

A/C-HEATER SYSTEM - MANUAL

1998 Mitsubishi Galant

1998 AIR CONDITIONING & HEAT
Mitsubishi - A/C-Heater System - Manual

Galant

* 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 AIR BAG RESTRAINT SYSTEM article.

A/C SYSTEM SPECIFICATIONS

A/C SYSTEM SPECIFICATIONS TABLE

Application	Specification
Compressor Type	Sanden MSC90C12 Scroll
Compressor Belt Deflection	
New	7/32-15/64" (5.5-6.0 mm)
Used	1/4-19/64" (6.5-7.5 mm)
Compressor Oil Capacity	(1) 4.1 ozs.
Refrigerant (R-134a) Capacity	23-24.3 ozs.
System Operating Pressures (2)	
High Side	111-139 psi (7.8-9.8 kg/cm ²)
Low Side	6-20 psi (.4-1.4 kg/cm ²)

(1) - Use SUN PAG 56 refrigerant oil.

(2) - With ambient temperature at about 77°F (25°C).

DESCRIPTION

Vehicle uses a Sanden scroll compressor and R-134a refrigerant. A/C system is controlled by an A/C control unit.

Compressors will only operate within the normal operating temperatures and pressures set for each model. An electric condenser fan operates whenever A/C system is operating. System components include an A/C control unit, fan switch, evaporator, temperature sensor, dual-pressure switch, engine coolant temperature switch, compressor, condenser, receiver-drier and various pipes and hoses.

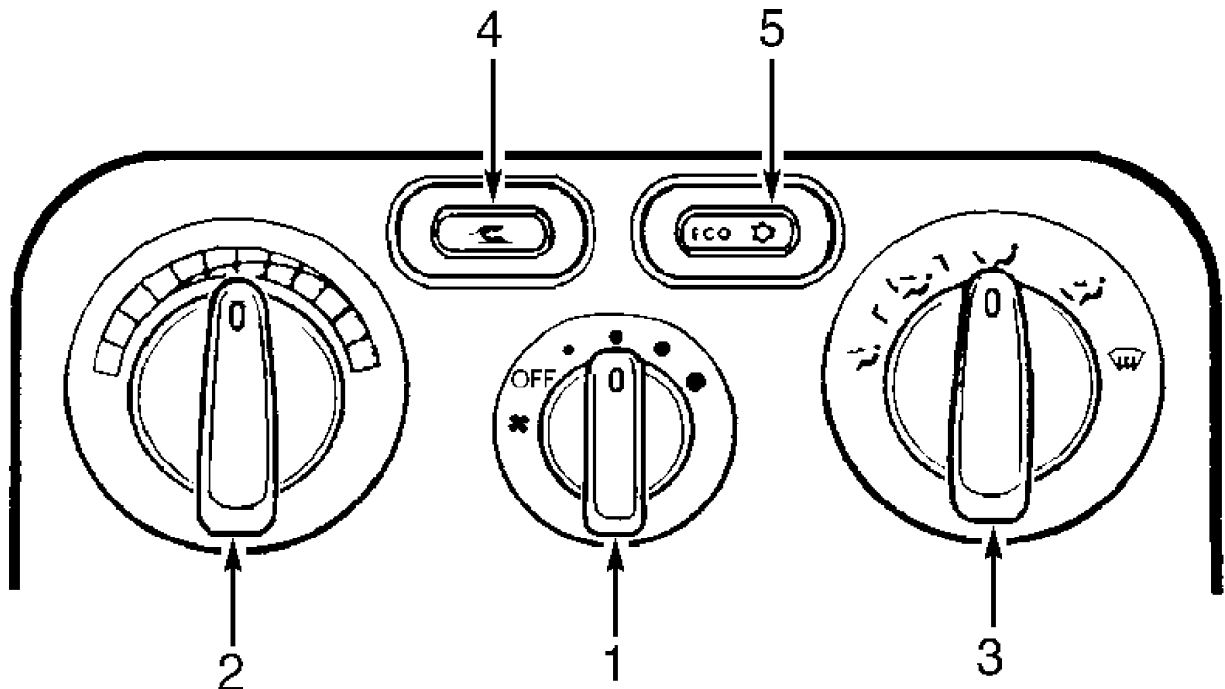
OPERATION

A/C CONTROL UNIT

The A/C control unit controls cycling of compressor clutch based on information received from fin thermo sensor, ECM, blower switch, dual pressure switch and engine coolant temperature sensor. The A/C control unit is located on bottom of evaporator housing.

A/C SWITCH

The A/C switch is located in the A/C control panel. See Fig. 1. A/C switch light will illuminate when A/C system is switched on.



