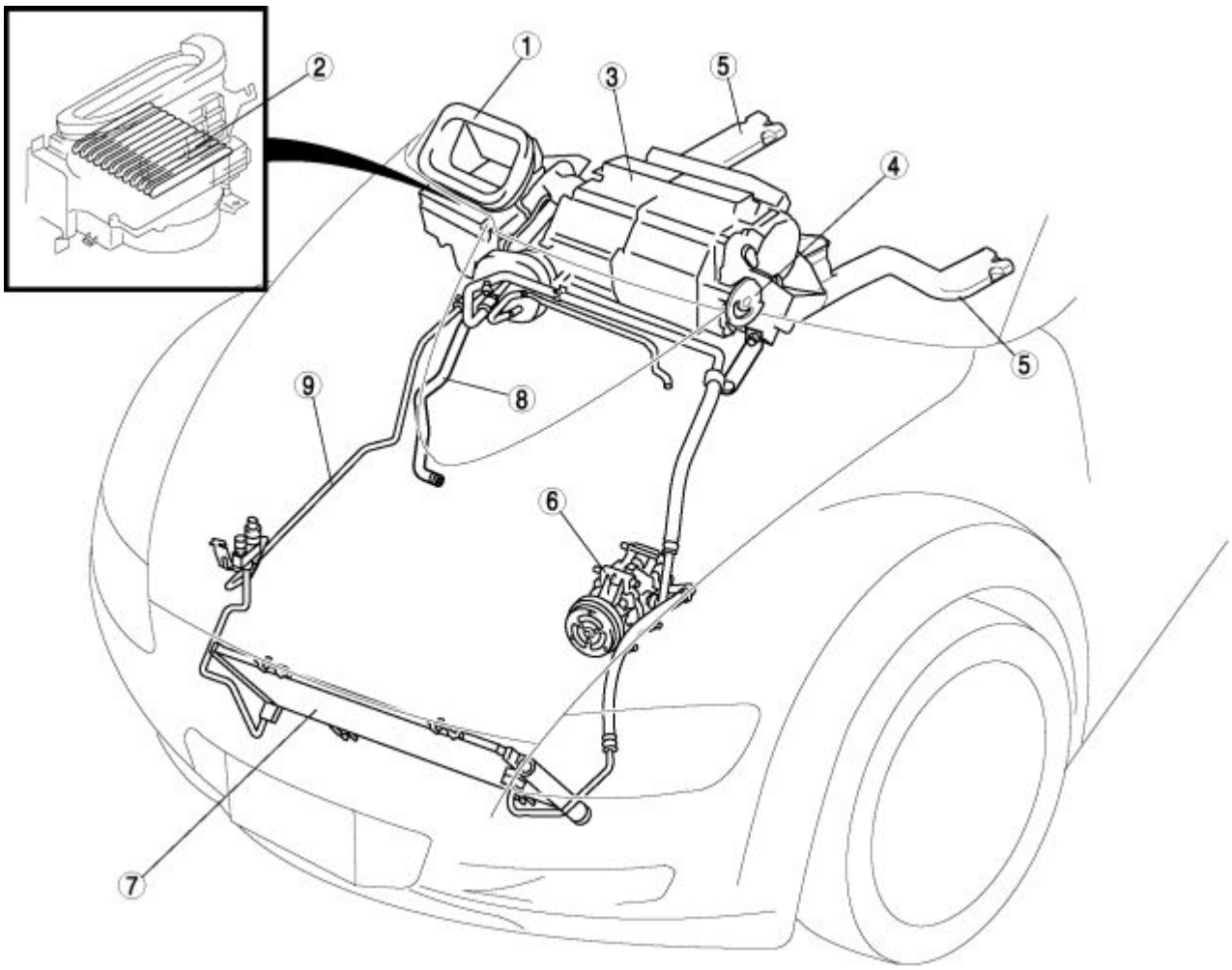
HVAC

HVAC SYSTEM

(w)



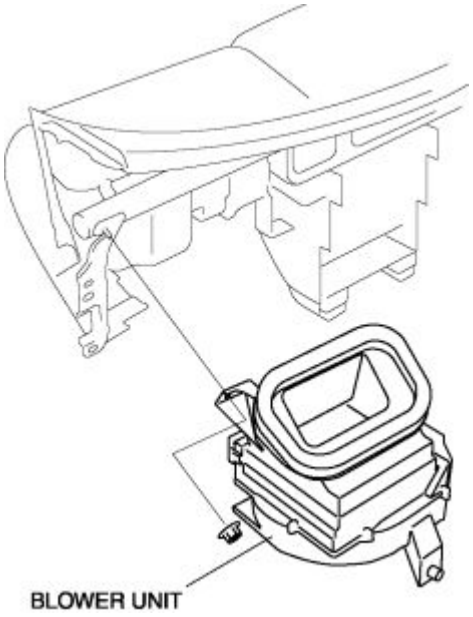
1	Blower unit (See BLOWER UNIT REMOVAL/INSTALLATION .) (See BLOWER UNIT DISASSEMBLY/ASSEMBLY .)
2	Air filter (See AIR FILTER REMOVAL/INSTALLATION .) (See AIR FILTER INSPECTION .)
3	A/C unit (See A/C UNIT REMOVAL/INSTALLATION .)

	(See A/C UNIT DISASSEMBLY/ASSEMBLY .) (See EVAPORATOR INSPECTION .) (See HEATER CORE INSPECTION .)
4	Airflow mode main link (See AIRFLOW MODE MAIN LINK REMOVAL/INSTALLATION .)
5	Rear heat duct (See REAR HEAT DUCT REMOVAL/INSTALLATION .)
6	A/C compressor (See A/C COMPRESSOR REMOVAL/INSTALLATION .)
7	Condenser (See CONDENSER REMOVAL/INSTALLATION .) (See CONDENSER INSPECTION .)
8	Heater hose
9	Refrigerant line (See REFRIGERANT LINE REMOVAL/INSTALLATION .)

BLOWER UNIT

BLOWER UNIT REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Remove the following parts:
    a. Ashtray
    b. Console (See CONSOLE REMOVAL/INSTALLATION .)
    c. Glove compartment (See GLOVE COMPARTMENT REMOVAL/INSTALLATION .)
    d. Side panel (See SIDE PANEL REMOVAL/INSTALLATION .)
    e. Lower panel (See LOWER PANEL REMOVAL/INSTALLATION .)
    f. Column cover (See COLUMN COVER REMOVAL/INSTALLATION .)
    g. Steering shaft installation nuts (See STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION .)
    h. A-pillar trim (See A-PILLAR TRIM REMOVAL/INSTALLATION .)
    i. Dashboard (See DASHBOARD REMOVAL/INSTALLATION .)
3. Remove the A/C unit from the dashboard.
4. Remove the blower unit as shown in the figure.



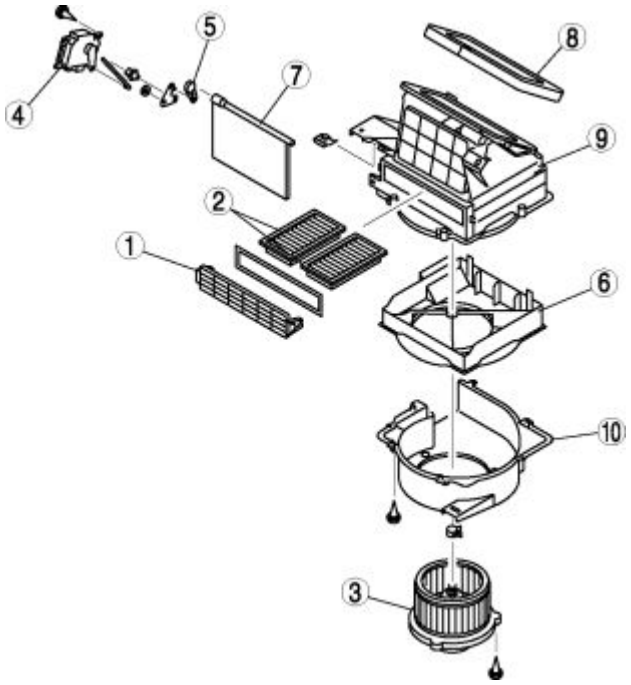
5. Install in the reverse order of removal.

BLOWER UNIT DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.

CAUTION:

- If a non-specified grease is used, it may result in abnormal noise or improper operation of the links. Apply only the specified grease to each link.



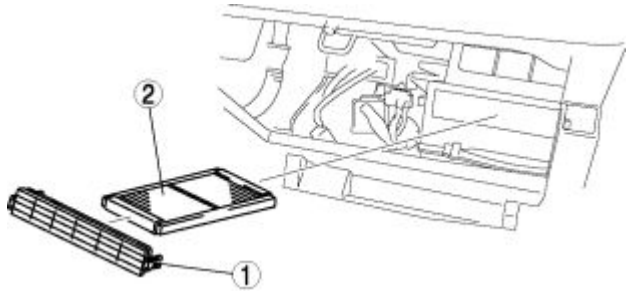
1	Air filter cover
2	Air filter
3	Blower motor
4	Air intake actuator
5	Air intake link
6	Plate
7	Air intake door
8	Adhesive polyurethane
9	Blower case (1)
10	Blower case (2)

2. Assemble in the reverse order of disassembly.

AIR FILTER

AIR FILTER REMOVAL/INSTALLATION

1. Remove the glove compartment.
2. Remove in the order indicated in the table.



1	Air filter cover
2	Air filter

3. Install in the reverse order of removal.

AIR FILTER INSPECTION

1. Verify that there is no damage, excessive dirt or abnormal odor on the air filter.
    - If there is any malfunction, replace the air filter.

NOTE:

- The air filter is replaced **once a year** or every **20,000 km {12,500 miles}** .
- The air filter cannot be reused by cleaning it with water or compressed air.

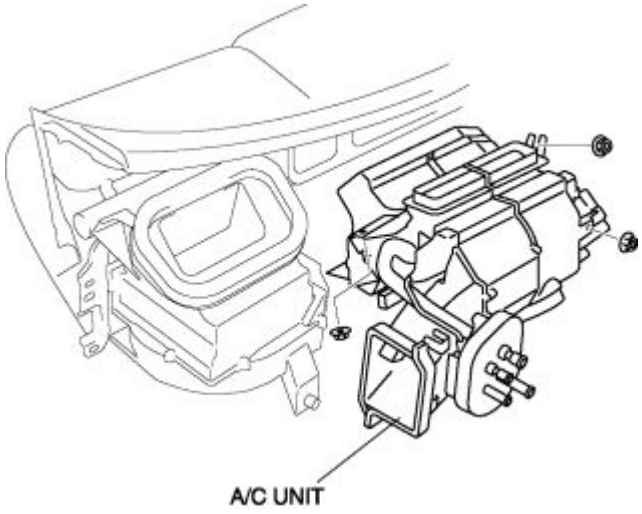
A/C UNIT

A/C UNIT REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Discharge the refrigerant from the system. (See REFRIGERANT CHARGING .)
3. Drain the engine coolant. (See ENGINE COOLANT REPLACEMENT .)
4. Remove the following parts:
    a. Ashtray
    b. Console (See CONSOLE REMOVAL/INSTALLATION .)
    c. Glove compartment (See GLOVE COMPARTMENT REMOVAL/INSTALLATION .)
    d. Side panel (See SIDE PANEL REMOVAL/INSTALLATION .)
    e. Lower panel (See LOWER PANEL REMOVAL/INSTALLATION .)
    f. Column cover (See COLUMN COVER REMOVAL/INSTALLATION .)
    g. Steering shaft installation nuts (See STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION .)
    h. A-pillar trim (See A-PILLAR TRIM REMOVAL/INSTALLATION .)
    i. Dashboard (See DASHBOARD REMOVAL/INSTALLATION .)

    CAUTION:

    - If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise or other malfunction could occur. Always plug open fittings immediately after removing any refrigeration cycle parts.
5. Remove the A/C unit as shown in the figure.
6. Install in the reverse order of removal.



7. Perform the refrigerant system performance test. (See REFRIGERANT SYSTEM PERFORMANCE TEST .)

A/C Unit Installation Note

1. When installing a new A/C unit or evaporator, add compressor oil to the refrigerant cycle.

    Supplemental amount (approx. quantity)

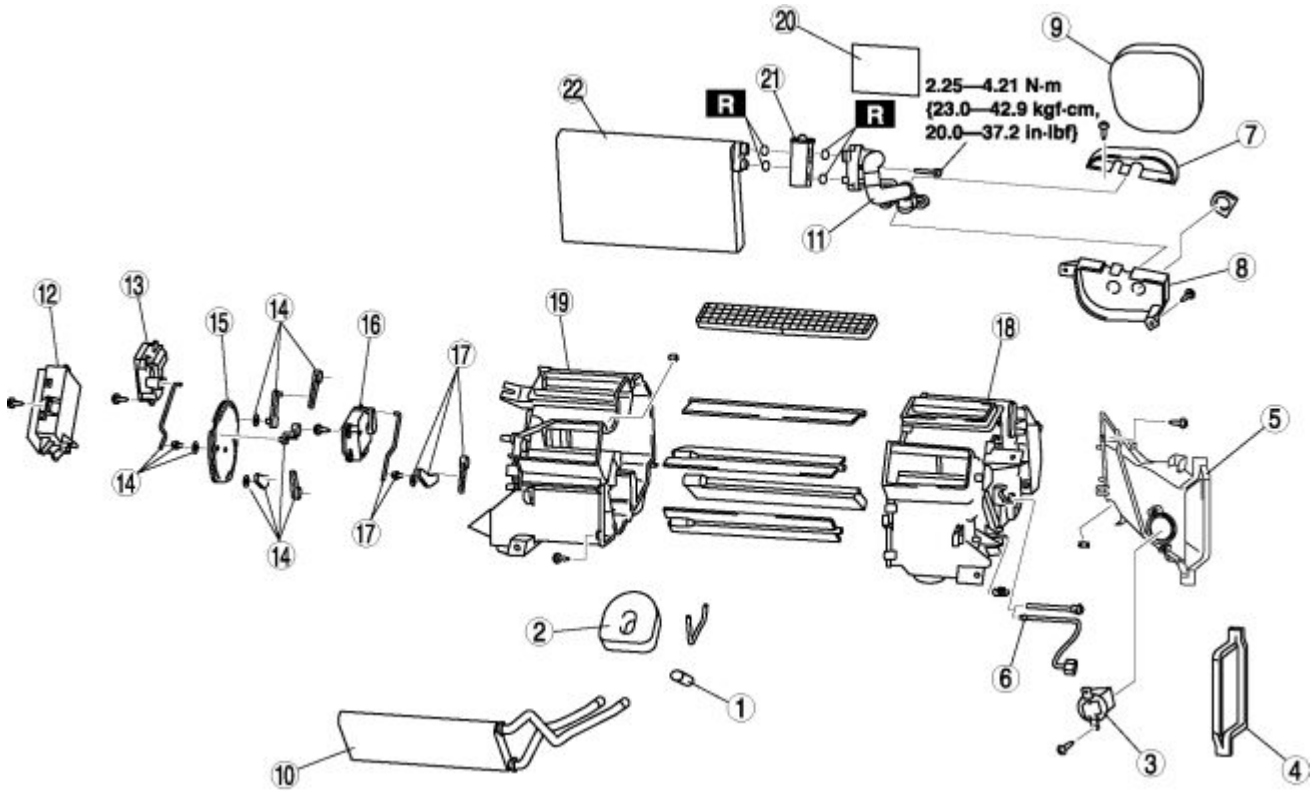
- 20 ml {20 cc, 0.7 fl oz}

A/C UNIT DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.

   CAUTION:

   - If a non-specified grease is used, it may result in abnormal noise or improper operation of the links. Apply only the specified grease to each link.
2. Assemble in the reverse order of disassembly.



1	Drain hose
2	Polyurethane foam (1)
3	Resistor
4	Adhesive polyurethane (1)
5	Air duct
6	Evaporator temperature sensor
7	Polyurethane foam (2)
8	Bracket (1)
9	Bracket (2)
10	Heater core
11	Evaporator pipe
12	A/C amplifier
13	Airflow mode actuator

14	Airflow mode link set
15	Airflow mode main link
16	Air mix actuator
17	Air mix link set
18	A/C case (1)
19	A/C case (2)
20	Adhesive polyurethane (2)
21	Expansion valve
22	Evaporator

Notes:

EVAPORATOR

EVAPORATOR INSPECTION

1. Inspect the evaporator for damage, cracks and oil leakage.
    - If there is any malfunction, replace the evaporator.
2. Visually inspect the fins for bending.
    - If there is any bending, use the end of a flathead screwdriver to straighten the fins.

