

A/C-HEATER SYSTEM - MANUAL

1994 Mitsubishi 3000GT

1994 AIR CONDITIONING & HEAT
Mitsubishi Manual A/C-Heater Systems

3000GT

A/C SYSTEM SPECIFICATIONS

MANUAL A/C SYSTEM SPECIFICATIONS TABLE

Application	Specification
Compressor Type	Sanden MSC105 Scroll
Compressor Belt Deflection	
DOHC	
New	9/64-5/32" (3.6-4.1 mm)
Used	5/32-13/64" (4.1-5.1 mm)
SOHC	
New	17/64-9/32" (6.6-7.1 mm)
Used	9/32-11/32" (7.1-8.6 mm)
Compressor Oil Capacity (1)	4.6-6.0 ozs.
Refrigerant Capacity (R-134a)	26-28 ozs.
System Operating Pressures (2)	
High Side	111-118 psi (7.8-8.3 kg/cm ²)
Low Side	18.5-27.5 psi (1.3-1.9 kg/cm ²)
(1) - Use SUN PAG 56 refrigerant oil.	
(2) - With ambient temperature at 80°F (27°C).	

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

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

DESCRIPTION

A/C system consists of A/C control unit, fan switch, evaporator, engine coolant temperature switch, compressor, condenser, receiver-drier and various pipes and hoses.

Compressor cycling is controlled by A/C control unit. Compressors will only operate within the normal operating temperatures and pressures set for 3000GT. An electric condenser fan comes on whenever A/C system is operating.

OPERATION

A/C CONTROL UNIT

The A/C Control Unit (ACCU) controls cycling of the compressor clutch based on information received various sensors and switches. The A/C control unit is attached to evaporator housing.

A/C SWITCH

When switch is pushed to the first position, the Amber light will glow, A/C will operate in the economy mode. When switch is pushed to the second position, Green light will glow, and A/C will operate in the maximum cooling mode.

AIR SELECTOR LEVER

This lever controls the source of airflow. When lever is at the fresh air setting (left side), outside air will be allowed to enter passenger compartment. When lever is at recirculated air setting (right side), air is recirculated inside passenger compartment. Recirculated air setting is used for maximum A/C cooling.

BLOWER MOTOR KNOB

The blower motor can only be operated with ignition switch in the ON position. Blower knob has 4 different speed positions.

MODE SELECTOR KNOB

Depending on position selected, airflow can be directed to different areas of passenger compartment. Airflow selection capabilities include individual areas or a combination of windshield, upper body, knee and/or foot area.

TEMPERATURE CONTROL KNOB

Temperature control knob is used for selecting desired temperature level. To increase temperature level, turn knob clockwise.

A/C COMPRESSOR LOCK CONTROLLER

A/C compressor lock controller is used on DOHC models and is located above glove box. Controller compares engine RPM and A/C compressor RPM to determine whether or not belt is slipping or compressor is seized. If RPM difference between engine and A/C compressor exceeds 92 percent for more than 3 seconds, A/C compressor lock controller will de-energize A/C compressor clutch relay. A/C compressor lock controller uses signals from ignition coil and A/C clutch revolution pick-up sensor located on A/C compressor.

DUAL-PRESSURE SWITCH

Dual-pressure switch, located on top of receiver-drier, is wired in series with compressor clutch relay. Whenever system pressure is outside the operating range, power to compressor is cut and compressor activity will cease until pressure is within operating range.

FIN THERMO & AIR INLET SENSORS

Air inlet sensor is located on the inlet side of evaporator and measures inlet air temperature. Fin thermo sensor is located on outlet side of the evaporator and measures outlet air temperature. Sensors provide a voltage signal to A/C Control Unit (ACCU) which it uses to control compressor clutch operation thus preventing evaporator freezing. Power to compressor clutch is cut, allowing evaporator to thaw, if temperature is 38°F (3.3°C) or less.

