

HEATER, AIR CONDITIONER AND VENTILATION

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E55AA--

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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 (from rendering the SRS inoperative).
- (2) Service or maintenance of any SRS component or SRS-related component must be performed only at an authorized MITSUBISHI dealer.
- (3) MITSUBISHI dealer personnel must thoroughly review this manual, and especially its GROUP 52B - Supplemental Restraint System (SRS), before beginning any service or maintenance of any component of the SRS or any SRS-related component.

NOTE

The SRS includes the following components: SRS diagnosis unit, SRS warning lamp, air bag module, clock spring and inter-connecting 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 (*).

55-1-1

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NOTES

SPECIFICATIONS

GENERAL SPECIFICATIONS

E55CA--

Items	Specifications
Heater unit	
Type	Three-way-flow full-air-mix system
Heater control assembly	Dial type
Compressor	
Model	10PA15 Inclined-plate type, 10PA17 Inclined-plate type, 10PA15 Inclined-plate type with refrigerant capacity control system <4D68>
Refrigerant unit lubricant	cm ³ (cu. in.)
<Vehicles using R-12 refrigerant>	DENSO oil 6 100±20 (6.1±1.2)
<Vehicles using R-134a refrigerant>	DENSO oil 8 120±20 (7.3±1.2): <10PA15> 180±20 (10.9±1.2): <10PA17>
Drive belt size	mm (in.)
	1,145 (45) : <4G93> 930 (36.6) : <4G63-4G64> 920 (36.2) : <4D65> 945 (37.2) : <4D68>
Refrigerant capacity control <4D68>	
Refrigerant capacity	
<Solenoid valve: ON>*1	% 50
<Solenoid valve: OFF>*2	% 100
Dual pressure switch <4G93>	
<Vehicles using R-12 refrigerant>	
High pressure switch	kPa (kg/cm ² , psi) OFF: 2,700 (27, 384), ON: 2,100 (21, 299)
Low pressure switch	kPa (kg/cm ² , psi) OFF: 210 (2.1, 30), ON: 235 (2.35, 33)
<Vehicles using R-134a refrigerant>	
High pressure switch	kPa (kg/cm ² , psi) OFF: 3,800 (38, 540), ON: 3,200 (32, 455)
Low pressure switch	kPa (kg/cm ² , psi) OFF: 200 (2.0, 28), ON: 230 (2.3, 33)
Triple pressure switch <except 4G93>	
<Vehicles using R-12 refrigerant>	
High pressure switch	kPa (kg/cm ² , psi) OFF: 2,700 (27, 384), ON: 2,100 (21, 299)
Medium pressure switch	kPa (kg/cm ² , psi) OFF: 1,400 (14, 199), ON: 1,800 (18, 256)
Low pressure switch	kPa (kg/cm ² , psi) OFF: 210 (2.1, 30), ON: 235 (2.35, 33)
<Vehicles using R-134a refrigerant>	
High pressure switch	kPa (kg/cm ² , psi) OFF: 3,200 (32, 455), ON: 2,600 (26, 370)
Medium pressure switch	kPa (kg/cm ² , psi) OFF: 1,400 (14, 199), ON: 1,800 (18, 256)
Low pressure switch	kPa (kg/cm ² , psi) OFF: 200 (2.0, 28), ON: 230 (2.3, 33)
Freezer prevention	°C (°F)
	Fin thermo sensor OFF: 3.2 (37.8), ON: 4.2 (39.6)
Fusible plug	°C (°F)
	Burn-out temperature 105 (226)
Refrigerant and quantity	g (oz.)
R-12	Approx. 800 (28.6)
R-134a	Approx. 720 (25.4)

NOTE

*1: When solenoid coil is electrified

*2: When solenoid coil is not electrified

LUBRICANTS

E55CD--

Items	Specified lubricants	Quantity
Each connection of refrigerant line	DENSO oil 6*1	As required
Shaft seal of the compressor	DENSO oil 8*2	
Shaft seal plate of the compressor		
Compressor refrigerant unit lubricant cm ³ (cu. in.)	DENSO oil 6*1	100 (6.1)
	DENSO oil 8*2	120 (7.3) : <10PA15> 180 (10.9) : <10PA17>

NOTE

- *1 : Vehicles using R-12 refrigerant
- *2 : Vehicles using R-134a refrigerant

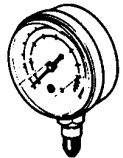
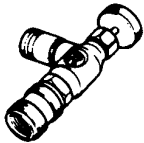
SEALANT

E55CE--

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

SPECIAL TOOLS

E55DA--

Tool	Number	Name	Use
	MB991402	Vacuum gauge	Vacuum check
	MB991403 (For high pressure) MB991404 (For low pressure)	Adaptor valve	Supplying refrigerant gas Replenishing refrigerant gas Draining refrigerant gas Function test

TROUBLESHOOTING

TROUBLESHOOTING PROCEDURE

- (1) Check that the air ducts and rods are not off.
- (2) 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.
- (3) When checking components, be sure to disconnect the connectors first.

TROUBLESHOOTING QUICK-REFERENCE CHART

<4G93>

Symptom	Inspection item																			
	Fuse	Automatic compressor control unit	Harness (including connector)	Blower switch	Air conditioner switch	Heater relay	Resistor	Drive belt	Blower motor	Air conditioner compressor relay	Magnetic clutch	Dual pressure switch	Sensors	Condenser fan motor relay	Condenser fan motor	Engine coolant temperature switch (Air conditioner cut)	Refrigerant amount	Engine control unit	Belt lock controller	Revolution pickup
1 Air conditioner does not operate when the ignition switch in the ON position.	①	⑪	②	⑨	⑧			⑫		③	④	⑥	⑩			⑦	⑤	⑬	⑮	⑭
2 Interior temperature does not lower (No cold air coming out).		⑤										②	④			③	①	⑥		
3 Blower motor does not rotate.	①		②	⑥		③	⑤		④											
4 Blower motor does not stop rotating.			①	②																
5 Condenser fan does not operate when the air conditioner is activated.	①		②											③	④					

NOTE

○ indicates the component requiring inspection. (Numbers in ○ are the priority order.)

TROUBLESHOOTING QUICK-REFERENCE CHART

<4G63-4G64>

Inspection item	Symptom																		
	Fuse	Automatic compressor control unit	Harness (including connector)	Blower switch	Air conditioner switch	Heater relay	Resistor	Drive belt	Blower motor	Air conditioner compressor relay	Magnetic clutch	Triple pressure switch	Sensors	Condenser fan motor relay (LO)	Condenser fan motor relay (HI)	Condenser fan motor	Engine coolant temperature switch (Air conditioner cut)	Refrigerant amount	Engine control unit
1	Air conditioner does not operate when the ignition switch in the ON position.	①	⑪	②	⑨	⑧		⑫		③	④	⑥	⑩				⑦	⑤	⑬
2	Interior temperature does not lower (No cold air coming out).		⑤									②	④				③	①	⑥
3	Blower motor does not rotate.	①		②	⑥		③	⑤	④										
4	Blower motor does not stop rotating.			①	②														
5	Condenser fan does not operate when the air conditioner is activated.	①		②										③	④	⑤			

NOTE

○ indicates the component requiring inspection. (Numbers in ○ are the priority order.)

NOTES

<4D65-4D68>

Symptom	Inspection item																		
	Fuse	Automatic compressor control unit	Harness (including connector)	Blower switch	Air conditioner switch	Heater relay	Resistor (for blower motor)	Blower motor	Air conditioner compressor relay	Magnetic clutch	Triple pressure switch	Sensors	Condenser fan motor relay (LO)	Condenser fan motor relay (HI)	Condenser fan motor	Engine coolant temperature switch (Air conditioner cut)	Refrigerant amount	Resistor (LO side of condenser fan motor relay)	Drive belt
1 Air conditioner does not operate when the ignition switch in the ON position.	①	⑪	②	⑨	⑧				③	④	⑥	⑩				⑦	⑤		⑫
2 Interior temperature does not lower (No cold air coming out).		⑤									②	④				③	①		
3 Blower motor does not rotate.	①		②	⑥		③	⑤	④											
4 Blower motor does not stop rotating.			①	②															
5 Condenser fan does not operate when the air conditioner is activated.	①		②										③	④	⑤			⑦	

NOTE

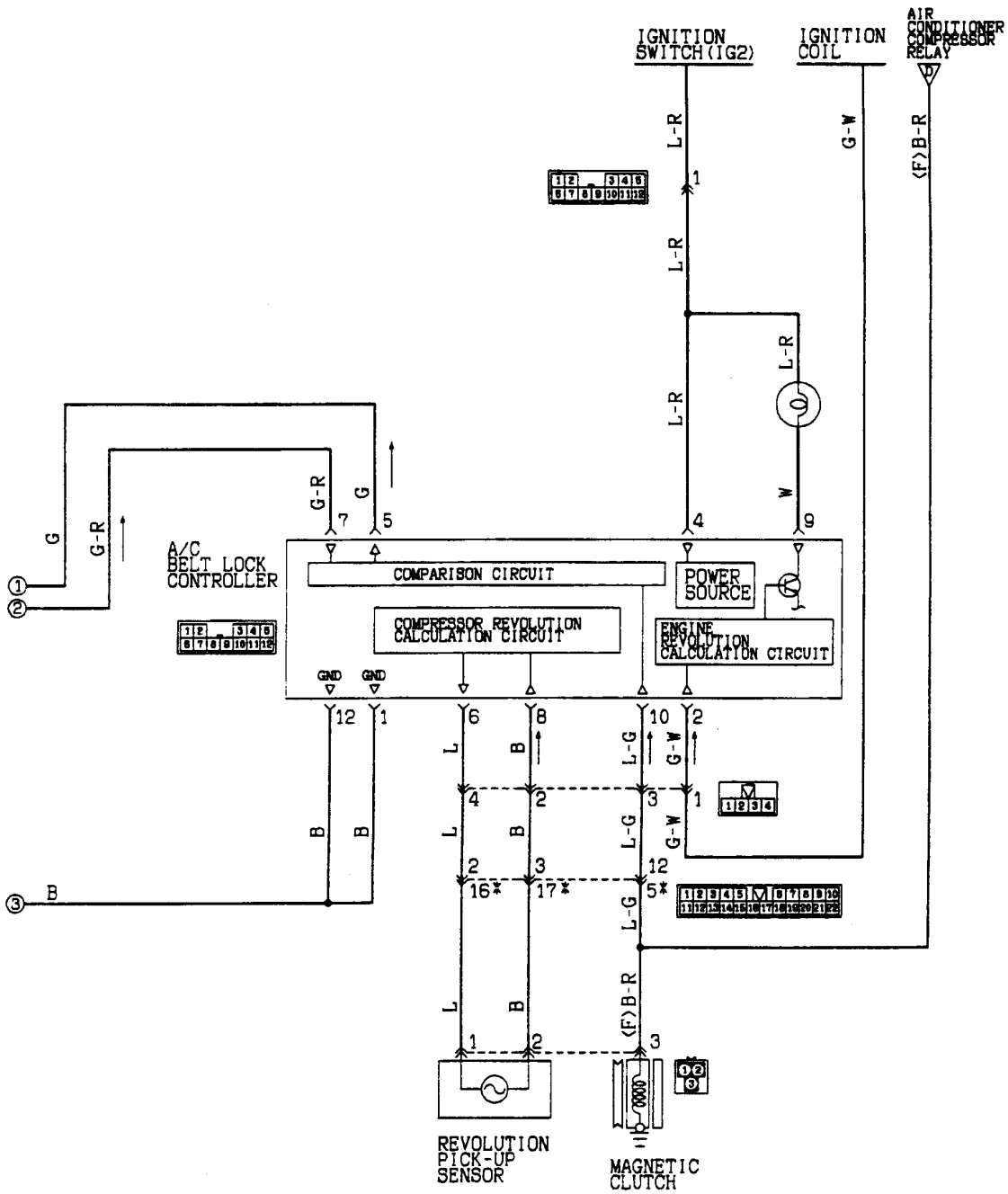
○ indicates the component requiring inspection. (Numbers in ○ are the priority order.)

55-6 HEATER, AIR CONDITIONER AND VENTILATION – Troubleshooting

No.	Trouble symptom	Problem cause	Remedy	Reference page
1	When the ignition switch is "ON", the air conditioner does not operate.	Air conditioner compressor relay is defective	Replace air conditioner compressor relay	P.55-25
		Magnetic clutch is defective	Replace the magnetic clutch	P.55-43
		Refrigerant leak or overfilling of refrigerant	Replenish the refrigerant, repair the leak or take out some of the refrigerant	P.55-16
		Dual pressure switch or triple pressure switch is defective	Replace the dual pressure switch or triple pressure switch	P.55-51
		Engine coolant temperature switch (for air conditioner cut) is defective	Replace the engine coolant temperature switch	P.55-49
		Air conditioner switch is defective	Replace the air conditioner switch	P.55-29
		Blower switch is defective	Replace the blower switch	P.55-29
		Air thermo sensor is defective	Replace the sensor	P.55-36
		Air inlet sensor is defective		
		Auto compressor control unit is defective	Replace the auto compressor control unit	P.55-36
		Belt lock controller is defective <4G93>	Replace the belt lock controller	P.55-36
		Revolution pick-up is defective <4G93>	Replace the revolution pick-up	P.55-39

HEATER, AIR CONDITIONER AND VENTILATION – Troubleshooting 55-7

No.	Trouble symptom	Problem cause	Remedy	Reference page
2	When the air conditioner is operating, temperature inside the passenger compartment doesn't decrease (cool air is not emitted).	Refrigerant leak	Replenish the refrigerant and repair the leak	P.55-16
		Dual pressure switch or triple pressure switch is defective	Replace the dual pressure switch or triple pressure switch	P.55-51
		Engine coolant temperature switch (for air conditioner cut) is defective	Replace the engine coolant temperature switch	P.55-49
		Air thermo sensor is defective	Replace the sensor	P.55-36
		Air inlet sensor is defective		
		Auto compressor control unit is defective	Replace the auto compressor control unit	P.55-36
3	Blower motor doesn't turn	Heater relay is defective	Replace the heater relay	P.55-25
		Blower motor is defective	Replace the blower motor	P.55-34
		Blower switch is defective	Replace the blower switch	P.55-29
		Resistor (for blower motor) is defective	Replace the resistor	P.55-34
4	Blower motor doesn't stop turning.	Short circuit of the harness between the blower motor and the blower switch	Repair the harness	-
		Blower switch is defective	Replace the blower switch	P.55-29
5	When the air conditioner is operating, condenser fan does not turn.	Condenser fan motor relay is defective	Replace the condenser fan motor relay	P.55-25
		Condenser fan motor is defective	Replace the condenser fan motor	P.55-46
		Dual pressure switch or triple pressure switch is defective	Replace the dual pressure switch or triple pressure switch	P.55-51
		Resistor (for condenser fan motor relay LO side) is defective <4D65-4D68>	Replace the resistor	P.55-47

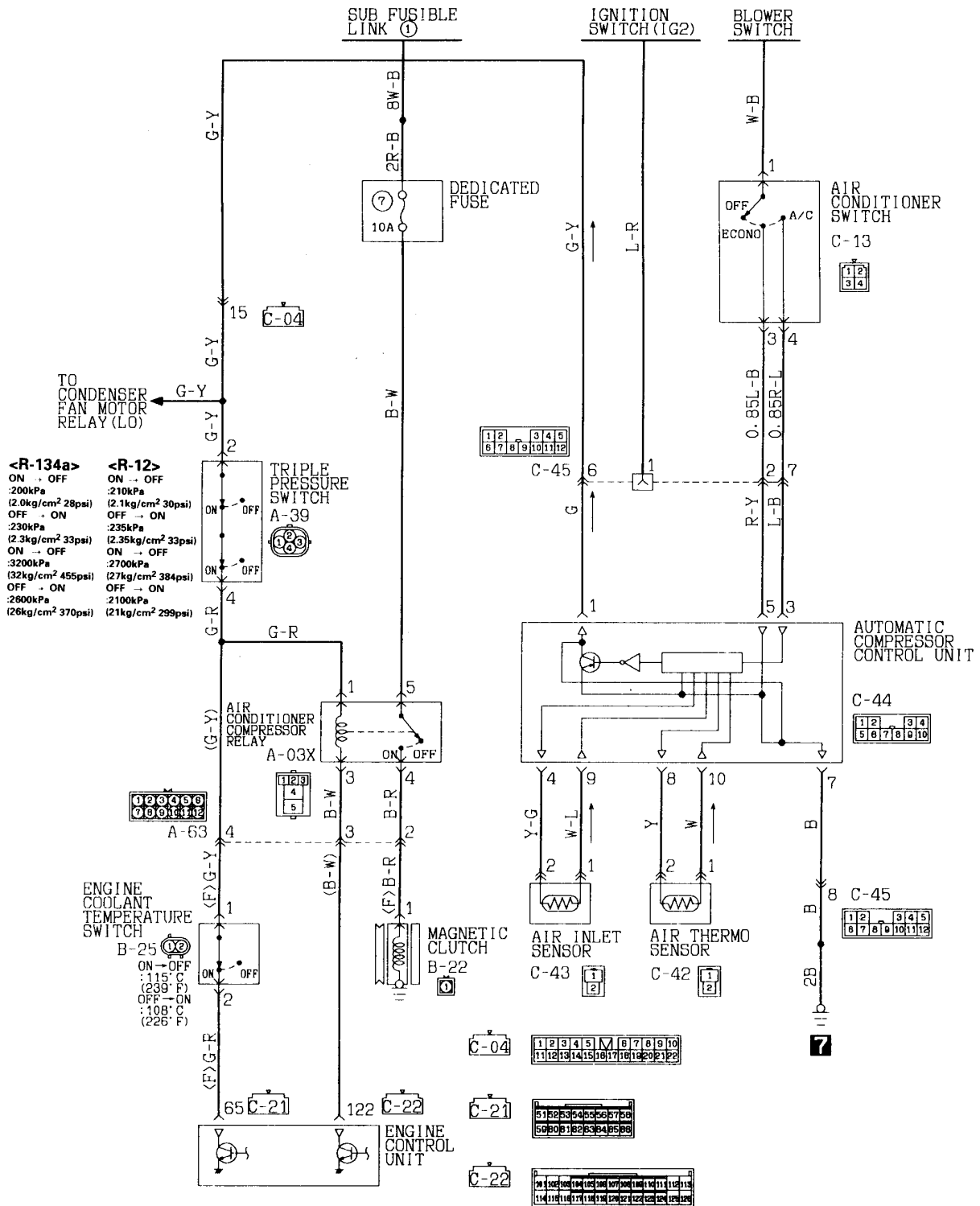


Remark
*: R.H. drive vehicles.

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55-9-1 HEATER, AIR CONDITIONER AND VENTILATION – Troubleshooting

<4G63-4G64>

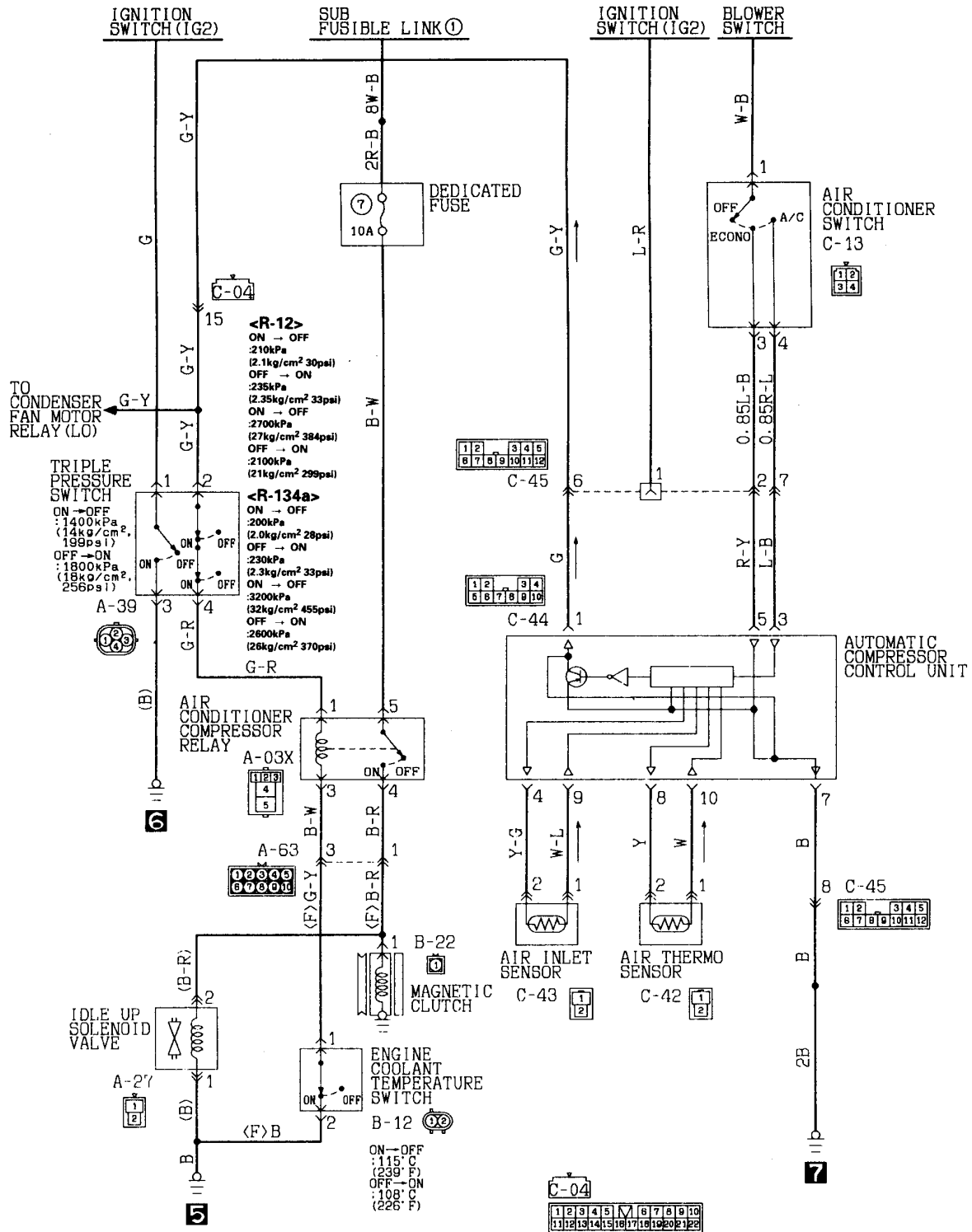


KX35-AK-Z1201-EC

NOTES

55-10 HEATER, AIR CONDITIONER AND VENTILATION - Troubleshooting

<4D65-4D68>



KX35-AK-Z1202-EC

EXPLANATION OF OPERATION

- (1) In the air thermo sensor and the air inlet sensor, a negative characteristic thermister which converts the temperature surrounding the sensors to a resistance value is used. The sensor power supply (5V) of the auto compressor control unit is applied to each sensor. The voltages at each terminal of the air thermo sensor (10) and the air inlet sensor (9) are divided by the resistance value of each sensor and by resistance inside the auto compressor control unit.
- (2) By turning the air conditioner switch from OFF to ECONO or A/C, the operation mode of the compressor is switched over. If it is turned to the first level, it becomes the ECONO mode,

and the voltage at terminal (3) of the air conditioner switch becomes battery voltage. Then, if it is turned to the second level, it switches to the A/C mode and the voltage at terminal (4) of the air conditioner switch become battery voltage.

