

HEATER, AIR CONDITIONER AND VENTILATION

CONTENTS

SERVICE SPECIFICATIONS	2	Condenser Fan Relay (LO) Check	23
LUBRICANTS	2	Condenser Fan Relay (HI) Check	23
SPECIAL TOOLS	2	Idle-up Operation Check	24
TROUBLESHOOTING	3	HEATER CONTROL ASSEMBLY (A/C-ECU) AND A/C SWITCH	25
ON-VEHICLE SERVICE	14	HEATER UNIT AND BLOWER ASSEMBLY .	28
Refrigerant Level Test through Performance Test .	14	REGISTOR, BLOWER MOTOR AND INSIDE/OUTSIDE AIR CHANGE OVER DAMPER MOTOR	32
Magnetic Clutch Test	14	EVAPORATOR AND AIR THERMO SENSOR	34
Receiver Drier Test	14	COMPRESSOR	36
Compressor Drive Belt Adjustment	15	CONDENSER ASSEMBLY AND CONDENSER FAN ASSEMBLY	40
Dual Pressure Switch Check	15	REFRIGERANT LINES	42
Charging	16	DUCTS	44
Correcting Low Refrigerant Level in case the Service can used	18	VENTILATION	45
Discharging System	19		
Refilling of Oil in the A/C System	19		
Performance Test	20		
Refrigerant Leak Repair	21		
Blower Relay Continuity Check	22		
A/C Compressor Relay Continuity Check	22		

SERVICE SPECIFICATIONS

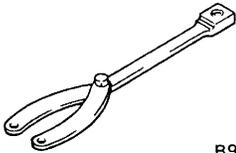
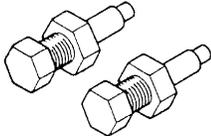
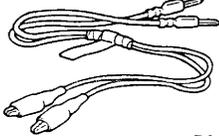
Item		Standard value
Idling speed (rpm): N or P range		850 ± 50
Idle-up speed (rpm): N or P range		850 ± 50
Register resistance (for blower motor) Ω	HI - LO (between terminals 1 and 3)	2.54
	HI - ML (between terminals 1 and 6)	1.24
	HI - MH (between terminals 1 and 4)	0.6
Air conditioner compressor air gap mm		0.3 – 0.5
Refrigerant temperature switch operating temperature (°C)	Continuity	Slightly below 150
	No continuity	150 or higher (until temperature falls to 120 when OFF)

NOTE* : When disconnected the compressor connector at A/C ON

LUBRICANTS

Items	Specified lubricants	Quantity
Compressor oil mL	SUN PAG 56	130 ± 10
Pipe coupling	SUN PAG 56	As required
Refrigerant (g)	R134a (HFC-134a)	550 ± 20

SPECIAL TOOLS

Tool	Number	Name	Use
 B991367	MB991367	Special spanner	For use on the air conditioner compressor armature locknut
 B991386	MB991386	Pin	
 B991529	MB991529	Diagnosis code check harness	For inspecting the air conditioner using a voltmeter

TROUBLESHOOTING

BASIC FLOW OF TROUBLESHOOTING

Refer to Group 00 – How to Use Troubleshooting/Inspection Service Points.

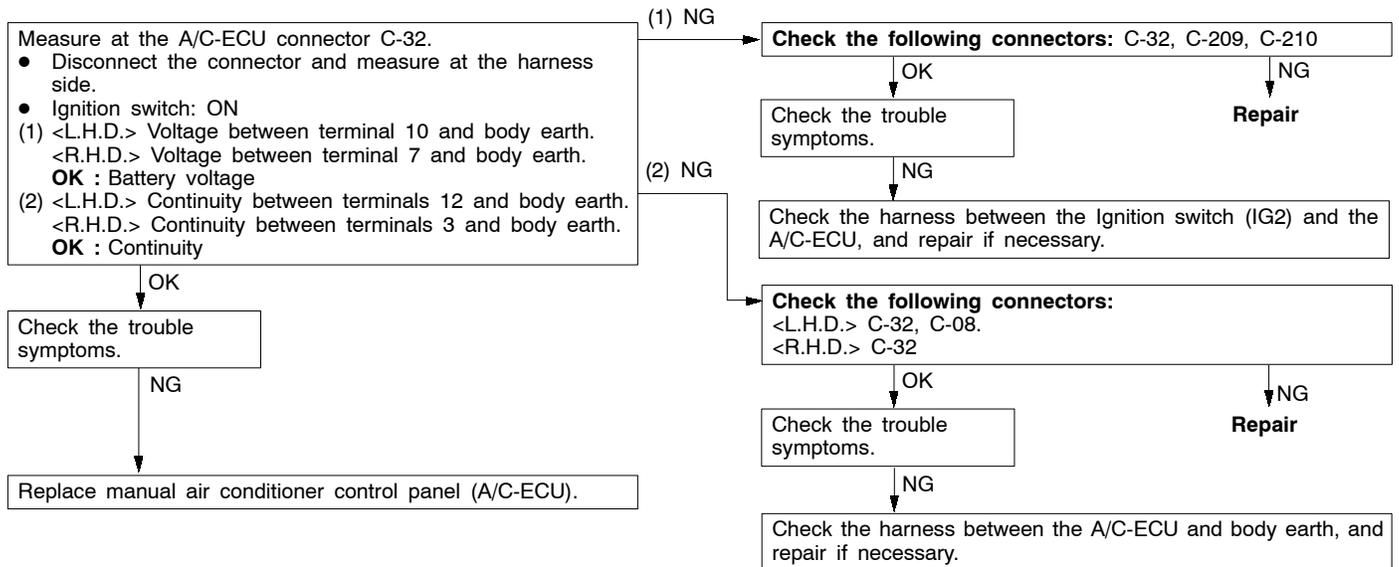
INSPECTION CHART FOR TROUBLE SYMPTOMS

Trouble symptom	Inspection procedure	Reference page
Air conditioner not working at all	1	55-3
Blower motor not working	2	55-4
Air cannot be switched between inside and outside	3	55-5
Rear defogger not working	4	55-6
Cold air not coming out from the air outlet	5	55-7
Magnet clutch not working normally	6	55-8
Condenser fan not working at all	7	55-9
Condenser fan not working only for LO	8	55-10
Condenser fan not working only for HI	9	55-11

INSPECTION PROCEDURE FOR TROUBLE SYMPTOM

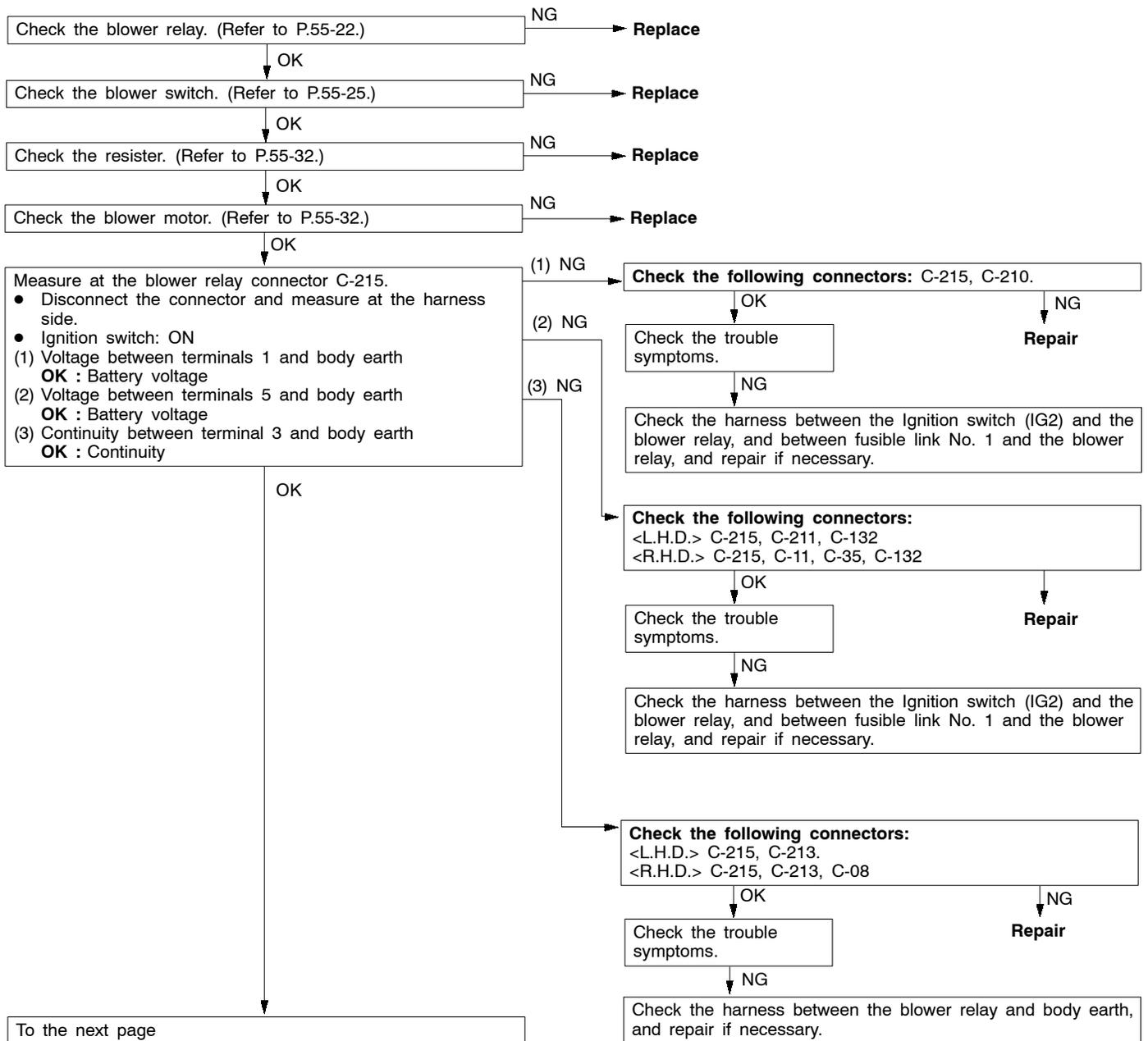
Inspection procedure 1

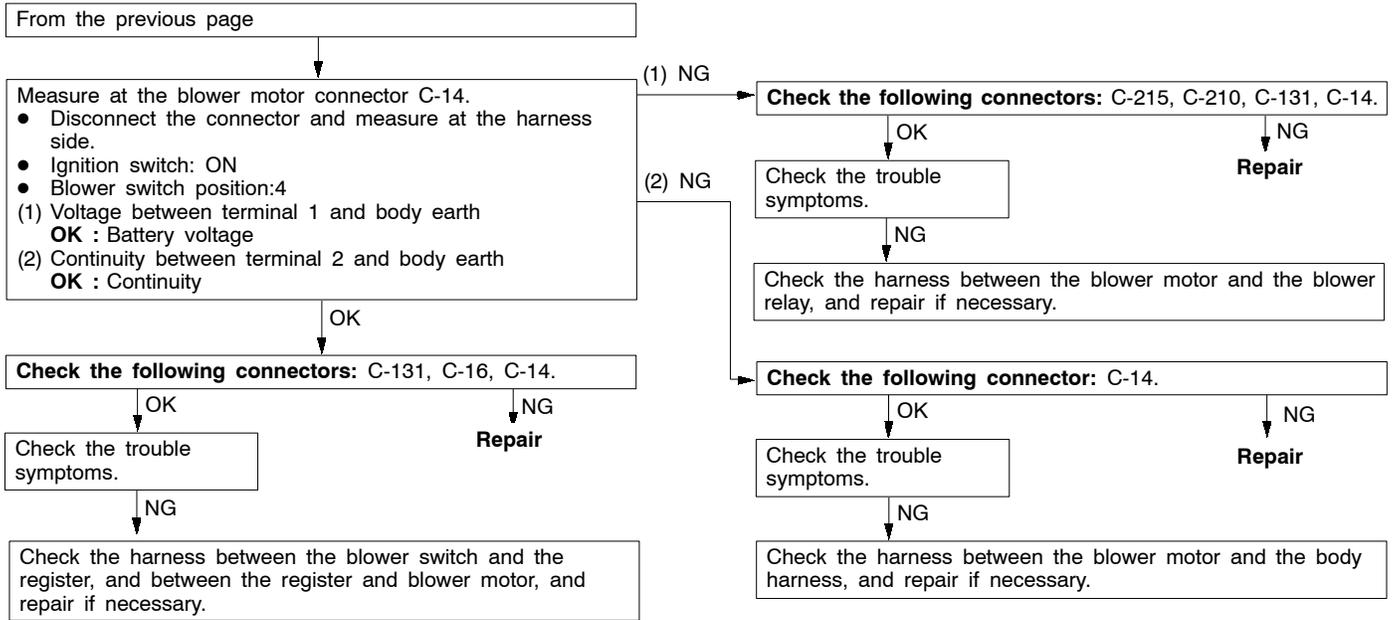
Air conditioner not working at all	Probable cause
The A/C-ECU power supply system (including earth) may be defective.	<ul style="list-style-type: none"> ● Harness or connector fault ● A/C-ECU fault



Inspection procedure 2

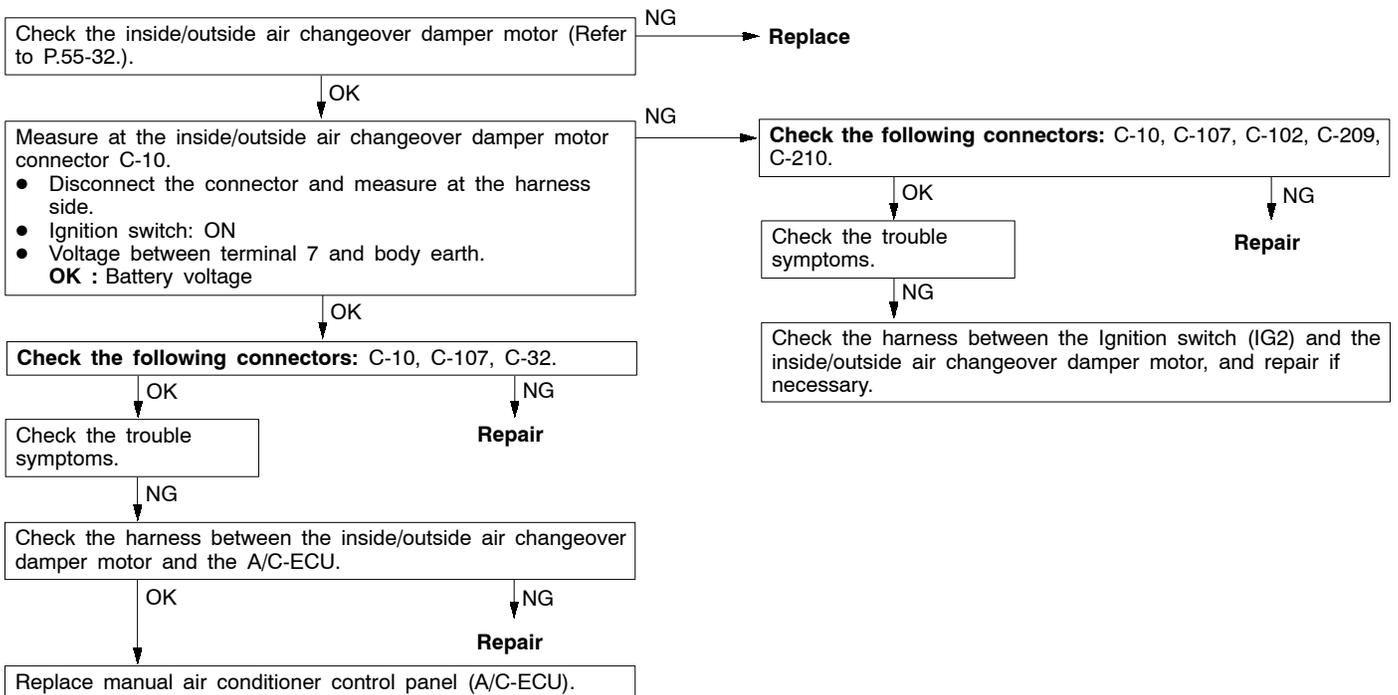
Blower motor not working	Probable cause
If the blower motor does not work, the blower motor circuit system may be defective.	<ul style="list-style-type: none"> ● Blower motor fault ● Harness or connector fault ● A/C-ECU fault