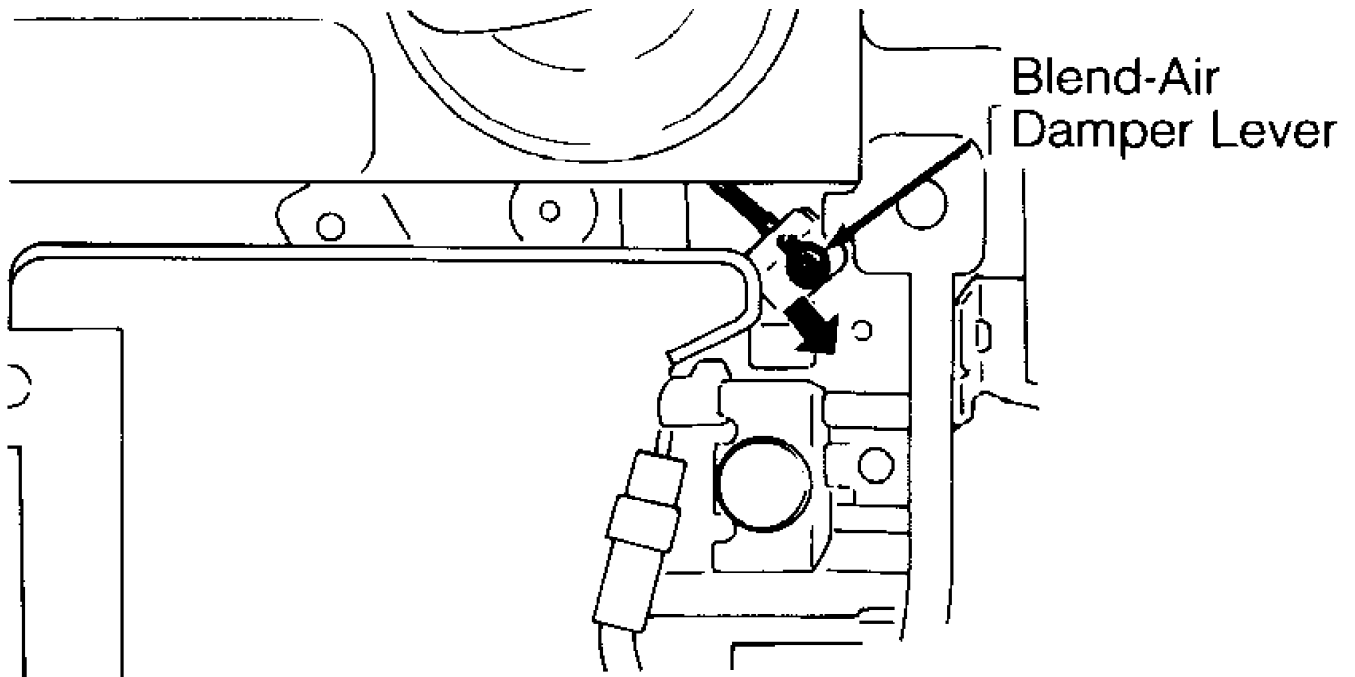
HIGH PRESSURE RELIEF VALVE

High pressure relief valve, located on side of compressor, is a safety feature which vents refrigerant to atmosphere. When A/C system pressure reaches 532 psi (37.4 kg/cm²), valve opens and releases refrigerant. When pressure is reduced to 418 psi (29.4 kg/cm²), valve closes.

ADJUSTMENTS

TEMPERATURE CONTROL CABLE

Position temperature control knob at warm setting (clockwise). Move blend-air damper lever completely downward, in direction of arrow, and connect inner wire of temperature control cable to damper lever. See Fig. 1. Secure outer wire of control cable using clip.

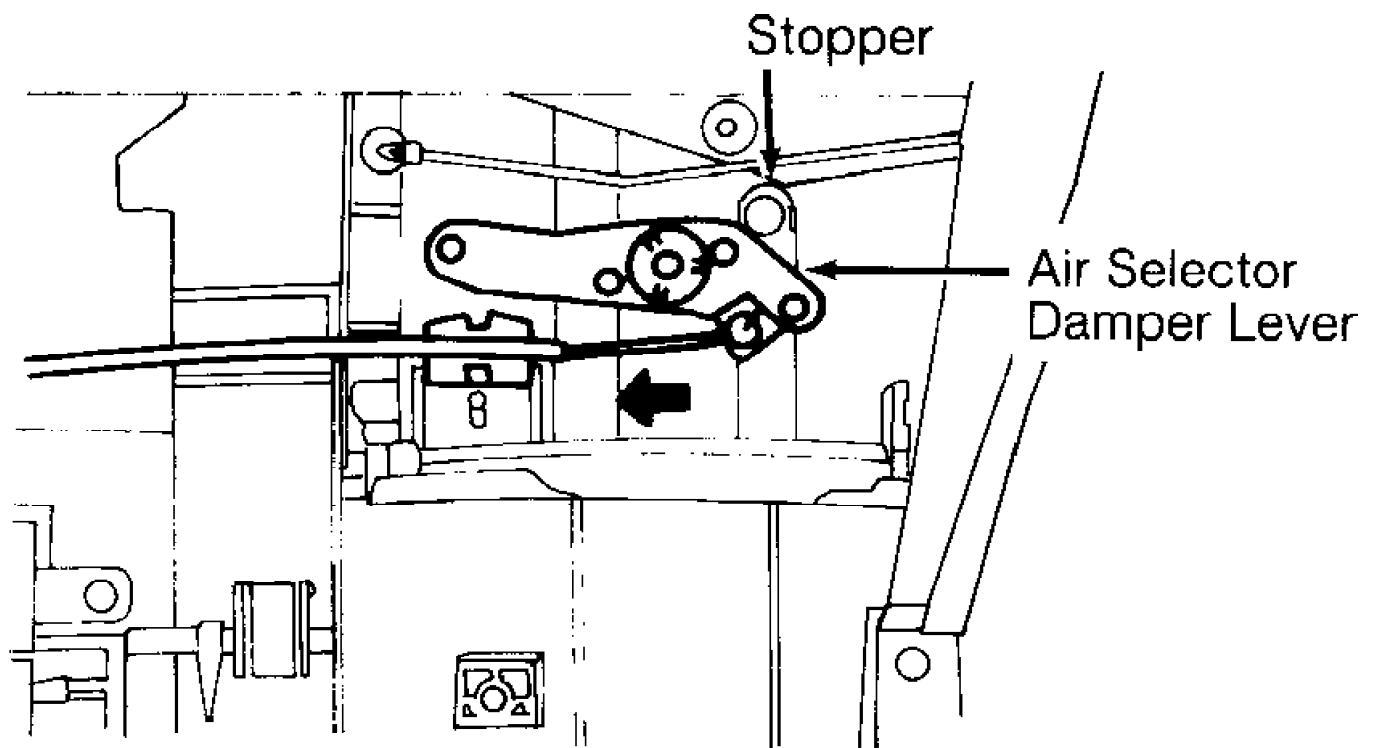


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Fig. 1: Adjusting Temperature Control Cable
Courtesy of Mitsubishi Motor Sales of America

AIR SELECTOR CABLE

Position fresh/recirculated air selector knob at recirculated air setting. Move air selector damper lever in direction of arrow until in contacts stopper. See Fig. 2. Connect inner wire of air selector cable to damper lever. Secure outer wire of selector cable using clip.

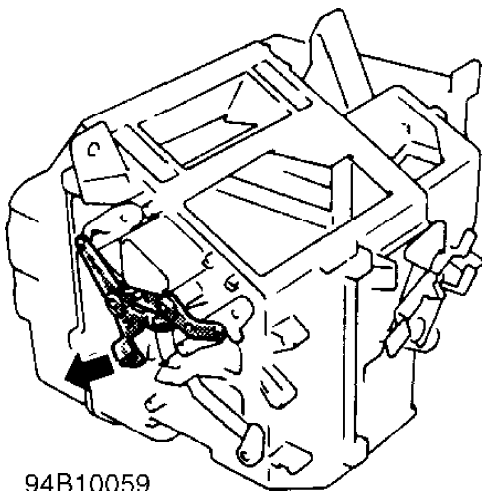


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Fig. 2: Adjusting Air Selector Cable
 Courtesy of Mitsubishi Motor Sales of America

MODE SELECTOR CABLE

Place mode selector lever at defrost setting. Move mode selector damper lever in direction of arrow, and connect inner wire of mode selector cable to damper lever. See Fig. 3. Secure outer wire of selector cable using clip.



