

**GROUP 55**

# HEATING AND AIR CONDITIONING

**CONTENTS**

<b>GENERAL INFORMATION . . . . .</b>	<b>55-3</b>	. . . . .	55-26
<b>MANUAL A/C DIAGNOSIS . . . . .</b>	<b>55-4</b>	INSPECTION. . . . .	55-29
INTRODUCTION TO HEATER, AIR CONDITIONING AND VENTILATION DIAGNOSIS. . . . .	55-4	<b>HEATER UNIT, HEATER CORE, BLOWER ASSEMBLY, EVAPORATOR UNIT . .</b>	<b>55-30</b>
HEATER, AIR CONDITIONING AND VENTILATION DIAGNOSTIC TROUBLESHOOTING STRATEGY . . . . .	55-5	HEATER/COOLER UNIT, HEATER CORE AND EVAPORATOR UNIT . . . . .	55-30
SYMPTOM CHART. . . . .	55-5	<b>BLOWER ASSEMBLY AND RESISTOR</b>	
SYMPTOM PROCEDURES . . . . .	55-5	. . . . .	<b>55-32</b>
CHECK AT ECU TERMINAL . . . . .	55-17	BLOWER ASSEMBLY AND RESISTOR. . . . .	55-32
TROUBLESHOOTING HINT. . . . .	55-19	INSPECTION. . . . .	55-33
<b>SPECIAL TOOLS. . . . .</b>	<b>55-19</b>	<b>COMPRESSOR ASSEMBLY AND TENSION PULLEY . . . . .</b>	<b>55-33</b>
<b>ON-VEHICLE SERVICE. . . . .</b>	<b>55-20</b>	COMPRESSOR ASSEMBLY AND TENSION PULLEY . . . . .	55-33
SIGHT GLASS REFRIGERANT LEVEL TEST . . . . .	55-20	INSPECTION. . . . .	55-36
MAGNETIC CLUTCH TEST . . . . .	55-20	COMPRESSOR MAGNETIC CLUTCH OPERATION INSPECTION. . . . .	55-36
RECEIVER DRIER TEST . . . . .	55-20	REVOLUTION PICK-UP SENSOR CHECK . . . . .	55-37
PRESSURE SWITCH CHECK . . . . .	55-21	MAGNETIC CLUTCH . . . . .	55-37
COMPRESSOR DRIVE BELT ADJUSTMENT . . . . .	55-21	<b>CONDENSER AND CONDENSER FAN MOTOR . . . . .</b>	<b>55-40</b>
CHARGING . . . . .	55-21	CONDENSER AND CONDENSER FAN MOTOR . . . . .	55-40
PERFORMANCE TEST . . . . .	55-22	INSPECTION. . . . .	55-41
REFRIGERANT LEAK REPAIR PROCEDURE . . . . .	55-23	<b>REFRIGERANT LINE . . . . .</b>	<b>55-41</b>
COMPRESSOR NOISE CHECK . . . . .	55-24	REFRIGERANT LINE . . . . .	55-41
POWER RELAY CHECK . . . . .	55-24	<b>VENTILATORS . . . . .</b>	<b>55-43</b>
IDLE-UP OPERATION CHECK . . . . .	55-25	VENTILATORS . . . . .	55-43
<b>HEATER CONTROL ASSEMBLY AND A/C SWITCH . . . . .</b>	<b>55-26</b>		
HEATER CONTROL ASSEMBLY AND A/C SWITCH . . . . .			

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<b>SPECIFICATIONS</b> .....	<b>55-44</b>	GENERAL SPECIFICATIONS .....	55-45
FASTENER TIGHTENING SPECIFICATIONS		SERVICE SPECIFICATIONS .....	55-45
.....	55-44	LUBRICANTS .....	55-45

## GENERAL INFORMATION

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The heater system uses a two-way-flow full-air-mix system that features high performance and low operating noise. It includes an independent face air blowing function. In addition, an air purifier which carries out fine A/C control has been included.

Items		Specifications
Heater unit	Type	Two-way-flow full-air-mix system
Heater control assembly		Dial type
Compressor	Model	Scroll type <MSC90C>
Dual pressure switch kPa (psi)	High-pressure switch	ON → OFF: 2,942 (426.7), OFF → ON: 2,354 (341.4)
	Low-pressure switch	ON → OFF: 196 (28.4), OFF → ON: 221 (32.1)
Refrigerant and quantity g (oz)		R-134a (HFC-134a), Approximately 630 – 670 (22.2 – 23.6)

### SAFETY PRECAUTIONS

**⚠ WARNING**

***Wear safety goggles and gloves when servicing the refrigeration system to prevent severe damage to eyes and hands.***

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

Ozone filters out harmful radiation from the sun. To assist in protecting the ozone layer, Mitsubishi Motors Corporation recommends an R-134a refrigerant recycling device.

Refrigerant R-134a is transparent and colorless in both the liquid and vapor state. Since it has a boiling point of  $-29.8^{\circ}\text{C}$  ( $-21.64^{\circ}\text{F}$ ) at atmospheric pressure, it will be a vapor at all normal temperatures and pressures. The vapor is heavier than air, non-flammable, and non-explosive. The following precautions must be observed when handling R-134a.

**⚠ WARNING**

***Do not heat R-134a above  $40^{\circ}\text{C}$  ( $104.0^{\circ}\text{F}$ ) or it may catch fire and explode.***

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.

1. 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.
2. Next splash the eyes with plenty of cold water.
3. Call your doctor immediately even though irritation has ceased after treatment.

**⚠ CAUTION**

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

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  $40^{\circ}\text{C}$  ( $104.0^{\circ}\text{F}$ ) 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.

**⚠ WARNING**

***The leak detector for R-134a should be used to check for refrigerant gas leaks.***

**⚠ CAUTION**

**Do not allow liquid refrigerant to touch bright metal or it will be stained.**

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.

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

**OPERATION**

**Condenser fan and radiator fan control**

- For the operation of each fan, refer to GROUP 14, Diagnosis - Symptom Chart P.14-2.

**Compressor control**

**When operating the air conditioning switch**

- The air thermo sensor, which senses the temperature of the air flowing out of the evaporator, deactivates the compressor at 5 °C (41.0 °F) or below.
- The dual pressure switch turns OFF when the refrigerant pressure becomes excessively high or low, thus protecting the compressor circuit. (See Table below.)
- When the air thermo sensor is activated, the dual pressure switch is ON, and the ignition switch, blower switch, and air conditioning switch are ON, the A/C compressor relay is energized.

**When operating the air outlet changeover control knob**

- When the air outlet changeover control knob is moved to DEFROSTER or DEFROSTER/FOOT position, the defroster switch, which is connected in series to the air conditioning switch, is turned on. The other compressor control than the above is the same as that when operating the air conditioning switch.

**When compressor locks <vehicles with 3.0 L engine>**

- Since the compressor and alternator are driven by the same belt, the electric generating function of the alternator also stops when the belt is broken. In order to assure the electric generating function of the alternator, there is an A/C-ECU to prevent breaking of the belt due to slipping when the compressor locks. The A/C-ECU makes a comparative calculation of the compressor revolutions and the engine revolutions which are detected by the revolution pick-up sensor. When 70% or more slip ratio continues for 3 seconds or more, the A/C compressor relay goes from on to off; at the same time, the operation display in the air conditioner switch blinks to announce an abnormality.

**A/C Compressor Relay ON Conditions**

Ignition switch (IG2)	ON	<i>NOTE: . A/C compressor relay is de-energized when any one switch, sensor or control unit shown on the left turns off.</i>	
Blower switch	ON		
Air conditioning switch or defroster switch	ON		
Air thermo sensor	*	<i>NOTE: . The * marked device measures the temperature of the outlet air, and according to the control characteristics of the magnetic clutch for the compressor, the automatic compressor controller outputs the "HI" signal (12V). When air of 5°C (41.0°F) or less blows out of the evaporator, the compressor magnetic clutch will be turned off.</i>	
Dual pressure switch	Low-pressure side 221 kPa (32.1 psi) or higher		ON
	High-pressure side 2,942 kPa (426.7 psi) or below		ON
A/C compressor relay driving transistor (within automatic compressor controller and engine control module <M/T>, powertrain control module <A/T>)	ON		

**MANUAL A/C DIAGNOSIS**

**INTRODUCTION TO HEATER, AIR CONDITIONING AND VENTILATION DIAGNOSIS**

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With this system, after the outside air or inside air is taken in through the damper, it is fed to the evaporator by the blower fan and motor and cooled. The air cooled by the air mix damper is mixed appropriately with the warmed air to achieve a comfortable temperature. If the A/C does not operate or the cooled air is not discharged, the machine components or relay may be faulty.

TSB Revision

**HEATER, AIR CONDITIONING AND VENTILATION DIAGNOSTIC TROUBLESHOOTING STRATEGY**

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Use these steps to plan your diagnostic strategy. If you follow them carefully, you will be sure that you have exhausted most of the possible ways to find a heater, air conditioning and ventilation fault.

1. Gather information from the customer.

2. Verify that the condition described by the customer exists.

3. Find the malfunction by following the Symptom Chart.

4. Verify malfunction is eliminated.

**SYMPTOM CHART**

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SYMPTOMS	INSPECTION PROCEDURE	REFERENCE PAGE
When the ignition switch is "ON," the A/C does not operate.	1.	P.55-5
When the air outlet changeover control knob is moved to DEFROSTER or DEFROSTER/FOOT position, the A/C or the inside/outside air changeover damper motor does not operate.	2.	P.55-9
When the A/C is operating, temperature inside the passenger compartment does not decrease (cool air is not emitted).	3.	P.55-9
Blower fan and motor does not turn.	4.	P.55-11
Blower fan and motor does not stop turning.	5.	P.55-13
When the A/C is operating condenser fan or radiator fan does not turn.*	6.	P.55-15
The A/C indicator flashes <Vehicles with 3.0l engine>	7.	P.55-15

*NOTE: For symptoms marked with an asterisk the condenser fan might not operate when there is an air conditioning low load from the air conditioning condenser control, so remove the battery terminal (-) and then check the symptoms after 5 minutes since initial start control after reconnection.*

**SYMPTOM PROCEDURES**

**INSPECTION PROCEDURE 1: WHEN THE IGNITION SWITCH IS "ON," THE A/C DOES NOT OPERATE.**

**DIAGNOSIS**

**STEP 1. Check for refrigerant leaks.**

**Q: Is the refrigerant leaking?**

**YES :** Repair the leak. Then go to Step 11.

**NO :** Go to Step 2.

**STEP 2. Check for excessive refrigerant.**

**Q: Is the refrigerant in good condition?**

**YES :** Go to Step 3.

**NO :** Use the refrigerant recovery station to remove all of the refrigerant, and then calculate the amount of the refrigerant and charge it. Then go to Step 11.

TSB Revision

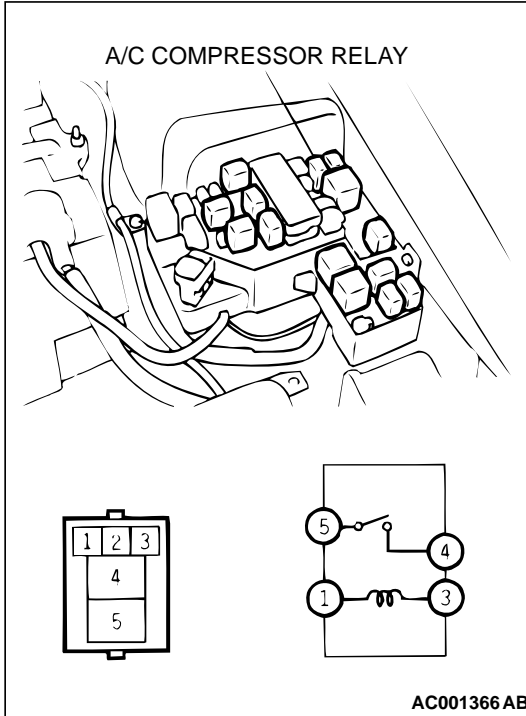
**STEP 3. Check the A/C compressor relay continuity.**

BATTERY VOLTAGE	TERMINAL NO. TO BE CONNECTED TO BATTERY	TERMINAL NO. TO BE CONDUCTED
SUPPLIED	1-3	4-5
NOT SUPPLIED	-	1-3

**Q: Is the A/C compressor relay in good condition?**

**YES :** Go to Step 4.

**NO :** Replace. Then go to Step 11.



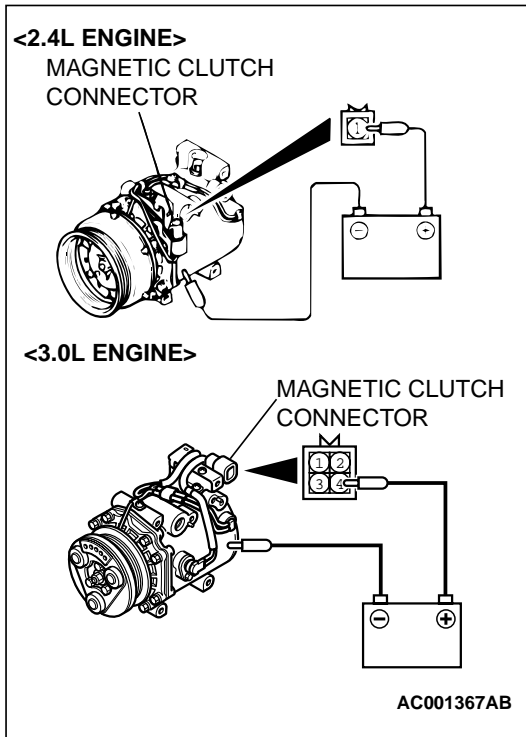
**STEP 4. Check the magnetic clutch operation.**

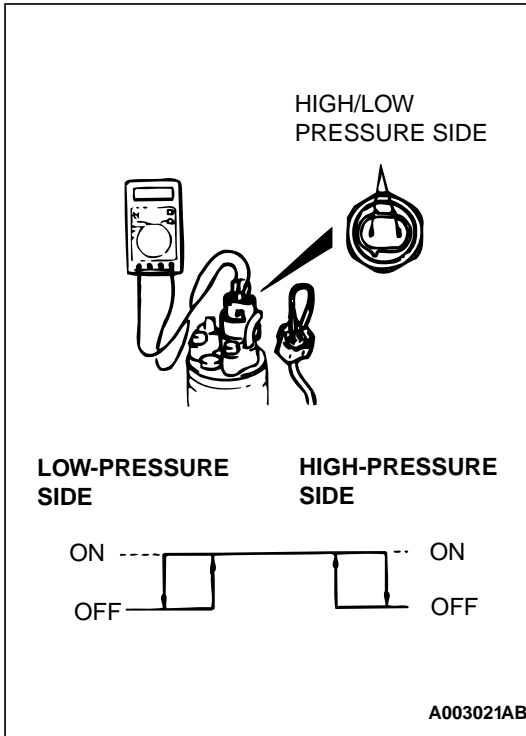
Connect the battery (+) terminal to the compressor magnetic clutch connector terminal 1; <2.4L engine>/terminal 4; <3.0L engine>, and ground the battery (-) terminal to the body of the compressor.

**Q: Can the sound of the magnetic clutch (click) be heard?**

**YES :** Go to Step 5.

**NO :** Replace. Then go to Step 11.





**STEP 5. Check the dual pressure switch operation.**

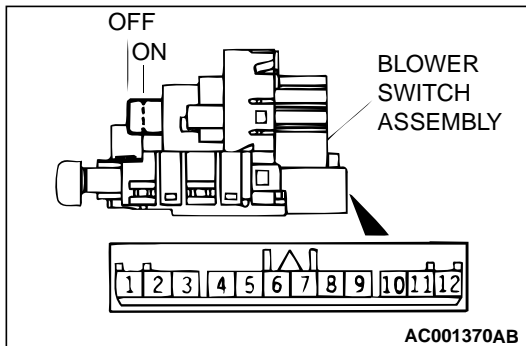
- (1) Remove the dual pressure switch connector and connect the high/low pressure side terminals located on the harness side as shown in the illustration.
- (2) Install a gauge manifold to the high-pressure side service valve of the refrigerant line. (Refer to P.55-22.)
- (3) When the high/low pressure sides of the dual pressure switch are at operation pressure (ON) and the resistance is less than two ohm between the respective terminals, then the condition is normal. If open loop, replace the switch.

