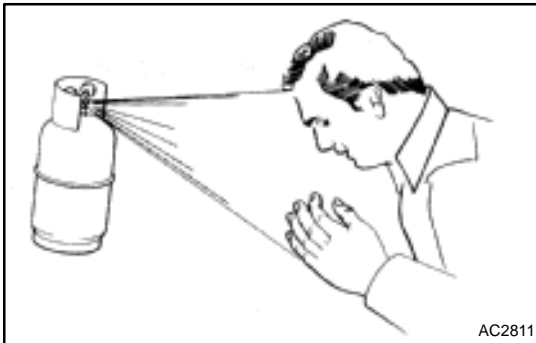


AC2810

## AIR CONDITIONING SYSTEM PRECAUTION

ACOLG-02

1. **DO NOT HANDLE REFRIGERANT IN AN ENCLOSED AREA OR WEAR EYE PROTECTION**
2. **ALWAYS WEAR EYE PROTECTION**



AC2811

3. **BE CAREFUL NOT TO GET LIQUID REFRIGERANT IN YOUR EYES OR ON YOUR SKIN**

If liquid refrigerant gets in your eyes or on your skin.

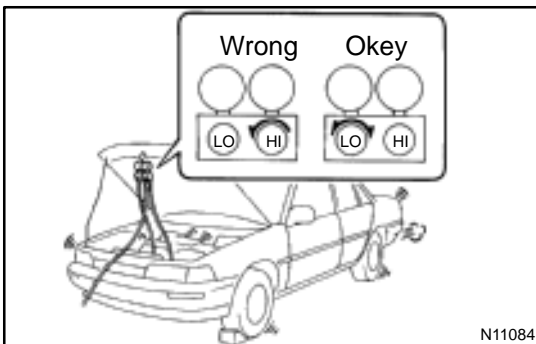
- (a) Wash the area with lots of cool water.

**CAUTION:**

**Do not rub your eyes or skin.**

- (b) Apply clean petroleum jelly to the skin.
- (c) Go immediately to a physician or hospital for professional treatment.

4. **NEVER HEAT CONTAINER OR EXPOSE IT TO NAKED FLAME**
5. **BE CAREFUL NOT TO DROP CONTAINER AND NOT TO APPLY PHYSICAL SHOCKS TO IT**



N11084

6. **DO NOT OPERATE COMPRESSOR WITHOUT ENOUGH REFRIGERANT IN REFRIGERATION SYSTEM**

If there is not enough refrigerant in the refrigerant system oil lubrication will be insufficient and compressor burnout may occur, so that care to avoid this, necessary care should be taken.

7. **DO NOT OPEN PRESSURE MANIFOLD VALVE WHILE COMPRESSOR IS OPERATE**

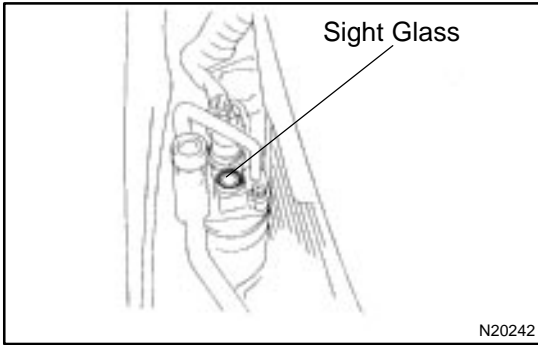
If the high pressure valve is opened, refrigerant flows in the reverse direction and could cause the charging cylinder to rupture, so open and close the only low pressure valve.

8. **BE CAREFUL NOT TO OVERCHARGE SYSTEM WITH REFRIGERANT**

If refrigerant is overcharged, it causes problems such as insufficient cooling, poor fuel economy, engine overheating etc.

**9. SUPPLEMENTAL RESTRAINT SYSTEM (SRS)**

The CAMRY is equipped with an SRS (Supplemental Restraint System) such as the driver airbag and passenger airbag. Failure to carry out service operations the correct sequence could cause the SRS to unexpectedly deployed during servicing, possible the SRS may fail to operate when required. Before servicing (including removal or installation of parts, inspection or replacement), be sure to read the following item carefully, then follow the correct procedure described in the repair manual.



## ON-VEHICLE INSPECTION

### 1. INSPECT REFRIGERANT VOLUME

Observe the sight glass on the liquid tube.

Test conditions:

- ◆ Running engine at 1,500 rpm
- ◆ Blower speed control switch at "HI" position
- ◆ A/C switch ON
- ◆ Temperature control dial at "COOL" position
- ◆ Fully open the doors

Item	Symptom	Amount of refrigerant	Remedy
1	Bubbles present in sight glass	Insufficient*	(1) Check for gas leakage with gas leak detector and repair if necessary (2) Add refrigerant until bubbles disappear
2	No bubbles present in sight glass	None, sufficient or too much	Refer item 3 and 4
3	No temperature difference between compressor inlet and outlet	Empty or nearly empty	(1) Check for gas leakage with gas leak detector and repair if necessary (2) Add refrigerant until bubbles disappear
4	Temperature between compressor inlet and outlet is noticeably different	Correct or too much	Refer to items 5 and 6
5	Immediately after air conditioning is turned off, refrigerant in sight glass stays clear	Too much	(1) Discharge refrigerant (2) Evacuate air and charge proper amount or purified refrigerant
6	When air conditioning is turned off, refrigerant foams and then stays clear	Correct	–

\*: Bubbles in the sight glass with ambient temperatures higher than usual can be considered normal if cooling is sufficient.

## 2. INSPECT REFRIGERANT PRESSURE WITH MANIFOLD GAUGE SET

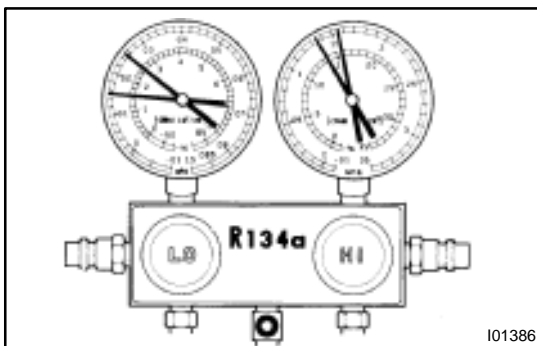
This is a method in which the trouble is located by using a manifold gauge set. Read the manifold gauge pressure when the these conditions are established.

Test conditions:

- ◆ Temperature at the air inlet with the switch set at RECIRC is 30 – 35 °C (86 – 95 °F)
- ◆ Engine running at 1500 rpm
- ◆ Blower speed control switch at "HI" position
- ◆ Temperature control dial on "COOL" position

HINT:

It should be noted that the gauge indications may vary slightly due to ambient temperature conditions.



(1) Normally functioning refrigeration system.

**Gauge reading:**

**Low pressure side:**

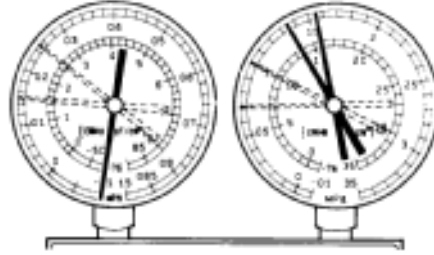
**0.15 – 0.25 MPa (1.5 – 2.5 kgf/cm<sup>2</sup>)**

**High pressure side:**

**1.37 – 1.57 MPa (14 – 16 kgf/cm<sup>2</sup>)**

(2) Moisture present in refrigeration system.

Condition: Periodically cools and then fails to cool

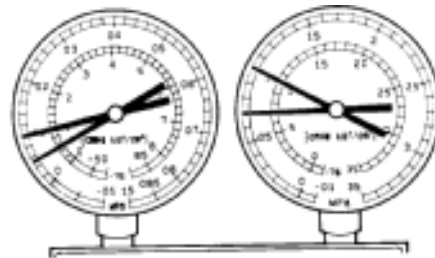


I01387

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
During operation, pressure on low pressure side sometimes become a vacuum and sometime normal	Moisture entered in refrigeration system freezes at expansion valve orifice and temporarily stops cycle, but normal state is restored after a time when the ice melts	<ul style="list-style-type: none"> <li>◆Drier oversaturated state</li> <li>◆Moisture in refrigeration system freezes at expansion valve orifice and blocks circulation of refrigerant</li> </ul>	<ol style="list-style-type: none"> <li>(1) Replace receiver</li> <li>(2) Remove moisture in cycle through repeatedly evacuating air</li> <li>(3) Charge proper amount of new refrigerant</li> </ol>

(3) Insufficient cooling

Condition: Insufficient cooling

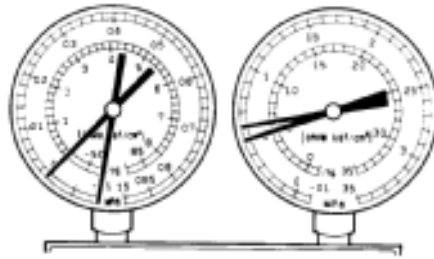


I01388

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
<ul style="list-style-type: none"> <li>◆Pressure low on both low and high pressure sides</li> <li>◆Bubbles seen in sight glass continuously</li> <li>◆Insufficient cooling performance</li> </ul>	Gas leakage at some place in refrigeration system	<ul style="list-style-type: none"> <li>◆Insufficient refrigerant in system</li> <li>◆Refrigerant leaking</li> </ul>	<ol style="list-style-type: none"> <li>(1) Check for gas leakage with gas leak detector and repair if necessary</li> <li>(2) Charge proper amount of refrigerant</li> <li>(3) If indicated pressure value is near 0 when connected to gauge, create the vacuum after inspecting and repairing the location of the leak</li> </ol>

