

HEATER, AIR CONDITIONER AND VENTILATION

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55109000058

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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) 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 lamp, 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 an asterisk(*).

VENTILATORS* (FLOOR)	39	VENTILATORS (AIR OUTLET)	41
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GENERAL INFORMATION

55200010084

The heater system uses a two-way-flow full-air-mix system that features high performance and low operating noise, and 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 and lever type
Compressor model		Scroll type <MSC105CVS>
Dual pressure switch kPa	High pressure switch	OFF: 2,942, ON: 2,550
	Low pressure switch	OFF: 196, ON: 221
Refrigerant and quantity g		R-134a (HFC-134a), Approx. 630 – 670

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 colourless in both the liquid and vapour state. Since it has a boiling point of -29.8°C , at atmospheric pressure, it will be a vapour at all normal temperatures and pressures. The vapour 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. 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. Next splash the eyes with plenty of cool water. Call your doctor immediately even though irritation has ceased after treatment.

Caution

Do not heat R-134a above 40°C

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 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 adding 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

- A leak detector designed for R-134a should be used to check for refrigerant gas leaks.**
- 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.

SERVICE SPECIFICATIONS

55200030103

Items		Standard value
Idle speed r/min		850±100
Idle-up speed r/min		850 in Neutral
Resistor (for blower motor) Ω	LO	1.83
	ML	0.87
	MH	0.31
Refrigerant temperature switch	ON (continuity) temperature	Approx. 160°C or less
	OFF (no continuity) temperature	Approx. 160°C or more (until the temperature drops to approx. 130°C when OFF)
Air gap (Magnetic clutch) mm		0.4–0.65

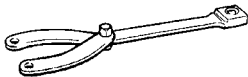
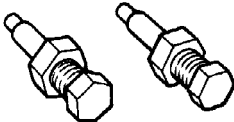
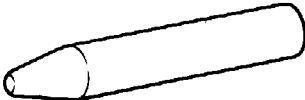
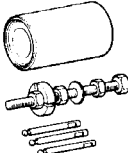
LUBRICANTS

55200040106

Items	Specified lubricants	Quantity
Each connection of refrigerant line Lip seal of the compressor	SUN PAG 56	As required
Compressor refrigerant unit lubricant lubricant ml	SUN PAG 56	170–190

SPECIAL TOOLS

55200060089

Tool	Number	Name	Application
	MB991367	Special spanner	Armature mounting nut of compressor removal and installation
	MB991386	Pin	
	MB991459	Lip seal installer guide	Installation of lip seal
	MB991456	Bearing puller	Removal of compressor bearing
	MB991458	Lip seal installer and remover	Removal and installation of lip seal

TROUBLESHOOTING

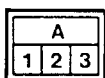
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TROUBLESHOOTING PROCEDURES

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	55-31
	Refrigerant leak or overfilling of refrigerant	Replenish the refrigerant, repair the leak or take out some of the refrigerant	55-9
	Dual pressure switch is defective	Replace the dual pressure switch	55-36
	A/C switch is defective	Replace the A/C switch	55-21
	Blower switch is defective	Replace the blower switch	55-17
	Refrigerant temperature switch is defective	Replace the refrigerant temperature switch	55-31
	Automatic compressor – ECU is defective	Replace the automatic compressor – ECU	55-28
When the A/C is operating, temperature inside the passenger compartment doesn't decrease (no cool air).	Refrigerant leak	Replenish the refrigerant and repair the leak	55-9
	Dual pressure switch is defective	Replace the dual pressure switch	55-36
	Refrigerant temperature switch is defective	Replace the refrigerant temperature switch	55-31
	Automatic compressor – ECU is defective	Replace the automatic compressor – ECU	55-28

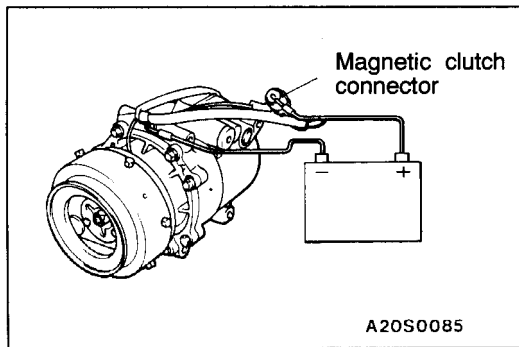
Trouble symptom	Problem cause	Remedy	Reference page
Blower-motor/fan inoperative	Blower moter relay is defective	Replace the blower moter relay	55-15
	Blower fan and motor is defective	Replace the blower fan and motor	55-24
	Resistor (for blower motor) is defective	Replace the resistor	55-24
	Blower switch is defective	Replace the blower switch	55-17
Blower fan and motor keeps running	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	55-17
	Blower moter relay is defective	Replace the blower moter relay	55-15
When the A/C is operating, con- denser fan oper- ates.	Condenser fan motor is defective	Replace the condenser fan motor	55-37
	Condenser fan relay (LO) is defective	Replace the condenser fan relay (LO)	55-15
	Condenser fan relay (HI) is defective	Replace the condenser fan relay (HI)	55-15
	Resistor (for condenser fan relay LO side) is defective	Replace the resistor	55-24

INSPECTION AT THE AUTOMATIC COMPRESSOR-ECU TERMINAL



20X0395

Terminal No.	Name of Signal	Check requirements	Terminal voltage
1	Automatic compressor-ECU power supply (output side)	The ignition switch, blower switch and A/C switch are all ON	System voltage
2	Automatic compressor-ECU power supply (input side)	The ignition switch, blower switch and A/C switch are all ON	System voltage
3	Automatic compressor-ECU earth	—	0V



ON-VEHICLE SERVICE

MAGNETIC CLUTCH TEST

55200850068

1. Disconnect the connector (1P) to the magnetic clutch.
2. Connect battery (–) to compressor body.
3. Connect battery (+) voltage directly to the connector for the magnetic clutch.
4. If the magnetic clutch is normal, there will be a “click”. If the pulley and armature do not make contact (‘click’), there is a malfunction.

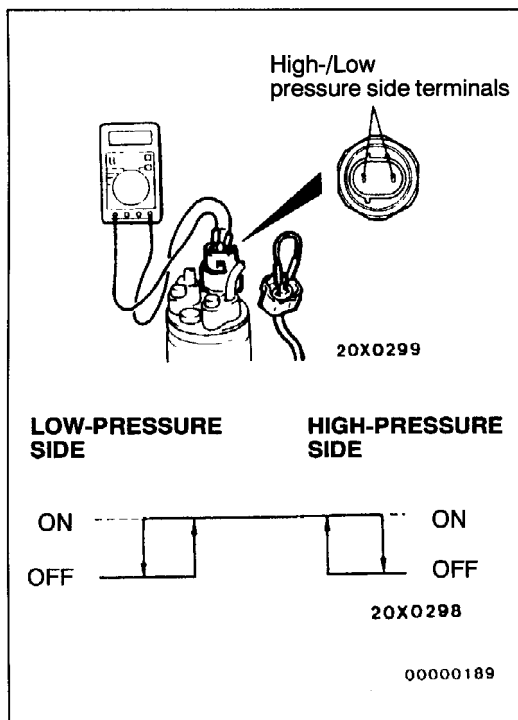
RECEIVER DRIER TEST

55200860061

Operate the unit and check the piping temperature by touching the receiver drier outlet and inlet.

If there is a difference in the temperatures, the receiver drier is restricted.

Replace the receiver drier.



DUAL PRESSURE SWITCH CHECK

55201040099

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 operating pressure (ON) and there is continuity between the respective terminals, then the condition is normal. If there is no continuity, replace the switch.

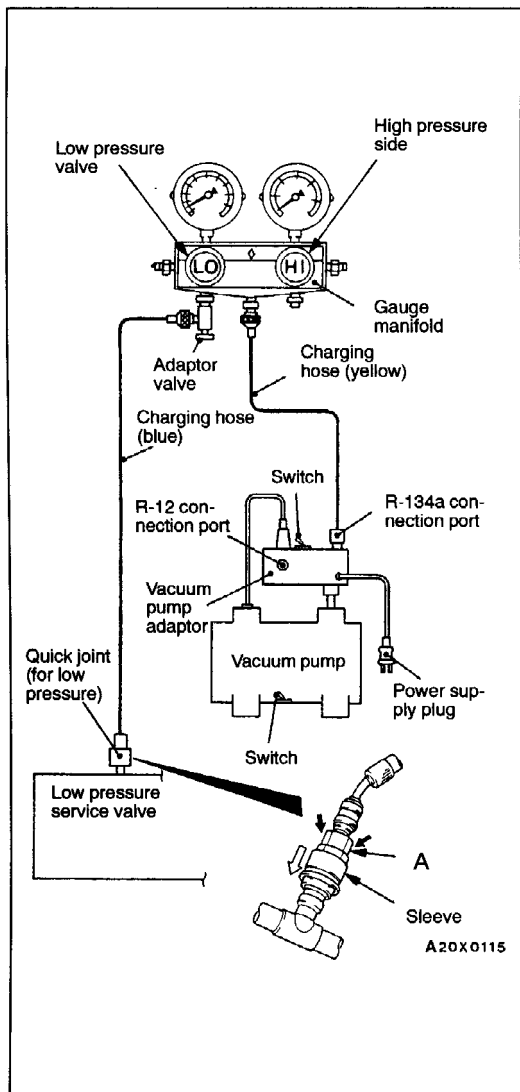
Unit: kPa

Items	Switch position			
	OFF	ON	ON	OFF
Low-pressure side	221		196	
High-pressure side	2,550		2,942	

COMPRESSOR DRIVE BELT ADJUSTMENT

55200100088

Refer to GROUP 11A – On-vehicle Service.



CHARGING

55200120091

1. With the handles turned back 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 designed for 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 A/C compressor during evacuation.

13. Evacuate to a vacuum reading of 100 kPa or higher (takes approx. 10 minutes).
14. Turn the vacuum pump adaptor switch OFF and allow to stand it for 5 minutes.

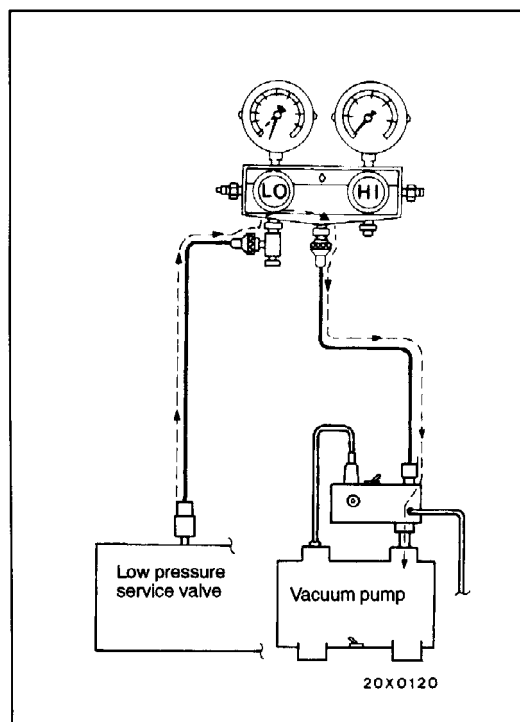
Caution

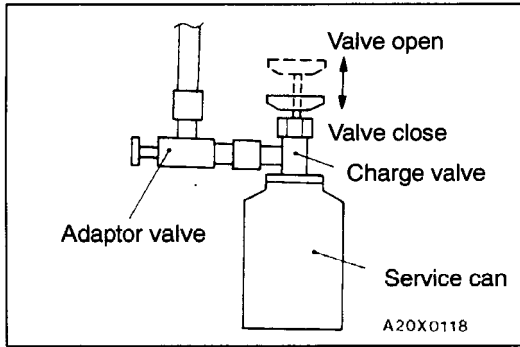
Do not operate the compressor in the vacuum condition; damage may occur.

15. Carry out a leak test. (Good if the negative pressure does not drop.)

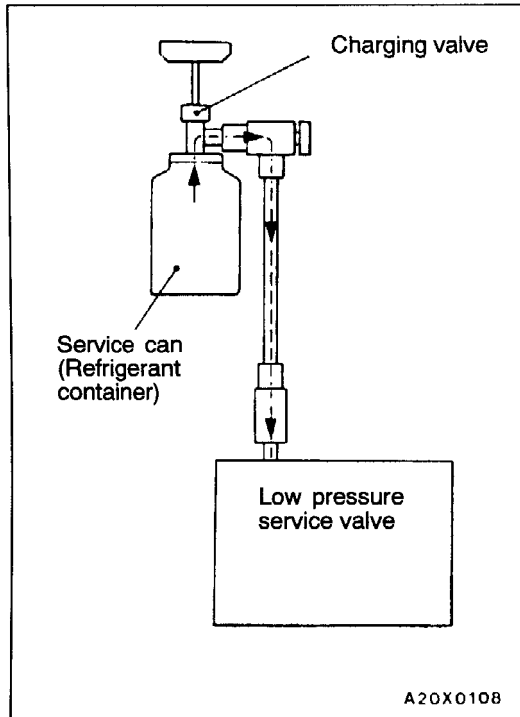
Caution

If the negative pressure (vacuum) is lost, check for loose connections. Then, repeat the evacuation procedure from step 12.





16. With the handle turned out all the way (valve open), install the charging valve to the service can.
17. Turn the handle of the adaptor valve back all the way (valve closed), remove it from the gauge manifold and install the service can.
18. Tighten the handle of the charging valve (valve closed) to puncture the service can.



19. Turn the handle of the charging valve back (valve open) and tighten the handle of the adaptor valve (valve open) to charge the system with refrigerant.