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Fig. 3: Adjusting Mode Selector Cable
 Courtesy of Mitsubishi Motor Sales of America

TROUBLE SHOOTING

AIR NOT COOL

1) Ensure compressor is operating. If compressor is not operating, check compressor clutch, fuses and relay. Check A/C switch and dual-pressure switch. Check thermostat, fin thermo and air inlet sensors. Check A/C Control Unit (ACCU). Check blower switch and relay. Check liquid pipe.

2) Ensure system is properly charged with correct amount of refrigerant. Ensure receiver-drier is not clogged. Check for clogged expansion valve. Check compressor operation.

A/C INOPERATIVE

Ignition On

Check power circuit harness. Check for defective compressor relay, compressor clutch, thermostat, dual-pressure switch or A/C switch. Ensure refrigerant level is correct. Check for a defective A/C compressor lock controller or A/C control unit.

CONDENSER FAN INOPERATIVE

A/C On

Check for defective condenser fan motor or relay.

A/C SWITCH INDICATOR LIGHT BLINKING

DOHC Engines

Ensure compressor drive belt is not wet. Ensure belt tension is correct. Check for defective compressor drive belt, compressor, revolution pick-up sensor, A/C switch, A/C compressor lock controller, A/C control unit, or Multi-Port Fuel Injection (MPI) control unit.

BLOWER INOPERATIVE

Check for blown fuse. Ensure blower motor has proper ground connection. Check for defective switch, blower motor relays or resistor.

INSUFFICIENT HEAT

Check for obstructed heater outlet or heater hoses. Ensure blend-air damper, mode selector damper and control cables are properly adjusted. Check for defective thermostat or plugged heater core.

NO VENTILATION

Ensure mode selector cable is correctly installed. Check duct connections, and ensure ducts are not crushed, bent or clogged.

TESTING

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A/C SYSTEM PERFORMANCE

1) Park vehicle away from direct sunlight. Connect manifold

gauge set to A/C system. Start engine. Set mode selector lever at face position.

2) Set temperature control lever at maximum cool setting, and air selector lever at recirculated air setting. Turn A/C on. Operate blower fan in high speed. Adjust engine speed to 1000 RPM with compressor clutch engaged. Close all doors and windows. Ensure hood is open.

NOTE: If clutch cycles, take temperature reading before clutch disengages.

3) Insert thermometer in center vent. Run engine for 20 minutes, and note discharge air temperature on thermometer. When discharge temperature reaches 33.8-39.2°F (1.0-4.0°C), ensure system low-side and high-side pressures are within specification. See A/C SPECIFICATIONS table at beginning of article.

A/C CONTROL UNIT

1) Locate A/C control unit under blower motor. Backprobe A/C control unit 12-pin and 6-pin connectors. See Fig. 1. Measure voltage at specified A/C control unit terminals. Repair harness and connector as required.

2) Terminals No. 8 and 9 (Black wire) are A/C control unit grounds. There should be zero volts at all times.

3) Terminal No. 1 (Blue/Red wire) is A/C control unit power supply. With ignition switch on, battery voltage should be present.

4) Terminal No. 6 (Green/Yellow wire) becomes power supply for A/C compressor clutch relay. When compressor ON conditions are satisfied, battery voltage should be present.

5) Terminal No. 7 (Red/Yellow wire) is A/C control unit power supply when A/C switch is pressed to second step. With ignition and blower switches on, and A/C switch to second step, battery voltage should be present.

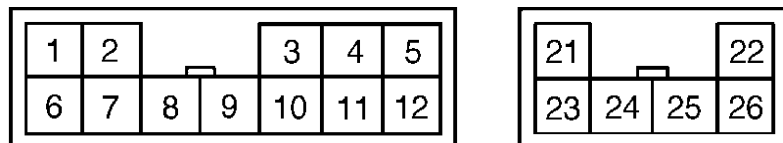
6) Terminal No. 2 (Blue/Black wire) is A/C control unit power supply when A/C switch is in economy mode. With ignition and blower switches on, and A/C switch to first level, battery voltage should be present.

7) Terminal No. 21 (Yellow/White wire) is air inlet sensor power supply. With ignition, blower and A/C switches on, approximately 2.5 volts should be present.

8) Terminal No. 23 (Yellow/Black wire) is air inlet sensor signal. When sensor temperature is 39°F (4°C) and ignition, blower and A/C switches are on, zero volts should be present.

9) Terminal No. 22 (Yellow/Black wire) is fin thermo sensor power supply. With ignition, blower and A/C switches on, approximately one volt should be present.

10) Terminal No. 26 (Yellow/Red wire) is fin thermo sensor signal. When sensor temperature is 39°F (4°C), there should be zero volts present.



