HEATER, AIR CONDITIONER AND VENTILATION

CONTENTS

E55AA-

CONTINUED ON NEXT PAGE

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 interconnecting wiring. Other SRS-related components (that may have to be removed/installed in connection with SRS service or maintenance) are indicated in the table of contents by an asterisk (*).

 Dec. 1993 PWME9117-D REVISED

NOTES

SPECIFICATIONS

GENERAL SPECIFICATIONS

E55CA--

Items		Specifications	
Heater unit			
Type		Two-way-flow full-air-mix system	
Heater control assembly		Dial type	
Compressor			
Model			
<Vehicles built up to September, 1993>		Scroll type <FX80, FX80L, FX105VS or FX105VSL>	
<Vehicles built from October, 1993>		Scroll type <MSC90C>	
Drive belt size	mm (in.)	<Hatchback, Sedan>	<Wagon>
<4G13>		790 (31.1)	790 (31.1)
<4G92, 4G93>			
<Vehicles built up to September, 1993>		855 (33.7)	885 (34.8)
		875 (34.4)*1	875 (34.4)*1
		1,110 (43.7)*2	1,120 (44.1)*2
<Vehicles built from October, 1993>		840 (33.0)*1	
		875 (34.4)	840 (33.0)
		1,120 (44.1)*2	1,120 (44.1)*2
<4D68>		930 (33.6)	930 (33.6)
Dual pressure switch*3			
<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)	
Dual pressure switch <4G13, 4G92, 4G93>			
<Vehicles using R-134a refrigerant>			
High pressure switch	kPa (kg/cm^2, psi)	OFF: 3,200 (32, 455), ON: 2,600 (26, 370)	
Low pressure switch	kPa (kg/cm^2, psi)	OFF: 200 (2.0, 28), ON: 225 (2.25, 32)	
Triple pressure switch*4			
<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: 1,500 (15, 213), ON: 1,800 (18, 256)	
Low pressure switch	kPa (kg/cm^2, psi)	OFF: 210 (2.1, 30), ON: 235 (2.35, 33)	
Triple pressure switch <4D68>			
<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: 1,500 (15, 213), ON: 1,800 (18, 256)	
Low pressure switch	kPa (kg/cm^2, psi)	OFF: 200 (2.0, 28), ON: 225 (2.25, 32)	
Freezer prevention	°C (°F)	Air 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. 680–780 (24–28)	
R-134a (HFC–134a)		Approx. 570–610 (20–22)	

NOTE
*1: 6B models
*2: Vehicles with power steering
*3: The dual pressure switch is equipped in the following petrol-powered vehicles.
- Hatchback (2WD built up to May 1992, all subsequent models except 6B models)
- Sedan except 6B models
- Wagon-2WD except 6B models

*4: The triple pressure switch is equipped in all petrol-powered vehicles other than the above and in diesel-powered vehicles.

SERVICE SPECIFICATIONS

Items		Specifications	
Standard value			
Idle speed	r/min.		
4G13, 4G15		750±100	
4G92, 4G93		800±100	
4D68		750±100	
Idle up speed	r/min.	850±50	
Resistor (for blower motor)	Ω	<L.H. drive vehicles>	<R.H. drive vehicles>
		MH: 0.35	MH: 0.33
		ML: 0.97	ML: 1.28
		LO: 2.21	LO: 2.81
Air gap (Magnetic clutch)	mm (in.)	0.4–0.65 (0.02–0.03)	
Refrigerant temperature switch			
ON (continuity) temperature		Approx. 155°C (311°F) or less	
OFF (no continuity) temperature		Approx. 155°C (311°F) or more [until the temperature drops to approx. 90°C (194°F) when OFF]	
Resistor (for condenser fan motor)	Ω	0.29	
Engine coolant temperature switch			
Petrol-powered vehicles		Continuity:	Approx. 115°C (239°F) or less
		No continuity:	Approx. 115°C (239°F) or more [Until temperature drops to 108°C (226°F) when engine coolant temperature switch is OFF]
Diesel-powered vehicles		Continuity:	Approx. 113°C (235°F) or less
		No continuity:	Approx. 113°C (235°F) or more [Until temperature drops to 108°C (226°F) when engine coolant temperature switch is OFF]

NOTES

LUBRICANTS

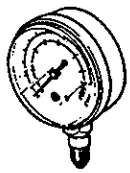
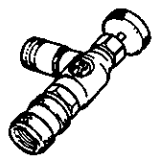
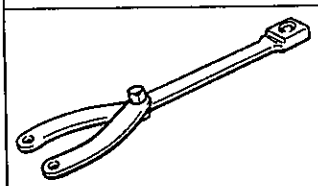
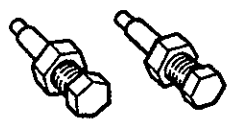
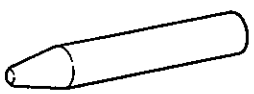
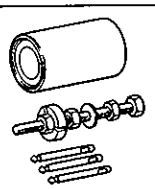
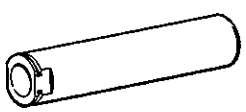
E55CD--

Items	Specified lubricants	Quantity
Each connection of refrigerant line Shaft seal of the compressor Shaft seal plate of the compressor	FREOL S-83 or SUNISO 5GS*1 SUN PAG56*2	As required
Compressor refrigerant unit lubricant mℓ (cu. in.)	FREOL S-83 or SUNISO 5GS*1	130–150 (7.9–9.2)
	SUN PAG56*2	120 (7.3)

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

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
	MB991367	Special spanner	Removal and installation of armature mounting nut of compressor
	MB991386	Pin	
	MB991459	Lip seal installer guide	Installation of lip seal
	MB991456	Bearing puller	Removal of compressor bearing
	MB991458	Lip seal installer and remover	Removal and installation of lip seal

TROUBLESHOOTING

E55EAASX

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

Symptom \ Inspection item		Fuse	Auto compressor control unit	Harness (including connector)	Blower switch	Air conditioner switch	Blower motor relay	Resistor	Engine coolant temoerature switch	Blower motor	Air conditioner compressor relay	Magnetic clutch	Dual pressure switch <2WD> or triple pressure switch <4WD>	Air thermo sensor	Condenser fan motor relay	Condenser fan motor	Refrigerant temperature switch	Refrigerant amount	Engine control unit	Condenser fan motor control relay <4WD>	Condenser fan motor HI relay*
1	Air conditioner does not operate when the ignition switch is in the ON position.	①	⑩	②	⑧	⑦			⑫		③	④	⑥	⑨			⑪	⑤	⑬		
2	Interior temperature does not lower (No cold air coming out).		④						⑥				②	③			⑤	①	⑦		
3	Blower motor does not rotate.	①		②	⑥		③	⑤		④											
4	Blower motor does not stop rotating.			①	②		③														
5	Condenser fan does not operate when the air conditioner is activated.	①		②									⑤		③	④				⑦	⑥

NOTE
○indicates the component requiring inspection. (Numbers in ○ are the priority order.)
*: 4G92, 4G93, 4D68

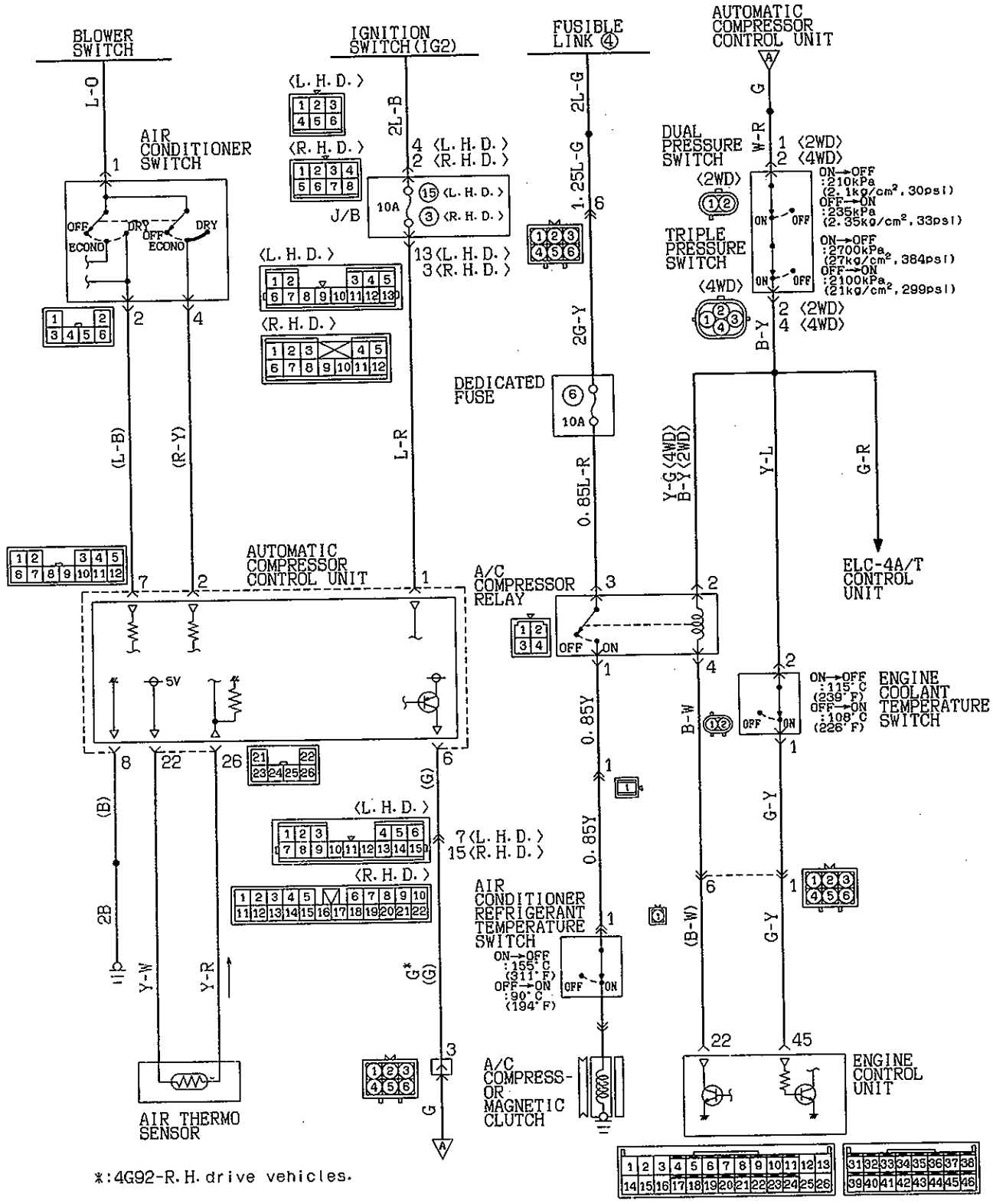
No.	Trouble symptom	Problem cause	Remedy	Reference page
1	When the ignition switch is "ON", the air conditioner does not operate.	Air conditioner compressor relay is defective	Replace air conditioner compressor relay	P.55-22
		Magnetic clutch is defective	Replace the magnetic clutch	P.55-42
		Refrigerant leak or overfilling of refrigerant	Replenish the refrigerant, repair the leak or take out some of the refrigerant	P.55-13
		Dual pressure switch or triple pressure switch is defective	Replace the dual pressure switch or triple pressure switch	P.55-49, 50
		Air conditioner switch is defective	Replace the air conditioner switch	P.55-28
		Blower switch is defective	Replace the blower switch	P.55-25
		Air thermo sensor is defective	Replace the sensor	P.55-34
		Auto compressor control unit is defective	Replace the auto compressor control unit	P.55-34
		Refrigerant temperature switch is defective	Replace the refrigerant temperature switch	P.55-46
		Engine coolant temperature switch (for air conditioner cut) is defective	Replace the engine coolant temperature switch	P.55-48-3

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.55-13
		Dual pressure switch or triple pressure switch is defective	Replace the dual pressure switch or triple pressure switch	P.55-49, 50
		Air thermo sensor is defective	Replace the sensor	P.55-34
		Refrigerant temperature switch is defective	Replace the refrigerant temperature switch	P.55-46
		Engine coolant temperature switch (for air conditioner cut) is defective	Replace the engine coolant temperature switch	P.55-48-3
		Auto compressor control unit is defective	Replace the auto compressor control unit	P.55-34
3	Blower motor doesn't turn	Blower motor relay is defective	Replace the blower motor relay	P.55-22
		Blower motor is defective	Replace the blower motor	P.55-30
		Blower switch is defective	Replace the blower switch	P.55-25
		Resistor (for blower motor) is defective	Replace the resistor	P.55-30
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.55-25
		Blower motor relay is defective	Replace the blower motor relay	P.55-22
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.55-22
		Condenser fan motor HI relay is defective <4G92, 4G93, 4D68>	Replace the condenser fan motor HI relay	P.55-22-1
		Condenser fan motor control relay is defective <4WD>	Replace the condenser fan motor control relay	P.55-22
		Condenser fan motor is defective	Replace the condenser fan motor	P.55-47
		Dual pressure switch or triple pressure switch is defective	Replace the dual pressure switch or triple pressure switch	P.55-49, 50
		Resistor (for condenser fan motor relay LO side) is defective <4WD, 6B models>	Replace the resistor	P.55-48

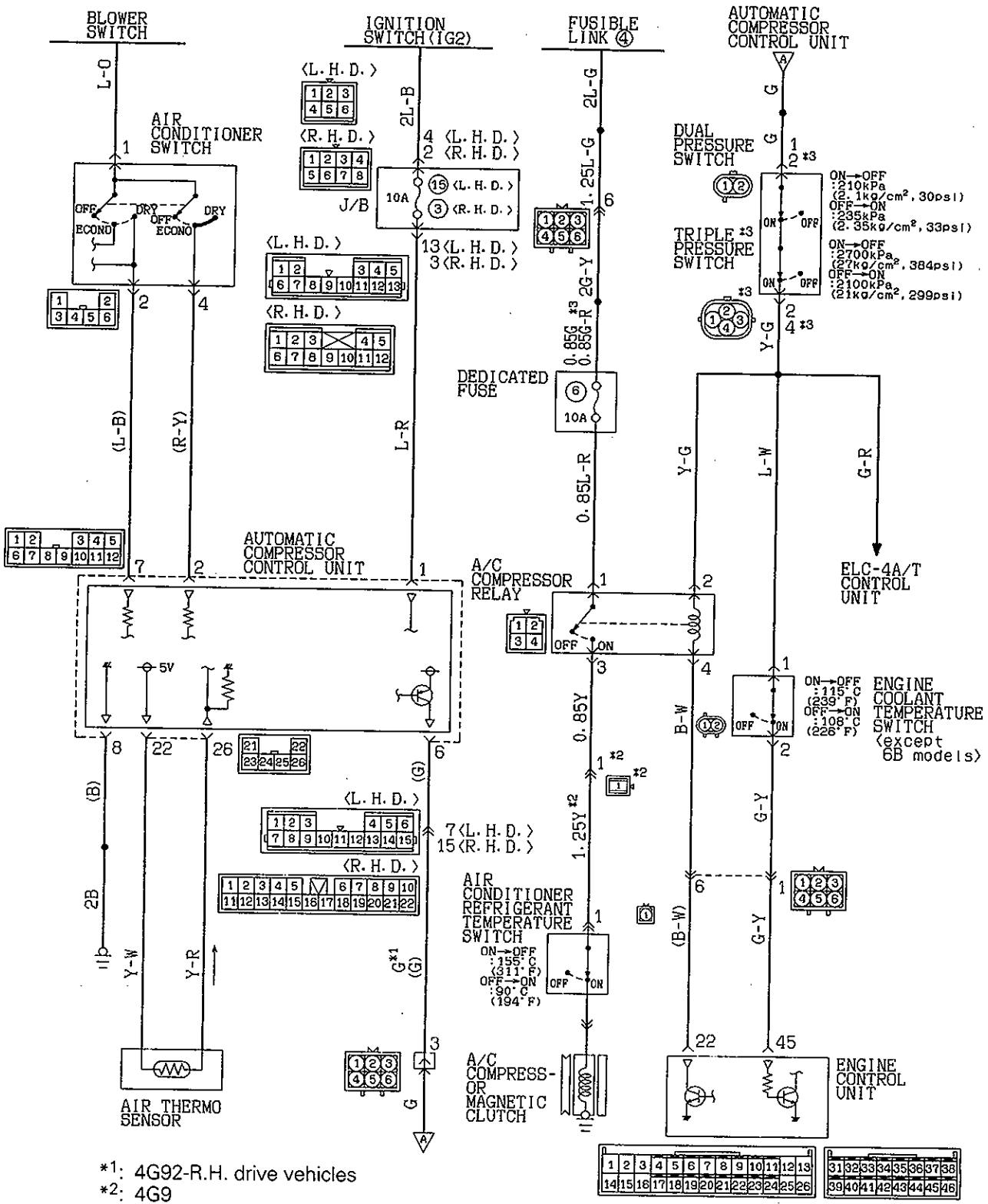
CIRCUIT CHECK

AUTO COMPRESSOR CONTROL UNIT

Petrol-powered vehicles <Hatchback built up to May 1992>



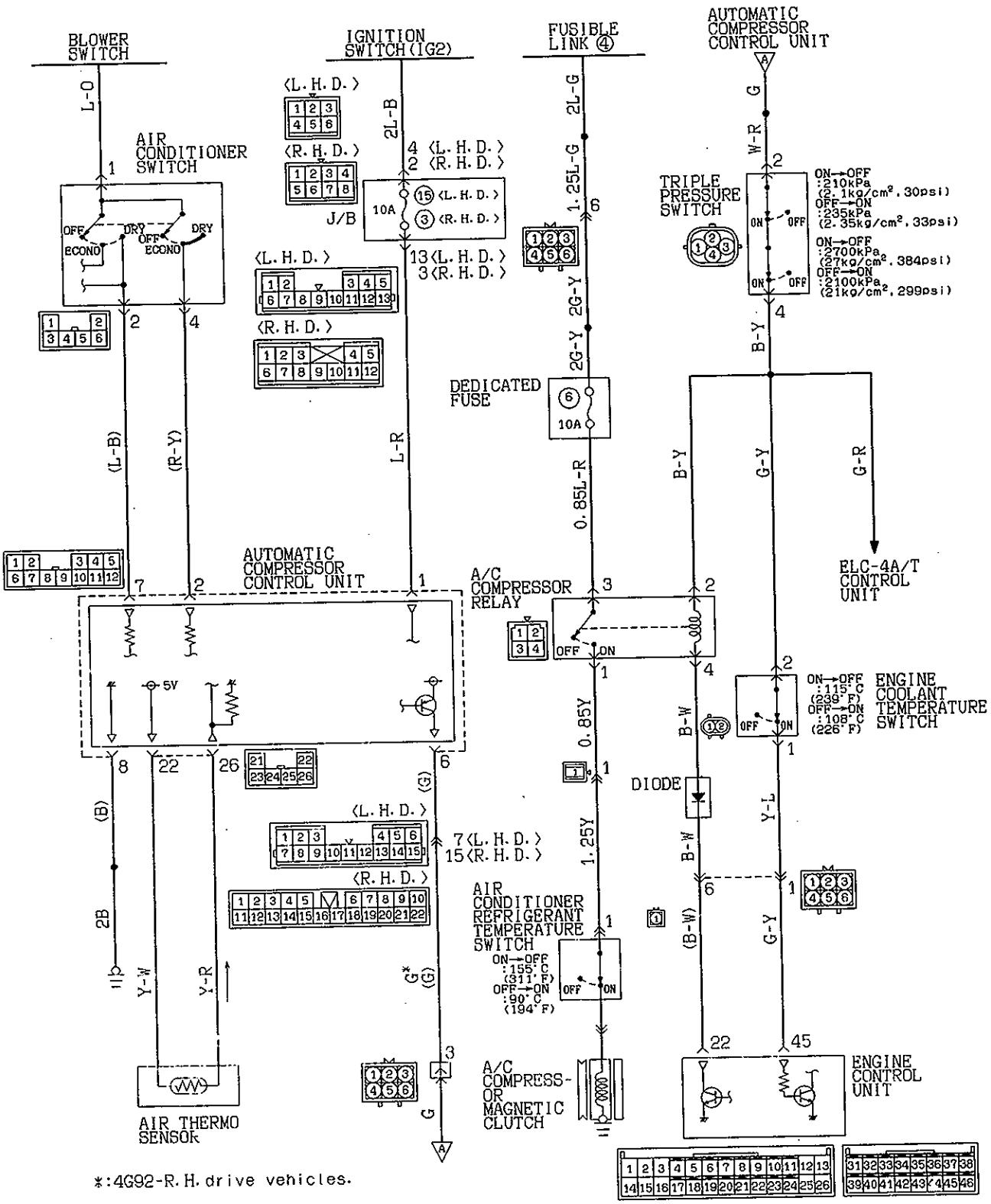
Petrol-powered vehicles <Hatchback built up to September, 1993, Sedan, Wagon-2WD except 6B models>



*1: 4G92-R.H. drive vehicles
*2: 4G9
*3: 6B models

KX35-AK-E5508-ECE

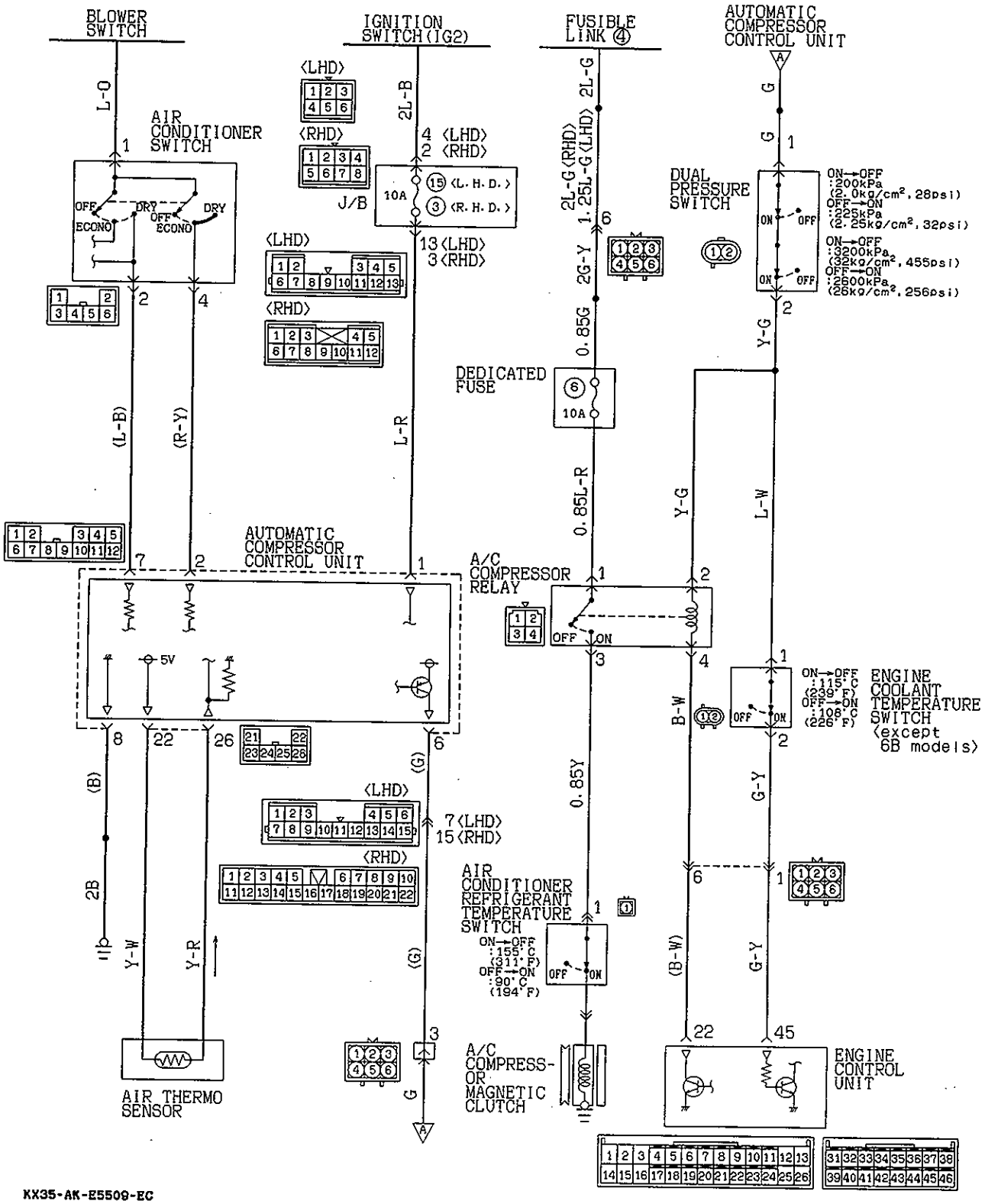
Petrol-powered vehicles <Wagon built up to September, 1993 (2WD-6B models, 4WD)>



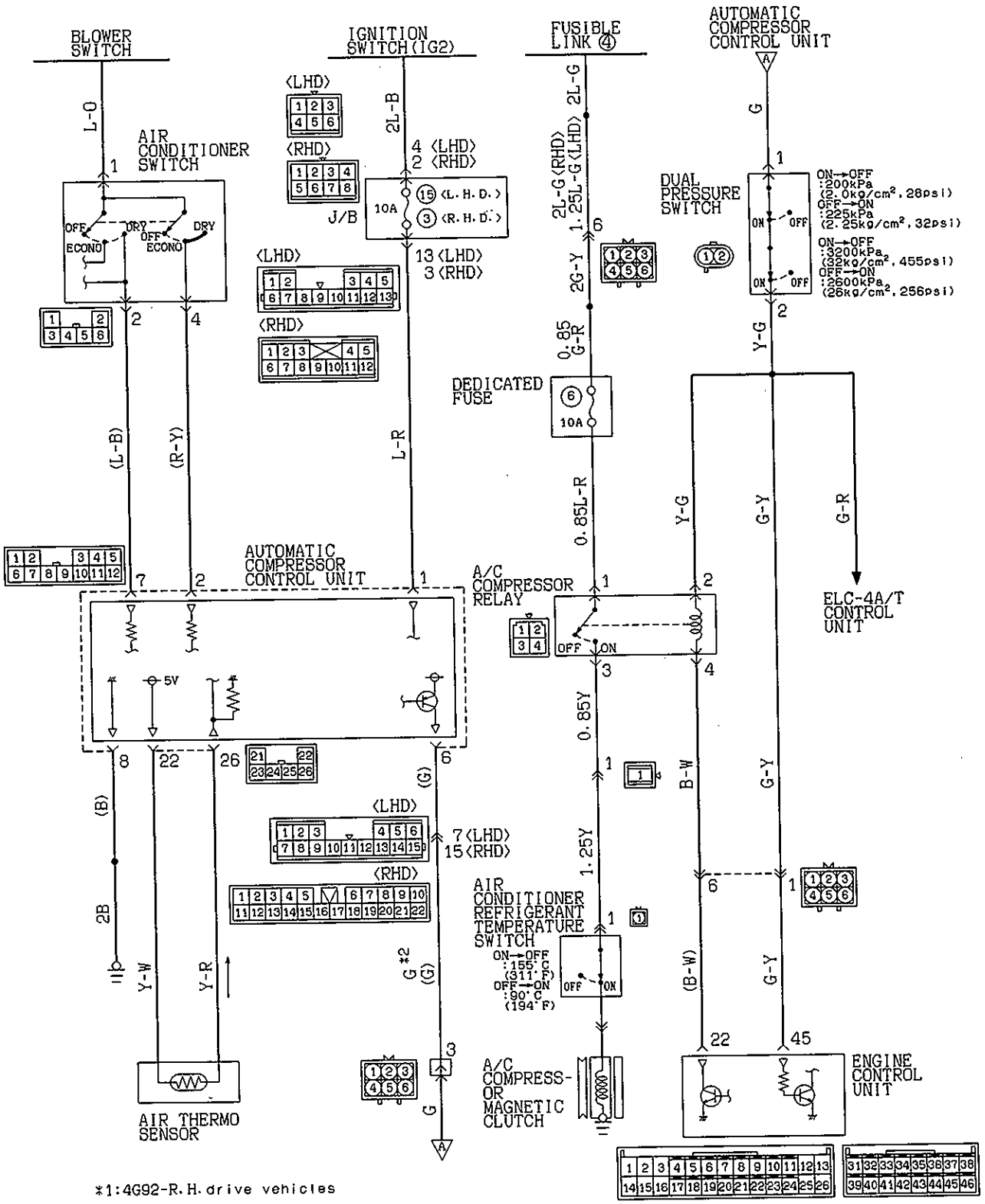
*:4G92-R.H.drive vehicles.

