HEATER, AIR CONDITIONER AND VENTILATION

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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: impact sensors, SRS diagnosis unit, 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 (*).

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GENERAL INFORMATION

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FRONT HEATER

The front heater system uses a three-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.

REAR HEATER

Two types of rear heater system are used: a built-in type which is installed in the under floor, and an under seat type which is installed in the rear floor.

SINGLE A/C

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.

DUAL A/C

The rear A/C unit is installed below the rear floor, and the main switch is provided at both the driver's seat and the rear seat so that operation can be from either position.
The overhead dual A/C is constructed so that it mounts on the ceiling and blows cool air from the ceilig to the passenger seats.

Items		Specifications
Front heater unit		Three-way-flow full-air-mix system
Rear heater unit	Built-in type	Air-mix system
	Under seat type	General-purpose water temperature type
Front heater performance kJ/h		18,837
Rear heater performance kJ/h	Built-in type	13,814
	Under seat type	12,558
Compressor model	Single A/C	Inclined-plate type <DKS-15CH>
	Dual A/C	Scroll type <MSC-130CV>
Front A/C cooling performance kJ/h	Single A/C	17, 581
	Dual A/C	18,000
Rear A/C cooling performance kJ/h	Built-in type	11,721
	Overhead type	8,372

SAFETY PRECAUTIONS

120000484

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.
Ozone filters out harmful radiation from the sun. To assist in protecting the ozone layer, Mitsubishi Motors Corporation recommends an R-134a refrigerant recycling device.
Refrigerant R-134a is transparent and colorless 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
1. **A leak detector for designed 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.

SERVICE SPECIFICATIONS

120002256

Items		Standard value	Remarks
Idle speed r/min.	4G63–M/T	700±50	"N" range
	4G63–A/T	750±50	"P" range
	4G64	800±50	"N" or "P" range
	4D56	750±30	
Idle-up speed r/min.	4G63	850–950	
	4D56	900–1,000	
Idle-up solenoid valve Ω		Approx. 40	–
Resistor (for blower motor) Ω	HI–LO	1.96±7%	Between terminals 2–3
	HI–ML	0.95±7%	Between terminals 2–1
	HI–MH	0.33±7%	Between terminals 2–4
Resistor (for air outlet changeover damper motor potentiometer) kΩ		Approx. 1–3	Between terminals 6–8 or Between terminals 7–8
Resistor (for pseudo signal) (Vehicles with overhead A/C) kΩ		4.7	–
Resistor (for rear blower motor – Built-in type) Ω	HI–LO	1.56±7%	Between terminal 4–3
	HI–ML	0.86±7%	Between terminals 4–6
	HI–MH	0.44±7%	Between terminals 4–5
Resistor (for rear blower motor – Under seat type) Ω		Approx. 1.7	Between terminals 2–3
Air gap (Magnetic clutch) mm		0.3–0.6	–
Engine coolant temperature switch (for A/C cut-off) °C	ON (continuity)	108 or less	–
	OFF (no continuity)	112–118 or more	–
Engine coolant temperature switch (for condenser fan) <4D56> °C	ON (continuity)	100–104 or more	–
	OFF (no continuity)	97 or less	–
Engine coolant temperature switch (for condenser fan) <4G63, 4G64> °C	ON (continuity)	99–105 or more	–
	OFF (no continuity)	95 or less	–

LUBRICANTS

120002657

Items		Quantity	Specified lubricants
Single A/C	Compressor refrigerant unit lubricant mℓ	180	ZXL 100PG
	Each connection of refrigerant line	As required	
	Refrigerant g	Approx. 650	R134a (HFC-134a)
Dual A/C	Compressor refrigerant unit lubricant mℓ	240	SUN PAG 56
	Each connection of refrigerant line Lip seal of the compressor	As required	
	Refrigerant g	Approx. 950	R134a (HFC-134a)

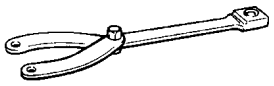
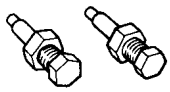
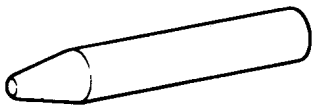
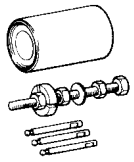
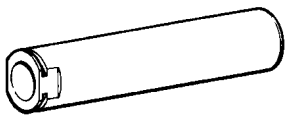
SEALANT

120000487

Item	Specified sealant	Remark
Engine coolant temperature switch threaded part	3M Nut Locking Part No. 4171 or equivalent	Drying sealant

SPECIAL TOOLS

120000488

Tool	Number	Name	Use
	MB991367	Special spanner	Removal and installation of armature mounting nut of compressor
	MB991386	Pin	
	MB991459	Lip seal installer guide	Installation of lip seal <Dual A/C>
	MB991456	Bearing puller	Removal of compressor bearing <Dual A/C>
	MB991458	Lip seal installer and remover	Removal and installation of lip seal <Dual A/C>

TROUBLESHOOTING

120002257

TROUBLESHOOTING PROCEDURE

(1) Check that the air ducts and rods are not off.
(2) Check that the connectors are connected securely and that there are no blown fuses.
(3) In carrying out the troubleshooting procedure, first look up the Troubleshooting Quick-Reference Chart to know the inspection items and then start the inspection procedure detailed in the following pages.
(4) When checking components, be sure to disconnect the connectors first.

TROUBLESHOOTING QUICK-REFERENCE CHART

1. Front Heater and Front A/C

Inspection item	Trouble symptom 1	Trouble symptom 2	Trouble symptom 3
	When the ignition switch is "ON", the A/C does not operate.	When the A/C is operating, temperature inside the passenger compartment doesn't decrease (cool air is not emitted).	Blower fan and motor don't turn.
Fuse	1		1
Connector (including harness)	2		2
Refrigerant amount	3	1	
A/C compressor relay	4	7	
Magnetic clutch	5	8	
Dual pressure switch	6	2	
Front A/C switch	7		
Front blower motor relay			3
Front blower motor			4
Front blower switch	8		5
Resistor (for front blower motor)			6
Front air thermo sensor	9	3	
Thermostat <Single A/C>	10	4	
Refrigerant temperature switch <Dual A/C>	11	5	
Engine coolant temperature switch <for A/C cut-off>	12	6	
Front magnetic valve <Dual A/C>	13	9	
A/C-ECU <Dual A/C>	14	10	
Engine ECU <Petrol-powered vehicles>	15		

NOTE
Numbers indicate the inspection order.

Trouble symptom	Problem cause	Remedy	Reference page
When the ignition switch is "ON", the A/C does not operate.	1. Fuse blown	Replace the fuse	–
	2. Harness or connector is defective	Repair the harness or connector	–
	3. Refrigerant leak or overfilling of refrigerant	Replenish the refrigerant, repair the leak or take out some of the refrigerant	P.55-17, 20
	4. A/C compressor relay is defective	Replace A/C compressor relay	P.55-24
	5. Magnetic clutch is defective	Replace the armature plate, rotor or clutch coil	P.55-63, 65
	6. Dual pressure switch is defective	Replace the dual pressure switch	P.55-24, 73, 74
	7. Front A/C switch is defective	Replace the front A/C switch	P.55-30, 31
	8. Front blower switch is defective	Replace the front blower switch	P.55-30, 33
	9. Front air thermo sensor is defective	Replace the front air thermo sensor	P.55-39
	10. Thermostat is defective <Single A/C>	Replace the thermostat	P.55-39
	11. Refrigerant temperature switch is defective <Dual A/C>	Replace the A/C compressor assembly	P.55-62, 67
	12. Engine coolant temperature switch (for A/C cut-off) is defective	Replace the engine coolant temperature switch	P.55-80
	13. Front magnetic valve is defective <Dual A/C>	Replace the front magnetic valve	P.55-74, 78
	14. A/C-ECU is defective <Dual A/C>	Replace the A/C-ECU	P.55-15, 37
	15. Engine ECU is defective <Petrol-powered vehicles>	Replace the engine ECU	–
When the A/C is operating, temperature inside the passenger compartment doesn't decrease (cool air is not emitted).	1. Refrigerant leak	Replenish the refrigerant and repair the leak	P.55-17
	2. Dual pressure switch is defective	Replace the dual pressure switch	P.55-24, 73, 74
	3. Front air thermo sensor is defective	Replace the front air thermo sensor	P.55-39
	4. Thermostat is defective <Single A/C>	Replace the thermostat	P.55-39
	5. Refrigerant temperature switch is defective <Dual A/C>	Replace the A/C compressor assembly	P.55-62, 67
	6. Engine coolant temperature switch (for A/C cut-off) is defective	Replace the engine coolant temperature switch	P.55-80, 81

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).	7. A/C compressor relay is defective	Replace the A/C compressor relay	P.55-24
	8. Magnetic clutch is defective	Replace the armature plate, rotor or clutch coil	P.55-63, 65
	9. Front magnetic valve is defective <Dual A/C>	Replace the front magnetic valve	P.55-74, 78
	10. A/C-ECU is defective	Replace the A/C-ECU	P.55-15, 37
Blower fan and motor don't turn.	1. Fuse blown	Replace the fuse.	–
	2. Harness or connector is defective	Repair the harness or connector	–
	3. Front blower motor relay is defective	Replace the front blower motor relay	P.55-25
	4. Front blower motor is defective	Replace the front blower motor	P.55-35, 36
	5. Front blower switch is defective	Replace the front blower switch	P.55-30, 31, 33
	6. Resistor (for front blower motor) is defective	Replace the resistor	P.55-35, 36

2. Rear Heater and Rear A/C (Built-in Type)

Inspection item	Trouble symptom 1	Trouble symptom 2	Trouble symptom 3	Trouble symptom 4
	Rear A/C does not operate independently.	When the A/C is operating, temperature inside the passenger compartment doesn't decrease (cool air is not emitted).	Blower fan and motor don't turn.	Blower change-over is not possible.
Connector (including harness)	1	1	1	1
Rear A/C switch	2			
Rear blower motor relay	3		2	
Rear magnetic valve	4	2		
Rear air thermo sensor	5	3		
Resistor (for rear blower motor)				2
Rear blower motor			3	4
Rear blower switch			4	3
Rear heater switch (rear panel side)	6		5	
Rear heater switch (front panel side)	7		6	
A/C-ECU	8	4		

NOTE
Numbers indicate the inspection order.

Trouble symptom	Problem cause	Remedy	Reference page
Rear A/C does not operate independently.	1. Harness or connector is defective	Repair the harness or connector	–
	2. Rear A/C switch is defective	Replace the rear A/C switch	P.55-40, 41
	3. Rear blower motor relay is defective	Replace the rear blower motor relay	P.55-25
	4. Rear magnetic valve is defective	Replace the rear magnetic valve	P.55-75, 78
	5. Rear air thermo sensor is defective	Replace the rear air thermo sensor	P.55-45, 46
	6. Rear heater switch (rear panel side) is defective	Replace the rear heater switch (rear panel side)	P.55-40, 41
	7. Rear heater switch (front panel side) is defective	Replace the rear heater switch (front panel side)	P.55-30, 31
	8. A/C-ECU is defective	Replace the A/C-ECU	P.55-15, 37
When the A/C is operating, temperature inside the passenger compartment doesn't decrease (cool air is not emitted).	1. Harness or connector is defective.	Repair the harness or connector	–
	2. Rear magnetic valve is defective	Replace the rear magnetic valve	P.55-75, 78
	3. Rear air thermo sensor is defective	Replace the rear air thermo sensor	P.55-45, 46
	4. A/C-ECU is defective	Replace the A/C-ECU	P.55-15, 37

Trouble symptom	Problem cause	Remedy	Reference page
Blower fan and motor don't turn.	1. Harness or connector is defective	Repair the harness or connector	–
	2. Rear blower motor relay is defective	Replace the rear blower motor relay	P.55-25
	3. Rear blower motor is defective	Replace the rear blower motor	P.55-52, 53
	4. Rear blower switch is defective	Replace the rear blower switch	P.55-40, 41
	5. Rear heater switch (rear panel side) is defective	Replace the rear heater switch (rear panel side)	P.55-40, 41
	6. Rear heater switch (front panel side) is defective	Replace the rear heater switch (front panel side)	P.55-30, 31
Blower changeover is not possible.	1. Harness or connector is defective	Repair the harness or connector	–
	2. Resistor (for rear blower motor) is defective	Replace the resistor	P.55-52, 53
	3. Rear blower switch is defective	Replace the rear blower switch	P.55-40, 41
	4. Rear blower motor is defective	Replace the rear blower motor	P.55-52, 53

3. Rear Heater (Under Seat Type)

Inspection item	Trouble symptom 1	Trouble symptom 2
	Blower fan and motor don't turn.	Air volume cannot be controlled in two steps.
Fuse blown	1	
Connection (including harness)	2	
Rear blower motor	3	
Rear heater switch	4	1
Rear blower resistor		2
Rear blower motor HI relay	5	3
Rear blower motor LO relay	6	4

NOTE
Numbers indicate the inspection order.

Trouble symptom	Problem cause	Remedy	Reference page
Blower fan and motor don't turn.	1. Fuse blown	Replace the fuse	–
	2. Harness or connector is defective	Repair the harness or connector	–
	3. Rear blower motor is defective	Replace the rear blower motor	P.55-55, 56
	4. Rear heater switch is defective	Replace the rear heater switch	P.55-30, 31
	5. Rear blower motor HI relay is defective	Replace the rear blower motor HI relay	P.55-25
	6. Rear blower motor LO relay is defective	Replace the rear blower motor LO relay	P.55-55, 56

Trouble symptom	Problem cause	Remedy	Reference page
Air volume cannot be controlled in two steps.	1. Rear heater switch is defective	Replace the rear heater switch	P.55-30, 31
	2. Rear blower resistor is defective	Replace the rear blower resistor	P.55-55
	3. Rear blower motor HI relay is defective	Replace the rear blower motor HI relay	P.55-25
	4. Rear blower motor LO relay is defective	Replace the rear blower motor LO relay	P.55-55, 56

4. Rear A/C (Overhead type)

Inspection item	Trouble symptom 1	Trouble symptom 2	Trouble symptom 3	Trouble symptom 4
	Rear cooler does not operate independently.	Temperature cannot be controlled by the blower air temperature control switch.	Blower fan and motor don't turn.	Blower changeover is not possible.
Fuse	1		1	
Connector (including harness)	2	1	2	1
Rear A/C switch	3		3	
Rear blower motor relay	4		4	
Resistor (for pseudo signal)	5	2		
Rear magnetic valve	6	3		
Rear air thermo sensor	7	4		
Blower air temperature control switch		5		
Resistor (for rear blower motor)				2
Rear blower motor			5	4
Rear blower switch			6	3
Rear cooler ECU	8	6		
A/C-ECU	9	7		

NOTE
Numbers indicate the inspection order.

Trouble symptom	Problem cause	Remedy	Reference page
Rear cooler does not operate independently.	1. Fuse blown	Replace the fuse	–
	2. Harness or connector is defective	Repair the harness or connector	–
	3. Rear A/C switch is defective	Replace the rear evaporator assembly	P.55-47, 48, 49
	4. Rear blower motor relay is defective	Replace the rear evaporator assembly	P.55-47, 48, 49
	5. Resistor (for pseudo-signal) is defective	Replace the resistor (for pseudo signal)	P.55-37, 38
	6. Rear magnetic valve is defective	Replace the rear magnetic valve	P.55-76, 77, 78
	7. Rear air thermo sensor is defective	Replace the rear evaporator assembly	P.55-47, 48, 49
	8. Rear cooler ECU is defective	Replace the rear evaporator assembly	P.55-47, 48, 49
	9. A/C-ECU is defective	Replace the A/C-ECU	P.55-15, 37
Temperature cannot be controlled by the blower air temperature control switch.	1. Harness or connector is defective	Repair the harness or connector	–
	2. Resistor (for pseudo-signal) is defective	Replace the resistor (for pseudo signal)	P.55-37, 38
	3. Rear magnetic valve is defective	Replace the rear magnetic valve	P.55-76, 77, 78
	4. Rear air thermo sensor is defective	Replace the rear evaporator assembly	P.55-47, 48, 49
	5. Blower air temperature control switch is defective	Replace the rear evaporator assembly	P.55-47, 48, 49
	6. Rear cooler ECU is defective	Replace the rear evaporator assembly	P.55-47, 48, 49
	7. A/C-ECU is defective	Replace the A/C-ECU	P.55-15, 37
Blower fan and motor don't turn.	1. Fuse blown	Replace the fuse	–
	2. Harness or connector is defective	Repair the harness or connector	–
	3. Rear A/C switch is defective	Replace the rear evaporator assembly	P.55-47, 48, 49
	4. Rear blower motor relay is defective	Replace the rear evaporator assembly	P.55-47, 48, 49
	5. Rear blower motor is defective	Replace the rear evaporator assembly	P.55-47, 48, 49
	6. Rear blower switch is defective	Replace the rear evaporator assembly	P.55-47, 48, 49
Blower changeover is not possible.	1. Harness or connector is defective	Repair the harness or connector	–
	2. Resistor (for rear blower motor) is defective	Replace the resistor	P.55-37, 38
	3. Rear blower switch is defective	Replace the rear evaporator assembly	P.55-47, 48, 49
	4. Rear blower motor is defective	Replace the rear evaporator assembly	P.55-47, 48, 49

5. A/C Auxilary Components

Inspection item	Trouble symptom 1	Trouble symptom 2	Trouble symptom 3
	Front condenser fan motor doesn't turn.	When the A/C is operating, side condenser fan does not turn. <Dual A/C>	When the A/C is operating, idle engine speed doesn't rise. <4G63, 4D56>
Fuse	1	1	
Connector (including harness)	2	2	1
Front condenser fan relay	3		
Side condenser fan relay		3	
Front condenser fan motor	4		
Side condenser fan motor		4	
A/C-ECU	5	5	
Engine coolant temperature switch (for condenser fan)	6		
Idle-up solenoid valve <4G63, 4D56>			2

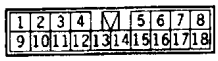
NOTE
Numbers indicate the inspection order.

Trouble symptom	Problem cause	Remedy	Reference page
Front condenser fan motor doesn't turn.	1. Fuse blown	Replace the fuse	–
	2. Harness or connector is defective	Repair the harness or connector	–
	3. Front condenser fan relay is defective	Replace the front condenser fan relay	P.55-24
	4. Front condenser fan motor is defective	Replace the front condenser fan motor	P.55-69, 70
	5. A/C-ECU is defective	Replace the A/C-ECU	P.55-15, 37
	6. Engine coolant temperature switch (for condenser fan) is defective	Replace the engine coolant temperature switch	P.55-80, 81
When the A/C is operating, side condenser fan does not turn. <Dual A/C>	1. Fuse blown	Replace the fuse	–
	2. Harness or connector is defective	Repair the harness or connector	–
	3. Side condenser fan relay is defective	Replace the side condenser fan relay	P.55-24
	4. Side condenser fan motor is defective	Replace the side condenser fan motor	P.55-71, 72
	5. A/C-ECU is defective	Replace the A/C-ECU	P.55-15, 37
When the A/C is operating, idle engine speed doesn't rise. <4G63, 4D56>	1. Harness or connector is defective	Repair the harness or connector	–
	2. Idle-up solenoid valve is defective	Replace the idle-up solenoid valve	P.55-28, 82

A/C-ECU TERMINALS INSPECTION <DUAL A/C>

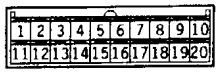
120002258

<Overhead type>



20W0241

<Built-in type>



20W0242

00000545

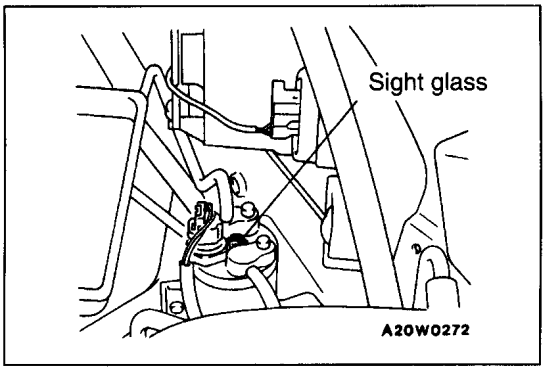
Terminal No.	Check Item	Check Condition	Normal Condition
1	Ignition switch input	When ignition switch is ON	System voltage
2	Front A/C switch input	When the ignition switch, front blower switch and front A/C switch are all ON	System voltage
3	Front magnetic valve	When ignition switch is ON	System voltage
4	A/C output	Turn off A/C.	0V
		Turn on A/C.	System voltage
5	Front condenser fan relay output (relay coil)	Turn off A/C.	0V
		Turn on A/C.	System voltage
6	Front compressor magnetic valve output	When the ignition switch, rear heater switch and rear A/C switch are all ON	0V (outputs during compressor capacity control only)
7	Engine coolant temperature sensor output	When lighting switch is ON	System voltage
8	Earth	At all times	Continuity
9	Earth	At all times	Continuity
10	Rear A/C switch input	When rear heater switch and rear A/C switch are ON	System voltage
11	Rear magnetic valve	When rear heater switch is ON	System voltage
12	Rear air thermo sensor power supply	When ignition switch is ON	2.4V
13	Rear air thermo sensor input	Sensor temperature is 25°C (4.0 kΩ)	2.4V
14	Front air thermo sensor input	Sensor temperature is 25°C (4.0 kΩ)	2.4V
15	Front air thermo sensor power supply	When ignition switch is ON	2.4V

SERVICE ADJUSTMENT PROCEDURES

120000492

COMPRESSOR DRIVE BELT ADJUSTMENT

Refer to GROUP 11 – Service Adjustment Procedures.

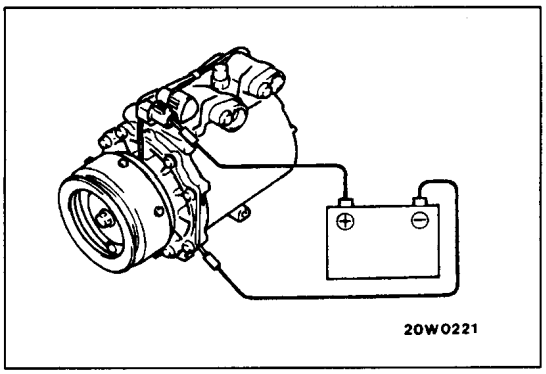


SIGHT GLASS REFRIGERANT LEVEL TEST

120000493

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 has to be recharged with refrigerant.



MAGNETIC CLUTCH TEST

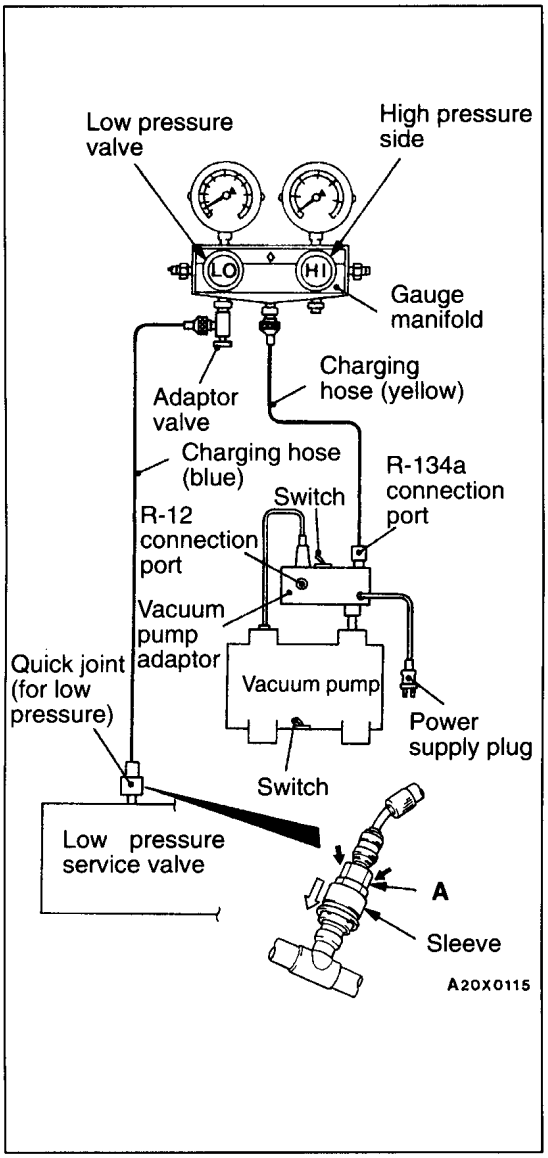
120000494

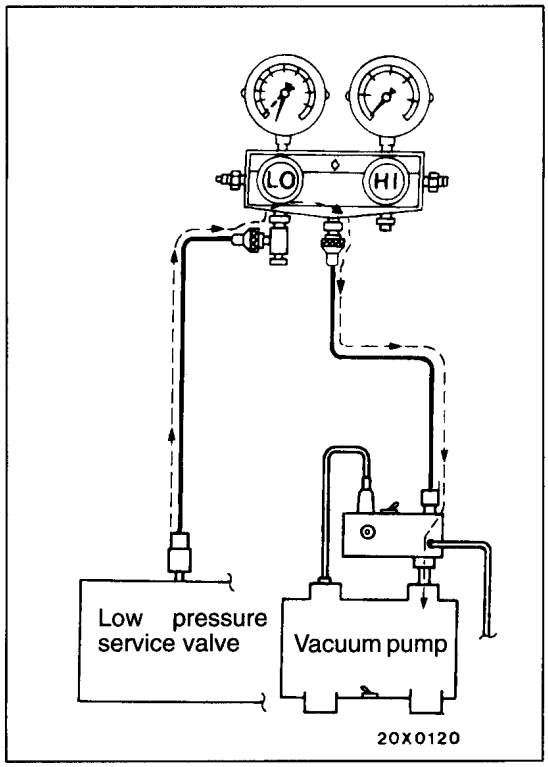
1. Disconnect the connector (1P) to the magnetic clutch.
2. Connect battery (+) voltage directly to the connector for the magnetic clutch.
3. If the magnetic clutch is normal, there will be a "click". If the pulley and armature do not make contact ('click'), there is a malfunction.

RECEIVER DRIER TEST

120000495

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





CHARGING

120000496

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.

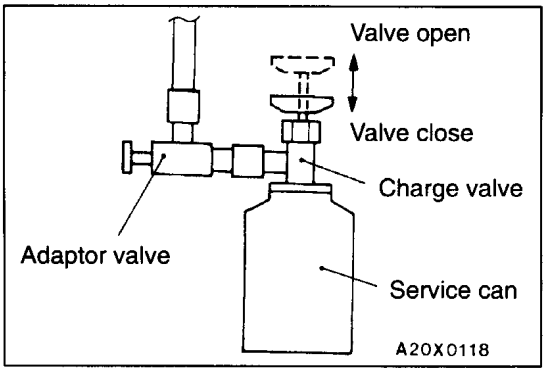
   Caution
   1. Use tools that are suited to R-134a.
   2. To install the quick joint, press section A firmly against the service valve until a click is heard. When connecting, run your hand along the hose while pressing to ensure that there are no bends in the hose.
5. Close the high and low pressure 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.

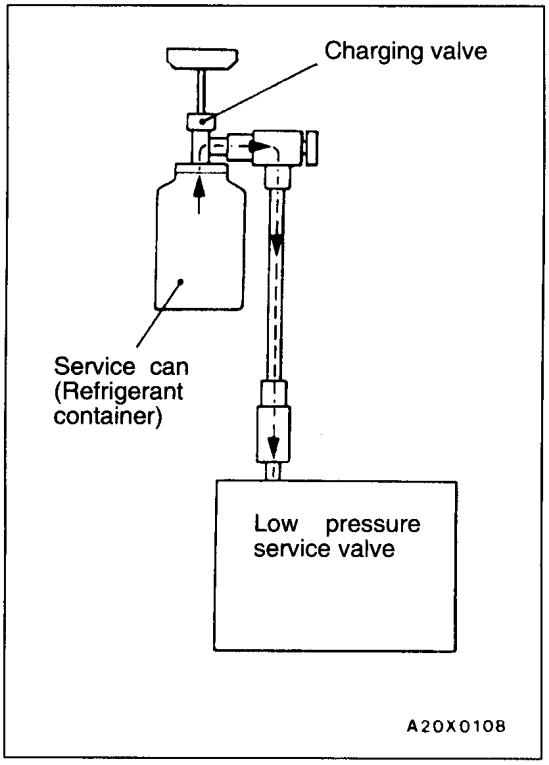
    Caution
    Do not operate the compressor for evacuation.
13. Evacuate to a vacuum reading of 100 kPa or higher (takes approx. 10 minutes).
14. Turn the vacuum pump adaptor switch OFF and allow to stand it for 5 minutes.

    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. With the handle turned back 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).

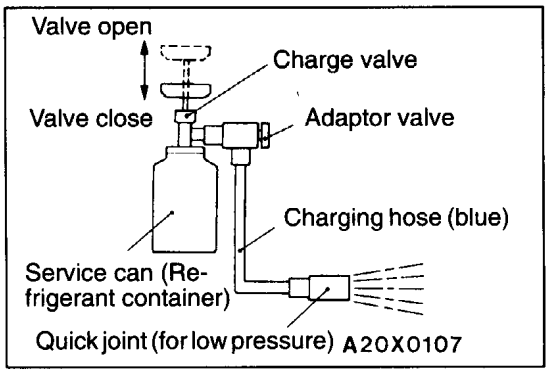
    Caution
    The leak detector for R-134a should be used.

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.

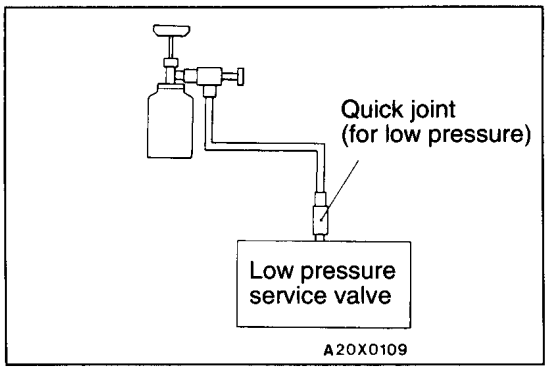
26. After charging with refrigerant, turn the handle of the adaptor valve back all the way (valve closed).
27. Tighten the charging valve handle (valve closed).
    Remove the quick joint (for low pressure) from the low-pressure service valve.

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



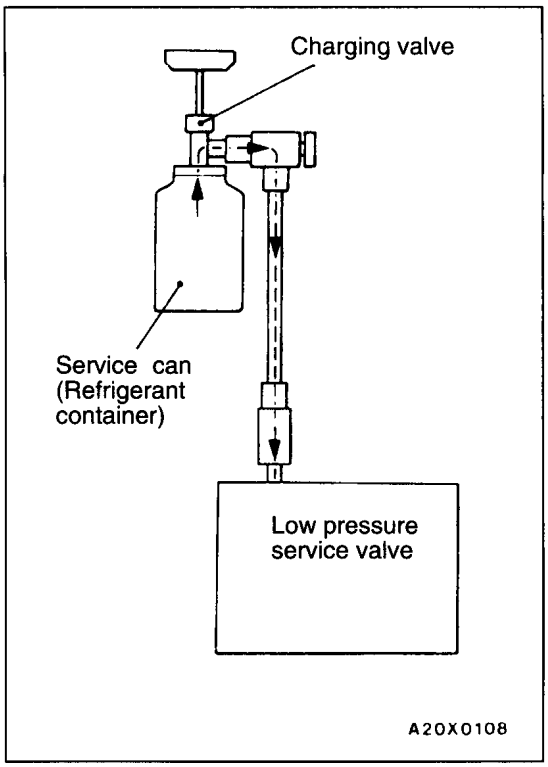
CORRECTING LOW REFRIGERANT LEVEL IN CASE THE SERVICE CAN IS USED

1. Install the charge valve with the handle turned all the way back (valve open) to the service can.
2. Install the adaptor value 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 piece 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.

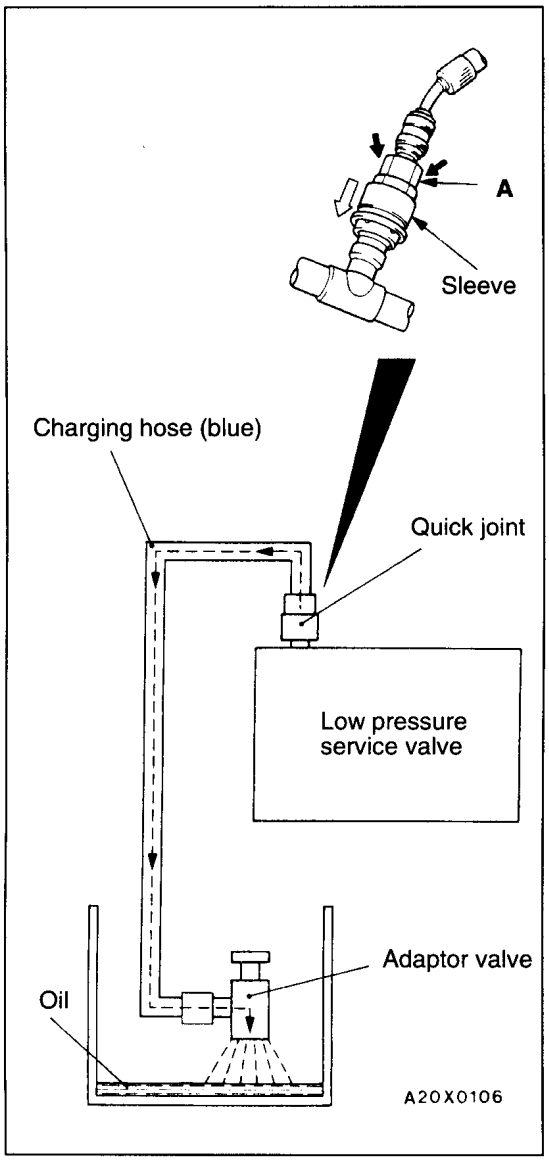


8. Start the engine.
9. Operate the air conditioner and set at the lowest temperature (MAX. COOL).
10. Fix the engine speed at 1,500 r/min..
11. Tighten the handle of the adaptor valve (valve open), and replenish refrigerant checking the quantity through the sight glass.