1. Blower Motor Control Knob
2. Temperature Control Knob
3. Mode Selector Knob

4. Fresh/Recirculated Air Selector Switch
5. A/C Switch

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Fig. 1: Identifying A/C Switch & Control Panel
 Courtesy of Mitsubishi Motor Sales of America.

FRESH/RECIRCULATED AIR SELECTOR CONTROL

Fresh/recirculated air selector control is used to select airflow source. With control at fresh air setting, outside air is allowed to enter and pass through heater and evaporator. With control at recirculated air setting, air is recirculated inside passenger compartment. Vehicle uses a fresh/recirculated air control switch and damper motor for fresh or recirculated air selection. Recirculation position is used to achieve maximum A/C cooling or heating.

BLOWER SWITCH

Blower switch controls 4 fan speeds to regulate amount of airflow. Fan speed increases as switch is turned clockwise.

MODE SELECTOR KNOB

Depending on position selected, air can be directed to both front and rear of passenger compartment. Airflow selection capabilities include individual areas or a combination of windshield (defrost), upper body, knee and/or foot area. Rear passenger air distribution is limited to foot area only.

TEMPERATURE CONTROL KNOB

Temperature level is selected by turning selector knob clockwise or counterclockwise. Highest heat setting is attained when selector knob is turned fully clockwise. When temperature selector knob is fully counterclockwise, ambient outside air temperature or A/C cooled air is available through vents.

DUAL-PRESSURE SWITCH

Dual-pressure switch is located on top of receiver-drier. Pressure switch is wired in series with compressor clutch. When system pressures are within control points, switch is ON and compressor can be energized. When system pressures decrease to less than (low charge) or increase to more than (overheating) control points of switch, power supplied to compressor will be cut. Compressor operation will cease until pressures are back within operating range.

ENGINE COOLANT TEMPERATURE SENSOR

Engine coolant temperature sensor signals Powertrain Control Module (PCM) when engine coolant temperature is 226°F (108°C) or less. PCM will then allow A/C operation until engine coolant reaches 239°F (115°C) or more.

FIN THERMO SENSOR

Fin thermo sensor is located in evaporator case. Fin thermo sensor provide a voltage signal to A/C control unit which it uses to control compressor clutch operation preventing evaporator freezing. Power to compressor clutch is cut, allowing evaporator to thaw, if temperature is 38°F (3.2°C) or less.

A/C REFRIGERANT TEMPERATURE SWITCH

A/C refrigerant temperature switch is located on compressor and is wired in series with compressor clutch relay. When A/C refrigerant temperature switch in ON compressor will operate. Switch is ON when refrigerant temperature is less than 320°F (160°C). Switch is OFF when refrigerant temperature is greater than 320°F (160°C) and until temperature drops to less than 266°F (130°C).

ADJUSTMENTS

NOTE: For cable adjustment procedures, see HEATER SYSTEM article.

TROUBLE SHOOTING

COMPRESSOR NOT OPERATING

1) Check fuses, A/C compressor clutch and clutch relay. Check A/C switch, dual-pressure switch and blower switch. Check fin thermo sensor or A/C control unit. Check refrigerant temperature switch.

2) Ensure system is properly charged and there are no leaks. Add refrigerant or repair leak and evacuate and recharge system as necessary. Ensure receiver-drier is not clogged. Check compressor belt for proper tension. Check for clogged expansion valve. Replace expansion valve as necessary. Check compressor operation. Repair or replace compressor as necessary.

INSUFFICIENT AIRFLOW

Check for air leakage at air duct joint. Check for frost on evaporator. Ensure blower motor is operating properly. Check for improper adjustment of mode selector dampers or incorrect installation of mode selector control cable. Check fresh/recirculated air selector. Check for faulty duct connections, or crushed, bent or clogged ducts. Check for obstructed air intake.

INSUFFICIENT COOLING

Ensure system is properly charged with correct amount of refrigerant and free of air and moisture. Add refrigerant or evacuate and recharge system as necessary. Check dual-pressure switch. Check fin thermo sensor or A/C control unit. Check refrigerant temperature switch. Ensure receiver-drier is not clogged. Ensure sufficient airflow through condenser and evaporator exists. Check compressor belt for proper tension. Check compressor operation. Repair or replace compressor as necessary. Check for clogged expansion valve. Replace expansion valve as necessary.

INTERMITTENT COOL AIR

Check for air or moisture in system. Evacuate and recharge system as necessary. Check for expansion valve malfunction. Replace expansion valve if necessary. Check compressor belt for proper tension.

TESTING

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A/C SYSTEM PERFORMANCE

1) Park vehicle out of direct sunlight. Install A/C gauge set. Start engine and allow it to idle at 1000 RPM. Set A/C controls to recirculate air, panel (vent) mode, full cold, and A/C button on.