HEATER CORE

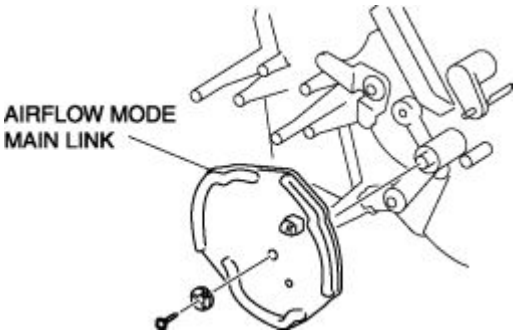
HEATER CORE INSPECTION

1. Inspect the heater core for damage, cracks and water leakage.
    - If there is any malfunction, replace the heater core.
2. Visually inspect the fins for bending.
    - If there is any bending, use the end of a flathead screwdriver to straighten the fins.
3. Visually inspect the heater hose for deformation.
    - Repair with pliers if there is deformation. If there is any malfunction, replace the heater core.

AIRFLOW MODE MAIN LINK

AIRFLOW MODE MAIN LINK REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Remove the A/C amplifier.
3. Remove the airflow mode link set.
4. Remove the airflow mode main link as shown in the figure.

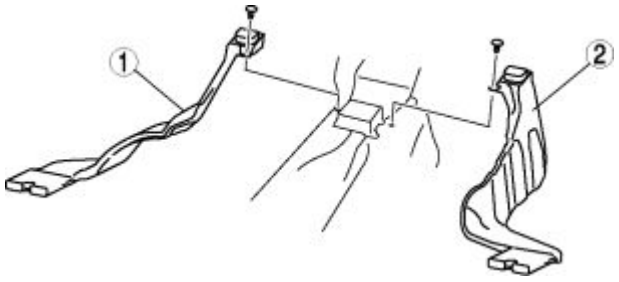


5. Install in the reverse order of removal.

REAR HEAT DUCT

REAR HEAT DUCT REMOVAL/INSTALLATION

1. Remove the following parts:
    a. Front seat (See FRONT SEAT REMOVAL/INSTALLATION .)
    b. Rear seat (See REAR SEAT REMOVAL/INSTALLATION .)
    c. Inner scuff plate (See INNER SCUFF PLATE REMOVAL/INSTALLATION .)
    d. Ashtray illumination bulb (See ASHTRAY ILLUMINATION BULB REMOVAL/INSTALLATION .)
    e. Console (See CONSOLE REMOVAL/INSTALLATION .)
    f. Front side trim (See FRONT SIDE TRIM REMOVAL/INSTALLATION .)
    g. Tire house trim (See TIRE HOUSE TRIM REMOVAL/INSTALLATION .)
    h. Seat belt rail (See FRONT SEAT BELT REMOVAL/INSTALLATION .)
    i. Floor covering (See FLOOR COVERING REMOVAL/INSTALLATION .)
2. Remove in the order indicated in the table.



1	Rear heat duct (LH)
2	Rear heat duct (RH)

3. Install in the reverse order of removal.

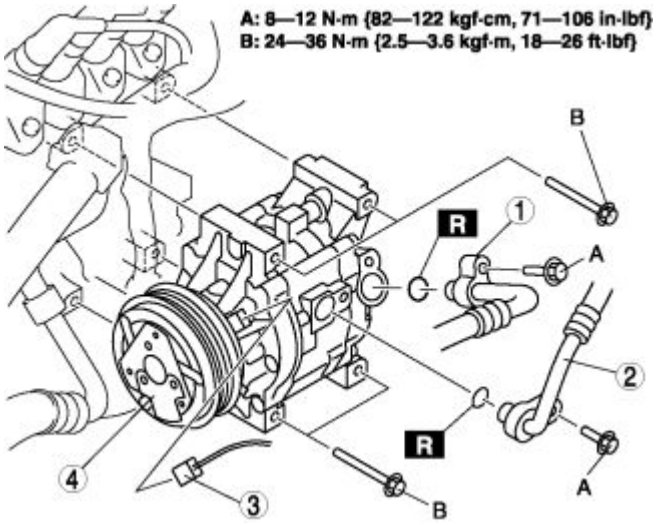
A/C COMPRESSOR

A/C COMPRESSOR REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Discharge the refrigerant from the system. (See REFRIGERANT CHARGING .)
3. Remove the fresh-air duct and air cleaner. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION .)
4. Remove the drive belt. (See DRIVE BELT REPLACEMENT .)
5. Do not allow remaining compressor oil in the A/C compressor and pipes to spill, and remove in the order indicated in the table.

CAUTION:

- If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise or other malfunction could occur.Always plug open fittings immediately after removing any refrigeration cycle parts.



1	Cooler hose (HI) (See Refrigerant Line Removal Note .) (See Refrigerant Line Installation Note .)
2	Cooler hose (LO) (See Refrigerant Line Removal Note .) (See Refrigerant Line Installation Note .)
3	A/C compressor connector
4	A/C compressor (See A/C Compressor Installation Note .)

6. Install in the reverse order of removal.

7. Perform the refrigerant system performance test. (See REFRIGERANT SYSTEM PERFORMANCE TEST .)

A/C Compressor Installation Note

1. When replacing the A/C compressor, remove the following amount of compressor oil from the new A/C compressor.

   Amount drained (approx. quantity)

   - 60 ml {60 cc, 2.03 fl oz} - (Oil amount drained from removed old A/C compressor + 15 ml {15 cc, 0.5 fl oz})

Notes:

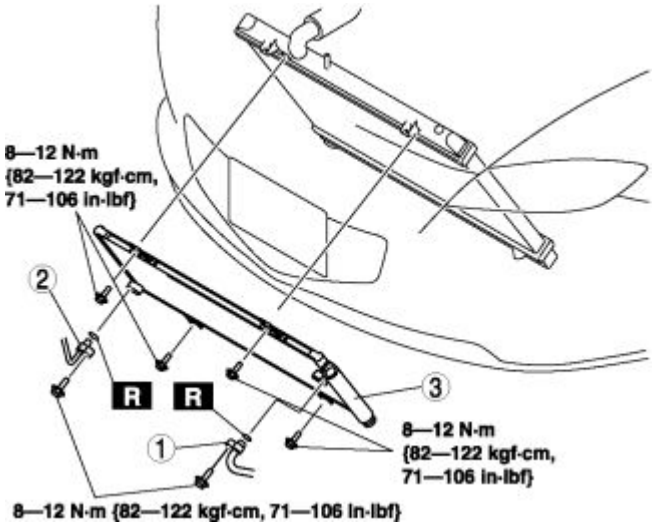
CONDENSER

CONDENSER REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Discharge the refrigerant from the system. (See REFRIGERANT CHARGING .)
3. Drain the engine coolant. (See ENGINE COOLANT REPLACEMENT .)
4. Remove the under cover.
5. Do not allow remaining compressor oil in the condenser and pipes to spill, and remove in the order indicated in the table.

CAUTION:

- If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise or other malfunction could occur. Always plug open fittings immediately after removing any refrigeration cycle parts.



1	Cooler hose (HI) (See Refrigerant Line Removal Note .) (See Refrigerant Line Installation Note .)
2	Cooler pipe No.1 (See Refrigerant Line Removal Note .) (See Refrigerant Line Installation Note .)
3	Condenser (See Condenser Installation Note .)

6. Install in the reverse order of removal.
7. Perform the refrigerant system performance test. (See REFRIGERANT SYSTEM PERFORMANCE TEST .)

Condenser Installation Note

1. When replacing the new condenser, add compressor oil to the refrigeration cycle.

   Supplemental amount (approx. quantity)

   - 20 ml {20cc, 0.7 fl oz}

CONDENSER INSPECTION

1. Inspect the condenser for cracks, damage, and oil leakage.
   - If there is any malfunction, replace the condenser.
2. Visually inspect the fins for clogging of foreign material.
   - If any fins are clogged, remove the foreign material.
3. Visually inspect the fins for bending.
   - If there is any bending, use the end of a flathead screwdriver to straighten fins.

Notes:

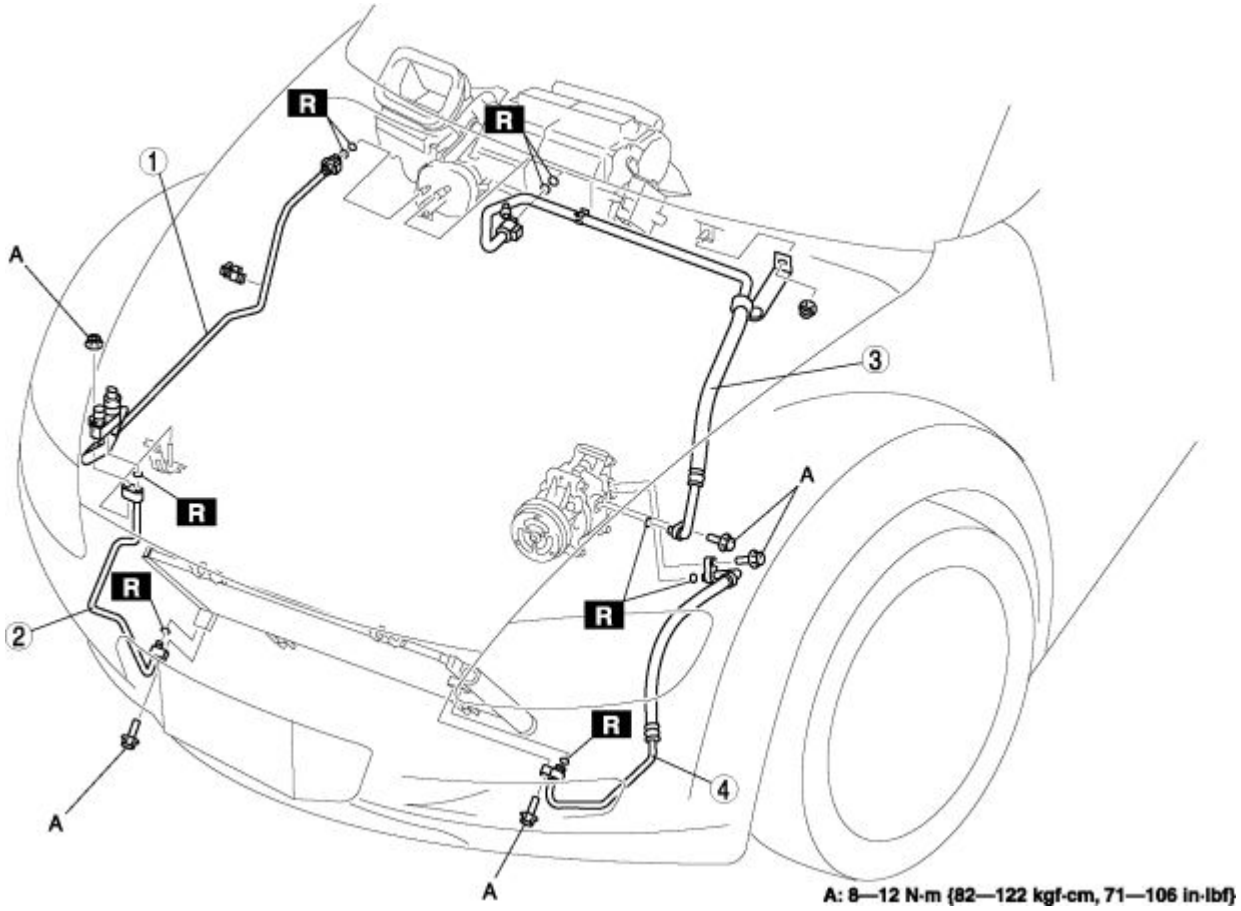
REFRIGERANT LINES

REFRIGERANT LINE REMOVAL/INSTALLATION

1. Remove the battery.
2. Remove the fresh-air duct and air cleaner. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION .)
3. Discharge the refrigerant from the system. (See REFRIGERANT CHARGING .)
4. Remove the front side marker light. (See FRONT SIDE MARKER LIGHT REMOVAL/INSTALLATION .)
5. Remove the front bumper. (See FRONT BUMPER REMOVAL/INSTALLATION .)
6. Remove the drive belt. (See DRIVE BELT REPLACEMENT .)
7. Do not allow remaining compressor oil in the piping and connecting parts to spill, and remove in the order indicated in the table.

CAUTION:

- If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise or other malfunction could occur. Always plug open fittings immediately after removing any refrigeration cycle parts.



1	Cooler pipe No.2 (See Refrigerant Line Removal Note .)

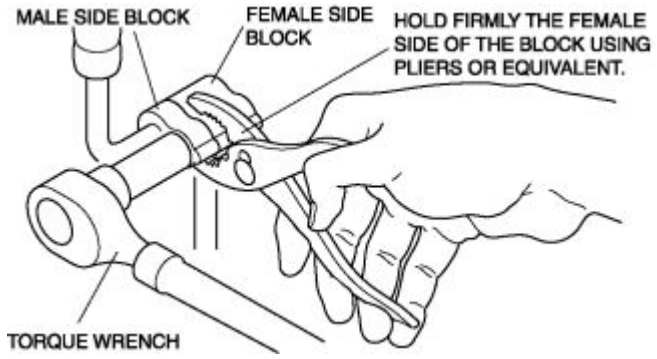
	(See Refrigerant Line Installation Note .)
2	Cooler pipe No.1 (See Refrigerant Line Removal Note .) (See Refrigerant Line Installation Note .)
3	Cooler hose (LO) (See Refrigerant Line Removal Note .) (See Refrigerant Line Installation Note .)
4	Cooler hose (HI) (See Refrigerant Line Removal Note .) (See Refrigerant Line Installation Note .)

8. Install in the reverse order of removal.
9. Perform the refrigerant system performance test. (See REFRIGERANT SYSTEM PERFORMANCE TEST .)

Refrigerant Line Removal Note

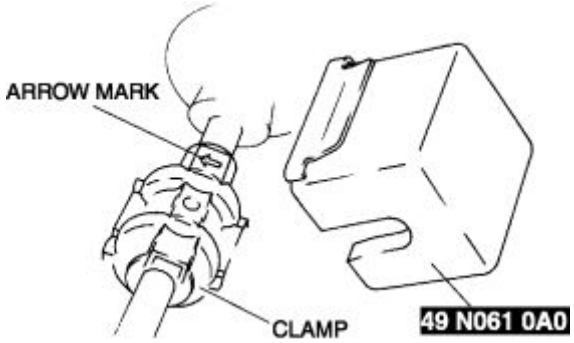
Block joint type

1. Disconnect the block joint type pipes by grasping the female side of the block with pliers or similar tool and holding firmly, and then remove the connection bolt or nut.



Quick joint type

1. Install the **SST (49 N061 0A0)** to the arrow side of the clamp.

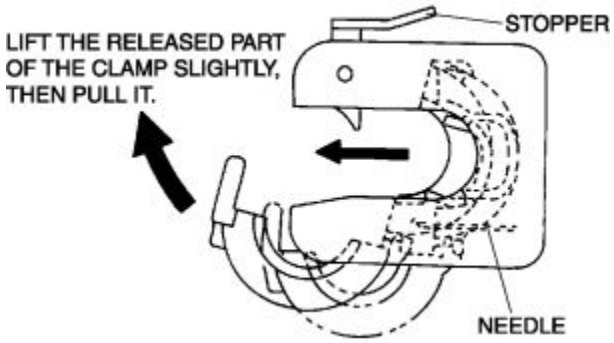


2. Push the **SST (49 N061 0A0)** with your thumb until it snaps into the clamp.

CAUTION:

- Excessive force to the SST (49 N061 0A0) may damage the clamp. Be careful not to press hard when inserting the SST (49 N061 0A0) into the clamp.