Caution

If the service can is inverted, liquid refrigerant may be drawn into the compressor damaging it by liquid compression. Keep the service can upright to ensure that refrigerant is charged in gas state.

20. If the refrigerant is not drawn in, turn the handle of the adaptor valve back all the way (valve closed).
21. 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

A leak detector designed for R-134a should be used.

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

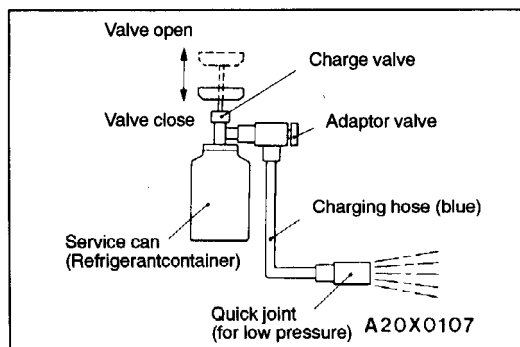
Caution

If the service can is inverted, liquid refrigerant may be drawn into the compressor damaging it by liquid compression. Keep the service can upright to ensure that refrigerant is charged in gas state.

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

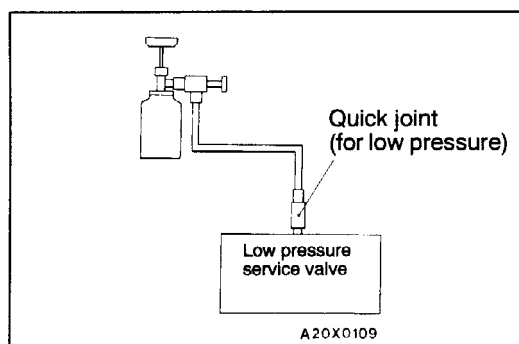
NOTE

If the service can is not emptied completely, keep the handles of the charging valve and adaptor valve closed for the next charging.



CORRECTING LOW REFRIGERANT LEVEL IN CASE THE SERVICE CAN IS USED

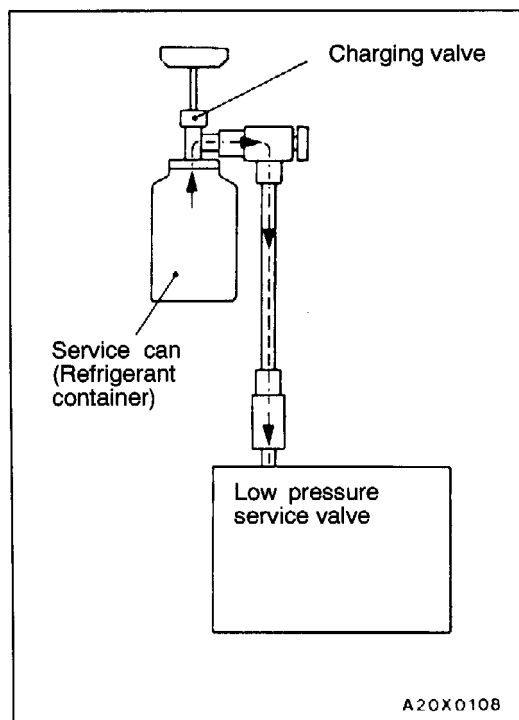
1. Install the charge valve with the handle turned all the way out (valve open) of the service can.
2. Install the adaptor valve with the handle turned all the way back (valve close) to the charging valve.
3. Connect the charging hose (blue) to the adaptor valve.
4. Connect the charging hose (blue) to the quick joint (for low pressure).
5. Tighten the handle of the charge valve (valve close), and pierce the service can.
6. Turn the handle of the adaptor valve to bleed the air.



7. 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.



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

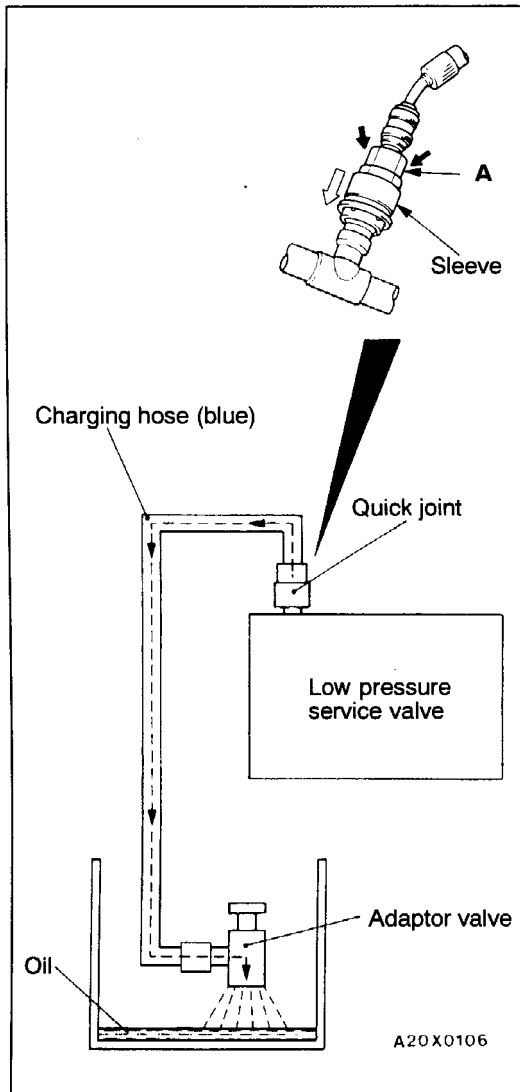
Caution

If the service can is inverted, liquid refrigerant may be draw into the compressor damaging it by liquid compression. Keep the service can upright to ensure that refrigerant is charged in gas state.

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

NOTE

If any refrigerant is remaining in the service can, close the adapter valve and save the refrigerant for another vehicle. Do not release into the atmosphere.



DISCHARGING SYSTEM

1. Run the engine at an engine speed of 1,200–1,500 r/min for approximately 5 minutes with the A/C operating to return to the oil.

NOTE

Returning the oil will be more effective if it is done while driving.

2. Stop the engine.
3. Connect the charging hose (blue) to the adaptor valve with its handle turned back all the way (valve closed).
4. Connect the quick joint to the charging hose (blue).
5. Install the quick joint to the low pressure service valve.

NOTE

The low-pressure service valve should be connected to 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. Place the adaptor valve inside the container and discharge the refrigerant by opening the handle gradually so that oil does not gush out.

NOTE

Any oil remaining in the container should be returned to the A/C system.

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 170 mℓ 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

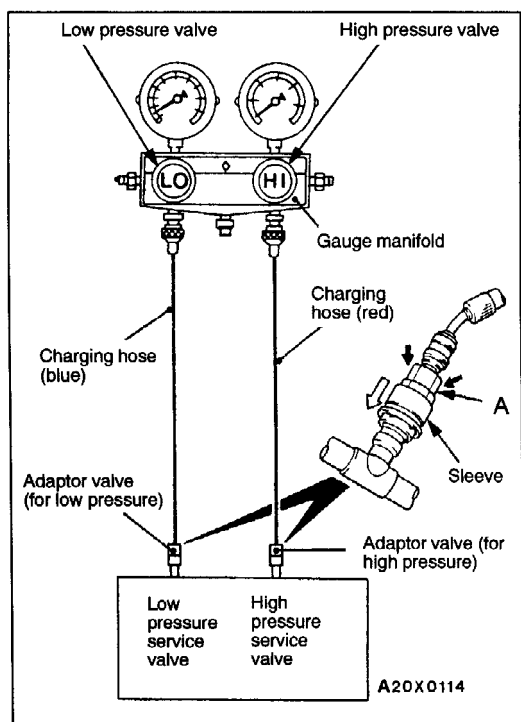
Quantity

Condenser: 15 mℓ

Evaporator: 60 mℓ

Suction hose: 10 mℓ

Receiver: 10 mℓ



PERFORMANCE TEST

55200140080

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.

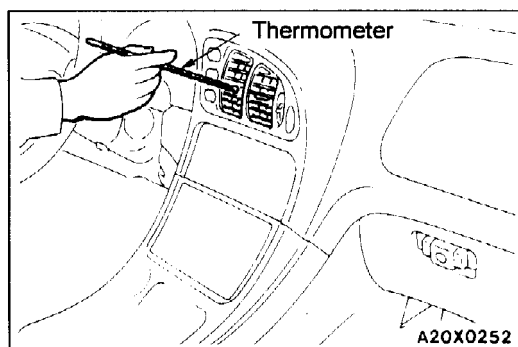
Caution

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 left centre A/C 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	20	25	35	40
Discharge air temperature °C	2.5–5.0	3.0–6.0	3.5–7.5	4.0–8.0
Compressor high pressure kPa	700–900	740–1,100	750–1,350	960–1,570
Compressor low pressure kPa	140	140–210	140–220	150–230

REFRIGERANT LEAK REPAIR 55200150076**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 vapour water 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.

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 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.

COMPRESSOR NOISE CHECK 55200870071

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.

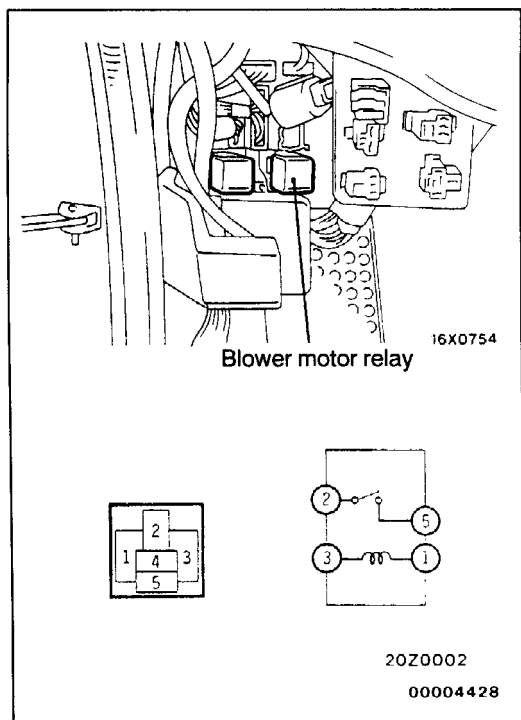
Noises that develop during A/C operation can often be misleading. For example: what sounds like a failed front bearing or connecting rod, may be caused by loose bolts, nuts, mounting brackets, or a loose clutch assembly. Verify accessory drive belt tension (power steering or alternator).

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.

ADJUSTMENT

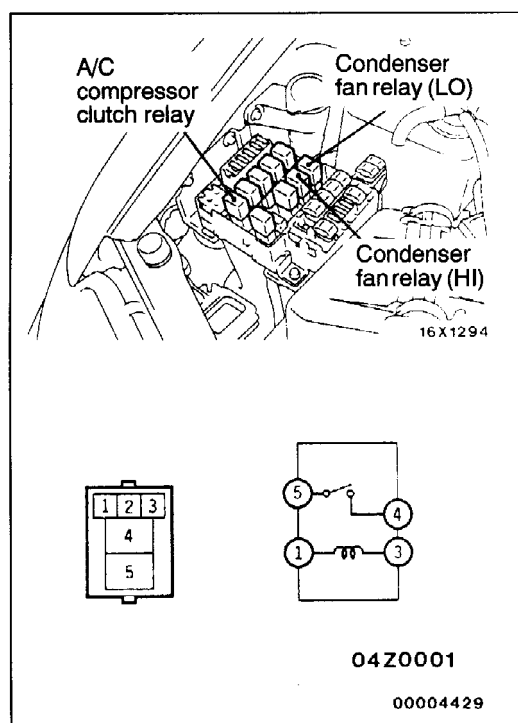
1. Select a quiet area for testing. Duplicate conditions as much as possible. Switch compressor on and off several times to clearly identify compressor noise. To duplicate high ambient conditions (high head pressure), restrict air flow through condenser. Install manifold gauge set to make sure discharge pressure doesn't exceed 2,070 kPa.
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.55-9.)
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**

55200880104

BLOWER MOTOR RELAY CONTINUITY CHECK

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

**A/C COMPRESSOR CLUTCH RELAY, CONDENSER FAN RELAY (LO) AND (HI) CONTINUITY CHECK**

Battery voltage	Terminal No.			
	1	3	4	5
Power is not supplied	○	○		
Power is supplied	⊕	⊖	○	○

IDLE-UP OPERATION CHECK

55200160109

1. Before inspection and adjustment, set vehicle in the following condition:
 - Engine coolant temperature: 80–90°C
 - Lights, electric cooling fan and accessories: Set to OFF
 - Transmission: Neutral
 - Steering wheel: Straightforward
2. Check whether or not the idling speed is the standard value.