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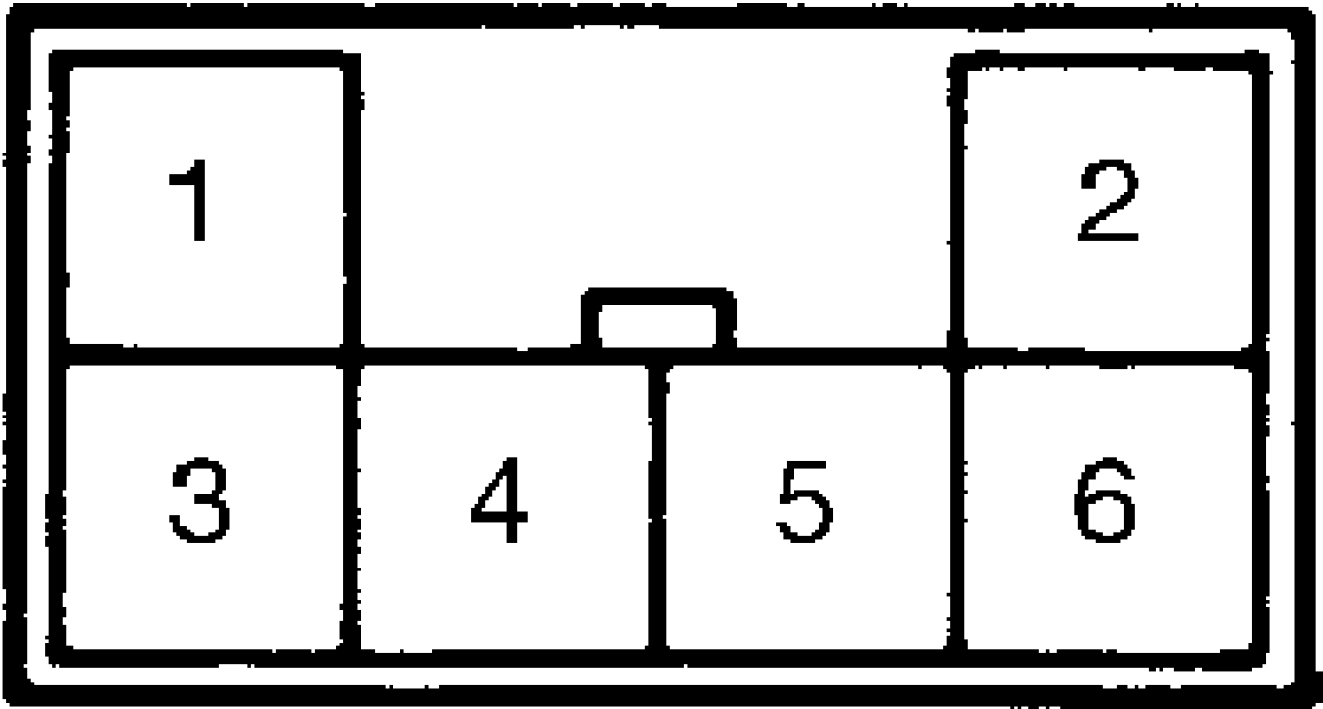
Fig. 4: Identifying A/C Control Unit Terminals
Courtesy of Mitsubishi Motor Sales of America.

A/C SWITCH

Operate A/C switch, and check continuity between indicated terminals using ohmmeter. See A/C SWITCH CONTINUITY table. See Fig. 5. Replace switch if continuity is not as specified.

A/C SWITCH CONTINUITY TABLE

Switch Position	Terminal No. (1)	Continuity
Economy	1 & 4; (2) 4 & 5	Yes
Maximum Cooling	1 & 2; 1 & 4; (3) 4 & 5	Yes
(1) - Terminals No. 3 and 6 are for light bulb circuit and should always have continuity.		
(2) - Amber indicator light on A/C switch.		
(3) - Green indicator light on A/C switch.		



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Fig. 5: Identifying A/C Switch Terminals
Courtesy of Mitsubishi Motor Sales of America.

FIN THERMO & AIR INLET SENSORS

Disconnect fin thermo or air inlet sensor at evaporator case. Using ohmmeter, check component resistance at indicated temperatures. See FIN THERMO & AIR INLET SENSOR SPECIFICATIONS table. Resistance value should be within 10 percent of specified value. If resistance of sensor is as specified, replace A/C control unit.

FIN THERMO & AIR INLET SENSOR SPECIFICATIONS TABLE

Component Temp. °F (°C)	Ohms
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32 (0)	4800
41 (5)	3800
50 (10)	3000
59 (15)	2300
68 (20)	1800
77 (25)	1500

BLOWER MOTOR

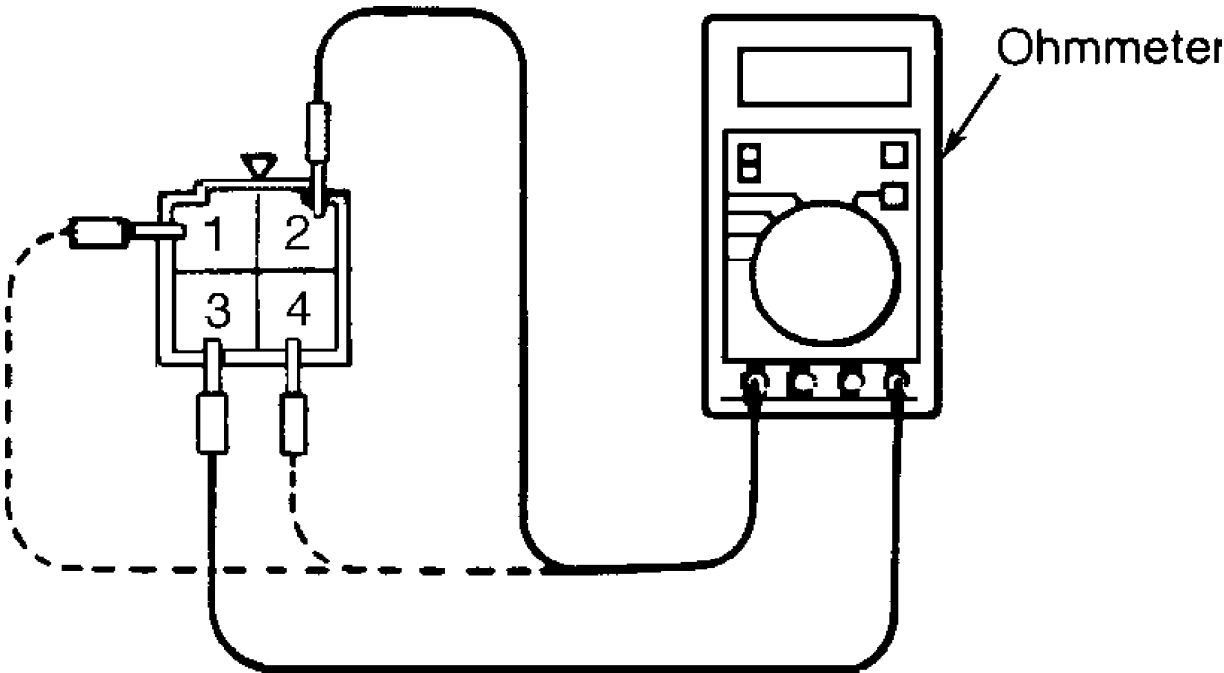
Apply battery voltage directly to blower motor terminals. Ensure blower motor operates smoothly. Reverse polarity, and ensure blower motor operates smoothly in the reverse direction.