3. Raise the stopper, and pull the **SST (49 N061 0A0)** from the piping.



4. Remove the **SST (49 N061 0A0)** from the clamp.

CAUTION:

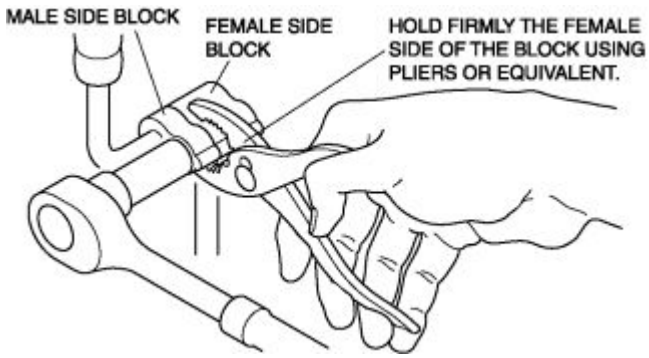
- Be careful not to bend the SST (49 N061 0A0) needle when removing the clamp. If the SST (49 N061 0A0) needle is bent, the clamp can not be opened.

Refrigerant Line Installation Note

1. Apply compressor oil to the O-ring joints.
2. Tighten the piping joints.

Block joint type

1. Temporarily tighten the joint bolt by hand.
2. Connect the block joint type pipes by grasping the female side of the block with pliers or similar tool and holding firmly, and then tighten the connection bolt or nut with a torque wrench.



Notes:

AIR INTAKE ACTUATOR

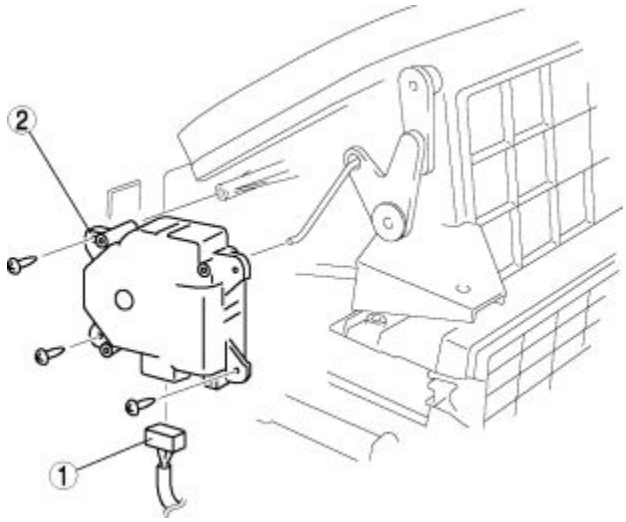
AIR INTAKE ACTUATOR REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.

2. Remove the glove compartment. (See GLOVE COMPARTMENT REMOVAL/INSTALLATION .)

3. Remove the keyless control module. (See KEYLESS CONTROL MODULE REMOVAL/INSTALLATION .)

4. Remove in the order indicated in the table.

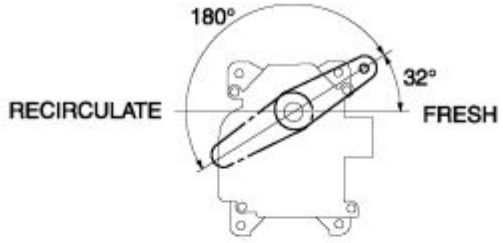


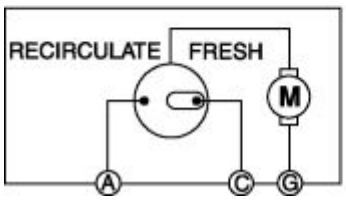
1	Air intake actuator connector
2	Air intake actuator

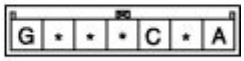
5. Install in the reverse order of removal.

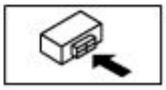
AIR INTAKE ACTUATOR INSPECTION

1. Connect battery positive voltage to air intake actuator terminal A (or C), and ground to terminal C (or A), and then verify that the air intake actuator operates as shown in the table.
   - If the operation condition is not normal, replace the air intake actuator.









Terminal		Air intake actuator operation
A	C	
Ground	B+	FRESH→RECIRCULATE
B+	Ground	RECIRCULATE→FRESH

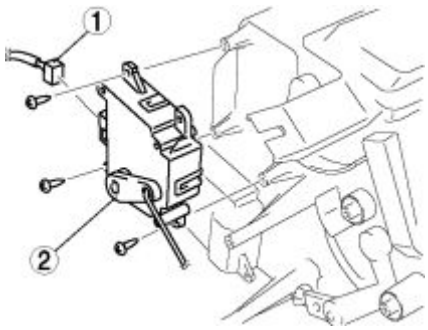
AIR MIX ACTUATOR

AIR MIX ACTUATOR REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.

2. Remove the A/C amplifier.

3. Remove in the order indicated in the table.

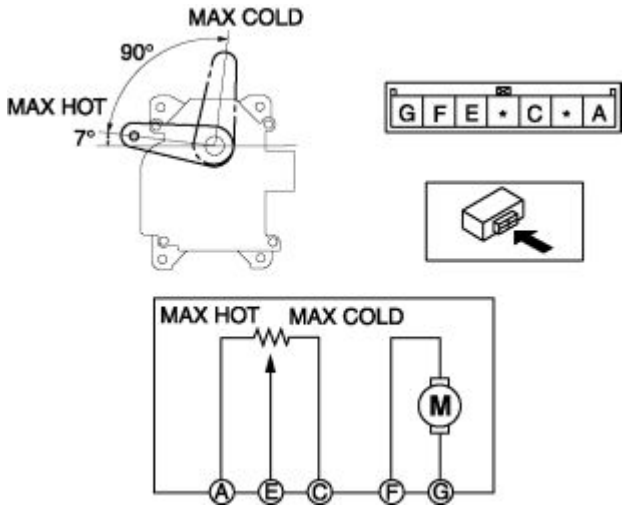


1	Air mix actuator connector
2	Air mix actuator

4. Install in the reverse order of removal.

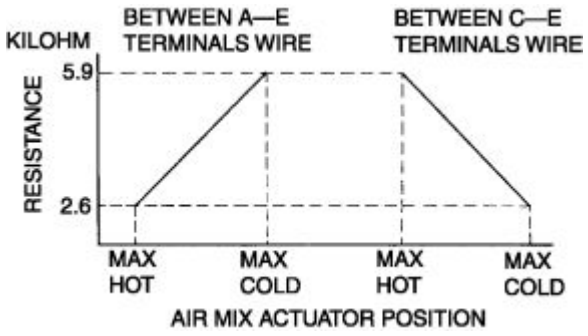
AIR MIX ACTUATOR INSPECTION

1. Connect battery positive voltage to air mix actuator terminal F (or G), and ground to terminal G (or F), and then verify that the air mix actuator operates as shown in the table.
    - If the operation condition is not normal, replace the air mix actuator.



Terminal		Air mix actuator operation
F	G	
B+	Ground	COLD→HOT
Ground	B+	HOT→COLD

2. Verify that the resistance between terminals A and E, and C and E matches the air mix actuator operation as shown in the graph.
    - If the operation condition and resistance are not normal, replace the air mix actuator.

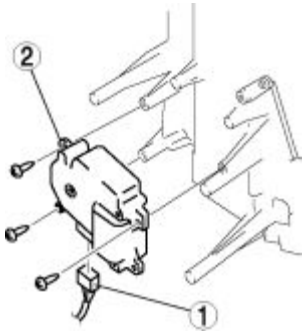


AIRFLOW MODE ACTUATOR

AIRFLOW MODE ACTUATOR REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.

2. Remove in the order indicated in the table.

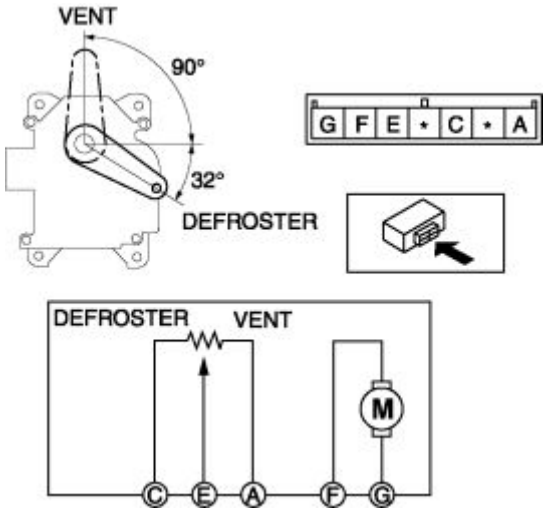


1	Airflow mode actuator connector
2	Airflow mode actuator

3. Install in the reverse order of removal.

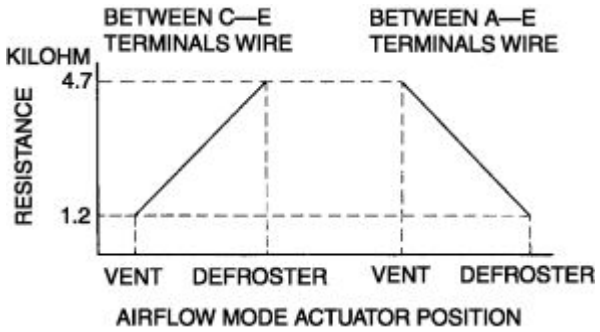
AIRFLOW MODE ACTUATOR INSPECTION

1. Connect battery positive voltage to airflow mode actuator terminal F (or G), and ground to terminal G (or F), and then verify that the airflow mode actuator operates as shown in the table.
    - If the operation condition is not normal, replace the airflow mode actuator.



Terminal		Airflow mode actuator operation
F	G	
B+	Ground	DEFROSTER→VENT
Ground	B+	VENT→DEFROSTER

2. Verify that the resistance between terminals A and E, and C and E matches the airflow mode actuator operation as shown in the graph.
    - If the operation condition and resistance are not normal, replace the airflow mode actuator.

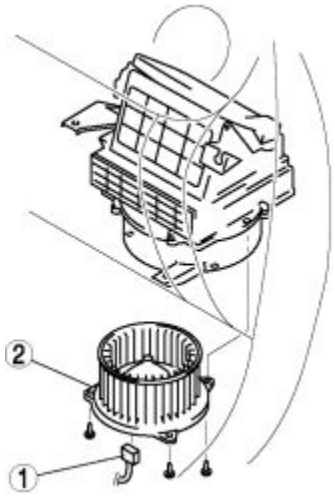


BLOWER MOTOR

BLOWER MOTOR REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.

2. Remove in the order indicated in the table.

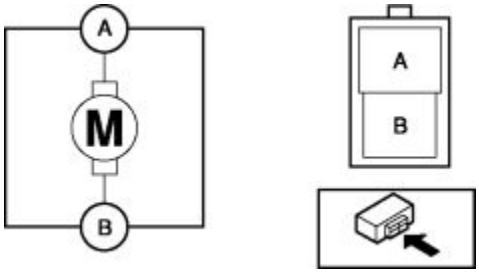


1	Blower motor connector
2	Blower motor

3. Install in the reverse order of removal.

BLOWER MOTOR INSPECTION

1. Connect battery positive voltage to blower motor terminal A, ground to terminal B, and then verify that the blower motor operates smoothly.
    - If the operation condition is not normal, replace the blower motor.



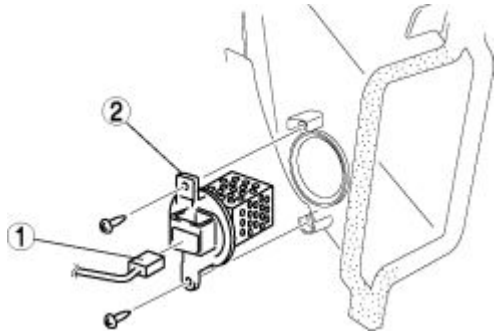
POWER

RESISTOR REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.

2. Remove the glove compartment. (See GLOVE COMPARTMENT REMOVAL/INSTALLATION .)

3. Remove in the order indicated in the table.

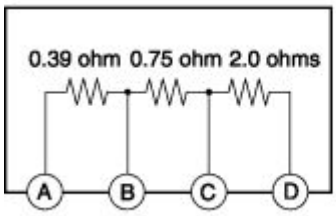


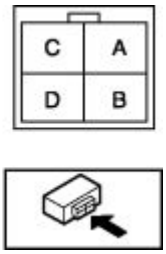
1	Resistor connector
2	Resistor

4. Install in the reverse order of removal.

RESISTOR INSPECTION

1. Verify that the resistance between the resistor terminals is as indicated in the table.
    - If there is any malfunction, replace the resistor.





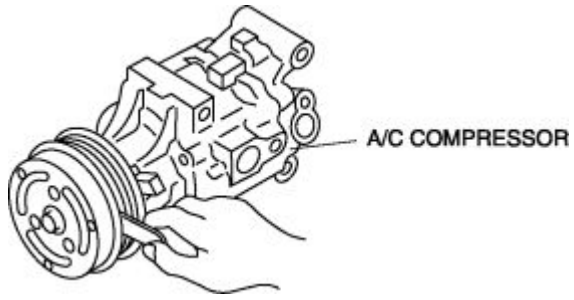
Terminal	Resistance (ohm)
A—B	0.39
A—C	1.14
A—D	3.14

Notes:

MAGNETIC CLUTCH

MAGNETIC CLUTCH ADJUSTMENT

1. Measure the clearance around the entire circumference between the pressure plate and A/C compressor pulley using a feeler gauge.



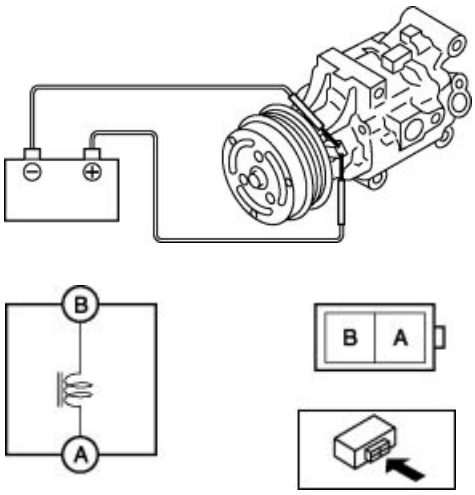
2. Inspect the clearance.
   - If not within the specification, adjust the clearance by changing the shim **(0.2 mm {0.008 in}, 0.5 mm {0.02 in})** or the number of shims.

     Standard clearance

     - 0.20—0.45 mm {0.008—0.017 in}

MAGNETIC CLUTCH INSPECTION

1. Connect battery positive voltage to magnetic clutch terminal B and ground to terminal A.



2. Verify that the magnetic clutch turns on.
   - If the magnetic clutch does not turn on, replace the A/C compressor.

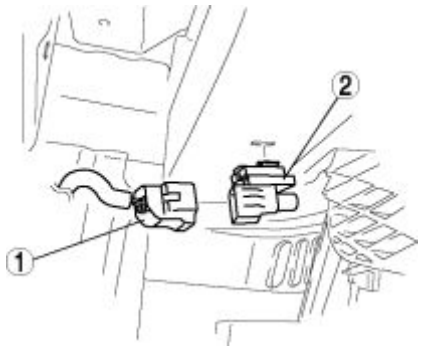
AMBIENT TEMPERATURE SENSOR

AMBIENT TEMPERATURE SENSOR REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.

2. Remove the under cover.

3. Remove in the order indicated in the table.

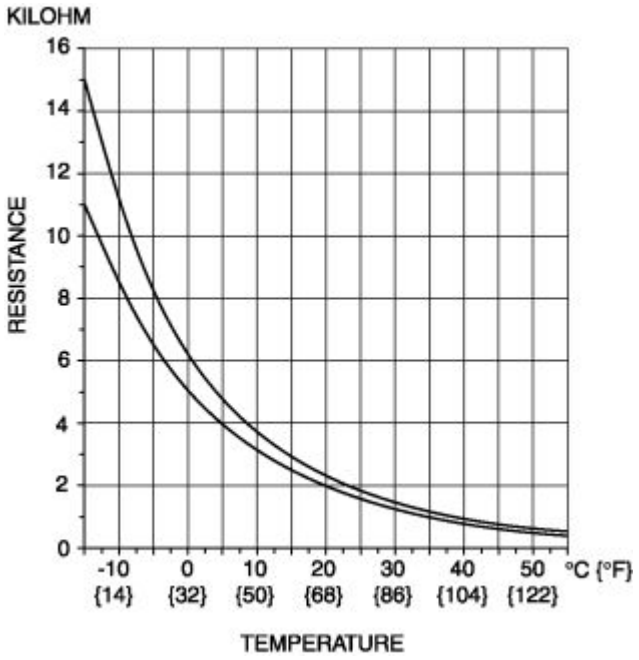


1	Ambient temperature sensor connector
2	Ambient temperature sensor

4. Install in the reverse order of removal.

AMBIENT TEMPERATURE SENSOR INSPECTION

1. Measure the temperature around the ambient temperature sensor, then measure the resistance between the terminals of the ambient temperature sensor.
   - If the characteristics of the ambient temperature sensor are not as shown in the graph, replace the ambient temperature sensor.


