

HEATER, AIR CONDITIONER AND VENTILATION

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E55AA--

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

WARNING!

- (1) **Improper service or maintenance of any component of the SRS, or any SRS-related component, can lead to personal injury or death to service personnel (from inadvertent firing of the air bag) or to the driver and passenger (from rendering the SRS inoperative).**
- (2) **Service or maintenance of any SRS component or SRS-related component must be performed only at an authorized MITSUBISHI dealer.**
- (3) **MITSUBISHI dealer personnel must thoroughly review this manual, and especially its GROUP 52B - Supplemental Restraint System (SRS), before beginning any service or maintenance of any component of the SRS or any SRS-related component.**

NOTE

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

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NOTES

55-2 HEATER, AIR CONDITIONER AND VENTILATION – Specifications

SPECIFICATIONS

E55CA--

GENERAL SPECIFICATIONS

Items	Specifications
Heater unit	
Type	Three-way-flow full-air-mix system
Air conditioner control assembly	Push button and dial type
Compressor	
Model	Scroll type (FX-105VS)
Refrigerant unit lubricant	cc (cu.in.) FREOL S-83 or SUNISO 5GS 160 ^{1.20} ₀ (9.8 ^{1.2} ₀)
V belt size	mm (in.) <DOHC>: 1150 (45.3), <SOHC>: 940 (37.0)
Dual pressure switch	
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)
Freezer prevention	°C (°F) Fin thermo sensor
	OFF: 3.2 (37.8) ON: 4.2 (39.6)
Fusible plug	°C (°F) Burn out temperature 105 (221)
Refrigerant and quantity	g (oz) R-12 MAX. 950 (34)

SERVICE SPECIFICATIONS

E55CB--

Items	Specifications
Standard value	
Engine coolant-temperature switch*1	°C (°F)
For radiator fan	ON: 82–88 (180–190) OFF: 78 (172) or less
For condenser fan	ON: 96–104 (205–219) OFF: 92 (198) or less
Idle speed	r/min 700 ± 100
Idle up speed	r/min 900 ± 100
Heater control panel	kΩ
Blower switch resistance	Blower speed (MIN): 2 ± 10% Blower speed (MAX): 0.25
Temperature control switch resistance	MAX COOL position: 0.275 MAX HOT position: ∞
Mode changeover switch resistance	FOOT mode: 0.33 ± 5% FOOT/DEF. mode: 1 ± 5% FACE/FOOT mode: 3.3 ± 5%
Potentiometer assembly for air-mixing damper	kΩ MAX. HOT position: approx. 0.2 MAX. COOL position: approx. 4.9
Potentiometer assembly for air outlet changeover damper	kΩ DEF. position: approx. 2.0 FACE position: approx. 4.3
Engine coolant temperature switch (air conditioner cut) <Vehicles with air conditioner>*1	°C (°F) OFF: 108–115 (226–239)

NOTE

*1 : <Vehicles built up to October, 1992>

LUBRICANTS

E55CD--

<Vehicles using R-12 refrigerant>

Items	Specified lubricants	Quantity
Each connection of refrigerant line Compressor refrigerant unit cc (cu.in.) lubricant	FREOL S-83 or SUNISO 5GS	As required 160 ⁺²⁰ ₀ (9.8 ^{+1.2} ₀)

<Vehicles using R-134a refrigerant>

Items	Specified lubricants	Quantity
Each connection of refrigerant line Compressor refrigerant unit cc (cu.in.) lubricant	SUN PAG 56	As required 170 ⁺²⁰ ₀ (10.4 ^{+1.2} ₀)

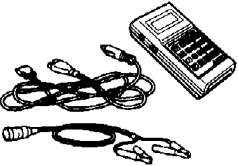

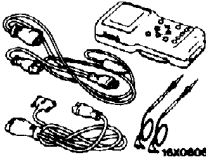

SEALANT

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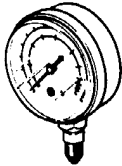

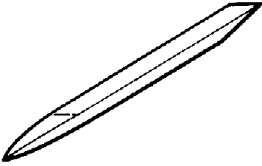
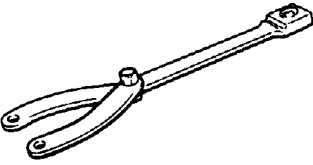

Items	Specified sealant	Characteristics
Engine coolant temperature switch threaded part	3M Nut Locking Part No. 4171 or equivalent	Drying sealant

SPECIAL TOOLS

E55DA--

Tool	Number	Name	Use
	MB991341	Multi-use tester sub-assembly	Up to 1993 models Inspection of fully automatic air condition- er or heater
	(For the number, refer to GROUP 00 – Precautions Before Service.)	ROM pack	
	MB991502	MUT-II	All models Inspection of fully automatic air condition- er or heater
 16X0607		ROM pack	

55-4 HEATER, AIR CONDITIONER AND VENTILATION – Special Tools/Troubleshooting

Tool	Number	Name	Use
	MB991402	Vacuum gauge	Vacuum check <Vehicles with air conditioner>
	MB991403 (For high pressure) MB991404 (For low pressure)	Adaptor valve	Supplying refrigerant gas Replenishing refrigerant gas Draining refrigerant gas Function test <Vehicles with air conditioner>
	MB990784	Ornament remover	Removal of photo sensor <Vehicles with air conditioner> Removal of passenger compartment temperature sensor Removal of defroster garnish
	MB991367	Special spanner	Removal and installation of armature mounting nut of compressor <Vehicles with air conditioner>
	MB991386	Pin	

TROUBLESHOOTING

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TROUBLESHOOTING PROCEDURE

- (1) Check that the air ducts and rods are not off.
- (2) Using the Multi-Use Tester <Up to 1993 models> or MUT-II <All models>, check diagnosis outputs. If failure code is being output, check the failing system and repair as necessary. (Refer to P.55-19.)
- (3) If the diagnosis outputs are normal, check for terminal voltage or continuity with a circuit tester according to the troubleshooting chart by symptom. (Refer to control unit terminal voltage list on P.55-10.)
- (4) 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.
- (5) When checking components, be sure to disconnect the connectors first.

TROUBLESHOOTING QUICK-REFERENCE CHART

Inspection item	Fuse	Harness (incl. connectors)	Compressor relay	Magnetic clutch	Sensors	Water temperature switch	Pressure switch	Air-conditioner control panel	Amount of refrigerant	Receiver	Expansion valve	Compressor	Thermostat	Belt lock controller <DOHC>	Air conditioner control unit	MPI control unit	Diagnosis outputs	Air mix damper motor and potentiometer	Heater link	Heater relay	Power transistor	Blower motor	Blower motor relay	Inside/outside air selector damper motor	Outlet selector damper motor/potentiometer	Condenser fan relay	Resistor	Condenser fan motor
1 Air conditioner does not operate when the ignition switch is in the ON position.	①	②	③	④	⑥	⑦	⑨	⑧	⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰	⑱	⑲	⑳	㉑	㉒	㉓	㉔	㉕	㉖	㉗	㉘	㉙
2 Interior temperature does not raise even the air conditioner is operating (No warm air coming out).		⑤		②											⑦		①	③	④									
3 Interior temperature does not lower even the air conditioner is operating (No cold air coming out).	①	④	⑤	⑬	⑪	⑫		⑭	⑥	⑦	⑧	⑨	⑩		⑮		②	③										
4 Blower motor does not rotate.	①	④						⑥							⑦					②	③	⑤						
5 Blower motor does not stop rotating.		③					④								⑤						②		①					
6 Inside/outside-air selector damper does not operate.		②					③								④								①					
7 Outlet selector damper does not operate.		③					④								⑤		①							②				
8 Condenser fan does not operate when the air conditioner is activated.	①																							②	③	④		
9 Air conditioner colour monitor cannot be displayed.*		①						②							③													
10 Set temperature returns to 25°C (122°F) when the ignition switch is turned ON and OFF.	①	②													③													

NOTE
 (1) ○ indicates the component requiring inspection. (Numbers in ○ are the priority order.)
 (2) Use an analog voltmeter to check the control unit.
 (3) * : <Vehicles built from November, 1992>

55-6 HEATER, AIR CONDITIONER AND VENTILATION – Troubleshooting

No.	Trouble symptom	Problem cause	Remedy	Reference page
1	When the ignition switch is "ON", the air conditioner does not operate.	Broken wire in the power circuit harness.	Repair the harness.	–
		Compressor relay in the relay box is defective.	Replace.	–
		Magnetic clutch is defective.	Replace.	P.55-55
		Thermostat is defective.	Replace.	P.55-55
		Coolant temperature switch to cut-off air conditioner is defective.	Replace.	P.55-45
		Dual pressure switch is defective.	Replace.	P.55-61
		Refrigerant leak.	Replenish the refrigerant, and repair the leak.	–
		Excess refrigerant.	Extract some of the refrigerant.	–
		Air conditioner control panel is defective.	Replace the air conditioner control panel.	P.55-38
		Belt lock controller is defective <DOHC>.	Replace the belt lock controller.	P.55-40
		Air conditioner control unit is defective.	Replace the air conditioner control unit.	P.55-40
MPI control unit is defective.	Replace the MPI control unit.	–		
2	When the air conditioner is operating, temperature inside the passenger compartment doesn't increase (hot air is not emitted).	Passenger compartment temperature sensor input circuit is defective.	Check the diagnosis output. Replace the defective component.	P.55-18
		Air-mixing damper potentiometer input circuit is defective.		
		Air-mixing damper drive motor is defective.	Replace the air-mixing damper drive motor.	P.55-42
		Air-mixing damper drive motor lever and air-mixing damper connection is defective.	Repair the connection.	–
		Air-mixing damper is stuck.	Repair the air-mixing damper.	–
		Broken harness wire between the air-mixing damper drive motor and the air conditioner control unit	Repair the harness.	–
		Air conditioner control panel is defective.	Replace the air conditioner control panel.	P.55-38
		Air conditioner control unit is defective.	Replace the air conditioner control unit.	P.55-40

HEATER, AIR CONDITIONER AND VENTILATION – Troubleshooting 55-7

No.	Trouble symptom	Problem cause	Remedy	Reference page
3	When the air conditioner is operating, temperature inside the passenger compartment doesn't decrease (cool air is not emitted).	Passenger compartment temperature sensor input circuit is defective.	Check the diagnosis output. Replace the defective component.	P.55-18
		Air inlet sensor input circuit is defective.		
		Fin thermo sensor input circuit defective.		
		Air-mixing damper potentiometer input circuit is defective.		
		Air-mixing damper drive motor is defective.	Replace the air-mixing damper driver motor.	P.55-42
		Air-mixing damper drive motor lever and air-mixing damper connection is defective.	Repair the connection.	–
		Air-mixing damper is stuck.	Repair the air-mixing damper.	–
		Broken harness wire between the air-mixing damper drive motor and the air conditioner control unit.	Repair the harness.	–
		Compressor relay in the relay box is defective.	Replace	–
		Refrigerant leak.	Replenish the refrigerant and repair the leak	–
		Excess refrigerant	Extract some of the refrigerant.	–
		Receiver is blocked.	Replace the receiver.	P.55-61
		Expansion valve is blocked.	Replace the expansion valve.	P.55-49
		Compressor is defective.	Replace the compressor.	P.55-51
		Thermostat is defective.	Replace the thermostat.	P.55-55
		Revolution pick-up sensor is defective. <DOHC>	Replace the revolution pick-up sensor.	P.55-55
		Magnetic clutch is defective.	Replace	P.55-55
Belt lock controller is defective. <DOHC>	Replace the belt lock controller.	P.55-40		
Air conditioner control panel is defective.	Replace the air conditioner control panel.	P.55-38		
Air conditioner control unit is defective.	Replace the air conditioner control unit.	P.55-40		

55-8 HEATER, AIR CONDITIONER AND VENTILATION – Troubleshooting

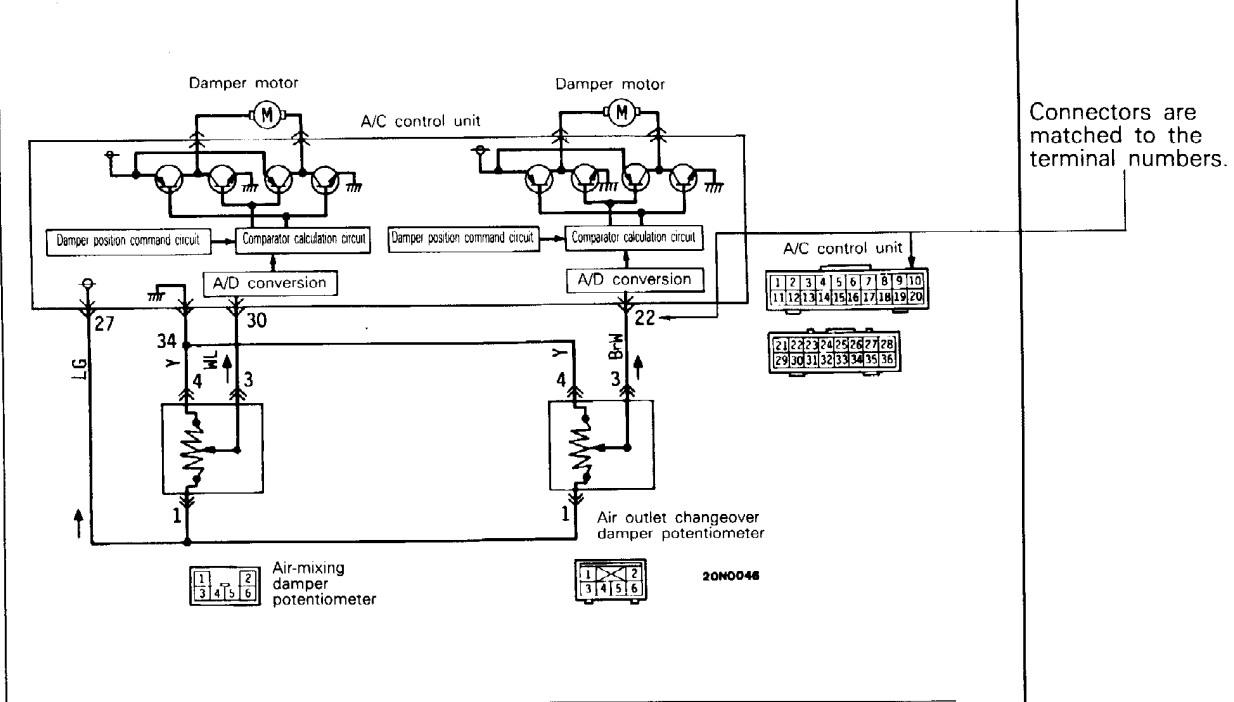
No.	Trouble symptom	Problem cause	Remedy	Reference page
4	Blower motor doesn't turn.	Heater relay is defective.	Replace the heater relay.	–
		Temperature fuse in the power transistor is blown.	Replace the power transistor.	P.55-40
		Broken harness wire between the fuse and the heater relay.	Repair the harness.	–
		Broken harness wire between the heater relay and the blower motor.		
		Broken harness wire between the power transistor and the air conditioner control unit.		
		Blower motor is defective.	Replace the blower motor.	P.55-47
		Air conditioner control panel is defective.	Replace the air conditioner control panel.	P.55-38
		Air conditioner control unit is defective.	Replace the air conditioner control unit.	P.55-40
5	Blower motor doesn't stop turning.	Blower motor relay is defective.	Replace the blower motor HI relay.	–
		Power transistor is defective.	Replace the power transistor.	P.55-40
		Shorted harness between the blower motor relay, power transistor and air conditioner control unit	Repair the harness.	–
		Air conditioner control panel is defective.	Replace the air conditioner control panel.	P.55-38
		Air conditioner control unit is defective.	Replace the air conditioner control unit.	P.55-40
6	Inside/outside air changeover damper does not operate.	Inside/outside air changeover damper motor is defective.	Replace the inside/outside air changeover drive motor.	P.55-42
		Linkage between inside/outside air changeover drive motor and inside/outside air changeover damper is defective.	Repair the linkage.	–
		Inside/outside air changeover damper operation is defective.	Repair the inside/outside air changeover damper.	–
		Broken harness wire between the inside/outside air changeover motor and the air conditioner control unit	Repair the harness.	–
		Air conditioner control panel is defective.	Replace the air conditioner control panel.	P.55-38
		Air conditioner control unit is defective.	Replace the air conditioner control unit.	P.55-40

No.	Trouble symptom	Problem cause	Remedy	Reference page
7	Air outlet changeover damper does not operate.	Air outlet changeover damper potentiometer input circuit is defective.	Check the diagnosis output. Replace the defective component.	P.55-18
		Air outlet changeover drive motor is defective.	Replace the air outlet changeover drive motor.	P.55-42
		Linkage between air outlet changeover drive motor and air outlet changeover damper assembly is defective.	Repair the linkage.	–
		Malfunction in the DEF.FACE and FOOT damper	Repair the DEF.FACE and FOOT damper.	–
		Broken harness wire between the air outlet changeover motor and the air conditioner control unit	Repair the harness.	–
		Air conditioner control panel is defective.	Replace the air conditioner control panel.	P.55-38
		Air conditioner control unit is defective.	Replace the air conditioner control unit.	P.55-40
8	When the air conditioner is operating, condenser fan does not turn.	Condenser fan motor relay is defective.	Replace the power relay.	Group 14
		Resistor is defective.	Replace the resistor.	P.55-59
		Condenser fan motor is defective.	Replace the condenser fan motor.	P.55-59
9	Air conditioner colour monitor cannot be displayed. <Vehicles built from November, 1992>	Air conditioner control panel is defective.	Replace the air conditioner control panel.	P.55-39-1
		Open-circuit of the harness between the air conditioner control panel and the air conditioner control unit	Repair the harness.	–
		Air conditioner control unit is defective.	Replace the air conditioner control unit.	P.55-40
		Rheostat is defective.	Replace the rheostat.	Group 54
10	When the ignition switch is "ON" or "OFF", set temperature returns to 25°C (122°F).	Broken harness wire in the power circuit	Repair the harness.	–
		Air conditioner control unit is defective.	Replace the air conditioner control unit.	P.55-40

READING THE "CIRCUIT AND UNIT CHECK"

E55EDAA

2. Inspection of potentiometer circuit



Troubleshooting Hints

- Diagnosis
 - No. 31 (Fix air mix damper at MAX. HOT position. However, fix at MAX. COOL position only when setting MAX. COOL.)
 - No. 32 (Fix outlet selector damper at FACE position. However, fix at FACE position only when setting FACE mode)
- Air conditioner control unit terminal voltages

Shows the diagnosis output code number and the system condition when the code is output.

Terminal No.	Signal name	Condition	Terminal voltage
30	Air mix damper potentiometer (input)	Air mix damper at MAX. COOL position	0.1–0.3V
		Air mix damper at MAX. HOT position	4.7–5.0V
22	Outlet selector damper potentiometer (input)	Outlet selector damper at FACE position	0.1–0.5V
		Outlet selector damper at DEF. position	4.7–5.0V
27	Air mix damper and outlet selector damper potentiometer (-)	Normally	0V
34	Sensor power source	Normally	4.8–5.2V

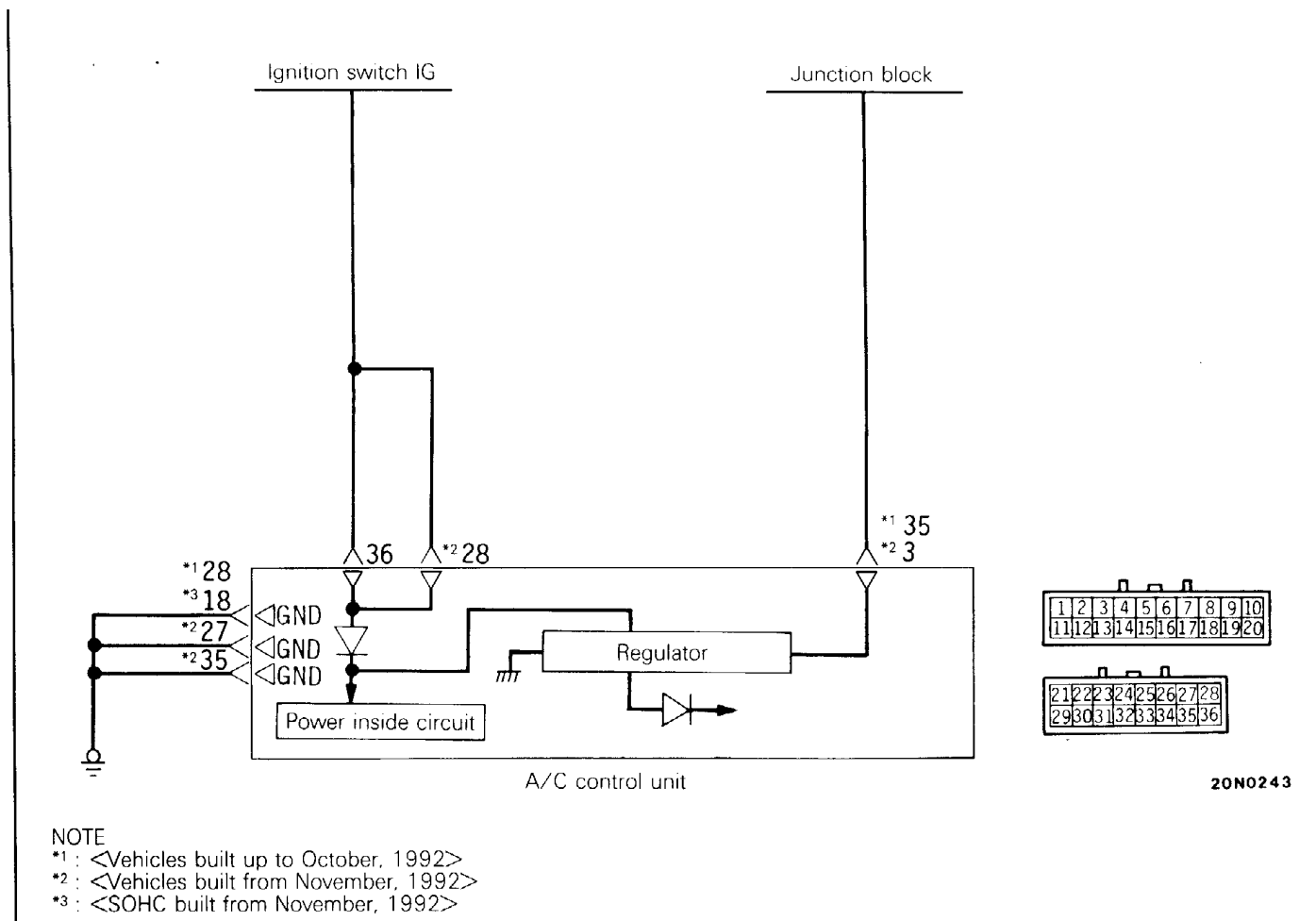
Shows the terminal number inspected.

Shows the condition when the terminal is inspected.

Shows the specifications that are the acceptable diagnosis standard. Especially when the condition in the column is not registered, the normal specifications are registered.

CIRCUIT AND BENCH CHECK

1. Inspection of air conditioner control unit power source circuit



NOTE

- *1 : <Vehicles built up to October, 1992>
- *2 : <Vehicles built from November, 1992>
- *3 : <SOHC built from November, 1992>

Troubleshooting Hints

Air conditioner control unit terminal voltage

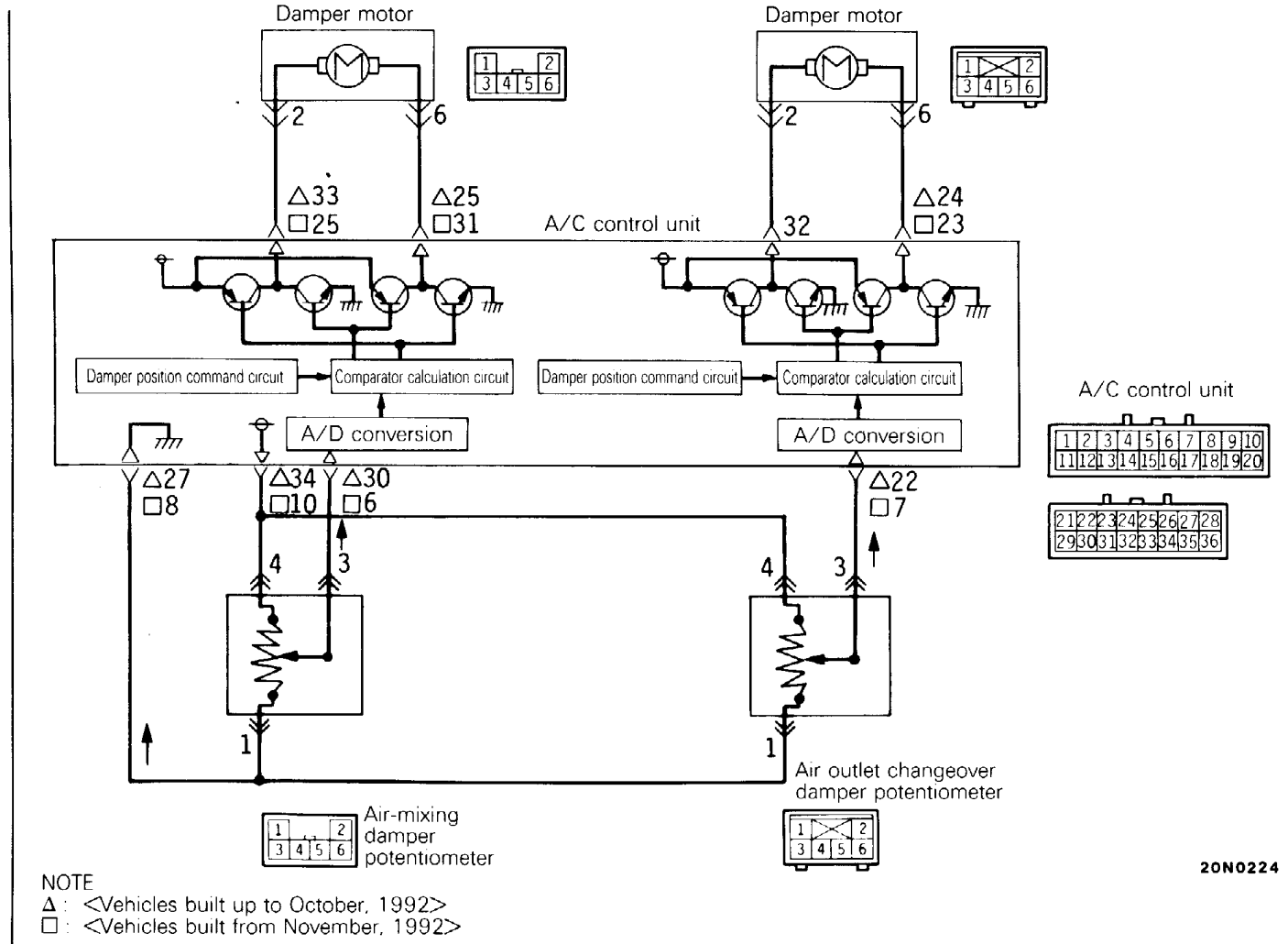
Terminal No.	Signal name	Condition	Terminal voltage
35*1 or 3*2	Back up power source	Normally	System voltage
36 and 28*2	A/C control unit power source	Ignition switch ON	System voltage
28*1 or 18*3	A/C control unit earth	Normally	0V
27*2 and 35*2	A/C control unit earth	Normally	0V

NOTE

- *1 : <Vehicles built up to October, 1992>
- *2 : <Vehicles built from November, 1992>
- *3 : <SOHC built from November, 1992>