BLOWER RESISTOR

Disconnect blower resistor connector. Using ohmmeter, measure resistance between indicated terminals. See BLOWER RESISTOR RESISTANCE table. See Fig. 6. Replace resistor if readings are not within specification.

BLOWER RESISTOR RESISTANCE TABLE

Terminal No.		Ohms
2 & 3	Approx. 0.38-0.44
2 & 4	Approx. 1.10-1.26
2 & 1	Approx. 1.79-2.06



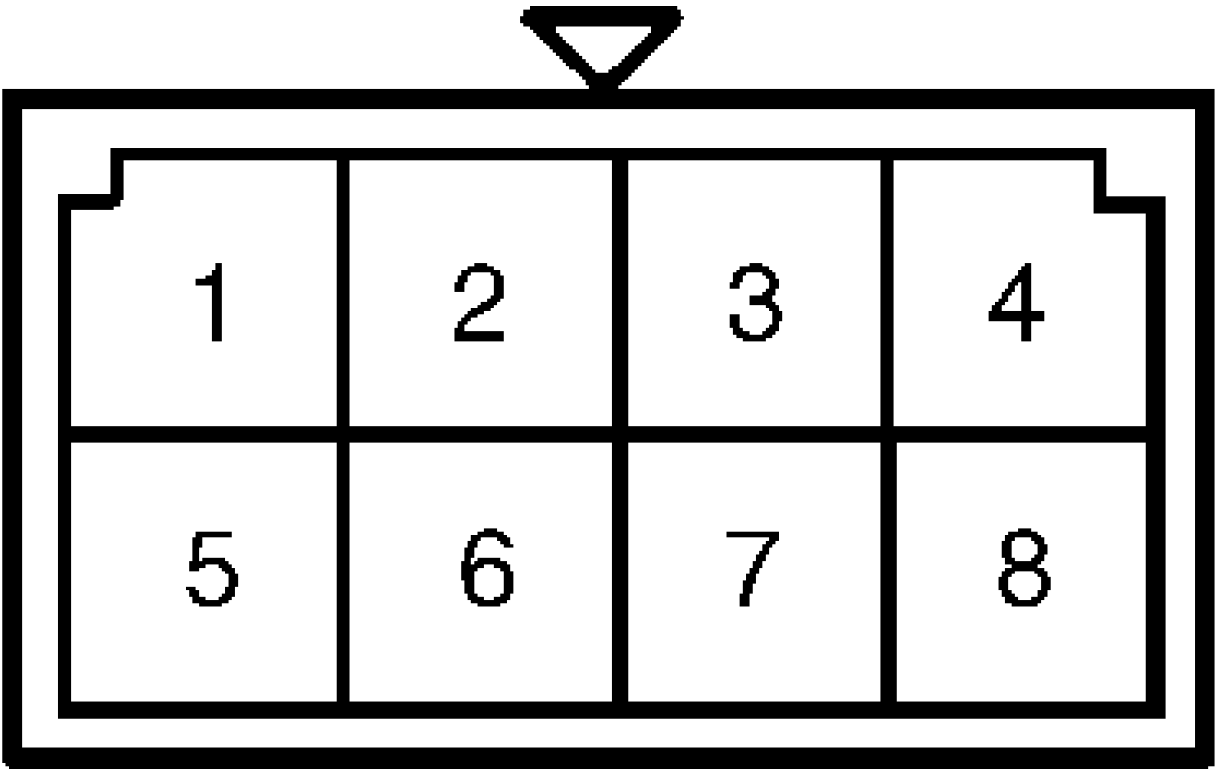
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Fig. 6: Testing Blower Resistor
Courtesy of Mitsubishi Motor Sales of America.

BLOWER SWITCH

With blower switch in position indicated in BLOWER SWITCH CONTINUITY table, ensure continuity exists between terminals listed. See Fig. 7. If continuity is not as specified, replace switch.

BLOWER SWITCH CONTINUITY TABLE

Switch Position	Terminal No.		Continuity
Low	1 & 8;	3 & 5	Yes
Medium-Low	1 & 8;	5 & 6	Yes
Medium-High	1 & 4;	1 & 8; 2 & 5	Yes
High	1 & 4;	1 & 8; 5 & 7	Yes



COMPONENT SIDE VIEW

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Fig. 7: Identifying Blower Switch Terminals
Courtesy of Mitsubishi Motor Sales of America.

DUAL-PRESSURE SWITCH

1) Turn adapter valve handle all the way back, and connect it to low-pressure service valve. Close low-pressure service valves, and connect high-pressure charging hose of manifold gauge to adapter

valve. Tighten adapter valve handle, and open service valve.

2) Check continuity between switch terminals. Continuity should exist when low-side pressure is 28-32 psi (2.0-2.2 kg/cm²). Continuity should exist when high-side pressure is 370-455 psi (26.0-32.0 kg/cm²). If continuity is not as specified, replace faulty dual-pressure switch.

RECEIVER-DRIER

Operate A/C system. Compare temperatures at receiver-drier outlet and inlet. If there is a difference in temperatures, replace restricted receiver-drier.

ENGINE COOLANT TEMPERATURE SWITCH

Ensure switch is turned on when engine coolant temperature reaches 73-87°F (23-31°C).