KILOHM
16
14
12
10
8
6
4
2
0
RESISTANCE
-10 {14}
0 {32}
10 {50}
20 {68}
30 {86}
40 {104}
50 {122}
°C {°F}
TEMPERATURE

Notes:

EVAPORATOR TEMPERATURE SENSOR

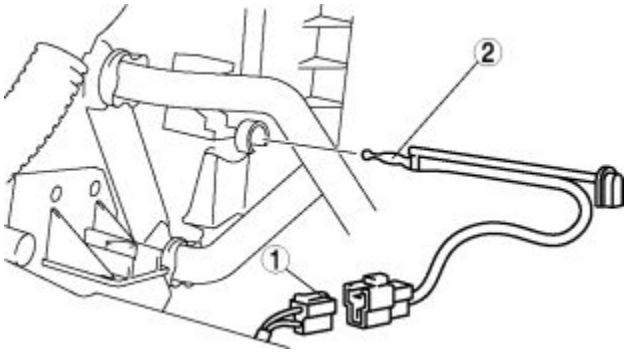
EVAPORATOR TEMPERATURE SENSOR REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.

2. Remove the glove compartment. (See GLOVE COMPARTMENT REMOVAL/INSTALLATION .)

3. Remove the keyless control module. (See KEYLESS CONTROL MODULE REMOVAL/INSTALLATION .)

4. Remove in the order indicated in the table.



1	Evaporator temperature sensor connector
2	Evaporator temperature sensor

5. Install in the reverse order of removal.

EVAPORATOR TEMPERATURE SENSOR INSPECTION

NOTE:

- Inspect the evaporator temperature sensor when it is installed to the A/C unit.

1. Set the fan switch to 4th speed.

2. Set the temperature control to MAX COLD.

3. Set the air intake mode to RECIRCULATE.

4. Turn the A/C switch off.

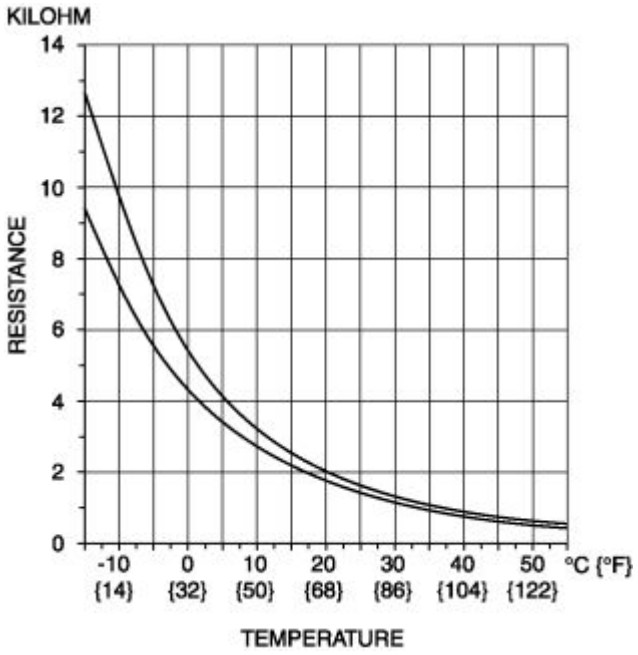
5. Close all of the doors and roll up all the windows.

6. Wait for **5 min** .

7. Disconnect the evaporator temperature sensor connector.

8. Measure the temperature at the air intake.

9. Measure the resistance between evaporator temperature sensor terminals.
    - If the characteristics of the evaporator temperature sensor are not as shown in the graph, replace the evaporator temperature sensor.


KILOHM
14
12
10
8
6
4
2
0
RESISTANCE
-10 {14}
0 {32}
10 {50}
20 {68}
30 {86}
40 {104}
50 {122}
°C {°F}
TEMPERATURE

Notes:

REFRIGERANT PRESSURE SWITCH

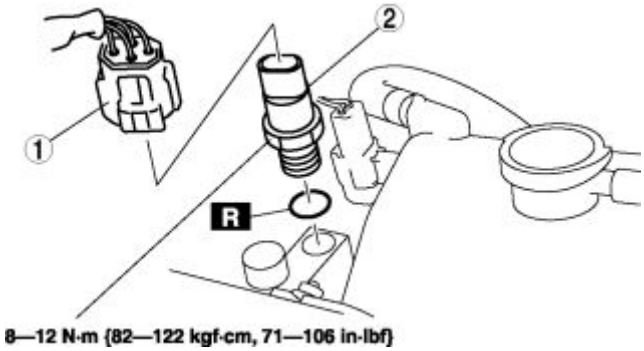
REFRIGERANT PRESSURE SWITCH REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.

2. Discharge the refrigerant from the system. (See REFRIGERANT CHARGING .)

3. Hold the piping block with pliers or a similar tool and loosen the refrigerant pressure switch using a wrench.

4. Remove in the order indicated in the table.



1	Refrigerant pressure switch connector
2	Refrigerant pressure switch (See Refrigerant Pressure Switch Installation Note .)

5. Install in the reverse order of removal.

Refrigerant Pressure Switch Installation Note

1. Apply compressor oil to the O-ring joints.

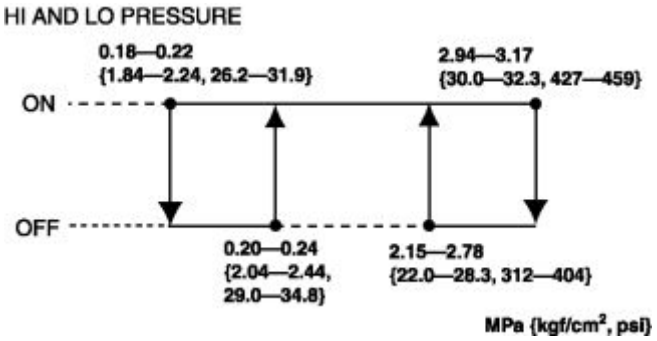
REFRIGERANT PRESSURE SWITCH INSPECTION

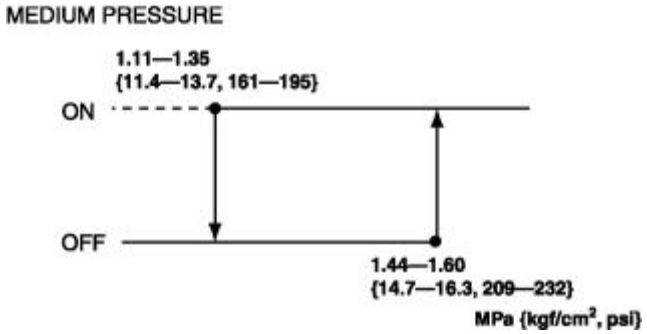
1. Connect the manifold gauge.

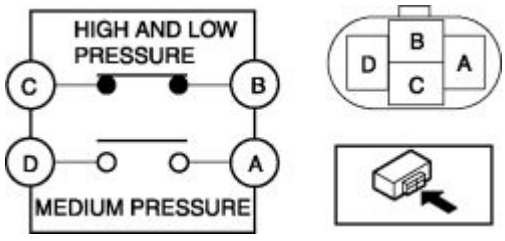
2. Verify the high-pressure side reading.

3. Disconnect the refrigerant pressure switch connector.

4. Verify continuity between the terminals of the refrigerant pressure switch.
   - If the continuity is not normal, replace the refrigerant pressure switch.







CLIMATE CONTROL UNIT

CLIMATE CONTROL UNIT REMOVAL/INSTALLATION

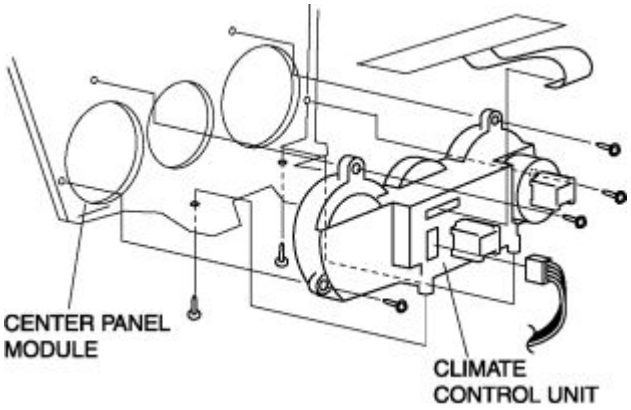
1. Disconnect the negative battery cable.

2. Remove the lower panel. (See LOWER PANEL REMOVAL/INSTALLATION .)

3. Remove the console. (See CONSOLE REMOVAL/INSTALLATION .)

4. Remove the center panel module. (See CENTER PANEL MODULE REMOVAL/INSTALLATION .)

5. Remove the climate control unit from the center panel module.



6. Install in the reverse order of removal.

CLIMATE CONTROL UNIT INSPECTION

On-board Diagnostic Test Procedure

1. Disconnect the negative battery cable.

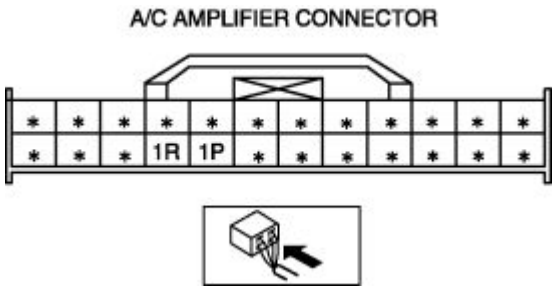
2. Remove the A/C amplifier.

3. Disconnect the A/C amplifier connector (24-pin).

4. Using a jumper wire or a similar device, short circuit A/C amplifier connector (24-pin) terminals 1P and 1R.

5. Connect the negative battery cable.

6. Turn the ignition switch to the ON position (engine off).



Output Signal Inspection

1. After performing the on-board diagnostic test procedure, inspect according to the following table:

INSPECTION	DISPLAY	ACTION	
Inspect the climate control switch indicator lights.		All indicator lights illuminate.	Output signal from the audio unit is normal.

		Except above	Replace the climate control unit. (See CLIMATE CONTROL UNIT REMOVAL/INSTALLATION .)

2. Disconnect the jumper wire or the similar device connected to the A/C amplifier connector (24-pin) to exit the on-board diagnostic test function.

Switch Inspection

1. After performing the on-board diagnostic test procedure, turn on the audio.

2. Inspect according to the following table:

STEP	INSPECTION	ACTION	
1	Press each mode switch of the climate control unit.	The buzzer sounds.	The switch is normal.
		The buzzer does not sound.	Go to the next step.
2	Inspect the audio buttons by referring to the diagnostic assist function in the on-board diagnostic system [audio].	The buzzer sounds.	Replace the climate control unit. (See CLIMATE CONTROL UNIT REMOVAL/INSTALLATION .)
		The buzzer does not sound.	Replace the base unit.

3. Disconnect the jumper wire or the similar device connected to the A/C amplifier connector (24-pin) to exit the on-board diagnostic test function.

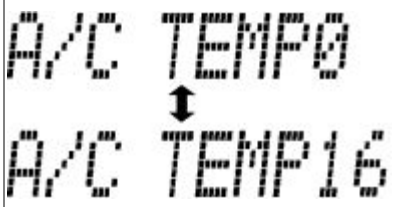
Temperature Control Dial Inspection

1. After performing the on-board diagnostic test procedure, turn on the audio.

2. Press the audio POWER and SCAN (upper) buttons simultaneously.

3. "A/C TEMP--" is displayed on the information display.

4. Inspect according to the following table:

INSPECTION	DISPLAY	ACTION	
Turn the temperature control dial.		Does the numeral on the information display change from 0 to 16?	The temperature control dial is normal.
		Except above	Replace the climate control unit. (See CLIMATE CONTROL UNIT REMOVAL/INSTALLATION .)

5. Disconnect the jumper wire or the similar device connected to the A/C amplifier connector (24-pin) to exit the on-board diagnostic test function.

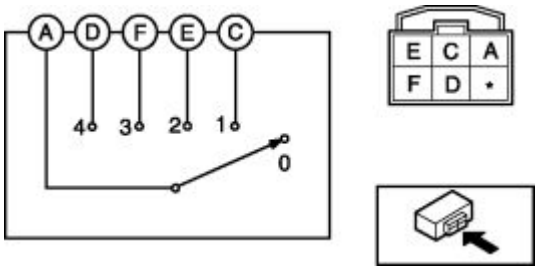
FAN SWITCH

FAN SWITCH INSPECTION

1. Inspect for continuity between the fan switch terminals using a tester.
    - If there is any malfunction, replace the fan switch.

○—○ : Continuity

Switch position	Terminal				
	A	C	D	E	F
0					
1	○	○			
2	○			○	
3	○				○
4	○		○		



A/C AMPLIFIER

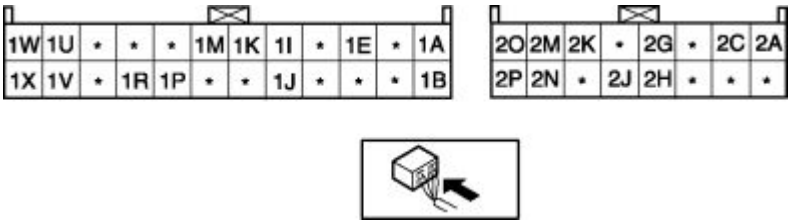
A/C AMPLIFIER INSPECTION

1. Turn the ignition switch to the ON position.

2. Connect the negative (-) lead of the tester to body ground.

3. By inserting the positive (+) lead of the tester into each A/C amplifier terminal, measure the voltage according to the terminal voltage table.
   - If there is any malfunction, inspect the parts under "Inspection item(s)".
     - If the parts under "Inspection item(s)" are found to be normal, replace the A/C amplifier.

