HEATER, AIR CONDITIONING AND VENTILATION

CONTENTS

55209000051

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WARNINGS REGARDING SERVICING OF SUPPLEMENTAL RESTRAINT SYSTEM (SRS) EQUIPPED VEHICLES

WARNING!

(1) Improper service or maintenance of any component of the SRS, or any SRS-related component, can lead to personal injury or death to service personnel (from inadvertent firing of the air bag) or to the driver and passenger (from rendering the SRS inoperative).

(2) Service or maintenance of any SRS component or SRS-related component must be performed only at an authorized MITSUBISHI dealer.

(3) MITSUBISHI dealer personnel must thoroughly review this manual, and especially its GROUP 52B - Supplemental Restraint System (SRS) and GROUP 00 - Maintenance Service before beginning any service or maintenance of any component of the SRS or any SRS-related component.

NOTE

The SRS includes the following components: SRS-ECU, SRS warning light, air bag module, clock spring and interconnecting wiring. Other SRS-related components (that may have to be removed/installed in connection with SRS service or maintenance) are indicated in the table of contents by and asterisk (*).

GENERAL INFORMATION

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The heater system uses a two-way-flow full-air-mix system that features high performance and low operating noise. If includes an independent face air blowing function and a cool air bypass function.

The A/C system is basically the same as the conventional system, but a new refrigerant system has been adopted as a response to restrictions on the use of chlorofluorocarbons.

Items		Specifications
Heater unit	Type	Two-way-flow full-air-mix system
Heater control assembly		Dial type
Compressor	Model	Scroll type <MSC90>
Dual pressure switch kPa (psi)	High-pressure switch	ON → OFF: 3,138 (455.2), OFF → ON: 2,550 (369.9)
	Low-pressure switch	ON → OFF: 196 (28.4), OFF → ON: 221 (32.1)
Refrigerant and quantity g (oz.)		R-134a (HFC-134a), Approx. 555 - 595 (19.6 - 21.0)

SAFETY PRECAUTIONS

Because R-134a refrigerant is a hydrofluorocarbon (HFC) which contains hydrogen atoms in place of chlorine atoms, it will not cause damage to the ozone layer.
Refrigerant R-134a is transparent and colorless in both the liquid and vapor state. Since it has a boiling point of -29.8°C (-21.6°F) at atmospheric pressure, it will be a vapor at all normal temperatures and pressures. The vapor is heavier than air, non-flammable, and nonexplosive. The following precautions must be observed when handling R-134a.

Caution
Wear safety goggles when servicing the refrigeration system.

R-134a evaporates so rapidly at normal atmospheric pressures and temperatures that it tends to freeze anything it contacts. For this reason, extreme care must be taken to prevent any liquid refrigerant from contacting the skin and especially the eyes. Always wear safety goggles when servicing the refrigeration part of the A/C system. Keep a bottle of sterile mineral oil handy when working on the refrigeration system.

1. Should any liquid refrigerant get into the eyes, use a few drops of mineral oil to wash them out. R-134a is rapidly absorbed by the oil.
2. Next splash the eyes with plenty of cold water.
3. Call your doctor immediately even though irritation has ceased after treatment.

Caution
Do not heat R-134a above 40°C (104°F)

In most instances, moderate heat is required to bring the pressure of the refrigerant in its container above the pressure of the system when charging or adding refrigerant.
A bucket or large pan of hot water not over 40°C (104°F) is all the heat required for this purpose. Do not heat the refrigerant container with a blow torch or any other means that would raise temperature and pressure above this temperature. Do not weld or steam clean on or near the system components or refrigerant lines.

Caution
Keep R-134a containers upright when charging the system.

When metering R-134a into the refrigeration system keep the supply tank or cans in an upright position. If the refrigerant container is on its side or upside down, liquid refrigerant will enter the system and damage the compressor.

Caution
1. **The leak detector for R-134a should be used to check for refrigerant gas leaks.**
2. **Do not allow liquid refrigerant to touch bright metal.**

Refrigerant will tarnish bright metal and chrome surfaces, and in combination with moisture can severely corrode all metal surfaces.

OPERATION

Condenser fan and radiator fan control

- For the operation of each fan, refer to GROUP 14 - Troubleshooting.

Compressor control

When operating the air conditioning switch

- The air thermo sensor, which senses the temperature of the air flowing out of the evaporator, deactivates the compressor at -2°C (28°F) or below.
  Here, the engine coolant temperature sensor senses the temperature of engine coolant, and turnes off the compressor at 115°C (239°F) or higher temperatures.
- The dual pressure switch turns OFF when the refrigerant pressure becomes excessively high or low, thus protecting the compressor circuit. (See Table below.)
- When these two sensors are all activated, the dual pressure switch is ON, and the ignition switch, blower switch, and air conditioning switch are ON, the A/C compressor relay is energized.

When operating the air outlet changeover control knob

- When the air outlet changeover control knob is moved to DEF or DEF/FOOT position, the micro switch, which is connected in series to the air conditioning switch, is turned on. The other compressor control than the above is the same as that when operating the air conditioning switch.

A/C Compressor Relay ON Conditions

Ignition switch (IG2)		ON	Remarks (1)A/C compressor relay is de-energized when any one switch, sensor or control unit shown on the left turns OFF (HI). (2)The * marked device measures the temperature of the outlet air, and according to the control characteristics of the magnetic clutch for the compressor, the automatic compressor-ECU outputs the "HI" signal (12V). When air of -2°C (28°F) or less blows out of the evaporator, the compressor magnet clutch will be turned off.
Blower switch		ON	
Air conditioning switch or micro switch		ON	
Air thermo sensor		*	
Engine coolant temperature sensor		ON [108°C (226°F) or below]	
Dual pressure switch	Low-pressure side	ON [221 kPa (32.1 psi) or higher]	
	High-pressure side	ON [2,550 kPa (369.9 psi) or below]	
A/C compressor relay driving transistor (within automatic compressor-ECU and engine control module)		ON	

SERVICE SPECIFICATIONS

55200030134

Items	Standard value
Idle speed r/min	750±100
Idle up speed r/min	850±100
Resistor (for blower motor) Ω	LO: 2.21, ML: 0.97, MH: 0.35
Air gap (Magnetic clutch) mm (in.)	0.3 - 0.5 (.012 - .020)

LUBRICANTS

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Items	Specified lubricants	Quantity
Each connection of refrigerant line	SUN PAG 56	As required
Compressor refrigerant unit lubricant cm^3 (ft.oz.)	SUN PAG 56	120 (4.1)

SPECIAL TOOLS

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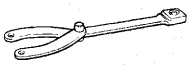
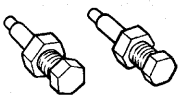
Tool	Tool number and name	Supersession	Application
	MB991367 Special spanner	MB991367-01	Armature mounting nut of compressor removal and installation
	MB991386 Pin	MIT217213	

TROUBLESHOOTING

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TROUBLESHOOTING PROCEDURES

Trouble symptom	Problem cause	Remedy	Reference page
When the ignition switch is "ON", the A/C does not operate.	A/C compressor relay is defective	Replace A/C compressor relay	55-15
	Magnetic clutch is defective	Replace the armature plate, rotor or clutch coil	55-7
	Refrigerant leak or overfilling of refrigerant	Replenish the refrigerant, repair the leak or take out some of the refrigerant	55-7
	Dual pressure switch is defective	Replace the dual pressure switch	55-8
	A/C switch is defective	Replace the A/C switch	55-18
	Blower switch is defective	Replace the blower switch	55-18
	Refrigerant temperature switch is defective	Replace the refrigerant temperature switch	55-27
	Automatic compressor-ECU is defective	Replace the automatic compressor-ECU	55-6
When the air outlet changeover control knob is moved to DEF or DEF/FOOT position, the air conditioning does not operate.	A/C compressor relay is defective.	Replace the A/C compressor relay.	55-6
	Magnetic clutch is defective	Replace the armature plate, rotor or clutch coil	55-6
	Refrigerant leak or overfilling of refrigerant	Refill the refrigerant, repair the leak or take out some of the refrigerant	55-6
	Dual pressure switch is defective	Replace the dual pressure switch	55-6
	Micro switch is defective	Replace the heater control panel illumination light and micro switch	55-6
	Blower switch is defective	Replace the blower switch	55-6
	Refrigerant temperature switch is defective	Replace the refrigerant temperature switch	55-27
	Automatic compressor-ECU is defective	Replace the automatic compressor-ECU	55-6

Trouble symptom	Problem cause	Remedy	Reference page
When the A/C is operating, temperature inside the passenger compartment doesn't decrease (cool air is not emitted).	Refrigerant leak	Replenish the refrigerant and repair the leak	55-7
	Dual pressure switch is defective	Replace the dual pressure switch	55-8
	Refrigerant temperature switch is defective	Replace the refrigerant temperature switch	55-27
	Automatic compressor-ECU is defective	Replace the automatic compressor-ECU	55-6
Blower fan and motor doesn't turn	Blower relay is defective	Replace the blower relay	55-15
	Blower fan and motor is defective	Replace the blower fan and motor	55-21
	Resistor (for blower motor) is defective	Replace the resistor	55-21
	Blower switch is defective	Replace the blower switch	55-18
Blower fan and motor doesn't stop turning.	Short circuit of the harness between the blower fan and motor and the blower switch	Repair the harness	-
	Blower switch is defective	Replace the blower switch	55-18
	Blower relay is defective	Replace the blower relay	55-15
When the A/C is operating condenser fan does not turn.	Condenser fan motor is defective	Replace the condenser fan motor	55-33
	Condenser fan relay is defective	Replace the condenser fan relay	55-15
	Dual pressure switch is defective	Replace the dual pressure switch	55-8