- (3) The output (terminal (1)) of the auto compressor control unit, occurs when the conditions listed below are satisfied.
- ① Air conditioner switch is ON (in ECONO or A/C modes)
 - ② The temperature surrounding the air thermo sensor (air temperature of the evaporator blower) is 4°C (39°F) or more
 - ③ The temperature surrounding the air inlet sensor (evaporator inlet air temperature) is 4°C (39°F) or more

TROUBLESHOOTING HINTS

Auto compressor control unit terminal voltage

Terminal No.	Name of Signal	Condition	Terminal voltage
7	Auto compressor control unit earth	At all time	0V
3	Auto compressor control unit power supply (A/C mode)	When the ignition switch and the blower switch are ON, and the air conditioner switch has been turned to the second level	System voltage
5	Auto compressor control unit power supply (ECONO mode)	When the ignition switch and the blower switch are ON, and the air conditioner switch has been turned to the first level	System voltage
1	Air conditioner compressor relay	When the compressor ON conditions are satisfied	System voltage
8	Air thermo sensor power supply	The ignition switch, blower switch and air conditioner switch are all ON	5V
10	Air thermo sensor	Sensor temperature is 25°C (77°F) [1.5 kΩ]	2.2V
4	Air inlet sensor power source	The ignition switch, blower switch and air conditioner switch are all ON	4.8V
9	Air inlet sensor	Sensor temperature is 25°C (77°F) [1.5 kΩ]	3.3V

SAFETY PRECAUTIONS

E55XAAD

<Vehicles using R-12 refrigerant>

R-12 refrigerant is a chlorofluoro-carbon (CFC) that can contribute to the depletion of the ozone layer in the upper atmosphere.

Ozone filters out harmful radiation from the sun. To assist in protecting the ozone layer.

Mitsubishi Motors Corporation recommends that a R-12 refrigerant recycling device that meets SAE standard J1991 be used.

Contact an automotive service equipment supplier for refrigerant recycling equipment that is available in your area.

The refrigerant used in all air conditioner is R-12. It is transparent and colorless in both the liquid and vapor state. Since it has a boiling point of -29.8°C (-21.7°F), at atmospheric pressure, it will be a vapor at all normal temperatures and pressures. The vapor is heavier than air, non-flammable, and nonexplosive. It is nonpoisonous except when it is in direct contact with open flame. It is noncorrosive except when combined with water. The following precautions must be observed when handling R-12.

Caution

Wear safety goggles when servicing the refrigeration system.

R-12 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 air conditioning 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-12 is rapidly absorbed by the oil. Next splash the eyes with plenty of cold water. Call your doctor immediately even though irritation has ceased after treatment.

Caution

Do not heat R-12 above 40°C (104°F)

In most instances, moderate heat is required to bring the pressure of the refrigerant in its container above the pressure of the system when charging or adding refrigerant.

A bucket or large pan of hot water not over 40°C (104°F) is all the heat required for this purpose. Do not heat the refrigerant container with a blow torch or any other means that would raise temperature and pressure above this temperature. **Do not weld or steam clean on or near the system components or refrigerant lines.**

Caution

Keep R-12 containers upright when charging the system.

When metering R-12 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

Always work in a well-ventilated room.

Good ventilation is vital in the working area. Although R-12 vapor is normally nonpoisonous contact with an open flame can cause the vapor to become very poisonous. A poisonous gas is produced when using the flame-type leak detector. Avoid inhaling the fumes from the leak detector.

Caution

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.

<Vehicles using R-134a refrigerant>

Because R-134a refrigerant is a hydrofluorocarbon (HFC) which contains hydrogen atoms in place of chlorine atoms, it will not cause damage to the ozone layer.

Refrigerant R-134a is transparent and colourless in both the liquid and vapour state. Since it has a boiling point of -29.8°C , at atmospheric pressure, it will be a vapour at all normal temperatures and pressures. The vapour is heavier than air, non-flammable, and nonexplosive. The following precautions must be observed when handling R-134a.

Caution

Wear safety goggles when servicing the refrigeration system.

R-134a evaporates so rapidly at normal atmospheric pressures and temperatures that it tends to freeze anything it contacts. For this reason, extreme care must be taken to prevent any liquid refrigerant from contacting the skin and especially the eyes. Always wear safety goggles when servicing the refrigeration part of the A/C system. Keep a bottle of sterile mineral oil handy when working on the refrigeration system. Should any liquid refrigerant get into the eyes, use a few drops of mineral oil to wash them out. R-134a is rapidly absorbed by the oil. Next splash the eyes with plenty of cold 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.

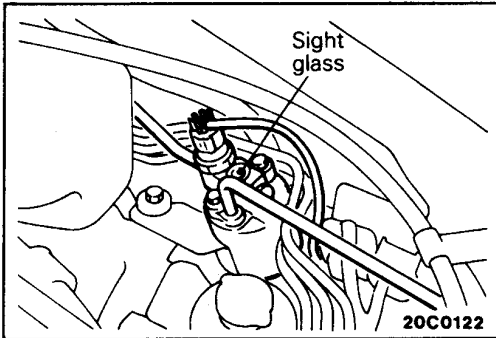
When metering R-134a into the refrigeration system keep the supply tank or cans in an upright position. If the refrigerant container is on its side or upside down, liquid refrigerant will enter the system and damage the compressor.

Caution

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

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

NOTES



SERVICE ADJUSTMENT PROCEDURES

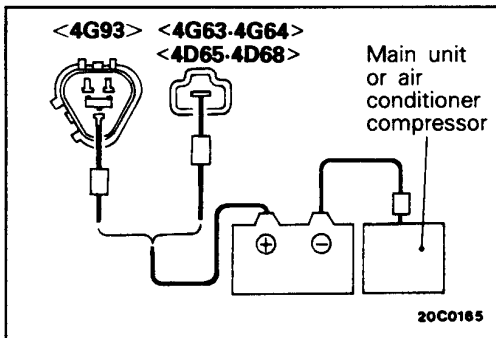
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TEST PROCEDURES

SIGHT GLASS REFRIGERANT LEVEL TEST

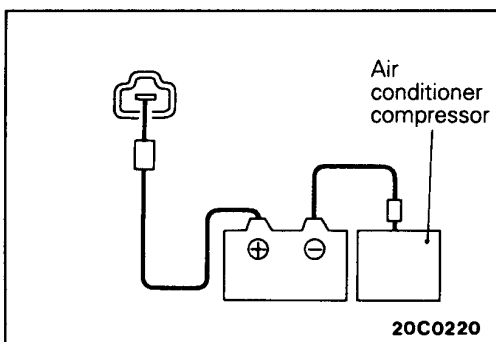
The sight glass is a refrigerant level indicator. To check the refrigerant level, clean the sight glass and start the vehicle engine. Push the air conditioner button to operate the compressor, place the blower switch to high and move the temperature control lever to max cool. After operating for a few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

- (1) Disconnect the wiring to the magnetic clutch.
- (2) Connect battery (+) voltage directly to the wiring 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.



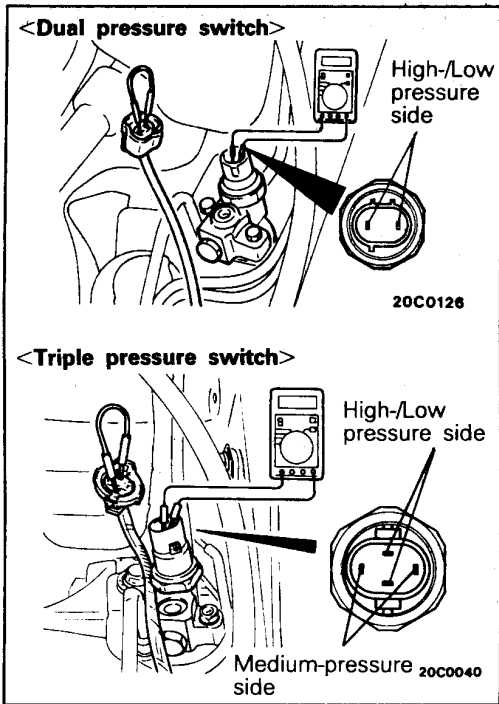
REFRIGERANT CAPACITY CONTROL SOLENOID VALVE <4D68>

- (1) Disconnect the wiring to the refrigerant capacity control solenoid valve.
- (2) Connect battery (+) voltage directly to the wiring for the refrigerant capacity control solenoid valve.
- (3) If the refrigerant control solenoid valve is normal, there will be an operational sound. If the sound is not heard, there is a malfunction in the refrigerant control solenoid valve.

RECEIVER DRIER

To Test the Receiver Drier

- (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.

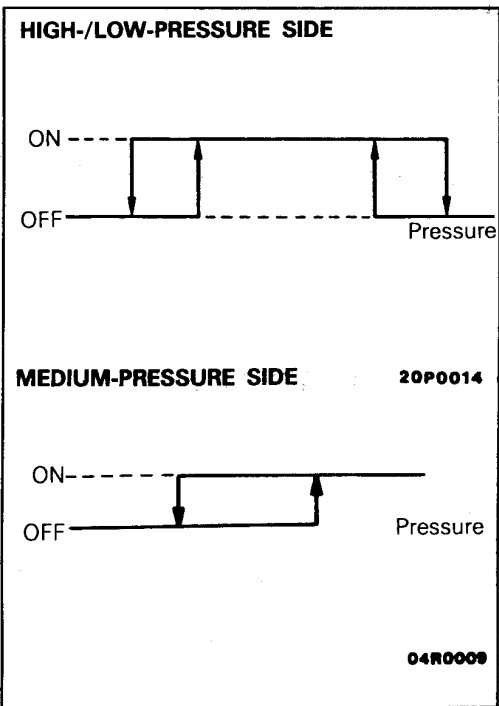


**DUAL PRESSURE SWITCH CHECK <4G93>/
TRIPLE PRESSURE SWITCH CHECK
<4G63·4G64·4D65·4D68>**

- (1) Remove the dual pressure switch or the triple 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 service valve of the refrigerant line. (Refer to Performance Test.)

NOTE

The high-pressure service valve is on the discharge pipe A.



- (3) When the high/low and medium pressure sides of the dual pressure switch or triple 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.

<Vehicles using R-12 refrigerant>

kPa (kg/cm², psi)

Items	Switch position	OFF → ON	ON → OFF
Low-pressure side		235 (2.35, 33)	210 (2.1, 30)
High-pressure side		2,100 (21, 299)	2,700 (27, 384)
Medium-pressure side		1,800 (18, 256)	1,400 (14, 199)

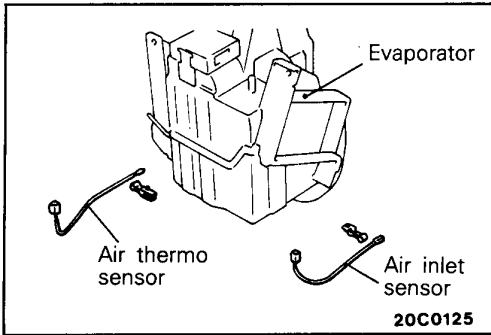
<Vehicles using R-134a refrigerant>

kPa (kg/cm², psi)

Items	Switch position	OFF → ON	ON → OFF
Low-pressure side		230 (2.3, 33)	200 (2.0, 28)
High-pressure side	A	3,200 (32, 455)	3,800 (38, 540)
	B	2,600 (26, 370)	3,200 (27, 455)
Medium-pressure side		1,800 (18, 256)	1,400 (14, 199)

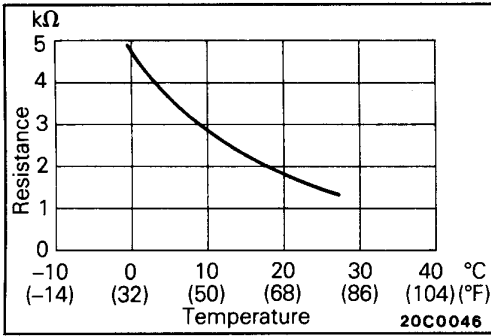
NOTE

A = Dual pressure switch
B = Triple pressure switch



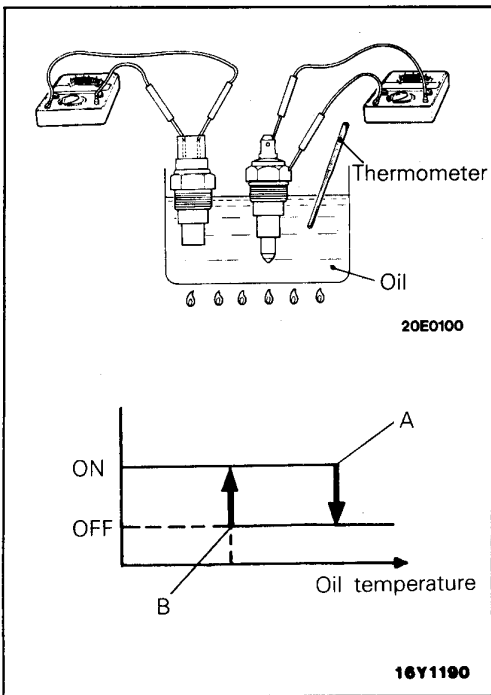
AIR THERMO SENSOR AND AIR INLET SENSOR

- (1) Disconnect the sensor's connector at the evaporator case, and by using an ohmmeter, measure the resistance. If the resistance is within $\pm 10\%$ of value of the characteristic curve, the sensor is functioning normally.
- (2) If the sensor is normal, there is a malfunction of the air conditioner control unit, and it should be replaced.



ENGINE COOLANT TEMPERATURE SWITCH CHECK

- (1) Immerse the engine coolant temperature switch in engine oil as shown in the illustration.
- (2) Check the continuity with the circuit tester when the temperature of the oil has been changed. The condition is normal if there is continuity within the following ranges of temperature.

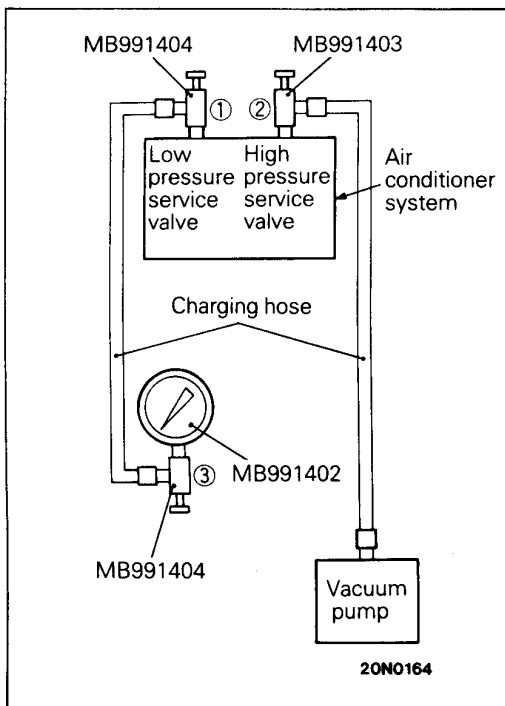


Standard values:

Item	For air conditioner cut	For condenser fan cut
Temperature at point A (ON→OFF)	112°C–118°C (234°F–244°F)	97°C (207°F)
Temperature at point B (OFF→ON)	108°C (226°F)	100°C–104°C (212°F–219°F)

COMPRESSOR DRIVE BELT ADJUSTMENT E55FWAE

Refer to GROUP 11 – Service Adjustment Procedures.



CHARGING <Vehicles using R-12 refrigerant> E55FU8D

CHARGING THE SYSTEM

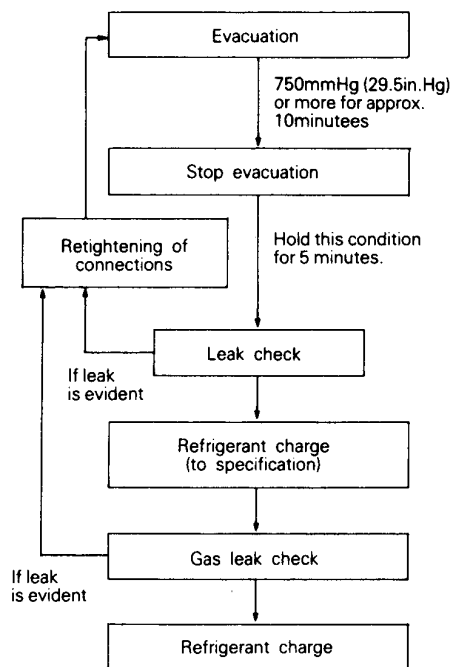
<In case the vacuum gauge is used>

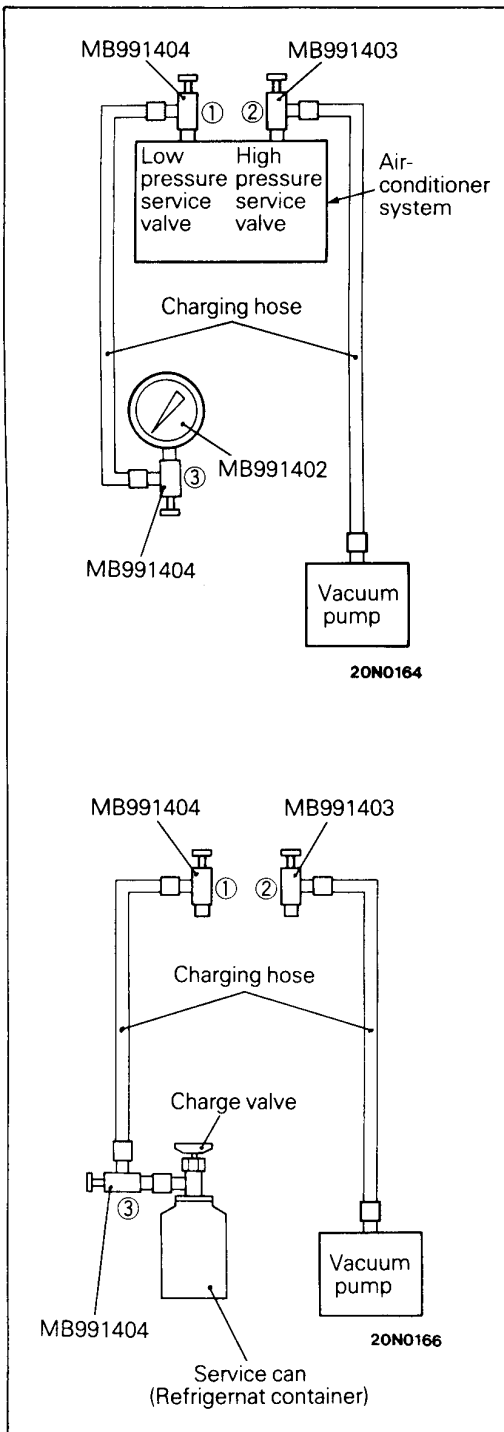
- (1) With the handle of the special tool ① and ② turned back all the way (valve close), install the special tool ① and ② to each high and low pressure service valve.

Note

Install the high pressure service valve to the discharge port of discharge hose, and the low pressure service valve to the suction port of compressor.

- (2) Tighten the handle of the special tool ① and ② (valve open).
- (3) Connect the charging hose to the special tool ① and ②.
- (4) With the handle of the special tool ③ tightened (valve open), install the special tool ③ to the low pressure side charging hose.
- (5) Install the vacuum gauge (MB991402) to the special tool ③.
- (6) Install the vacuum pump to the high pressure side charging hose.





- (7) Start up the vacuum pump.
- (8) Evacuate to a vacuum reading of 750mmHg (29.5in. Hg) or higher (approx. 10minutes).

Caution

Read the vacuum gauge as it is stood upright because otherwise it shows wrong indication.

- (9) Turn back the handle of the special tool ② on the high pressure side (valve close) all the way.
- (10) Stop the vacuum pump and allow to stand for 5minutes.
- (11) Check for leaks. (Good if the vacuum is held.)
- (12) With the handle of the charge valve turned back all the way (valve open), install the charge valve to the service can.
- (13) Turn back the handle of the special tool ③ (valve close) all the way, remove the vacuum gauge and install the service can.
- (14) Tighten the handle of the charge valve (valve close) to puncture the service can.
- (15) Turn back the handle of the charge valve (valve open) and tighten the handle of the special tool ③ (valve open) to charge refrigerant.
- (16) When refrigerant is no longer drawn in, turn back the handle of the special tool ① all the way (valve close).
- (17) Check for gas leaks using a leak detector.
- (18) Start the engine.
- (19) Operate the air conditioner and set at the lowest temperature (MAX. COOL).
- (20) Fix the engine speed at 1,500 r/min.
- (21) Tighten the handle of the special tool ① (valve open) to charge refrigerant to specified amount.

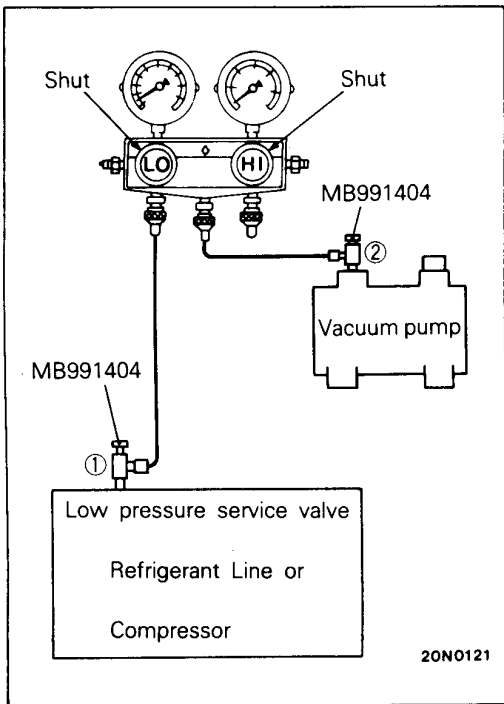
Caution

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.

- (22) After finishing charging refrigerant, turn back the handle of special tool ① all the way (valve close).
- (23) Tighten the handle of the charge valve (valve close).
- (24) Remove the special tool ① and ② from each high and low pressure service valve.
- (25) Remove the service can.

Note

When there is remainder of refrigerant in the service can, keep it for next use with the charge valve and the valves of special tools ① and ③ being closed.



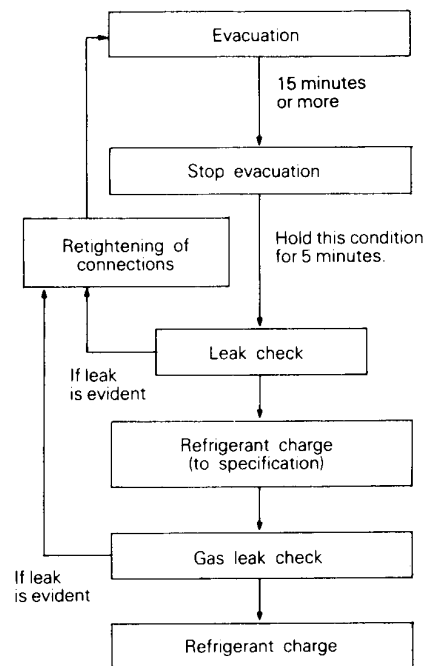
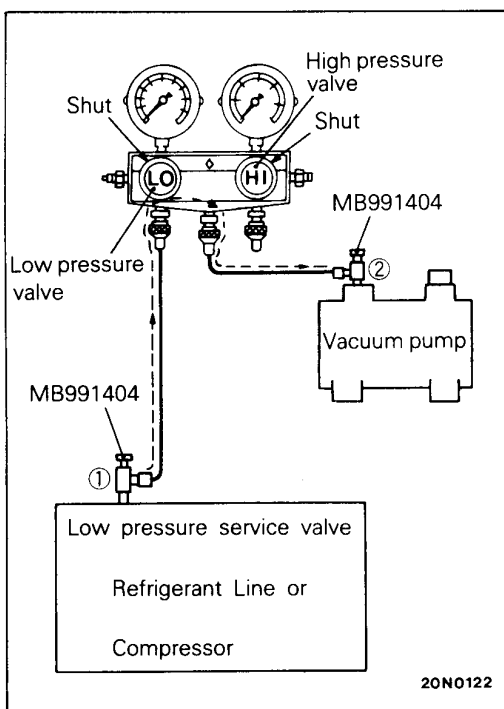
<In case the gauge manifold is used>

- (1) Attach the special tools with the handles ① and ② turned all the way back (valves closed) to the low pressure service valve and the vacuum pump respectively.