COMPRESSOR CLUTCH

Disconnect wiring to compressor clutch. Connect negative battery cable to compressor body. Connect positive battery cable to clutch Black/White wire. Listen for click, indicating pulley and armature are making contact. If click is not heard, repair or replace clutch as necessary.

CONDENSER FAN MOTOR

Connect positive battery cable to Blue/White wire terminal (high speed), and ground Blue/Black wire terminal. Ensure motor operates. Connect positive battery cable to Blue wire terminal (low speed) and ground Black wire terminal. Ensure motor operates. Replace condenser fan motor if it does not test as specified.

RELAYS

4-Terminal Relay

1) Remove relay from holder. Using ohmmeter, check continuity between relay terminals No. 1 and 3. See Fig. 8. Continuity should not be present.

2) Check continuity between relay terminals No. 2 and 4. Ensure continuity is present. Apply battery voltage to terminals No. 2 and 4. Ensure continuity is present between terminals No. 1 and 3 with voltage applied. If continuity is not as specified, replace relay.

5-Terminal Relay

1) Remove relay from holder. Using ohmmeter, check continuity between relay terminals No. 4 and 5. See Fig. 8. Continuity should not be present.

2) Check continuity between relay terminals No. 1 and 3. Ensure continuity is present. Apply battery voltage to terminals No. 1 and 3. Ensure continuity is present between terminals No. 4 and 5 with voltage applied. If continuity is not as specified, replace relay.

REFRIGERANT THERMOSTAT SWITCH

1) Remove refrigerant thermostat switch located on side of compressor. Immerse thermostat in heated engine oil. Check for continuity between Green/Red wire and White/Green wire of 3-pin connector (6-pin connector on DOHC).

2) Continuity is present (switch on) until about 311°F (155°C). As temperature increases, continuity is not present (switch

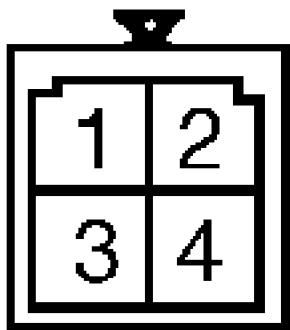
off). When temperature decreases to about 230°F (110°C), continuity will be present (switch on). Replace switch as needed.

NOTE: On DOHC, revolution pick-up sensor is part of refrigerant thermostat switch harness. Do not immerse revolution pick-up sensor in hot oil.

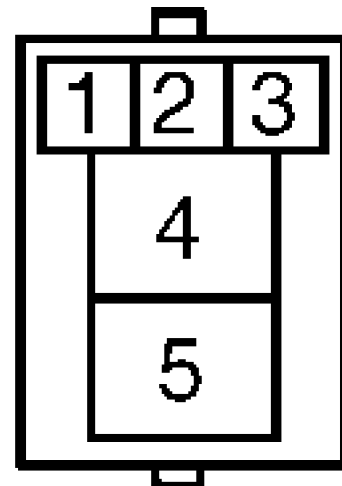
REVOLUTION PICK-UP SENSOR

DOHC

Disconnect refrigerant thermostat switch/revolution pick-up sensor 6-pin connector. Check resistance between Yellow/Red wire and Yellow/Green wire. Resistance should be 370-440 ohms at 68°F (20°C). Replace as necessary.



4-TERMINAL
RELAY



5-TERMINAL
RELAY

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Fig. 8: Identifying Relay Terminals
Courtesy of Mitsubishi Motor Sales of America.

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 appropriate AIR BAG RESTRAINT SYSTEM article in ACCESSORIES/SAFETY EQUIPMENT section.

A/C SWITCH

Removal & Installation

Using flat-tip screwdriver, disengage clips from center air outlet panel. Remove center air outlet panel using trim stick. Insert

hand through air outlet panel opening, and push A/C switch out. Disconnect A/C switch connector. To install, reverse removal procedure.

COMPRESSOR

Removal

1) Discharge A/C system using approved refrigerant recovery/recycling equipment. Remove compressor drive belt. On DOHC engines, remove condenser fan motor assembly and alternator.

2) Disconnect and cap refrigerant hoses. Disconnect compressor electrical connectors. Cover brake tubes with shop towel, and remove compressor. On DOHC engines, remove idler pulley.

3) Remove compressor bracket. Remove bolt and tension pulley assembly from compressor bracket. DO NOT allow oil to spill when removing compressor. Remove compressor mounting bolts and compressor.

Installation

1) Install tension pulley assembly and compressor bracket. On DOHC engines, install idler pulley. Cover brake tubes with shop towels.

2) If installing new compressor, measure amount of oil (ounces) in old compressor. Subtract this amount from 5.4 ounces. Remove calculated amount from new compressor. DO NOT allow oil to spill when installing compressor. To complete installation, reverse removal procedure. Adjust compressor drive belt.

CONDENSER

Removal

1) Discharge A/C system using approved refrigerant recovery/recycling equipment. On DOHC engines, remove alternator. Disconnect condenser and cooling fan motor electrical connectors.

2) Remove condenser fan motor assembly. Remove condenser fan and motor. Remove condenser fan shroud and cooling fan motor assembly. Remove condenser-to-radiator insulator bolts. Using 2 wrenches, remove high pressure and liquid pipe. Move radiator toward engine, and remove condenser and bushings.

Installation

To install, reverse removal procedure. If installing new condenser, add .5 ounce of refrigerant oil to condenser.