INSPECTION AT THE AUTOMATIC COMPRESSOR-ECU TERMINAL

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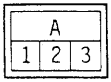

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TERMINAL NO.	CHECK ITEM	CHECKING REQUIREMENTS	NORMAL CONDITION
1	Output from ECU to A/C compressor relay	A/C compressor relay: OFF	Battery voltage
		A/C compressor relay: ON	0 V
2	Input from A/C switch to ECU	A/C switch: OFF	0 V
		A/C switch: ON	Battery voltage
3	Ground	Always	0V

TROUBLESHOOTING HINTS

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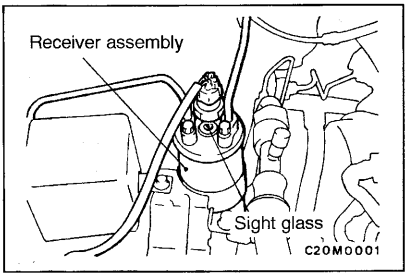
Condenser fan and radiator fan control

- Refer to GROUP 14 - Troubleshooting.

Compressor control

- Refer to P.55-5.



ON-VEHICLE SERVICE

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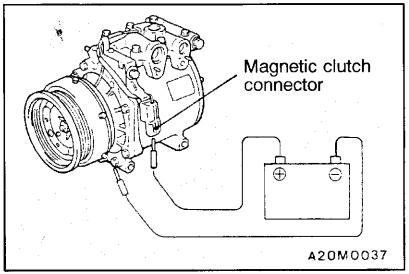
SIGHT GLASS REFRIGERANT LEVEL TEST

The sight glass is a refrigerant level indicator. To check the refrigerant level, clean the sight glass and start the vehicle engine. Push the A/C button to operate the compressor, place the blower switch to high and move the temperature control lever to max cool. After operating for a few minutes in this manner, check the sight glass.

1. If the sight glass is clear, the magnetic clutch is engaged, the compressor discharge line is warm and the compressor inlet line is cool; the system has a full charge.
2. If the sight glass is clear, the magnetic clutch is engaged and there is no significant temperature difference between compressor inlet and discharge lines; the system has lost some refrigerant.
3. If the sight glass shows foam or bubbles, the system could be low on charge. The system should be checked for leaks, evacuated and recharged with refrigerant.



MAGNETIC CLUTCH TEST

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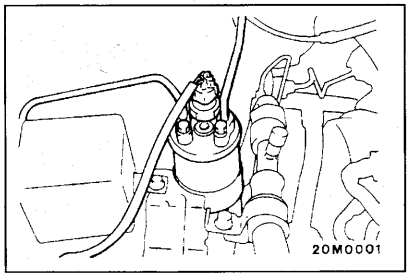
1. Disconnect the connector (1P) to the magnetic clutch.
2. Connect battery (+) voltage directly to the connector for the magnetic clutch.
3. If the magnetic clutch is normal, there will be "click". If the pulley and armature do not make contact ('click'), there is a malfunction.



RECEIVER DRIER TEST

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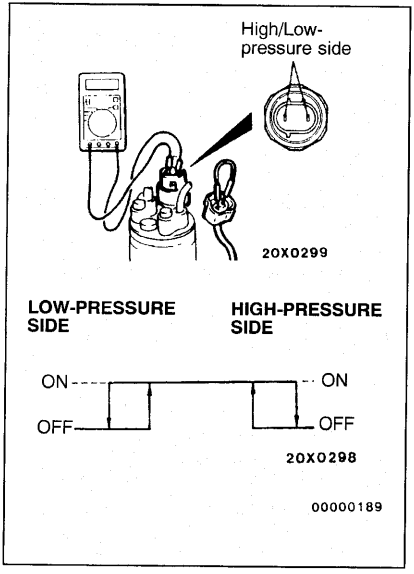
1. Operate the unit and check the piping temperature by touching the receiver assembly outlet and inlet.
   If there is a difference in the temperatures, the receiver assembly is restricted.
   Replace the receiver assembly.



DUAL PRESSURE SWITCH CHECK

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1. Remove the dual pressure switch connector and connect the high/low-pressure side terminals located on the harness side as shown in the illustration.
2. Install a gauge manifold to the high-pressure side service valve of the refrigerant line. (Refer to Performance Test.)
3. When the high/low-pressure sides of the dual pressure switch are at operation pressure (ON) and there is continuity between the respective terminals, then the condition is normal. If there is no continuity, replace the switch.

Unit: kPa (psi)

Items	Switch position	
	OFF → ON	ON → OFF
Low-pressure side	221 (32)	196 (28)
High-pressure side	2,550 (370)	3,138 (455)

COMPRESSOR DRIVE BELT ADJUSTMENT

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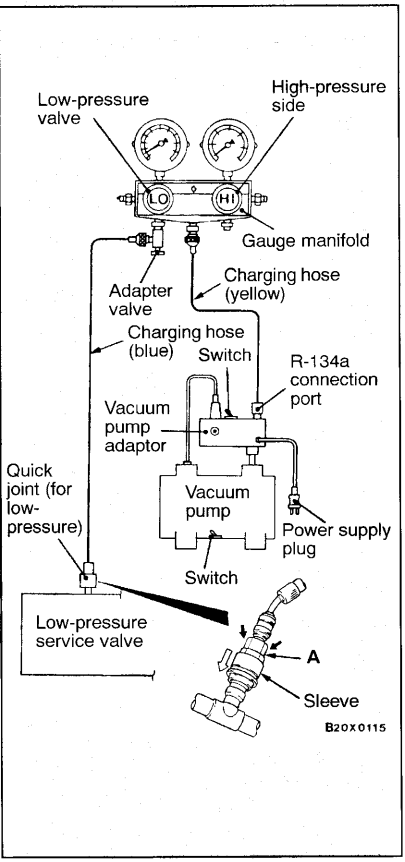
Refer to GROUP 11A - On-vehicle Service <Vehicles with power steering>, <Vehicles without power steering>, or GROUP 11C - On-vehicle Service.



CHARGING

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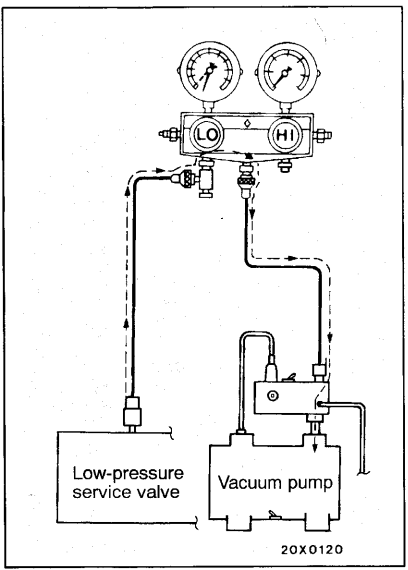
1. With the handles turned in all the way (valve closed), install the adaptor valve to the low-pressure side of the gauge manifold.
2. Connect the charging hose (blue) to the adaptor valve.
3. Connect the quick joint (for low-pressure) to the charging hose (blue).
4. Connect the quick joint (for low-pressure) to the low-pressure service valve.

   NOTE
   The low-pressure service valve should be connected to the suction hose.

   Caution
   1. Use tools that are suited to R-134a.
   2. To install the quick joint, press section "A" firmly against the service valve until a click is heard. When connecting, run your hand along the hose while pressing to ensure that there are no bends in the hose.
5. Close the high and low-pressure valves of the gauge manifold.
6. Install the vacuum pump adaptor to the vacuum pump.
7. Connect the vacuum pump plug to the vacuum pump adaptor.
8. Connect the charging hose (yellow) to the R-134a connection port of the vacuum pump adaptor.
9. Tighten the adaptor valve handle (valve open).
10. Open the low-pressure valve of the gauge manifold.
11. Turn the power switch of the vacuum pump to the ON position.

    NOTE
    Even if the vacuum pump power switch is turned ON, the vacuum pump will not operate because of the power supply connection in step (7).

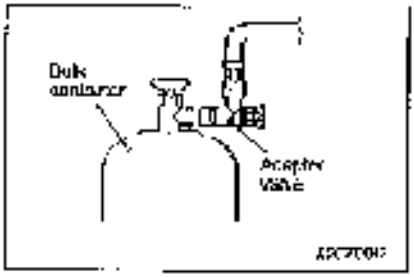


12. Turn the vacuum pump adaptor switch to the R-134a side to start the vacuum pump.

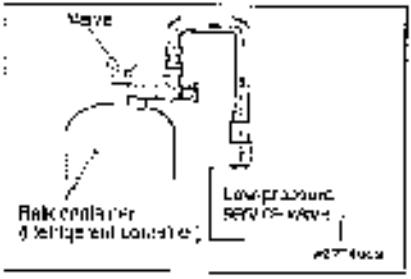
    Caution
    Do not operate the compressor for evacuation.
13. Evacuate to a vacuum reading of 100 kPa (29.5 in.Hg) or higher (takes approx. 10 minutes).
14. Turn the vacuum pump adaptor switch OFF and allow to stand it for 5 minutes.