55-12 HEATER, AIR CONDITIONER AND VENTILATION – Troubleshooting

2. Inspection of potentiometer circuit



20N0224

Troubleshooting Hints

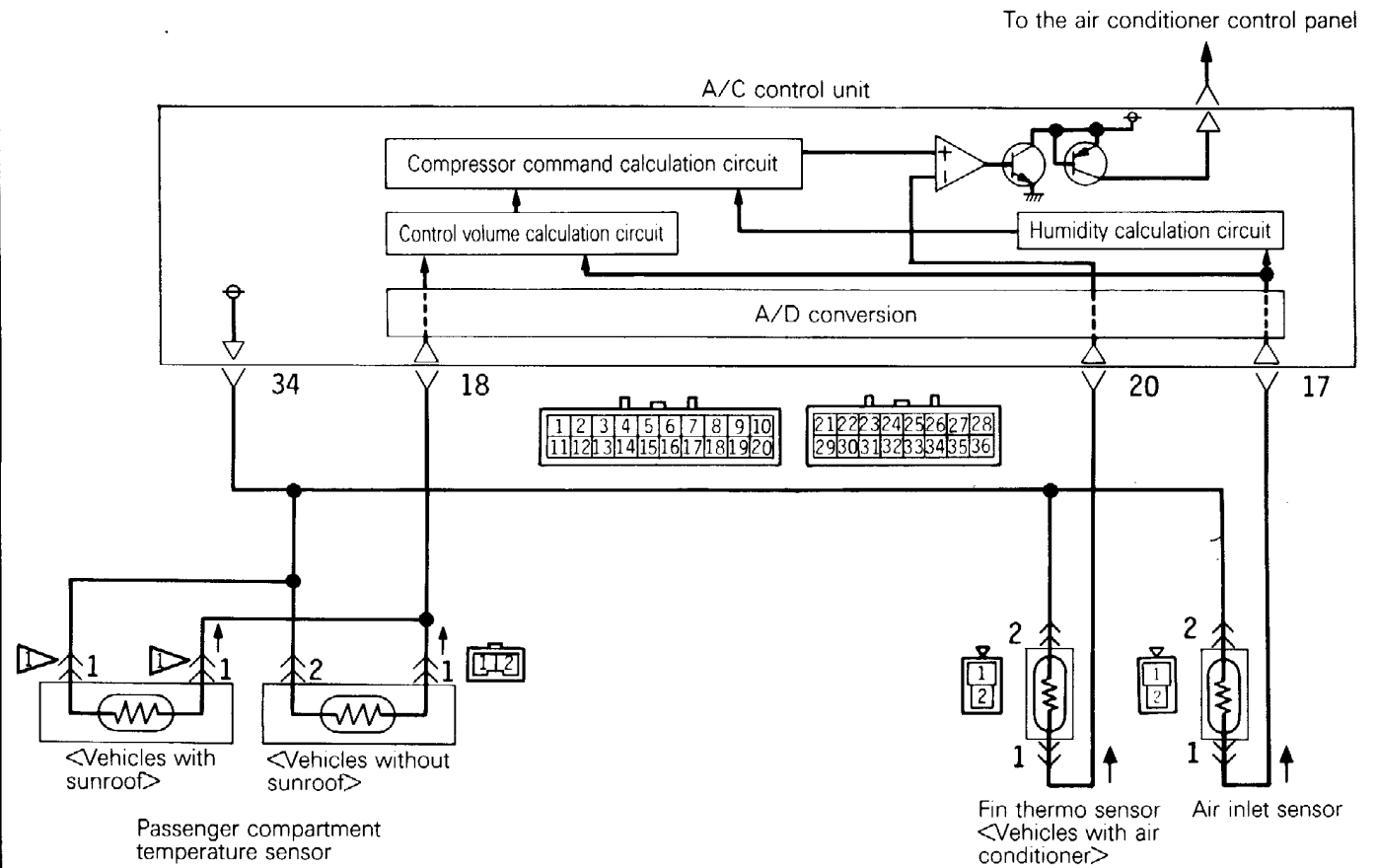
- **Diagnosis**
 No. 31 (Fix air mix damper at MAX. HOT position. However, fix at MAX. COOL position only when setting MAX. COOL.)
 No. 32 (Fix outlet selector damper at FACE position. However, fix at FACE position only when setting FACE mode.)
- **Air conditioner control unit terminal voltages**

Terminal No.	Signal name	Condition	Terminal voltage
30*1 or 6*2	Air mix damper potentiometer (input)	Air mix damper at MAX. COOL position	0.1 – 0.3V
		Air mix damper at MAX. HOT position	4.7 – 5.0V
22*1 or 7*2	Air outlet changeover damper potentiometer (input)	Air outlet changeover damper at FACE position	0.1 – 0.5V
		Air outlet changeover damper at DEF. position	4.7 – 5.0V
27*1 or 8*2	Air mix damper and air outlet changeover damper potentiometer (-)	Normally	0V
34*1 or 10*2	Sensor power source	Normally	4.8 – 5.2V

NOTE
 *1 : <Vehicles built up to October, 1992>
 *2 : <Vehicles built from November, 1992>

3. Inspection of passenger compartment temperature sensor, air inlet sensor, outside thermo sensor, and fin thermo sensor <Vehicles with air conditioner> circuits

<Vehicles built up to October, 1992>



20N0245

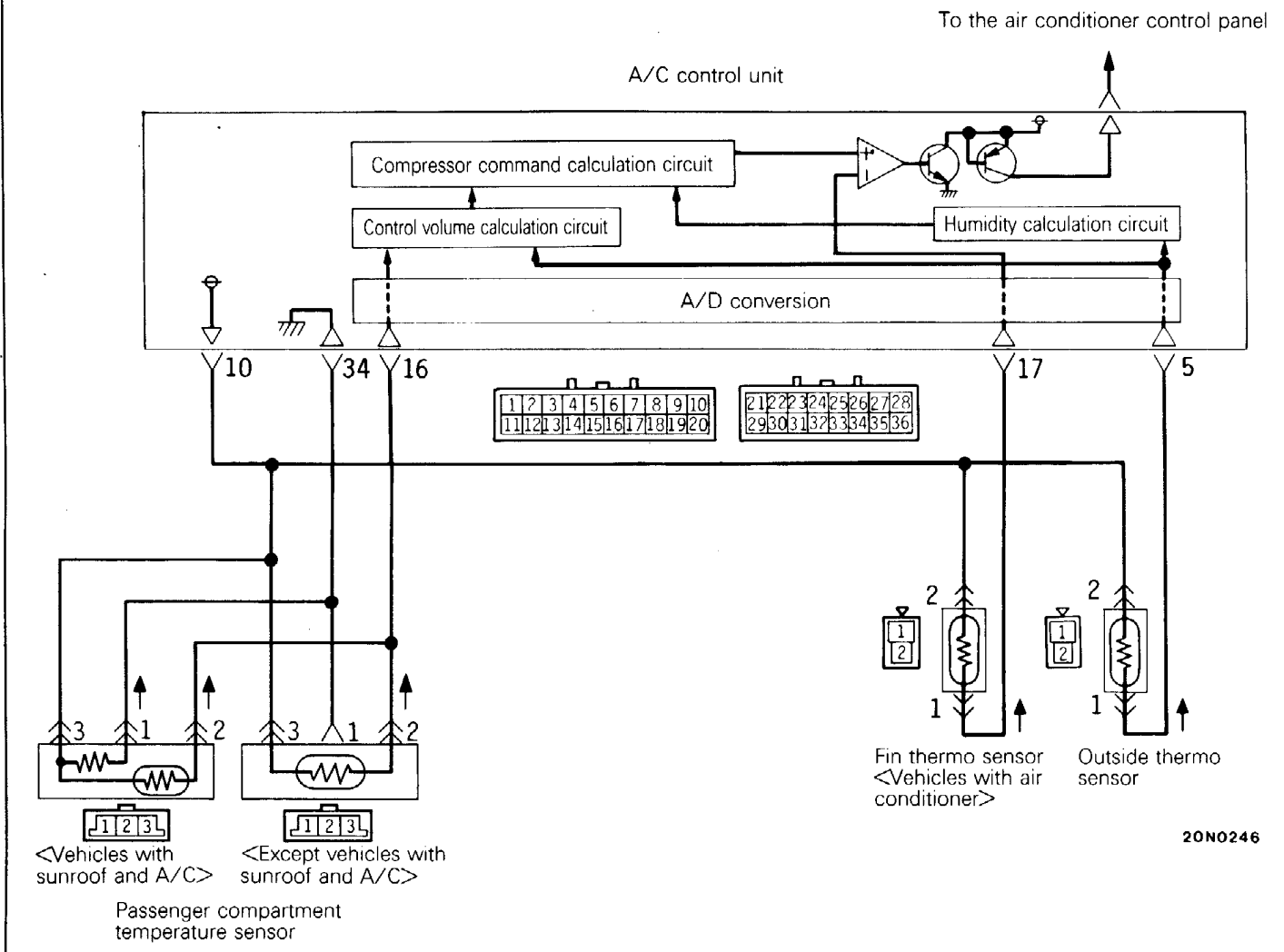
Troubleshooting Hints

- Diagnosis
 - No. 11, 12 [Fix passenger compartment temperature sensor input signal at 25°C (77°F).]
 - No. 13, 14 [Fix air inlet sensor input signal at 20°C (68°F).]
 - No. 21, 22 [Fix fin thermo sensor input signal at -2°C (28°F).] <Vehicles with air conditioner>
- Air conditioner control unit terminal voltages.

Terminal No.	Signal name	Condition	Terminal voltage
17	Air inlet sensor	Temperature at sensor 25°C (77°F) (4 kΩ)	2.3–2.6V
34	Sensor power source	Normally	4.8–5.2V
18	Passenger compartment temperature sensor	Temperature at sensor 25°C (77°F) (4 kΩ)	2.5–2.7V
20	Fin thermo sensor <Vehicles with air conditioner>	Temperature at sensor 25°C (77°F) (4 kΩ) when air conditioner is OFF	2.5–2.7V

55-13-1 HEATER, AIR CONDITIONER AND VENTILATION – Troubleshooting

<Vehicles built from November, 1992>



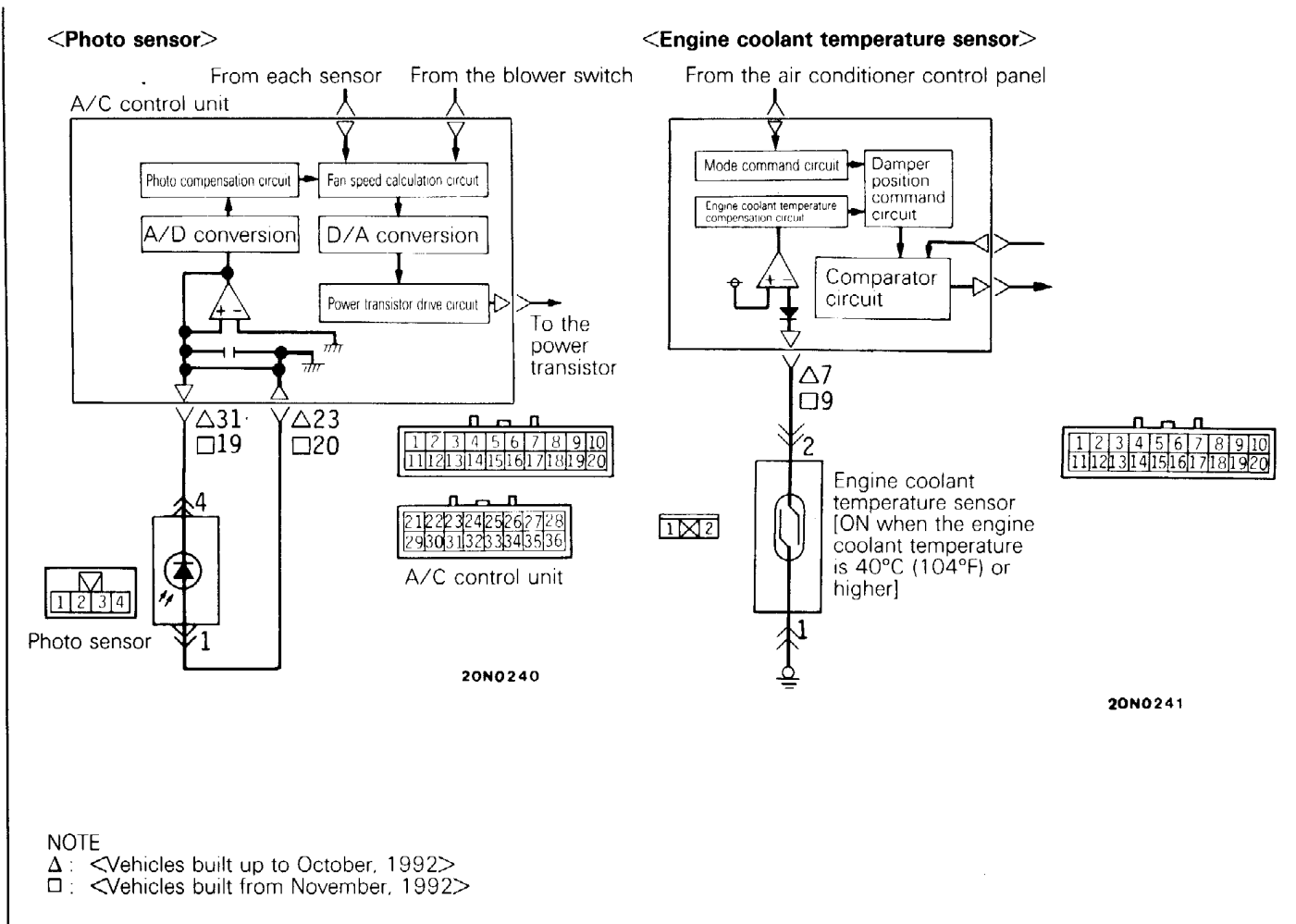
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Troubleshooting Hints

- Diagnosis
 - No. 11, 12 [Fix passenger compartment temperature sensor input signal at 25°C (77°F).]
 - No. 13, 14 [Fix outside thermo sensor input signal at 20°C (68°F).]
 - No. 21, 22 [Fix fin thermo sensor input signal at -2°C (28°F).] <Vehicles with air conditioner>
- Air conditioner control unit terminal voltages.

Terminal No.	Signal name	Condition	Terminal voltage
5	Outside thermo sensor	Temperature at sensor 25°C (77°F) (4 kΩ)	2.3–2.6V
10	Sensor power source	Normally	4.8–5.2V
16	Passenger compartment temperature sensor	Temperature at sensor 25°C (77°F) (4 kΩ)	2.5–2.7V
17	Fin thermo sensor <Vehicles with air conditioner>	Temperature at sensor 25°C (77°F) (4 kΩ) when air conditioner is OFF	2.5–2.7V

4. Inspection of photo sensor <Vehicles with air conditioner> and engine coolant temperature sensor circuits



Troubleshooting Hints

Air conditioner control unit terminal voltages

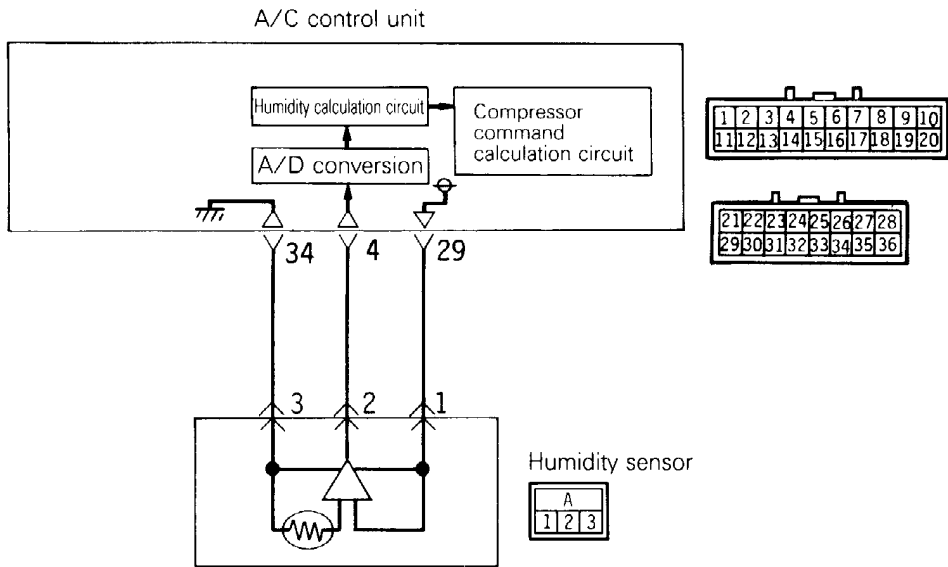
Terminal No.	Signal name	Condition	Terminal voltage
23*1 or 20*2	Photo sensor (-) <Vehicles with air conditioner>	Normally	0V
31*1 or 19*2	Photo sensor (+) <Vehicles with air conditioner>	Illuminance 100,000 lux or more	-0.1 to -0.2V
		Illuminance less than 0 lux	0V
7*1 or 9*2	Engine coolant temperature sensor (+)	Switch OFF [Engine coolant temperature less than 40°C (104°F)]	1.2V
		Switch ON [Engine coolant temperature 40°C (104°F) or higher]	0V

NOTE

*1 : <Vehicles built up to October, 1992>
 *2 : <Vehicles built from November, 1992>

55-14 HEATER, AIR CONDITIONER AND VENTILATION – Troubleshooting

5. Inspection of humidity sensor circuit <Vehicles built from November, 1992>



20N0238

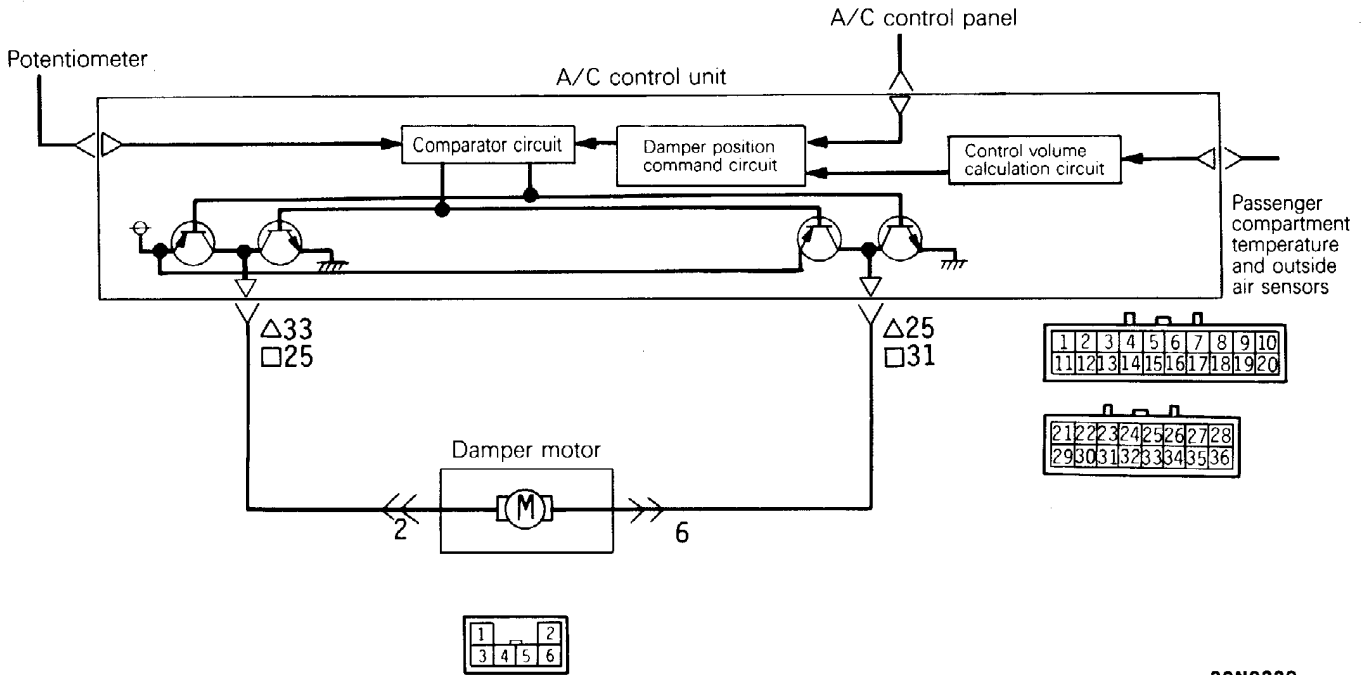
Troubleshooting Hints

Air conditioner control unit terminal voltage

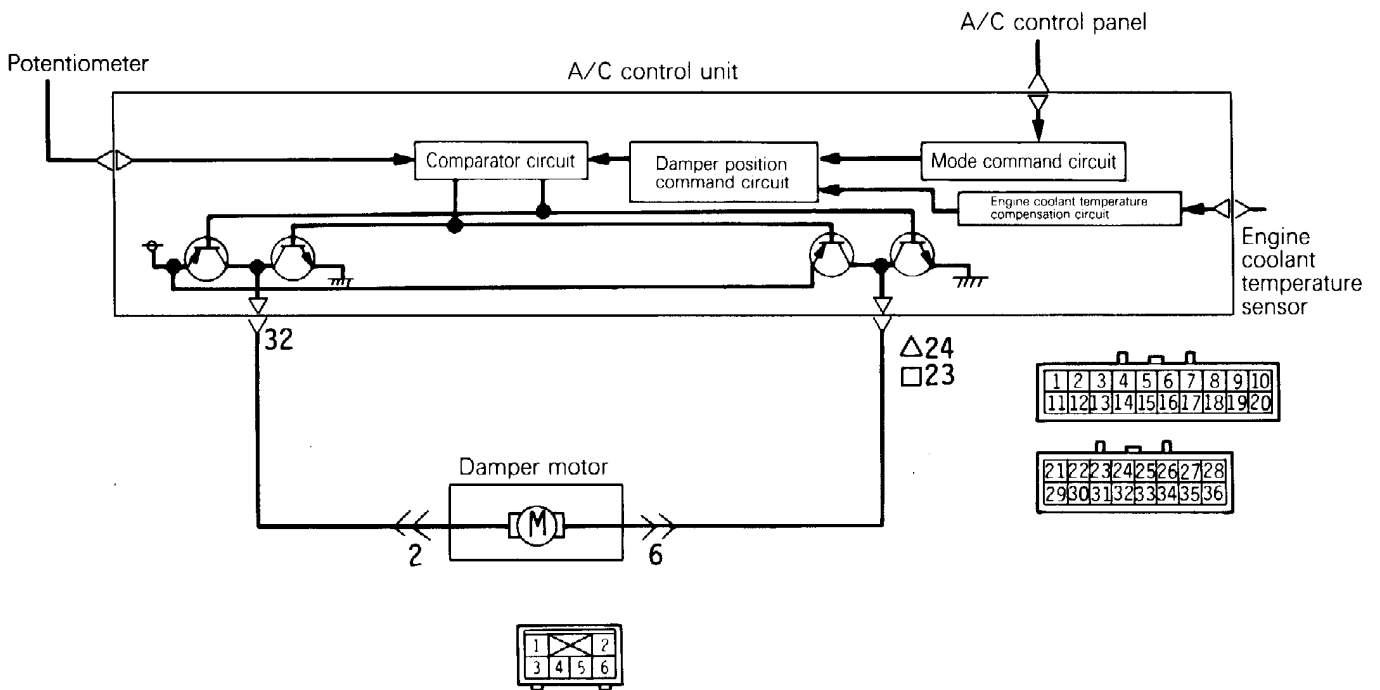
Terminal No.	Signal name	Condition	Terminal voltage
4	Sensor input	Normally	4.8–5.2V
29	Humidity sensor (+)	Humidity 50 %	2–2.4V
34	Humidity sensor (-)	Normally	0V

6. Inspection of air mix damper, outlet selector damper circuits

<Air-mixing damper motor>



<Air outlet changeover damper motor>

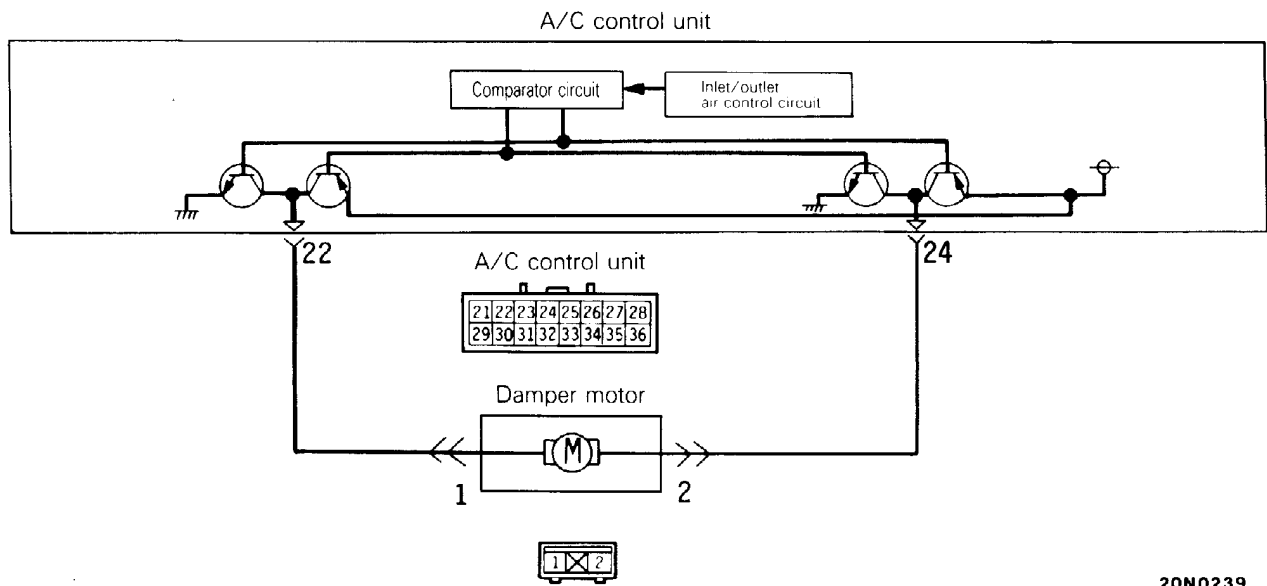


NOTE

- Δ: <Vehicles built up to October, 1992>
- : <Vehicles built from November, 1992>

55-16 HEATER, AIR CONDITIONER AND VENTILATION – Troubleshooting

<Inlet/outlet air changeover damper motor (Vehicles built from November, 1992)>



20N0239

Troubleshooting Hints

Air conditioner control unit terminal voltages

Terminal No.	Signal name	Condition	Terminal voltage
24* ²	Inlet/outlet air changeover damper motor (-)	Inlet air circulation switch: ON (Output turns OFF 40 seconds after the damper moved to inlet air circulation position)	0.5V
		Outlet air introduction switch: ON (Output turns OFF 40 seconds after the damper moved to outlet air introduction position)	10 to system voltage
24* ¹ or 23* ²	Outlet selector damper motor (-)	FACE switch ON (Output turns OFF 40 seconds after the damper moved to FACE position.)	0.5V
		DEF switch ON (Output turns OFF 40 seconds after the damper moved to DEF. position.)	10 to system voltage
25* ¹ or 31* ²	Air mix damper motor (-)	Temperature is set at 17°C (62.6°F). (Output turns OFF 40 seconds after the damper moved to MAX. COOL position.)	10 to system voltage
		Temperature is set at 32.5°C (90.5°F). (Output turns OFF 40 seconds after the damper moved to MAX. HOT position.)	0.5V

NOTE

*¹: <Vehicles built up to October, 1992>

*²: <Vehicles built from November, 1992>

HEATER, AIR CONDITIONER AND VENTILATION – Troubleshooting 55-16-1

Terminal No.	Signal name	Condition	Terminal voltage
22*2	Inlet/outlet air changeover damper motor (+)	Inlet air circulation switch: ON (Output turns OFF 40 seconds after the damper moved to inlet air circulation position)	10 to system voltage
		Outlet air introduction switch: ON (Output turns OFF 40 seconds after the damper moved to outlet air introduction position)	0.5V
32	Outlet selector damper drive motor (+)	FACE switch ON (Output turns OFF 40 seconds after the damper moved to FACE position.)	10 to system voltage
		DEF. switch ON (Output turns OFF 40 seconds after the damper moved to DEF. position.)	0.5V
33*1 or 25*2	Air mix damper drive motor (+)	Temperature is set at 17°C (62.6°F). (Output turns OFF 40 seconds after the damper moved to MAX. COOL position.)	0.5V
		Temperature is set at 32.5°C (90.5°F). (Output turns OFF 40 seconds after the damper moved to MAX. HOT position.)	10 to system voltage

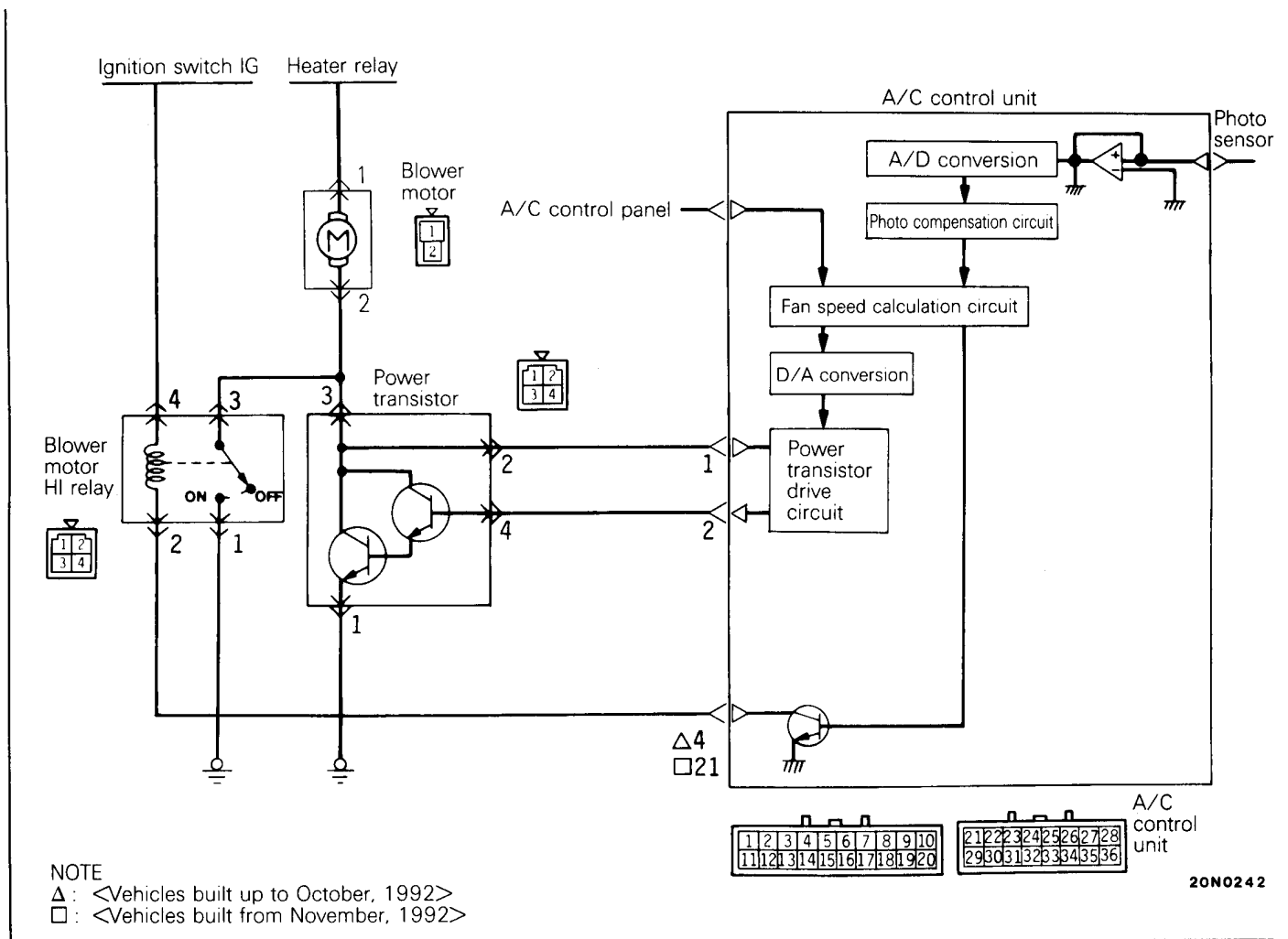
NOTE

*1 : <Vehicles built up to October, 1992>

*2 : <Vehicles built from November, 1992>

NOTES

6. Inspection of power transistor and blower motor relay circuits



Troubleshooting Hints

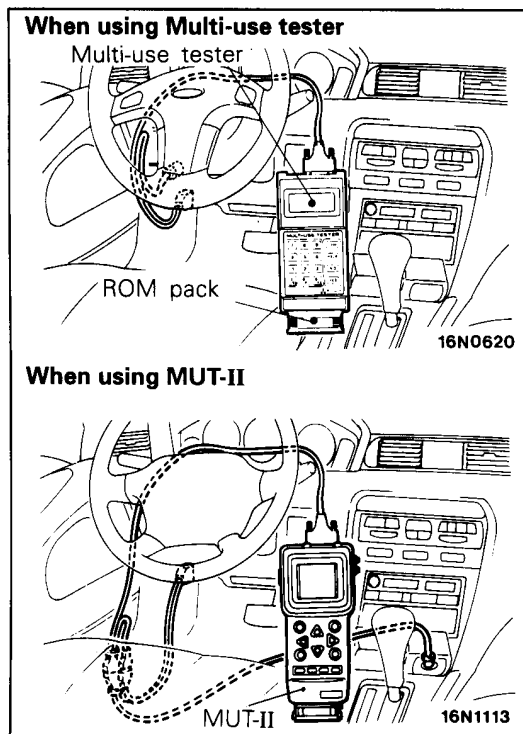
Air conditioner control unit terminal voltages

Terminal No.	Signal name	Condition	Terminal voltage
1	Power transistor collector	Switch is turned OFF.	System voltage
		Switch is placed in LO.	Approx. 7V
		Switch is placed in HI.	0
2	Power transistor base	Blower switch is turned OFF.	0
		Blower switch is placed in LO.	Approx. 1.3V
		Blower switch is placed in HI.	Approx. 1.2V
4*1 or 21*2	Blower motor relay	Fan switch H is ON.	1.5V or less
		Fan switch in M, L, or OFF.	System voltage

NOTE

*1 : <Vehicles built up to October, 1992>
 *2 : <Vehicles built from November, 1992>

55-18 HEATER, AIR CONDITIONER AND VENTILATION – Troubleshooting



SELF-DIAGNOSIS CHECKING

Caution

Connection and disconnection of the multi-use tester <Up to 1993 models> or MUT-II <All models> should always be made with the ignition switch in the OFF position.