2) Set blower/fan on high speed and close doors and windows. Insert thermometer in left center vent. Operate system for 20 minutes to allow system to stabilize. If clutch cycles, take temperature reading before clutch disengages.

3) Measure temperature at center vent, with ambient temperature at 77°F (25°C). Temperature must be about 33-40°F (2.5-4.5°C). Check that high side and low side pressures are within specification. See A/C SYSTEM SPECIFICATIONS table at beginning of article.

A/C CONTROL UNIT

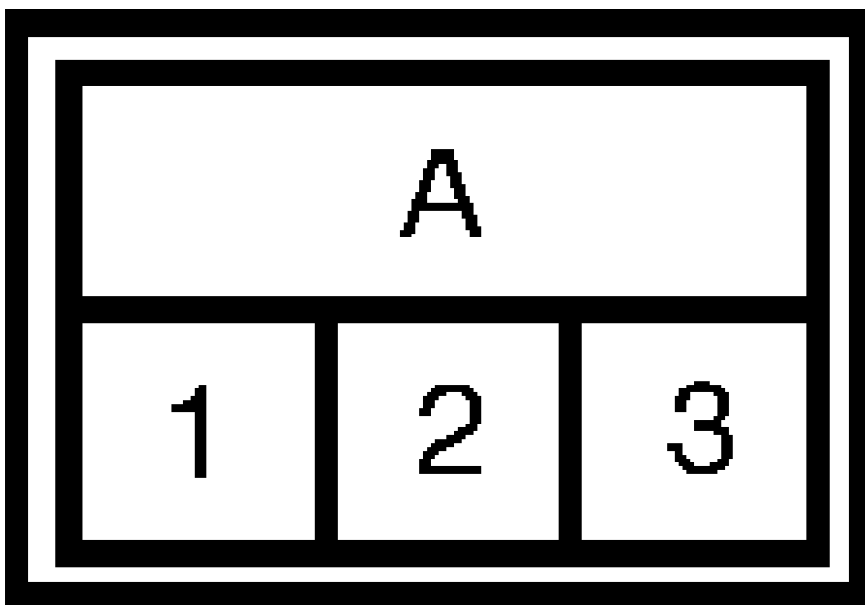
Start engine and allow it to reach normal operating temperature. Locate A/C Control Unit (ACCU) 3-pin connector. ACCU is located under blower motor. Inspect connector and wiring for damage. Repair as required. See Fig. 2. Turn ignition on, A/C switch to ON position, temperature control to maximum cooling and blower switch to high. Using a DVOM set to appropriate test function, backprobe ACCU harness connector. Test readings should be as specified. See A/C

CONTROL UNIT CIRCUIT TESTS table. If all test readings are as specified and all other components are within specifications, replace ACCU. If all test readings are not as specified, repair circuit(s) as required.

A/C CONTROL UNIT CIRCUIT TESTS TABLE

Terminal No. (Circuit) (1)	Value
1 (ACCU Power Supply Output)	Battery Voltage
2 (ACCU Power Supply Input)	Battery Voltage
3 (ACCU Ground)	Zero Volts

(1) - Resistance between terminals No. 7 and 9, should
185 ohms at 68°F (20°C)