KK35-AK-E5507-ECE

Petrol-powered vehicles <Vehicles with 4G13 built from October, 1993>



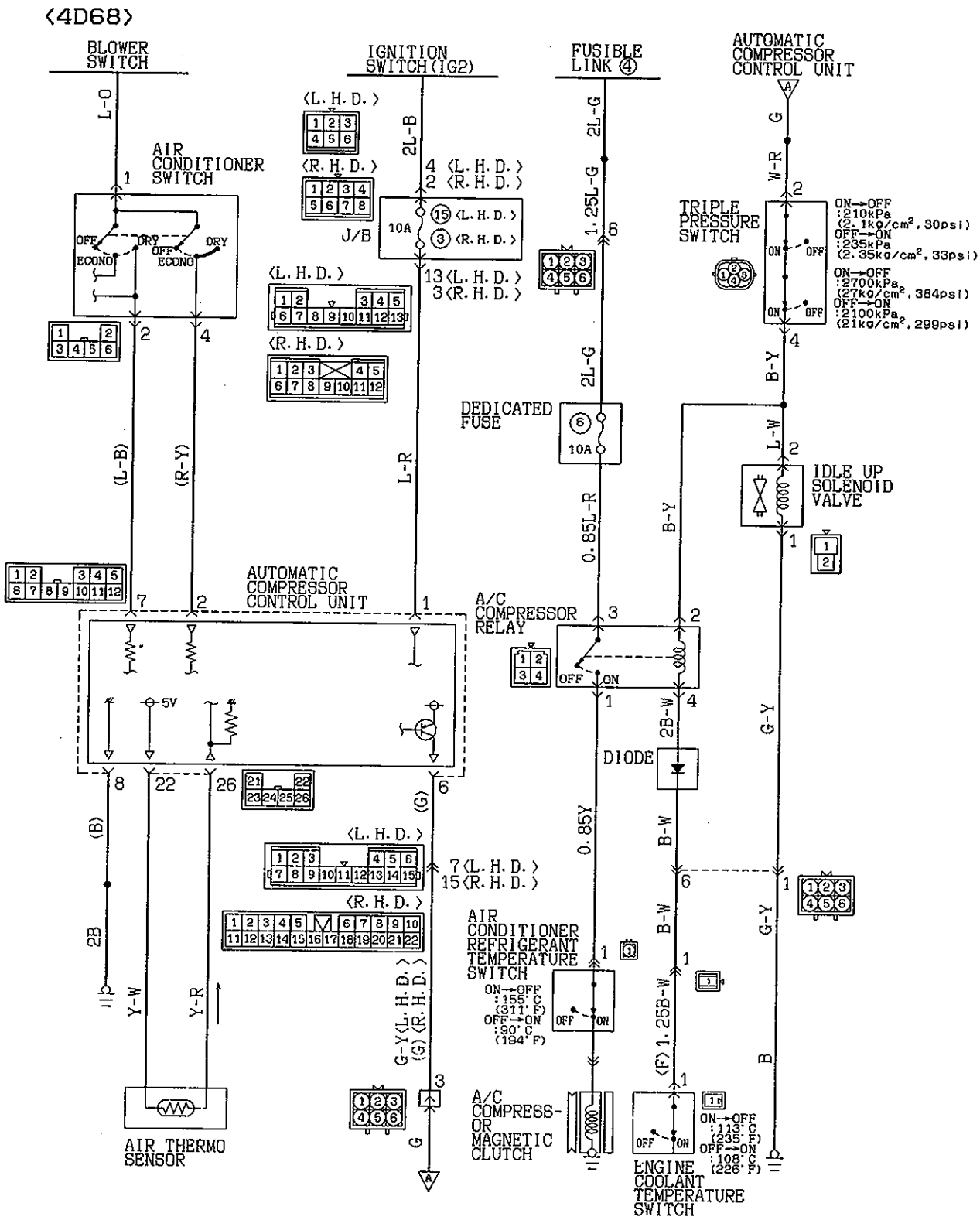
Petrol-powered vehicles <Vehicles with 4G9 built from October, 1993>



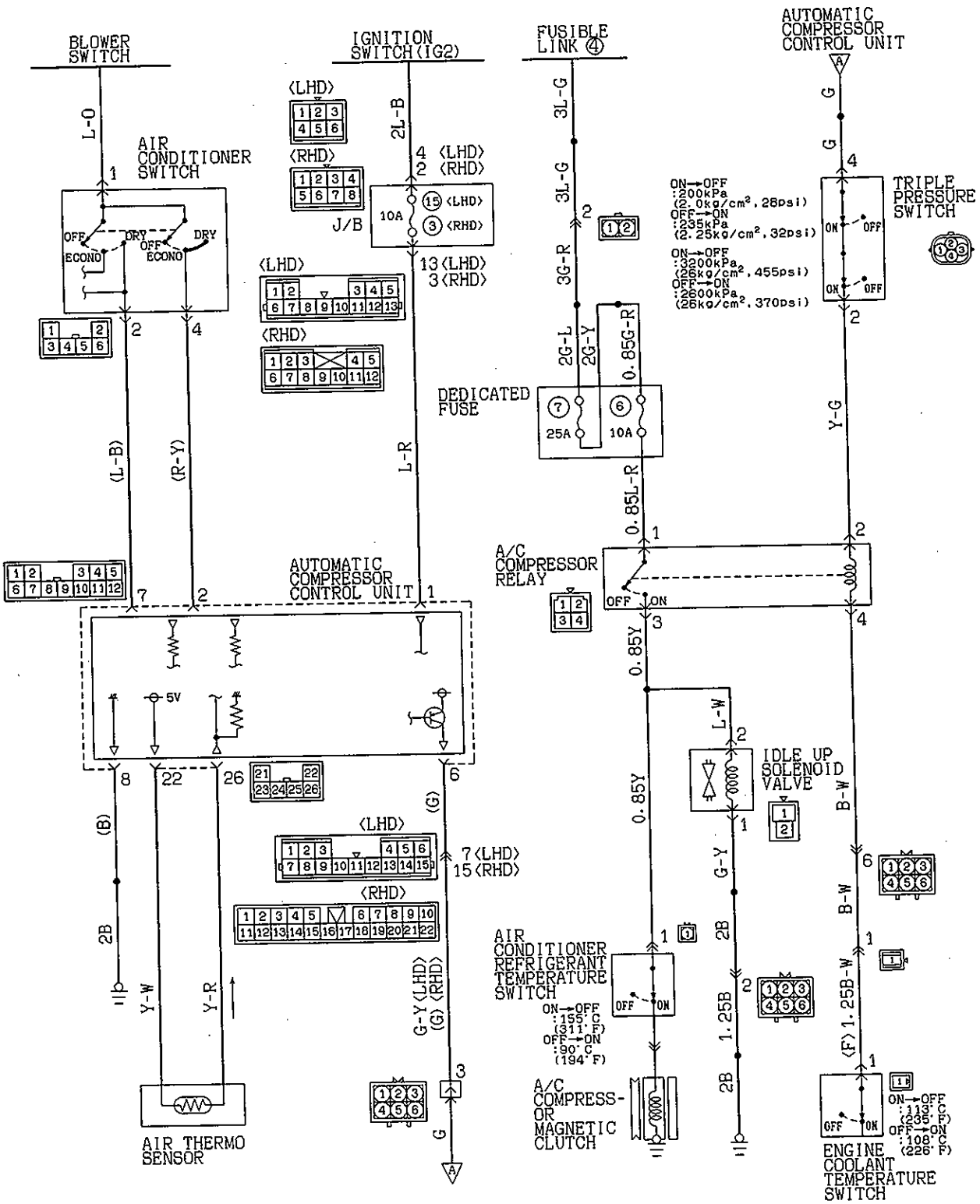
*1:4G92-R.H.drive vehicles

KX35-AK-E5510-EC

Diesel-powered vehicles <Vehicles built up to September, 1993>



Diesel-powered vehicles <Vehicles built from October, 1993>



EXPLANATION OF OPERATION

(1) In the air thermo sensor a negative characteristic thermister which converts the temperature surrounding the sensors to a resistance value is used. The sensor power supply (Approx. 3V) of the auto compressor control unit is applied to air thermo sensor. The voltages at terminal of the air thermo sensor (26) is divided by the resistance value of air thermo sensor and by resistance inside the auto compressor control unit.

(2) Depressing the air conditioner switch from OFF to ECONO or DRY, the operation mode of the compressor is switched over. If it is depressed to the first level, it becomes the ECONO mode, and the voltage at terminal (4) of the air conditioner switch becomes battery voltage. Then, if it is depressed to the second level, it switches to the DRY mode and the voltage at terminal (2) of the air conditioner switch become battery voltage.

(3) The output (terminal (6)) of the auto compressor control unit, occurs when the conditions listed below are satisfied.
   ① Air conditioner switch is ON (in ECONO or DRY modes)
   ② The ambient temperature of the air thermo sensor (air temperature of the evaporator blower) is 3.2°C (38°F) or more in DRY mode, and 8°C (46°F) or more in ECONO mode.

TROUBLESHOOTING HINTS

Auto compressor control unit terminal voltage

Terminal No.	Name of Signal	Condition	Terminal voltage
1	Auto compressor control unit power supply	Ignition switch ON	System voltage
8	Auto compressor control unit earth	At all time	0V
7	Auto compressor control unit power supply (DRY 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
2	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
6	Air conditioner compressor relay	When the compressor ON conditions are satisfied	System voltage
22	Air thermo sensor power supply	The ignition switch, blower switch and air conditioner switch are all ON	Approx. 3V
26	Air thermo sensor	At all time	0V

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 is has a boiling point of –29.8°C (–21.7°F), at atomospheric pressure, it will be a vapour at all normal temperatures and pressures. The vapour is heavier than air, nonflammable, 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 refriferant 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 (104°F)

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

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

Caution

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

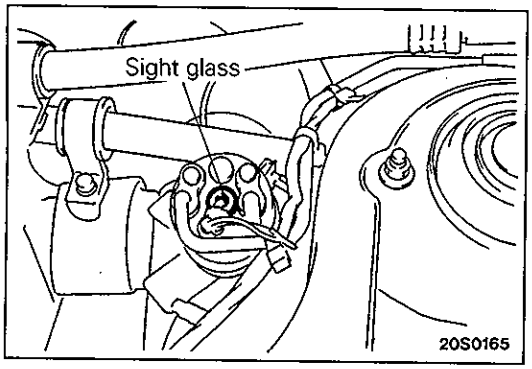
When metering R-134a into the refrigeration system keep the supply tank or cans in an upright position. If the refrigerant container is on its side or upside down, liquid refrigerant will enter the system and damage the compressor.

Caution

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

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

NOTES



SERVICE ADJUSTMENT PROCEDURES

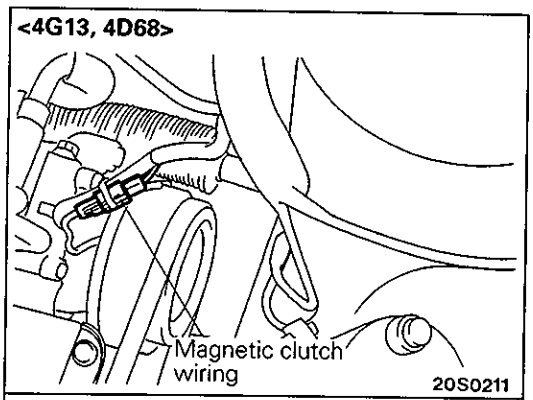
E55FABEK

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

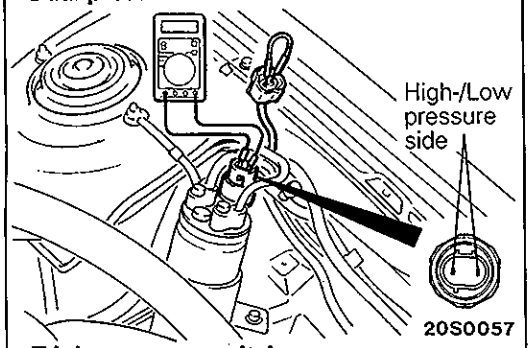
(1) Disconnect the wiring to the magnetic clutch.
(2) Connect battery (+) voltage directly to the wiring for the magnetic clutch.
(3) If the magnetic clutch is normal, there will be a "click". If the pulley and armature do not make contact ('click'), there is a malfunction.

RECEIVER DRIER

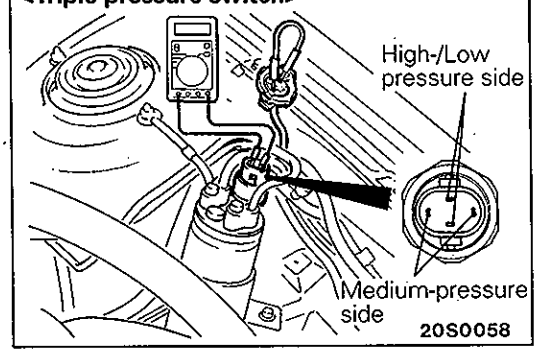
To Test the Receiver Drier

(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

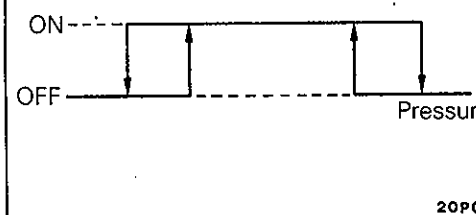
<Dual pressure switch>



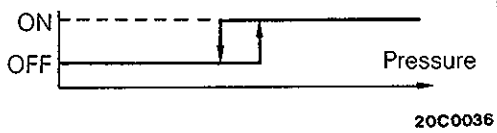
<Triple pressure switch>



HIGH-/LOW-PRESSURE SIDE



MEDIUM-PRESSURE SIDE



DUAL PRESSURE SWITCH CHECK / TRIPLE PRESSURE SWITCH CHECK

NOTE

<Vehicles built up to September, 1993>

1. The dual pressure switch is equipped in the following petrol-powered vehicles.
   - Hatchback (2WD built up to May 1992, all subsequent models except 6B models)
   - Sedan except 6B models
   - Wagon-2WD except 6B models
2. The triple pressure switch is equipped in all petrol-powered vehicles other than the above and in diesel-powered vehicles.

<Vehicles built from October, 1993>

1. The dual pressure switch is equipped in the petrol-powered vehicles.
2. The triple pressure switch is equipped in the diesel-powered vehicles.

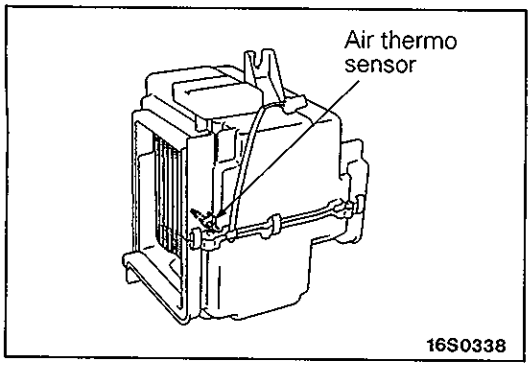
(1) Remove the dual pressure switch or the triple pressure switch connector and connect the high/low pressure side terminals located on the harness side as shown in the illustration.
(2) Install a gauge manifold to the high pressure side service valve of the refrigerant line. (Refer to Performance Test.)
(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/cm^2, 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)	1,500 (15,213)

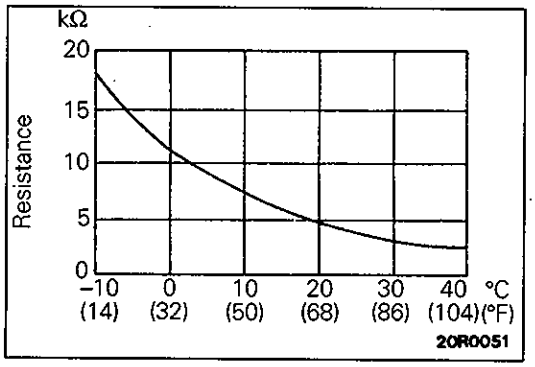
<Vehicles using R-134 refrigerant> kPa (kg/cm^2, psi)

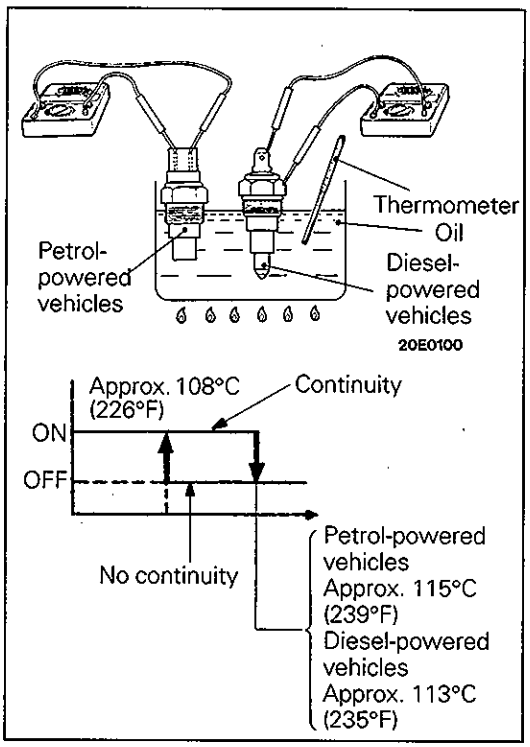
Items \ Switch position	OFF → ON	ON → OFF
Low-pressure side	225 (2.25, 32)	200 (2.0, 28)
High-pressure side	2,600 (26, 370)	3,200 (32, 455)
Medium-pressure side	1,800 (18, 256)	1,500 (15,213)



AIR THERMO SENSOR CHECK

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





ENGINE COOLANT TEMPERATURE SWITCH CHECK

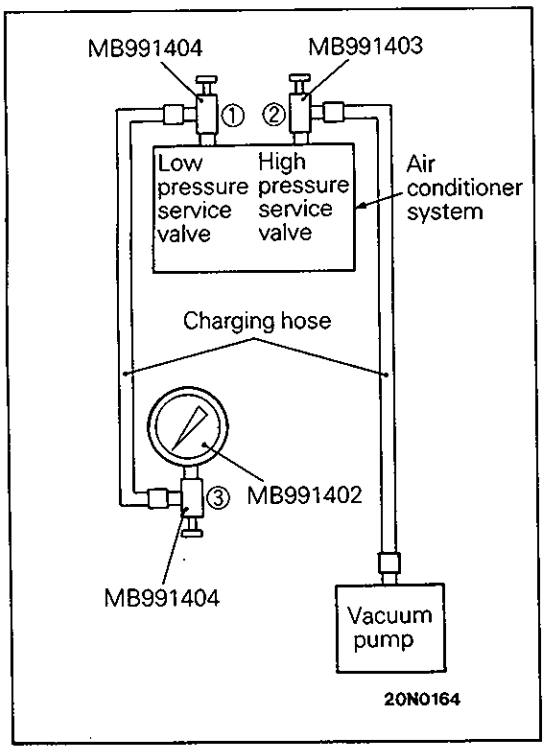
(1) Immerse the engine coolant temperature switch in engine oil as shown in the illustration.
(2) Check the continuity with the circuit tester when the temperature of the oil has been changed. The condition is normal if there is continuity within the following ranges of temperature.

Standard values:

Item		Temperature
Petrol-powered vehicles	Continuity	Approx. 115°C (239°F) or less
	No continuity	Approx. 115°C (239°F) or more [Until temperature drops to 108°C (226°F) when engine coolant temperature switch is OFF]
Diesel-powered vehicles	Continuity	Approx. 113°C (235°F) or less
	No continuity	Approx. 113°C (235°F) or more [Until temperature drops to 108°C (226°F) when engine coolant temperature switch is OFF]

COMPRESSOR DRIVE BELT ADJUSTMENT E55FWAE

Refer to GROUP 11 – Service Adjustment Procedures.



CHARGING
E55FUBI

<Vehicles using R-12 refrigerant>

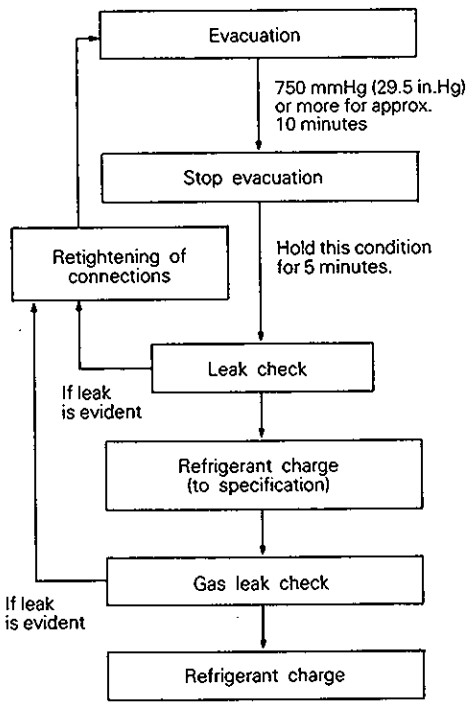
CHARGING THE SYSTEM

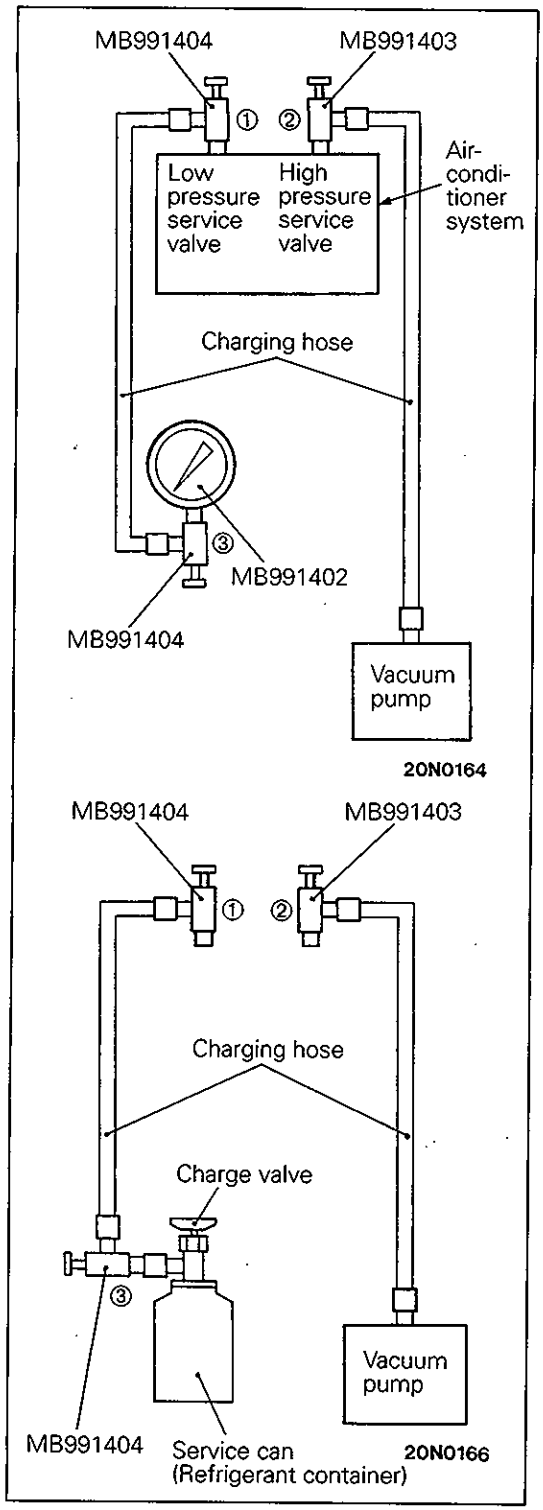
<In case the vacuum gauge is used>

(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 pipe, and the low pressure service valve to the suction port of suction hose.

(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 750 mmHg (29.5 in.Hg) or higher (approx. 10 minutes).

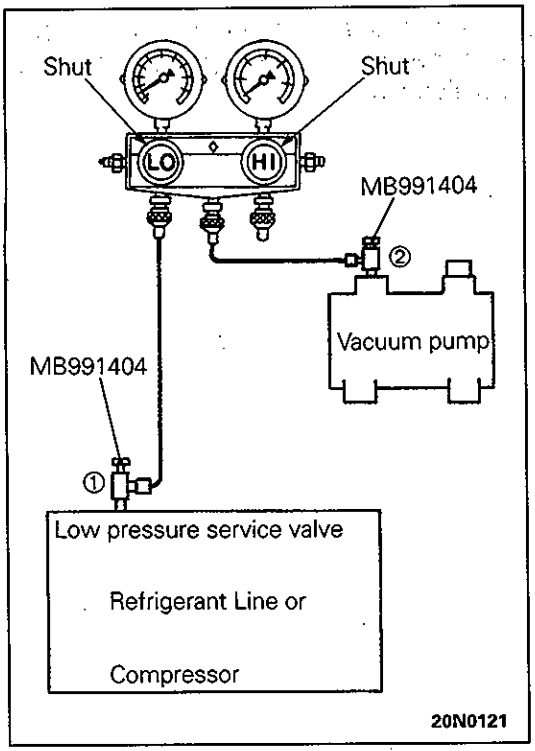
Caution
Read the vacuum gauge as it is stood upright because otherwise it shows wrong indication.

(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 5 minutes.
(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 (vale 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.

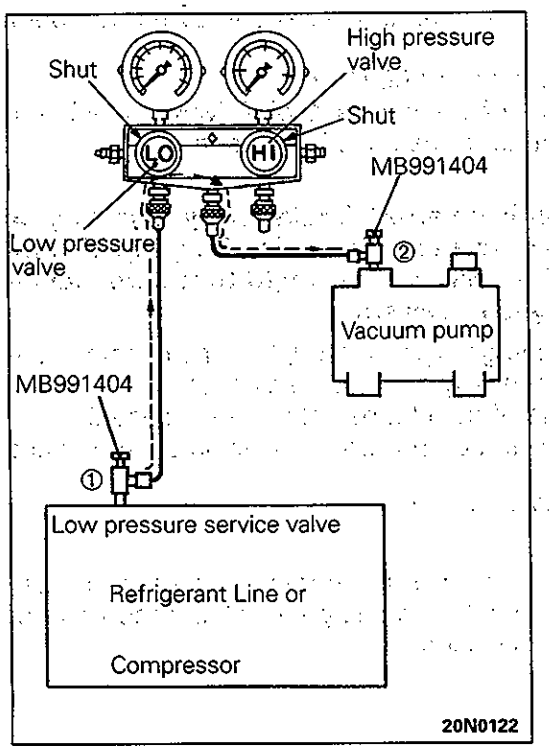
(22) After finishing charging refrigerant, turn back the handle of special tool ① all the way (valve close).
(23) Tighten the handle of the charge valve (valve close).
(24) Remove the special tool ① and ② from each high and low pressure service valve.
(25) Remove the service can.

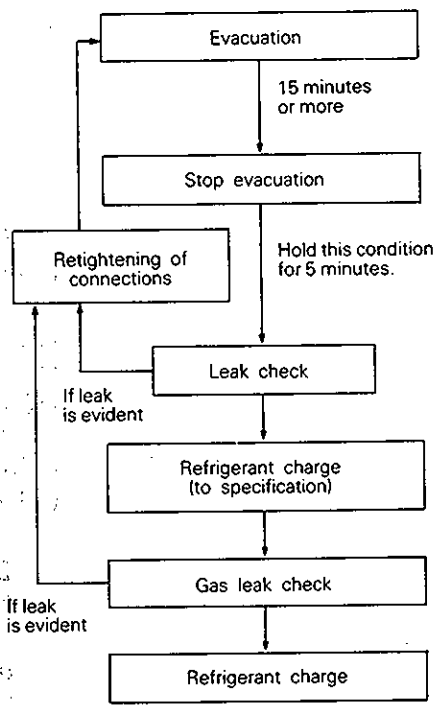
Note
When there is remainder of refrigerant in the service can, keep it for next use with the charge valve and the valves of special tools ① and ③ being closed.



<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).

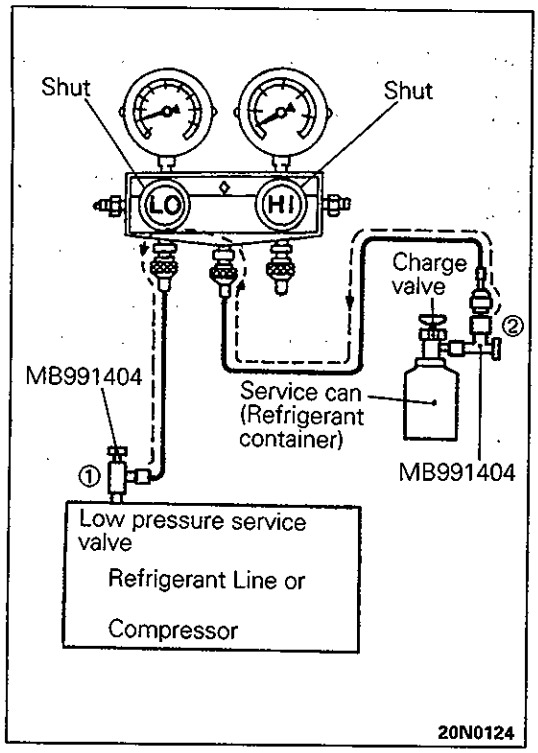




(5) Start up the vacuum pump.

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.