NOTE

The low pressure service valve should be connected to the compressor suction port.

- (2) Close the high and low pressure valves of the gauge manifold.
- (3) Connect the charging hoses to the special tools ① and ②.
- (4) Tighten the handles of the special tools ① and ② (valves opened).

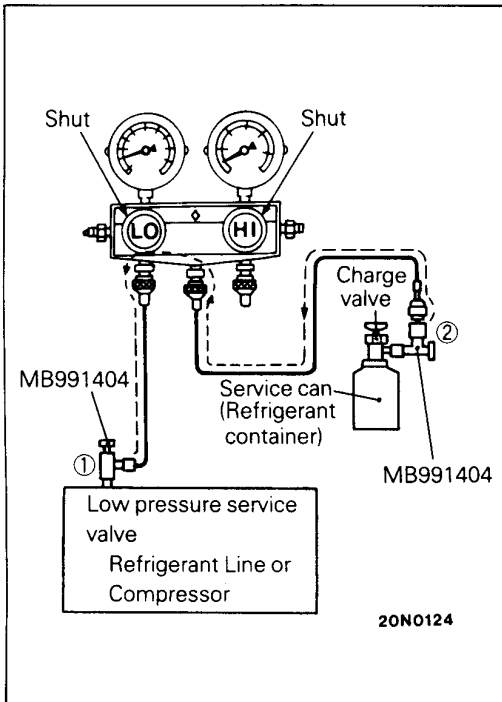


- (5) Start up the vacuum pump.

Caution

1. Do not use the compressor for evacuation.
2. Do not operate the compressor in the vacuum condition; damage may occur.

- (6) Evacuate to a vacuum reading of 100 kPa (1.0 kg/cm², 14.2 psi) or higher (approx. 10 minutes).
- (7) Turn back the handle of the special tool ② (valve closed)
- (8) Stop the vacuum pump and allow to stand for 5 minutes.
- (9) Check for leaks. (Good if the vacuum is held.)



- (10) Tighten the charge valve handle to puncture the service can.
- (11) Turn back the handle of the charge valve tighten the handle of the special tool ② (valve close).

- (12) Open the low pressure valve of the gauge manifold to charge 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.

- (13) When refrigerant is no longer drawn in, turn back the handle of the special tool ① (valve close).
- (14) Check for gas leaks using a leak detector.
- (15) Start the engine.
- (16) Operate the air conditioner and set at the lowest temperature (MAX. COOL).
- (17) Fix the engine speed at 1,500 r/min.
- (18) Tighten the handle of the special tool ① (valve open), and charge refrigerant up to the specified quantity.

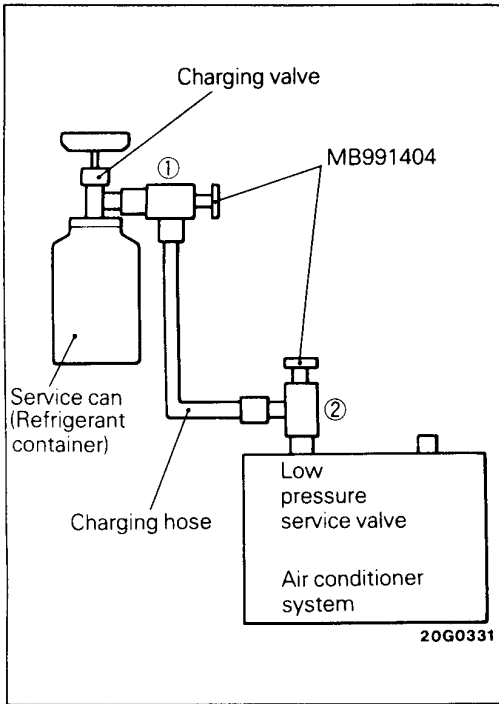
Caution

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.

- (19) After refrigerant charge is completed, turn the handle of the special tool ① all the way back (valve closed).
- (20) Tighten the handle of the charge valve (valve closed).
- (21) Remove the special tool ① from the low pressure service valve.
- (22) Remove the service can.

NOTE

When there is remainder of refrigerant in the service can, keep it for next use with the charge valve and the valve of special tool ② being closed.



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 closed) to the service can.
- (2) Install the special tool ① with the handle tightened (valve open) to the charge valve.
- (3) Connect the charging hose to the special tool ①.
- (4) Connect the special tool ② with the handle turned all the way back (valve closed) to the charging hose.
- (5) Tighten the handle of the charge valve (valve closed), and pierce the service can.
- (6) Turn the handle of the charge valve all the way back (valve open), and by operating the handle of the special tool ②, perform air bleeding.
- (7) Install the special tool ② to the low pressure service valve.

Caution

Never use the high pressure side as this may cause refrigerant to flow back, resulting rupture of the service can or the charging 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 special tool ② (valve open), and replenish refrigerant checking the quantity through the sight glass.
- (12) After replenishing is completed, turn the handle of the special tool ② all the way back (valve closed), and then remove the special tool ②.

NOTE

When there is remainder of refrigerant in the service can, keep it for next use with the charge valve and the valves of special tools ① and ③ being closed.

IN CASE REFRIGERANT RECOVERY AND RECYCLING UNIT IS USED

Replenish refrigerant with the refrigerant recovery and recycling unit.

NOTE

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

DISCHARGING SYSTEM

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

NOTE

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

REFILLING OF OIL IN THE AIR-CONDITIONER SYSTEM

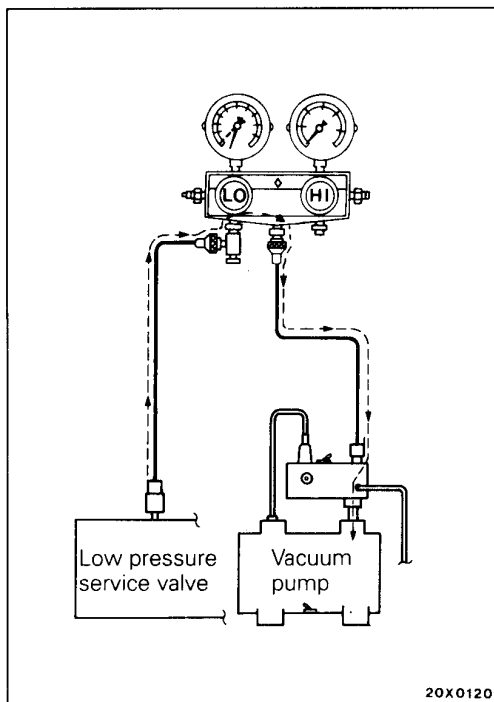
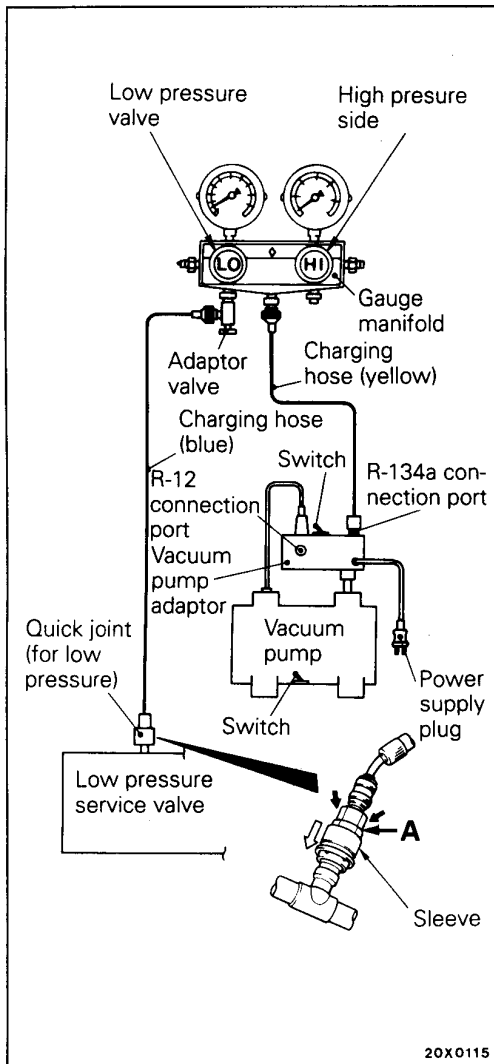
Too little oil will provide inadequate compressor lubrication and cause a compressor failure. Too much oil will increase discharge air temperature.

When a 10PA15 compressor is installed at the factory, it contains 80 cm³ (4.9 cu.in.) of refrigerant oil. 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 : DENSO oil 6**Quantity:**

Evaporator :	60 cm³ (3.6 cu. in.)
Condenser :	30 cm³ (1.8 cu. in.)
Suction hose :	10 cm³ (0.6 cu. in.)
Receiver :	10 cm³ (0.6 cu. in.)

**CHARGING <Vehicles using R-134a refrigerant>**

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 750 mmHg or higher (takes approx. 10 minutes).
14. Turn the vacuum pump adaptor switch OFF and allow to stand it for 5 minutes.

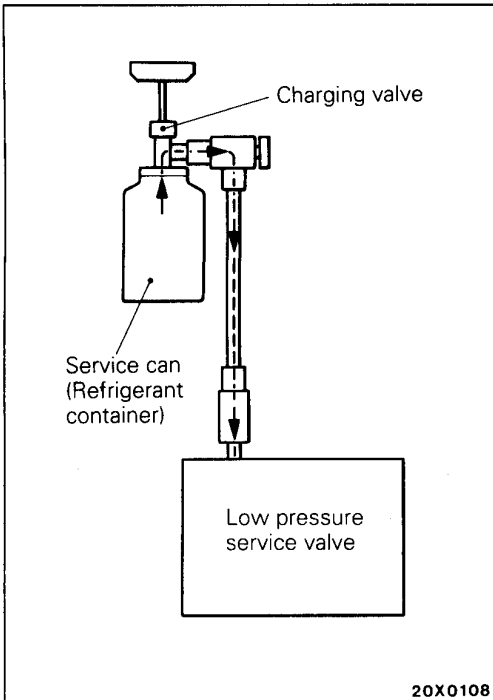
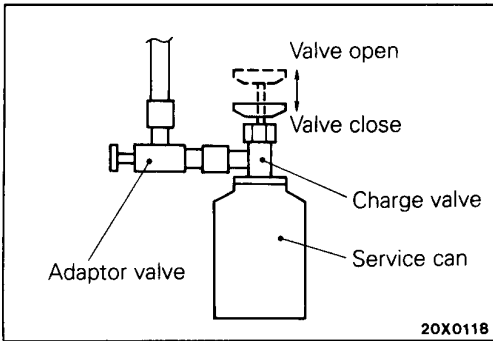
Caution

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.

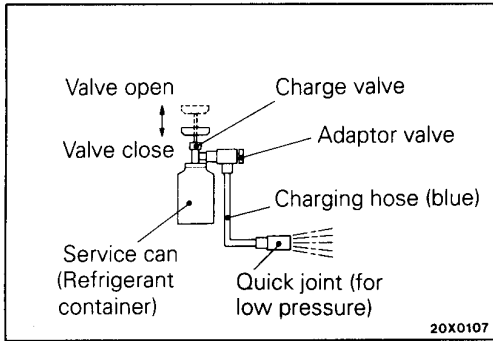
Caution

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.

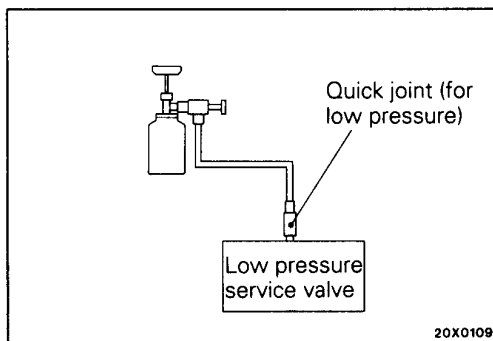
26. After charging with refrigerant, turn the handle of the adaptor valve back all the way (valve closed).
27. Tighten the charging valve handle (valve closed).
Remove the quick joint (for low pressure) from the low-pressure service valve.

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**

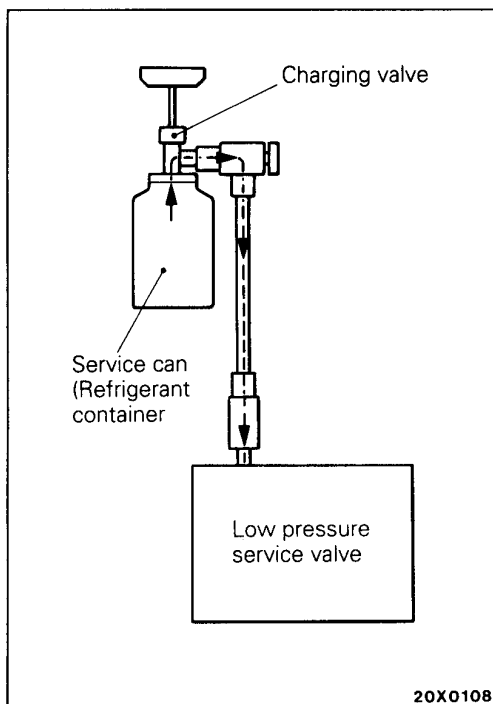
1. Install the charge valve with the handle turned all the way back (valve open) to the service can.
2. Install the adaptor valve with the handle turned all the way back (valve close) to the charging valve.
3. Connect the charging hose (blue) to the adaptor valve.
4. Connect the charging hose (blue)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



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

NOTE

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



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

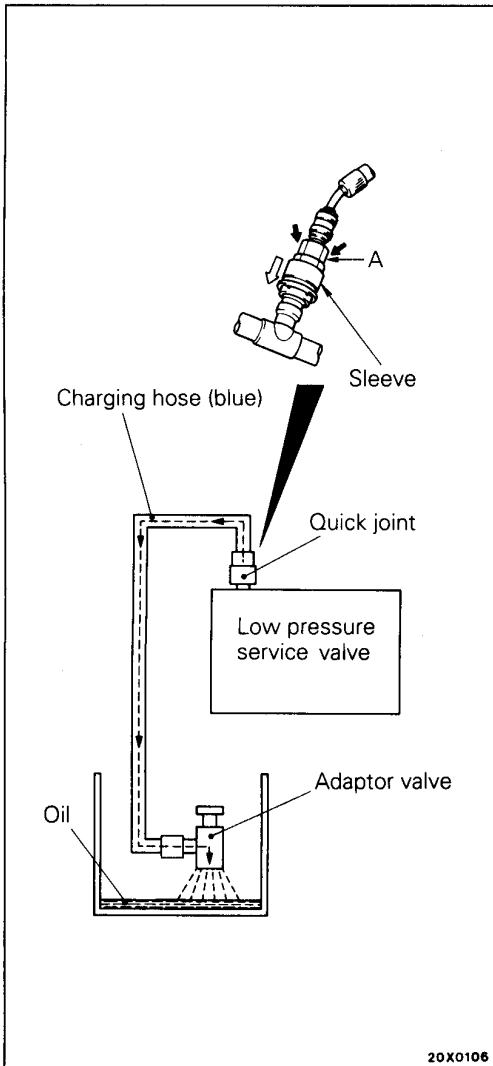
Caution

If the service can is inverted, liquid refrigerant may be 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 valve and the valve of the adaptor valve being closed.



DISCHARGING SYSTEM

1. Run the engine at an engine speed of 1200–1500 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 suction hose.

Caution

To connect the quick joint, press section A firmly against the service valve until a click is heard.

When connecting, run your hand along the hose while pressing to ensure that there are no bends in the hose.

6. Place the adaptor valve inside the container and discharge the refrigerant by opening the handle gradually so that oil does not gush out.

NOTE

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

REFILLING OF OIL IN THE AIR-CONDITIONER 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 120 cm³ (7.3 cu. in.)*¹, 180 cm³ (10.9 cu. in.)*² of refrigerant oil. 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 changed, it is necessary to add oil to the system to replace the oil being removed with the component.

NOTE

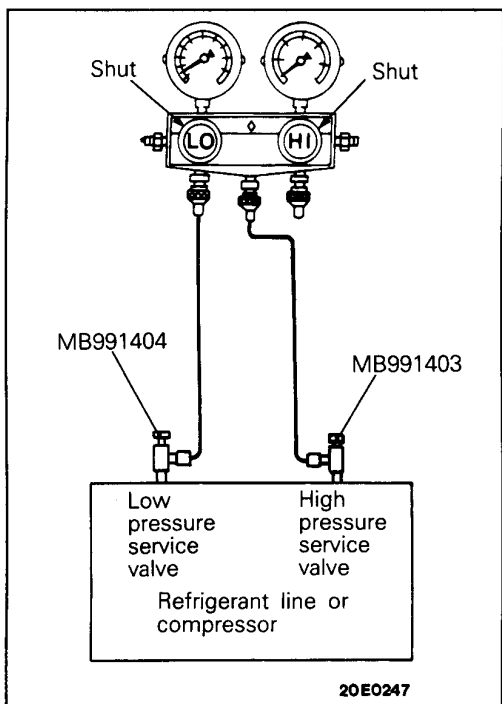
*¹ : 10PA15 compressor

*² : 10PA17 compressor

Compressor oil : DENSO oil 8

Quantity:

Evaporator :	60 cm³ (3.6 cu. in.)
Condenser :	30 cm³ (1.8 cu. in.)
Suction hose :	10 cm³ (0.61 cu. in.)
Receiver :	10 cm³ (0.61 cu. in.)



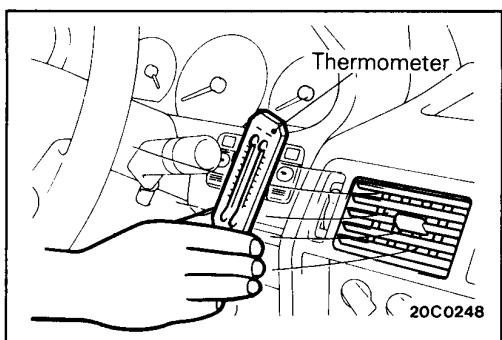
PERFORMANCE TEST <Vehicles using R-12 refrigerant>

E55FTA1

- (1) The vehicle to be tested should be in a place that is not in direct sunlight.
- (2) Connect a tachometer.
- (3) Turn back the handle of the special tools (MB991403, MB991404) valve closed) and install the special tools (MB991403, MB991404) to the high pressure and low pressure service valves.
- (4) Connect the gauge manifold to the special tools (MB991403, MB991404).
- (5) Tighten the handle of the special tools (MB991403, MB991404, valve open).
- (6) Start the engine.
- (7) Set the controls to the air conditioner as follows:
 Air conditioning switch: Air conditioner – ON position
 Mode selection: Face position
 Temperature control: Max. cooling position
 Air selection: Recirculation position
 Blower switch: HI (Fast) position
- (8) Adjust engine speed to 1,000 r/min with air conditioner clutch engaged.
- (9) Engine should be warmed up with doors, windows closed and bonnet opened.
- (10) Insert a thermometer in the left center air conditioner outlet and operate the engine for 20 minutes.
- (11) Note the discharge air temperature.

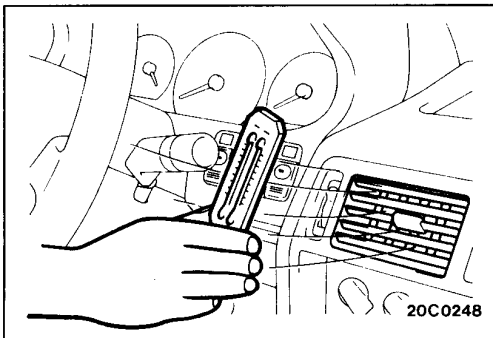
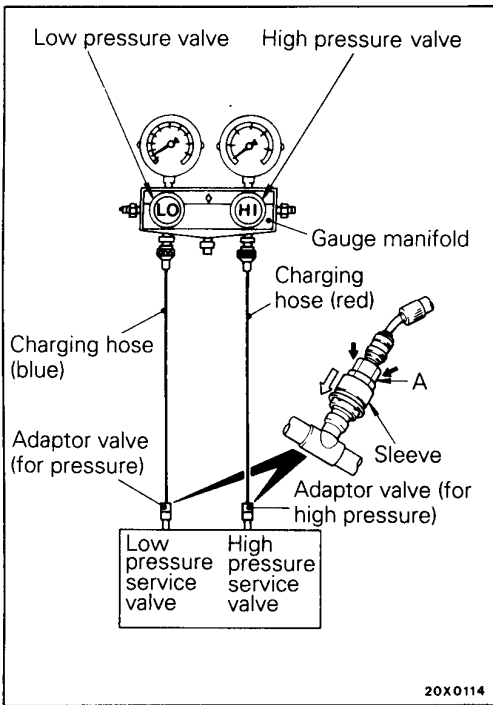
NOTE

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



Performance Temperature Chart

Garage ambient temperature °C (°F)	21 (70)	26.7 (80)	32.2 (90)	37.8 (100)	43.3 (110)
Discharge air temperature °C (°F)	2.5–7.5 (36.5–45.5)	2.5–8.0 (36.5–46.5)	3.0–8.0 (37.4–46.5)	3.5–8.0 (38.3–46.5)	3.5–8.0 (38.3–46.5)
Compressor discharge pressure kPa (kg/cm ² , psi)	850–900 (8.5–9.0, 121.0–128.1)	1,000–1,070 (10.0–10.7, 142.3–152.3)	1,100–1,150 (11.0–11.5, 156.5–163.6)	1,250–1,320 (12.5–13.2, 177.9–187.8)	1,350–1,400 (13.5–14.0, 192.1–199.2)
Compressor suction pressure kPa (kg/cm ² , psi)	130–310 (1.3–1.9, 18.5–27.0)	140–310 (1.4–1.9, 19.9–27.0)	140–320 (1.4–2.0, 19.9–28.5)	160–320 (1.6–2.0, 22.8–28.5)	165–320 (1.65–2.1, 23.5–29.9)



PERFORMANCE TEST <Vehicles using R-134a refrigerant>

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

NOTE

The high-pressure service valve is on discharge pipe 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 1,000 r/min with A/C clutch engaged.
9. Engine should be warmed up with doors and windows closed.
10. Insert a thermometer in the left center A/C outlet and operate the engine for 20 minutes.
11. Note the discharge air temperature.