HARNESS SIDE VIEW

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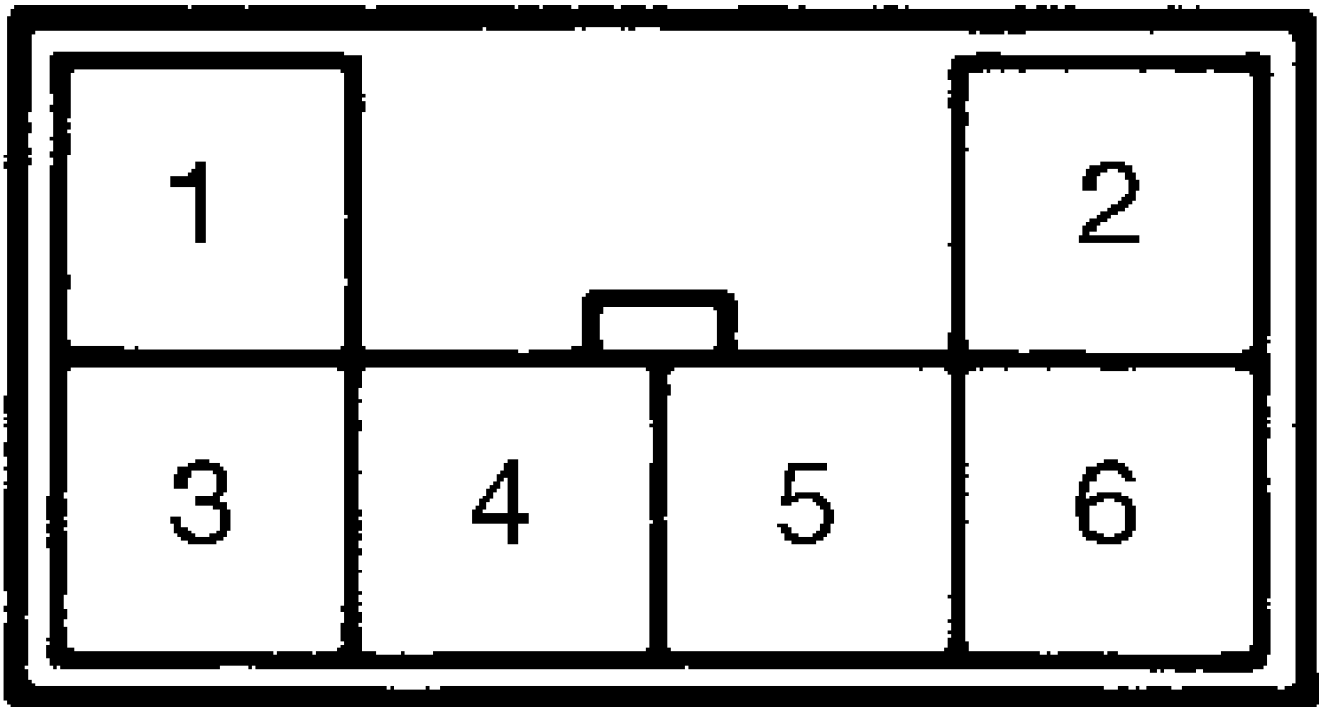
Fig. 2: Identifying A/C Control Unit Terminals
Courtesy of Mitsubishi Motor Sales of America.

A/C SWITCH

Disconnect A/C switch connector. With A/C switch in indicated position, ensure continuity exists between switch terminals. See A/C SWITCH CONTINUITY TEST table. See Fig. 3.

A/C SWITCH CONTINUITY TEST TABLE

Switch Position	Terminal No.	Continuity
Off	3 & 6	No
On	1 & 2, 2 & 5, 3 & 6	Yes



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Fig. 3: Identifying A/C Switch Terminals