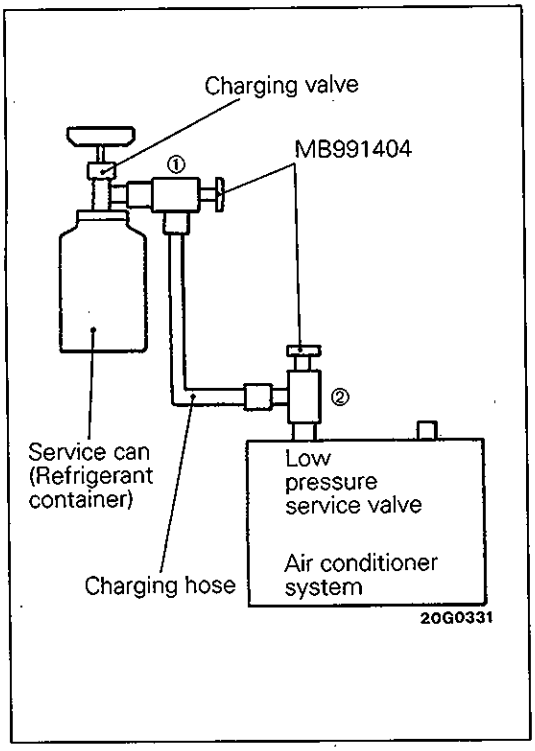
Caution
If the service can is inverted, liquid refrigerant may be drawn into the compressor damaging it by liquid compression. Keep the service can upright to ensure that refrigerant is charged in gas state.

(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) State 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

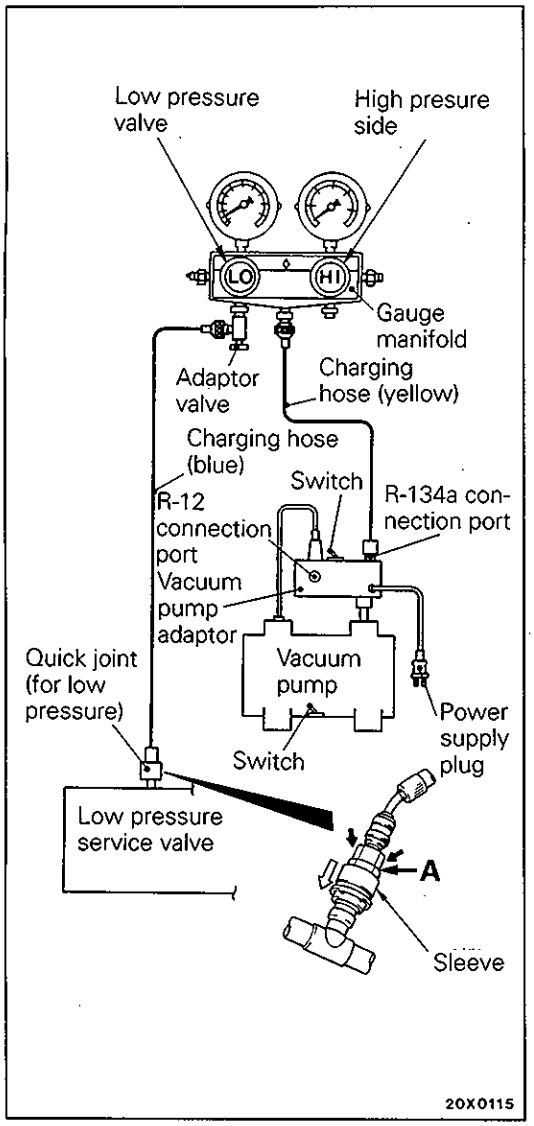
Use the refrigerant recovery unit to discharge refrigerant gas from the system.

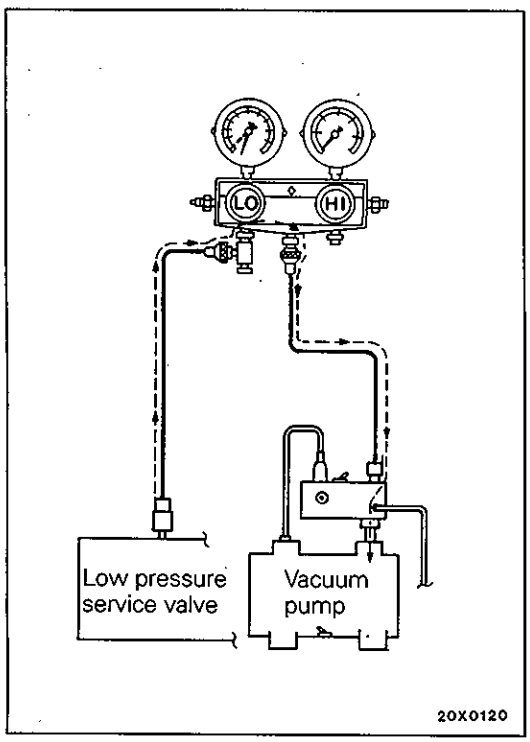
NOTE
Refer to that Refrigerant Recovery and Recycling Unit Instruction Manual for operation of the unit.

REFILLING OF OIL IN THE AIR-CONDITIONER SYSTEM

Tool 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 130 m ℓ (7.93 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: FREOL S-83 or SUNISO 5GS
Quantity
- **Evaporator: 60 m ℓ (3.6 cu.in.)**
- **Condenser: 15 m ℓ (0.9 cu.in.)**
- **Suction hose: 10 m ℓ (0.6 cu.in.)**
- **Receiver: 10 m ℓ (0.6 cu.in.)**





<Vehicles using R-134a refrigerant>

CHARGING THE SYSTEM

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.

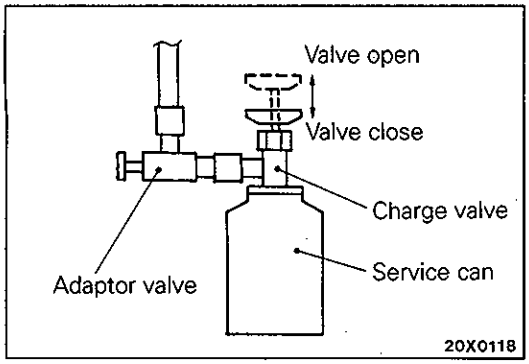
   Caution
   1. Use tools that are suited to R-134a.
   2. To install the quick joint, press section A firmly against the service valve until a click is heard. When connecting, run your hand along the hose while pressing to ensure that there are no bends in the hose.
5. Close the high and low pressure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

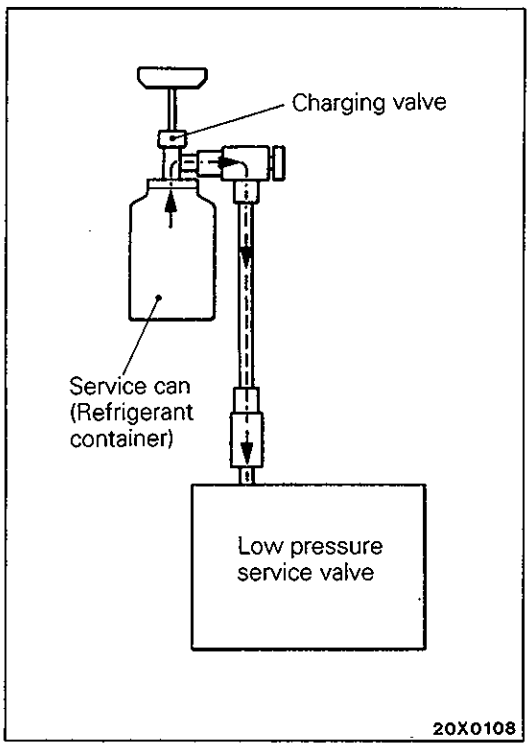
    Caution
    Do not operate the compressor for evacuation.
13. Evacuate to a vacuum reading of 750 mmHg or higher (takes approx. 10 minutes).
14. Turn the vacuum pump adaptor switch OFF and allow to stand it for 5 minutes.

    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.



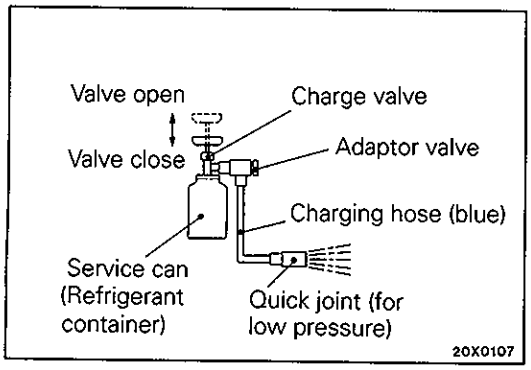
19. Turn the handle of the charging valve back (valve open) and tighten the handle of the adaptor valve (valve open) to charge the system with refrigerant.

    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.

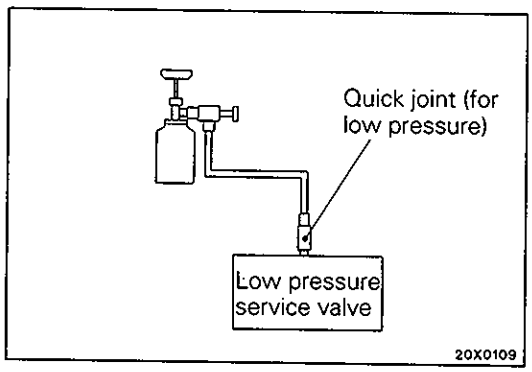
    Caution
    If the service can is inverted, liquid refrigerant may be drawn into the compressor damaging it by liquid compression. Keep the service can upright to ensure that refrigerant is charged in gas state.
26. After charging with refrigerant, turn the handle of the adaptor valve back all the way (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.



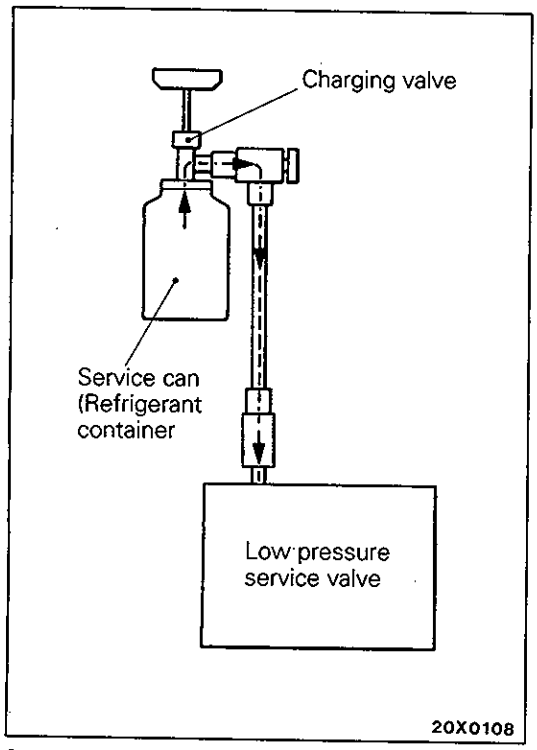
CORRECTING LOW REFRIGERANT LEVEL IN CASE THE SERVICE CAN IS USED

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

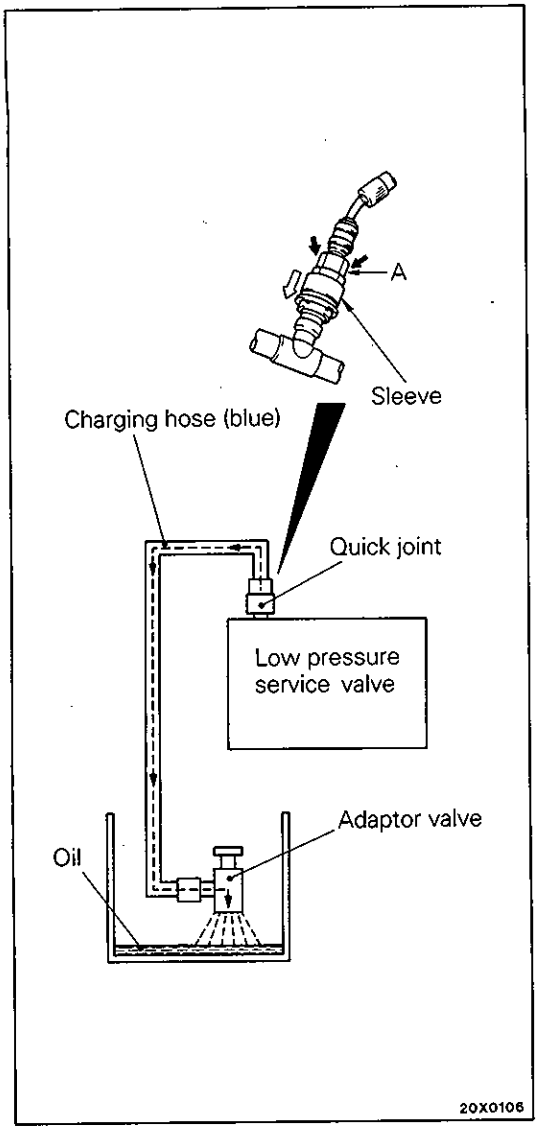


8. Start the engine.
9. Operate the air conditioner and set at the lowest temperature (MAX. COOL).
10. Fix the engine speed at 1,500 r/min.
11. Tighten the handle of the adaptor valve (valve open), and replenish refrigerant checking the quantity through the sight glass.

    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 value 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.

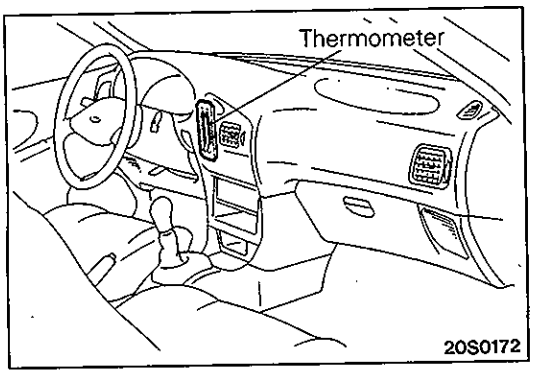
   NOTE
   Any oil remaining in the container should be returned to the A/C system.

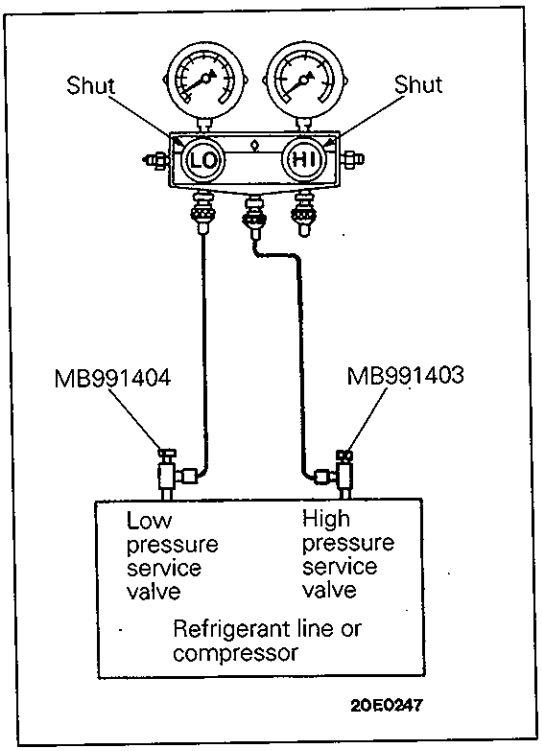
REFILLING OF OIL IN THE AIR-CONDITIONER SYSTEM

Tool 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 mℓ (7.3 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 : SUN PAG56
Quantity:

Evaporator :	**60 mℓ (3.6 cu. in.)**
Condenser :	**15 mℓ (0.9 cu. in.)**
Suction hose :	**10 mℓ (0.6 cu. in.)**
Receiver :	**10 mℓ (0.6 cu. in.)**





PERFORMANCE TEST <Vehicles using R-12 refrigerant>

E55FTAK

(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 engine hood 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)	2.5–5.0 (36.5–41.0)	3.0–5.5 (37.4–41.9)	3.0–6.0 (37.4–42.8)	3.5–7.5 (38.3–45.5)	3.5–8.0 (38.3–46.4)
Compressor discharge pressure kPa (kg/cm2, psi)	650–890 (6.5–8.9, 92.5–126.6)	740–1,040 (7.4–10.4, 105.3–147.9)	750–1,130 (7.5–11.3, 106.7–160.7)	950–1,320 (9.5–13.2, 135.1 – 187.7)	1,150–1,410 (11.5–14.1, 163.6–200.5)
Compressor suction pressure kPa (kg/cm2, psi)	140–210 (1.4–2.1, 19.9–29.9)	140–210 (1.4–2.1, 19.9–29.9)	140–210 (1.4–2.1, 19.9–29.9)	150–220 (1.5–2.2, 21.3–31.3)	150–220 (1.5–2.2, 21.3–31.3)

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.

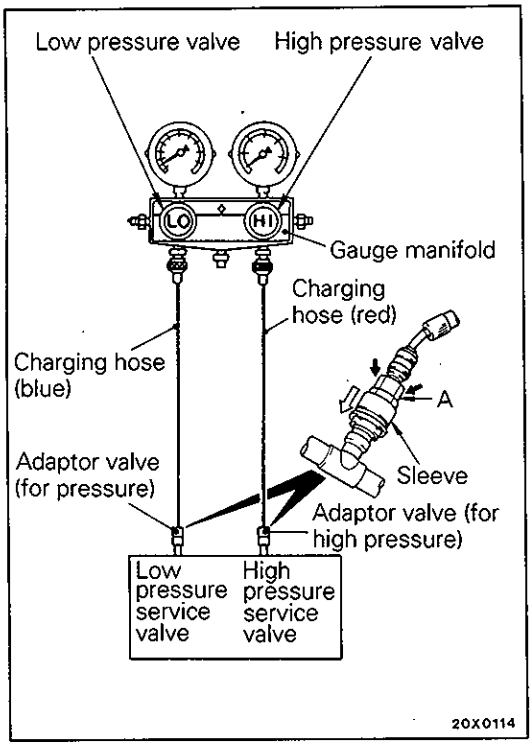
(7) Evacuate and charge the system.

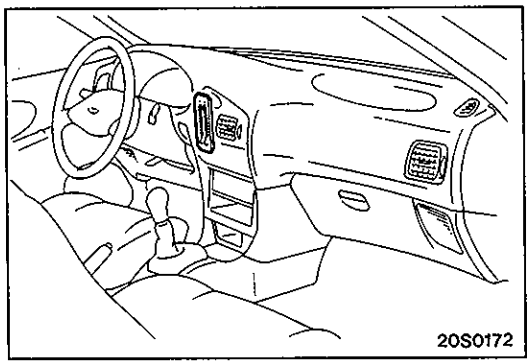
LOW CHARGE

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-ring, these O-rings are not reusable.





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)	21 (70)	26.7 (80)	32.2 (90)	37.8 (100)	43.3 (110)
Discharge air temperature °C (°F)	5.0–8.0 (41.0–46.4)	5.5–8.5 (41.9–47.3)	5.5–9.0 (41.9–48.2)	6.0–10.0 (42.8–50.0)	6.0–10.5 (42.8–50.9)
Compressor discharge pressure kPa (kg/cm^2, psi)	735–971 (7.5–9.9 107–141)	824–1,118 (8.4–11.4 119–162)	834–1,206 (8.5–12.3 121–175)	1,030–1,393 (10.5–14.2 149–202)	1,226–1,481 (12.5–15.1 178–215)
Compressor suction pressure kPa (kg/cm^2, psi)	186–255 (1.9–2.6 27–37)	186–255 (1.9–2.6 27–37)	186–225 (1.9–2.6 27–37)	196–265 (2.0–2.7 28–38)	196–265 (2.0–2.7 28–38)

NOTES

COMPRESSOR NOISE E55FXAC

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.

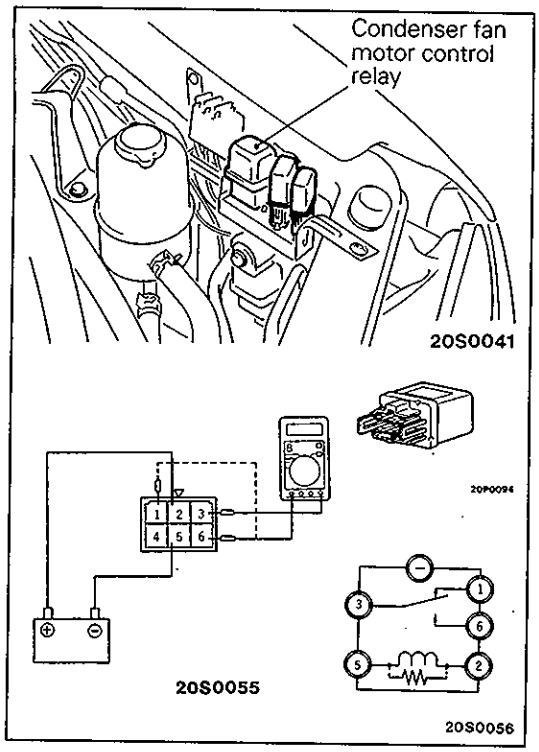
Noises that develop during air conditioning operation can often be misleading. For example: what sounds like a failed front bearing or connecting rod, may be caused by loose bolts, nuts, mounting brackets, or a loose clutch assembly. Verify accessory drive belt tension (power steering or alternator).

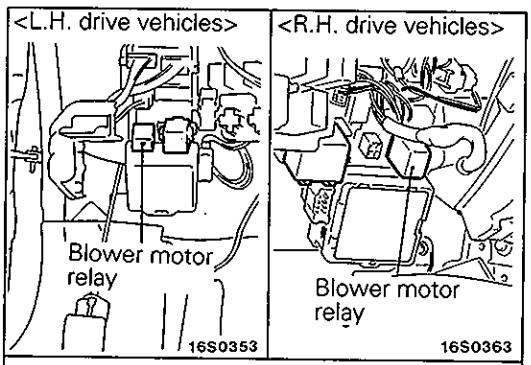
Improper accessory drive belt tension can cause a misleading noise when the compressor is engaged and little or no noise when the compressor is disengaged.

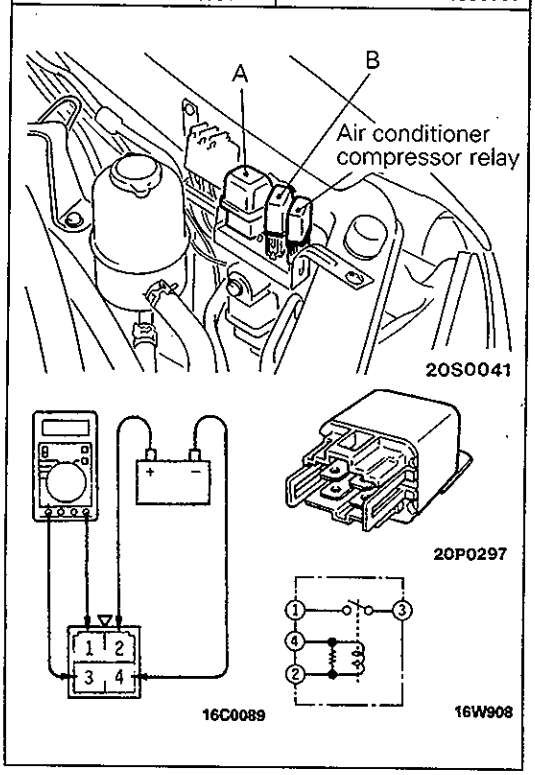
Drive belts are speed-sensitive. That is, at different engine speeds, and depending upon belt tension, belts can develop unusual noises that are often mistaken for mechanical problems within the compressor.

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/cm^2, 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

E55FRAV

CONDENSER FAN MOTOR CONTROL RELAY (Wagon <4WD, 6B models>, Diesel-powered vehicles)

Battery voltage \ Terminal	1	2	3	5	6
Not supplied	○	○	○	○	
Supplied		⊖	⊕	○	○

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

BLOWER MOTOR RELAY, CONDENSER FAN MOTOR RELAY, AIR CONDITIONER COMPRESSOR RELAY

Battery voltage \ Terminal	1	2	3	4
Not supplied		○		○
Supplied	○	⊕	○	⊖

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

The names of the relays in the illustrations at left are shown in the table below.

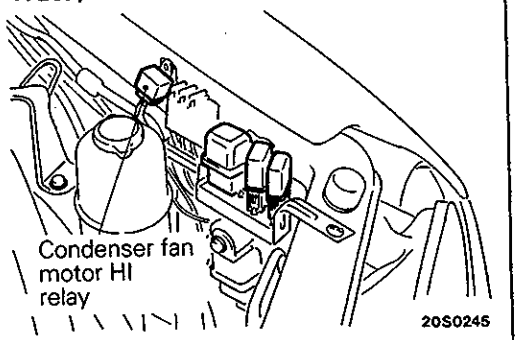
Hatchback built up to May, 1992

Relay	Name	Applicable models
A	Radiator fan motor control relay	4G9–2WD
	Condenser fan motor control relay	4G9–4WD
B	Condenser fan motor relay	All models

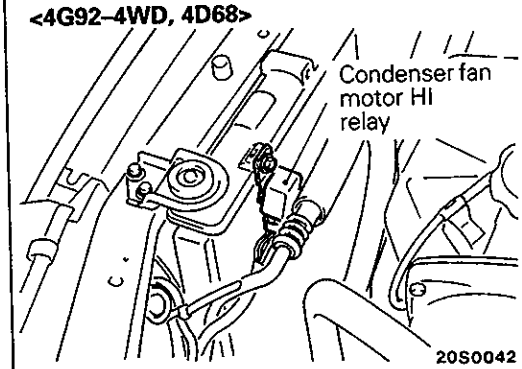
Hatchback built from June 1992, Sedan and Wagon

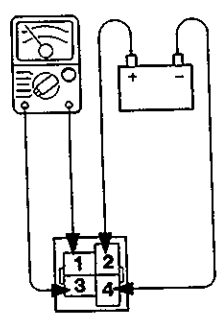
Relay	Name	Applicable models
A	Condenser fan motor relay	4G9-6B models <Hatchback, Sedan>
	Radiator fan motor control relay	4G9-except 6B models <Hatchback, Sedan, Wagon–2WD
	Condenser fan motor control relay	Wagon <4WD, 6B models> Diesel-powered vehicles
B	Fan motor control relay	4G9-6B model <Hatchback, Sedan>
	Condenser fan motor relay	Except 4G9-6B models <Hatchback, Sedan>

<4G92, 4G93–2WD>

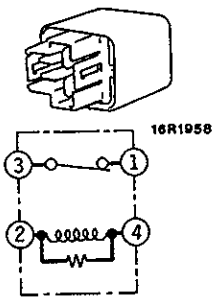


<4G92–4WD, 4D68>





16A0572



16A0571

CONDENSER FAN MOTOR HI RELAY <4G92, 4G93, 4D68>

Battery voltage \ Terminal	1	2	3	4
Not supplied	○	○	○	○
Supplied		⊕		⊖

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

NOTES

IDLE-UP OPERATION CHECK

E55F0AQ

<MPI>

(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:

4G13	**750 ± 100 r/min.**
4G92,4G93	**800 ± 100 r/min.**

(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.)

<Diesel-powered vehicles>

(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
- Steering wheel: Straightforward

(2) Check whether or not the idling speed is the standard value

Standard value: 750 ± 100 r/min.

NOTE
If there is a deviation of the idling speed from the standard value, make the adjustment of the idling speed.

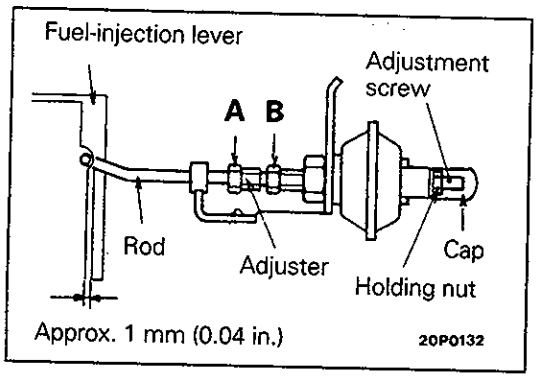
(Refer to GROUP 11 – Engine Adjustment)

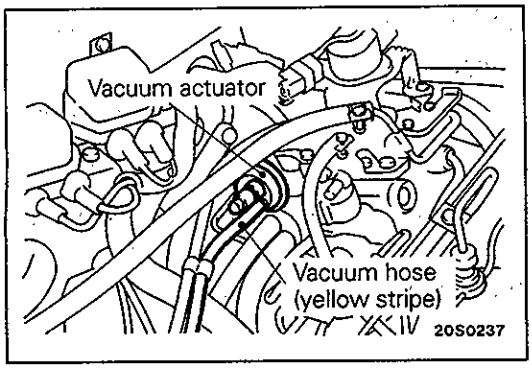
(3) When the air conditioner is running after turning the air conditioner switch to ON, and the blower switch to the MH or HI position, check to be sure that the idle speed is at the standard value.

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.