Standard value: 850±100 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 r/min (in Neutral)

NOTE

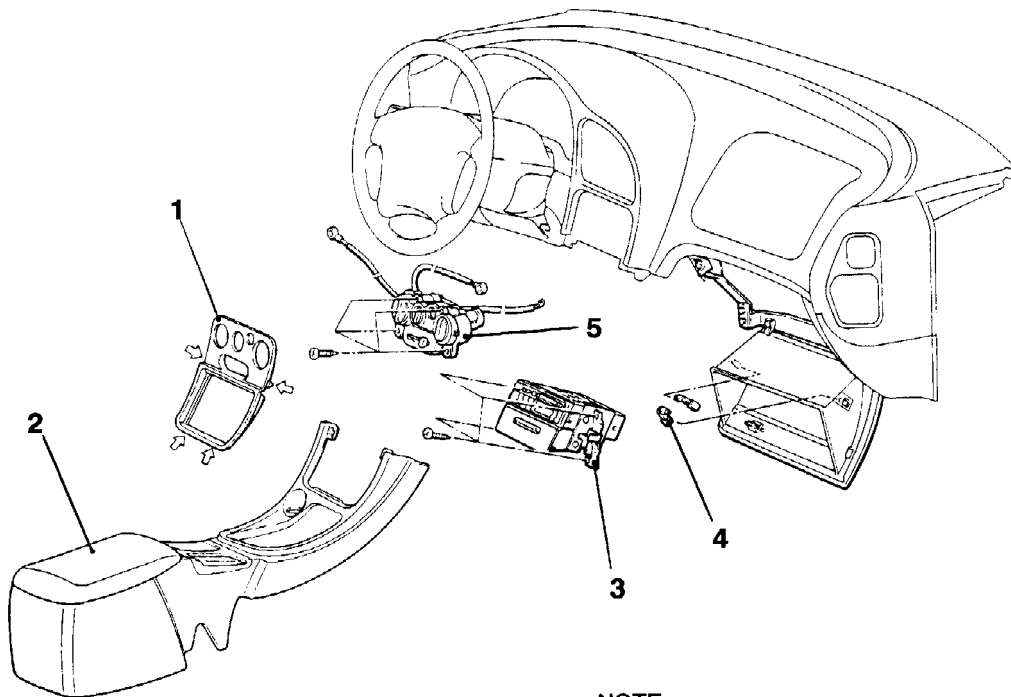
Idle speed is controlled by the ISC system and is not adjustable. If, idle speed is not within specifications, check the ISC system. (Refer to GROUP 13A – On-vehicle Service.)

HEATER CONTROL ASSEMBLY REMOVAL AND INSTALLATION

55100110095

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.



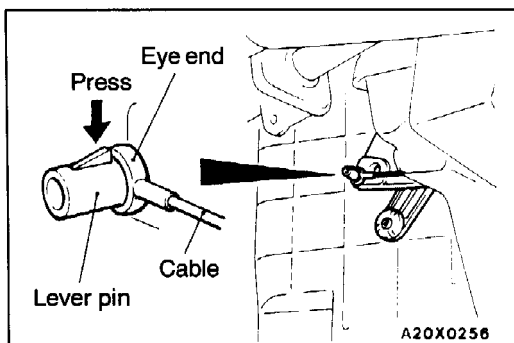
NOTE

↔ : indicates sheet metal clip positions.

A20X0391

Removal steps

1. Centre panel
2. Floor console (Refer to GROUP 52A.)
3. Radio and tape player (Refer to GROUP 54.)
4. Stopper
5. Heater control assembly

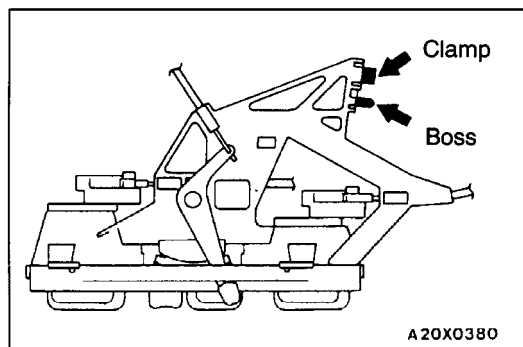


A20X0256

REMOVAL SERVICE POINT

➡ HEATER CONTROL ASSEMBLY REMOVAL

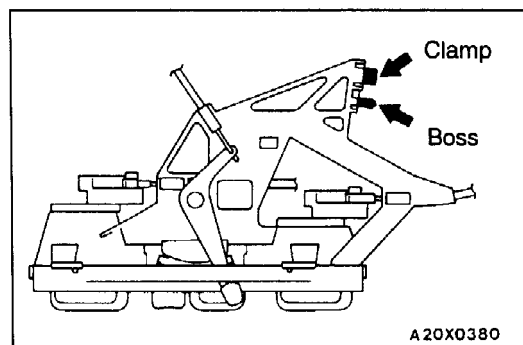
- (1) Press the lever pin to disconnect the air outlet changeover damper cable.



- (2) Snap the boss and clamp with nippers or a flat-tipped screwdriver, etc to remove the heater control assembly.

NOTE

The boss and clamp are needed for assembly line at the factory, but not needed for service work.



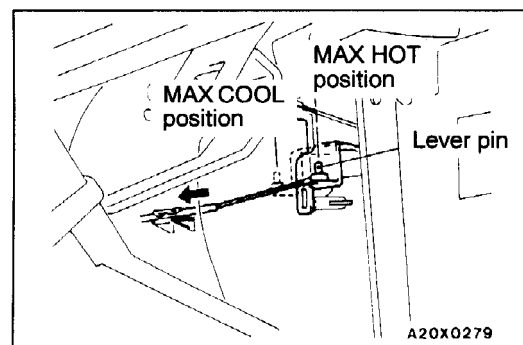
INSTALLATION SERVICE POINT

►A◄ HEATER CONTROL ASSEMBLY INSTALLATION

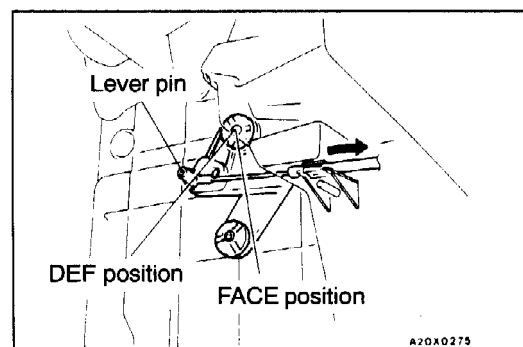
- (1) Always snap the boss and clamp before installing a new heater control assembly to the instrument panel.

NOTE

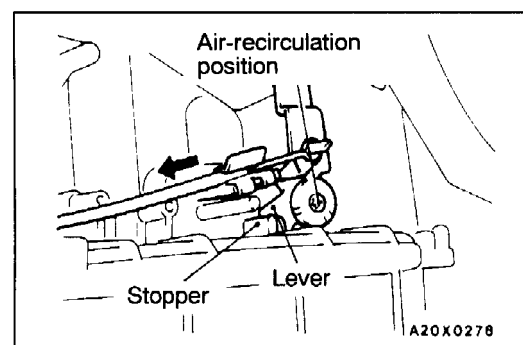
The boss and clamp are needed for assembly line at the factory, but not needed for service work.



- (2) Set the temperature control knob on the heater control assembly to MAX HOT.
- (3) Set the air mix damper lever at the upper part of the heater unit to the MAX HOT position, and install the cable to the lever pin.
- (4) Push the outer cable in the direction of the arrow so that there is no looseness, and then secure it with the clip.



- (5) Set the knob for the air outlet changeover on the heater control assembly to the DEF position.
- (6) Set the air outlet changeover damper lever of the heater unit to DEF position and install the cable to the lever pin.
- (7) Push the outer cable in the direction of the arrow so that there is no looseness, and then secure it with the clip.

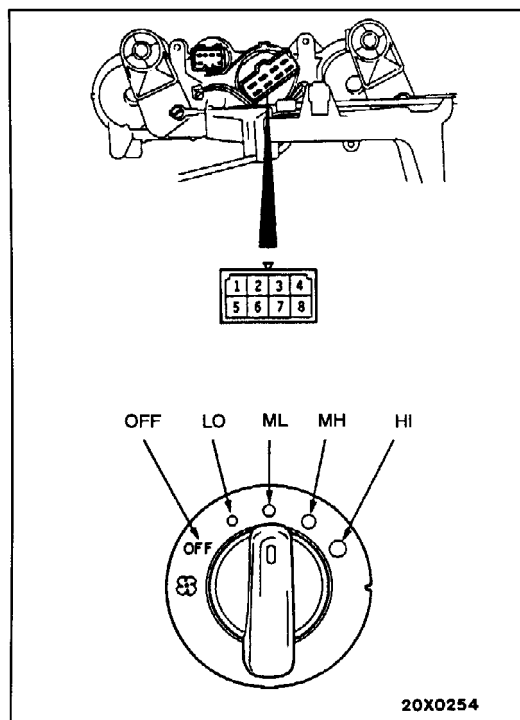


- (8) Set the lever for the inside/outside air changeover on the heater control assembly to the air-recirculation position.
- (9) Set the inside/outside air changeover damper lever of the blower unit to air-recirculation position (with the inside/outside air changeover damper lever touched to the stopper of the blower case) and install the cable to the lever pin.
- (10) Push the outer cable in the direction of the arrow so that there is no looseness, and then secure it with the clip.

INSPECTION

55100120036

- Check each knob and lever for proper operation and possible damage.
- Check the connection between the lever and cable.
- Check that the cable sides properly.
- Check the illumination lamp for a possible broken filament.

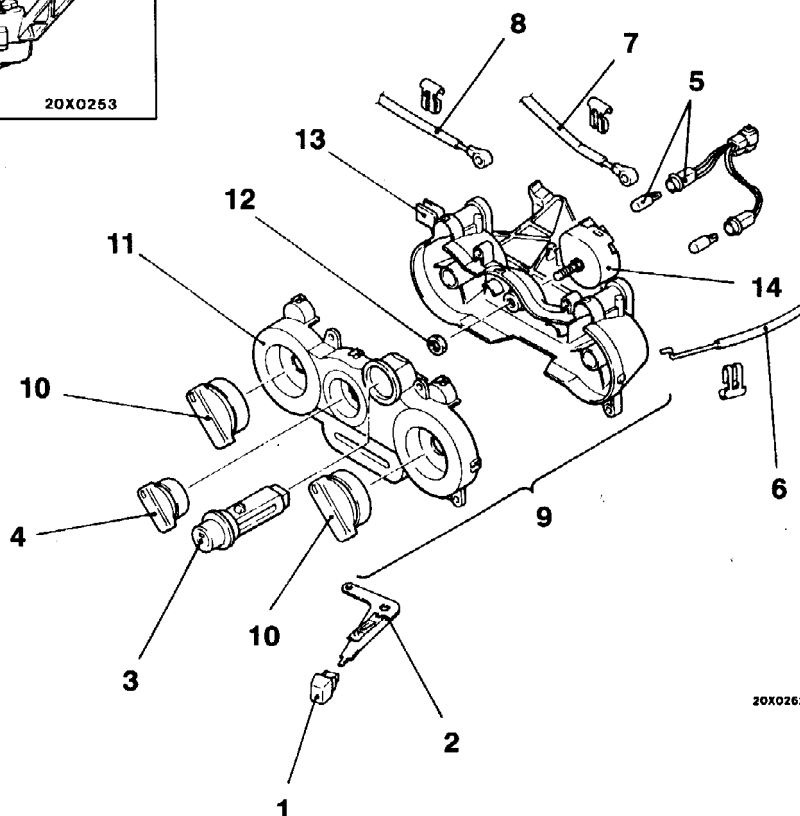
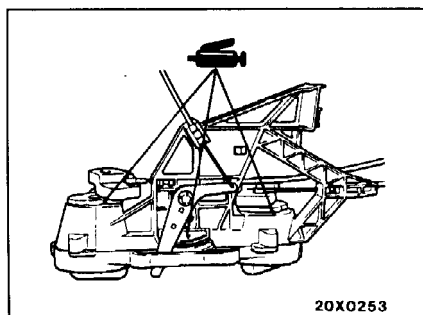


BLOWER SWITCH CONTINUITY CHECK

Switch position	Terminal No.							
	1	2	3	4	5	6	7	8
OFF								
• (LO)	○		○	○				○
• (ML)	○				○	○		○
● (MH)	○	○	○	○				○
● (HI)	○			○	○	○		○

DISASSEMBLY AND REASSEMBLY

55100130046



Disassembly steps

1. Knob
2. Lever assembly
3. A/C switch
4. Knob assembly B
5. Bulb and socket assembly
6. Air outlet changeover damper cable
7. Air mix damper cable
8. Inside/outside air changeover damper cable
9. Control base assembly

10. Knob assembly A
11. Panel case
12. Nut
13. Control base
14. Blower switch

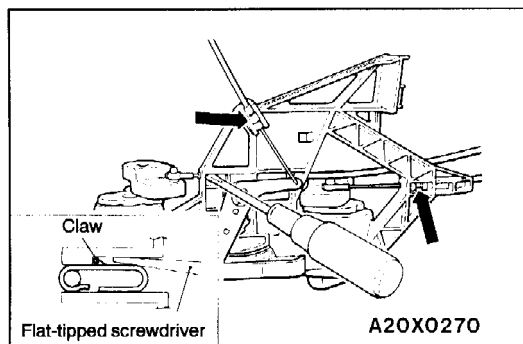
NOTE

Parts from No. 10 to No. 13 are not supplied as single parts.