- (1) Check the self-diagnosis codes.
- (2) After the malfunction has been repaired, erase the self-diagnosis codes.
- (3) Recheck the self-diagnosis codes, and make sure that the self-diagnosis codes are normal.

CHECKING WITH THE MULTI-USE TESTER (MUT) OR MUT-II

Inspection item	Inspection		Probable cause of malfunction or remedy	
	Inspection conditions	Normal diagnosis value		
Passenger compartment temperature sensor MUT or MUT-II (11)	Ignition switch: "ON"	Passenger compartment temperature and multi-use display temperature are the same.	Passenger compartment temperature sensor or related circuitry is defective.	
Air inlet sensor*1 Outside thermo sensor*2 MUT or MUT-II (13)	Ignition switch: "ON"	Atmospheric temperature and multi-use display temperature are the same.	Passenger outside air sensor or related circuitry is defective.	
Air-mixing damper potentiometer MUT or MUT-II (31)	Ignition switch: "ON"	Damper position	Opening position (%)	Air-mixing damper potentiometer or related circuitry is defective.
		MAX. HOT	Approx. 100	
		MAX. COOL	Approx. 0	
Air outlet changeover damper potentiometer MUT or MUT-II (32)	Ignition switch: "ON"	Damper position	Opening position (%)	Air outlet changeover damper potentiometer or related circuitry is defective.
		FACE	Approx. 0	
		FOOT	Approx. 50	
		FOOT/DEF.	Approx. 75	
		DEF.	Approx. 100	

NOTE

*1 : <Vehicles built up to October, 1992>

*2 : <Vehicles built from November, 1992>

DIAGNOSIS DISPLAY CODES

Code No.	Cause	Fail safe
0	Normal	–
11	Open-circuited passenger compartment temperature sensor	Condition in which 25°C (77°F) is detected
12	Short-circuited passenger compartment temperature sensor	
13	Open-circuited air inlet sensor*1 or Outside thermo sensor*2	Condition in which 20°C (68°F) is detected
14	Short-circuited air inlet sensor*1 or Outside thermo sensor*2	
21	Open-circuited fin thermo sensor <Vehicles with air conditioner>	Condition in which –2°C (28°F) is detected
22	Short-circuited fin thermo sensor <Vehicles with air conditioner>	
31	Open-circuited and short-circuited air mix damper potentiometer	MAX. HOT Becomes MAX. COOL only when MAX. COOL is set.
32	Open-circuited and short-circuited mode selector damper potentiometer	DEF. Becomes FACE only when FACE mode is set.
41	Defective air mix damper motor	–
42	Defective mode selector damper motor	–

NOTE

- (1) If two or more abnormal conditions occur at the same time, the code numbers are alternately displayed, in order, repeatedly.
- (2) The nature of the malfunction is entered and stored in the memory from the time the malfunction occurs until the ignition switch is next turned to OFF.
- (3) *1 : <Vehicles built up to October, 1992>
- (4) *2 : <Vehicles built from November, 1992>

55-20 HEATER, AIR CONDITIONER AND VENTILATION – Troubleshooting

SERVICE DATA

Item No.	Inspection location	Inspection point	Diagnosis		Problem cause	Remedy
			Normal	Abnormal		
11	Passenger compartment temperature sensor	Measure the sensor resistance when the passenger compartment temperature is 25°C (77°F).	Approx. 4kΩ	Outside approx. 4kΩ	Passenger compartment temperature sensor is defective.	Replace the passenger compartment temperature sensor.
		Measure the voltage between the air conditioner control unit terminal ⑩* ¹ or ⑪* ² and the earth when the passenger compartment temperature is 25°C (77°F).	Within the range of approx. 2.3–2.9V	–	Broken harness wire between the passenger compartment temperature sensor and the air conditioner control unit.	Repair the harness.
			–	Outside the range of approx. 2.3–2.9V	Air conditioner control unit connector contact is defective, or air conditioner control unit is defective.	Repair the connector contact or replace the air conditioner control unit.
13	Air inlet sensor* ¹ Outside thermo sensor* ²	Measure the sensor resistance when the atmospheric temperature is 25°C (77°F).	Approx. 4kΩ	Outside approx. 4kΩ	Sensor is defective.	Replace the sensor.
		Measure the voltage between the air conditioner control unit terminal ⑦* ¹ or ⑧* ² and the earth when the atmospheric temperature is 25°C (77°F).	Within the range of approx. 2.3–2.8V	–	Broken harness wire between the sensor and the air conditioner control unit	Repair the harness.
			–	Outside the range of approx. 2.3–2.8V	Air conditioner control unit connector contact is defective, or air conditioner control unit is defective.	Repair the connector contact or replace the air conditioner control unit.
15	Engine coolant temperature sensor	Check the continuity in the sensor when the engine coolant temperature is 29.5°C–42.5°C (85.1°F–108.5°F)	Continuity	No continuity	Engine coolant temperature sensor is defective.	Replace the engine coolant temperature sensor.
		Measure the voltage between the air conditioner control unit terminal ⑦* ¹ or ⑧* ² and the earth when the engine coolant temperature is 29.5°C–42.5°C (85.1°F–108.5°F).	Approx. 12V	–	Broken harness wire between the engine coolant temperature sensor and the air conditioner control unit	Repair the harness.
			–	Outside approx. 12V	Air conditioner control unit connector contact is defective, or air conditioner control unit is defective.	Repair the connector contact or replace the air conditioner control unit.

NOTE

*¹ : <Vehicles built up to October, 1992>

*² : <Vehicles built from November, 1992>

HEATER, AIR CONDITIONER AND VENTILATION – Troubleshooting 55-21

Item No.	Inspection location	Inspection point	Diagnosis		Problem cause	Remedy
			Normal	Abnormal		
21	Fin thermo sensor <Vehicles with air conditioner>	Measure the resistance in the sensor when the sensor detected temperature is 25°C (77°F).	Approx. 4kΩ	Outside approx. 4kΩ	Fin thermo sensor is defective.	Replace the fin thermo sensor.
		Measure the voltage between the air conditioner control unit terminal ②*1 or ⑦*2 and the earth when the sensor detected temperature is 25°C (77°F).	Within the range of approx. 2.3–2.9V	–	Broken harness wire between the fin thermo sensor and the air conditioner control unit	Repair the harness.
			–	Outside the range of approx. 2.3–2.9V	Air conditioner control unit connector contact is defective, or air conditioner control unit is defective.	Repair the connector contact or replace the air conditioner control unit.
31	Air-mixing damper potentiometer	Refer to P.55-43.			Air-mixing damper potentiometer is defective.	Replace the air-mixing damper potentiometer.
		Measure the voltage between the air conditioner control unit terminal ⑦*1 or ⑧*2 and the earth when the potentiometer is in the MAX. COOL position.	Within the range of approx. 0.1–0.3V	–	Broken harness wire between the air-mixing damper potentiometer and the air conditioner control unit	Repair the harness
			–	Outside the range of approx. 0.1–0.3V	Air conditioner control unit connector contact is defective, or air conditioner control unit is defective.	Repair the connector contact or replace the air conditioner control unit.
33	Air outlet changeover damper potentiometer	Refer to P.55-43.			Air outlet changeover damper potentiometer is defective.	Replace the air outlet changeover damper potentiometer.
		Measure the voltage between the air conditioner control unit terminal ⑦*1 or ⑧*2 and the earth when the potentiometer is in the FACE position.	Within the range of approx. 0.1–0.3V	–	Broken harness wire between the air outlet changeover damper potentiometer and the air conditioner control unit	Repair the harness.
			–	Outside the range of approx. 0.1–0.3V	Air conditioner control unit connector contact is defective, or air conditioner control unit is defective.	Repair the connector contact or replace the air conditioner control unit.

NOTE

*1 : <Vehicles built up to October, 1992>

*2 : <Vehicles built from November, 1992>

55-22 HEATER, AIR CONDITIONER AND VENTILATION – Troubleshooting

ACTUATOR TEST

Item No.	Actuator test item	Item No.	Actuator test item
01	Blower fan motor OFF command	08	Air outlet mode FACE drive
02	Blower fan motor LO drive	09	Air outlet mode FOOT drive
03	Blower fan motor ME drive	10	Air outlet mode DEF drive
04	Blower fan motor HI drive	11	Magnetic clutch OFF command <Vehicles with air conditioner>
05	Air-mixing damper 0% drive	12	Magnetic clutch ON command <Vehicles with air conditioner>
06	Air-mixing damper 50% drive	13	Inside/outside changeover FRESH drive
07	Air-mixing damper 100% drive	14	Inside/outside changeover RECIRC drive

SAFETY PRECAUTIONS

<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 noncorrosive 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 52°C (125.6°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 52°C (125.6°F) is all the heat required for this purpose. Do not heat the refrigerant container with a blow torch or any other means that would raise temperature and pressure above this temperature. **Do not weld or steam clean on or near the system components or refrigerant lines.**

Caution

Keep R-12 containers upright when charging the system.

When metering R-12 into the refrigeration system keep the supply tank or cans in an upright position. If the refrigerant container is on its side or upside down, liquid refrigerant will enter the system and damage the compressor.

Caution

Always work in a well-ventilated room.

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

Caution

Do not allow liquid refrigerant to touch bright metal.

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

<Vehicles using R-134a refrigerant>

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

Refrigerant R-134a is transparent and colourless in both the liquid and vapour state. Since it has a boiling point of -29.8°C (-21.7°F) at atmospheric pressure, it will be a vapour at all normal temperatures and pressures. The vapour is heavier than air, non-flammable, and nonexplosive. The following precautions must be observed when handling R-134a.

Caution

Wear safety goggles when servicing the refrigeration system.

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

Caution

Do not heat R-134a above 40°C (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.

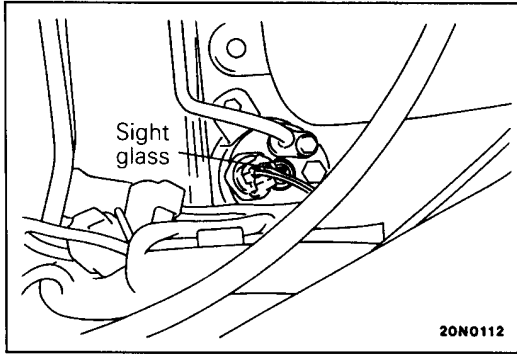
When metering R-134a into the refrigeration system keep the supply tank or cans in an upright position. If the refrigerant container is on its side or upside down, liquid refrigerant will enter the system and damage the compressor.

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

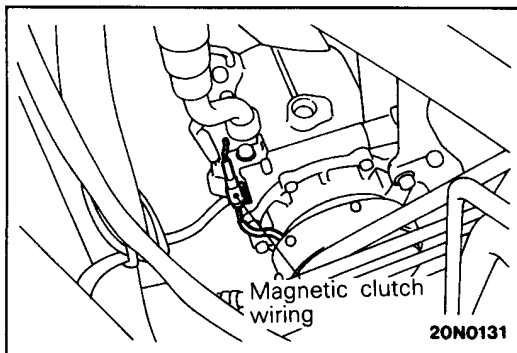
E55FABA

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.

COMPRESSOR CHECK

After driving the compressor for 5 minutes, inspect the following contents to determine whether it is okay or not.

	Inspection contents			Judgement criteria	Probable cause	Remedy
	High lateral pressure	Low lateral pressure	Performance test			
Case 1	Saturation pressure of outside air	150 ~ 200 kPa (1.5 ~ 2.0 kg/cm ²) (21.3 ~ 28.4 psi)	Pass	Good	-	-
Case 2	+ 200 ~ 500 kPa (2.0 ~ 5.0 kg/cm ²) (28.4 ~ 71.1 psi)	100 kPa or less (1.0 kg/cm ² or less) (14.2 psi or less)	Pass	Abnormality Magnetic clutch goes ON and OFF frequently.	Compressor is defective* ¹	Replace the compressor.
Case 3	Almost saturation pressure of outside air		Fail	Abnormality No difference between high pressure and low pressure.	Compressor is defective* ²	
Case 4	Lower than case 1	150 ~ 200 kPa (1.5 ~ 2.0 kg/cm ²) (21.3 ~ 28.4 psi)	Fail	Abnormality Outlet temperature is high.	Expansion valve is blocked.	Replace the expansion valve.

NOTE

(1) Saturation pressure of outside air

Temperature °C (°F)	15 (59)	20 (68)	25 (77)	30 (86)	35 (95)	40 (104)
Saturation pressure of outside air kPa (kg/cm ² , psi)	400 (4.0, 56.9)	470 (4.7, 66.8)	560 (5.6, 79.7)	650 (6.5, 92.5)	760 (7.6, 108.1)	870 (8.7, 123.7)

(2) For a summary of the efficiency tests, refer to P.55-33.

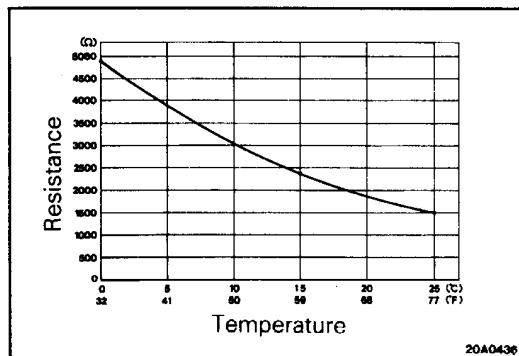
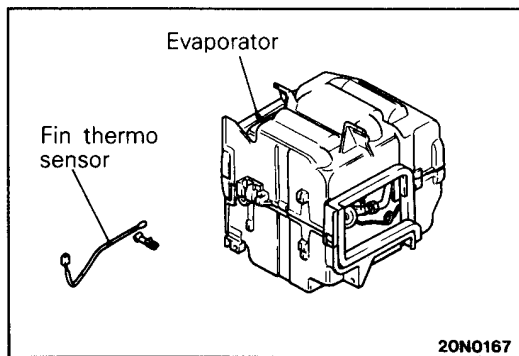
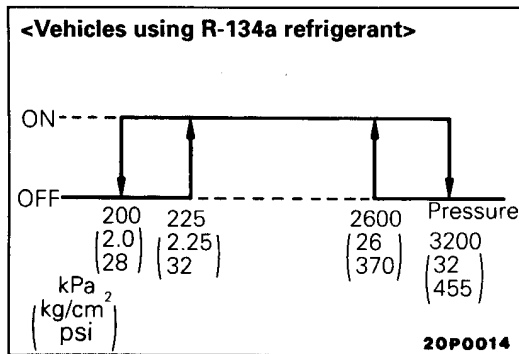
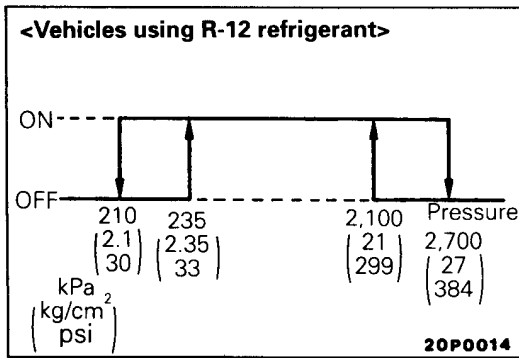
(3) *¹ is when the compressor is locked in a fully loaded condition (100% discharge).

(4) *² is when the compressor is locked in a full capacity control condition (amount of discharge is 0).

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 (LOW PRESSURE SWITCH)

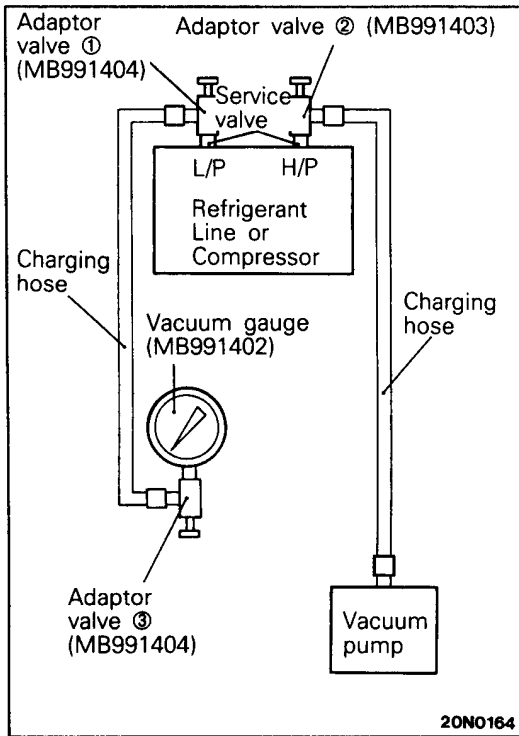
- (1) Turn back the adaptor valve handle all the way and install it to the low pressure side service valve.
- (2) With the gauge manifold low pressure service valves closed, connect the gauge manifold high pressure side charging hose to the adaptor valve.
- (3) Tighten the adaptor valve handle and open the service valve.
- (4) If there is continuity between the dual pressure switch terminals when the low pressure side pressure is at the level of dual pressure switch ON condition shown to the left, the switch is functioning normally. If not, replace the switch.

FIN-THERMO SENSOR

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

COMPRESSOR DRIVE BELT ADJUSTMENT E55FWAE

Refer to GROUP 11 – Engine Adjustment.



CHARGING PROCEDURES

<Vehicles using R-12 refrigerant>

INSTALLATION OF CHARGE EQUIPMENT

<When Using a Vacuum Gauge>

- (1) Turn the adaptor valves ① and ② handles back fully (valves shut) and attach adaptor valves ① and ② to the high and low pressure service valves respectively.

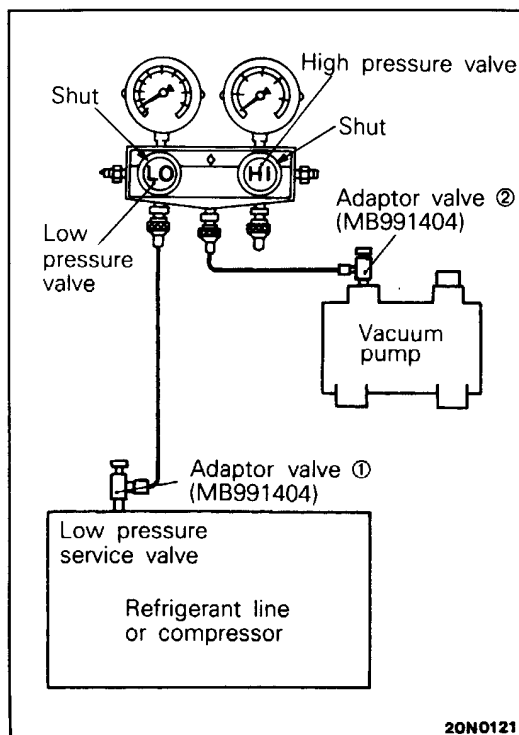
NOTE

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

- (2) Fully tighten the handles of adaptor valves ① and ② (valves open) and open the high and low pressure service valves.
- (3) Connect the charging hoses to adaptor valves ① and ②.
- (4) Attach the fully tightened adaptor valve ③ (valve open) handle to the low pressure charging hose.
- (5) Attach the vacuum gauge to adaptor valve ③.
- (6) Attach the vacuum pump to the high pressure charging hose.

NOTE

- (1) Do not connect the high and low pressure sides adversely. (Connect high pressure side to the condenser and low pressure side to the evaporator.)
- (2) The indications "DIS" and "SUC" on the compressor indicate high and low pressure sides respectively.



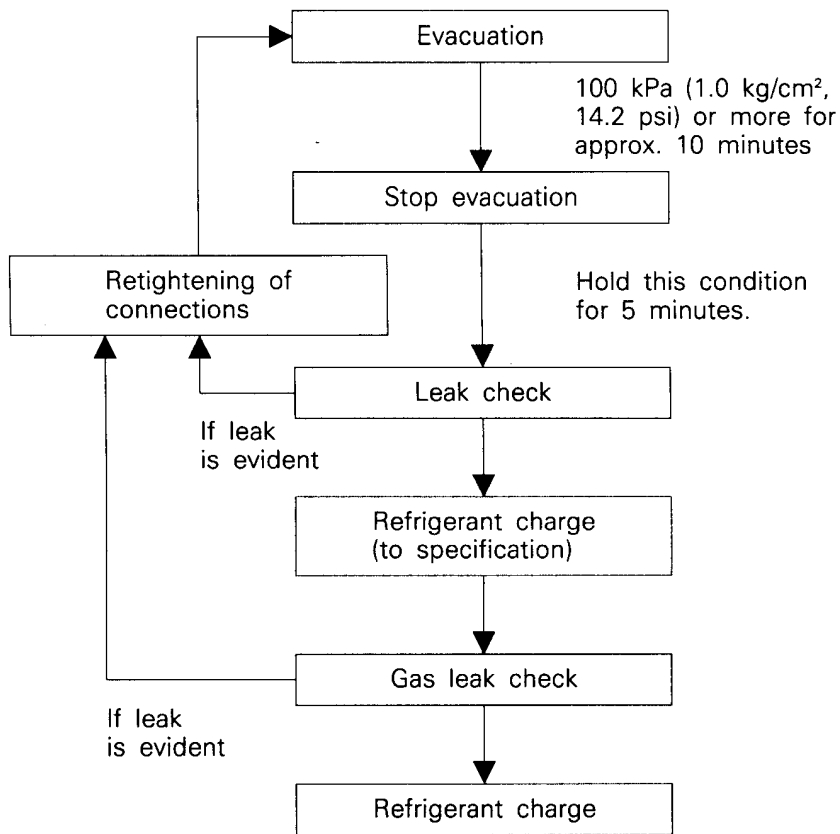
<When Using a Gauge Manifold>

- (1) Turn the adaptor valve handles anti-clockwise (valve shut) and attach the respective adaptor valves ① and ② to the low pressure service valve and to the vacuum pump.
- (2) Shut the gauge manifold high and low pressure valves.
- (3) Connect the charging hoses to each adaptor valve as shown in the diagram.
- (4) Turn the adaptor valves ① and ② handles clockwise (valve open) to open the line the service valves and to the vacuum pump.

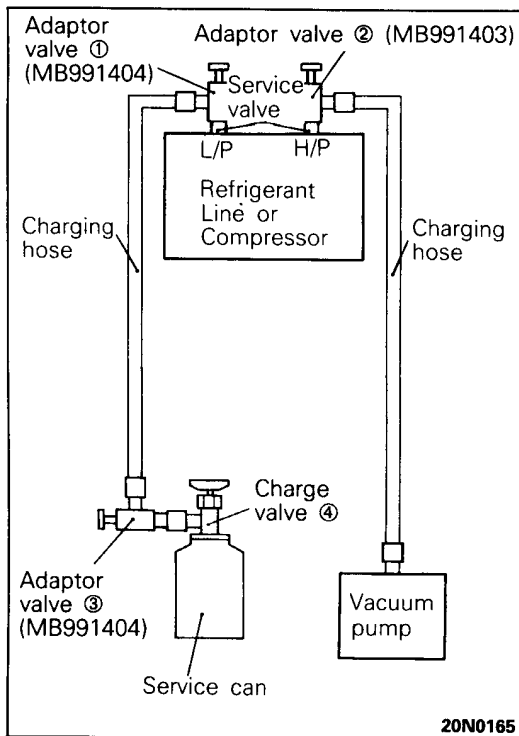
NOTE

- (1) Do not connect the high and low pressure sides adversely. (Connect high pressure side to the condenser and low pressure side to the evaporator.)
- (2) The indications "DIS" and "SUC" on the compressor indicate high and low pressure sides respectively.

CHARGING SYSTEM



The refrigerant system must have been evacuated using the previous procedure before charging. Charge using only R-12 refrigerant. R-12 is available in bulk tanks or small cans. Follow the safety precautions for handling R-12 as listed in this group.



CHARGING THE REFRIGERANT <Vehicles using R-12 refrigerant>

CHARGING WITH SMALL CANS

<When Using a Vacuum Gauge>

When using disposable cans of this type, follow carefully the can manufactures instructions:

- (1) Start up the vacuum pump.

Caution

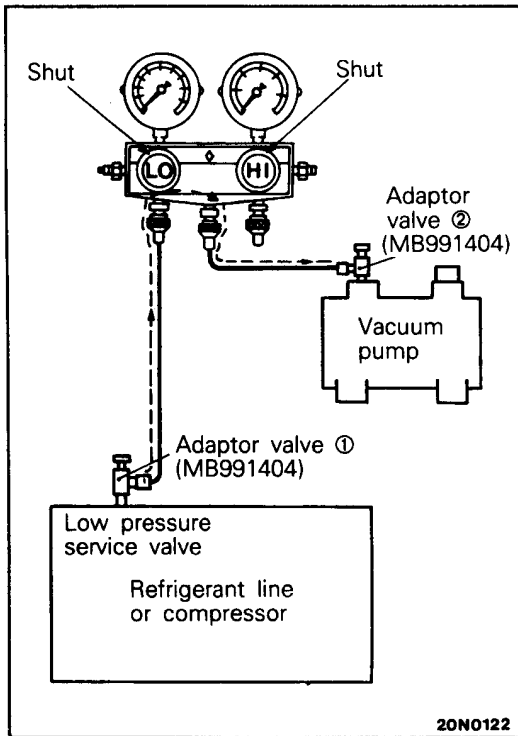
1. Do not use the compressor for evacuation.
2. Do not operate the compressor in the vacuum condition; damage may occur.

- (2) Evacuate to a vacuum reading of 100 kPa (1.0 kg/cm², 14.2 psi) or higher (approx. 10 minutes).
- (3) Turn the high pressure adaptor valve ② handle all the way anti-clockwise (valve shut).
- (4) Stop the vacuum pump and allow to stand for 5 minutes.
- (5) Check for leaks. (Good if the vacuum is held.)
- (6) Turn the charge valve ④ handle back (valve open), and attach it to the service can.
- (7) Turn the adaptor valve ③ handle back fully (valve shut), remove the vacuum meter and attach the service can.
- (8) Tighten the charge valve handle to puncture the service can.
- (9) Turn the charge valve handle back, tighten the handle of adaptor valve ③ fully (valve open).
- (10) If the refrigerant is not drawn in, turn the adaptor valve ① handle all the way anti-clockwise (valve shut).
- (11) Check for gas leaks using a leak detector.
- (12) Start the engine.
- (13) Operate the air conditioner and set at the lowest temperature (MAX. COOL).
- (14) Fix the engine speed at 1,500 r/min.
- (15) Turn the adaptor valve ① handle fully clockwise (valve open) and 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.