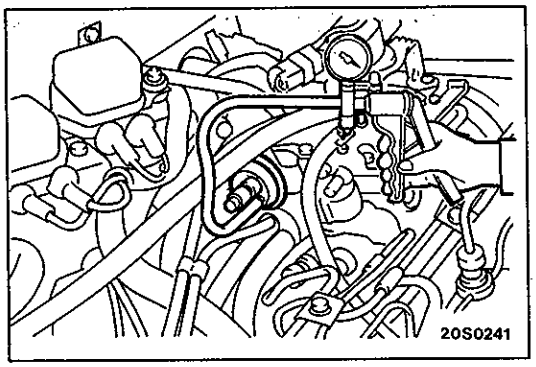


VACUUM ACTUATOR CHECK

E55FRAW

<Diesel-powered vehicles>

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

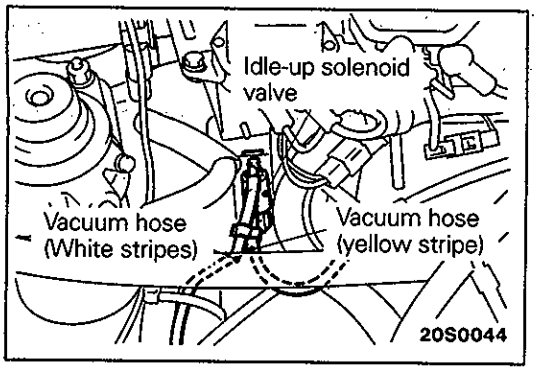


(2) Connect a manual vacuum pump to the nipple of the vacuum actuator.

(3) Check to be sure that the vacuum actuator rod starts to contract when 33 kPa (250 mmHg, 9.8 in.Hg) of negative pressure is applied, and that the rod contracts to its full stroke when 46.7 kPa (350 mmHg, 13.8 in.Hg) of negative pressure is applied.

(4) Disconnect the manual vacuum pump from the vacuum actuator, and connect the vacuum hose (yellow stripe) to the vacuum actuator.

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



IDLE-UP SOLENOID VALVE CHECK

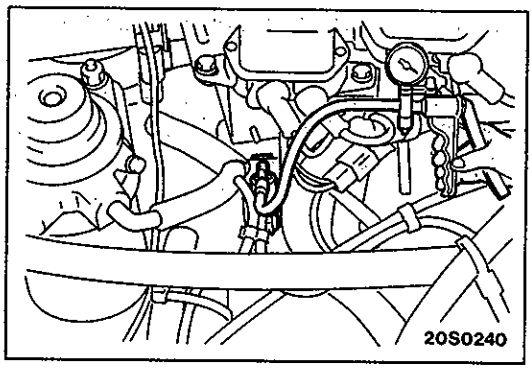
E55FRAX

<Diesel-powered vehicles>

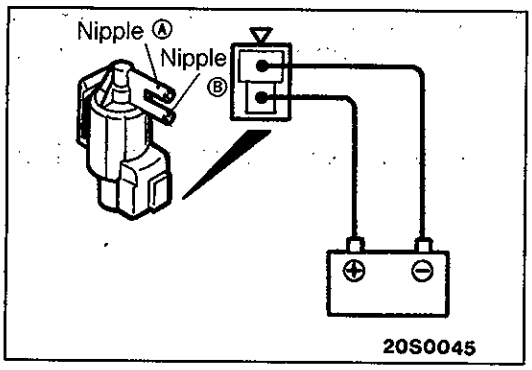
(1) Disconnect the vacuum hose (white stripes, yellow stripes) from the solenoid valve.

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

(2) Disconnect the harness connector.

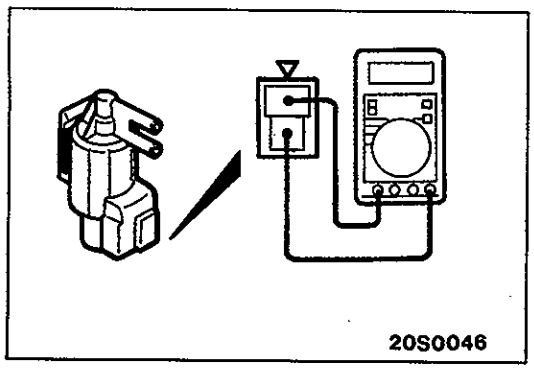


(3) Connect a manual vacuum pump to the nipple to which the vacuum hose with white stripes was connected.



(4) Check airtightness by applying a vacuum with voltage applied directly from the battery to the solenoid valve terminal and without applying voltage.

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



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

(5) Measure the resistance of the solenoid valve.

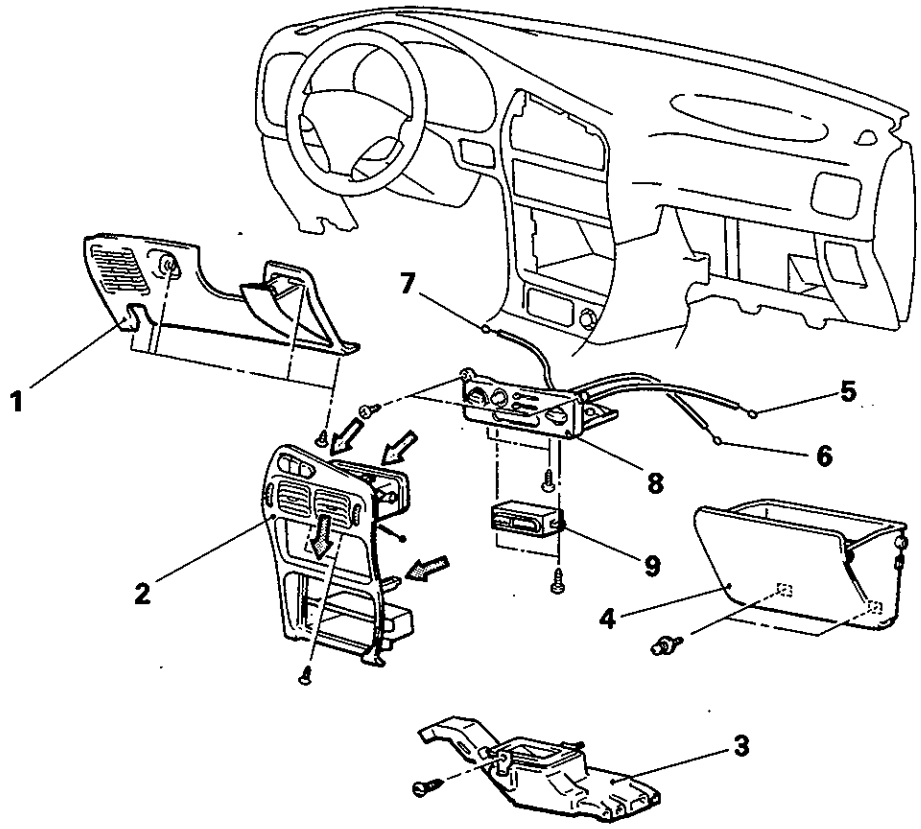
Standard value: Approx. 36Ω

NOTES

HEATER CONTROL ASSEMBLY

REMOVAL AND INSTALLATION

E55GA-

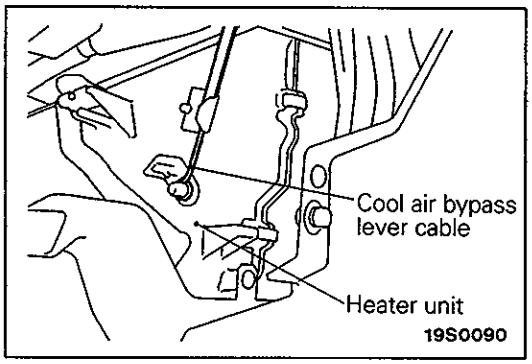


20S0166

Removal steps

1. Instrument lower panel assembly
2. Air outlet center panel assembly
3. Foot duct
4. Glove box
5. Connection for inside/outside air change-over damper cable
6. Connection for air-mixing damper cable
7. Connection for air outlet changeover damper cable
8. Heater control assembly
9. Clock or plug

NOTE
⇦ : Clip positions



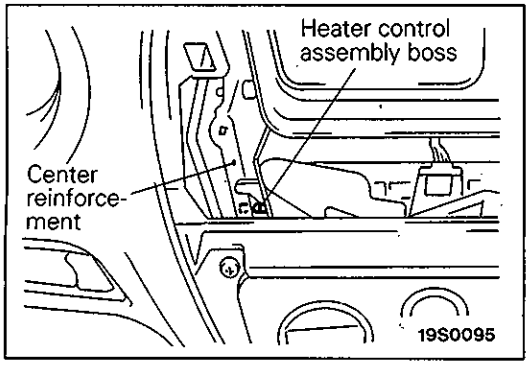
19S0090

SERVICE POINTS OF REMOVAL

E55GBAO

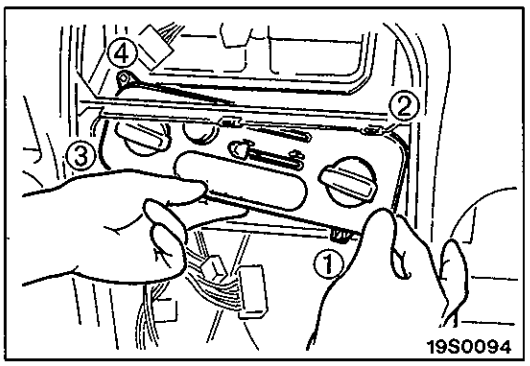
2. REMOVAL OF AIR OUTLET CENTER PANEL ASSEMBLY

(1) Remove the cool air bypass lever cable of the air outlet center panel assembly at the heater unit side.
(2) Remove the air outlet center panel assembly mounting screws, and remove the air outlet center panel assembly.

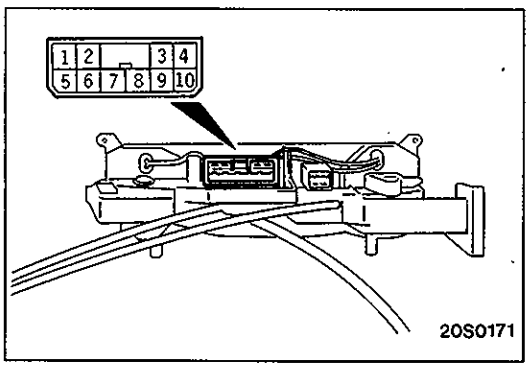


8. REMOVAL OF HEATER CONTROL ASSEMBLY

(1) Remove the heater control assembly mounting screws.
(2) Remove the heater control assembly boss from the center reinforcement (L.H.).



(3) Take out the heater control assembly from the instrument panel in the order shown in the illustration, and pull the heater control assembly out towards you.



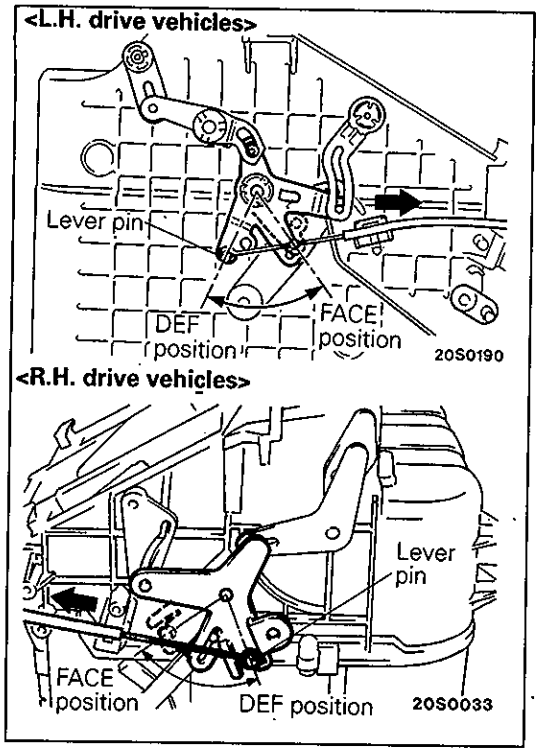
INSPECTION

E55GCAP

BLOWER SWITCH CONTINUITY

Switch position \ Terminal No.	6	7	8	9	10	2	3	4	1	5
OFF									Illumination lamp	
LO	○	○				○	○			
ML	○		○			○	○			
MH	○			○		○	○	○		
HI	○				○	○	○	○		

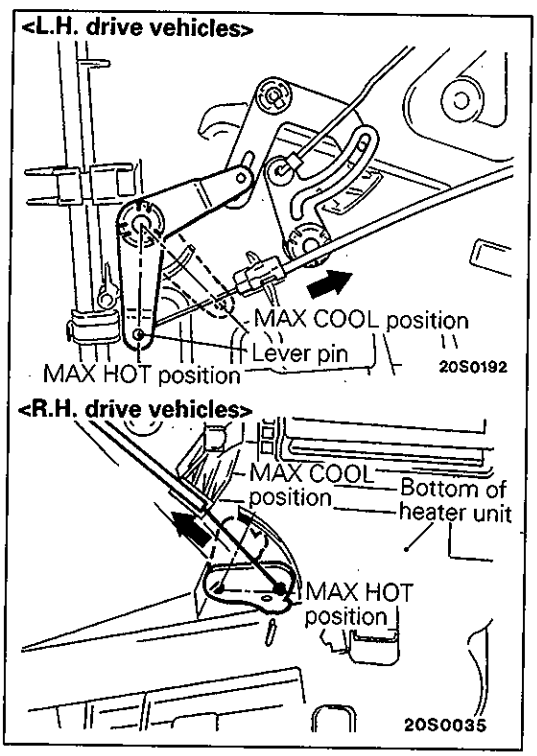
NOTE
○—○ indicates that there is continuity between the terminals.



SERVICE POINTS OF INSTALLATION E55GDAP

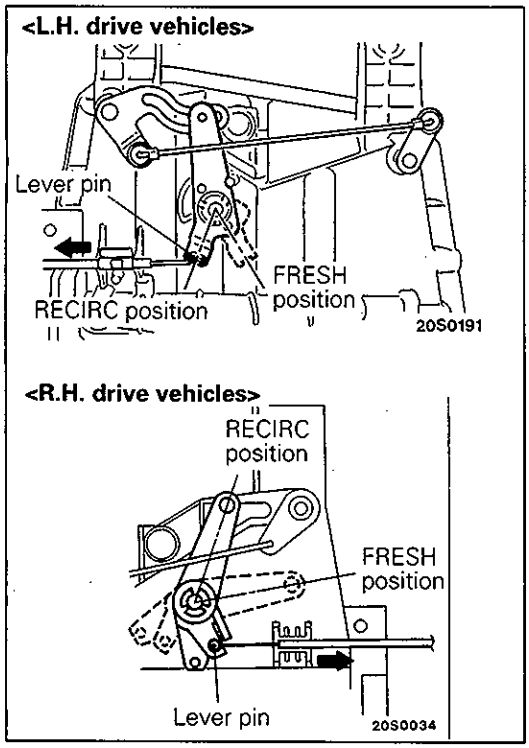
7. CONNECTION OF AIR OUTLET CHANGEOVER DAMPER CABLE

(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 and install the cable to the lever pin.
(3) Push the outer cable in the direction of the arrow so that there is no looseness, and then secure it with the clip.



6. CONNECTION OF AIR MIXING DAMPER LEVER

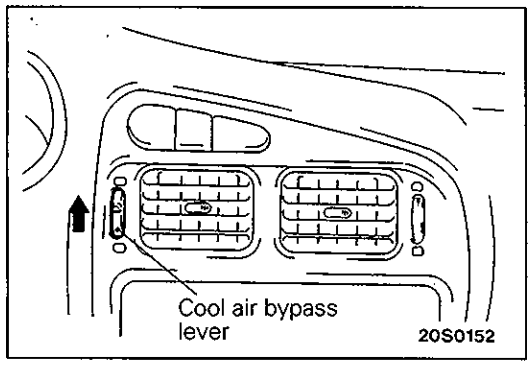
(1) Set the temperature control knob on the heater control assembly to MAX HOT.
(2) Set the air mix damper lever at the bottom of the heater unit to the MAX HOT position, and install the cable.
(3) Push the outer cable in the direction of the arrow so that there is no looseness, and then secure it with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



5. CONNECTION OF INSIDE/OUTSIDE AIR CHANGEOVER DAMPER CABLE

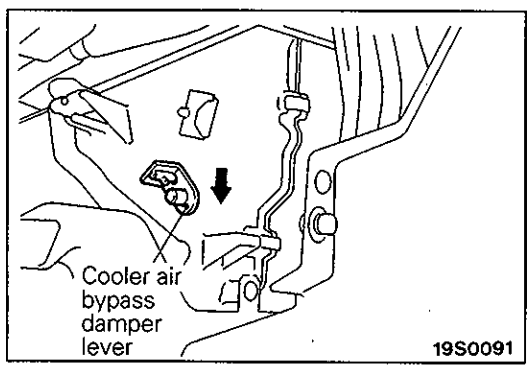
(1) Set the inside/outside air changeover lever to the RECIRC position.
(2) Set the inside/outside air changeover damper lever of the blower motor to the RECIRC position, and install the cable.
(3) Pull the outer cable in the direction of the arrow so that there is no looseness, and then secure it with the clip.

NOTE
After installing each cable, confirm that each damper operates correctly.



2. INSTALLATION OF AIR OUTLET CENTER PANEL ASSEMBLY

(1) Install the air outlet center panel assembly to the instrument panel.
(2) Turn the cool air bypass lever of the air outlet center panel assembly fully upward.

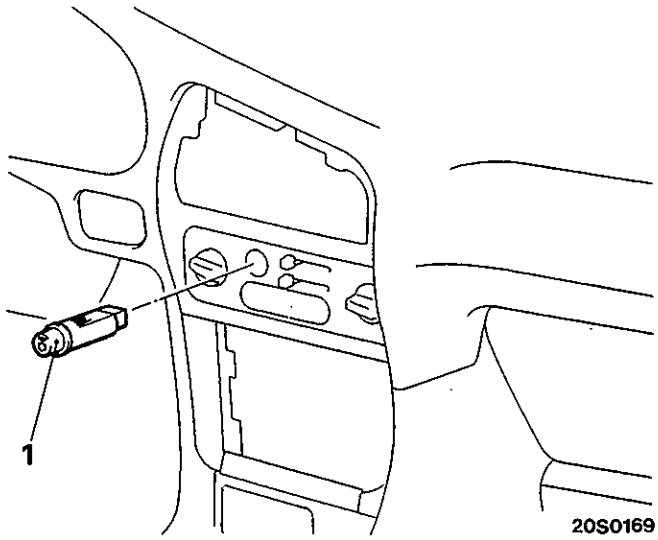


(3) Turn the cool air bypass damper lever at the heater unit side fully downward, and install the cool air bypass lever cable.

AIR CONDITIONER SWITCH

E550A--

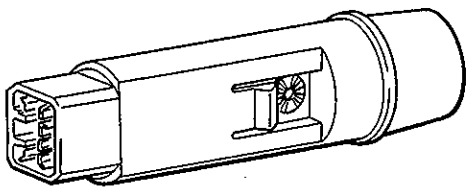
REMOVAL AND INSTALLATION



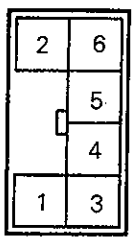
Removal steps

- Center outlet panel assembly (Refer to P.55-24.)

1. Air conditioner switch



20S0070



20A0189

INSPECTION

E550CAH

AIR CONDITIONER SWITCH CHECK

Terminal / Switch position	1	2	4	5	3	6
OFF					Illumination lamp	
If pressed 1 step (ECONOMY)	○		○	⊳○		
If pressed 2 steps (DRY)	○	○	○	⊳○		

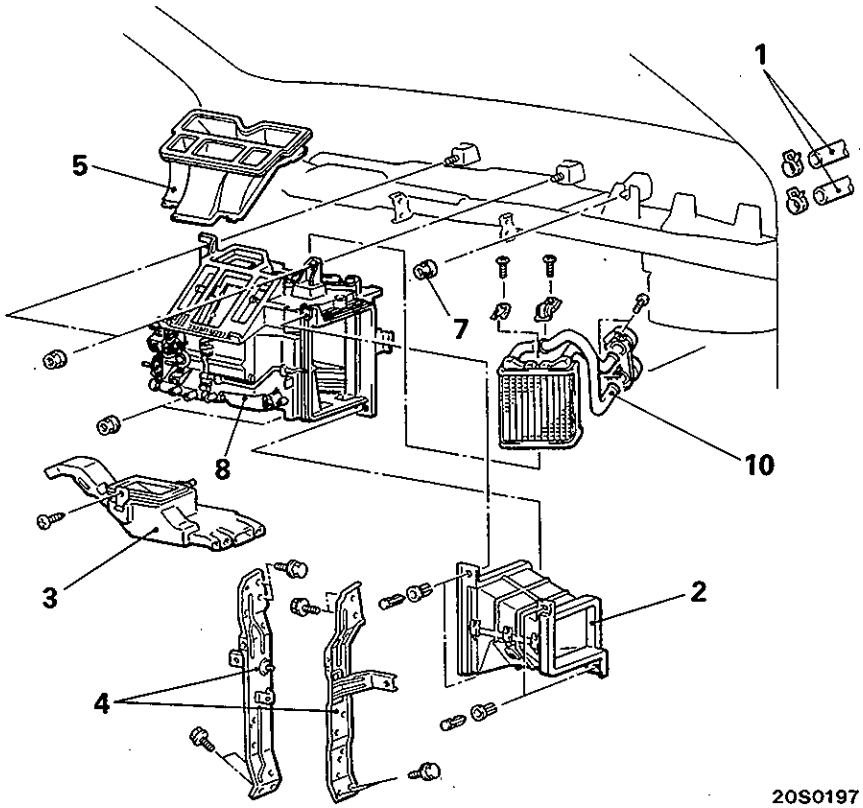
NOTE
The ○—○ symbol indicates continuity.

HEATER UNIT AND HEATER CORE

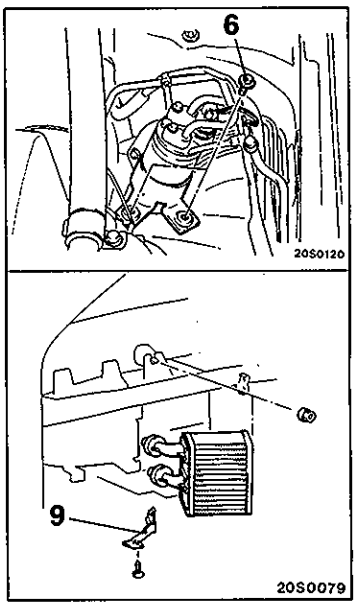
REMOVAL AND INSTALLATION

E55IA--

Pre-removal and Post-installation Operation
- Draining and Supplying of Coolant
- Removal and Installation of Instrument Panel Assembly and Floor Console Box (Refer to GROUP 52A – Instrument Panel and Floor Console Box)



20S0197



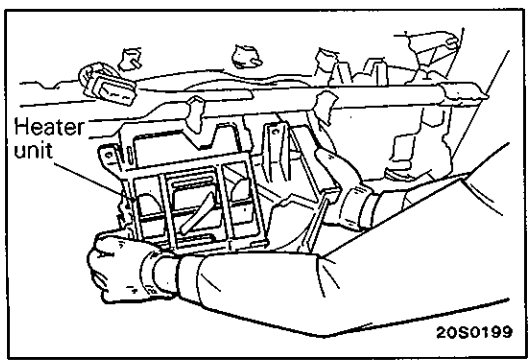
Removal steps
1. Heater hose connection
2. Joint duct <vehicles without air conditioner>
3. Foot duct
4. Center reinforcement
5. Center ventilation duct
6. Receiver bracket installation bolt <R.H. drive vehicles with air conditioner>
7. Evaporator installation nut <Vehicles with air conditioner>

◀■▶ 8. Heater unit

9. Heater core support <R.H. drive vehicles>
10. Heater core

CAUTION: SRS

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



SERVICE POINTS OF REMOVAL

E55IBAN

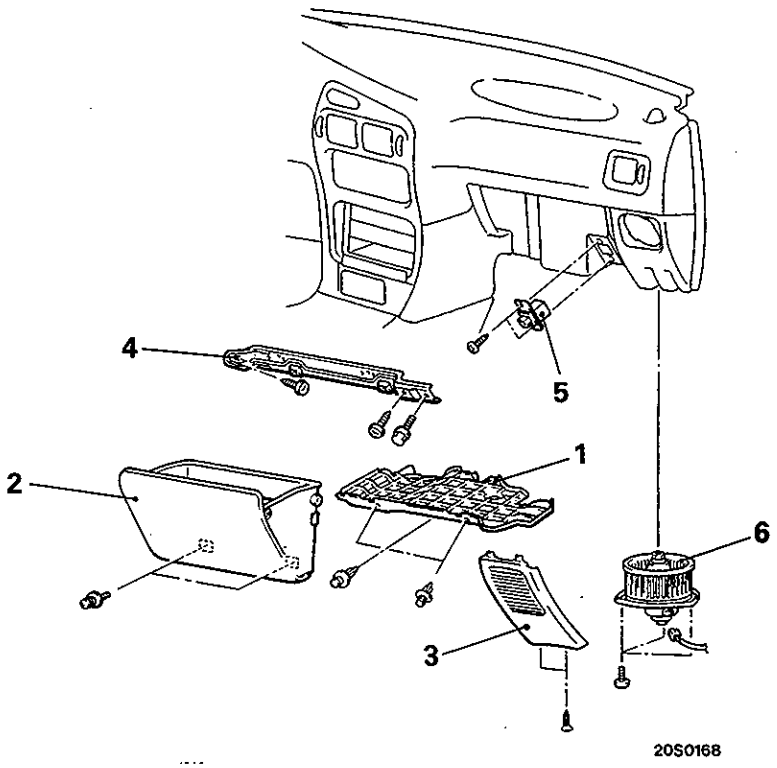
8. REMOVAL OF HEATER UNIT <VEHICLES WITH AIR CONDITIONER>

After moving the evaporator slightly towards you, remove the heater unit.

BLOWER MOTOR ASSEMBLY AND RESISTOR

E55KA--

REMOVAL AND INSTALLATION



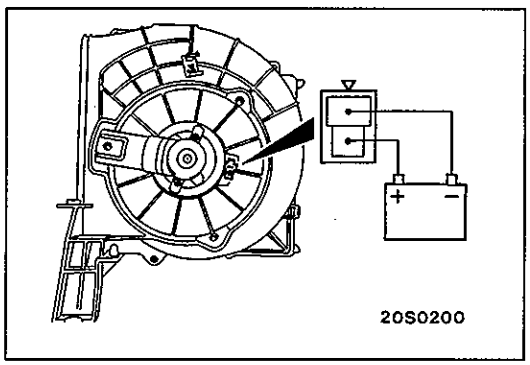
20S0168

Resistor removal steps

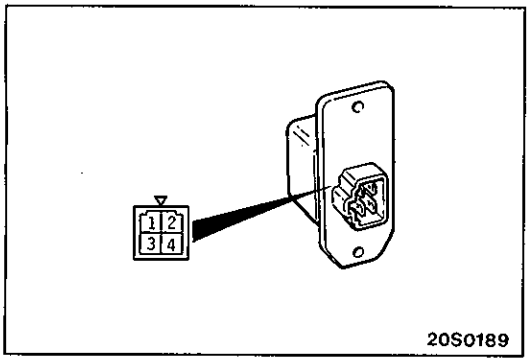
1. Under cover
2. Glove box
3. Corner panel
4. Glove box frame
5. Resistor

Blower motor assembly removal steps

1. Under cover
6. Blower motor assembly



20S0200



20S0189

INSPECTION

E55KCA0

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.