(4) Poor circulation of refrigerant

Condition: Insufficient cooling

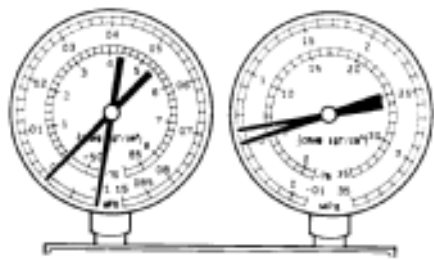


I01389

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
<ul style="list-style-type: none"> <li>◆Pressure low in both low and high pressure sides</li> <li>◆Frost on tube from receiver to unit</li> </ul>	Refrigerant flow obstructed by dirt in receiver	Receiver clogged	Replace receiver

(5) Refrigerant does not circulate

Condition: Does not cool (Cools from time to time in some cases)

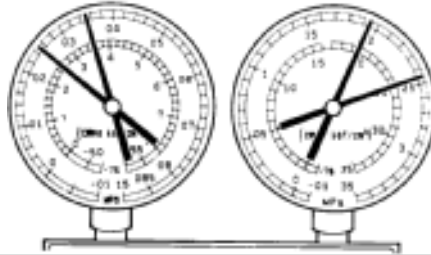


I01449

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
<ul style="list-style-type: none"> <li>◆Vacuum indicated on low pressure side, very low pressure indicated on high pressure side</li> <li>◆Frost or dew seen on piping before and after receiver/ drier or expansion valve</li> </ul>	<ul style="list-style-type: none"> <li>◆Refrigerant flow obstructed by moisture or dirt in refrigeration system</li> <li>◆Refrigerant flow obstructed by gas leakage from expansion valve</li> </ul>	Refrigerant does not circulate	<ol style="list-style-type: none"> <li>(1) Check expansion valve</li> <li>(2) Clean out dirt in expansion valve by blowing with air</li> <li>(3) Replace receiver</li> <li>(4) Evacuate air and charge new refrigerant to proper amount</li> <li>(5) For gas leakage from expansion valve, replace expansion valve</li> </ol>

(6) Refrigerant overcharged or insufficient cooling of condenser

Condition: Insufficient cooling

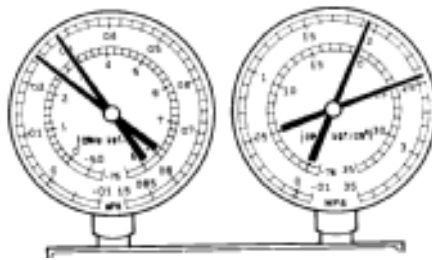


I01390

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
<ul style="list-style-type: none"> <li>◆Pressure too high on both low and high pressure sides</li> <li>◆No air bubbles seen through the sight glass even when the engine rpm is lowered</li> </ul>	<ul style="list-style-type: none"> <li>◆Unable to develop sufficient performance due to excessive refrigeration system</li> <li>◆Insufficient cooling of condenser</li> </ul>	<ul style="list-style-type: none"> <li>◆Excessive refrigerant in cycle → refrigerant over charged</li> <li>◆Condenser cooling → condenser fins clogged of condenser fan faulty</li> </ul>	<ol style="list-style-type: none"> <li>(1) Clean condenser</li> <li>(2) Check condenser fan motor operation</li> <li>(3) If (1) and (2) are in normal state, check amount of refrigerant Charge proper amount of refrigerant</li> </ol>

(7) Air present in refrigeration system

Condition: Insufficient cooling



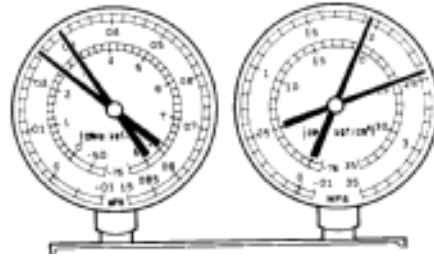
NOTE : These gauge indications are shown when the refrigeration system has been opened and the refrigerant charged without vacuum purging.

I01392

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
<ul style="list-style-type: none"> <li>◆Pressure too high on both low and high pressure sides</li> <li>◆The low pressure piping hot to touch</li> <li>◆Bubbles seen in sight glass</li> </ul>	<p>Air entered in refrigeration system</p>	<ul style="list-style-type: none"> <li>◆Air present in refrigeration system</li> <li>◆Insufficient vacuum purging</li> </ul>	<ol style="list-style-type: none"> <li>(1) Check compressor oil to see if it is dirty or insufficient</li> <li>(2) Evacuate air and charge new refrigerant</li> </ol>

(8) Expansion valve improperly

Condition: Insufficient cooling

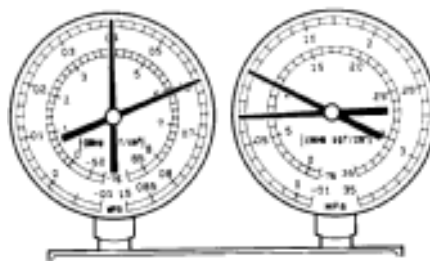


I01450

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
<ul style="list-style-type: none"> <li>◆Pressure too high on both low and high pressure sides</li> <li>◆Frost or large amount of dew on piping on low pressure side</li> </ul>	Trouble in expansion valve	<ul style="list-style-type: none"> <li>◆Excessive refrigerant in low pressure piping</li> <li>◆Expansion valve opened too wide</li> </ul>	Check expansion valve Replace if defective

(9) Defective compression compressor

Condition : Does not cool



I01393

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
<ul style="list-style-type: none"> <li>◆Pressure too high on low and high pressure sides</li> <li>◆Pressure too low on high pressure side</li> </ul>	Internal leak in compressor	<ul style="list-style-type: none"> <li>◆Compression defective</li> <li>◆Valve leaking or broken sliding parts</li> </ul>	Repair or replace compressor



**3. INSPECT IDLE-UP SPEED**

- (a) Warm up engine.
- (b) Inspect idle-up speed when the these conditions are established.
  - ◆ Warm up engine
  - ◆ Blower speed control switch at "HI" position
  - ◆ A/C switch ON
  - ◆ Temperature control dial at "COOL" position

Magnetic clutch condition	Idle-up speed
Magnetic clutch not engaged	700 ± 50 rpm
Magnetic clutch engaged	700 ± 50 rpm

If idle speed is not as specified, check ISC valve and air intake system.

**4. INSPECT FOR LEAKAGE OF REFRIGERANT**

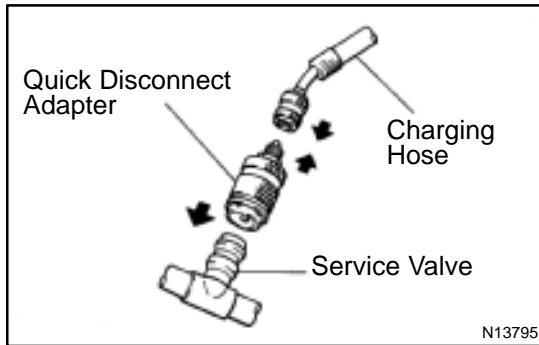
- (a) Perform in these conditions:
  - ◆ Stop engine.
  - ◆ Secure good ventilation (If not the gas leak detector may react to volatile gases witch are not refrigerant, such as evaporated gasoline and exhaust gas.)
  - ◆ Repeat the test 2 or 3 times.
  - ◆ Make sure that there is some refrigerant remaining in the refrigeration system.  
When compressor is OFF: approx. 392 – 588 kPa (4 – 6 kgf/ cm<sup>2</sup>, 57 – 85 psi)
- (b) Bring the gas leak detector close to the drain hose before performing the test.

**HINT:**

- ◆ After the blower motor stopped, leave the cooling unit for more than 15 minutes.
- ◆ Expose the gas leak detector sensor the under the drain hose.
- ◆ When bring the gas leak detector close to the drain hose, make sure that the gas leak detector does not react to the volatile gases.

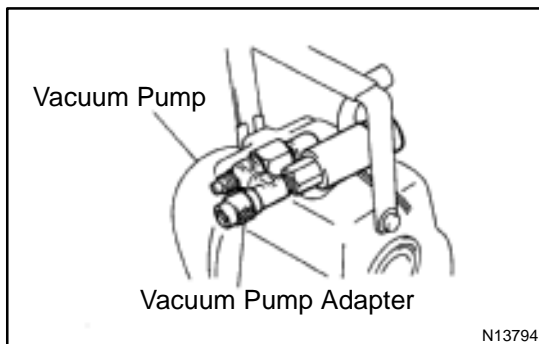
If such reaction is unavoidable, the vehicle must be lifted up.

- (c) If gas leak is not detected on the drain hose, remove the blower resistor from the cooling unit. Then insert the gas leak detector sensor into the unit and perform the test.
- (d) Disconnect the connector and leave the pressure switch for approx. 20 minutes. Then bring the gas leak detector close to the pressure switch and perform the test.
- (e) Bring the gas leak detector close to the refrigerant lines and perform the test.

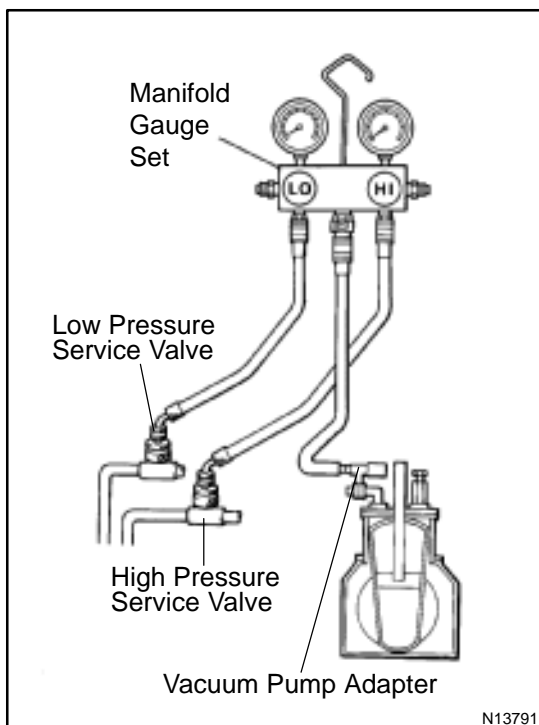


## EVACUATING

1. **CONNECT QUICK DISCONNECT ADAPTER TO CHARGING HOSES**
2. **REMOVE CAPS FROM SERVICE VALVES ON REFRIGERANT LINES**
3. **SET ON MANIFOLD GAUGE SET**
  - (a) Close both hand valves of manifold gauge set.
  - (b) Connect the quick disconnect adapters to the service valves.