NOTE

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

Performance Temperature Chart

Garage ambient temperature °C (°F)	20 (68)	25 (77)	35 (95)	45 (113)
Discharge air temperature °C (°F)	10.8 (51.4)	16.8 (62.2)	23.5 (74.3)	24.3 (75.7)
Compressor discharge pressure kPa (kg/cm ² , psi)	1030 (10.5, 149.4)	1128 (11.5, 163.6)	1393 (14.2, 202.1)	1736 (17.7, 251.8)
Compressor suction pressure kPa (kg/cm ² , psi)	178 (1.82, 25.8)	184 (1.88, 26.7)	196 (2.0, 28.4)	210 (2.14, 30.4)

NOTES

REFRIGERANT LEAK REPAIR PROCEDURE

E55FUAF

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 the 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 of refrigerant. If it is possible to repair the leak without discharging the refrigerant system, use the procedure for correcting low refrigerant level.

HANDLING TUBING AND FITTINGS^{E55FVAD}

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 keep the radius of all bends at least 10 times the diameter of the hose.

Sharper bends will reduce the flow of refrigerant. The flexible hose lines should be routed so that they are at least 80 mm (3 in.) from the exhaust manifold. It is good practice to inspect all flexible hose lines at least once a year to make sure they are in good condition and properly routed.

Unified plumbing connections with O-rings. These O-rings are not reusable.

COMPRESSOR NOISE

E65FXAC

When investigating an air conditioning related noise, you must first know the conditions when the noise occurs. These conditions are: weather, vehicle speed, in gear on neutral, engine temperature or any other special conditions.

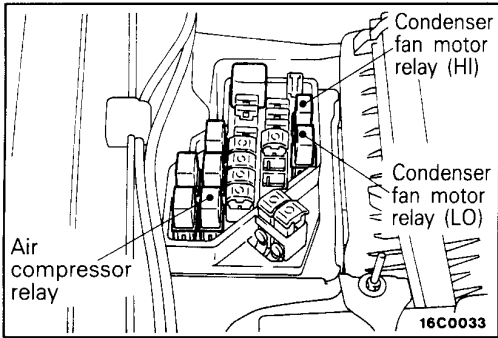
Noises that develop during air conditioning operation can often be misleading. For example: what sounds like a failed front bearing or connecting rod, may be caused by loose bolts, nuts, mounting brackets, or a loose clutch assembly. Verify accessory drive belt tension (power steering or alternator).

Improper accessory drive belt tension can cause a misleading noise when the compressor is engaged and little or no noise when the compressor is disengaged.

Drive belts are speed sensitive. That is, at different engine speeds, and depending upon belt tension, belts can develop unusual noises that are often mistaken for mechanical problems within the compressor.

ADJUSTMENT PROCEDURES

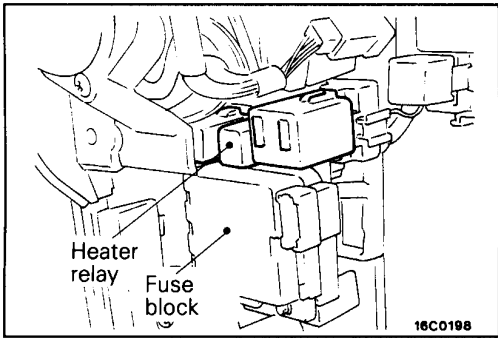
- (1) Select a quiet area for testing. Duplicate conditions as much as possible. Switch compressor on and off several times to clearly identify compressor noise. To duplicate high ambient conditions (high head pressure), restrict air flow through condenser. Install manifold gauge set to make sure discharge pressure doesn't exceed 2,070 kPa (21.4 kg/cm², 300 psi).
- (2) Tighten all compressor mounting bolts, clutch mounting bolt, and compressor drive belt. Check to assure clutch coil is tight (no rotation or wobble).
- (3) Check refrigerant hoses for rubbing or interference that can cause unusual noises.
- (4) Check refrigerant charge. (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.



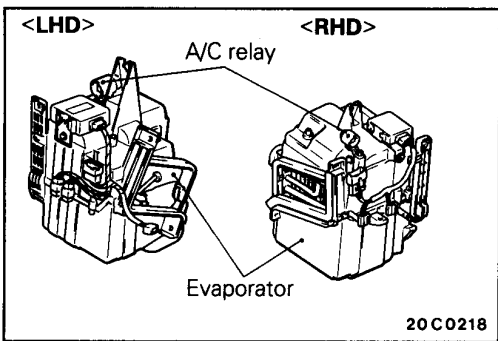
POWER RELAY CHECK

E55FRAS

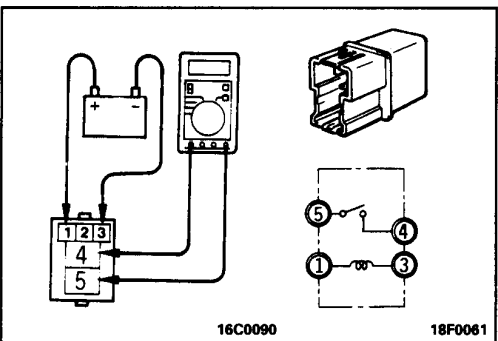
(1) Remove the air conditioner compressor relay and the condenser fan motor (HI) and (LO) relays from the relay box inside the engine compartment.



(2) Remove the heater relay from the junction block behind the front left speaker.



(3) Remove the A/C relay from the evaporator behind the glove box.



(4) Check continuity between each terminal.

AIR CONDITIONER COMPRESSOR RELAY, CONDENSER FAN MOTOR RELAY (HI)/(LO)

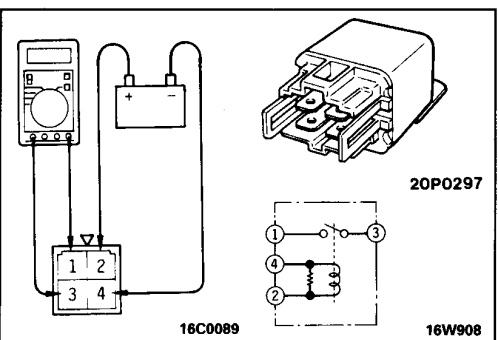
Terminal	1	3	4	5
Battery voltage				
Continuity no voltage	○—○			
Continuity with voltage	⊕—○	○—○		

HEATER RELAY, A/C RELAY <4D68>

Terminal	1	2	3	4
Battery voltage				
Continuity no voltage		○—○		○—○
Continuity with voltage	○—○	⊕—○	○—○	○—○

NOTE

○—○ indicates that there is continuity between the terminals.
 ⊕—○ indicates terminals to which battery voltage is applied.



IDLE-UP OPERATION CHECK

<4G63-4G64-4G93>

E55FOAR

- (1) Before inspection and adjustment set vehicle in the following condition:
 - Engine coolant temperature: 80–90°C (176–194°F)
 - Lights, electric cooling fan and accessories: Set to OFF
 - Transmission: Neutral (N or P for vehicles with A/T)
 - Steering wheel: Straightforward
- (2) Check whether or not the idling speed is the standard value.

Standard value:

800±100 r/min. <4G63-4G64>

800±100 r/min. <4G93, Vehicles with catalytic converter>

700±100 r/min. <4G93, Vehicles without catalytic converter>

- (3) When the air conditioner is running after turning the air conditioner switch to ON, and the blower switch to the MH or HI position, check to be sure that the idle speed is at the standard value.

Standard value: 850±50 r/min.

NOTE

There is no necessity to make an adjustment, because the idling speed is automatically adjusted by the ISC system. If, however, there occurs a deviation from the standard value for some reason, check the ISC system.

(Refer to GROUP 13 – Service Adjustment Procedures.)

<4D65-4D68>

- (1) Before inspection and adjustment set vehicle in the following condition:
 - Engine coolant temperature: 80–90°C (176–194°F)
 - Transmission: Neutral (N or P for vehicles with A/T)
 - Steering wheel: Straightforward
- (2) Check whether or not the idling speed is the standard value.

Standard value: 750±100 r/min.

NOTE

If the idle speed is outside the standard value, adjust the idle speed. (Refer to GROUP 11 – Service Adjustment Procedures.)

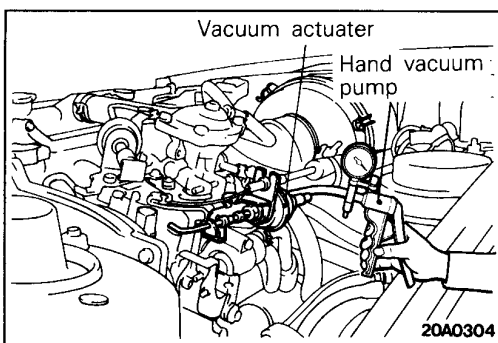
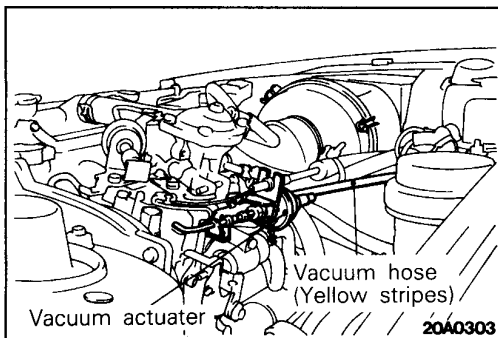
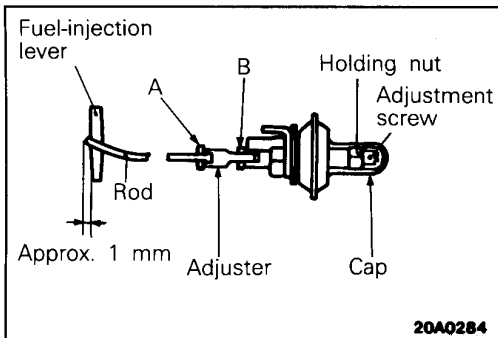
- (3) When the air conditioner is running after turning the air conditioner switch to ON, and the blower switch to the MH or HI position, check to be sure that the idle speed is at the standard value.

Standard value: 850 ± 50 r/min.

NOTE

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 canceled.
- ⑤ Remove the cap and loosen the nut for holding.
- ⑥ Adjust to the specified r/min. by turning the adjustment screw.
- ⑦ Securely tighten the holding nut, and then attach the cap.



VACUUM ACTUATOR CHECK

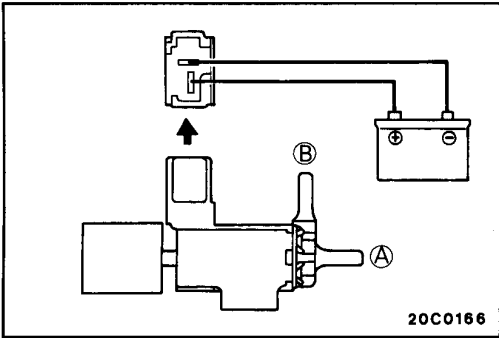
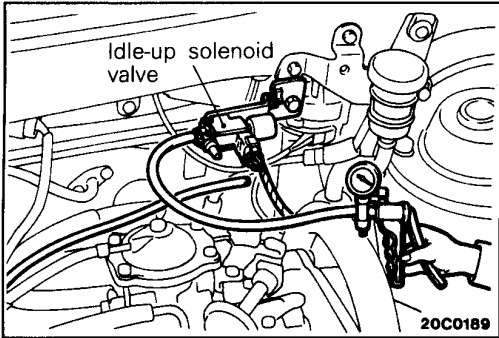
E55FRAU

<4D65-4D68>

- (1) Take out the vacuum hose (with the yellow stripe) that is connected to the vacuum actuator.
- (2) Connect a hand vacuum pump to the nipple on the vacuum actuator assembly.
- (3) Check to be sure that the vacuum actuator rod begins to retract when approximately 33.3 kPa (250 mmHg, 9.8 in.Hg) of negative pressure is applied, and that the rod retracts to its shortest level when 46.6 kPa (350 mmHg, 13.7 in.Hg) of negative pressure is applied.
- (4) Remove the hand vacuum pump from the vacuum actuator assembly, and install the vacuum hose (yellow stripe) to the vacuum actuator assembly.

NOTE

When installing the vacuum hose, be careful not to damage the vacuum hose.



IDLE-UP SOLENOID VALVE CHECK

E55FRAT

<4D65-4D68>

- (1) Remove the vacuum hose from the idle-up solenoid valve.

NOTE

When installing the vacuum hose, be careful to install it to the correct connecting tip.

- (2) Disconnect the idle-up solenoid valve connector.
- (3) Connect a vacuum pump (Mighty Vac) to nipple (A).
- (4) Inspect the passage of air with the vacuum pump (Mighty Vac) when battery voltage is applied between the idle-up solenoid valve terminals, and when it is not supplied.

Battery voltage	Nipple (B)	Vacuum condition
Applied	Open	Vacuum leaks from nipple (B)
	Covered with a finger	Vacuum is maintained*1
Not applied	Open	
	Covered with a finger	Vacuum is maintained

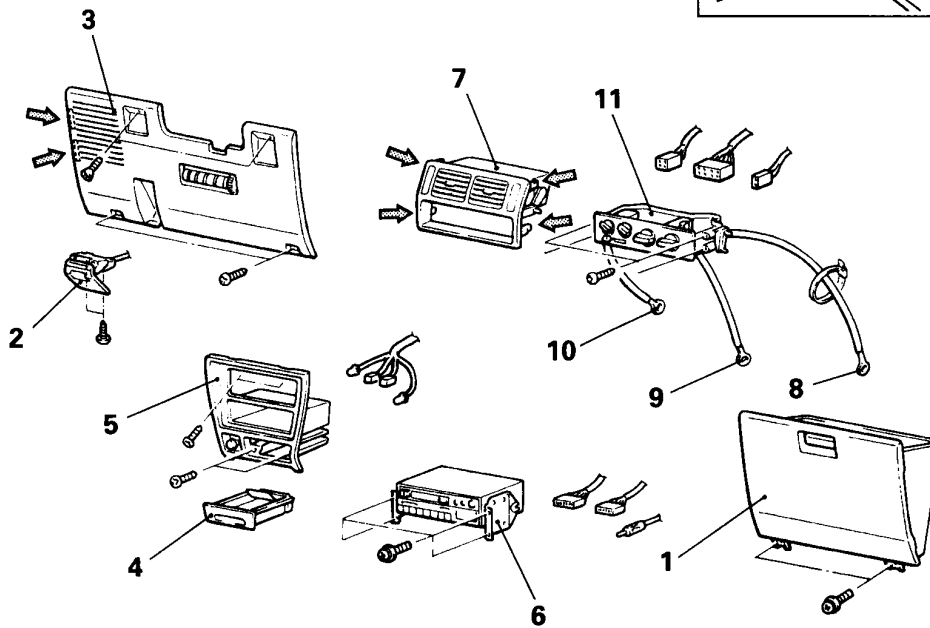
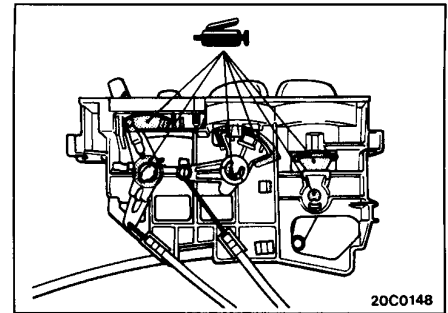
NOTE

At *1, negative pressure can be felt, but at *2, negative pressure cannot be felt.

- (5) Measure the resistance between the idle-up solenoid valve terminals.

Standard value: approx. 40 Ω

HEATER CONTROL ASSEMBLY REMOVAL AND INSTALLATION



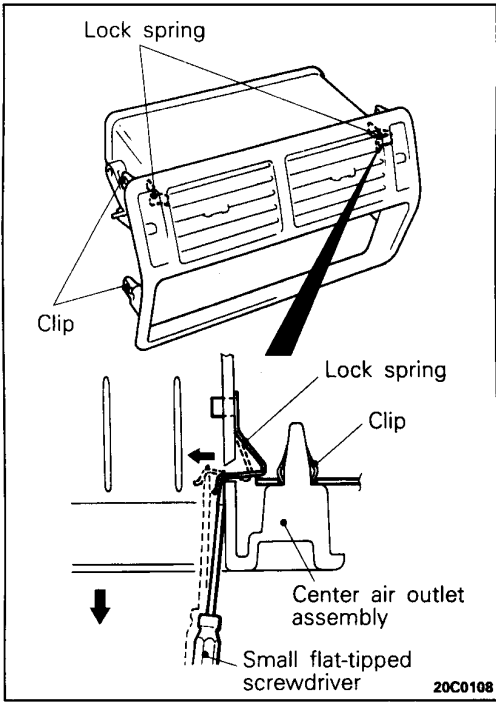
20C0141

Removal steps

1. Glove box
2. Hood lock release handle
3. Instrument under cover
4. Ashtray
5. Center panel
6. Radio and tape player
7. Center air outlet assembly
8. Connection for inside/outside air changeover damper cable
9. Connection for air-mixing damper cable
10. Connection for air outlet changeover damper cable
11. Heater control assembly

NOTE

⇒ : Clip positions

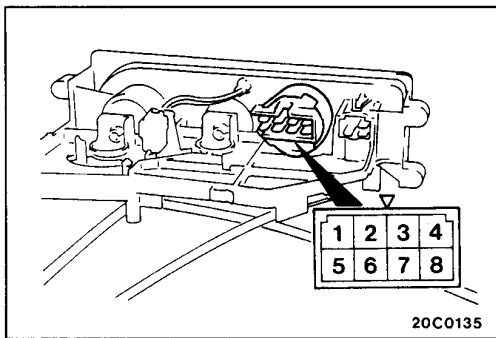


SERVICE POINTS OF REMOVAL

E55GBAN

7. REMOVAL OF CENTER AIR OUTLET ASSEMBLY

- (1) First remove the clip on the lower section of the center air outlet assembly.
- (2) Insert a small flat-tipped screwdriver in between the fins, and remove the clip on the top section while pulling the lock spring toward the inside.
- (3) Take out the center air outlet assembly.



INSPECTION

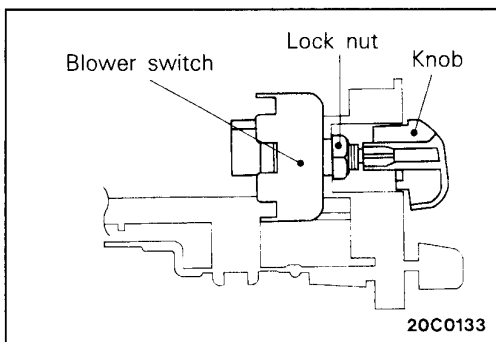
E55GCAO

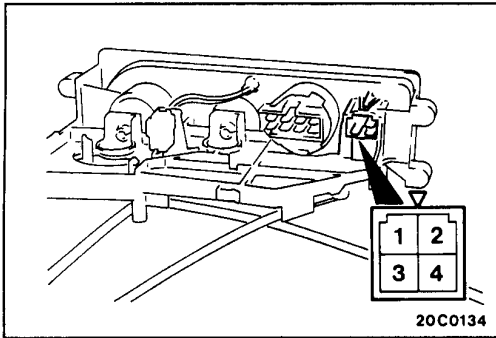
BLOWER SWITCH CONTINUITY

Terminal	1	2	3	4	5	6	7	8
Switch position								
OFF					○			
• (LO)	○		○		○			○
• (MI)	○				○	○		○
• (MH)	○	○		○	○			○
• (HI)	○			○	○		○	○

NOTE

○—○ indicates that there is continuity between the terminals. If the continuity between the terminals is defective, replace the switch.



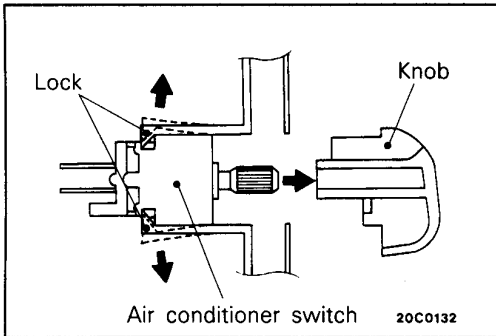


AIR CONDITIONER SWITCH CONTINUITY

Terminal	1	3	4
Switch position			
OFF position	○		
ECONO position	○	○	
A/C position	○		○

NOTE

○—○ indicates that there is continuity between the terminals. If the continuity between the terminals is defective, replace the switch.

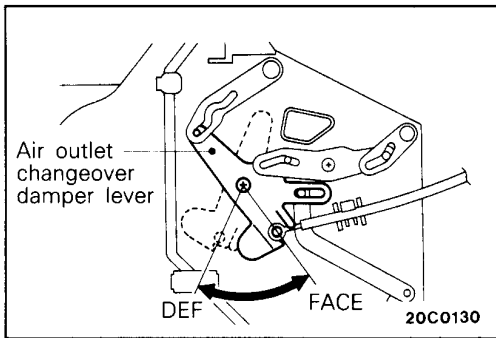


SERVICE POINTS OF INSTALLATION

E55GDAO

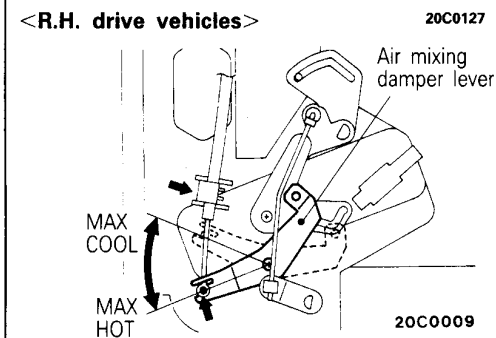
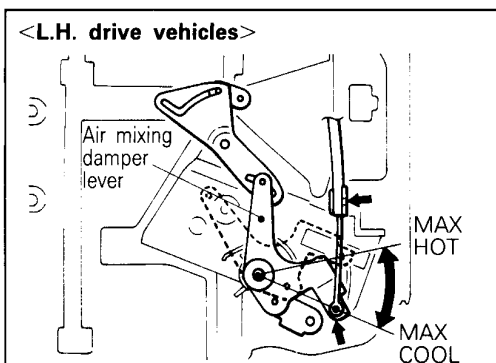
10. CONNECTION OF AIR OUTLET CHANGEOVER DAMPER CABLE

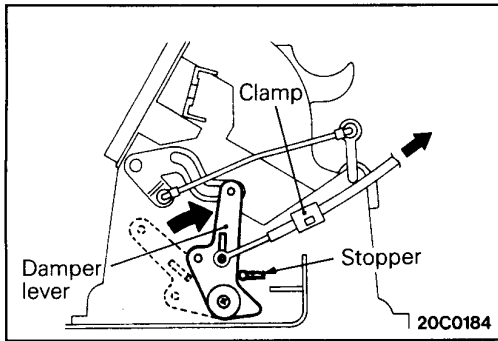
- (1) Set the knob for the air outlet changeover on the heater control assembly to the DEF position.
- (2) Set the air outlet changeover damper lever of the heater unit to DEF position (the damper turned left until it stops), and install the cable.



9. CONNECTION OF AIR MIXING DAMPER LEVER

- (1) Set the temperature control knob on the heater control assembly to MAX HOT.
- (2) Set the air mixing damper lever of the heater unit to the MAX HOT position (the damper lever turned left until it stops), and install the cable.



