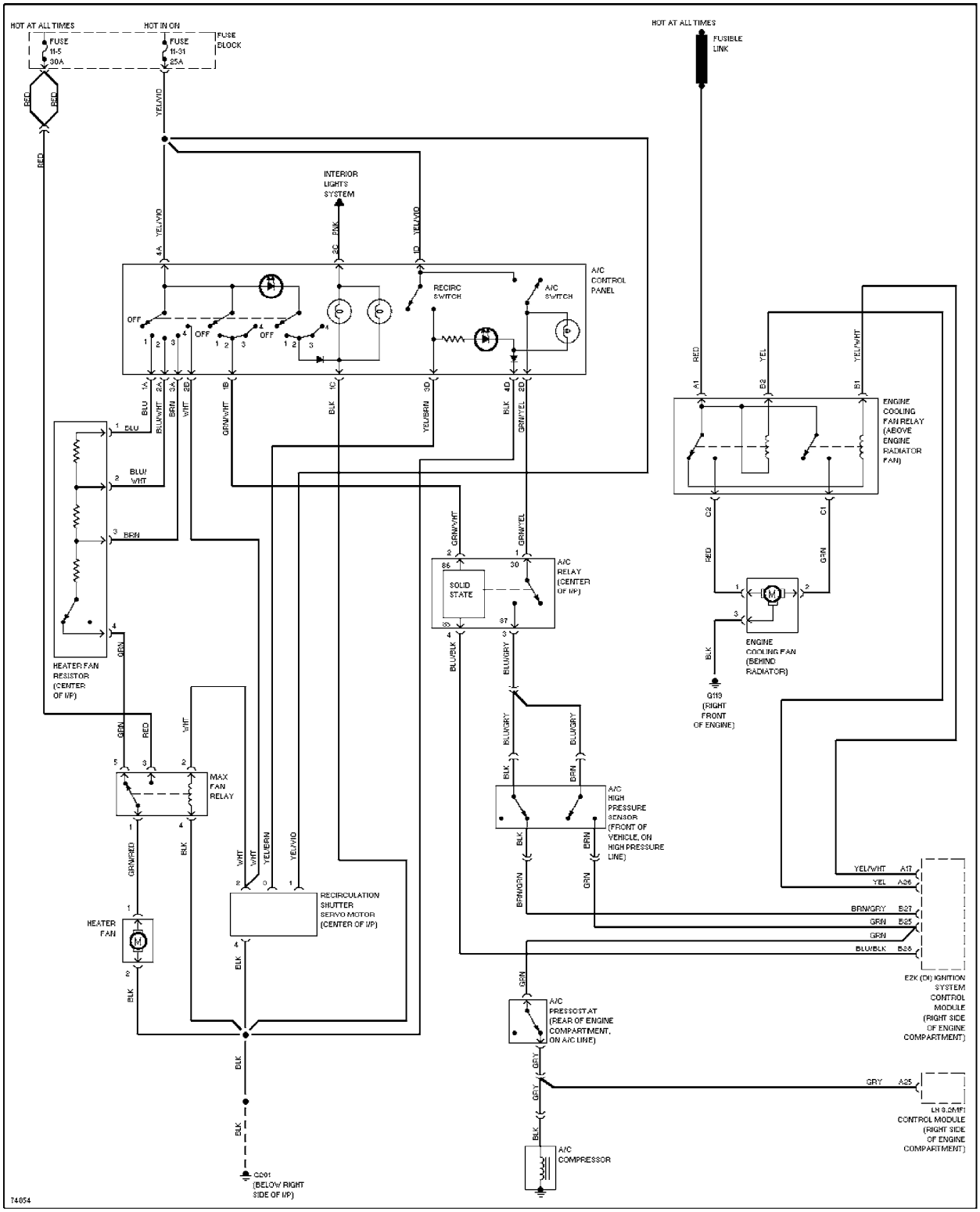

Fig. 9: Manual A/C-Heater System Wiring Diagram