4. **EVACUATE AIR FROM REFRIGERATION SYSTEM**
  - (a) Connect the vacuum pump adapter to the vacuum pump.

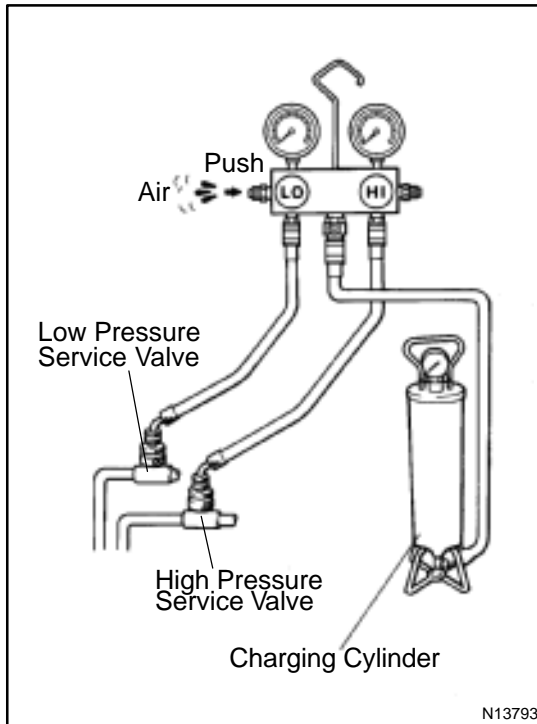


- (b) Connect the center hose of the manifold gauge set to the vacuum pump adapter.
- (c) Open both the high and low hand valves and run the vacuum pump.
- (d) After 10 minutes or more, check that the low pressure gauge indicates 750 mmHg (30 in. Hg) or more.

### HINT:

If the reading 750 mmHg (30 in. Hg) or more, close both hand valves of manifold gauge set and stop the vacuum pump. Check the system for leaks and repair necessary.

- (e) Close both the high and low hand valves and stop the vacuum pump.
- (f) Leave the system in this condition for 5 minutes or more and check that there is no gauge indicator.



## CHARGING

### 1. INSTALL CHARGING CYLINDER

#### HINT:

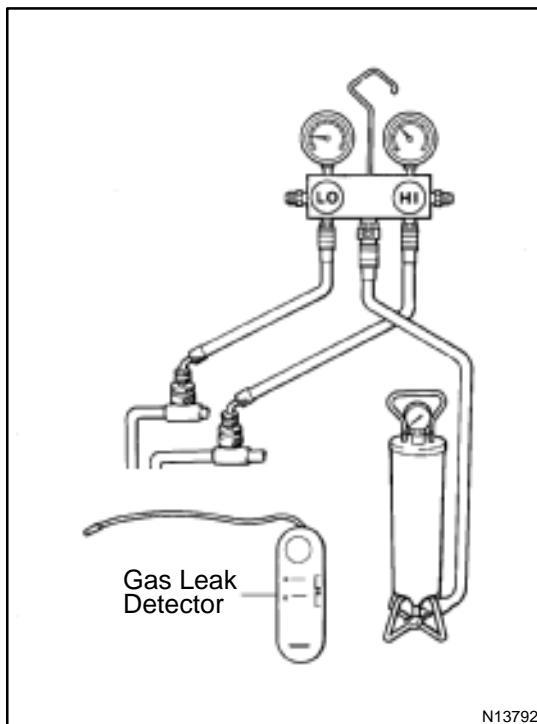
When handling the charging cylinder, always follow the directions given in the instruction manual.

- (a) Charge the proper amount of refrigerant into the charging cylinder.
- (b) Connect the center hose to the charging cylinder.

#### CAUTION:

**Do not open both high and low hand valves of manifold gauge set.**

- (c) Open the valve of charging cylinder.
- (d) Press the valve core on the side of manifold gauge and expel the air inside of the center hose.

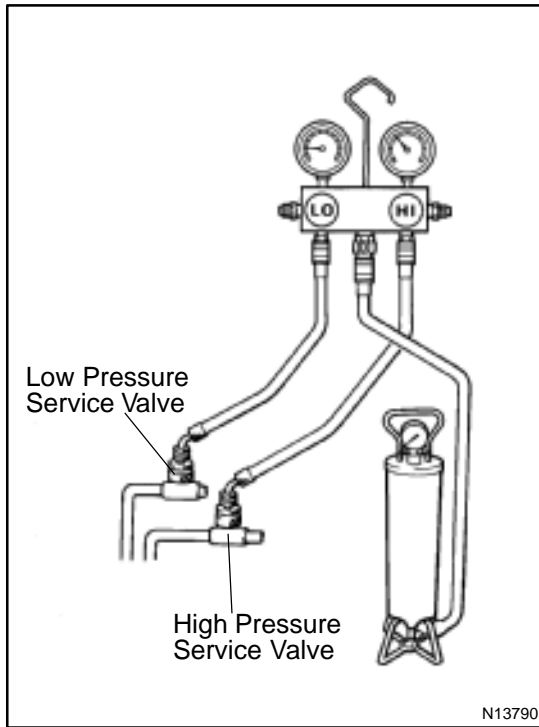


### 2. INSPECT REFRIGERATION SYSTEM FOR LEAKS

- (a) Open the high pressure hand valve and charge refrigerant.
- (b) When the low pressure gauge indicates 98 kPa (1 kgf/cm<sup>2</sup>, 14 psi) close the high pressure hand valve.
- (c) Using a gas leak detector, check the system for leakage.
- (d) If leak is found, repair the faulty component or connection.

#### CAUTION:

**Use the refrigerant recovery/ recycling machine to recover the refrigerant whenever replacing parts.**



### 3. CHARGE REFRIGERANT INTO REFRIGERANT SYSTEM

If there is no leak after refrigerant leak check, charge the proper amount of refrigerant into refrigeration system.

#### CAUTION:

- ◆ Never run the engine when charging the system through the high pressure side.
- ◆ Do not open the low pressure hand valve when the system is being charged with liquid refrigerant.

- (a) Open the high pressure hand valve fully.
- (b) Charge specified amount of refrigerant, then close the high pressure hand valve.

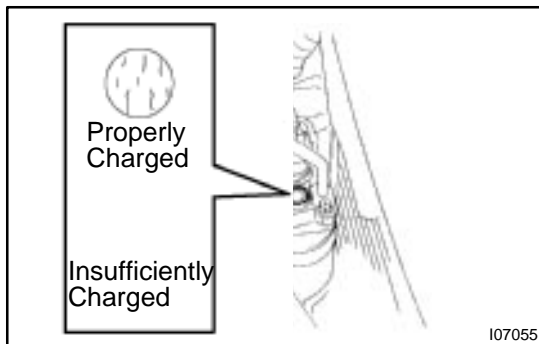
#### HINT:

A fully charged system is indicated by the sight glass being free of any bubbles.

- (c) Charge partially refrigeration system with refrigerant.
  - (1) Set vehicle in these conditions:
    - ◆ Running engine at 1,500 rpm
    - ◆ Blower speed control set at "HI"
    - ◆ Temperature control set at "MAX. COOL"
    - ◆ Air inlet control set at "RECIRC"
    - ◆ Fully open doors (Sliding roof: closed)
  - (2) Open the low pressure hand valve.