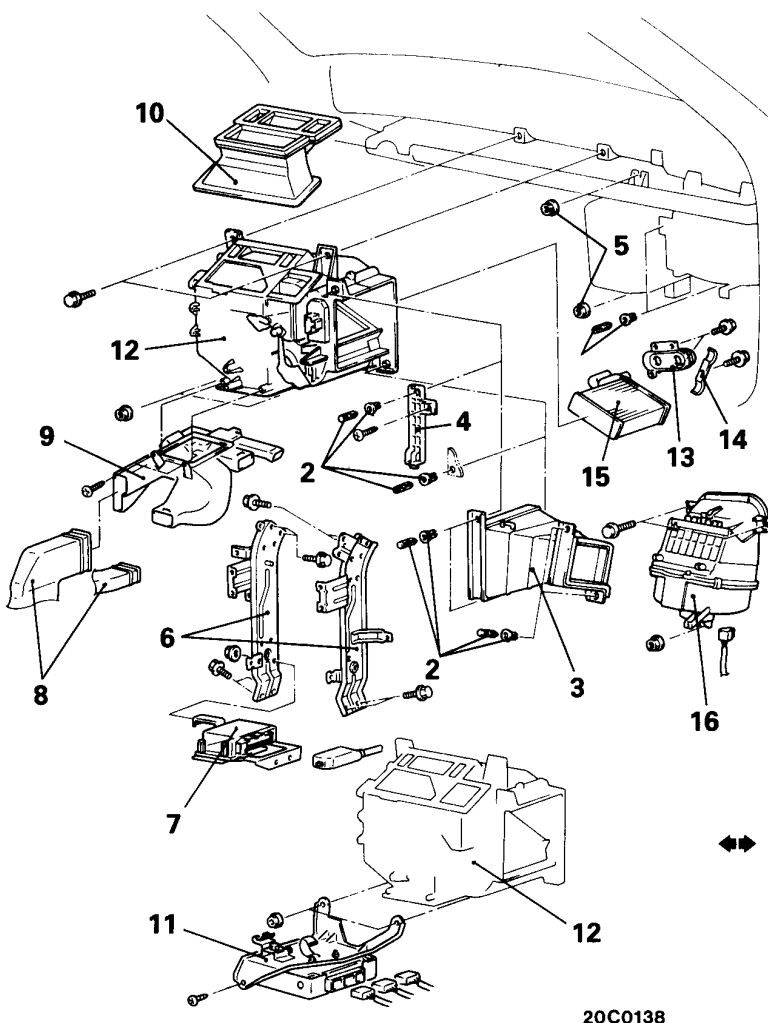


8. CONNECTION OF INSIDE/OUTSIDE AIR CHANGEOVER DAMPER CABLE

- (1) Set the inside/outside air changeover lever to the inside air recirculation position.
- (2) Turn the inside/outside air changeover damper lever in the direction of the arrow so that it touches the stopper.
- (3) Install the inner wire of the inside/outside air changeover cable to the damper lever.
- (4) Insert the outer cable of the inside/outside air changeover cable into the clamp while lightly pulling the outer cable from the heater control assembly side.
- (5) After operating the inside/outside air changeover lever 2 – 3 times, set it to the inside air recirculation position.
At this time, check that the damper lever touches the stopper.
If the damper lever is not touching the stopper, readjust the cable.

**HEATER UNIT AND BLOWER ASSEMBLY
REMOVAL AND INSTALLATION**

E551A--



20C0138

Pre-removal and Post-installation Operation

- Draining and Supplying of the Coolant (Refer to GROUP 14 – Service Adjustment Procedures.) (Unnecessary when only removing or installing the blower assembly)

CAUTION: SRS

When removing and installing the floor console assembly from vehicles equipped with SRS, do not let it bump against the SRS diagnostic unit or the components.

Heater unit removal steps

- Floor console box (Refer to GROUP 52A – Floor Console.)
 - Instrument panel (Refer to GROUP 52A – Instrument Panel.)
1. Heater hose connection
 2. Clip
 3. Joint duct
 4. Plate sub assembly <Vehicles with air conditioner>
 5. Cooling unit installation nut <Vehicles with air conditioner>
 6. Center reinforcement
 7. A.B.S. Control unit assembly
 8. Rear heater duct connection
 9. Foot distribution duct
 10. Center ventilation duct assembly
 11. Automatic transmission control unit
 12. Heater unit
 13. Plate
 14. Clamp
 15. Heater core

Blower assembly removal steps

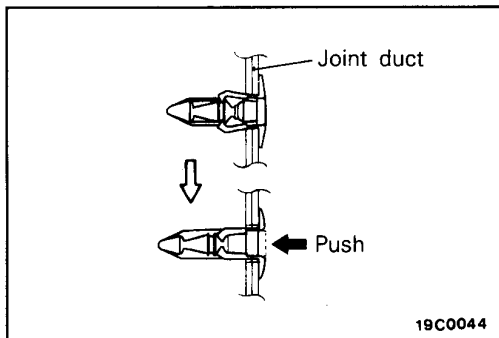
- Instrument panel (Refer to GROUP 52A – Instrument Panel.)
2. Clip
 3. Joint duct
 16. Blower assembly

SERVICE POINTS OF REMOVAL

E551BAM

2. REMOVAL OF CLIP

Remove the clip by pushing it at the centre.



19C0044

**BLOWER MOTOR ASSEMBLY
REMOVAL AND INSTALLATION**

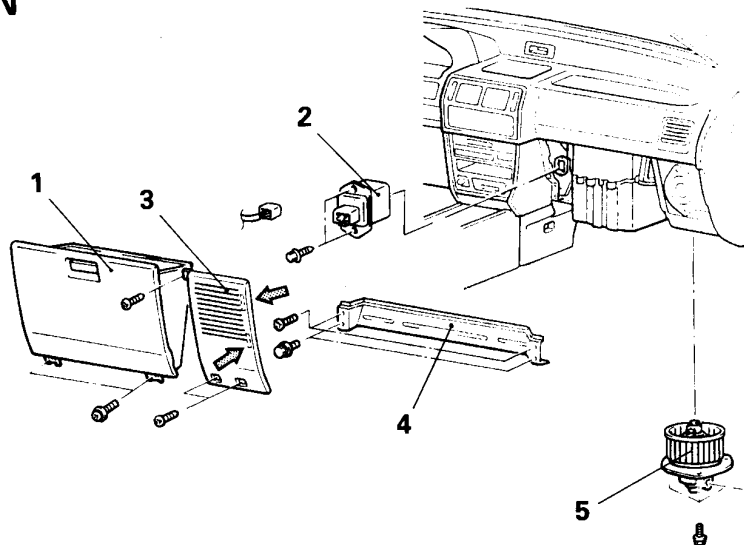
E55KA--

Removal steps

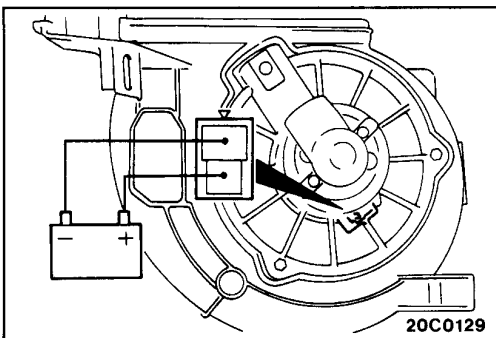
1. Glove box
2. Resistor
3. Speaker garnish
4. Glove box frame
5. Blower motor assembly

NOTE

⇒ : Clip positions



20C0168



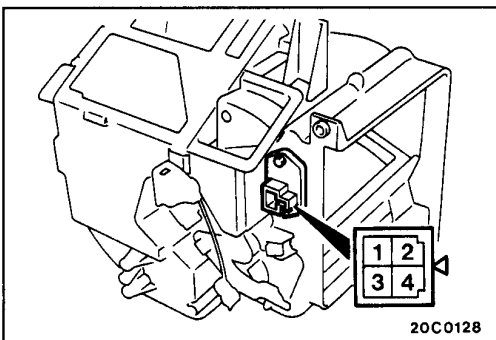
20C0129

INSPECTION

E55KCAO

BLOWER MOTOR ASSEMBLY 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.



20C0128

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.

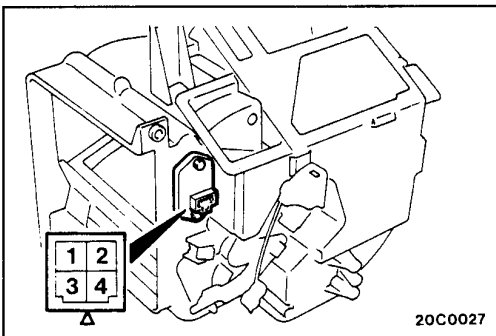
Standard value:

<L.H. drive vehicles>

Measurement terminal	Standard value Ω
Between terminals 4 – 1	1.83
Between terminals 3 – 1	0.87
Between terminals 2 – 1	0.31

<R.H. drive vehicles>

Measurement terminal	Standard value Ω
Between terminals 3 – 2	2.81
Between terminals 1 – 2	1.28
Between terminals 4 – 2	0.33

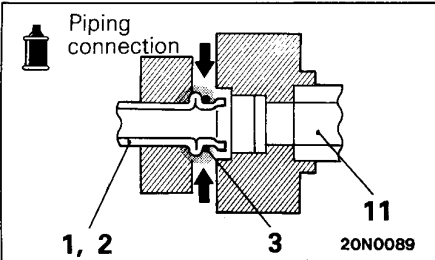


20C0027

EVAPORATOR

REMOVAL AND INSTALLATION

E55JA--

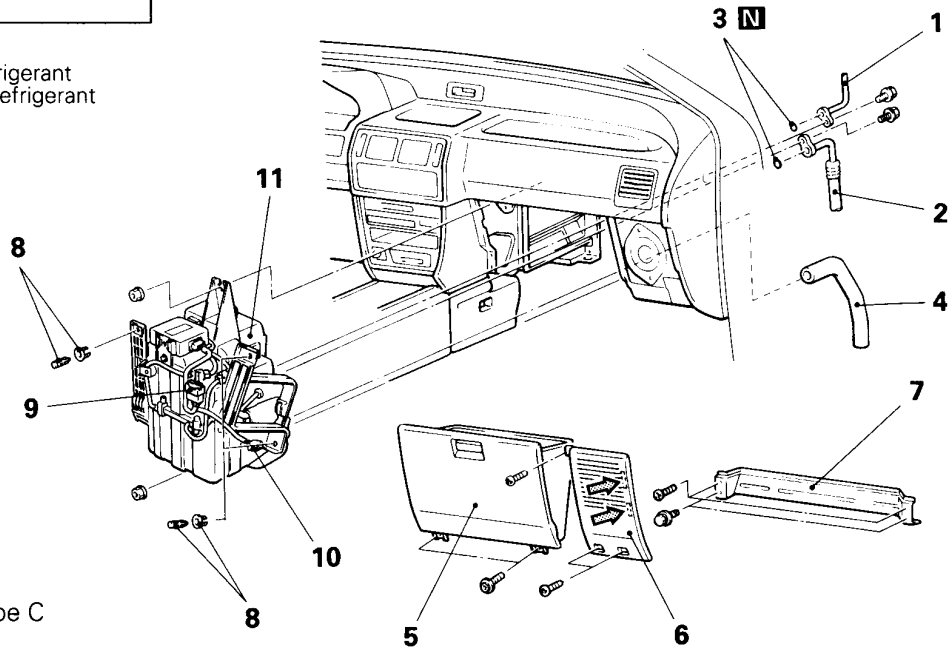


**Compressor oil: DENSO oil 6*1
DENSO oil 8*2**

Pre-removal and Post-installation Operation
 • Discharge and charge of Refrigerant (Refer to P. 55-16, 21-1)

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

NOTE
 *1 : Vehicles using R-12 refrigerant
 *2 : Vehicles using R-134a refrigerant



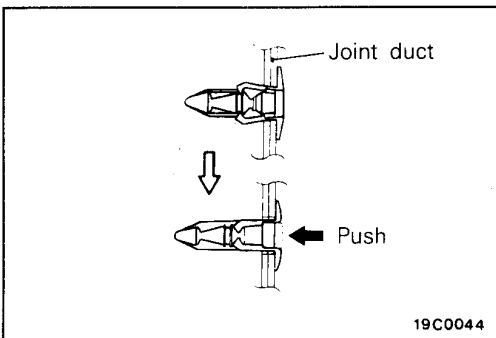
Removal steps

1. Discharge pipe C
2. Suction pipe
3. O-ring
4. Drain hose
5. Glove box
6. Speaker garnish
7. Glove box frame
8. Clip
9. Connector
10. Connector <4G93>
11. Evaporator



NOTE
 ➡ : Clip positions

20C0251



19C0044

SERVICE POINTS OF REMOVAL

E55JBAL

8. REMOVAL OF CLIP

Remove the clip by pushing it at the centre.

INSPECTION

E55JFAB

- Check for damage of the evaporator fin part.
- Check for damage or collapse of the drain hose.
- Check for peeling or cracking of the insulator.

SERVICE POINTS OF INSTALLATION**11. INSTALLATION OF EVAPORATOR**

When replacing the evaporator, refill the evaporator with a specified amount of compressor oil.

<Vehicles using R-12 refrigerant>

Compressor oil : DENSO oil 6

Quantity : 60 cm³ (3.6 cu. in.)

<Vehicles using R-134a refrigerant>

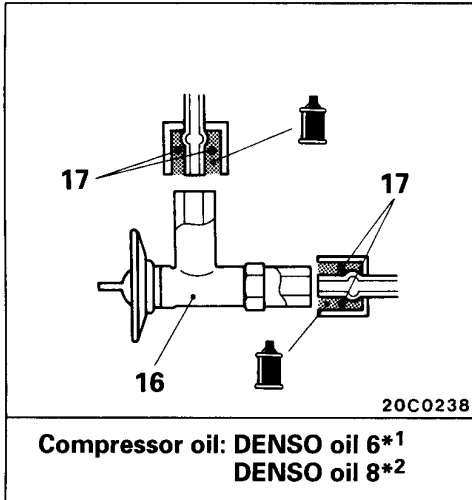
Compressor oil : DENSO oil 8

Quantity : 40 cm³ (2.44 cu. in.)

NOTES

DISASSEMBLY AND REASSEMBLY

<L.H. drive vehicles>

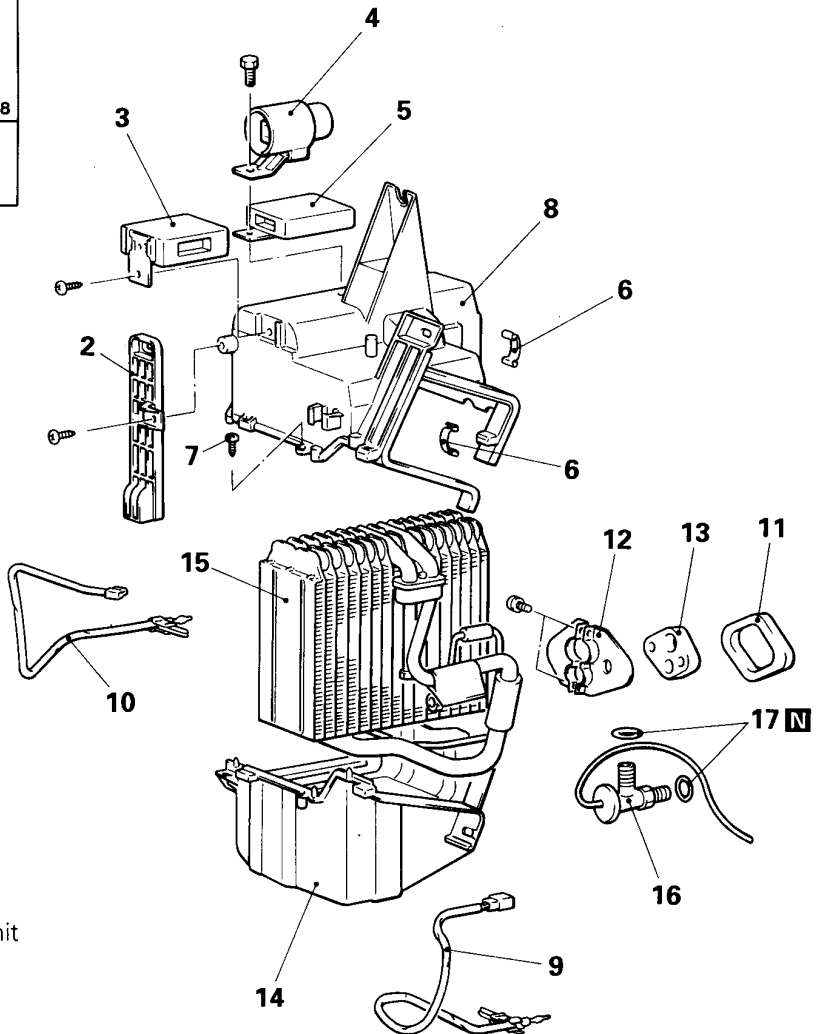
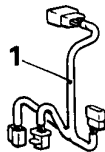
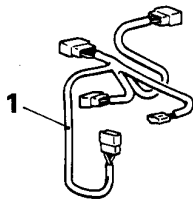


NOTE

- *1 : Vehicles using R-12 refrigerant
- *2 : Vehicles using R-134a refrigerant

<4G93>

<4G63 · 4G64>
<4D65 · 4D68>



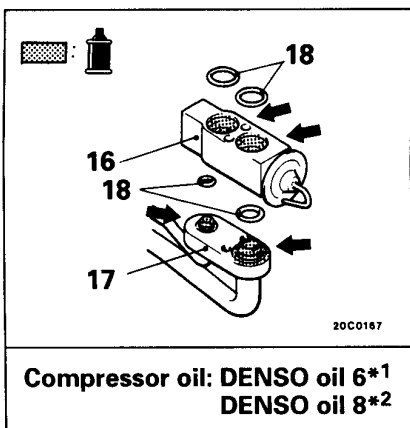
Disassembly steps

1. Harness
2. Plate sub assembly
3. Auto compressor control unit
4. A/C relay <4D68>
5. Belt lock controller <4G93>
6. Clip
7. Tapping screw
8. Evaporator case (upper)
9. Air inlet sensor
10. Air thermo sensor
11. Packing
12. Bracket
13. Grommet
14. Evaporator case (lower)
15. Evaporator assembly
16. Expansion valve
17. O-ring



20C0252

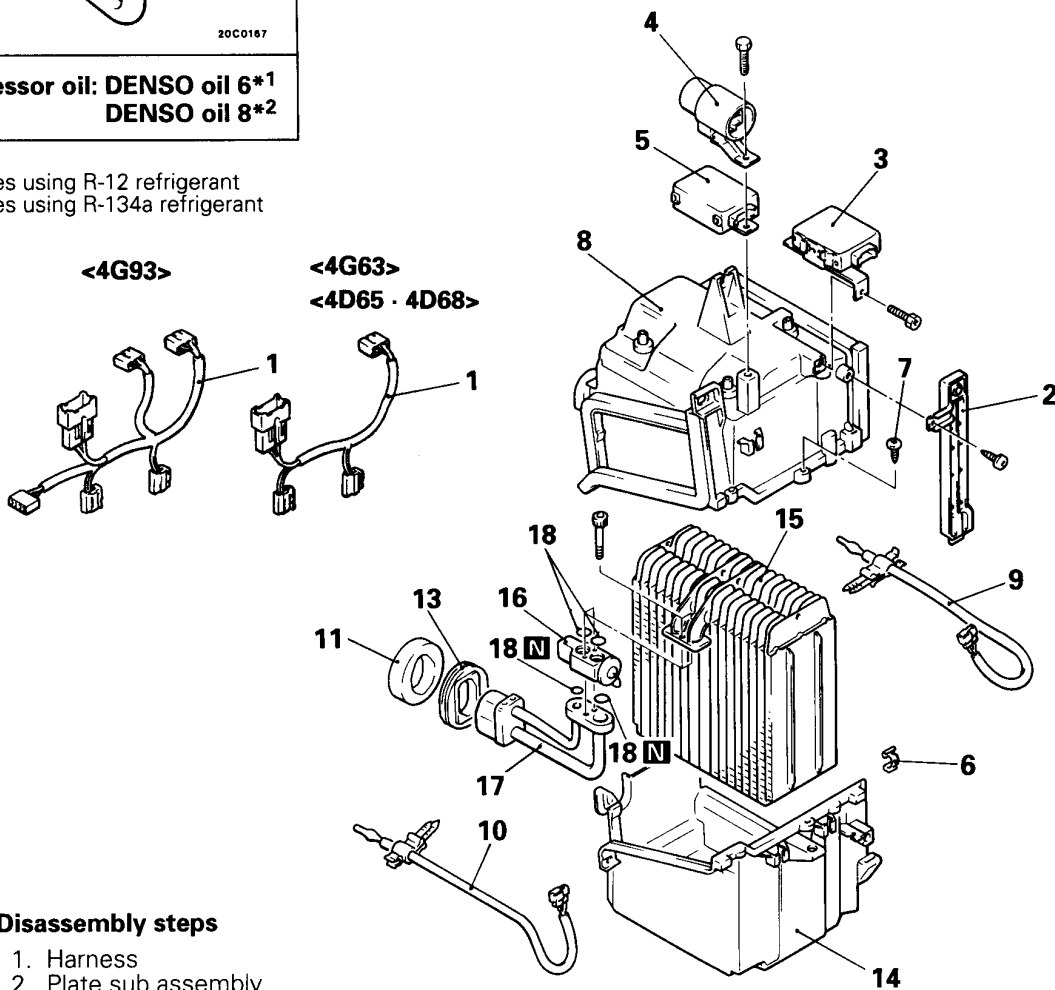
<R.H. drive vehicles>



Compressor oil: DENSO oil 6*1
DENSO oil 8*2

NOTE

- *1 : Vehicles using R-12 refrigerant
- *2 : Vehicles using R-134a refrigerant



Disassembly steps

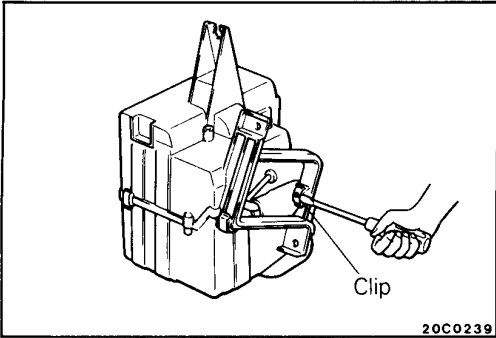
1. Harness
2. Plate sub assembly
3. Auto compressor control unit
4. A/C relay <4D68>
5. Belt lock controller <4G93>
6. Clip
7. Tapping screw
8. Evaporator case (upper)
9. Air inlet sensor
10. Air thermo sensor
11. Packing
13. Grommet
14. Evaporator case (lower)
15. Evaporator assembly
16. Expansion valve
17. Pipe sub assembly
18. O-ring

20C0215

SERVICE POINTS OF DISASSEMBLY

6. REMOVAL OF CLIPS

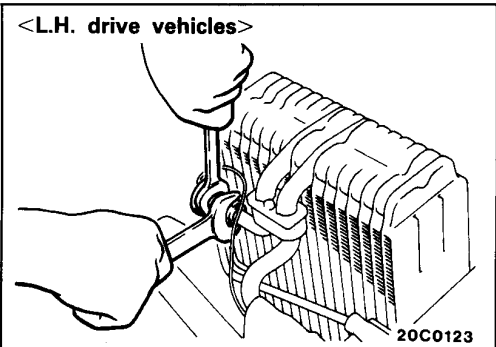
Remove the clips with a flat-blade screwdriver covered with a shop towel to prevent damage to case surfaces.