EVAPORATOR

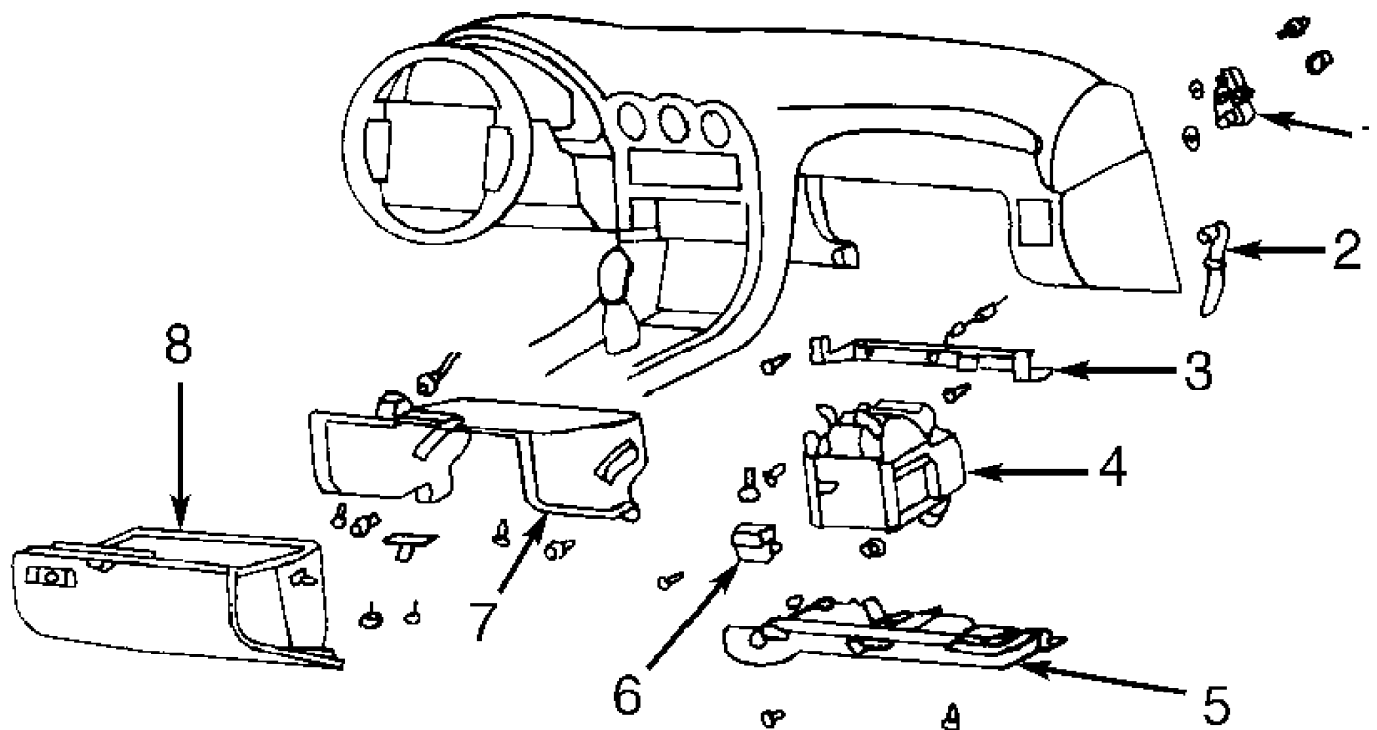
Removal

1) Discharge A/C system using approved refrigerant recovery/recycling equipment. Disconnect negative battery cable. Disconnect liquid pipes, suction hoses and "O" rings. See Fig. 9. Plug hose and pipe. Remove evaporator drain hose.

2) Remove glove box door stops and glove box. Remove glove box outer case. Remove glove box undercover and bracket. Disconnect electrical connectors. Remove A/C control unit and evaporator.

Installation

To install, reverse removal procedure. If installing NEW evaporator, add 2 ounces of refrigerant oil to evaporator.



1. Liquid Pipe & Suction
Hose Connector
2. Drain Hose
3. Lower Frame
4. Evaporator

5. Undercover
6. A/C Control Unit
7. Glove Box Outer Case
8. Glove Box

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Fig. 9: Exploded View Of Evaporator Assembly
Courtesy of Mitsubishi Motor Sales of America.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS TABLE

Application	Ft. Lbs. (N.m)
Alternator Bolt	15-18 (20-25)
Compressor-To-Bracket Bolts	31 (42)
High-Pressure Pipe Fitting	17 (23)
Idler Pulley Bolt	33 (45)
	INCH Lbs. (N.m)
Condenser-To-High Pressure Pipe Fitting	115 (13)
Condenser-To-Radiator Insulator Bolts	106 (12)
Low-Pressure Hose Fitting	115 (13)
Low-Pressure Pipe Fitting	106-132 (12-15)