Terminal Voltage Table (Reference)



Ter-minal	Signal name	Connected to	Measured condition	Voltage (V)	Inspection item(s)
1A	—	—	—	—	—
1B	—	—	—	—	—
1C	—	—	—	—	—
1D	—	—	—	—	—
1E	Blower motor feedback	• Resistor	Fan stopped	B+	1. Wiring harness: continuity, short circuit (A/C amplifier—resistor
			Fan switch: 1st	0.3	
			Fan switch: 2nd	1.5	
			Fan switch: 3rd	1.3	

		• Fan switch	Fan switch: 4th	0.7	(A/C amplifier—resistor, fan switch: 1E—D, C) (Blower motor—blower relay: A—C) (Blower relay—fuse: D—HEATER 40 A) 2. Resistor 3. Fan switch 4. Blower motor 5. Blower relay 6. HEATER 40 A fuse
1F	—	—	—	—	—
1G	—	—	—	—	—
1H	—	—	—	—	—
1I	Motor operation	Air intake actuator	Switched to RECIRCULATE	1.0 or less	• Wiring harness: continuity, short circuit (A/C amplifier—air intake actuator: 1I—A, 1J—C) • Air intake actuator
			Switched to FRESH	12	
1J	Motor operation	Air intake actuator	Switched to RECIRCULATE	12	• Wiring harness: continuity, short circuit (A/C amplifier—air intake actuator: 1J—C, 1I—A) • Air intake actuator
			Switched to FRESH	1.0 or less	
1K	Rear window defroster operation	Rear window defroster relay	Rear window defroster switch OFF	B+	• Wiring harness: continuity, short circuit (A/C amplifier—rear window defroster relay: 1K—E) • Rear window defroster relay

			Rear window defroster switch ON	1.0 or less	• A/C amplifier: terminal voltage (2C, 2N)
1L	—	—	—	—	—
1M	A/C	Refrigerant pressure switch	Fan stopped	B+	• Wiring harness: continuity, short circuit (A/C amplifier—refrigerant pressure switch: 1M—B) (Refrigerant pressure switch —PCM: C —4W) • Refrigerant pressure switch • PCM: terminal voltage (4W)
			Fan switch: ON and A/C switch: ON	1.0 or less	• A/C amplifier: terminal voltage (2C, 2N)
1N	—	—	—	—	—
1O	—	—	—	—	—
1P	Signal	—	—	—	—
1Q	—	—	—	—	—
1R	Signal	—	—	—	—
1S	—	—	—	—	—
1T	—	—	—	—	—
1U	Motor operation	Air mix actuator	Moving towards COLD	1.0 or less	• Wiring harness: continuity, short circuit (A/C amplifier—air mix actuator: 1U—F, 1V—G) • Air mix actuator
			Moving towards HOT	12	
1V	Motor operation	Air mix actuator	Moving towards COLD	12	

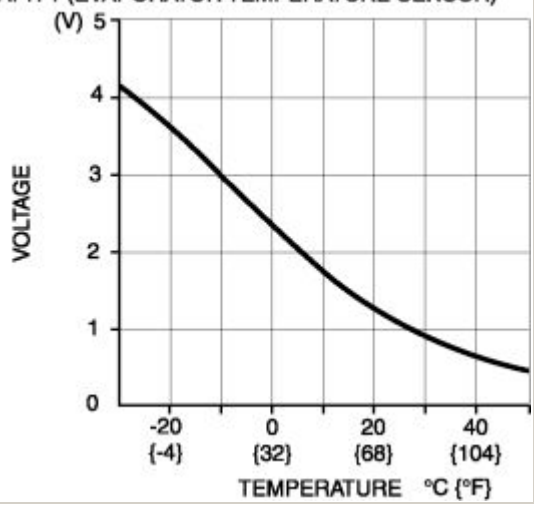
			Moving towards HOT	1.0 or less	• Wiring harness: continuity, short circuit (A/C amplifier—air mix actuator: 1U—F, 1V—G) • Air mix actuator
1W	Motor operation	Airflow mode actuator	Switched to DEFROSTER	12	• Wiring harness: continuity, short circuit (A/C amplifier—airflow mode actuator: 1W—G, 1X—F) • Airflow mode actuator
			Switched to VENT	1.0 or less	
1X	Motor operation	Airflow mode actuator	Switched to DEFROSTER	1.0 or less	• Wiring harness: continuity, short circuit (A/C amplifier—airflow mode actuator: 1W—G, 1X—F) • Airflow mode actuator
			Switched to VENT	12	
2A	B+	ROOM 15 A fuse	Under any condition	B+	• Wiring harness: continuity, short circuit (A/C amplifier—fuse: 2F—ROOM 15 A) • ROOM 15 A fuse
2B	—	—	—	—	—
2C	IG2	A/C 7.5 A fuse	IG SW ON	B+	• Wiring harness: continuity, short circuit (A/C amplifier— fuse: 2C—A/C 7.5 A) • A/C 7.5 A fuse

			IG SW LOCK	1.0 or less	• Wiring harness: continuity, short circuit (A/C amplifier—fuse: 2C—A/C 7.5 A)
2D	—	—	—	—	—
2E	—	—	—	—	—
2F	—	—	—	—	—
2G	Potentiometer input	Airflow mode actuator	VENT	4.0	• Wiring harness: continuity, short circuit (A/C amplifier—airflow mode actuator: 2G—E, 2P—C) • Airflow mode actuator • A/C amplifier: terminal voltage (2O)
			BI-LEVEL	3.3	
			HEAT	2.6	
			HEAT/DEF	1.8	
			DEFROSTER	1.0	
2H	Potentiometer input	Air mix actuator	Set temperature at MAX COLD	3.9	• Wiring harness: continuity, short circuit (A/C amplifier—air mix actuator: 2H—E, 2P—A) • Air mix actuator • A/C amplifier: terminal voltage (2O)
			Set temperature at MAX HOT	1.1	
2I	—	—	—	—	—
2J	Evaporator temperature sensor input	Evaporator temperature sensor	Compared with temperature detected by evaporator temperature sensor	Refer to graph 1	• Wiring harness: continuity (A/C amplifier—evaporator temperature sensor: 2J—B, 2P—A) • Wiring harness: short circuit (A/C amplifier—evaporator temperature sensor: 2J—B)

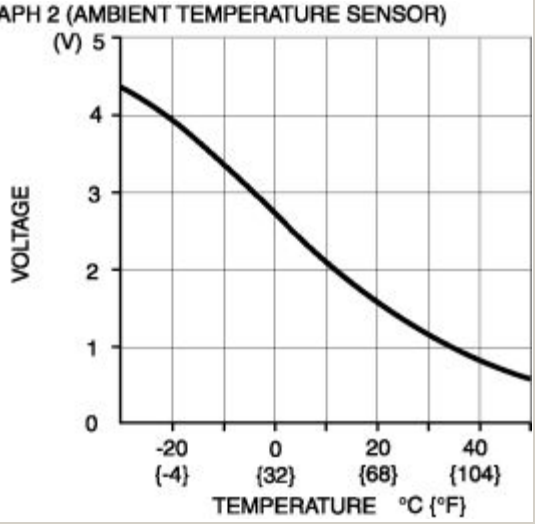
					• Evaporator temperature sensor • A/C amplifier: terminal voltage (2C, 2N)
2K	Ambient temperature sensor input	Ambient temperature sensor	Compared with temperature detected by ambient temperature sensor	Refer to graph 2	• Wiring harness: continuity (A/C amplifier—ambient temperature sensor: 2K—B, 2P—A) • Wiring harness: short circuit (A/C amplifier—ambient temperature sensor: 2K—B) • Ambient temperature sensor • A/C amplifier: terminal voltage (2C, 2N)
2L	—	—	—	—	—
2M	ECT sensor input	PCM	Compared with temperature detected by ECT sensor	Refer to graph 3	• Wiring harness: continuity, short circuit (A/C amplifier—PCM: 2M—5W) • ECT sensor • A/C amplifier: terminal voltage (2C, 2N)
2N	GND	Body ground	Under any condition	1.0 or less	• Wiring harness: continuity (A/C amplifier—GND: 2N—GND)
2O	+5 V	• Air mix actuator • Airflow mode actuator	IG SW ON	5.0	• Wiring harness: short circuit (A/C amplifier—air mix actuator, airflow mode actuator: 2O—C, A) • Air mix actuator • Airflow mode actuator • A/C amplifier: terminal voltage (2C, 2N)

			IG SW LOCK	1.0 or less	• A/C amplifier replacement
2P	Sensor GND	• Ambient temperature sensor • Evaporator temperature sensor • Air mix actuator • Airflow mode actuator	Under any condition	1.0 or less	• A/C amplifier: terminal voltage (2N)

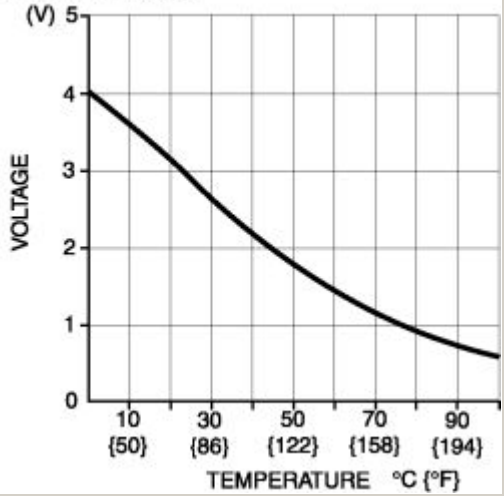
GRAPH 1 (EVAPORATOR TEMPERATURE SENSOR)



GRAPH 2 (AMBIENT TEMPERATURE SENSOR)



GRAPH 3 (ECT SENSOR)



REFRIGERANT SYSTEM

REFRIGERANT SYSTEM SERVICE WARNINGS

Using/Handling Unapproved Refrigerant

- **Using a flammable refrigerant, such as OZ-12, in this vehicle is dangerous. In an accident, the refrigerant may catch fire, resulting in serious injury or death. When servicing this vehicle, use only R-134a.**
- **Checking for system leakage on a vehicle that has been serviced with flammable refrigerant, such as OZ-12, is dangerous. Conventional leak detectors use an electronically generated arc which can ignite the refrigerant, causing serious injury or death. If a flammable refrigerant may have been used to service the system, or if you suspect a flammable refrigerant has been used, contact the local fire marshal or EPA office for information on handling the refrigerant.**

Handling Refrigerant

- **Avoid breathing air conditioning refrigerant or lubricant vapor. Exposure may irritate eyes, nose and throat. Also, due to environmental concerns, use service equipment certified to meet the requirements of SAE J2210 (R-134a recycling equipment) when draining R-134a from the air conditioning system. If accidental system discharge occurs, ventilate work area before resuming service.**
- **Do not pressure test or leak test R-134a service equipment and/or vehicle air conditioning system with compressed air. Some mixtures of air and R-134a have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information may be obtained from refrigerant manufacturers.**
- **Do not allow the refrigerant to leak near fire or any kind of heat. A poisonous gas may be generated if the refrigerant gas contacts fire or heat such as from cigarettes and heaters. When carrying out any operation that can cause refrigerant leakage, extinguish or remove the above-mentioned heat sources and maintain adequate ventilation.**
- **Handling liquid refrigerant is dangerous. A drop of it on the skin can result in localized frostbite. When handling the refrigerant, wear gloves and safety goggles. If refrigerant splashes into the eyes, immediately wash them with clean water and consult a doctor.**

Storing Refrigerant

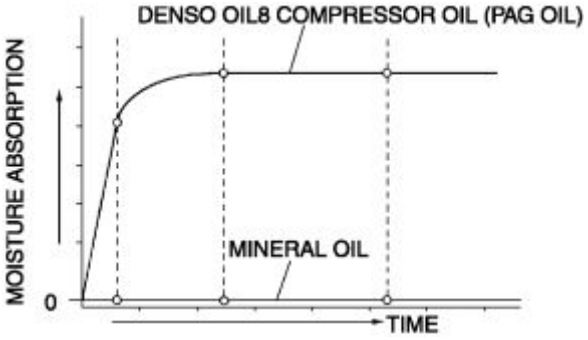
- **The refrigerant container is highly pressurized. If it is subjected to high heat, it could explode, scattering metal fragments and liquid refrigerant that can seriously injure you. Store the refrigerant at temperatures below 40 °C {104 °F}.**

REFRIGERANT SYSTEM SERVICE CAUTIONS

Handling Compressor Oil

- **Use only DENSO OIL8 compressor oil for this vehicle. Using PAG oil other than DENSO OIL8 compressor oil can damage the A/C compressor.**
- **Do not spill DENSO OIL8 compressor oil on the vehicle. A drop of compressor oil on the vehicle surface can eat away at the paint. If oil gets on the vehicle, wipe it off immediately.**

- **DENSO OIL8 compressor oil (PAG oil) has a higher moisture absorption efficiency than the previously used mineral oil. If moisture mixes with the compressor oil, the refrigerant system could be damaged. Therefore, install caps immediately after using the compressor oil or removing refrigerant system parts to prevent moisture absorption.**

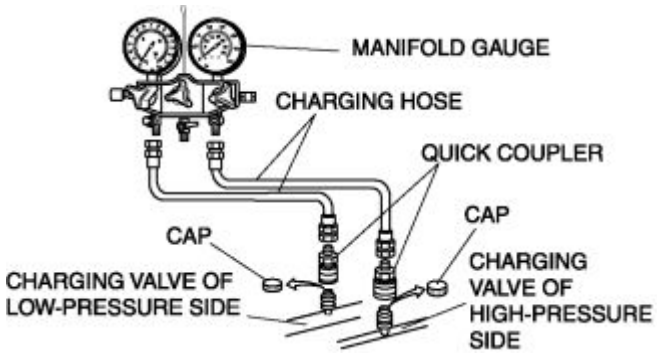


REFRIGERANT SYSTEM GENERAL PROCEDURES

Manifold Gauge Set Installation

1. Fully close the valves of the manifold gauge.

2. Connect the charging hoses to the high/low pressure side joints of the manifold gauge.



3. Connect the quick couplers to the ends of the charging hoses.

4. Connect the quick couplers to the charging valves.

REFRIGERANT SYSTEM PERFORMANCE TEST

1. Inspect the refrigerant pressure. (See REFRIGERANT PRESSURE CHECK .)

2. Place a dry-bulb thermometer in the driver-side center ventilator outlet.

3. Start the engine and after it is warmed up, run it at a constant **1,500 rpm** .

4. Set the fan switch to 4th speed.

5. Turn the A/C switch on.

6. Set to RECIRCULATE mode.

7. Set the temperature control to MAX COLD.

8. Set to VENT mode.

9. Close all the doors and windows.

10. Wait until the air conditioner output temperature stabilizes.

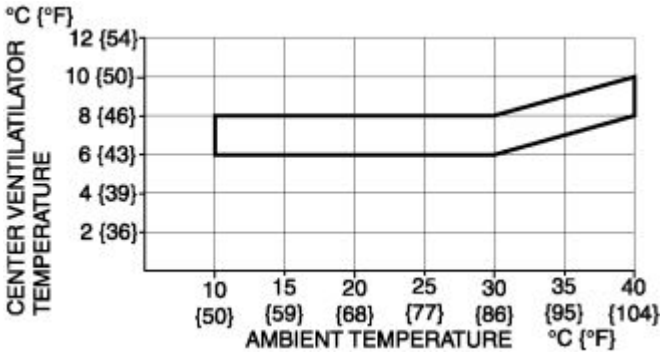
    Stabilized condition

    - The A/C compressor repeatedly turns on and off at regular intervals.

11. After the blower air is stabilized, read the dry-bulb thermometer.

12. Verify the ambient temperature.

13. Verify that the temperature reading is in the shaded zone.
    - If the there is any malfunction, inspect the refrigerant system according to the troubleshooting chart.



Notes:

REFRIGERANT

REFRIGERANT PRESSURE CHECK

1. Connect the manifold gauge.

2. Start the engine and after it is warmed up, run it at a constant **1,500 rpm** .

3. Set the fan switch to 4th speed.

4. Turn the A/C switch on.

5. Set to RECIRCULATE mode.

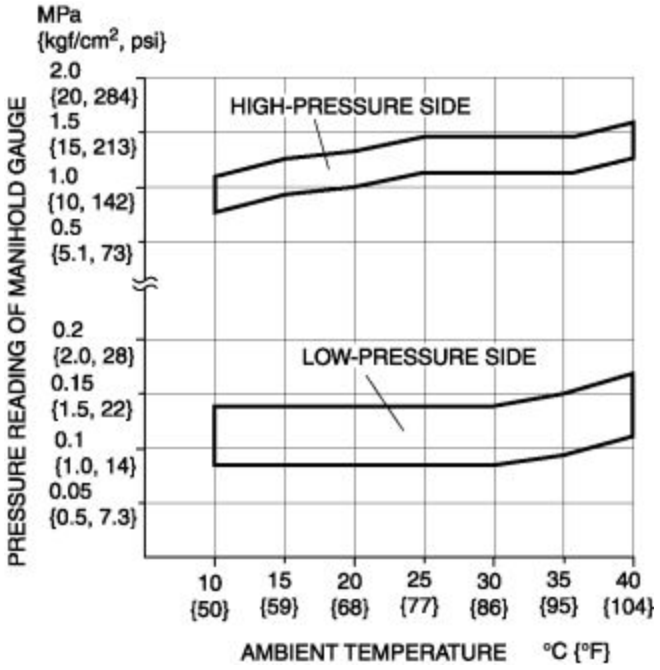
6. Set the temperature control to MAX COLD.

7. Set to VENT mode.

8. Close all the doors and all the windows.

9. Measure the manifold gauge reading and ambient temperature.

10. Verify that the high and low pressure readings are within each shaded zone.
    - If there is any malfunction, inspect the refrigerant system according to the troubleshooting chart.



REFRIGERANT RECOVERY

WARNING:

- Avoid breathing air conditioning refrigerant or lubricant vapor. Exposure may irritate eyes, nose and throat. Also, due to environmental concerns, use service equipment certified to meet the requirements of SAE J2210 (R-134a recycling equipment) when draining R-134a from the air conditioning system. If accidental system discharge occurs, ventilate work area before resuming service.

1. Connect an R-134a recovery/recycling/recharging device to the vehicle and follow the device manufacturer's instructions.

REFRIGERANT CHARGING

WARNING:

- Avoid breathing air conditioning refrigerant or lubricant vapor. Exposure may irritate eyes, nose and throat. Also, due to environmental concerns, use service equipment certified to meet the requirements of SAE J2210 (R-134a recycling equipment) when draining R-134a from the air conditioning system. If accidental system discharge occurs, ventilate work area before resuming service.