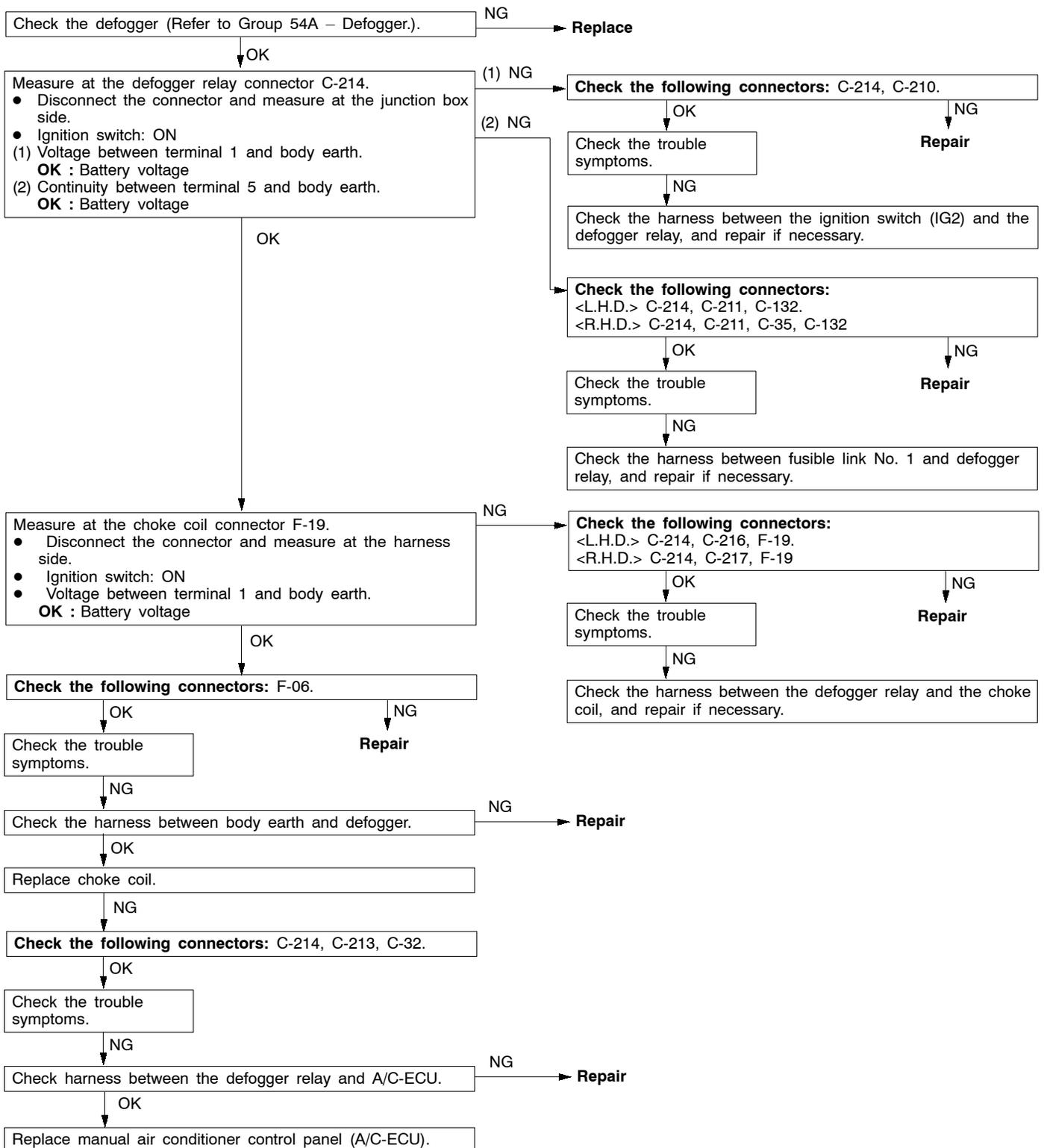
Inspection procedure 3

Air cannot be switched between inside and outside.	Probable cause
If the air cannot be switched between the inside and outside even though the inside/outside switch is ON, the inside/outside changeover damper motor system may be defective.	<ul style="list-style-type: none"> • Inside/outside air changeover damper motor fault • Harness or connector fault • A/C-ECU fault



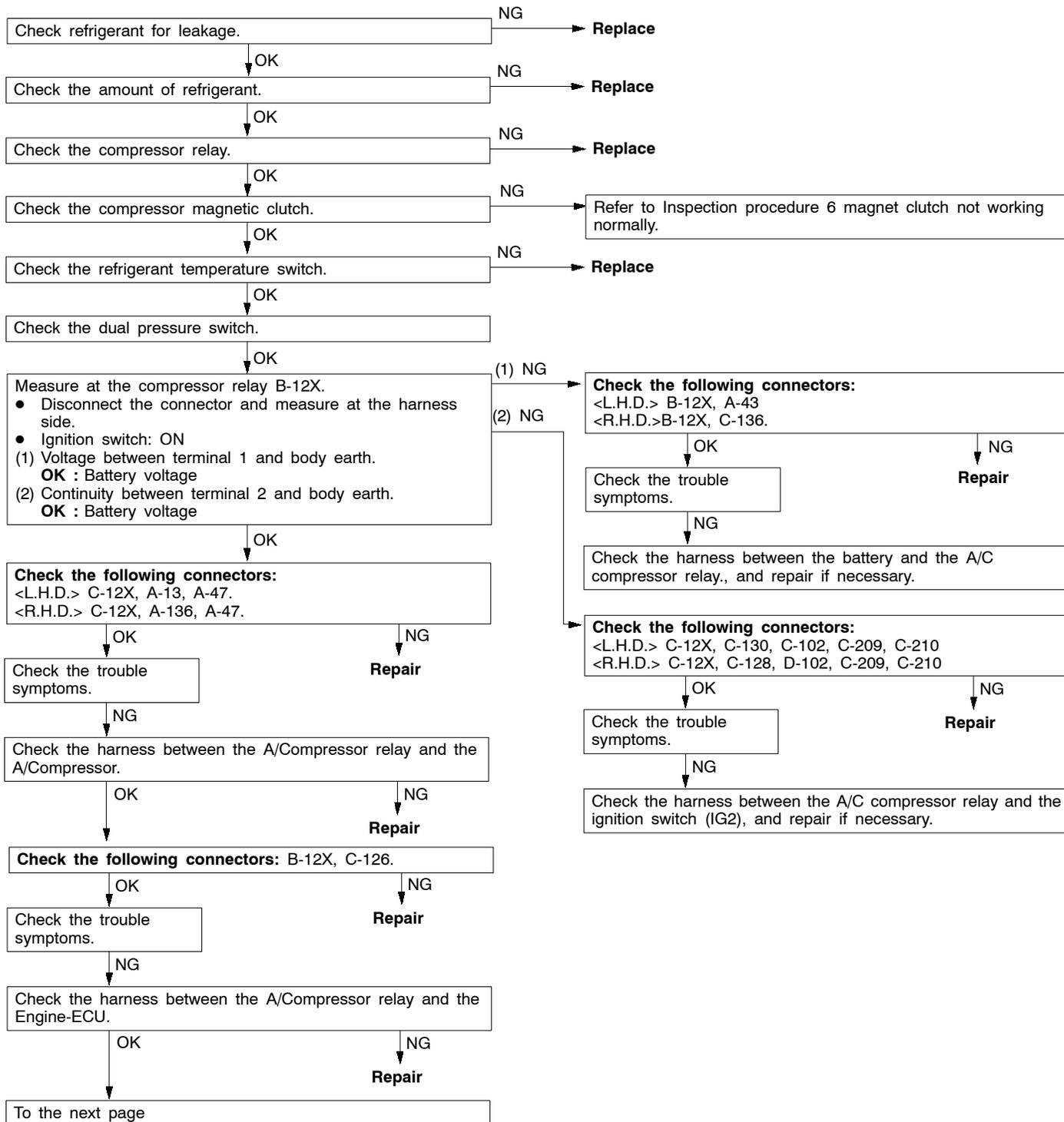
Inspection procedure 4

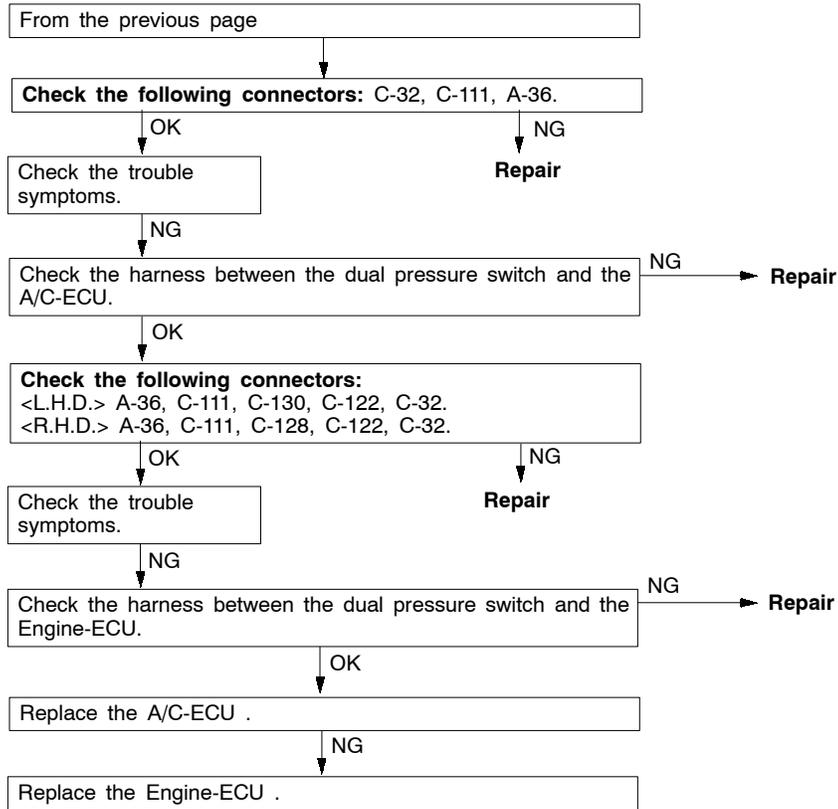
Rear defogger not working	Probable cause
If the rear window defogger does not work even though the rear defogger switch is ON (a 20-minute timer operates), the defogger relay system may be defective.	<ul style="list-style-type: none"> ● Defogger relay fault ● Harness or connector fault ● A/C-ECU fault



Inspection procedure 5

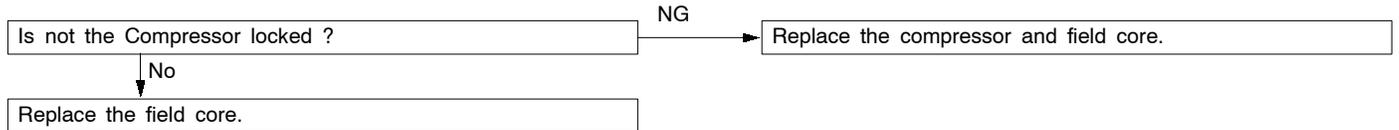
Cold air not coming out from the air outlet	Probable cause
If cold air does not come out from the air outlet, the amount of refrigerant may be inappropriate or the compressor circuit system may be defective.	<ul style="list-style-type: none"> ● Refrigerant line fault ● Amount of refrigerant fault ● Compressor fault ● Compressor relay fault ● Dual pressure switch fault ● Engine-ECU fault ● A/C-ECU fault





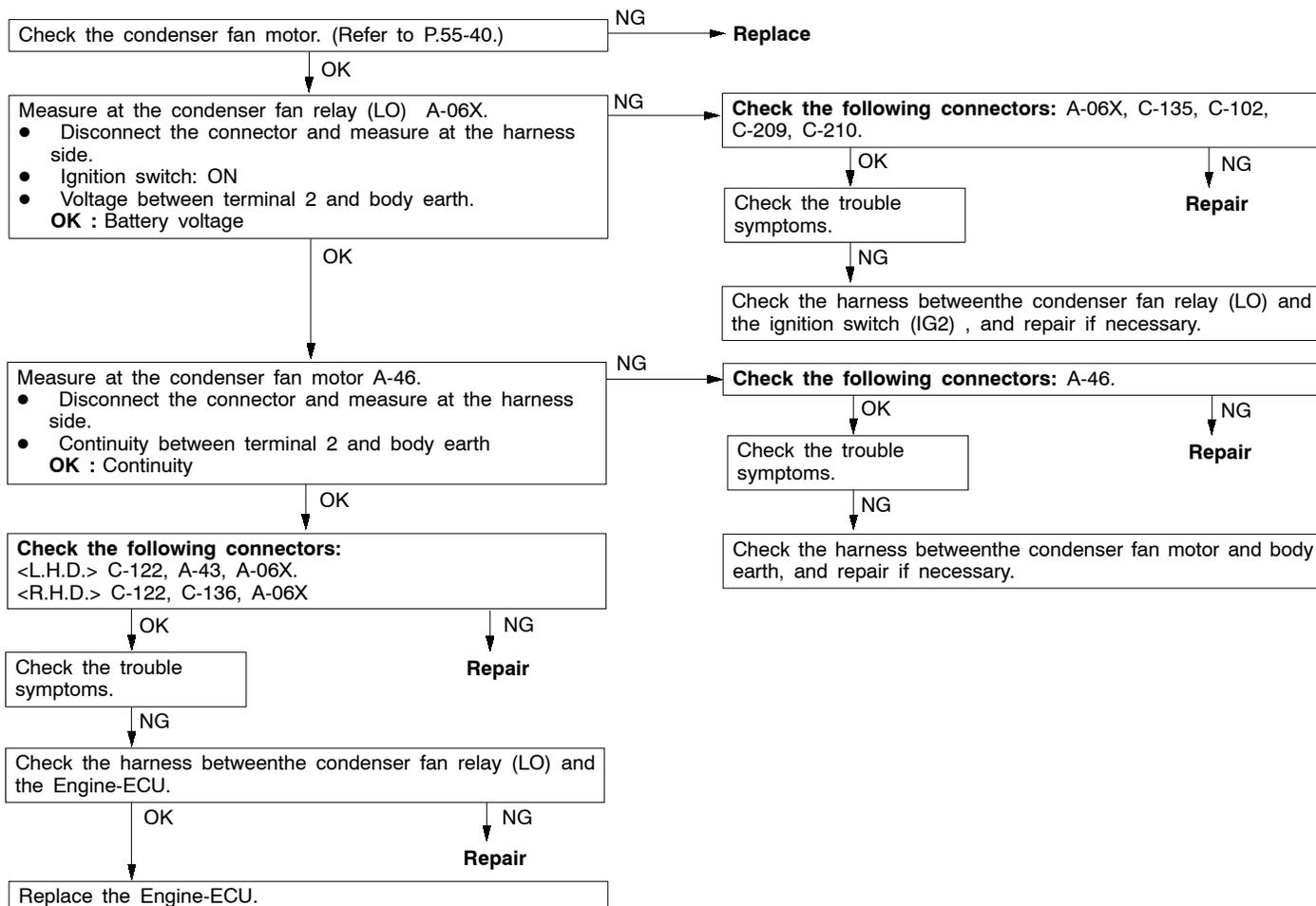
Inspection procedure 6

Magnet clutch not working normally	Probable cause
If the magnet clutch does not work normally, the field core or the compressor may be defective.	<ul style="list-style-type: none"> ● Compressor fault ● Field core fault



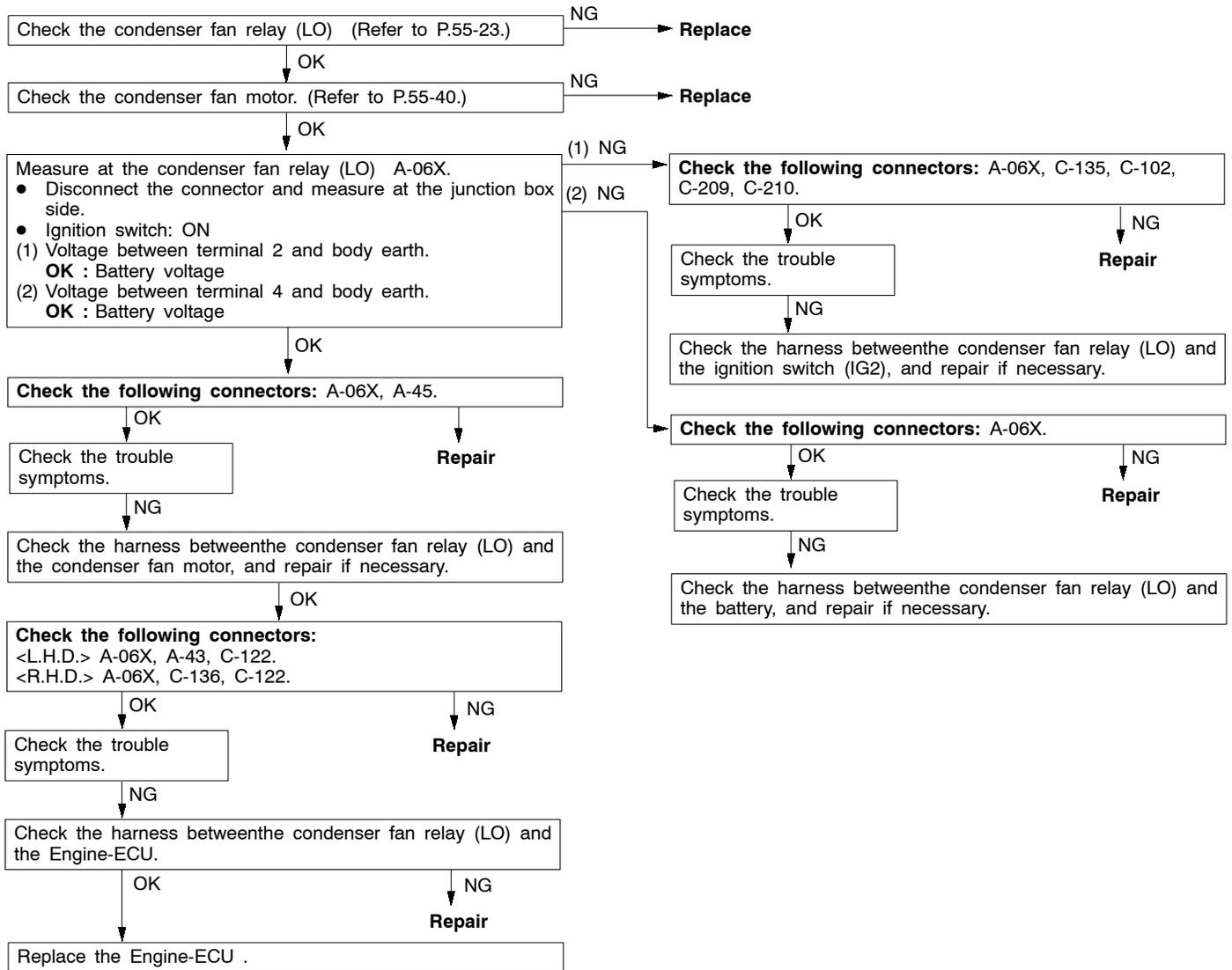
Inspection procedure 7

Condenser fan not working at all	Probable cause
If the condenser fan does not work at all, the condenser fan circuit system may be defective.	<ul style="list-style-type: none"> ● Condenser fan motor fault ● Harness or connector fault ● Engine-ECU fault