    Caution
    Do not operate the compressor in the vacuum condition; damage may occur.
15. Carry out a leak test. (Good if the negative pressure does not drop.)

    Caution
    If the negative pressure drops, increase the tightness of the connections, and then repeat the evacuation procedure from step (12).



16. Turn the handle of the adaptor valve back all the way (valve closed), remove it from the gauge manifold and install the bulk container.



17. Open the valve of the bulk container.
18. Tighten the handle of the adaptor valve (valve open) to charge the system with refrigerant.

    Caution
    If the bulk container is inverted, liquid refrigerant may be drawn into the compressor damaging it by hydraulic lock. Keep the bulk container upright to ensure that refrigerant is charged in gas state.

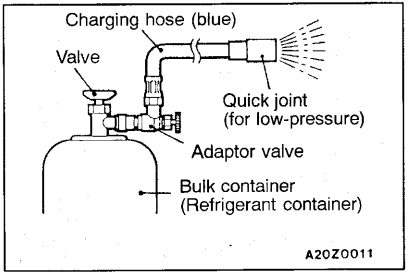
19. If the refrigerant is not drawn in, turn the handle of the adaptor valve back all the way (valve closed).
20. Check for gas leaks using a leak detector.
    If a gas leak is detected, re-tighten the connections, and then repeat the charging procedure from evacuation in step (12).

    Caution
    The leak detector for R-134a should be used.

21. Start the engine.
22. Operate the A/C and set to the lowest temperature (MAX. COOL).
23. Fix the engine speed at 1,500 rpm.
24. Tighten the handle of the adaptor valve (valve open) to charge the required volume of refrigerant.

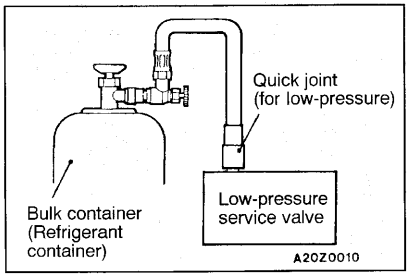
    Caution
    If the bulk container can is inverted, liquid refrigerant may be drawn into the compressor damaging it by hydraulic lock. Keep the bulk container upright to ensure that refrigerant is charged in gas state.

25. After charging with refrigerant, turn the handle of the adaptor valve back all the way (valve closed).
26. Tighten the charging valve handle (valve close).
    Remove the quick joint (for low-pressure) from the low-pressure service valve.



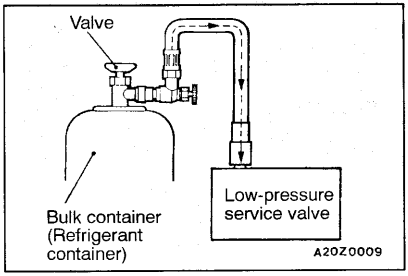
CORRECTING LOW REFRIGERANT LEVEL IN CASE THE BULK CONTAINER IS USED.

1. Install the adaptor valve with the handle turned all the way in (valve close) to the bulk container.
2. Connect the charging hose (blue) to the adaptor valve.
3. Connect the charging hose (blue) to the quick joint (for low-pressure).
4. Open the valve of the bulk container.
5. Turn the handle of the adaptor valve to bleed the air.



6. Install the quick joint (for low-pressure) to the low-pressure service valve.

   NOTE
   The low-pressure service valve should be connected to the suction hose.



7. Start the engine.
8. Operate the air conditioner and set at the lowest temperature (MAX. COOL).
9. Fix the engine speed at 1,500 r/min.
10. Tighten the handle of the adaptor valve (valve open), and replenish refrigerant while checking the quantity through the sight glass.

    Caution
    If the bulk container is inverted, liquid refrigerant may be draw into the compressor damaging it by hydraulic lock. Keep the bulk container upright to ensure that refrigerant is changed in gas state.

11. After replenishing is completed, turn the handle of the adaptor valve all the way in (valve close), and remove the quick joint.

METHOD BY USING REFRIGERANT RECOVERY AND RECYCLING UNIT

Using the refrigerant recovery and recycling unit, refill the refrigerant.

NOTE
Refer to that Refrigerant Recovery and Recycling Unit Instruction Manual for operation of the unit.

DISCHARGING SYSTEM

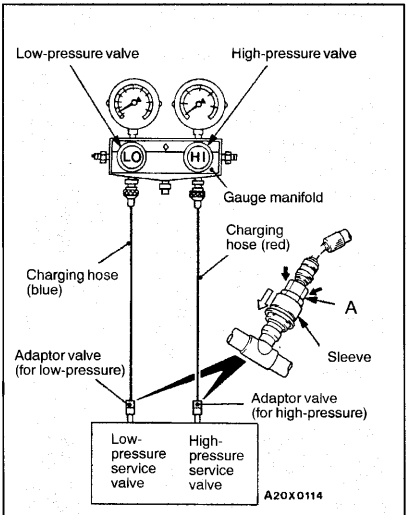
Use the refrigerant recovery unit to discharge refrigerant gas from the system.

NOTE
Refer to that Refrigerant Recovery and Recycling Unit Instruction Manual for operation of the unit.

REFILLING OF OIL IN THE A/C SYSTEM

Too little oil will provide inadequate compressor lubrication and cause a compressor failure. Too much oil will increase discharge air temperature.
When a compressor is installed at the factory, it contains 150 cm^3 (5.1 fl.oz.) of refrigerant oil. While the A/C system is in operation, the oil is carried through the entire system by the refrigerant. Some of this oil will be trapped and retained in various parts of the system.
When the following system components are changed, it is necessary to add oil to the system to replace the oil being removed with the component.

Compressor oil: SUN PAG 56
Quantity:
Evaporator: 60 cm^3 (2.0 fl.oz.)
Condenser: 15 cm^3 (.5 fl.oz.)
Suction hose: 10 cm^3 (.3 fl.oz.)
Receiver: 10 cm^3 (.3 fl.oz.)



PERFORMANCE TEST

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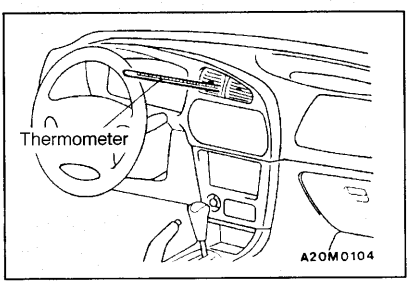
1. The vehicles to be tested should be in a place that is not in direct sunlight.
2. Close the high and low-pressure valve of the gauge manifold.
3. Connect the charging hose (blue) to the low-pressure valve and connect the charging hose (red) to the high-pressure valve of the gauge manifold.
4. Install the quick joint (for low-pressure) to the charging hose (blue), and connect the quick joint (for high-pressure) to the charging hose (red).
5. Connect the quick joint (for low-pressure) to the low-pressure service valve and connect the quick joint (for high-pressure) to the high-pressure service valve.

   NOTE
   The high-pressure service valve is on discharge pipe B, and the low-pressure service valve is on the suction hose.

Caution
To connect the quick joint, press section A firmly against the service valve until a click is heard. When connecting, run your hand along the hose while pressing to ensure that there are no bends in the hose.

6. Start the engine.
7. Set the A/C controls as follows:
   A/C switch: A/C - ON position
   Mode selection: Face position
   Temperature control: Max. cooling position
   Air selection: Recirculation position
   Blower switch: HI (Fast) position
8. Adjust engine speed to 1,000 r/min with A/C clutch engaged.
9. Engine should be warmed up with doors and windows closed.



10. Insert a thermometer in the center air outlet and operate the engine for 20 minutes.
11. Note the discharge air temperature.

NOTE
If the clutch cycles, take the reading before the clutch disengages.

Performance Temperature Chart

Garage ambient temperature °C (°F)	20 (68)	25 (77)	35 (95)	40 (104)
Discharge air temperature °C (°F)	2.5-4.5 (37-40)	2.5-4.5 (33-40)	4.0-6.5 (39-44)	6.5-9.0 (44-48)
Compressor high pressure kPa (psi)	765-960 (111.0-139.3)	765-960 (111.0-139.3)	1,325-1,420 (192.2-206.0)	1,570-1,765 (227.8-256.1)
Compressor low pressure kPa (psi)	40-135 (5.8-19.6)	40-135 (5.8-19.6)	80-175 (11.6-25.4)	155-255 (22.5-37.0)

REFRIGERANT LEAK REPAIR 55200150021

LOST CHARGE

If the system has lost all charge due to a leak:

1. Evacuate the system. (See procedure.)
2. Charge the system with approximately one pound of refrigerant.
3. Check for leaks.
4. Discharge the system.
5. Repair leaks.
6. Replace receiver drier.

Caution
Replacement filter-drier units must be sealed while in storage. The drier used in these units will absorb water/water vapor quickly upon exposure to the atmosphere. When installing a drier, have all tools and supplies ready for quick reassembly to avoid keeping the system open any longer than necessary.