- (16) After charging with refrigerant, turn the adaptor valve ① handle fully anti-clockwise (valve shut).



<When Using a Gauge Manifold>

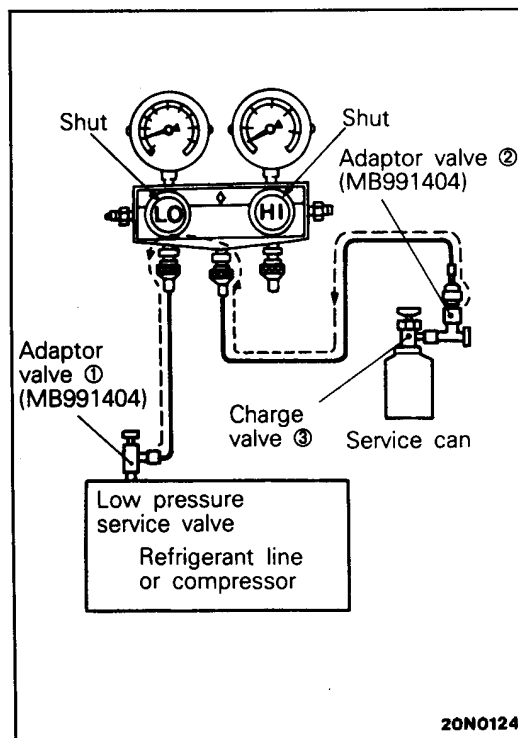
When using disposable cans of this type, follow carefully the can manufacturers instructions:

- (1) 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.

- (2) Evacuate to a vacuum reading of 100 kPa (1.0 kg/cm², 14.2 psi) or higher (approx. 10 minutes).
- (3) Turn the adaptor valve ② handle fully anticlockwise (valve shut).
- (4) Stop the vacuum pump and allow to stand for 5 minutes.
- (5) Check for leaks. (Good if the vacuum is held.)



- (6) Tighten the charge valve ② handle to puncture the service can.
- (7) Turn the charge valve ③ handle back, tighten the adaptor valve ③ handle fully, and open the service valves.
- (8) Charge the gas from the low pressure valve on the manifold gauge by opening valve.

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.

- (9) If the refrigerant is not drawn in, turn the adaptor valve ① handle all the way anticlockwise (valve shut).
- (10) Use a gas leak detector to check for leaking gas.

- (11) Start the engine.
- (12) Turn on the air conditioner, and adjust the setting to the lowest temperature (MAX. COOL).
- (13) Run the engine revolutions at 1,500 r/min.
- (14) Turn the low pressure adaptor valve handle all the way clockwise (valve open) and to charge the required volume of refrigerant.

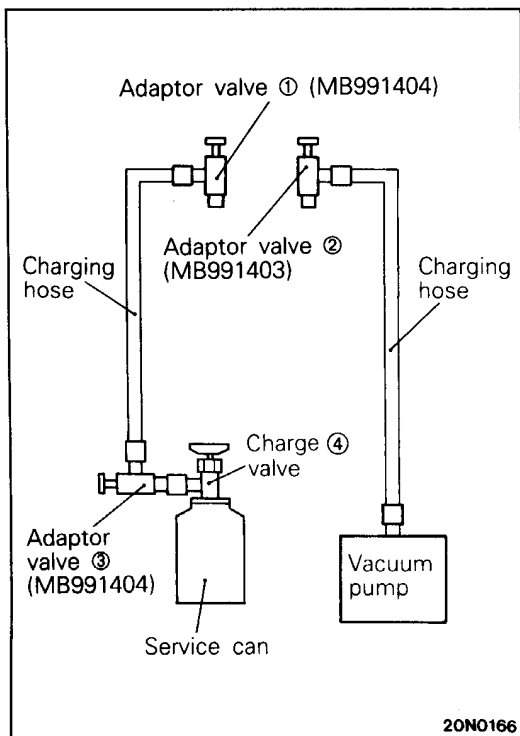
Caution

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

- (15) After charging the refrigerant, turn the low pressure adapter valve ① handle completely back (valve shut).

CHARGING WITH REFRIGERANT RECOVERY AND RECYCLING UNIT

When using refrigerant recovery and recycling unit, follow carefully the instruction manual for the unit.



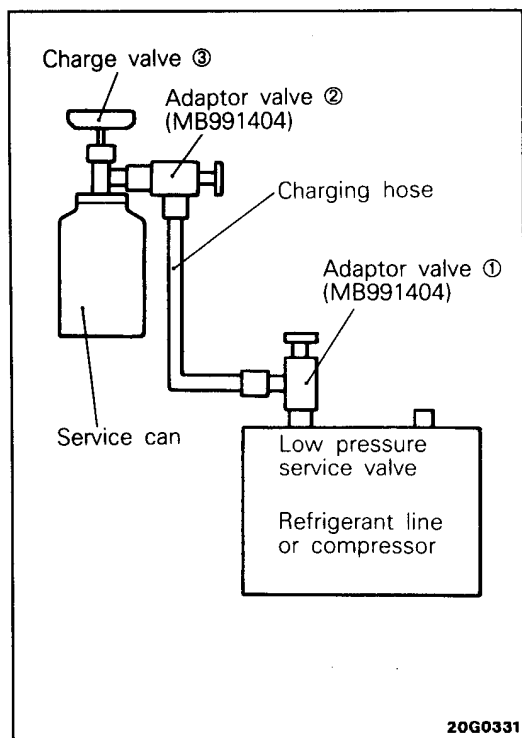
REMOVAL OF CHARGE EQUIPMENT

- (1) Close the charge valve ④ (valve shut).
- (2) Remove the adaptor valve ① and ② from each service valve.
- (3) Remove the service can.

Caution

If some refrigerant is remaining, keep the charge valve ④ and adaptor valves ① and ③ connected to the service can until after the next operation.

- (4) Remove the charge valve ④.
- (5) Remove the adaptor valve ③.
- (6) Remove the adaptor valve ①.
- (7) Remove the adaptor valve ②.
<When using a gauge manifold>
- (8) Remove the vacuum pump.



CORRECTING LOW REFRIGERANT LEVEL

- (1) Install the charge valve ③ to the service can with its handle turned back all the way (valve open).
- (2) Attach the adaptor valve ② with the handle tightened to the charge valve ③ (valve open).
- (3) Attach the charge hose to adaptor valve ②.
- (4) Turn the handle of adaptor valve ① back fully (valve shut) and attach the charging hose.
- (5) Tighten the charge valve ③ handle to puncture the service can.
- (6) Turn the charge valve ③ handle back fully (valve open).
- (7) Operate the handle of adaptor valve ① to bleed the air.
- (8) Install the adaptor valve ① to the low pressure side service valve.

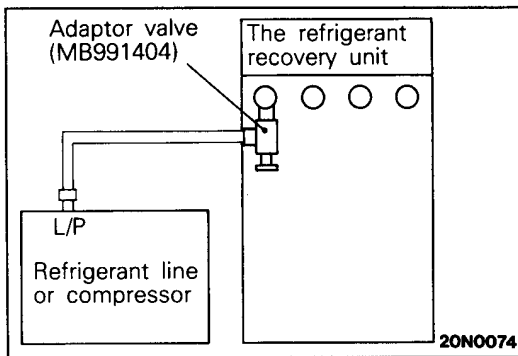
Caution

Never use the high pressure side as this may cause refrigerant to flow back, using rupture of the service can.

- (9) Start the engine.
- (10) Operate the air conditioner and set at the lowest temperature (MAX. COOL).
- (11) Fix the engine speed at 1,500 r/min.
- (12) Tighten the adaptor valve ① handle (valve open) and charge refrigerant checking level with the sight glass.
- (13) Upon completion of charging, the adaptor valve ① handle turn back all the way (valve shut).
- (14) Remove the adaptor valve ① from the service valve.

NOTE

If the service can is not emptied completely, keep the charge valve and adaptor valves ① and ② closed until after the next operation.



DISCHARGING SYSTEM

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

NOTE

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

REFILLING OF OIL IN THE AIR-CONDITIONER SYSTEM

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

When a FX-105VS compressor is installed at the factory, it contains 160 cc (9.8 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

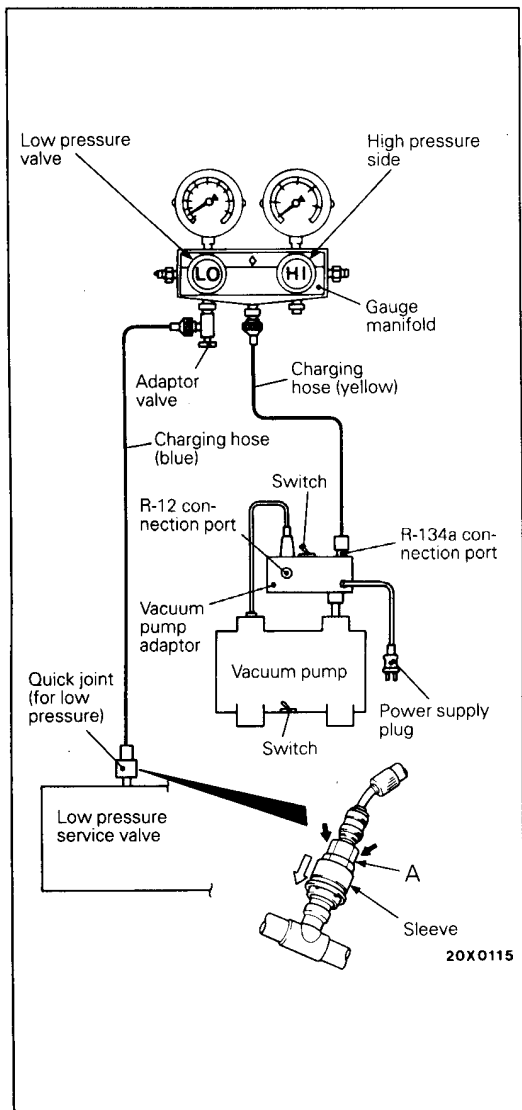
Quantity:

Evaporator: 60 cc (3.66 cu.in.)

Condenser: 15 cc (0.92 cu.in.)

Suction hose: 10 cc (0.61 cu.in.)

Receiver: 10 cc (0.61 cu.in.)



CHARGING <Vehicles using R-134a refrigerant>

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

NOTE

The low-pressure service valve is on the suction hose.

Caution

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

5. Close the high and low pressure valves of the gauge manifold.
6. Install the vacuum pump adaptor to the vacuum pump.
7. Connect the vacuum pump plug to the vacuum pump adaptor.
8. Connect the charging hose (yellow) to the R-134a connection port of the vacuum pump adaptor.
9. Tighten the adaptor valve handle (valve open).
10. Open the low pressure valve of the gauge manifold.
11. Turn the power switch of the vacuum pump to the ON position.

NOTE

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

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

Caution

Do not operate the compressor for evacuation.

13. Evacuate to a vacuum reading of 100 kPa (1.0 kgm/cm², 14.2psi) or higher (takes approx. 10 minutes).
14. Turn the vacuum pump adaptor switch OFF and allow to stand it for 5 minutes.

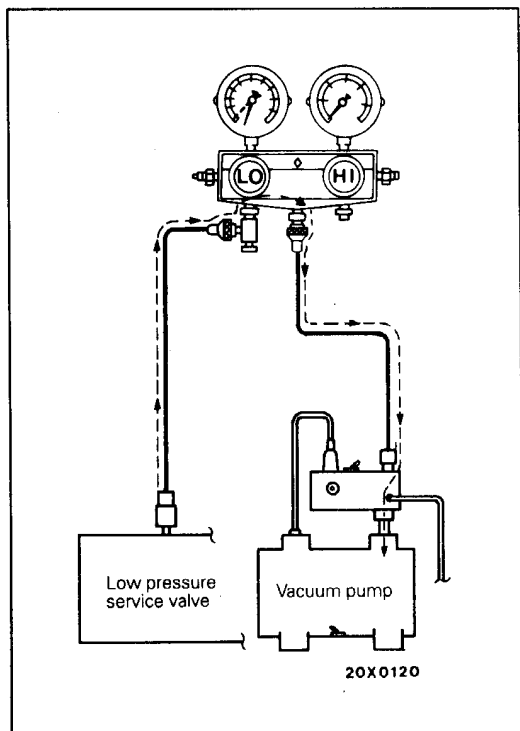
Caution

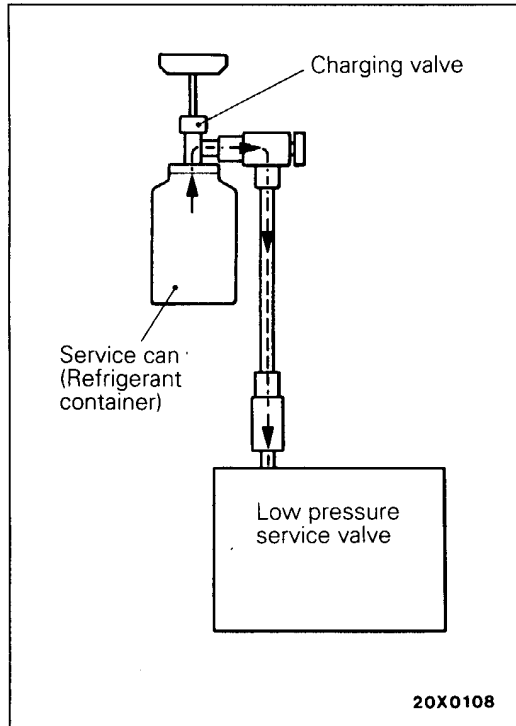
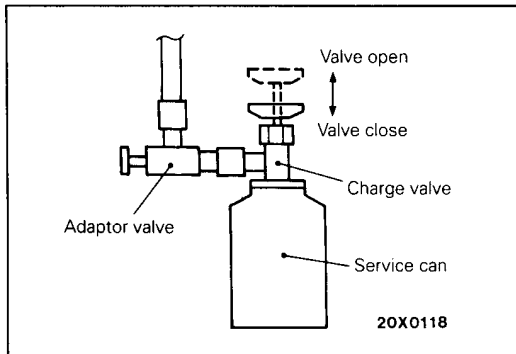
Do not operate the compressor in the vacuum condition; damage may occur.

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

Caution

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





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

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

Caution

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

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

Caution

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

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

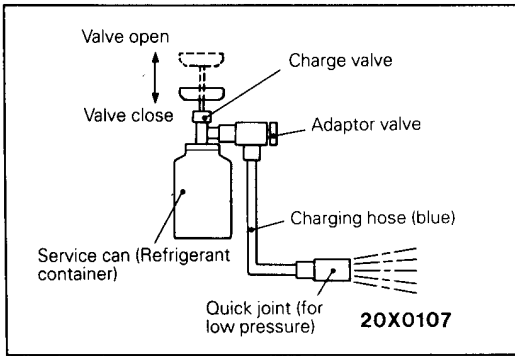
Caution

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

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

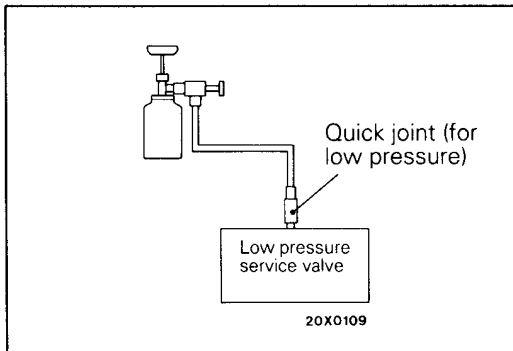
NOTE

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



CORRECTING LOW REFRIGERANT LEVEL IN CASE THE SERVICE CAN IS USED

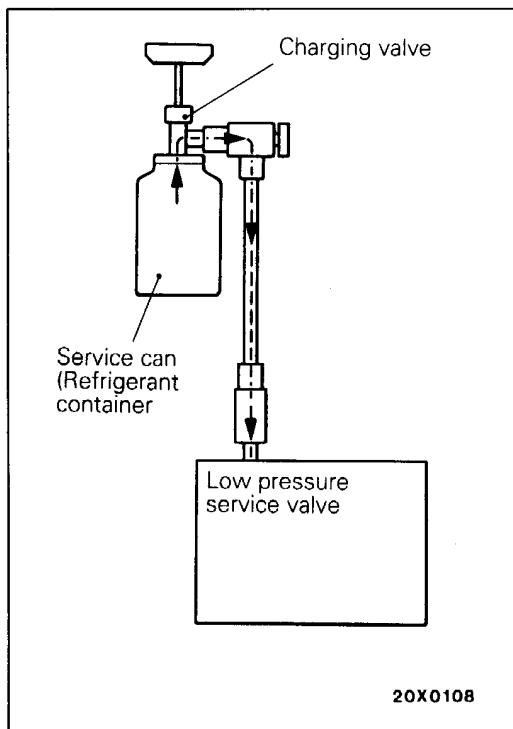
1. Install the charge valve with the handle turned all the way back (valve open) to the service can.
2. Install the adaptor valve with the handle turned all the way back (valve close) to the charging valve.
3. Connect the charging hose (blue) to the adaptor valve.
4. Connect the charging hose (blue)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



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

NOTE

The low-pressure service valve is on the suction hose.



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

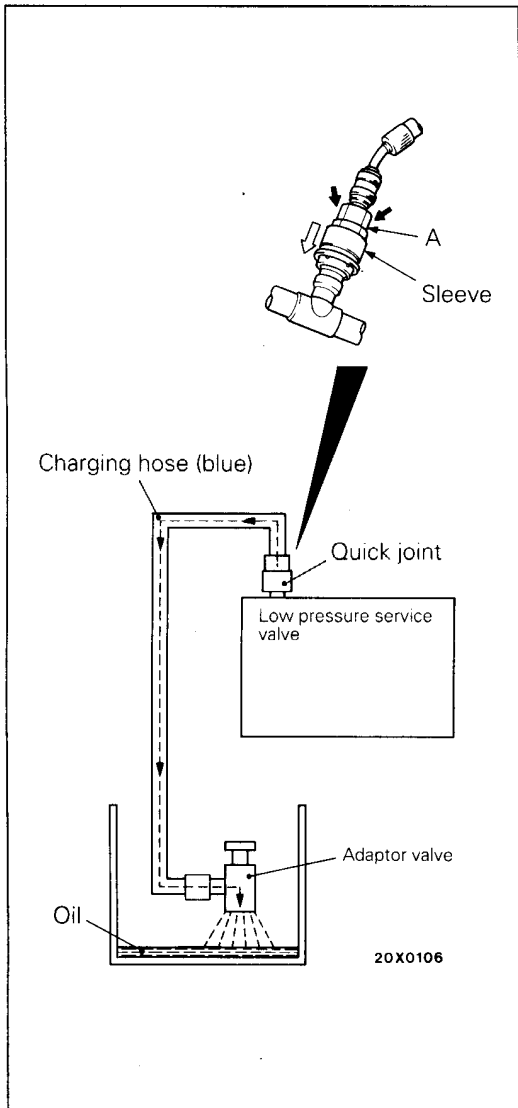
Caution

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

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

NOTE

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



DISCHARGING SYSTEM

1. Run the engine at an engine speed of 1200–1500 r/min for approximately 5 minutes with the A/C operating to return the oil.

NOTE

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

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

NOTE

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

NOTE

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

REFILLING OF OIL IN THE A/C SYSTEM

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

When a compressor is installed at the factory, it contains 170 cc (10.4 cu.in.) of refrigerant oil.

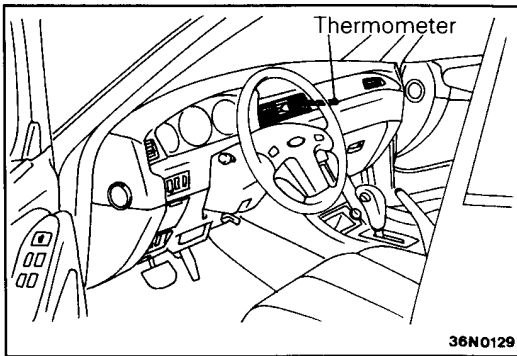
While the A/C system is in operation, the oil is carried through the entire system by the refrigerant. Some of this oil will be trapped and retained in various parts of the system.

When the following system components are 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 cc (3.66 cu.in.)
Condenser:	15 cc (0.92 cu.in.)
Suction hose:	10 cc (0.61 cu.in.)
Receiver:	10 cc (0.61 cu.in.)



PERFORMANCE TEST

E24FWAH

<Vehicles using R-12 refrigerant>

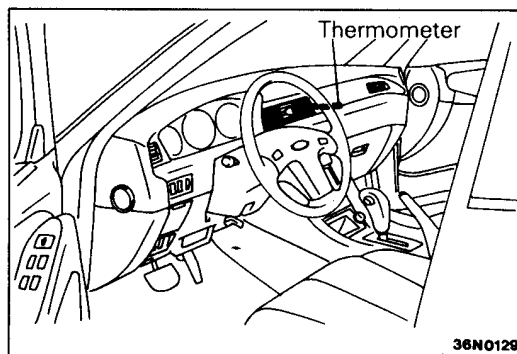
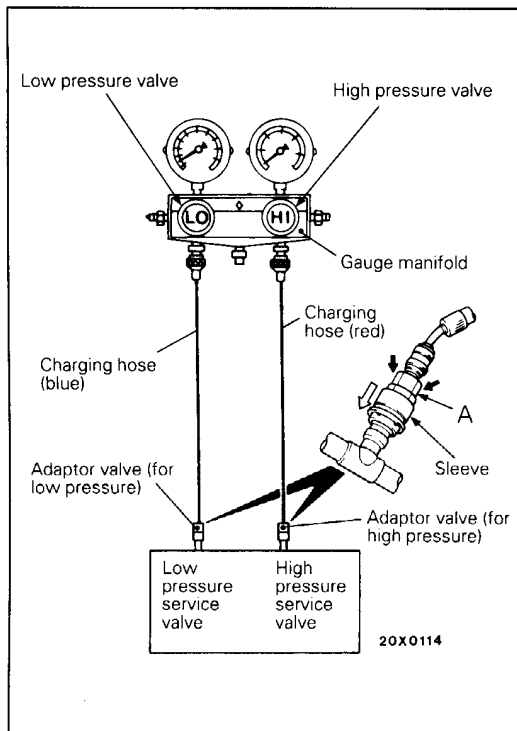
- (1) Park the tested vehicle at the area which is not exposed to the direct sunlight.
- (2) Connect a tachometer.
- (3) Turn back the adaptor valve handle all the way and install the adaptor valves to the high pressure and low pressure service valves.
- (4) Connect the gauge manifold to the adaptor valves.
- (5) Tighten the adaptor valve handle and open the service valves.
- (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 close, and hood open.
- (10) Insert a thermometer in the 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)	0.0–3.0 (32.0–37.4)	0.0–3.0 (32.0–37.4)	0.0–4.0 (32.0–39.2)	0.0–4.0 (32.0–39.2)	0.0–4.0 (32.0–39.2)
Compressor discharge pressure kPa (kg/cm ² , psi)	650–700 (6.5–7.0) (92.5–99.6)	740–790 (7.4–7.9) (105.3–112.4)	980–1020 (9.8–10.2) (139.4–145.1)	1150–1200 (11.5–12.0) (163.6–170.7)	1320–1370 (13.2–13.7) (187.7–194.9)
Compressor suction pressure kPa (kg/cm ² , psi)	130–190 (1.3–1.9) (18.5–27.5)	130–190 (1.3–1.9) (18.5–27.5)	130–190 (1.3–1.9) (18.5–27.5)	130–190 (1.3–1.9) (18.5–27.5)	130–190 (1.3–1.9) (18.5–27.5)



PERFORMANCE TEST

<Vehicles using R-134a refrigerant>

1. The vehicle 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 the liquid pipe B, and the low-pressure service valve is on the suction hose.

Caution

To connect the quick joint, press section A firmly against the service valve until a click is heard. When connection, 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)	0.0–3.0 (3.20–37.4)	0.0–3.0 (32.0–37.4)	0.0–4.0 (32.0–39.2)	0.0–4.0 (32.0–39.2)	0.0–4.0 (32.0–39.2)
Compressor discharge pressure kPa (kg/cm ² , psi)	650–700 (6.5–7.0) (92.5–99.6)	740–790 (7.4–7.9) (105.3–112.4)	980–1020 (9.8–10.2) (139.4–145.1)	1150–1200 (11.5–12.0) (163.6–170.7)	1320–1370 (13.2–13.7) (187.7–194.9)
Compressor suction pressure kPa (kg/cm ² , psi)	130–190 (1.3–1.9) 18.5–27.5)	130–190 (1.3–1.9) 18.5–27.5)	130–190 (1.3–1.9) 18.5–27.5)	130–190 (1.3–1.9) (18.5–27.5)	130–190 (1.3–1.9) 18.5–27.5)

REFRIGERANT LEAK REPAIR PROCEDURE E24FHAQ

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

E24FIAF

Kinks in the refrigerant tubing or sharp bends in the refrigerant hose lines will greatly reduce the capacity of the entire system. High pressures are produced in the system when it is operating. Extreme care must be exercised to make sure that all connections are pressure tight. Dirt and moisture can enter the system when it is opened for repair or replacement of lines or components. The following precautions must be observed. The system must be completely discharged before opening any fitting or connection in the refrigeration system. Open fittings with caution even after the system has been discharged. If any pressure is noticed as a fitting is loosened, allow trapped pressure to bleed off very slowly.

Never attempt to rebend formed lines to fit. Use the correct line for the installation you are servicing.

A good rule for the flexible hose lines is keep the radius of all bends at least 10 times the diameter of the hose.

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

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

COMPRESSOR NOISE

E24FLAD

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

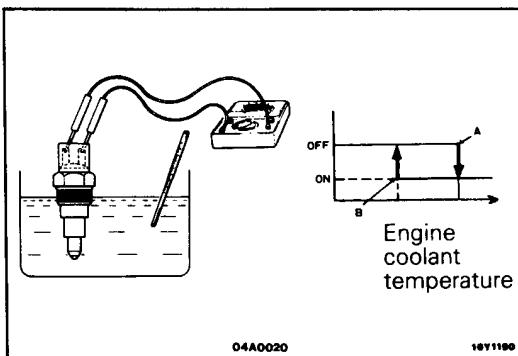
Noises that develop during air conditioning operation can often be misleading. For example: what sounds like a failed front bearing or connecting rod, may be caused by loose bolts, nuts, mounting brackets, or a loose clutch assembly. Verify accessory drive belt tension (power steering or alternator).

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

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

ADJUSTMENT PROCEDURES

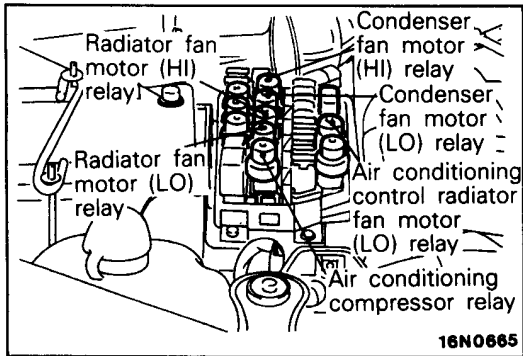
- (1) Select a quiet area for testing. Duplicate conditions as much as possible. Switch compressor on and off several times to clearly identify compressor noise. To duplicate high ambient conditions (high head pressure), restrict air flow through condenser. Install manifold gauge set to make sure discharge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



INSPECTION OF ENGINE COOLANT TEMPERATURE SWITCHES FOR CONDENSER FAN <VEHICLES WITH AIR CONDITIONER> AND FOR RADIATOR FAN

- (1) As shown in the figure, dip the engine coolant temperature switch into warm water or oil as far as the screw.
- (2) Check the continuity when the temperature of the water or oil changes using a circuit tester, and if it is within the following ranges, the switch is functioning properly.

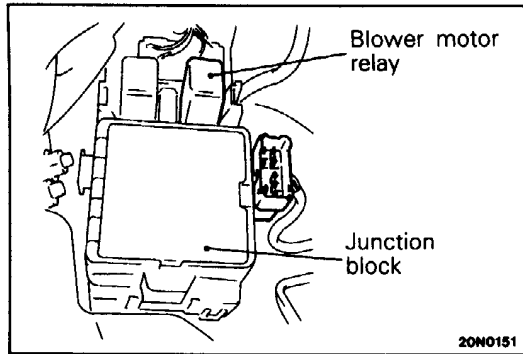
Item	Condenser fan <Vehicles with air conditioner>	Radiator fan
Continuity (temperature at point A)	96–100°C (205–212°F) or more	82–88°C (180–190°F) or more
No continuity (temperature at point B)	92°C (198°F) or less	78°C (172°F) or less



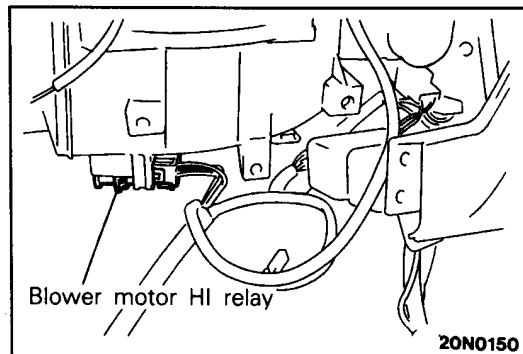
POWER RELAY CHECK

(1) Disconnect each power relay.