DISASSEMBLY SERVICE POINT

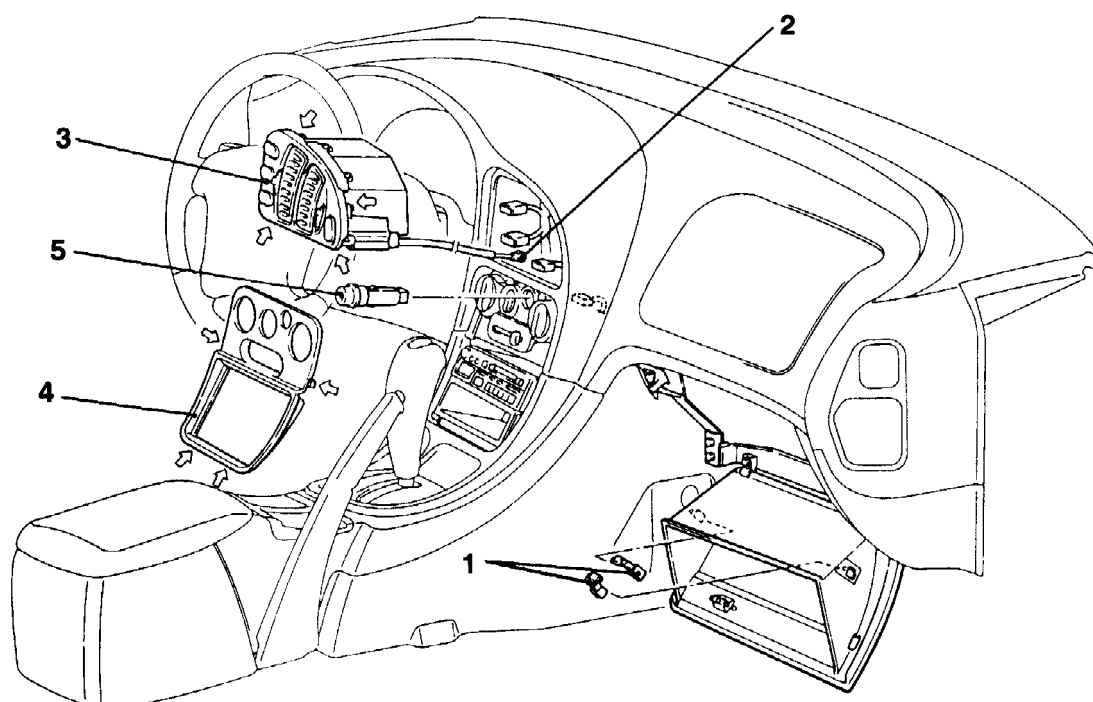
◀A▶ AIR OUTLET CHANGEOVER DAMPER CABLE/AIR MIXING DAMPER CABLE/ INSIDE/OUTSIDE AIR CHANGEOVER DAMPER CABLE REMOVAL

Insert a flat-tipped screwdriver to disengage the claws, and then remove the cables.



A/C SWITCH

55200210040

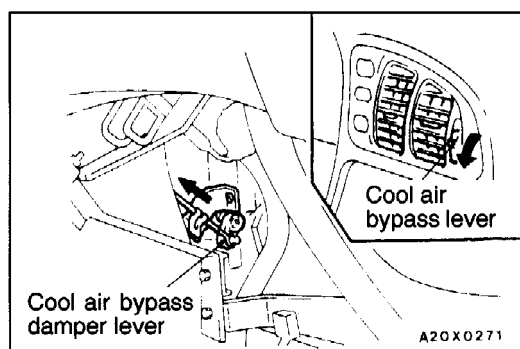
REMOVAL AND INSTALLATION**NOTE**

↔ : indicates sheet metal clip positions.

B 20X0261

Removal steps

- A◄
1. Stopper
 2. Cool air bypass cable connection
 3. Centre air outlet assembly
 4. Centre console panel
 5. A/C switch

**INSTALLATION SERVICE POINT****►A◄ CENTRE AIR OUTLET ASSEMBLY INSTALLATION**

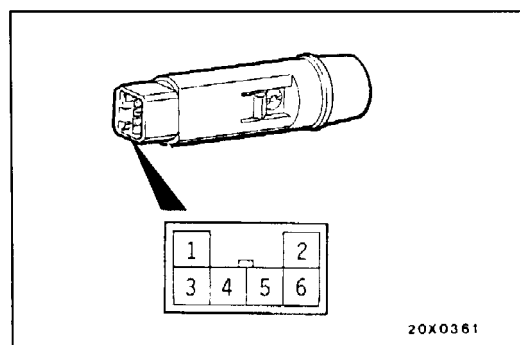
- (1) Turn the cool air bypass lever of the centre air outlet assembly fully downwards.
- (2) Pull the cool air bypass damper lever on the heater unit side all the way towards you, and then connect the cable to the lever pin.
- (3) Push the outer cable in the direction of the arrow so that there is no looseness, and then secure it with the clip.

INSPECTION

55200220067

A/C SWITCH CONTINUITY CHECK

Switch position	Terminal No.						
	1	4	IND	5	3	ILL	6
OFF	○	○	▶	○	○	○	○
ON	○	○	▶	○	○	○	○



HEATER UNIT AND HEATER CORE

55100190105

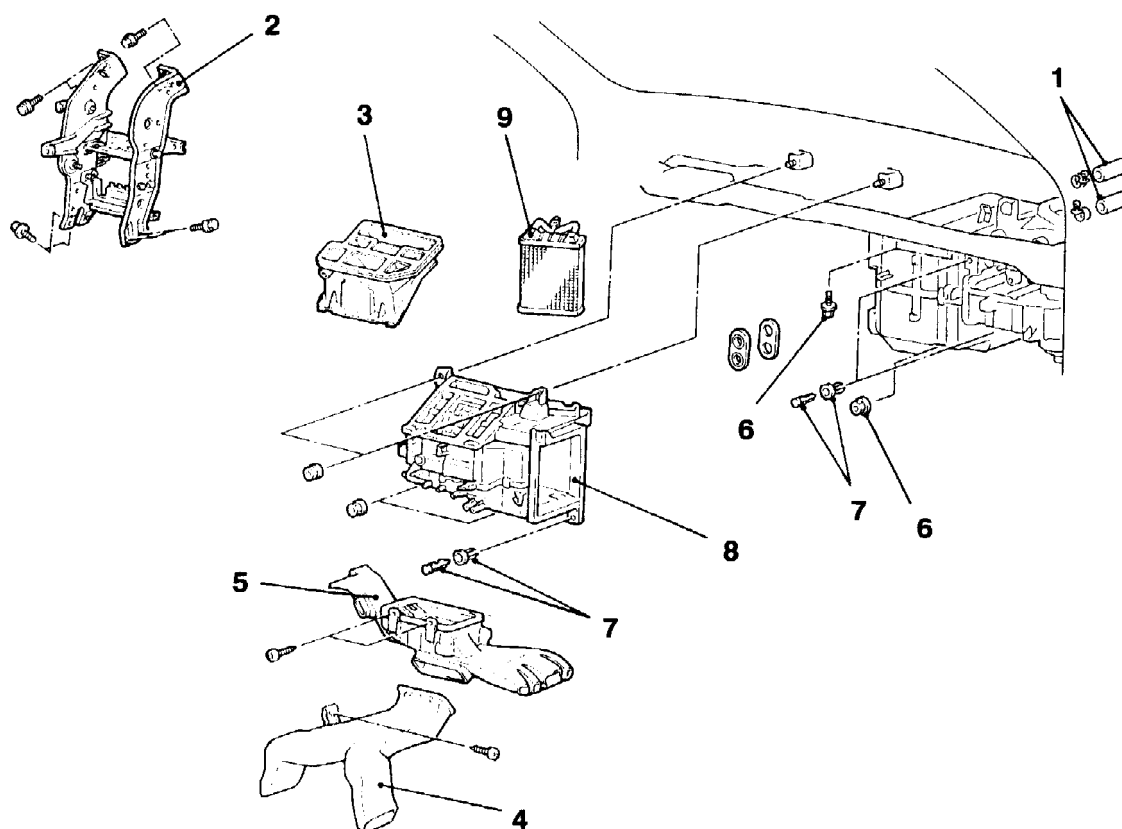
REMOVAL AND INSTALLATION

Pre-removal and Post-Installation Operation

- (1) Draining and refilling coolant
(Refer to GROUP 14 – On-vehicle Service.)
- (2) Instrument Panel Removal and Installation
(Refer to GROUP 52A.)

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.



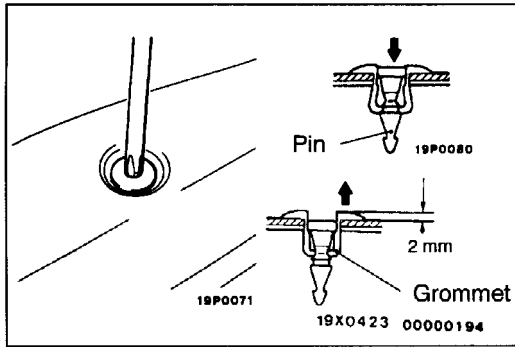
A20X0363

Removal steps

1. Heater hose connection
2. Centre stay
3. Centre duct
4. Semi rear heater duct
(Refer to P.55-39)
5. Foot distribution duct



6. Cooling unit installation bolt and nut <Vehicles with A/C>
7. Clip
8. Heater unit
9. Heater core



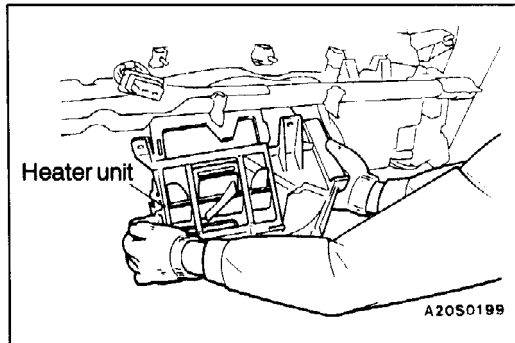
REMOVAL SERVICE POINTS

◀A▶ CLIP REMOVAL

- (1) Use a Philips-head screwdriver to push inward the pin (at the centre of the clip) to a depth of about 2 mm.
- (2) Pull the clip outwards to remove it.

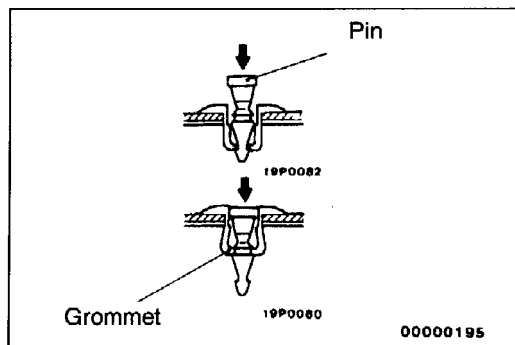
Caution

Do not push the pin inwards more than necessary because it may damage the grommet, or the pin may fall in, if pushed too far.



◀B▶ HEATER UNIT REMOVAL

After sliding the cooling unit towards you slightly, remove the heater unit.



INSTALLATION SERVICE POINT

▶A◀ CLIP INSTALLATION

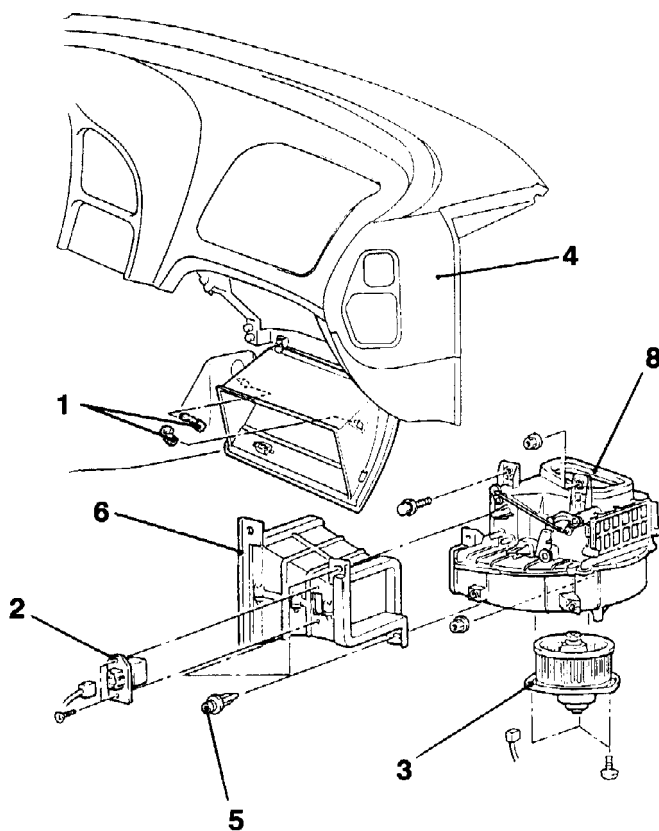
- (1) With the pin pulled out, insert the clip into the hole.
- (2) Push the pin inwards until the pin's head is flush with the grommet.

**BLOWER ASSEMBLY AND RESISTOR
REMOVAL AND INSTALLATION**

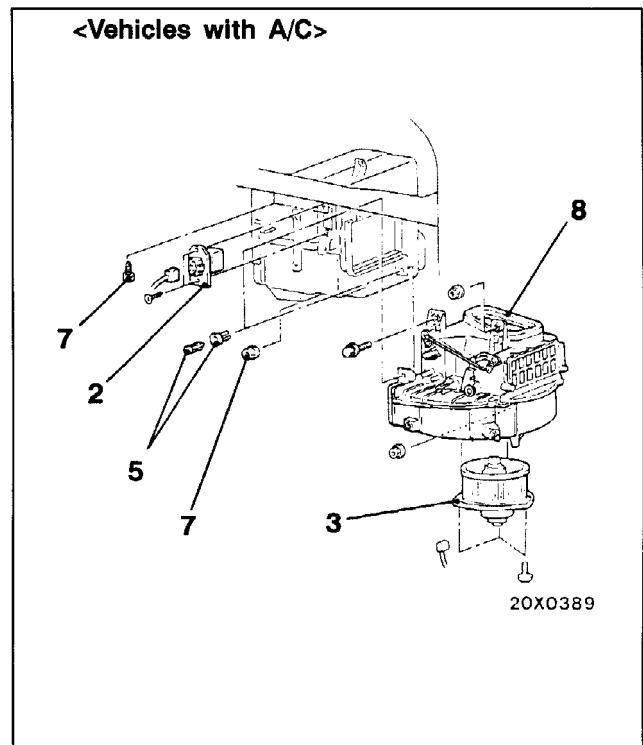
55100280109

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 other components.