    Caution
    If the service can is inverted, liquid refrigerant may be drawn 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
    When there is remainder of refrigerant in the service can, keep it for next use with the charge value and the valve of the adaptor valve being closed.



DISCHARGING SYSTEM

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

   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 180 mℓ, 240 mℓ* of refrigerant oil.

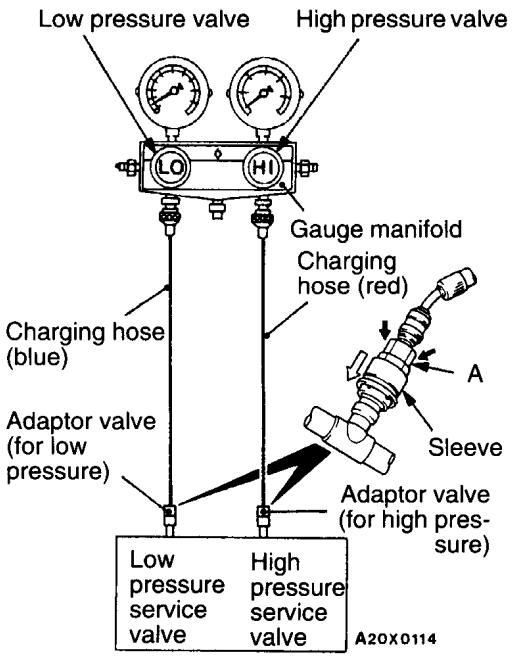
NOTE
*: For dual A/C

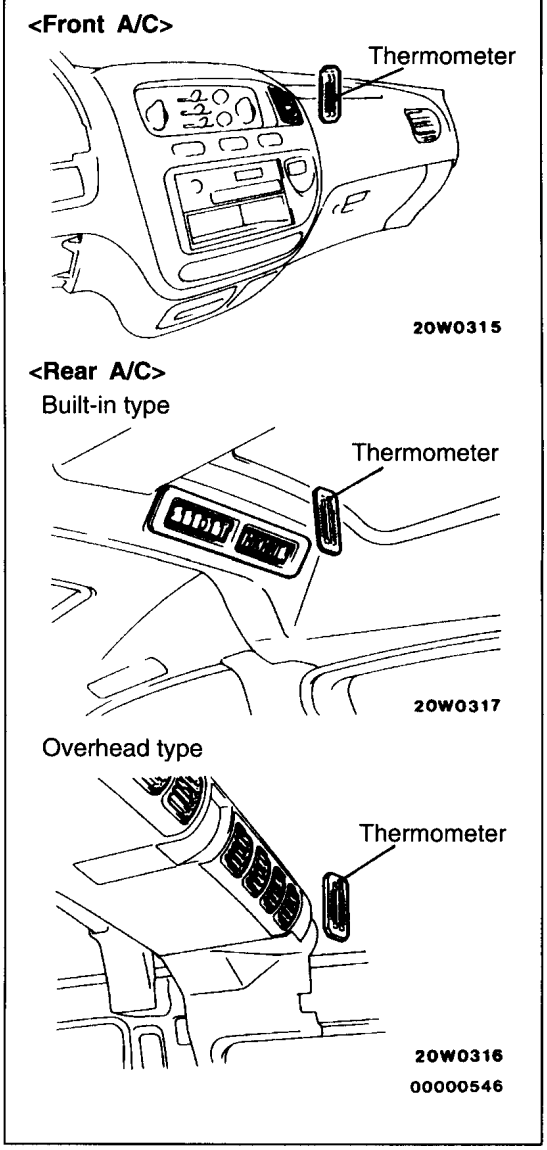
While the air conditioning system is in operation, the oil is carried through the entire system by the refrigerant.
Some of this oil will be trapped and retained in various parts of the system.
When the following system components are charged, it is necessary to add oil to the system to replace the oil being removed with the component.

Compressor oil:
- **Vehicles with single A/C ZXL 100PG**
- **Vehicles with dual A/C SUN PAG 56**

Quantity:

Item	Single A/C	Dual A/C
Evaporator mℓ	40	60
Condenser mℓ	40	60
Suction hose mℓ	10	10
Receiver mℓ	10	10





PERFORMANCE TEST 120000497

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 liquid pipe A 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 controls to the A/C 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 1,500 r/min. with A/C clutch engaged.
9. Engine should be warmed up with passenger side door open.
10. Insert a thermometer in the 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

SINGLE A/C

Garage ambient temperature °C	35
Discharge air temperature °C	12
Compressor discharge pressure kPa	1,843
Compressor suction pressure kPa	196

DUAL A/C

Type		Built-in type	Overhead type
Garage ambient temperature °C		35	35
Discharge air temperature °C	Front	10	10
	Rear	14	16
Compressor discharge pressure kPa		1,608	1,608
Compressor suction pressure kPa		245	245

REFRIGERANT LEAK REPAIR 120000498

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 saturate 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.

COMPRESSOR NOISE 120000499

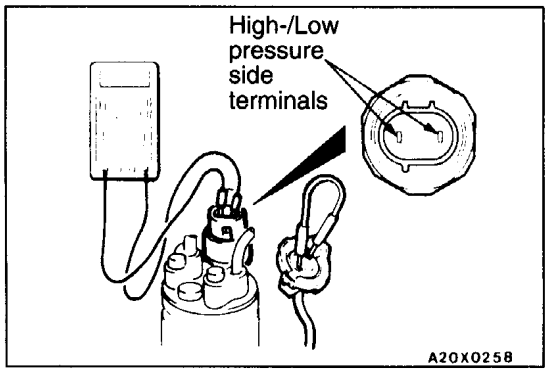
You must first know the conditions when the noise occurs. These conditions are: weather, vehicle speed, in gear or neutral, engine temperature or any other special conditions.
Noises that develop during A/C operation can often be misleading. For example: what sounds like a failed front bearing or connecting 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.

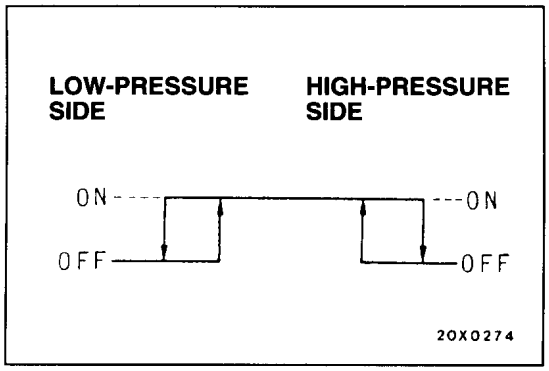
HANDLING TUBING AND FITTINGS

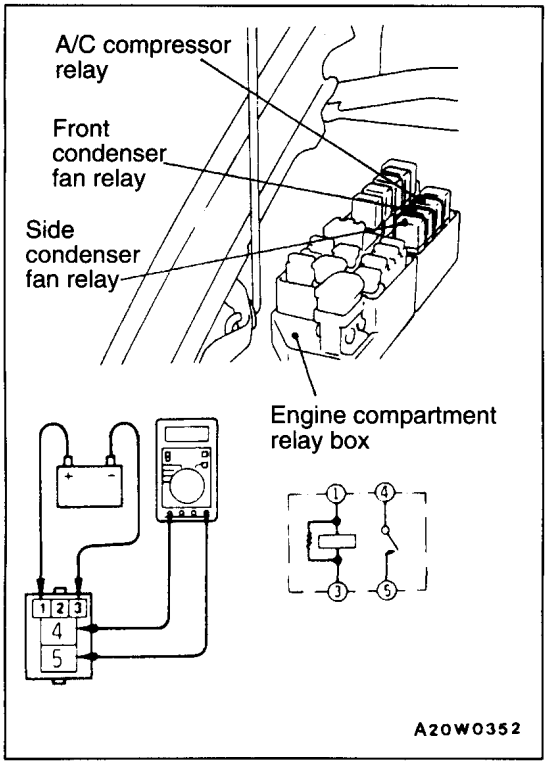
Kinks in the refrigerant tubing or sharp bends in the refrigerant hose lines will greatly reduce the capacity of the entire system. High pressures are produced in the system when it is operating. Extreme care must be exercised to make sure that all connections are pressure tight. Dirt and moisture can 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 of 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 to 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.
Unified plumbing connections with O-ring, these O-rings 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.
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. (See "Charging System".)
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.







DUAL PRESSURE SWITCH CHECK 120000500

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.

<Single A/C>

Switch position	OFF→ON	ON→OFF
Low-pressure side kPa	186	177
High-pressure side kPa	2,059	2,648

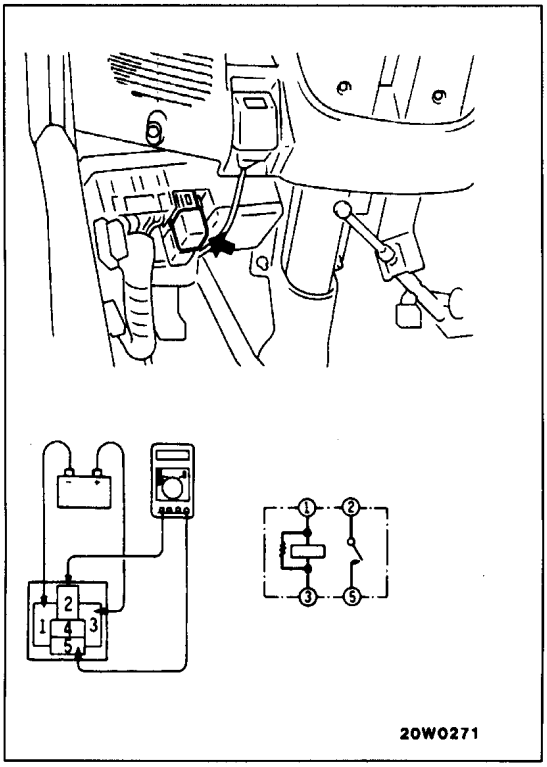
<Dual A/C>

Switch position	OFF→ON	ON→OFF
Low-pressure side kPa	221	196
High-pressure side kPa	2,549	3,138

POWER RELAY CHECK 120002259

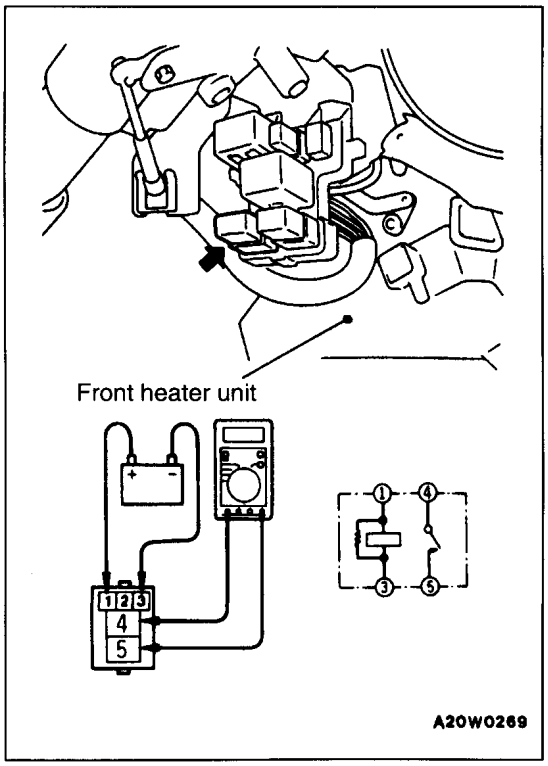
A/C COMPRESSOR RELAY, FRONT CONDENSER FAN RELAY AND SIDE CONDENSER FAN RELAY CONTINUITY INSPECTION

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



FRONT BLOWER MOTOR RELAY CONTINUITY INSPECTION

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



REAR BLOWER MOTOR RELAY <DUAL A/C (BUILT-IN TYPE)> REAR BLOWER MOTOR HI RELAY <DUAL A/C (OVERHEAD TYPE)> CONTINUITY INSPECTION

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

IDLE-UP OPERATION CHECK 120002260

<4G63>

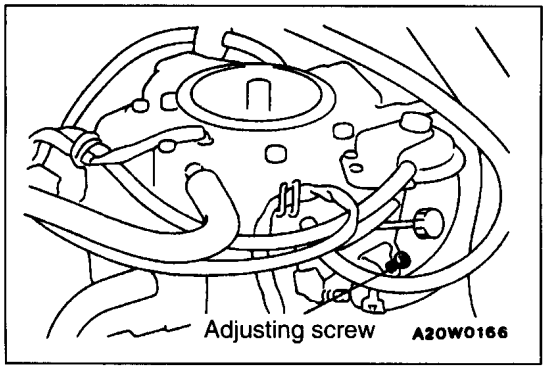
1. Before inspection and adjustment set vehicle in the following condition:
- Engine coolant temperature: 80–90°C
- Lights, electric cooling fan and accessories: Set to OFF
- Transmission: Neutral (N or P for vehicles with A/T)
- Steering wheel: Straight forward

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

   Standard value:
   700±50 r/min. <A/T>
   750±50 r/min. <M/T>

3. If there is a deviation of the idling speed from the standard value, make the adjustment of the idling speed. (Refer to GROUP 11 – Service Adjustment Procedures.)
4. Check to be sure that the idling speed becomes the standard value when the A/C switch is switched ON and the A/C is activated.

   Standard value: 850–950 r/min.



5. If there is a deviation of the idling speed from the standard value, adjust the idling speed by turning the adjusting screw for adjustment.

<4D56>

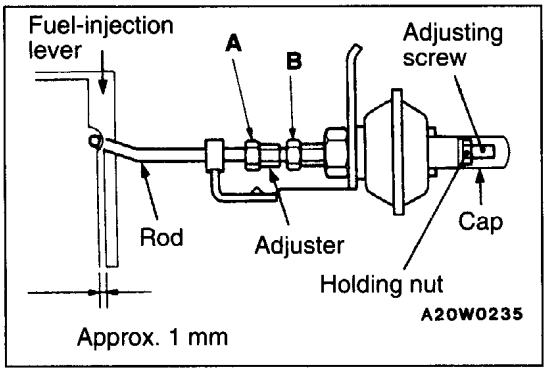
1. Before inspection and adjustment, set vehicle in the following condition:
- Engine coolant temperature: 80–90°C
- Lights, electric cooling fan and accessories: Set to OFF
- Transmission: Neutral
- Steering wheel: Straight forward

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

   Standard value: 750±30 r/min.

3. If there is a deviation of the idling speed from the standard value, make the adjustment of the idling speed. (Refer to GROUP 11 – Service Adjustment Procedures.)
4. Check to be sure that the idling speed becomes the standard value when the A/C switch is switched ON and the A/C is activated.

   Standard value: 900–1,000 r/min.

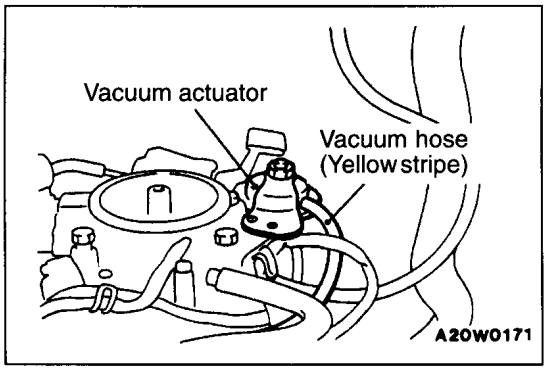


5. If there is a deviation of the idling speed from the standard value, make the adjustment of the idling speed by following the procedures described below.
   (1) Loosen nuts (A) and (B).
   (2) Adjust, by using the adjuster, so that the end of the vacuum actuator's rod is at the position indicated in the illustration.
   (3) Securely tighten nuts (A) and (B).
   (4) After activating the vacuum actuator, check to be sure that the rod and the lever do not contact when the activation is cancelled.
   (5) Remove the cap and loosen the nut for holding.
   (6) Adjust to the specified r/min. by turning the adjusting screw.
   (7) Securely tighten the holding nut, and then attach the cap.

<4G64>

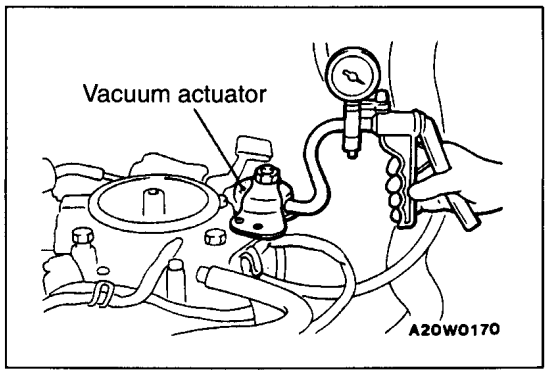
The idle speed is automatically controlled by the ISC system, and so need not be adjusted.

Standard value: 800±50 r/min.



VACUUM ACTUATOR CHECK <4G63> 120000503

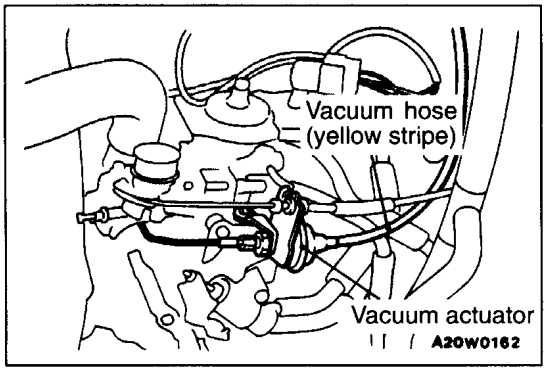
1. Pull off the vacuum hose (yellow stripe) connected to the vacuum actuator.
2. Connect a manual vacuum pump to the nipple of the vacuum actuator.



3. Check that the rod of the vacuum actuator assembly is drawn up when negative pressure is applied.
4. Apply 87 kPa of negative pressure and check that the vacuum does not leak.
5. Start the engine and let it run at idle. Then cover the end of the vacuum hose (yellow stripe) with a finger and check the negative pressure when the A/C switch is turned on and off.

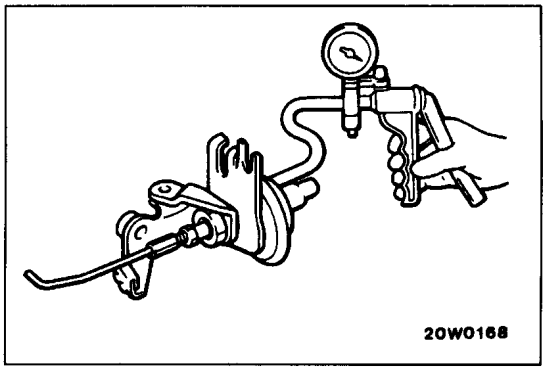
A/C switch	Negative pressure at hose end
OFF	No
ON	Yes

Caution
Be careful not to damage the vacuum hose.



VACUUM ACTUATOR CHECK <4D56> 120000504

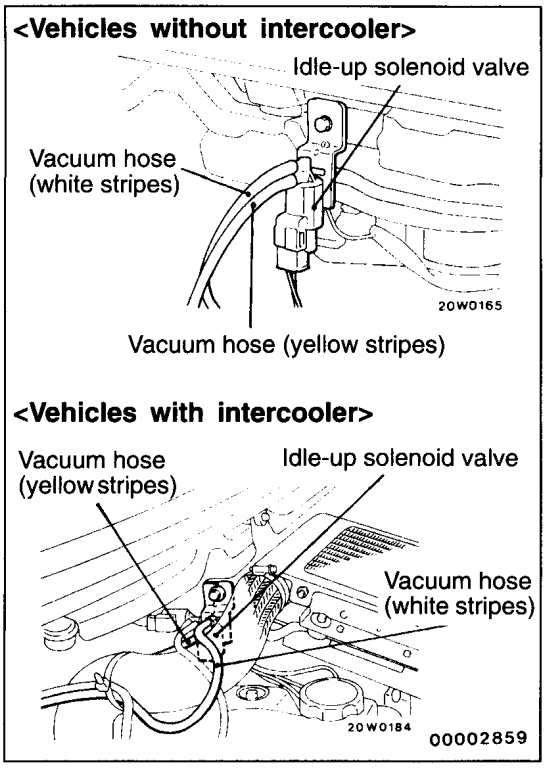
1. Pull off the vacuum hose (yellow stripe) connected to the vacuum actuator.



2. Connect a manual vacuum pump to the nipple of the vacuum actuator.
3. Check to be sure that the vacuum actuator rod starts to contract when 8 kPa of negative pressure is applied, and that the rod contracts to its full stroke when 12 kPa of negative pressure is applied.
4. Disconnect the manual vacuum pump from the vacuum actuator, and connect the vacuum hose (yellow stripe) to the vacuum actuator.
5. Start the engine and let it run at idle. Then cover the end of the vacuum hose (yellow stripe) with a finger and check the negative pressure when the A/C switch is turned on and off.

A/C switch	Negative pressure at hose end
OFF	No
ON	Yes

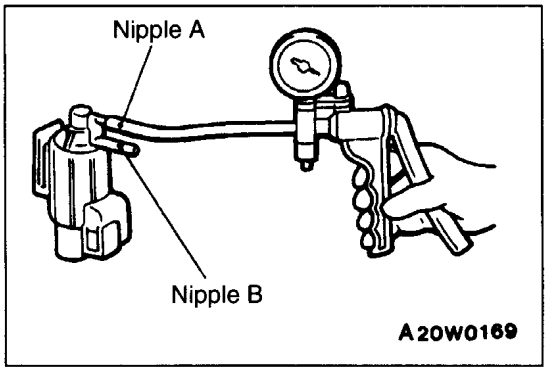
Caution
Be careful, when connecting the vacuum hose not to damage it.



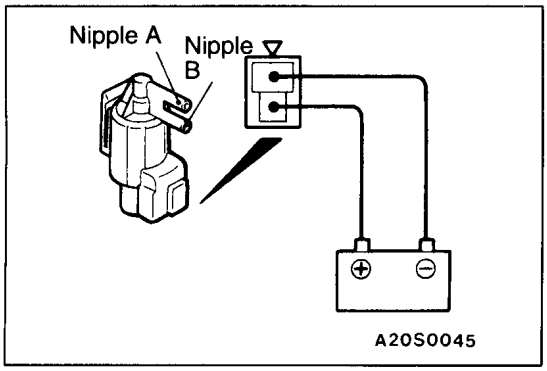
IDLE-UP SOLENOID VALVE CHECK <4G63, 4D56>

120002261

1. Disconnect the vacuum hose (white stripes, yellow stripes) from the solenoid valve.
2. Disconnect the harness connector.



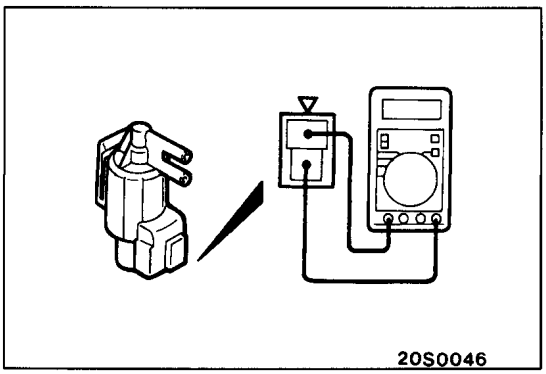
3. Connect a manual vacuum pump to the nipple A.



4. Check air-tightness by applying a vacuum with voltage applied directly from the battery to the solenoid valve terminal and without applying voltage.

Battery voltage	Nipple B	Vacuum condition
Applied	Open	Vacuum leaks from nipple B
	Blocked with finger*1	Vacuum is maintained
Not applied	Open	Vacuum is maintained
	Blocked with finger*2	

NOTE
In case of mark *1, a vacuum can be felt but in case of mark *2, a vacuum can not be felt.



5. Measure the resistance of the solenoid valve.
   Standard value: Approx. 40Ω

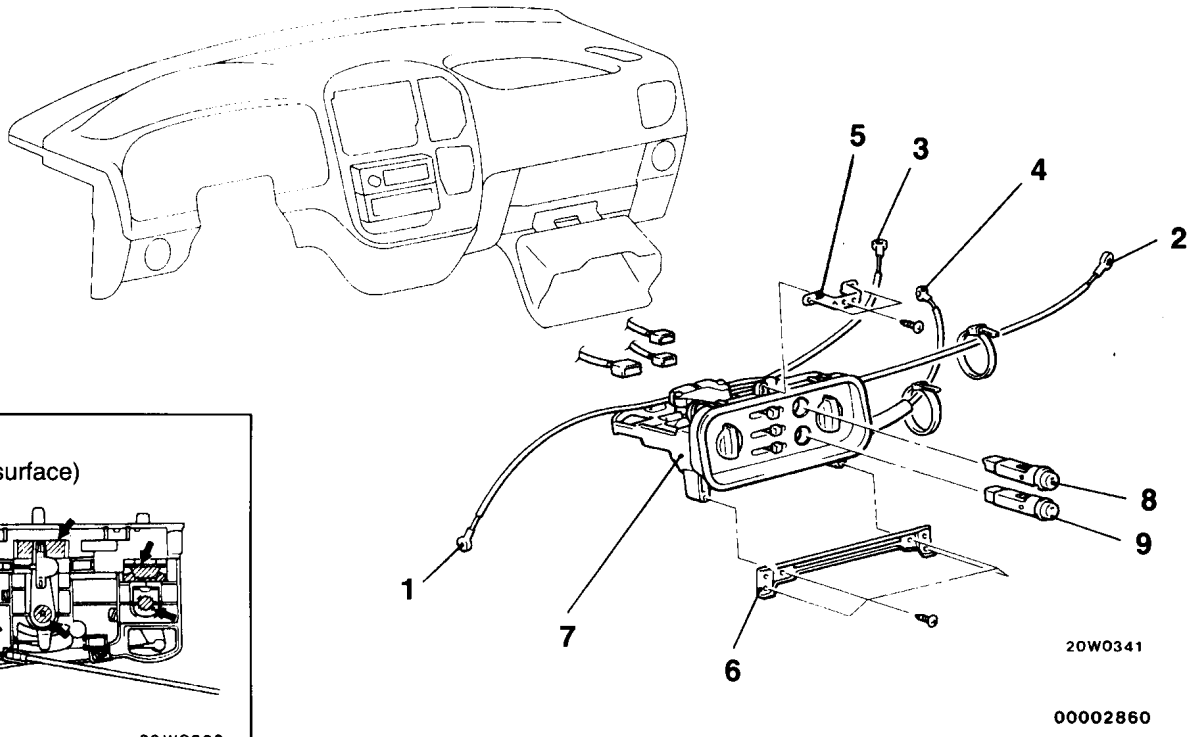
6. When disconnecting the vacuum hose, always make a mark so that the hose can be reconnected at original position.

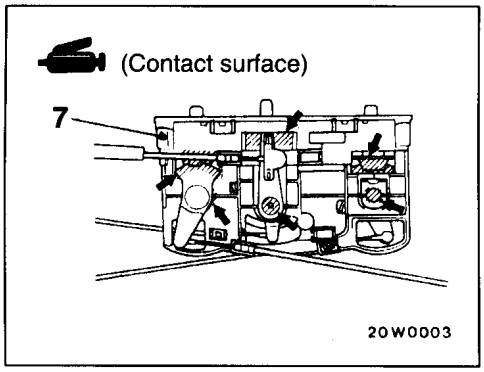
FRONT PANEL ASSEMBLY, REAR HEATER SWITCH AND FRONT A/C SWITCH

120002262

REMOVAL AND INSTALLATION

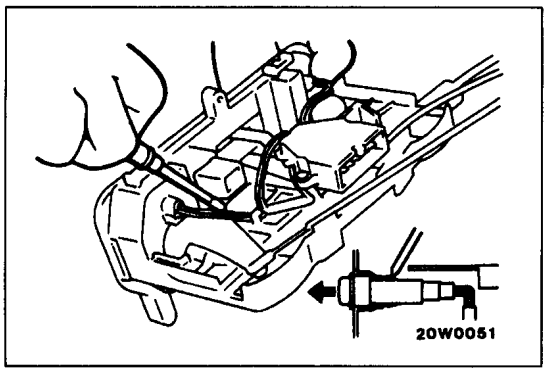
Pre-removal and Post-installation Operation
(1)Centre Panel Removal and Installation
(Refer to GROUP 52A – Instrument Panel.)
(2)Glove Box Stopper Removal and Installation
(3)Under Cover Removal and Installation
(Refer to GROUP 52A – Instrument Panel.)





Removal steps

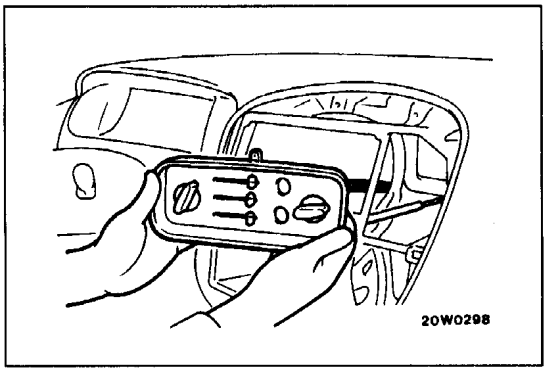
▶D◀ 1. Air outlet changeover damper cable connection
▶C◀ 2. Inside/outside air changeover damper cable connection
▶B◀ 3. Air mixing damper cable connection <Vehicles with heater>
▶A◀ 4. Cool air bypass damper cable connection
5. Heater upper bracket
6. Heater control lower bracket
◀A▶ 7. Front panel assembly
8. Rear heater switch
9. Front A/C switch



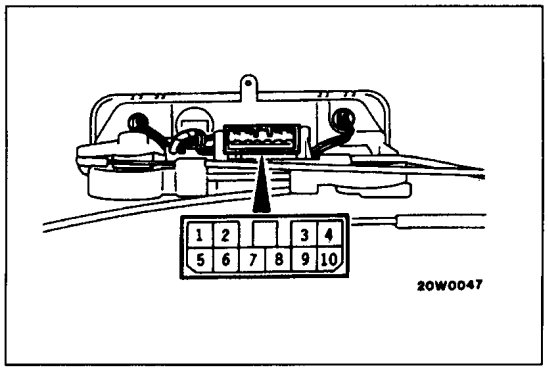
REMOVAL SERVICE POINT

◀A▶ FRONT PANEL ASSEMBLY REMOVAL

(1) Pull the front panel assembly out slightly from the instrument panel.
(2) Push the tab on top of the A/C switch from the top of the front panel assembly. Then pull the A/C switch forward to disconnect the connector.



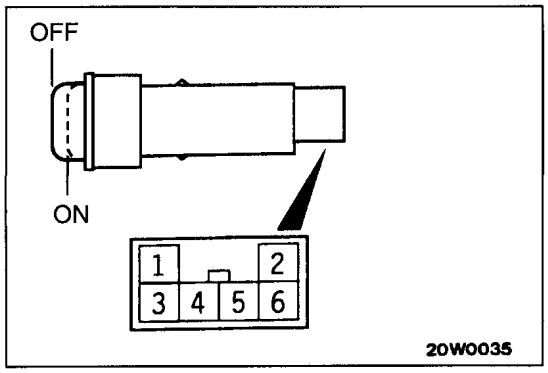
(3) Push the front panel assembly while being careful that the air outlet changeover control cable doesn't recoil. Then tilt it towards the passenger's seat and remove it.