WIRING DIAGRAMS

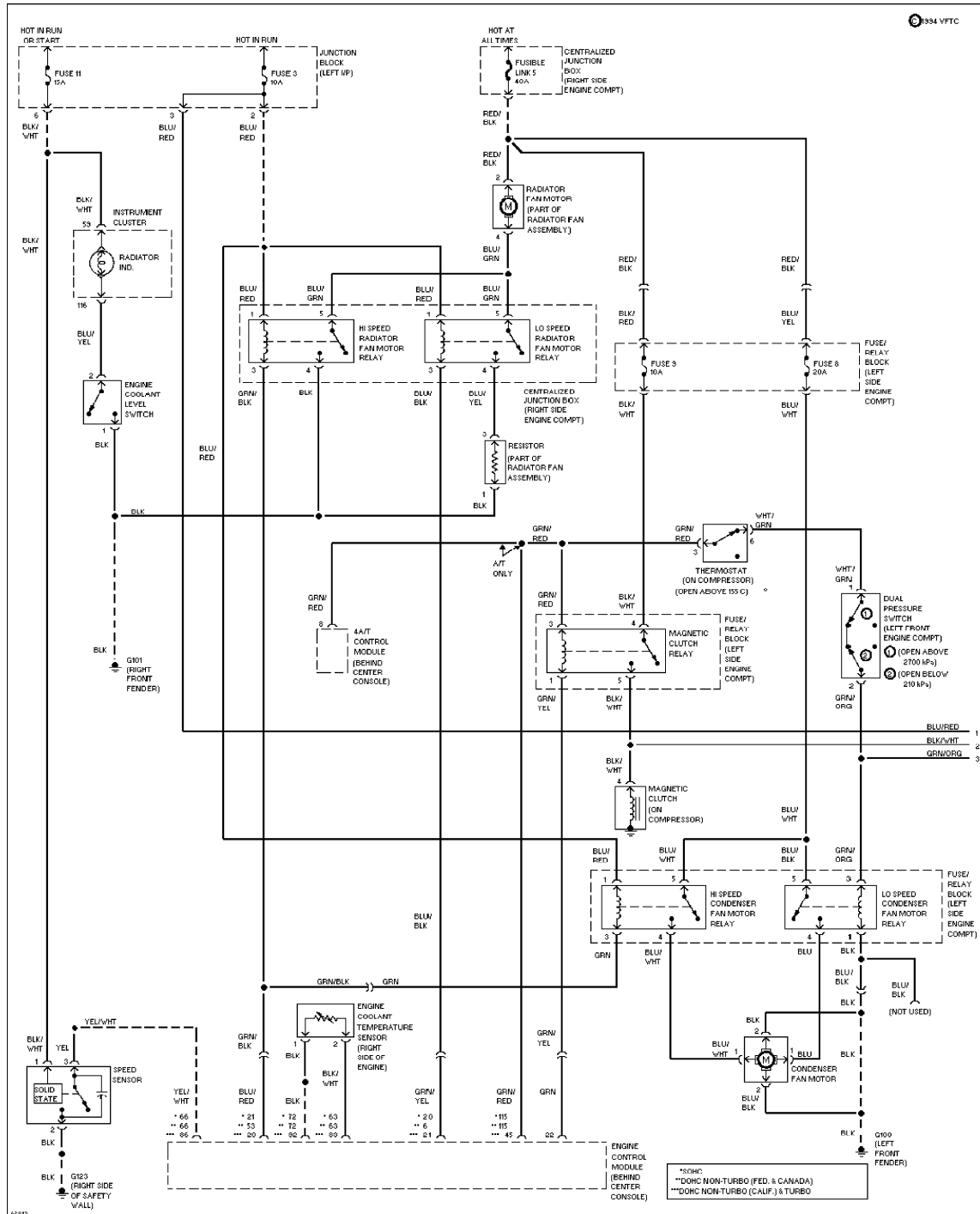


Fig. 10: Manual A/C-Heater System Wiring Diagram (1 Of 2)

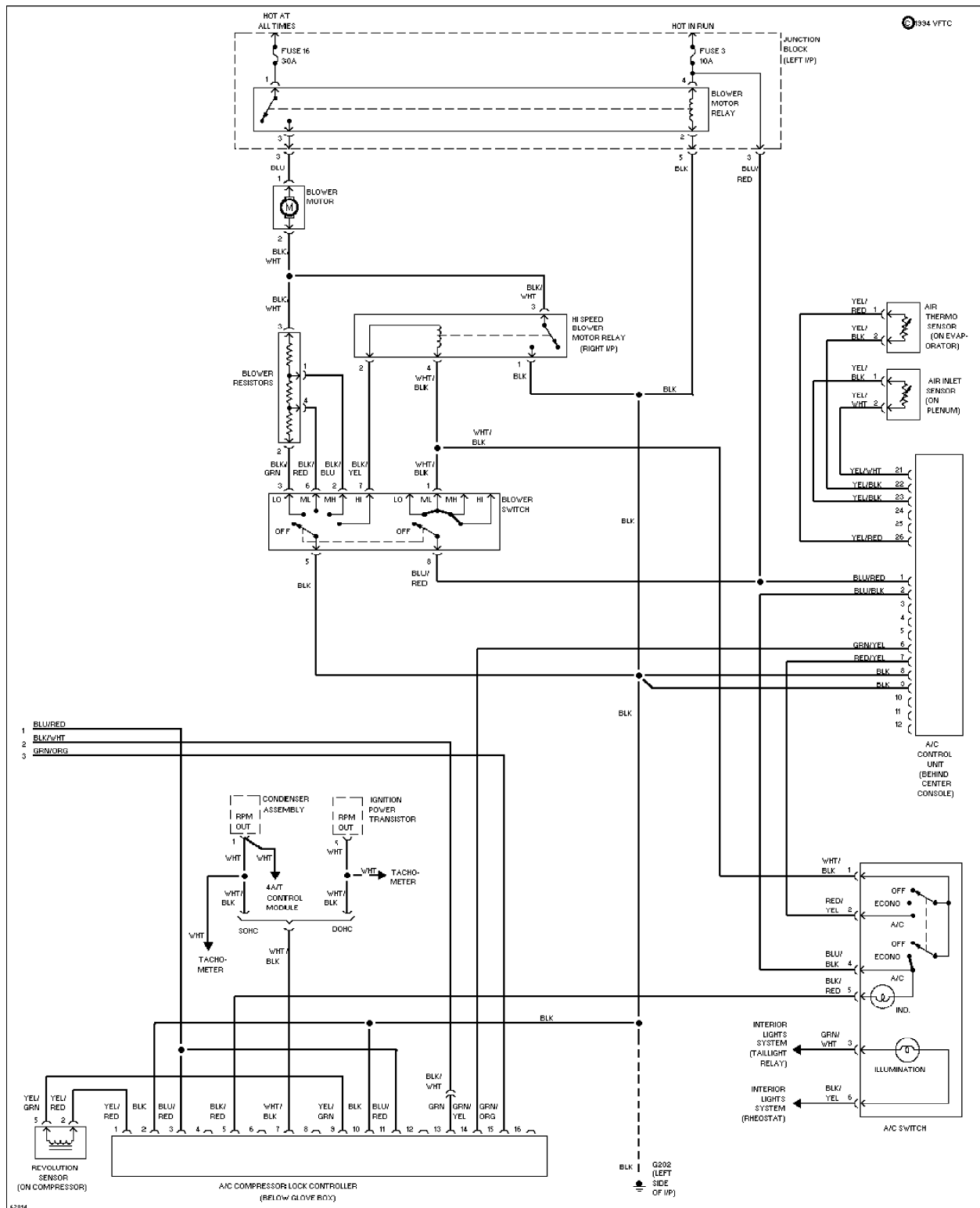


Fig. 11: Manual A/C-Heater System Wiring Diagram (2 Of 2)