ITEMS	SWITCH POSITION	
	OFF → ON	ON → OFF
Low-pressure side kPa (psi)	221 (32.1)	196 (28.4)
High-pressure side kPa (psi)	2,354 (341.4)	2,942 (426.7)

**Q: Is the dual pressure switch operating properly?**

**YES :** Go to Step 6.

**NO :** Replace the switch. Then go to Step 11.



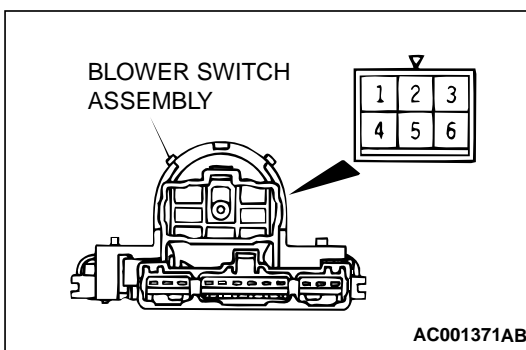
**STEP 6. Check the A/C switch continuity.**

SWITCH POSITION	TESTER CONNECTION (CONNECTOR B)	SPECIFIED CONDITION
Off	-	No continuity
On	5-6-7	Continuity

**Q: Is the A/C switch continuity in good condition?**

**YES :** Go to Step 7.

**NO :** Replace. Then go to Step 11.



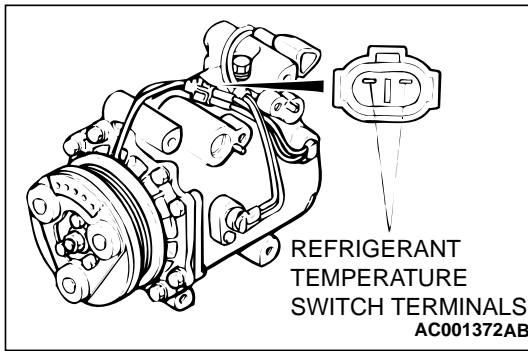
**STEP 7. Check the blower switch continuity.**

SWITCH POSITION	TESTER CONNECTION (CONNECTOR A)	SPECIFIED CONDITION
0 (OFF)	-	No continuity
1 (LO)	3-5	Continuity
2 (ML)	1-3	Continuity
3 (MH)	3-6	Continuity
4 (HI)	3-4	Continuity

**Q: Is the blower switch continuity in good condition?**

**YES :** Go to Step 8.

**NO :** Replace. Then go to Step 11.




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**STEP 8. Check the refrigerant-temperature switch operation.**

When the A/C is off, check that there is less than 2  $\Omega$  between the refrigerant-temperature switch terminals.

**Q: Is the refrigerant-temperature switch in good condition?**

**YES** : Go to Step 9.

**NO** : If the switch has an open circuit, replace the switch.  
Then go to Step 11.

---

**STEP 9. Measure the automatic compressor controller terminal voltage.**

Refer to [P.55-17](#).

**Q: Is the automatic compressor controller terminal voltage good?**

**YES** : Go to Step 10.

**NO** : Replace. Then go to Step 11.

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**STEP 10. Measure the engine control module <M/T>/the powertrain control module <A/T> terminal voltage.**

Refer to GROUP 13A, Diagnosis – Check at The Engine Control Module (ECM) <M/T> or Powertrain Control Module (PCM) <A/T> <2.4L engine>[P.13A-417](#)

Refer to GROUP 13B, Diagnosis – Check at The Powertrain Control Module (PCM) <A/T> <3.0L engine>[P.13B-499](#)

**Q: Is the terminal voltage in good condition?**

**YES** : Go to Step 11.

**NO** : Replace. Then go to Step 11.

---

**STEP 11. Check symptoms.**
**Q: Is the A/C operating properly?**

**YES** : This diagnosis is complete. (If no malfunctions are not found in all steps, an intermittent malfunction is suspected. Refer to Introduction, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction[P.00-8](#).)

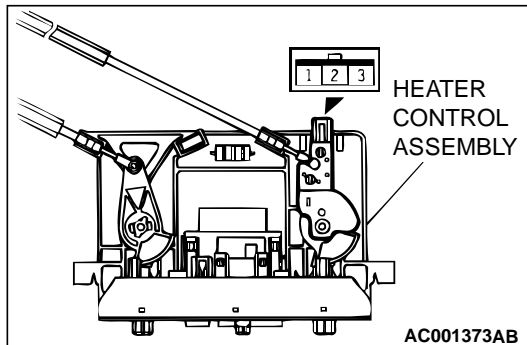
**NO** : Go to Step 1.



**INSPECTION PROCEDURE 2: WHEN THE AIR OUTLET CHANGEOVER CONTROL KNOB IS MOVED TO DEFROSTER OR DEFROSTER/FOOT POSITION, THE A/C OR THE INSIDE/OUTSIDE AIR CHANGEOVER DAMPER MOTOR DOES NOT OPERATE.**

**DIAGNOSIS**

**STEP 1. Check the defroster switch continuity.**



AIR OUTLET CHANGEOVER CONTROL KNOB POSITION	TESTER CONNECTION	SPECIFIED CONDITION
DEFROSTER, DEFROSTER/FOOT	2-3	Continuity
OTHER POSITION	1-3	Continuity

**Q: Is the defroster switch in good condition?**

**YES :** Go to Step 2.

**NO :** Replace. Then go to Step 2.

**STEP 2. Check each A/C part.**

Refer to Inspection Procedure 1.

**Q: Is the A/C operating properly?**

**YES :** This diagnosis is complete. (If no malfunctions are not found in all steps, an intermittent malfunction is suspected. Refer to Introduction, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction [P.00-8.](#))

**NO :** Go to Step 1.

**INSPECTION PROCEDURE 3: WHEN THE A/C IS OPERATING, TEMPERATURE INSIDE THE PASSENGER COMPARTMENT DOES NOT DECREASE (COOL AIR NOT EMITTED).**

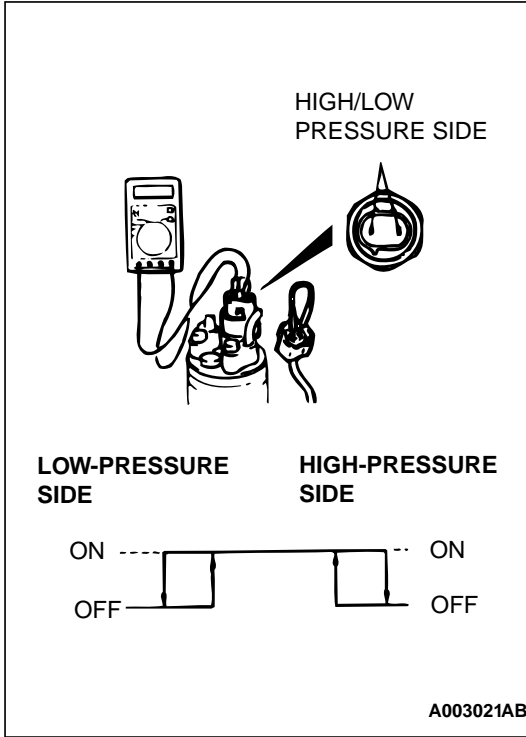
**DIAGNOSIS**

**STEP 1. Check for refrigerant leaks.**

**Q: Is the refrigerant leaking?**

**YES :** Repair. Then go to Step 6.

**NO :** Go to Step 2.



**STEP 2. Check the dual pressure switch operation.**

- (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 P.55-22.)
- (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.

ITEMS	SWITCH POSITION	
	OFF → ON	ON → OFF
Low-pressure side kPa (psi)	221 (32.1)	196 (28.4)
High-pressure side kPa (psi)	2,354 (341.4)	2,942 (426.7)

**Q: When the high/low pressure sides of the dual pressure switch are at operation pressure (ON), is there continuity between the respective terminals?**

**YES :** Go to Step 3.

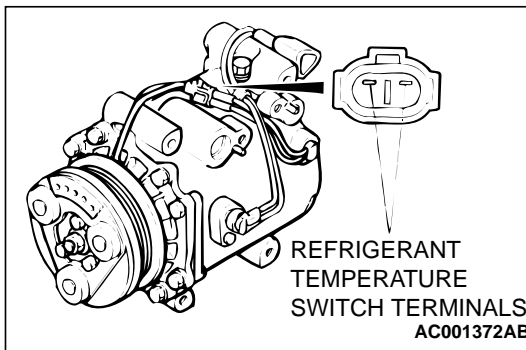
**NO :** Replace the switch. Then go to Step 6.

**STEP 3. Check the refrigerant-temperature switch operation.**

**Q: When the A/C is off, check that there is continuity between the refrigerant-temperature switch terminals. Is the circuit open loop?**

**YES :** Replace the switch. Then go to Step 6.

**NO :** If less than two ohm, go to Step 4.



**STEP 4. Measure the automatic compressor controller terminal voltage.**

Refer to P.55-17.

**Q: Is the automatic compressor controller terminal voltage in good condition?**

**YES :** Go to Step 5.

**NO :** Replace. Then go to Step 6.

**STEP 5. Measure the engine control module <M/T>/the powertrain control module <A/T> terminal voltage.**

- (1) Refer to GROUP 13A, Diagnosis – Check at The Engine Control Module (ECM) <M/T> or Powertrain Control Module (PCM) <A/T> <2.4L engine> [P.13A-417](#)
- (2) Refer to GROUP 13B, Diagnosis – Check at The Powertrain Control Module (PCM) <A/T> <3.0L engine> [P.13A-417](#)

**Q: Is the voltage in good condition?**

**YES :** Go to Step 6.

**NO :** Replace. Then go to Step 6.

**STEP 6. Check symptoms.**

**Q: Is the cool air discharged?**

**YES :** This diagnosis is complete. (If no malfunctions are not found in all steps, an intermittent malfunction is suspected. Refer to Introduction, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction [P.00-8.](#))

**NO :** Go to Step 1.

**INSPECTION PROCEDURE 4: BLOWER FAN AND MOTOR DOES NOT TURN.**

**DIAGNOSIS**

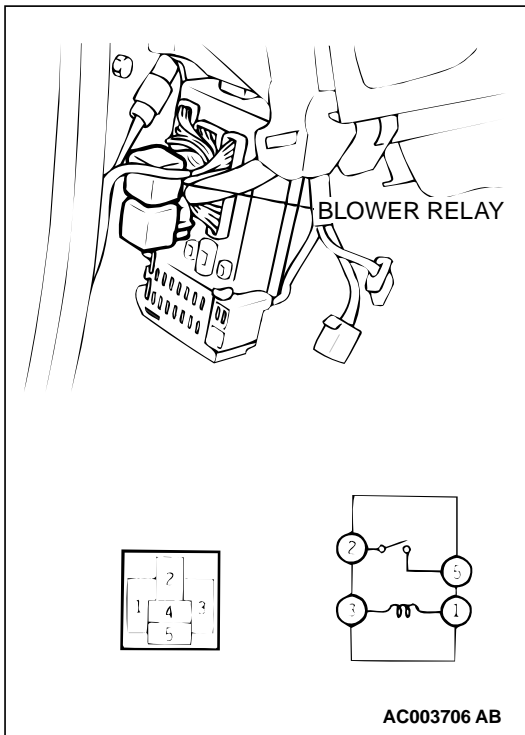
**STEP 1. Check the blower relay continuity.**

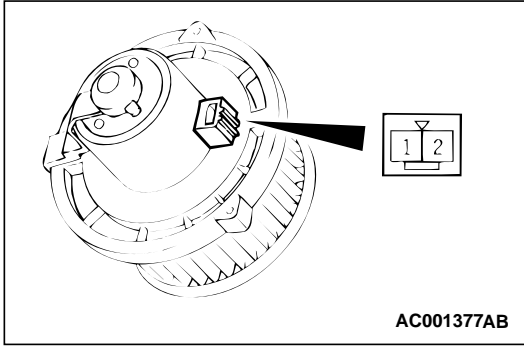
BATTERY VOLTAGE	TERMINAL NO. TO BE CONNECTED TO BATTERY	TERMINAL NO. TO BE CONDUCTED
SUPPLIED	1-3	2-5
NOT SUPPLIED	-	1-3

**Q: Is the blower relay continuity in good condition?**

**YES :** Go to Step 2.

**NO :** Replace. Then go to Step 5.





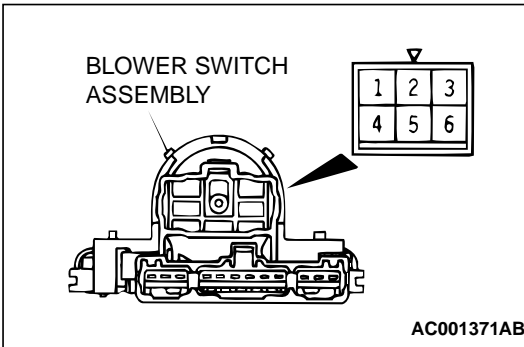
**STEP 2. Check the blower fan and motor operation.**

When battery voltage is applied between the terminals, check that the motor operates.

**Q: Is there any abnormal noise?**

**YES :** Go to Step 3.

**NO :** Replace. Then go to Step 5.



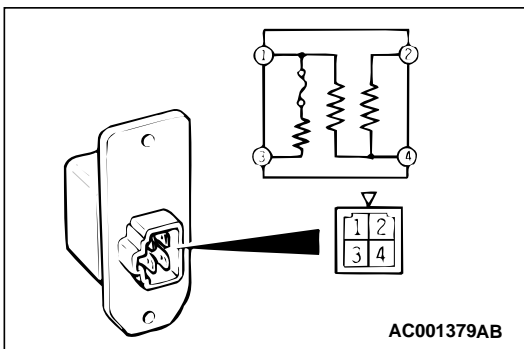
**STEP 3. Check the blower switch continuity.**

SWITCH POSITION	TESTER CONNECTION (CONNECTOR A)	SPECIFIED CONDITION
0 (OFF)	-	No continuity
1 (LO)	3-5	Continuity
2 (ML)	1-3	Continuity
3 (MH)	3-6	Continuity
4 (HI)	3-4	Continuity

**Q: Is the blower switch continuity in good condition?**

**YES :** Go to Step 4.

**NO :** Replace. Then go to Step 5.



**STEP 4. Check the resistor resistance value.**

Use an ohmmeter to measure the resistance between the terminals as indicated below. Check that the measured value is at the standard value.