20X0263



20X0389

00004430

Resistor removal steps

1. Stopper
2. Resistor

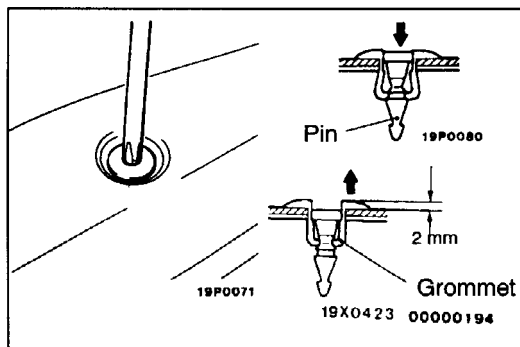
Blower fan and motor removal steps

3. Blower fan and motor

Blower unit removal steps

4. Instrument panel
(Refer to GROUP 52A)
5. Clip
6. Joint duct <Vehicles without A/C>
7. Cooling unit installation bolts and nuts <Vehicles with A/C>
8. Blower unit assembly





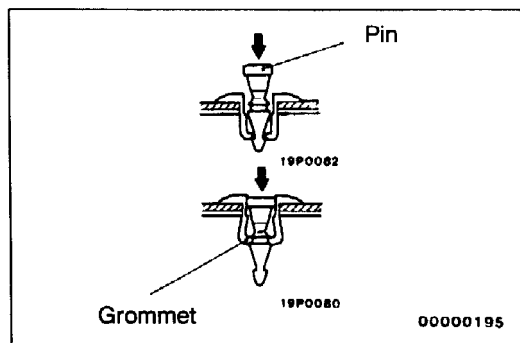
REMOVAL SERVICE POINT

◀A▶ CLIP REMOVAL

- (1) Use a Philip-head screwdriver to push inwards the pin (at the centre of the clip) to a depth of about 2 mm.
- (2) Pull the clip outwards to remove it.

Caution

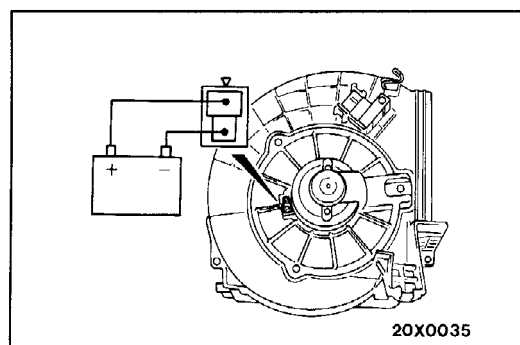
Do not push the pin inwards more than necessary because it may damage the grommet, or the pin may fall in, if pushed too far.



INSTALLATION SERVICE POINT

▶A◀ CLIP INSTALLATION

- (1) With the pin pulled out, insert the clip into the hole.
- (2) Push the pin inwards until the pin's head is flush with the grommet.

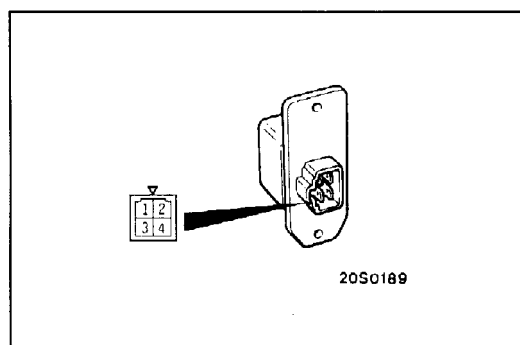


INSPECTION

55100290058

BLOWER FAN AND MOTOR CHECK

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



RESISTOR RESISTANCE CHECK

Use an ohmmeter 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 3–2 (LO)	1.83
Between terminals 3–4 (ML)	0.87
Between terminals 3–1 (MH)	0.31

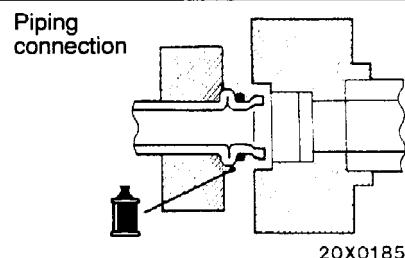
COOLING UNIT

55200490055

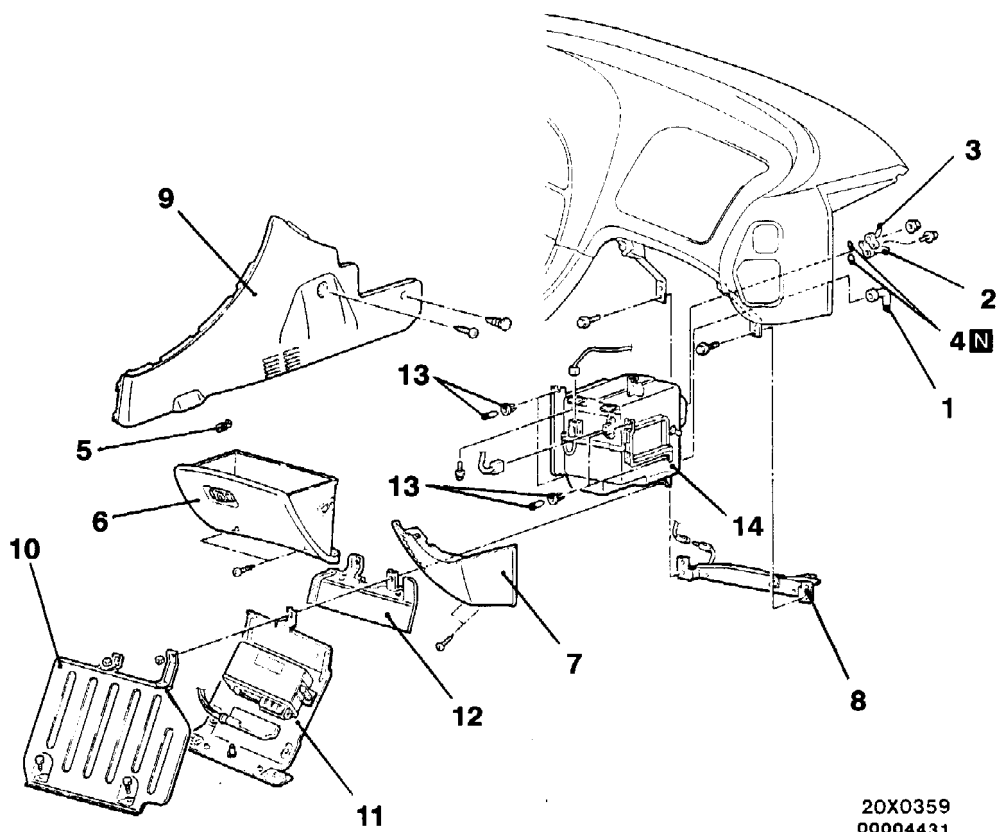
REMOVAL AND INSTALLATION

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

CAUTION
Plug refrigerant lines to prevent air from mixing
when disconnecting them.



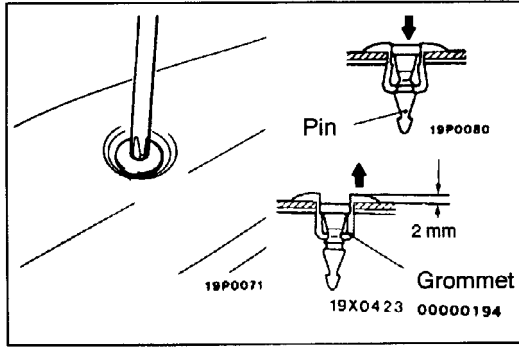
Compressor oil: SUN PAG 56



Removal steps

1. Drain hose
2. Suction hose connection
3. Liquid pipe connection
4. O-ring
5. Stopper
6. Glove box
7. Corner panel
8. Glove box under frame
9. Console side cover <R.H.>
10. Control unit cover
11. ABS-ECU bracket
12. Harness protector
13. Clip
14. Cooling unit





REMOVAL SERVICE POINT

◀A▶ CLIP REMOVAL

- (1) Use a Philips-head screwdriver to push inwards the pin (at the centre of the clip) to a depth of about 2 mm.
- (2) Pull the clip outwards to remove it.

Caution

Do not push the pin inwards more than necessary because it may damage the grommet, or the pin may fall in, if pushed too far.

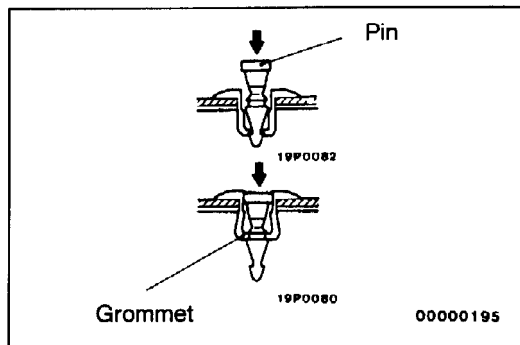
INSTALLATION SERVICE POINTS

▶A◀ COOLING UNIT INSTALLATION

When replacing the cooling unit with new one, refill the evaporator with a specified amount of compressor oil.

Compressor oil: SUN PAG 56

Quantity: 60 ml

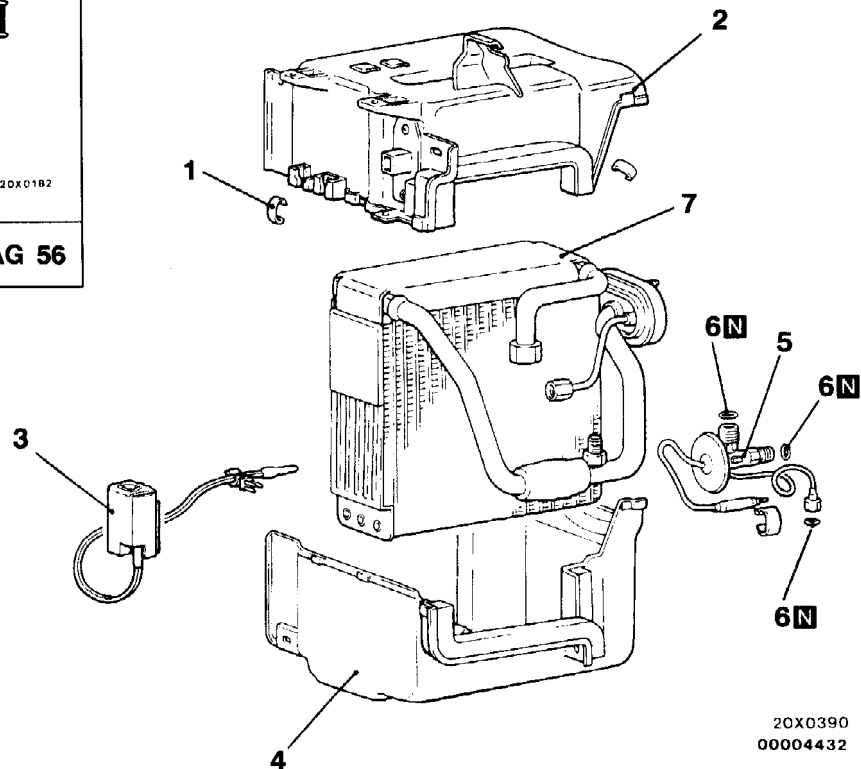
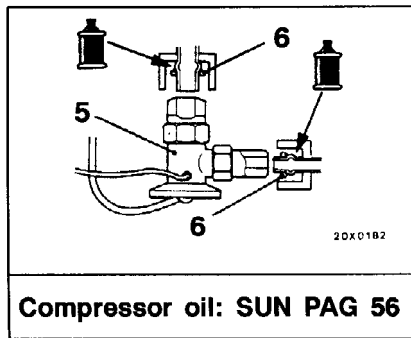


▶B◀ CLIP INSTALLATION

- (1) With the pin pulled out, insert the clip into the hole.
- (2) Push the pin inwards until the pin's head is flush with the grommet.

DISASSEMBLY AND REASSEMBLY

55201060057

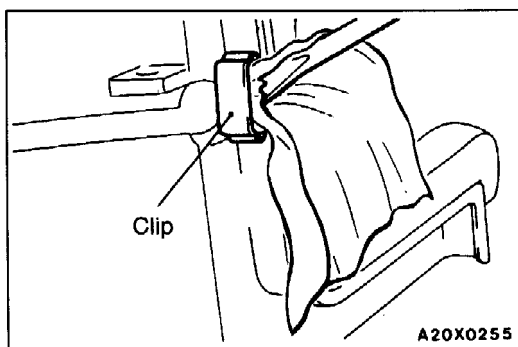


Disassembly steps



1. Clip
2. Evaporator case (upper)
3. Automatic compressor-ECU and fin thermo sensor assembly

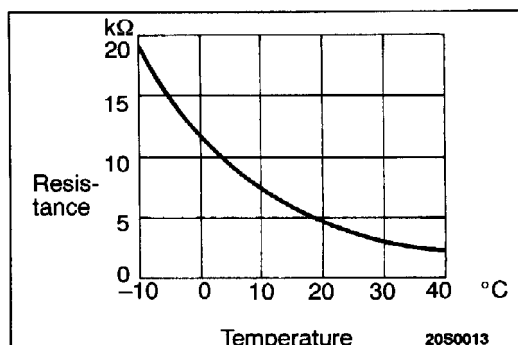
4. Evaporator case (lower)
5. Expansion valve
6. O-ring
7. Evaporator



DISASSEMBLY SERVICE POINT

CLIP REMOVAL

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



INSPECTION

55201070012

AUTOMATIC COMPRESSOR-ECU (FIN THERMO SENSOR) CHECK

When the resistance value between the sensor terminals is measured under two or more temperature conditions, the resistance value should be close to the values shown in the graph.