CAUTION:

- Do not exceed the specification when charging the system with refrigerant. Doing so will decrease the efficiency of the air conditioner or damage the refrigeration cycle parts.

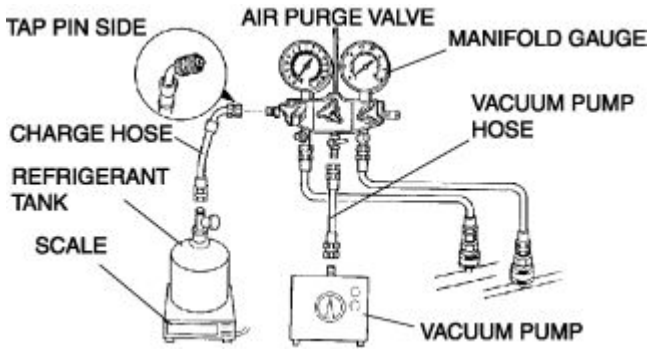
Charging Recycled R-134a Refrigerant

1. Connect an R-134a recovery/recycling/recharging device to the vehicle and follow the device manufacturer's instructions.

Charging New R-134a Refrigerant

1. Install the manifold gauge set.

2. Connect the tap pin side of the charging hose to the air purge valve of the manifold gauge.



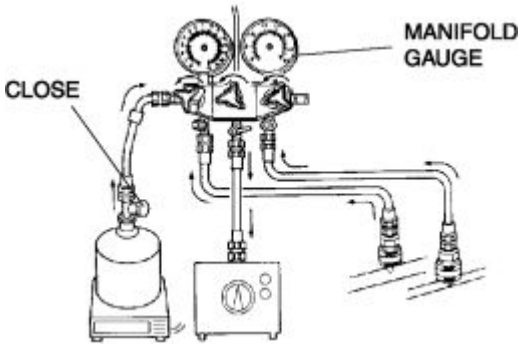
3. Connect the vacuum pump hose to the center joint of the manifold gauge.

4. Connect the vacuum pump hose to the vacuum pump.

5. Connect the charging hose to the refrigerant tank.

6. Place the refrigerant tank on the scale.

7. Open all the valves of the manifold gauge.

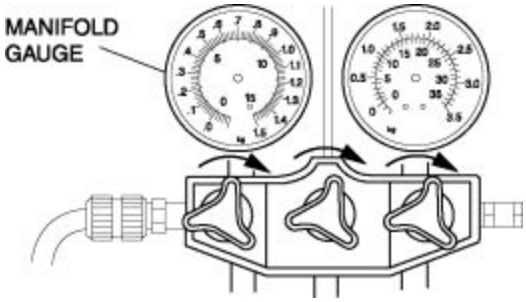


CAUTION:

- Close the manifold gauge valve immediately after stopping the vacuum pump. If the valve is left open, the vacuum pump oil will back flow into the refrigeration cycle and cause a decrease in the efficiency of the air conditioner.

8. Start the vacuum pump and let it operate for **15 min** .

9. Verify that high- and low-pressure side readings of the manifold gauge are at **–101 kPa {–760 mmHg, –29.9 inHg}** . Close each valve of the manifold gauge.



10. Stop the vacuum pump and wait for **5 min** .

11. Inspect the high- and low-pressure side readings of the manifold gauge.
    - If the reading has changed, inspect for leakage and then repeat from Step 7.
    - If the reading has not changed, go to next step.

12. Open the valve of the refrigerant tank.

13. Weigh the refrigerant tank to charge the suitable amount of refrigerant.

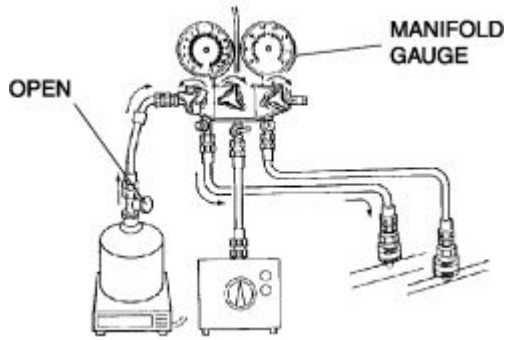
Regular amount of refrigerant (approx. quantity)

- 430 g {15.2 oz}

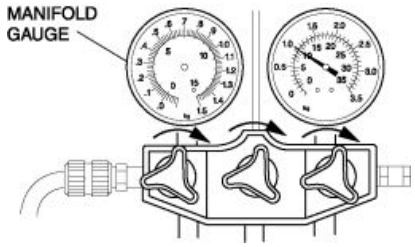
WARNING:

- If the refrigerant system is charged with a large amount of refrigerant when checking for gas leakage, and if any leakage should occur, the refrigerant will be released into the atmosphere. In order to prevent the accidental release of refrigerant which can destroy the ozone layer in the stratosphere, follow the proper procedures and charge with only a small amount of refrigerant when checking for gas leakage.
- If charging the system with refrigerant by service cans or refrigerant tank, running the engine with the high-pressure side valve open is dangerous. Pressure within the service cans or refrigerant tank will increase and they could explode, scattering metal fragments and liquid refrigerant that can seriously injure you. Therefore, do not open the high-pressure side valve while the engine is running.

14. Open the low-pressure side valve of the manifold gauge.



15. When the high-pressure side reading increases to **98 kPa {1.0 kgf/cm^2 , 14 psi}** , close the low-pressure side valve of the manifold gauge.



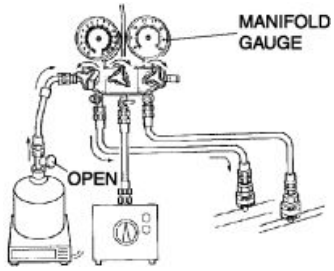
16. Inspect for leakage from the cooler pipe/hose connections using a gas leak tester.
    - If there is no leakage, go to Step 18.
    - If leakage is found at a loose joint, tighten the joint, go to next step.

17. Inspect for leakage again.
    - If there is no leakage after tightening the joint, go to next step.
    - If there is still a leakage at the same joint, discharge the refrigerant and then repair the joint. Repeat the charging procedure from Step 7.

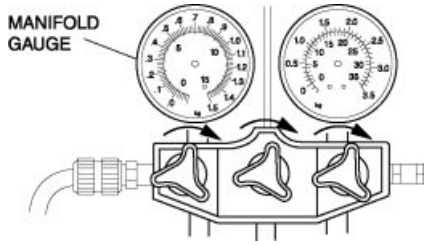
WARNING:

- If charging the system with refrigerant by service cans or refrigerant tank, running the engine with the high-pressure side valve open is dangerous. Pressure within the service cans or refrigerant tank will increase and they could explode, scattering metal fragments and liquid refrigerant that can seriously injure you. Therefore, do not open the high-pressure side valve while the engine is running.

18. Open the low-pressure side valve of the manifold gauge and charge with refrigerant until the weight of refrigerant tank has decreased **200 g {7.06 oz}** from the amount in Step 13.



19. Close the low-pressure side valve of the manifold gauge.

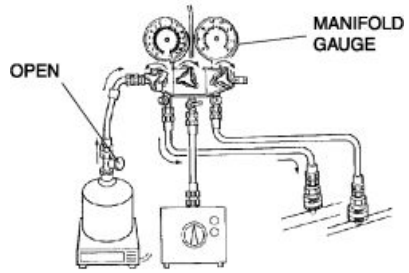


WARNING:

- If charging the system with refrigerant by service cans or refrigerant tank, running the engine with the high-pressure side valve open is dangerous. Pressure within the service cans or refrigerant tank will increase and they could explode, scattering metal fragments and liquid refrigerant that can seriously injure you. Therefore, do not open the high-pressure side valve while the engine is running.

20. Start the engine and actuate the A/C compressor.

21. Open the low-pressure side valve of the manifold gauge and charge with refrigerant until the weight of the refrigerant tank has decreased **430 g {15.2 oz}** from the amount in Step 13.



22. Close the low-pressure side valve of the manifold gauge and the valve of the refrigerant tank.

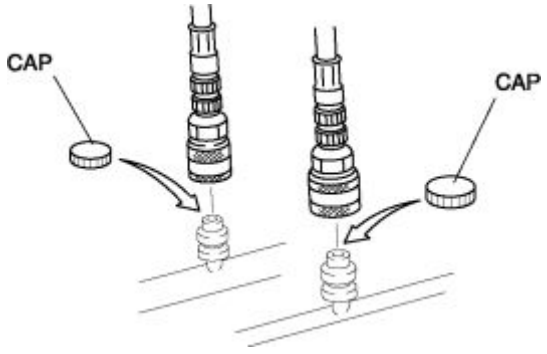
23. Stop the engine and A/C compressor.

24. Inspect for leakage using a gas leak tester.
    - If there is no leakage, go to Step 26.
    - If leakage is found at a loose joint, tighten the joint, then go to next step.

25. Inspect for leakage again.
    - If there is still leakage after tightening the joint, go to next step.
    - If there is still leakage at the same joint, discharge the refrigerant and then repair the joint. Repeat the charging procedure from Step 7.

26. Remove the manifold gauge set.

27. Install the caps to the charging valves.



TECHNICAL DATA

HEATER, VENTILATION AND AIR CONDITIONING

HVAC TECHNICAL DATA

Item				Specification
REFRIGERANT SYSTEM				
Refrigerant	Type			R-134a
	Regular amount (approx. quantity)		(g {oz})	430 {15.2}
BASIC SYSTEM				
A/C compressor	Lubrication oil	Type		DENSO OIL8
		Sealed volume (approx. quantity)	(ml {cc, fl oz})	60 {60, 2.03}
CONTROL SYSTEM				
A/C compressor	Magnetic clutch clearance		(mm {in})	0.20—0.45 {0.008—0.017}

TROUBLESHOOTING INDEX

No.	TROUBLESHOOTING ITEM	DESCRIPTION
1	Insufficient air (or no air) blown from vents.	• Problem with each vent or duct or both. • Airflow mode does not change.
2	Amount of air blown from vents does not change.	• Malfunction in blower system.
3	Air intake mode does not change.	• Air intake mode does not change when switching REC/FRESH mode.
4	No temperature control with climate control unit.	• Temperature does not change when operating temperature control dial.
5	Windshield fogged.	• A/C compressor does not operate while airflow mode is in DEFROSTER or HEAT/DEF modes. • Air intake mode does not change to FRESH while airflow mode is in DEFROSTER or HEAT/DEF modes.
6	Air from vents not cold enough.	• Magnetic clutch operates but A/C system malfunctions.
7	No cool air.	• Magnetic clutch does not operate.
8	Noise while operating A/C system.	• Noise from magnetic clutch, A/C compressor, hose or refrigerant line.

NO.1 INSUFFICIENT AIR (OR NO AIR) BLOWN FROM VENTS

1	**Insufficient air (or no air) blown from vents.**
DESCRIPTION	• Problem with each vent or duct or both. • Airflow mode does not change.
POSSIBLE CAUSE	• Malfunction in airflow mode actuator (Step 1) • Malfunction in VENT mode system (Steps 2—5) • Malfunction in HEAT mode system (Step 6) • Malfunction in DEFROSTER mode system (Steps 7—9)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT AIRFLOW MODE ACTUATOR** • Inspect airflow mode actuator. (See AIRFLOW MODE ACTUATOR INSPECTION .) • Is it normal?	Yes	Go to next step
		No	Repair or replace malfunctioning part in accordance with further inspection result. (See AIRFLOW MODE ACTUATOR INSPECTION .)
2	**INSPECT TO SEE WHETHER MALFUNCTION IS IN VENT MODE OR OTHER MODES** • Does air blow out when in VENT mode?	Yes	Go to Step 5.
		No	Go to next step.
3	**INSPECT VENT** • Is vent clogged?	Yes	Remove obstruction, then go to Step 9.
		No	Go to next step.
4	**VERIFY THAT DUCT IN DASHBOARD IS INSTALLED** • Is duct in dashboard properly installed?	Yes	Inspect duct for clogging, deformity and air leakage, then go to Step 9.
		No	Install duct securely in the proper position, then go to Step 9.
5		Yes	Go to next step.

	INSPECT TO SEE WHETHER MALFUNCTION IS IN HEAT MODE OR DEFROSTER MODE • Does air blow out when in HEAT mode?	No	Inspect vent for clogging, then go to Step 9.
6	**INSPECT DEFROSTER MODE** • Does air blow out when in DEFROSTER mode?	Yes	Operation is normal. Recheck malfunction symptoms.
		No	Go to next step.
7	**INSPECT VENT** • Is vent clogged?	Yes	Remove obstruction, then go to Step 9.
		No	Go to next step.
8	**VERIFY THAT DEFROSTER DUCT IS INSTALLED** • Is defroster duct properly installed?	Yes	Inspect duct for clogging, deformity, and air leakage, then go to next step.
		No	Install duct securely in proper position, then go to next step.
9	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR** • Does air blow out?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.2 AMOUNT OF AIR BLOWN FROM VENTS DOES NOT CHANGE

2	**Amount of air blown from vents does not change.**
DESCRIPTION	• Malfunction in blower system.
POSSIBLE CAUSE	• Blower relay, blower motor, resistor, fan switch malfunction (Step 1) • Blower unit malfunction (Steps 2—4)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT BLOWER SYSTEM** • Inspect the following systems and electrical parts: ▪ Blower relay ▪ Blower motor ▪ Resistor ▪ Fan switch ▪ Related wiring harnesses • Are they normal?	Yes	Go to next step.
		No	Repair or replace malfunctioning part, then go to Step 5.
2	**CHECK TO SEE WHETHER MALFUNCTION IS IN BLOWER UNIT OR ELSEWHERE** • Turn ignition switch to ON position. • Turn fan switch on. • Recirculate air inside vehicle. • Does fan in blower unit rotate smoothly?	Yes	Go to Step 4.
		No	Go to next step.
3	**INSPECT BLOWER UNIT**	Yes	Go to next step.

	• Inspect fan in blower unit.
	  ▪ Is fan free of interference from blower unit case?
	  ▪ Is fan free of foreign material and obstructions?
	• Is fan normal?
		No	Remove obstruction, repair or replace fan and blower unit case, then go to Step 5.

4	**INSPECT BLOWER UNIT INTAKE VENT** • Is blower unit intake vent clogged?	Yes	Remove obstruction, then go to next step.
		No	Inspect if there are any obstructions in passage between blower unit and A/C unit, then go to next step.
5	**VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR** • Does air blow out?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.3 AIR INTAKE MODE DOES NOT CHANGE

3	**Air intake mode does not change.**
DESCRIPTION	• Air intake mode does not change when switching REC/FRESH mode.
POSSIBLE CAUSE	• Malfunction in air intake actuator (Steps 1—6) • Malfunction in air intake door (Step 7)

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harnesses are connected correctly and undamaged.

Diagnostic procedure

STEP	INSPECTION		ACTION
1*	**INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN AIR INTAKE ACTUATOR, WIRING HARNESS (BETWEEN A/C AMPLIFIER AND AIR INTAKE ACTUATOR) OR ELSEWHERE** • Turn ignition switch to ON position. • Test voltages at the following terminals of A/C amplifier: ▪ Terminal 1I (24-pin, FRESH motor drive signal) ▪ Terminal 1J (24-pin, RECIRCULATE motor drive signal) (See A/C AMPLIFIER INSPECTION) • Are voltages normal?	Yes	Go to next step.
		No	Go to Step 3.
2*	**INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN AIR INTAKE**	Yes	Replace air intake actuator, then go to Step 8.