**Standard value:**

MEASUREMENT TERMINAL	STANDARD VALUE Ω
Between terminals 3 and 2 (LO)	2.3
Between terminals 3 and 4 (ML)	1.1
Between terminals 3 and 1 (MH)	0.4

**Q: Is the measured value at the standard value?**

**YES :** Go to Step 5.

**NO :** Replace. Then go to Step 5.

---

**STEP 5. Check symptoms.**

**Q: Is the blower fan and motor turned?**

**YES :** This diagnosis is complete. (If no malfunctions are not found in all steps, an intermittent malfunction is suspected. Refer to Introduction, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction [P.00-8.](#))

**NO :** Go to Step 1.

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**INSPECTION PROCEDURE 5: BLOWER FAN AND MOTOR DOES NOT STOP TURNING.**

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**DIAGNOSIS**

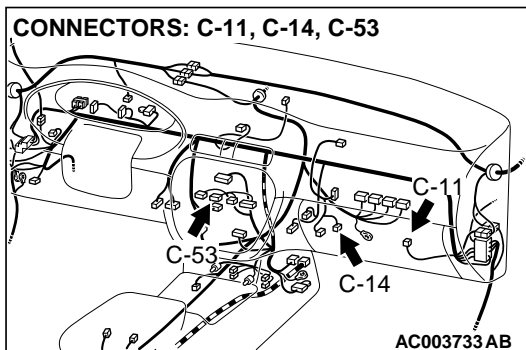
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**STEP 1. Check the harness wire between the blower fan and motor connector C-11, the resistor connector C-14, and the blower switch connector C-53.**

**Q: Is the harness wire between the blower fan and motor connector C-11, the resistor connector C-14, and the blower switch connector C-53 in good condition?**

**YES :** Go to Step 2.

**NO :** Repair it. Then go to Step 4.



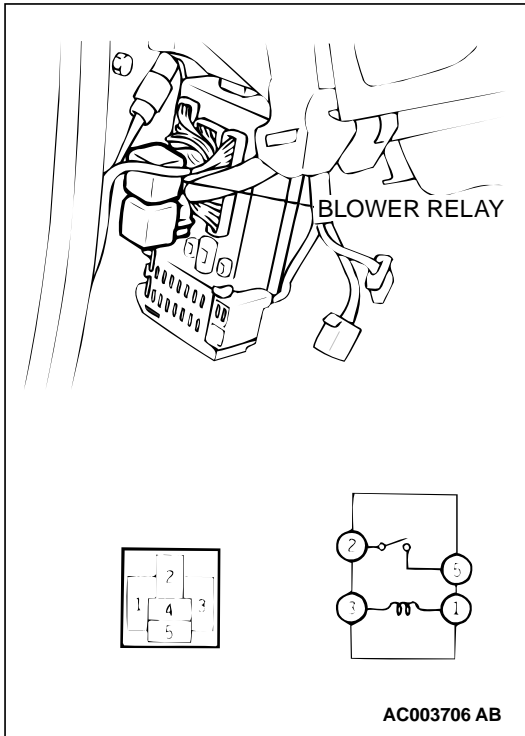
**STEP 2. Check the blower relay continuity.**

BATTERY VOLTAGE	TERMINAL NO. TO BE CONNECTED TO BATTERY	TERMINAL NO. TO BE CONDUCTED
SUPPLIED	1-3	2-5
NOT SUPPLIED	-	1-3

**Q: Is the blower relay continuity in good condition?**

**YES :** Go to Step 3.

**NO :** Replace. Then go to Step 4.



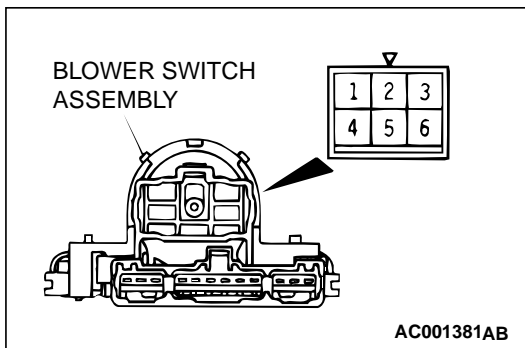
**STEP 3. Check the blower switch continuity.**

SWITCH POSITION	TESTER CONNECTION (CONNECTOR A)	SPECIFIED CONDITION
0 (OFF)	-	No continuity
1 (LO)	3-5	Continuity
2 (ML)	1-3	Continuity
3 (MH)	3-6	Continuity
4 (HI)	3-4	Continuity

**Q: Is the blower switch continuity in good condition?**

**YES :** Go to Step 4.

**NO :** Replace. Then go to Step 4.



**STEP 4. Check symptoms.**

**Q: Does the blower motor stop turning?**

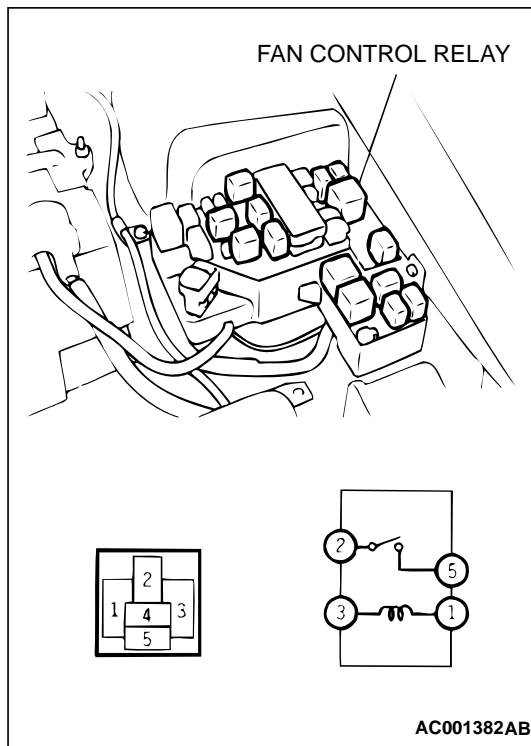
**YES :** This diagnosis is complete. (If no malfunctions are not found in all steps, an intermittent malfunction is suspected. Refer to Introduction, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-8.)

**NO :** Go to Step 1.

**INSPECTION PROCEDURE 6: WHEN THE A/C IS OPERATING CONDENSER FAN OR RADIATOR FAN DOES NOT TURN.**

**DIAGNOSIS**

**STEP 1. Check the fan control relay continuity.**

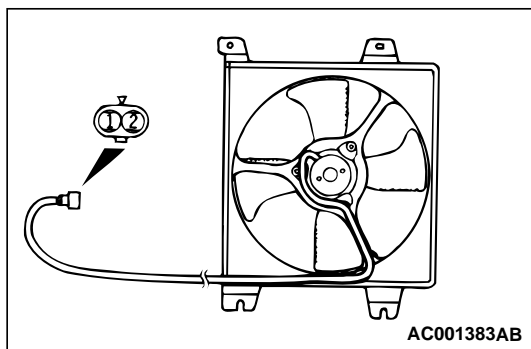


BATTERY VOLTAGE	TERMINAL NO. TO BE CONNECTED TO BATTERY	TERMINAL NO. TO BE CONDUCTED
SUPPLIED	1-3	2-5
NOT SUPPLIED	-	1-3

**Q: Is the fan control relay continuity in good condition?**

**YES :** Go to Step 2.

**NO :** Replace. Then go to Step 4.



**STEP 2. Check the condenser fan motor operation <vehicles with 3.0L engine>.**

Check to be sure that the condenser fan motor operates when battery voltage is applied to terminal 2 and terminal 1 grounded.

**Q: Is the condenser fan motor operating correctly?**

**YES :** Go to Step 3.

**NO :** Replace. Then go to Step 3.

**STEP 3. Measure the fan controller terminal voltage.**

Refer to GROUP 14, On-vehicle Service – Fan Control Module Check [P.14-15](#)

**Q: Is the fan controller terminal voltage in good condition?**

**YES :** Go to Step 4.

**NO :** Replace. Then go to Step 4.

**STEP 4. Check symptoms.**

*NOTE: Condenser fan might not operate when there is an air conditioning low load from the air conditioning condenser control, so remove the negative battery terminal and then check the symptoms after 5 minutes since initial start control after reconnection.*

**Q: Is the condenser fan or radiator fan operating correctly?**

**YES :** This diagnosis is complete. (If no malfunctions are not found in all steps, an intermittent malfunction is suspected. Refer to Introduction, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction [P.00-8.](#))

**NO :** Go to Step 1.

**INSPECTION PROCEDURE 7: THE A/C INDICATOR FLASHES <VEHICLES WITH 3.0L ENGINE> .****THE A/C INDICATOR FLASHES.****STEP 1. Check the drive belt tension.**

Refer to GROUP 00, Lubrication and Maintenance Service – Drive belts.

**Q: Is the drive belt tension in good condition?**

**YES :** Go to Step 2.

**NO :** Repair. Then go to Step 4.

**STEP 2. Check the revolution pick-up sensor.**

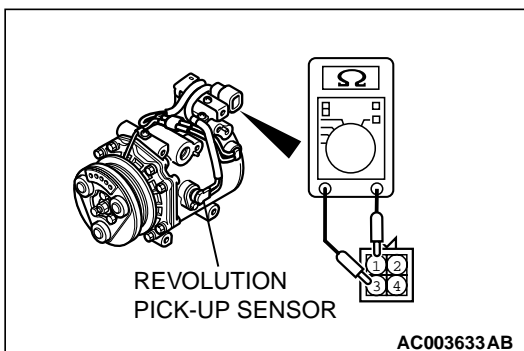
Measure the resistance between terminals 1 and 3. Check that the measured value is at the standard value.

**Standard value:  $405 \pm 35$  when the ambient temperature is 20 °C (68 °F)**

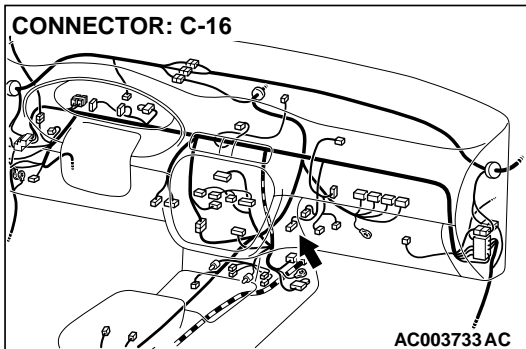
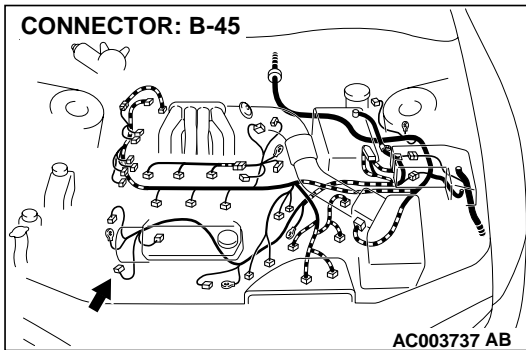
**Q: Is the measured value at the standard value?**

**YES :** Go to Step 3.

**NO :** Replace. Then go to Step 3.







**STEP 3. Check the harness wire between the compressor connector B-45 and automatic compressor controller connector C-16.**

**Q: Is the harness wire between the compressor connector B-45 and automatic compressor controller connector C-16 in good condition?**

**YES :** Go to Step 4.

**NO :** Repair. Then go to Step 4.

**STEP 4. Measure the automatic compressor controller terminal voltage.**

Refer to [P.55-17](#).

**Q: Is the automatic compressor controller terminal voltage in good condition?**

**YES :** Go to Step 5.

**NO :** Replace. Then go to Step 5.

**STEP 5. Check symptoms.**

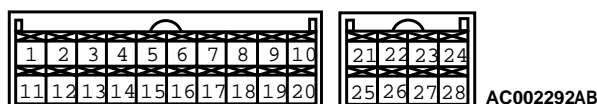
**Q: Does the A/C indicator flashes?**

**YES :** Go to Step 1.

**NO :** This diagnosis is complete. (If no malfunctions are not found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00E, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction [P.00-8](#).)

**CHECK AT ECU TERMINAL**

M1552010300088



TERMINAL NO.	CHECK ITEM	CHECKING REQUIREMENTS	NORMAL CONDITION
1	Power supply	Ignition switch: "LOCK" (OFF)	0 V
		Ignition switch: "ON"	Battery positive voltage
2	Input from thermistor sensor to controller	Ignition switch and A/C switch: OFF	0 V
		Ignition switch and A/C switch: ON	2 – 5 V
3	Thermistor sensor power supply	Ignition switch and A/C switch: OFF	0 V
		Ignition switch and A/C switch: ON	5 V
4, 5	Output from controller to engine control module <M/T>/ powertrain control module <A/T>	Air thermistor sensor detection temperature: 5°C (41.0°F) or less	0 V
		Air thermistor sensor detection temperature: 8°C (46.4°F) or less	Battery positive voltage
6	-	-	-
7	Input from A/C switch (outside/ inside air selection damper control switch) to controller	<ul style="list-style-type: none"> <li>• Outside air switch: ON</li> <li>• Inside air switch: OFF</li> </ul>	0 V
		<ul style="list-style-type: none"> <li>• Outside air switch: OFF</li> <li>• Inside air switch: ON</li> </ul>	Battery positive voltage
8	Input from defroster switch (FOOT) to controller	Defroster switch (FOOT): ON	0 V
		Defroster switch (FOOT): OFF	Battery positive voltage
9	Input from defroster switch (DEF) to controller	Defroster switch (DEF): ON	0 V
		Defroster switch (DEF): OFF	Battery positive voltage
10	Input from A/C switch to controller	A/C switch: OFF	0 V
		A/C switch: ON	Battery positive voltage
11	Ground	Always	0 V
12	-	-	-
13	Input from A/C switch (outside/ inside air selection damper control switch) to controller	<ul style="list-style-type: none"> <li>• Outside air switch: ON</li> <li>• Inside air switch: OFF</li> </ul>	Battery positive voltage
		<ul style="list-style-type: none"> <li>• Outside air switch: OFF</li> <li>• Inside air switch: ON</li> </ul>	0 V
14	Input from A/C switch (IND) to controller	A/C switch: OFF	0 V
		A/C switch: ON	Battery positive voltage
15	-	-	-
16	Output from controller to outside/inside air selection damper control motor	<ul style="list-style-type: none"> <li>• Outside air switch: ON</li> <li>• Inside air switch: OFF</li> </ul>	Battery positive voltage
		<ul style="list-style-type: none"> <li>• Outside air switch: OFF</li> <li>• Inside air switch: ON</li> </ul>	0 V

TERMINAL NO.	CHECK ITEM	CHECKING REQUIREMENTS	NORMAL CONDITION
17	Output from controller to outside/inside air selection damper control motor	<ul style="list-style-type: none"> <li>• Outside air switch: ON</li> <li>• Inside air switch: OFF</li> </ul>	0 V
		<ul style="list-style-type: none"> <li>• Outside air switch: OFF</li> <li>• Inside air switch: ON</li> </ul>	Battery positive voltage
18	Input from taillight relay to controller	Taillight relay: OFF	0 V
		Taillight relay: ON	Battery positive voltage
19	Input from blower switch (LO) to controller	Blower switch (LO): OFF	0 V
		Blower switch (LO): ON	Battery positive voltage
20	-	-	-
21	Input from A/C compressor relay to controller	A/C compressor relay: OFF	0 V
		A/C compressor relay: ON	Battery positive voltage
22	Input from distributor assembly to controller	Ignition switch: "LOCK" (OFF)	0 V
		Ignition switch: "ON" (engine stopped)	Battery positive voltage
		Ignition switch: "ON" (engine started)	0 V – Battery positive voltage
23	Revolution pick-up sensor power supply	Ignition switch and A/C switch: OFF	0 V
		Ignition switch and A/C switch: ON	5 V
24	Input from revolution pick-up sensor relay to controller	A/C compressor relay: OFF	0 V
		A/C compressor relay: ON	2 – 5 V

**TROUBLESHOOTING HINT**

M1552013400051

**Condenser fan and radiator fan control**

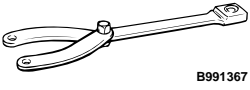
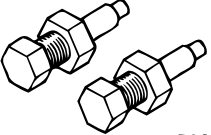
**Compressor control**

- Refer to GROUP 14, Diagnosis – Symptom Chart P.14-3.

- Refer to P.55-3.