RESISTOR INSPECTION

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

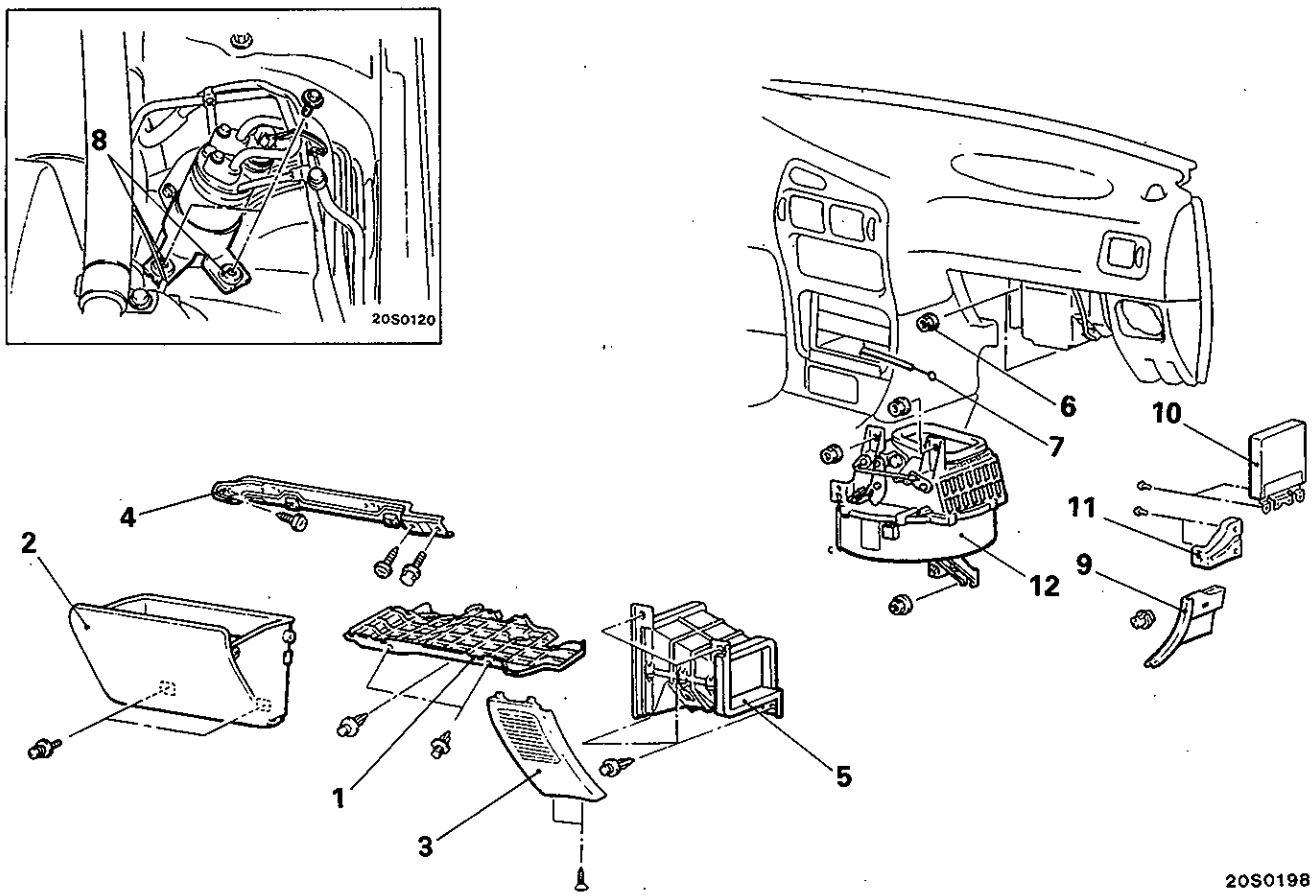
Standard value:

Measurement terminal	Standard value Ω	
	L.H.drive vehicles	R.H. drive vehicles
Between terminals 3–2	2.21	2.81
Between terminals 3–4	0.97	1.28
Between terminals 3–1	0.35	0.33

BLOWER ASSEMBLY

E55KA-B

REMOVAL AND INSTALLATION



Removal steps

1. Under cover
2. Glove box
3. Corner panel
4. Glove box flame
5. Duct <Vehicles without air conditioner>
6. Evaporator installation nut*
7. Inside/outside air changeover damper cable
8. Receiver bracket installation bolt* <R.H. drive vehicles with air conditioner>
9. Cowl side trim*
10. Engine control unit*
11. Lower bracket*
12. Blower assembly

NOTE
* : Vehicles with air conditioner

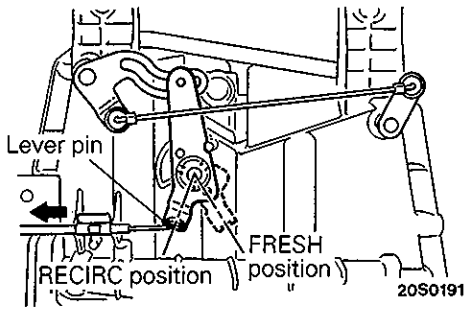
SERVICE POINTS OF REMOVAL

E55KCAQ

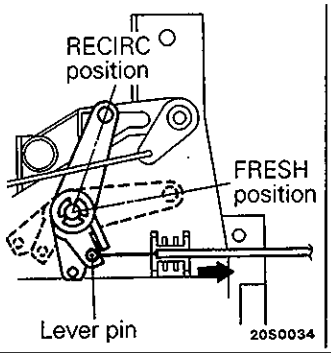
12. REMOVAL OF BLOWER ASSEMBLY <Vehicles with air conditioner>

After moving the evaporator slightly towards you, remove the blower assembly.

<L.H. drive vehicles>



<R.H. drive vehicles>



SERVICE POINTS OF INSTALLATION E55KDAH

7. CONNECTION OF INSIDE/OUTSIDE AIR CHANGEOVER DAMPER CABLE

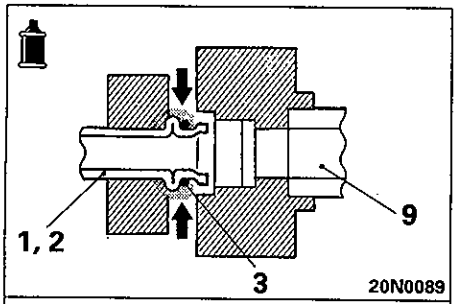
(1) Set the inside/outside air changeover lever to the RECIRC position.
(2) Set the inside/outside air changeover damper lever of the blower motor to the RECIRC position, and install the cable to the lever pin.
(3) Pull the outer cable in the direction of the arrow so that there is no looseness, and then secure it with the clip.

NOTE
After installing the cable, confirm that the damper operates correctly.

EVAPORATOR

E55JA--

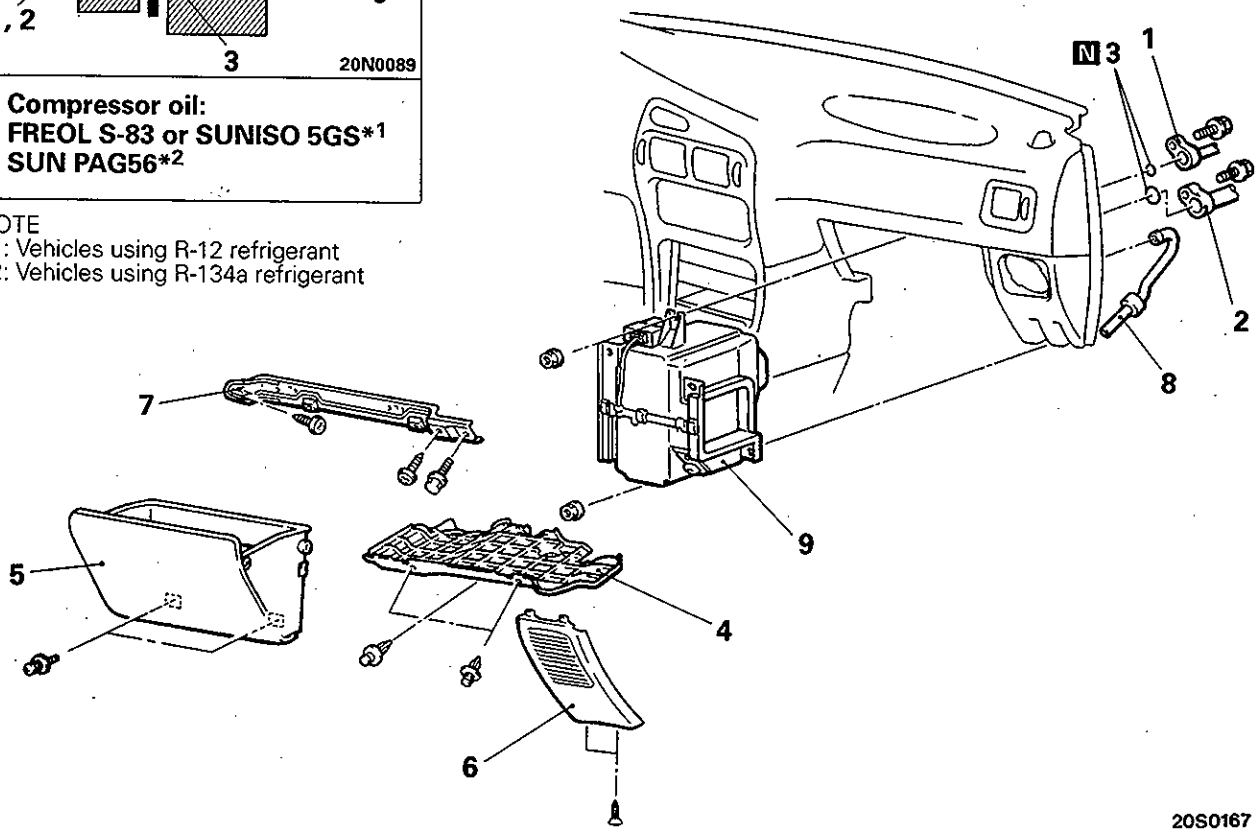
REMOVAL AND INSTALLATION



Compressor oil:
FREOL S-83 or SUNISO 5GS*1
SUN PAG56*2

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

Pre-removal and Post-installation Operation
- Discharge and Charging of Refrigerant (Refer to P.55-13.)



Removal steps
1. Discharge pipe connection
2. Suction hose connection
3. O-ring
4. Under cover
5. Glove box
6. Corner panel
7. Glove box frame
8. Drain hose
◆◆ 9. Evaporator

SERVICE POINTS OF INSTALLATION

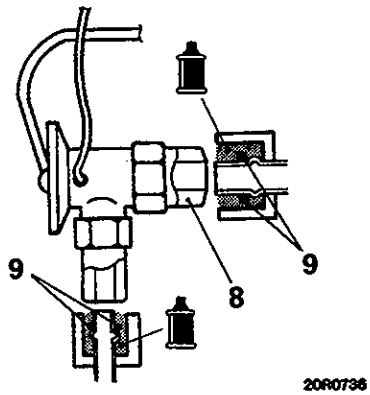
9. INSTALLATION OF EVAPORATOR

When replacing the evaporatior, refill it with a specified amount of compressor oil and install it.

<Vehicles using R-12 refrigerant>
Compressor oil: FREOL S83 or SUNISO 5GS
Quantity: 60 m ℓ (3.6 cu. in.)
<Vehicles using R-134a refrigerant>
Compressor oil: SUN PAG56
Quantity: 60 m ℓ (3.6 cu. in.)

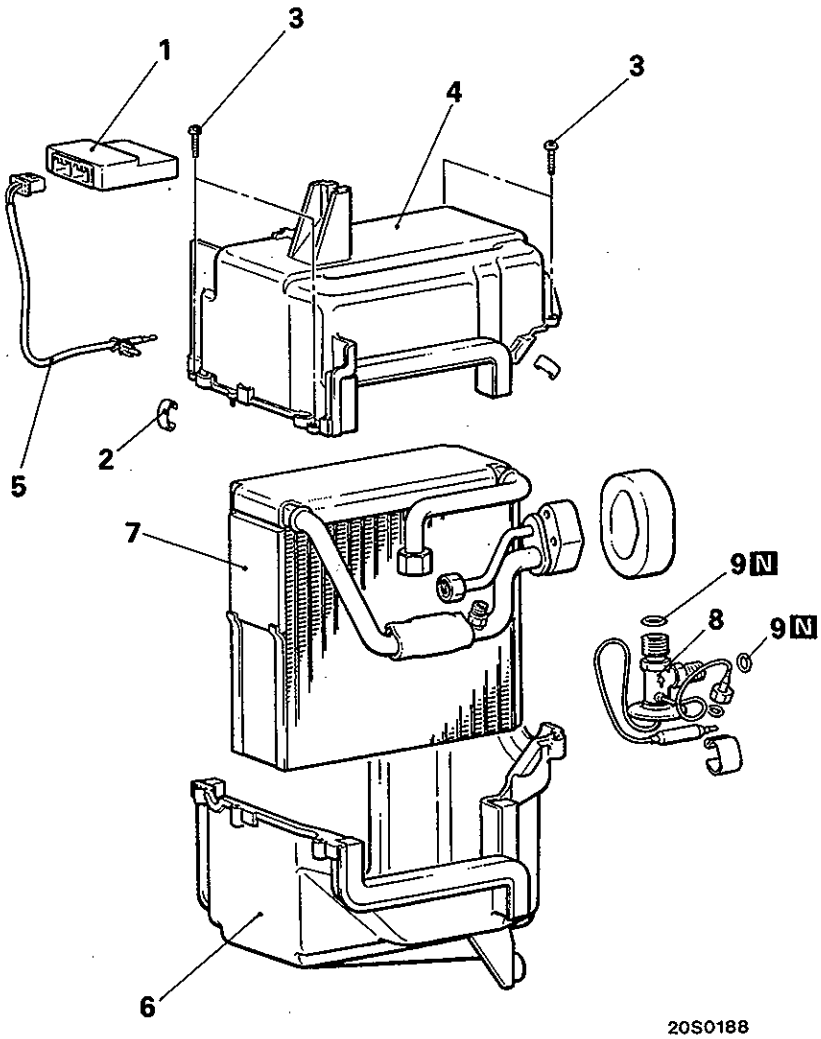
DEASSEMBLY AND REASSEMBLY

E55JC--



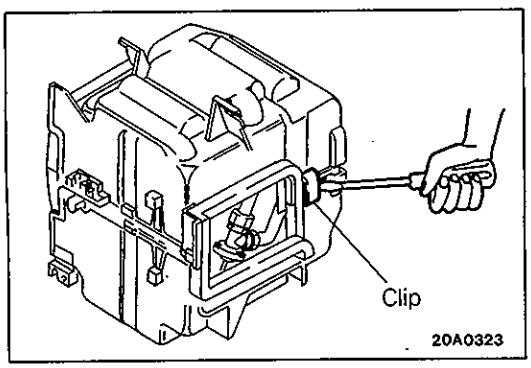
Compressor oil:
FREOL S-83 or SUNISO 5GS*1
SUN PAG56*2

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



Disassembly steps

1. Auto compressor control unit
2. Clip
3. Tapping screw
4. Evaporator case (upper)
5. Air thermo sensor
6. Evaporator case (lower)
7. Evaporator assembly
8. Expansion valve
9. O-ring

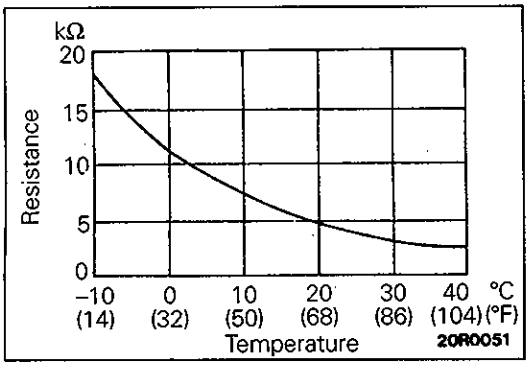


SERVICE POINTS OF DISASSEMBLY

E55JDAL

2. REMOVAL OF CLIPS

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



INSPECTION

E55JFAO

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 AND TENSION PULLEY <4G13, 4D68>

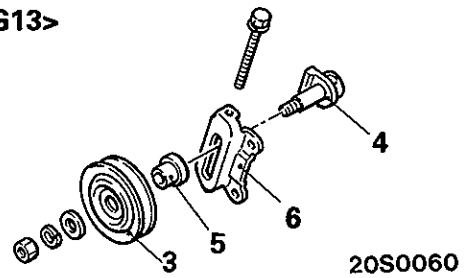
E55LA-A

REMOVAL AND INSTALLATION

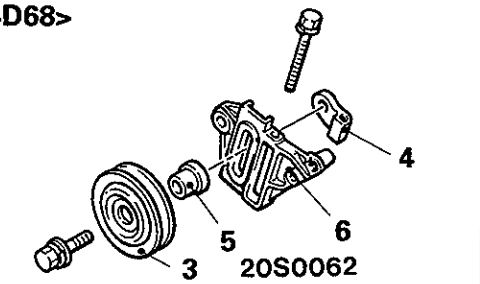
Pre-removal Operation
- Discharge of Refrigerant (Refer to P.55-13.)

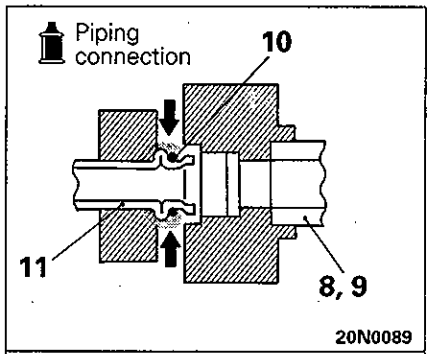
Post-installation Operation
- Adjustment of the Compressor Drive Belt (Refer to GROUP 11 – Service Adjustment Procedures.)
- Charging of Refrigerant (Refer to P.55-13.)

<4G13>



<4D68>



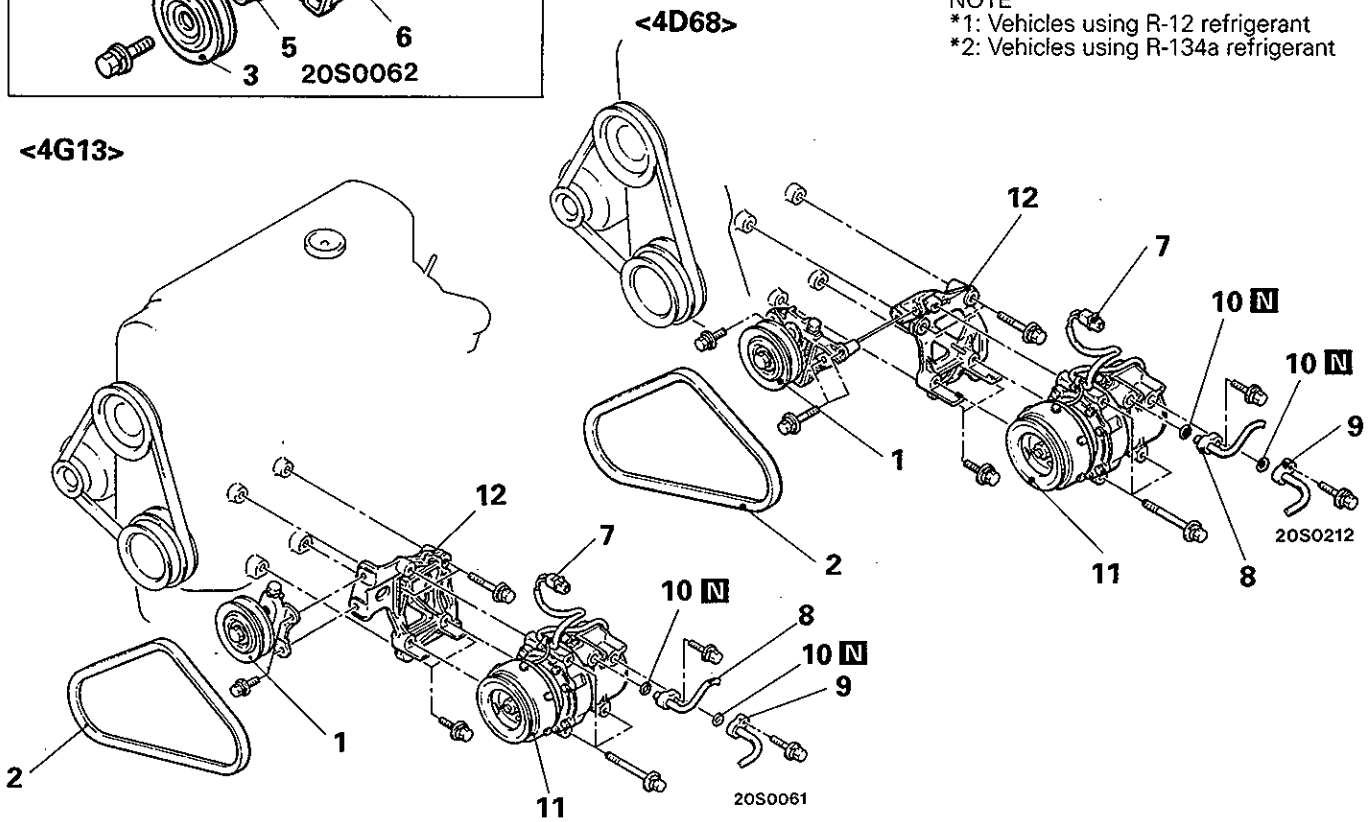


Compressor oil:
FREOL S-83 or SUNISO 5GS*1
SUN PAG56*2

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

<4G13>

<4D68>

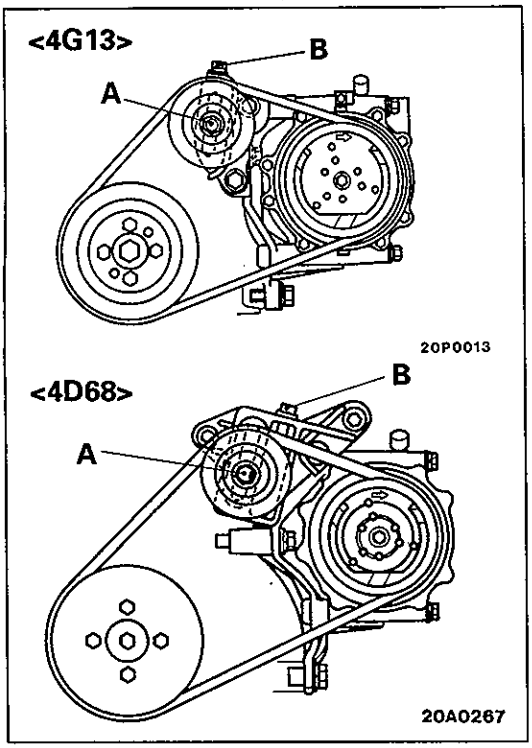


Tension pulley removal steps

1. Tension pulley assembly
2. Compressor drive belt
3. Tension pulley
4. Adjust plate
5. Collar
6. Tension pulley bracket

Compressor removal steps

1. Tension pulley assembly
2. Compressor drive belt
7. Connector
8. Suction hose
9. Discharge pipe
10. O-ring
11. Compressor
12. Compressor bracket



SERVICE POINTS OF REMOVAL E55LFAK

1. REMOVAL OF TENSION PULLEY ASSEMBLY/2. COMPRESSOR DRIVE BELT

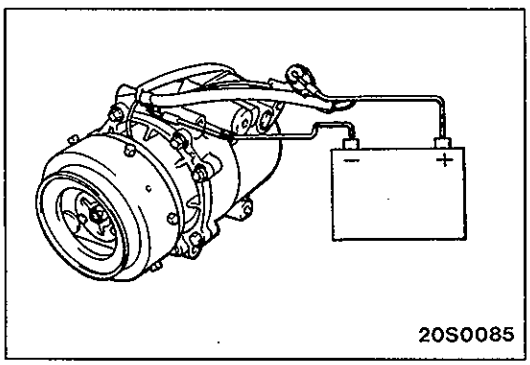
(1) Loosen nut "A" for holding the tension pulley.
(2) Loosen bolt "B" for adjustment, and remove the compressor drive belt.
(3) Remove the tension pulley assembly.

11. REMOVAL OF COMPRESSOR

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

INSPECTION E55LGAK1

- 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 compressor drive belt.
- Check for unusual wear or abrasion of the compressor drive belt.



OPERATION CHECK OF THE COMPRESSOR'S MAGNETIC CLUTCH

(1) Connect terminal 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.

SERVICE POINTS OF INSTALLATION E55LHAJ1

11. 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 m ℓ) 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

130 m ℓ (7.93 cu.in.)*1
120 m ℓ (7.3 cu.in.)*2 } – Xm ℓ = Ym ℓ

NOTE

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

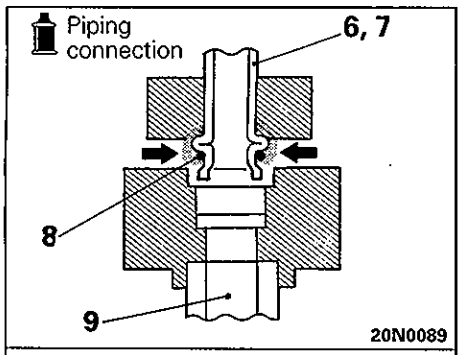
Evaporator: 60 m ℓ (3.6 cu. in.)
Condenser: 15 m ℓ (0.9 cu. in.)
Suction hose: 10 m ℓ (0.6 cu. in.)
Receiver: 10 m ℓ (0.6 cu. in.)

COMPRESSOR AND TENSION PULLEY <4G92, 4G93>

REMOVAL AND INSTALLATION

E55LA-B

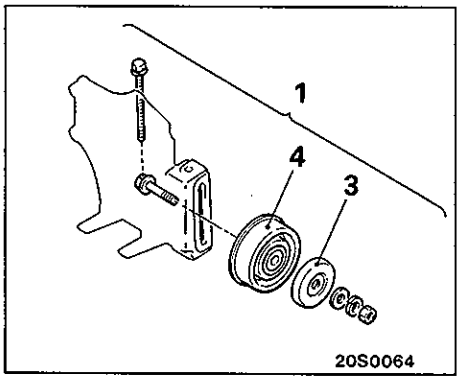
<Vehicles using R-12 refrigerant>

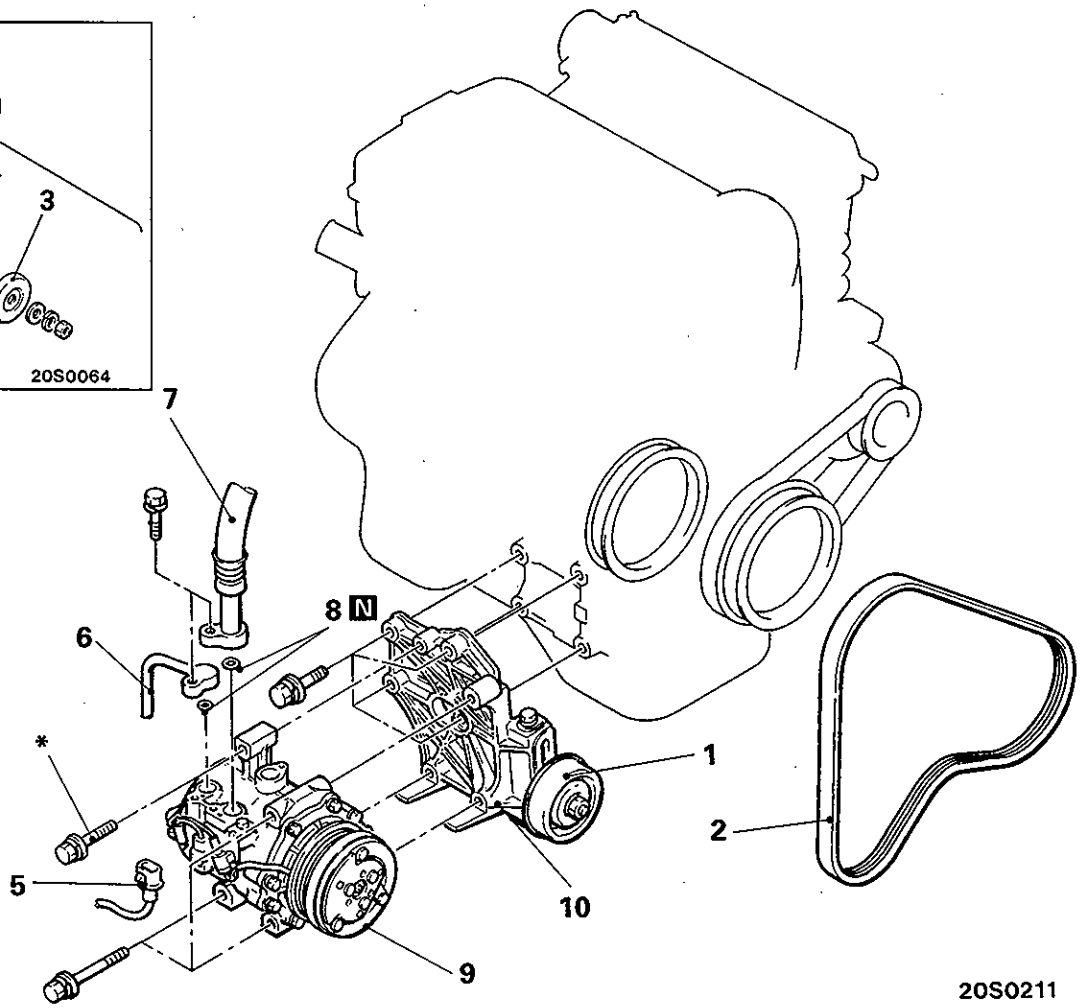


Compressor oil:
FREOL S-83 or SUNISO 5GS

Pre-removal Operation
- Discharge of Refrigerant (Refer to P.55-13.)

Post-installation Operation
- Adjustment of the Compressor Drive Belt (Refer to GROUP 11 – Service Adjustment Procedures.)
- Charging of Refrigerant (Refer to P.55-13.)