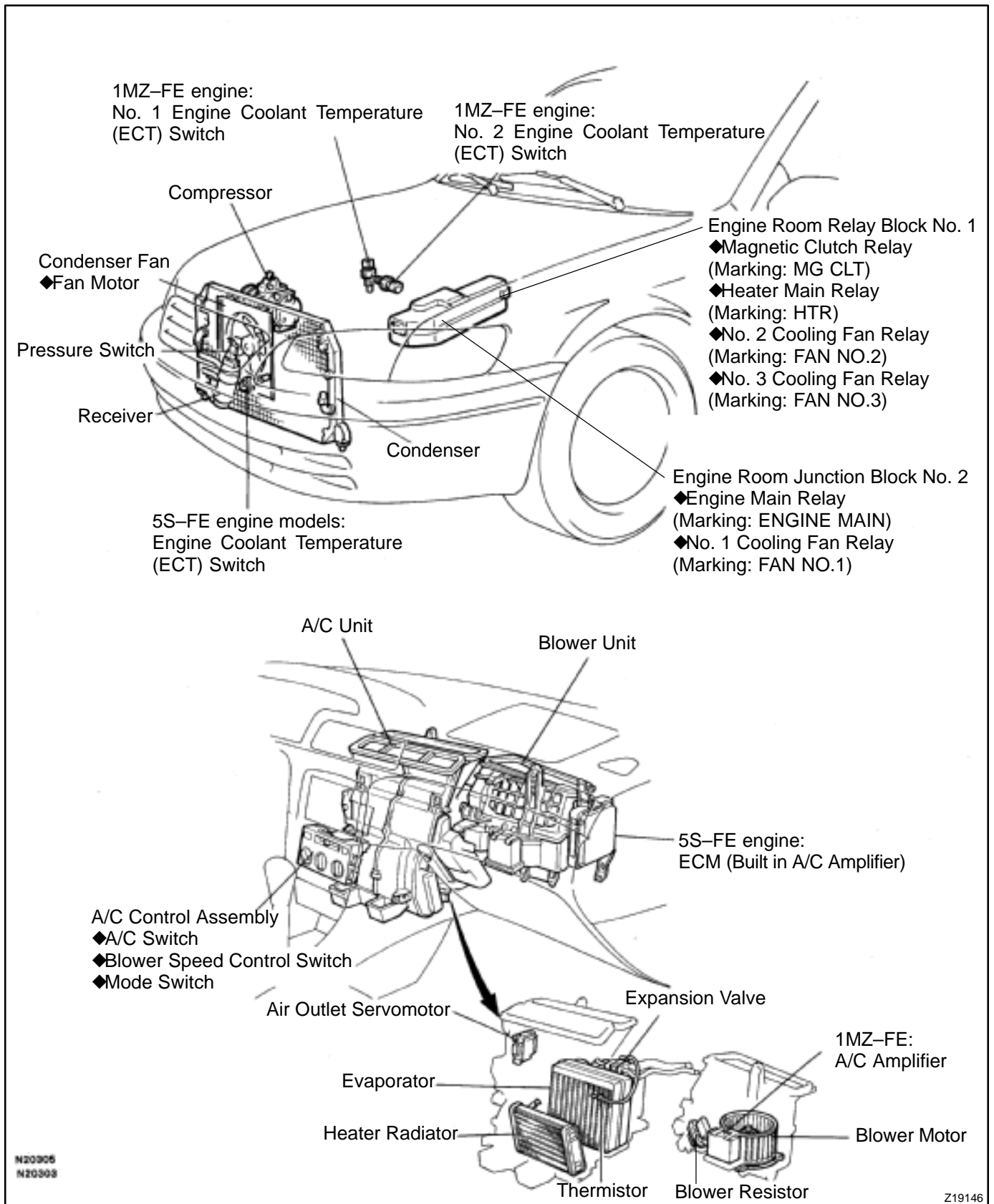
#### CAUTION:

**Do not open the high pressure hand valve.**



- (d) Charge refrigerant until bubbles disappear and check the pressure on the gauge through the sight glass.

# LOCATION



# TROUBLESHOOTING

AC21T-01

## PROBLEM SYMPTOMS TABLE

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

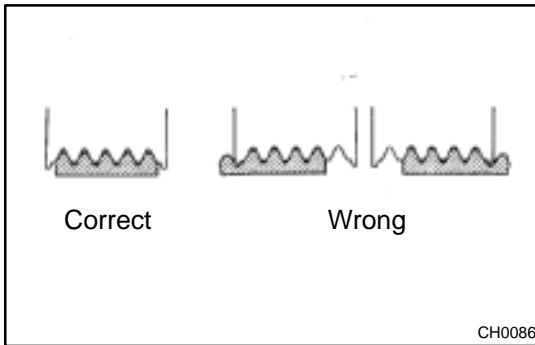
Symptom	Suspect Area	See page
No blower operation	<ol style="list-style-type: none"> <li>4. HTR Fuse</li> <li>5. Heater main relay</li> <li>6. Blower motor</li> <li>7. Blower resistor</li> <li>8. Blower speed control switch</li> <li>9. Wire harness</li> </ol>	<p>–</p> <p><a href="#">AC-70</a></p> <p><a href="#">AC-63</a></p> <p><a href="#">AC-64</a></p> <p><a href="#">AC-84</a></p> <p>–</p>
No air temperature control	<ol style="list-style-type: none"> <li>1. Engine coolant volume</li> <li>2. A/C control assembly</li> </ol>	<p>–</p> <p><a href="#">AC-80</a></p>
No air inlet control	<ol style="list-style-type: none"> <li>1. A/C control assembly</li> </ol>	<a href="#">AC-80</a>
No air outlet control	<ol style="list-style-type: none"> <li>1. HTR Fuse</li> <li>2. Air outlet servomotor</li> <li>3. Mode switch</li> </ol>	<p>–</p> <p><a href="#">AC-65</a></p> <p><a href="#">AC-84</a></p>
No compressor operation	<ol style="list-style-type: none"> <li>1. Refrigerant volume</li> <li>2. A.C Fuse</li> <li>3. HTR Fuse</li> <li>4. Magnetic clutch relay</li> <li>5. Magnetic clutch</li> <li>6. Compressor</li> <li>7. Pressure switch</li> <li>8. Heater main relay</li> <li>9. Blower speed control switch</li> <li>10. A/C switch</li> <li>11. *1 ECM</li> <li style="padding-left: 20px;">*2 A/C amplifier</li> <li>12. Wire harness</li> </ol>	<p><a href="#">AC-3</a></p> <p>–</p> <p>–</p> <p><a href="#">AC-71</a></p> <p><a href="#">AC-39</a></p> <p><a href="#">AC-39</a></p> <p><a href="#">AC-67</a></p> <p><a href="#">AC-70</a></p> <p><a href="#">AC-84</a></p> <p><a href="#">AC-84</a></p> <p><a href="#">DI-218</a></p> <p><a href="#">AC-88</a></p> <p>–</p>
No compressor operates intermittently	<ol style="list-style-type: none"> <li>1. Refrigerant volume</li> <li>2. Condenser fan</li> <li>3. Pressure switch</li> <li>4. *1 ECM</li> <li style="padding-left: 20px;">*2 A/C amplifier</li> <li>5. Thermistor</li> <li>6. Wire harness</li> </ol>	<p><a href="#">AC-3</a></p> <p><a href="#">AC-74</a></p> <p><a href="#">AC-67</a></p> <p><a href="#">DI-218</a></p> <p><a href="#">AC-88</a></p> <p><a href="#">AC-24</a></p> <p>–</p>
No cool air comes out	<ol style="list-style-type: none"> <li>1. Refrigerant volume</li> <li>2. Refrigerant pressure</li> <li>3. Drive belt</li> <li>4. Compressor lock sensor</li> <li>5. Magnetic clutch</li> <li>6. Compressor</li> <li>7. Pressure switch</li> <li>8. Thermistor</li> <li>9. A/C switch</li> <li>10. *1 ECM</li> <li style="padding-left: 20px;">*2 A/C amplifier</li> <li>11. Wire harness</li> </ol>	<p><a href="#">AC-3</a></p> <p><a href="#">AC-3</a></p> <p><a href="#">AC-16</a></p> <p><a href="#">AC-16</a></p> <p><a href="#">AC-39</a></p> <p><a href="#">AC-39</a></p> <p><a href="#">AC-67</a></p> <p><a href="#">AC-24</a></p> <p><a href="#">AC-84</a></p> <p><a href="#">DI-218</a></p> <p><a href="#">AC-88</a></p> <p>–</p>

## AIR CONDITIONING – TROUBLESHOOTING

Cool air comes out only at high engine rpm	<ol style="list-style-type: none"> <li>1. Refrigerant volume</li> <li>2. Drive belt</li> <li>3. Magnetic clutch</li> <li>4. Compressor</li> <li>5. Condenser</li> <li>6. Condenser fan</li> <li>7. Receiver</li> <li>8. Expansion valve</li> <li>9. Evaporator</li> <li>10. Thermistor</li> <li>11. Refrigerant line</li> <li>12. Pressure switch</li> <li>13. *1 ECM</li> <li style="padding-left: 20px;">*2 A/C amplifier</li> </ol>	<p>AC-3</p> <p>AC-16</p> <p>AC-16</p> <p>AC-39</p> <p>AC-52</p> <p>AC-74</p> <p>AC-49</p> <p>AC-59</p> <p>AC-30</p> <p>AC-24</p> <p>AC-21</p> <p>AC-67</p> <p>DI-218</p> <p>AC-88</p>
No engine idle-up when A/C switch ON	<ol style="list-style-type: none"> <li>1. *1 ECM</li> <li style="padding-left: 20px;">*2 A/C amplifier</li> <li>2. Wire harness</li> </ol>	<p>DI-218</p> <p>AC-88</p> <p>–</p>
Blinking of A/C indicator	<ol style="list-style-type: none"> <li>1. *1 ECM</li> <li style="padding-left: 20px;">*2 A/C amplifier</li> <li>2. Thermistor</li> <li>3. Compressor</li> </ol>	<p>DI-218</p> <p>AC-88</p> <p>AC-24</p> <p>AC-39</p>
A/C indicator does not lights up when turn mode switch to DEF. position	<ol style="list-style-type: none"> <li>1. A/C Fuse</li> <li>2. Mode switch</li> <li>3. A/C switch</li> <li>4. *1 ECM</li> <li style="padding-left: 20px;">*2 A/C amplifier</li> <li>5. Wire harness</li> </ol>	<p>–</p> <p>AC-84</p> <p>AC-84</p> <p>DI-218</p> <p>AC-88</p> <p>–</p>
No warm air comes out	<ol style="list-style-type: none"> <li>1. Engine coolant volume</li> <li>2. A/C control assembly</li> <li>3. Heater radiator</li> </ol>	<p>–</p> <p>AC-80</p> <p>AC-57</p>
No condenser fan operation	<ol style="list-style-type: none"> <li>1. CDS FAN Fuse</li> <li>2. Engine main relay</li> <li>3. Cooling fan relay No. 1</li> <li>4. Cooling fan relay No. 2</li> <li>5. Cooling fan relay No. 3</li> <li>6. Condenser fan motor</li> <li>7. Pressure switch</li> <li>8. *1 Engine coolant temp. switch</li> <li style="padding-left: 20px;">*2 No. 1 Engine coolant temp. switch</li> <li>9. *2 No. 2 Engine coolant temp. switch</li> <li>10. Wire harness</li> </ol>	<p>–</p> <p>–</p> <p>AC-72</p> <p>AC-72</p> <p>AC-72</p> <p>AC-74</p> <p>AC-67</p> <p>AC-92</p> <p>AC-92</p> <p>AC-92</p> <p>–</p>

\*1: 5S-FE Engine Models

\*2: 1MZ-FE Engine Models

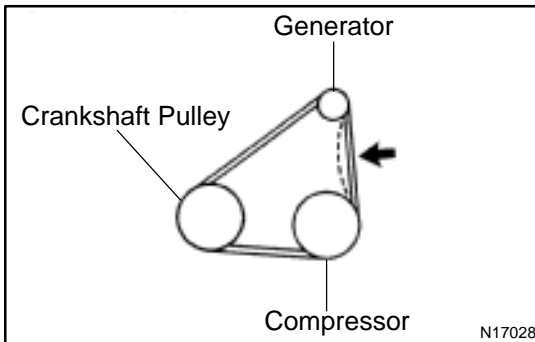


## DRIVE BELT ON-VEHICLE INSPECTION

ACOLM-02

### 1. INSPECT DRIVE BELT'S INSTALLATION CONDITION

Check that the drive belt fits properly in the ribbed grooves.