**SPECIAL TOOLS**

M1552000600099

TOOL	TOOL NUMBER AND NAME	REPLACED BY MILLER TOOL NUMBER	APPLICATION
 B991367	MB991367 Special spanner	MB991367-01	Armature mounting nut of compressor removal and installation
 B991386	MB991386 Pin	MIT217213	Armature mounting nut of compressor removal and installation

TSB Revision

## ON-VEHICLE SERVICE

## SIGHT GLASS REFRIGERANT LEVEL TEST

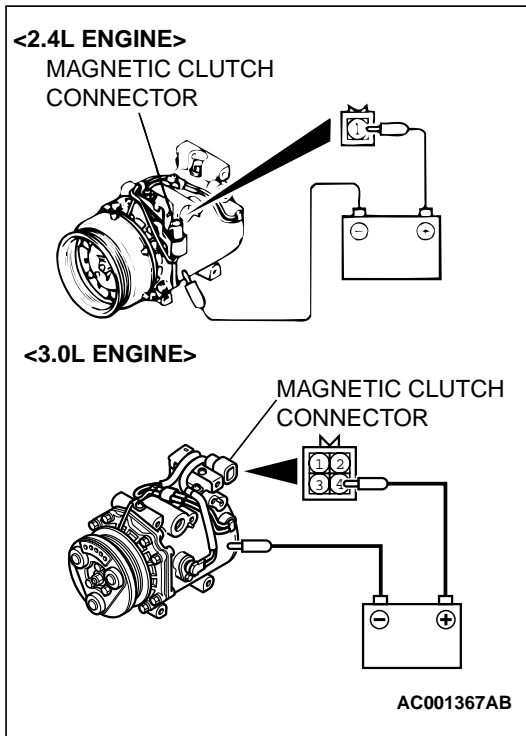
M1552008400077

Use the refrigerant recovery station to remove all of the refrigerant, and then calculate the amount of the refrigerant and charge it.

## MAGNETIC CLUTCH TEST

M1552008500104

1. Disconnect the magnetic clutch connector to the magnetic clutch.
2. Connect positive battery voltage directly to the connector for the magnetic clutch.
3. If the magnetic clutch is normal, there will be



## RECEIVER DRIER TEST

M1552008600071

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

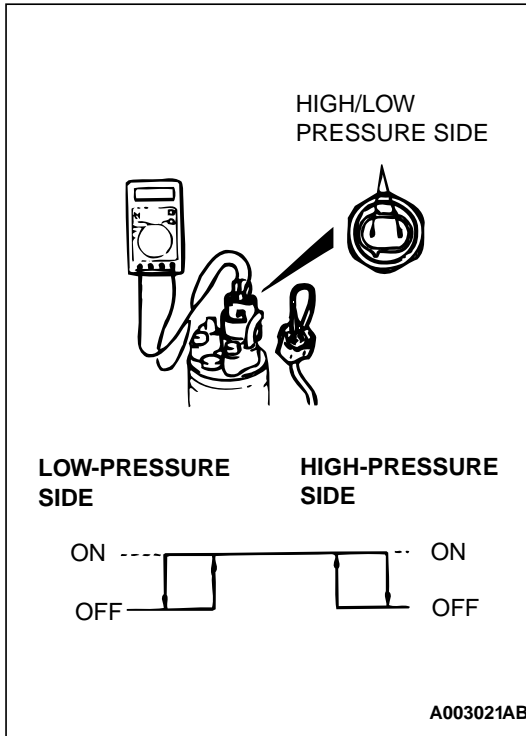
If there is a difference in the temperatures, the receiver drier is restricted.

Replace the receiver drier.

**PRESSURE SWITCH CHECK**

M1552010400074

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 P.55-22.)
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.



ITEMS	SWITCH POSITION	
	OFF → ON	ON → OFF
Low-pressure side kPa (psi)	221 (32.1)	196 (28.4)
High-pressure side kPa (psi)	2,354 (341.4)	2,942 (426.7)

**COMPRESSOR DRIVE BELT ADJUSTMENT**

M1552001000078

Refer to GROUP 11A, On-vehicle Service <2.4L engine>P.00-39 .

Refer to GROUP 11C, On-vehicle Service <3.0L engine>P.00-39 .

**CHARGING**

M1552001200083

Use the refrigerant recovery station to charge the refrigerant.

**METHOD BY USING REFRIGERANT RECOVERY AND RECYCLING UNIT**

Using the refrigerant recovery and recycling unit, refill the refrigerant.

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

**DISCHARGING SYSTEM**

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

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

**REFILLING OF OIL IN THE 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 120 cm<sup>3</sup> (4.1 floz) 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:**

- Evaporator: 60 cm<sup>3</sup> (2.0 floz)
- Condenser: 15 cm<sup>3</sup> (0.5 floz)
- Suction hose: 10 cm<sup>3</sup> (0.3 floz)
- Receiver: 10 cm<sup>3</sup> (0.3 floz)

## PERFORMANCE TEST

M1552001400076

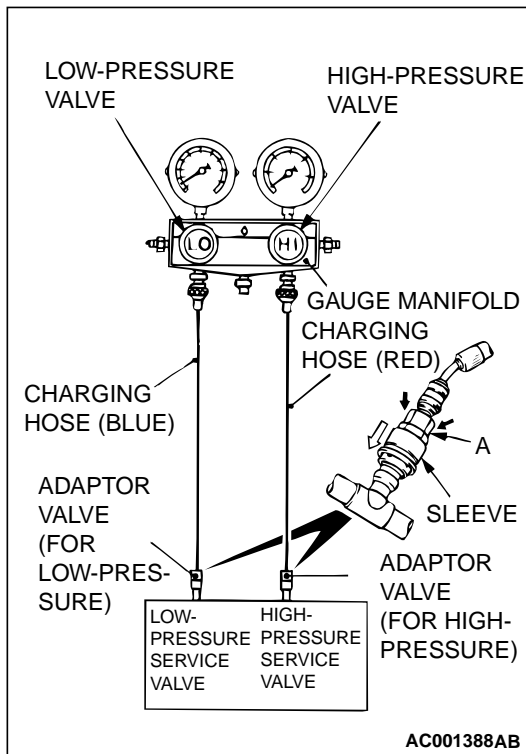
1. The vehicles to be tested should be in a place that is not in direct sunlight.
2. Close the high and low-pressure valve of the gauge manifold.
3. Connect the charging hose (blue) to the low-pressure valve and connect the charging hose (red) to the high-pressure valve of the gauge manifold.
4. Install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

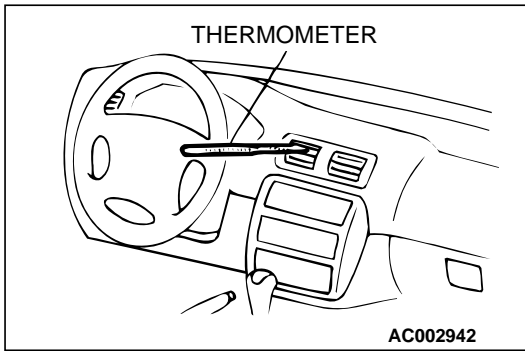
**CAUTION**

- 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.
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 A/C pipe and the low-pressure service valve is on the suction hose.*

6. Start the engine.
7. Set the A/C controls as follows:
  - A/C switch: A/C – ON position
  - Mode selection: FACE position
  - Temperature control: MAXIMUM COOLING position
  - Air selection: RECIRCULATION position
  - Blower switch:
8. Adjust engine speed to 1,500 r/min with A/C clutch engaged.
9. Engine should be warmed up with doors and windows closed.





10. Insert a thermometer in the center air outlet and operate the engine for 20 minutes.
11. Note the discharge air temperature.  
*NOTE: If the clutch cycles, take the reading before the clutch disengages.*

#### Performance Temperature Chart

GARAGE AMBIENT TEMPERATURE °C (°F)	20 (68)	25 (77)	35 (95)	40 (104)
Discharge air temperature °C (°F)	5.0 – 10.0 (42 – 50)	6.0 – 10.5 (43 – 51)	7.5 – 12.0 (46 – 54)	7.5 – 12.5 (46 – 55)
Compressor high pressure kPa (psi)	1,540 – 1,935 (224 – 281)	1,618 – 2,000 (235 – 290)	2,070 – 2,205 (301 – 320)	2,140 – 2,620 (311 – 380)
Compressor low pressure kPa (psi)	125 – 155 (18 – 23)	125 – 155 (18 – 23)	150 – 180 (22 – 26)	145 – 190 (21 – 28)

### REFRIGERANT LEAK REPAIR PROCEDURE

M1552001500073

#### 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 0.453 kg (1 pound) of refrigerant.
3. Check for leaks.
4. Discharge the system.
5. Repair leaks.

#### **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 assembly to avoid keeping the system open any longer than necessary.**

6. Replace receiver drier.
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.

#### 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 rebind 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 (3.1 inches) 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.

On standard plumbing fittings with O-rings, these O-rings are not reusable.

**COMPRESSOR NOISE CHECK**

M1552008700078

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 generator).

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.

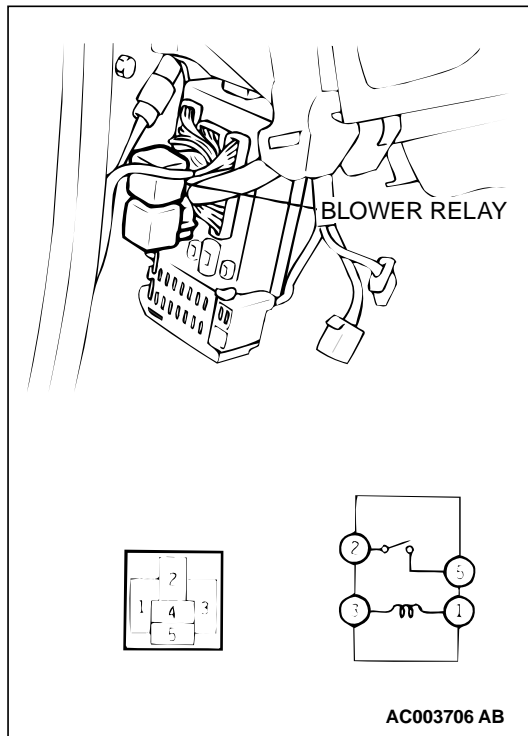
**ADJUSTMENT**

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 (300.2 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. (Refer to [P.55-21.](#))
5. Recheck compressor noise as in Step 1.
6. If noise still exists, loosen compressor mounting bolts and retorque. Repeat Step 1.
7. If noise continues, replace compressor and repeat Step 1.

**POWER RELAY CHECK**

M1552008800075

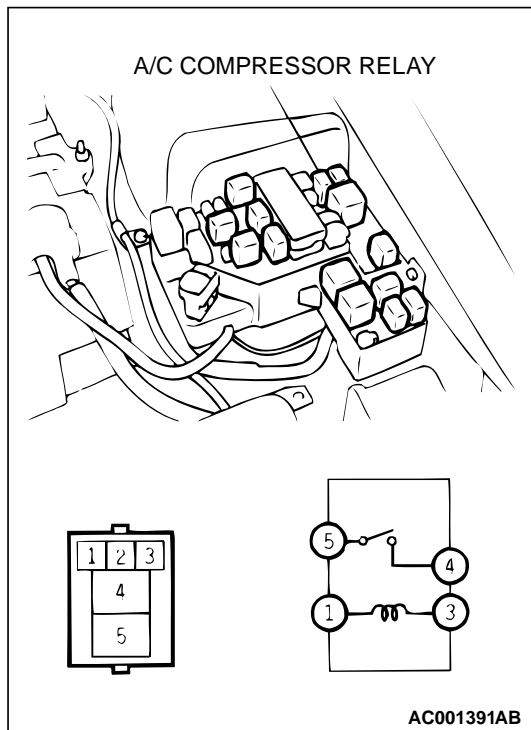
**BLOWER RELAY**



BATTERY VOLTAGE	TERMINAL NO. TO BE CONNECTED TO BATTERY	TERMINAL NO. TO BE CONDUCTED
SUPPLIED	1-3	2-5
NOT SUPPLIED	-	1-3

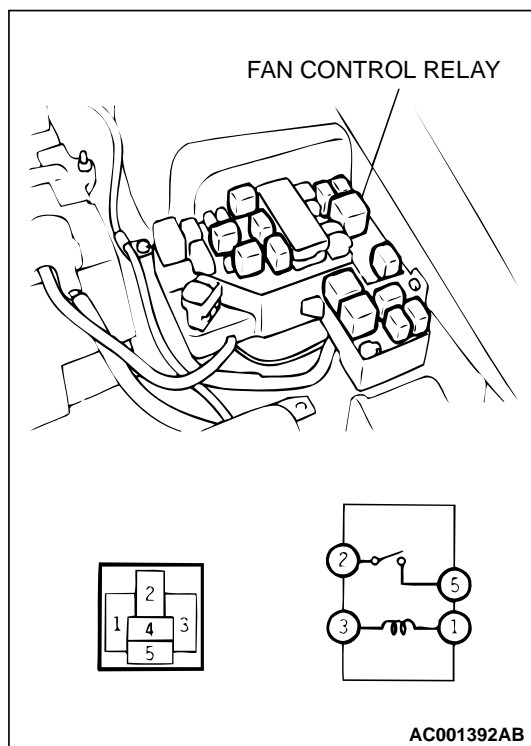


**A/C COMPRESSOR RELAY**



BATTERY VOLTAGE	TERMINAL NO. TO BE CONNECTED TO BATTERY	TERMINAL NO. TO BE CONDUCTED
SUPPLIED	1-3	4-5
NOT SUPPLIED	-	1-3

**FAN CONTROL RELAY CONTINUITY CHECK**



BATTERY VOLTAGE	TERMINAL NO. TO BE CONNECTED TO BATTERY	TERMINAL NO. TO BE CONDUCTED
SUPPLIED	1-3	2-5
NOT SUPPLIED	-	1-3

**IDLE-UP OPERATION CHECK**

M1552001600070

1. Before inspection and adjustment, set vehicle in the following condition:
  - Engine coolant temperature: 80 – 90 °C (176.0 - 194.0 °F)

TSB Revision

- Lights, electric cooling fan and accessories: Set to OFF
  - Transmission: Neutral (N or P for vehicles with A/T)
  - Steering wheel: Straightforward
2. Check whether or not the idle speed is the standard value.
- <2.4L Engine>: Refer to GROUP 13A, On-vehicle Service – Basic Idle Speed Adjustment [P.11A-8](#).
- <3.0L Engine>: Refer to GROUP 13B, On-vehicle Service – Basic Idle Speed Adjustment [P.11A-8](#).

**Standard value:**

- <2.4L engine> 750 + 100 r/min
- <3.0L engine> 700 + 100 r/min

*NOTE: Check 4 minutes after idling begins.*

3. When the A/C is running after turning the A/C switch to ON, and the blower switch to the 3(MH) or 4(HI) position, check to be sure that the idle speed is at the standard value.

**Standard value: 850 ± 100 r/min**

*NOTE: The engine control module <MIT>/the powertrain control module <AIT> determines whether the A/C load is low or high according to the output signal from the automatic compressor controller.*

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

*NOTE: Check 4 minutes after idling begins.*

## HEATER CONTROL ASSEMBLY AND A/C SWITCH

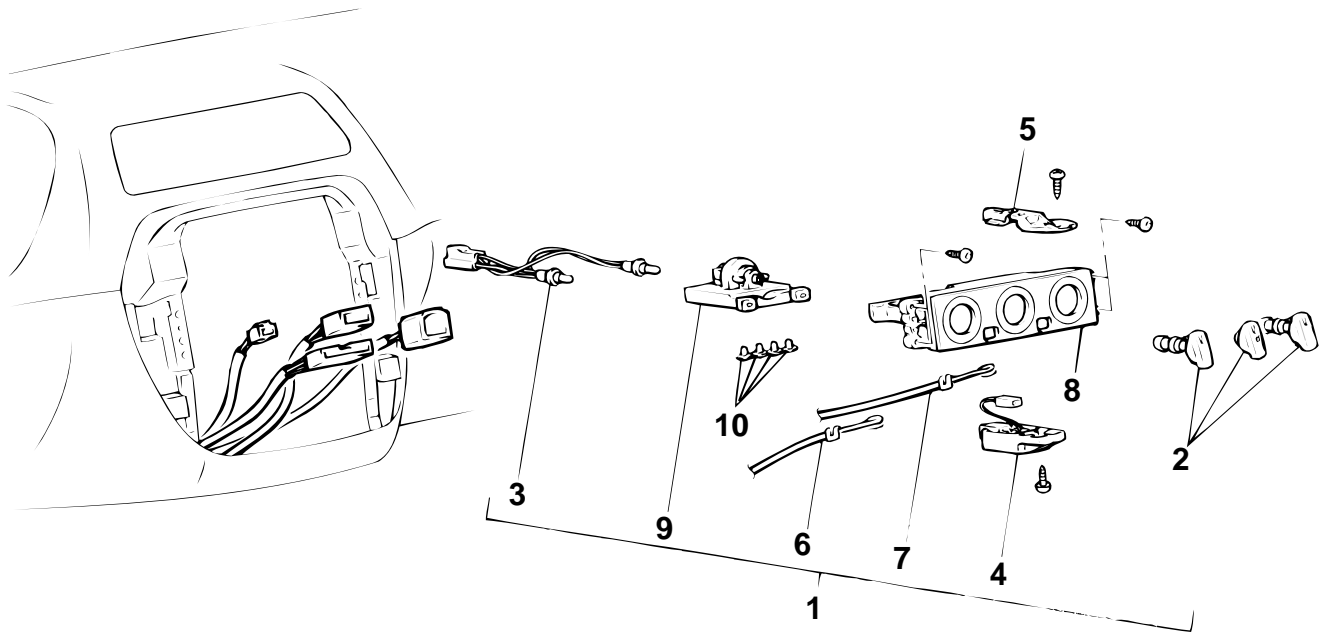
### HEATER CONTROL ASSEMBLY AND A/C SWITCH

M1552002400068

#### REMOVAL AND INSTALLATION

##### Pre-removal and Post-installation Operation

- Center Panel Assembly, Front Driver's Side Under Cover and Front Passenger's Side Under Cover Removal and Installation (Refer to GROUP 52A, Instrument Panel [P.52A-4](#).)
- Radio and Tape Player Removal and Installation (Refer to GROUP 54A, Audio System - Radio and Tape Player, CD Player and CD Auto Changer [P.54A-150](#).)
- Floor Console Removal and Installation (Refer to GROUP 52A, Floor Console [P.52A-11](#).)
- Instrument Panel Center Reinforcement Removal and Installation (Refer to GROUP 52A, Instrument Panel [P.52A-4](#).)
- Foot Duct (LH) Removal and Installation (Refer to [P.55-43](#).)