16. REMOVAL OF EXPANSION VALVE

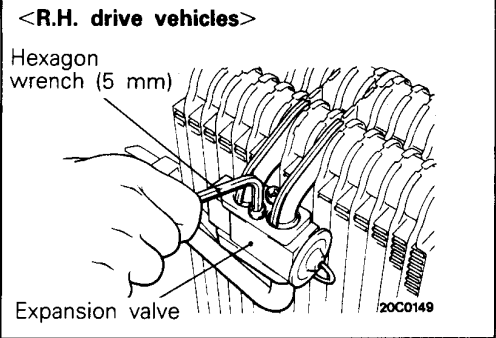
<L.H. drive vehicles>

Loosen the flare nut by using two wrenches. (for both the inlet and outlet.)



<R.H. drive vehicles>

Use a hexagon wrench (5 mm) to remove the expansion valve.



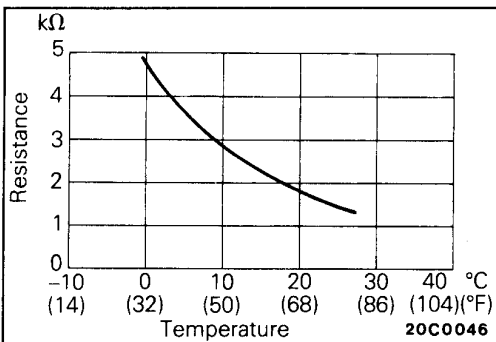
INSPECTION

AIR INLET SENSOR AND AIR THERMO SENSOR CHECK

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

NOTE

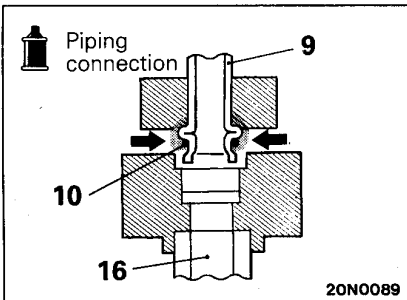
The temperature conditions when testing should not exceed the range of the characteristic curve in the graph.



**COMPRESSOR
REMOVAL AND INSTALLATION**

E55LA--

<4G93>



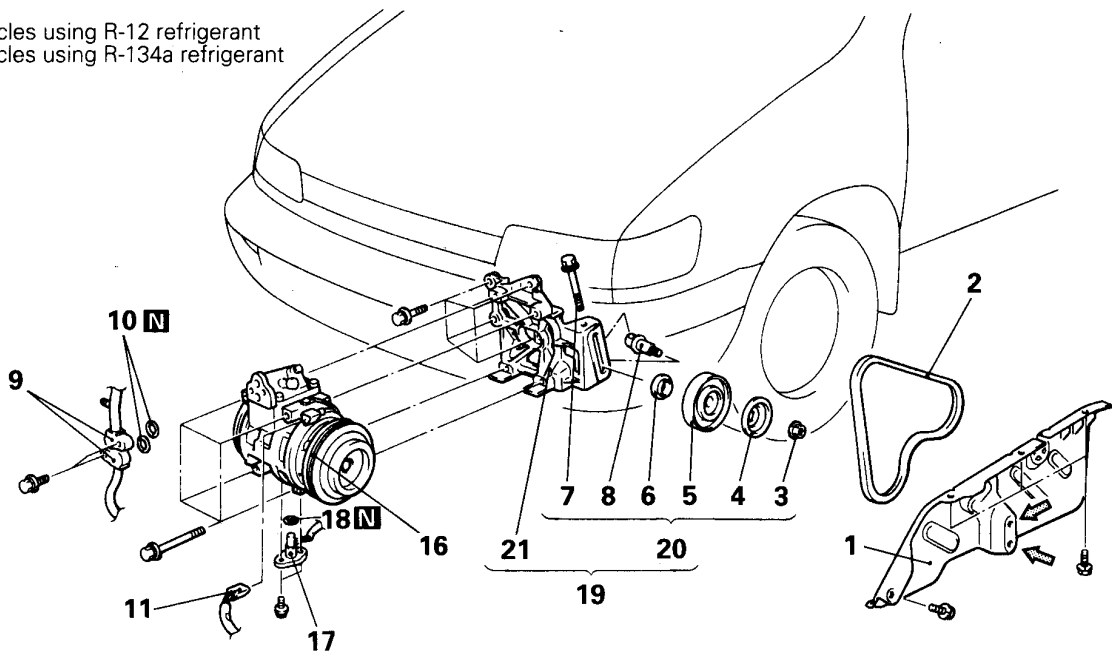
**Compressor oil: DENSO oil 6*1
DENSO oil 8*2**

NOTE

- *1 : Vehicles using R-12 refrigerant
- *2 : Vehicles using R-134a refrigerant

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

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



20C0153

Removal steps of tension pulley



1. Under cover panel (LH)
2. Drive belt
3. Nut
4. Plate
5. Tension pulley
6. Collar
7. Bolt
8. Tension pulley bolt

Removal steps of compressor



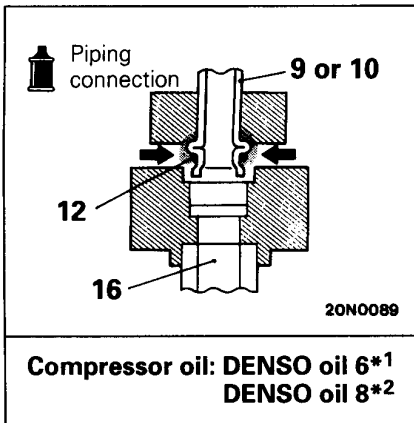
1. Under cover panel (LH)
2. Drive belt
9. Connection for discharge/suction pipe
10. O-ring
11. Connector
16. Compressor
17. Revolution pick-up sensor
18. O-ring
19. Compressor bracket assembly
20. Tension pulley assembly
21. Compressor bracket

NOTE

⇒ : Clip positions

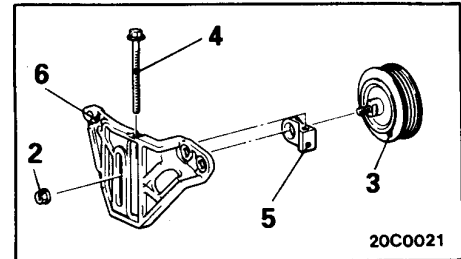
55-39-1 HEATER, AIR CONDITIONER AND VENTILATION – Compressor

<4G63 · 4G64>



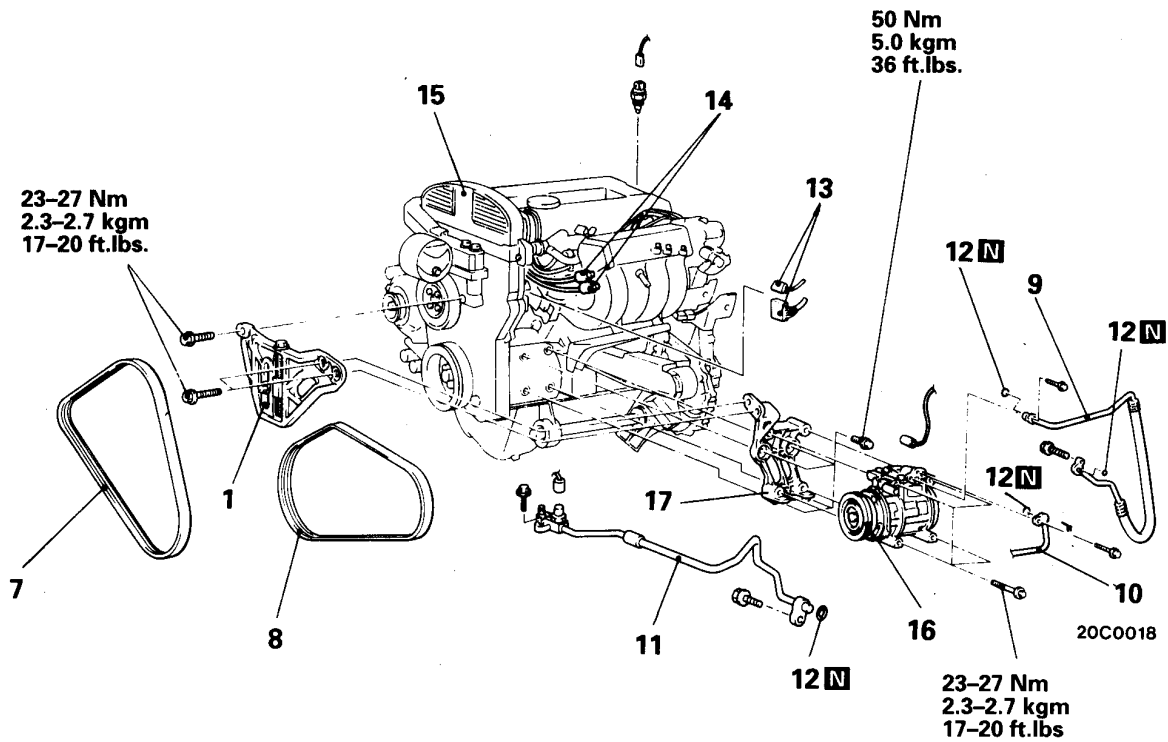
Post-installation Operation

- Adjustment of the Drive Belt (Refer to GROUP 11 – Service Adjustment Procedures.)



NOTE

- *1 : Vehicles using R-12 refrigerant
- *2 : Vehicles using R-134a refrigerant



Removal steps of tension pulley



1. Tension pulley assembly
2. Nut
3. Tension pulley
4. Bolt
5. Adjust plate
6. Tension pulley bracket
7. Drive belt (for alternator)
8. Drive belt (for air conditioner)

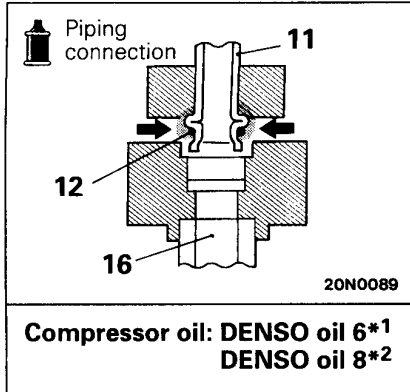
Removal steps of compressor



9. Suction hose
10. Discharge hose connection
11. Discharge pipe B
12. O-ring
13. Connector (for ignition coil)
14. High-tension cable connection (2 positions)
15. Timing belt upper cover
16. Compressor
17. Compressor bracket

NOTES

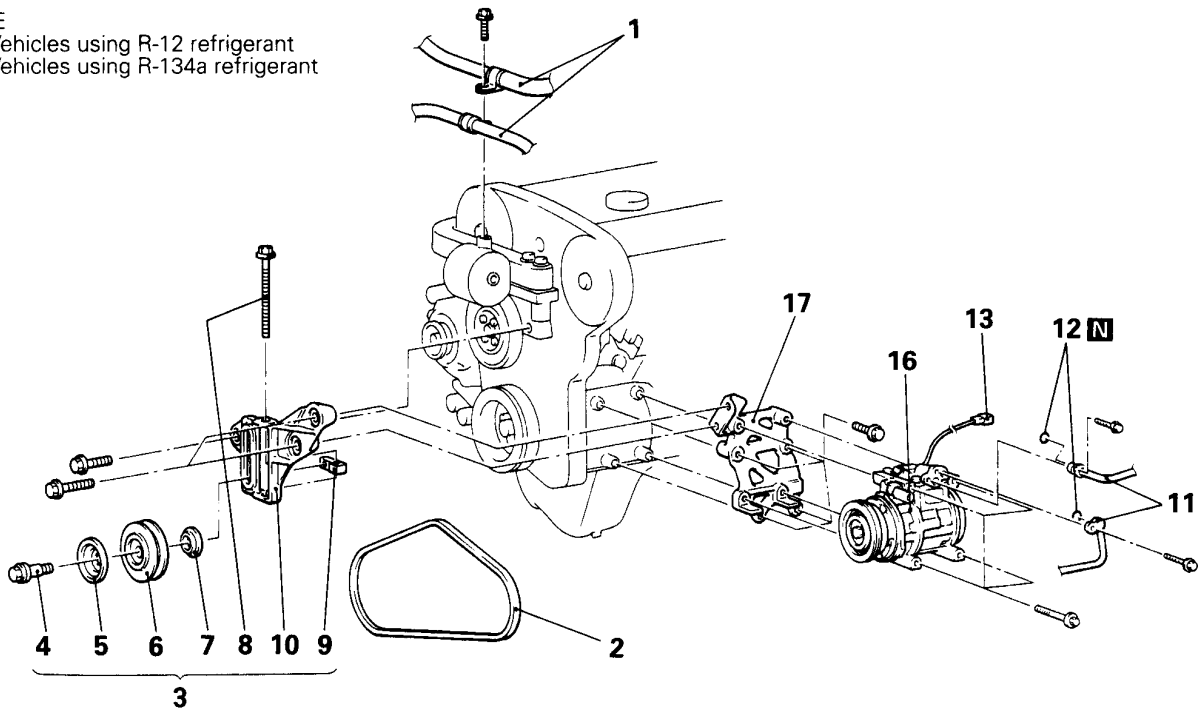
<4D65-4D68>



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

NOTE

- *1 : Vehicles using R-12 refrigerant
- *2 : Vehicles using R-134a refrigerant



20C0174

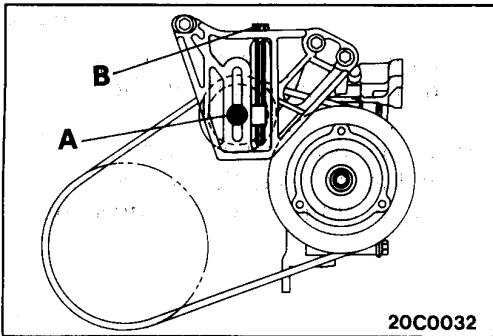
Removal steps of tension pulley

- 1. Pressure hose
- 2. Drive belt
- 3. Tension pulley assembly and tension pulley bracket
- 4. Tension pulley bolt
- 5. Plate
- 6. Tension pulley
- 7. Collar
- 8. Bolt
- 9. Adjust plate
- 10. Tension pulley bracket

Removal steps of compressor

- 1. Pressure hose
- 2. Drive belt
- 11. Discharge/suction pipe connection
- 12. O-ring
- 13. Connector connection
- 16. Compressor
- 17. Compressor bracket

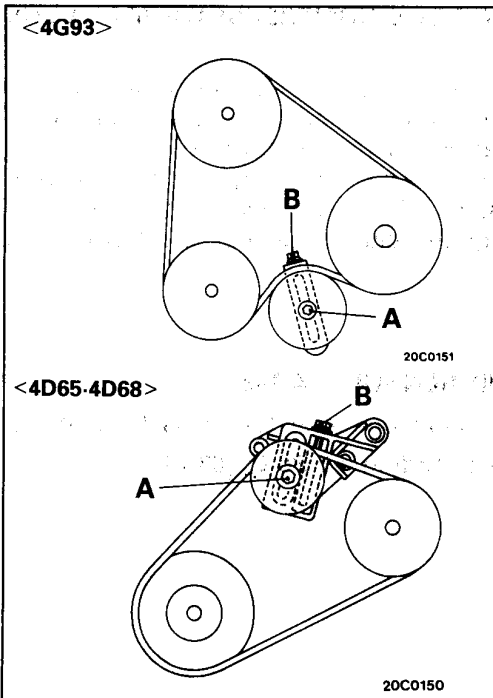
E55LFAI



SERVICE POINTS OF REMOVAL

1. REMOVAL OF TENSION PULLEY ASSEMBLY <4G63-4G64>

- (1) Loosen tension pulley fixing bolt "A".
- (2) Loosen adjusting bolt "B" to loosen the drive belt (for air conditioner).



2. REMOVAL OF DRIVE BELT <4G93-4D65-4D68>

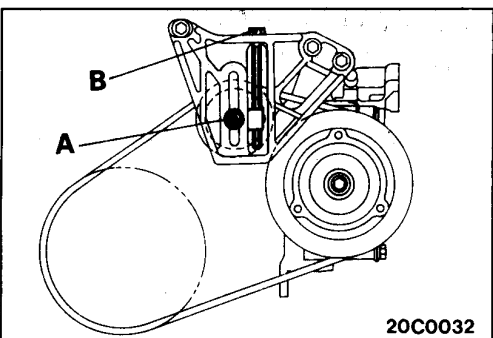
- (1) Loosen bolt "A" for holding the tension pulley.
- (2) Loosen bolt "B" for adjustment, and remove the drive belt.

9. REMOVAL OF DISCHARGE/SUCTION PIPE CONNECTION <4G93>/SUCTION HOSE <4G63-4G64>/10. DISCHARGE HOSE CONNECTION <4G63-4G64>/11. DISCHARGE/SUCTION PIPE CONNECTION <4D65-4D68>

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

16. REMOVAL OF COMPRESSOR <4G93-4G65-4D68>

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

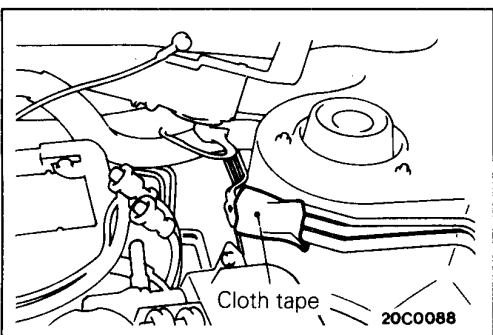


<4G63-4G64>

- (1) Loosen tension pulley fixing bolt "A".
- (2) Loosen adjusting bolt "B" to loosen the air conditioner V-ribbed belt.
- (3) Remove the wiper motor connector.
- (4) Remove the three protector mounting bolts of the engine control harness and move the harness toward the air intake plenum.
- (5) Attach cloth tape to the brake tubes so that the tubes are not damaged when removing the compressor.
- (6) Remove the compressor.

NOTE

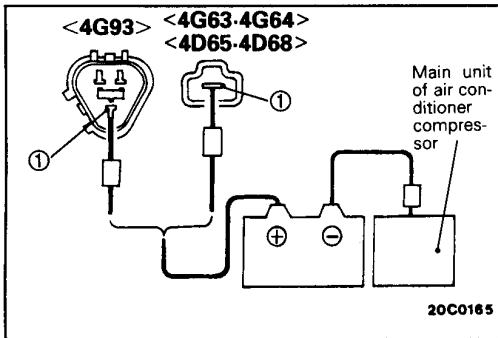
When doing this work, be careful not to spill the compressor oil.



INSPECTION

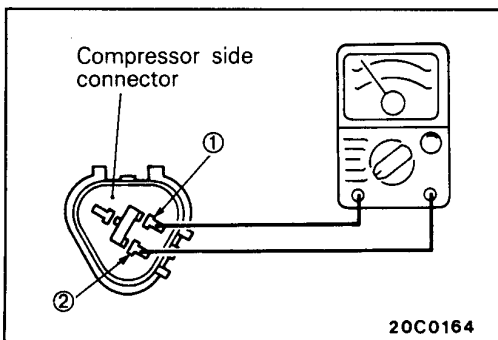
E55LGAH

- Checking for heat damage of the tension pulley.
- Check for excessive play or deflection of the tension pulley.
- Check for unusual wear of the tension pulley.
- Check for hardening of the air conditioner belt.
- Check for unusual wear or abrasion of the drive belt.



OPERATION CHECK OF THE COMPRESSOR'S MAGNETIC CLUTCH

- (1) Connect terminal (1) at the compressor side to the positive (+) terminal of the battery, and earth the negative (-) terminal of the battery to the compressor.
- (2) The condition of the compressor's magnetic clutch can be considered satisfactory if the operation sound (a "click" sound) of the magnetic clutch can be heard when this check is made.



REVOLUTION PICKUP SENSOR <4G93>

Check the resistance value between terminals (1) and (2).

Standard value: 185 Ω [when at 20°C (68°F)]

SERVICE POINTS OF INSTALLATION

E55LHAJ

16. INSTALLATION OF COMPRESSOR

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 cm³) of oil within the removed compressor.
- (2) Wipe away (from the new compressor) the amount of oil calculated according to the following formula, and then install the new compressor.

New compressor oil amount

$$\left. \begin{array}{l} 100 \text{ cm}^3 \text{ (6.1 cu. in.)}^*1 \\ 120 \text{ cm}^3 \text{ (7.3 cu. in.)}^*2 \\ 180 \text{ cm}^3 \text{ (10.9 cu. in.)}^*3 \end{array} \right\} - X \text{ cm}^3 = Y \text{ cm}^3$$

NOTE

- (1) *¹ : Vehicles using R-12 refrigerant
- (2) *² : Vehicles using R-134a refrigerant <10PA15>
- (3) *³ : Vehicles using R-134a refrigerant <10PA17>
- (4) Y cm³ indicates the amount of oil in the refrigerant line, the condenser, the evaporator, etc.
- (5) When replacing the following parts at the same time as the compressor, subtract the rated oil amount of the each part from Ycm³ and discharge from the new compressor.

Quantity:**<Vehicles using R-12 refrigerant>**

Evaporator :	60 cm³ (3.6 cu. in.)
Condenser :	30 cm³ (1.8 cu. in.)
Suction hose :	10 cm³ (0.61 cu. in.)
Receiver :	10 cm³ (0.61 cu. in.)

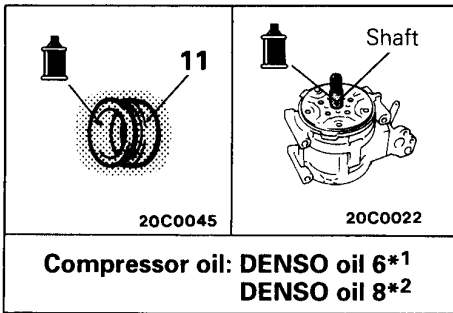
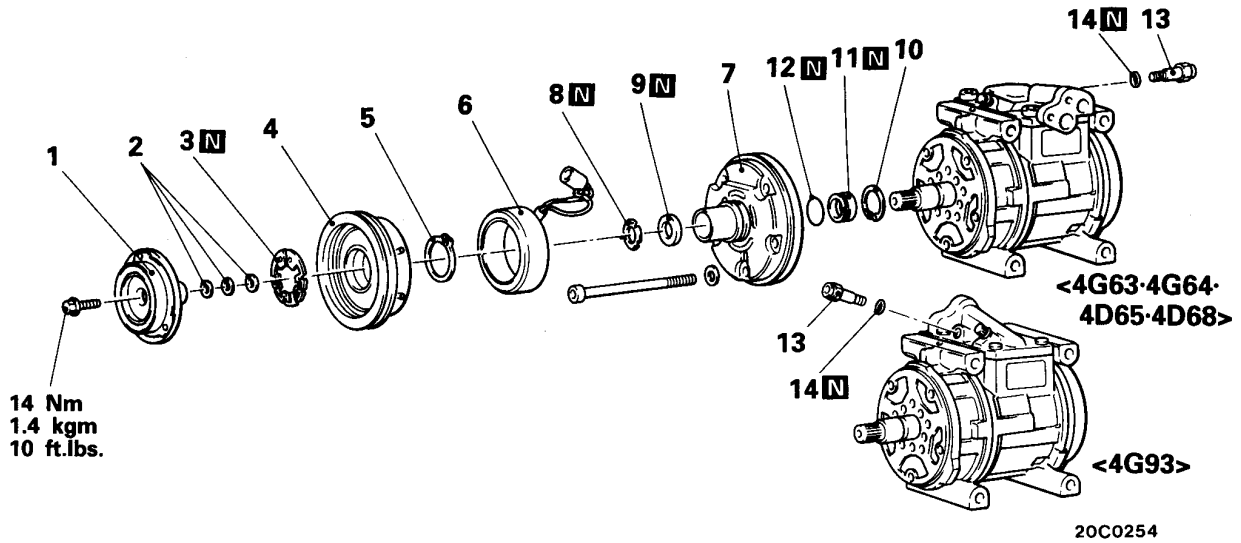
<Vehicles using R-134a refrigerant>

Evaporator :	40 cm³ (2.44 cu. in.)
Condenser :	40 cm³ (2.44 cu. in.)
Suction hose :	10 cm³ (0.61 cu. in.)
Receiver :	10 cm³ (0.61 cu. in.)