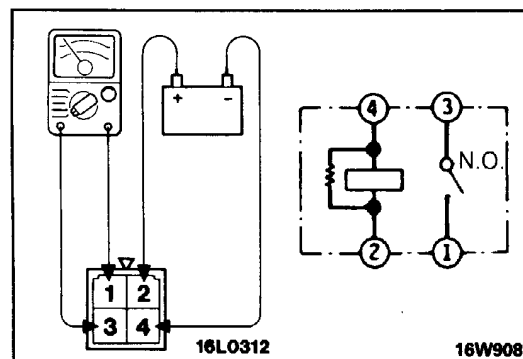
① Remove the radiator fan motor (HI) and (LO) relays, air conditioning control radiator fan motor (LO) relay <vehicles with air conditioner>, condenser fan motor (HI) and (LO) relays and the air conditioner compressor relay from the relay box inside the engine compartment.



② Remove the blower motor relay from the junction block.



③ Remove the blower motor HI relay from the blower case assembly.



(2) Inspect the continuity between the terminals when battery power is applied to terminal 2 and terminal 4 is earthed, or when there is no current flowing.

Current	Between terminals 1 and 3	Continuity
No current	Between terminals 1 and 3	No continuity
	Between terminals 2 and 4	Continuity

IDLE-UP OPERATION CHECK

E24FOAB

- (1) Before inspection and adjustment set vehicle in the following condition:
 - Engine coolant temperature: 80–95°C (176–203°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 that the idling speed is at the standard value.
Standard value: 700±100 r/min
- (3) Check to be sure that the idling speed becomes the standard value when the air conditioner switch is switched ON and the air conditioner is activated.

Standard value: 900±100 r/min

NOTE

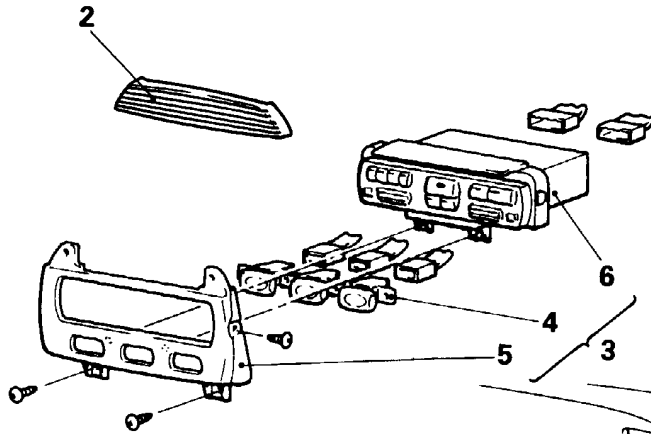
It is not necessary to make an adjustment, because the idling speed is automatically adjusted by the ISC* system. If, however, there occurs a deviation from the standard value for some reason, check the ISC* system.

ISC: Idle Speed Control

AIR CONDITIONER CONTROL PANEL ASSEMBLY

E55GEAA

REMOVAL AND INSTALLATION <VEHICLES WITHOUT AIR CONDITIONER AND VEHICLES WITH AIR CONDITIONER BUILT UP TO OCTOBER, 1992>



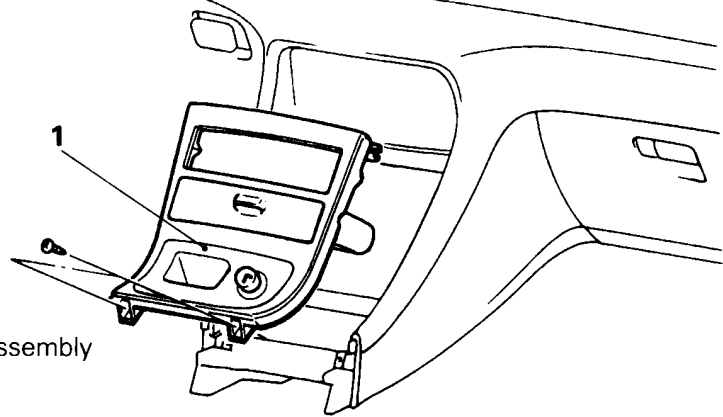
Pre-removal and Post-installation Operation

- Removal and Installation of the Floor Console (Refer to GROUP 52 – Floor Console.)

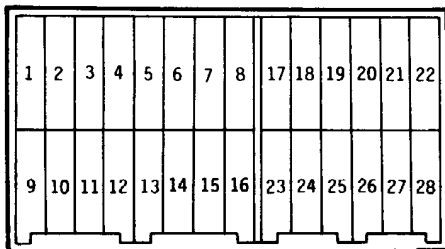
CAUTION: SRS <L.H. drive vehicles>
When removing and installing the floor console in vehicles equipped with SRS, do not let it bump against the SRS diagnostic unit or other components.

Removal steps

1. Audio panel
2. Heater control garnish
3. Air conditioner control panel assembly
4. Center switch
5. Heater panel
6. Air conditioner control panel



20N0142



20N0069

INSPECTION

E55GCAK

BLOWER SWITCH INSPECTION

- (1) When the AUTO mode switch is ON, check the continuity between terminals ⑧ and ⑫.
- (2) Operate the switch and measure the resistance between terminals ⑧ and ⑫.

Switch position	Resistance kΩ (Standard value)
Blower speed MIN.	0.25
Blower speed MAX.	2 ± 10%

TEMPERATURE CONTROL SWITCH INSPECTION

Operate the switch and measure the resistance between terminals ④ and ⑪.

Switch position	Resistance kΩ (Standard value)
MAX. COOL	0.275
MAX. HOT	∞

INSPECTION OF AIR CONDITIONER SWITCH <VEHICLES WITH AIR CONDITIONER>, MODE CHANGEVER SWITCH AND INSIDE/OUTSIDE AIR CHANGEVER SWITCH

(1) Operate the switch and check the continuity between the terminals.

Terminal	6	13	14	17	18	20	23	24	28
Switch									
AUTO Mode switch					○—○				
FACE Mode switch DEF. Mode switch				○—○					
A/C switch <Vehicles with air conditioner>							○—○		
ECONO switch <Vehicles with air conditioner>								○—○	
Outside air inlet switch	○—○			○					○
Inside air circulation switch	○—○		○						○

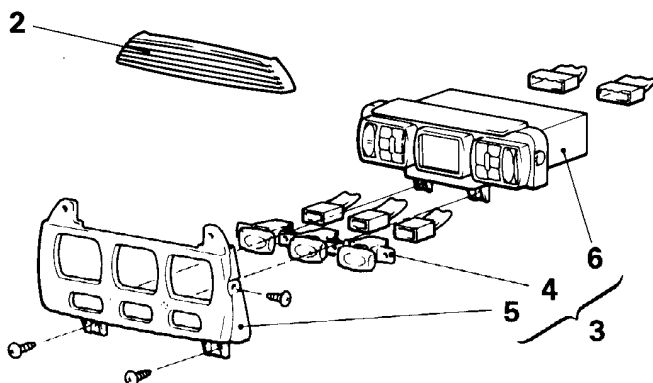
NOTE

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

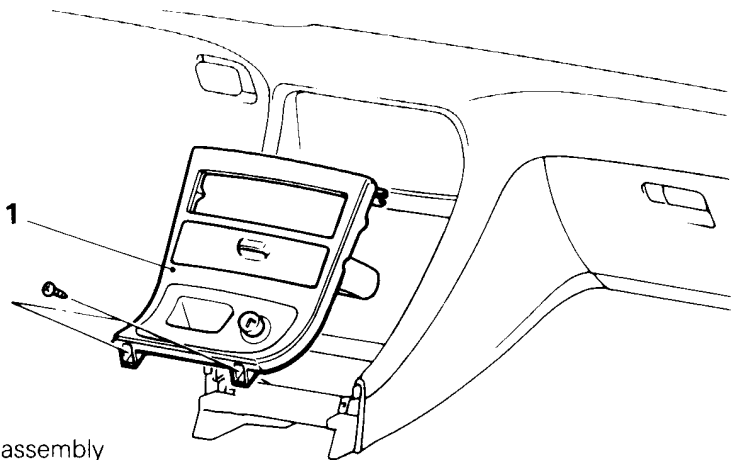
- (2) After checking the FACE mode switch, press the DEF. mode switch and check the continuity between terminals ⑰ and ⑳ . If there is no continuity, it is normal.
- (3) Operate the switch and measure the resistance between terminals ⑰ and ㉑ .

Switch operation	Resistance kΩ (Standard value)
FOOT Mode	0.33±5%
FOOT/DEF. Mode	1±5%
FACE/FOOT Mode	3.3±5%

REMOVAL AND INSTALLATION
<VEHICLES WITH AIR CONDITIONER BUILT FROM NOVEMBER, 1992>



Pre-removal and Post-installation Operation
● Removal and Installation of the Floor Console (Refer to GROUP 52 – Floor Console.)
CAUTION: SRS <L.H. drive vehicles>
When removing and installing the floor console in vehicles equipped with SRS, do not let it bump against the SRS diagnostic unit or other components.



Removal steps

1. Audio panel
2. Heater control garnish
3. Air conditioner control panel assembly
4. Center switch
5. Heater panel
6. Air conditioner control panel

20N0236

NOTES

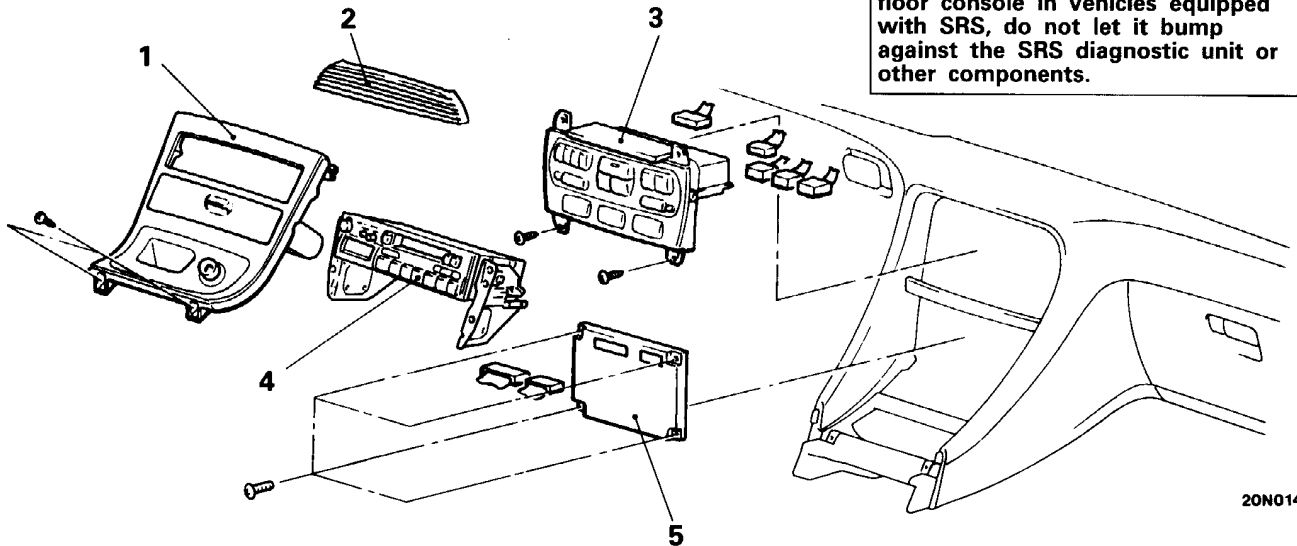
A/C CONTROL UNIT

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation

- Removal and Installation of the Floor Console (Refer to GROUP 52 – Floor Console.)

CAUTION: SRS <L.H. drive vehicles>
When removing and installing the floor console in vehicles equipped with SRS, do not let it bump against the SRS diagnostic unit or other components.



20N0141

Removal steps

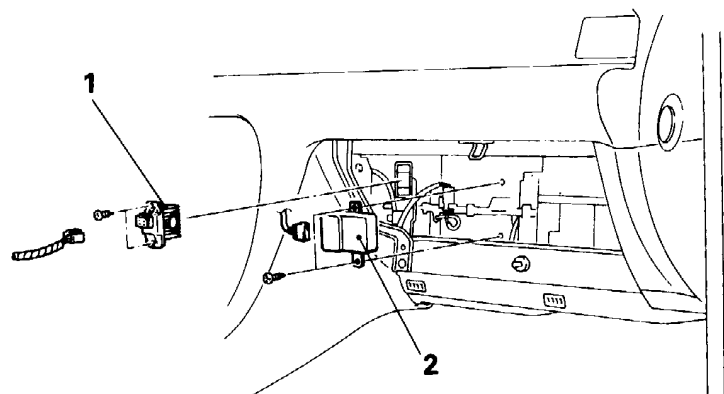
1. Audio panel
2. Heater control garnish
3. Air conditioner control panel assembly
4. Radio and tape player
5. A/C control unit

POWER TRANSISTOR, BELT LOCK CONTROLLER

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation

- Removal and Installation of the glove box (Refer to GROUP 52 – Instrument Panel.)



1. Power transistor
2. Belt lock controller <DOHC>

20N0152

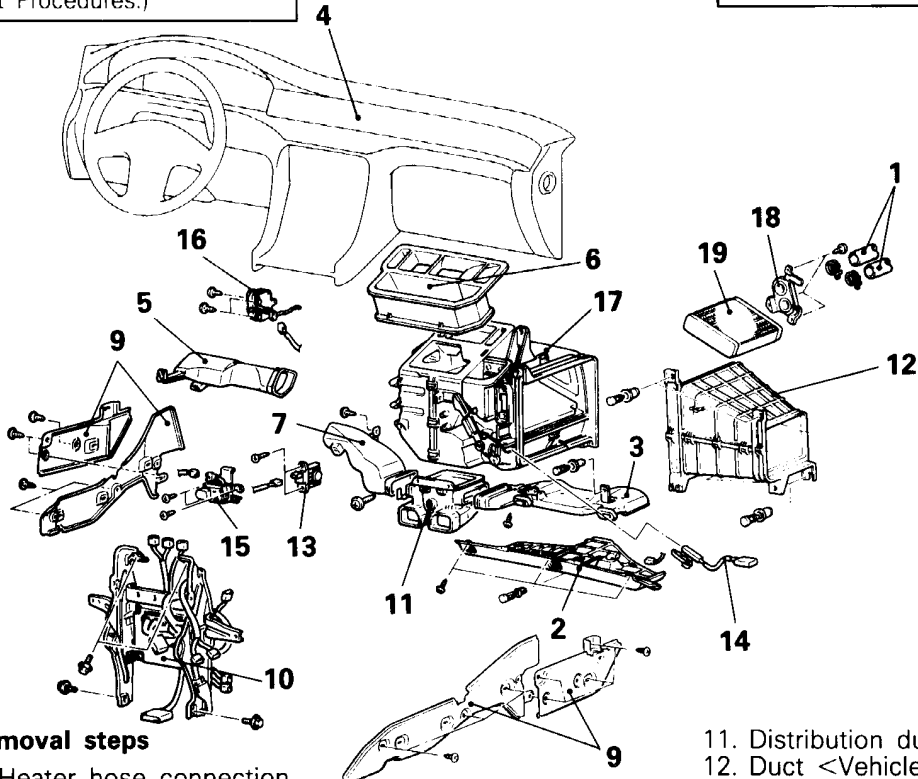
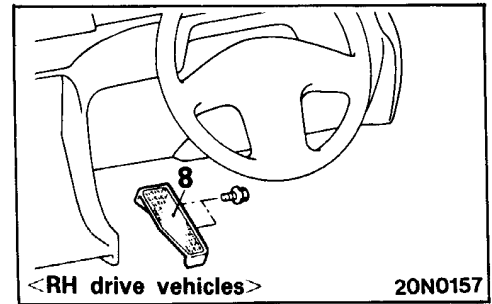
E55IBAK

HEATER UNIT

REMOVAL AND INSTALLATION

CAUTION: SRS <R.H. drive vehicles>
 When removing and installing the instrument panel in vehicles equipped with SRS, do not let it bump against the SRS diagnostic unit or other components.

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



20N0154

Removal steps

1. Heater hose connection
2. Passenger side under cover
3. Foot shower duct (right side)
4. Instrument panel (Refer to GROUP 52 – Instrument Panel.)
5. Foot shower nozzle
6. Center duct assembly
7. Foot shower duct (left side)
8. Foot rest <RH drive vehicles>
9. Front and rear center reinforcement
10. Center stay assembly

11. Distribution duct assembly
12. Duct <Vehicles without air conditioner>
13. Power transistor
14. Engine coolant temperature sensor
15. Air-mixing damper motor assembly
16. Air outlet changeover damper motor assembly
17. Heater unit
18. Plate
19. Heater core

INSPECTION

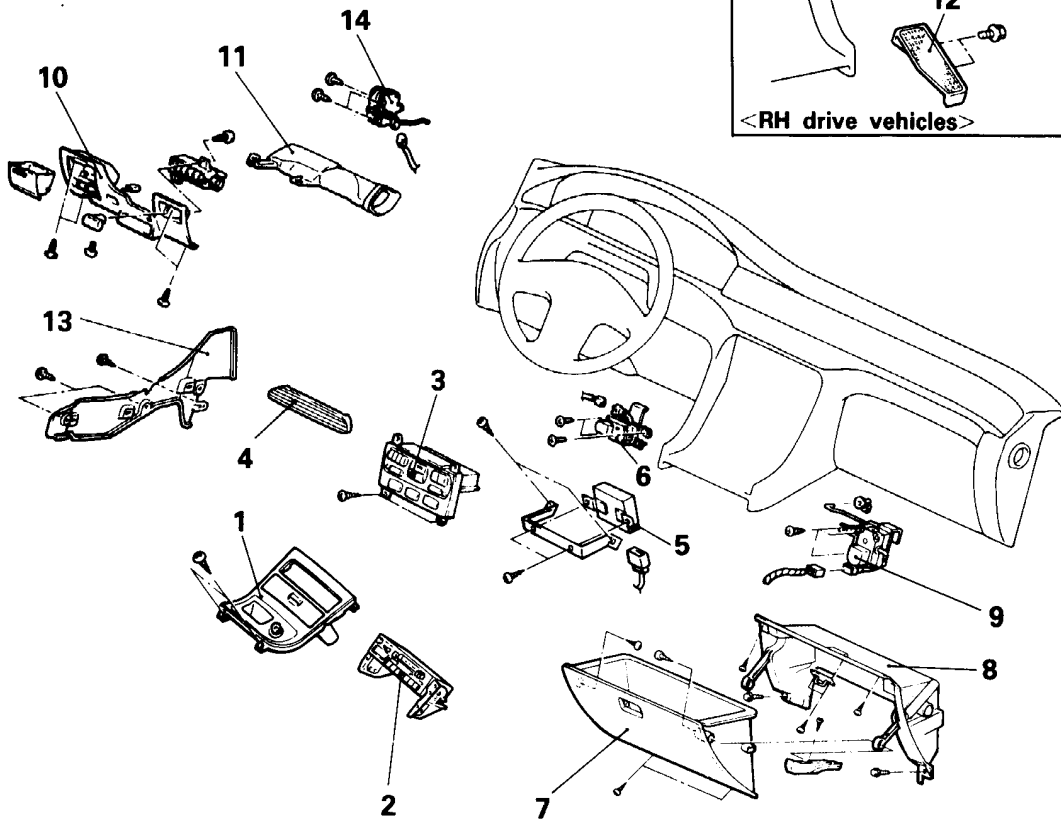
E55ICAG

- Check the operation of dampers and link mechanism.
- Check the heater core for clogging and water leakage.

DAMPER CONTROL MOTOR ASSEMBLY

REMOVAL AND INSTALLATION

E55HA--



CAUTION: SRS <L.H. drive vehicles>
 When removing and installing the floor console in vehicles equipped with SRS, do not let it bump against the SRS diagnostic unit or other components.

20N0144

Air-mixing damper motor assembly removal steps

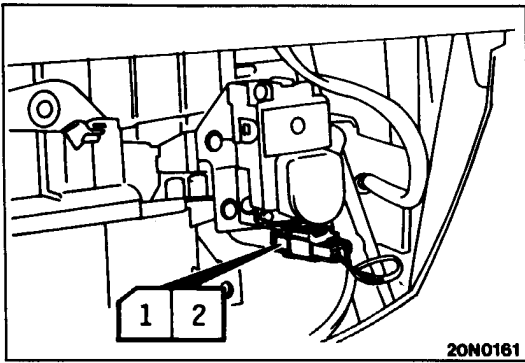
- Floor console (Refer to GROUP 52 – Console Box.)
- 1. Audio panel
- 2. Radio and tape player
- 3. A/C control panel
- 4. Heater control garnish
- 5. EPS control unit <DOHC>
- 6. Air-mixing damper motor assembly

Inside/outside air changeover damper motor assembly removal steps

- 7. Glove box
- 8. Glove box outer case
- 9. Inside/outside air changeover damper motor assembly

Air outlet changeover damper motor assembly removal steps

- 10. Driver's side lower panel
- 11. Foot shower nozzle
- 12. Foot rest <RH drive vehicles>
- 13. Center reinforcement
- 14. Air outlet changeover damper motor assembly



INSPECTION

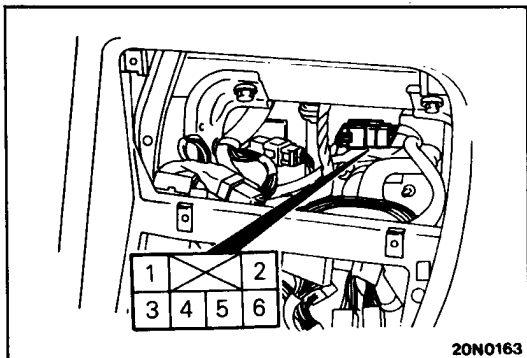
E55HCAM

INSPECTION OF INSIDE/OUTSIDE-AIR DAMPER MOTOR ASSEMBLY

Check that the motor rotates when battery voltage is applied to the connector on the motor assembly side. Check also that the motor rotates in the backward direction when polarity is changed.

Caution

1. Cut off the voltage when the damper is in the RECIRCULATION or FRESH position.
2. Cut off the voltage if the motor does not turn when battery voltage is applied.

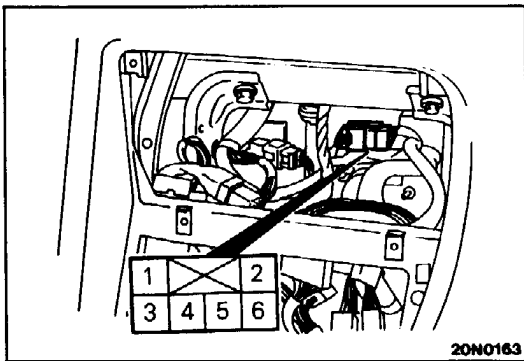


INSPECTION OF AIR MIX DAMPER MOTOR

Check that the motor rotates when battery voltage is applied across terminals ② and ⑥ of motor assembly side connector. Check also that the motor turns in the backward direction when polarity is changed.

Caution

1. Cut off the voltage when the damper is in the MAX. HOT or MAX. COOL position.
2. Cut off the voltage if the motor does not turn when battery voltage is applied.



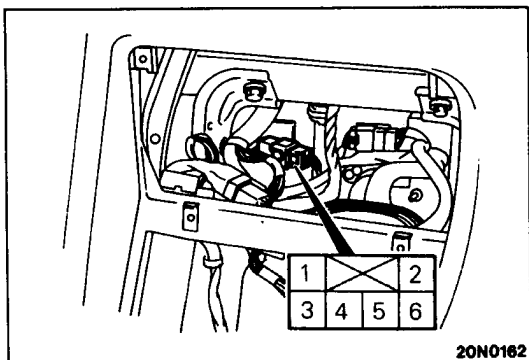
INSPECTION OF AIR MIX DAMPER POTENTIOMETER

Connect a circuit tester across terminals ③ and ④ of the motor assembly connector and check that resistance gradually changes as the damper is moved from MAX. HOT to MAX. COOL position.

Standard value

MAX. HOT: Approx. 0.2 kΩ

MAX. COOL: Approx. 4.9 kΩ

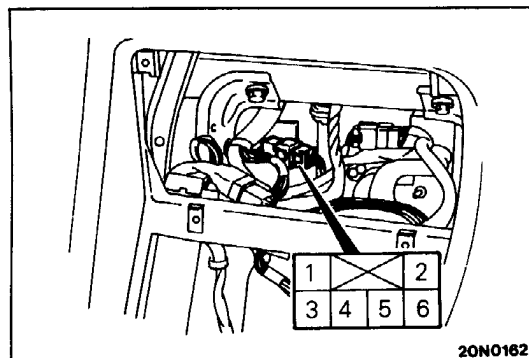


INSPECTION OF OUTLET SELECTOR DAMPER MOTOR

Check that the motor turns when battery voltage is applied across terminals ② and ⑥ of the motor assembly connector. Check also that the motor turns in the backward direction when polarity is changed.

Caution

1. Cut off the voltage when the damper is in the DEF. or FACE position.
2. Cut off the voltage if the motor does not turn when battery voltage is applied.



INSPECTION OF OUTLET SELECTOR DAMPER POTENTIOMETER

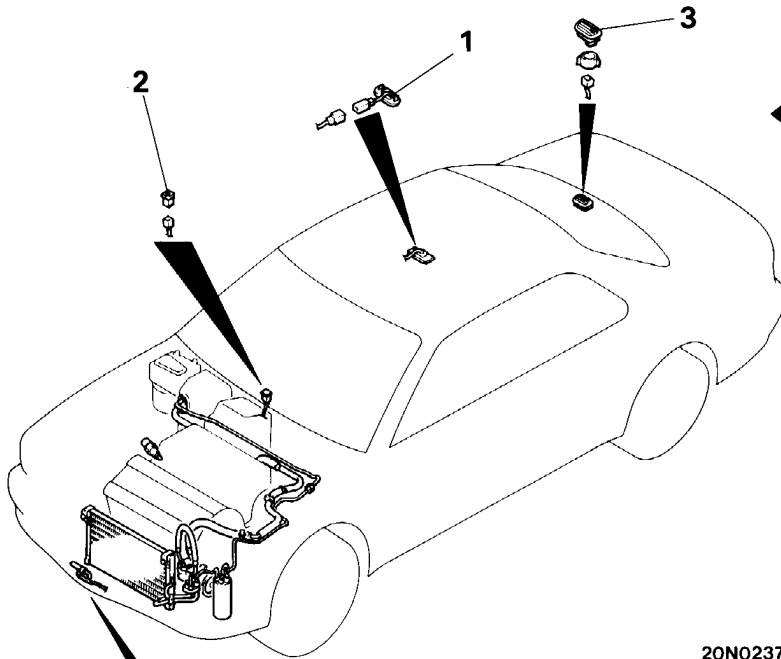
Connect a circuit tester across terminals ③ and ④ of the motor assembly connector and check that resistance gradually changes as the damper is moved from DEF. to FACE position.