AC02943 AC

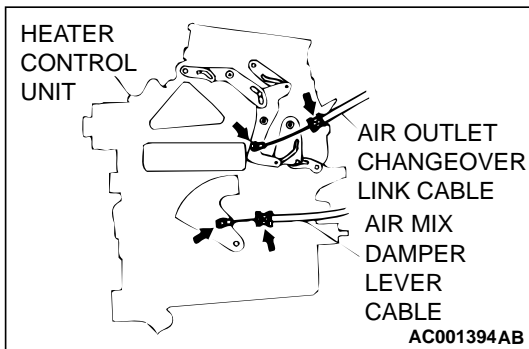
- REMOVAL STEPS**
- <<A>> >>A<< 1. HEATER CONTROL ASSEMBLY <<B>>  
 2. KNOB ASSEMBLY  
 3. BULB HARNESS  
 4. DEFROSTER SWITCH  
 <<B>> 5. AIR MIX DAMPER LEVER CABLE

- REMOVAL STEPS (Continued)**
6. AIR OUTLET CHANGEOVER DAMPER LINK CABLE  
 7. HEATER CONTROL PANEL  
 8. BLOWER SWITCH ASSEMBLY  
 9. BULB

**REMOVAL SERVICE POINTS**

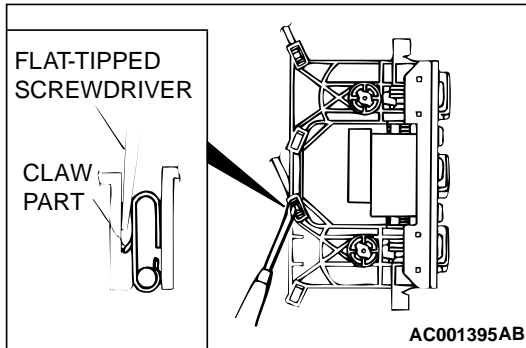
**<<A>> HEATER CONTROL ASSEMBLY REMOVAL**

After disconnecting the heater/cooler unit side connections of the air mix damper lever cable and air outlet changeover link cable, remove the heater control assembly.

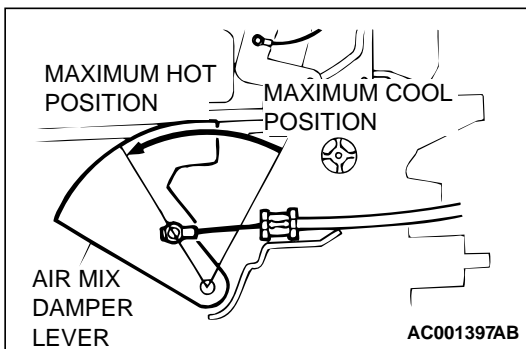
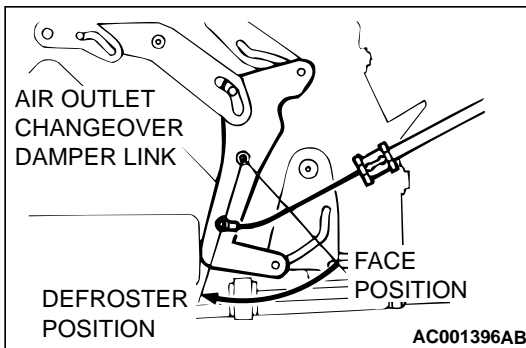


**<<B>> AIR MIX DAMPER LEVER CABLE, AIR OUTLET  
CHANGEOVER DAMPER LINK CABLE REMOVAL**

Insert a flat-tipped screwdriver into the control base clip from inner side, and then remove the cable by lifting the claw part of the clip.

**INSTALLATION SERVICE POINT****>>A<< HEATER CONTROL ASSEMBLY INSTALLATION**

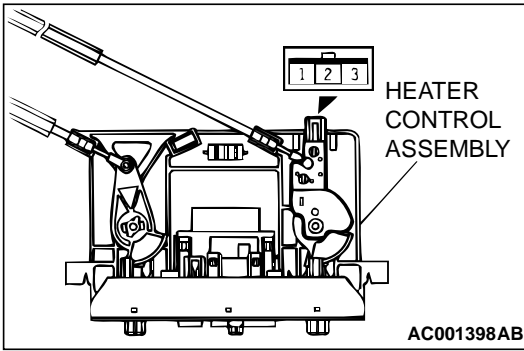
1. Follow the steps below to install the air outlet changeover damper link cable.
  - (1) Set the air outlet changeover control knob on the heater control assembly to the defroster position.
  - (2) Set the air outlet changeover damper link of the heater/cooler unit to the defroster position as shown in the illustration, and then connect the cable to the link pin.
  - (3) Push the outer cable in the direction so that there is no looseness, and then secure it with the clip.
2. Follow the steps below to install the air mix damper lever cable.
  - (1) Set the temperature control knob on the heater control assembly to the maximum hot position.
  - (2) Set the air mix damper lever of the heater/cooler unit to the maximum hot position as shown in the illustration, and then connect the cable to the lever pin.
  - (3) Push the outer cable in the direction so that there is no looseness, and then secure it with the clip.
3. After installation, ensure that each damper operates smoothly by operating the heater control assembly knob.



M1552002500043

**INSPECTION**

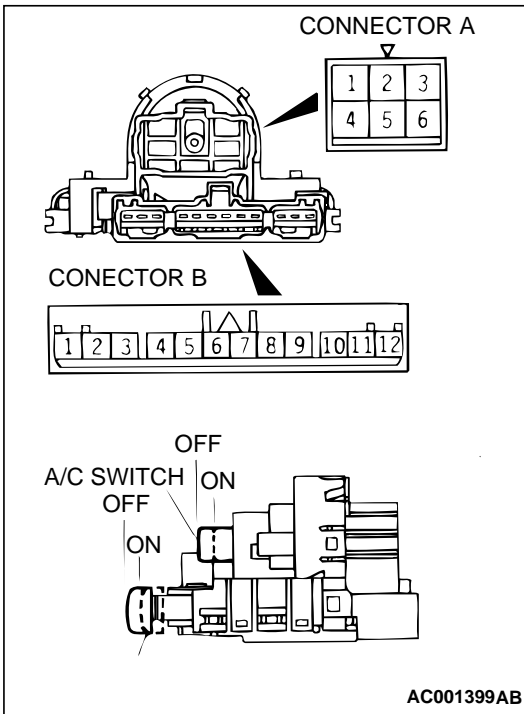
**DEFROSTER SWITCH CONTINUITY CHECK**



AIR OUTLET CHANGEOVER CONTROL KNOB POSITION	TESTER CONNECTION	SPECIFIED CONDITION
DEFROSTER, DEFROSTER/ FOOT	2-3	Continuity
OTHER POSITION	1-3	Continuity

**BLOWER SWITCH ASSEMBLY CONTINUITY CHECK**

**1. BLOWER SWITCH**



SWITCH POSITION	TESTER CONNECTION (CONNECTOR A)	SPECIFIED CONDITION
0 (OFF)	-	No continuity
1 (LO)	3-5	Continuity
2 (ML)	1-3	Continuity
3 (MH)	3-6	Continuity
4 (HI)	3-4	Continuity

**2. A/C SWITCH**

SWITCH POSITION	TESTER CONNECTION (CONNECTOR B)	SPECIFIED CONDITION
Off	-	No continuity
On	5-6-7	Continuity

**3. INSIDE/OUTSIDE AIR CHANGEOVER SWITCH**

SWITCH POSITION	TESTER CONNECTION (CONNECTOR B)	SPECIFIED CONDITION
Off	1-3	Continuity
On	2-3-4	Continuity

# HEATER UNIT,HEATER CORE,BLOWER ASSEMBLY, EVAPORATOR UNIT

## HEATER/COOLER UNIT, HEATER CORE AND EVAPORATOR UNIT

M1552011600048

### REMOVAL AND INSTALLATION

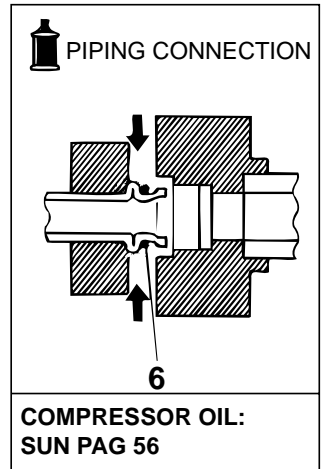
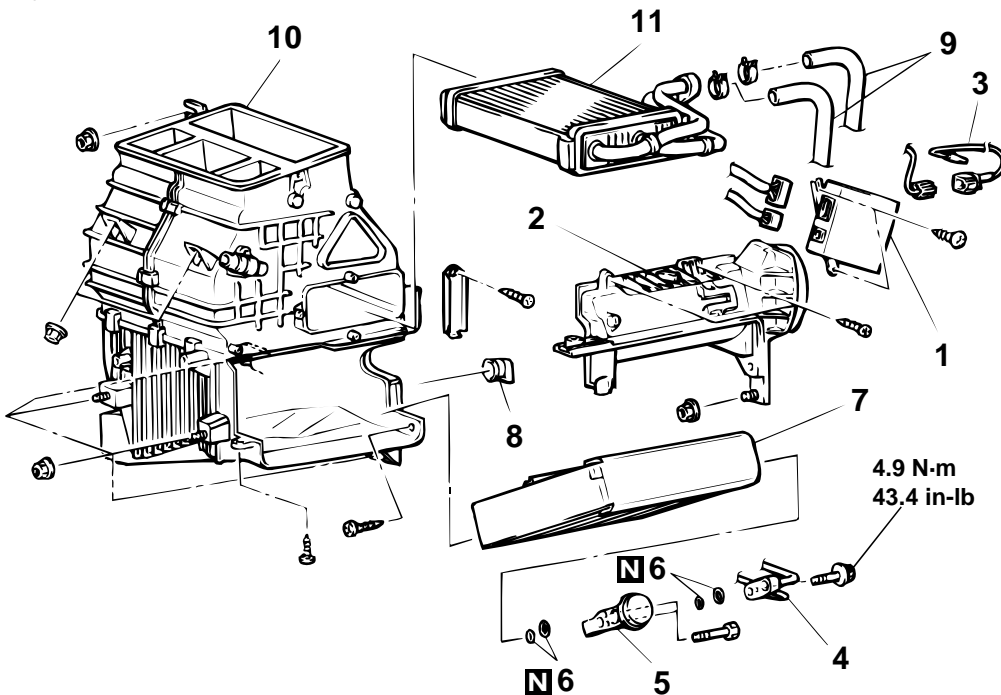


**WARNING**  
When removing and installing the heater unit, do not let it bump against the SRS-ECU or the components.

- Under Cover Removal and Installation (Refer to P.52A-4.)
- Joint Duct Removal and Installation (Refer to P.55-32.)

#### Pre-removal and Post-installation Operation

- Front Driver's Side Under Cover, Center Panel Assembly, Glove Box and Front Passenger's Side Under Cover Removal and Installation (Refer to GROUP 52A, Instrument Panel P.52A-4.)



AC002946 AC

#### REMOVAL STEPS

1. AUTOMATIC COMPRESSOR CONTROLLER <VEHICLES WITH A/C>
2. COVER
3. THERMISTOR SENSOR
  - REFRIGERANT DISCHARGING AND CHARGING <VEHICLES WITH A/C>(REFER TO P.55-26.)
4. A/C PIPE <VEHICLES WITH A/C>
5. EXPANSION VALVE
6. O-RING <VEHICLES WITH A/C>
7. EVAPORATOR
8. DRAIN HOSE <VEHICLES WITH A/C>]

<<A>>

>>A<<

#### REMOVAL STEPS (Continued)

- ENGINE COOLANT DRAINING AND REFILLING [REFER TO GROUP 00E, MAINTENANCE SERVICE - ENGINE COOLANT (CHANGE) P.00-50.]
- 9. HEATER HOSE
- RADIO AND TAPE PLAYER (REFER TO GROUP 54A, AUDIO SYSTEM - RADIO AND TAPE PLAYER, P.54A-150.)
- HEATER CONTROL ASSEMBLY (REFER TO P.55-26.)
- INSTRUMENT PANEL ASSEMBLY (REFER TO GROUP 52A, INSTRUMENT PANEL P.52A-4.)
- FRONT DECK CROSSMEMBER

TSB Revision

**REMOVAL STEPS (Continued)**

- FLOOR CONSOLE (REFER TO GROUP 52A, FLOOR CONSOLE [P.52A-11.](#))
  - INSTRUMENT PANEL CENTER REINFORCEMENT (REFER TO GROUP 52A, INSTRUMENT PANEL [P.52A-4.](#))
  - FOOT DUCT (LH/RH), REAR HEATER DUCT <VEHICLES WITH REAR HEATER DUCT> AND FOOT CENTER DUCT (REFER TO [P.55-43.](#))
10. HEATER/COOLER UNIT  
11. HEATER CORE

**REMOVAL SERVICE POINT**

**<<A>> A/C PIPE REMOVAL**



**Seal the pipes completely, otherwise the compressor oil and receiver will absorb water vapor easily, possibly damaging the compressor and deteriorating performance.**  
Plug the disconnected pipe and the evaporator nipple to prevent foreign material from getting into them.