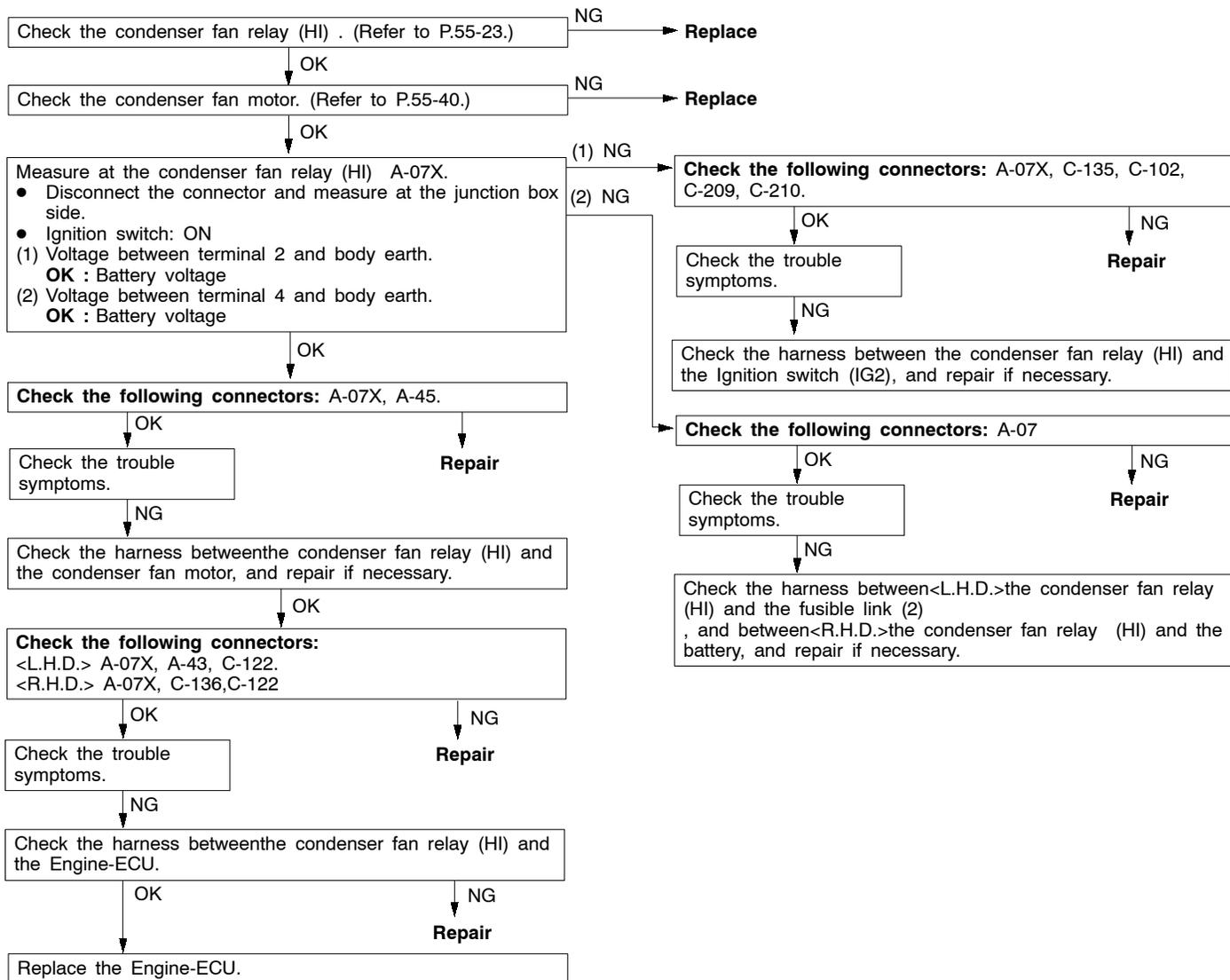
Inspection procedure 8

Condenser fan not working only for LO	Probable cause
If the condenser fan does not work only for LO, the condenser fan circuit system or the condenser fan relay (LO) circuit system may be defective.	<ul style="list-style-type: none"> ● Condenser fan motor fault ● Condenser fan relay (LO) fault ● Harness or connector fault ● Engine-ECU fault



Inspection procedure 9

Condenser fan not working only for HI	Probable cause
If the condenser fan does not work only for HI, the condenser fan circuit system or the condenser fan relay (HI) circuit system may be defective.	<ul style="list-style-type: none"> ● Condenser fan motor fault ● Condenser fan relay (HI) fault ● Harness or connector fault ● Engine-ECU fault



CHECK AT THE ENGINE-ECU TERMINAL

1	2	3	4	5	6	7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22	23	24	25	26

31	32	33	34	35	36	37	38
39	40	41	42	43	44	45	46

51	52	53	54	55	56
57	58	59	60	61	62

71	72	73	74	75	76	77	78	79	80	81
82	83	84	85	86	87	88	89	90	91	92

Y2369AU

Terminal no.	Check item	Check when	Normal state
21	Fan controller output	Radiator fan: ON	0 - 0.3 V
		Radiator fan: OFF	0.7 V or more
22	A/C compressor output	A/C compressor relay: OFF	0 V
		A/C compressor relay: ON	Battery voltage or temporarily 6V or more → 1V or less
24	A/C-ECU input (A/C2)	At A/C low load	Battery voltage
32	Condenser fan motor relay (HI)	Fan: OFF (engine coolant temperature: 90°C or lower)	Battery voltage
		Fan: ON (engine coolant temperature: 105°C or lower)	1V or more
34	Condenser fan motor relay (LOW)	Fan: OFF (engine coolant temperature: 90°C or lower)	Battery voltage
		Fan: ON (engine coolant temperature: 105°C or lower)	1V or more
45	A/C-ECU input (A/C1)	A/C ON (When dual pressure switch is ON)	Battery voltage

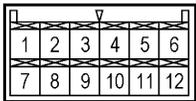
CHECK AT THE A/C-ECU TERMINAL <L.H.drive vehicles>

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16

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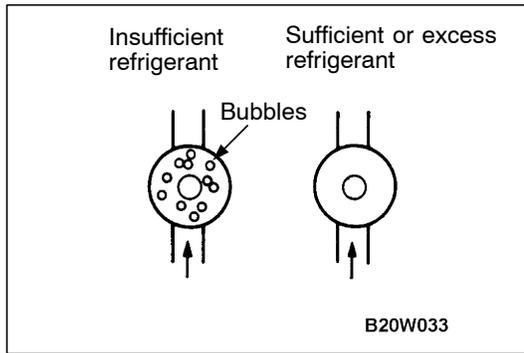
Terminal no.	Check item	Check when	Normal state
1	Rear defogger switch	Defogger switch: ON	0 V
		Defogger switch: OFF	Battery voltage
2	Inside/outside air changeover damper motor (outside air)	When damper moved to inside circulation position	0 V
		When damper moved to outside air induction position	Battery voltage
3	Inside/outside air changeover damper motor (inside air)	When damper moved to inside circulation position	Battery voltage
		When damper moved to outside air induction position	0 V
4	Engine-ECU output (A/C1)	When A/C OFF	0 V
		A/C switch: ON, blower: ON (room temperature)	Battery voltage
5	Engine-ECU output (A/C2)	At A/C low load	Battery voltage
		At A/C high load	0 V
6	Illumination power supply	Lighting switches: ON	Battery voltage
7	-	-	-
8	Blower switch (LO)	Blower switch: LO	Battery voltage

Terminal no.	Check item	Check when	Normal state
9	-	-	-
10	Ignition switch (IG2) power supply	Ignition switch: ON	Battery voltage
11	Illumination earth	Any time	0 V
12	Earth	Any time	0 V
13	Air thermo sensor	When temperature around sensor 25°C (1.5kΩ)	2.2 V
14	-	-	-
15	-	-	-
16	Air thermo sensor earth	Any time	0 V

CHECK AT THE A/C-ECU TERMINAL <R.H.drive vehicles>

Y2370AU

Terminal no.	Check item	Check when	Normal state
1	Engine-ECU output (A/C1)	When A/C OFF	0 V
		A/C switch: ON, blower: ON (room temperature)	Battery voltage
2	Engine-ECU output (A/C2)	At A/C low load	Battery voltage
		At A/C high load	0 V
3	Earth	Any time	0 V
4	Air thermo sensor earth	Any time	0 V
5	Illumination power supply	Lighting switches: ON	Battery voltage
6	Air thermo sensor	When temperature around sensor 25°C (1.5kΩ)	2.2 V
7	Ignition switch (IG2) power supply	Ignition switch: ON	Battery voltage
8	Blower switch (LO)	Blower switch: LO	Battery voltage
9	Rear defogger switch	Defogger switch: ON	0 V
		Defogger switch: OFF	Battery voltage
10	Inside/outside air changeover damper motor (outside air)	When damper moved to inside circulation position	0 V
		When damper moved to outside air induction position	Battery voltage
11	Inside/outside air changeover damper motor (inside air)	When damper moved to inside circulation position	Battery voltage
		When damper moved to outside air induction position	0 V
12	Illumination earth	Any time	0 V



ON-VEHICLE SERVICE

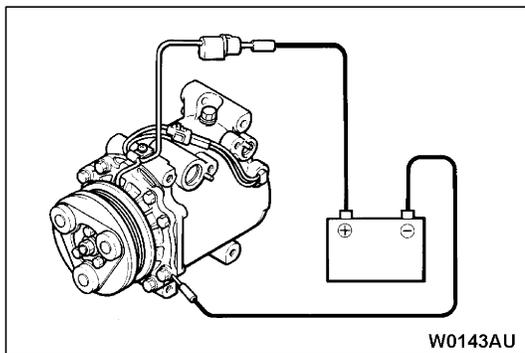
REFRIGERANT LEVEL TEST THROUGH PERFORMANCE TEST

1. Start the engine.
2. Turn on the A/C switch, and set the A/C control to MAX. COOL.
3. Adjust the engine speed to 1,500 r/min.
4. Check the refrigerant level (bubble state) through the sight glass.

Item	State
Insufficient refrigerant	Many bubbles are seen. If refrigerant is extremely low, it appears white.
Sufficient or excess refrigerant	No bubbles are seen

NOTE

1. If insufficient, replenish the refrigerant as follows.
 - a) Replenish until bubbles disappear from the sight glass.
 - b) After the bubbles disappear from the sight glass, replenish 100g of refrigerant.
2. If excessive, replenish the refrigerant as follows.
 - a) Drain the refrigerant until bubbles can be seen through the sight glass.
 - b) Replenish until bubbles disappear from the sight glass.
 - c) After the bubbles disappear from the sight glass, replenish 100g of refrigerant.



MAGNETIC CLUTCH TEST

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

RECEIVER DRIER TEST

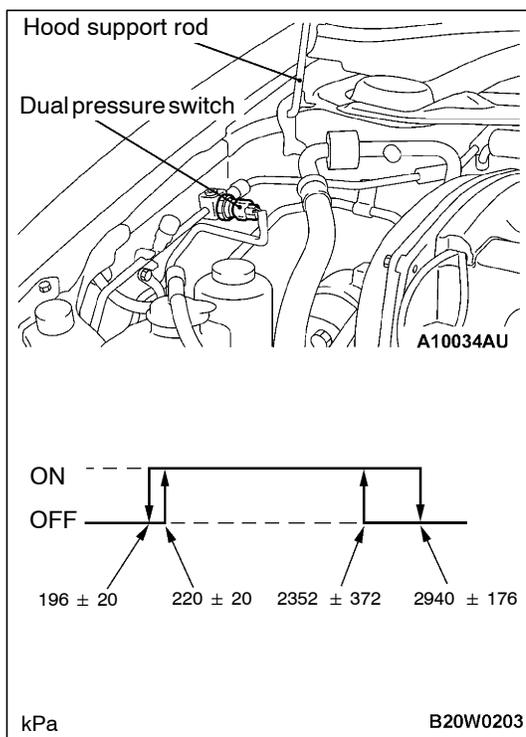
Operate the unit and check the piping temperature by touching the receiver drier outlet and inlet.

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

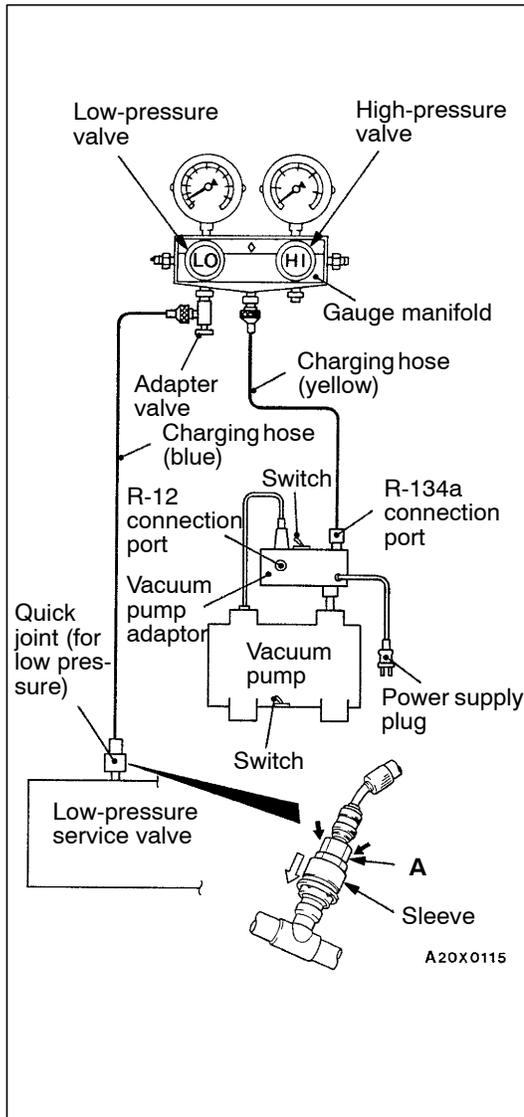
Replace the receiver drier.

COMPRESSOR DRIVE BELT ADJUSTMENT

Refer to GROUP 11 - On-vehicle Service.

**DUAL PRESSURE SWITCH CHECK**

1. Remove the dual pressure switch connector and connect the high/low pressure side terminals located on the harness side as shown in the illustration.
2. Install a gauge manifold to the high-pressure side service valve of the refrigerant line. (Refer to 55-42.)
3. When the high/low pressure sides of the dual pressure switch are at operation pressure (ON) and there is continuity between the respective terminals, then the condition is normal. If there is no continuity, replace the switch.



CHARGING

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

NOTE

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

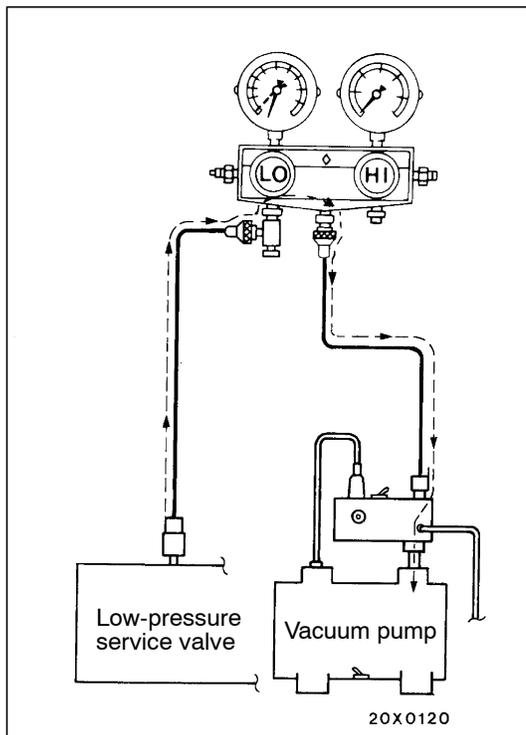
Caution

- (1) Use tools that are suited to R134a.
- (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 R134a side to start the vacuum pump.