INSPECTION

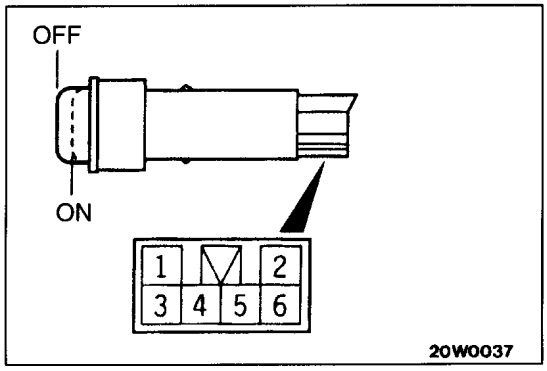
FRONT BLOWER SWITCH CONTINUITY INSPECTION

Lever position	Terminal No.										
	1	ILL	5	2	3	4	6	7	8	9	10
OFF	○	○	○								
LO	○	○	○	○	○		○	○			
ML	○	○	○	○	○		○		○		
MH	○	○	○	○	○	○	○			○	
HI	○	○	○	○	○	○	○				○



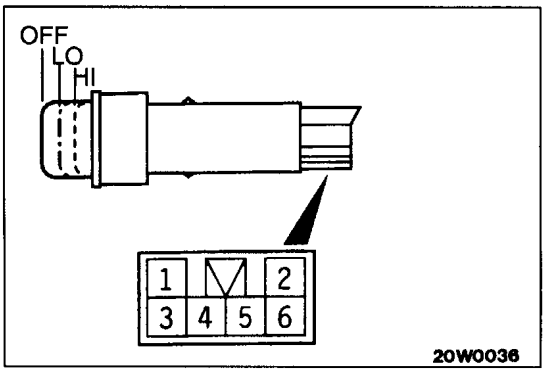
FRONT A/C SWITCH CONTINUITY

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



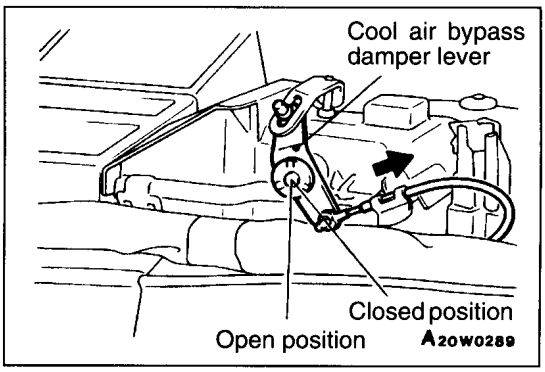
REAR HEATER SWITCH CONTINUITY INSPECTION
<Vehicles with built-in type rear heater>

Switch position	Terminal No.							
	1	2	4	IND	5	3	ILL	6
OFF	○	○		○	○	○	○	○
ON	○		○	○	○	○	○	○



<Vehicles with under seat type rear heater>

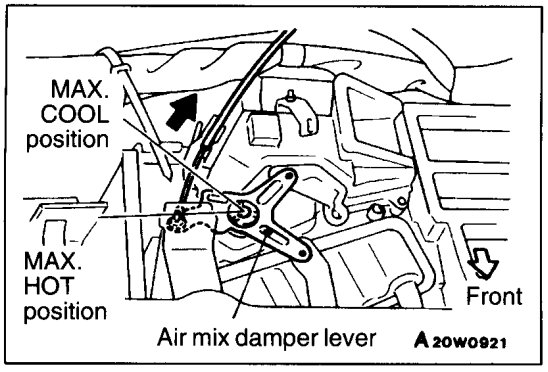
Switch position	Terminal No.							
	1	2	4	IND	5	3	ILL	6
OFF						○	○	○
LO		○	○	Green ◀	○	○	○	○
HI	○	○	○	Orange ◀	○	○	○	○



INSTALLATION SERVICE POINTS

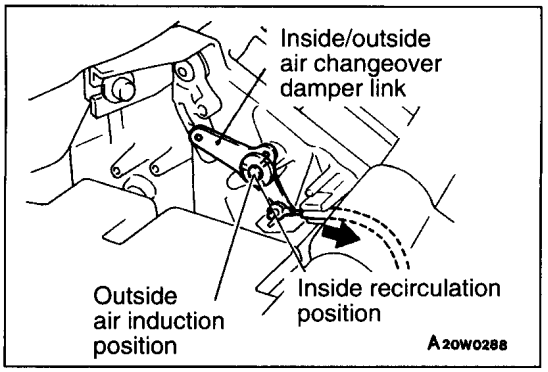
▶A◀ COOL AIR BYPASS DAMPER CABLE INSTALLATION

(1) Set the cool air bypass lever on the front panel assembly to the closed position.
(2) Set the cool air bypass damper lever at the bottom of the heater unit to the closed position, and install the cable to the lever pin.
(3) Pull the outer cable in the direction of the arrow so that there is no looseness, and then clamp it.



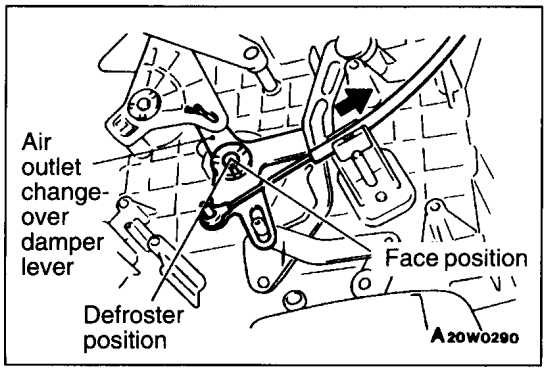
▶B◀ AIR MIXING DAMPER CABLE INSTALLATION

(1) Set the temperature control knob on the front panel assembly to the MAX. HOT position.
(2) Set the air mix damper lever at the bottom of the heater unit to the MAX. HOT position, and install the cable to the lever pin.
(3) Pull the outer cable in the direction of the arrow so that there is no looseness, and then clamp it.



▶C◀ INSIDE/OUTSIDE AIR CHANGEOVER DAMPER CABLE INSTALLATION

(1) Set the inside/outside air changeover lever on the front panel assembly to the inside recirculation position
(2) Set the inside/outside air changeover damper lever of the blower motor to the inside recirculation position, and install the cable to the lever pin.
(3) Pull the outer cable in the direction of the arrow so that there is no looseness, and then clamp it.

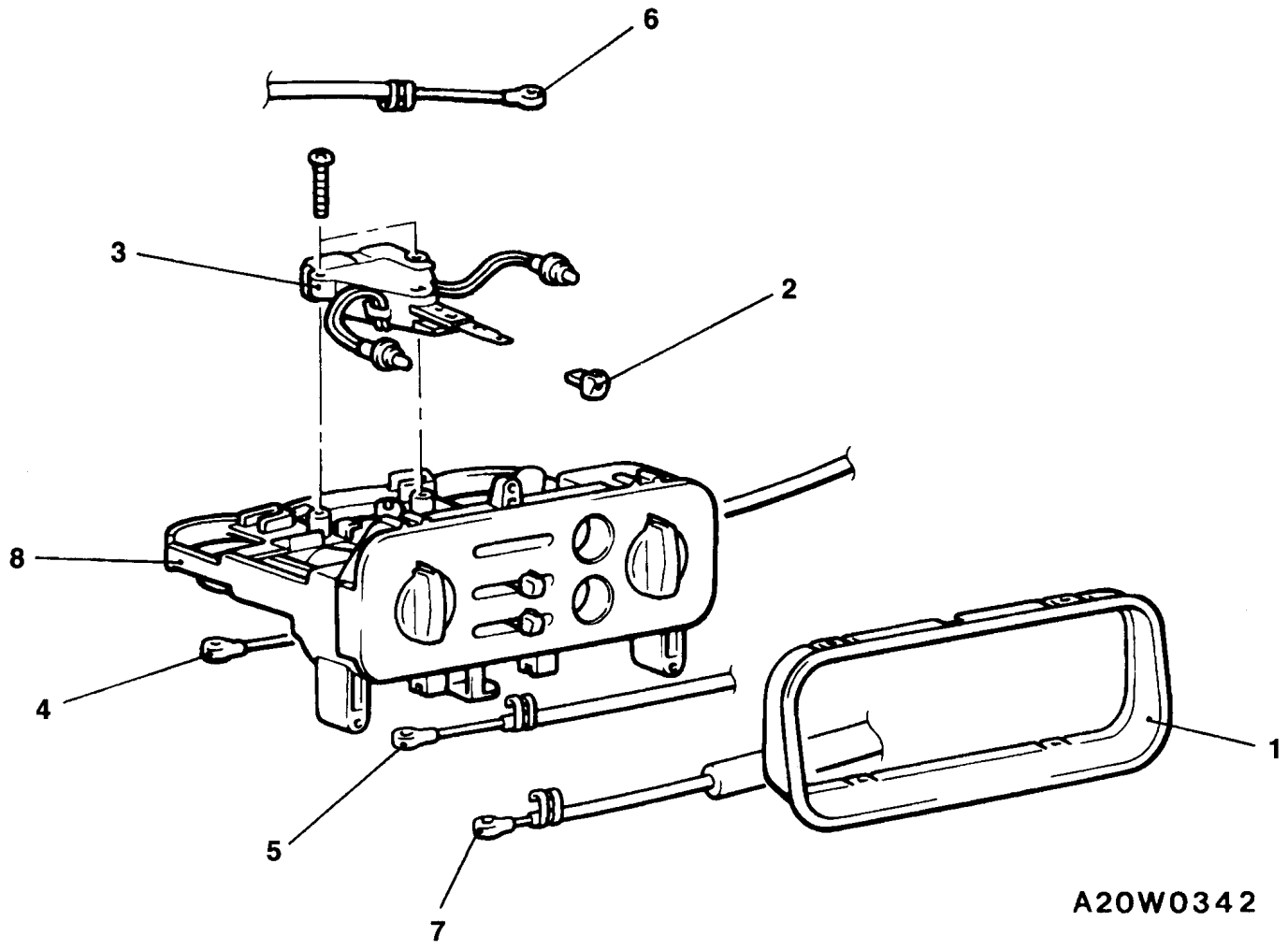


▶D◀ AIR OUTLET CHANGEOVER DAMPER CABLE INSTALLATION

(1) Set the air outlet changeover knob on the front panel assembly to the defroster position.
(2) Set the air outlet changeover damper lever of the heater unit to the defroster position, and install the cable to the lever pin.
(3) Pull the outer cable in the direction of the arrow so that there is no looseness, and then clamp it.

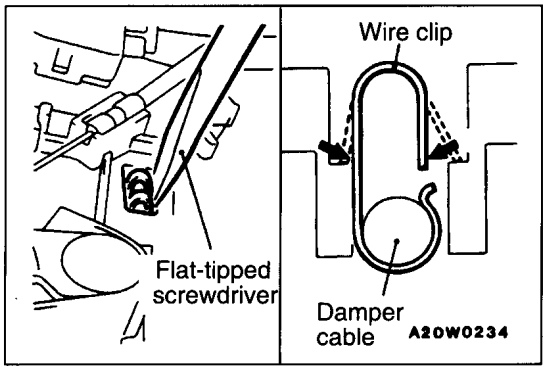
FRONT PANEL ASSEMBLY DISASSEMBLY AND REASSEMBLY

120002263



Disassembly steps

1. Panel cover
2. Knob
3. Front blower switch
4. ◀A▶ Air mix damper cable
5. ◀A▶ Inside/outside changeover damper cable
6. ◀A▶ Air outlet changeover damper cable
7. ◀A▶ Cool air bypass damper lever
8. Base assembly



DISASSEMBLY SERVICE POINT

◀A▶ EACH DAMPER CABLE REMOVAL

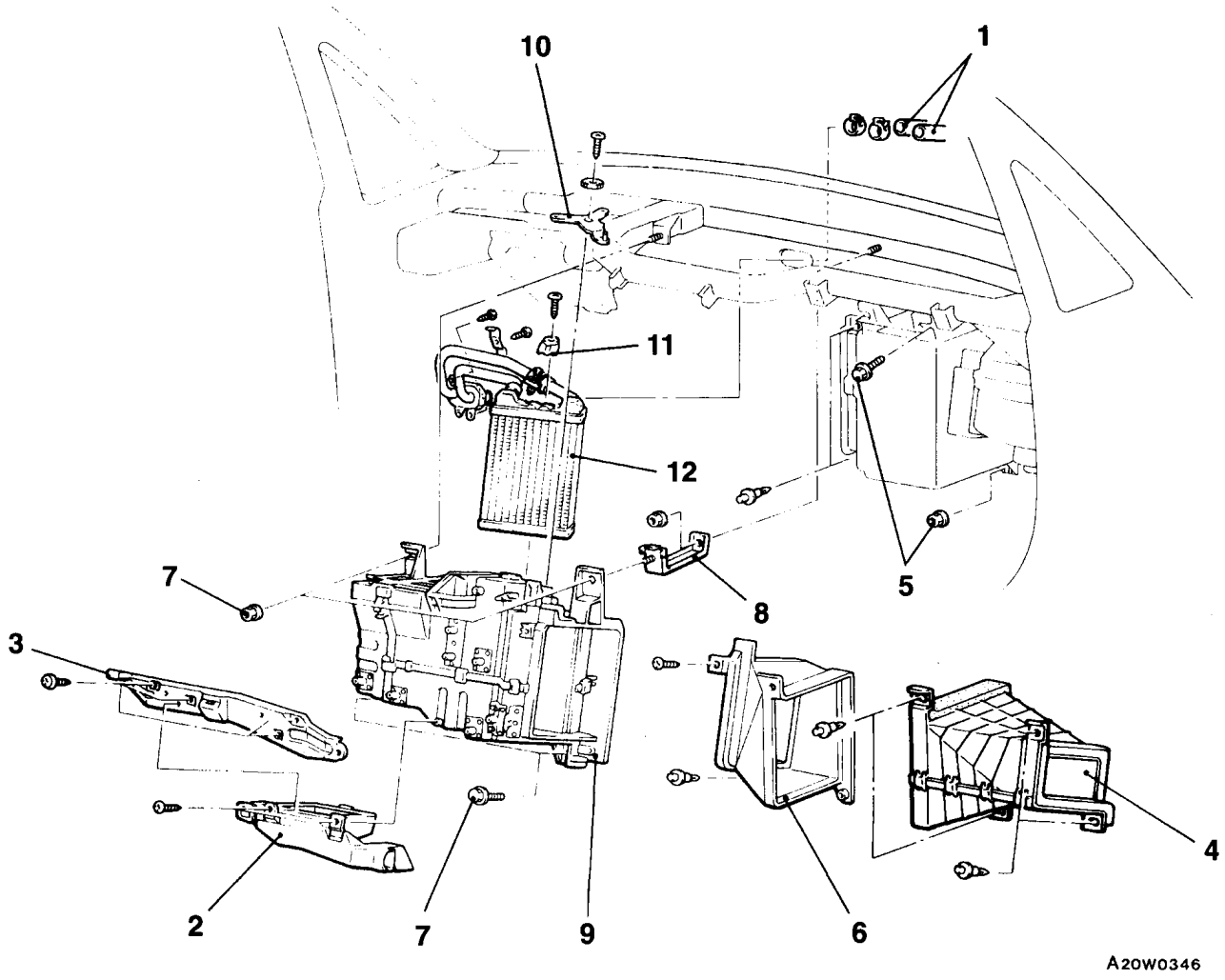
Insert a flat-tipped screwdriver to disengage the claws, and then remove the cables.

FRONT HEATER UNIT AND FRONT HEATER CORE

120002264

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
(1) Draining and Supplying of Coolant (Refer to GROUP 14 – Service Adjustment Procedures.)
(2) Instrument Panel Assembly Removal and Installation (Refer to GROUP 52A – Instrument Panel.)
CAUTION: SRS
When removing and installing the computer cover from vehicles equipped with SRS, do not let it bump against the SRS diagnostic unit or the components.



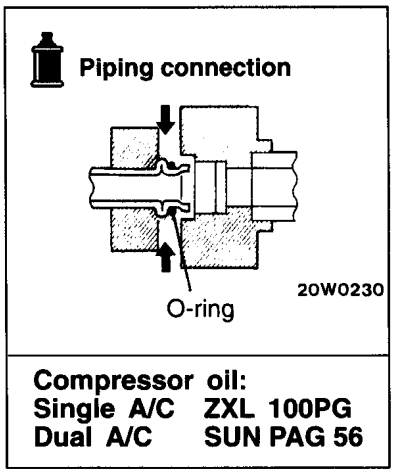
Removal steps

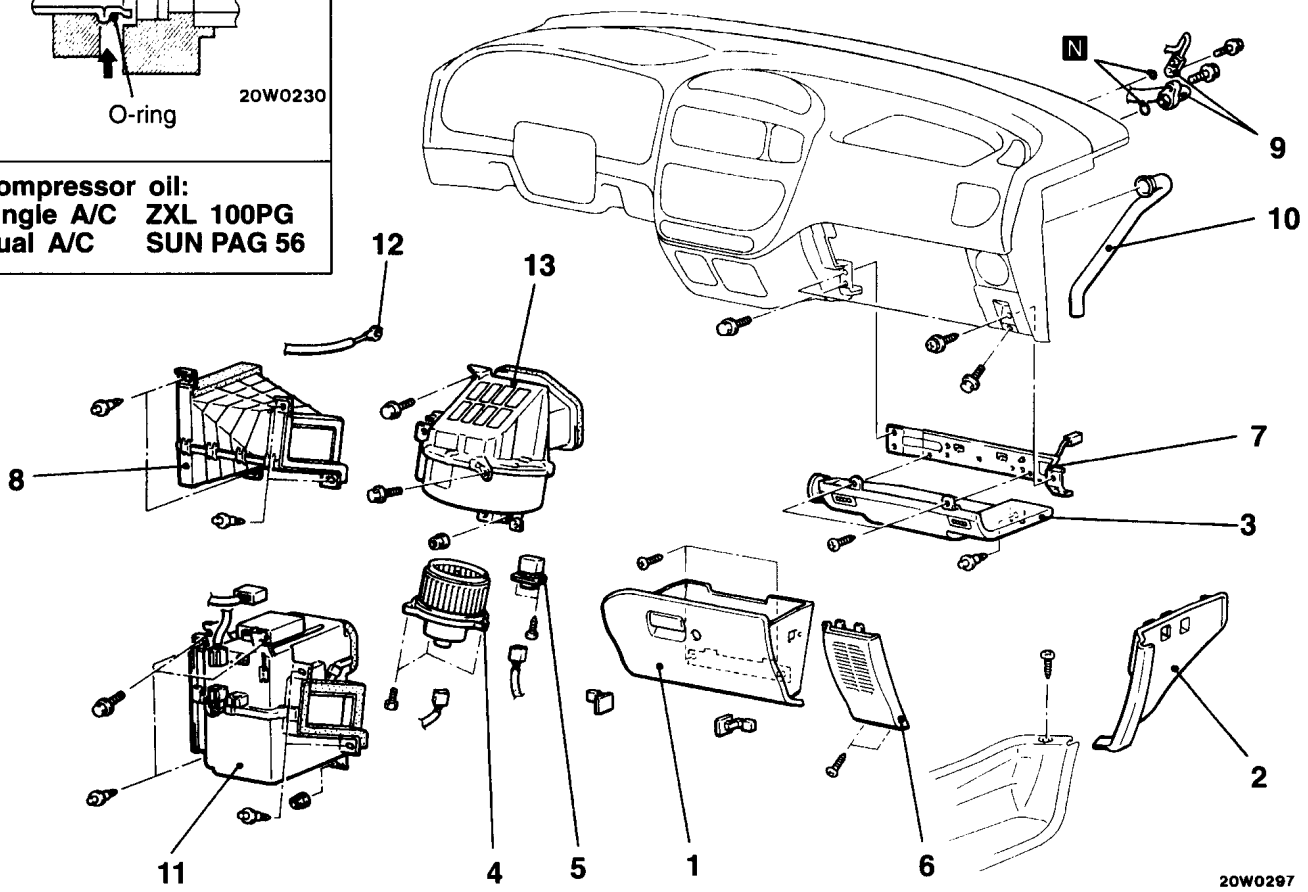
1. Heater hose connection
2. Foot distribution duct
3. Centre frame
4. Joint duct B
5. Evaporator installation bolt and nut <Vehicles with A/C>
6. Joint duct
7. Front heater unit installation bolt and nut
8. Heater bracket
9. Front heater unit
10. Air mix damper link
11. Bracket
12. Front heater core

FRONT BLOWER MOTOR ASSEMBLY AND RESISTOR

120002265

REMOVAL AND INSTALLATION





00000549

Front blower motor assembly and resistor removal steps

1. Glove box
2. Cowl side trim
   (Refer to GROUP 52A – Trim.)
3. Shower duct <Vehicles with ABS>
4. Front blower motor assembly
5. Resistor

Blower case assembly removal steps

- Discharge and Charging of Refrigerant
  (Refer to P.55-17, 20.)

1. Glove box
2. Cowl side trim
   (Refer to GROUP 52A – Trim.)
3. Shower duct <Vehicles with ABS>
6. Speaker garnish
7. Glove box frame
8. Joint duct B

◀A▶

9. Suction hose, liquid pipe and cooling unit connection
   <Vehicles with A/C>
10. Drain hose <Vehicles with A/C>
11. Evaporator <Vehicles with A/C>

▶A◀

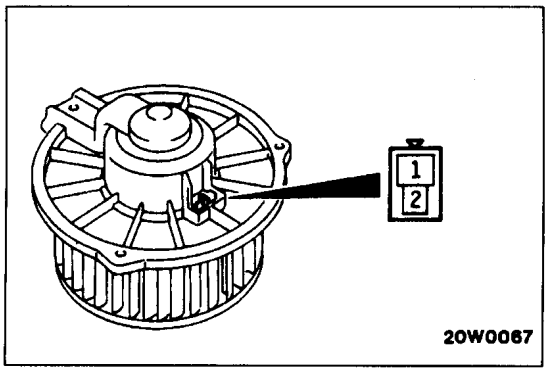
12. Inside/outside air changeover damper cable connection
13. Blower case assembly

REMOVAL SERVICE POINT

◀A▶ SUCTION HOSE, LIQUID PIPE AND COOLING UNIT DISCONNECTION

If the hoses are disconnected, cap the hoses with a blank plug to prevent entry of dust, dirt, and water.

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

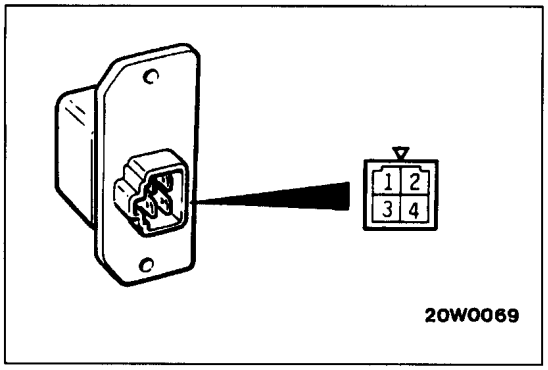


INSPECTION

BLOWER FAN AND MOTOR INSPECTION

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

Battery terminals		Motor
1	2	
⊖ - - - - - -	- - - - - - ⊕	Runs



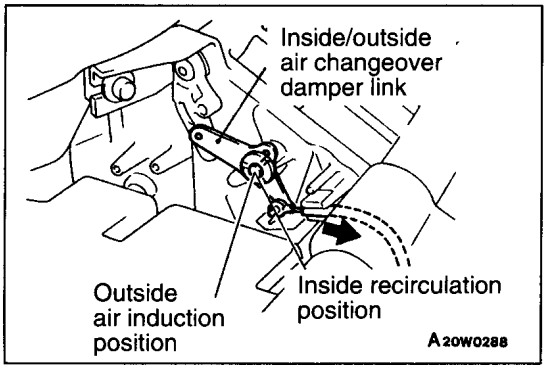
Caution
Do not touch the blower during inspection, or it may lead to personal injury.

RESISTOR INSPECTION

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

Standard value:

Measurement terminal	Standard value Ω
Between terminals 2–3 (LO)	1.96±7%
Between terminals 2–1 (ML)	0.95±7%
Between terminals 2–4 (MH)	0.33±7%



INSTALLATION SERVICE POINT

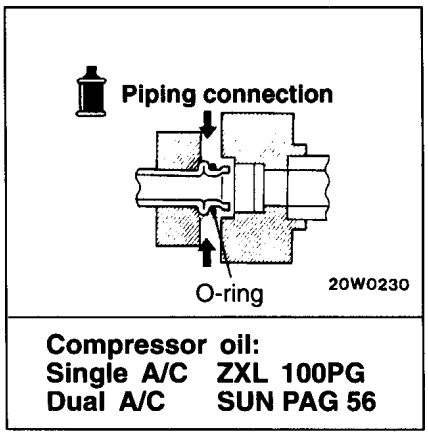
▶A◀ INSIDE/OUTSIDE AIR CHANGEOVER DAMPER CABLE INSTALLATION

(1) Set the inside/outside air changeover lever on the front panel assembly to the inside recirculation position.
(2) Set the inside/outside air changeover damper lever of the blower motor to the inside recirculation position, and install the cable to the lever pin.
(3) Pull the outer cable in the direction of the arrow so that there is no looseness, and then clamp it.

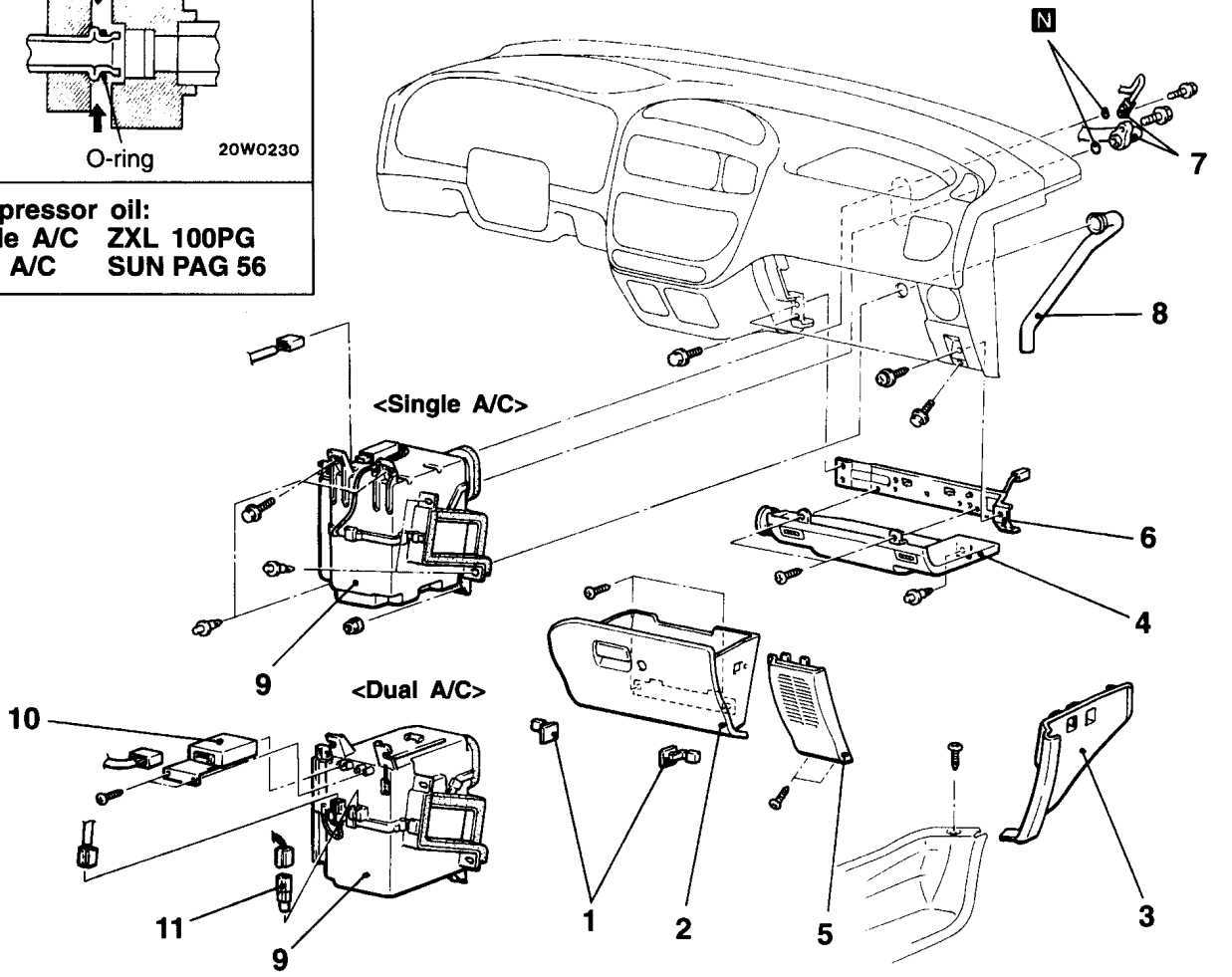
FRONT EVAPORATOR AND A/C-ECU

120002266

REMOVAL AND INSTALLATION



Compressor oil:
Single A/C ZXL 100PG
Dual A/C SUN PAG 56



Front evaporator removal steps

- Discharging and Charging of Refrigerant (Refer to P.55-17, 20.)

1. Glove box stopper
2. Glove box
3. Cowl side trim (Refer to GROUP 52A – Trim.)
4. Shower duct <Vehicles with ABS>
5. Speaker garnish
6. Glove box frame

◀A▶ 7. Suction hose and liquid pipe connection

8. Drain hose

▶A◀ 9. Front evaporator

A/C-ECU removal steps

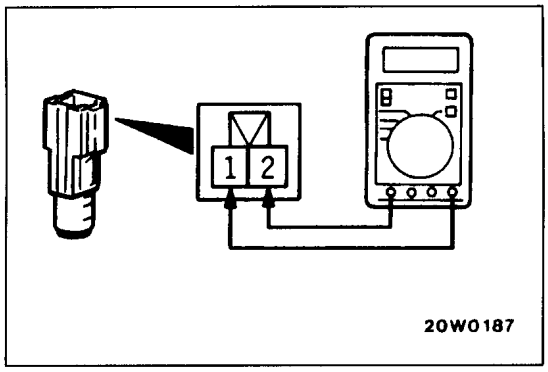
1. Glove box stopper
10. A/C-ECU
11. Resistor <Vehicles with overhead type rear evaporator>

REMOVAL SERVICE POINT

◀A▶ SUCTION HOSE AND LIQUID PIPE DISCONNECTION

Plug the disconnected hose and the cooling unit nipple with blind caps not to let foreign matter get into them.

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



INSPECTION

RESISTOR INSPECTION <VEHICLES WITH OVERHEAD TYPE REAR EVAPORATOR>

Use a circuit tester to measure the resistance between the terminals in the illustration. Check to be sure that the measured value is at the standard value.

Standard value: 4.7 kΩ

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).

<Vehicles with single A/C>

Compressor oil: ZXL 100PG

Quantity: 40 mℓ

<Vehicles with dual A/C>

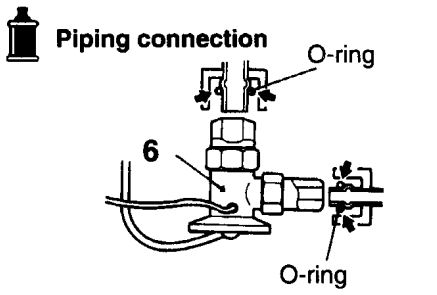
Compressor oil: SUN PAG 56

Quantity: 30 mℓ

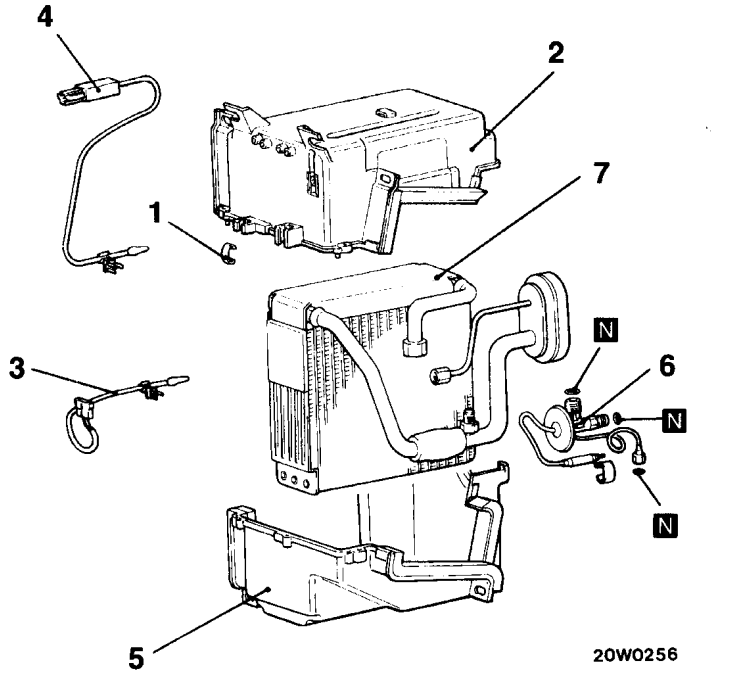
FRONT EVAPORATOR

120002121

DISASSEMBLY AND REASSEMBLY



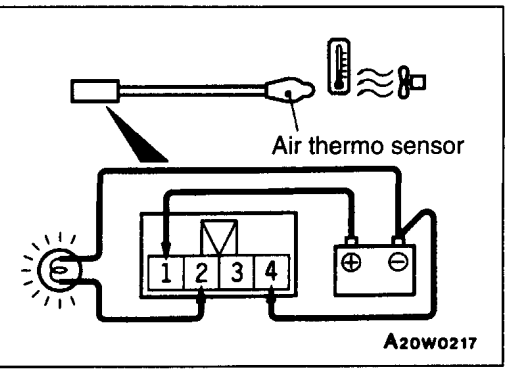
Compressor oil:
Single A/C ZXL 100PG
Dual A/C SUN PAG 56

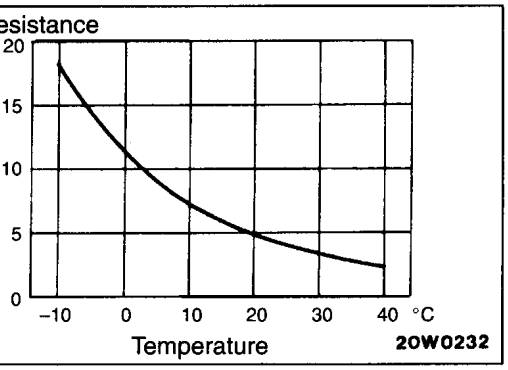


00000552

Disassembly steps

1. Clip
2. Evaporator case (upper)
3. Air thermo sensor <Dual A/C>
4. Thermostat <Single A/C>
5. Evaporator case (lower)
6. Expansion valve
7. Evaporator





INSPECTION

THERMOSTAT INSPECTION <SINGLE A/C>

(1) Apply battery voltage between the thermostat terminals shown in the illustration, and connect a test lamp to terminal (2).
(2) Blow cool air onto the air thermo sensor and check that the test lamp switches off when the cool air temperature becomes approximately 3°C or less.