NOTES

E55LB-

DISASSEMBLY AND REASSEMBLY



NOTE

- *1: Vehicles using R-12 refrigerant
- *2: Vehicles using R-134a refrigerant

Disassembly steps

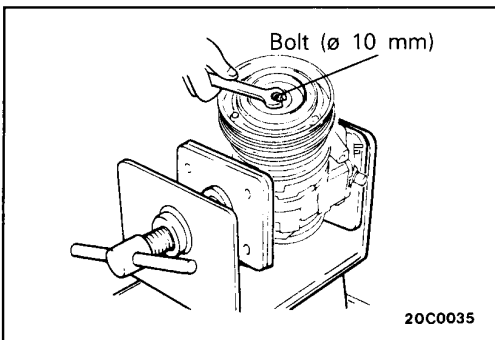
- Air gap adjustment
- 1. Clutch hub
- 2. Shim
- 3. Snap ring
- 4. Rotor assembly
- 5. Snap ring
- 6. Clutch coil
- 7. Front housing
- 8. Felt holder
- 9. Felt
- 10. Snap ring
- 11. Shaft seal
- 12. O-ring
- 13. High pressure relief valve*2
- 14. O-ring*2

SERVICE POINTS OF DISASSEMBLY

E55LCA

1. REMOVAL OF CLUTCH HUB

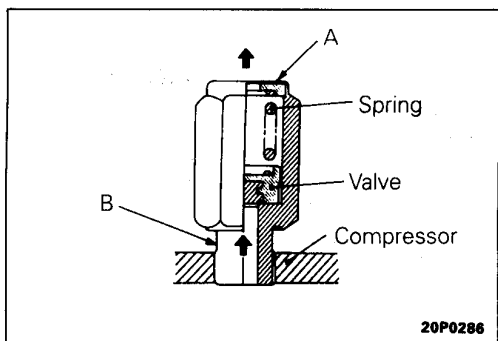
- (1) Remove the clutch hub mounting bolt.
- (2) Tighten a $\varnothing 10$ mm bolt into the bolt hole of the clutch hub to remove the serration assembly of the shaft and the clutch hub.



INSPECTION

E55LDAH

- Check the surface of the armature for scoring or bluing.
- Check the surface of the rotor for scoring or bluing.
- Check the sealing surfaces for cracks, scratches and deformation.
- Check the front housing for cracks or scoring on the sealing surfaces.
- Check the compressor shaft for scoring.



HIGH PRESSURE RELIEF VALVE CHECK

The high pressure relief valve is a safety feature which releases part of the refrigerant inside the system into the atmosphere when the high pressure level exceeds 4,138 kPa (42.2 kg/cm², 600.2 psi) during air conditioner operation.

Once the pressure inside the system has been reduced to 2,756 kPa (28.1 kg/cm², 399.7 psi) or lower, the high pressure relief valve closes, thus allowing continued operation.

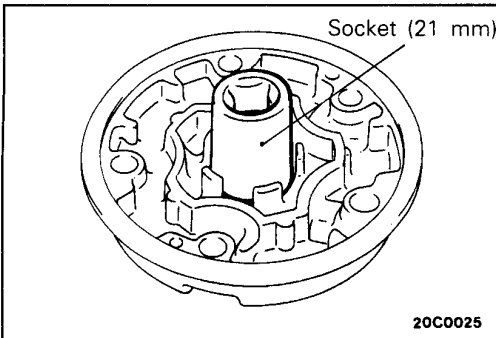
- (1) If a leak is detected at section A, replace the high pressure relief valve. The valve can be used unless there is leak from that section.
- (2) If a leak is detected at section B, retighten the valve. If the leak still persists after retightening the valve, replace the packing.

NOTES

SERVICE POINTS OF REASSEMBLY

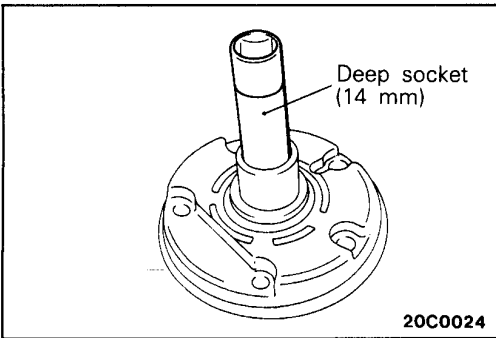
11. INSTALLATION OF SHAFT SEAL

Use a 21 mm socket to install the shaft seal so that the O-ring assembly side is facing the front housing.



9. INSTALLATION OF FELT/8. FELT HOLDER

After installing the felt in the felt holder, install them to the front housing using a 14 mm deep socket.

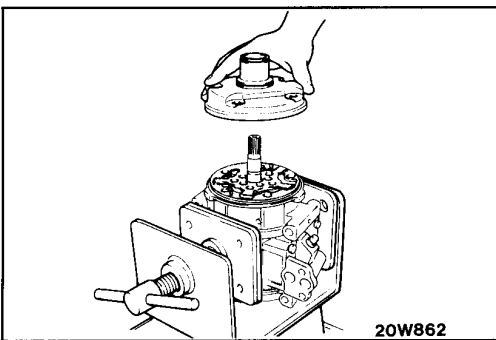


7. INSTALLATION OF FRONT HOUSING

(1) Apply compressor oil to the shaft.

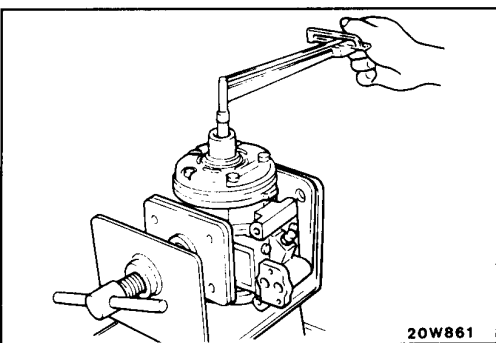
**Compressor oil: DENSO oil 6 <R-12>
DENSO oil 8 <R-134a>**

(2) Install the front housing without damaging the shaft seal lip.



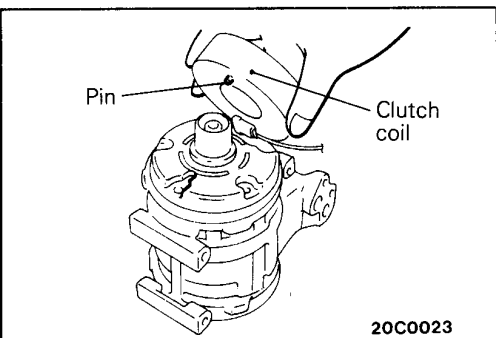
(3) After installing the front housing, install the clutch hub mounting bolt to the shaft, and check to be sure that the starting torque is within the specified torque value.

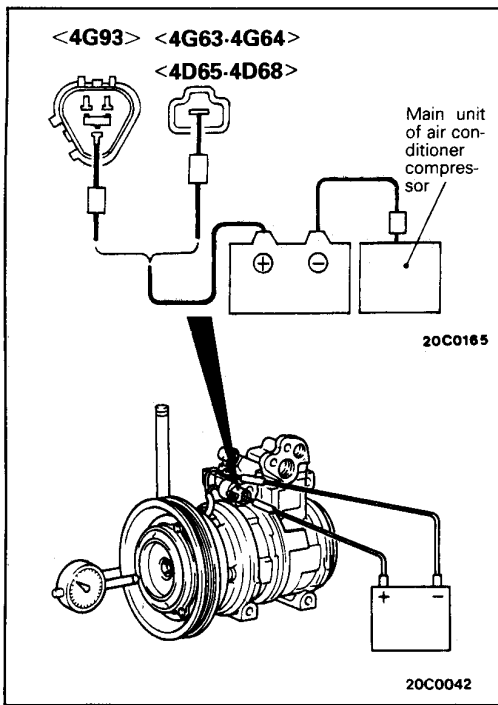
Starting torque: 5 Nm (0.5 kgm, 4 ft.lbs.) or less



6. INSTALLATION OF CLUTCH COIL

Set the clutch coil pin in the compressor housing notch, and install the clutch coil.





- **AIR GAP ADJUSTMENT**

Apply battery voltage to the magnetic clutch and check to be sure that the air gap is within the standard value. If the air gap is outside the standard value, adjust with a shim.

Standard value: 0.35–0.65 mm (0.014–0.026 in.)

NOTE

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

CONDENSER AND CONDENSER FAN MOTOR <4G63-4G64-4G93>

REMOVAL AND INSTALLATION

E55NA--

**12 Nm
1.2 kgm
9 ft.lbs.**

Pre-removal and Post-installation Operation

- Discharge and Charging of Refrigerant (Refer to P.55-16.)
- Removal and Installation of the Radiator Grille (Refer to GROUP 51 – Radiator Grille.)

CAUTION

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

20N0089

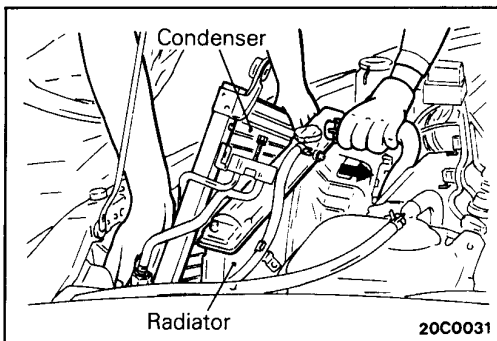
**Compressor oil:
DENSO oil 6*2
DENSO oil 8*3**

Removal steps

1. Fan motor and shroud assembly
2. Fan
3. Cover
4. Motor assembly
5. Fan shroud
6. Upper insulator
7. Discharge pipe A
8. Discharge hose connection
9. O-ring
10. Condenser

NOTE

- *1 : Resistor connector <4G63-4G64>
- *2 : Vehicles using R-12 refrigerant
- *3 : Vehicles using R-13a refrigerant

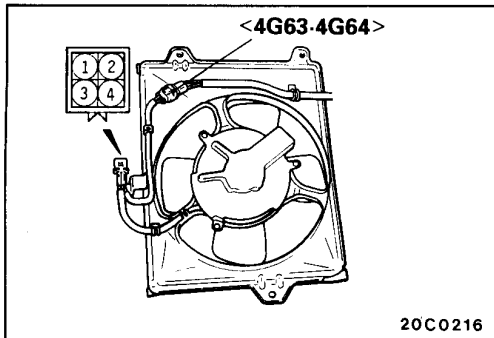


SERVICE POINTS OF REMOVAL

E55NBAP

10. REMOVAL OF CONDENSER

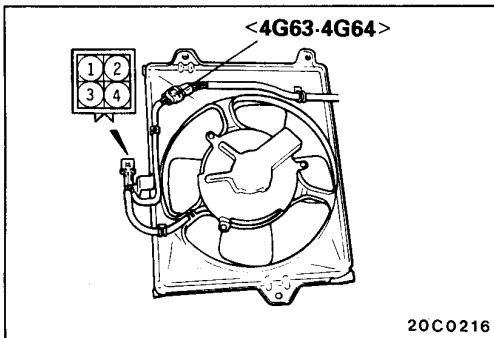
Slide the radiator toward the engine and lift up the condenser to remove it.



INSPECTION

CONDENSER FAN MOTOR CHECK

Check to be sure that the condenser fan motor turns over when battery voltage is applied to terminal (3) and terminal (1) has been earthed.



RESISTOR CHECK <4G63-4G64>

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

Standard value

Measurement terminal	Standard value	Ω
Between terminals (4)-(2)	0.45±10 %	

SERVICE POINTS OF INSTALLATION

10. INSTALLATION OF CONDENSER

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

<Vehicles using R-12 refrigerant>

Compressor oil : DENSO oil 6

Quantity : 30 cm³ (1.8 cu. in.)

<Vehicles using R-134a refrigerant>

Compressor oil : DENSO oil 8

Quantity : 40 cm³ (2.44 cu. in.)

55-46-2

NOTES

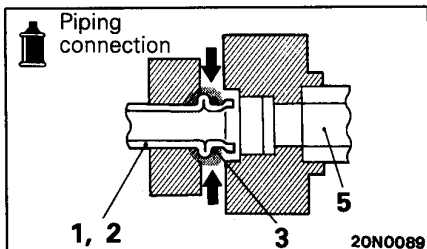
CONDENSER AND CONDENSER FAN MOTOR <4D65-4D68>

REMOVAL AND INSTALLATION

E55NA-B

CAUTION

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



Compressor oil: DENSO oil 6*1
DENSO oil 8*2

NOTE

- *1 : Vehicles using R-12 refrigerant
- *2 : Vehicles using R-134a refrigerant

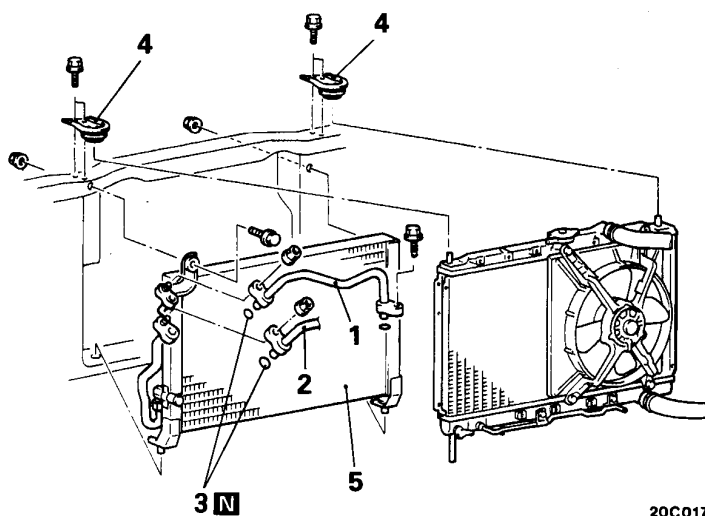
Removal steps of condenser

1. Discharge pipe A
2. Discharge hose connection
3. O-ring
4. Upper insulator
5. Condenser



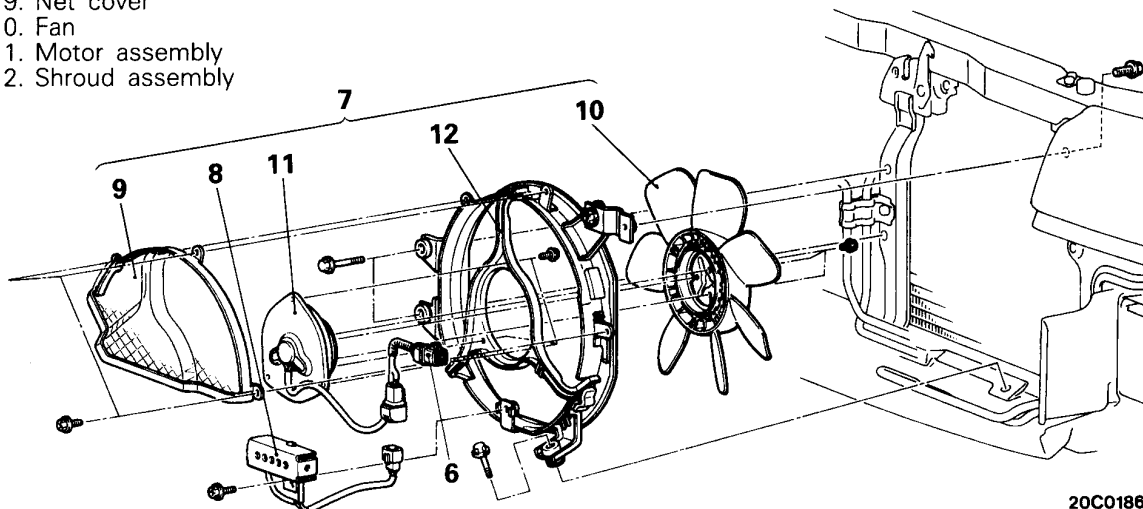
Pre-removal and Post-installation Operation

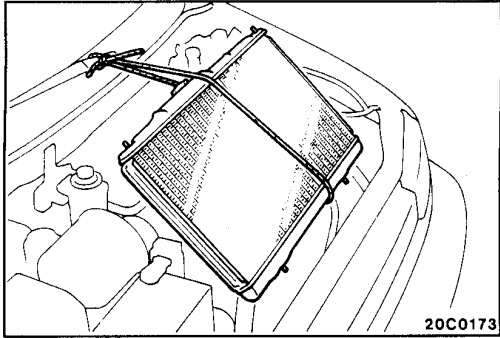
- Discharge and Charging of Refrigerant (Refer to P.55-16.) <For condenser>
- Removal and Installation of the Radiator Grille (Refer to GROUP 51 – Radiator Grille) <For condenser fan motor>
- Removal and Installation of the Radiator Grille (Refer to GROUP 51 – Radiator Grille.)



Removal steps of condenser fan motor

6. Connector
7. Fan motor and shroud assembly
8. Resistor
9. Net cover
10. Fan
11. Motor assembly
12. Shroud assembly





SERVICE POINTS OF REMOVAL

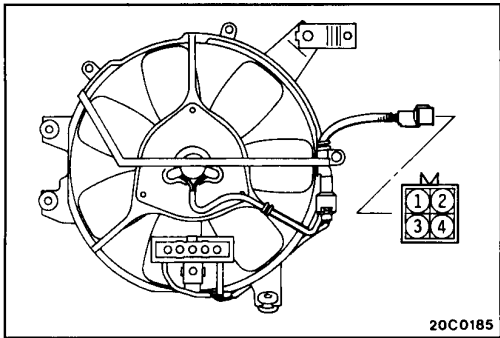
E55NBAQ

5. REMOVAL OF CONDENSER

Raise the radiator and secure with a rope as shown in the illustration, and then remove the condenser.

Caution

Be careful not to damage the radiator or the condenser fin.



INSPECTION

E55NEAG

CONDENSER FAN MOTOR CHECK

Check to be sure that the condenser fan motor turns over when battery voltage is applied to terminal (2) and terminal (4) has been earthed.

RESISTOR CHECK

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

Standard value

Measurement terminal	Standard value	Ω
Between terminals (1)–(3)	0.45 \pm 10%	

SERVICE POINTS OF INSTALLATION

5. INSTALLATION OF CONDENSER

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

<Vehicles using R-12 refrigerant>

Compressor oil : DENSO oil 6

Quantity : 30 cm³ (1.8 cu. in.)

<Vehicles using R-134a refrigerant>

Compressor oil : DENSO oil 8

Quantity : 40 cm³ (2.44 cu. in.)

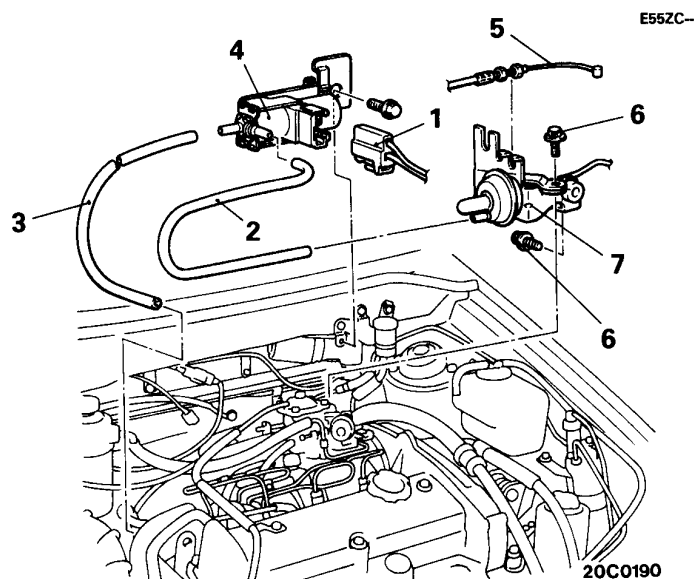
IDLE UP SYSTEM <4D65-4D68> REMOVAL AND INSTALLATION

Removal steps for idle-up solenoid valve

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

Removal steps for vacuum actuator assembly

2. Vacuum hose (yellow stripe) connection
5. Accelerator cable
6. Vacuum actuator assembly mounting bolt
7. Vacuum actuator assembly



INSPECTION

E55ZDAA

- Check the vacuum hose for splitting or cracking.

Checking Vacuum Actuator and Idle-up Solenoid Valve

For information concerning the checking of the vacuum actuator and the idle-up solenoid valve, refer to P.55-27, 28 Service Adjustment Procedures.

55-48-2

NOTES

ENGINE COOLANT TEMPERATURE SWITCH

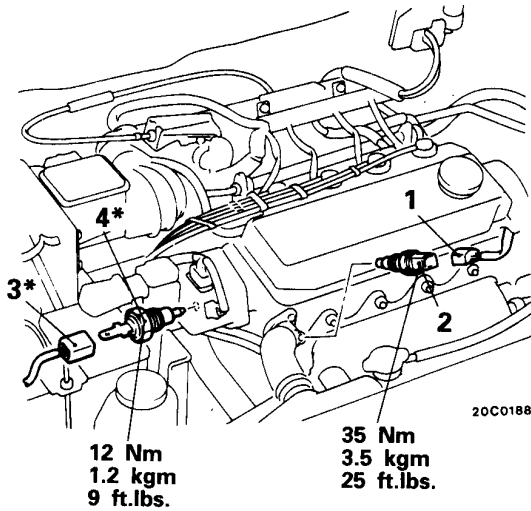
REMOVAL AND INSTALLATION

E55HA--

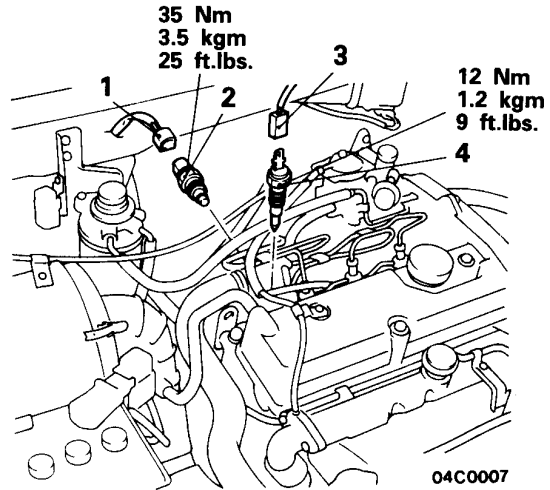
Pre-removal and Post-installation Operation

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

<4G93>

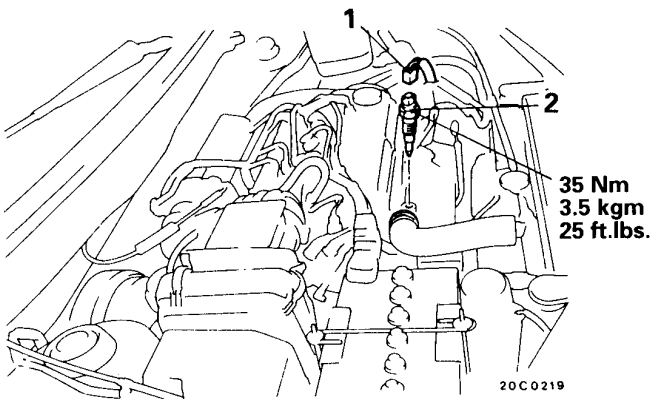


<4D65-4D68>



<4G63 · 4G64>

(Vehicles built up to April 1993.)