Caution

Do not operate the compressor for evacuation.

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

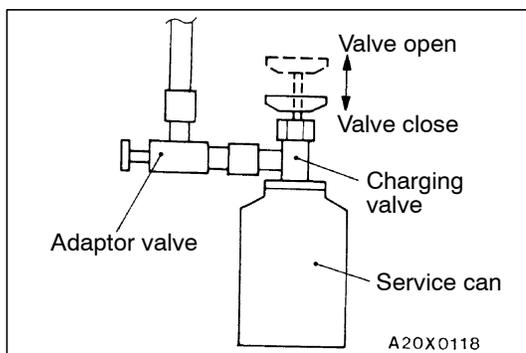
Caution

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

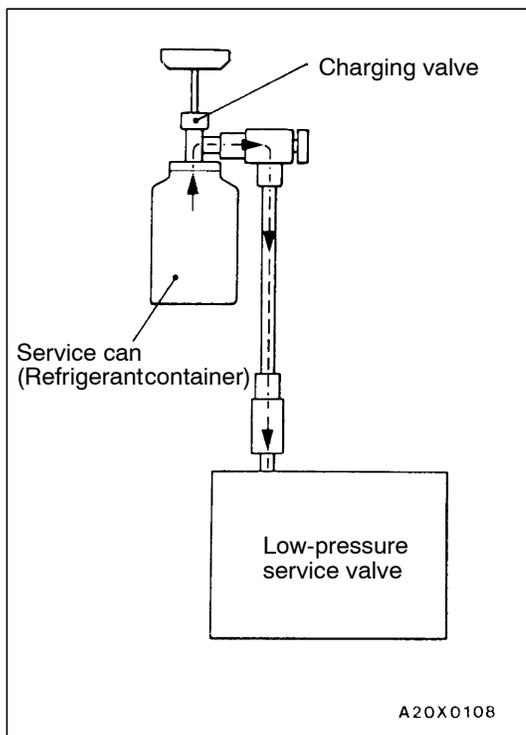
15. Carry out a leak test. (Good if the negative pressure does not drop.)

Caution

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



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



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

Caution

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

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

Caution

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

22. Start the engine.
23. Operate the A/C and set to the lowest temperature (MAX. COOL).

24. Fix the engine speed at 1,500 r/min.
25. Tighten the handle of the adaptor valve (valve open) to charge the required volume of refrigerant.

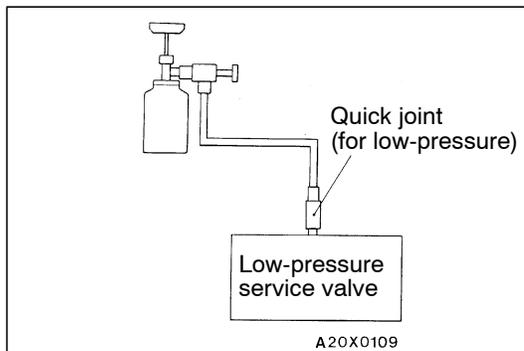
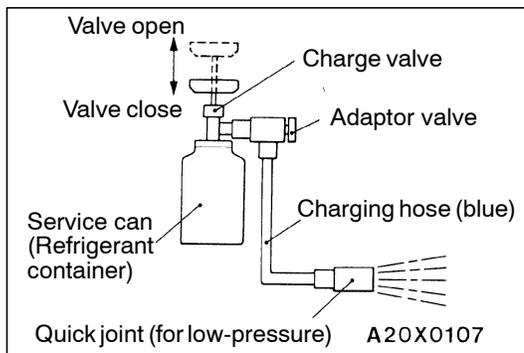
Caution

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

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

NOTE

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

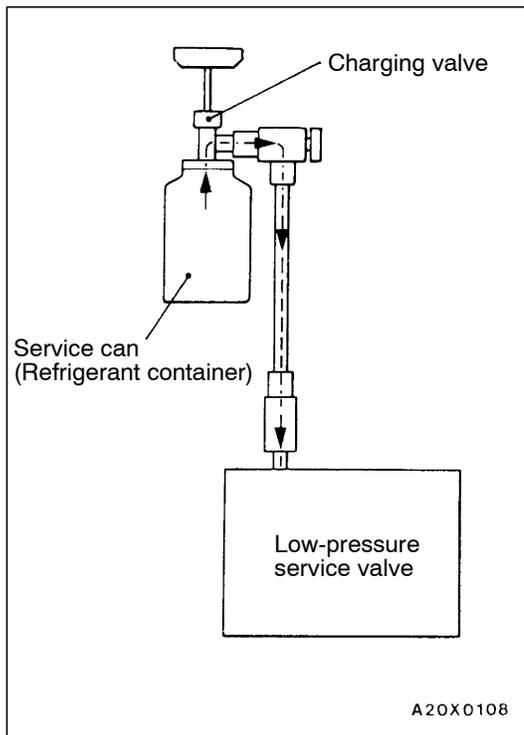


CORRECTING LOW REFRIGERANT LEVEL IN CASE THE SERVICE CAN IS USED

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

NOTE

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



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

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

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

REFILLING OF OIL IN THE A/C SYSTEM

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

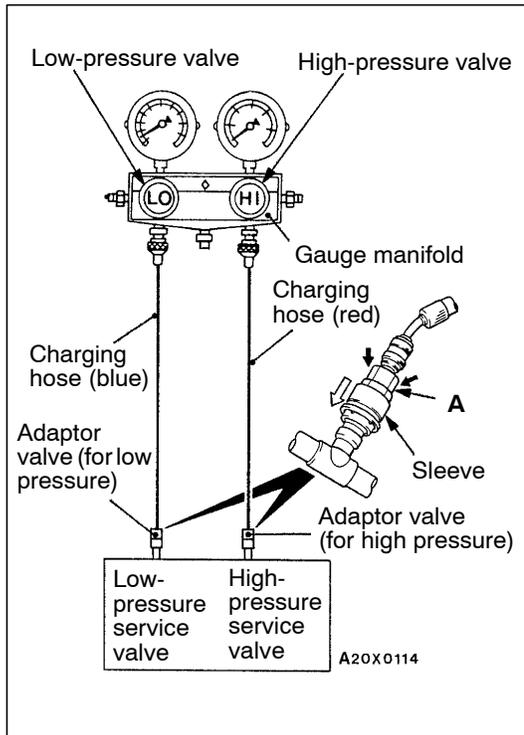
When a compressor is installed at the factory, it contains 130 cm³ of refrigerant oil. While the A/C system is in operation, the oil is carried through the entire system by the refrigerant. Some of this oil will be trapped and retained in various parts of the system.

When the following system components are changed, it is necessary to add oil to the system to replace the oil being removed with the component.

Compressor oil: SUN PAG 56

Quantity

Condenser: 180 cm³



PERFORMANCE TEST

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

5. Connect the quick joint (for low-pressure) to the low-pressure service valve and connect the quick joint (for high-pressure) to the high-pressure service valve.

NOTE

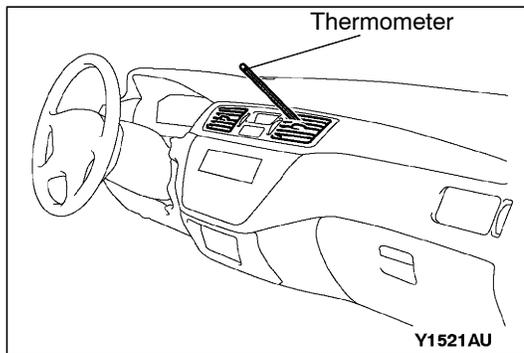
The high-pressure service valve is on liquid pipe A and the low-pressure service valve is on the suction hose.

Caution

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

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

6. Start the engine.
7. Set the controls to the A/C as follows:
 - A/C switch: A/C - ON position
 - Mode selection: Face position
 - Temperature control: Max. cooling position
 - Air selection: Recirculation position
 - Blower switch: HI (Fast) position
8. Keep engine speed to idling speed with A/C clutch engaged.
9. Engine should be warmed up with doors and all windows opened.



10. Insert a thermometer in the 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	20	25	30	35
Discharge air temperature °C	8 - 11	12 - 16	17 - 21	22.5 - 27.5
Compressor high-pressure kPa	740 - 840	950 - 1,050	1,160 - 1,300	1,360 - 1,550
Compressor low-pressure kPa	150 - 190	190 - 240	240 - 300	300 - 375

REFRIGERANT LEAK REPAIR

LOST CHARGE

If the system has lost all charge due to a leak:

1. Evacuate the system. (See procedure.)
2. Charge the system with approximately one pound of refrigerant.
3. Check for leaks.
4. Discharge the system.
5. Repair leaks.
6. Replace receiver drier.

Caution

Replacement filter-drier units must be sealed while in storage. The drier used in these units will saturate water quickly upon exposure to the atmosphere. When installing a drier, have all tools and supplies ready for quick reassembly to avoid keeping the system open any longer than necessary.

7. Evacuate and charge system.

LOW CHARGE

If the system has not lost all of its refrigerant charge; locate and repair all leaks. If it is necessary to increase the system pressure to find the leak (because of an especially low charge) add refrigerant. If it is possible to repair the leak without discharging the refrigerant system, use the procedure for correcting low refrigerant level.

COMPRESSOR NOISE

You must first know the conditions when the noise occurs. These conditions are: weather, vehicle speed, in gear or neutral, engine temperature or any other special conditions.

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

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

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

HANDLING TUBING AND FITTINGS

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

Never attempt to rebend formed lines to fit. Use the correct line for the installation you are servicing. A good rule for the flexible hose lines is keep the radius of all bends at least 10 times the diameter of the hose.

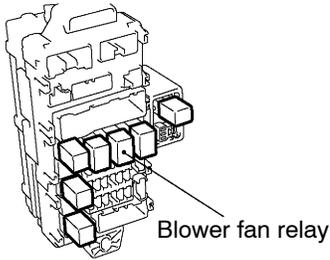
Sharper bends will reduce the flow of refrigerant. The flexible hose lines should be routed so that they are at least 80 mm from the exhaust manifold. It is good practice to inspect all flexible hose lines at least once a year to make sure they are in good condition and properly routed.

Unified plumbing connections with O-rings, these O-rings are not reusable.

ADJUSTMENT

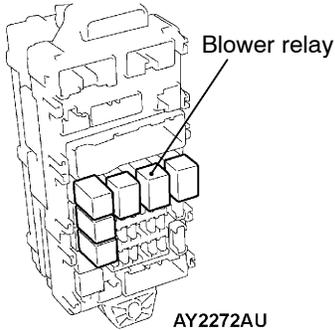
1. Select a quiet area for testing. Duplicate conditions as much as possible. Switch compressor on and off several times to clearly identify compressor noise. To duplicate high ambient conditions (high head pressure), restrict air flow through condenser. Install manifold gauge set to make sure discharge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

<L.H. drive vehicle>

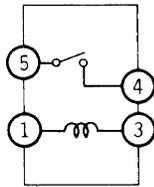
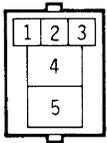


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<R.H. drive vehicle>



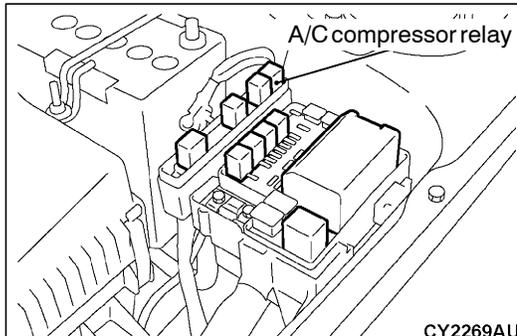
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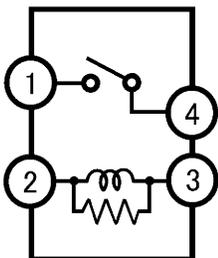
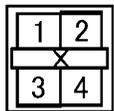
04Z0001

BLOWER RELAY CONTINUITY CHECK

System voltage	Terminal No.			
	1	3	4	5
When current is not supplied	○	○		
When current is supplied	⊕	⊖	○	○



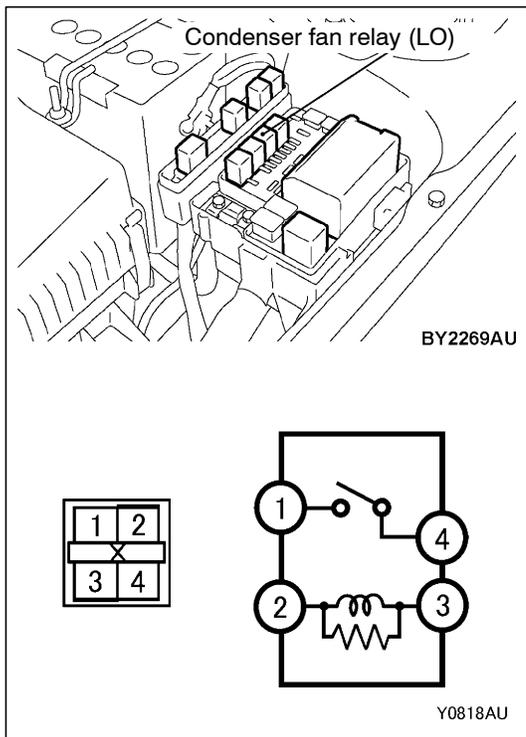
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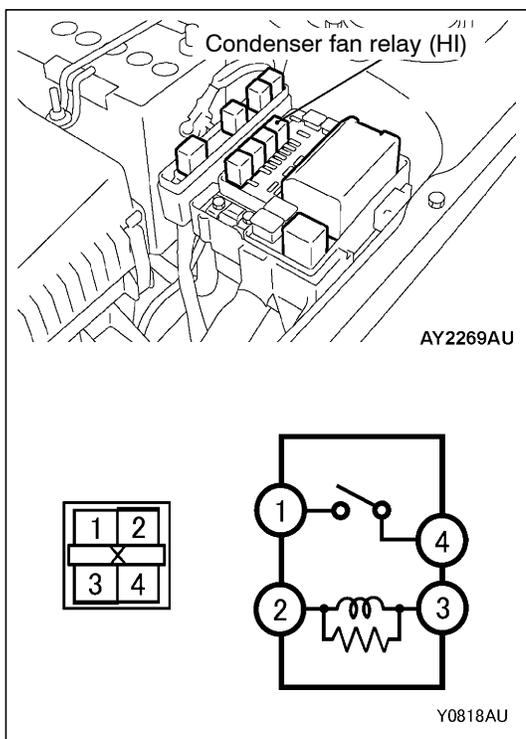
A/C COMPRESSOR RELAY CONTINUITY CHECK

System voltage	Terminal No.			
	3	2	1	4
When current is not supplied	○	○		
When current is supplied	⊕	⊖	○	○



CONDENSER FAN RELAY (LO) CHECK

System voltage	Terminal No.			
	2	3	1	4
When current is not supplied	○	○		
When current is supplied	⊕	⊖	○	○



CONDENSER FAN RELAY (HI) CHECK

System voltage	Terminal No.			
	2	3	1	4
When current is not supplied	○	○		
When current is supplied	⊕	⊖	○	○

IDLE-UP OPERATION CHECK

1. Set the vehicle in the pre-inspection condition:
Engine coolant temperature: 80 – 90 °C
Lamps, electric cooling fan and all accessories: OFF
2. Check that the idle speed is within the standard value.

Standard value: 850 ± 50 r/min

NOTE

The idle speed is controlled by the ISC system and should not be adjusted.

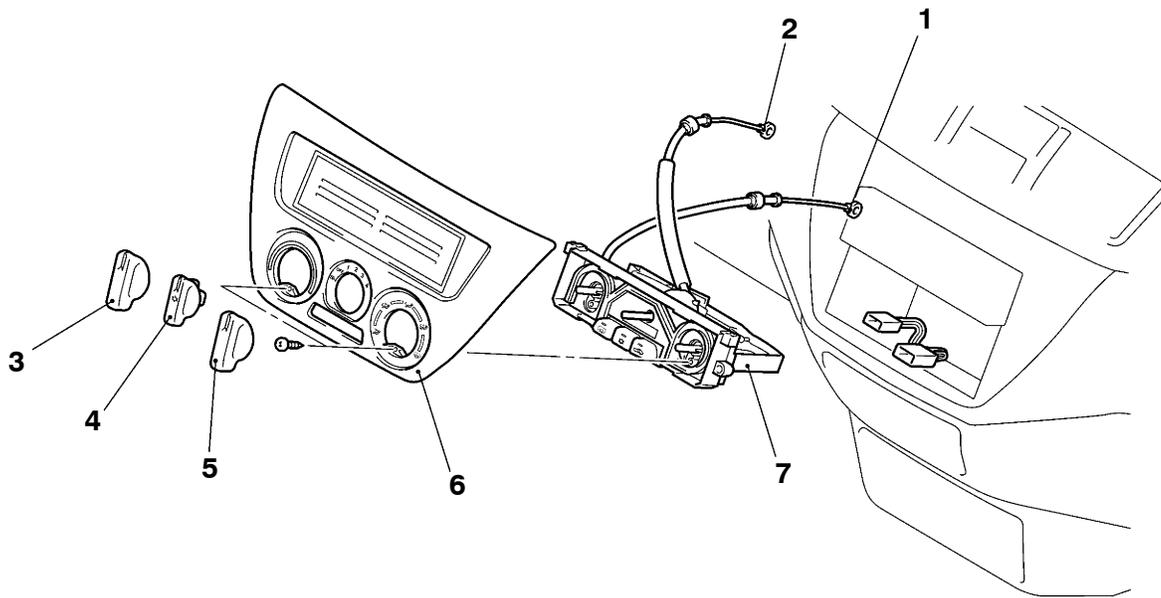
3. The idle speed should be within the standard value when the A/C switch is turned on and the A/C is operating.