 Courtesy of Mitsubishi Motor Sales of America.

FIN THERMO SENSOR

1) Fin thermo sensor is part of the A/C control unit. Disconnect A/C control unit. Probe wires between fin thermo sensor and control unit, measure continuity. See FIN THERMO SENSOR SPECIFICATIONS table.

2) If resistance is not within specifications, fin thermo sensor is faulty. Replace A/C control unit.

FIN THERMO SENSOR SPECIFICATIONS TABLE

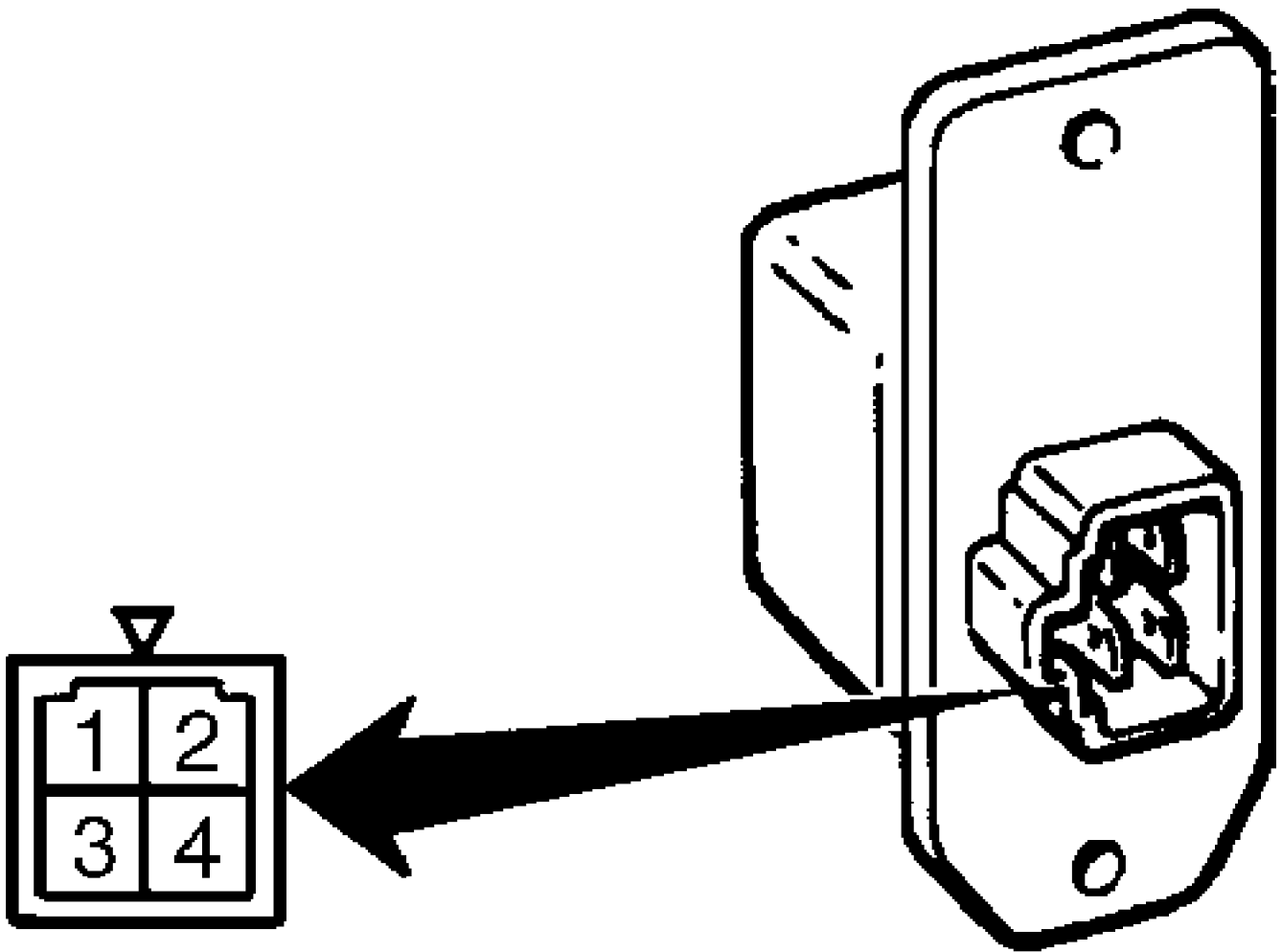
Sensor Temperature °F (°C)	Approximate Ohms
32 (0)	11,500
50 (10)	7500
68 (20)	4800
86 (30)	3300
104 (40)	2300