**INSTALLATION SERVICE POINT**

**>>A<< EVAPORATOR INSTALLATION**

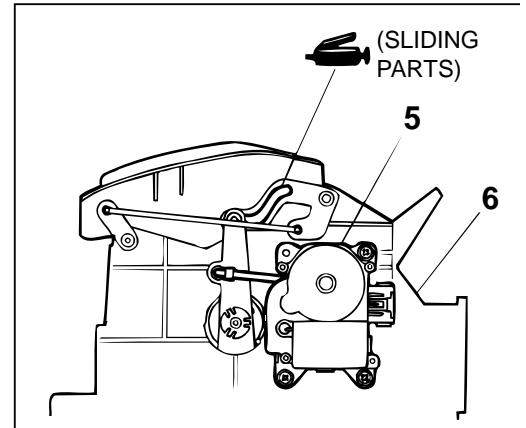
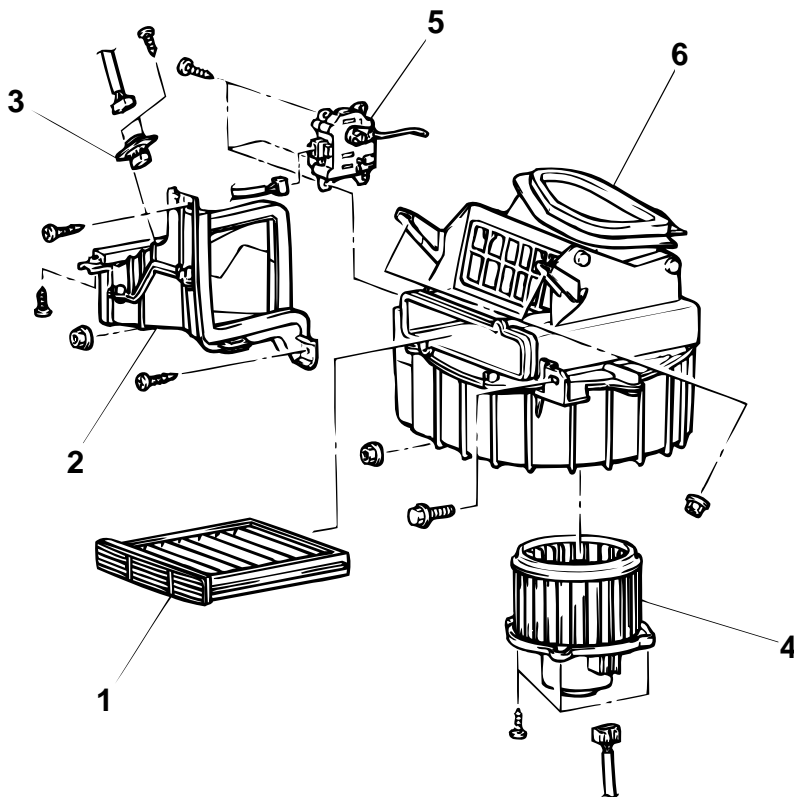
When replacing the evaporator, refill with a specified amount of compressor oil and install it.

**Compressor oil: SUN PAG 56**

**Quantity: 60 cm<sup>3</sup> (2.0 floz)**

**BLOWER ASSEMBLY AND RESISTOR****BLOWER ASSEMBLY AND RESISTOR  
REMOVAL AND INSTALLATION**

M1551002800074



AC002947 AC

**AIR PURIFIER ASSEMBLY, JOINT  
DUCT AND RESISTOR REMOVAL  
STEPS**

- GLOVE BOX AND FRONT PASSENGER'S UNDER COVER PLUG (REFER TO GROUP 52A, INSTRUMENT PANEL P.52A-4.)
1. AIR PURIFIER ASSEMBLY
  2. JOINT DUCT
  3. RESISTOR
- UNDER COVER(REFER TO P.52A-4.)
4. BLOWER FAN AND MOTOR

**AIR PURIFIER ASSEMBLY, JOINT  
DUCT AND RESISTOR REMOVAL  
STEPS**

- CENTER PANEL ASSEMBLY, FRONT DRIVER'S SIDE UNDER COVER AND FRONT PASSENGER'S SIDE UNDER COVER (REFER TO GROUP 52A, INSTRUMENT PANEL P.52A-4.)
5. INSIDE/OUTSIDE AIR CHANGEOVER DAMPER MOTOR
  6. BLOWER ASSEMBLY



M1551002900071

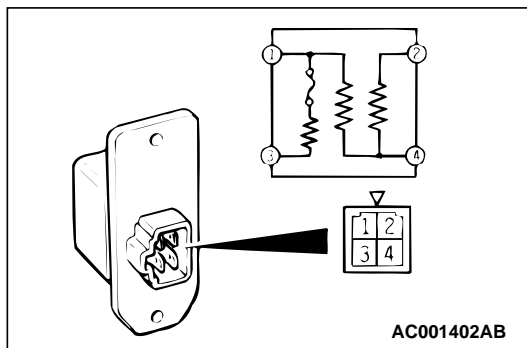
## INSPECTION

### RESISTOR CHECK

Use an ohmmeter to measure the resistance between the terminals. Check that the measured value is at the standard value.

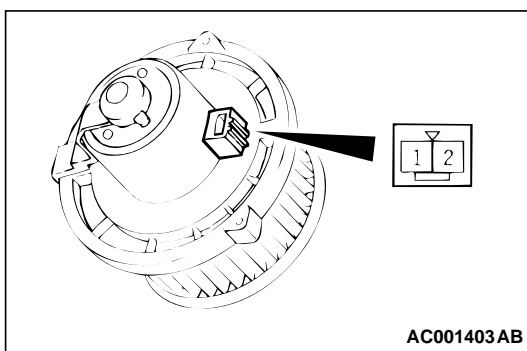
Standard value:

MEASUREMENT TERMINAL	STANDARD VALUE $\Omega$
Between terminals 3 and 2 (LO)	2.3
Between terminals 3 and 4 (ML)	1.1
Between terminals 3 and 1 (MH)	0.4



### BLOWER FAN AND MOTOR CHECK

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

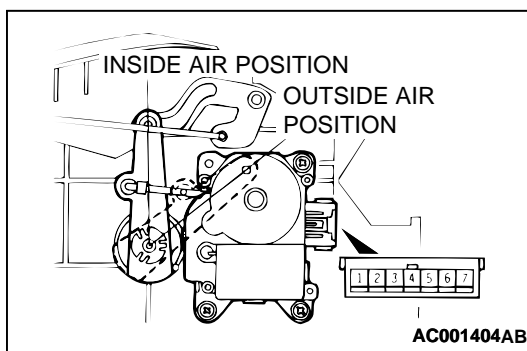


### INSIDE/OUTSIDE AIR CHANGEOVER DAMPER MOTOR CHECK

#### ⚠ CAUTION

Cut off the battery voltage when the damper is in the inside/outside air position.

BATTERY CONNECTION TERMINALS	LEVER POSITION
1-7	Move to the outside air position
1-5	Move to the inside air position



## COMPRESSOR ASSEMBLY AND TENSION PULLEY

### COMPRESSOR ASSEMBLY AND TENSION PULLEY

#### REMOVAL AND INSTALLATION

M1552004100052

- Refrigerant Discharging (Refer to P.55-21.)

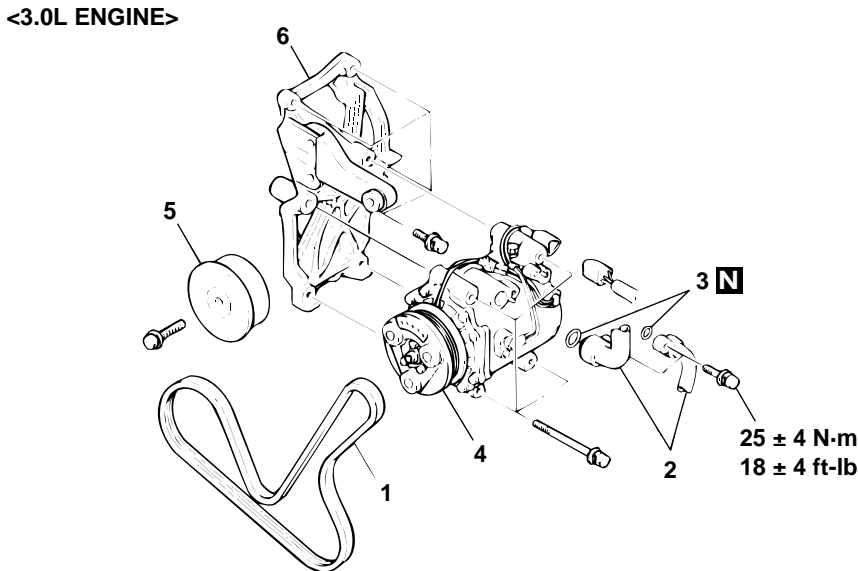
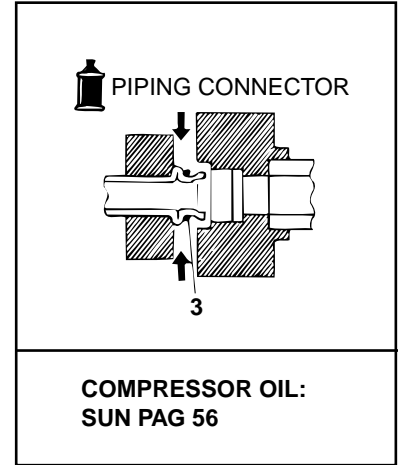
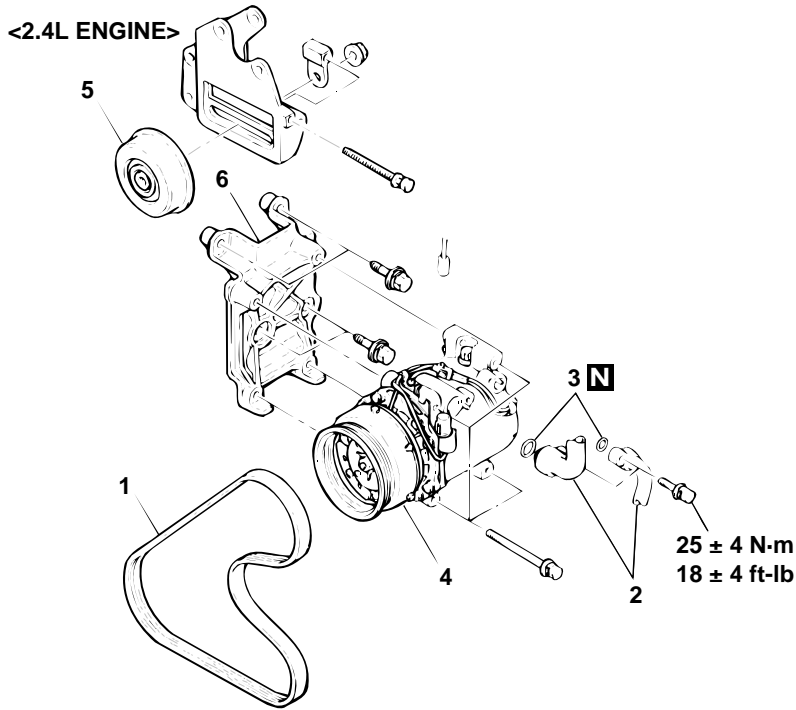
#### Pre-removal Operation

TSB Revision

Post-installation Operation

- Refrigerant Charging (Refer to P.55-21.)

- Drive Belt Tension Adjustment (2.4: Refer to GROUP 11A, On-vehicles Service, P.00-39 3.0: Refer to GROUP 11C, On-vehicles Service.)



AC001405AB

REMOVAL STEPS

- UNDER COVER (REFER TO P.55-40.) <<B>>
  - CONDENSER FAN MOTOR <3.0L ENGINE> (REFER TO P.55-40.) <<C>> >>A<<
- <<A>>
1. DRIVE BELT

REMOVAL STEPS (Continued)

2. DISCHARGE HOSE AND SUCTION HOSE
3. O-RING
4. COMPRESSOR
5. TENSION PULLEY
6. COMPRESSOR BRACKET

## REMOVAL SERVICE POINTS

### <<A>> DRIVE BELT REMOVAL

1. Loosen the nut "A" for holding.
2. Loosen the bolt "B" for adjustment.
3. Remove the drive belt.

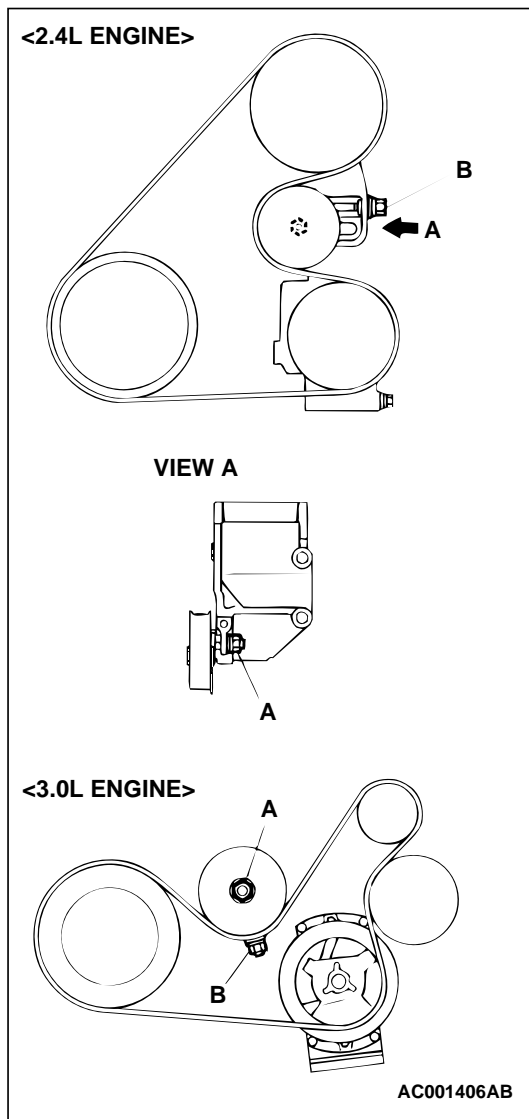
### <<B>> SUCTION HOSE, DISCHARGE HOSE DISCONNECTION

#### **⚠ CAUTION**

Seal the hoses completely, otherwise the compressor oil and receiver will absorb water vapor easily, possibly damaging the compressor and deteriorating performance. Plug the disconnected hose and compressor nipple to prevent foreign matter from getting into them.

### <<C>> COMPRESSOR REMOVAL

When removing the compressor, be careful not to spill the compressor oil.



## INSTALLATION SERVICE POINT

### >>A<< COMPRESSOR INSTALLATION

If a new compressor is installed, first adjust the amount of oil according to the procedures described below, and then install the compressor.

1. Measure the amount [ $X \text{ cm}^3$  ( $X \text{ floz}$ )] of oil within the removed compressor.
2. Measure the amount [ $X \text{ cm}^3$  ( $X \text{ floz}$ )] of oil within the removed compressor.

New compressor oil amount

$$140 \text{ cm}^3 - X \text{ cm}^3 = Y \text{ cm}^3 \quad (4.7 \text{ floz} - X \text{ floz} = Y \text{ floz})$$

NOTE:  $Y \text{ cm}^3$  ( $Y \text{ floz}$ ) indicates the amount of oil in the refrigerant line, the condenser, the evaporator, etc.

*NOTE: When replacing the following parts at the same times as the compressor, subtract the rated oil amount of the each part from  $Y \text{ cm}^3$  ( $Y \text{ floz}$ ) and discharge from the new compressor.*

**Quantity:**

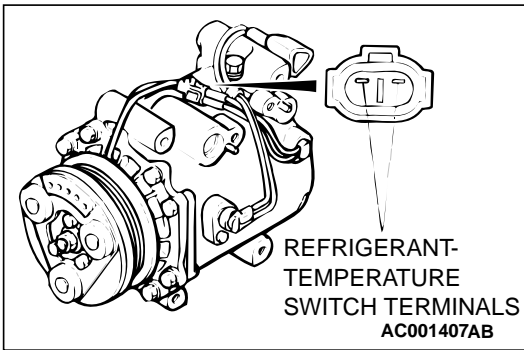
- Evaporator:  $60 \text{ cm}^3$  (2.0 floz)
- Condenser:  $15 \text{ cm}^3$  (0.5 floz)
- Suction hose:  $10 \text{ cm}^3$  (0.3 floz)
- Receiver:  $10 \text{ cm}^3$  (0.3 floz)

**INSPECTION**

M1552009300051

**REFRIGERANT TEMPERATURE SWITCH CHECK**

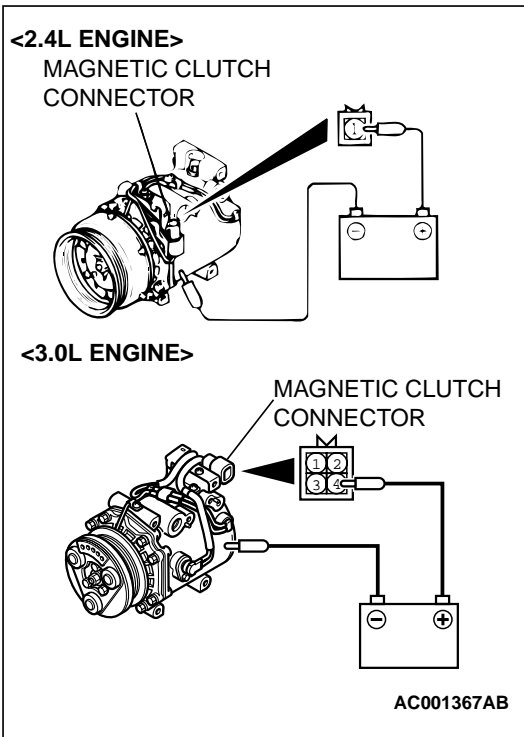
When the A/C is off, check that there is continuity between the refrigerant-temperature switch terminals. If not, replace the switch.