NOTE

The temperature conditions when testing should not exceed the range of the characteristic curve in the graph.

COMPRESSOR AND TENSION PULLEY

55200410143

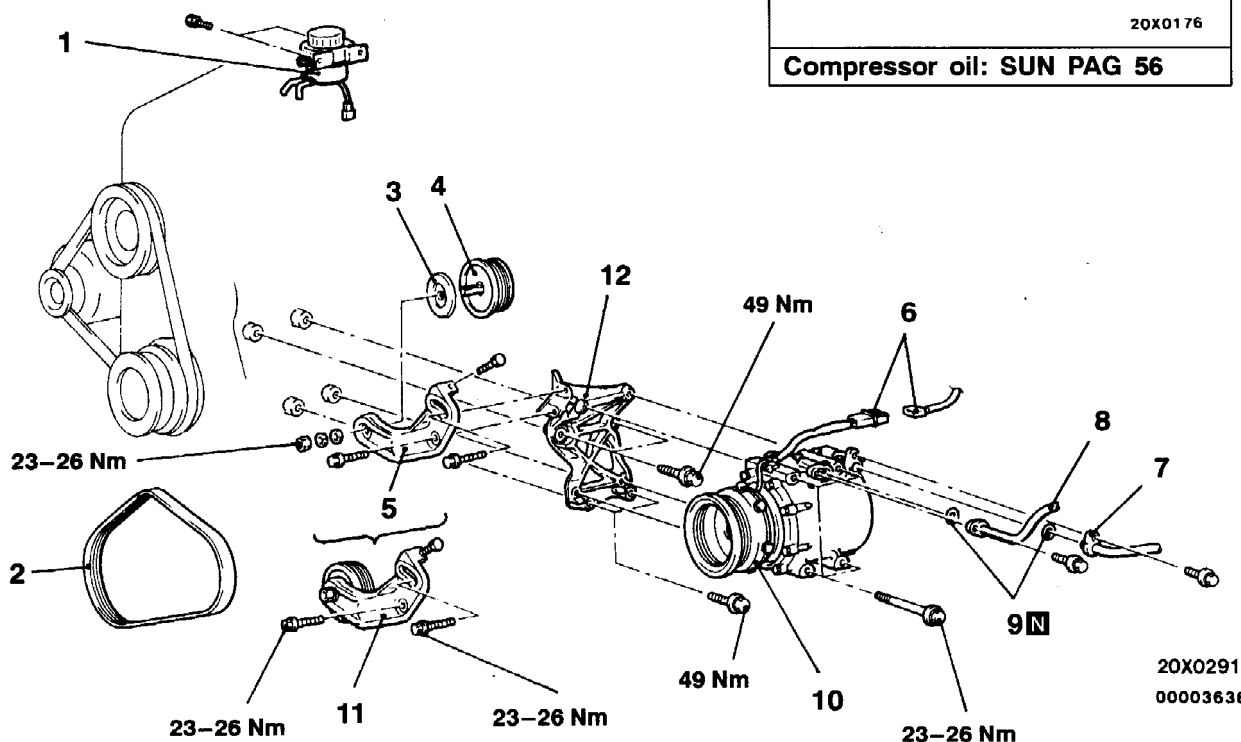
REMOVAL AND INSTALLATION

Pre-removal and Post-Installation Operation

- (1) Refrigerant Discharging and Charging
(Refer to P.54-9.)
- (2) Compressor Drive Belt Adjustment
(Refer to GROUP 11A – On-vehicle Service.)

CAUTION

Plug refrigerant lines to prevent air from mixing when disconnecting them.



Tension pulley and tension pulley bracket removal steps



1. Brake fluid reservoir
2. Compressor drive belt
3. Cover
4. Tension pulley
5. Tension pulley bracket

Compressor and compressor bracket removal steps



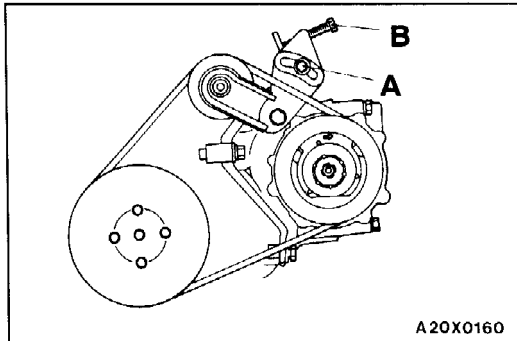
1. Brake fluid reservoir
2. Compressor drive belt
6. Compressor connector
7. Discharge hose connection
8. Suction hose connection
9. O-ring
10. Compressor
11. Tension pulley and tension pulley bracket assembly
12. Compressor bracket

REMOVAL SERVICE POINTS**◀A▶ BRAKE FLUID RESERVOIR REMOVAL**

Disconnect the brake fluid level sensor connector and remove the brake fluid reservoir from the compressor bracket with the hose still attached.

NOTE

Place the removed brake fluid reservoir in a place where it will not be a hindrance when removing and installing the A/C compressor, and tie it with a cord.

**◀B▶ COMPRESSOR DRIVE BELT REMOVAL**

- (1) Loosen bolt "A" for holding the tension pulley.
- (2) Loosen bolt "B" for adjustment.
- (3) Remove the compressor drive belt.

◀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 ml) 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

$$170 \text{ ml} - X \text{ ml} = Y \text{ ml}$$

NOTE

- (1) Y ml indicates the amount of oil in the refrigerant line, the condenser, the evaporator etc.
- (2) When replacing the following parts as well as the compressor, subtract the rated oil amount of the each part from Yml and discharge from the new compressor.

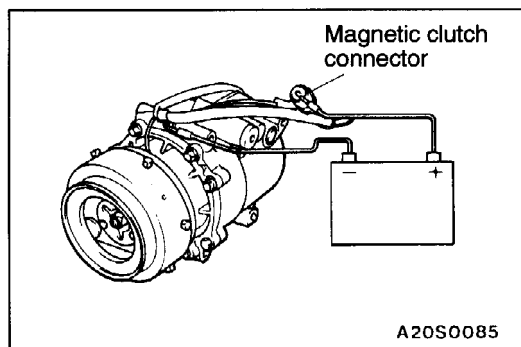
Quantity

Evaporator: 60 ml

Condenser: 15 ml

Suction hose: 10 ml

Receiver: 10 ml



INSPECTION

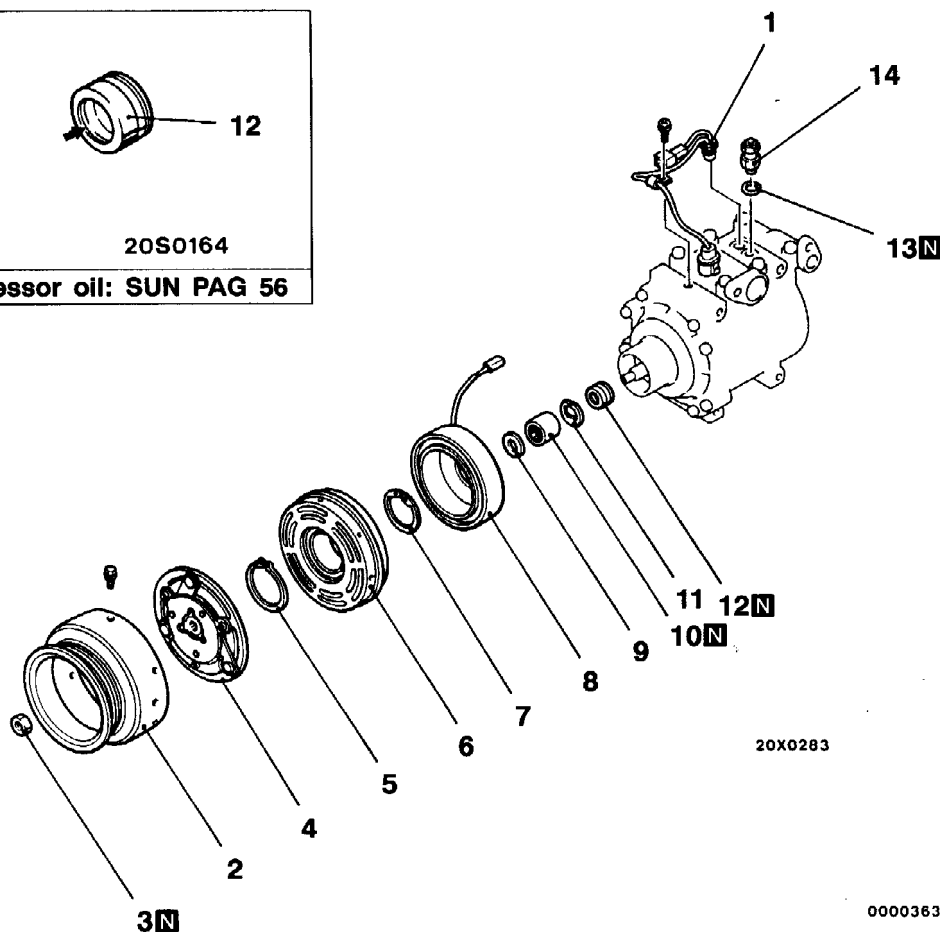
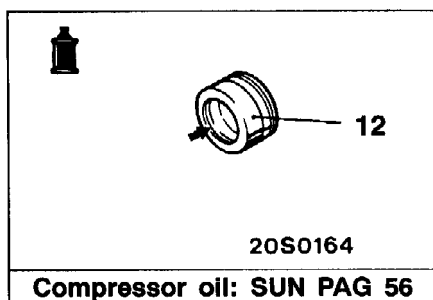
55200420054

COMPRESSOR MAGNETIC CLUTCH OPERATION INSPECTION

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

DISASSEMBLY AND REASSEMBLY

55200460100

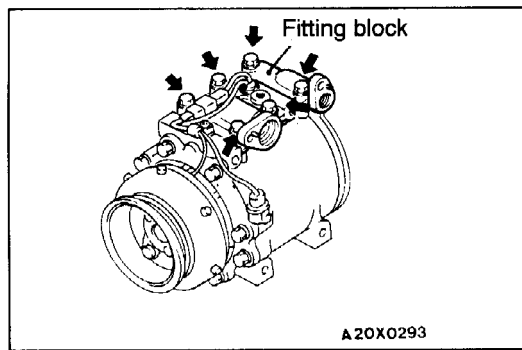


00003637

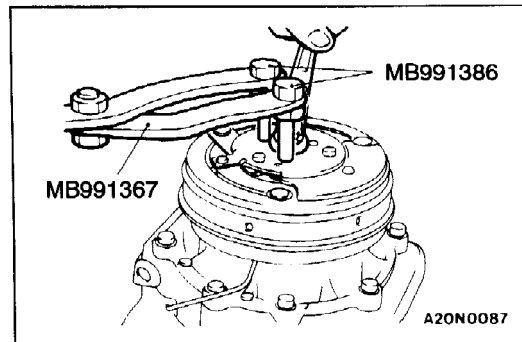
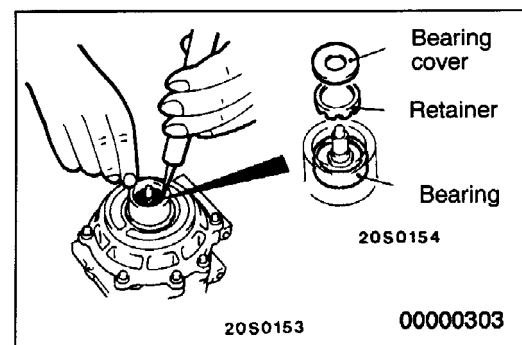
Disassembly steps

- ◀A▶ 1. Refrigerant-temperature switch
2. Pulley
● Air gap adjustment
◀B▶ ▶G▶ 3. Nut
▶F▶ 4. Armature plate
▶E▶ 5. Snap ring
6. Rotor
▶D▶ 7. Snap ring

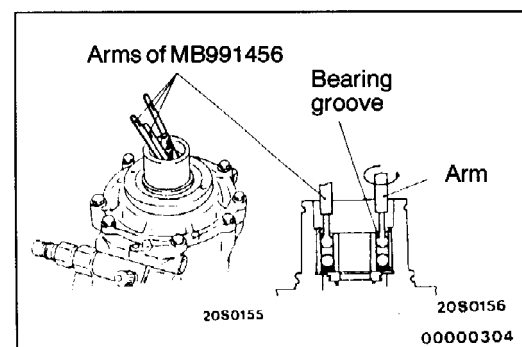
- ▶C▶ 8. Clutch coil
9. Shims
◀C▶ ▶B▶ 10. Bearing
11. Snap ring
◀D▶ ▶A▶ 12. Lip seal
13. O-ring
14. High pressure relief valve

**DISASSEMBLY SERVICE POINTS****◀A▶ REFRIGERANT-TEMPERATURE SWITCH REMOVAL**

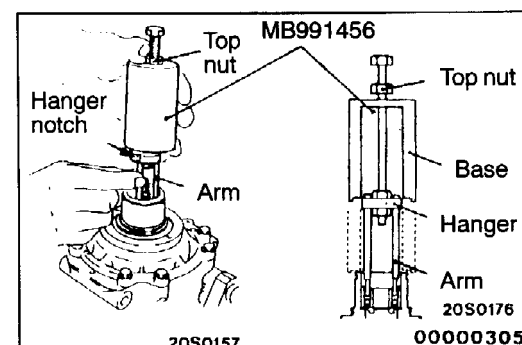
- (1) Remove the compressor fitting block.
- (2) Disconnect the snap ring from the inside of the fitting block to remove the refrigerant-temperature switch.