Standard value:

850 ± 50 r/min

HEATER CONTROL ASSEMBLY (A/C-ECU) AND A/C SWITCH

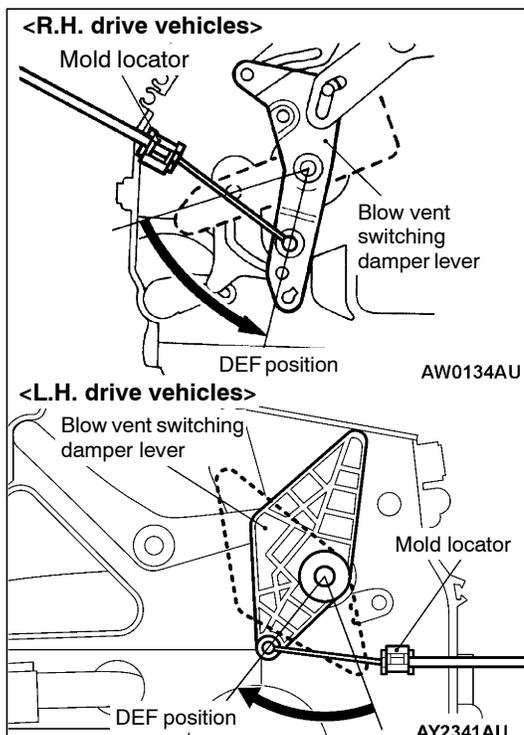
REMOVAL AND INSTALLATION



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Removal steps

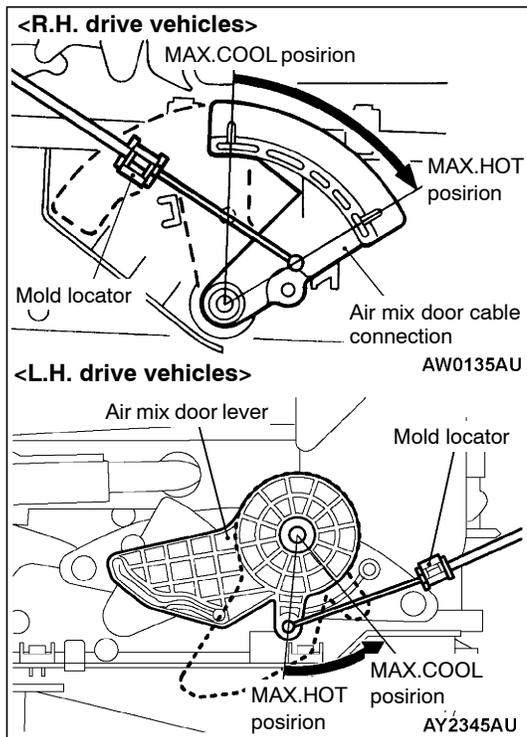
- | | | |
|-----|--|-------------------------------|
| ▶B◀ | 1. Air mix door cable connection | 4. Air volume adjustment knob |
| ▶A◀ | 2. Blow vent switching damper cable connection | 5. Blow vent switching knob |
| | 3. Temperature adjustment knob | 6. Center panel |
| | | 7. Control panel assembly |



INSTALLATION SERVICE POINTS

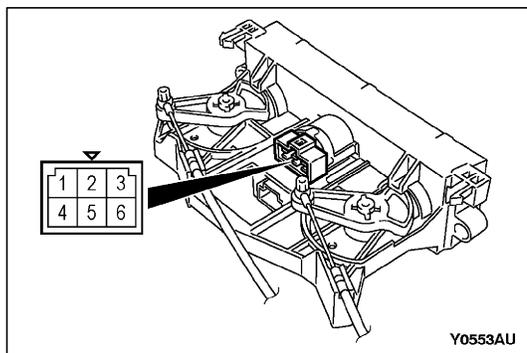
▶A◀ BLOW VENT SWITCHING DAMPER CABLE CONNECTION

1. Set the heater control assembly's blow vent switching knob to the DEF position.
2. Set the heater unit's blow vent switching damper lever to the DEF position (turn the damper lever as the left sketch.) and install the cable.
3. Set the I type position of cable to the heater unit case and secure with a clip.



►B◄ AIR MIX DOOR CABLE CONNECTION

1. Turn the heater control assembly's temperature adjustment knob all the way to the HOT side.
2. Set the heater unit's air mix door lever to the MAX HOT position (turn the damper lever as the left sketch.) and attach the cable.
3. Set the I type position of cable to the heater unit case and secure with a clip.

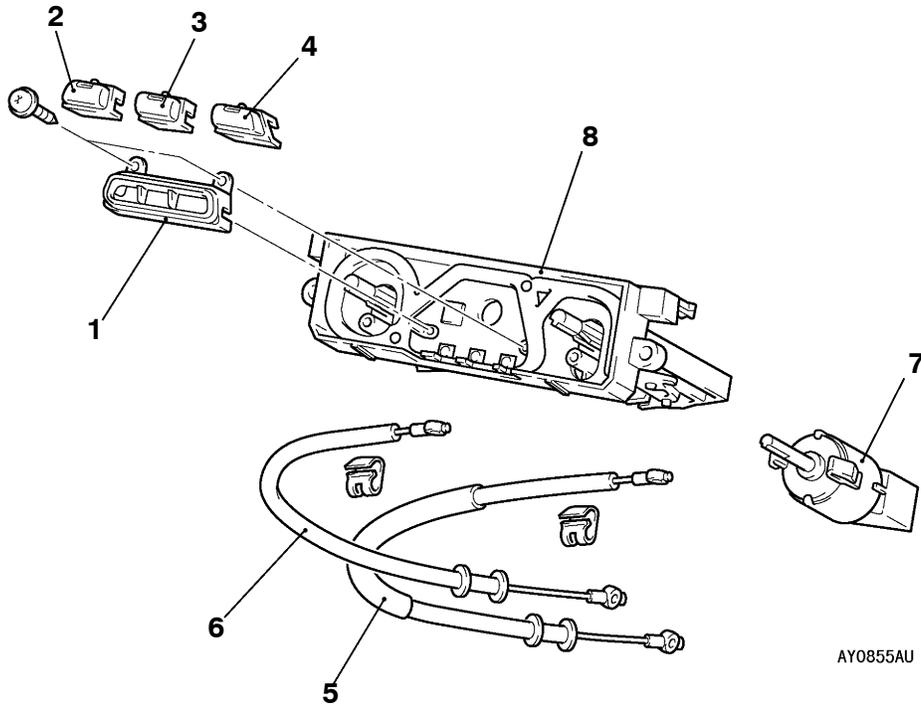


INSPECTION

Blower switch continuity check

Switch position	Terminal no.				
	1	2	4	5	6
0 (OFF)					
1	○—○				
2		○—○			
3		○—○		○	
4		○—○			○

DISASSEMBLY AND REASSEMBLY

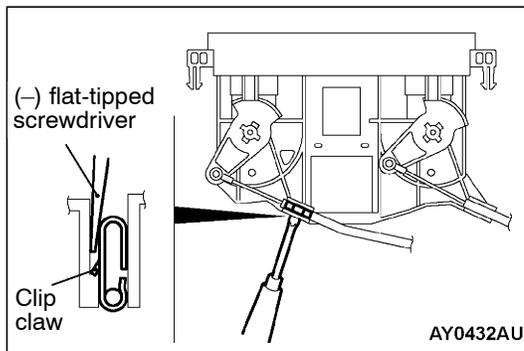


Disassembly steps

1. Switch panel
2. Rear window defogger switch
3. Air conditioner switch
4. Inside/outside air changeover switch
5. Blow vent changeover damper cable



6. Air mix damper cable
7. Blower switch assembly
8. Manual air conditioner control panel (A/C-ECU)



ASSEMBLY SERVICE POINTS

◀▶ BLOW VENT CHANGEOVER DAMPER CABLE AND AIR MIX DAMPER CABLE REMOVAL

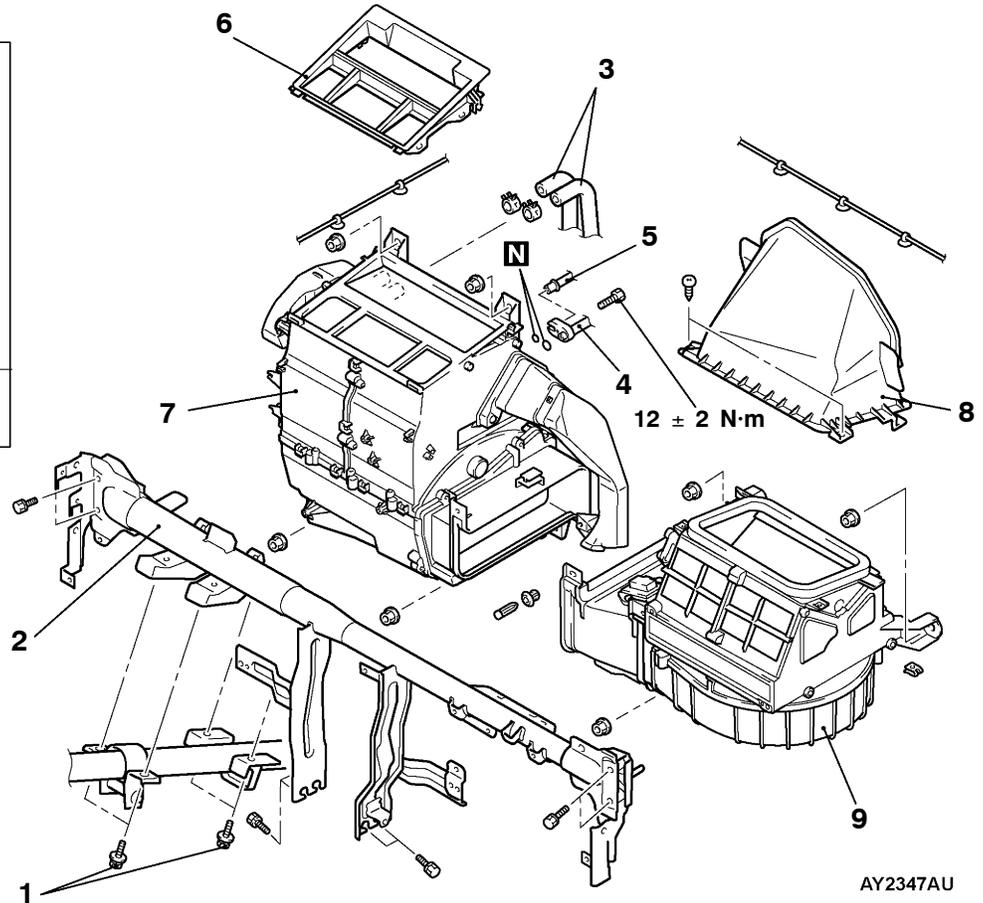
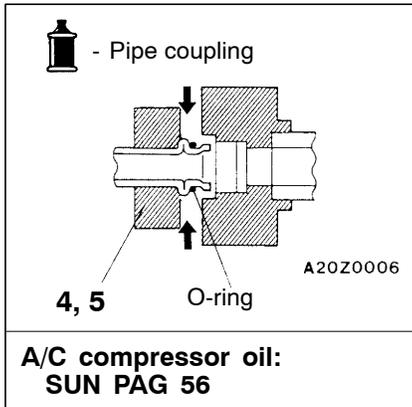
Insert a flat-tipped screwdriver into the clip through the inside of the control base and prise out the clip claw to disconnect the cables.

HEATER UNIT AND BLOWER ASSEMBLY

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operations

- Refrigerant Draining and Refilling (Refer to P.55-16, 19.)
- Coolant Draining and Refilling (Refer to GROUP 14 – On-vehicle Service.)
- Instrument Panel Removal and Installation (Refer to GROUP 52A – Instrument Panel.)
- Front Seat Removal and Installation (Refer to GROUP 52A – Front Seat.)
- Floor Console Removal and Installation (Refer to GROUP 52A – Floor Console.)
- Floor Carpet Removal and Installation



Heater unit and blower assembly removal steps

1. Steering shaft attachment bolt
2. Front deck crossmember
3. Heater hose connection
4. Suction pipe connection



5. Liquid pipe B connection
6. Center duct
7. Heater unit
8. Intake duct
9. Blower assembly

REMOVAL SERVICE POINTS

◀▶ SUCTION PIPE AND LIQUID PIPE B DISCONNECTION

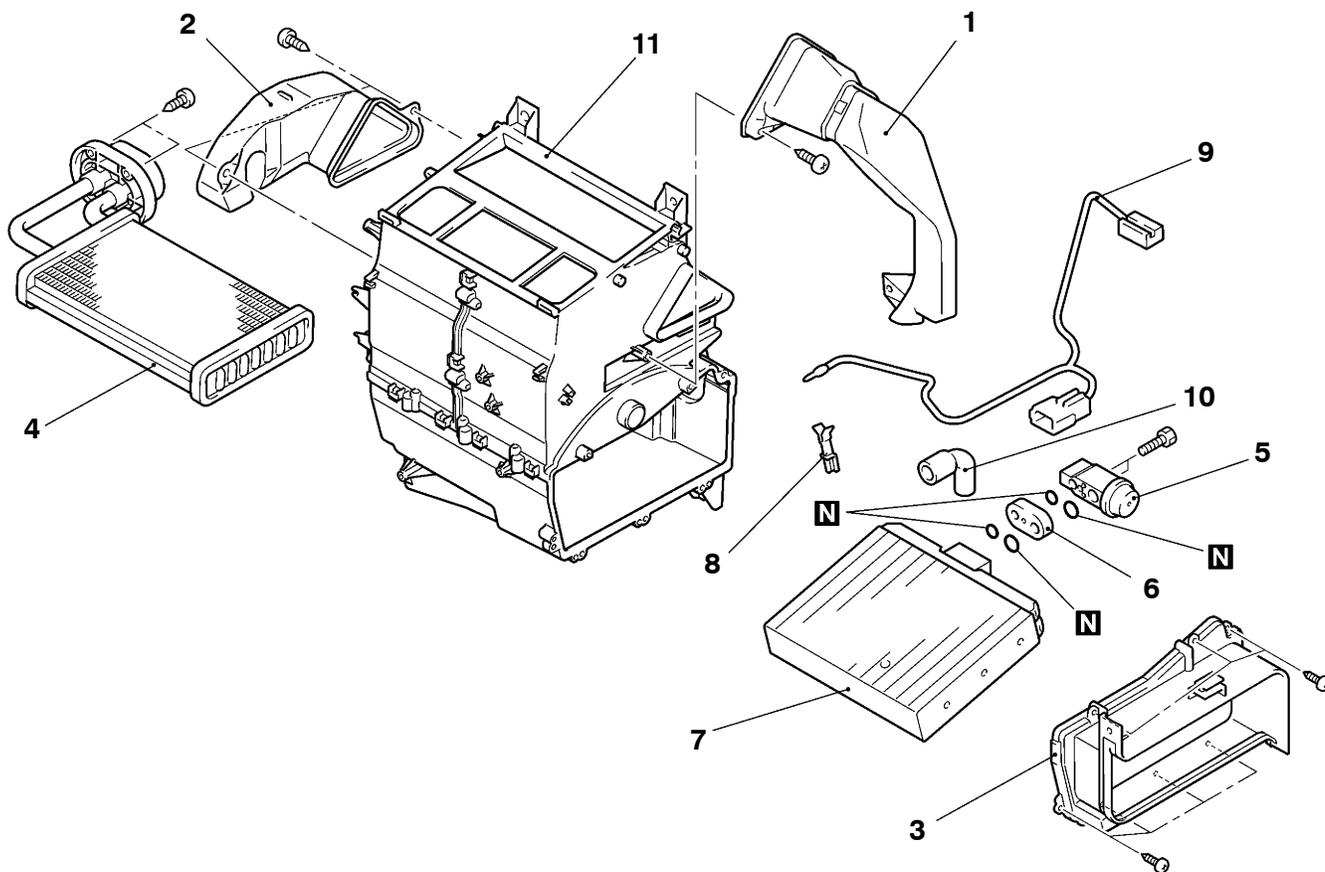
To prevent the entry of dust or other foreign bodies, plug the dismantled hose and the nipples of the expansion valves.