BLOWER RESISTOR

Disconnect blower resistor connector. Using an ohmmeter, measure resistance between terminals indicated in BLOWER RESISTOR RESISTANCE table. See Fig. 4.

BLOWER RESISTOR RESISTANCE TABLE

Terminal No. & Blower Speed	Approximate Ohms
3 & 2 (Low)	2.3
3 & 4 (Medium-Low)	1.1
3 & 1 (Medium-High)	0.4



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Fig. 4: Testing Blower Resistor
 Courtesy of Mitsubishi Motor Sales of America.

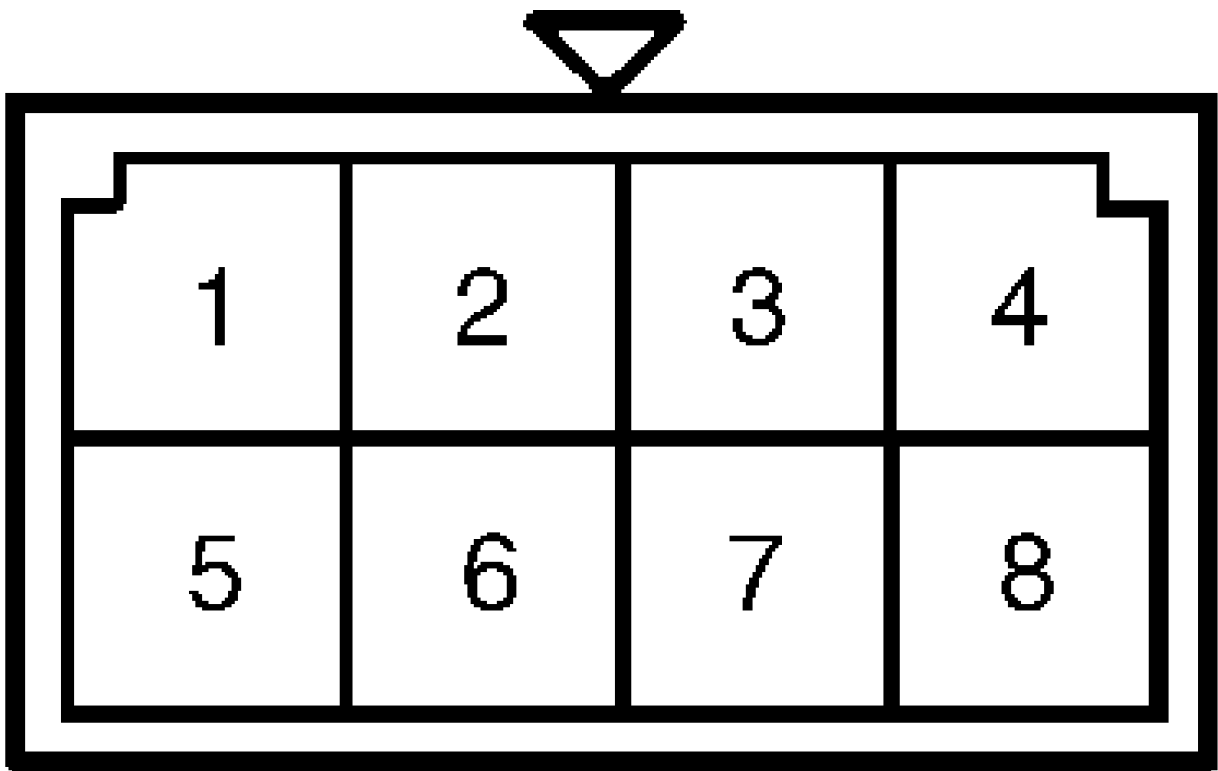
BLOWER SWITCH

With blower switch in position indicated in BLOWER SWITCH CONTINUITY TEST table, ensure continuity exists between listed terminals. See Fig. 5.

BLOWER SWITCH CONTINUITY TEST TABLE

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

(1) - Continuity should not exist between any terminals.



COMPONENT SIDE VIEW

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Fig. 5: Identifying Blower Switch Terminals
 Courtesy of Mitsubishi Motor Sales of America.

DUAL-PRESSURE SWITCH

Disconnect dual-pressure connector and connect a jumper wire across connector terminals. Connect manifold gauge set to system and check operating pressures. Dual-pressure switch will allow compressor

operation when system pressure is within specification. Check continuity between switch terminals when pressures are as specified. See PRESSURE SWITCH SPECIFICATIONS table. If continuity is not present when switch is on, replace dual-pressure switch.

PRESSURE SWITCH SPECIFICATIONS TABLE

Pressure Side	Switch Position	
	Off To On psi (kg/cm ²)	On To Off psi (kg/cm ²)
Low	32 (2.2)	29 (2.0)
High	341 (24)	427 (30)

COMPRESSOR CLUTCH

Disconnect wiring to compressor clutch. Connect battery negative lead to compressor housing. Connect battery positive lead to A/C compressor clutch wiring harness connector. If click is heard, clutch engagement is okay. If click is not heard, pulley and armature are not making contact. Repair or replace compressor clutch as necessary.

REFRIGERANT TEMPERATURE SWITCH

Turn A/C off. Unplug temperature switch on compressor. Check for continuity between terminals. If continuity does not exist. Replace compressor.

RELAYS

NOTE: For blower motor relay and high blower relay testing see HEATER SYSTEM article.

Compressor Clutch & Condenser Fan Relays

Remove relay from under hood relay box. Using an ohmmeter, check that continuity exists between terminals No. 1 and 3. Check that continuity does not exist between terminals No. 4 and 5. Connect battery voltage to terminal No. 1, and ground terminal No. 3. Check that continuity exists between terminals No. 4 and 5. See Fig. 6. If continuity is not as specified, replace relay.

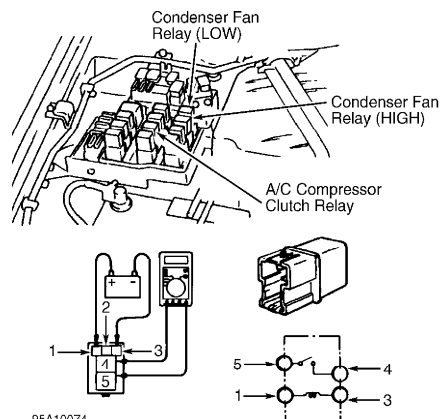


Fig. 6: Identifying Compressor Clutch & Condenser Fan Relays
 Courtesy of Mitsubishi Motor Sales of America.

REMOVAL & INSTALLATION

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CAUTION: DO NOT allow any impact or shock to Supplemental Restraint System Electronic Control Unit (SRS-ECU), located under floor console.

NOTE: For removal and installation procedures not covered in this article, see HEATER SYSTEM article.

A/C SWITCH

Removal & Installation

Remove shift lever knob (M/T). Remove shift lever boots. Remove center console panel. Remove fresh/recirculated air switch. Remove A/C switch. Disconnect A/C switch electrical connector. To install A/C switch, reverse removal procedure.

COMPRESSOR

Removal & Installation

Discharge A/C system, using approved refrigerant recovery/recycling equipment. Remove compressor drive belt. Disconnect compressor electrical connector. Remove high and low pressure lines, and "O" rings from compressor. Remove compressor mounting bolts. Remove compressor. To install, reverse removal procedure.