7. Evacuate and charge system.

LOW CHARGE

If the system has not lost all of its refrigerant charge; locate and repair all leaks. If it is necessary to increase the system pressure to find the leak (because of an especially low charge) add refrigerant. If it is possible to repair the leak without discharging the refrigerant system, use the procedure for correcting low refrigerant level.

COMPRESSOR NOISE CHECK 55200870088

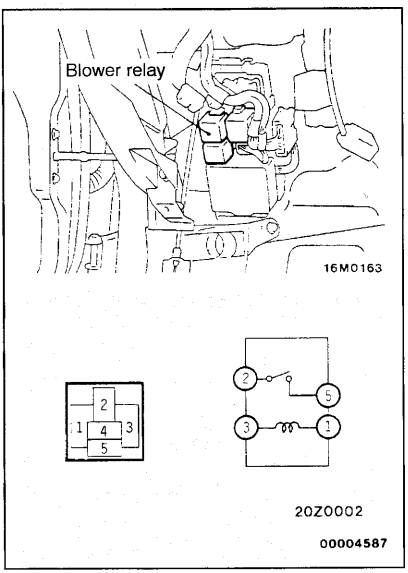
You must first know the conditions when the noise occurs. These conditions are: weather, vehicle speed, in gear or neutral, engine temperature or any other special conditions.
Noises that develop during A/C operation can often be misleading. For example: what sounds like a failed front bearing or connecting rod, may be caused by loose bolts, nuts, mounting brackets, or a loose clutch assembly. Verify accessory drive belt tension (power steering or alternator).
Improper accessory drive belt tension can cause a misleading noise when the compressor is engaged and little or no noise when the compressor is disengaged.
Drive belts are speed-sensitive. That is, at different engine speeds, and depending upon belt tension, belts can develop unusual noises that are often mistaken for mechanical problems within the compressor.

HANDLING TUBING AND FITTINGS

Kinks in the refrigerant tubing or sharp bends in the refrigerant hose lines will greatly reduce the capacity of the entire system. High pressures are produced in the system when it is operating. Extreme care must be exercised to make sure that all connections are pressure tight. Dirt and moisture can enter the system when it is opened for repair or replacement of lines or components. The following precautions must be observed. The system must be completely discharged before opening any fitting or connection in the refrigeration system. Open fittings with caution even after the system has been discharged. If any pressure is noticed as a fitting is loosened, allow trapped pressure to bleed off very slowly.
Never attempt to rebend formed lines to fit. Use the correct line for the installation you are servicing. A good rule for the flexible hose lines is keep the radius of all bends at least 10 times the diameter of the hose.
Sharper bends will reduce the flow of refrigerant. The flexible hose lines should be routed so that they are at least 80 mm (3 in.) from the exhaust manifold. It is good practice to inspect all flexible hose lines at least once a year to make sure they are in good condition and properly routed.
O-rings used on connections are not reusable.

ADJUSTMENT

1. Select a quiet area for testing. Duplicate conditions as much as possible. Switch compressor on and off several times to clearly identify compressor noise. To duplicate high ambient conditions (high head pressure), restrict air flow through condenser. Install manifold gauge set to make sure discharge pressure doesn't exceed 2,070 kPa (300 psi).
2. Tighten all compressor mounting bolts, clutch mounting bolt, and compressor drive belt. Check to assure clutch coil is tight (no rotation or wobble).
3. Check refrigerant hoses for rubbing or interference that can cause unusual noises.
4. Check refrigerant charge. (Refer to P.5-7.)
5. Recheck compressor noise as in Step 1.
6. If noise still exists, loosen compressor mounting bolts and retorque. Repeat Step 1.
7. If noise continues, replace compressor and repeat Step 1.

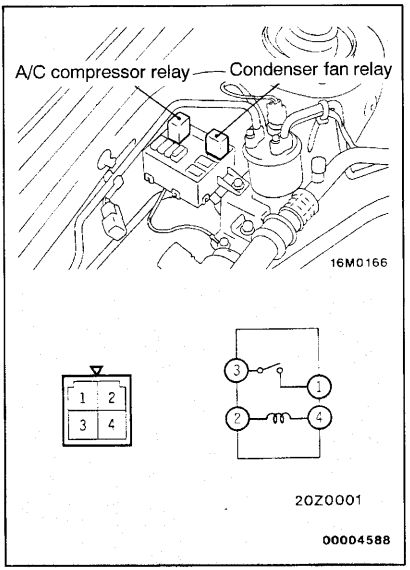


POWER RELAY CHECK

55200880135

BLOWER RELAY

Battery voltage	Terminal No.			
	1	3	2	5
Power is not supplied	○	○		
Power is supplied	⊕	⊖	○	○



A/C COMPRESSOR RELAY, CONDENSER FAN RELAY

Battery voltage	Terminal No.			
	2	4	1	3
Power is not supplied	○	○		
Power is supplied	⊕	⊖	○	○

IDLE-UP OPERATION CHECK

55200160130

1. Before inspection and adjustment, set vehicle in the following condition:
   - Engine coolant temperature: 80-90°C (176-194°F)
   - Lights, electric cooling fan and accessories: Set to OFF
   - Transmission: Neutral (N or P for vehicles with A/T)
   - Steering wheel: Straightforward

2. Check whether or not the idling speed is the standard value.

   Standard value: 750 ± 50 r/min

3. When the A/C is running after turning the A/C switch to ON, and the blower switch to the MH or HI position, check to be sure that the idle speed is at the standard value.

   Standard value: 850 ± 50 r/min

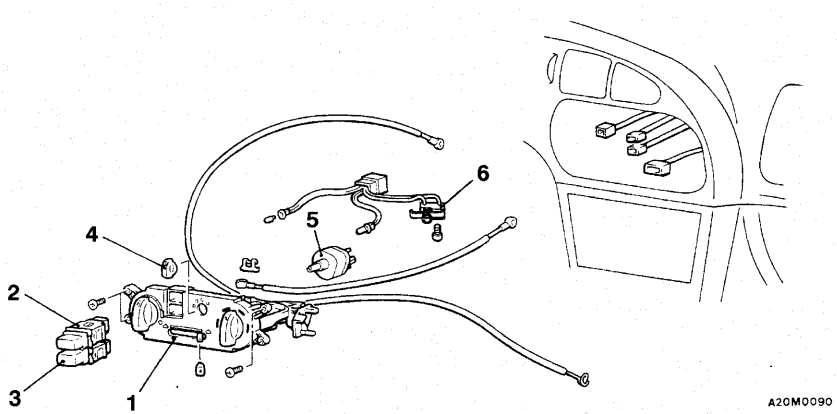
   NOTE
   Idle speed is controlled by the IAC system and is not adjustable. If, idle speed is not within specifications, check the IAC system. (Refer to GROUP 13A - On-vehicle Service.)

HEATER CONTROL ASSEMBLY AND A/C SWITCH

55200240100

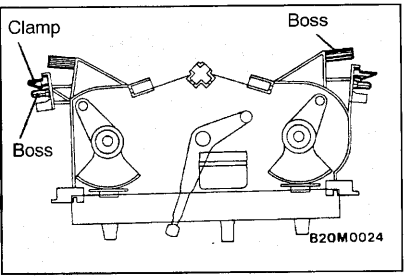
REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
- Driver's side Lower Cover and Heater Control Panel Removal and Installation
- Floor Console Assembly Removal and Installation (Refer to GROUP 52A.)
- Foot Distribution Duct Removal and Installation (Refer to P.55-33.)



Removal steps

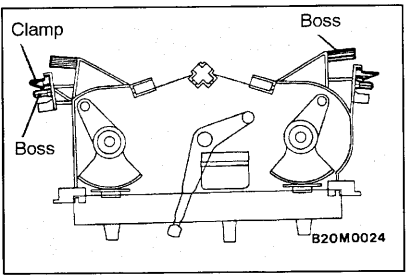
◀A▶ ▶A◀ 1. Heater control assembly
2. Rear window defogger switch
3. A/C switch
4. Knob
5. Blower switch
6. Heater control panel illumination light and micro switch



REMOVAL SERVICE POINT

◀A▶ HEATER CONTROL ASSEMBLY REMOVAL

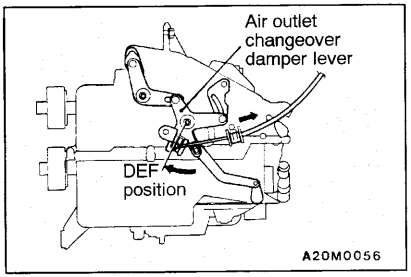
1. Remove the heater control assembly mounting screws.
2. Bend the two clamps and the four bosses, which are inserted into the center reinforcement.
3. Remove the heater control assembly.