Standard value

- DEF. position: Approx. 2.0 k Ω
- FACE position: Approx. 4.3 k Ω

SENSORS

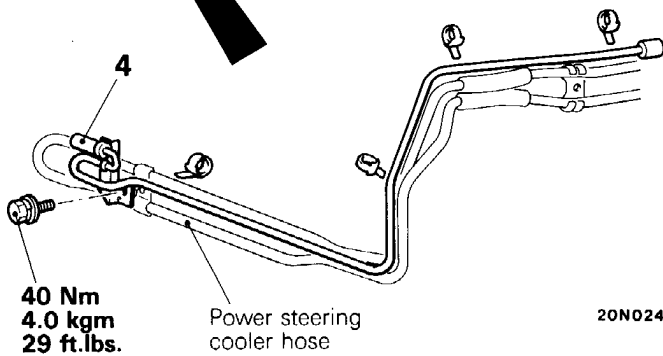
REMOVAL AND INSTALLATION



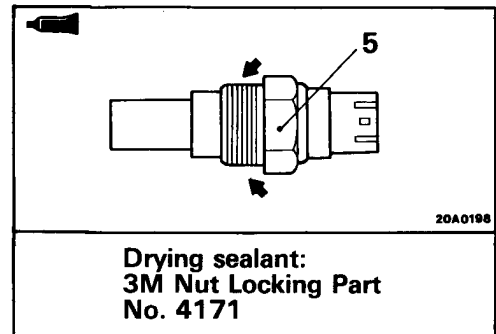
- 1. Passenger compartment temperature sensor
- 2. Photo sensor*1
- ↔ 3. Humidity sensor <Vehicles built from November, 1992>*1

Outside thermo sensor removal steps
<Vehicles built from November, 1992>

- Front bumper
- 4. Outside thermo sensor

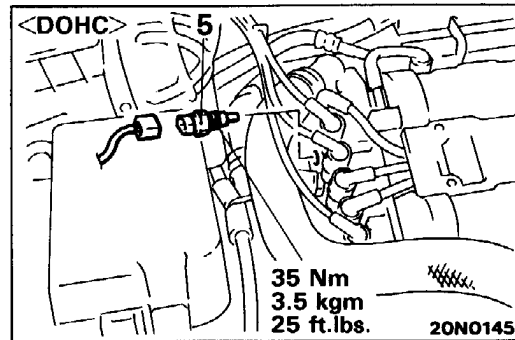
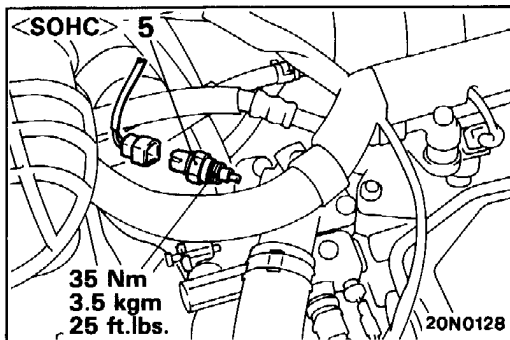


20N0237



Engine coolant temperature switch (air conditioner cut) removal steps
<Vehicles built up to October, 1992>

- Draining and supplying of engine coolant
- 5. Engine coolant temperature switch*1 (air conditioner cut)



NOTE

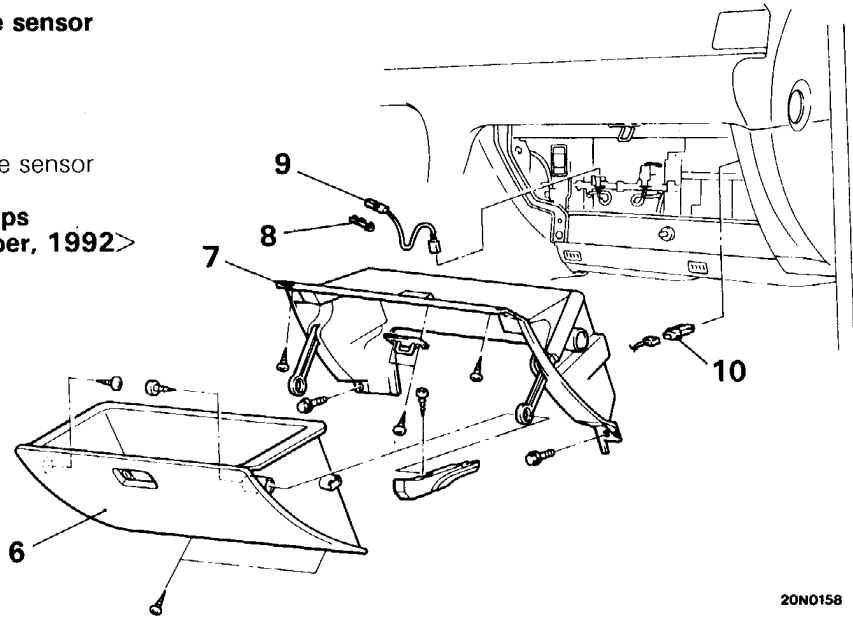
*1: Vehicles with air conditioner

Engine coolant temperature sensor removal steps

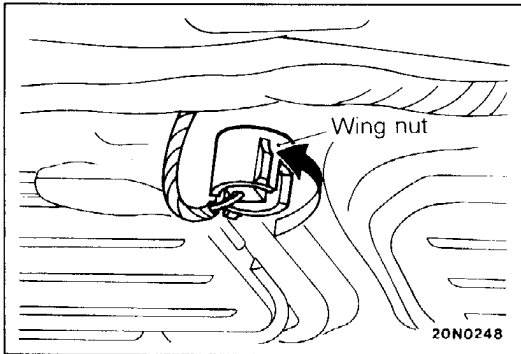
- 6. Glove box
- 7. Glove box outer case
- 8. Clip
- 9. Engine coolant temperature sensor

Air inlet sensor removal steps
 <Vehicles built up to October, 1992>

- 6. Glove box
- 7. Glove box outer case
- 10. Air inlet sensor



20N0158

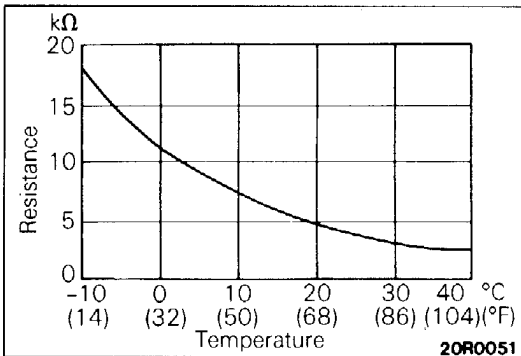


20N0248

SERVICE POINTS OF REMOVAL

3. REMOVAL OF HUMIDITY SENSOR <Vehicles built from November, 1992>

- (1) Turn to remove the wing nut on the back side of the rear shelf panel from the humidity sensor.
- (2) Remove the connector of the humidity sensor.



20R0051

INSPECTION

E55HCAN

PASSENGER COMPARTMENT TEMPERATURE SENSOR AND AIR INLET SENSOR <VEHICLES BUILT UP TO OCTOBER, 1992> INSPECTION

The resistance values should approximately be the same as shown in the figure when resistance values between the terminals are measured under two or more temperature conditions.

NOTE

The temperature conditions should not exceed the temperature shown in the characteristics graph at the time when the check is being made.

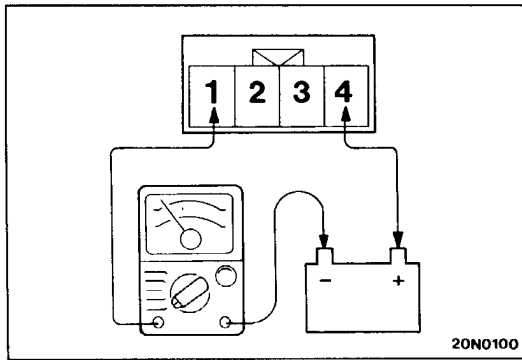
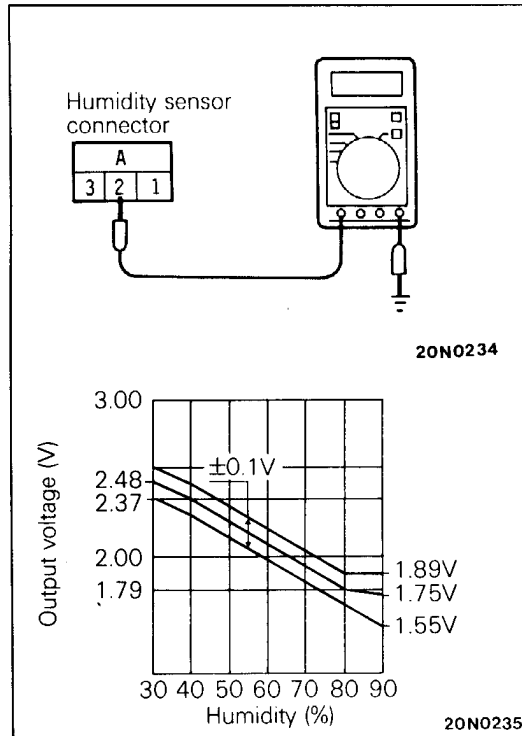


PHOTO SENSOR INSPECTION

Compare the current between terminals ① and ④ when the light receiver of the photo sensor is covered by hand, if the current when the covering is removed is greater, then the sensor is normal.

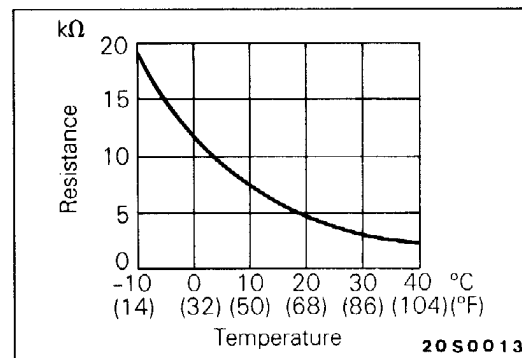


HUMIDITY SENSOR INSPECTION <Vehicles built from November, 1992>

- (1) With the ignition switch and air conditioner switch in the ON position, check by connecting the humidity sensor connector.
- (2) The output voltage should approximately be the same as shown in the figure when output voltage of the sensor terminal 2 is measured under two or more humidity conditions.

NOTE

The humidity conditions should not exceed the temperature shown in the characteristics graph at the time when the check is being made.

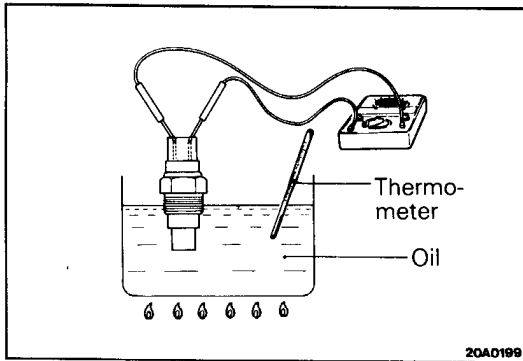


OUTSIDE THERMO SENSOR INSPECTION <Vehicles built from November, 1992>

The resistance values should approximately be the same as shown in the figure when resistance values between the sensor terminals are measured under two or more temperature conditions.

NOTE

The temperature conditions should not exceed the temperature shown in the characteristics graph at the time when the check is being made.



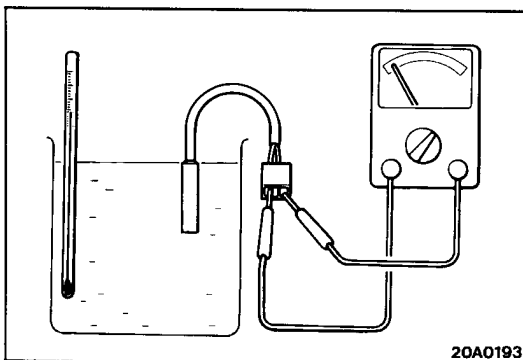
ENGINE COOLANT TEMPERATURE SWITCH CHECK (AIR CONDITIONER CUT) <Vehicles built up to October, 1992>

- (1) Remove the engine coolant temperature switch from the water outlet fitting.
- (2) Immerse the engine coolant temperature switch in oil and heat by a gas stove or similar method so as to increase the oil temperature.
- (3) Check to be sure that the engine coolant temperature switch is switched OFF when the oil temperature reaches the standard value.

Standard value: 108–115°C (226–239°F)

Caution

Use engine oil for this test; stir it well while heating, and do not heat more than necessary.



ENGINE COOLANT TEMPERATURE SENSOR CHECK

- (1) Dip the engine coolant temperature sensor in hot water and using a stove, etc., raise the water temperature.
- (2) Check that the engine coolant temperature sensor is conductive when the water temperature reaches the specified temperature.

Standard value: 29.5–42.5° (85.1–108.5°F)

BLOWER ASSEMBLY

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation

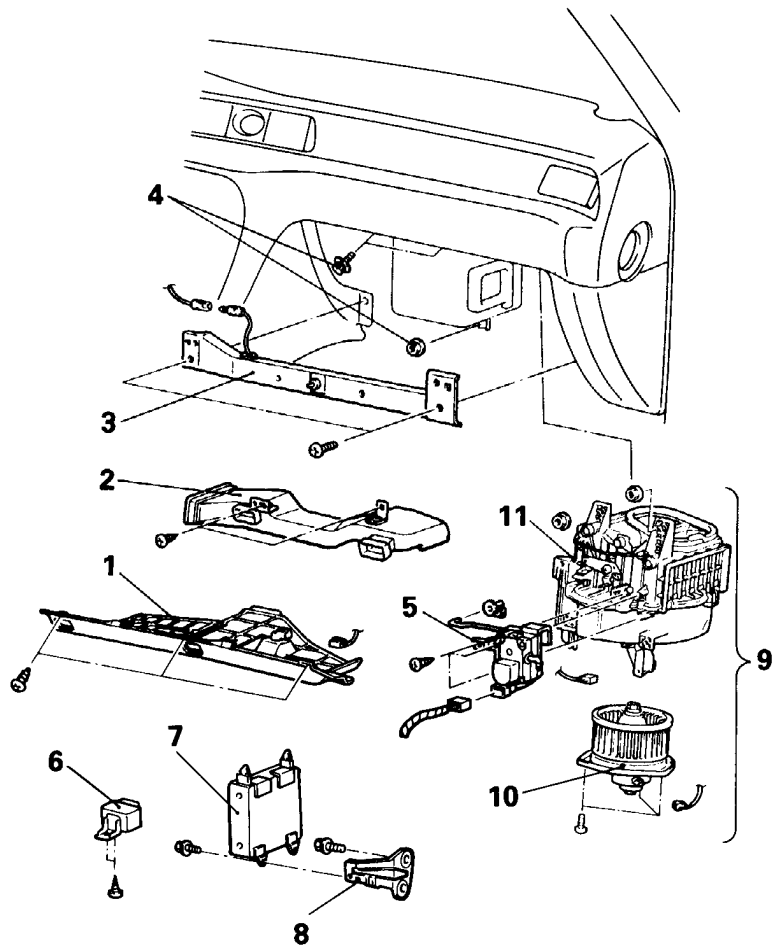
- Removal and Installation of the Glove Box and Glove Box Outer Case (Refer to GROUP 52 – Instrument Panel.)

Removal steps

1. Passenger side under cover
2. Foot shower duct
3. Glove box flame
4. Evaporator mounting bolt and nut
5. Inside/outside air changeover damper motor assembly
6. MPI control relay
7. MPI control unit
8. Instrument panel passenger side lower bracket
9. Blower assembly
- ◆◆ 10. Blower motor assembly
11. Blower case

Removal steps of Blower motor assembly

1. Passenger side under cover
2. Foot shower duct
- ◆◆ 10. Blower motor assembly

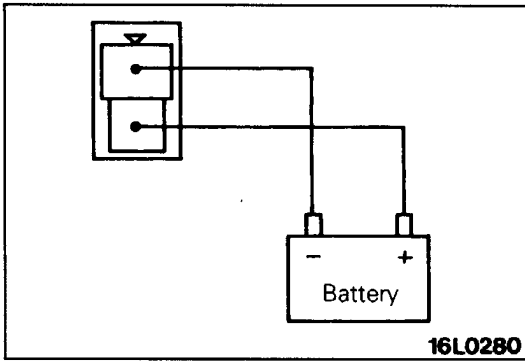


20N0156

INSPECTION

E55KCAG

- Check for bending or abnormal deflection of the rotating shaft of the blower motor assembly.
- Check for cracking or deterioration of the packing.
- Check for damage to the fan.
- Check for damage to the blower case.
- Check the operation of the inside/outside air-selection damper, and for damage.



BLOWER MOTOR ASSEMBLY CHECK

- (1) Disconnect the blower motor terminals.
- (2) Connect the blower motor terminals directly to the battery and check that the blower motor operates smoothly.
- (3) Next, reverse the polarity and check that the blower motor operates smoothly in the reverse direction.

SERVICE POINTS OF INSTALLATION

E24KDAF

10. INSTALLATION OF BLOWER MOTOR ASSEMBLY

Before installing the blower motor assembly, carefully clean away and dust, dirt, etc. adhering to the inner surface of the blower case.

E55JA--

EVAPORATOR

REMOVAL AND INSTALLATION

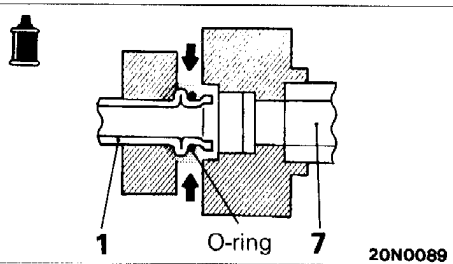
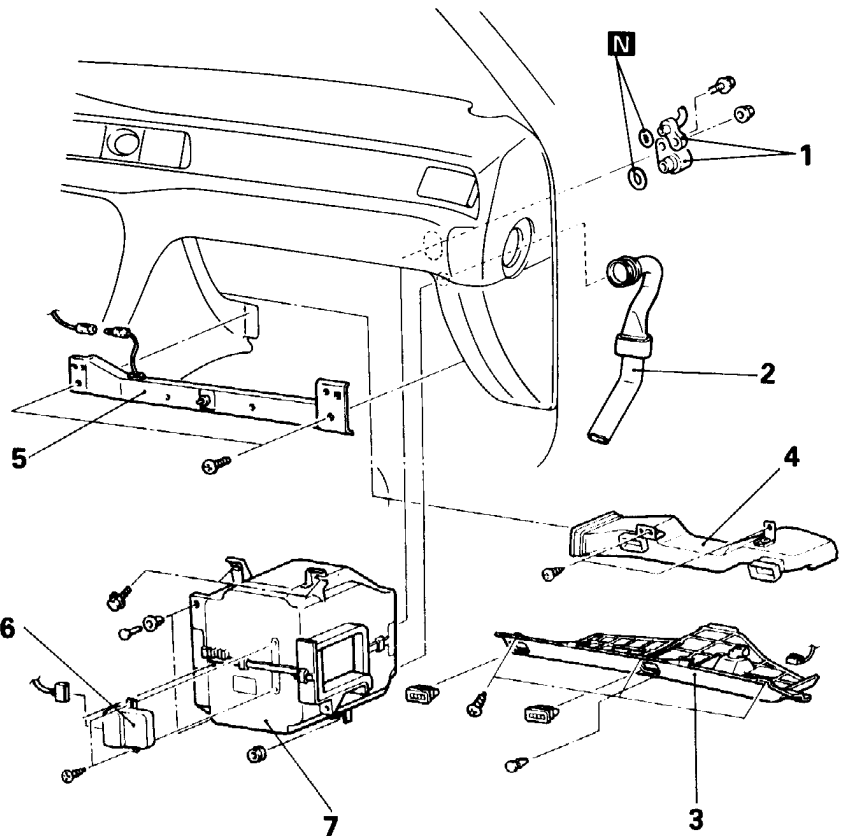
Pre-removal and Post-installation Operation

- Discharge and Charging of Refrigerant
(R-12: Refer to P.55-31-1, 26)
(R-134a: Refer to P.55-31-5, 31-2)
- Removal and Installation of the Glove Box and the Glove Box Outer Case (Refer to GROUP 52-Instrument panel.)

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

Removal steps

1. Discharge pipe and suction hose
2. Drain hose
3. Passenger side under cover
4. Foot shower duct
5. Glove box frame
6. Belt lock controller <DOHC>
7. Evaporator



Compressor oil:
<Vehicles using R-12 refrigerant
FREOL S-83 or SUNISO 5GS
<Vehicles using R-134a refrigerant>
SUN PAG 56

20N0155

INSPECTION

E55JFAB

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

SERVICE POINTS OF INSTALLATION

7. INSTALLATION OF EVAPORATOR

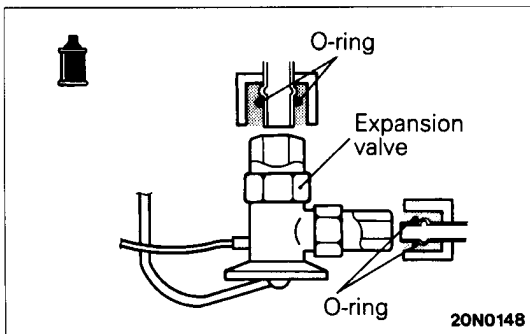
When replacing the evaporator with new one, refill the evaporator with a specified amount of compressor oil and install it (to the vehicle).

Compressor oil: <Vehicles using R-12 refrigerant>
FREOL S-83 or SUNISO 5GS
<Vehicles using R-134a refrigerant>
SUN PGA 56

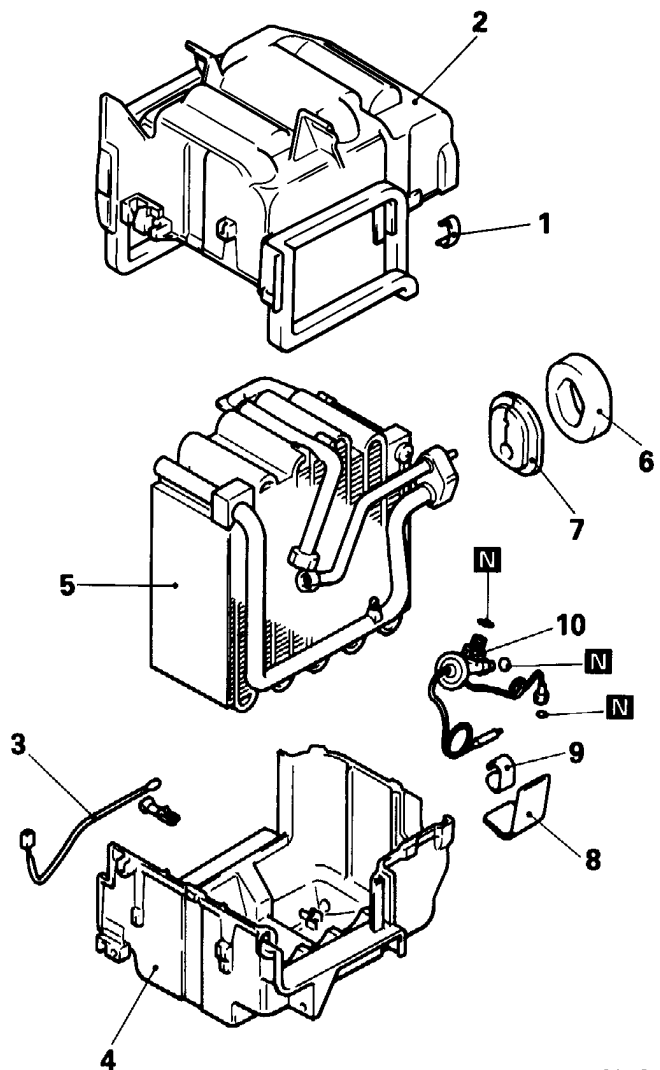
Quantity: 60 cc (3.66 cu.in.)

DISASSEMBLY AND REASSEMBLY

E55JC--

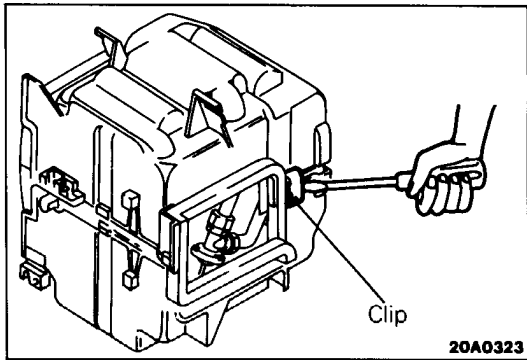


Compressor oil:
<Vehicles using R-12 refrigerant>
FREOL S-83 or SUNISO 5GS
<Vehicles using R-134a refrigerant>
SUN PAG 56



Disassembly steps

- ↔ 1. Clips
- ↔ 2. Evaporator case (upper)
- ↔ 3. Fin thermo sensor
- ↔ 4. Evaporator case (lower)
- ↔ 5. Evaporator assembly
- ↔ 6. Grommet
- ↔ 7. Insulator
- ↔ 8. Rubber insulator
- ↔ 9. Clip
- ↔ 10. Expansion valve

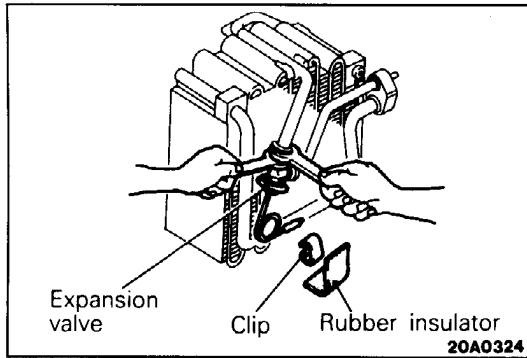


SERVICE POINTS OF DISASSEMBLY

E55JDAB

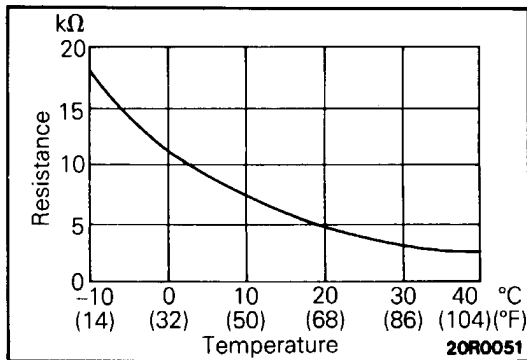
1. REMOVAL OF CLIPS

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



10. REMOVAL OF EXPANSION VALVE

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



INSPECTION

E55JFAG

FIN THERMO SENSOR CHECK

The resistance between the sensor terminals should be basically equal to the values in the figure at left when the temperature is measured in at least two points.

NOTE

The temperature condition when measuring should not exceed the range indicated in the figure.

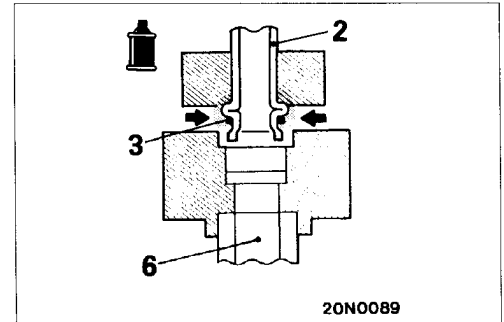
COMPRESSOR

REMOVAL AND INSTALLATION

<SOHC>

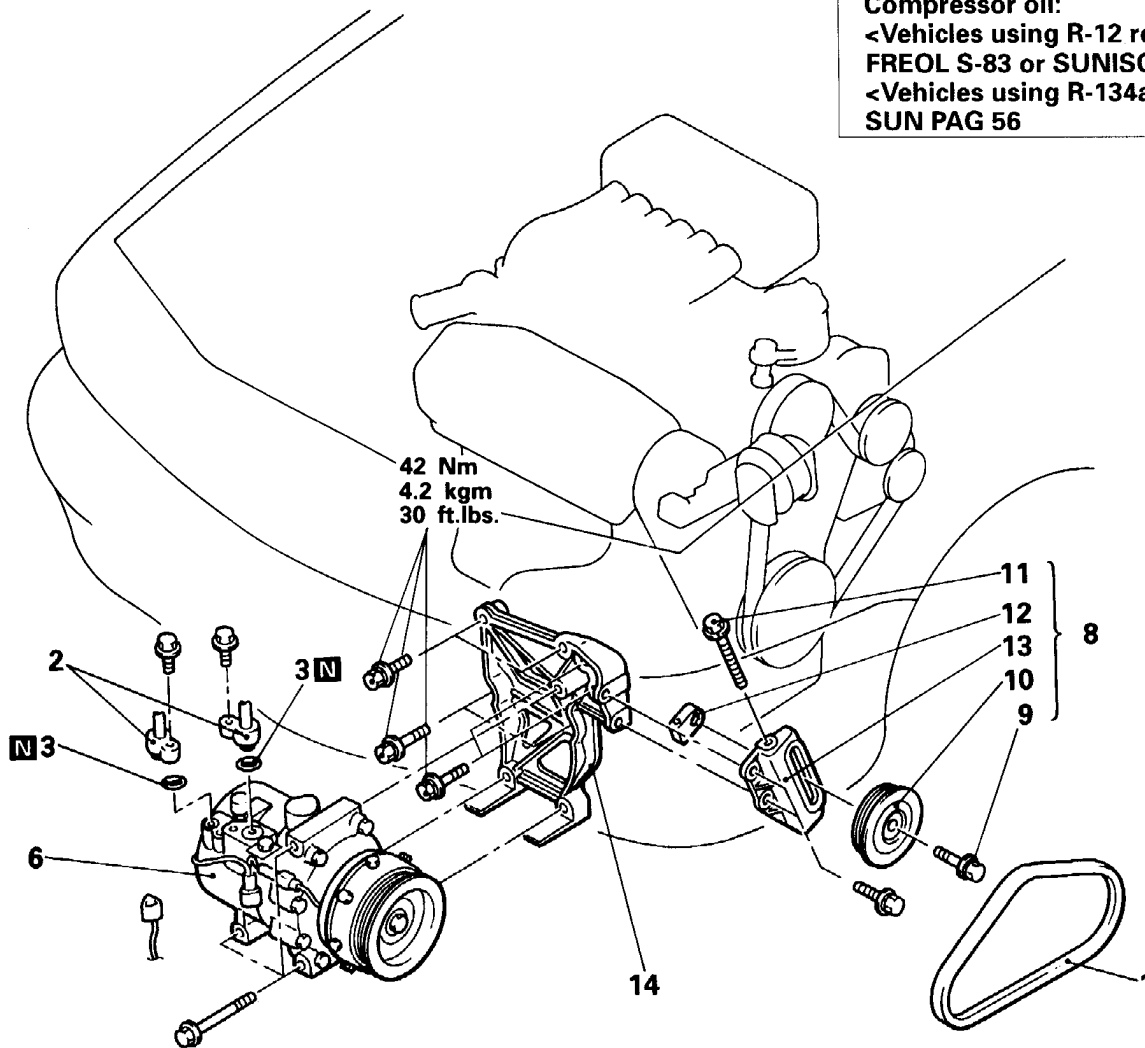
Caution
 Plug refrigerant lines to prevent air from mixing when disconnecting them.

Post-installation Operation
 • Adjustment of the Compressor Drive Belt (Refer to P.55-25.)