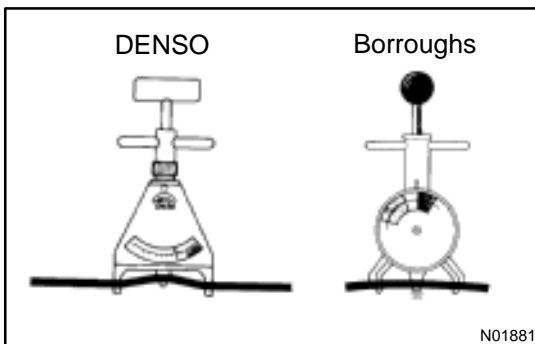
### 2. INSPECT DRIVE BELT TENSION

Using a belt tension gauge, check the drive belt tension.

**Drive belt tension:**

**New belt:  $165 \pm 26$  lbf**

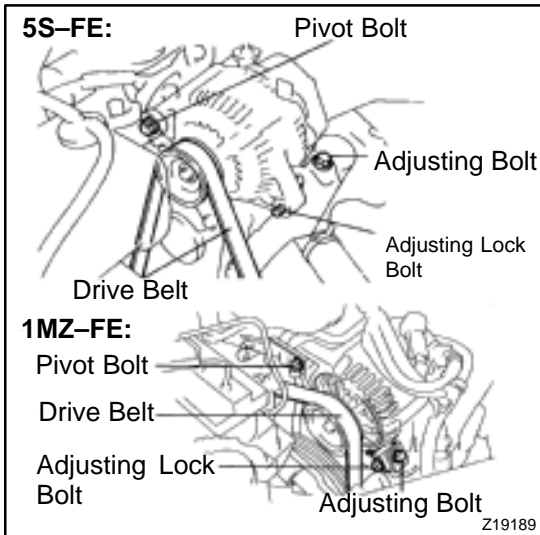
**Used belt:  $110 \pm 11$  lbf**



#### HINT:

- ◆ "New belt" refers to a belt which has been used less than 5 minutes on a running engine.
- ◆ "Used belt" refers to a belt which has been used on a running engine for 5 minutes or more.
- ◆ After installing the drive belt, check that it fits properly in the ribbed grooves.





## REMOVAL

### REMOVE DRIVE BELT

- (a) Loosen the pivot bolt and adjusting lock bolt.

**Torque:**

**5S-FE:**

**Pivot bolt: 52 N·m (530 kgf·cm, 38 ft·lbf)**

**Adjusting lock bolt: 18 N·m (185 kgf·cm, 13 ft·lbf)**

**1MZ-FE:**

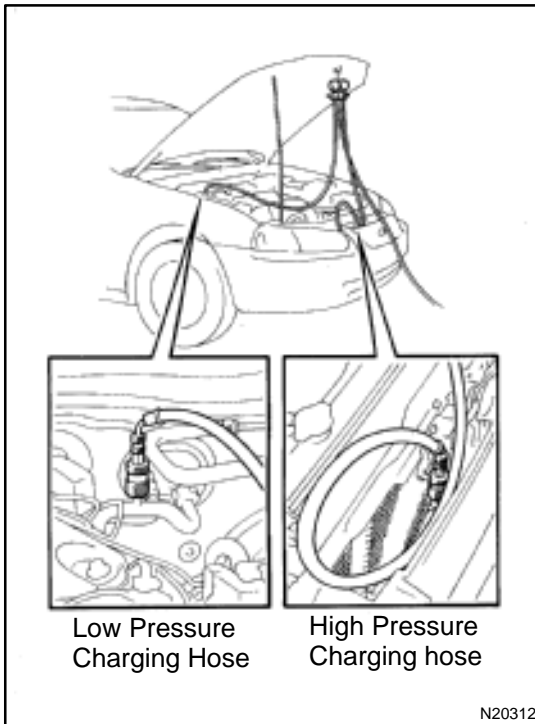
**Pivot bolt: 56 N·m (570 kgf·cm, 41 ft·lbf)**

**Adjusting lock bolt: 18 N·m (185 kgf·cm, 13 ft·lbf)**

- (b) Loosen the drive belt tension by adjusting bolt and remove the drive belt.

## INSTALLATION

Installation is in the reverse order of removal (See page [AC-17](#)).



## MANIFOLD GAUGE SET SET ON

ACOLP-02

### 1. CONNECT CHARGING HOSES TO MANIFOLD GAUGE SET

Tighten the nuts by hand.

#### CAUTION:

Do not connect the wrong hoses.

### 2. CONNECT QUICK DISCONNECT ADAPTERS TO CHARGING HOSES

Tighten the nuts by hand.

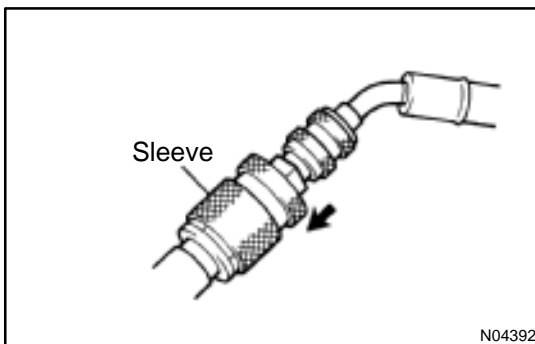
### 3. CLOSE BOTH HAND VALVES OF MANIFOLD GAUGE SET

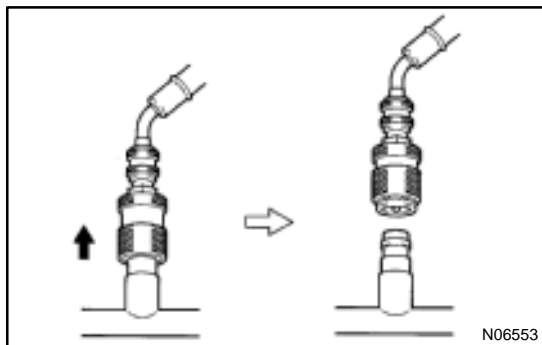
### 4. REMOVE CAPS FROM SERVICE VALVES ON REFRIGERANT LINE

### 5. CONNECT QUICK DISCONNECT ADAPTERS TO SERVICE VALVES

#### HINT:

Push the quick disconnect adapter onto the service valve, then slide the sleeve of the quick disconnect adapter downward to lock it.





## SET OFF

1. **CLOSE BOTH HAND VALVES OF MANIFOLD GAUGE SET**
2. **DISCONNECT QUICK DISCONNECT ADAPTERS FROM SERVICE VALVES ON REFRIGERANT LINE**

### HINT:

Slide the sleeve of the quick disconnect adapter upward to unlock the adapter and remove it from the service valve.