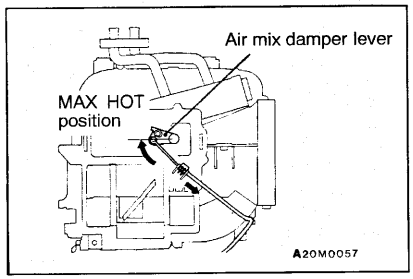
INSTALLATION SERVICE POINT

▶A◀ HEATER CONTROL ASSEMBLY INSTALLATION

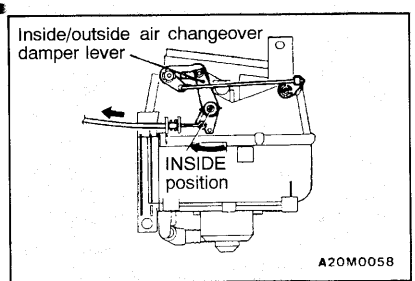
1. Cut off the bosses and clips shown before installing a new heater control assembly.
2. Install the heater control assembly mounting screws.



3. Follow the steps below to install the air outlet changeover damper lever cable.
   (1) Set the air outlet changeover control knob on the heater control assembly to the DEF position.
   (2) Set the air outlet changeover damper lever of the heater unit to the DEF position as shown in the illustration, and then connect the cable to the lever pin.
   (3) Push the outer cable in the direction of the arrow so that there is no looseness, and then secure it with clip.

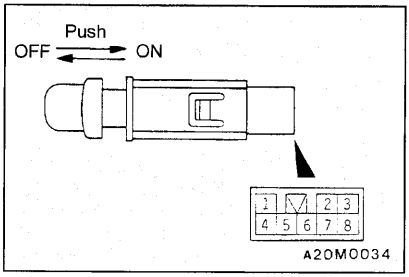


4. Follow the steps below to install the air mix damper lever cable.
   (1) Set the temperature control knob on the heater control assembly to the MAX HOT position.
   (2) Set the air mix damper lever of the heater unit to the MAX HOT position as shown in the illustration, and then connect the cable to the lever pin.
   (3) Push the outer cable in the direction of the arrow so that there is no looseness, and then secure it with clip.



5. Follow the steps below to install the inside/outside air changeover damper lever cable.
   (1) Set the inside/outside air changeover control knob on the heater control assembly to the INSIDE position.
   (2) Set the inside/outside air changeover damper lever of the heater unit to the INSIDE position as shown in the illustration, and then connect the cable to the lever pin.
   (3) Push the outer cable in the direction of the arrow so that there is no looseness, and then secure it with clip.

6. After installation, ensure that each damper operates smoothly by operating the heater control assembly knob.

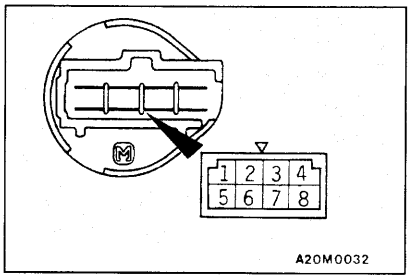


INSPECTION

55200250035

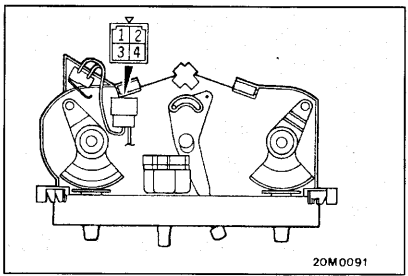
A/C SWITCH CONTINUITY CHECK

Switch position	Terminal No.						
	1	ILL	2	IND	4	5	7
OFF	○	⊖			○		
ON	○	⊖			○		
			○	⊖		○	○



BLOWER SWITCH CONTINUITY CHECK

Switch position	Terminal No.						
	1	2	3	5	6	7	8
OFF							
• (LO)	○		○	○			○
• (ML)	○			○	○		○
• (MH)	○	○		○			○
• (HI)	○			○		○	○



MICRO SWITCH CONTINUITY CHECK

Air outlet changeover control knob position	Terminal No.	
	1	3
DEF, DEF/FOOT	○	○
Other positions		

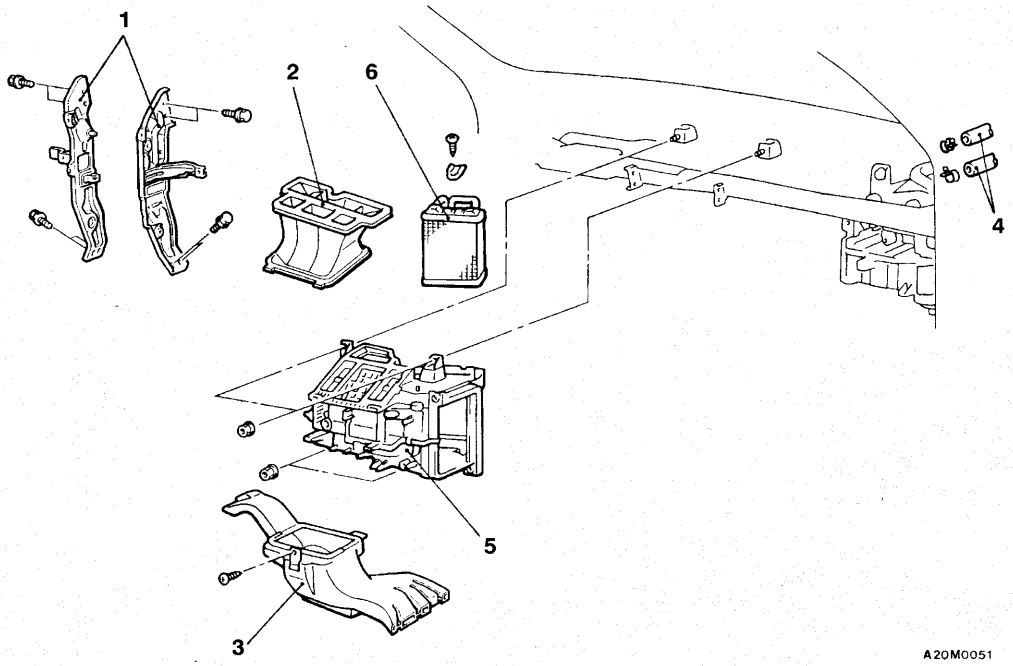
HEATER UNIT AND HEATER CORE

55100190242

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
- Draining and Refilling Engine Coolant (Refer to GROUP 00 - Maintenance Service.)
- Air Cleaner Cover and Air Intake Hose Removal and Installation
- Instrument Panel Removal and Installation (Refer to GROUP 52A.)
- Joint Duct Removal and Installation <Vehicles without A/C> (Refer to P.55-20.)
- Evaporator Removal and Installation <Vehicles with A/C> (Refer to P.55-22.)

Caution: SRS
When removing and installing the floor console assembly from vehicles equipped with SRS, do not let it bump against the SRS-ECU or the components.



A20M0051

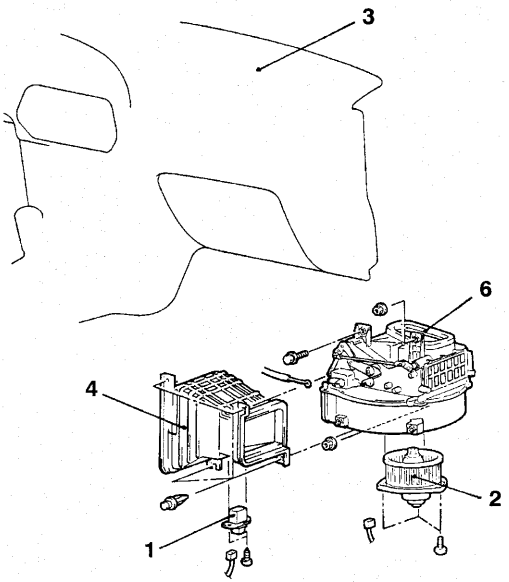
Removal steps
1. Center reinforcement
2. Center ventilation duct
3. Foot distribution duct
4. Heater hose connection
5. Heater unit
6. Heater core

BLOWER ASSEMBLY AND RESISTOR

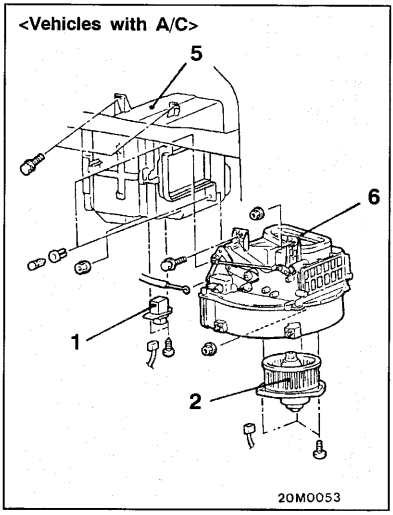
55100280246

REMOVAL AND INSTALLATION

Caution: SRS
When removing and installing the floor console assembly from vehicles equipped with SRS, do not let it bump against the SRS-ECU or the components.