Tension pulley removal steps

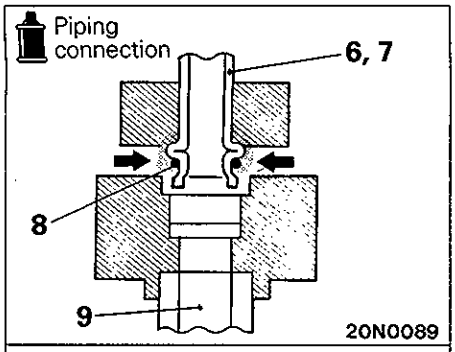
1. Tension pulley assembly
2. Compressor drive belt
3. Cover
4. Tension pulley

Compressor removal steps

1. Tension pulley assembly
2. Compressor drive belt
5. Connector
6. Discharge pipe
7. Suction hose
8. O-ring
9. Compressor
10. Compressor bracket

NOTE
The bolt indicated with * is for FX105VL.

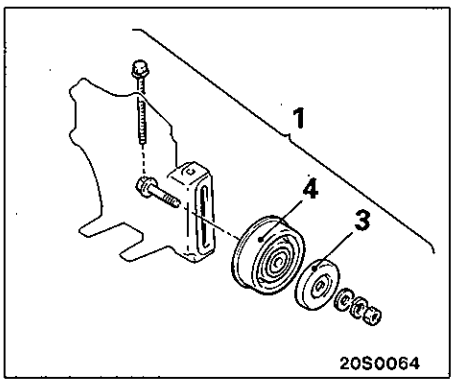
<Vehicles using R-134a refrigerant>

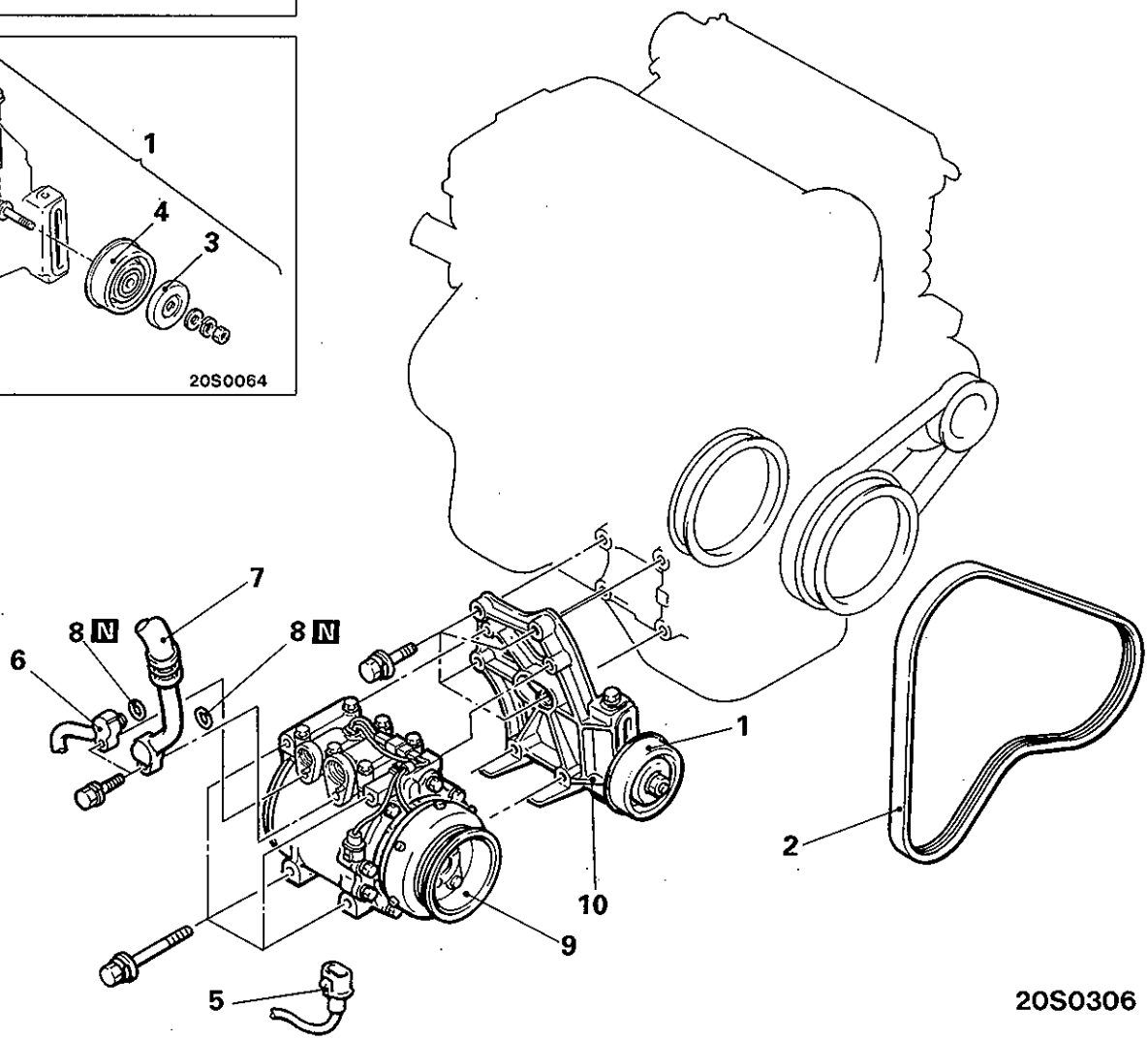


Compressor oil: SUN PAG56

Pre-removal Operation
- Discharge of Refrigerant (Refer to P.55-18-1.)

Post-installation Operation
- Adjustment of the Compressor Drive Belt (Refer to GROUP 11 – Service Adjustment Procedures.)
- Charging of Refrigerant (Refer to P.55-18-1.)





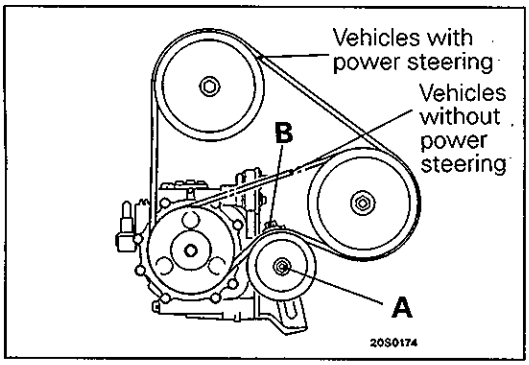
Tension pulley removal steps

1. Tension pulley assembly
2. Compressor drive belt
3. Cover
4. Tension pulley

Compressor removal steps

1. Tension pulley assembly
2. Compressor drive belt
5. Connector
6. Discharge pipe
7. Suction hose
8. O-ring
9. Compressor
10. Compressor bracket

NOTES



SERVICE POINTS OF REMOVAL

E55LFAL

1. REMOVAL OF TENSION PULLEY ASSEMBLY/2. COMPRESSOR DRIVE BELT

(1) Loosen nut "A" for holding the tension pulley.
(2) Loosen bolt "B" for adjustment.
(3) Loosen the power steering oil pump fixing bolt.
<Vehicles with power steering>
(Refer to GROUP 37 – Service Adjustment Procedures)
(4) Remove the compressor drive belt.
(5) Remove the tension pulley.

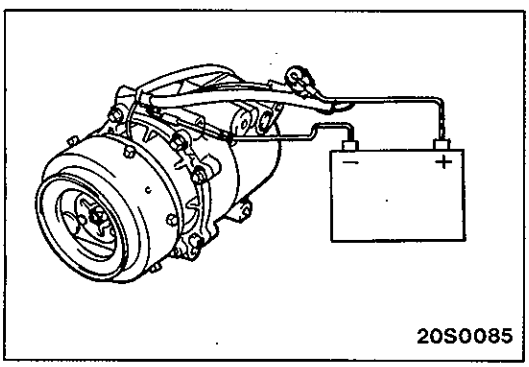
9. REMOVAL OF COMPRESSOR

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

INSPECTION

E55LGAK2

- 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 compressor drive belt.
- Check for unusual wear or abrasion of the compressor drive belt.



OPERATION CHECK OF THE COMPRESSOR'S MAGNETIC CLUTCH

(1) Connect terminal 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.

SERVICE POINTS OF INSTALLATION E55LHAJ2

9. 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 m ℓ) 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

130 m ℓ (7.93 cu.in.)*1
120 m ℓ (7.3 cu.in.)*2
} – Xm ℓ = Ym ℓ

NOTE

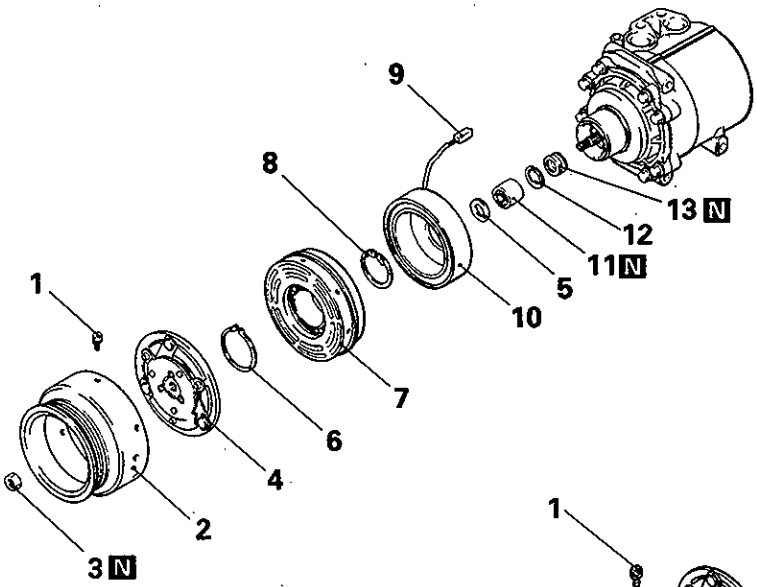
(1) *1: Vehicles using R-12 refrigerant
(2) *2: Vehicles using R-134a refrigerant
(3) Y m ℓ indicates the amount of oil in the refrigerant line, the condenser, the evaporator, etc.
(4) When replacing the following parts at the same time as the compressor, subtract the rated oil amount of the each part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

Evaporator: 60 m ℓ (3.6 cu. in.)
Condenser: 15 m ℓ (0.9 cu. in.)
Suction hose: 10 m ℓ (0.6 cu. in.)
Receiver: 10 m ℓ (0.6 cu. in.)

DISASSEMBLY AND REASSEMBLY

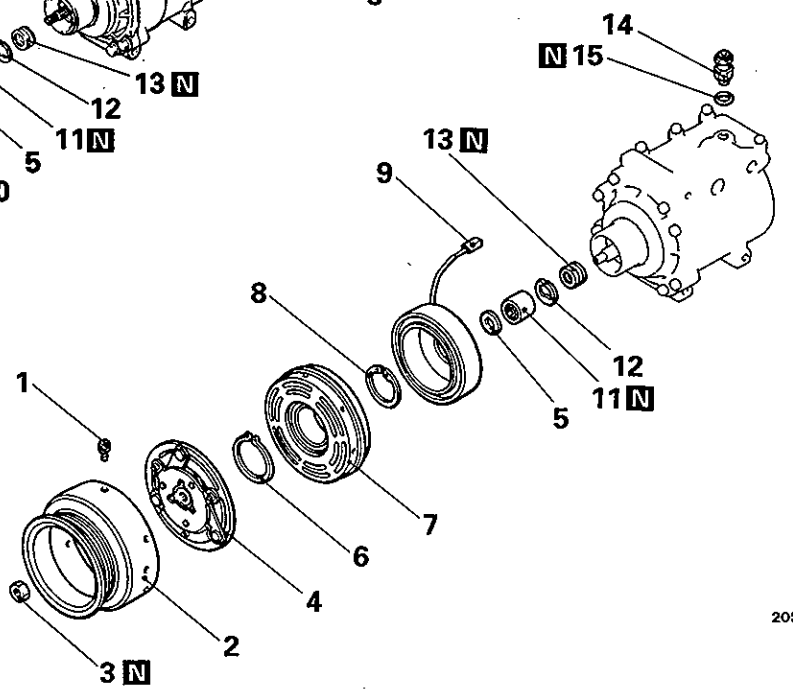
E55LB--

<Vehicles using R-12 refrigerant>

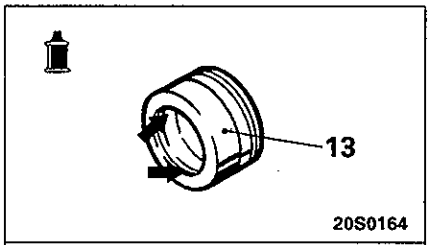


20S0178

<Vehicles using R-134a refrigerant>



20S0310



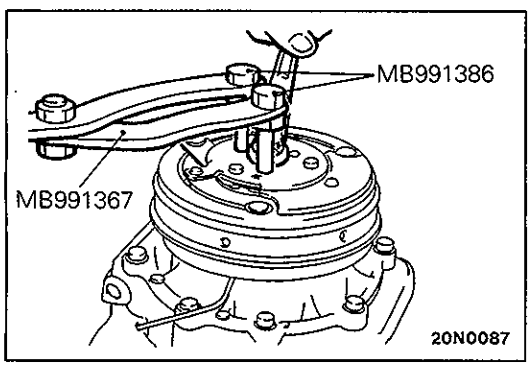
20S0164

Compressor oil:
FREOL S-83 or SUNISO 5GS,*1
SUN PAG56*2

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

Disassembly steps

1. Bolts
2. Pulley
   - ● Air gap adjustment
3. Nut
4. Armature plate
5. Shims
6. Snap ring
7. Rotor
8. Snap ring
9. Harness
10. Clutch coil
11. Bearing
12. Snap ring
13. Lip seal
14. High pressure relief valve*2 <4G13, 4D68>
15. O-ring*2 <4G13, 4D68>

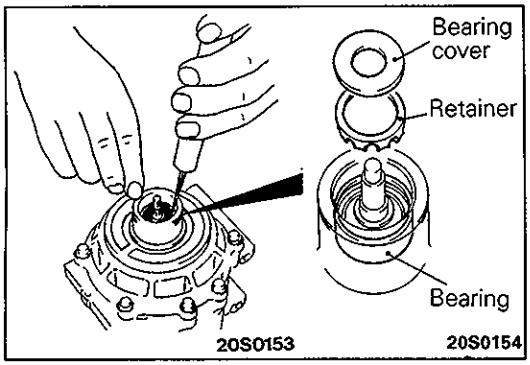


20N0087

SERVICE POINTS OF DISASSEMBLY

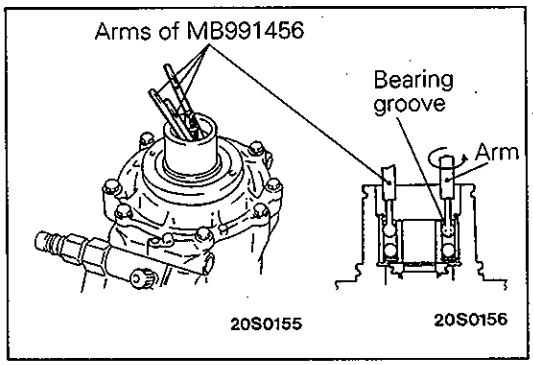
E55LCAM

3. REMOVAL OF NUT

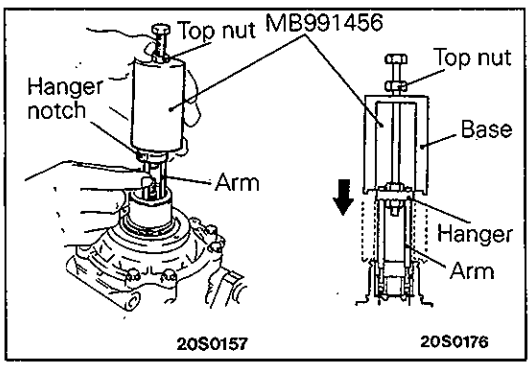


11. REMOVAL OF BEARING

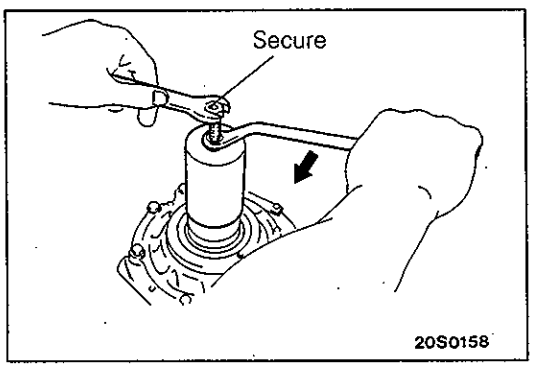
(1) Use a pointed tool such as an awl to remove the bearing cover and retainer.



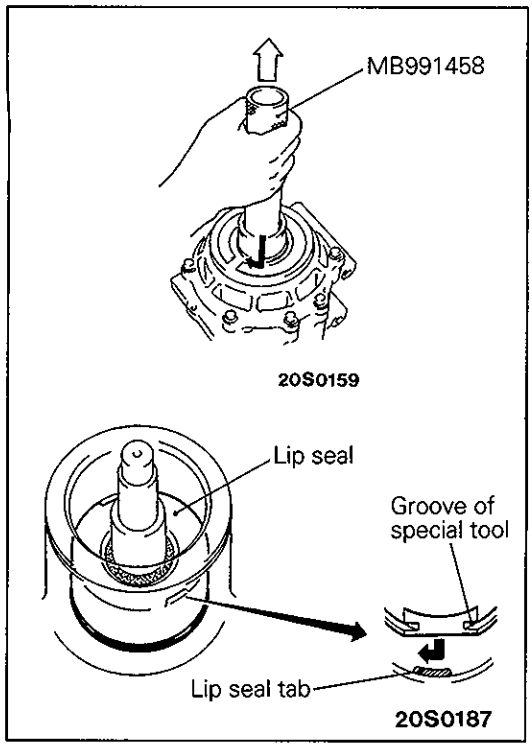
(2) Insert the arms (3) of the special tool into the bearing groove at regular intervals
(3) Turn the arms 90° to secure the arms to the bearing.



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



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



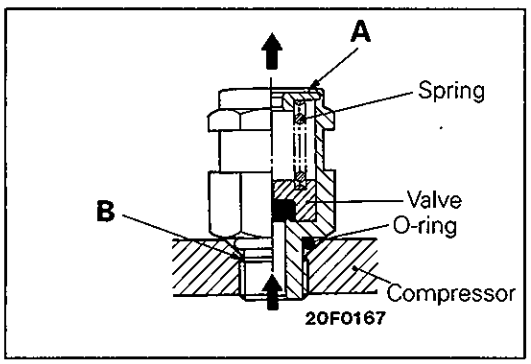
13. REMOVAL OF LIP SEAL

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

INSPECTION

E55LDAF

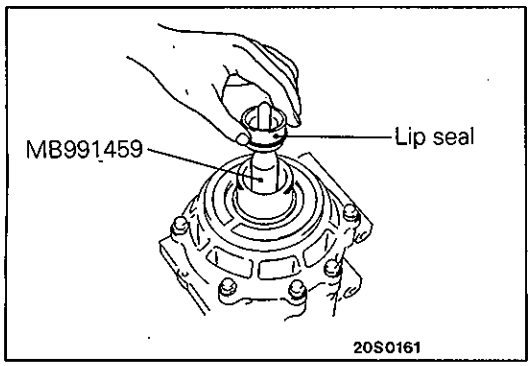
- Check the surface of the armature for scoring or bluing.
- Check the surface of the rotor for scoring or bluing.
- Check the sealing surfaces for cracks, scratches and deformation.
- Check the front housing for cracks or scoring on the sealing surfaces.
- Check the compressor shaft for scoring.



HIGH PRESSURE RELIEF VALVE CHECK <Vehicles using R-134a refrigerant>

The high pressure relief valve is a safety feature which releases part of the refrigerant inside the system into the atmosphere when the high pressure level exceeds 3,740 kPa (38.1 kg/cm^2 532 psi) during air conditioning operation.
Once the pressure inside the system has been reduced to 2,940 kPa (30.0 kg/cm^2 418 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 a 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 O-ring.

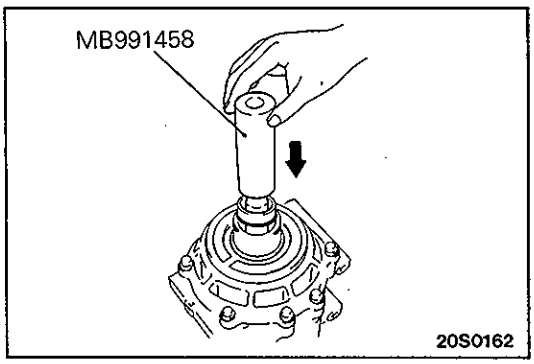


SERVICE POINTS OF REASSEMBLY E55LEAM

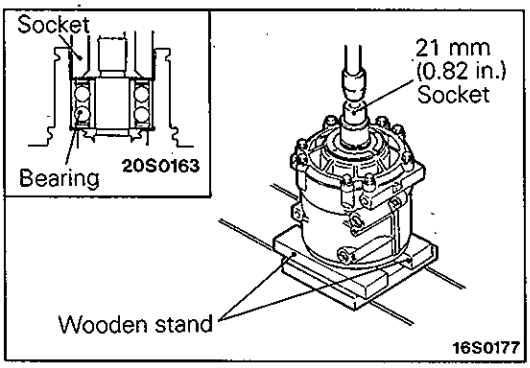
13. INSTALLATION OF LIP SEAL

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

Compressor oil: FREOL S-83 or SUNISO 5GS <R-12>
SUN PAG56 <R-134a>

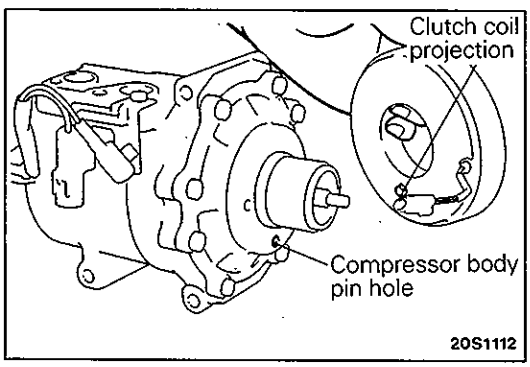


(3) Use the special tool to insert the lip seal.



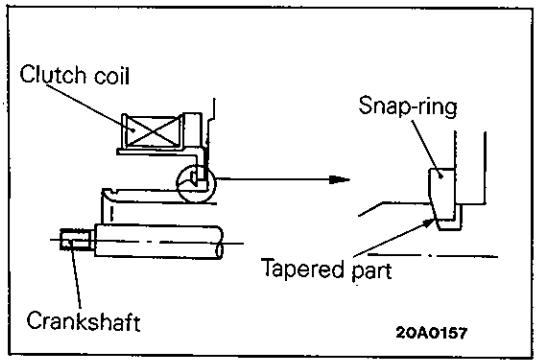
11. INSTALLATION OF BEARING

Use a wooden stand and a 21 mm (0.82in.) socket to insert the bearing into the compressor.



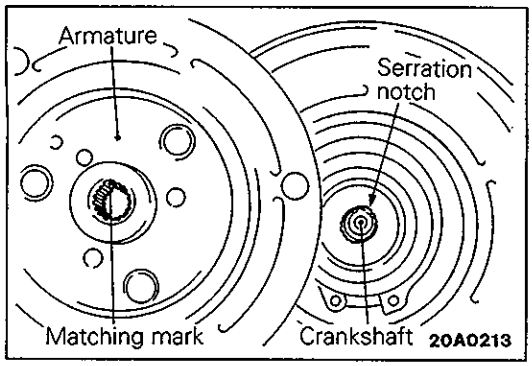
10. INSTALLATION OF CLUTCH COIL

When installing the clutch coil to the air-conditioner compressor body, install so that the pin hole of the air-conditioner compressor body and the clutch coil projection are aligned.



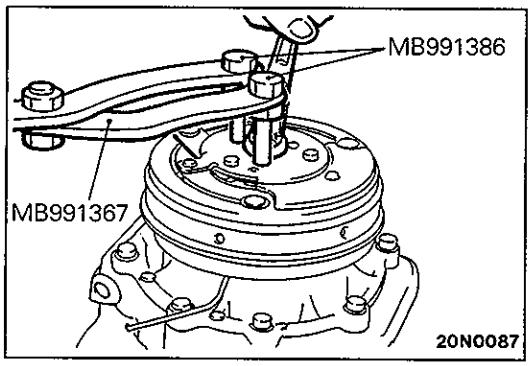
8. INSTALLATION OF SNAP RING

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

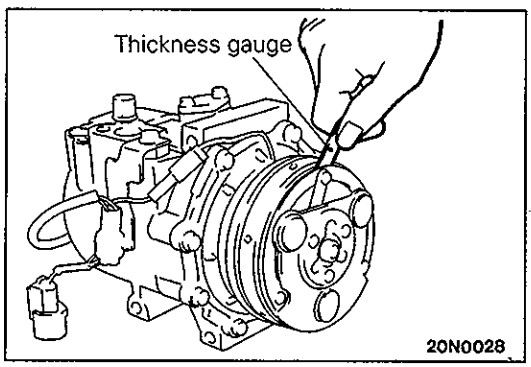


4. INSTALLATION OF ARMATURE PLATE

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



3. INSTALLATION OF NUT



- **AIR GAP ADJUSTMENT**

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

Standard value: **0.4–0.65 mm (0.02–0.03 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.

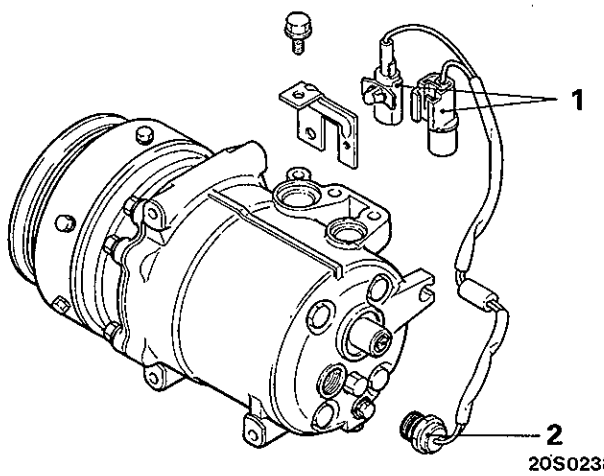
NOTES

REFRIGERANT-TEMPERATURE SWITCH <WAGON, 6B models>

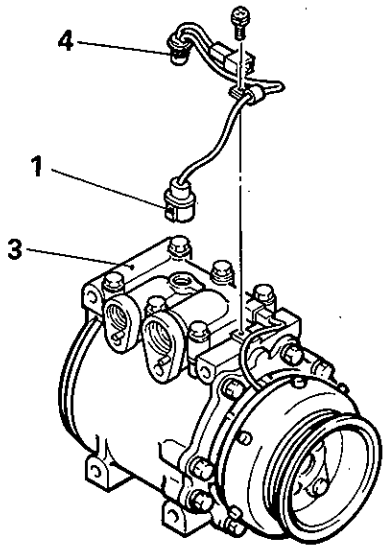
E55LJ--

REMOVAL AND INSTALLATION

<Vehicles using R-12 refrigerant>

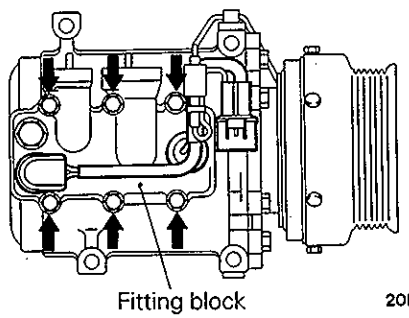


<Vehicles using R-134a refrigerant>



Removal steps

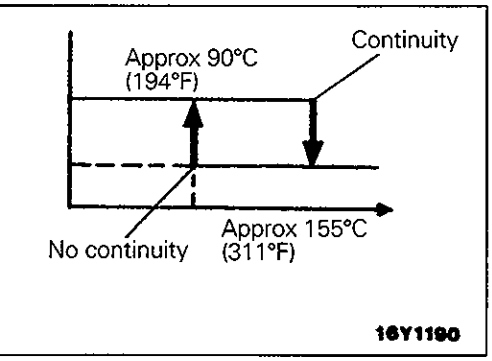
1. Connector
2. Refrigerant-temperature switch
3. Fitting block
4. Refrigerant-temperature switch



SERVICE POINTS OF REMOVAL

4. REMOVAL OF REFRIGERANT-TEMPERATURE SWITCH

(1) Remove the fitting block.
(2) Remove the snap ring from the inside fitting block.
(3) Remove the refrigerant-temperature switch.



INSPECTION

E55LKAB

REFRIGERANT-TEMPERATURE SWITCH CHECK

(1) Immerse the refrigerant-temperature switch in engine oil.
(2) Use a circuit tester to confirm the continuity condition when the engine oil has become heated.