3. **INSTALL CAPS TO SERVICE VALVES ON REFRIGERANT LINE**

# REFRIGERANT LINE

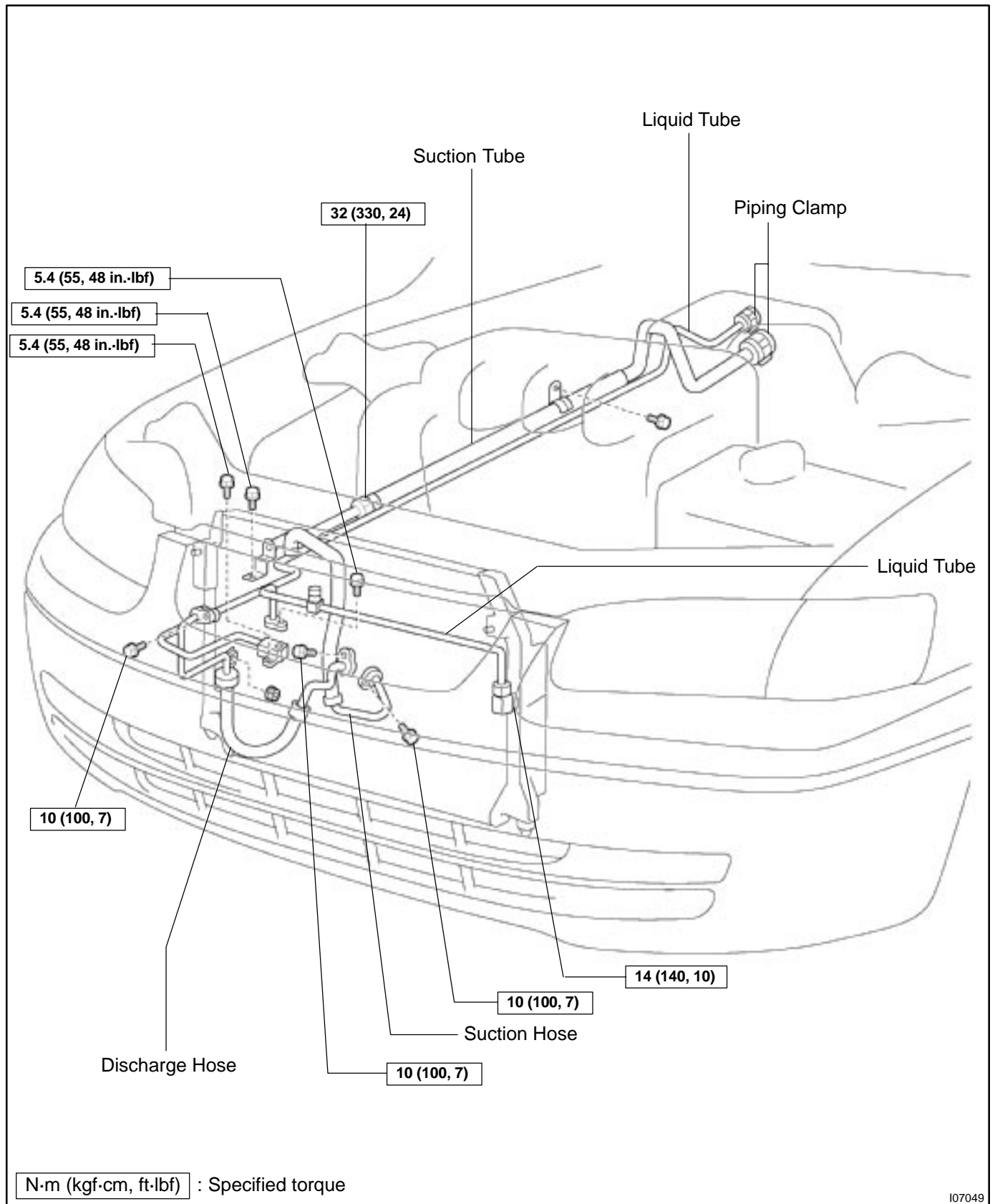
ACQLR-01

## ON-VEHICLE INSPECTION

1. INSPECTION HOSE AND TUBE CONNECTIONS FOR LOOSENESS
2. INSPECT HOSES AND TUBES FOR LEAKAGE

Using a gas leak detector, check for leakage of refrigerant.

# LOCATION



# REPLACEMENT

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM
2. REPLACE FAULTY TUBE OR HOSE

**NOTICE:**

Cap the open fittings immediately to keep moisture or dirt out of the system.

3. TIGHTEN JOINT OF BOLT OR NUT TO SPECIFIED TORQUE

**NOTICE:**

Connections should not be torqued tighter than the specified torque.

Part tightened	N-m	kgf-cm	ft-lbf
Receiver x Liquid tube	5.4	55	48 in.-lbf
Condenser x Discharge hose	10	100	7
Condenser x Liquid tube	14	140	10
Compressor x Discharge hose	10	100	7
Compressor x Suction hose	10	100	7
Expansion valve x Evaporator	5.4	55	48 in.-lbf
Suction line (Piping joint)	32	330	24
Suction line (Block joint)	10	100	7

4. EVACUATE AIR FROM REFRIGERATION SYSTEM AND CHARGE WITH REFRIGERANT

Specified amount : 800 ± 50g (28.22 ± 1.76 oz.)

5. INSPECT FOR LEAKAGE OF REFRIGERANT

Using a gas leak detector, check for leakage of refrigerant.

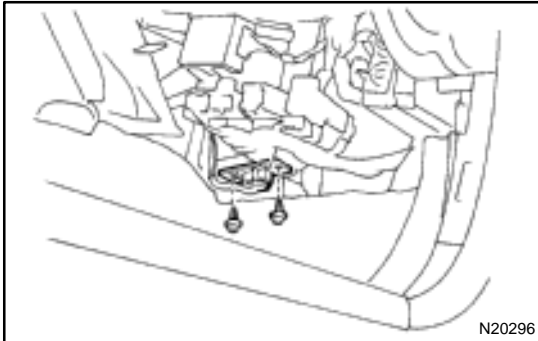
6. INSPECT AIR CONDITIONING OPERATION

# AIR CONDITIONING UNIT ON-VEHICLE INSPECTION

AC21U-01

## 1. INSPECT FOR LEAKAGE OF REFRIGERANT

- (a) Remove glove compartment (See page [BO-75](#)).



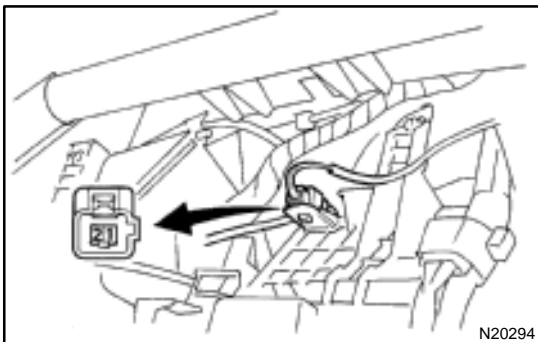
- (b) Remove the blower resistor.  
 (1) Disconnect the connector.  
 (2) Remove the 2 screws and blower resistor.

- (c) Using a gas leak detector, check for leakage.

If there is leakage, check the tightening torque at the joints or check the evaporator.

- (d) Install the blower resistor.

- (e) Install the lower No. 2 finish panel (See page [BO-81](#)).



## 2. INSPECT THERMISTOR RESISTANCE

- (a) Disconnect the connector.

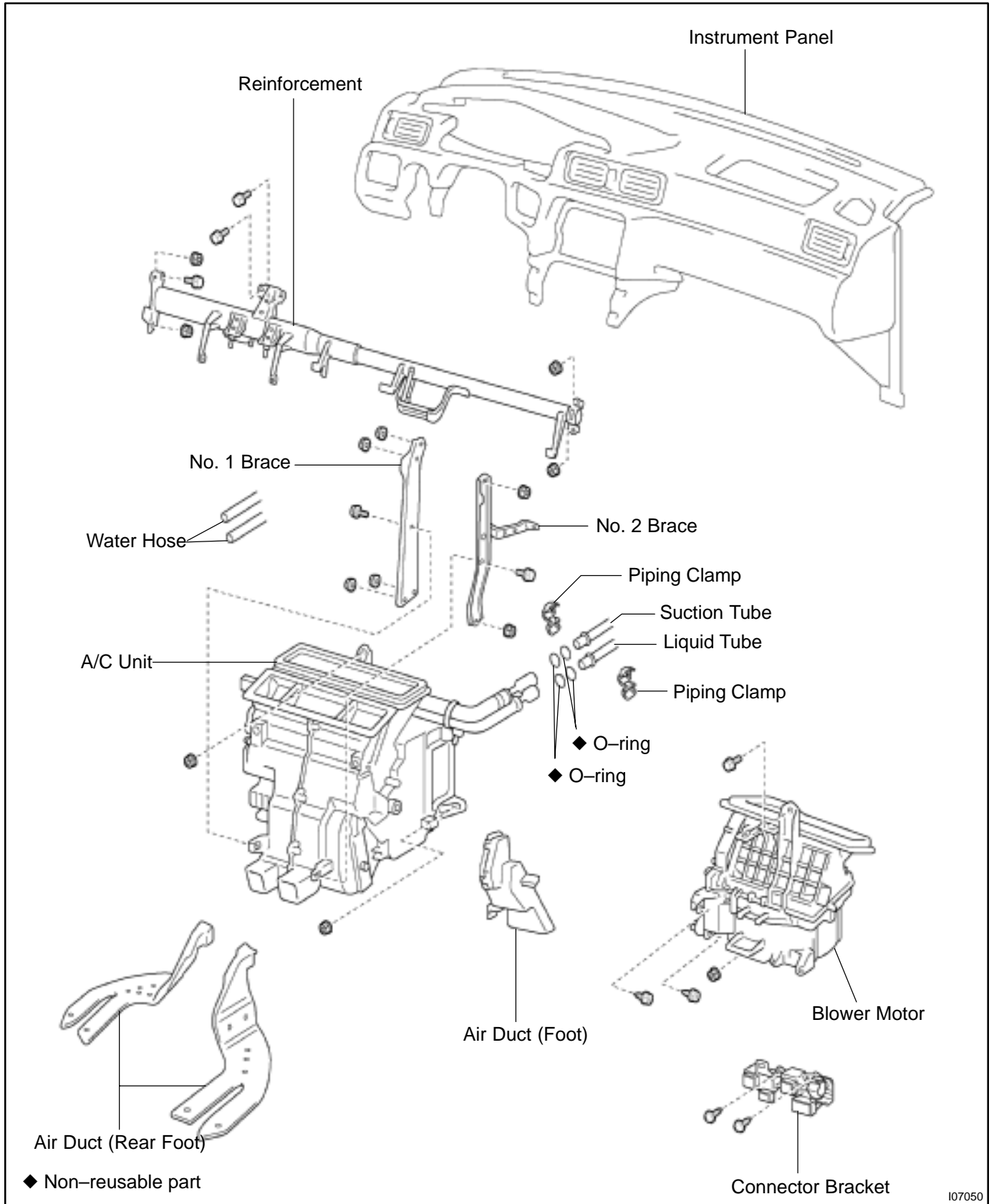
- (b) Measure resistance between terminals.