	(LACK OF CONTINUITY) IS IN AIR INTAKE ACTUATOR OR WIRING HARNESS (BETWEEN A/C AMPLIFIER AND AIR INTAKE ACTUATOR) • Test voltages at the following terminals of air intake actuator: ▪ Terminal A (FRESH motor drive signal) ▪ Terminal C (RECIRCULATE motor drive signal) • Are voltages as shown below? ▪ Terminal A: **approx. 0.5 V** during RECIRCULATE and **approx. 10 V** during FRESH ▪ Terminal C: **approx. 10 V** during RECIRCULATE and **approx. 0.5 V** during FRESH	No	Repair wiring harness between A/C amplifier and air intake actuator, then go to Step 8.
3	**INSPECT TO SEE WHETHER MALFUNCTION IS IN AIR INTAKE ACTUATOR OR ELSEWHERE** • Disconnect air intake actuator connector. • Test voltages at the following terminals of A/C amplifier: ▪ Terminal 1I (24-pin, FRESH motor drive signal) ▪ Terminal 1J (24-pin, RECIRCULATE motor drive signal) (See A/C AMPLIFIER INSPECTION) • Are voltages normal?	Yes	Inspect air intake actuator, then go to Step 8.
		No	Go to next step.
4	**INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (SHORT TO B+ BETWEEN A/C AMPLIFIER AND AIR INTAKE ACTUATOR) OR ELSEWHERE** • Disconnect A/C amplifier connector. • Test voltages at the following terminals of A/C amplifier: ▪ Terminal 1I (24-pin, FRESH motor drive signal) ▪ Terminal 1J (24-pin, RECIRCULATE motor drive signal) • Are voltages **approx. 0 V** ?	Yes	Go to next step.
		No	Repair wiring harness between A/C amplifier and air intake actuator, then go to Step 8.
5	**INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (SHORT TO GROUND BETWEEN A/C AMPLIFIER AND AIR INTAKE ACTUATOR) OR**	Yes	Repair wiring harness between A/C amplifier and air intake actuator, then go to Step 8.

	A/C AMPLIFIER AND AIR INTAKE ACTUATOR) OR ELSEWHERE • Turn ignition switch to LOCK position. • Inspect for continuity at the following terminals between A/C amplifier and ground: ▪ Terminal 1I (24-pin, FRESH motor drive signal) ▪ Terminal 1J (24-pin, RECIRCULATE motor drive signal) • Is there continuity?	No	Go to next step.
6	**INSPECT AIR INTAKE LINK** • Inspect air intake links. ▪ Is there grease on link? ▪ Are links securely and properly installed? ▪ Are links free of obstructions and hindrances? • Are above items normal?	Yes	Go to next step.
		No	Apply grease to links. If any links are damaged, replace air intake actuator, then go to Step 8.
7	**INSPECT TO SEE WHETHER MALFUNCTION IS IN A/C AMPLIFIER OR AIR INTAKE DOOR** • Inspect blower unit air intake door. ▪ Is door free of obstructions, cracks, and damage? ▪ Are doors securely and properly installed? • Are above items normal?	Yes	Replace A/C amplifier, then go to next step.
		No	Remove obstruction, or install doors in proper position. If any doors are cracked or damaged, replace them, then go to next step.
8	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR** • Does air intake mode change smoothly?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.4 NO TEMPERATURE CONTROL WITH A/C AMPLIFIER

4	**No temperature control with A/C amplifier.**
DESCRIPTION	• Temperature does not change with operating temperature control dial.
POSSIBLE CAUSE	• Air mix actuator (+5 V signal) system malfunction (Steps 3—7, 10) • A/C amplifier (potentiometer GND signal) system malfunction (Steps 8, 9) • Air mix actuator (potentiometer input signal) system malfunction (Steps 11—13) • Air mix actuator (potentiometer GND signal, motor drive signal) system malfunction (Step 14) • Air mix actuator system malfunction (Steps 15, 16) • A/C unit air mix door malfunction (Steps 17, 18)

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harnesses are connected correctly and undamaged.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT COOLANT TEMPERATURE** • Is coolant sufficiently warmed up?	Yes	Go to next step.
		No	Warm engine up, then go to Step 19.
2	**CHECK CIRCUITS COMMON TO BOTH AIR MIX ACTUATOR AND AIRFLOW MODE ACTUATOR** • Does airflow mode change when operating airflow mode selector switch?	Yes	Go to Step 10.
		No	Go to next step.
3		Yes	Go to next step.

	CHECK TO SEE WHETHER PROBLEM IS IN AIR MIX ACTUATOR +5 V SIGNAL OR POTENTIOMETER GND SIGNAL • Is air mix actuator set at MAX HOT and airflow mode actuator at VENT? (Verify position of air mix actuator link and airflow mode actuator link.)	No	Go to Step 8. (Set actuator at MAX COLD and DEFROSTER.)
4*	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN WIRING HARNESS (BETWEEN A/C AMPLIFIER AND AIR MIX ACTUATOR) OR ELSEWHERE** • Turn the ignition switch to ON position. • Is there voltage of **approx. 5 V** at A/C amplifier connector (16-pin) terminal 2P (+5 V signal)?	Yes	Repair wiring harness between A/C amplifier and air mix actuator, then go to Step 19.
		No	Go to next step.
5*	**CHECK TO SEE WHETHER MALFUNCTION IS IN AIR MIX ACTUATOR (SHORT TO GROUND) OR ELSEWHERE** • Disconnect air mix actuator connector. • Is there voltage of **approx. 5 V** at A/C amplifier connector (16-pin) terminal 2P (+5 V signal)?	Yes	Inspect air mix actuator, then go to Step 19.
		No	Go to next step.
6*	**CHECK TO SEE WHETHER MALFUNCTION IS IN AIRFLOW MODE ACTUATOR (SHORT TO GROUND) OR ELSEWHERE** • Disconnect airflow actuator connector. • Is there voltage of **approx. 5 V** at A/C amplifier connector (16-pin) terminal 2P (+5 V signal)?	Yes	Inspect airflow mode actuator, then go to Step 19.
		No	Go to next step.
7*	**CHECK TO SEE WHETHER MALFUNCTION (SHORT TO GROUND) IS IN A/C AMPLIFIER OR WIRING HARNESS (BETWEEN A/C AMPLIFIER AND AIR MIX ACTUATOR)** • Disconnect A/C amplifier connector (16-pin). • Is there continuity between A/C amplifier connector (16-pin) terminal 2P (+5 V signal)?	Yes	Repair wiring harness between A/C amplifier and air mix actuator, then go to Step 19.
		No	Replace A/C amplifier, then go to Step 19.
8*		Yes	Go to next step.

	CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN A/C AMPLIFIER OR WIRING HARNESS (BETWEEN A/C AMPLIFIER AND AIR MIX ACTUATOR) • Disconnect A/C amplifier connector (16-pin) and air mix actuator connector. • Is there continuity between A/C amplifier connector (16-pin) terminal 2O (potentiometer GND signal) and air mix actuator connector terminal C?	No	Repair wiring harness between A/C amplifier and air mix actuator, then go to Step 19.
9*	**CHECK TO SEE WHETHER MALFUNCTION (SHORT TO B+) IS IN A/C AMPLIFIER OR WIRING HARNESS (BETWEEN A/C AMPLIFIER AND AIR MIX ACTUATOR)** • Turn the ignition switch to ON position. • Test voltage at A/C amplifier connector (16-pin) and terminal 2O (potentiometer GND signal). • Is voltage **approx. 12 V** ?	Yes	Repair wiring harness between A/C amplifier and air mix actuator, then go to Step 19.
		No	Replace A/C amplifier, then go to Step 19.
10*	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN WIRING HARNESS (BETWEEN A/C AMPLIFIER AND AIR MIX ACTUATOR) OR ELSEWHERE** • Turn the ignition switch to ON position. • Test voltage at air mix actuator connector terminal A (+5 V signal). • Is voltage **approx. 5 V** ?	Yes	Go to next step.
		No	Repair wiring harness between A/C amplifier and air mix actuator, then go to Step 19.
11*	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN WIRING HARNESS (BETWEEN A/C AMPLIFIER AND AIR MIX ACTUATOR) OR ELSEWHERE** • Turn the ignition switch to LOCK position. • Disconnect A/C amplifier connector (16-pin) and air mix actuator connector. • Is there continuity between A/C amplifier connector (16-pin) terminal 2H (potentiometer input signal) and air mix actuator connector terminal E?	Yes	Go to next step.
		No	Repair wiring harness between A/C amplifier and air mix actuator, then go to Step 19.
12*	**CHECK TO SEE WHETHER MALFUNCTION (SHORT TO GROUND) IS IN WIRING HARNESS (BETWEEN A/C AMPLIFIER AND AIR MIX**	Yes	Repair wiring harness between A/C amplifier and air mix actuator, then go to Step 19.

	(BETWEEN A/C AMPLIFIER AND AIR MIX ACTUATOR) OR ELSEWHERE • Is there continuity between A/C amplifier connector (16-pin) terminal 2H (potentiometer input signal) and ground?	No	Go to next step.
13*	**CHECK TO SEE WHETHER MALFUNCTION (SHORT TO B+) IS IN WIRING HARNESS (BETWEEN A/C AMPLIFIER AND AIR MIX ACTUATOR) OR ELSEWHERE** • Turn the ignition switch to ON position. • Test voltage at A/C amplifier connector (16-pin) terminal 2H (potentiometer input signal). • Is voltage **approx. 12 V** ?	Yes	Repair wiring harness between A/C amplifier and air mix actuator, then go to Step 19.
		No	Go to next step.
14*	**CHECK TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN WIRING HARNESS (BETWEEN A/C AMPLIFIER AND AIR MIX ACTUATOR) OR ELSEWHERE** • Turn the ignition switch to LOCK position. • Is there continuity between following A/C amplifier connector (16-pin, 24-pin) terminals and air mix actuator connector terminals? ▪ Terminal 2O and terminal C (potentiometer GND signal) ▪ Terminal 1V and terminal G (motor drive signal) ▪ Terminal 1U and terminal F (motor drive signal)	Yes	Go to next step.
		No	Repair wiring harness between A/C amplifier and air mix actuator, then go to Step 19.
15	**INSPECT A/C UNIT AIR MIX ACTUATOR LINK AND CRANK** • Is there grease on the link and crank?	Yes	Go to next step.
		No	Apply grease, then go to Step 19.
16	**INSPECT AIR MIX ACTUATOR** • Inspect air mix actuator. • Is it normal?	Yes	Go to next step.
		No	Replace air mix actuator, then go to Step 19.
17	**VERIFY THAT A/C UNIT AIR MIX DOORS DO NOT HAVE ANY FOREIGN MATERIAL OR OBSTRUCTION** • Is there any foreign material or obstructions on any A/C unit door?	Yes	Remove material/obstruction, then go to Step 19.
		No	Go to next step.

18	**INSPECT A/C UNIT AIR MIX DOORS** • Are all doors within A/C unit securely and properly positioned? • Inspect A/C unit doors. ▪ Are doors cranked or damaged? ▪ Are doors securely and properly installed? • Are they normal?	Yes	Replace A/C amplifier, then go to next step. (Malfunction in A/C amplifier temperature control lever circuit)
		No	Replace or install door(s) in proper position, then go to next step.
19	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR** • Does temperature change when operating temperature control dial?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

Notes:

NO.5 WINDSHIELD FOGGED

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

5	**Windshield fogged.**
DESCRIPTION	• A/C compressor does not operate while airflow mode is in DEFROSTER or HEAT/DEF modes. • Air intake mode does not change to FRESH while airflow mode is in DEFROSTER or HEAT/DEF modes.
POSSIBLE CAUSE	• A/C amplifier (B+ signal) system malfunction (Steps 2, 4, 5) • Air intake actuator malfunction (Steps 3, 7) • A/C amplifier (RECIRCULATE, FRESH signal) system malfunction (Steps 9—11) • Malfunction in blower unit air intake doors (Steps 12, 13)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**COOL AIR BLOW OUT INSPECTION** • When both A/C and fan switch in A/C amplifier are on, does cool air blow out from front vent?	Yes	Go to next step.
		No	Go to Step 1 of troubleshooting index No.7.
2	**INSPECT A/C AMPLIFIER POWER SUPPLY FUSE FOR B+ SIGNAL** • Is A/C amplifier power supply fuse for B+ signal normal?	Yes	Go to next step.
		No	Inspect for a short to ground on blown fuse circuit. • Repair or replace as necessary. Install appropriate amperage fuse.
3	**INSPECT AIR INTAKE ACTUATOR**	Yes	Go to next step.

	• Inspect air intake actuator. ▪ Is there grease on link? ▪ Is link securely and properly positioned? ▪ Is link free of obstructions? • Are above items normal?	No	Apply grease or install link properly and securely, remove obstruction, then go to Step 14.
*4	**INSPECT WIRING HARNESS BETWEEN FUSE BLOCK AND A/C AMPLIFIER FOR CONTINUITY** • Disconnect A/C amplifier connector (16-pin). • Turn ignition switch to ON position. • Test voltage at A/C amplifier connector terminal 2A (B+ signal). • Is voltage **approx. 12 V** ?	Yes	Go to next step.
		No	Repair wiring harness between fuse block and A/C amplifier, then go to Step 14.
*5	**INSPECT WIRING HARNESS BETWEEN A/C AMPLIFIER AND GROUND FOR VOLTAGE** • Test voltage at A/C amplifier connector terminal 2N (Ground). • Is voltage **approx. 0V** ?	Yes	Go to next step.
		No	Repair wiring harness between A/C amplifier and ground, then go to Step 14.
6	**VERIFY WHETHER MALFUNCTION IS IN BLOWER UNIT AIR INTAKE DOOR OR ELSEWHERE** • Turn ignition switch to LOCK position. • Connect A/C amplifier connector (16-pin). • Remove air intake actuator. • Turn ignition switch to ON position. • Set fan switch to 4th position. • Does air intake mode (RECIRCULATE, FRESH) change smoothly when air intake link is operated by hand?	Yes	Go to next step.
		No	Go to Step 12.
7	**INSPECT AIR INTAKE ACTUATOR** • Inspect air intake actuator. (See AIR INTAKE ACTUATOR INSPECTION) • Is it normal?	Yes	Go to next step.
		No	Replace air intake actuator, go to Step 14.
8		Yes	Go to next step.

	INSPECT AIR INTAKE SELECTOR SWITCH AND DEFROSTER SWITCH IN A/C AMPLIFIER • Test voltage at A/C amplifier connector (24-pin) terminals 1I and 1J. • Is it normal?	No	Replace A/C amplifier, then go to Step 14.
*9	**INSPECT WIRING HARNESS BETWEEN A/C AMPLIFIER AND AIR INTAKE ACTUATOR FOR CONTINUITY** • Turn ignition switch to LOCK position. • Is there continuity between the following A/C amplifier connector (24-pin) terminals and air intake actuator connector terminals? ▪ Terminal 1I—Terminal A (FRESH signal) ▪ Terminal 1J—Terminal C (RECIRCULATE signal)	Yes	Go to next step.
		No	Repair wiring harness between A/C amplifier and air intake actuator, then go to Step 14.
*10	**INSPECT WIRING HARNESS BETWEEN A/C AMPLIFIER AND AIR INTAKE ACTUATOR FOR SHORT TO GROUND** • Is there continuity between the following A/C amplifier connector (24-pin) terminals and ground? ▪ Terminal 1I (FRESH signal) ▪ Terminal 1J (RECIRCULATE signal)	Yes	Repair wiring harness between A/C amplifier and air intake actuator, then go to Step 14.
		No	Go to next step.
*11	**INSPECT WIRING HARNESS BETWEEN A/C AMPLIFIER AND AIR INTAKE ACTUATOR FOR SHORT TO B+** • Turn ignition switch to ON position • Test voltage at the following A/C amplifier connector (24-pin) terminal: ▪ Terminal 1I (FRESH signal) ▪ Terminal 1J (RECIRCULATE signal) • Is voltage **approximately 12 V** ?	Yes	Repair wiring harness between A/C amplifier and air intake actuator, then go to Step 14.
		No	Replace A/C amplifier, then go to Step 14.
12	**INSPECT BLOWER UNIT AIR INTAKE DOOR** • Is there any foreign material or obstruction in blower unit air intake door?	Yes	Remove obstruction, then go to Step 14.
		No	Go to next step.
13	**VERIFY THAT BLOWER UNIT AIR INTAKE DOOR IS POSITIONED SECURELY AND**	Yes	Inspect air intake door for cracks or damage, then go to next step.