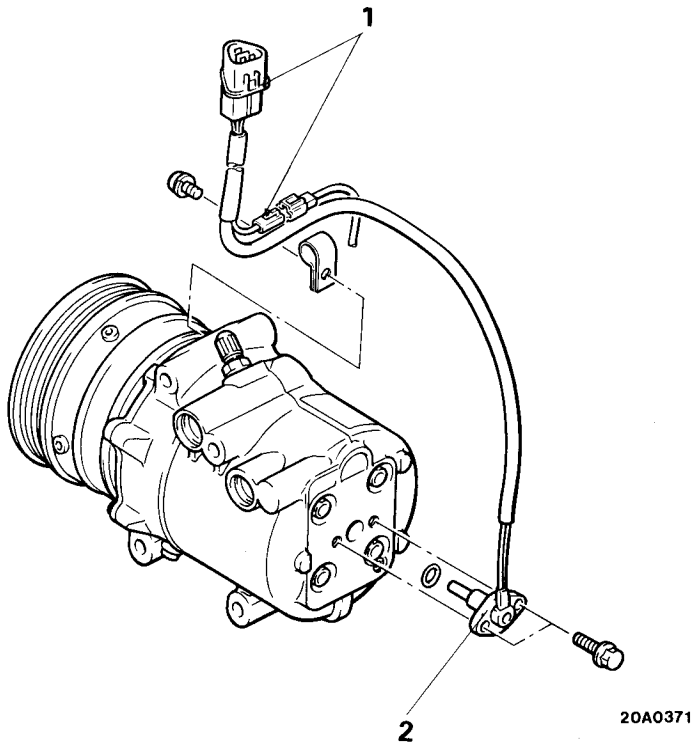
Standard value:

Item	Temperature
Continuity	Less than approx. 155°C (311°F)
No continuity	Approx. 155°C (311°F) or more [until the temperature drops to approx. 90°C (194°F) when OFF]

Caution
Do not heat the oil more than necessary.

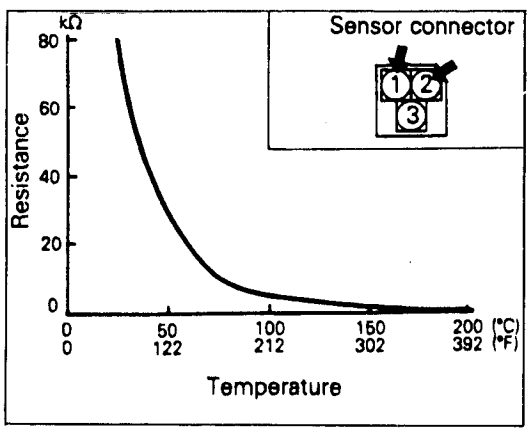
REFRIGERANT-TEMPERATURE SENSOR <HATCHBACK, SEDAN> E55LJ--

REMOVAL AND INSTALLATION



Removal steps

1. Connector
2. Refrigerant-temperature sensor



INSPECTION E55LKAA

- **REFRIGERANT-TEMPERATURE SENSOR CHECK**
  (1) Immerse the regrigerant-temperature sensor in engine oil.
  (2) Heat the engine oil; the resistance value must approximately satisfy the resistance value indicated in the illustration when the resistance value is measured at two places or more between the terminals of the sensor (in the heated condition).

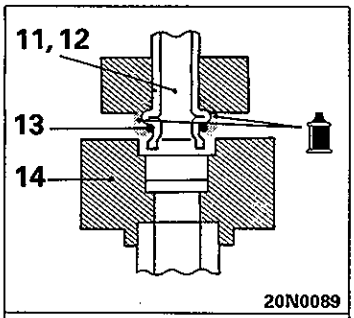
  NOTE
  The temperature condition during heating for checking must not exceed the range indicated in the characteristics diagram.

CONDENSER AND CONDENSER FAN MOTOR

E55NA--

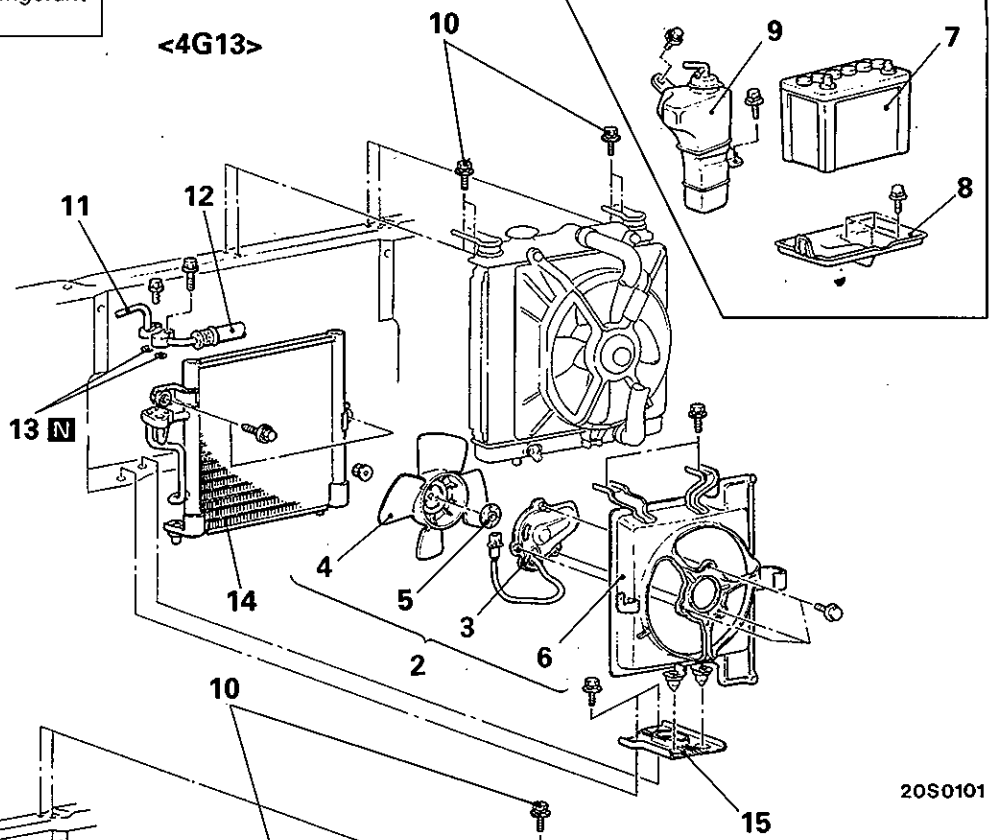
REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
- Discharge and Charging of Refrigerant (Refer to P.55-13.)

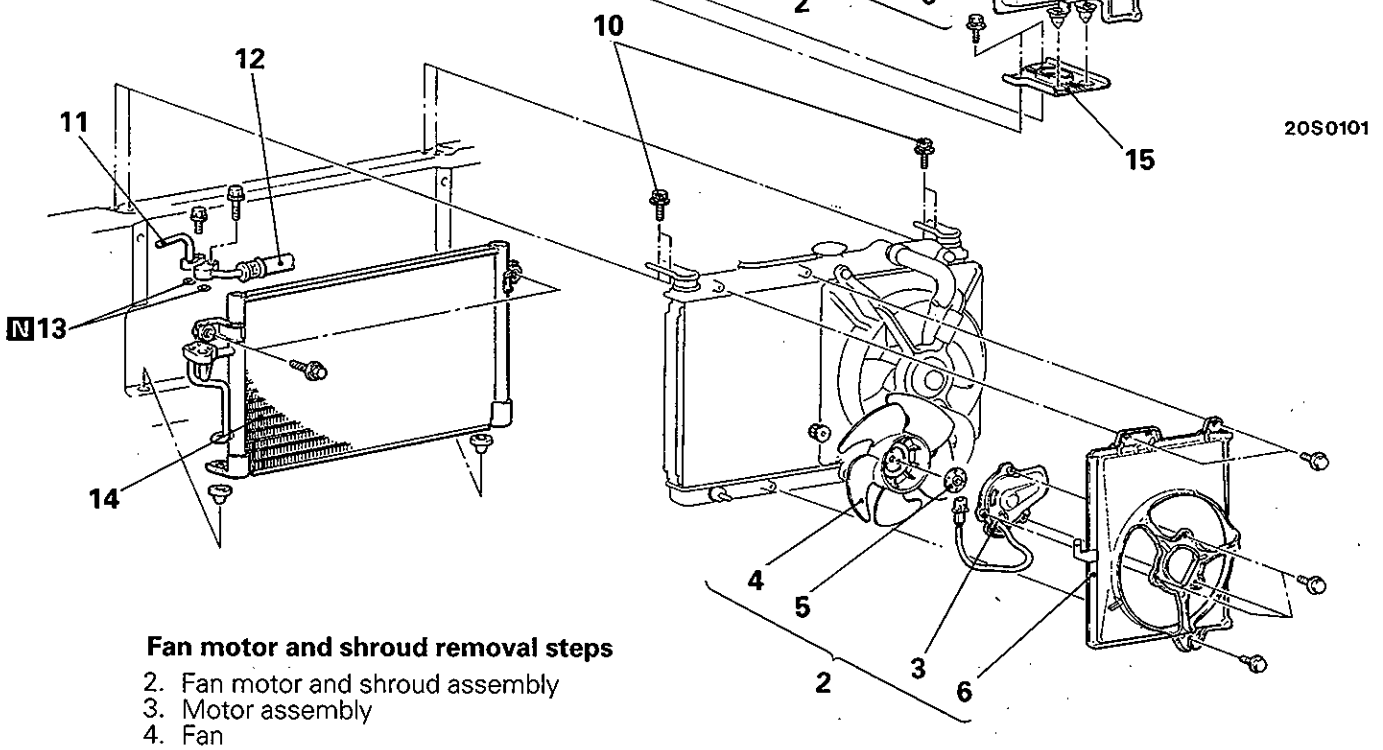


Compressor oil:
FREOL S-83 or SUNISO 5GS*1
SUN PAG56*2

<4G13>



<4G92, 4G93>



20S0101

20S0186

Fan motor and shroud removal steps
2. Fan motor and shroud assembly
3. Motor assembly
4. Fan
5. Spacer
6. Fan shroud

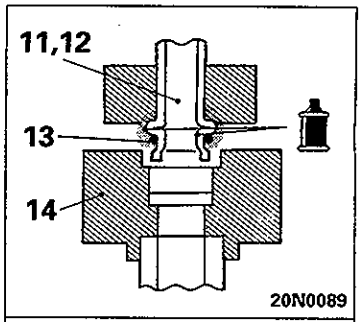
Condenser removal steps
2. Fan motor and shroud assembly
7. Battery
8. Battery tray
9. Reserve tank
10. Upper insulator installation bolt
11. Discharge pipe A
12. Discharge hose connection
13. O-ring
14. Condenser
15. Bracket

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

REMOVAL AND INSTALLATION

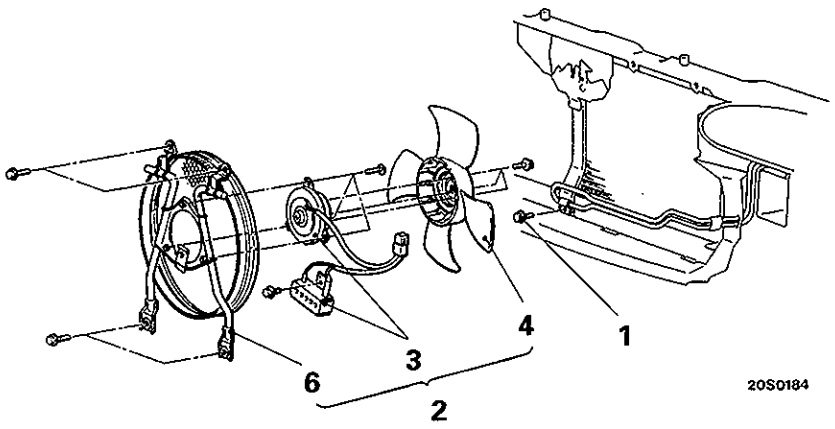
<4D68>

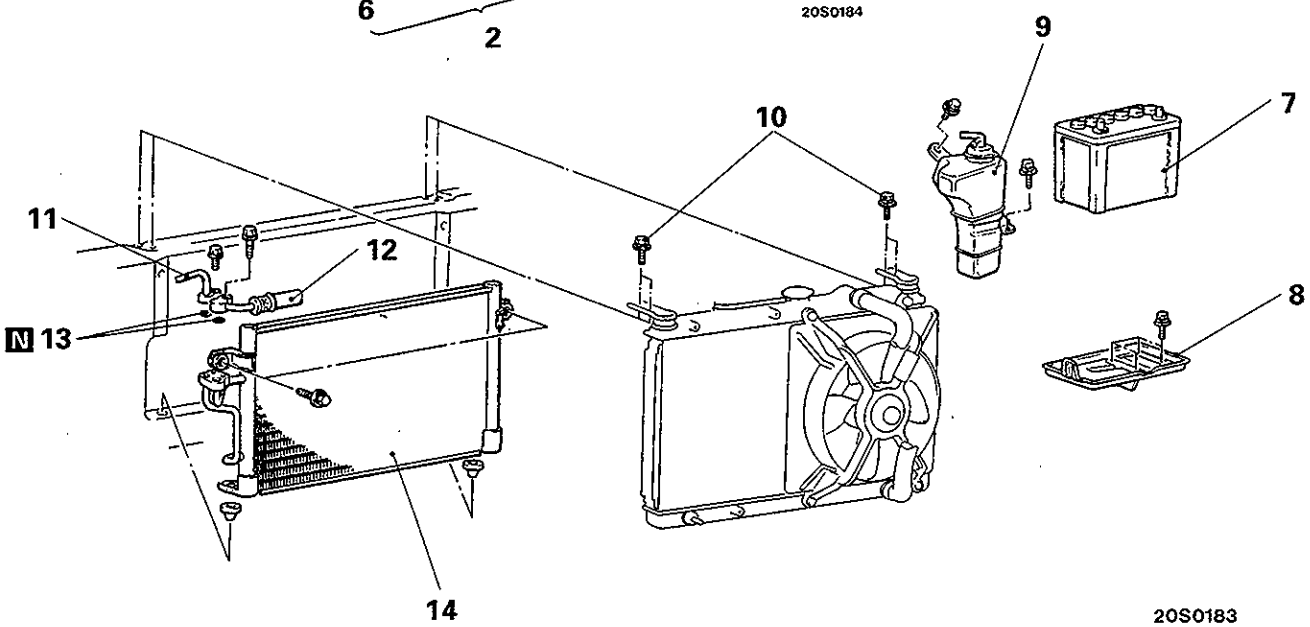
Pre-removal and Post-installation Operation
- Discharge and Charging of Refrigerant (Refer to P.55-13.)



Compressor oil:
FREOL S-83 or SUNISO 5GS*1
SUN PAG56*2

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



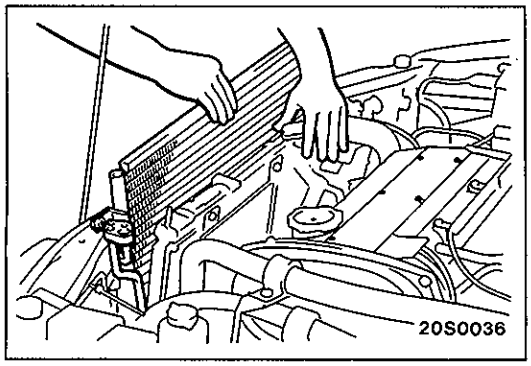


Fan motor and shroud removal steps
- Radiator grille and front bumper (Refer to GROUP 51– Radiator Grille and Front Bumper)

1. Power steering oil cooler tube mounting bolt
2. Fan motor and shroud assembly
3. Motor assembly
4. Fan
6. Fan shroud

Condenser removal steps

7. Battery
8. Battery tray
9. Reserve tank
10. Upper insulator installation bolt
11. Discharge pipe A
12. Discharge hose connection
13. O-ring
14. Condenser



SERVICE POINTS OF REMOVAL

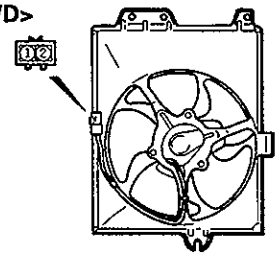
E55NBAR

14. REMOVAL OF CONDENSER

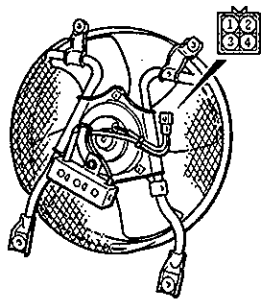
Slide the radiator toward the engine and lift up the condenser to remove it.

Petrol-powered vehicles

<2WD>



Diesel-powered vehicles



INSPECTION

E55NEAI

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 (1) <Petrol-powered vehicles–2WD> or (4) <Diesel-powered vehicles> has been earthed.

RESISTOR CHECK <Diesel-powered vehicles>

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)	0.29

SERVICE POINTS OF INSTALLATION

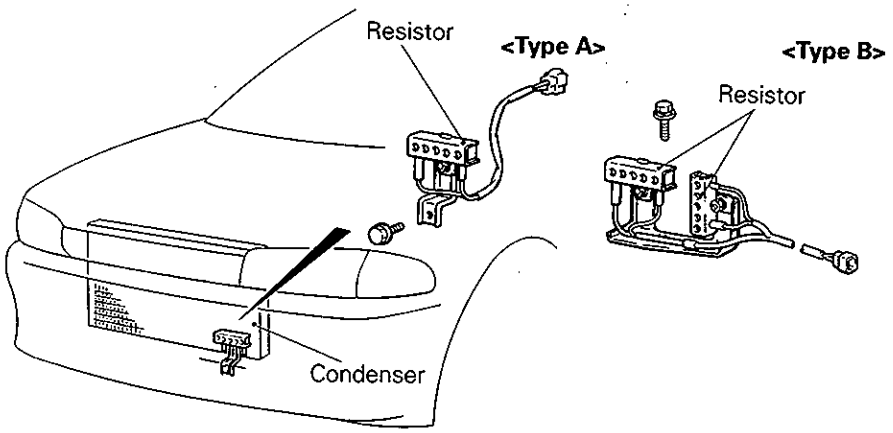
14. INSTALLATION OF CONDENSER

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

<Vehicles using R-12 refrigerant>
Compressor oil: FREOL S83 or SUNISO 5GS
Quantity: 15 m ℓ (0.9 cu. in.)
<Vehicles using R-134a refrigerant>
Compressor oil: SUN PAG56
Quantity: 15 m ℓ (0.9 cu. in.)

RESISTOR <WAGON–4WD, 6B models>

REMOVAL AND INSTALLATION



20S0261

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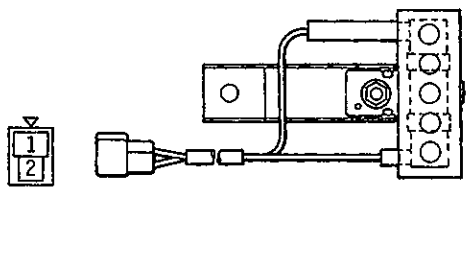

20S0242

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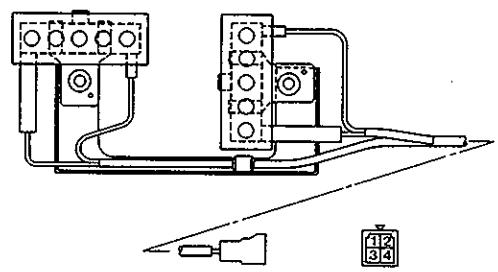


20S0250

INSPECTION

E55NEAI

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

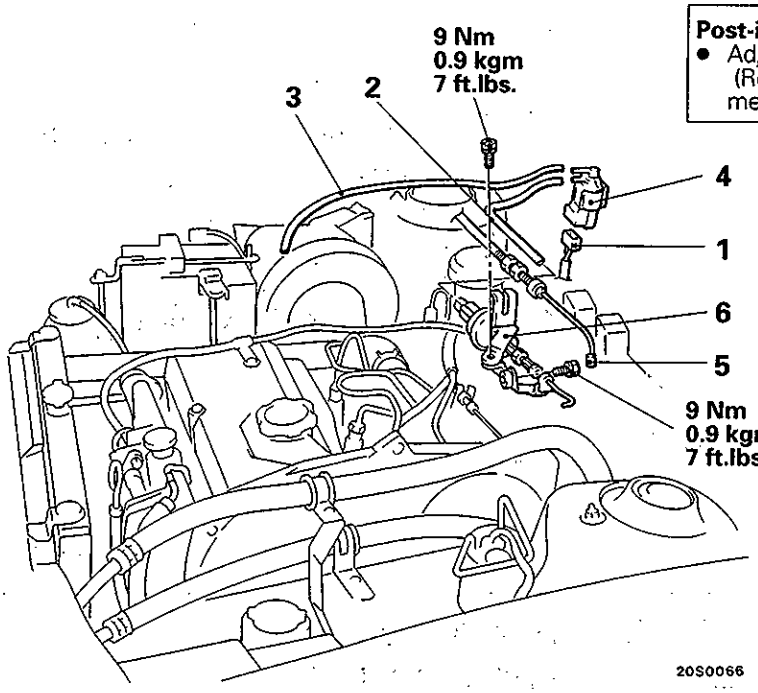
Measurement terminal	Standard value Ω
Between terminals (1)–(2)	0.29
Between terminals (1)–(3), (2)–(4)	0.45

IDLE-UP SYSTEM <4D68>

REMOVAL AND INSTALLATION

E55ZC--

Post-installation Operation
- Adjusting the Accelerator Cable. (Refer to GROUP 13 – Service Adjustment Procedures)



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

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.55-23-1, Service Adjustment Procedures.

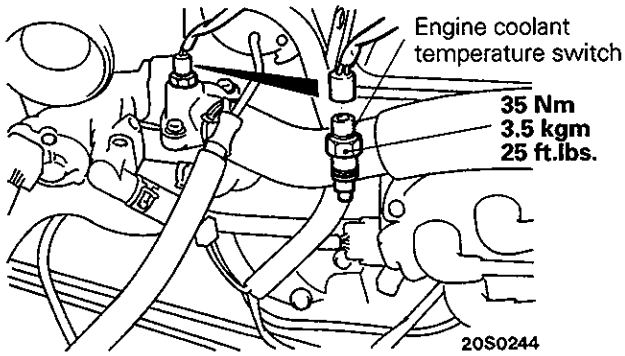
ENGINE COOLANT TEMPERATURE SWITCH

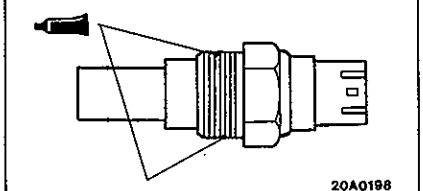
REMOVAL AND INSTALLATION

E55HA--

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

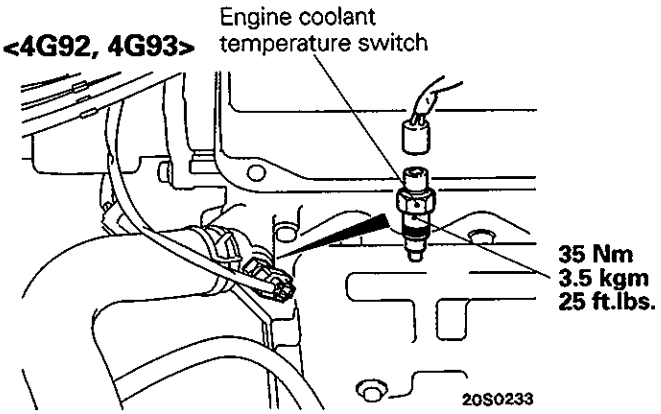
<4G13>





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

<4G92, 4G93>



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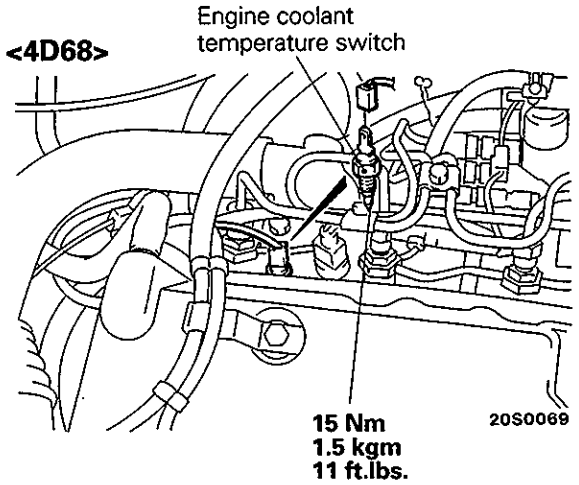
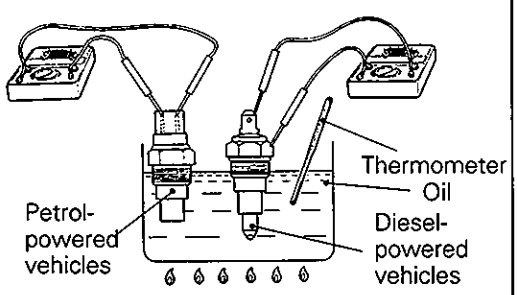
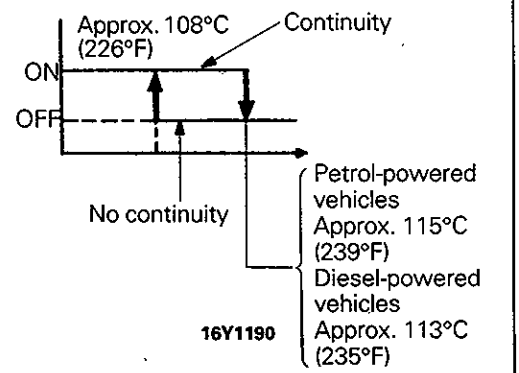






INSPECTION

E55HCAT

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		Temperature
Petrol-powered vehicles	Continuity	Approx. 115°C (239°F) or less
	No continuity	Approx. 115°C (239°F) or more [Until temperature drops to 108°C (226°F) when engine coolant temperature switch is OFF
Diesel-powered vehicles	Continuity	Approx. 113°C (235°F) or less
	No continuity	Approx. 113°C (235°F) or more [Until temperature drops to 108°C (226°F) when engine coolant temperature switch is OFF

ADDED

NOTES

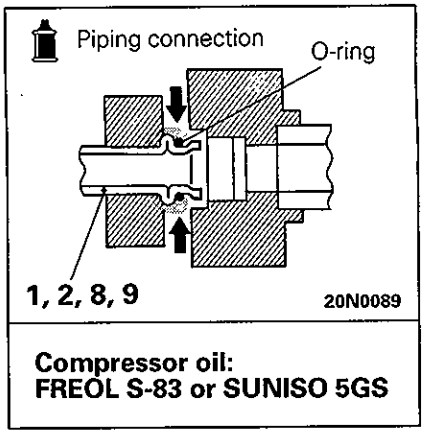
REFRIGERANT LINE

REMOVAL AND INSTALLATION <L.H. DRIVE VEHICLES>

E55ZE-A

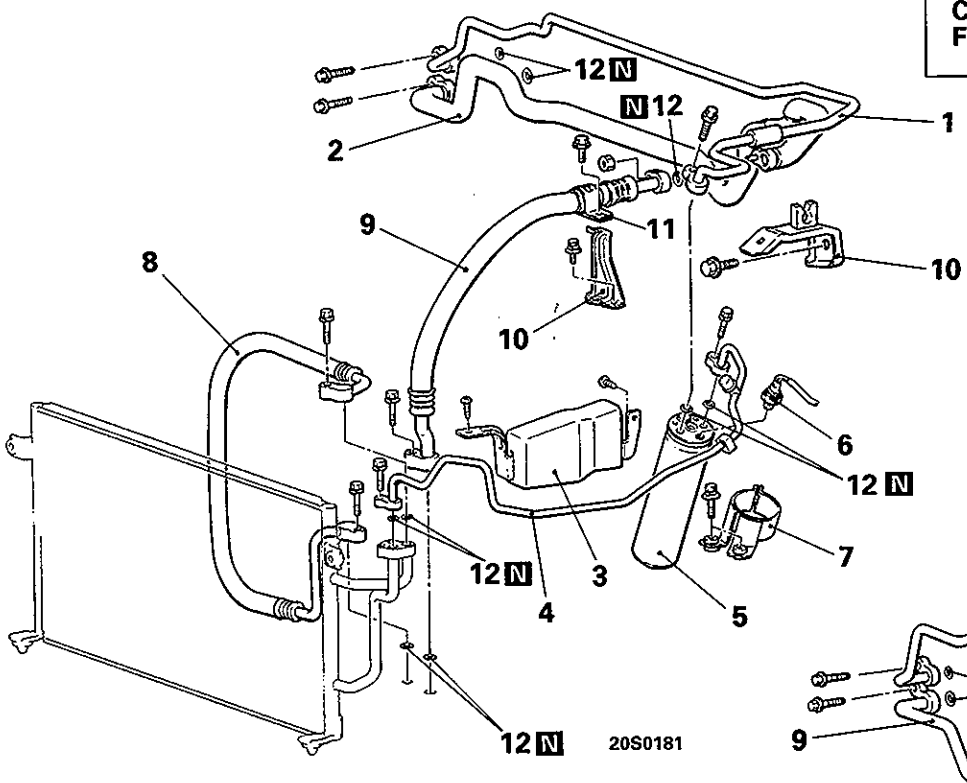
<Vehicles using R-12 refrigerant>

Pre-removal and Post-installation Operation
- Discharge and Charging of Refrigerant (Refer to P.55-13.)
- Windshield Washer Tank Removal and Installation (Refer to GROUP 51 – Windshield Wiper and Washer.)