20N0089

Compressor oil:
 <Vehicles using R-12 refrigerant>
 FREOL S-83 or SUNISO 5GS
 <Vehicles using R-134a refrigerant>
 SUN PAG 56



20N0021

Removal steps of compressor

- Discharge and charging of refrigerant (R-12: Refer to P.55-31-1, 26) (R-134a: Refer to P.55-31-5, 31-2)
- ◄◄ 1. Compressor drive belt
- ◄◄ 2. High pressure and suction hose connections
- ◄◄ 3. O-rings
- ◄◄ ◄◄ 6. Compressor
- ◄◄ 8. Tension pulley assembly
- ◄◄ 14. Compressor bracket

Removal steps of tension pulley

- 1. Compressor drive belt
- 8. Tension pulley assembly
- 9. Tension pulley installation bolt
- 10. Tension pulley
- 11. Bolt
- 12. Adjustment plate
- 13. Tension pulley bracket

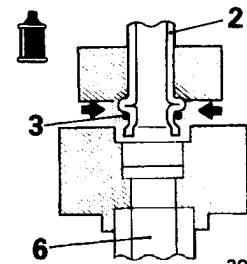
<DOHC>

Pre-removal Operation

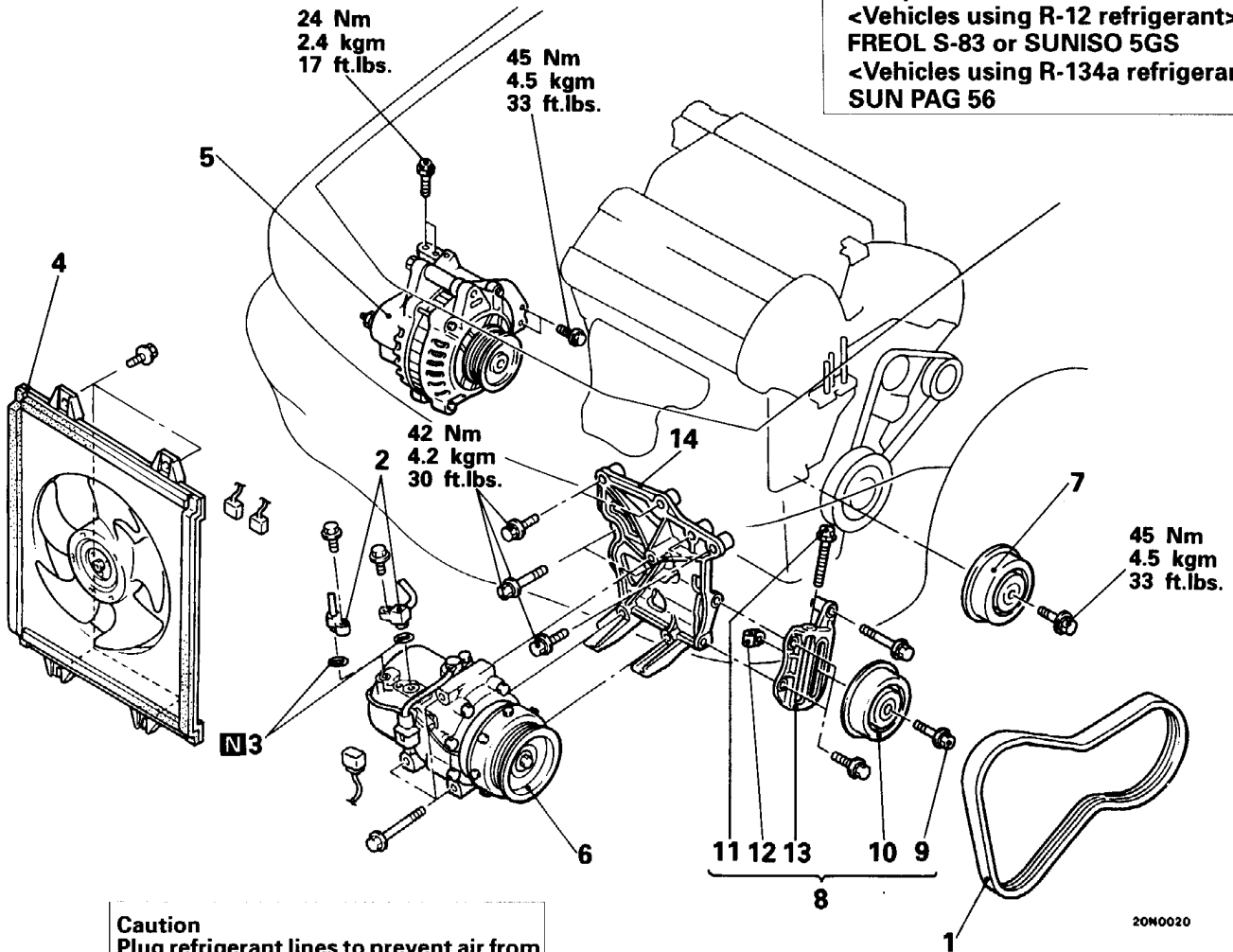
- Removal of Radiator Upper Insulator

Post-installation Operation

- Adjustment of the Compressor Drive Belt (Refer to P.55-25.)
- Installation of Radiator Upper Insulator



Compressor oil:
 <Vehicles using R-12 refrigerant>
 FREOL S-83 or SUNISO 5GS
 <Vehicles using R-134a refrigerant>
 SUN PAG 56



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

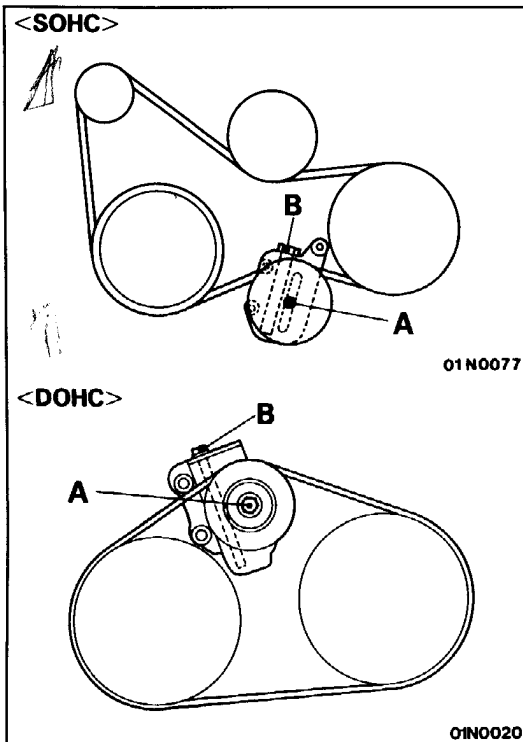
Removal steps of compressor

- Discharge and charging of refrigerant (R-12: Refer to P.55-31-1, 26) (R-134a: Refer to P.55-31-5, 31-2)

- ↔ 1. Compressor drive belt
- ↔ 2. High pressure and suction hose connections
- 3. O-rings
- 4. Condenser fan assembly
- 5. Alternator (Refer to GROUP 16 – Alternator.)
- ↔ ↔ 6. Compressor
- ↔ ↔ 8. Tension pulley assembly
- 14. Compressor bracket

Removal steps of tension pulley

- ↔ 1. Compressor drive belt
- 8. Tension pulley assembly
- 9. Tension pulley installation bolt
- 10. Tension pulley
- 11. Bolt
- 12. Adjustment plate
- 13. Tension pulley bracket

**SERVICE POINTS OF REMOVAL**

E55LFAE

1. REMOVAL OF COMPRESSOR DRIVE BELT

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

2. REMOVAL OF SUCTION HOSE

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

6. REMOVAL OF COMPRESSOR

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

For DOHC engines, remove the compressor with the compressor mounting bolt set in the compressor.

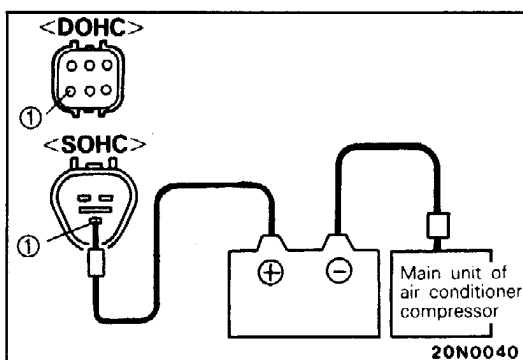
INSPECTION

E55LGAE

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

OPERATION CHECK OF THE COMPRESSOR'S MAGNETIC CLUTCH

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



SERVICE POINTS OF INSTALLATION

E55LHAE

6. INSTALLATION OF COMPRESSOR

(1) 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 cc) 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.

<Vehicles using R-12 refrigerant>

New compressor oil amount

160 cc (9.8 cu.in.) – X cc = Y cc

<Vehicles using R-134a refrigerant>

New compressor oil amount

170 cc (10.4 cu.in.) – X cc = Y cc

NOTE

(1) Ycc indicates the amount of oil in the refrigerant line, the condenser, the cooling unit, etc.

(2) When replacing the following parts at the same time as the compressor, subtract the rated oil amount of the each part from Y cc and discharge from the new compressor.

Quantity:

Evaporator: 60 cc (3.66 cu.in.)

Condenser: 15 cc (0.92 cu.in.)

Suction hose: 10 cc (0.61 cu.in.)

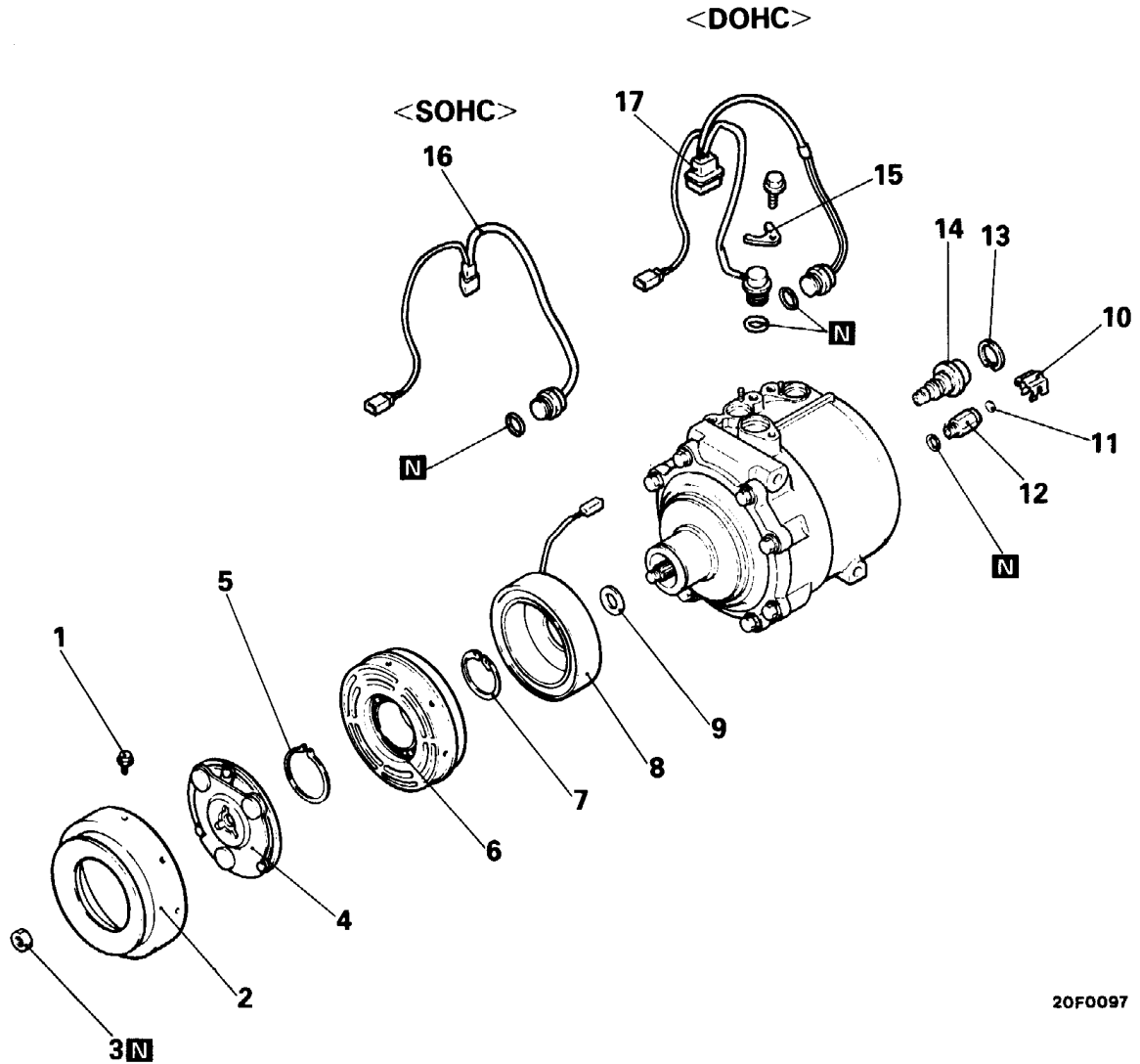
Receiver: 10 cc (0.61 cu.in.)

(2) For DOHC engines, install the compressor with the compressor mounting bolt set in the compressor.

DISASSEMBLY AND REASSEMBLY

E55LB-

<Vehicles using R-12 refrigerant>



20F0097

Magnetic clutch disassembly steps

- 1. Bolts
- 2. Pulley
- ◆◆ ● Air gap adjustment
- ◆◆ 3. Nut
- ◆◆ 4. Armature plate
- 5. Snap ring
- 6. Rotor
- 7. Snap ring
- ◆◆ 8. Clutch coil
- 9. Shims

High pressure relief valve disassembly steps

- 10. Cover
- 11. Dust cover
- 12. High pressure relief valve

Control valve disassembly steps

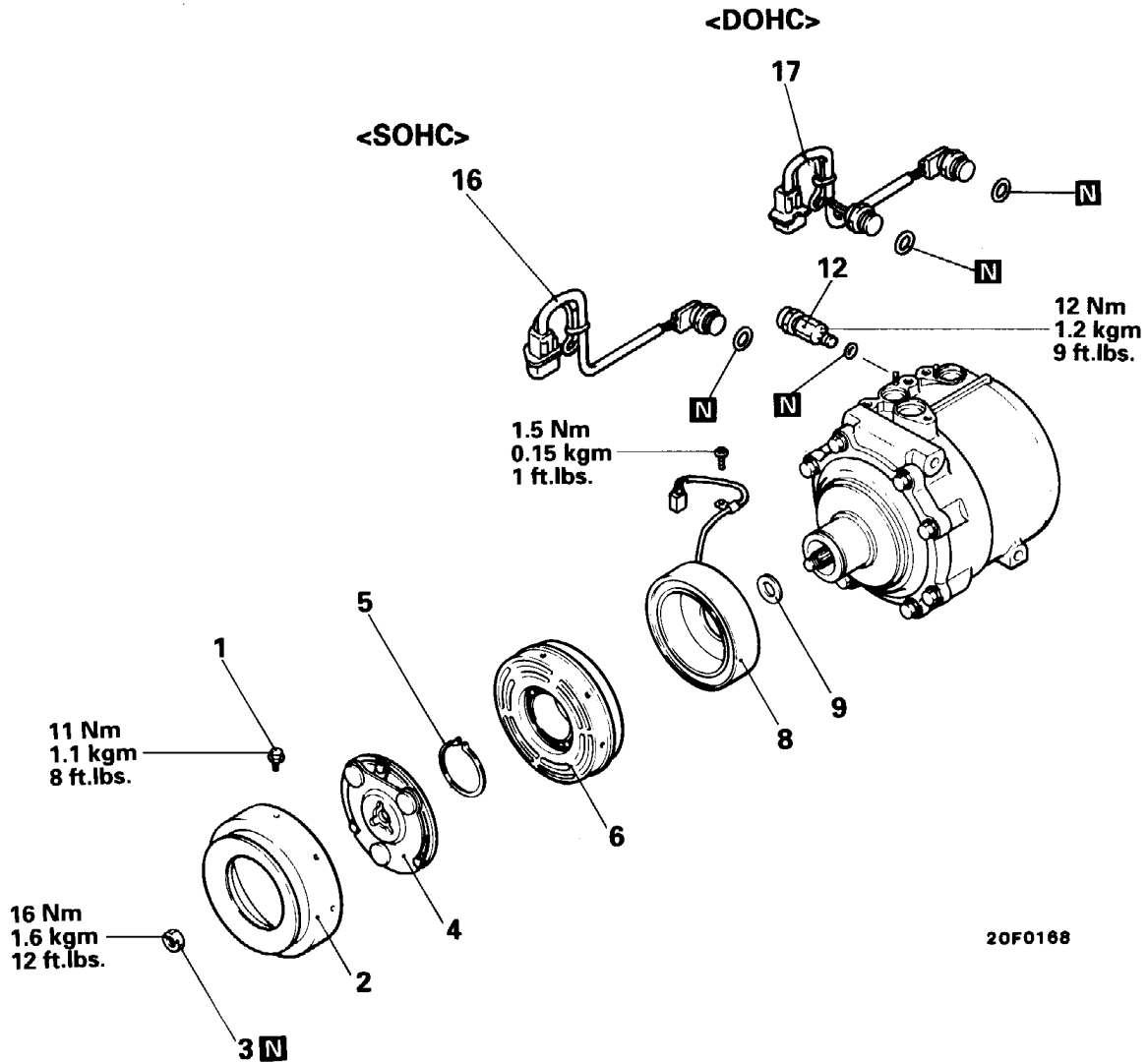
- 13. Snap ring
- 14. Control valve

Thermostat and revolution pick up sensor disassembly steps

- 15. Plate <DOHC>
- 16. Thermostat <SOHC>
- 17. Thermostat and revolution pick up sensor <DOHC>

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

<Vehicles using R-134a refrigerant>



20F0168

Magnetic clutch disassembly steps

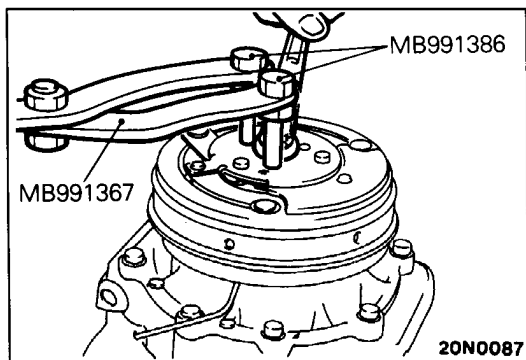
- 1. Bolts
- 2. Pulley
- Air gap adjustment
- ♦♦ 3. Nut
- ♦♦ 4. Armature plate
- ♦♦ 5. Snap ring
- ♦♦ 6. Rotor
- ♦♦ 8. Clutch coil
- 9. Shims

Thermostat and revolution pick up sensor disassembly steps

- ♦♦ ♦♦ 16. Thermostat <SOHC>
- ♦♦ ♦♦ 17. Thermostat and revolution pick up sensor <DOHC>

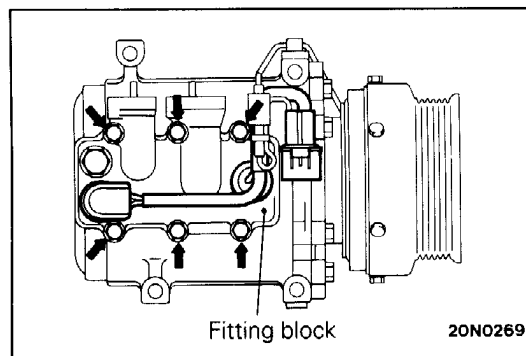
High pressure relief valve disassembly

- 12. High pressure relief valve



SERVICE POINTS OF DISASSEMBLY

3. REMOVAL OF NUT



16. REMOVAL OF THERMOSTAT <SOHC>/17. THERMOSTAT AND REVOLUTION PICK UP SENSOR <DOHC>

In case of vehicles using refrigerant R-134a, remove the thermostat and revolution pick up sensor according to the following procedure:

- (1) Remove the fitting block from the compressor.
- (2) Remove the snap ring from the inside of the fitting block, and remove the thermostat from the fitting block.
- (3) Remove the revolution pick up sensor from the fitting block.

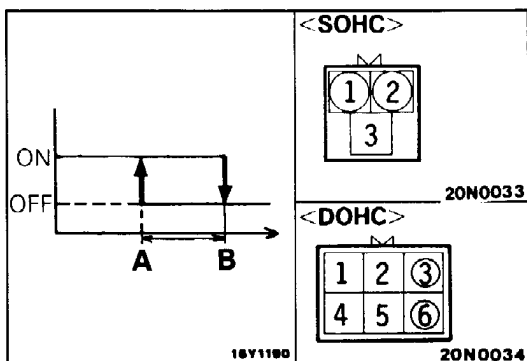
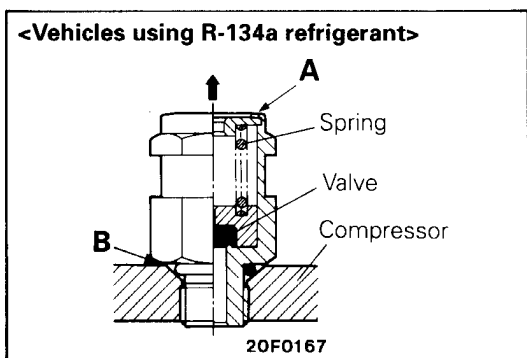
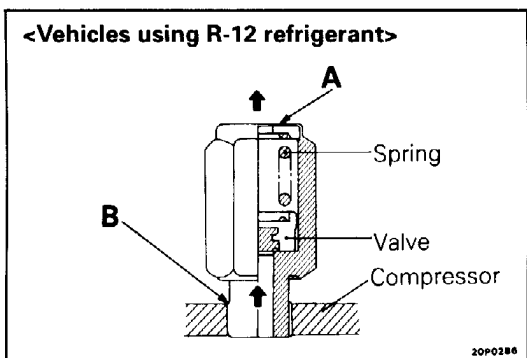
INSPECTION

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

HIGH PRESSURE RELIEF VALVE CHECK

The high pressure relief valve is a safety feature which releases part of the refrigerant inside the system into the atmosphere when the high pressure level exceeds 3,550 kPa (35.5 kg/cm², 505 psi): R-12, 3,740 kPa (37.4 kg/cm², 532 psi): R-134a during air conditioner operation. Once the pressure inside the system has been reduced to 2,400 kPa (24.0 kg/cm², 341 psi): R-12, 2,940 kPa (29.4 kg/cm², 418 psi): R-134a 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 packing.



REFRIGERANT TEMPERATURE SENSOR CHECK

- (1) Dip the refrigerant temperature sensor in engine oil.
- (2) Check for continuity across terminals ① and ② <SOHC> or ③ and ⑥ <DOHC> when the engine oil is heated.

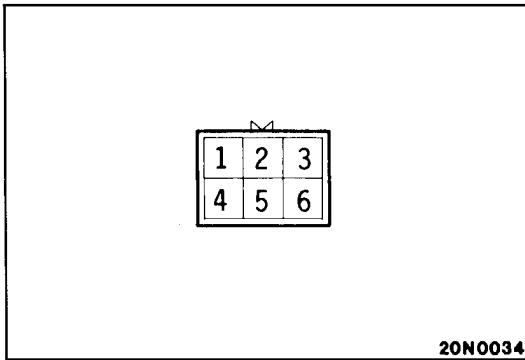
Standard value:

<Vehicles using R-12 refrigerant>

Continuity at
 approx. 110°C (230°F) or less at A point
No continuity at
 approx. 155°C (311°F) or more at B point

<Vehicles using R-134a refrigerant>

Continuity at
 approx. 130°C (226°F) or less at A point
No continuity at
 approx. 160°C (320°F) or more at B point

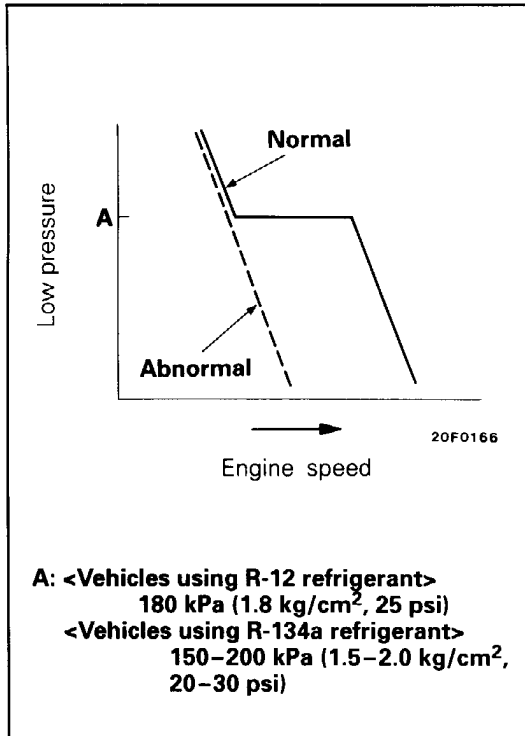


REVOLUTION PICK UP SENSOR CHECK

Measure the resistance between terminals ② and ⑤ of the connector.

Normal resistance: 405 ± 35 Ω when ambient temperature is 20°C (68°F)

If the measurement deviates greatly from the above resistance, replace the revolution pick up sensor assembly.



CONTROL VALVE CHECK

The control valve detects a low pressure level during the operation of the air conditioner, and adjusts the amount of refrigerant to be bypassed.

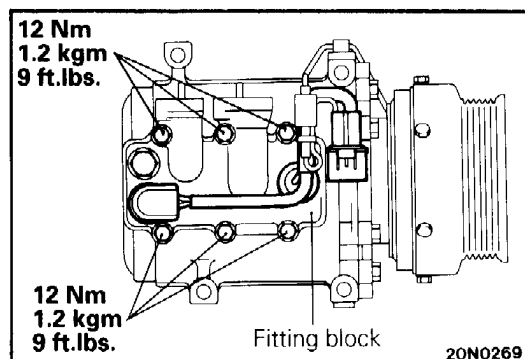
NOTE

In case of vehicles using refrigerant R-134a, the control valve is incorporated in the compressor.

- (1) Operate the air conditioner under a high temperature load condition (when vehicle interior temperature is high).
- (2) Connect a low pressure gauge to the air compressor.
- (3) Operate the air conditioner with the engine running at idle.
- (4) Gradually increase the engine speed while observing the low pressure gauge.

If the valve is normal, the low pressure drops slowly as the engine speed increases until a pressure of 180 kPa (1.8 kg/cm², 25 psi): R-12, 150–200 kPa (1.5–2.0 kg/cm², 20–30 psi): R-134a is reached, at which point the pressure temporarily cease to drop. Then, the pressure again starts dropping as the engine speed further increases.

If the valve is abnormal, the low pressure drops in direct proportion to the increase in engine speed without temporary leveling off at the 180 kPa (1.8 kg/cm², 25 psi): R-12, 150–200 kPa (1.5–2.0 kg/cm², 20–30 psi): R-134a pressure level. If the low pressure drops like this, replace the control valve.

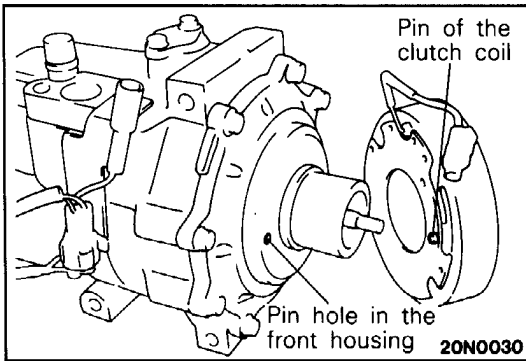


SERVICE POINTS OF REASSEMBLY

E55LEAI

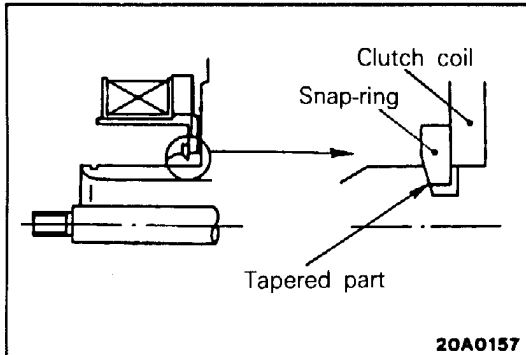
17. INSTALLATION OF THERMOSTAT AND REVOLUTION PICK UP SENSOR <DOHC> / 16. THERMOSTAT <SOHC>

- (1) Clamp the revolution pickup sensor and the thermostat in the fitting block, and then clamp the snap ring from the inside.
- (2) Tighten the fitting block to the specified torque.



8. INSTALLATION OF CLUTCH COIL

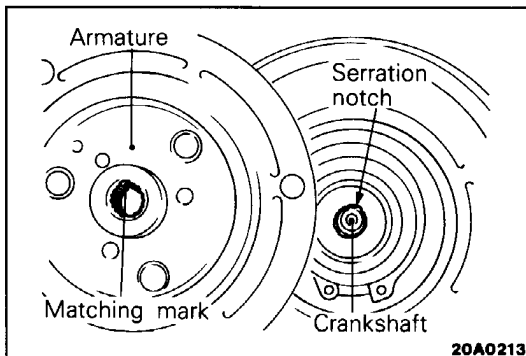
(1) Align the pin of the clutch coil with the pin hole in the front housing, and then fit it into the hole.



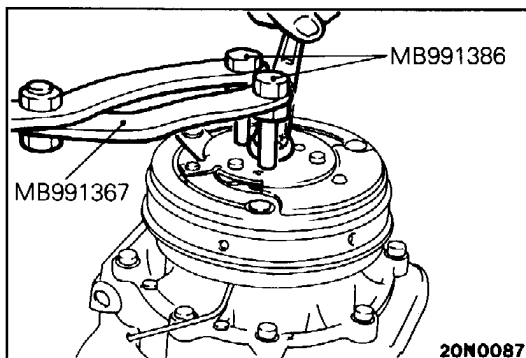
(2) Install the snap ring so that the tapered surface is at the outer side.

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

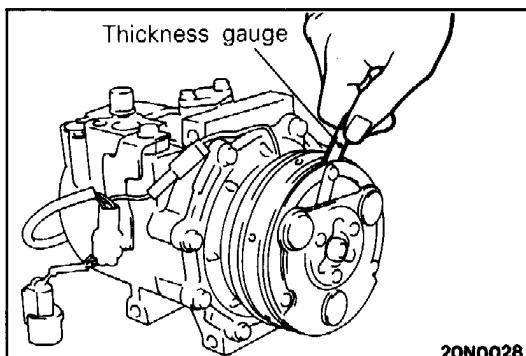
Check whether or not the air gap of the clutch is within the standard value.

Standard value:

- <Vehicles using R-12 refrigerant>
0.4 – 0.65 mm (0.016 – 0.026 in.)
- <Vehicles using R-134a refrigerant>
0.4 – 0.6 mm (0.016 – 0.024 in.)