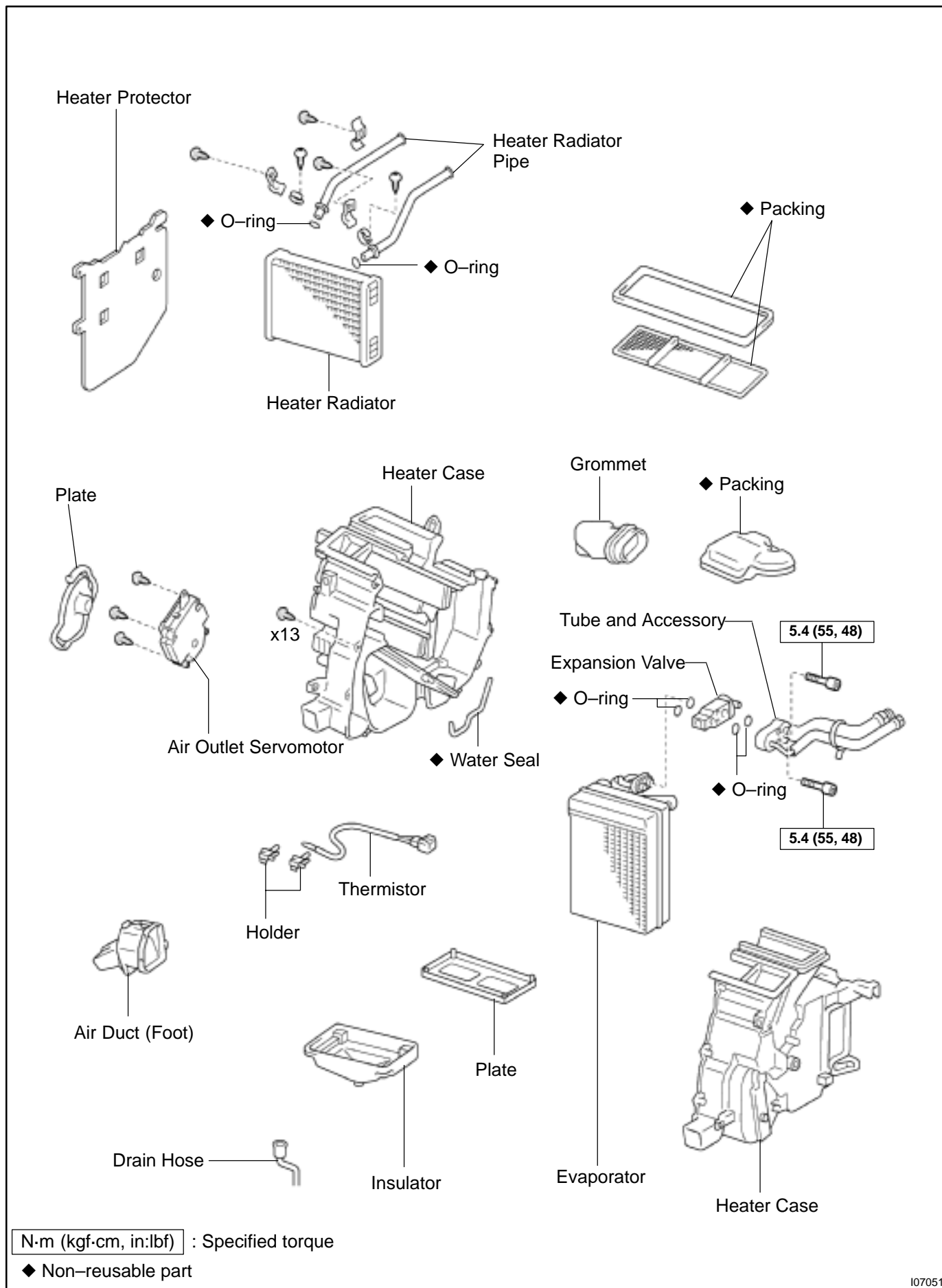
**Standard resistance: 1,500  $\Omega$  at 25°C (77°F)**

If resistance is not as specified, replace the thermistor.



# COMPONENTS





## REMOVAL

### 1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

HINT:

At the time of installation, please refer to the following item.

Evacuate air from refrigeration system.

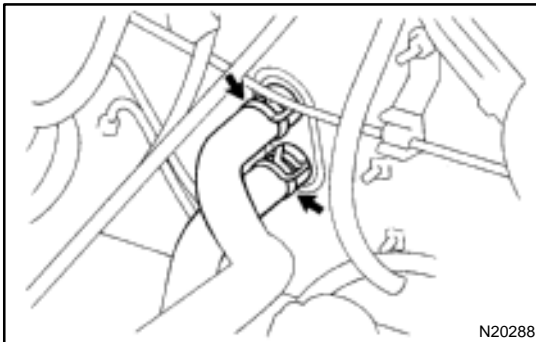
Charge system with refrigerant and inspect for leakage of refrigerant.

**Specified amount: 800 ± 50 g (28.22 ± 1.76 oz.)**

### 2. DRAIN ENGINE COOLANT FROM RADIATOR

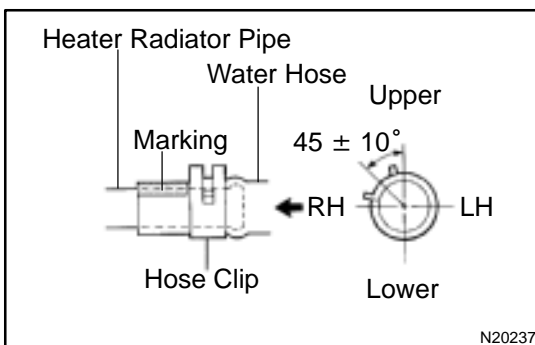
HINT:

It is not necessary to drain out all the coolant.



### 3. DISCONNECT WATER HOSE FROM HEATER RADIATOR PIPES

- (a) Using pliers, grip the claws of the hose clip and slide the hose clip along the hose.
- (b) Disconnect the water hose.



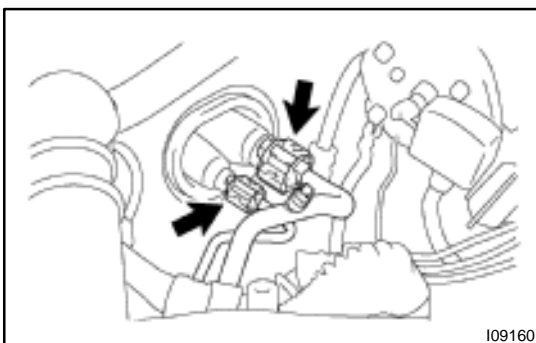
HINT:

At the time of installation, please refer to the following items.

- ◆ Push the water hose onto the heater radiator pipe as far as ridge on the pipe and install the hose clip.
- ◆ Install the hose clip in a position, as shown in the illustration.

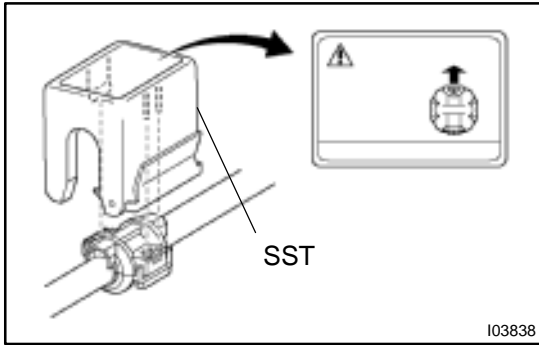
### 4. REMOVE BLOWER UNIT (See page AC-35)

### 5. REMOVE INSTRUMENT PANEL AND REINFORCEMENT (See page BO-75)



### 6. DISCONNECT LIQUID AND SUCTION TUBES

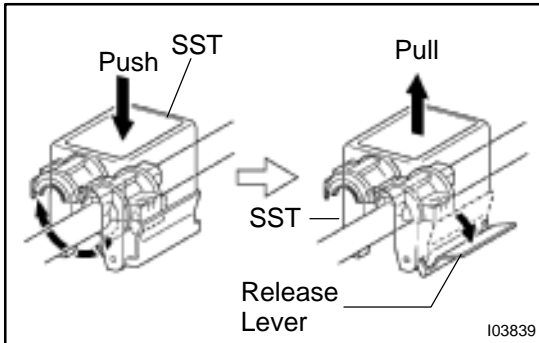
- (a) Using SST, remove the 2 piping clamps.
  - SST 09870-00015 (Suction tube)
  - 09870-00025 (Liquid tube)



(1) Inert SST to piping clamp.

HINT:

Confirm the direction of the piping clamp claw and SST using the illustration showing on the caution label.



(2) Push down SST and release the clamp lock.

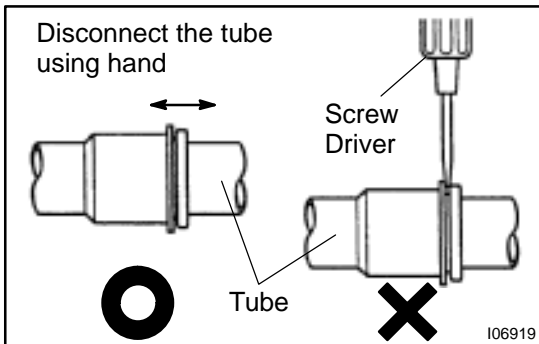
**NOTICE:**

**Be careful not to deform the tubes, when pushing SST.**

(3) Pull SST slightly and push the release lever, then remove the piping clamp with SST.

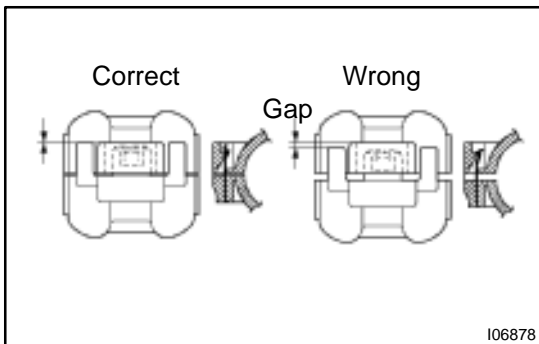
(4) Remove the piping clamp from SST.