Caution

As the compressor oil and receiver are highly moisture absorbent, use a non-porous material to plug the hose and nipples.

DISASSEMBLY AND REASSEMBLY

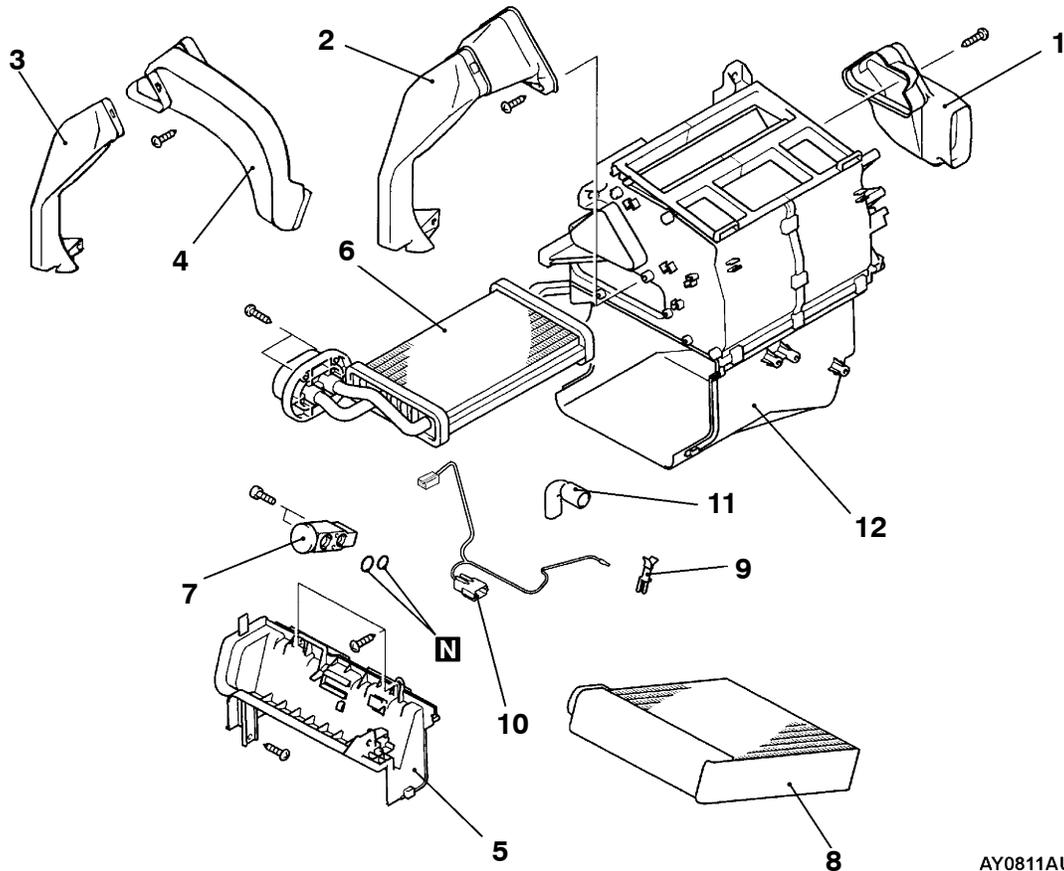
<L.H. DRIVE VEHICLES>

**Disassembly steps**

1. Right-hand foot duct
2. Left-hand foot duct
3. Evaporator cover
4. Heater core
5. Expansion valve
6. Expansion valve adapter

7. Evaporator
8. Air thermo sensor clip
9. Air thermo sensor
10. Drain plug
11. Heater case

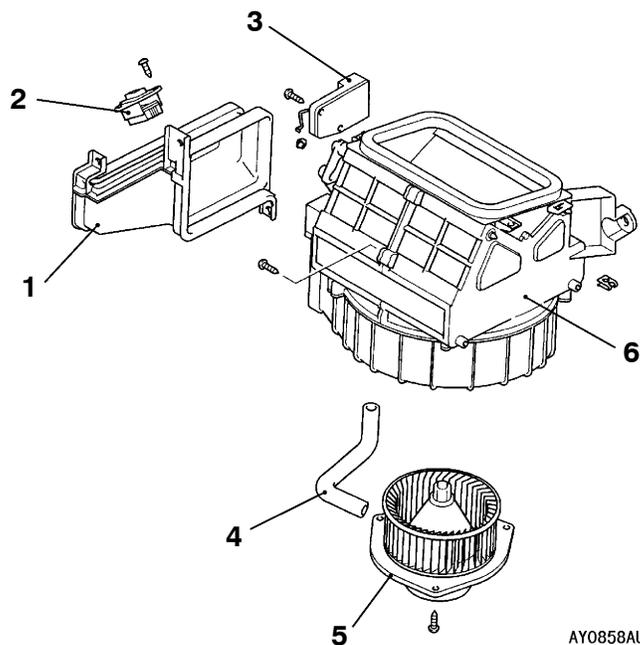
<R.H. DRIVE VEHICLES>



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Disassembly steps

- | | |
|--------------------------------|---------------------------|
| 1. Right-hand foot duct | 6. Heater core |
| 2. Left-hand foot duct | 7. Expansion valve |
| 3. Left-hand foot duct | 8. Evaporator |
| <Rear duct mounted vehicle> | 9. Air thermo sensor clip |
| 4. Rear heater duct A upper LH | 10. Air thermo sensor |
| <Rear duct mounted vehicle> | 11. Drain plug |
| 5. Evaporator cover | 12. Heater case |

DISASSEMBLY AND REASSEMBLY

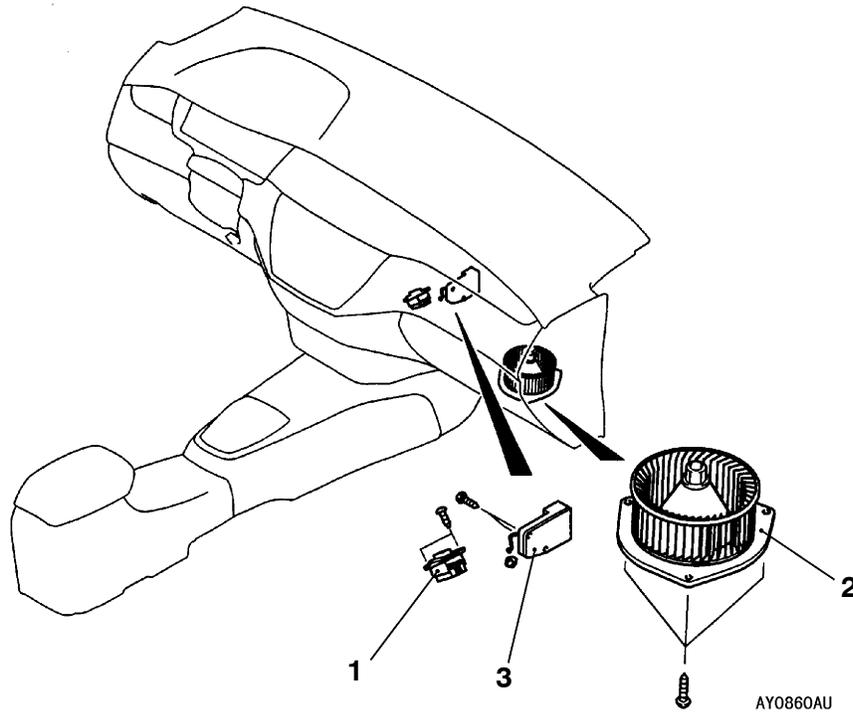
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Disassembly steps

1. Joint duct
2. Resister
3. Inside/outside air changeover damper motor
4. Hose
5. Blower motor
6. Blower case

RESISTER, BLOWER MOTOR AND INSIDE/OUTSIDE AIR CHANGE OVER DAMPER MOTOR

REMOVAL AND INSTALLATION



Resister removal steps

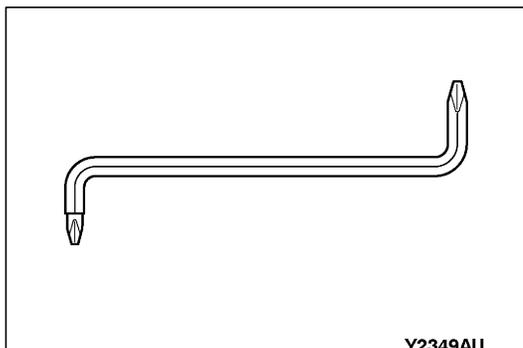
- Glove box (Refer to GROUP 52A – Instrument Panel.)
 - Engine-ECU (Refer to GROUP 14.)
1. Resister

Blower motor removal steps

2. Blower motor

Inside/outside air changeover damper motor removal steps

- Glove box (Refer to GROUP 52A – Instrument Panel.)
 - Engine-ECU (Refer to GROUP 14.)
3. Inside/outside air changeover damper motor

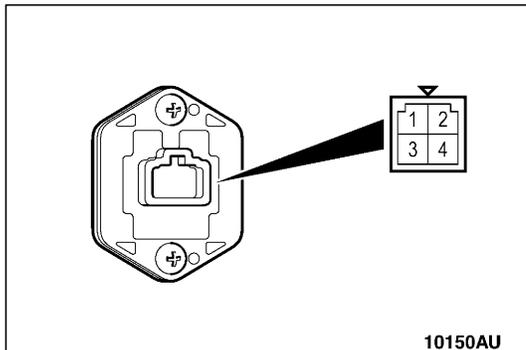


REMOVAL SERVICE POINTS

◀A▶ BLOWER MOTOR REMOVAL

NOTE

Use of commercially available offset screw driver is recommended.

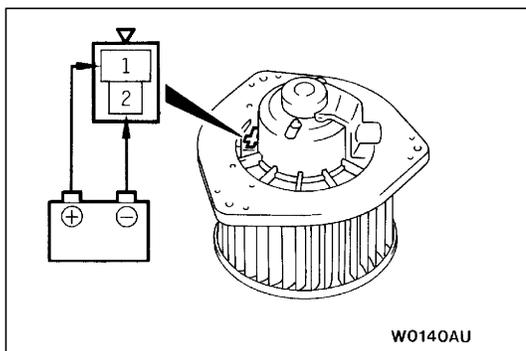


INSPECTION

Resister Check

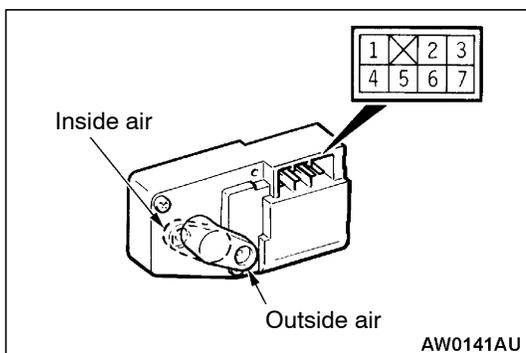
Standard values:

Test terminals	Standard value (Ω)
HI - LO (between terminals 2 and 4)	2.54
HI - ML (between terminals 2 and 1)	1.24
HI - MH (between terminals 2 and 3)	0.6



Blower Motor Check

Check that the motor is running when the battery voltage is applied between the terminals. Check that the motor is not producing any abnormal noise at that time.



Inside/Outside Air Changeover Damper Motor Check

<L.H. DRIVE VEHICLES>

Battery connection terminal lever operation			Operating the lever
4	6	7	
	⊖	⊕	Turn to cabin air side
⊖		⊕	Turn to outside air side

<R.H. DRIVE VEHICLES>

Battery connection terminal lever operation			Operating the lever
4	6	7	
	⊖	⊕	Turn to outside air side
⊖		⊕	Turn to cabin air side

Caution

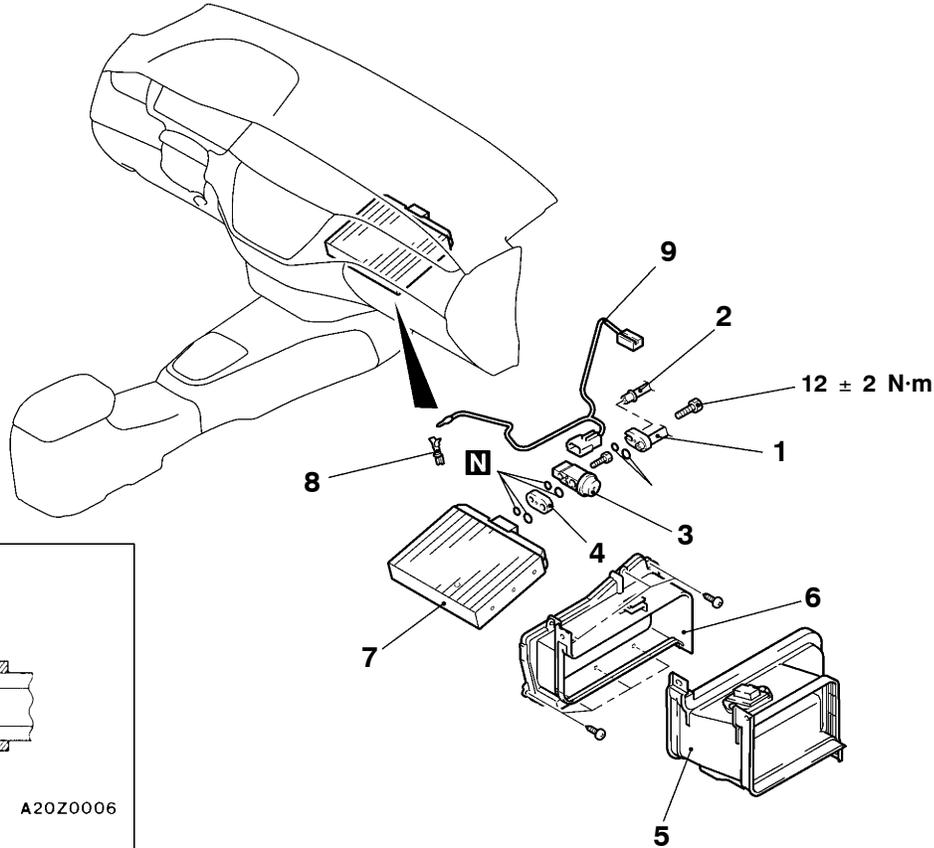
When the lever is in the OFF position, no power is supplied.

EVAPORATOR AND AIR THERMO SENSOR

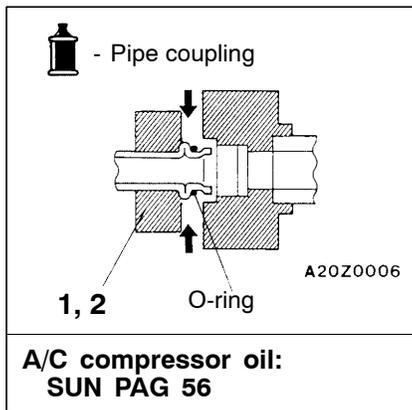
REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operations

- Refrigerant Draining and Refilling (Refer to P.55-16, 19.)



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Disassembly steps

- Glove box (Refer to GROUP 52A – Instrument Panel.)
 - Engine-ECU (Refer to GROUP 14.)
1. Suction pipe connection
 2. Liquid pipe B connection
 3. Expansion valve



4. Expansion valve adapter
5. Joint duct
6. Evaporator cover
7. Evaporator
8. Air thermo sensor clip
9. Air thermo sensor

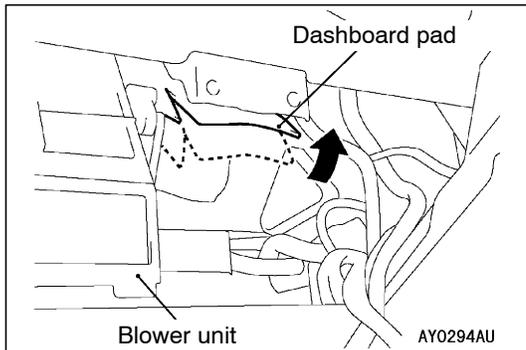
REMOVAL SERVICE POINTS

◀A▶ WHEN DISCONNECTING THE SUCTION PIPE, LIQUID PIPE B, AND THE EXPANSION VALVE

To prevent the entry of dust or other foreign bodies, plug the dismantled hose and the nipples of the expansion valves.

Caution

As the compressor oil and receiver are highly moisture absorbent, use a non-porous material to plug the hose and nipples.



**◀B▶ EVAPORATOR REMOVAL
<R.H. DRIVE VEHICLE>**

1. When removing the evaporator, cut and fold back the dashboard pad as in the diagram. (The thickness of the pad interferes with the removal of the evaporator.)
2. Remove the evaporator.