NOTE

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



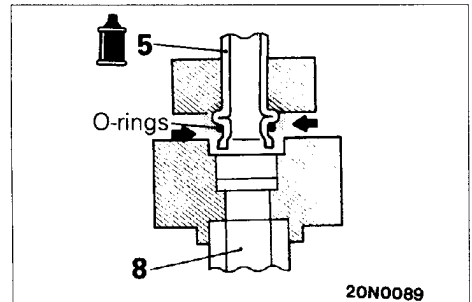
CONDENSER AND CONDENSER FAN MOTOR

E55NA--

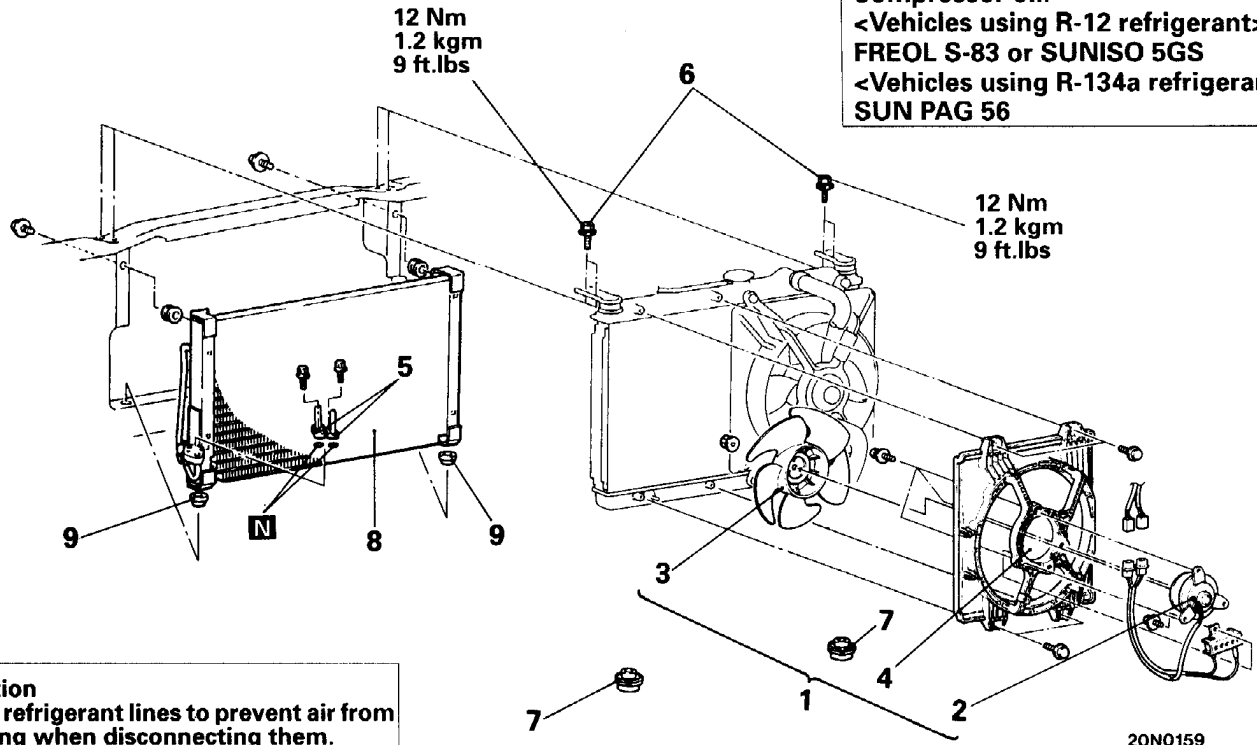
REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation

- Discharge and Charging of Refrigerant (R-12: Refer to P.55-31-1, 26) (R-134a: Refer to P.55-31-5, 31-2)
- Removal and Installation of the Radiator Grille (Refer to GROUP 51 – Radiator Grille.)



Compressor oil:
 <Vehicles using R-12 refrigerant>
 FREOL S-83 or SUNISO 5GS
 <Vehicles using R-134a refrigerant>
 SUN PAG 56



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

Removal steps

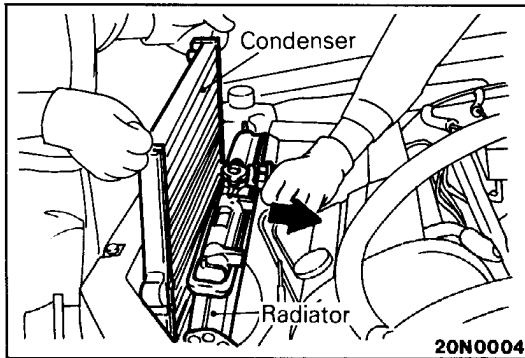
1. Condenser fan motor
2. Fan motor assembly
3. Fan
4. Shroud
- ↔ 5. Connection for the liquid pipe and liquid hose
6. Insulator mounting bolt
7. Lower insulator
- ↔ ↔ 8. Condenser
9. Bushings

SERVICE POINTS OF REMOVAL

E55NBAH

5. DISCONNECTION OF CONNECTION OF THE LIQUID PIPE AND LIQUID HOSE

Plug the disconnected hose and pipes and the openings of the condenser in order to prevent dust, dirt and other foreign materials from entering.



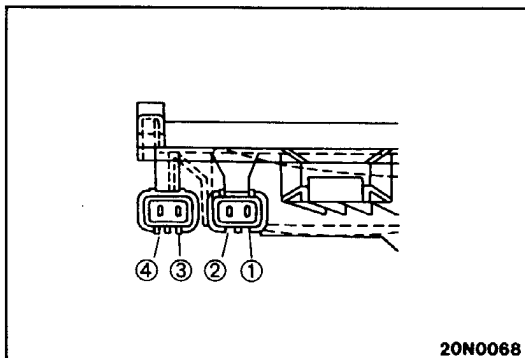
8. REMOVAL OF CONDENSER

Move the radiator toward the engine, and then remove the condenser upward.

INSPECTION

E55NEAA

- Check the condenser fin for crushing or other damage.
- Check the condenser's high-pressure hose and pipe installation parts for damage or deformation.
- Check the condenser fan shroud for damage.



CONDENSER FAN MOTOR CHECK

Apply battery voltage to terminal ③ and check that the condenser fan motor turns when terminal ④ is earthed.

RESISTOR CHECK

Measure the resistance between terminals ① and ②.

Standard value: 0.29Ω

SERVICE POINTS OF INSTALLATION

8. INSTALLATION OF CONDENSER

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

Compressor oil: <Vehicles using R-12 refrigerant>
FREOL S-83 or SUNISO 5GS
<Vehicles using R-134a refrigerant>
SUN PAG 56

Quantity: 60 cc (3.66 cu.in.)

REFRIGERANT LINE REMOVAL AND INSTALLATION

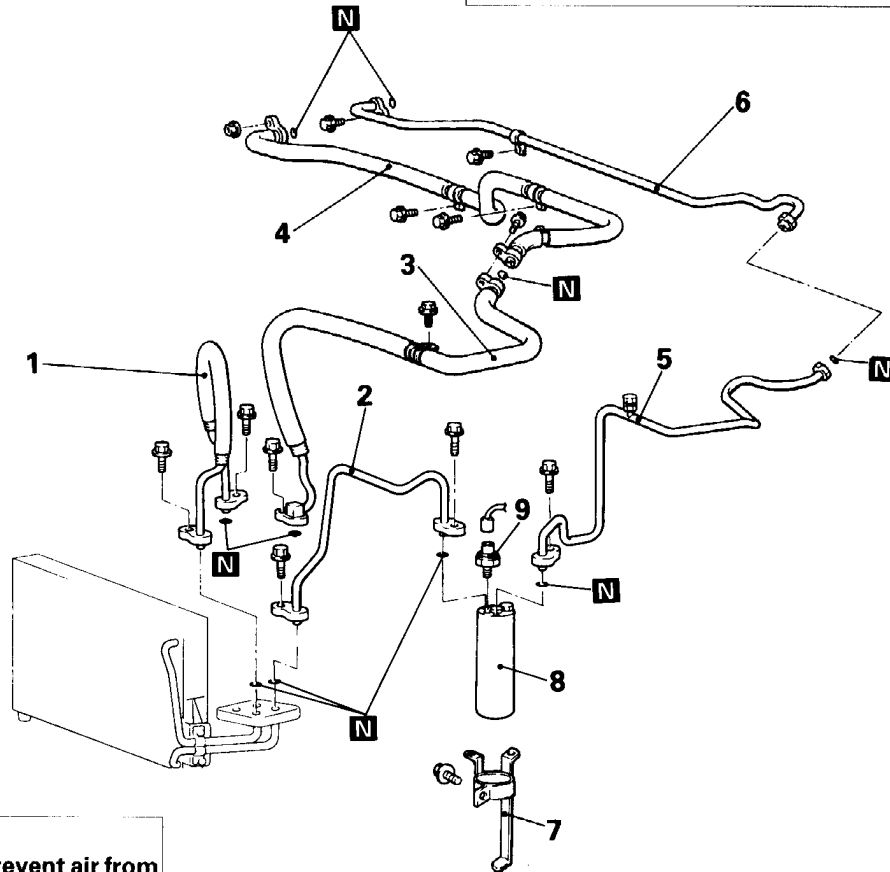
<LH drive vehicles>

Pre-removal Operation

- Discharge of Refrigerant
(R-12: Refer to P.55-31-1)
(R-134a: Refer to P.55-31-5)

Post-installation Operation

- Charging of Refrigerant
(R-12: Refer to P.55-26)
(R-134a: Refer to P.55-31-2)
- Checking for Gas Leakage
- Performance Test (Refer to P.55-32.)



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

20N0120

Removal steps

1. Discharge hose
2. Liquid pipe A
- ◆◆ 3. Suction hose
4. Suction pipe
5. Liquid pipe B
6. Liquid pipe C
- ◆◆ 7. Receiver bracket
8. Receiver
9. Dual-pressure switch

Piping assembly

O-ring

20N0089

Compressor oil:
 <Vehicles using R-12 refrigerant>
FREOL S-83 or SUNISO 5GS
 <Vehicles using R-134a refrigerant>
SUN PAG 56

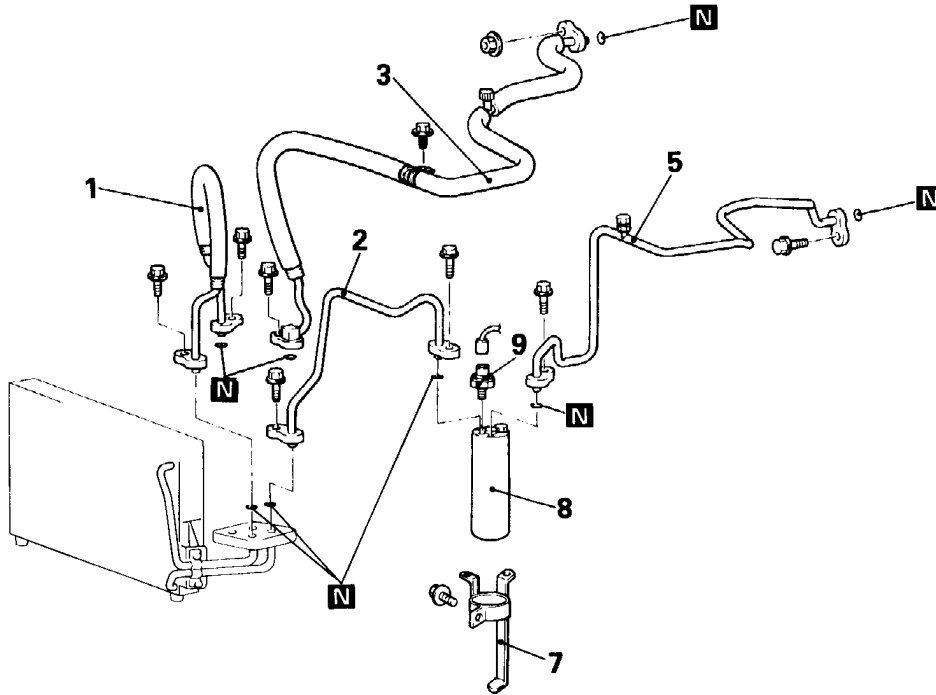
< RH drive vehicles >

Pre-removal Operation

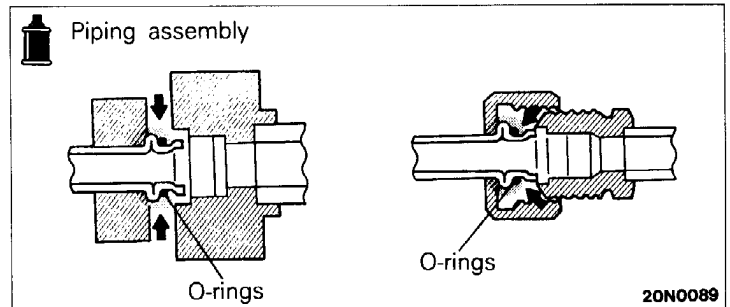
- Discharge of Refrigerant
 (R-12: Refer to P.55-31-1
 R-134a: Refer to P.55-31-5)

Post-installation Operation

- Charging of Refrigerant
 (R-12: Refer to P.55-26
 R-134a: Refer to P.55-31-2)
- Checking for Gas Leakage
- Performance Test (Refer to P.55-32.)



20N0119



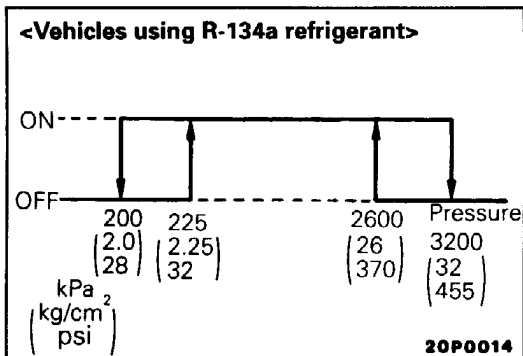
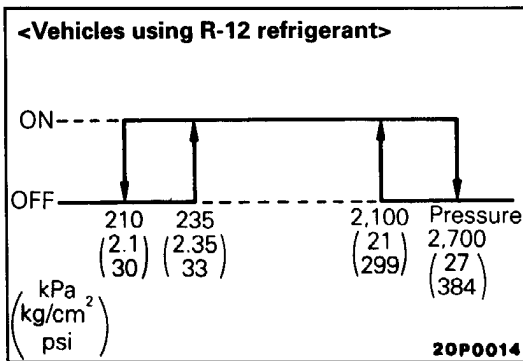
20N0089

Compressor oil:
 <Vehicles using R-12 refrigerant>
 FREOL S-83 or SUNISO 5GS
 <Vehicles using R-134a refrigerant>
 SUN PAG 56

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

Removal steps

1. Discharge hose
2. Liquid pipe A
- ◆◆ 3. Suction hose
5. Liquid pipe B
7. Receiver bracket
- ◆◆ 8. Receiver
9. Dual-pressure switch



INSPECTION

DUAL PRESSURE SWITCH CHECK

Measure the pressure at the high pressure side. When the dual pressure switch is ON as in the figure at left, and if there is continuity between the dual pressure switch terminals, then the condition is normal; if there is no continuity, replace the switch.

SERVICE POINTS OF INSTALLATION

8. INSTALLATION OF RECEIVER/3. SUCTION HOSE

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

Compressor oil: <Vehicles using R-12 refrigerant>
FREOL S-83 or SUNISO 5GS
<Vehicles using R-134a refrigerant>
SUN PAG 56

Quantity:

Suction hose: 10 cc (0.61 cu.in.)

Receiver: 10 cc (0.61 cu.in.)

55-62-2

NOTES

VENTILATORS (INSTRUMENT PANEL AND FLOOR)

E55MA--

REMOVAL AND INSTALLATION

CAUTION: SRS

When removing and installing the following parts in vehicles equipped with SRS, do not let it bump against the SRS diagnostic unit or other components.

- Floor console <L.H. drive vehicles>
- Instrument panel <R.H. drive vehicles>

Pre-removal Operation

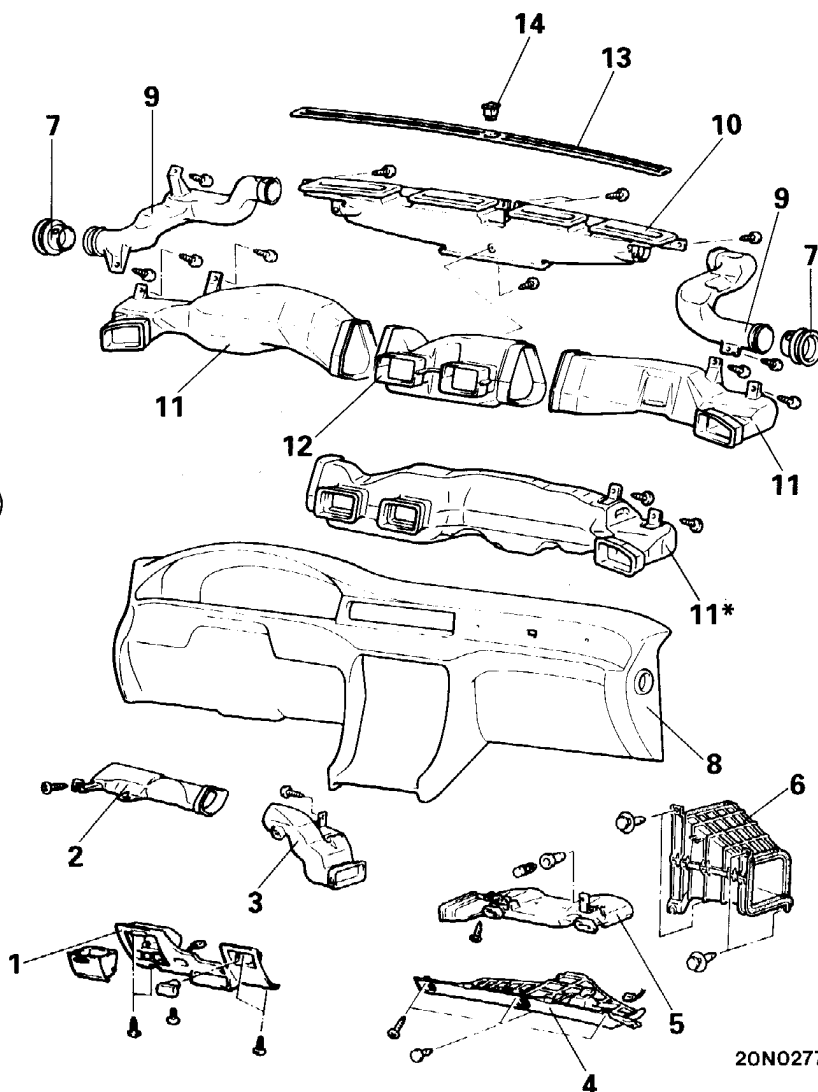
- Removal of the Front Seat (Refer to GROUP 52 – Front Seat.)
- Removal of the Floor Console (Refer to GROUP 52 – Floor Console.)
- Remove the Front Scuff Plate and the Cowl Side Trim, and then Pull up the Carpet. (Refer to GROUP 52 – Trim.)

Post-installation Operation

- Return the Front Carpet as it was, and then install the Cowl Side Trim and the Front Scuff Plate. (Refer to GROUP 52 – Trim.)
- Installation of the Floor Console (Refer to GROUP 52 – Floor Console.)
- Installation of the Front Seat (Refer to GROUP 52 – Front Seat.)

Removal steps

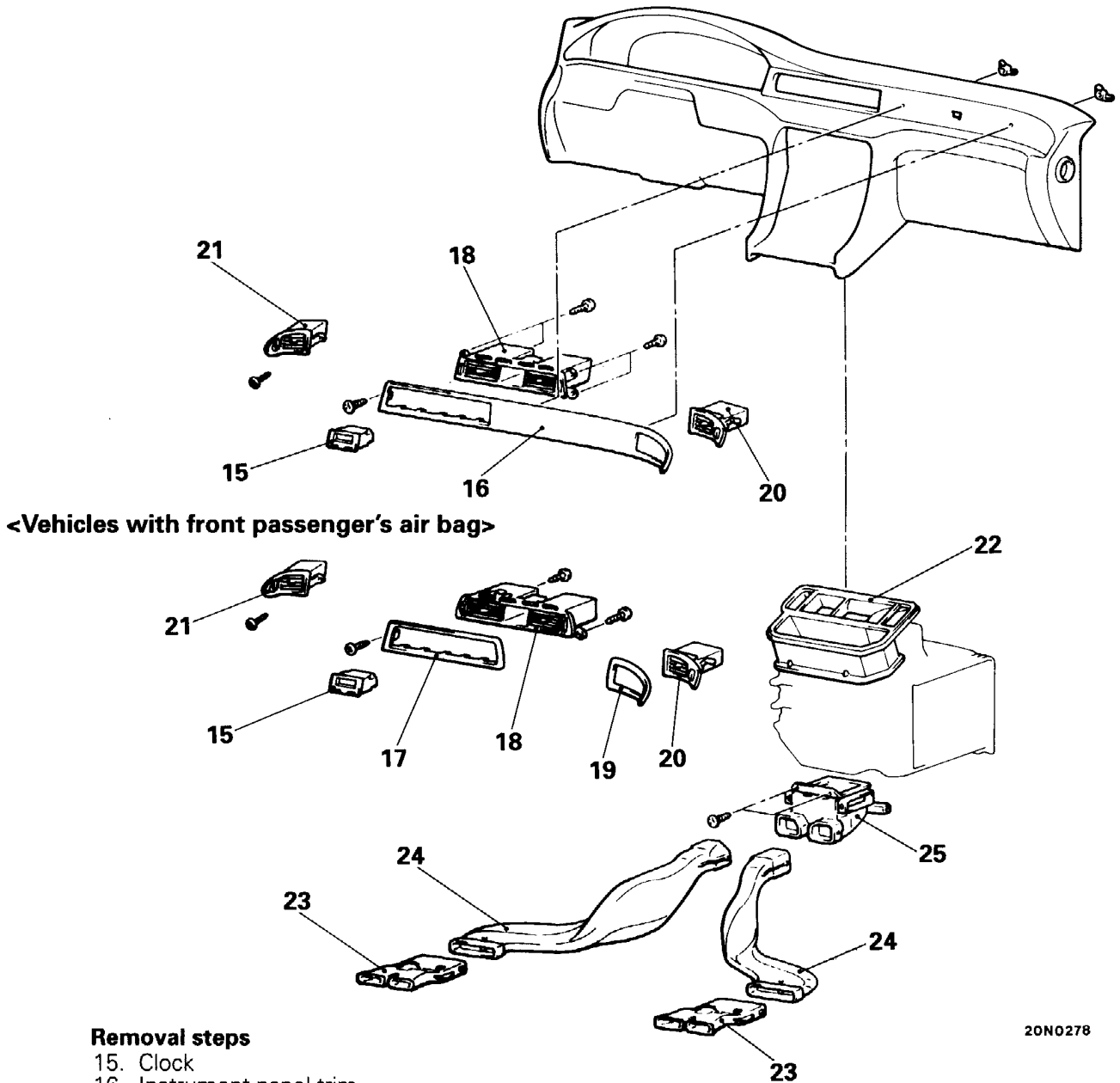
1. Driver side lower panel
2. Foot shower nozzle
3. Foot shower duct (Left side)
4. Passenger side under cover
5. Foot shower duct (Right side)
6. Duct <Vehicles without air conditioner>
7. Grommet
8. Instrument panel (Refer to GROUP 52 – Instrument Panel)
9. Side defroster hose
10. Defroster nozzle
11. Air duct
12. Distribution duct
13. Defroster garnish
14. Photo sensor



20N0277

NOTE

* : Vehicles with front passenger's air bag



Removal steps

15. Clock
16. Instrument panel trim
17. Instrument panel trim, center
18. Center outlet assembly
19. Instrument panel trim C
20. Side outlet assembly (Right side)
21. Side outlet assembly (Left side)
22. Center duct assembly
23. Rear heater nozzle
24. Rear heater duct
25. Distribution duct

20N0278

NOTES

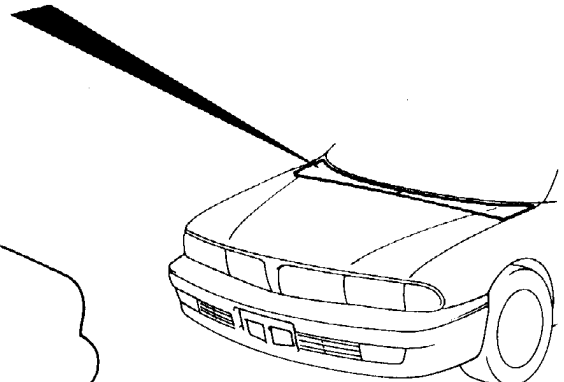
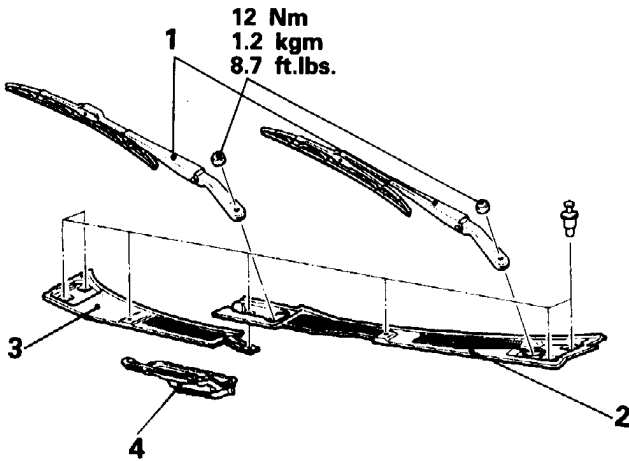
VENTILATORS (AIR INLET AND AIR OUTLET)

E55MA-B

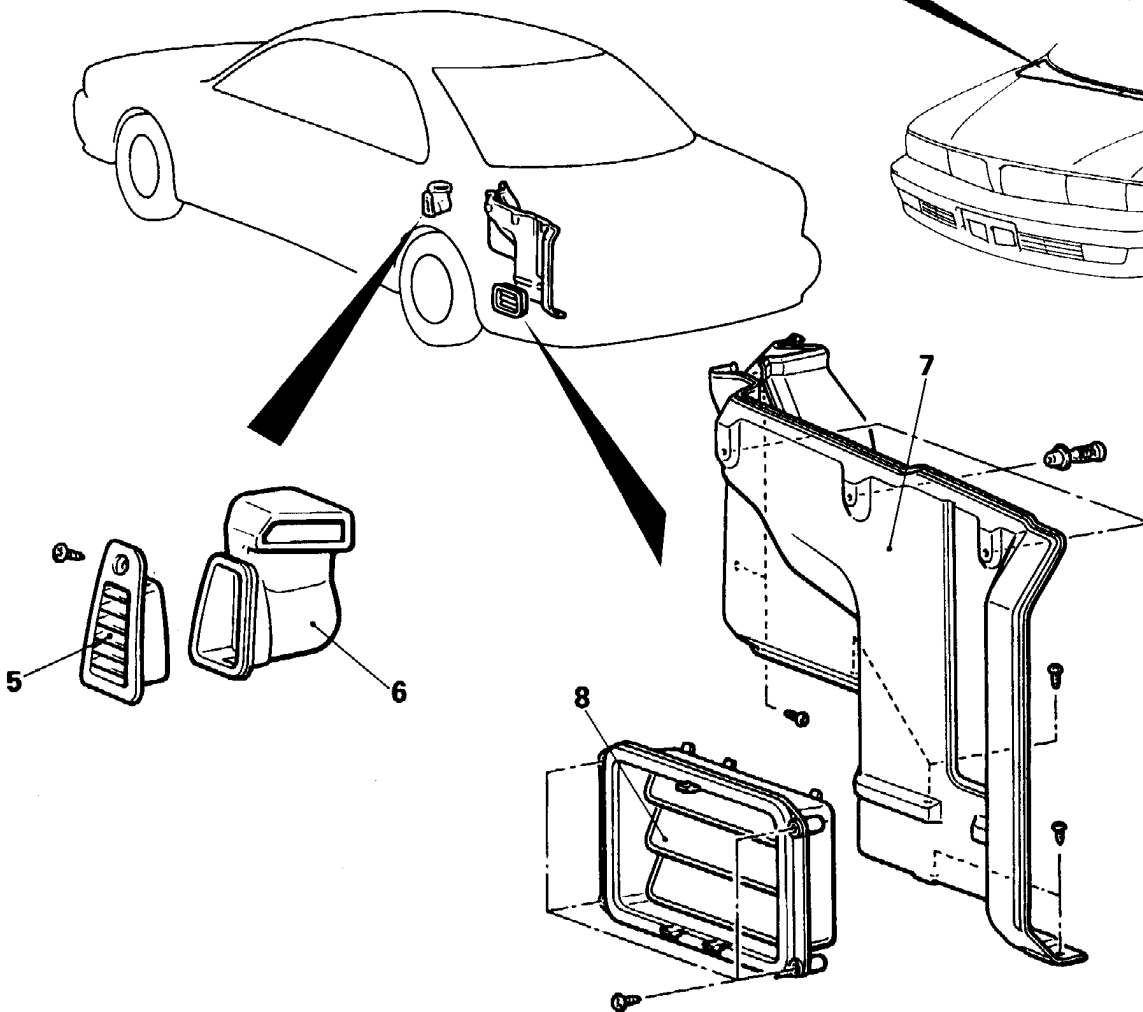
REMOVAL AND INSTALLATION

Air intake garnish removal steps

1. Wiper arm
2. Front deck grille (Left side)
3. Front deck grille (Right side)
4. Air intake garnish



20N0133



20N0104

Rear ventilation duct removal steps

5. Rear vent garnish assembly
6. Rear vent duct
- Rear bumper (Refer to GROUP 51 – Rear Bumper.)
7. Trunk side trim
8. Rear vent duct assembly