**COMPRESSOR MAGNETIC CLUTCH OPERATION INSPECTION**

M1552008500115

Connect the battery (+) terminal to the compressor magnetic clutch connector terminal 1 <2.4L engine> or terminal 4 <3.0L engine>, and ground the battery (-) terminal to the body of the compressor. The condition is normal if the sound of the magnetic clutch (click) can be heard.

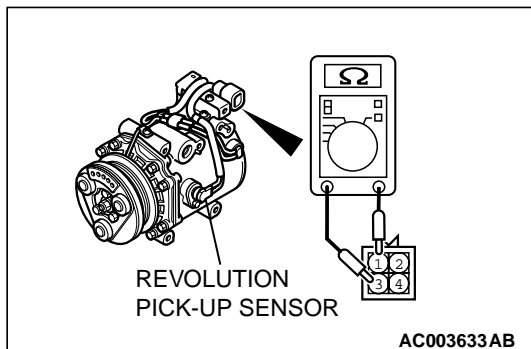


**REVOLUTION PICK-UP SENSOR CHECK**

M1552004500050

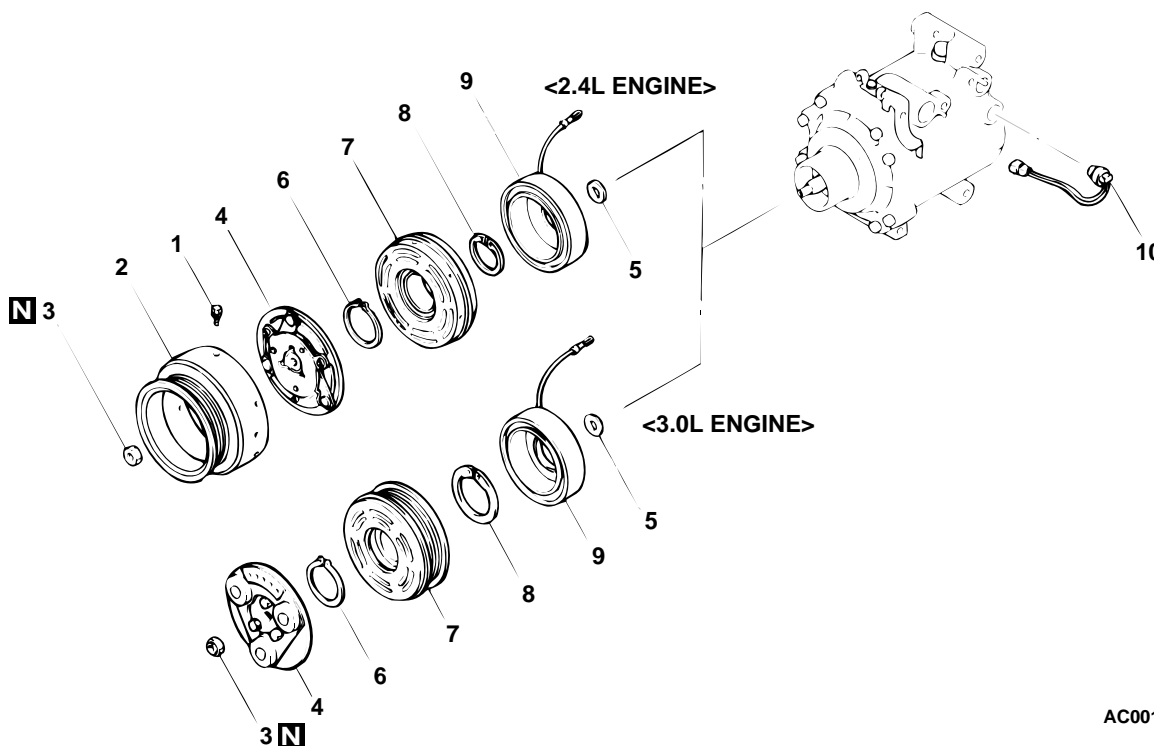
Measure the resistance between terminals 1 and 3. Check that the measured value is at the standard value.

**Standard value:  $405 \pm 35 \Omega$  when the ambient temperature is 20 °C (68 °F)**



**MAGNETIC CLUTCH  
DISASSEMBLY AND ASSEMBLY**

M1552004600079



**MAGNETIC CLUTCH DISASSEMBLY STEPS**

- <<A>> >>E<<  
>>D<<  
>>C<<  
>>B<<  
>>A<<
1. BOLT <2.4L ENGINE>
  2. PULLEY <2.4L ENGINE>
  - AIR GAP ADJUSTMENT
  3. NUT
  4. ARMATURE PLATE
  5. SHIMS
  6. SNAP RING
  7. ROTOR
  8. SNAP RING
  9. CLUTCH COIL

**REFRIGERANT TEMPERATURE SWITCH REMOVAL**

10. REFRIGERANT TEMPERATURE SWITCH

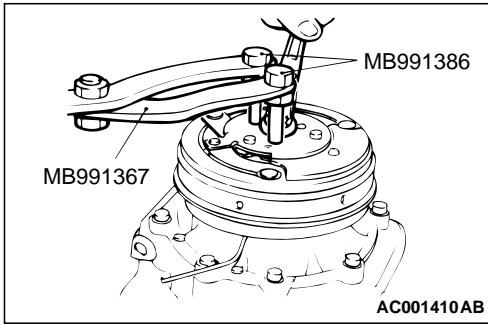
**Required Special Tools:**

- MB991367: Special Spanner
- MB991386: Pin

**DISASSEMBLY SERVICE POINT**

**<<A>> NUT REMOVAL**

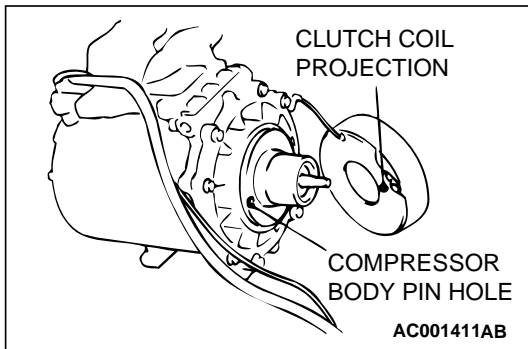
Use special tools MB991367 and MB991386 to hold the magnetic clutch, and remove the nut.



**ASSEMBLY SERVICE POINTS**

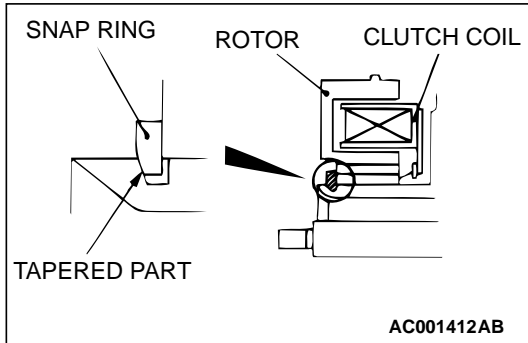
**>>A<< CLUTCH COIL INSTALLATION**

When installing the clutch coil to the A/C compressor body, install so that the pin hole of the A/C compressor body and the clutch coil projection are aligned.



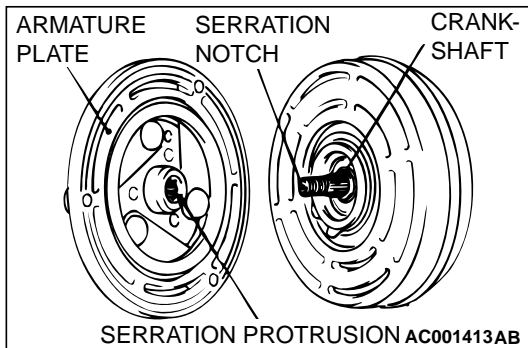
**>>B<< SNAP RING INSTALLATION**

Install the snap ring so that the tapered surface is to the outside.



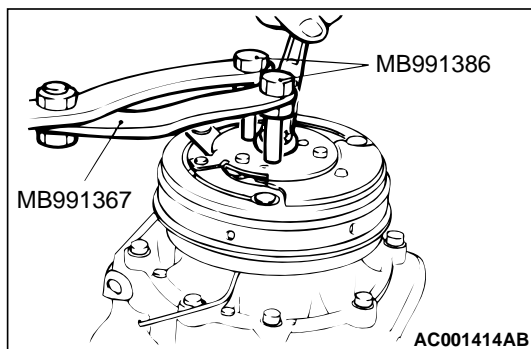
**>>C<< ARMATURE PLATE INSTALLATION**

Align the serration protrusion on the crankshaft with the notch on the armature and install.



**>>D<< NUT INSTALLATION**

Use special tools MB991367 and MB991386 to hold the magnetic clutch, and tighten the nut in the same manner as for removal.



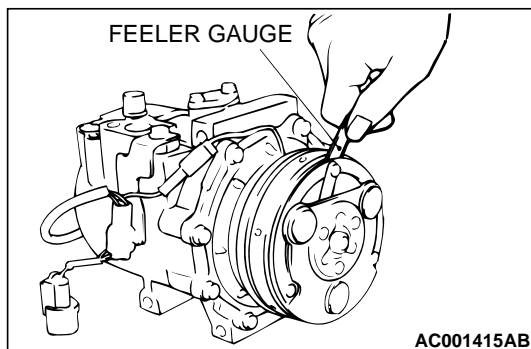
**>>E<< AIR GAP ADJUSTMENT**

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

**Standard value:**

- <2.4L engine> 0.3 – 0.5 mm (0.012 – 0.020 inch)
- <3.0L engine> 0.4 – 0.6 mm (0.016 – 0.024 inch)

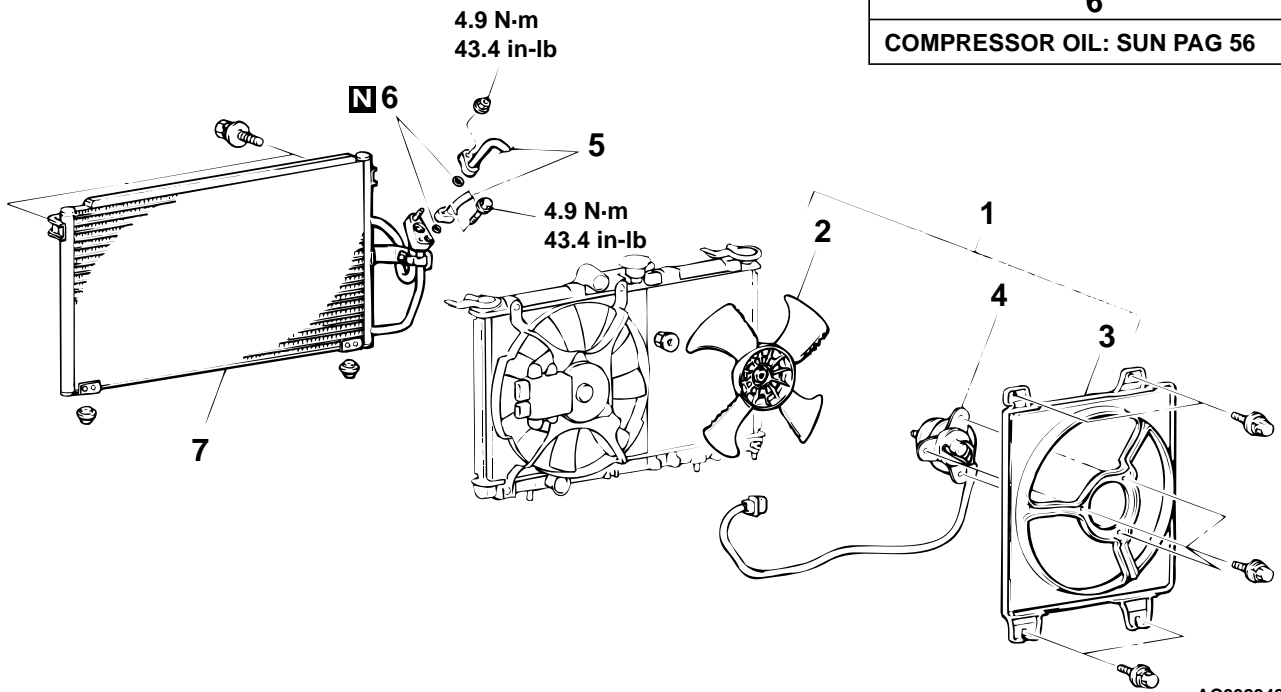
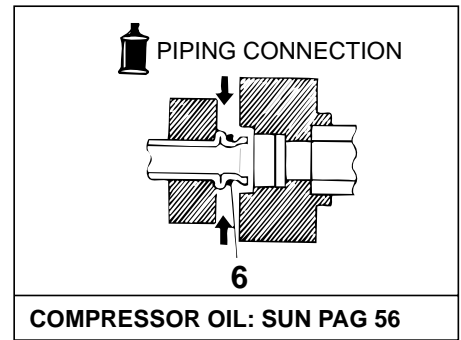
*NOTE: If there is a deviation of the air gap from the standard value, make the necessary adjustment by adjusting the number of shims.*



# CONDENSER AND CONDENSER FAN MOTOR

## CONDENSER AND CONDENSER FAN MOTOR REMOVAL AND INSTALLATION

M1552006700072



### CONDENSER FAN MOTOR <3.0L ENGINE> REMOVAL STEPS

1. CONDENSER FAN MOTOR AND SHROUD ASSEMBLY
  2. CONDENSER FAN
  3. SHROUD
  4. CONDENSER FAN MOTOR
- CONDENSER REMOVAL STEPS** <<A>>
- REFRIGERANT DISCHARGING AND CHARGING (REFER TO P.55-21.)
  - AIR CLEANER (REFER TO GROUP 15, AIR CLEANER P.15-4.)

### CONDENSER REMOVAL STEPS

- ENGINE COOLANT DRAINING AND SUPPLYING (REFER TO GROUP 14, ON-VEHICLE SERVICE P.14-14.)
- RADIATOR (REFER TO GROUP 14, RADIATOR P.14-14.)
- 5. DISCHARGE HOSE AND LIQUID PIPE A
- 6. O-RING
- 7. CONDENSER

>>A<<



## REMOVAL SERVICE POINT

### <<A>> LIQUID PIPE A/DISCHARGE HOSE DISCONNECTION

**⚠ CAUTION**

Seal the hoses completely, otherwise the compressor oil and receiver will absorb water vapor easily, possibly damaging the compressor and deteriorating performance. Plug the disconnected pipe, hose and condenser nipple to prevent foreign material from getting into them.

## INSTALLATION SERVICE POINT

### >>A<< CONDENSER INSTALLATION

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

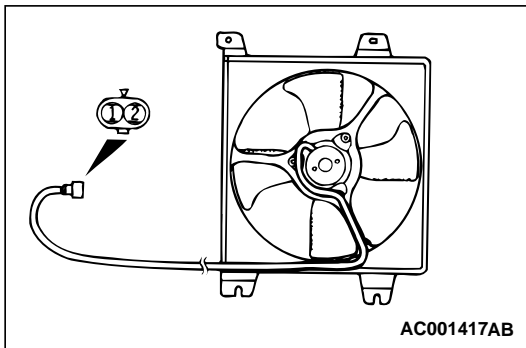
- Compressor oil: **SUN PAG 56**
- Quantity: **15 cm<sup>3</sup> (0.5 floz)**

## INSPECTION

M1552006800079

### CONDENSER FAN MOTOR CHECK

Check to be sure that the condenser fan motor operates when battery voltage is applied to terminal 2 and terminal 1 grounded.