**◀B▶ NUT REMOVAL****◀C▶ BEARING REMOVAL**

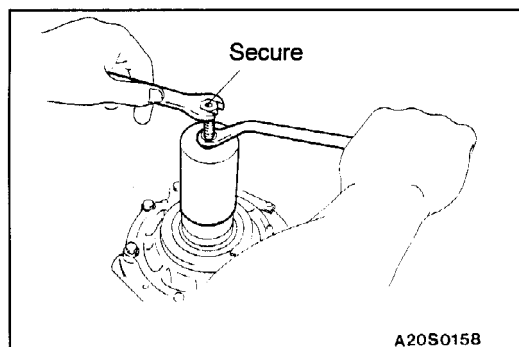
- (1) Use a pointed tool such as an awl to remove the bearing cover and retainer.



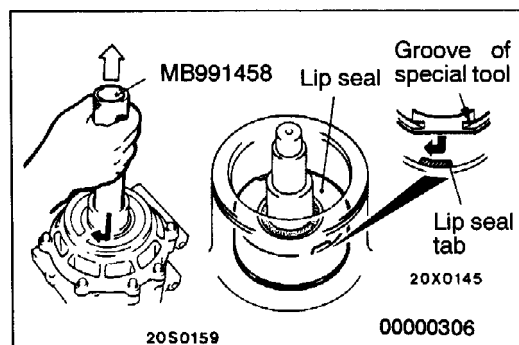
- (2) Insert the arms (3) of the special tool into the bearing groove at regular intervals.
- (3) Turn the arms 90° to secure the arms to the bearing.



- (4) Set the 3 arms installed to the bearing into the notches (3 places) located on the hanger of the special tool.
- (5) Lower the base of the special tool to cover the hanger, and tighten the top nut until it touches the base.

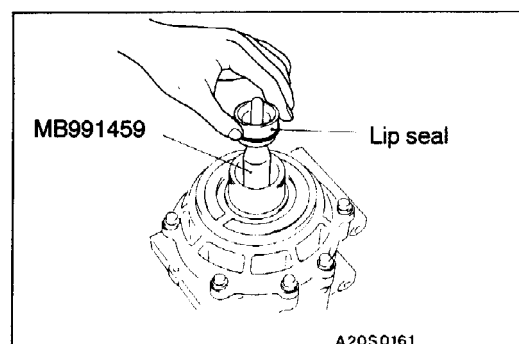


- (6) Next, with the bolt of the special tool secured, tighten the nut, and remove the bearing from the compressor.



◀D▶ LIP SEAL REMOVAL

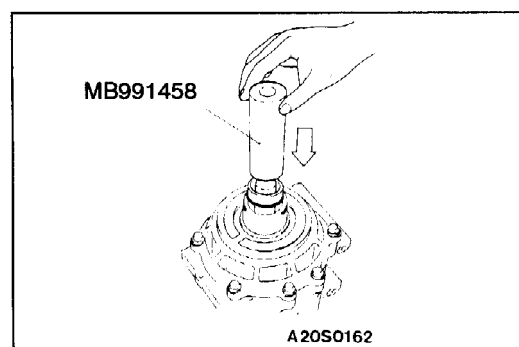
Catch the groove of the special tool on the lip seal tab, and slowly pull the lip seal straight upwards.



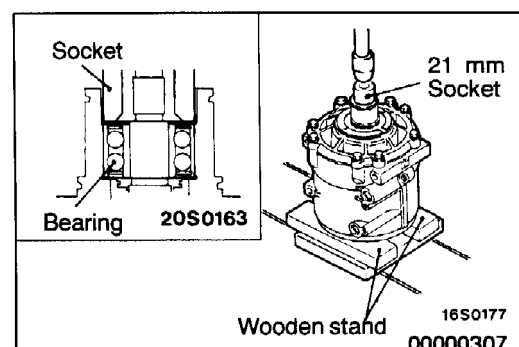
REASSEMBLY SERVICE POINTS

▶A◀ LIP SEAL INSTALLATION

- (1) Install the special tool to the compressor crankshaft.
- (2) Apply compressor oil to the sliding surface of the lip seal and the O-ring, and insert the lip seal.

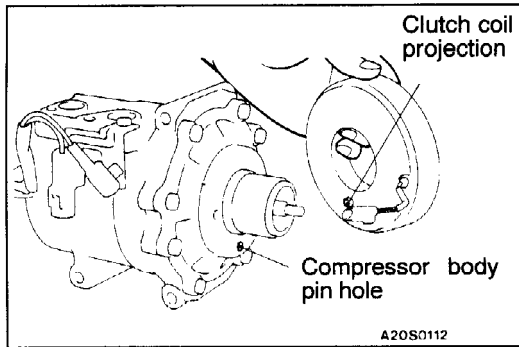


- (3) Use the special tool to insert the lip seal.



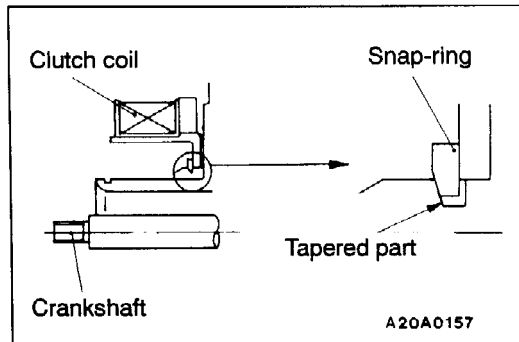
▶B◀ BEARING INSTALLATION

Use a wooden stand and a 21 mm socket to insert the bearing into the compressor.



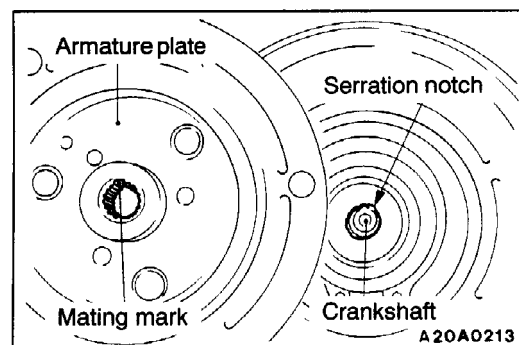
►C◄ CLUTCH COIL INSTALLATION

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.



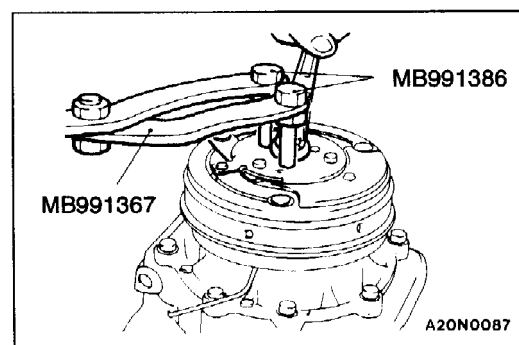
►D◄ SNAP RING INSTALLATION

Install the snap ring so that the tapered surface is at the outer side.

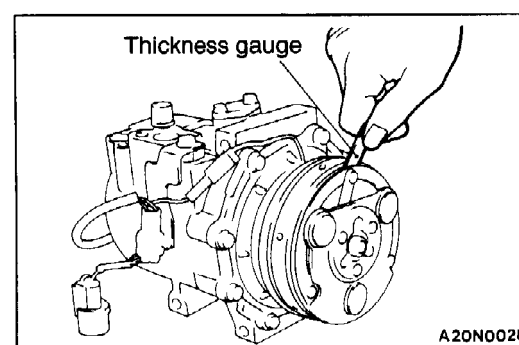


►E◄ ARMATURE PLATE INSTALLATION

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



►F◄ NUT INSTALLATION



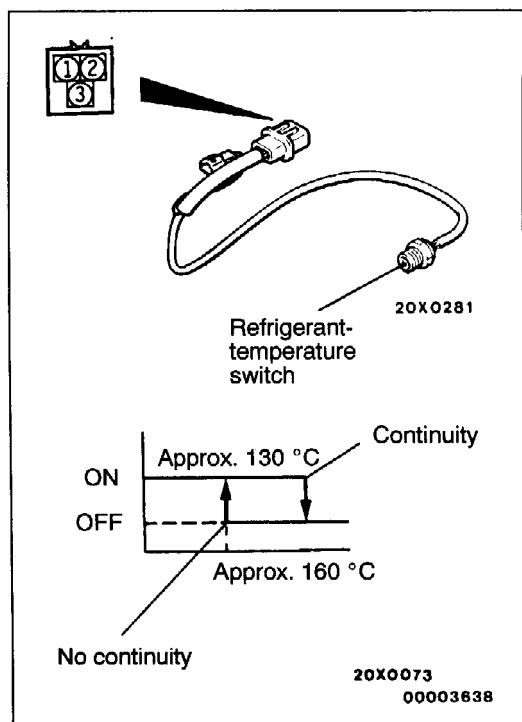
►G◄ AIR GAP ADJUSTMENT

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

Standard value: 0.4–0.65 mm

NOTE

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



INSPECTION

55200470073

REFRIGERANT-TEMPERATURE SWITCH CONTINUITY CHECK

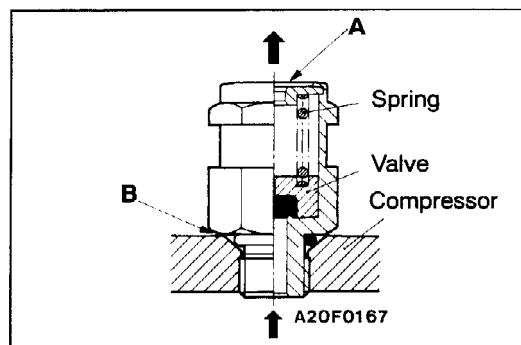
- (1) Immerse the refrigerant-temperature switch in engine oil.
- (2) Use an ohmmeter to check the continuity between the terminals (1) or (2) when the engine oil has become heated.

Standard value:

Item	Temperature
Continuity (ON)	Less than approx. 160°C
No continuity (OFF)	Approx. 160°C or more [until the temperature drops to approx. 130°C when OFF]

Caution

Do not heat the oil more than necessary.



HIGH PRESSURE RELIEF VALVE CHECK

The high pressure relief valve is a safety feature which releases part of the refrigerant inside the system into the atmosphere when the high pressure level exceeds 3,740 kPa during air conditioning operation.

Once the pressure inside the system has been reduced to 2,940 kPa or lower, the high pressure relief valve closes, thus allowing continued operation.

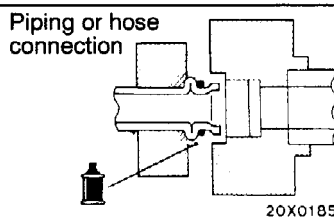
- (1) If a leak is detected at section A, replace the high pressure relief valve. The valve can be used unless there is a leak from that section.
- (2) If a leak is detected at section B, retighten the valve. If the leak persists after retightening the valve, replace the packing.

REFRIGERANT LINE

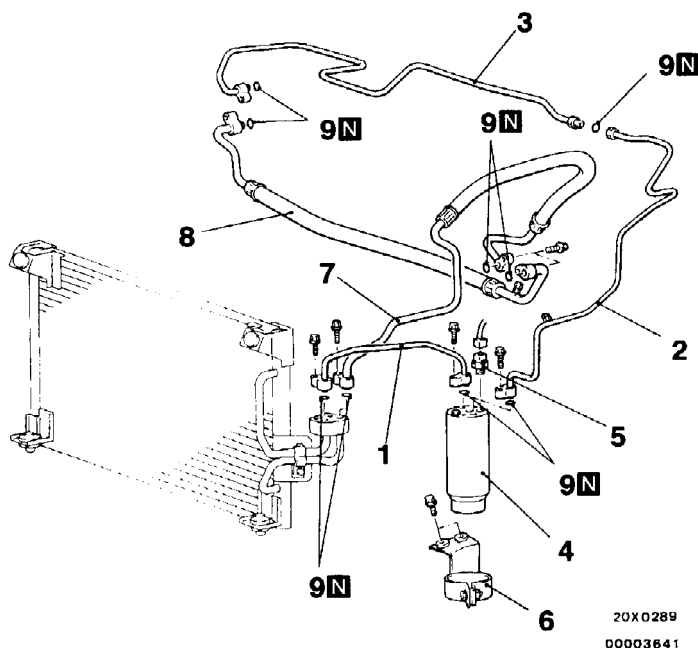
REMOVAL AND INSTALLATION

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

CAUTION
Plug refrigerant lines to prevent air from mixing
when disconnecting them.