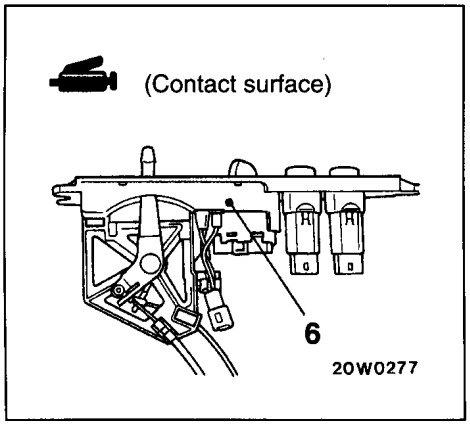
AIR THERMO SENSOR INSPECTION <DUAL A/C>

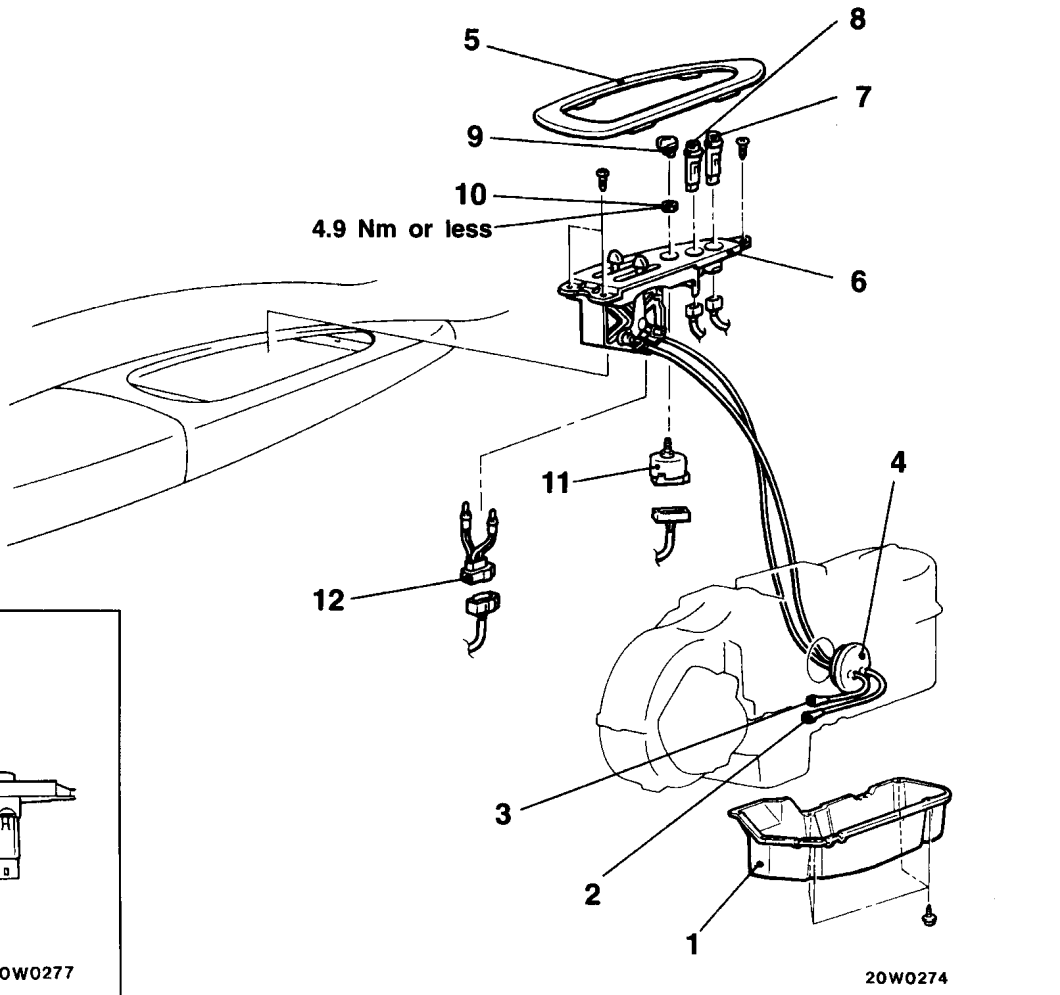
When the resistance value between the sensor terminals is measured under two or more temperature conditions, the resistance value should be close to the values shown in the graph.

REAR PANEL ASSEMBLY AND REAR A/C SWITCH <BUILT-IN TYPE>

120000512

REMOVAL AND INSTALLATION

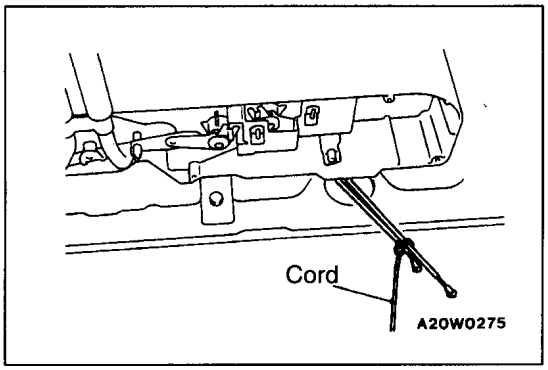




00000553

Removal steps

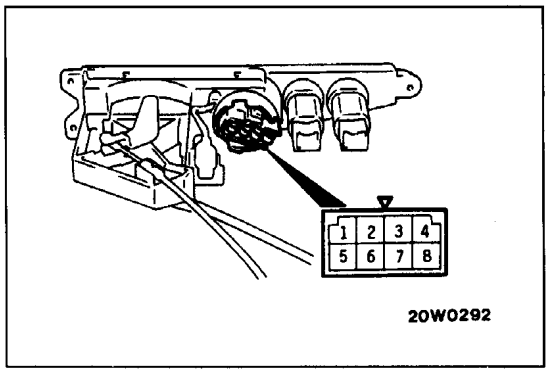
1. Link cover
- ▶B◀ 2. Air mixing damper cable connection
- ▶A◀ 3. Air outlet changeover damper cable connection
4. Wire grommet
5. Rear heater control bezel
- ◀A▶ 6. Rear panel assembly
7. Rear heater switch
8. Rear A/C switch
9. Knob
10. Lock nut
11. Rear blower switch
12. Illumination lamp assembly

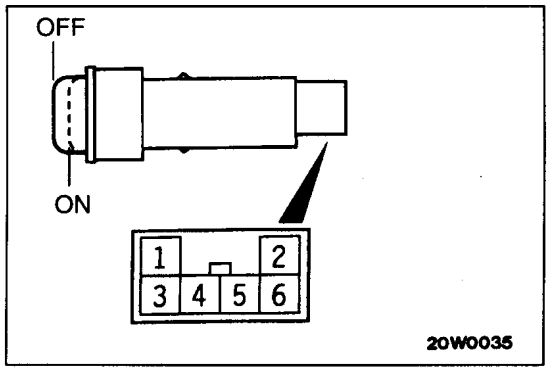


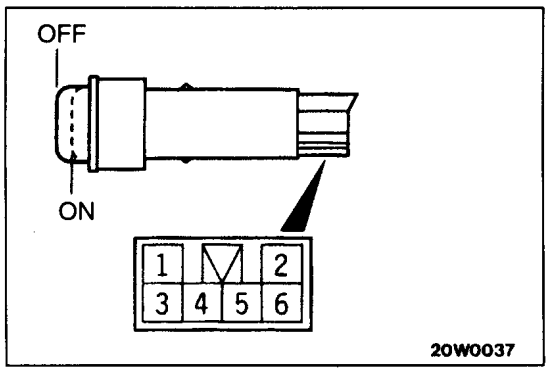
REMOVAL SERVICE POINT

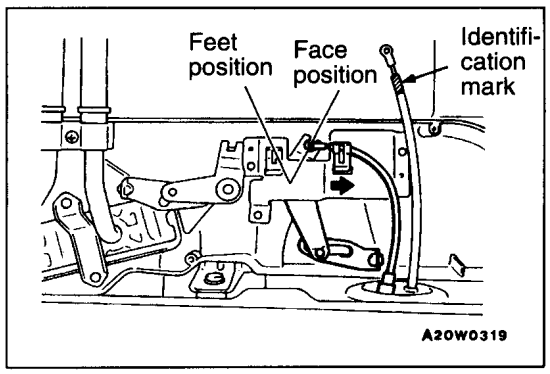
◀A▶ REAR PANEL ASSEMBLY REMOVAL

Tie a cord to the end of the control cable for easier reinstallation.









INSPECTION

REAR BLOWER SWITCH CONTINUITY INSPECTION

Knob position	Terminal No.				
	2	3	5	6	7
LO		○	○		
ML			○	○	
MH	○		○		
HI			○		○

REAR A/C SWITCH CONTINUITY INSPECTION

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

REAR HEATER SWITCH CONTINUITY INSPECTION

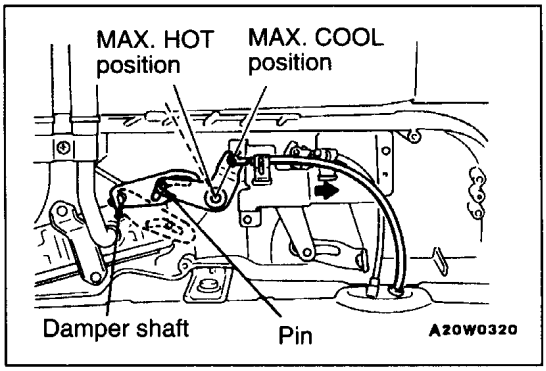
Switch position	Terminal No.							
	1	2	4	IND	5	3	ILL	6
OFF	○	○		○	○	○	○	○
ON	○		○	○	○	○	○	○

INSTALLATION SERVICE POINTS

▶A◀ AIR OUTLET CHANGEOVER DAMPER CABLE INSTALLATION

(1) Set the air outlet changeover lever on the rear panel assembly to the face position.
(2) Set the air outlet changeover damper lever of the heater unit to face position, and install the cable to the lever pin.
(3) Pull the outer cable in the direction of the arrow so that there is no looseness, and then clamp it.

NOTE
The air mixing damper cable has a yellow identification mark on its end.



▶B◀ AIR MIXING DAMPER CABLE INSTALLATION

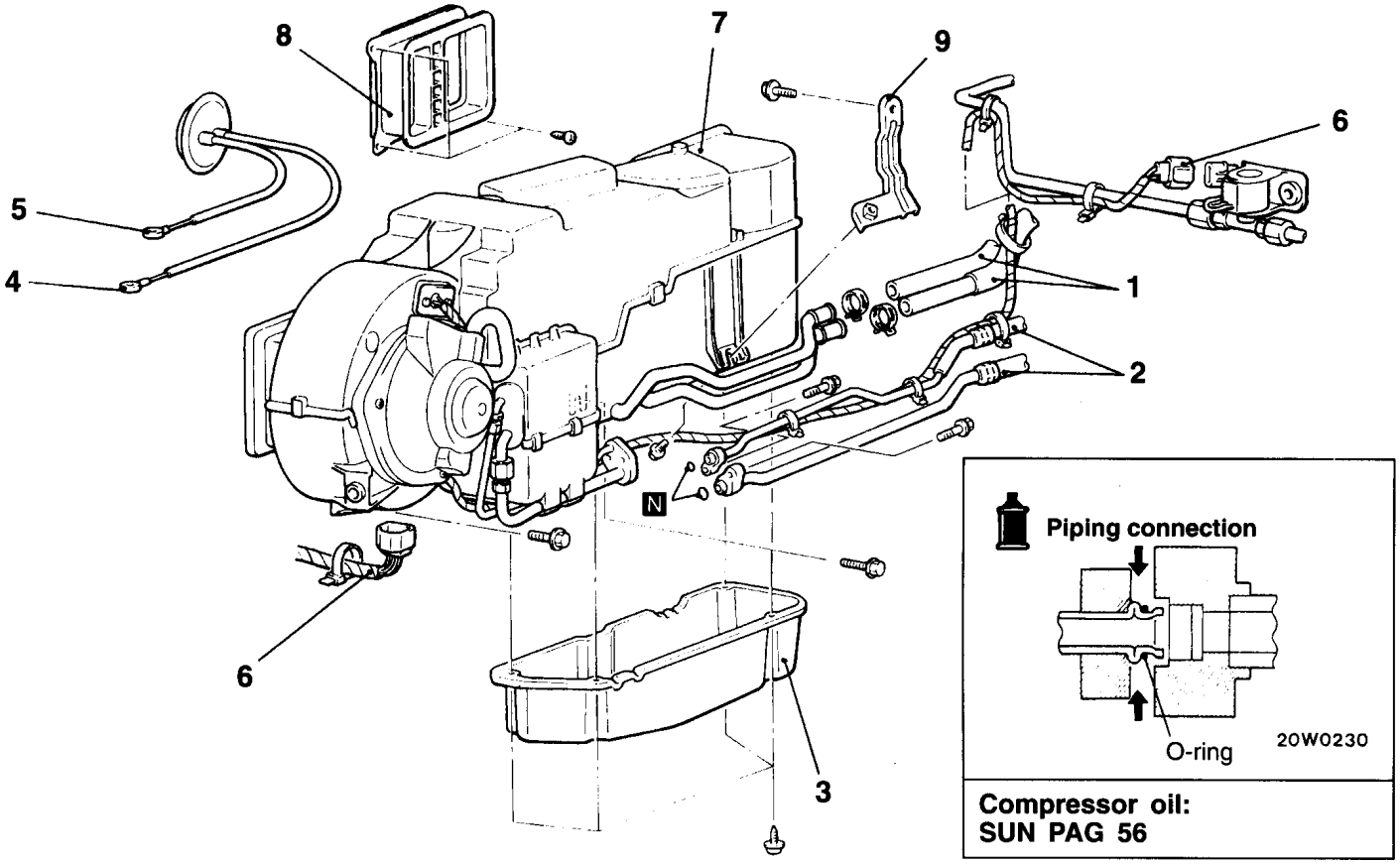
(1) Set the temperature control lever on the rear panel assembly to the MAX. COOL position.
(2) Set the air mix damper lever at the bottom of the heater unit to the MAX. COOL position, and install the cable to the lever pin.
(3) Pull the outer cable in the direction of the arrow so that there is no looseness.
(4) Position the damper shaft and pin as shown in the illustration, and then clamp the cable.

REAR EVAPORATOR ASSEMBLY <BUILT-IN TYPE>

120002267

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
(1)Refrigerant Discharging and Charging
(Refer to P.55-17, 20)
(2)Draining and Supplying of Coolant (Refer to GROUP 14 – Service Adjustment Procedures.)



Removal steps

◀A▶ ▶C◀ 1. Rear water hose connection
◀B▶ 2. Rear suction hose and rear liquid hose connection
3. Link cover
▶B◀ 4. Air mixing damper cable connection
▶A◀ 5. Air outlet changeover damper cable connection
6. Connector
7. Rear unit assembly
8. Rear joint duct
9. Rear unit bracket

REMOVAL SERVICE POINTS

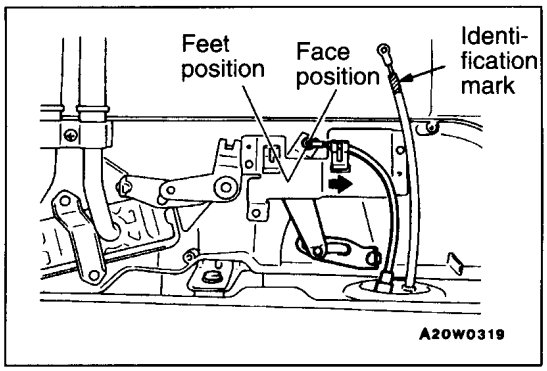
◀A▶ REAR WATER HOSE DISCONNECTION

Caution
Be sure to cool down the coolant inside the rear heater core and rear water pipe before disconnecting the hose. Otherwise, it will lead to personal injury.

◀B▶ REAR SUCTION HOSE AND REAR LIQUID DISCONNECTION

Plug the disconnected hose and the cooling unit nipple with blind caps not to let foreign matter get into them.

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

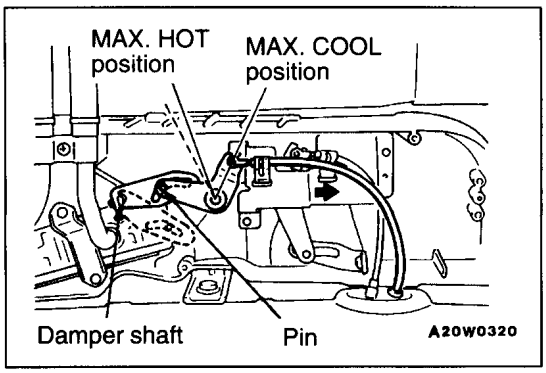


INSTALLATION SERVICE POINTS

▶A◀ AIR OUTLET CHANGEOVER DAMPER CABLE INSTALLATION

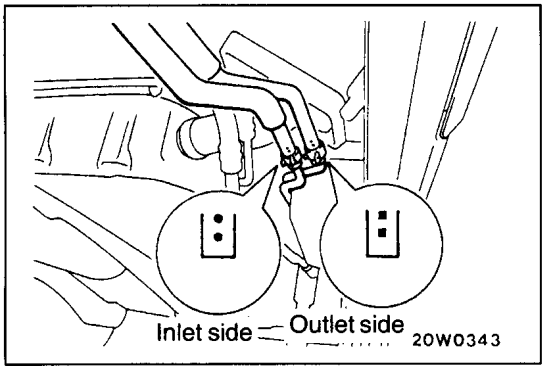
(1) Set the air outlet changeover lever on the rear panel assembly to the face position.
(2) Set the air outlet changeover damper lever of the heater unit to face position, and install the cable to the lever pin.
(3) Pull the outer cable in the direction of the arrow so that there is no looseness, and then clamp it.

NOTE
The air mixing damper cable has a yellow identification mark on its end.



▶B◀ AIR MIX DAMPER CABLE INSTALLATION

(1) Set the temperature control lever on the rear panel assembly to the MAX. COOL position.
(2) Set the air mix damper lever at the bottom of the heater unit to the MAX. COOL position, and install the cable to the lever pin.
(3) Pull the outer cable in the direction of the arrow so that there is no looseness.
(4) Position the damper shaft and pin as shown in the illustration, and then clamp the cable.

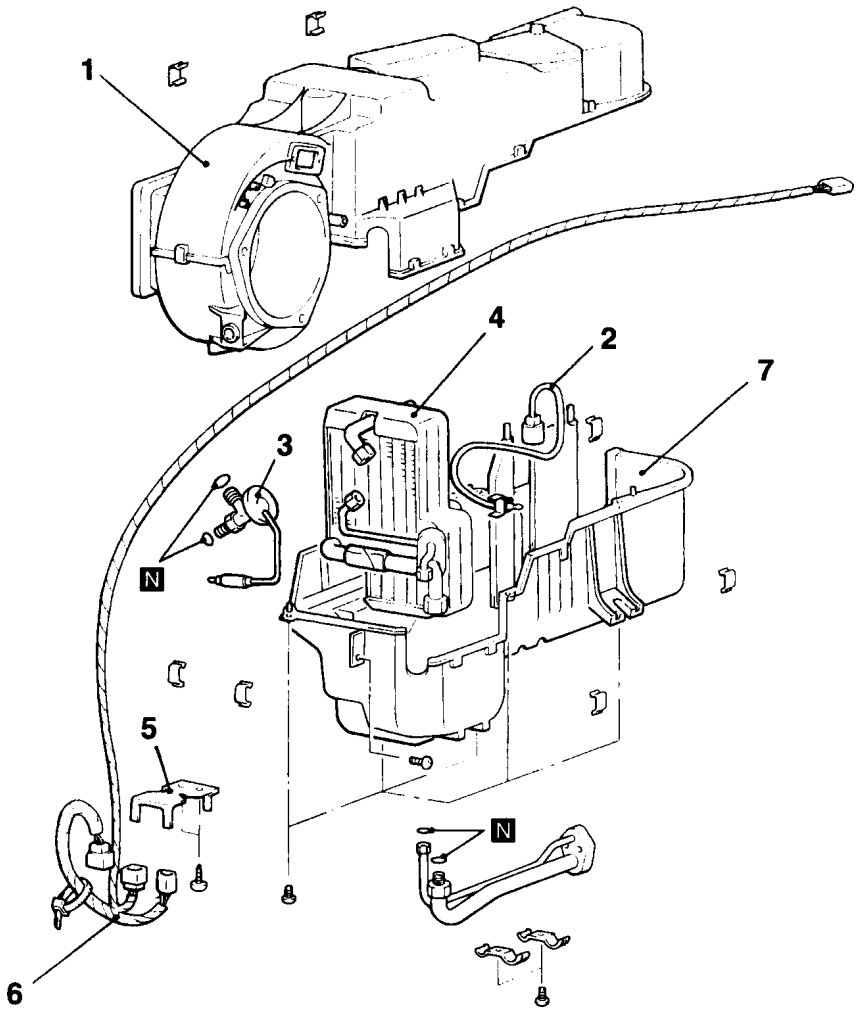


▶C◀ REAR WATER HOSE INSTALLATION

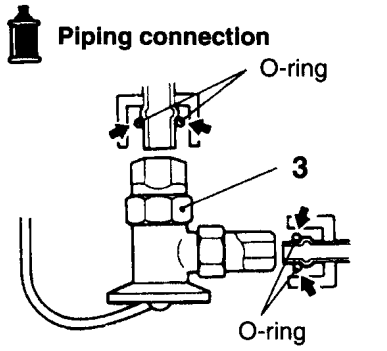
Connect the rear water hose so that the pink hose identification mark is at the bottom.

DISASSEMBLY AND REASSEMBLY

120002513



20W0347



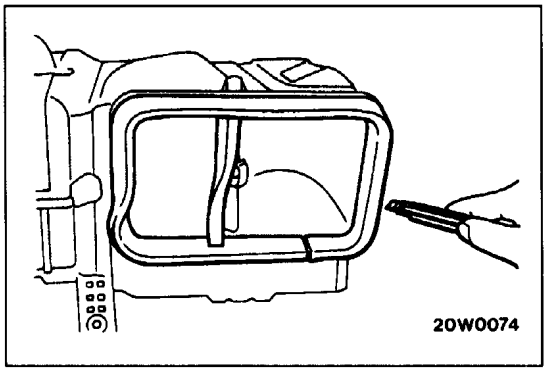
20W0295

Compressor oil:
SUN PAG 56

00002862

Disassembly steps

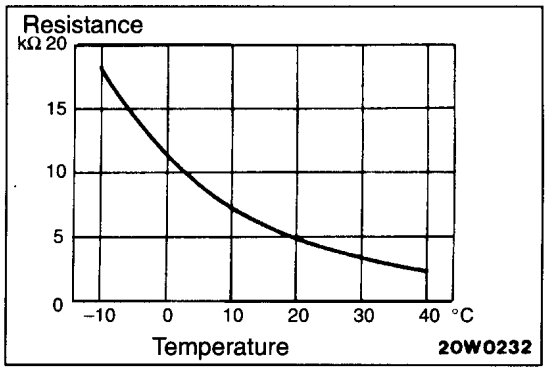
◀A▶ 1. Rear unit case (upper)
2. Air thermo sensor
3. Expansion valve
▶A◀ 4. Rear evaporator
5. Harness bracket
6. Wiring harness
7. Rear unit case (lower)



DISASSEMBLY SERVICE POINT

◀A▶ REAR UNIT CASE (UPPER) REMOVAL

(1) Use a knife to cut the packing between the upper and lower cases.
(2) Remove the six screws and the seven clips, and then remove the upper case.



INSPECTION

AIR THERMO SENSOR INSPECTION

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.

REASSEMBLY SERVICE POINT

▶A◀ REAR 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: 30 mℓ

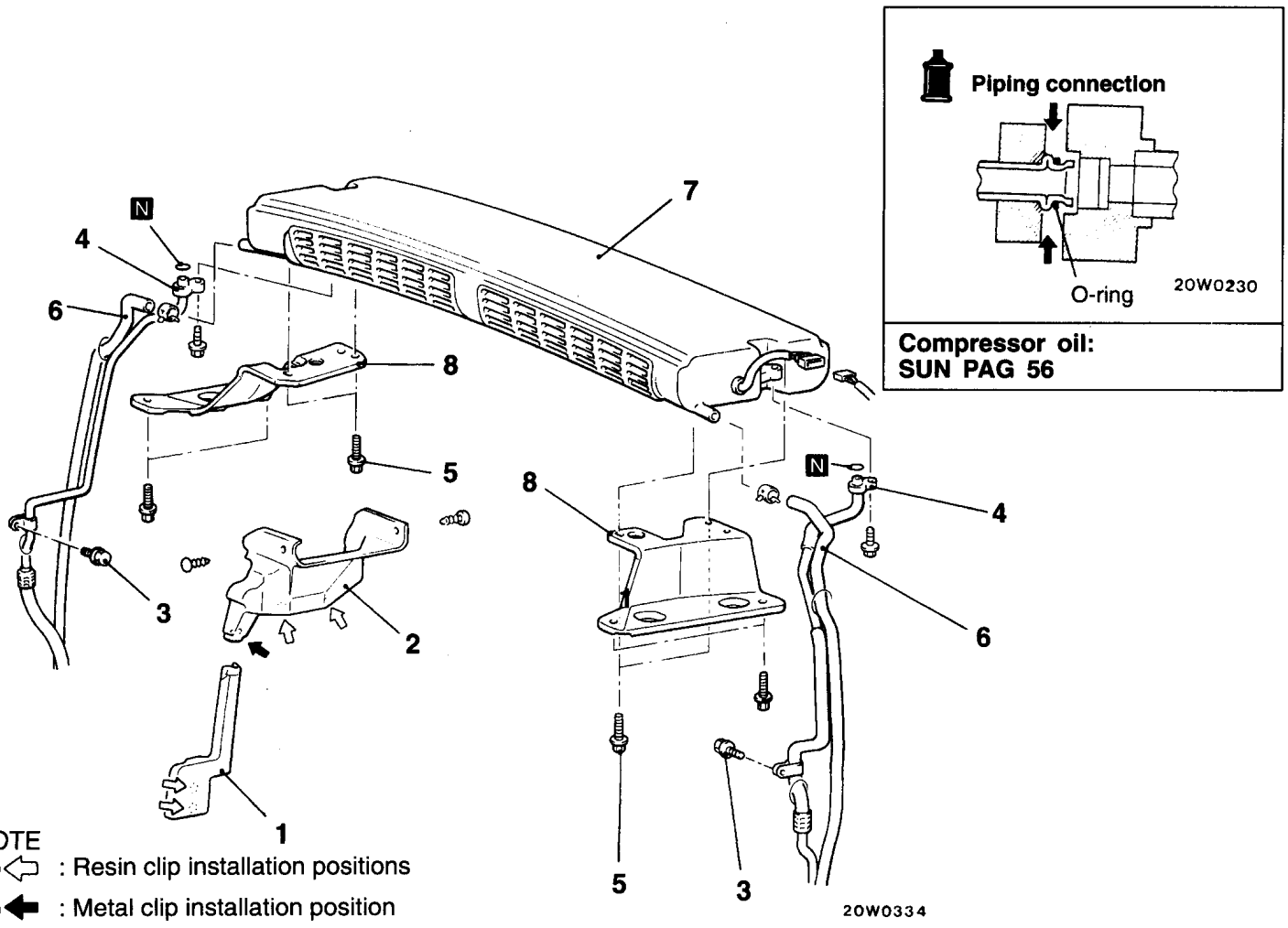
REAR EVAPORATOR ASSEMBLY <OVERHEAD TYPE>

120002268

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
- Discharge and Charging of Refrigerant (Refer to P.55-17, 20.)

<High roof>



NOTE
(1)⇦ : Resin clip installation positions
(2)⬅ : Metal clip installation position

00002863

Removal steps

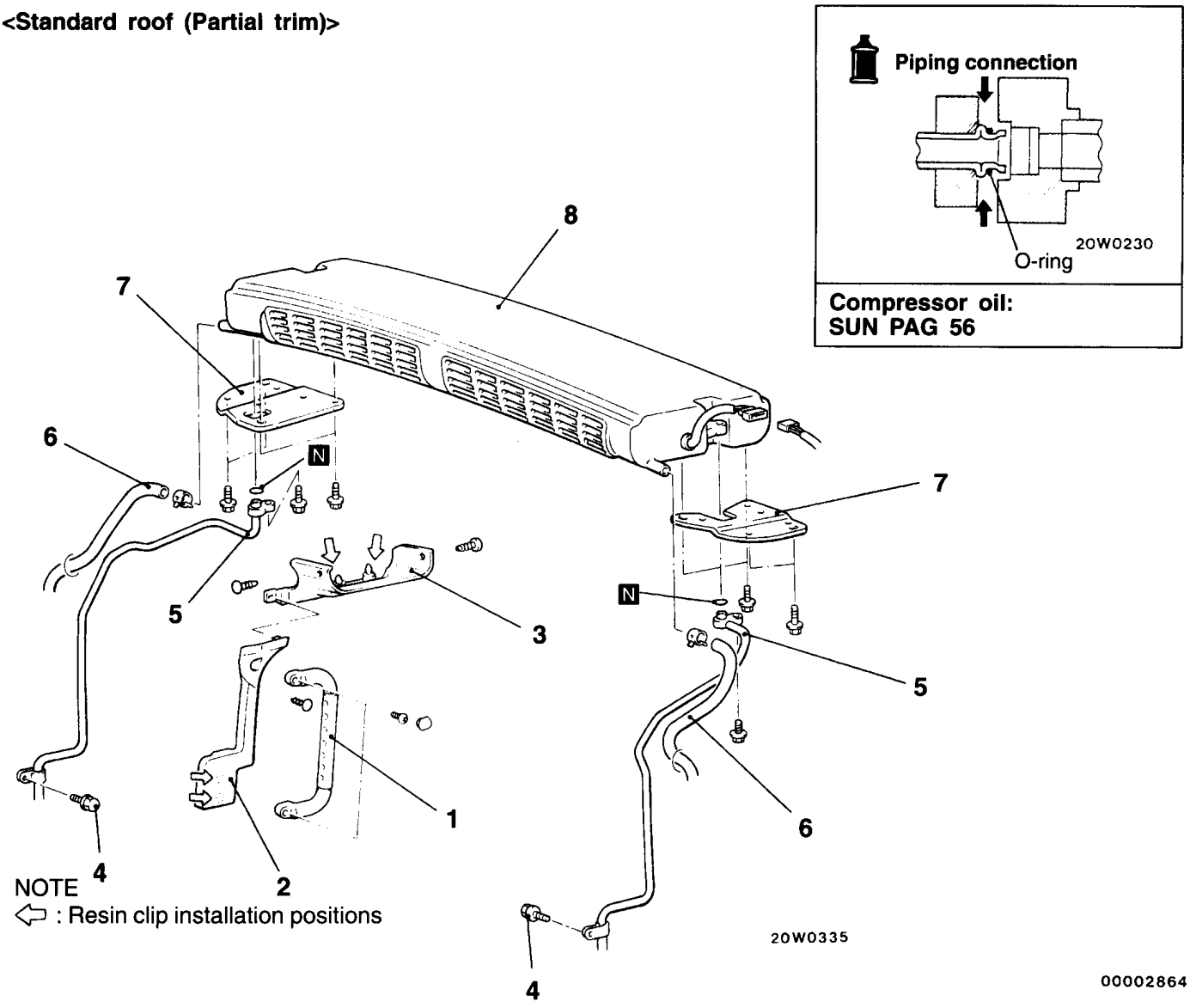
1. Centre pillar cover
2. Rear cooler bracket cover
3. Bolt
4. Liquid hose and discharge hose connection

◀A▶ ▶A◀

5. Bolt
6. Drain hose connection
7. Rear evaporator assembly
8. Rear cooler bracket

Pre-removal and Post-installation Operation
- Discharge and Charging of Refrigerant (Refer to P.55-17, 20.)

<Standard roof (Partial trim)>



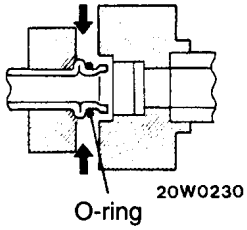
Removal steps

1. Rear door grip <4WD>
2. Centre pillar cover
3. Rear cooler bracket cover
4. Bolt
5. Liquid hose and discharge hose connection
6. Drain hose connection
7. Rear cooler bracket
▶A◀ 8. Rear evaporator assembly

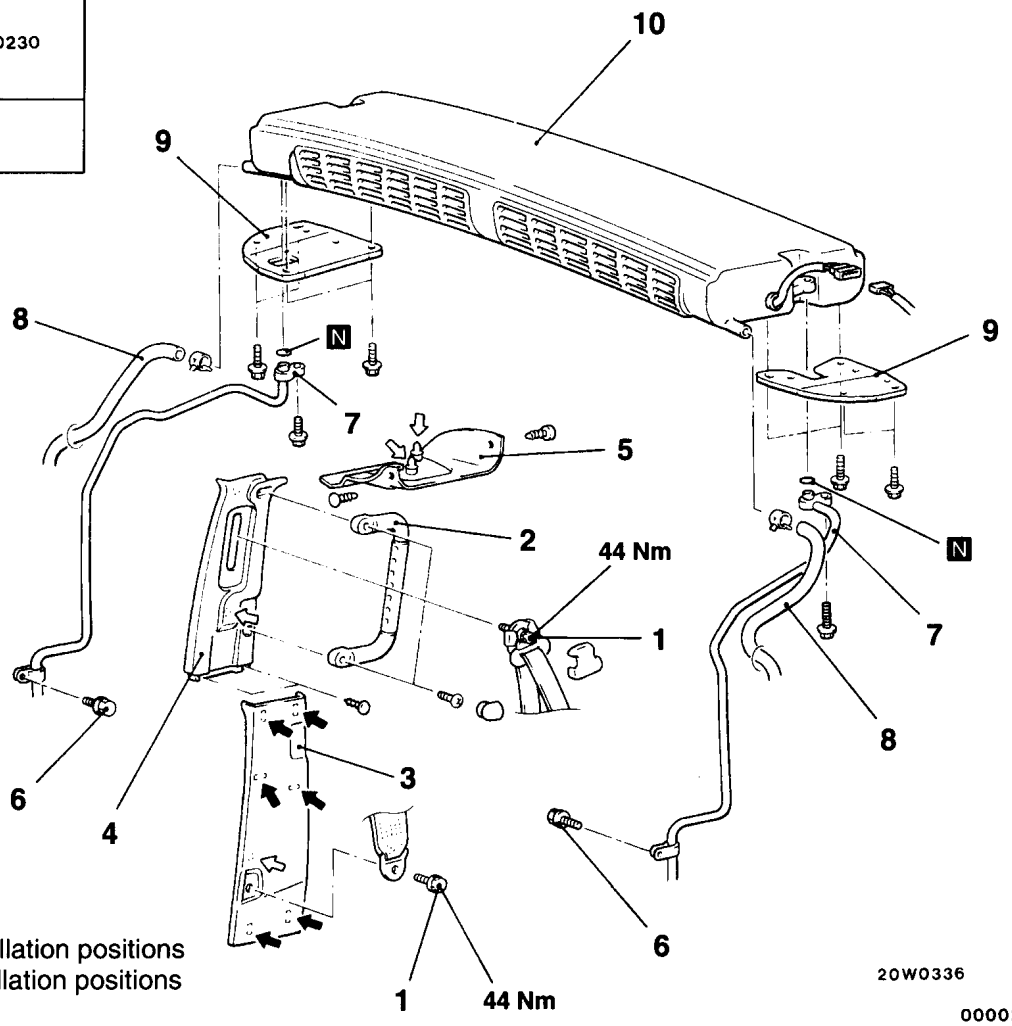
Pre-removal and Post-Installation Operation
- Discharge and Charging of Refrigerant (Refer to P.55-17, 20.)