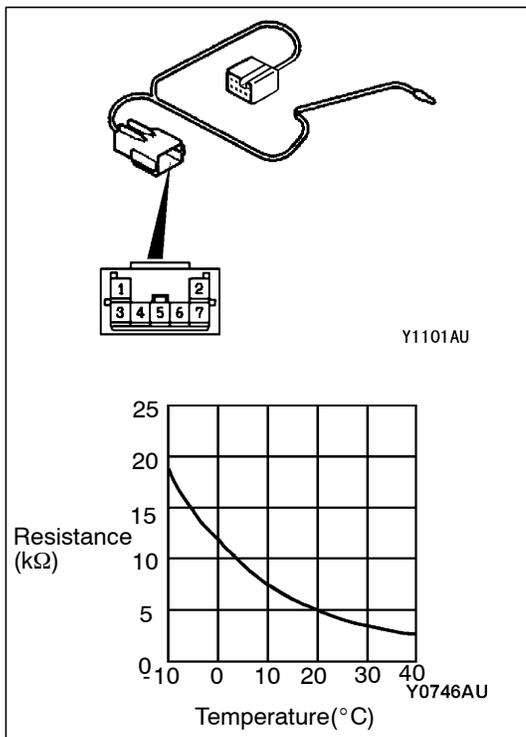
Caution:

Do not cut the upper side of the pad.

INSTALLATION SERVICE POINTS

▶A◀ EVAPORATOR INSTALLATION

After installing the evaporator, glue the cut dashboard panel pad with an adhesive agent.



INSPECTION

Air thermo sensor inspection

Measure the resistance between connector terminals 4 and 5 under at least two different temperatures. The resistance values should generally match those in the graph.

NOTE

The temperature at the check should not exceed the range in the graph.

COMPRESSOR

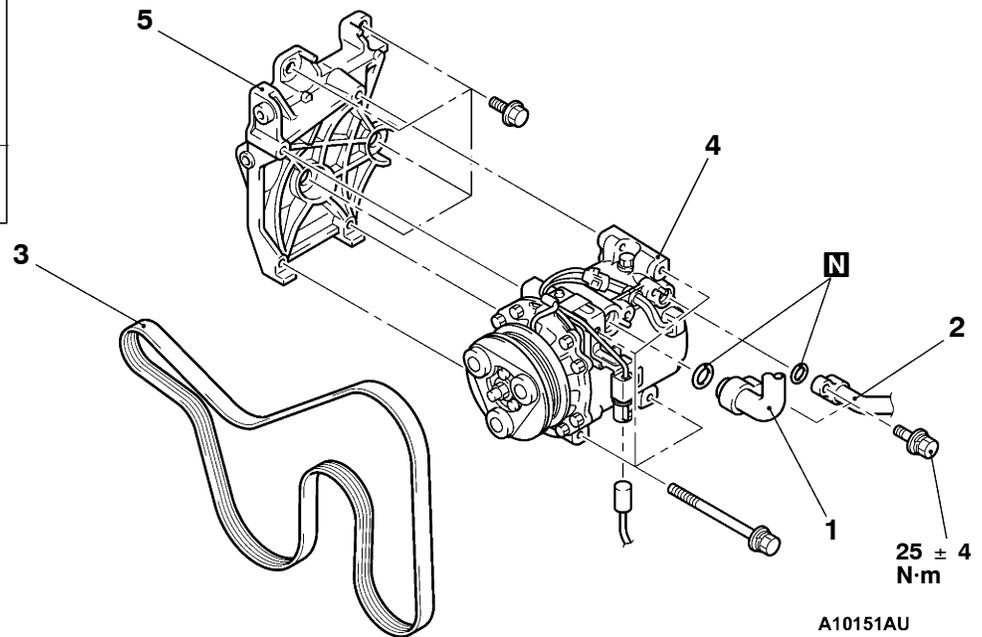
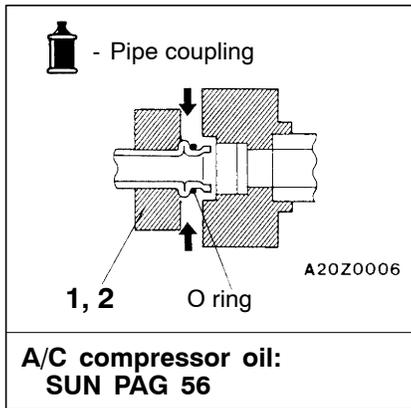
REMOVAL AND INSTALLATION

Before Removal

Refrigerant Draining (Refer to P.55-19.)

After Removal

- Refrigerant Replenishing (Refer to P.55-16.)
- Drive Belt Tension Check (Refer to GROUP 11A – Engine Adjustment.)



Removal steps



1. Flexible suction hose connection
2. Flexible discharge hose connection
3. Drive belt



4. Compressor
5. Compressor bracket

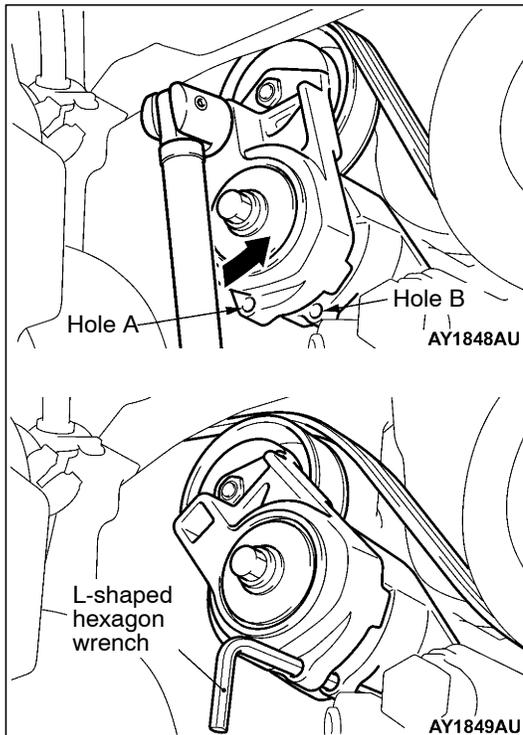
REMOVAL SERVICE POINTS

◀A▶ DISCONNECTION OF FLEXIBLE SUCTION HOSE AND FLEXIBLE DISCHARGE HOSE

To prevent the entry of dust or other foreign bodies, plug the dismantled hoses and compressor nipples.

Caution

As the compressor oil and receiver are highly moisture absorbent, use a non-porous material to plug the hose and nipples.



◀B▶ DRIVE BELT REMOVAL

Due to the adoption of the Serpentine drive system with the automatic tensioner, the following operation is required for removing the drive belt:

1. Insert the 12.7sq. spinner handle into the tool hole of the automatic tensioner and rotate it counterclockwise until the automatic tensioner reaches to the stopper.
2. Align hole A with hole B for fixing by inserting the L-shaped hexagon wrench, then remove the drive belt.

Caution

When the drive belt is reused, use a chalk to indicate an arrow of rotation direction on the back of the belt so that it can be re-assembled in the same direction as before.

◀C▶ COMPRESSOR REMOVAL

Take care not to spill any compressor oil when removing the compressor.

INSTALLATION SERVICE POINTS

▶A◀ COMPRESSOR INSTALLATION

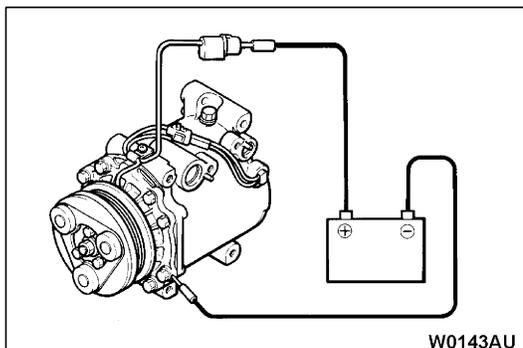
When installing a new compressor, first adjust the oil level as follows.

1. Measure the oil in the compressor you removed.
(X cm³)
2. Drain the amount of oil calculated by the following formula from the new compressor. Now install the compressor.

$$130 \text{ cm}^3 - X \text{ cm}^3 = Y \text{ cm}^3$$

NOTE

- (1) 130 cm³ indicates the amount of oil sealed in the new compressor at the factory.
- (2) Y cm³ indicates the amount of oil in the refrigerant line, compressor, and cooling unit.

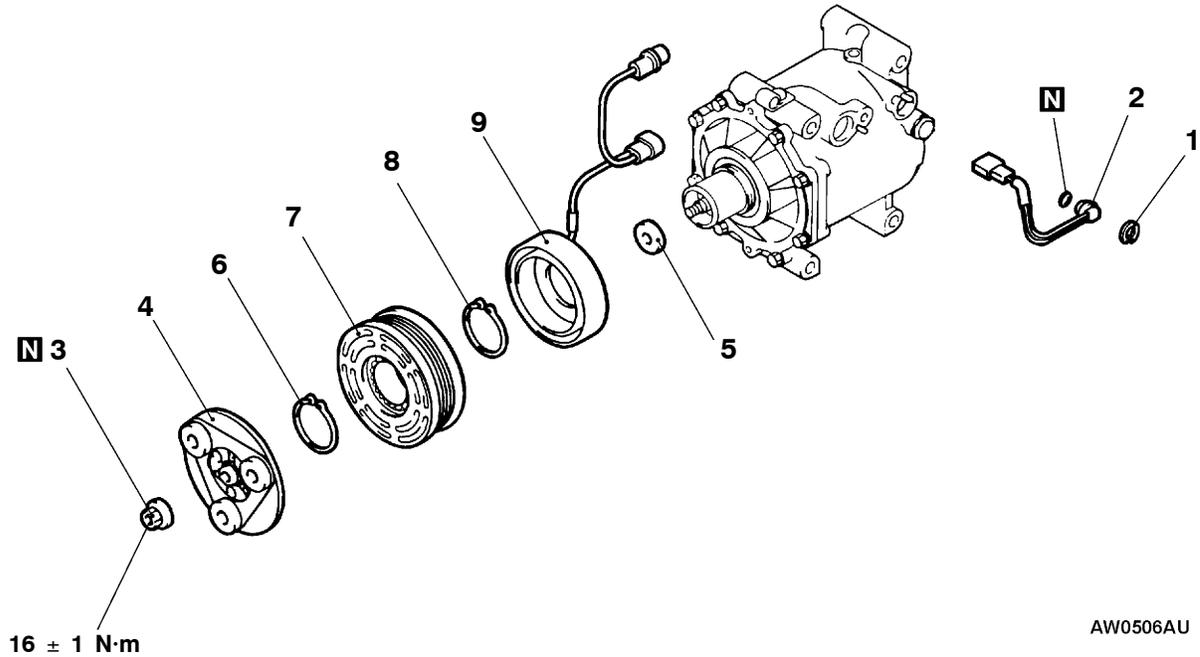


INSPECTION

Compressor Magnetic Clutch Operation Check

Connect the compressor connector terminal to the battery positive (+) terminal and ground the battery's negative (-) terminal to the compressor unit. At that time, the magnetic clutch should make a definite operating sound.

DISASSEMBLY AND REASSEMBLY



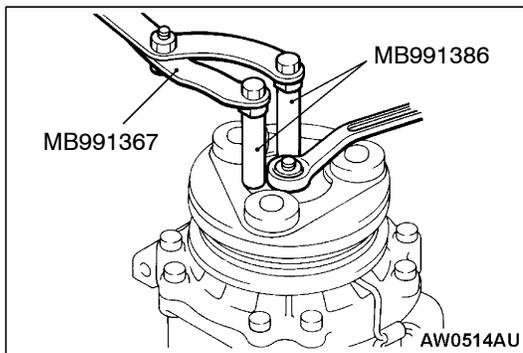
Cooling temperature switch dismantling steps

- 1. Snap ring
- 2. Cooling temperature switch

Magnetic clutch dismantling procedure

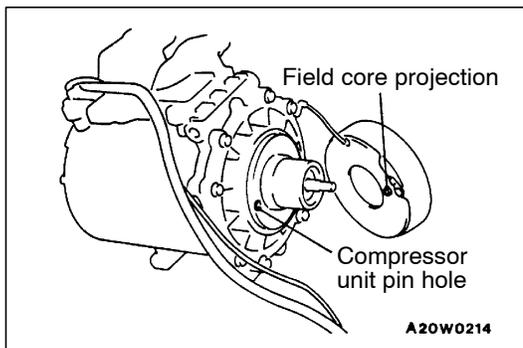
- ▶D◀ • Air gap adjustment

- ◀A▶ ▶C◀ 3. Self-locking nut
- 4. Armature
- ▶B◀ 5. Shim
- 6. Snap ring
- 7. Rotor
- ▶A◀ 8. Snap ring
- 9. Field core



ASSEMBLY SERVICE POINT

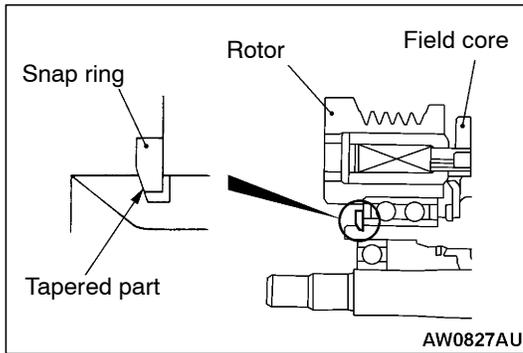
◀A▶ **DISMANTLING OF SELF-LOCKING NUT**



ASSEMBLY SERVICE POINTS

▶A◀ **FIELD CORE ATTACHMENT**

Line up the pin hole on the compressor unit with the field core projection and attach.

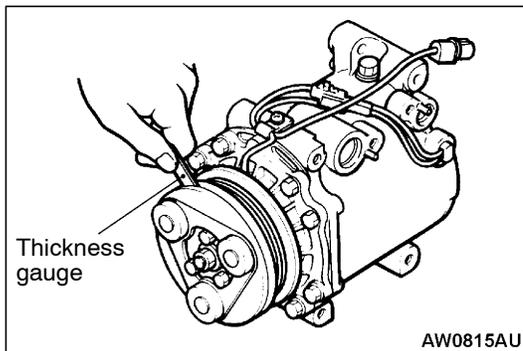


►B◄ SNAP RING INSTALLATION

Using snap ring pliers, fit the snap ring so that the snap ring's tapered part is on the outside.

►C◄ SELF-LOCKING NUT INSTALLATION

Using a special tool, as when removing the nut, secure the armature and tighten the self-locking nut.



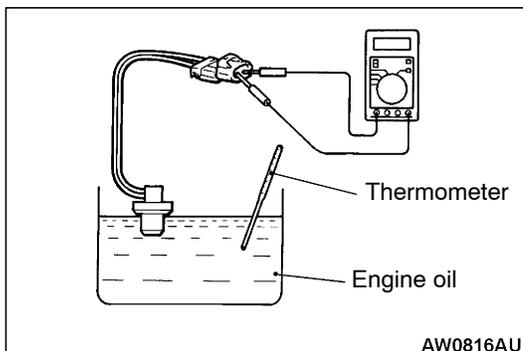
►D◄ AIR GAP ADJUSTMENT

Apply voltage from the battery to the magnetic clutch and check that the clutch air gap is inside the type. value. If outside the type. value, use a shim to adjust the gap.

Standard value: 0.3 – 0.5 mm

NOTE

The shims are available in 0.05 mm steps across the thickness range 0.35 - 0.70 mm, and in 0.1 mm steps of thickness.



INSPECTION

Cooling temperature switch

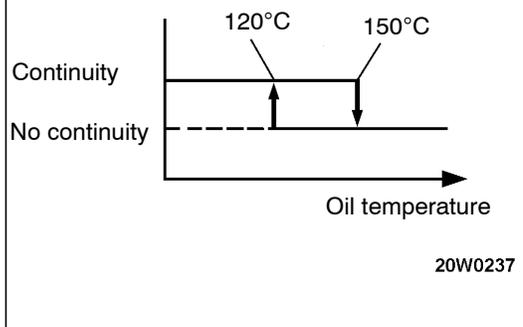
1. Dip the metal part of the cooling temperature switch into engine oil and increase the oil temperature using a gas burner or similar.

Caution

Do not heat more than necessary.