20M0078

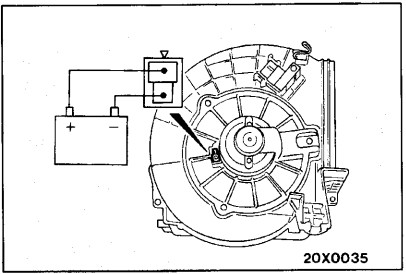


00004806

1. Resistor
2. Blower fan and motor

Blower unit removal steps

3. Instrument panel (Refer to GROUP 52A.)
4. Joint duct <Vehicles without A/C>
5. Evaporator <Vehicles with A/C> (Refer to P.55-22.)
6. Blower unit assembly

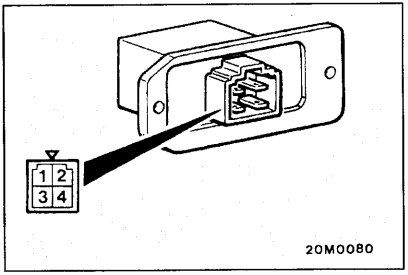


INSPECTION

55200560015

BLOWER FAN AND MOTOR CHECK

When battery voltage is applied between the terminals, check that the motor operates. Also, check that that there is no abnormal noise.



RESISTOR CHECK

Use a circuit tester to measure the resistance between the terminals as indicated below. Check that the measured value is at the standard value.

Standard value:

Measurement terminal	Standard value Ω
Between terminals 3 and 2 (LO)	2.21
Between terminals 3 and 4 (ML)	0.97
Between terminals 3 and 1 (MH)	0.35

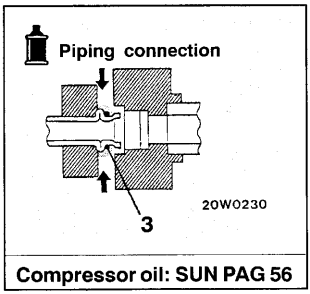
EVAPORATOR <VEHICLES WITH A/C>

55200360103

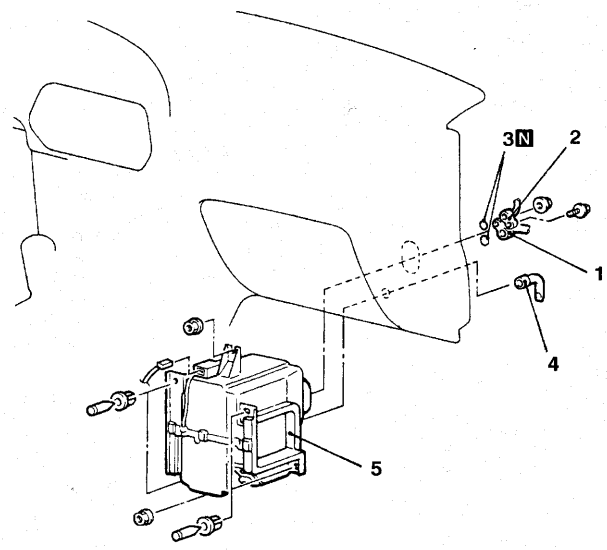
REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
- Discharging and Charging of Refrigerant (Refer to P.55-9.)
- Glove Box and Glove Box Frame Removal and Installation (Refer to GROUP 52A - Instrument Panel.)

Caution: SRS
When removing and installing the floor console assembly from vehicles equipped with SRS, do not let it bump against the SRS-ECU or the components.



Compressor oil: SUN PAG 56



20M0054

00004589

Removal steps

◀A▶ 1. Suction hose connection
◀A▶ 2. Discharge pipe connection
3. O-ring
4. Drain hose
▶A◀ 5. Evaporator

REMOVAL SERVICE POINT

◀A▶ SUCTION HOSE, DISCHARGE PIPE DISCONNECTION

Plug the disconnected hose and the evaporator nipple not to let foreign matter get into them.

Caution
Seal the hoses completely, otherwise the compressor oil and receiver will absorb water vapor easily.

INSTALLATION SERVICE POINT

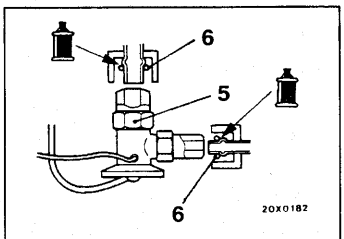
▶A◀ EVAPORATOR INSTALLATION

When replacing the evaporator, refill it with a specified amount of compressor oil and install it (to the vehicle).

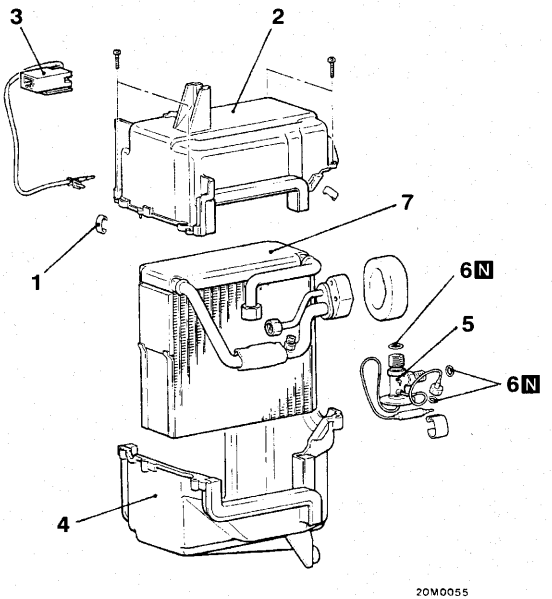
Compressor oil: SUN PAG 56
Quantity: 60 cm^3 (2.0 fl.oz.)

DISASSEMBLY AND REASSEMBLY

55200380093



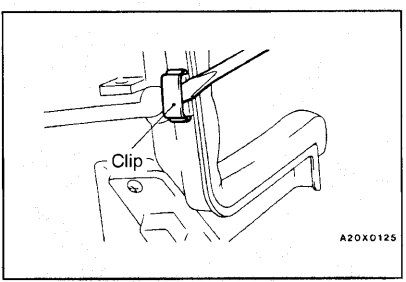
Compressor oil: SUN PAG 56



00004590

Disassembly steps

◀A▶ 1. Clip
2. Evaporator cover (upper)
3. Thermostat (Automatic compressor-ECU)
4. Evaporator cover (lower)
5. Expansion valve
6. O-ring
7. Evaporator



DISASSEMBLY SERVICE POINT

◀A▶ CLIP REMOVAL

Remove the clips with a flat-tipped screwdriver covered with a shop towel to prevent damage to case surfaces.

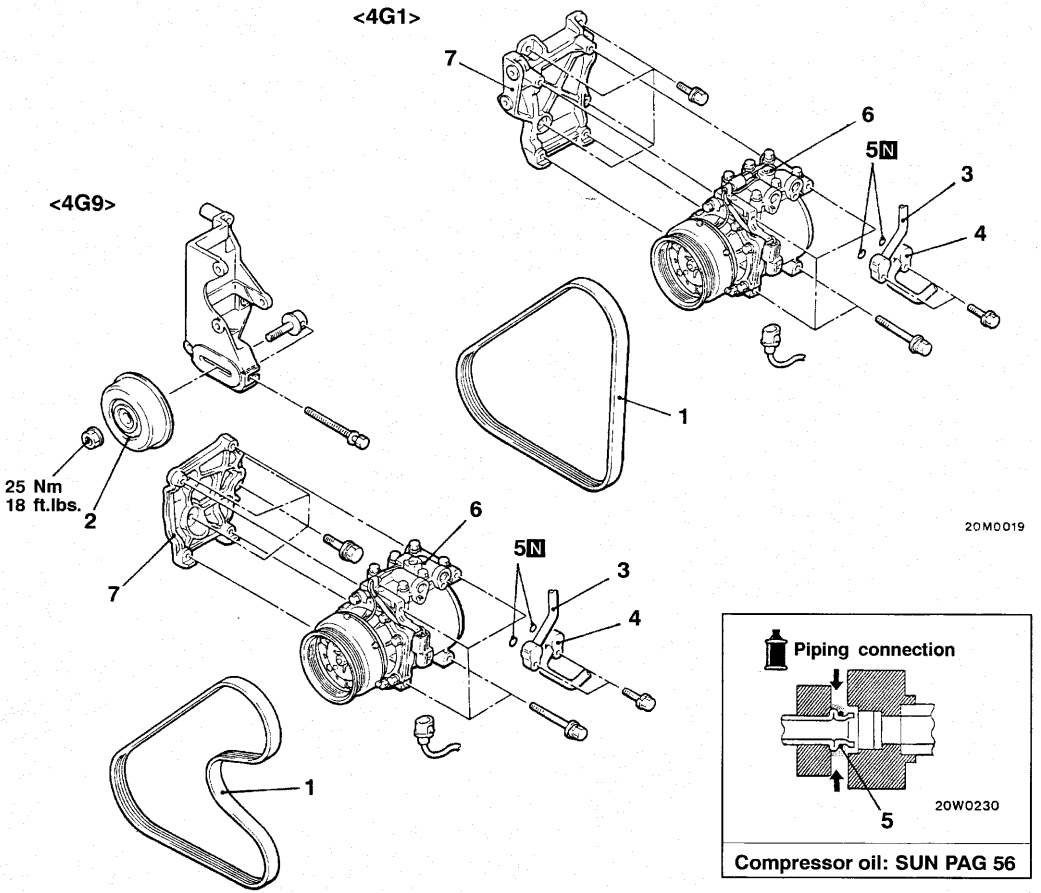
COMPRESSOR AND TENSION PULLEY

55200410327

REMOVAL AND INSTALLATION

Pre-removal Operation
- Discharging of Refrigerant (Refer to P.55-9.)