<Standard roof (Full trim)>

Piping connection

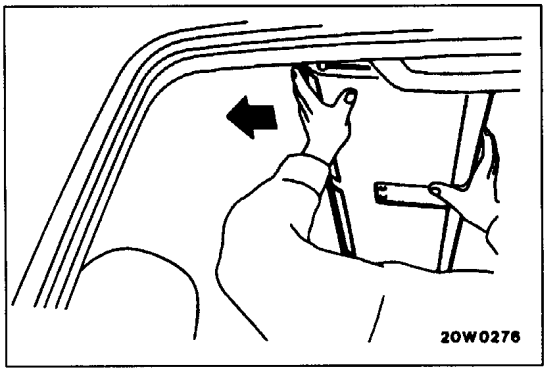


Compressor oil:
SUN PAG 56



NOTE
(1) ⬅ : Resin clip installation positions
(2) ⇦ : Metal clip installation positions

Removal steps
1. Front seat belt anchor bolt
2. Rear door grip <4WD>
3. Centre pillar trim, lower
4. Centre pillar trim, upper
5. Rear cooler bracket cover
6. Bolt
7. Liquid hose and discharge hose connection
8. Drain hose connection
9. Rear cooler bracket
▶A◀ 10. Rear evaporator assembly



REMOVAL SERVICE POINT <HIGH ROOF>

◀A▶ REAR EVAPORATOR ASSEMBLY REMOVAL

With the bracket secured to the body, remove the rear evaporator assembly sliding it to the front of the vehicle.

INSTALLATION SERVICE POINT

▶A◀ REAR EVAPORATOR ASSEMBLY 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

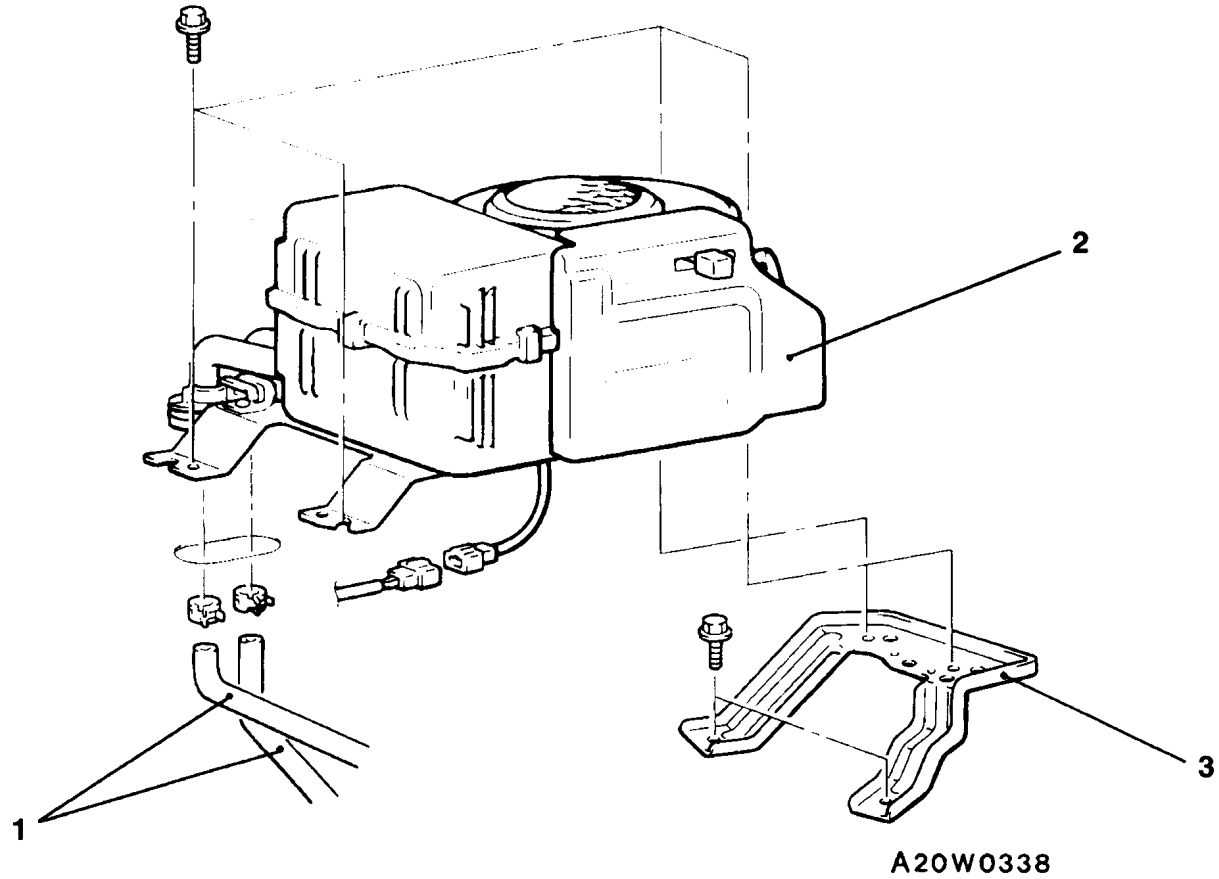
Quantity: 30 mℓ

REAR HEATER UNIT <UNDER SEAT TYPE>

120002269

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
(1) Draining and Supplying of Coolant (Refer to GROUP 14 – Service Adjustment Procedures.)
(2) Second Seat Removal and Installation (Refer to GROUP 52A – Rear Seats.)



A20W0338

Removal steps

◀A▶ 1. Rear water hose connection
2. Rear heater unit
3. Rear heater bracket

REMOVAL SERVICE POINT

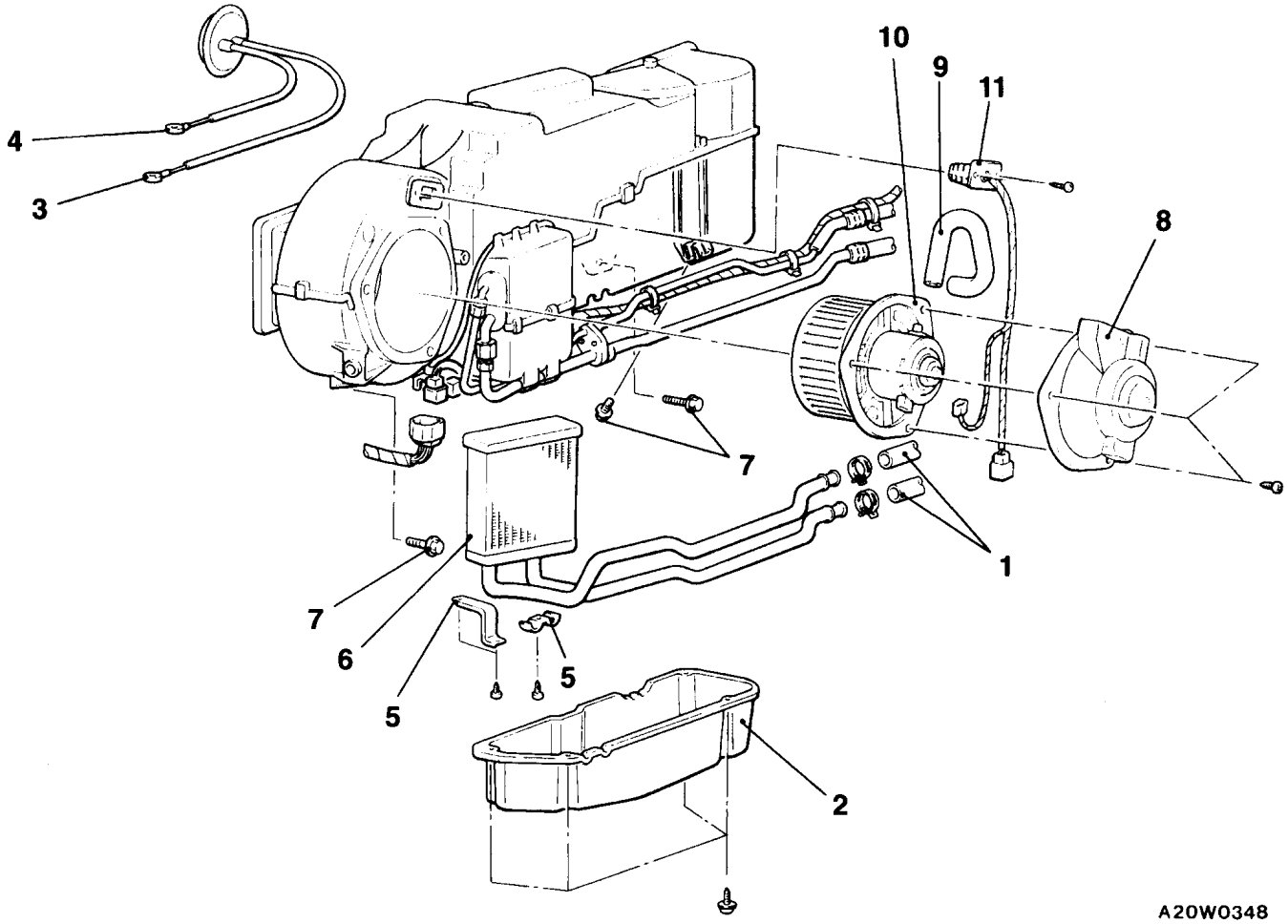
◀A▶ REAR WATER HOSE DISCONNECTION

Caution
Be sure to cool down the coolant inside the rear heater core and rear water pipe before disconnecting the hose. Otherwise, it will lead to personal injury.

REAR HEATER CORE, REAR BLOWER MOTOR ASSEMBLY AND RESISTOR <BUILT-IN TYPE>

120002270

REMOVAL AND INSTALLATION



Rear heater core removal steps

- Draining and Supplying of the Coolant (Refer to GROUP 14 – Service Adjustment Procedures.)

◀A▶ ▶C◀ 1. Rear water hose connection
2. Link cover
▶B◀ 3. Air mixing damper cable connection
5. Bracket
6. Rear heater core

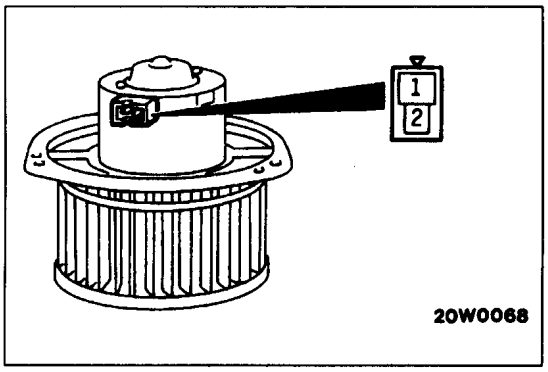
Rear blower motor assembly and resistor removal steps

2. Link cover
▶B◀ 3. Air mixing damper cable connection
▶A◀ 4. Air outlet changeover damper cable connection
7. Bolt
8. Motor cover
9. Hose
10. Rear blower motor assembly
11. Resistor

REMOVAL SERVICE POINT

◀A▶ REAR WATER HOSE DISCONNECTION

Caution
Be sure to cool down the coolant inside the rear heater core and rear water pipe before disconnecting the hose. Otherwise, it will lead to personal injury.



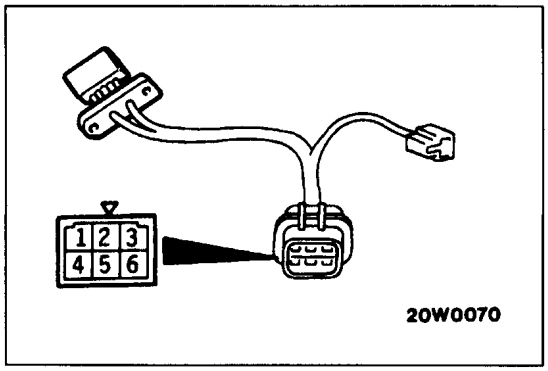
INSPECTION

BLOWER FAN AND MOTOR INSPECTION

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

Battery terminals		Motor
1	2	
⊖ - - - - - -	- - - - - - ⊕	Runs

Caution
Do not touch the blower during inspection, or it may lead to personal injury.

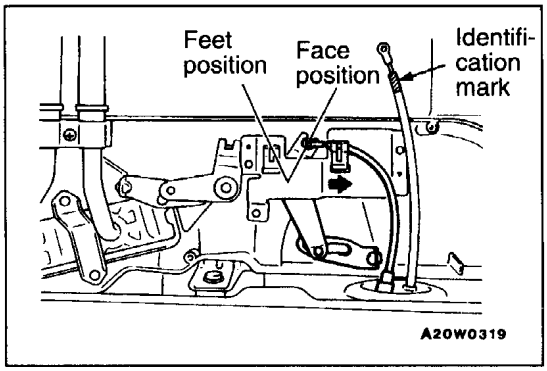


RESISTOR INSPECTION

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

Standard value:

Measurement terminal	Standard value Ω
Between terminals 4–3 (LO)	1.56±7%
Between terminals 4–6 (ML)	0.86±7%
Between terminals 4–5 (MH)	0.44±7%

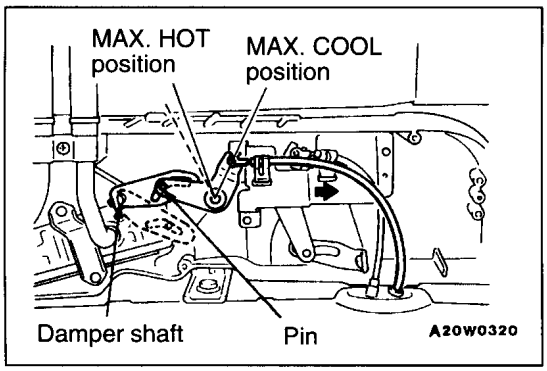


INSTALLATION SERVICE POINTS

▶A◀ AIR OUTLET CHANGEOVER DAMPER CABLE INSTALLATION

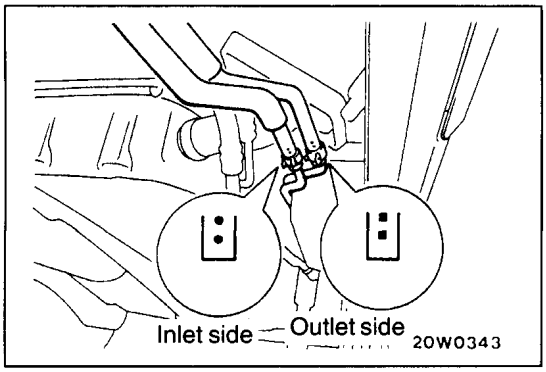
(1) Set the air outlet changeover lever on the rear panel assembly to the face position.
(2) Set the air outlet changeover damper lever of the heater unit to face position, and install the cable to the lever pin.
(3) Pull the outer cable in the direction of the arrow so that there is no looseness, and then clamp it.

NOTE
The air mixing damper cable has a yellow identification mark on its end.



▶B◀ AIR MIX DAMPER CABLE INSTALLATION

(1) Set the temperature control lever on the rear panel assembly to the MAX. COOL position.
(2) Set the air mix damper lever at the bottom of the heater unit to the MAX. COOL position, and install the cable to the lever pin.
(3) Pull the outer cable in the direction of the arrow so that there is no looseness.
(4) Position the damper shaft and pin as shown in the illustration, and then clamp the cable.



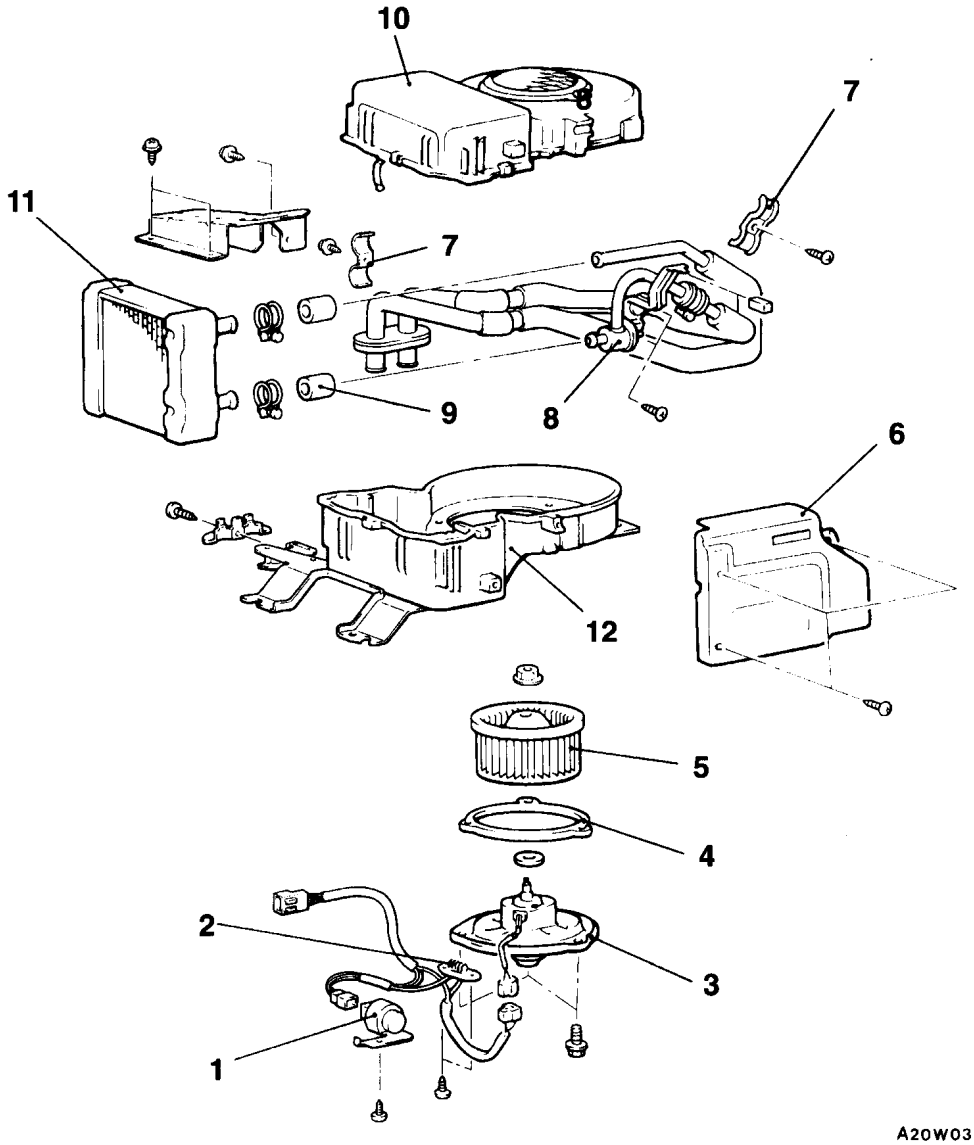
▶C◀ REAR WATER HOSE INSTALLATION

Connect the rear water hose so that the pink hose identification mark is at the bottom.

REAR HEATER CORE, REAR BLOWER MOTOR ASSEMBLY, BLOWER MOTOR LO RELAY AND RESISTOR <UNDER SEAT TYPE> 120002271

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
(1) Draining and Supplying of Coolant (Refer to GROUP 14 – Service Adjustment Procedures.)
(2) Second Seat Removal and Installation (Refer to GROUP 52A – Rear Seats.)
(3) Rear Heater Unit Removal and Installation (Refer to P.55-51.)



A20W0337

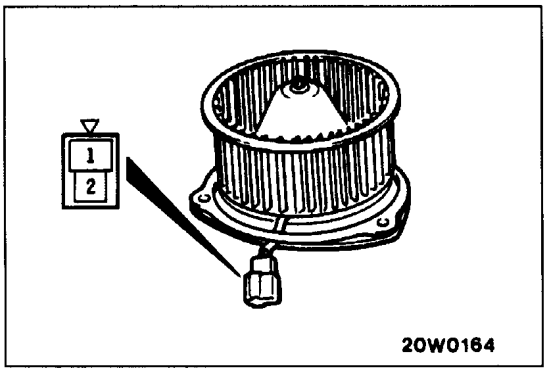
1. Blower motor LO relay
2. Resistor

Rear blower motor assembly and resistor removal steps

3. Rear blower motor assembly
4. Packing
5. Blower fan

Rear heater core removal steps

6. Heater cover
7. Clamp
8. Valve assembly
9. Hose
10. Heater case (upper)
11. Rear heater core
12. Heater case (lower)



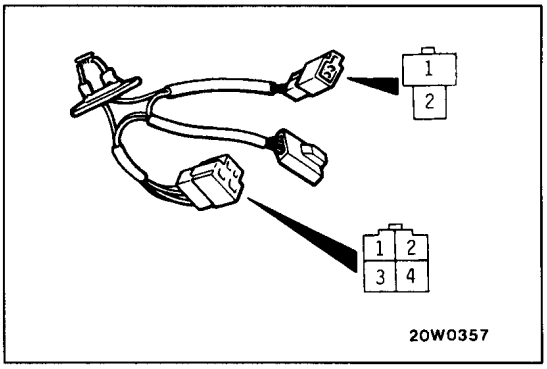
INSPECTION

BLOWER FAN AND MOTOR INSPECTION

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

Battery terminals		Motor
1	2	
⊖ - - - - - -	- - - - - - ⊕	Runs

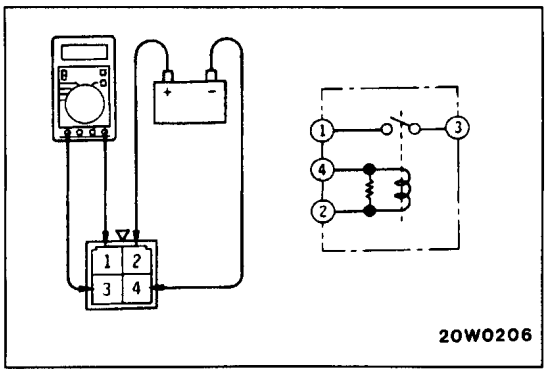
Caution
Do not touch the blower during inspection, or it may lead to personal injury.



RESISTOR INSPECTION

Use an ohmmeter to check that the resistance between terminal (2) of the 2-pin connector and terminal (2) of the 4-pin connector is at the standard value.

Standard value: approx. 1.7Ω



REAR BLOWER MOTOR LO RELAY CONTINUITY INSPECTION

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

HEATER HOSE

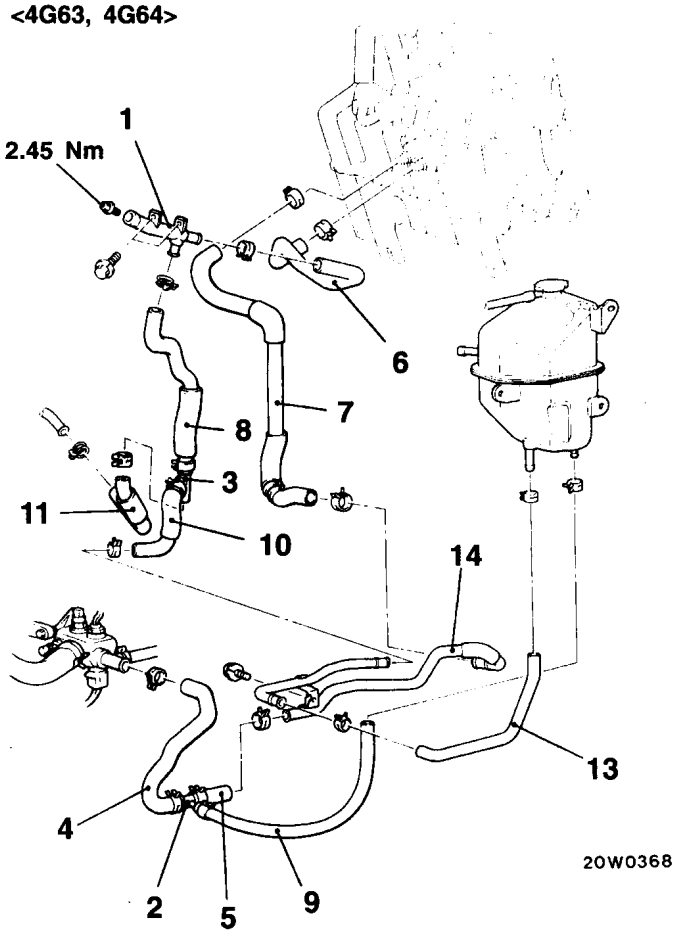
120002514

REMOVAL AND INSTALLATION

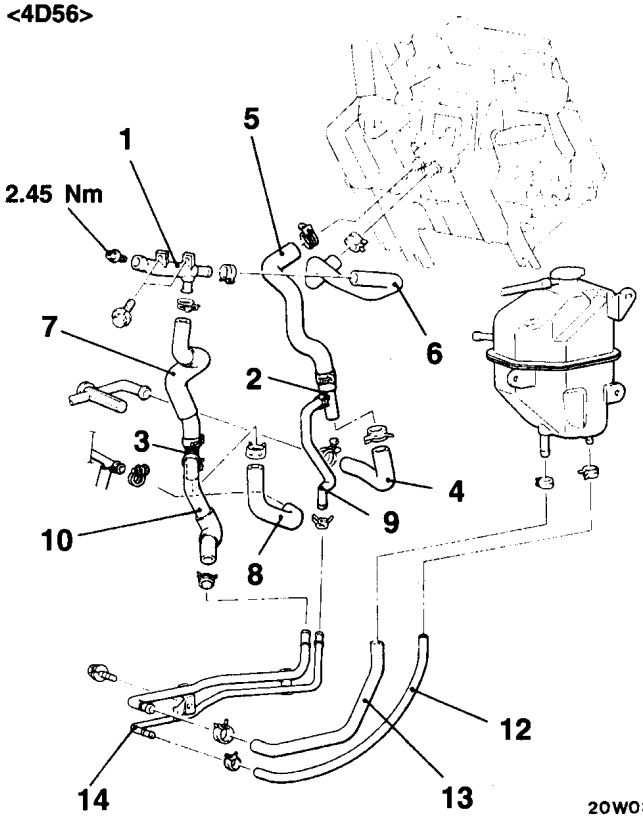
Vehicles Without Rear Heater

Pre-removal and Post-installation Operation
(1)Draining and Supplying of Coolant (Refer to GROUP 14 – Service Adjustment Procedures.)
(2)Battery and Battery Tray Removal and Installation

<4G63, 4G64>



<4D56>



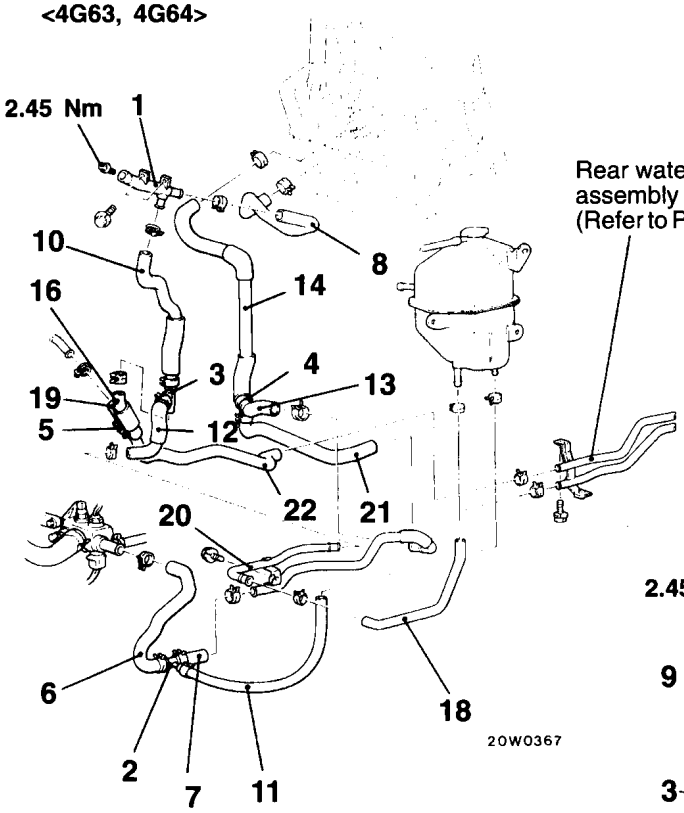
Removal steps

1. Separator box
2. Water hose assembly A
3. Water hose assembly B
▶A◀ 4. Water hose A
▶A◀ 5. Water hose B
▶A◀ 6. Water hose C
▶A◀ 7. Water hose D
▶A◀ 8. Water hose E
▶A◀ 9. Water hose F
▶A◀ 10. Water hose G
▶A◀ 11. Water hose J
12. Water hose
▶A◀ 13. Water hose M
14. Water pipe assembly

Vehicles With Rear Heater (Engine Room Side)

Pre-removal and Post-installation Operation
(1) Under Cover Removal and Installation <4G63, 4G64> (Refer to GROUP 42 – Under Cover.)
(2) Draining and Supplying of Coolant (Refer to GROUP 14 – Service Adjustment Procedures.)
(3) Battery and Battery Tray Removal and Installation

<4G63, 4G64>



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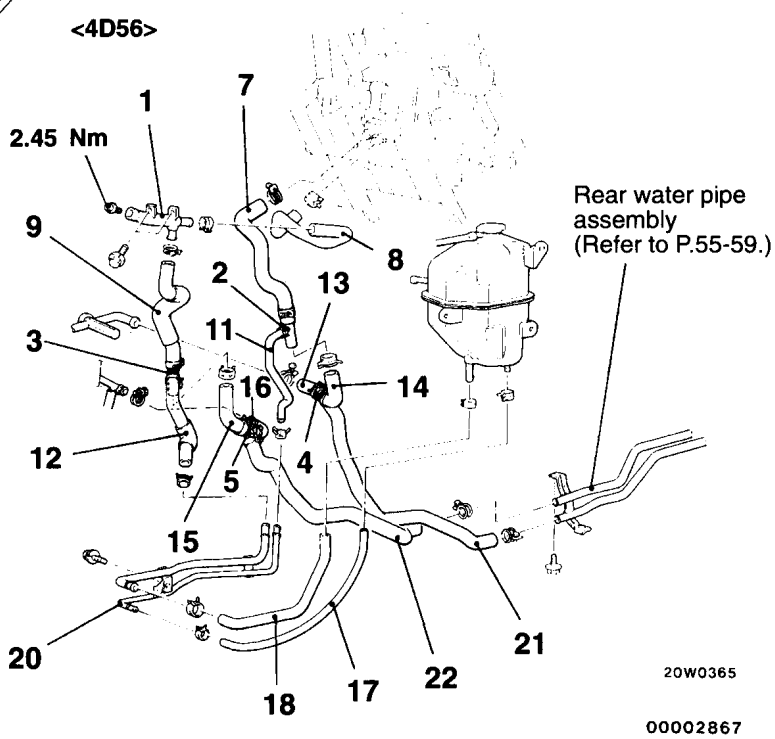


00002867

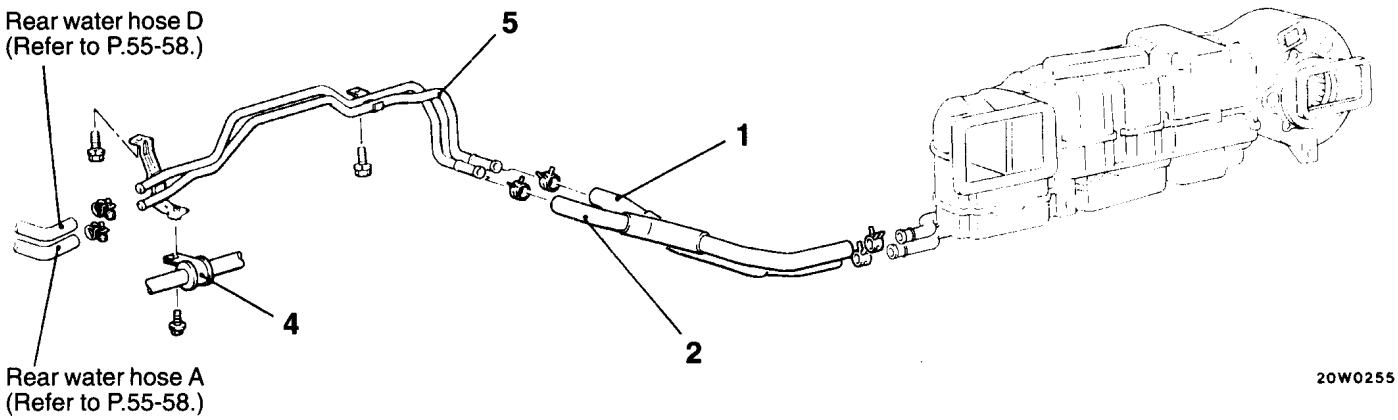
Removal steps

1. Separator box
2. Water hose assembly A
3. Water hose assembly B
4. Water hose assembly C
5. Water hose assembly D
▶A◀ 6. Water hose A
▶A◀ 7. Water hose B
▶A◀ 8. Water hose C
▶A◀ 9. Water hose D
▶A◀ 10. Water hose E
▶A◀ 11. Water hose F
▶A◀ 12. Water hose G
▶A◀ 13. Water hose H
▶A◀ 14. Water hose I
▶A◀ 15. Water hose J
▶A◀ 16. Water hose K
17. Water hose
▶A◀ 18. Water hose M
▶A◀ 19. Water hose N
20. Water pipe assembly
▶A◀ 21. Rear water hose A
▶A◀ 22. Rear water hose D

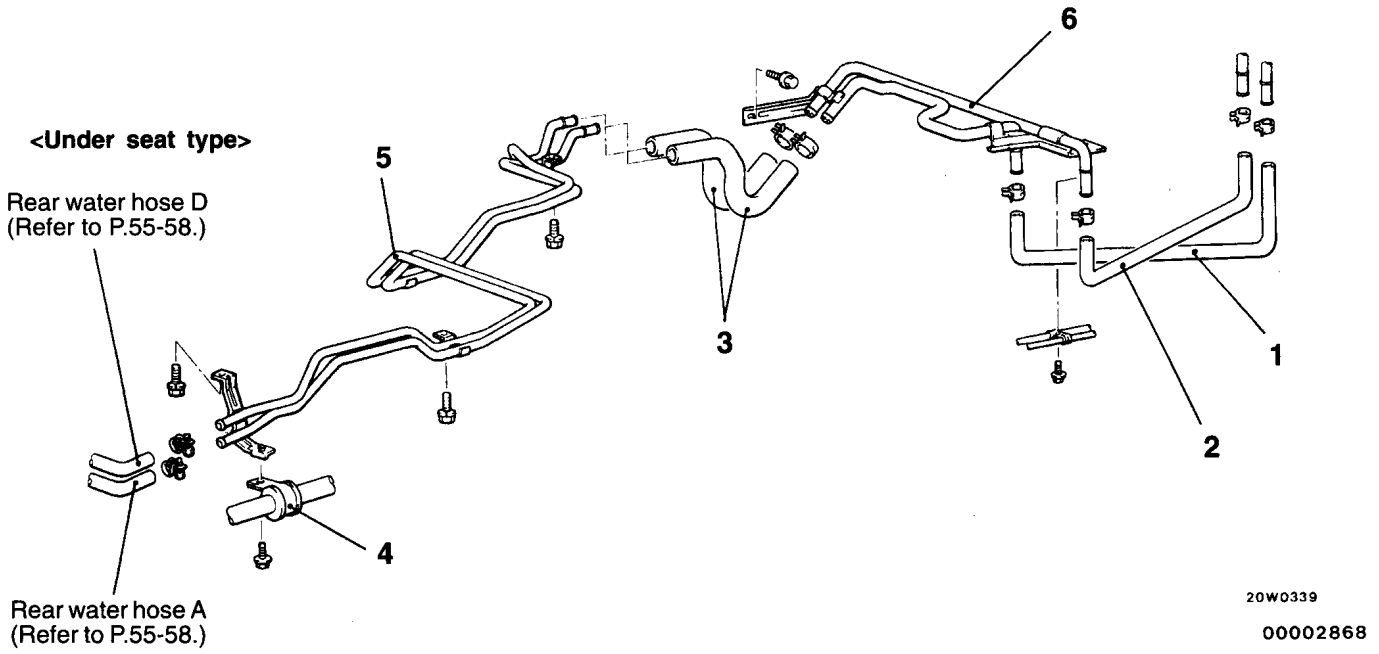
Vehicles With Rear Heater (Under Floor Side)

Pre-removal and Post-installation Operation
- Draining and Supplying of Coolant (Refer to GROUP 14 – Service Adjustment Procedures.)