Compressor oil: SUN PAG 56



Removal steps

1. Liquid pipe A
2. Liquid pipe B
3. Liquid pipe C
4. Receiver assembly
5. Dual pressure switch



6. Receiver bracket
7. Discharge hose
8. Suction hose
9. O-ring



INSTALLATION SERVICE POINT

▶A◀ SUCTION HOSE, RECEIVER ASSEMBLY INSTALLATION

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

Compressor oil: SUN PAG 56

Quantity:

Suction hose: 10 ml

Receiver: 10 ml

CONDENSER AND CONDENSER FAN MOTOR

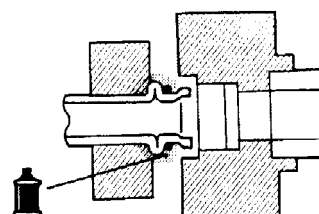
55200670107

REMOVAL AND INSTALLATION

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

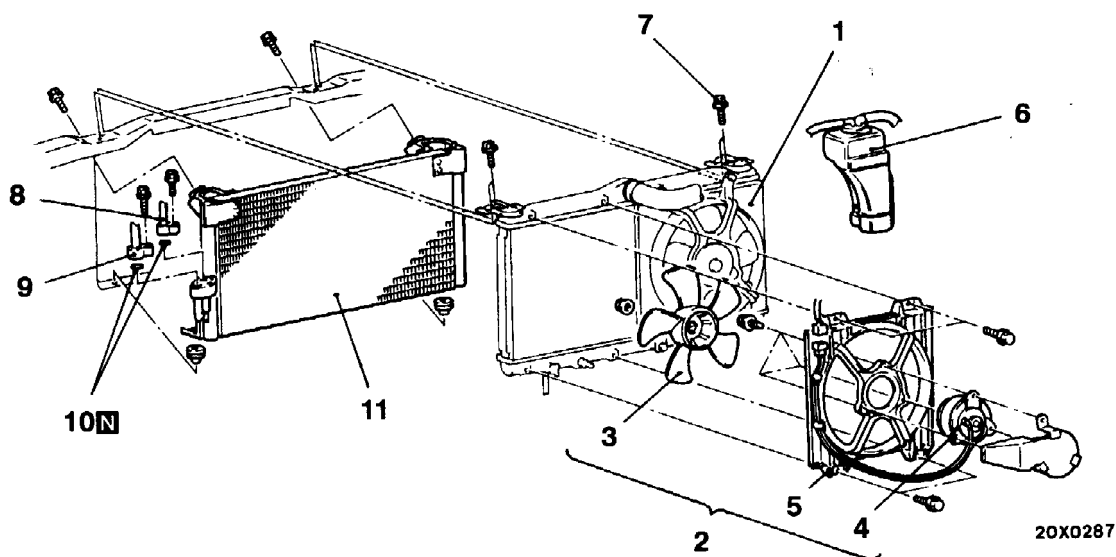
CAUTION
Plug refrigerant lines to prevent air from mixing
when disconnecting them.

Piping or hose connection



20X0185

Compressor oil: SUN PAG 56



00003643

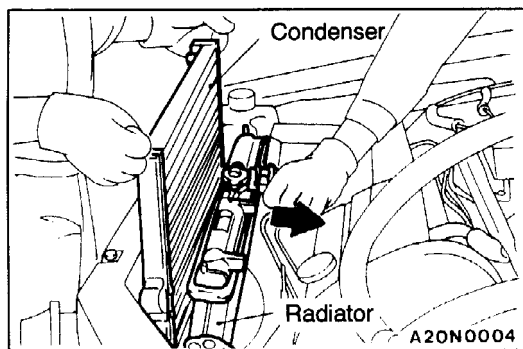
Condenser removal steps

1. Radiator fan motor assembly
(Refer to GROUP 14.)
2. Condenser fan motor and shroud
assembly
6. Reserve tank
7. Upper insulator installation bolts
8. Liquid pipe A
9. Discharge hose
10. O-ring
11. Condenser

Condenser fan motor removal steps

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



**REMOVAL SERVICE POINT****◀A▶ CONDENSER REMOVAL**

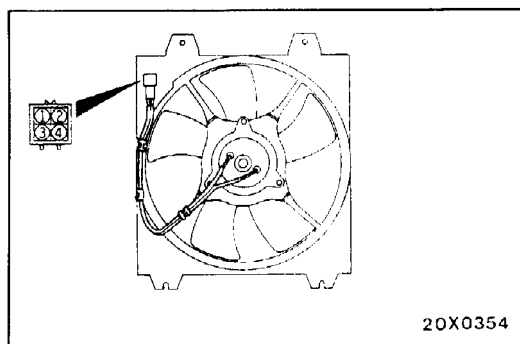
Move the radiator to the engine side and then lift up the condenser to remove it.

INSTALLATION SERVICE POINT**▶A◀ CONDENSER INSTALLATION**

When replacing the condenser with a new one, refill the condenser with a specified amount of compressor oil.

Compressor oil: SUN PAG 56

Quantity: 15 ml

**INSPECTION**

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CONDENSER FAN MOTOR CHECK

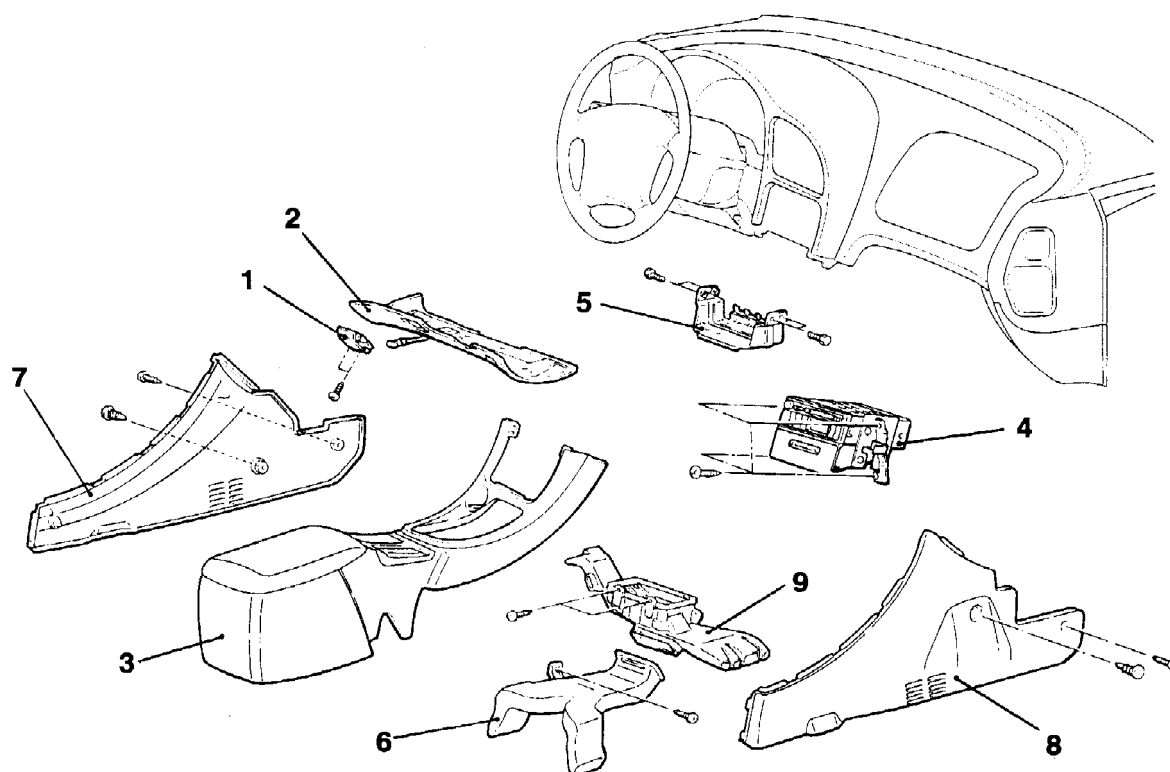
- (1) Check that the condenser fan motor operates when battery voltage (+) is applied to terminal 1 and terminal 4 is grounded (-).
- (2) In this same condition, apply battery (+) voltage to terminal 3 and grounded terminal 2. Check that the condenser fan motor operates faster at this time.

VENTILATORS (FLOOR)

55300220060

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 other components.



A16X1284

Foot distribution duct removal steps

1. Hood lock release handle
2. Driver's side under cover
3. Floor console (Refer to GROUP 52A.)
4. Radio and tape player (Refer to GROUP 54.)
5. Relay bracket
6. Semi rear heater duct
7. Console side cover (L.H.)
8. Console side cover (R.H.)
9. Foot distribution duct

Semi rear heater duct removal steps

3. Floor console (Refer to GROUP 52A.)
4. Radio and tape player (Refer to GROUP 54.)
5. Relay bracket
6. Semi rear heater duct

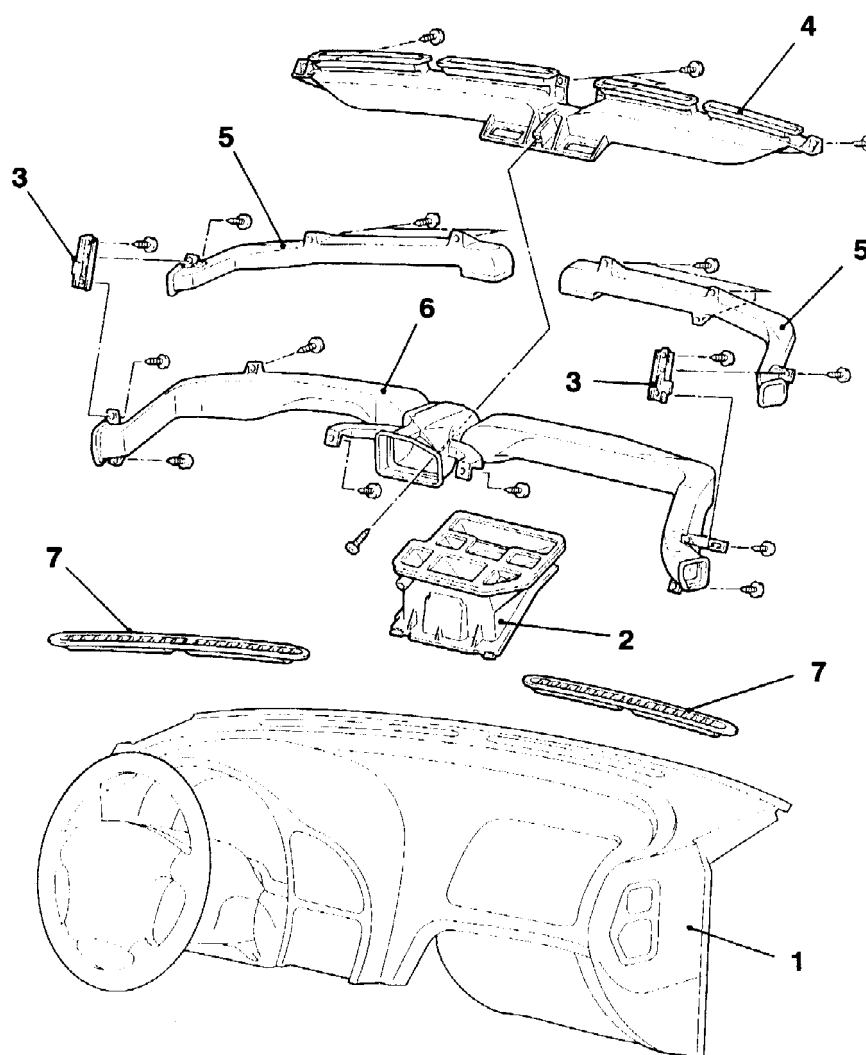
VENTILATORS (INSTRUMENT PANEL)

55300130066

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 other components.



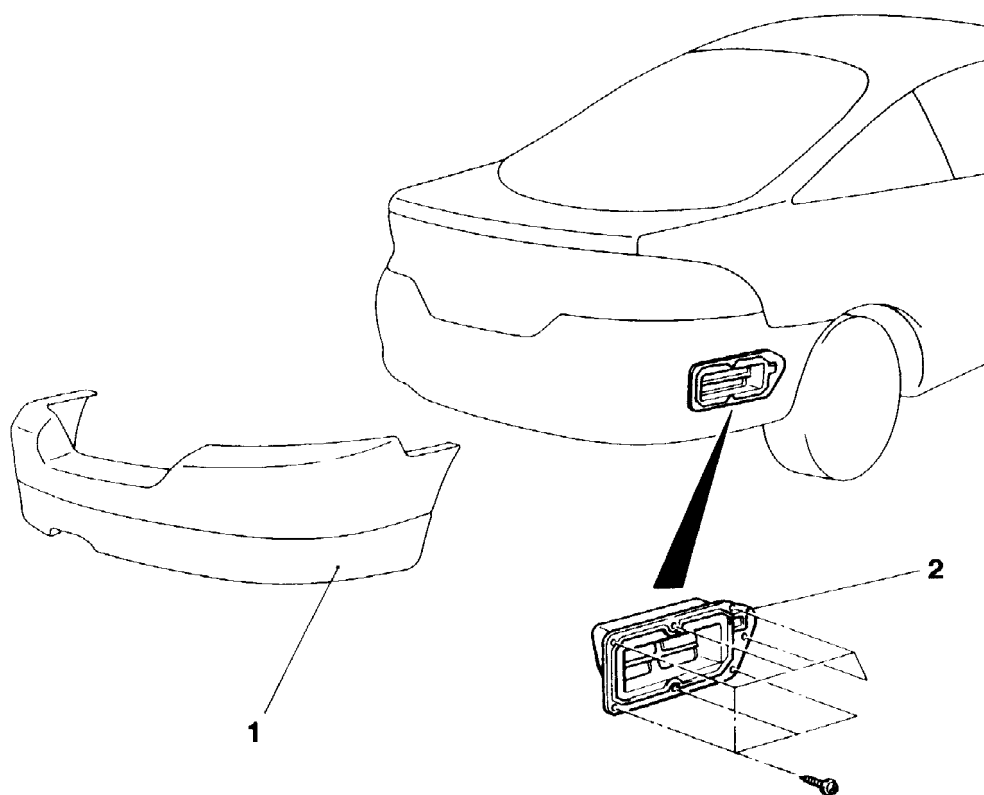
A20X0362

Removal steps

1. Instrument panel (Refer to GROUP 52A.)
2. Centre duct
3. Duct bracket
4. Defroster nozzle
5. Side defroster hose
6. Air duct
7. Defroster garnish

VENTILATORS (AIR OUTLET)

55300250038

REMOVAL AND INSTALLATION

A20X0269

Removal steps

1. Rear bumper
(Refer to GROUP 51.)
2. Rear ventilation duct

NOTE

For the front deck garnish, refer to GROUP 51 – Windshield Wiper and Washer.

NOTES