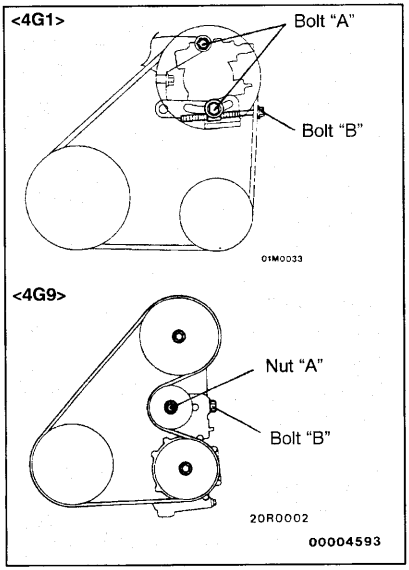
Post-installation Operation
- Drive Belt Tension Adjustment (Refer to GROUP 00 - Maintenance Service.)
- Charging of Refrigerant (Refer to P.55-9.)



00004592

Removal steps

◀A▶ 1. Drive belt
2. Tension pulley <4G9>
◀B▶ 3. Suction hose connection
◀B▶ 4. Discharge hose connection
5. O-ring
◀C▶ ▶A◀ 6. Compressor
7. Compressor bracket



REMOVAL SERVICE POINTS

◀A▶ DRIVE BELT REMOVAL

1. Loosen the bolts "A" <4G1> or nut "A" <4G9> for holding.
2. Loosen the bolt "B" for adjustment.
3. Remove the drive belt.

◀B▶ SUCTION HOSE, DISCHARGE HOSE DISCONNECTION

Plug the disconnected hose and the compressor nipple not to let foreign matter get into them.

Caution
Seal the hoses completely, otherwise the compressor oil and receiver will absorb water vapour easily.

◀C▶ COMPRESSOR REMOVAL

When doing this work, be careful not to spill the compressor oil.

INSTALLATION SERVICE POINT

▶A◀ COMPRESSOR INSTALLATION

If a new compressor is installed, first adjust the amount of oil according to the procedures described below, and then install the compressor.

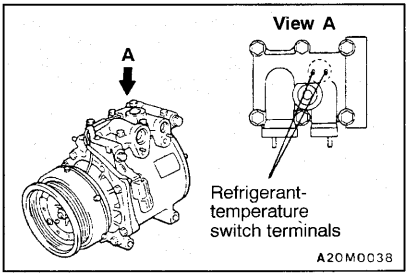
(1) Measure the amount {X cm^3 (X fl.oz.)} of oil within the removed compressor.

(2) Drain (from the new compressor) the amount of oil calculated according to the following formula, and then install the new compressor.
New compressor oil amount

120 cm^3 - X cm^3 = Y cm^3
(4.1 fl.oz. - X fl.oz. = Y fl.oz.)

NOTE
(1) Y cm^3 (Y fl.oz.) indicates the amount of oil in the refrigerant line, the condenser, the evaporator etc.
(2) When replacing the following parts at the same times as the compressor, subtract the rated oil amount of the each part from Y cm^3 (Y fl.oz.) and discharge from the new compressor.

Quantity
Evaporator: 60 cm^3 (2.0 fl.oz.)
Condenser: 15 cm^3 (.5 fl.oz.)
Suction hose: 10 cm^3 (.3 fl.oz.)
Receiver: 10 cm^3 (.3 fl.oz.)

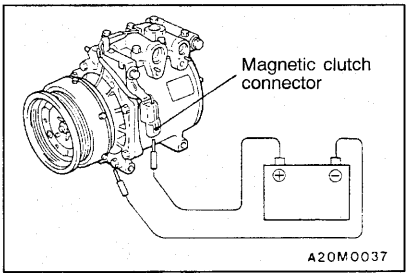


INSPECTION

55200930052

REFRIGERANT-TEMPERATURE SWITCH SIMPLE CHECK

When the A/C is off, check that there is continuity between the refrigerant-temperature switch terminals. If no, replace the compressor assembly.



COMPRESSOR MAGNETIC CLUTCH OPERATION INSPECTION

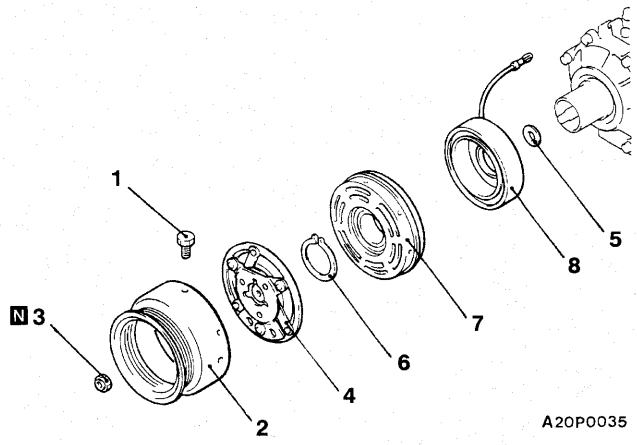
55200850075

Connect the battery (+) terminal to the compressor side terminal, and ground the battery (-) terminal to the body of the compressor. The condition is normal if the sound of the magnetic clutch (click) can be heard.

MAGNETIC CLUTCH

55200460124

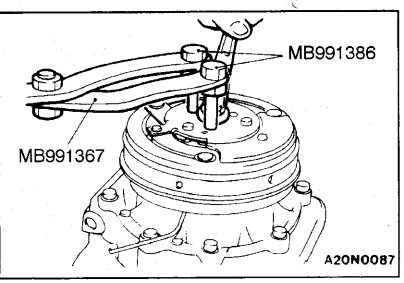
DISASSEMBLY AND REASSEMBLY



Disassembly steps

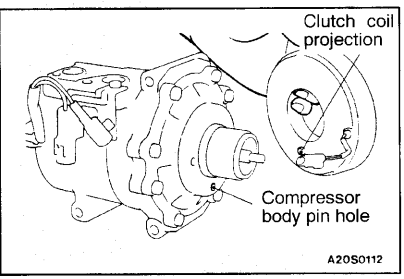
1. Bolt
2. Pulley
- Air gap adjustment

◀A▶ ▶E◀ ▶D◀ ▶C◀ 3. Nut
4. Armature plate
5. Shims
▶B◀ 6. Snap ring
7. Rotor
▶A◀ 8. Clutch coil



DISASSEMBLY SERVICE POINT

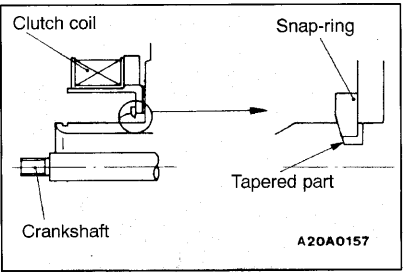
◀A▶ NUT REMOVAL



REASSEMBLY SERVICE POINTS

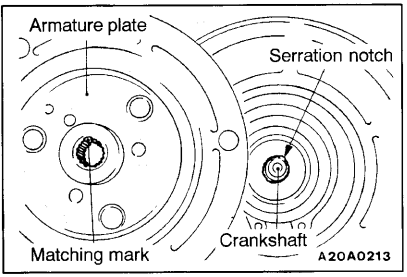
▶A◀ CLUTCH COIL INSTALLATION

When installing the clutch coil to the A/C compressor body, install so that the pin hole of the A/C compressor body and the clutch coil projection are aligned.



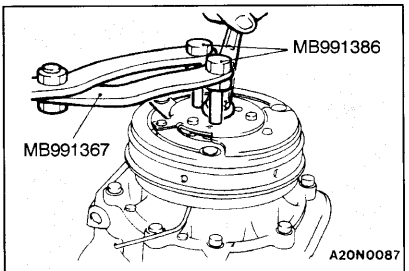
▶B◀ SNAP RING INSTALLATION

Install the snap ring so that the tapered surface is to the outside.



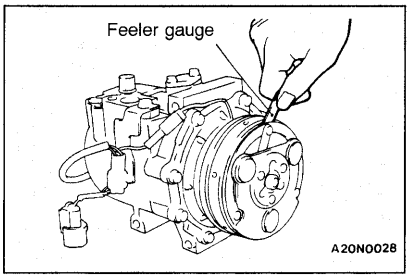
▶C◀ ARMATURE PLATE INSTALLATION

Align the mating mark of the crankshaft spline and the mating mark of the armature plate, and then fit them together.



▶D◀ NUT INSTALLATION

Use the special tool to hold the magnet clutch, and tighten the nut in the same manner as removal.



▶E◀ AIR GAP ADJUSTMENT

Check whether or not the air gap of the clutch is within the standard value.

Standard value: 0.3 - 0.5 mm (.012 - .020 in.)