<Built-in type>



<Under seat type>



▶A◀ 1. Rear water hose B
▶A◀ 2. Rear water hose C
3. Rear water hose

Rear water pipe assembly removal steps
- Exhaust pipe (Refer to GROUP 15 – Exhaust Pipe and Muffler.)
- Heat protector panel
- Propeller shaft assembly (Refer to GROUP 25 – Propeller Shaft.)

4. Discharge hose connection <Vehicles with dual A/C>
5. Water pipe assembly
6. Rear water pipe assembly

INSTALLATION SERVICE POINT

▶A◀ WATER HOSE CONNECTION

Connect water hoses according to the table below.

Engine	Hose	Mark	Direction of marking
4G63, 4G64	A, B, D, G, I	1 round (blue)	Facing up
	J	2 round (blue)	
	C	Rectangular (yellow)	
	E	2 round (blue)	Towards the radiator
	F	1 round (blue)	Towards the engine
	M	2 round (white)	
	Rear A	Rectangular (blue)	Facing down
	Rear D	2 square (blue)	
4D56	A, B, F, G, H	1 round (white)	Facing up
	E, K	2 round (white)	
	C	Rectangular (yellow)	
	D	2 round (white)	Towards the radiator
	M	2 round (white)	Towards the engine
	Rear A	Rectangular (white)	Facing down
	Rear D	2 square (white)	

NOTE
A single marking indicates that the engine coolant gets into the heater core; two markings indicate that it comes out of the heater core.

<Built-in type>

Connect to:	Hose	Mark	Direction of marking
Rear water pipe assembly	Rear B	1 round (pink)	Facing down
	Rear C	Rectangular (pink)	
Rear unit assembly	Rear B	2 round (pink)	
	Rear C	2 square (pink)	

<Under seat type>

Connect to:	Hose	Mark	Direction of marking
Rear water pipe assembly	Rear B	1 round (red)	Facing the radiator
	Rear C	Rectangular (red)	
Rear heater unit	Rear B	2 round (red)	
	Rear C	2 square (red)	
Water pipe assembly	Rear water hose	1 round (yellow)	Facing down
Rear water pipe assembly	Rear water hose	2 round (yellow)	

COMPRESSOR AND TENSION PULLEY

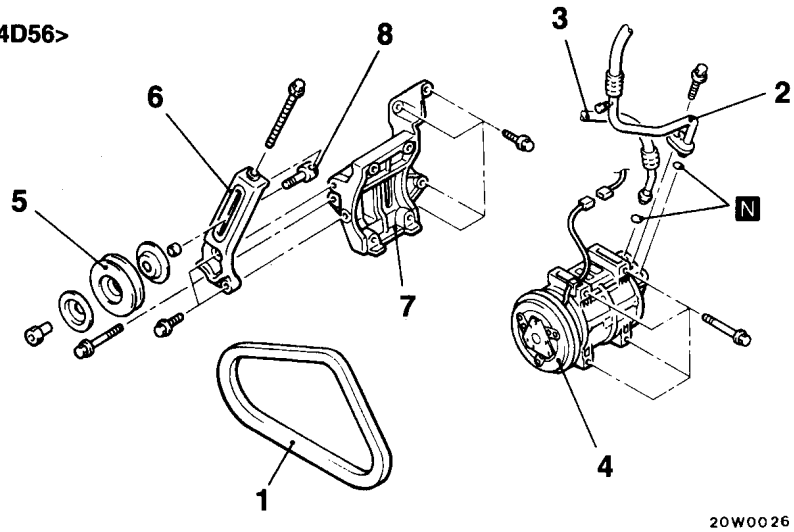
120002515

REMOVAL AND INSTALLATION

Single A/C

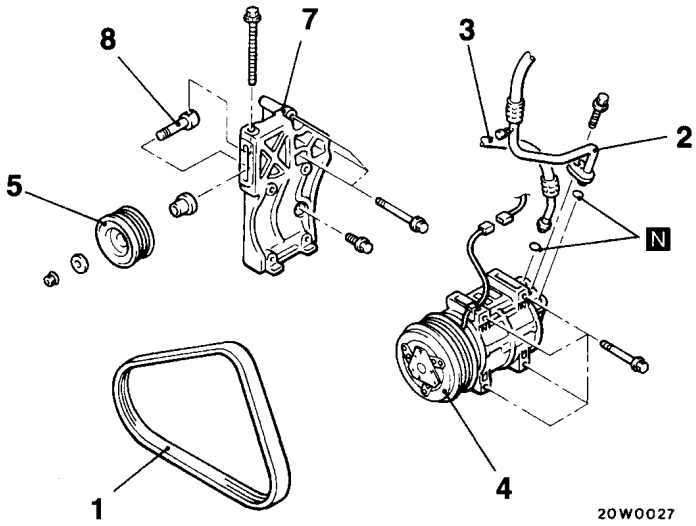
Post-Installation Operation
- Compressor Drive Belt Adjustment (Refer to GROUP 11 – Service Adjustment Procedures.)

<4D56>



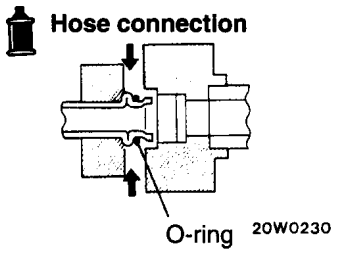
20W0026

<4G63, 4G64>



20W0027

00002869



Compressor oil:
ZXL 100PG

Compressor and tension pulley removal steps

◀A▶ 1. Compressor drive belt
- Discharging and charging of refrigerant (Refer to P.55-17, 20.)

◀B▶ 2. Suction hose connection

◀B▶ 3. Discharge hose connection
- Under cover (Refer to GROUP 42 – Under Cover.)

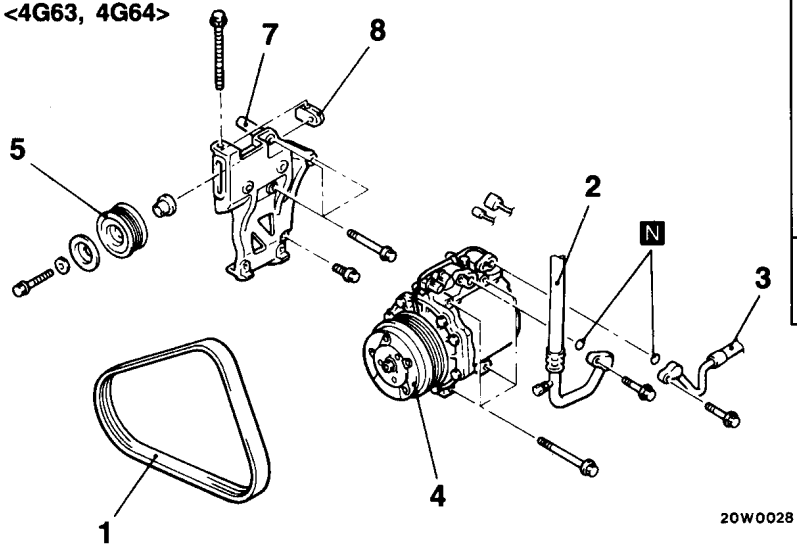
◀C▶ ▶A◀ 4. Compressor

5. Tension pulley
6. Tension pulley bracket assembly <4D56>
7. Compressor bracket
8. Shaft

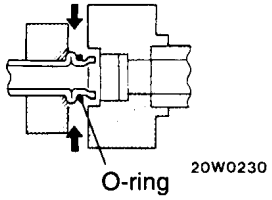
Dual A/C

Post-installation Operation
- Compressor Drive Belt Adjustment (Refer to GROUP 11 – Service Adjustment Procedures.)

<4G63, 4G64>

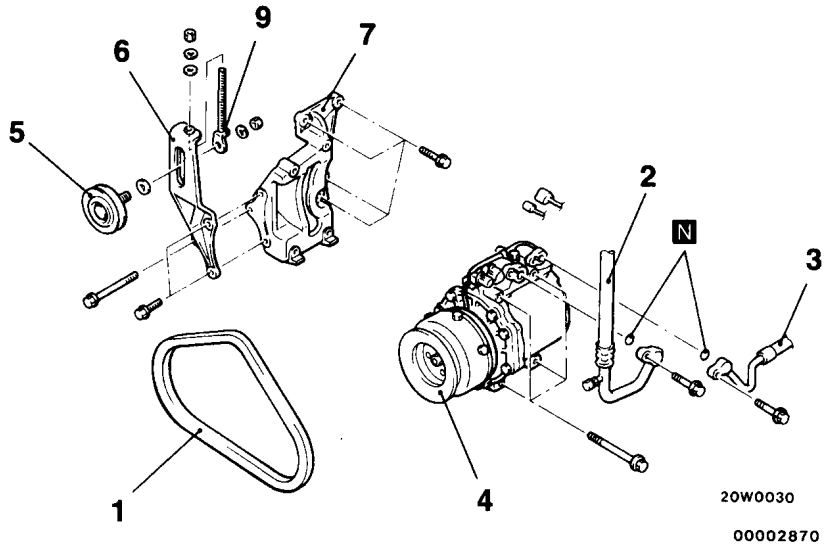


Hose connection



Compressor oil: SUN PAG 56

<4D56>



00002870

Compressor and tension pulley removal steps

◀A▶ 1. Compressor drive belt
- Discharging and charging of refrigerant (Refer to P.55-17, 20.)
- Battery and battery tray

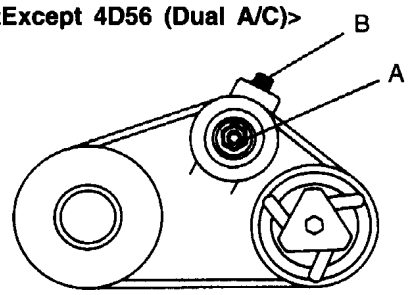
◀B▶ 2. Suction hose connection

◀B▶ 3. Discharge hose connection
- Under cover (Refer to GROUP 42 – Under Cover.)

◀C▶ ▶A◀ 4. Compressor

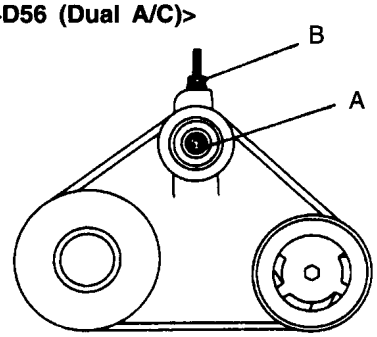
5. Tension pulley
6. Tension pulley bracket assembly <4D56>
7. Compressor bracket
8. Adjust plate <4G63, 4G64>
9. Adjust bolt

<Except 4D56 (Dual A/C)>



20W0082

<4D56 (Dual A/C)>



20W0083

00000565

REMOVAL SERVICE POINTS

◀A▶ COMPRESSOR DRIVE BELT REMOVAL

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

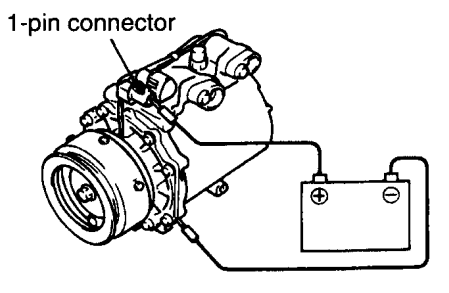
◀B▶ SUCTION HOSE, DISCHARGE HOSE DISCONNECTION

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.



A20W0221

INSPECTION

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.

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

<Single A/C>: 180 mℓ – X mℓ = Y mℓ

<Dual A/C>: 240 mℓ – X mℓ = Y 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 at the same times as the compressor, subtract the rated oil amount of the each part from Y mℓ and discharge from the new compressor.

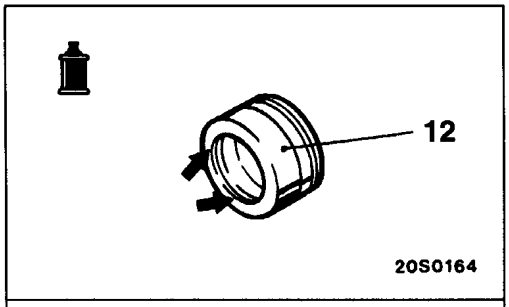
Quantity :

Item	Single A/C	Dual A/C
Front evaporator mℓ	40	30
Rear evaporator mℓ	–	30
Front condenser mℓ	40	30
Side condenser mℓ	–	30
Suction hose mℓ	10	10
Receiver mℓ	10	10

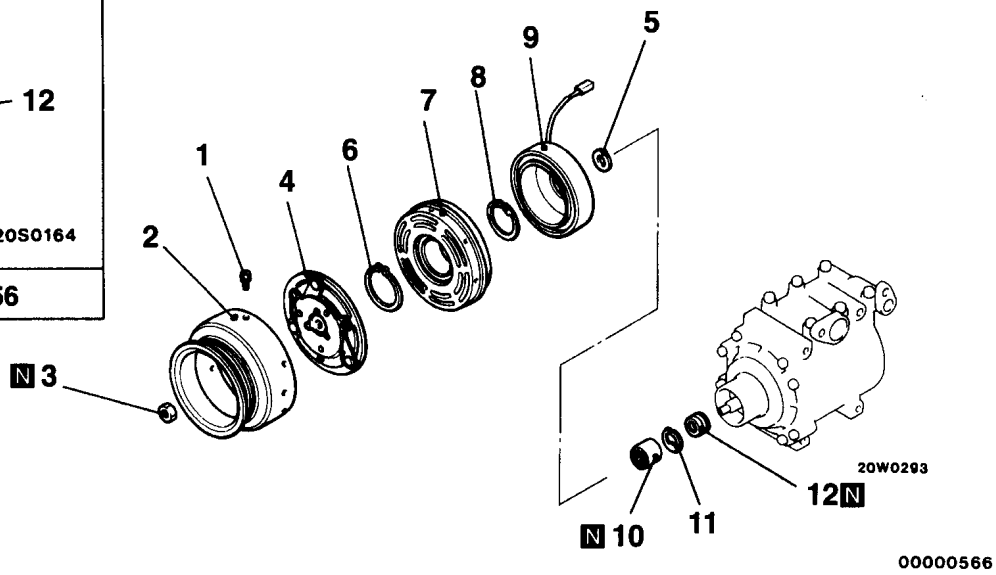
MAGNETIC CLUTCH

120000017

DISASSEMBLY AND REASSEMBLY

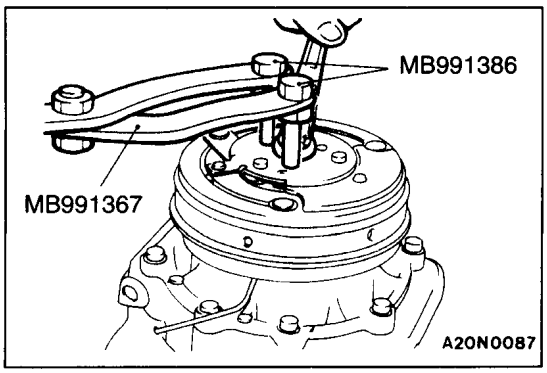


Compressor oil: SUN PAG 56



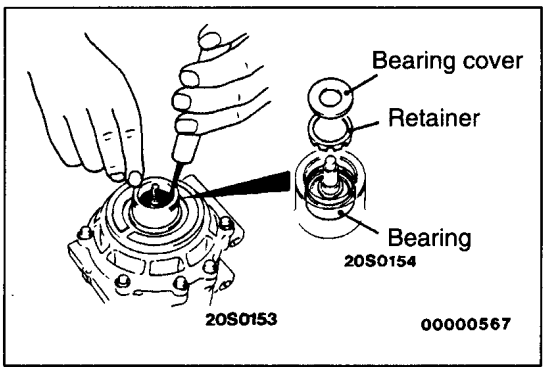
Disassembly steps

1. Bolt <4D56>
2. Pulley <4D56>
   ▶G◀ • Air gap adjustment
◀A▶ ▶F◀ 3. Nut
   ▶E◀ 4. Armature plate
5. Shims
   ▶D◀ 6. Snap ring
7. Rotor
8. Snap ring
   ▶C◀ 9. Clutch coil
◀B▶ ▶B◀ 10. Bearing <Compressor for dual A/C>
11. Snap ring <Compressor for dual A/C>
◀C▶ ▶A◀ 12. Lip seal <Compressor for dual A/C>



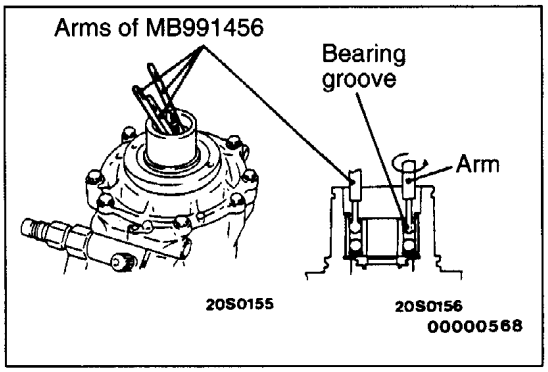
DISASSEMBLY SERVICE POINTS

◀A▶ NUT REMOVAL

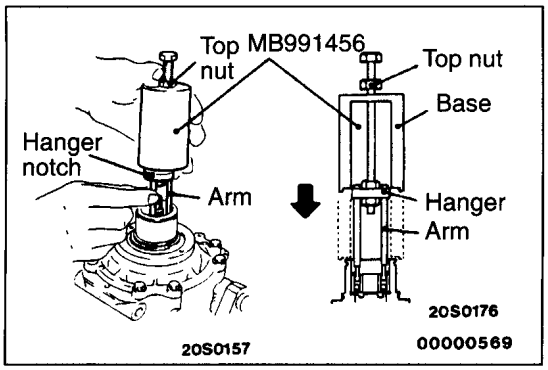


◀B▶ BEARING REMOVAL <Compressor for dual A/C>

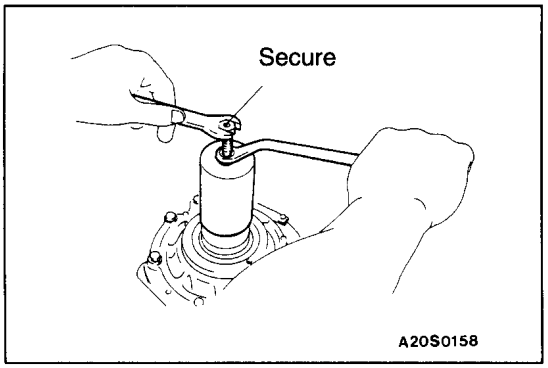
(1) Use a pointed tool such as an awl to remove the bearing cover and retainer.



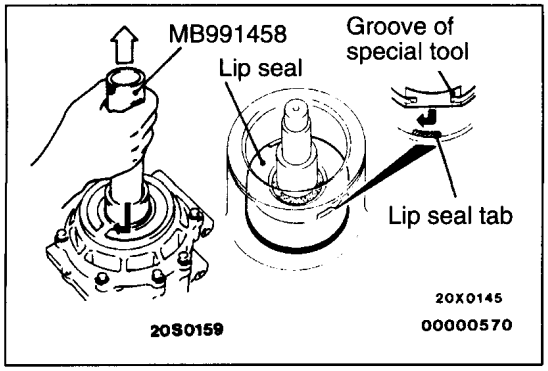
(2) Insert the arms (3) of the special tool into the bearing groove at regular intervals.
(3) Turn the arms 90° to secure the arms to the bearing.



(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.

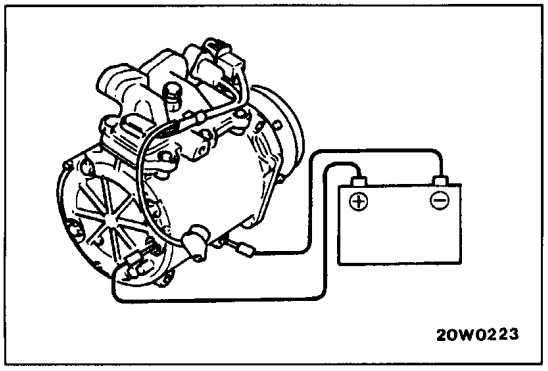


(6) Next, with the bolt of the special tool secured, tighten the nut, and remove the bearing from the compressor.



◀C▶ LIP SEAL REMOVAL <Compressor for dual A/C>

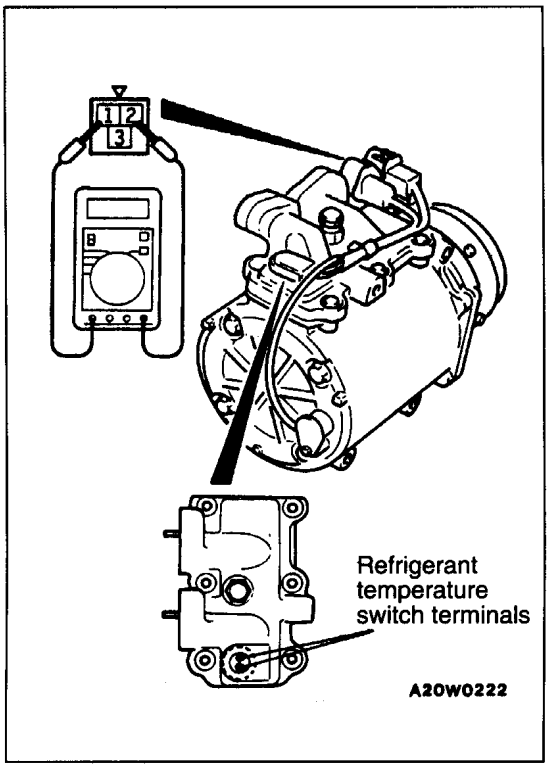
Catch the groove of the special tool on the lip seal tab, and slowly pull the lip seal straight upwards.



INSPECTION

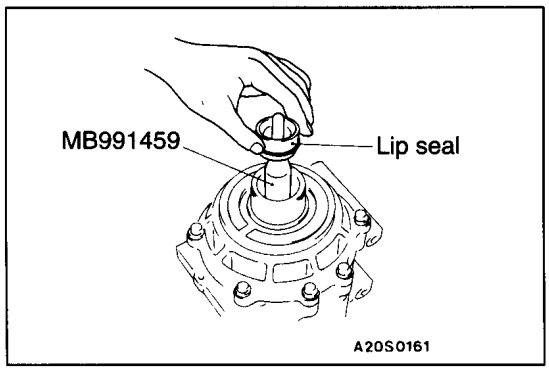
COMPRESSOR MAGNETIC VALVE OPERATION INSPECTION

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 valve (click) can be heard.



REFRIGERANT TEMPERATURE SWITCH SIMPLE INSPECTION

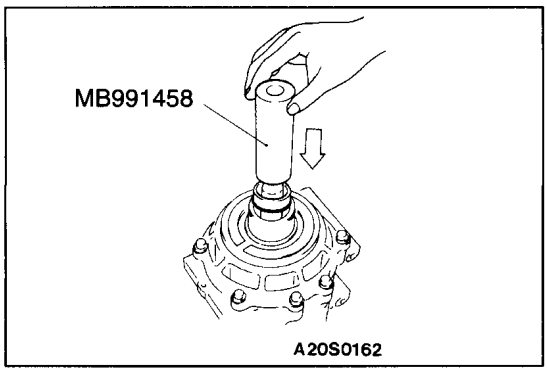
Check that there is continuity between connector terminals (1) and (2) and between the refrigerant temperature switch terminals when the air conditioner is not operating. If there is no continuity, replace the compressor assembly.



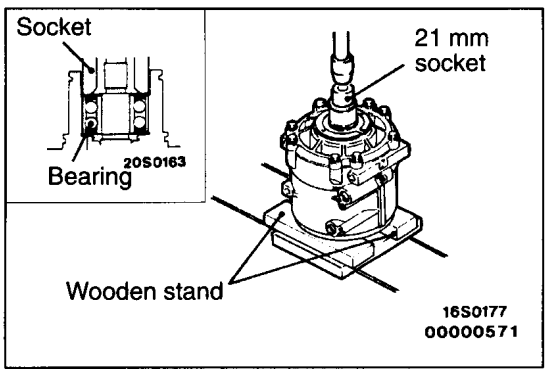
REASSEMBLY SERVICE POINTS

▶A◀ LIP SEAL INSTALLATION <Compressor for dual A/C>

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

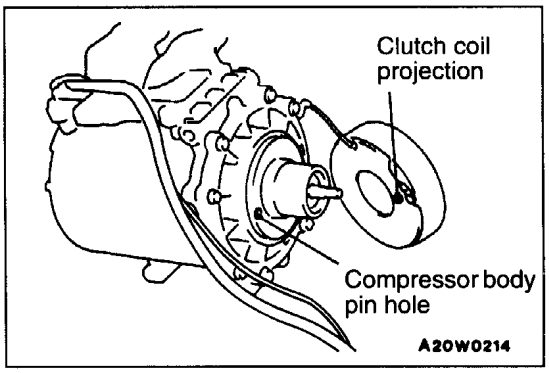


(3) Use the special tool to insert the lip seal.



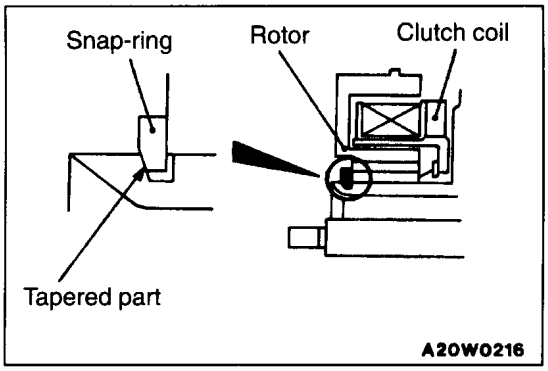
▶B◀ BEARING INSTALLATION <Compressor for dual A/C>

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



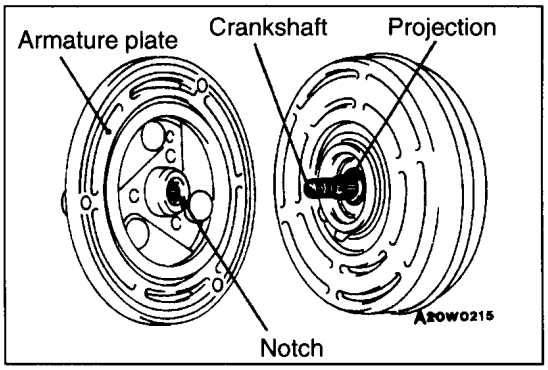
▶C◀ CLUTCH COIL INSTALLATION

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.



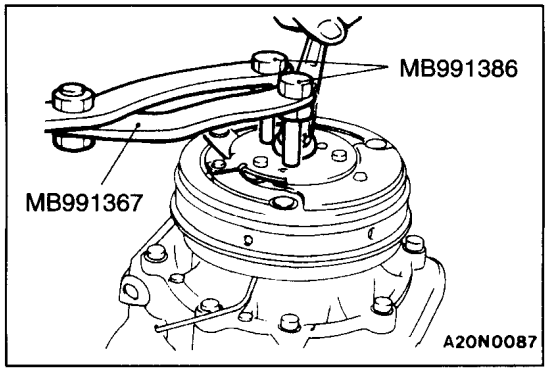
▶D◀ SNAP RING INSTALLATION

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

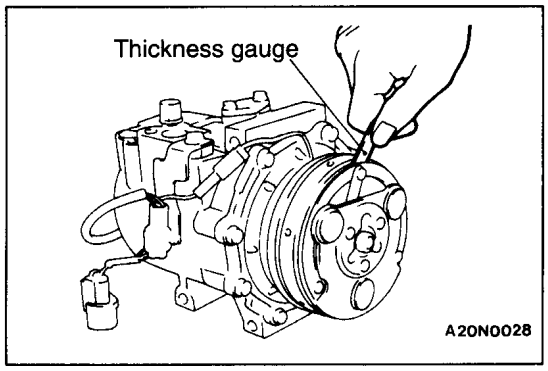


▶E◀ ARMATURE PLATE INSTALLATION

Align the projection on the crankshaft serration with the armature notch, 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: 0.3–0.6 mm <Single A/C>
0.4–0.6 mm <Dual A/C>

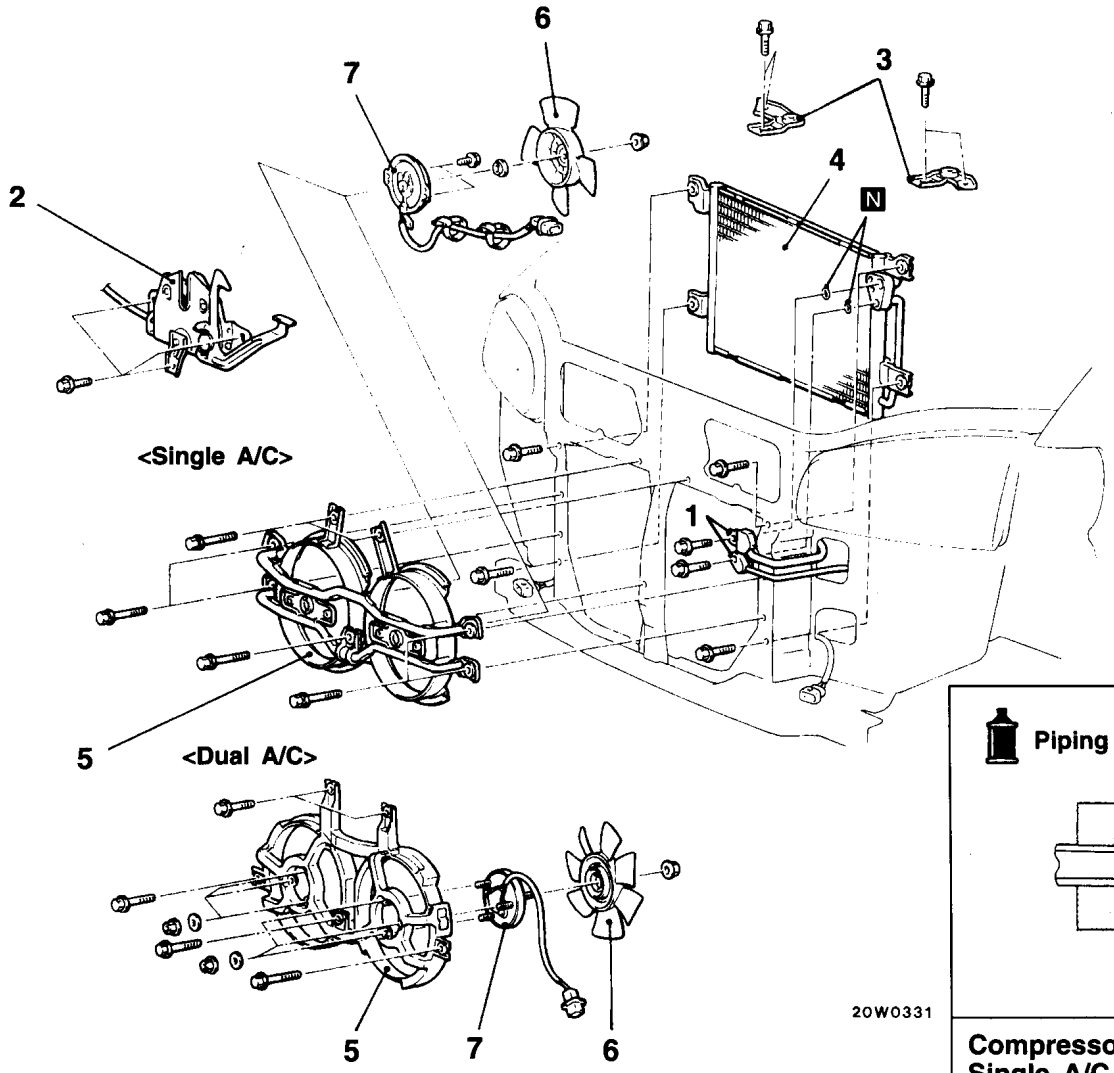
NOTE
If there is a deviation of the air gap from the standard value, make the necessary adjustment by adjusting the number of shims.