CONDENSER

Removal & Installation

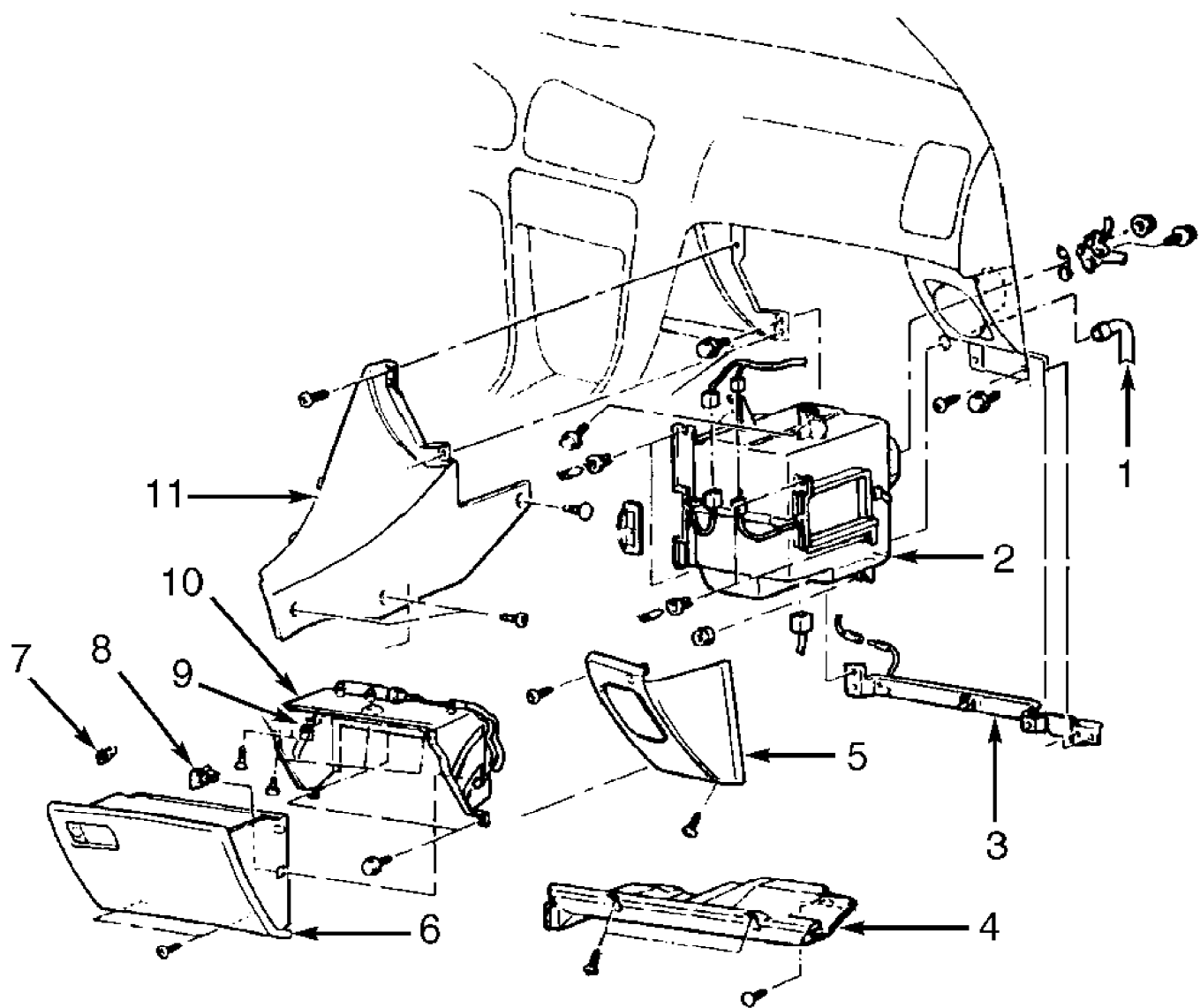
Discharge A/C system, using approved refrigerant recovery/recycling equipment. Remove coolant reservoir. Remove upper radiator mounting bolts. Slide condenser out of vehicle. To install, reverse removal procedure.

EVAPORATOR ASSEMBLY

Removal & Installation

1) Discharge A/C system, using approved refrigerant recovery/recycling equipment. Disconnect drain hose. Remove refrigerant lines and "O" rings from firewall side of evaporator. Remove instrument panel undercover. Remove glove box stopper and glove box. Remove glove box striker and cover.

2) Remove corner panel. Remove glove box frame. Remove 3 screws and instrument panel side cover. Disconnect evaporator electrical connectors. Unbolt and remove evaporator assembly. See Fig. 7. To install, reverse removal procedure. Evacuate and recharge system, and check for leaks.