Removal steps

1. Connector (2-pin)
2. Engine coolant temperature switch (For air conditioner cut)
3. Connector (1-pin)
4. Engine coolant temperature switch (For condenser fan)

Engine coolant temperature switch

<For air conditioner cut>

20A0198

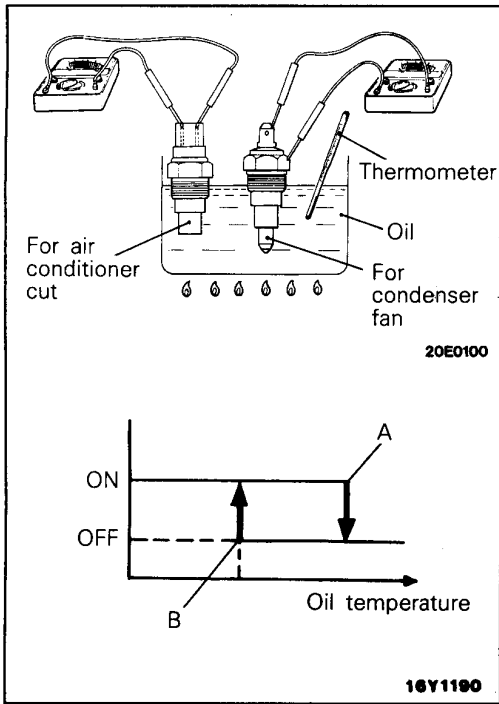
<For condenser fan>

20L0120

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

NOTE

*: Vehicles built up to January 1992.



INSPECTION

ENGINE COOLANT TEMPERATURE SWITCH CHECK

- (1) Immerse the engine coolant temperature switch in engine oil as shown in the illustration.
- (2) Check the continuity with the circuit tester when the temperature of the oil has been changed. The condition is normal if there is continuity within the following ranges of temperature.

Standard value:

Item	For air conditioner cut	For condenser fan cut
Temperature at point A (ON→OFF)	112°C–118°C (234°F–244°F)	97°C (207°F)
Temperature at point B (OFF→ON)	108°C (226°F)	100°C–104°C (212°F–219°F)

REFRIGERANT LINE

REMOVAL AND INSTALLATION

E55ZE-

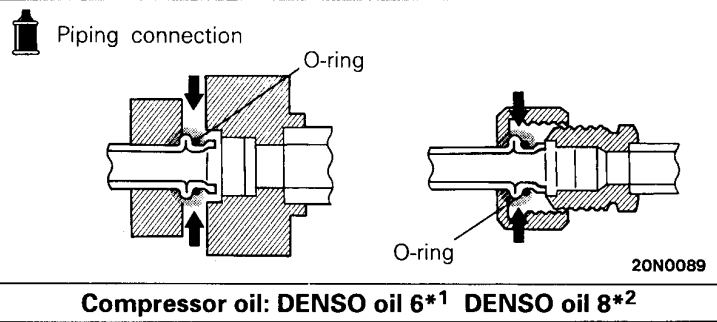
<4G93>

Pre-removal and Post-installation Operation

- Discharge and Charging of Refrigerant (Refer to P.55-16.)

CAUTION

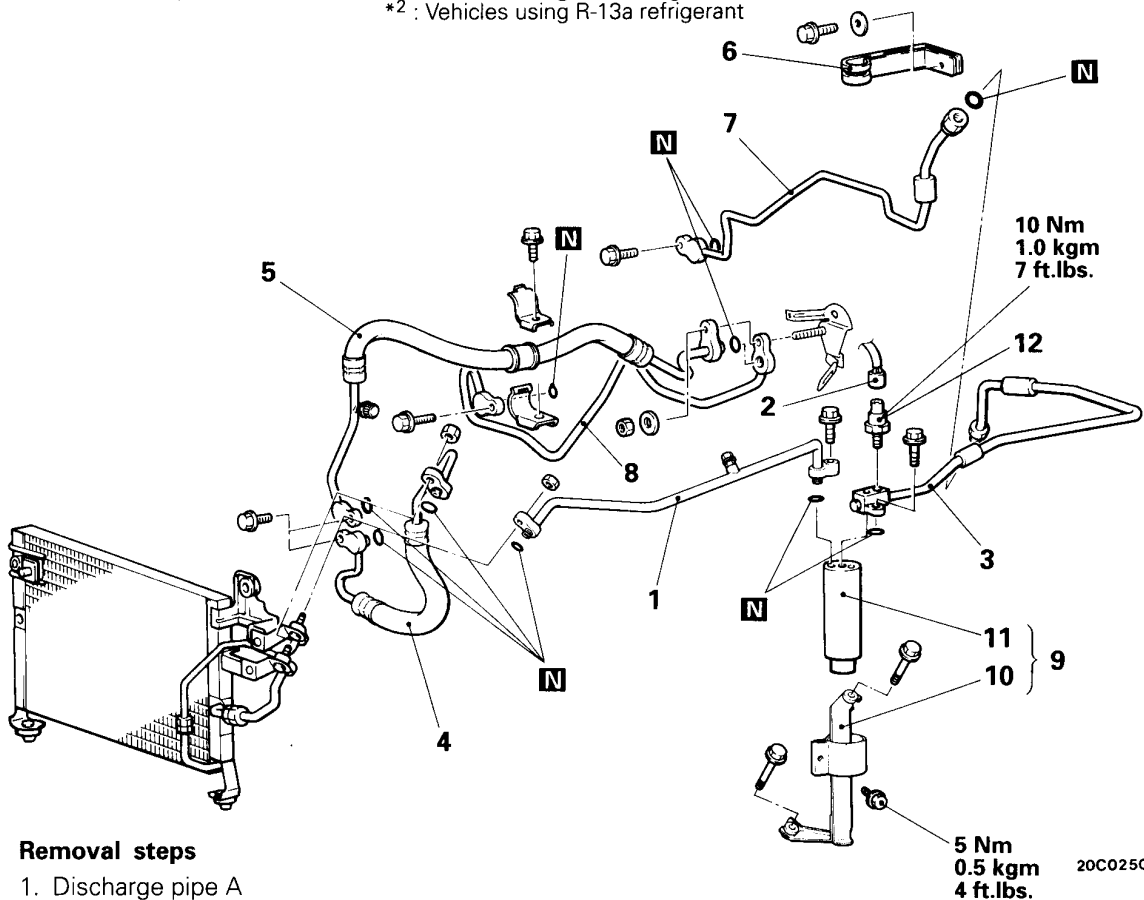
Plug refrigerant lines to prevent air from mixing when disconnecting them.



L.H. drive vehicles

NOTE

- *1 : Vehicles using R-12 refrigerant
- *2 : Vehicles using R-13a refrigerant



Removal steps

1. Discharge pipe A
2. Connection for dual pressure switch
3. Discharge pipe B
4. Discharge hose
- ◆◆ 5. Suction hose
6. Bracket
7. Discharge pipe C
8. Suction pipe
9. Receiver assembly
10. Receiver bracket
- ◆◆ 11. Receiver
12. Dual pressure switch

<4G63-4G64-4D65-4D68>

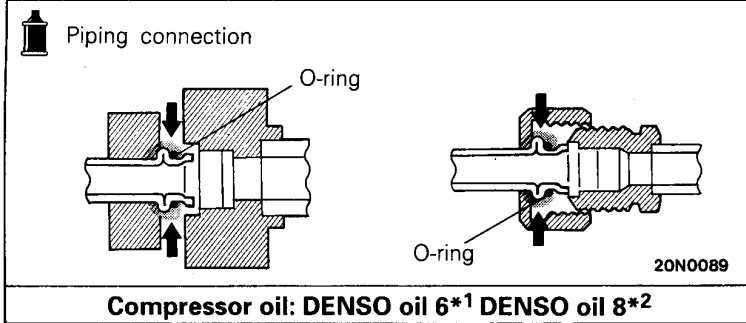
E55ZG-

Pre-removal and Post-installation Operation

- Discharge and Charging of Refrigerant (Refer to P.55-16.)

CAUTION

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

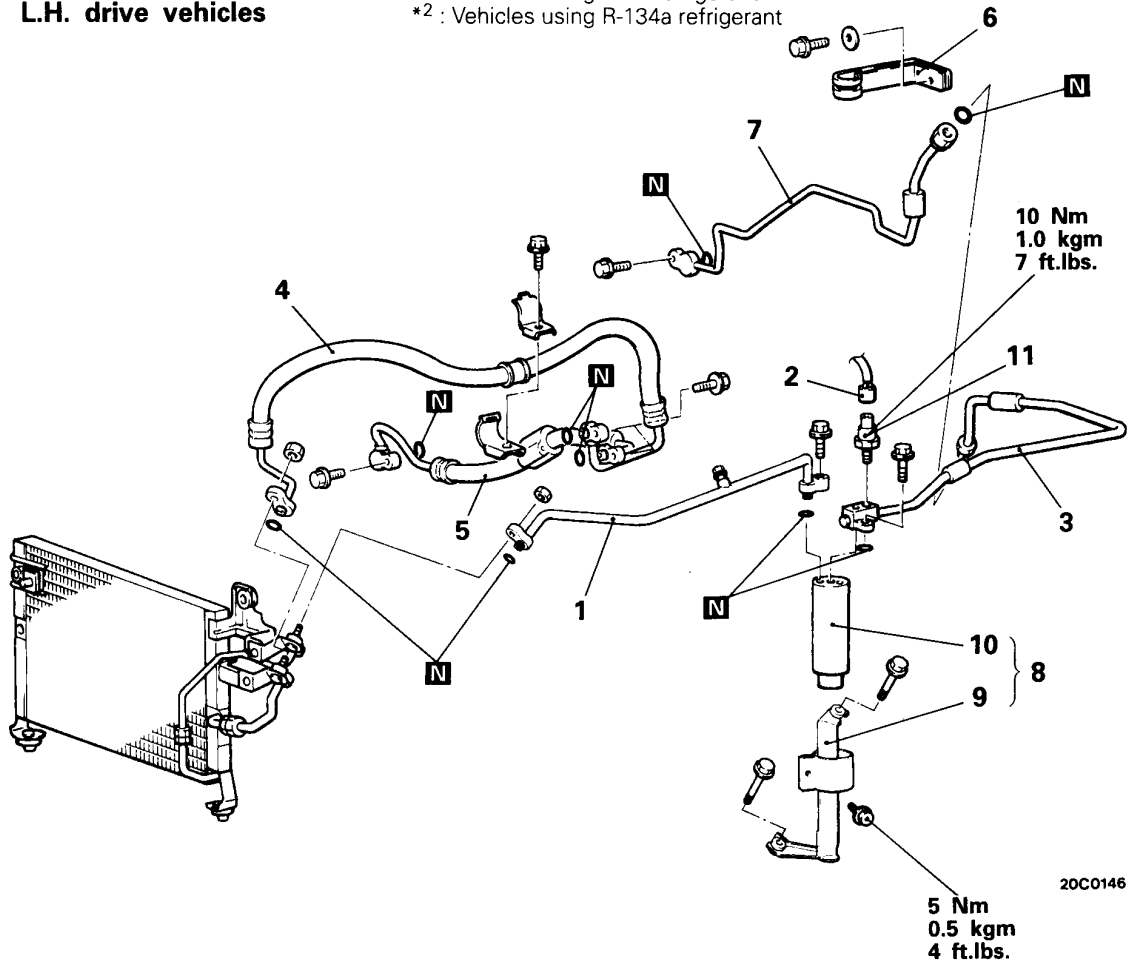


Compressor oil: DENSO oil 6*1 DENSO oil 8*2

NOTE

- *1 : Vehicles using R-12 refrigerant
- *2 : Vehicles using R-134a refrigerant

L.H. drive vehicles



Removal steps

1. Discharge pipe A
2. Connection for triple pressure switch
3. Discharge pipe B
4. Discharge hose
- ◆◆ 5. Suction hose
6. Bracket
7. Discharge pipe C
8. Receiver assembly
9. Receiver bracket
- ◆◆ 10. Receiver
11. Triple pressure switch

VENTILATORS (INSTRUMENT PANEL AND FLOOR)

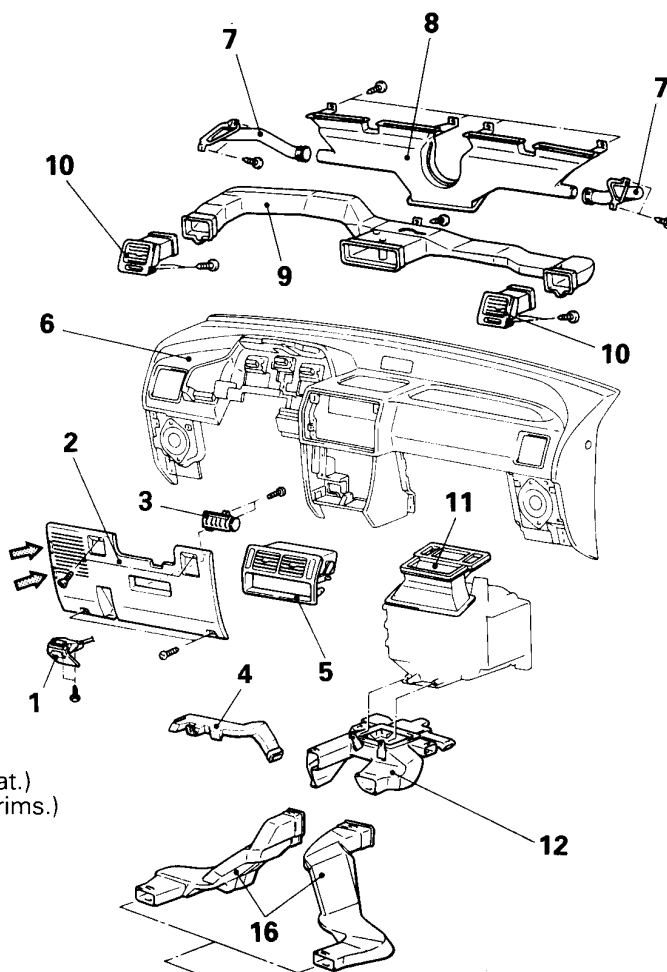
REMOVAL AND INSTALLATION

CAUTION: SRS

When removing and installing the floor console assembly from vehicles equipped with SRS, do not let it bump against the SRS diagnostic unit or the components.

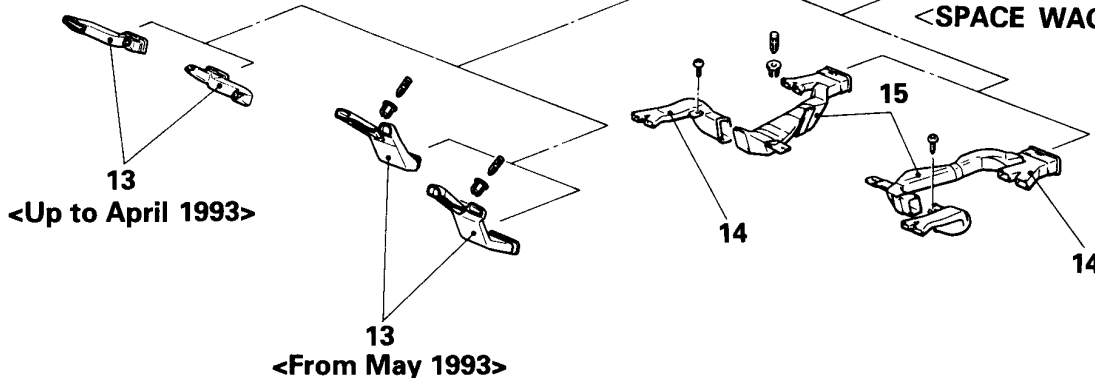
Removal steps

- Floor console (Refer to GROUP 52A – Floor Console)
- 1. Hood lock release handle
- 2. Instrument under cover
- 3. Lap shower grille assembly
- 4. Foot duct
- 5. Center air outlet assembly
- 6. Instrument panel (Refer to GROUP 52A – Instrument Panel.)
- 7. Side defroster duct
- 8. Defroster nozzle assembly
- 9. Distribution duct
- 10. Side air outlet assembly
- 11. Center ventilation duct assembly
- 12. Foot distribution duct
- 13. Rear heater nozzle
- Front seat (Refer to GROUP 52A – Seat.)
- Rear seat (Refer to GROUP 52A – Seat.)
- Scuff plate (Refer to GROUP 52A – Trims.)
- Center pillar lower trim (Refer to GROUP 52A – Trims.)
- 14. Rear heater duct C
- 15. Rear heater duct B
- 16. Rear heater duct A



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NOTE

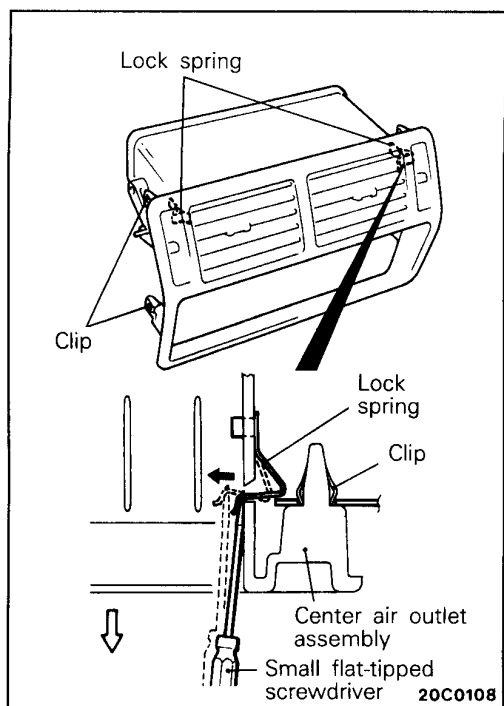
⇒ : Clip positions

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SERVICE POINTS OF REMOVAL

5. REMOVAL OF CENTER DUCT ASSEMBLY

- (1) First remove the clip on the lower section of the center air outlet assembly.
- (2) Insert a small flat-tipped screwdriver in between the fins, and remove the clip on the top section while pulling the lock spring toward the inside.
- (3) Take out the center air outlet assembly.

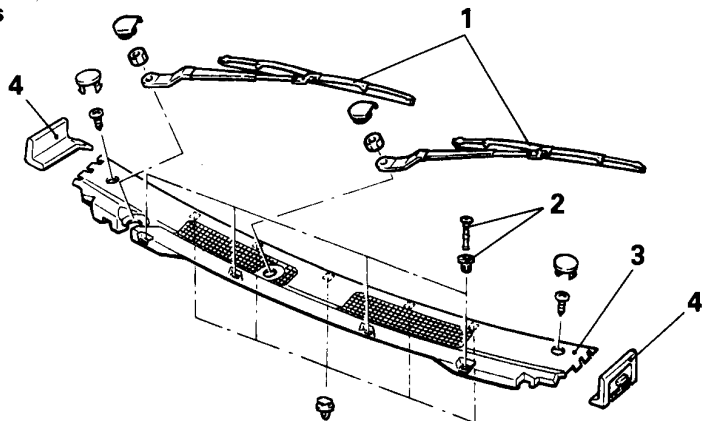


**VENTILATORS (AIR INLET AND AIR OUTLET)
REMOVAL AND INSTALLATION**

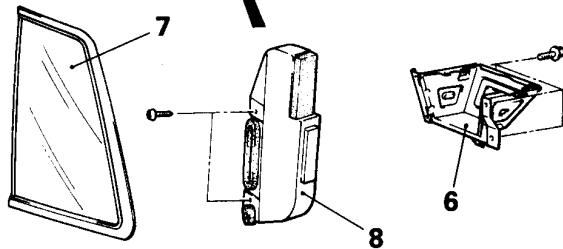
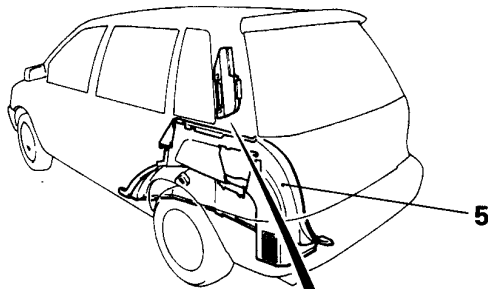
E55MA-B

Front deck garnish removal steps

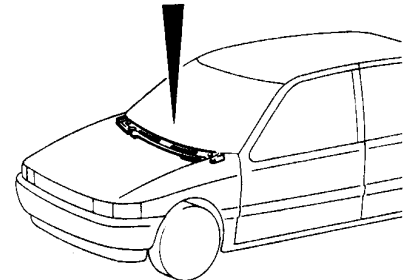
1. Wiper arm
2. Clip
3. Front deck garnish
4. Side protector



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Rear ventilation duct removal steps

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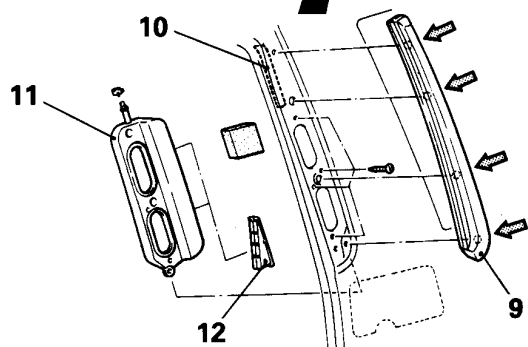
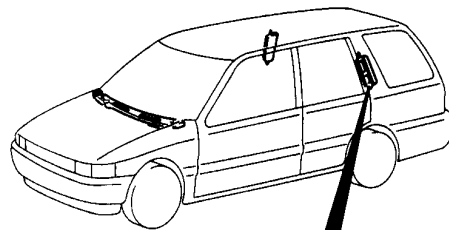
5. Cargo side lower trim (Refer to GROUP 52A – Trims.)
6. Rear speaker bracket lower
7. Quarter window glass (Refer to GROUP 42 – Quarter Window Glass.)
8. Rear ventilation duct

Rear ventilation duct removal steps

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- Cargo side lower trim (Refer to GROUP 52A – trims.)
- Cargo side upper trim <Vehicles with a sunroof> (Refer to GROUP 52A – Trims.)
- Third seat belt retractor (Refer to GROUP 52A – Seat Belt.)
- 9. Rear pillar garnish
- 10. Sunroof drain hose
- 11. Rear ventilation duct assembly
- 12. Rear ventilation valve assembly

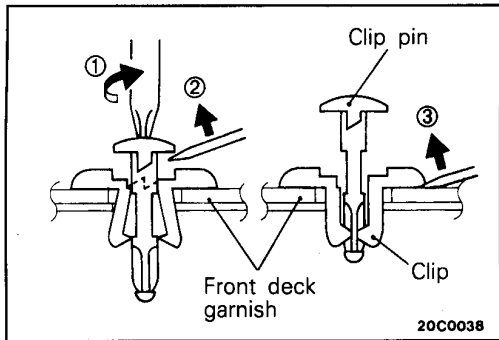
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NOTE

: Clip positions



SERVICE POINTS OF REMOVAL

E55MBCH

2. REMOVAL OF CLIP

- (1) Turn the clip pin 1/4 turn.
- (2) Pull up the clip pin and remove the clip.