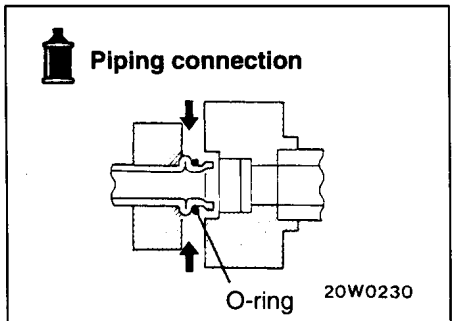
FRONT CONDENSER AND CONDENSER FAN MOTOR

120002272

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
- Front Bumpe Removal and Installation (Refer to GROUP 51 – Bumper.)





Compressor oil:

Single A/C	**ZXL 100PG**
Dual A/C	**SUN PAG 56**

00002871

Front condenser removal steps
- Discharging and charging of refrigerant (Refer to P.55-17, 20.)

◀A▶ 1. Discharge hose and liquid pipe A connection
2. Hood latch
3. Radiator upper bracket
◀B▶ ▶A◀ 4. Front condenser

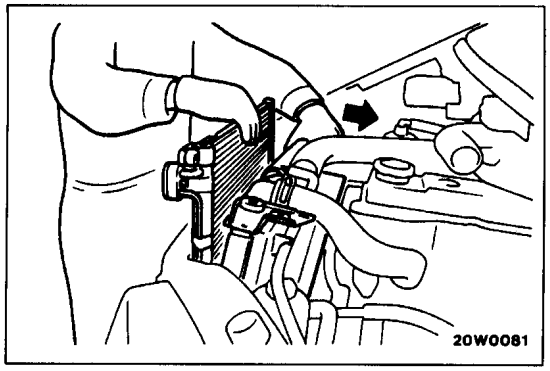
Condenser fan motor removal steps
5. Condenser fan motor and shroud assembly
6. Condenser fan
7. Condenser fan motor

REMOVAL SERVICE POINTS

◀A▶ DISCHARGE HOSE AND LIQUID PIPE A DISCONNECTION

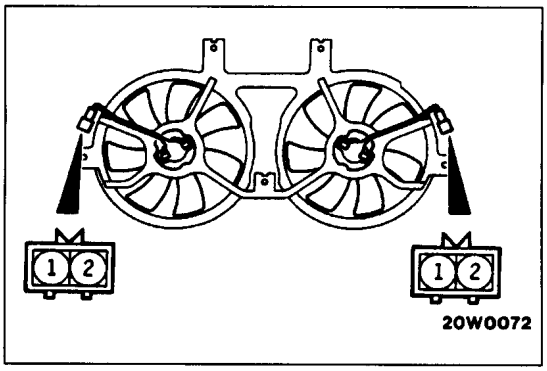
Plug the disconnected hose and the condenser nipple not to let foreign matter get into them.

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



◀B▶ FRONT CONDENSER REMOVAL

(1) Remove the mounting bolts from the front of the headlamp support member.
(2) Pull out the stay at the bottom of the radiator, and then slide the radiator towards the engine.
(3) Lift up the front condenser assembly to remove it.



INSPECTION

CONDENSER FAN AND MOTOR INSPECTION

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

Battery terminals		Motor
1	2	
⊖ - - - - - - -	- - - - - - - ⊕	Runs

Caution
Do not touch the fan during inspection, or it may lead to personal injury.

INSTALLATION SERVICE POINT

▶A◀ FRONT CONDENSER INSTALLATION

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

<Single A/C>

Compressor oil: ZXL 100PG

Quantity: 40 mℓ

<Dual A/C>

Compressor oil: SUN PAG 56

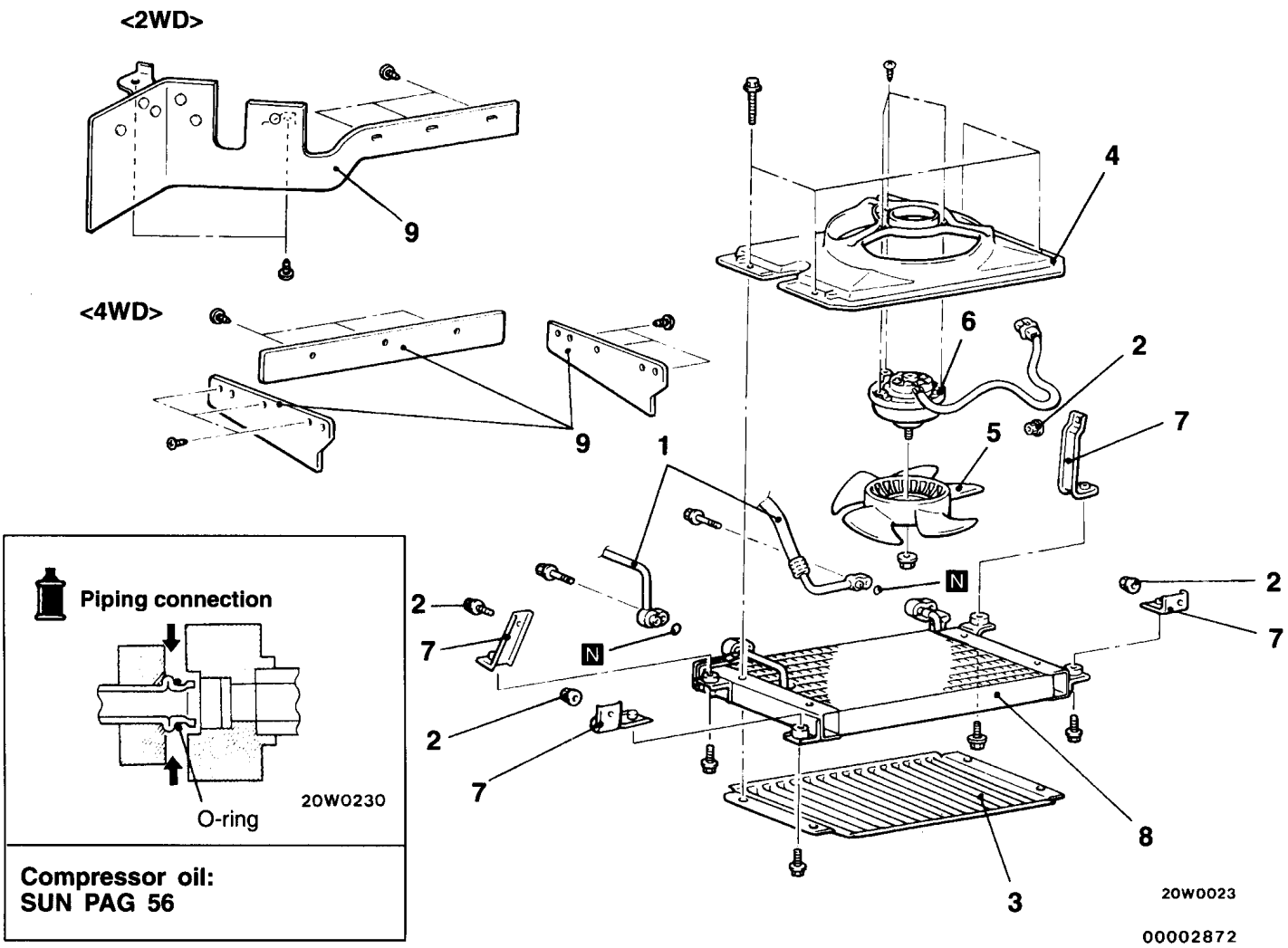
Quantity: 30 mℓ

SIDE CONDENSER AND CONDENSER FAN MOTOR <DUAL A/C>

120002273

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
- Discharging and Charging of Refrigerant (Refer to P.55-17, 20.)



Removal steps

◀A▶
1. Discharge hose and discharge pipe A connection
2. Side condenser assembly mounting bolt and nut
3. Grille
4. Shroud
5. Condenser fan
6. Condenser fan motor
7. Bracket

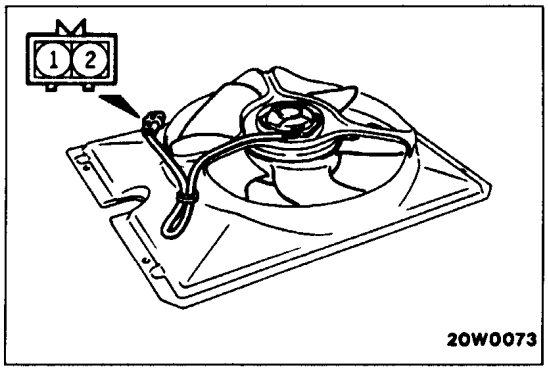
▶A◀
8. Side condenser
9. Rubber plate

REMOVAL SERVICE POINT

◀A▶ DISCHARGE HOSE AND DISCHARGE PIPE A DISCONNECTION

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

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



INSPECTION

CONDENSER FAN AND MOTOR INSPECTION

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

Battery terminals		Motor
1	2	
⊖ - - - - - - -	- - - - - - ⊕	Runs

Caution
Do not touch the fan during inspection, or it may lead to personal injury.

INSTALLATION SERVICE POINT

▶A◀ SIDE CONDENSER INSTALLATION

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

Compressor oil: SUN PAG 56

Quantity: 30 mℓ

REFRIGERANT LINE

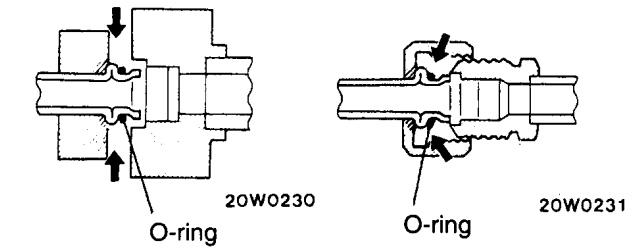
120002274

REMOVAL AND INSTALLATION

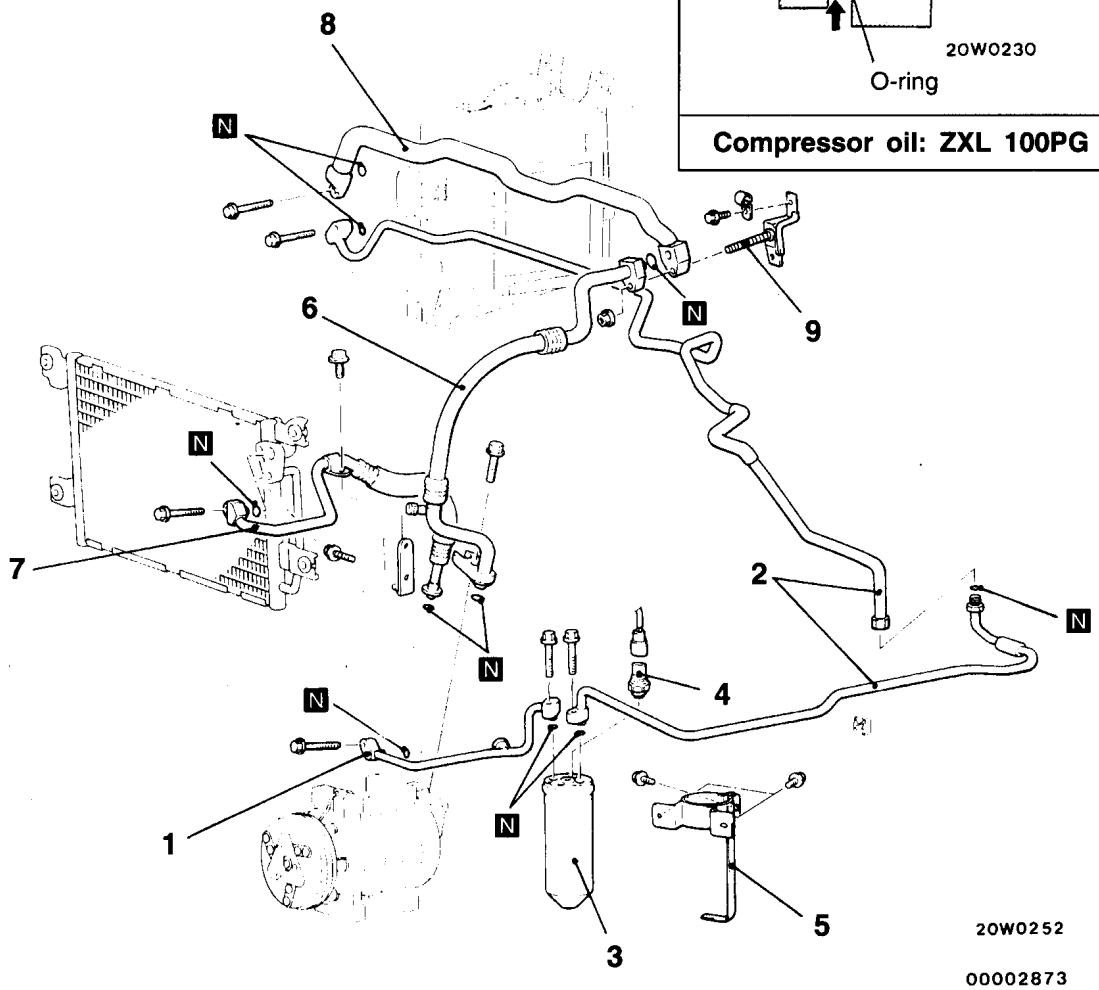
Single A/C

Pre-removal and Post-installation Operation
(1)Discharging and Charging of Refrigerant
(Refer to P.55-17, 20.)
(2)Battery and Battery Tray Removal and Installation
(3)Front Bumper Removal and Installation
(Refer to GROUP 51 – Bumper.)

Piping connection



Compressor oil: ZXL 100PG



00002873

Receiver assembly removal steps

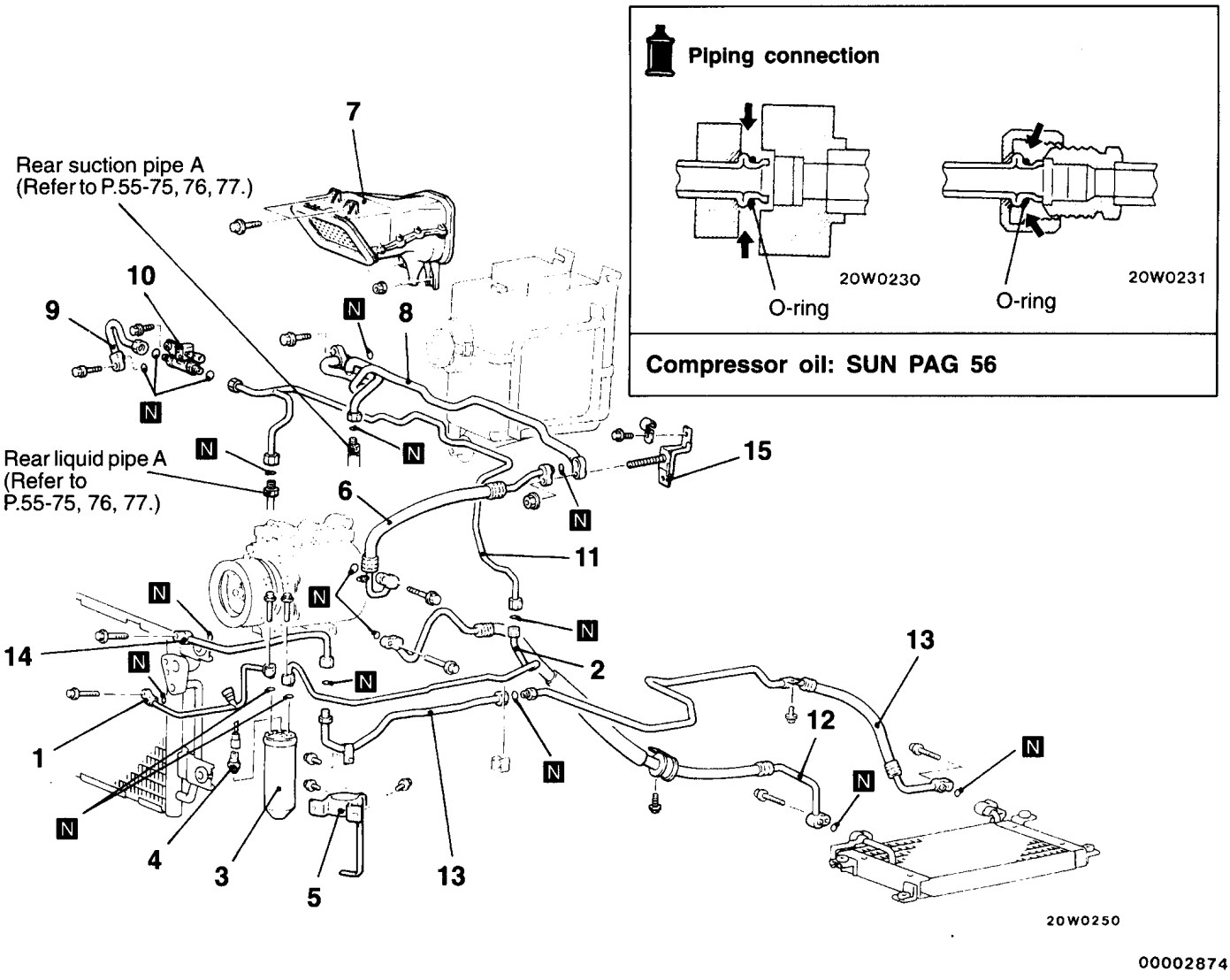
◀A▶ 1. Liquid pipe A
◀A▶ 2. Liquid pipe assembly B
▶A◀ 3. Receiver assembly
4. Dual pressure switch
5. Receiver bracket

Hoses disconnection

◀A▶ ▶A◀ 6. Suction hose
◀A▶ 7. Discharge hose
◀A▶ 8. Suction pipe
9. Suction hose bracket

Dual A/C (Front Refrigerant Line)

Pre-removal and Post-installation Operation
(1)Discharging and Charging of Refrigerant
(Refer to P.55-17, 20.)
(2)Battery and Battery Tray Removal and Installation
(3)Front Bumper Removal and Installation
(Refer to GROUP 51 – Bumper.)



Receiver assembly removal steps

◀A▶ 1. Liquid pipe A
◀A▶ 2. Liquid pipe B
▶A◀ 3. Receiver assembly
4. Dual pressure switch
5. Receiver bracket

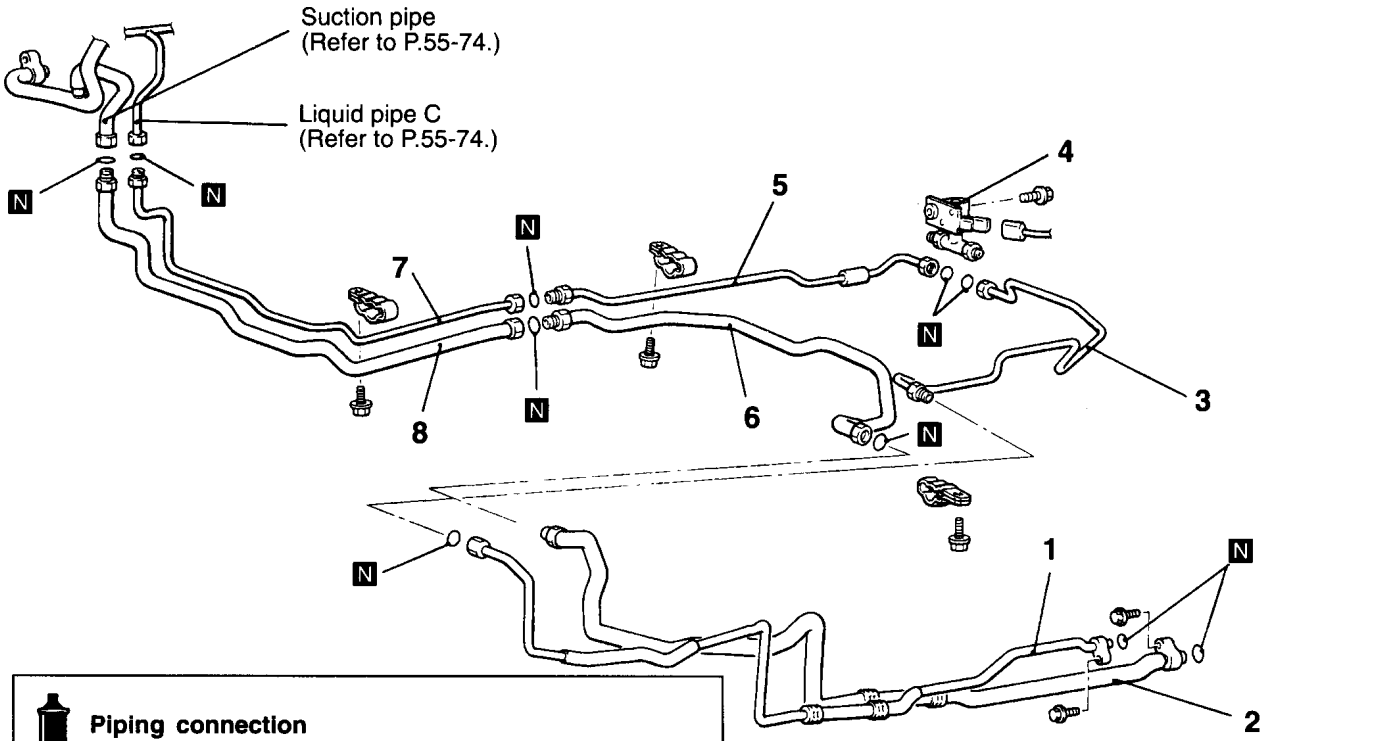
Hoses and pipes disconnection

◀A▶ ▶A◀ 6. Suction hose
7. Air intake duct assembly C
◀A▶ 8. Suction pipe
◀A▶ 9. Liquid pipe
10. Front magnetic valve
11. Liquid pipe C
◀A▶ 12. Discharge hose
◀A▶ 13. Discharge pipe A
◀A▶ 14. Discharge pipe B
15. Suction hose bracket

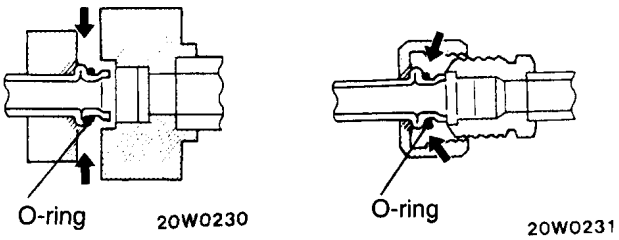
Dual A/C (Rear Refrigerant Line)

Pre-removal and Post-installation Operation
(1)Discharging and Charging of Refrigerant
(Refer to P.55-17, 20.)
(2)Battery and Battery Tray Removal and Installation
(3)Exhaust Pipe Removal and Installation
(Refer to GROUP 15 – Exhaust Pipe and Muffler.)
(4)Heat Protector Panel Removal and Installation

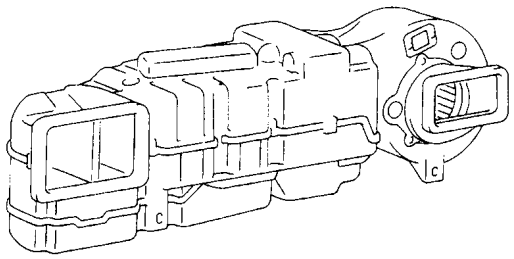
<Built-in type>



Piping connection



Compressor oil: SUN PAG 56



20W0253
00002875

Hoses and pipes disconnection

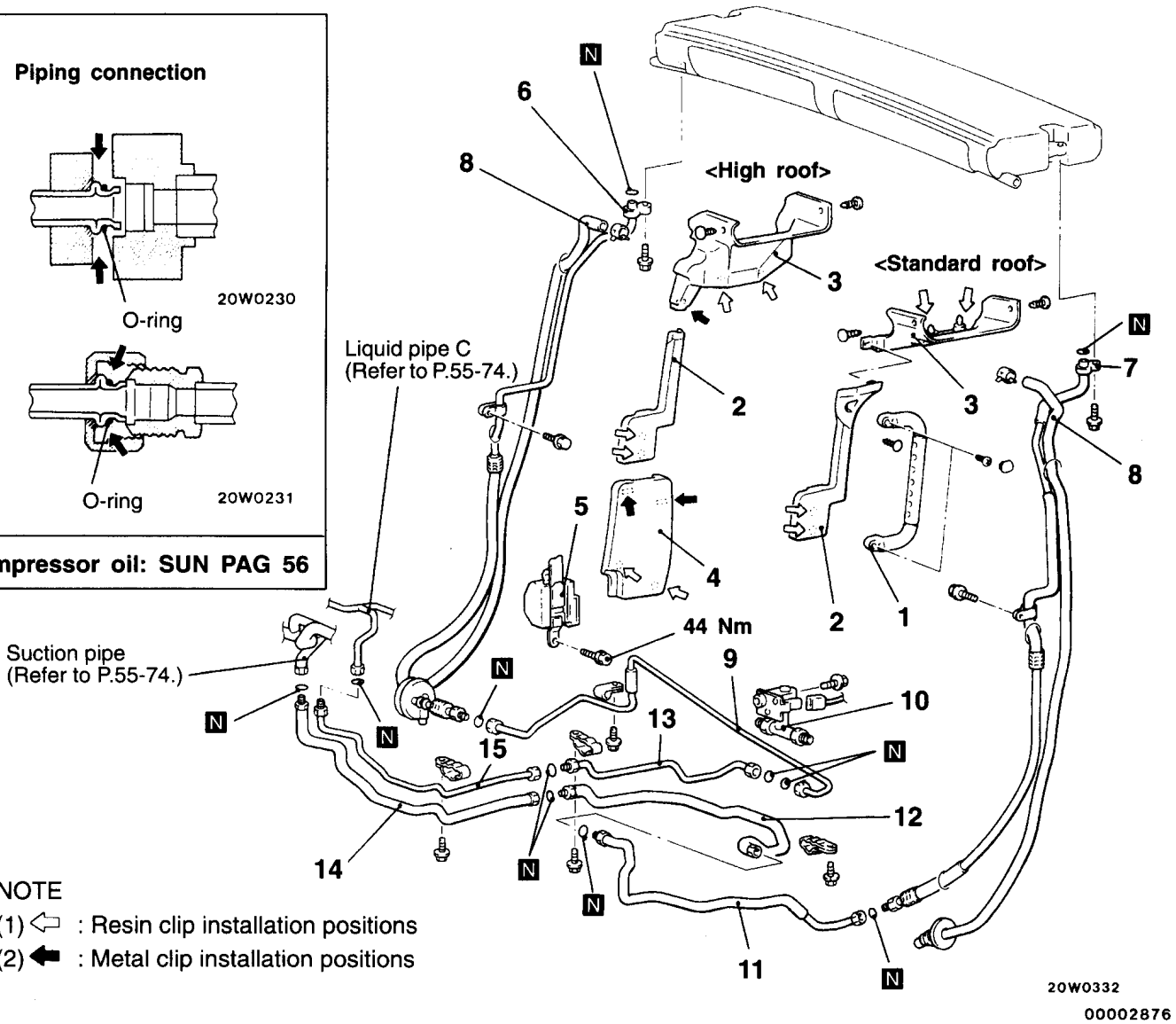
◀A▶ 1. Rear liquid hose
◀A▶ 2. Rear suction hose
3. Liquid pipe F
4. Rear magnetic valve
5. Liquid pipe E
6. Suction pipe B
7. Liquid pipe D
8. Suction pipe A

Pre-removal and Post-installation Operation
(1)Discharging and Charging of Refrigerant
(Refer to P.55-17, 20.)
(2)Battery and Battery Tray Removal and Installation
(3)Exhaust Pipe Removal and Installation
(Refer to GROUP 15 – Exhaust Pipe and Muffler.)
(4)Heat Protector Panel Removal and Installation

<Overhead type (Partial trim)>

Piping connection

Compressor oil: SUN PAG 56



NOTE
(1) ⇦ : Resin clip installation positions
(2) ⬅ : Metal clip installation positions

00002876

Hoses and pipes disconnection

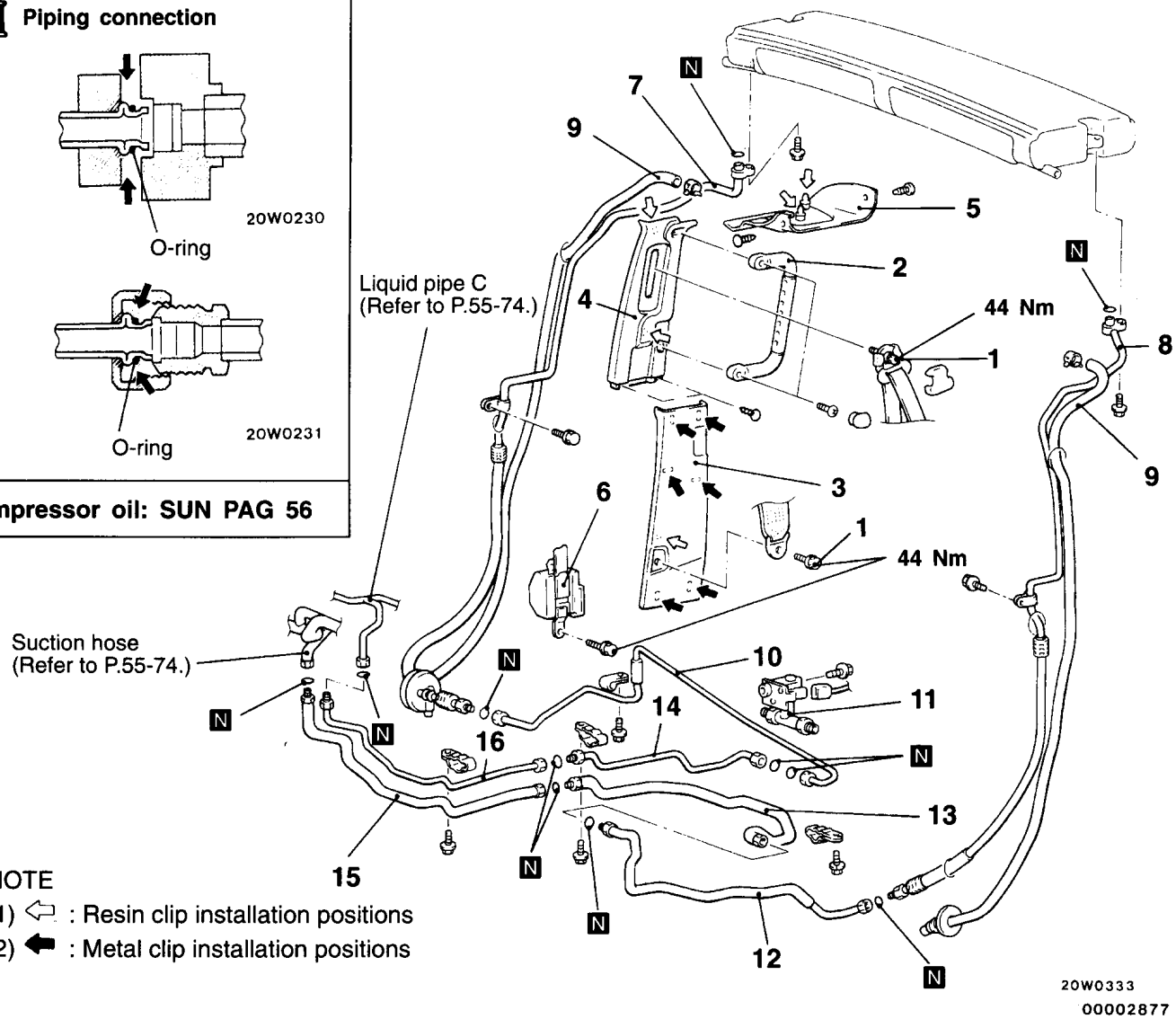
1. Rear door grip <4WD>
2. Centre pillar cover
3. Rear cooler bracket cover
4. Retractor cover
5. Front seat belt retractor connection
◀B▶ 6. Rear liquid hose
◀B▶ 7. Rear discharge hose
◀B▶ 8. Drain hose
9. Liquid pipe F
10. Rear magnetic valve
11. Suction pipe C
12. Suction pipe B
13. Liquid pipe E
14. Suction pipe A
15. Liquid pipe D

Pre-removal and Post-installation Operation
(1)Discharging and Charging of Refrigerant
(Refer to P.55-17, 20.)
(2)Battery and Battery Tray Removal and Installation
(3)Exhaust Pipe Removal and Installation
(Refer to GROUP 15 – Exhaust Pipe and Muffler.)
(4)Heat Protector Panel Removal and Installation

<Overhead type (Full trim)>

Piping connection

Compressor oil: SUN PAG 56



NOTE
(1) ⇦ : Resin clip installation positions
(2) ⬅ : Metal clip installation positions

Hoses and pipes disconnection

1. Front seat belt anchor bolt
2. Rear door grip <4WD>
3. Center pillar trim, lower
3. Center pillar trim, upper
5. Rear cooler bracket cover
6. Front seat belt retractor
◀B▶ 7. Rear liquid hose
◀B▶ 8. Rear discharge hose
◀B▶ 9. Drain hose
10. Liquid pipe F
11. Rear magnetic valve
12. Suction pipe C
13. Suction pipe B
14. Liquid pipe E
15. Suction pipe A
16. Liquid pipe D

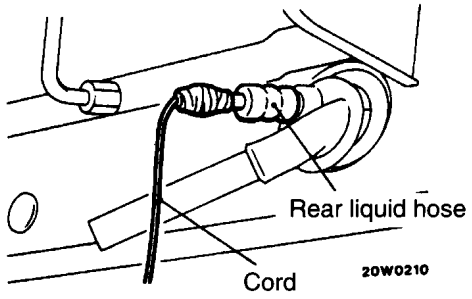
REMOVAL SERVICE POINTS

◀A▶ HOSES AND PIPES DISCONNECTION

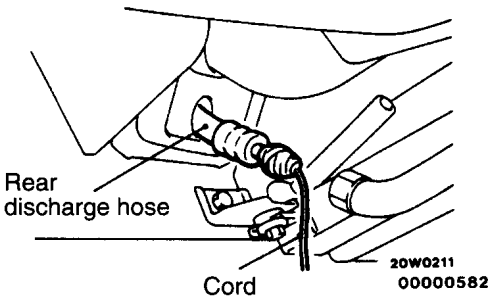
Plug the condenser, compressor and cooling unit nipples not to let dust or other foreign matter get into them.