- | | |
|------------------------|---|
| 1. Drain Hose | 7. Stopper |
| 2. Evaporator Assembly | 8. Glove Box Damper Catcher (If Equipped) |
| 3. Glove Box Frame | 9. Glove Box Striker |
| 4. Undercover | 10. Glove Box Cover |
| 5. Corner Panel | 11. Side Cover |
| 6. Glove Box | |

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Fig. 7: Removing Evaporator Assembly
 Courtesy of Mitsubishi Motor Sales of America.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS TABLE

Application	Ft. Lbs. (N.m)
Belt Tensioner Adjusting Nut	17-19 (23-26)
Belt Tensioner Mounting Bolt	17-20 (23-27)
Clutch Mounting Bolt/Nut	11-13 (15-17)
Compressor Bracket Bolts	36 (49)
Compressor-To-Bracket Bolts	17-20 (23-27)
	INCH Lbs. (N.m)
Dual-Pressure Switch	80-97 (9-11)
Duct Screws	13-22 (1.5-2.5)

WIRING DIAGRAMS

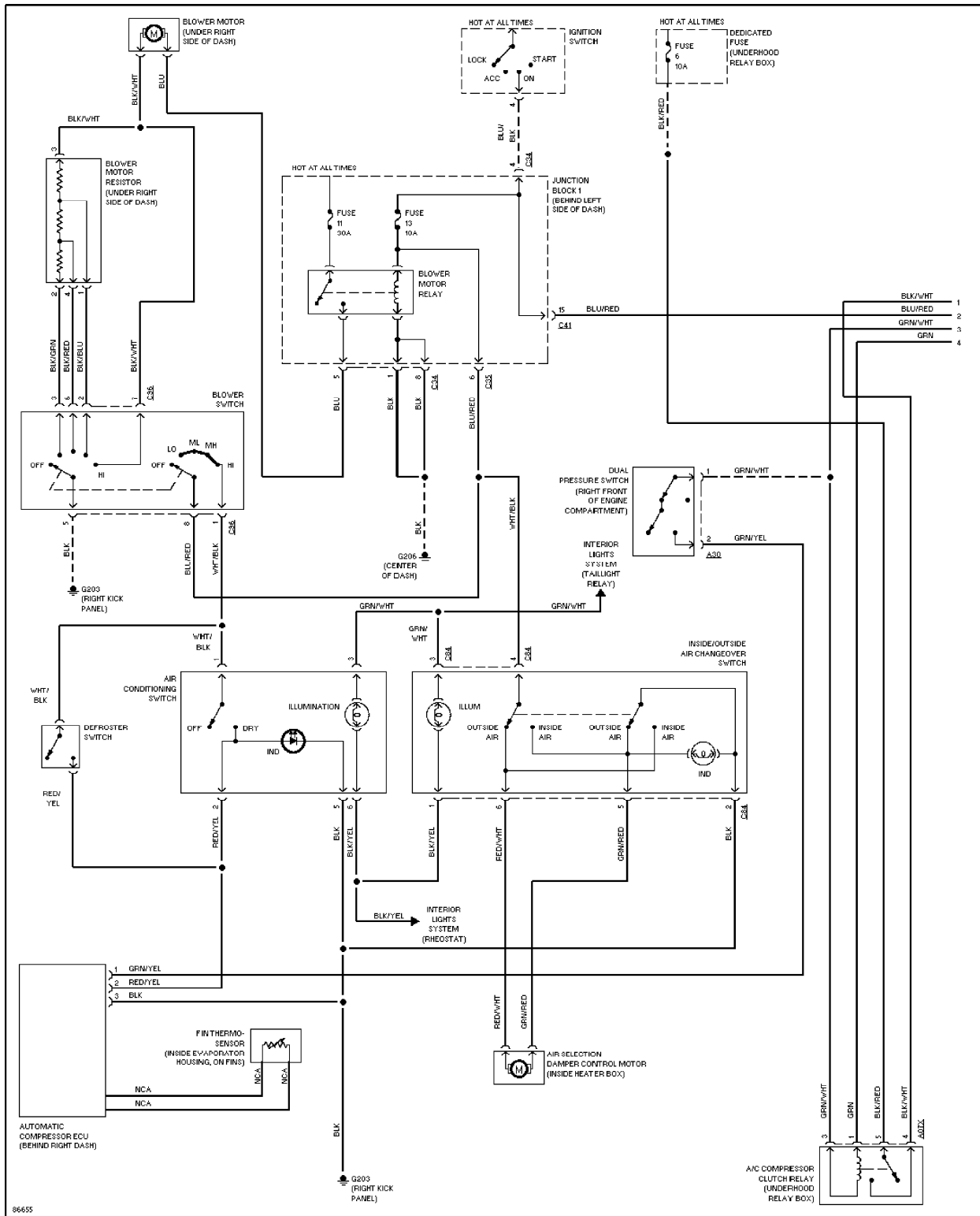


Fig. 8: Manual A/C-Heater System Wiring Diagram (1 Of 2)