# REFRIGERANT LINE

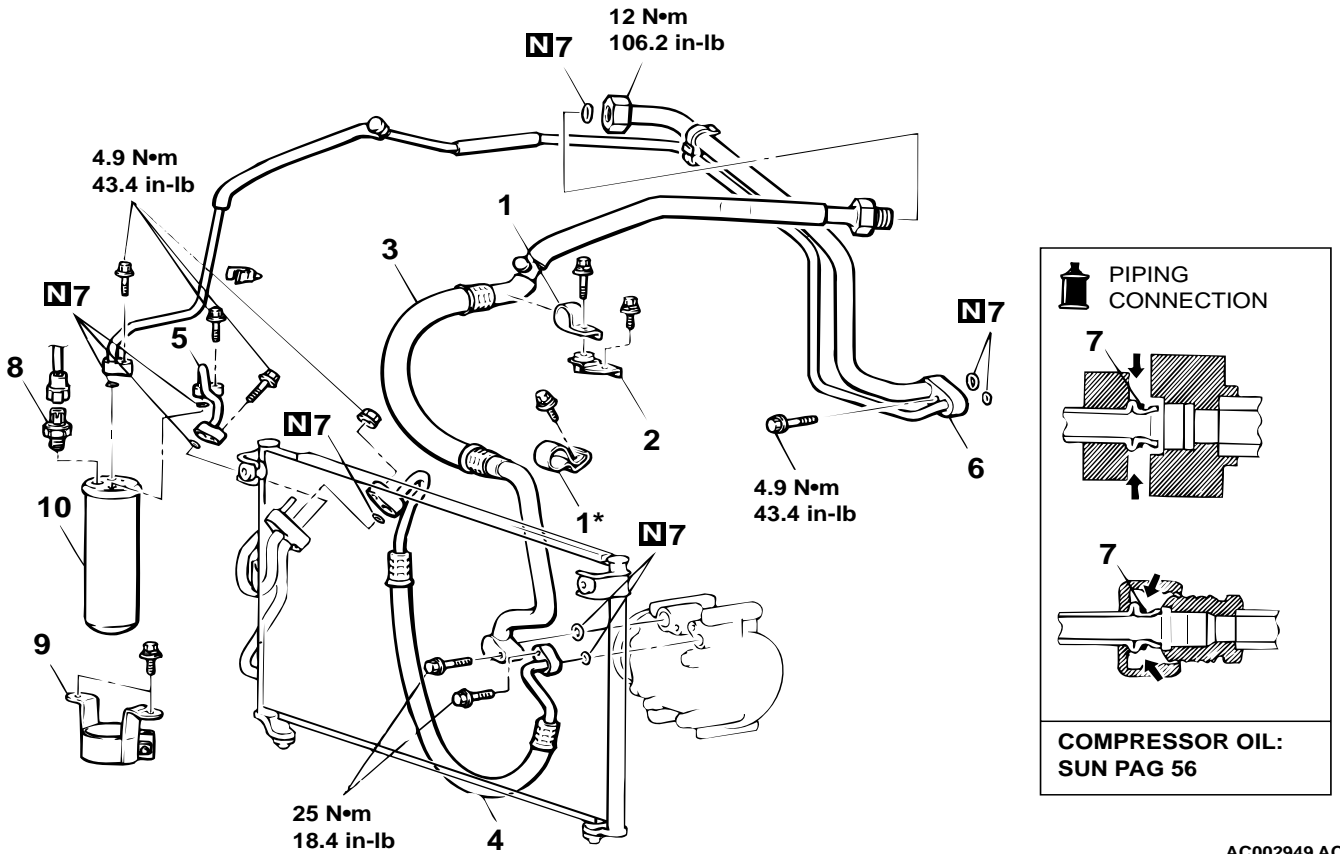
## REFRIGERANT LINE

### REMOVAL AND INSTALLATION

M1552006400082

#### Pre-removal and Post-installation Operation

- Refrigerant Discharging and Charging (Refer to [P.55-21.](#))



NOTE  
The clamp marked with an asterisk is for the 3.0L engine

- |       |                      |       |                                  |
|-------|----------------------|-------|----------------------------------|
|       | <b>REMOVAL STEPS</b> |       | <b>REMOVAL STEPS (Continued)</b> |
|       | 1. CLAMP             | <<A>> | 6. A/C PIPE                      |
| <<A>> | 2. BRACKET           |       | 7. O-RING                        |
| <<A>> | 3. SUCTION HOSE      |       | 8. DUAL PRESSURE SWITCH          |
| <<A>> | 4. DISCHARGE HOSE    | <<A>> | 9. RECEIVER BRACKET              |
|       | 5. LIQUID PIPE A     | >>A<< | 10. RECEIVER ASSEMBLY            |

**REMOVAL SERVICE POINT**

**<<A>> HOSE/PIPE/RECEIVER ASSEMBLY DISCONNECTION**

**⚠ CAUTION**

Seal the hoses completely, otherwise the compressor oil and receiver will absorb water vapor easily, possibly damaging the compressor and deteriorating performance. Plug the disconnected hose, the condenser, the evaporator and the compressor nipple to prevent foreign material from getting into them.

**INSTALLATION SERVICE POINT**

**>>A<< SUCTION HOSE/RECEIVER INSTALLATION**

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

Compressor oil: **SUN PAG 56**

Quantity:

- Suction hose: 10 cm<sup>3</sup> (0.3 floz)

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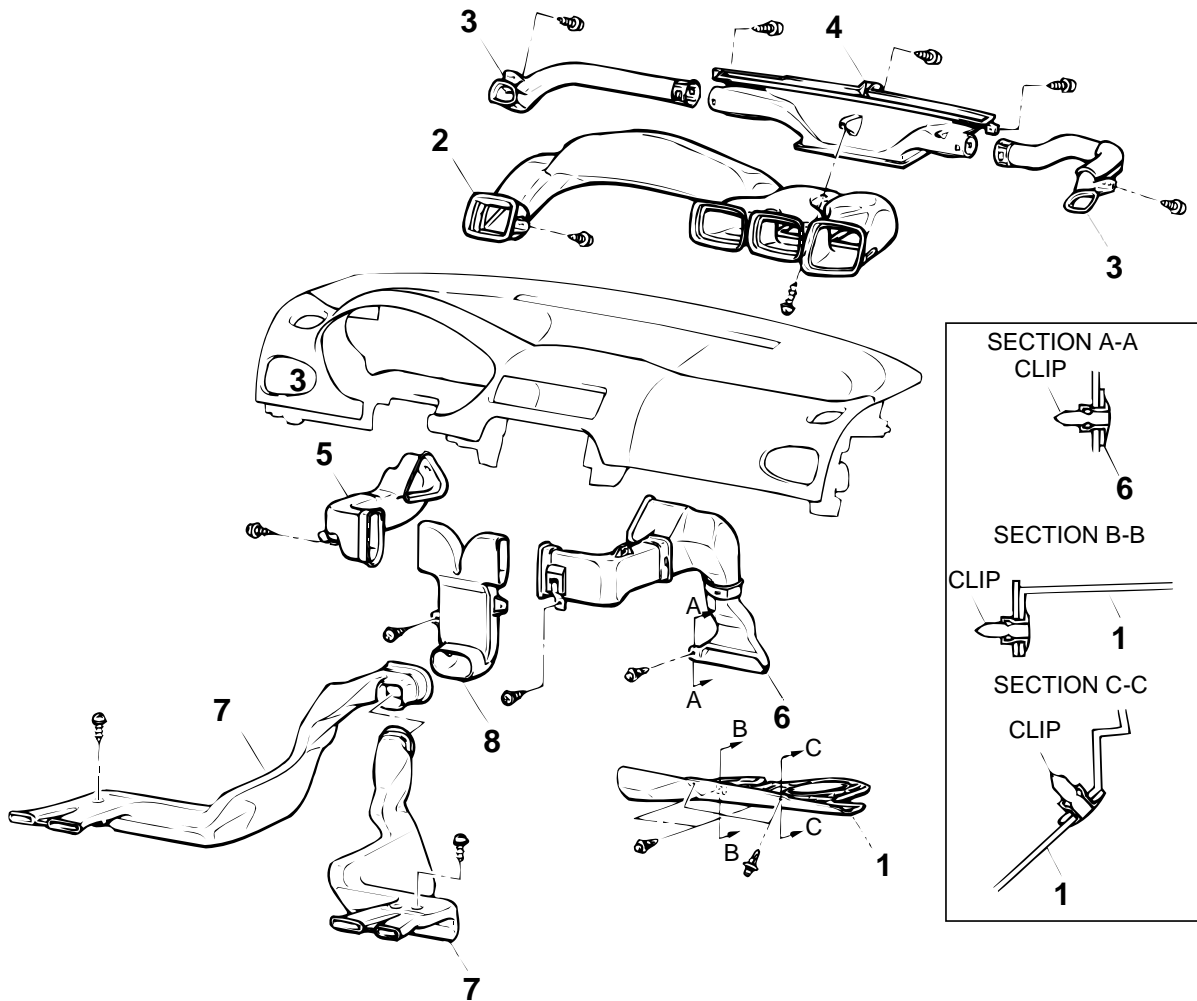
- Receiver assembly: 10 cm<sup>3</sup> (0.3 fl oz)

## VENTILATORS

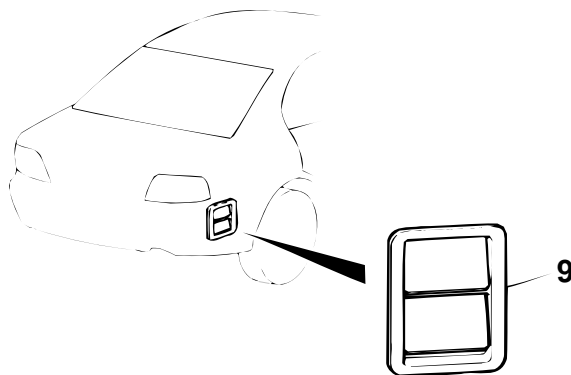
### VENTILATORS

### REMOVAL AND INSTALLATION

M1553001600084



AC002950 AC



AC002951 AC

- UNDER COVER REMOVAL**
1. UNDER COVER

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**DISTRIBUTION DUCT, SIDE  
DEFROSTER DUCT AND  
DEFROSTER NOZZLE  
ASSEMBLY REMOVAL STEPS**

- INSTRUMENT PANEL ASSEMBLY (REFER TO GROUP 52A, INSTRUMENT PANEL [P.52A-4.](#))
- 2. DISTRIBUTION DUCT
- 3. SIDE DEFROSTER DUCT
- 4. DEFROSTER NOZZLE ASSEMBLY

**FOOT DUCT, REAR HEATER  
DUCT AND FOOT CENTER  
DUCT REMOVAL STEPS**

1. UNDER COVER
  - CENTER PANEL ASSEMBLY, GLOVE BOX, FRONT DRIVER'S SIDE UNDER COVER AND FRONT PASSENGER'S SIDE UNDER COVER ASSEMBLY (REFER TO GROUP 52A, INSTRUMENT PANEL [P.52A-11.](#))
  - FLOOR CONSOLE (REFER TO GROUP 52A, FLOOR CONSOLE [P.54A-150.](#))
  - RADIO AND TAPE PLAYER (REFER TO GROUP 54A, AUDIO SYSTEM - RADIO AND TAPE PLAYER [P.54A-150.](#))
  - HEATER CONTROL ASSEMBLY (REFER TO [P.55-26.](#))

**FOOT DUCT, REAR HEATER  
DUCT AND FOOT CENTER  
DUCT REMOVAL STEPS**

- INSTRUMENT PANEL CENTER REINFORCEMENT (REFER TO GROUP 52A, INSTRUMENT PANEL [P.52A-4.](#))
  - 5. FOOT DUCT (LH)
    - JOINT DUCT (REFER TO [P.55-32.](#))
  - 6. FOOT DUCT (RH)
    - FRONT SEAT <VEHICLES WITH REAR HEATER DUCT> (REFER TO GROUP 52A, FRONT SEAT [P.55-32.](#))
  - 7. REAR HEATER DUCT <VEHICLES WITH REAR HEATER DUCT>
  - 8. FOOT CENTER DUCT
- REAR VENTILATION DUCT  
ASSEMBLY REMOVAL STEPS**
- REAR BUMPER ASSEMBLY (REFER TO GROUP 51, REAR BUMPER [P.55-32.](#))
  - 9. REAR VENTILATION DUCT ASSEMBLY

*NOTE: For the front deck garnish, refer to GROUP 51, Windshield Wiper and Washer [P.51-12.](#)*

*NOTE: For the center/side air outlet assembly and side defroster grille, refer to GROUP 52A, Instrument Panel [P.52A-4.](#)*

## SPECIFICATIONS

### FASTENER TIGHTENING SPECIFICATIONS

M1552012100068

ITEMS	SPECIFICATIONS
A/C pipe mounting bolt (heater/cooler unit side)	4.9 ± 1.0 N·m (44 ± 8 in-lb)
A/C pipe mounting bolt (condenser side)	4.9 ± 1.0 N·m (44 ± 8 in-lb)
A/C pipe mounting nut (suction hose side)	13 ± 2 N·m (109 ± 21 in-lb)
Discharge hose mounting bolt (compressor side)	25 ± 4 N·m (18 ± 4 ft-lb)
Discharge hose mounting nut (condenser side)	4.9 ± 1.0 N·m (44 ± 8 in-lb)
Liquid A mounting nut (condenser side)	4.9 ± 1.0 N·m (44 ± 8 in-lb)
Liquid A mounting nut (receiver assembly side)	4.9 ± 1.0 N·m (44 ± 8 in-lb)
Suction hose mounting bolt (compressor side)	25 ± 4 N·m (18 ± 4 ft-lb)
Suction hose mounting nut (A/C pipe side)	13 ± 2 N·m (109 ± 21 in-lb)

TSB Revision
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**GENERAL SPECIFICATIONS**

M1552000200057

ITEMS			MANUAL HEATER	MANUAL AIR CONDITIONING
Heater/cooler unit			Full-air mix type providing stratified cool and warm air flows	Full-air mix type providing stratified cool and warm air flows
Heater control			Dial type	Dial type
Air conditioning switch			-	Push-button type
Compressor			-	MSC90C (Scroll type)
Dual pressure switch kPa (psi)	High-pressure switch	ON → OFF	-	2,942 (426.7)
		OFF → ON	-	2,354 (341.4)
	Low-pressure switch	ON → OFF	-	196 (28.4)
		OFF → ON	-	221 (32.1)
Refrigerant	Type	-		R134a (HFC-134a)
	Amount g (oz)	-		Approximately 670 – 710 (14.6 – 15.3)

**SERVICE SPECIFICATIONS**

M1552000300076

ITEMS		STANDARD VALUE
Idle speed r/min	2.4L engine	750 ± 100*
	3.0L engine	700 ± 100*
Idle-up speed r/min		850 ± 100*
Resistor (for blower motor) Ω	LO	2.3
	ML	1.1
	MH	0.4
Air gap (magnetic clutch) mm (in)	2.4L engine	0.3 – 0.5 (0.012 – 0.020)
	3.0L engine	0.4 – 0.6 (0.016 – 0.024)

*NOTE: The rpm marked by an asterisk should be checked 4 minutes after idling begins.*

**LUBRICANTS**

M1552000400073

ITEMS	SPECIFIED LUBRICANTS	QUANTITY
Each connection of refrigerant line	SUN PAG 56	As required
Compressor refrigerant unit lubricant cm <sup>3</sup> (floz)	SUN PAG 56	140 (4.7)

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## NOTES