Compressor oil:
FREOL S-83 or SUNISO 5GS

<4G92, 4G93>



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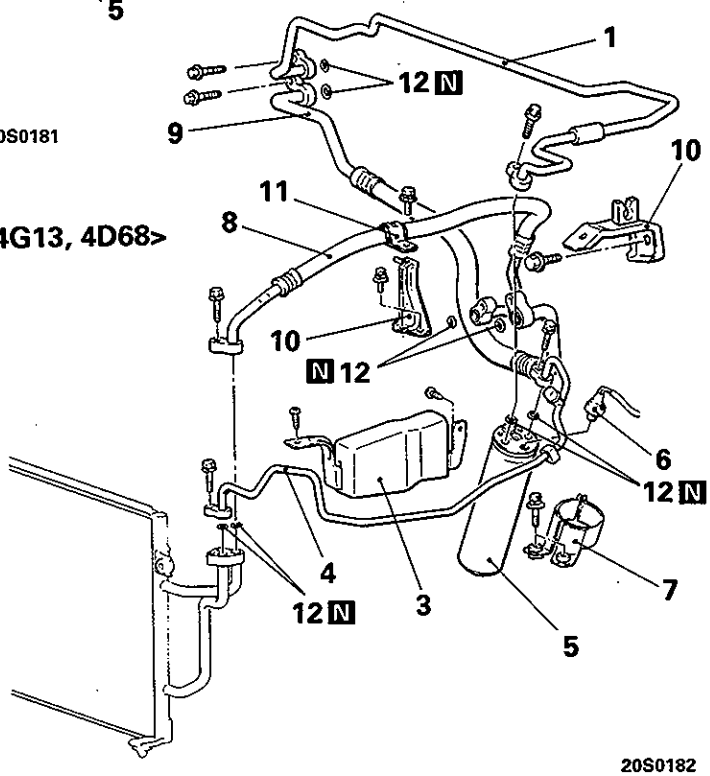
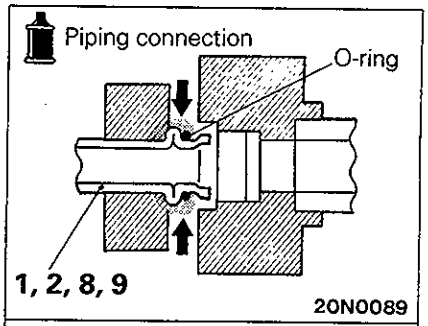


Removal steps
1. Discharge pipe B
2. ◆◆ Suction pipe
3. Relay Box
4. Discharge pipe A
5. ◆◆ Receiver assembly
6. Dual pressure switch or triple pressure switch
7. Receiver bracket
8. Discharge hose
9. ◆◆ Suction hose
10. Bracket
11. Clamp
12. O-ring

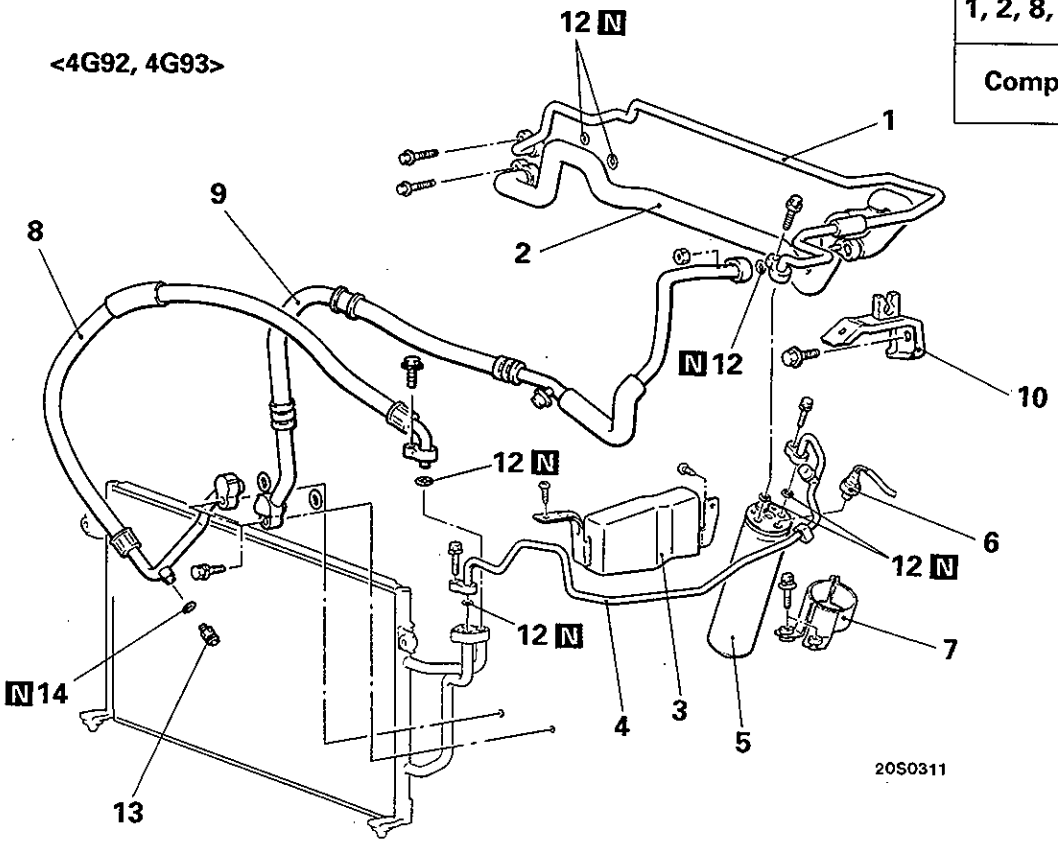
<Vehicles using R-134a refrigerant>

Pre-removal and Post-installation Operation
- Discharge and Charging of Refrigerant (Refer to P.55-18-1.)
- Windshield Washer Tank Removal and Installation (Refer to GROUP 51 – Windshield Wiper and Washer.)



Compressor oil: SUN PAG56

<4G92, 4G93>



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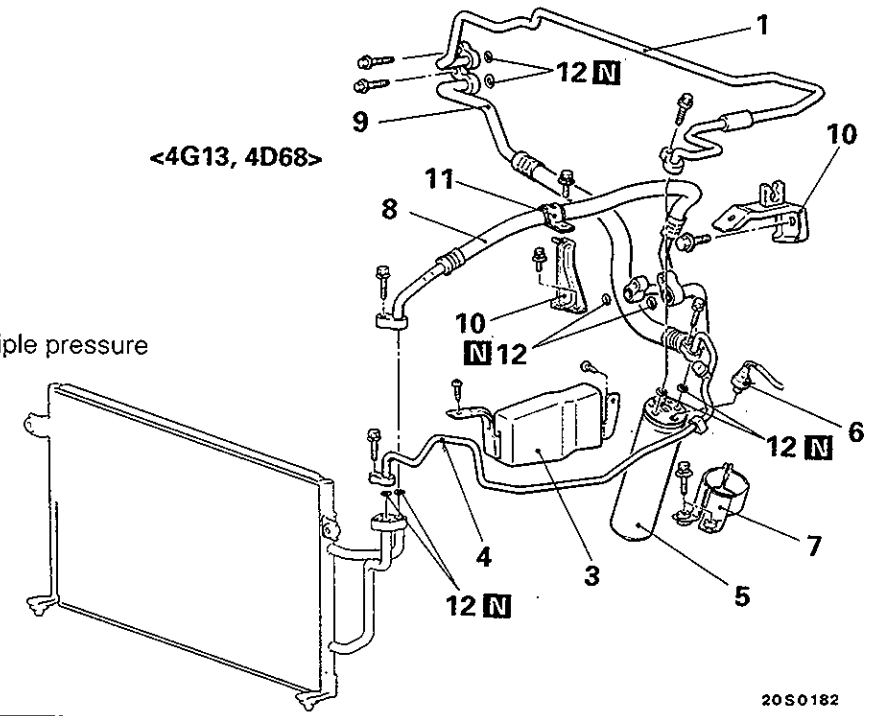


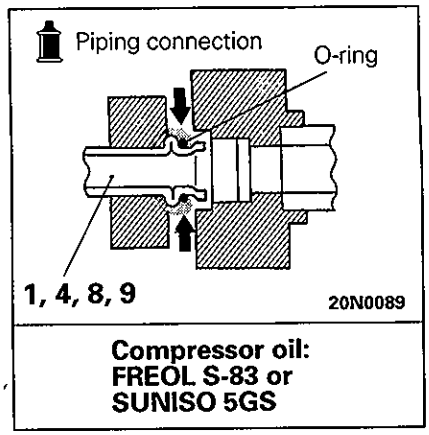
Removal steps
1. Discharge pipe B
2. ◆◆ Suction pipe
3. Relay Box
4. Discharge pipe A
5. ◆◆ Receiver assembly
6. Dual pressure switch or triple pressure switch
7. Receiver bracket
8. Discharge hose
9. ◆◆ Suction hose
10. Bracket
11. Clamp
12. O-ring
13. High pressure relief valve
14. O-ring

REMOVAL AND INSTALLATION <R.H. DRIVE VEHICLES>

E55ZE-B

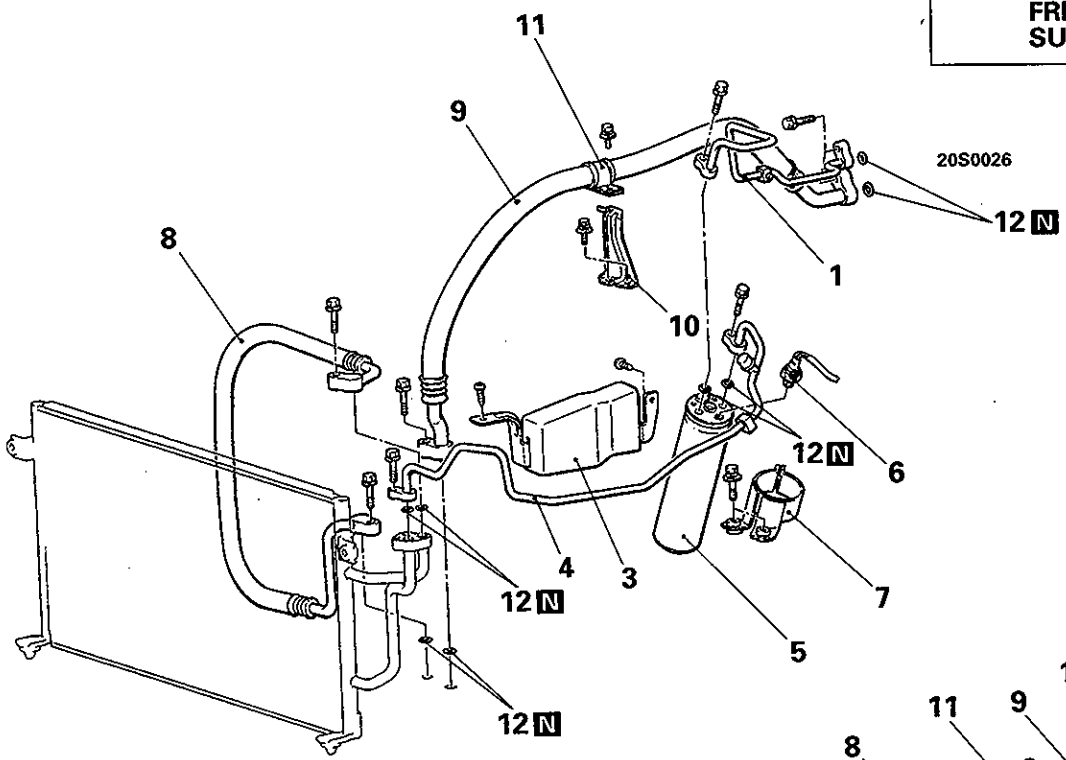
<Vehicles using R-12 refrigerant>

Pre-removal and Post-installation Operation
- Discharge and Charging of Refrigerant (Refer to P.55-13.)



Compressor oil: FREOL S-83 or SUNISO 5GS

<4G92, 4G93>



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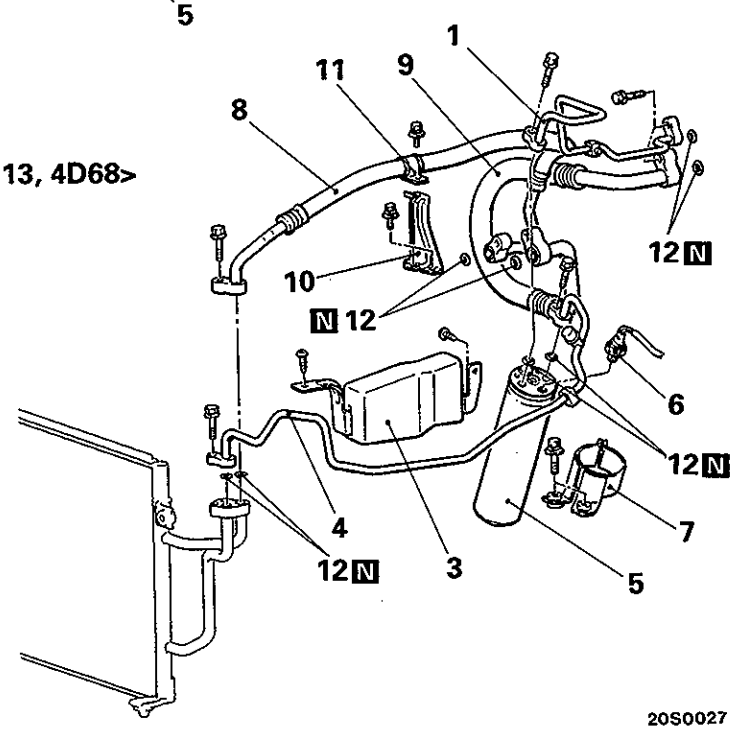


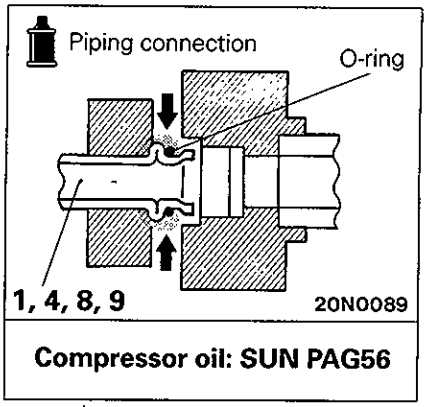
Removal steps

1. Discharge pipe B
3. Relay box
4. Discharge pipe A
5. ◆◆ Receiver assembly
6. Dual pressure switch or triple pressure switch
7. Receiver bracket
8. Discharge hose
9. ◆◆ Suction hose
10. Bracket
11. Clamp
12. O-ring

20S0027

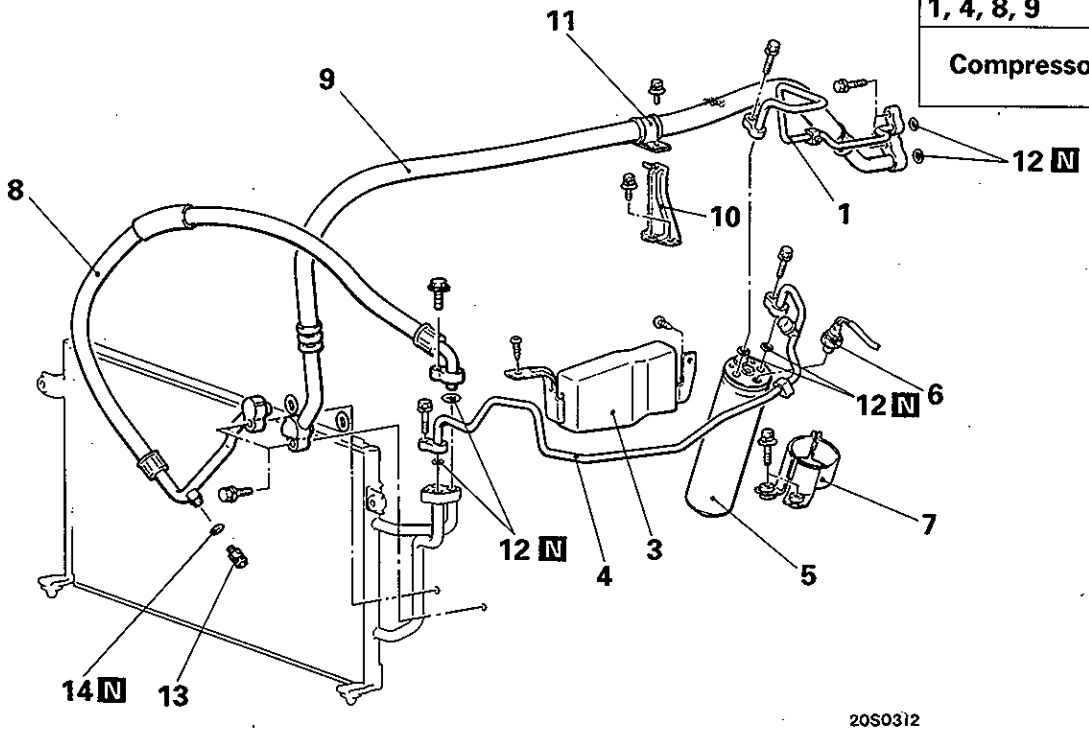
<Vehicles using R-134a refrigerant>

Pre-removal and Post-installation Operation
- Discharge and Charging of Refrigerant (Refer to P.55-18-1.)



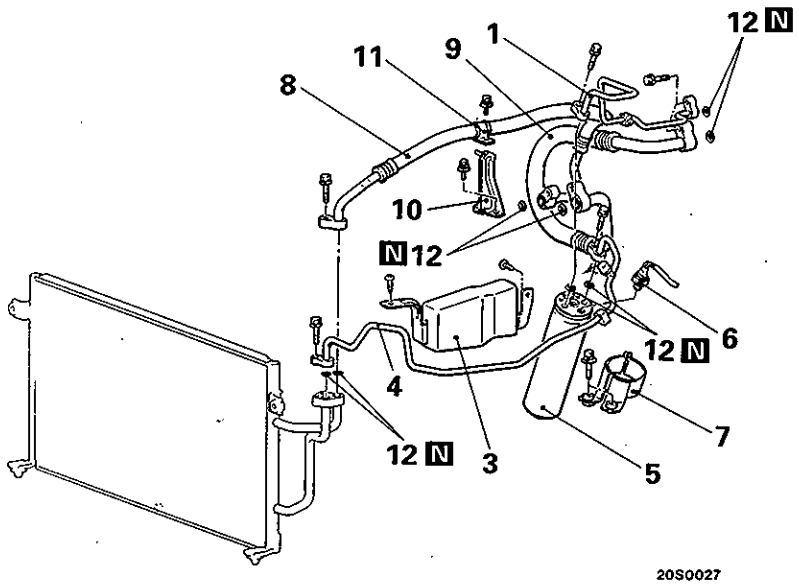
Compressor oil: SUN PAG56

<4G92, 4G93>



<4G13, 4D68>

Removal steps
1. Discharge pipe B
3. Relay box
4. Discharge pipe A
◆◆ 5. Receiver assembly
6. Dual pressure switch or triple pressure switch
7. Receiver bracket
8. Discharge hose
◆◆ 9. Suction hose
10. Bracket
11. Clamp
12. O-ring
13. High pressure relief valve
14. O-ring



SERVICE POINTS OF INSTALLATION

9. INSTALLATION OF SUCTION HOSE /5. RECEIVER ASSEMBLY /2. SUCTION PIPE

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

<Vehicles using R-12 refrigerant>
Compressor oil: FREOL S83 or SUNISO 5GS
Quantity:
Suction hose: 10 m ℓ (0.6 cu. in.)
Receiver: 10 m ℓ (0.6 cu. in.)
<Vehicles using R-134a refrigerant>
Compressor oil: SUN PAG56
Quantity:
Suction hose: 10 m ℓ (0.6 cu. in.)
Reciever: 10 m ℓ (0.6 cu. in.)

NOTES

VENTILATORS (INSTRUMENT PANEL AND FLOOR)

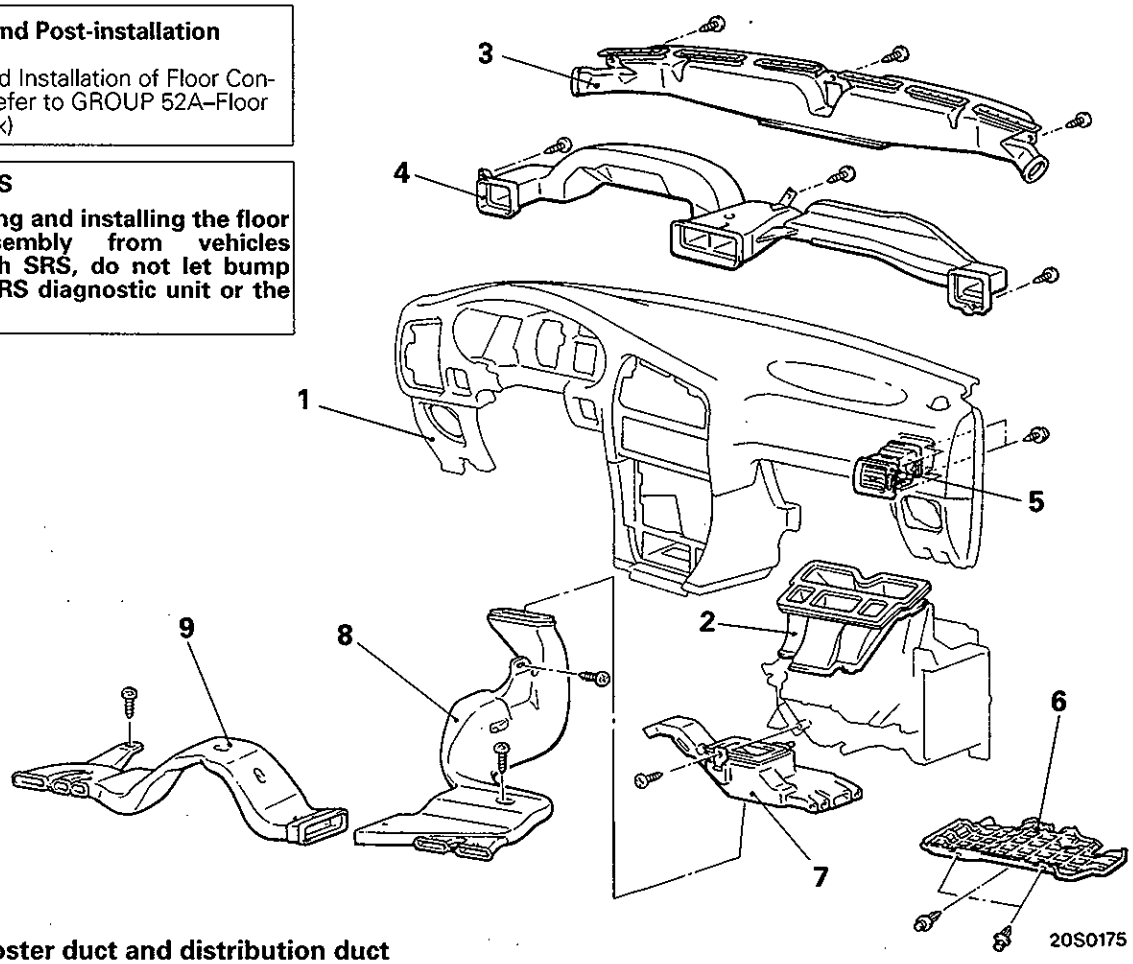
E55MA-A

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
- Removal and Installation of Floor Console Box (Refer to GROUP 52A–Floor Console Box)

CAUTION: SRS

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



Defroster duct and distribution duct removal steps

1. Instrument panel (Refer to GROUP 52A–Instrument panel)
2. Center ventilation duct
3. Defroster duct
4. Distribution duct
5. Air outlet panel assembly

Rear heater duct removal steps

6. Under cover
7. Foot duct
8. ◀▶ Rear heater duct A
9. ◀▶ Rear heater duct B

SERVICE POINTS OF REMOVAL

E55MBAP

8. REMOVAL OF REAR HEATER DUCT A/9. REAR HEATER DUCT B

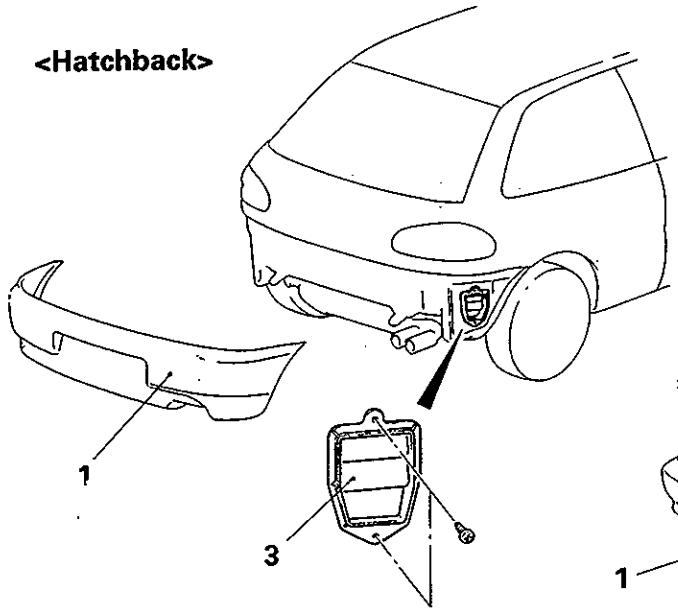
After removing the front seat, scuff plate, cowl side trim and center pillar trim (lower), take out the floor carpet and then remove the rear heater ducts A and B. (Refer to GROUP52A–Seat and Trims)

VENTILATORS (AIR INLET AND AIR OUTLET)

E55MA-B

REMOVAL AND INSTALLATION

<Hatchback>



20S0179

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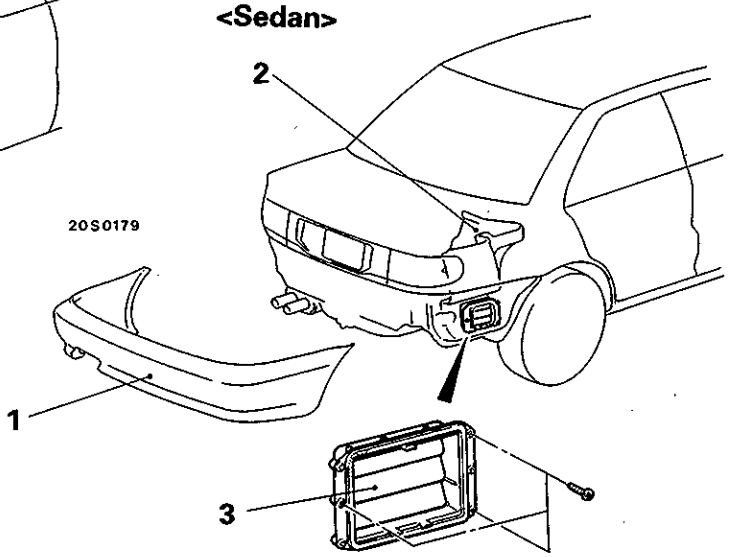

20S0180

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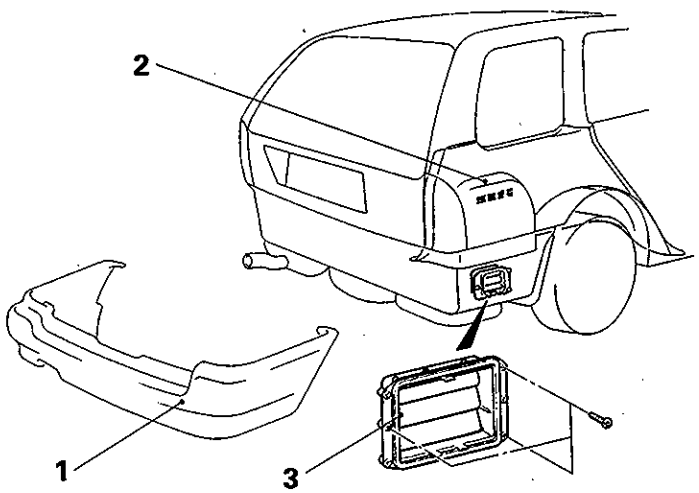

20S0236

Removal steps

1. Rear bumper (Refer to GROUP 51 – Bumper.)
2. Trunk room side trim or quarter trim (Refer to GROUP 52A–Trims.)
3. Rear ventilation duct

NOTE
(1) A rer centilation duct for Hatchback is equipped on the L.H. side also.
(2) For the front deck garnish, refer to GROUP 51 – Windshield Wiper and Washer.