	DOOR IS POSITIONED SECURELY AND PROPERLY • Is blower unit air intake door securely and properly positioned?	No	Install air intake door securely in proper position, then go to next step.
14	**VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR** • Does malfunction disappear?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

Notes:

NO.6 AIR FROM VENTS COLD ENOUGH

6	**Air from vents not cold enough.**
DESCRIPTION	• Magnetic clutch operates but A/C system malfunctions.
POSSIBLE CAUSE	• Drive belt malfunction (Step 2) • Malfunction in blower unit or condenser (Steps 4, 5) • Malfunction in receiver/drier or expansion valve (valve closes too much) (Steps 8, 9) • Malfunction in refrigerant lines (Steps 10, 11) • A/C compressor system malfunction, insufficient compressor oil (Steps 15, 16) • Over filling of compressor oil, malfunction in expansion valve or A/C unit air mix link system (Steps 17—19)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT DRIVE BELT** • Inspect drive belt. (See DRIVE BELT DEFLECTION/TENSION INSPECTION) • Is it normal?	Yes	Go to next step.
		No	Adjust or replace drive belt, then go to Step 20.
2	**INSPECT REFRIGERANT SYSTEM PERFORMANCE** • Perform refrigerant system performance test. (See REFRIGERANT SYSTEM PERFORMANCE TEST) • Is operation normal?	Yes	Operation is normal. (Recheck malfunction symptoms.)
		No	Go to next step.
3		Yes	Go to next step.

	CHECK TO SEE WHETHER MALFUNCTION IS IN BLOWER UNIT INTAKE AND CONDENSER OR ELSEWHERE • Are refrigerant high-pressure and low-pressure values both high?	No	Go to Step 6.
4	**INSPECT BLOWER UNIT INTAKE** • Is blower unit intake clogged?	Yes	Remove obstruction, then go to Step 20. (If air does not reach evaporator within A/C unit, heat exchange does not occur and refrigerant pressure becomes high. Therefore, removal of obstruction is necessary.)
		No	Go to next step.
5	**INSPECT CONDENSER** • Inspect condenser. (See CONDENSER INSPECTION) • Is it normal?	Yes	Adjust refrigerant to specified amount, then go to Step 20. (Excessive amount of refrigerant.)
		No	Replace condenser, or repair and clean condenser fins, then go to Step 20.
6	**CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE, RECEIVER/DRIER AND REFRIGERANT LINES OR ELSEWHERE** • Are refrigerant high-pressure and low-pressure values low?	Yes	Go to next step.
		No	Go to Step 14.
7	**CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE AND RECEIVER/DRIER OR ELSEWHERE** • Immediately after A/C compressor operates, does refrigerant high-pressure value momentarily rise to correct value, then fall and stay below it? (Is there negative pressure on low-pressure side?)	Yes	Go to next step.
		No	Go to Step 10.
8		Yes	Go to next step.

	CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE OR RECEIVER/DRIER • Turn A/C switch off and let air conditioner stop for **10 min** . • Start engine. • Turn both A/C switch and fan switch on. • Does malfunction occur after A/C compressor turns on?	No	Replace condenser and bleed refrigerant line for **30 min or more** using a vacuum pump, add refrigerant to specified level, then go to Step 20. (Since water has intermixed in receiver/drier and it is saturated, replacement is necessary.)
9	**VERIFY THAT EXPANSION VALVE HEAT-SENSING TUBE WITHIN A/C UNIT IS POSITIONED SECURELY AND CORRECTLY** • Is expansion valve heat-sensing tube within A/C unit securely installed in proper position?	Yes	Replace expansion valve, then go to Step 20. (Since valve closes too much, replacement is necessary.)
		No	Install heat-sensing tube securely in proper position, then go to Step 20.
10	**INSPECT REFRIGERANT LINES** • Inspect refrigerant lines. ▪ Is piping free of damage and cracks? ▪ Are piping connections free of oil grime? (Visual inspection) ▪ Are piping connections free of gas leakage? ▪ Are piping installation points on condenser free of gas leakage? ▪ Are piping installation points on receiver/drier free of gas leakage? ▪ Are piping installation points on A/C compressor free of gas leakage? ▪ Are piping installation points on A/C unit free of gas leakage? ▪ Perform gas leak inspection using gas leak tester. • Are above items normal?	Yes	Go to next step.
		No	If piping or A/C component(s) are damaged or cracked, replace them. Then go to Step 20. If there is no damage, go to Step 13.
11	**INSPECT EVAPORATOR PIPING CONNECTIONS IN A/C UNIT FOR GAS LEAKAGE** • Are piping connections for evaporator in A/C unit free of gas leakage?	Yes	If the vane makes a noise, add **10 ml {10 cc, 0.34 fl oz}** of compressor oil to the A/C compressor. Verify that the noise is no longer heard. Adjust refrigerant to specified amount, then go to Step 20.

	A/C unit free of gas leakage?	No	If piping is damaged or cracked, replace it. Then go to Step 20. If there is no damage, go to next step.
12	**INSPECT EVAPORATOR PIPING CONNECTIONS IN A/C UNIT FOR LOOSE** • Are piping connections for evaporator in A/C unit loose?	Yes	Tighten connections with specified torque, adjust both compressor oil and refrigerant to specified amount, then go to Step 20.
		No	If the vane makes a noise, add **10 ml {10 cc, 0.34 fl oz}** of compressor oil to the A/C compressor. Verify that the noise is no longer heard. Replace O-ring on piping, adjust refrigerant to specified amount, then go to Step 20.
13	**INSPECT PIPING CONNECTIONS FOR LOOSENESS** • Are piping connections loose?	Yes	Tighten connections with specified torque, adjust both compressor oil and refrigerant to specified amount, then go to Step 20.
		No	If the vane makes a noise, add **10 ml {10 cc, 0.34 fl oz}** of compressor oil to the A/C compressor. Verify that the noise is no longer heard. Replace O-ring on piping, adjust refrigerant to specified amount, then go to Step 20.
14	**CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE, AIR MIX ACTUATOR AND COMPRESSOR OIL OR ELSEWHERE** • Does refrigerant high-pressure value increase only a little?	Yes	Go to next step. (Pressure increases only a little.)
		No	Go to Step 17.
15	**CHECK TO SEE WHETHER MALFUNCTION IS IN COMPRESSOR OIL AMOUNT AND A/C COMPRESSOR OR ELSEWHERE** • When engine is racing, does high-pressure value increase?	Yes	Return to Step 3.
		No	Go to next step.
16	**CHECK TO SEE WHETHER MALFUNCTION IS IN COMPRESSOR OIL AMOUNT OR A/C COMPRESSOR** • After compressor oil is replenished each **10 ml {10 cc, 0.34 fl oz}** , does high-pressure value increase?	Yes	Troubleshooting completed. (Explain to customer that cause was insufficient compressor oil.)
		No	Replace A/C compressor, then go to Step 20. (Cause is defective A/C compressor.)

17	**CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE OR ELSEWHERE** • Is only refrigerant low-pressure value high?	Yes	Go to Step 19.
		No	Go to next step.
18	**VERIFY THAT AIR MIX IS INSTALLED SECURELY AND PROPERLY** • Are A/C unit air mix links, air mix cranks, and air mix rods securely and properly installed?	Yes	Set fan switch to 4th position. Turn A/C switch on. Set FRESH mode. Set temperature control to MAX COLD. Set VENT mode. o (1)Start and run the engine at **1,500 rpm** for **10 min** . o (2)Run the engine at idle for **1 min** . o (3)Within **12 s** , idle → **4,000 rpm** → idle. Perform cycle **5 times** . o (4) Run the engine at idle for **30 s** . o (5)Drain the compressor oil completely from the A/C compressor and verify the amount. • If there is **approx. 90 ml {90 cc, 3.0 fl oz}** of compressor oil, go to Step 20. • If there is **90 ml {90 cc, 3.0 fl oz} or more** of compressor oil, remove surplus oil and fill A/C compressor with **90 ml {90 cc, 3.0 fl oz}** of compressor oil. Repeat Steps (1) to (5). (Cause is excessive amount of compressor oil.)
		No	Repair or install links, cranks and rods securely in proper position, then go to Step 20.
19	**VERIFY THAT EXPANSION VALVE HEAT-SENSING TUBE WITHIN A/C UNIT IS POSITIONED SECURELY AND CORRECTLY** • Is expansion valve heat-sensing tube within A/C unit securely installed in proper position?	Yes	Replace expansion valve, then go to next step. (Since valve opens too much, replacement is necessary.)
		No	Install heat-sensing tube securely in proper position, then go to next step.

20	**VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR** • Does cool air blow out? (Are results of refrigerant system performance test normal?)	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.7 NO COOL AIR

7	No cool air
DESCRIPTION	• Magnetic clutch does not operate.
POSSIBLE CAUSE	• Malfunction in PCM A/C cut control system (Step 3) • Malfunction in A/C amplifier (Step 4) • Malfunction in refrigerant pressure switch (Steps 5, 7—9) • Malfunction in PCM (A/C signal) (Step 6) • Malfunction in PCM (IG1 signal) (Steps 10, 11) • Malfunction in A/C compressor (Step 12) • Malfunction in A/C relay (Steps 13—15) • Malfunction in evaporator temperature sensor (Step 16)

- When performing an asterisked (*) troubleshooting inspection, shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harnesses are connected correctly and undamaged.

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT AIR BLOW OUT** • Does air blow out?	Yes	Go to next step.
		No	Go to Step 1 of troubleshooting indexes No.1 and 2.
2	**INSPECT A/C COMPRESSOR OPERATION** • Start engine. • Turn A/C switch and fan switch on. • Does A/C compressor operate?	Yes	Go to Step 1 of troubleshooting index No.6.
		No	Go to next step.
3	**INSPECT FOR DTC IN PCM** • Inspect for DTCs related to the PCM on-board diagnostic system. • Are any DTCs displayed?	Yes	Go to appropriate inspection procedure.
		No	Go to next step.

4	**INSPECT TO SEE WHETHER MALFUNCTION IS IN A/C AMPLIFIER OR ELSEWHERE** • Does cool air blow out when terminal 1M of A/C amplifier connector (24-pin, A/C signal) is grounded?	Yes	Replace A/C amplifier, then go to Step 17.
		No	Release short, then go to next step.
5*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN A/C SIGNAL CIRCUIT (BETWEEN REFRIGERANT PRESSURE SWITCH AND PCM) OR ELSEWHERE** • Test voltage at the following terminal of refrigerant pressure switch: ▪ Terminal B (A/C signal) • Is voltage **approx. 12 V** ?	Yes	Go to Step 7.
		No	Go to next step.
6*	**INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN WIRING HARNESS (BETWEEN REFRIGERANT PRESSURE SWITCH AND PCM) OR PCM** • Test voltage at A/C signal terminal of PCM. • Is voltage **approx. 12 V** ?	Yes	Repair wiring harness between PCM and refrigerant pressure switch, then go to Step 17.
		No	Inspect PCM, then go to Step 17.
7	**INSPECT TO SEE WHETHER MALFUNCTION IS IN REFRIGERANT PRESSURE SWITCH, REFRIGERANT AMOUNT, OR ELSEWHERE** • Does cool air blow out when terminals A and B of refrigerant pressure switch connector are shorted?	Yes	Go to Step 9.
		No	Go to next step.
8*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (BETWEEN REFRIGERANT PRESSURE SWITCH AND A/C AMPLIFIER) OR ELSEWHERE** • Test voltage at the following terminal of A/C amplifier. ▪ Terminal 1M (24-pin, A/C signal) • Is voltage **approx. 12 V** ?	Yes	Go to Step 10.
		No	Repair wiring harness between refrigerant pressure switch and A/C amplifier, then go to Step 17.
9	**INSPECT TO SEE WHETHER MALFUNCTION IS IN REFRIGERANT PRESSURE SWITCH OR REFRIGERANT AMOUNT**	Yes	If there is no refrigerant, replace condenser, bleed the refrigerant line for **30 min or more** using a vacuum pump, and add refrigerant to specified level, then go to Step 17.

	• Inspect refrigerant pressure switch. • Is it normal?	No	Replace refrigerant pressure switch, then go to Step 17.
10	**INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN A/C CONTROL SIGNAL CIRCUIT (BETWEEN A/C RELAY AND PCM) OR ELSEWHERE** • Does cool air blow out when terminal E of A/C relay connector (A/C control signal) is grounded?	Yes	Release short, then go to next step.
		No	Go to Step 12.
11*	**INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN PCM OR WIRING HARNESS (BETWEEN A/C RELAY AND PCM)** • Test voltage at the A/C relay control signal terminal of PCM. • Is voltage **approx. 12 V** ?	Yes	Inspect PCM, then go to Step 17.
		No	Repair wiring harness between A/C relay and PCM, then go to Step 17.
12*	**INSPECT TO SEE WHETHER MALFUNCTION IS IN MAGNETIC CLUTCH OR ELSEWHERE** • Test voltage at the following terminal of magnetic clutch thermal protector: ▪ Terminal B (magnetic clutch operation signal) • Is voltage **approx. 12 V** ?	Yes	Inspect magnetic clutch, then go to Step 17.
		No	Go to next step.
13	**INSPECT FUSE** • Are A/C relay power supply fuses normal?	Yes	Go to next step.
		No	Replace fuse, then go to Step 17. If fuse burns out immediately, go to next step.
14	**INSPECT WIRING HARNESS BETWEEN FUSE BLOCK AND A/C RELAY FOR LACK OF CONTINUITY** • Test voltages at the following terminals of A/C relay. ▪ Terminal A (A/C relay control signal) ▪ Terminal C (A/C control signal) • Are voltages **approx. 12 V** ?	Yes	Go to next step.
		No	Repair wiring harness between fuse block and A/C relay, then go to Step 17.

15	**INSPECT TO SEE WHETHER MALFUNCTION IS IN A/C RELAY OR WIRING HARNESS (BETWEEN A/C RELAY AND MAGNETIC CLUTCH) AND EVAPORATOR TEMPERATURE SENSOR** • Test voltage at the following terminal of A/C relay: ▪ Terminal D (magnetic clutch operation signal) • Is voltage **approx. 12 V** ?	Yes	Inspect wiring harness between A/C relay and magnetic clutch. • If above wiring harness is OK, go to next step. • If above wiring harness malfunctions, repair wiring harness, then go to Step 17.
		No	Replace A/C relay, then go to Step 17.
16	**INSPECT EVAPORATOR TEMPERATURE SENSOR** • Inspect evaporator temperature sensor. • Is it normal?	Yes	Go to next step.
		No	Replace evaporator temperature sensor, then go to next step.
17	**CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR** • Does cool air blow out? (Are the results of refrigerant system performance test normal?)	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

NO.8 NOISE WHILE OPERATING A/C SYSTEM

8	**Noise while operating A/C system.**
DESCRIPTION	• Noise from magnetic clutch, A/C compressor, hose or refrigerant line.
POSSIBLE CAUSE	• Magnetic clutch operation noise (Step 3) • A/C compressor slippage noise (Steps 4—6) • Hose or refrigerant line interference noise (Step 7)

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT A/C COMPRESSOR SLIPPAGE NOISE** • Is there a squeaking or whirling sound (A/C compressor slippage noise)?	Yes	Go to Step 4.
		No	Go to next step.
2	**INSPECT A/C COMPRESSOR INTERFERENCE NOISE** • Is there a rattling or vibrating sound (interference noise)?	Yes	Go to Step 7.
		No	Go to next step.
3	**INSPECT MAGNETIC CLUTCH OPERATION NOISE** • Is there a clicking sound (magnetic clutch operation noise)?	Yes	Adjust clearance between pressure plate of magnetic clutch and A/C compressor pulley, then go to Step 8.
		No	Condition is normal. (Recheck malfunction symptoms.)
4	**INSPECT DRIVE BELT** • Inspect drive belt. • Is it normal?	Yes	Go to next step.
		No	Adjust or replace drive belt, then go to Step 8.
5	**INSPECT DRIVE BELT CONDITION**	Yes	Remove obstruction, remove oil, or replace drive belt, then go to Step 8.

	• Is drive belt worn? • Does it have foreign material imbedded in it, or have oil on it?	No	Go to next step.
6	**INSPECT MAGNETIC CLUTCH** • Inspect magnetic clutch. • Is it normal?	Yes	Replace A/C compressor (excluding pressure plate, A/C compressor pulley, and stator), then go to Step 8.
		No	Replace magnetic clutch, then go to Step 8.
7	**CHECK TO SEE WHETHER MALFUNCTION IS IN A/C COMPRESSOR OR REFRIGERANT LINES** • Is noise emitted from A/C compressor?	Yes	Visually inspect A/C compressor, replace appropriate parts if necessary, then go to next step.
		No	If noise is due to refrigerant lines, repair detached or missing clips, tighten loose bolts, then go to next step.
8	**VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR** • Has A/C compressor noise stopped?	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.