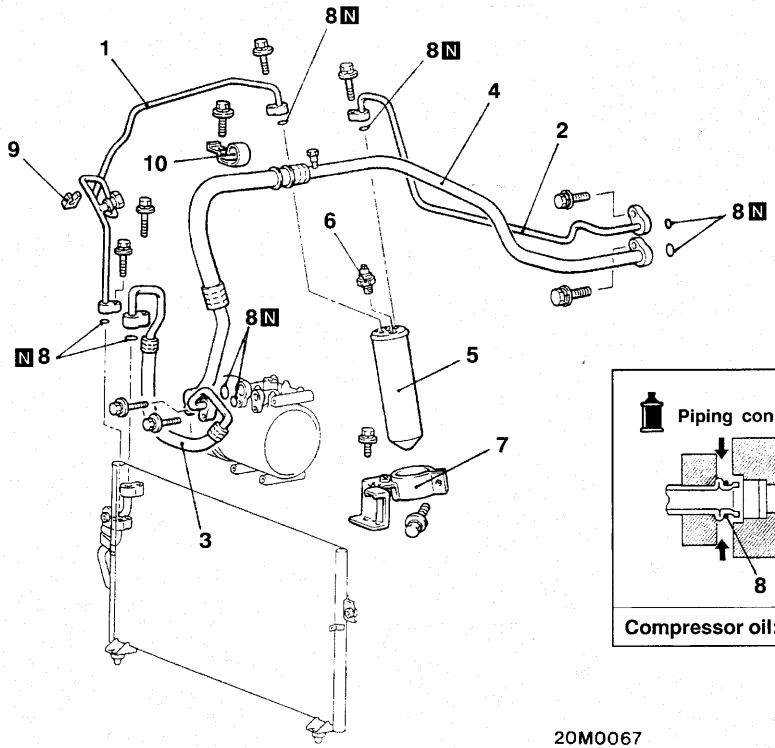
NOTE
If there is a deviation of the air gap from the standard value, make the necessary adjustment by adjusting the number of shims.

REFRIGERANT LINE

55200640139

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
- Discharging and Charging of Refrigerant (Refer to P.55-9.)



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◀A▶ 1. Discharge pipe A
◀A▶ 2. Discharge pipe B
◀A▶ 3. Discharge hose
◀A▶ 4. Suction hose
◀A▶ ▶A◀ 5. Receiver assembly
6. Dual pressure switch
7. Receiver bracket
8. O-ring
9. Clip
10. Clamp

REMOVAL SERVICE POINT

◀A▶ HOSE/PIPE/RECEIVER ASSEMBLY DISCONNECTION

Plug the disconnected hose, the receiver, the evaporator and the compressor nipple not to let foreign matter get into them.

Caution
Seal the hoses completely, otherwise the compressor oil and receiver will absorb water vapor easily.

INSTALLATION SERVICE POINT

▶A◀ SUCTION HOSE/RECEIVER ASSEMBLY INSTALLATION

When replacing the suction hose or receiver assembly, refill them with a specified amount of compressor oil, and then install them.

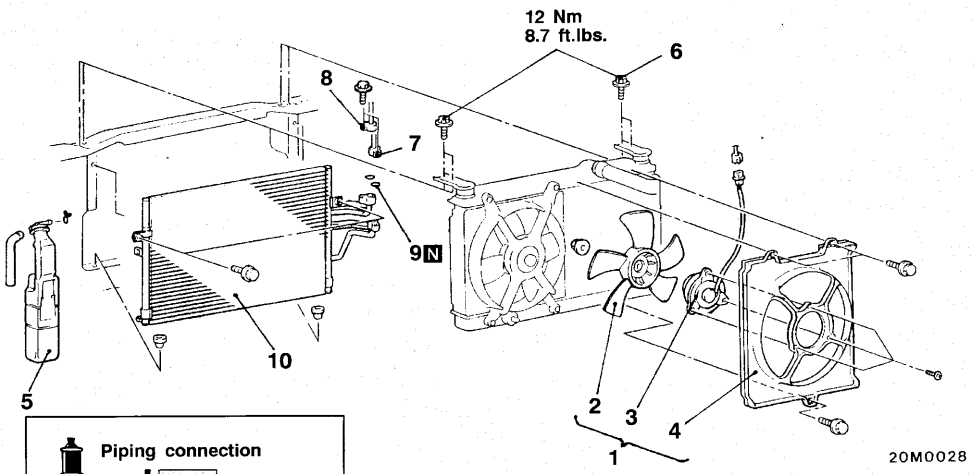
Compressor oil: SUN PAG 46

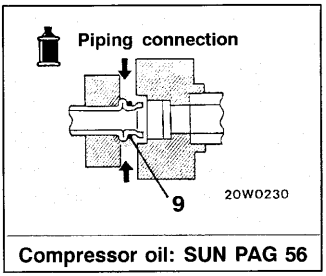
Quantity:
Suction hose: 10 cm³ (.3 fl.oz.)
Receiver assembly: 10 cm³ (.3 fl.oz.)

CONDENSER AND CONDENSER FAN MOTOR

55200670121

REMOVAL AND INSTALLATION





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Condenser fan motor removal steps

1. Condenser fan motor and shroud assembly
2. Condenser fan
3. Condenser fan motor
4. Shroud

Condenser removal steps

- Discharging and charging of refrigerant (Refer to P.55-9.)

5. Reserve tank
6. Upper insulator installation bolt
7. ◀A▶ Discharge pipe A connection
8. ◀A▶ Discharge hose connection
9. O-ring
10. ◀B▶ ▶A◀ Condenser

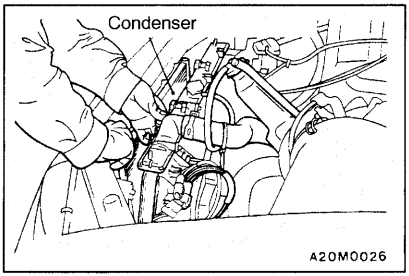
REMOVAL SERVICE POINTS

◀A▶ DISCHARGE PIPE "A" /DISCHARGE HOSE DISCONNECTION

Plug the disconnected pipe, hose and the condenser nipple not to let foreign matter get into them.

Caution

Seal the hoses completely, otherwise the compressor oil and receiver will absorb water vapor easily.



◀B▶ CONDENSER REMOVAL

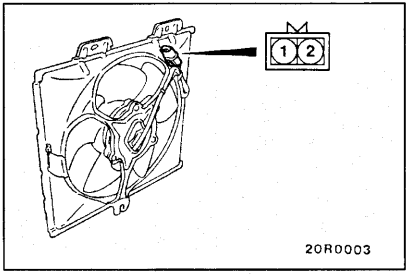
Move the radiator to the engine side and then lift up the condenser to remove it.

INSTALLATION SERVICE POINT

▶A◀ CONDENSER INSTALLATION

When replacing the condenser, refill it with a specified amount of compressor oil and install it. (to the vehicle).

Compressor oil: SUN PAG 56
Quantity: 15 cm^3 (.5 fl.oz.)



INSPECTION

55200680087

CONDENSER FAN MOTOR CHECK

Check to be sure that the condenser fan motor operates when battery voltage is applied to terminal 1 and terminal 2 is grounded.

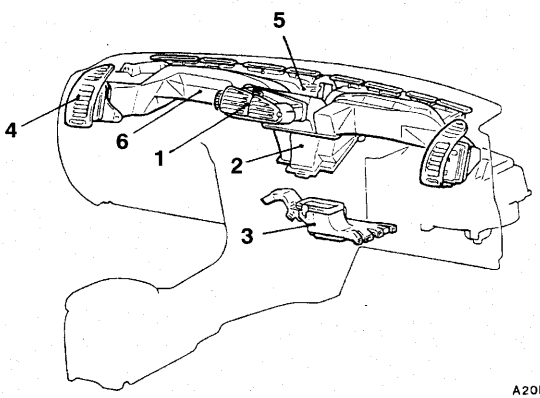
VENTILATORS

55300160188

REMOVAL AND INSTALLATION

Caution: SRS
When removing and installing the floor console assembly from vehicles equipped with SRS, do not let it bump against the SRS-ECU or the components.

<Instrument panel>



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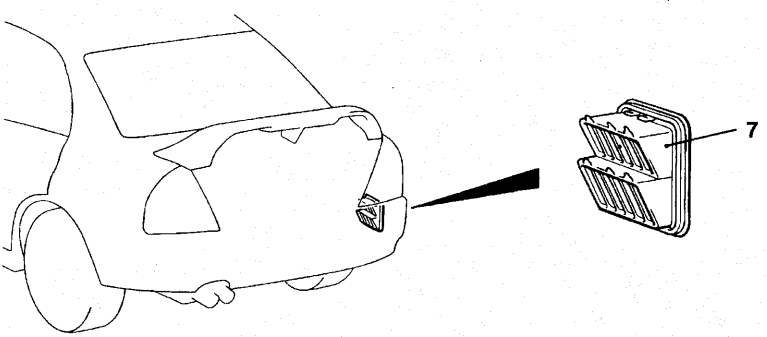
1. Center air outlet assembly (Refer to GROUP 52A - Instrument Panel.)
2. Center ventilation duct (Refer to P.55-19.)
3. Foot distribution duct
4. Side air outlet assembly (Refer to GROUP 52A - Instrument Panel.)
5. Defroster nozzle (Refer to GROUP 52A - Instrument Panel.)
6. Distribution duct (Refer to GROUP 52A - Instrument Panel.)

<Air outlet>



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Rear ventilation duct removal steps

- Rear bumper (Refer to GROUP 51.)
- Trunk side trim (Refer to GROUP 52A.)

7. Rear ventilation duct