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

<R.H.>

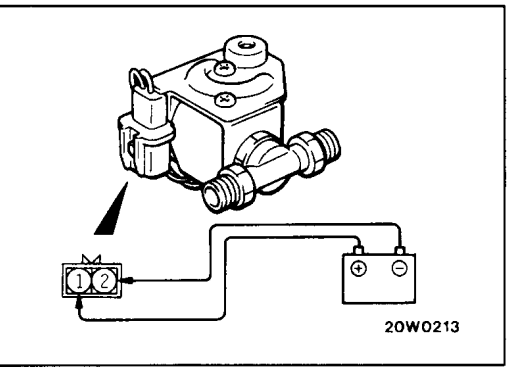


<L.H.>



◀B▶ REAR LIQUID HOSE, REAR DISCHARGE HOSE AND DRAIN HOSE REMOVAL

Remove the grommet. Tie a cord to the end of the hose, wind plastic tape around it so that there is no unevenness, and pull the hose out into the passenger compartment.



INSPECTION

MAGNETIC VALVE INSPECTION

Apply battery voltage to the magnetic valve terminals, and then check that operating sound can be heard.

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.

<Single A/C>

Compressor oil: ZXL 100PG

Quantity:

Suction hose: 10 mℓ

Receiver: 10 mℓ

<Dual A/C>

Compressor oil: SUN PAG 56

Quantity:

Suction hose: 10 mℓ

Receiver: 10 mℓ

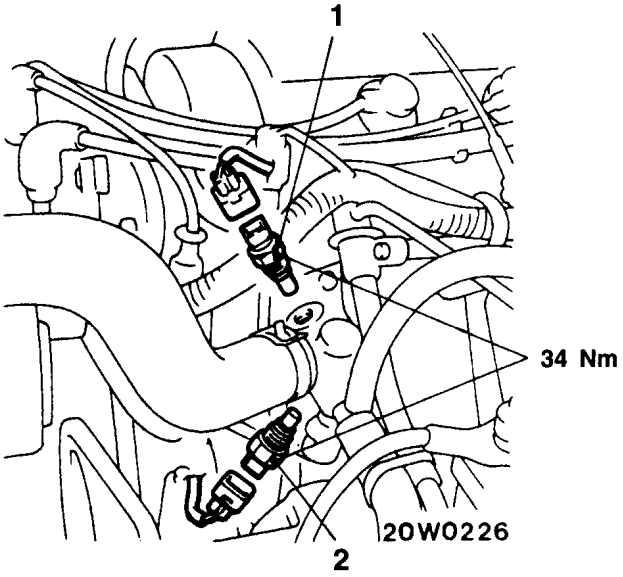
ENGINE COOLANT TEMPERATURE SWITCH

120002275

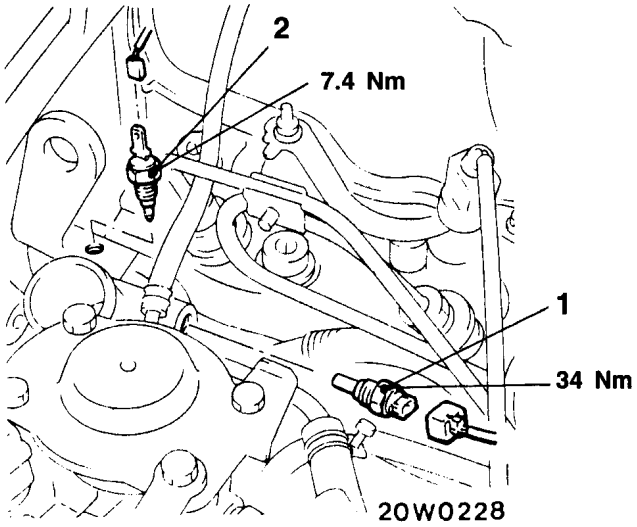
REMOVAL AND INSTALLATION

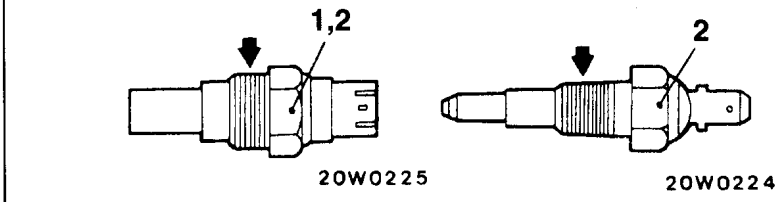
Pre-removal and Post-installation Operation
(1) Refilling Coolant (Refer to GROUP 14 – Service Adjustment Procedures.)
(2) Intercooler Removal and Installation <Vehicles with intercooler> (Refer to GROUP 15 – Intercooler.>

<4G63, 4G64>



<4D56>

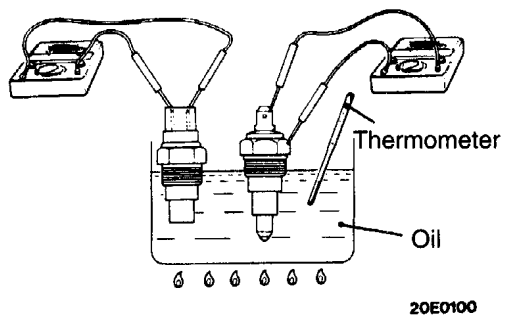




Sealant: 3M Nut Locking Part No. 4171 or equivalent

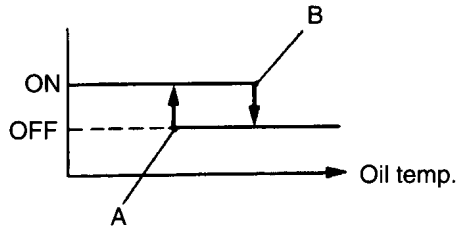
00002878

1. Engine coolant temperature switch (for A/C cut-off)
2. Engine coolant temperature switch (for condenser fan and compressor magnetic valve)



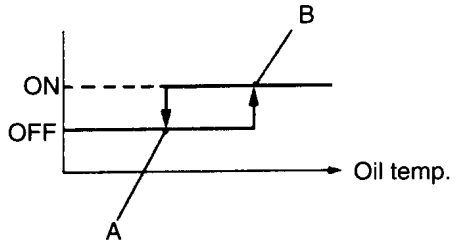
20E0100

<For A/C cut-off>



20W0237

<For condenser fan>



20W0204
00000585

INSPECTION

ENGINE COOLANT TEMPERATURE SWITCH CONTINUITY INSPECTION

(1) Dip the engine coolant temperature switch in oil and heat the oil with a gas burner or similar item.

Caution
Do not heat any more than is necessary.

(2) Check the continuity with a circuit tester as the temperature of the oil changes, and the condition is normal if the continuity is within the following ranges.

Standard value:

Engine coolant temperature switch	Temperature	Continuity
For A/C cut-off	Less than 108°C (Temperature at point A)	ON (Continuity)
	More than 112–118°C (Temperature at point B)	OFF (No continuity)
For conditioner fan	Less than 95°C <4G63, G64> Less than 97°C <4D56> (Temperature at point A)	OFF (No continuity)
	More than 99–105°C <4G63, 4G64> More than 100–104°C <4D56> (Temperature at point B)	ON (Continuity)

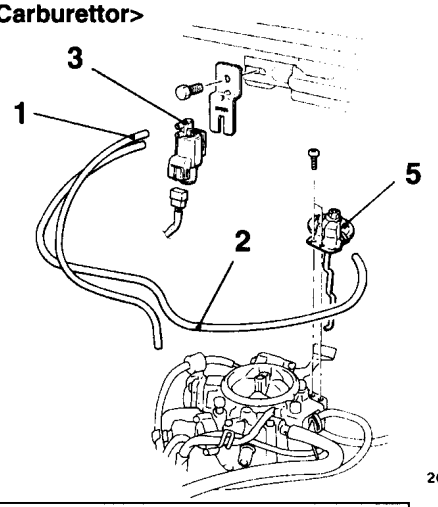
IDLE-UP SYSTEM <4G63 – Carburettor, 4D56>

120002276

REMOVAL AND INSTALLATION

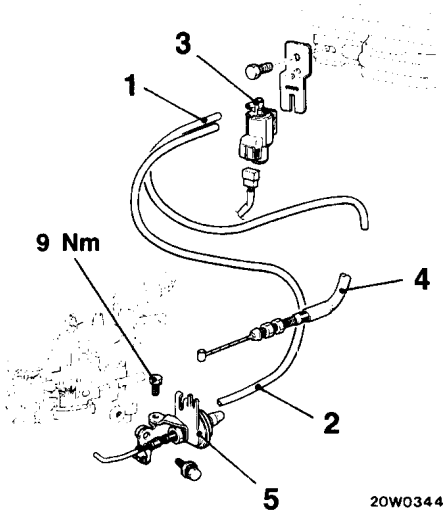
Post-installation Operation
(1)Accelerator Cable Adjustment <4D56> (Refer to GROUP 13 – Service Adjustment Procedures.)
(2)Idle-up Operation Check (Refer to P.55-26.)

<4G63 – Carburettor>



20W0192

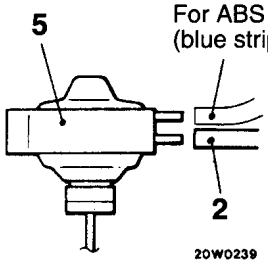
<4D56 – Vehicles without intercooler>



20W0344

Vehicles with ABS

<4G63 – Carburettor>



20W0239

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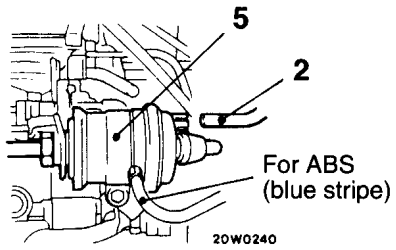
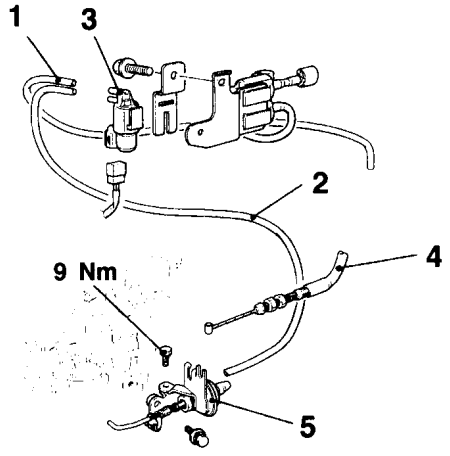


20W0240

<4D56 – Vehicles with intercooler>



20W0345

00002879

Idle-up solenoid valve removal steps

1. Vacuum hose (white stripe) connection
2. Vacuum hose (yellow stripe) connection
3. Idle-up solenoid valve

Vacuum actuator assembly removal steps

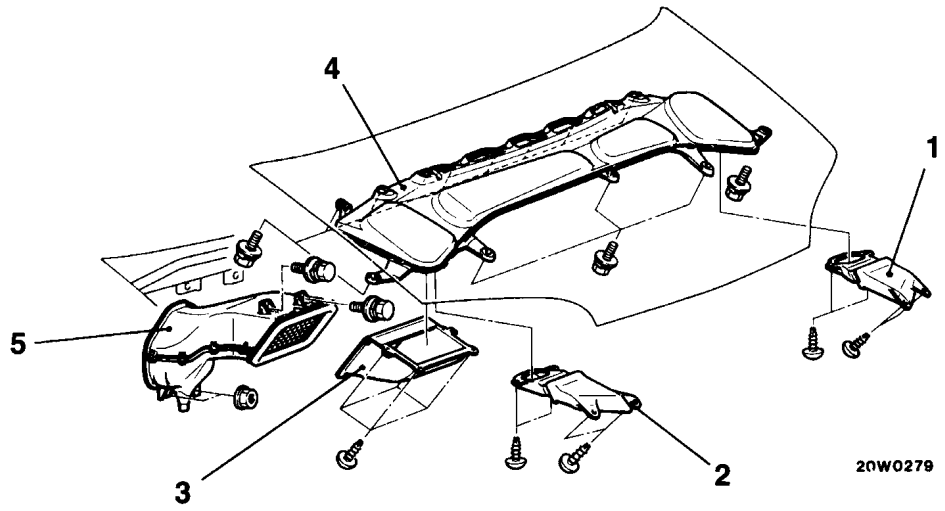
- Air horn assembly <4G63> (Refer to GROUP 15 – Air Cleaner.)
- Intercooler <Vehicles with intercooler> (Refer to GROUP 15 – Intercooler>
2. Vacuum hose (yellow stripe) connection
4. Accelerator cable connection <4D56>
5. Vacuum actuator assembly

VENTILATORS

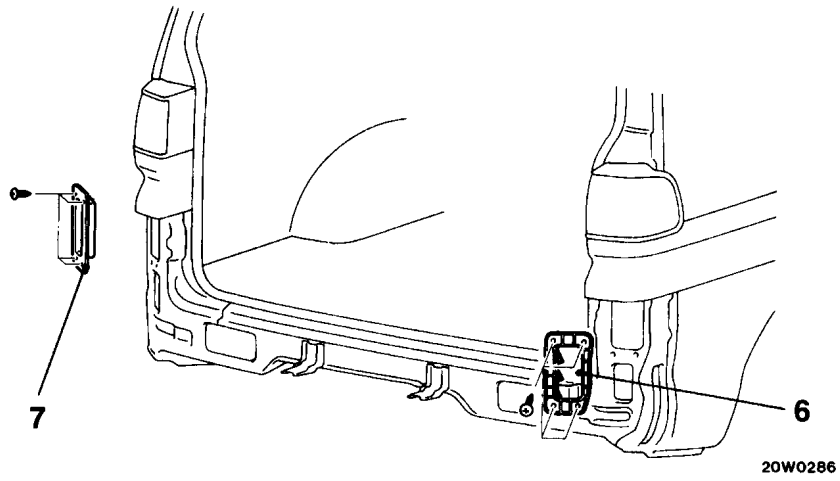
120000526

REMOVAL AND INSTALLATION

<Front>



<Rear>



00000587

Front ventilator duct removal steps

1. Air intake drain duct assembly L.H.
2. Air intake drain duct R.H.
3. Air intake duct B
4. Air intake duct A
   - Battery
5. Air intake duct C

Rear ventilator duct removal steps

- Rear bumper
  (Refer to GROUP 51 – Bumper.)

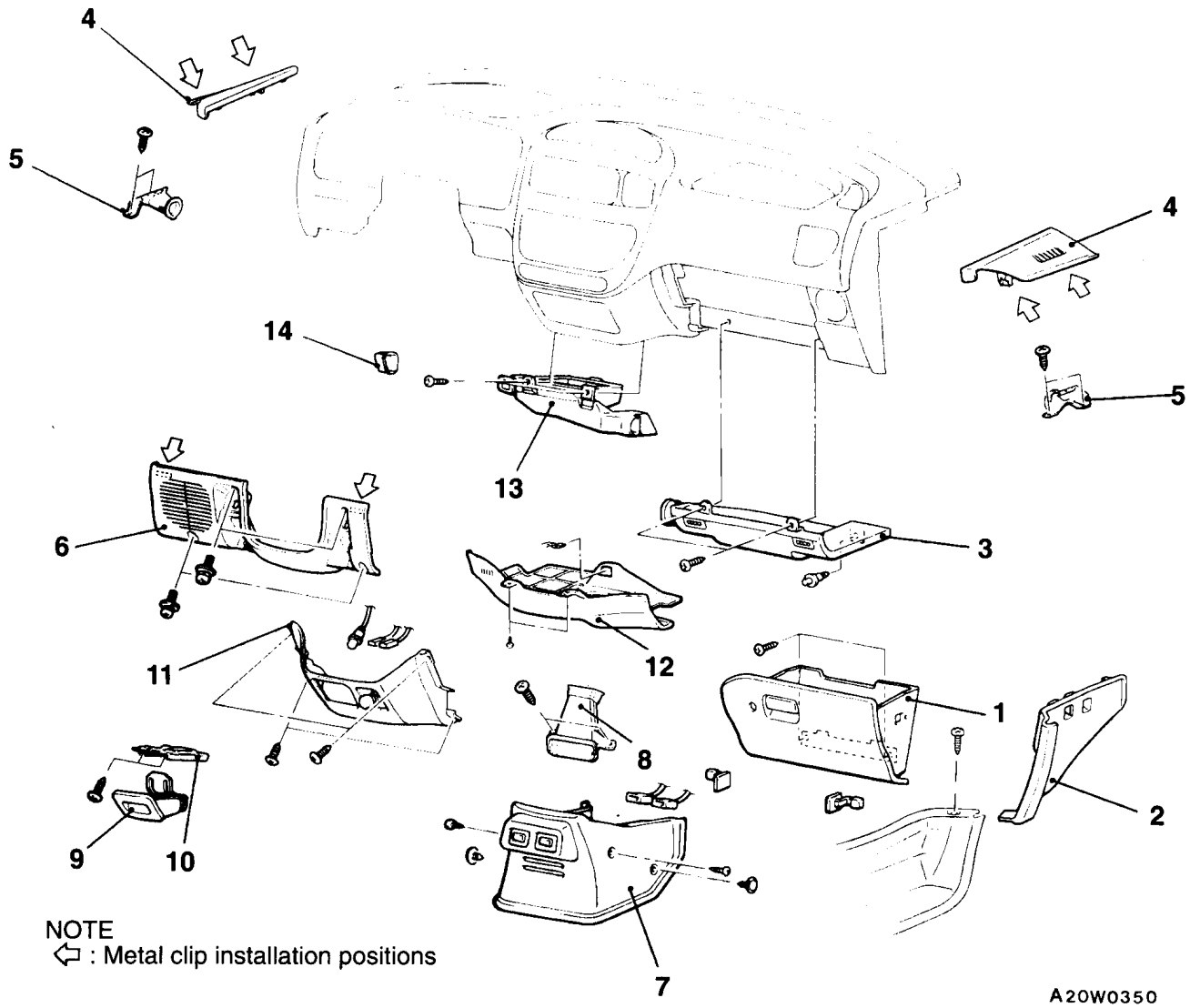
6. Rear ventilator duct assembly R.H.
7. Rear ventilator duct assembly L.H.

VENTILATORS (INSTRUMENT PANEL)

120002277

REMOVAL AND INSTALLATION

CAUTION:SRS
(1) When removing and installing the computer cover (vehicles equipped with SRS), do not let it bump against the SRS diagnostic unit.
(2) For the passenger side air bag module removal/ installation, always observe the service procedures of GROUP 52B – Air Bag Modules and Clock Spring.



NOTE
⇦ : Metal clip installation positions

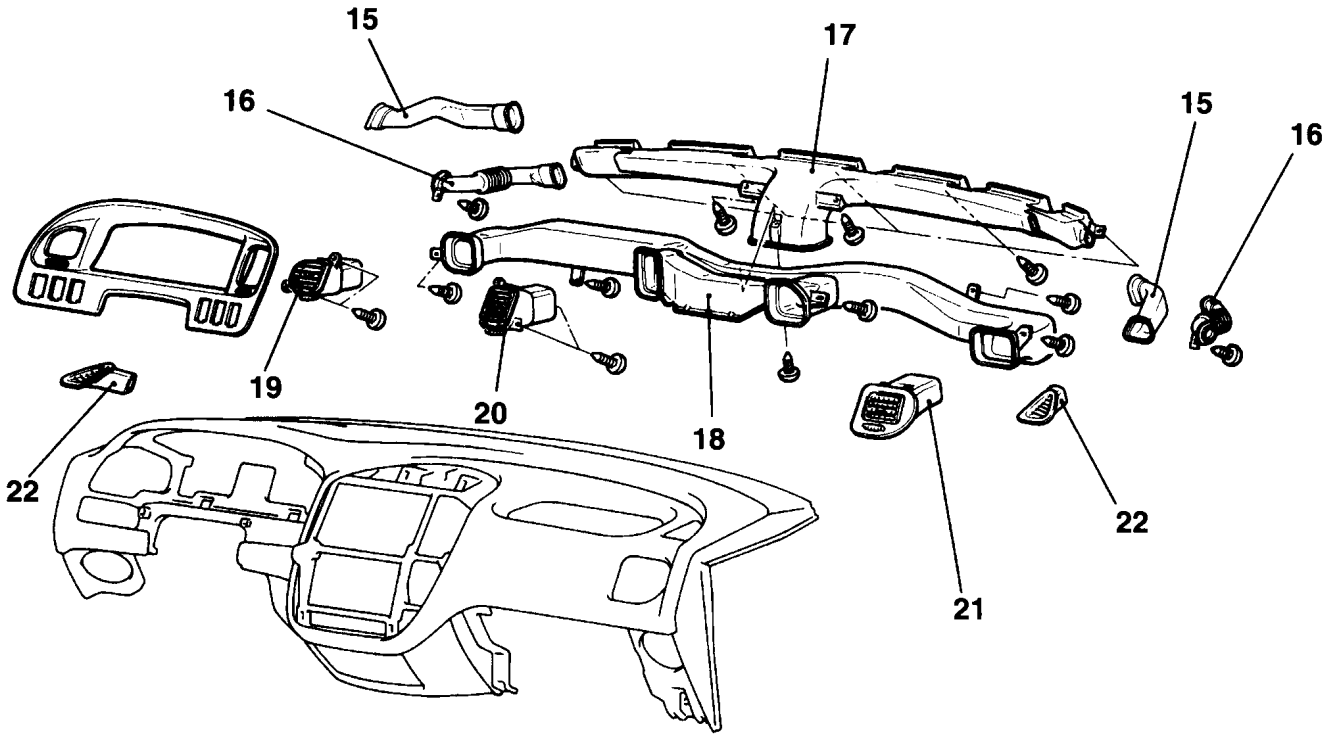
Shower duct removal steps
1. Glove box assembly
2. Cowl side trim
   (Refer to GROUP 52A – Trim.)
3. Shower duct <Vehicles with ABS>

Side defroster duct B removal steps
4. Instrument panel side trim
5. Side defroster duct B

Foot distribution duct removal steps
6. Under cover assembly
7. Computer cover assembly
8. Foot distribution rear duct
9. Ashtray
10. Bracket
11. Centre under cover
12. Heater cover
13. Foot distribution duct
14. Lap cover

Pre-removal and Post-installation Operation
- Instrument Panel Removal and Installation
  (Refer to GROUP 52A – Instrument Panel.)

CAUTION:SRS
(1) When removing and installing the computer cover (vehicles equipped with SRS), do not let it bump against the SRS diagnostic unit.
(2) For the passenger side air bag module removal/installation, always observe the service procedures of GROUP 52B – Air Bag Modules and Clock Spring.



Defroster nozzle and distribution duct removal steps
15. Side defroster duct
16. Side defroster hose
17. Defroster nozzle
18. Distribution duct

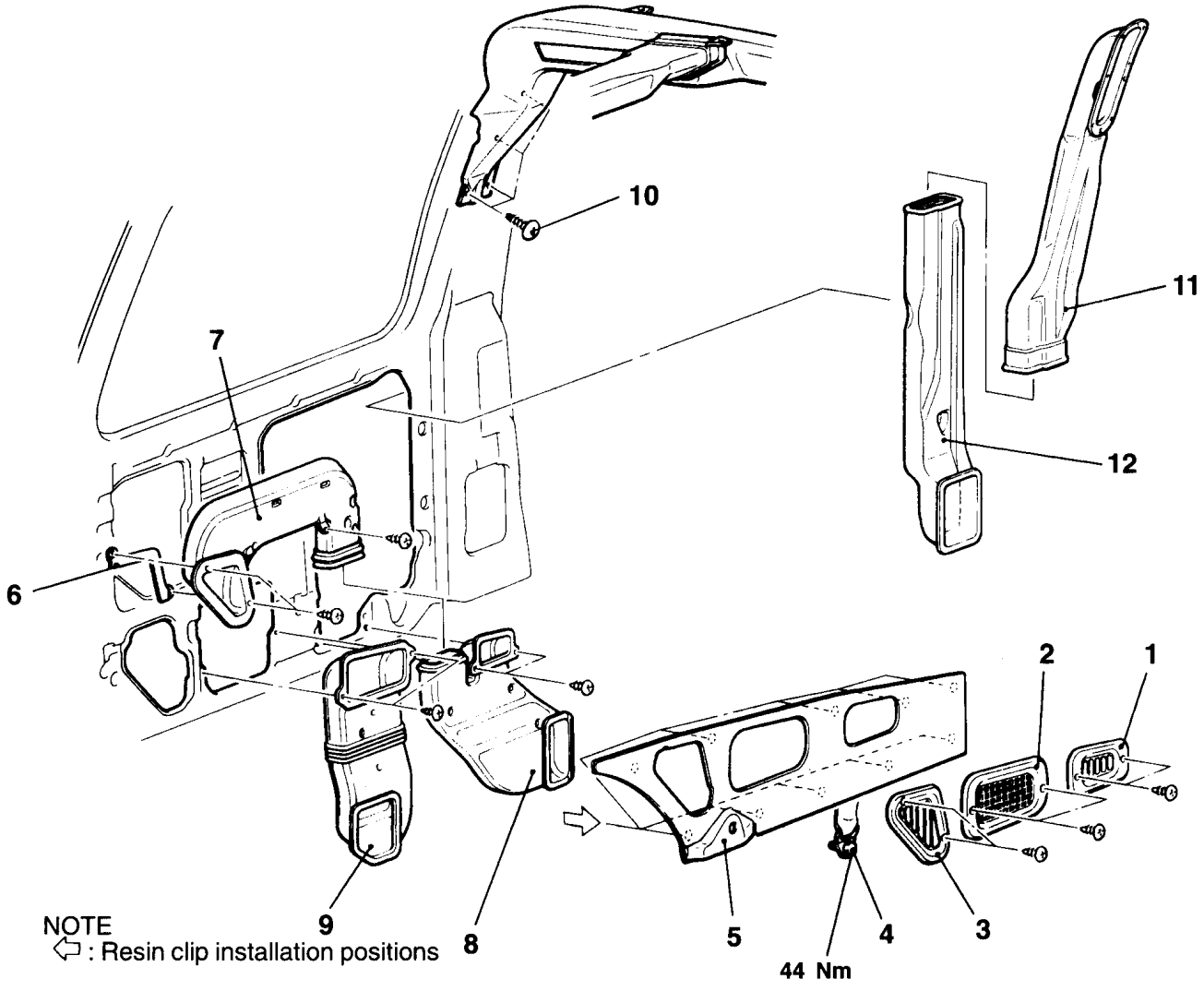
Air outlet assembly removal steps
19. Side air outlet assembly (driver's side)
20. Centre air outlet assembly (driver's side)
21. Side air outlet assembly (passenger's side)
22. Side defroster grille A

REAR VENTILATORS <BUILT-IN TYPE>

120002278

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
(1) Refrigerant Discharging and Charging (Refer to P.55-17, 20.)
(2) Draining and Supplying of Coolant (Refer to GROUP 14 – Service Adjustment Procedures.)
(3) Rear Evaporator Assembly Removal and Installation (Refer to P.55-43.)
(4) Rear Panel Assembly Removal and Installation (Refer to P.55-43.)
(5) Third Seat Assembly Removal and Installation (Refer to GROUP 52A – Rear Seats.)



A20W0340

Removal steps

1. Foot grille A
2. Rear air inlet grille
3. Foot grille B
4. Seat belt anchor bolt
5. Rear side trim, lower
- Rear side trim, upper (Refer to GROUP 52A – Trims.)

6. Bracket
7. Rear heater duct B
8. Rear heater duct A
9. Rear air inlet duct
- Rear headlining (Refer to GROUP 52A – Headlining.)

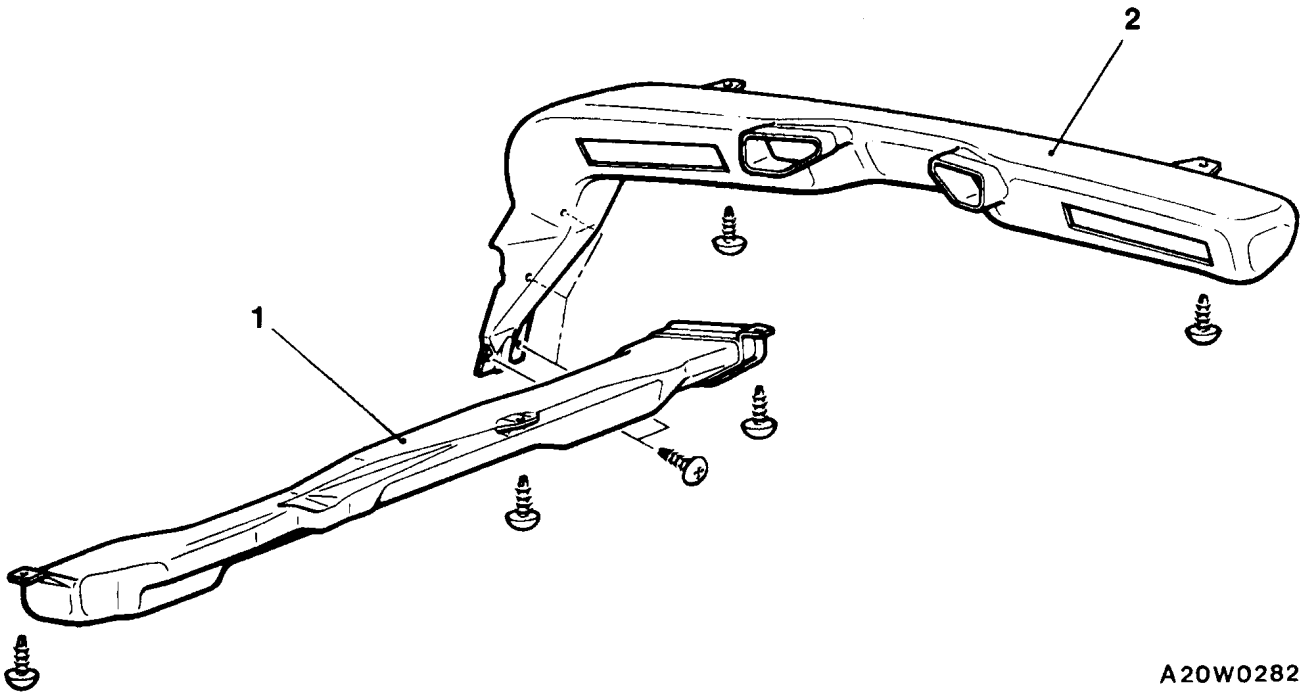
10. Screw
11. Pillar duct B
12. Pillar duct A

ROOF DUCT <BUILT-IN TYPE>

120002279

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
- Headlining Removal and Installation
  (Refer to GROUP 52A – Headlining.)



Removal steps
1. Centre duct
2. Roof duct