2. When the oil temperature reaches the type. value, check that voltage is supplied between the terminals.

Standard value:



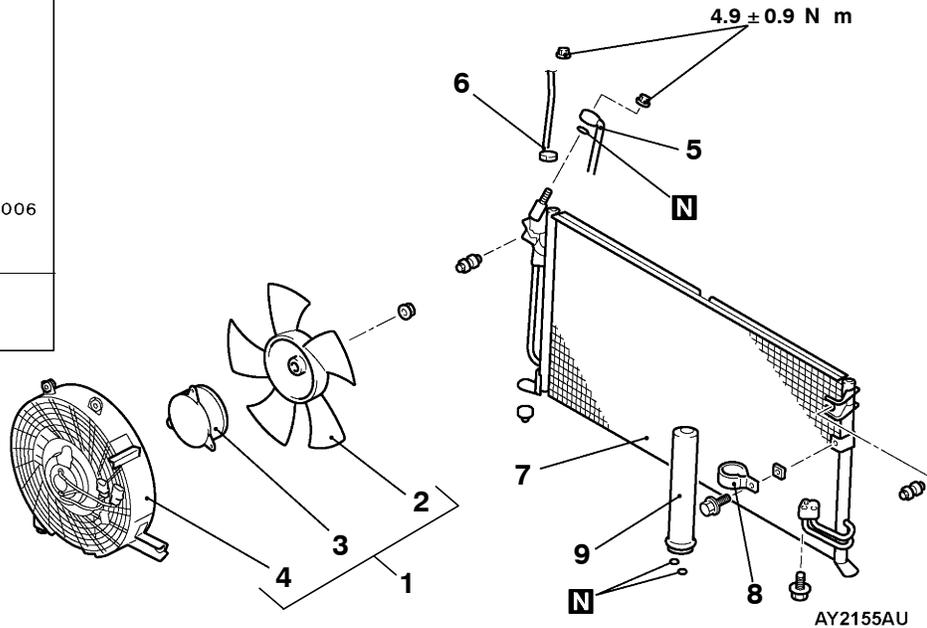
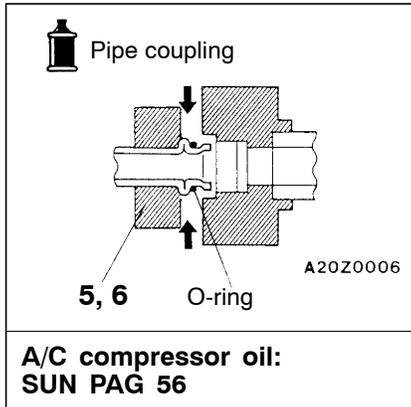
Item	Temperature
Continuity	Slightly below 150°C
No continuity	150°C or higher (until temperature falls to 120°C when OFF)

CONDENSER ASSEMBLY AND CONDENSER FAN ASSEMBLY

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation

- Refrigerant Draining and Refilling (Refer to P.55-16, 19.)
- Front Bumper Removal and Installation (Refer to GROUP 51.)



Fan motor assembly removal steps

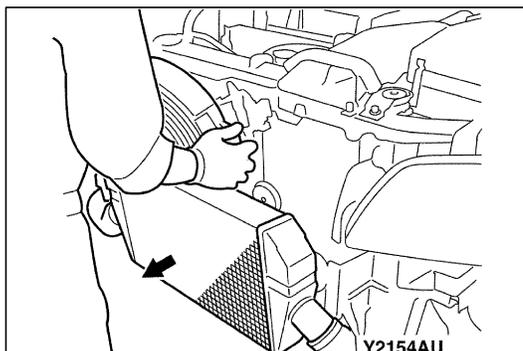
1. Fan motor and shroud assembly
2. Fan
3. Motor assembly
4. Fan shroud



Condenser assembly removal steps

- Air cleaner (Refer to GROUP 15.)

- Refrigerant draining and refilling (Refer to P55A-16,19.)
- 5. Flexible discharge hose connection
- 6. Liquid pipe A connection
- 7. Condenser assembly
- 8. Clamp
- 9. Receiver



REMOVAL SERVICE POINTS

◀A▶ FAN MOTOR AND SHROUD ASSEMBLY REMOVAL

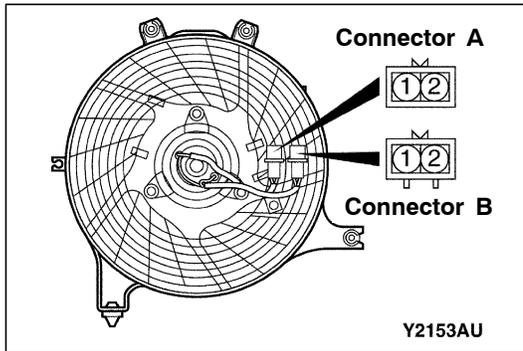
1. Remove the intercooler mounting bolts/nuts and pull the intercooler forward.
2. Move the fan motor/shroud assembly upward for removal.

◀B▶ FLEXIBLE DISCHARGE HOSE AND LIQUID PIPE A DISCONNECTION

To prevent the entry of dust or other foreign objects, plug the dismantled hose and condenser assembly nipples.

Caution

As the compressor oil and receiver are highly moisture absorbent, use a non-porous material to plug the hose and nipples.



INSPECTION

CONDENSER FAN CHECK

Battery connection terminal				Condenser fan
Connector A		Connector B		
1	2	1	2	
	⊖		⊕	LO rotation
	⊖	⊕		HI rotation

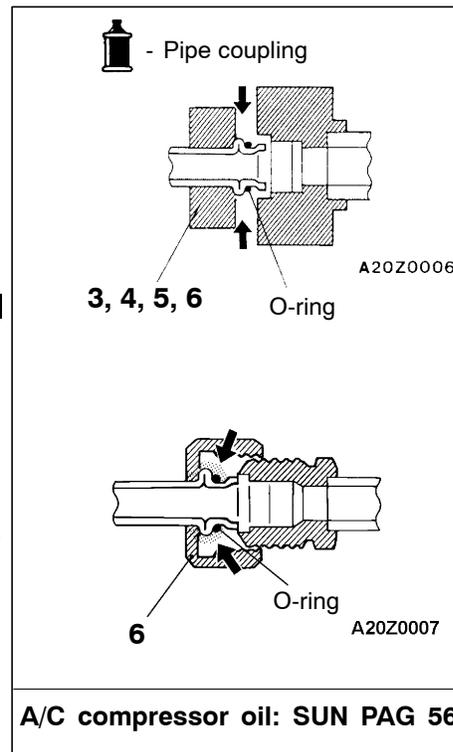
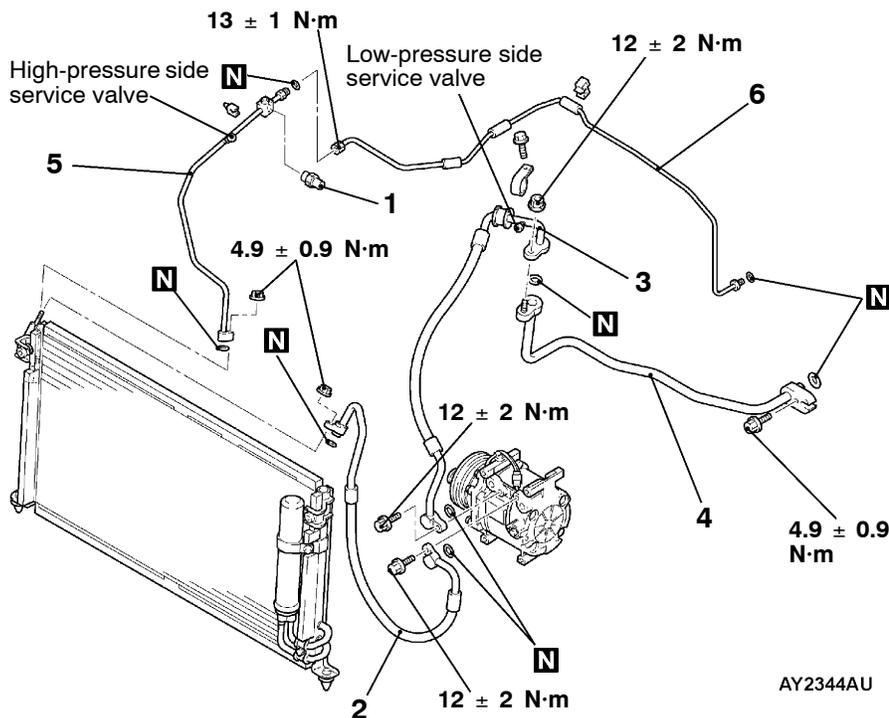
REFRIGERANT LINES

REMOVAL AND INSTALLATION

<L.H. DRIVE VEHICLES>

Pre-removal and Post-installation Operations

- Refrigerant Draining and Refilling (Refer to P.55-16, 19.)
- Radiator Grille Removal and Installation (Refer to GROUP 51.)
- Air Cleaner Removal and Installation (Refer to GROUP 15.)



Removal steps



1. Dual pressure switch
2. Flexible discharge hose
3. Flexible suction hose



4. Suction pipe
5. Liquid pipe A
6. Liquid pipe B

REMOVAL SERVICE POINTS

◀▶ REMOVAL OF HOSES AND PIPES

To prevent the entry of dust or other foreign bodies, plug the condenser, compressor, and expansion valve nipples.

Caution

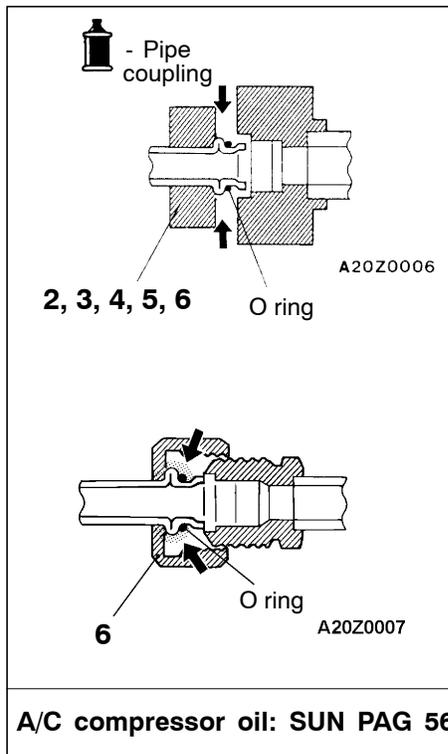
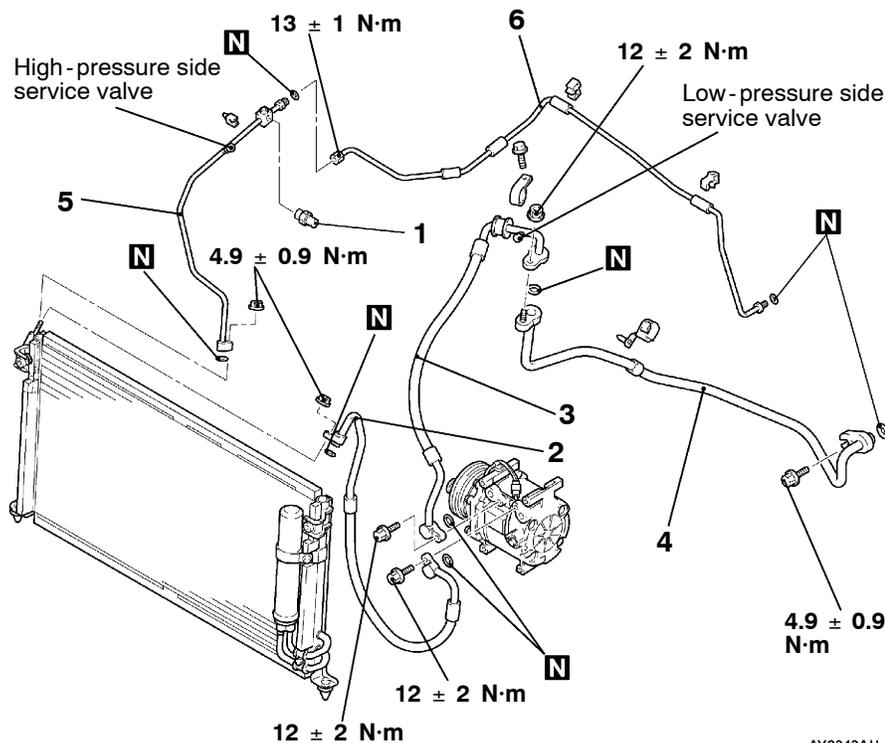
As the compressor oil and receiver are highly moisture absorbent, use a non-porous material to plug the hose and nipples.

REMOVAL AND INSTALLATION

<R.H. DRIVE VEHICLES>

Pre-removal and Post-installation Operations

- Refrigerant Draining and Refilling (Refer to P.55-16, 19.)
- Radiator Grille Removal and Installation (Refer to GROUP 51.)
- Air Cleaner Removal and Installation (Refer to GROUP 15.)



Removal steps

- 1. Dual pressure switch
- 2. Flexible discharge hose
- 3. Flexible suction hose

- 4. Suction pipe
- 5. Liquid pipe A
- 6. Liquid pipe B

REMOVAL SERVICE POINTS

◀A▶ REMOVAL OF HOSES AND PIPES

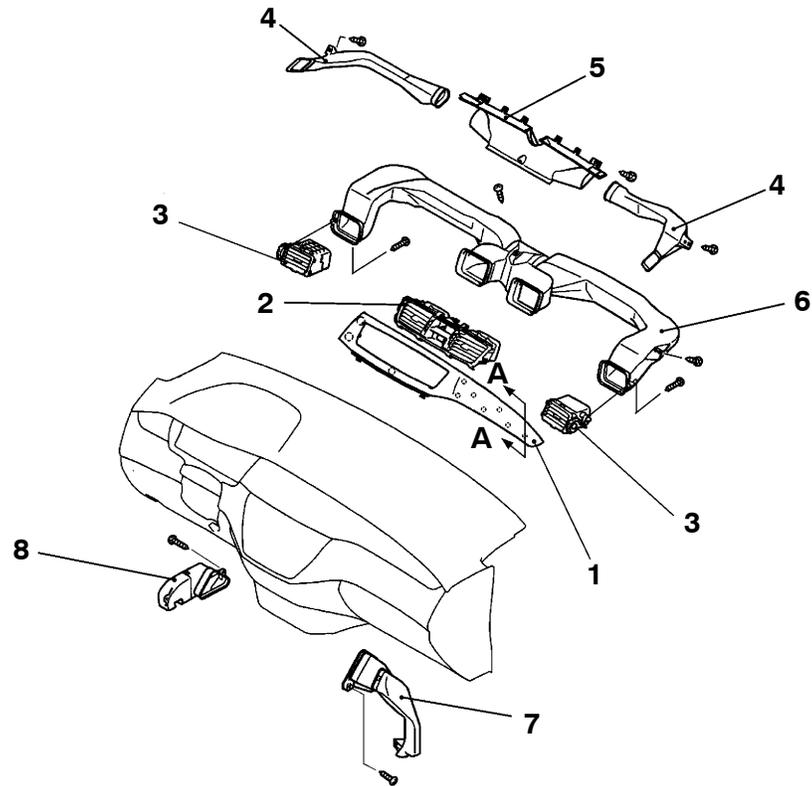
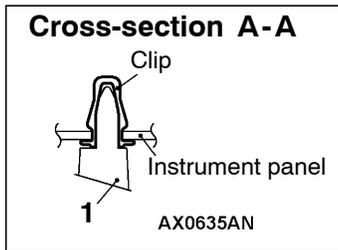
To prevent the entry of dust or other foreign bodies, plug the condenser, compressor, and expansion valve nipples.

Caution

As the compressor oil and receiver are highly moisture absorbent, use a non-porous material to plug the hose and nipples.

DUCTS

REMOVAL AND INSTALLATION



AY2340AU

Air outlet removal steps

1. Center air outlet panel
2. Center air outlet
3. Side air outlet

Defroster nozzle and distribution duct removal steps

- Instrument panel (Refer to GROUP 52A.)
- 4. Side defroster duct

5. Defroster nozzle

6. Distribution duct

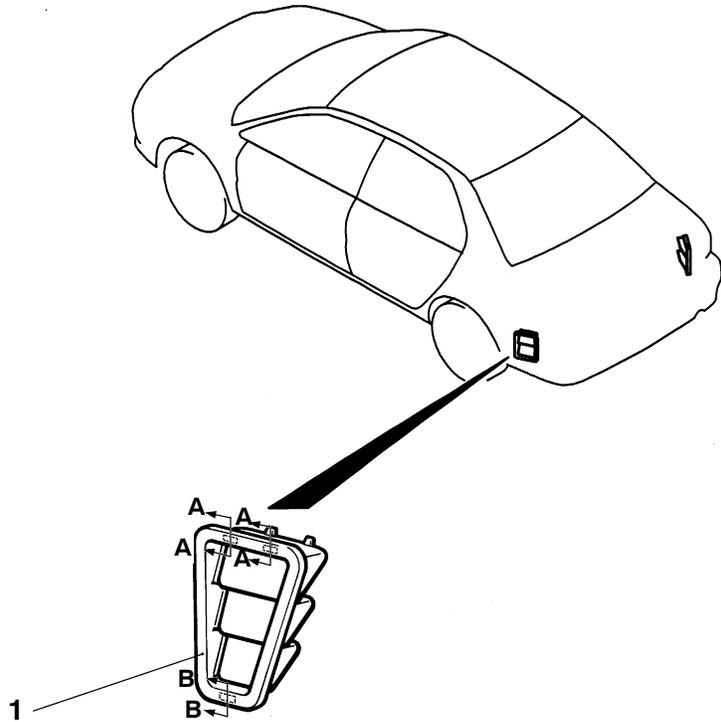
Foot duct removal step

- Console cover and glove box (Refer to GROUP 52A – Instrument Panel.)
- 7. Right-hand foot duct
- Under cover (Refer to GROUP 52A – Instrument Panel.)
- 8. Left-hand foot duct

VENTILATION

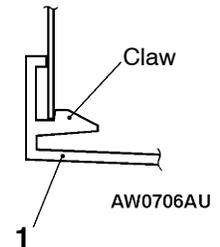
REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operations
 Rear Bumper Removal and Installation (Refer to GROUP 51.)

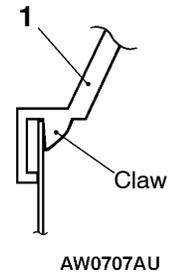


1. Rear ventilation duct

Cross-section A-A



Cross-section B-B



NOTES