(b) Disconnect the both tubes.



**NOTICE:**

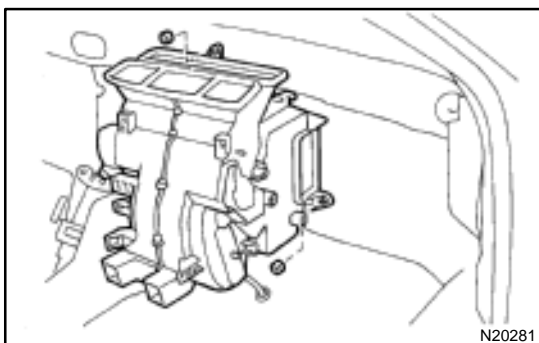
- ◆ Do not use tools like screwdriver to remove the tube.
- ◆ Cap the open fittings immediately to keep moisture or dirt out of the system.



HINT:

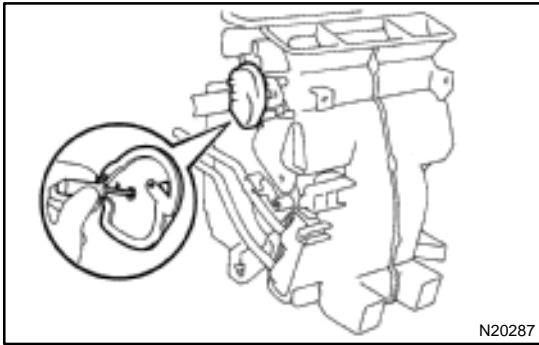
At the time of installation, please refer to the following item.

- ◆ Lubricate 4 new O-rings with compressor oil and install the tubes.
- ◆ After connection, check the fitting for claw of the piping clamp.



## 7. REMOVE A/C UNIT

- (a) Disconnect the connector.
- (b) Slide the floor carpet backward.
- (c) Remove the rear heater duct.
- (d) Remove the 2 nuts and A/C unit.



**DISASSEMBLY**

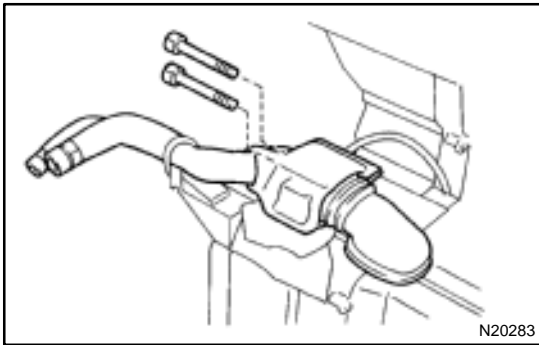
**1. REMOVE AIR OUTLET SERVOMOTOR**

- (a) Release the claw and pull out the plate.
- (b) Remove the 3 screws and servomotor.

**2. REMOVE HEATER RADIATOR**

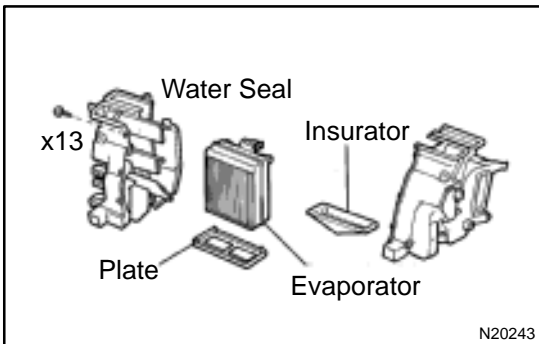
- (a) Remove the 3 screws and 3 plates.
- (b) Remove the 2 clips and heater radiator pipes.
- (c) Pull out the heater radiator.

**3. REMOVE THESE FOOT AIR DUCT LH**



**4. REMOVE EXPANSION VALVE**

- (a) Remove piping clamp.
- (b) Remove the packings.
- (c) Using a hexagon wrench (5.0 mm, 0.20 in.), remove the 2 bolts and separate the expansion valve and evaporator.



**5. REMOVE EVAPORATOR**

- (a) Remove the grommet from the evaporator.
- (b) Using a knife, cut off each packings.

**HINT:**

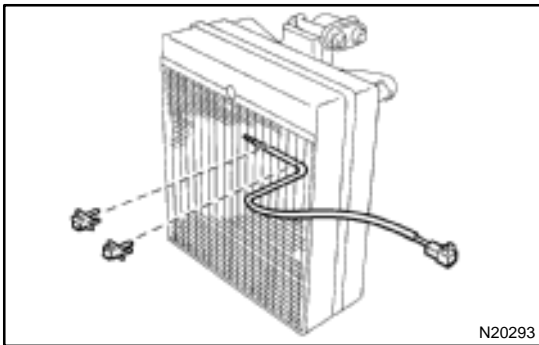
Do not reuse the packing.

- (c) Remove the 13 screws and separate the heater cases, then remove the evaporator and water seal.
- (d) Release the 4 claws and remove the plate from the evaporator.

**6. PEEL OFF THE WATER SEAL FROM HEATER UNIT**

**7. REMOVE THERMISTOR**

Pull out the thermistor with the holders.



## INSPECTION

### 1. CHECK EVAPORATOR FINS FOR BLOCKAGE

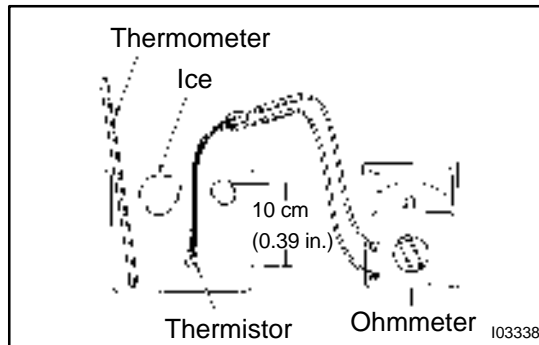
If the fins are clogged, clean them with compressed air.

#### NOTICE:

**Never use water to clean the evaporator.**

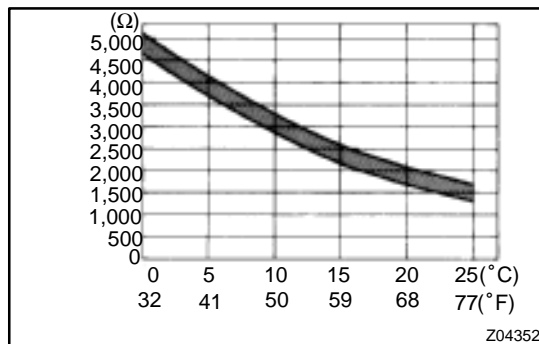
### 2. CHECK FITTING FOR CRACKS OR SCRATCHES

Repair as necessary.



### 3. INSPECT THERMISTOR RESISTANCE

- (a) Place the thermistor in cold water, and while changing the temperature of water, measure resistance at the connector and at the same time, measure temperature of water with a thermometer.



- (b) Compare the 2 readings on the chart.  
If resistance value is not as specified, replace the thermistor.

## REASSEMBLY

1. **INSTALL THERMISTOR TO EVAPORATOR**
2. **INSTALL EVAPORATOR**
  - (a) Install the plate to the evaporator.
  - (b) Install the evaporator on the insulator.
  - (c) Connect the heater case with the 13 screws.

**NOTICE:**

**The packing for water seal should be replaced, with a new one when the A/C unit is reassembled.**

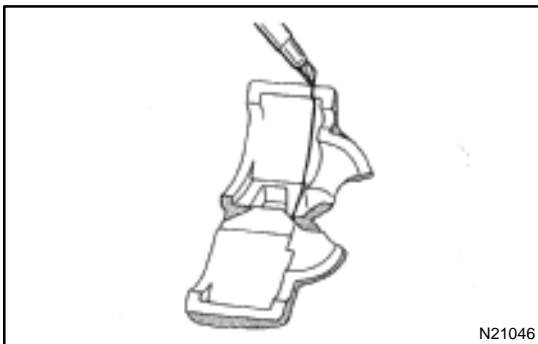
- (d) Install the 2 new packings.
- (e) Install the grommet to evaporator.

**HINT:**

If evaporator is replaced, add compressor oil to the compressor.

**Add 40 – 50 cc (1.4 – 1.7 fl.oz.)**

**Compressor oil: ND – OIL 8 or equivalent**



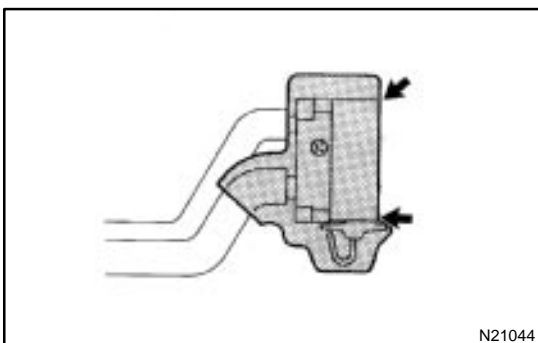
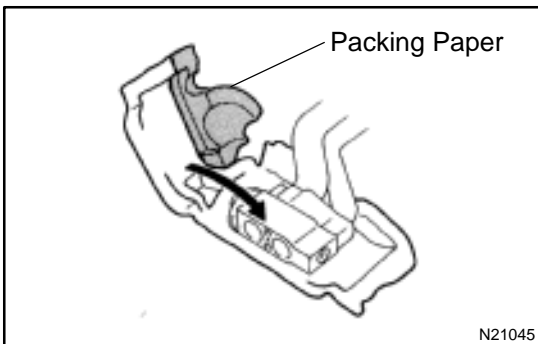
### 3. **INSTALL EXPANSION VALVE**

- (a) Lubricate 2 new O-rings with compressor oil and install the tubes.
- (b) Install the liquid tube and suction tube on the expansion valve.
- (c) Using a knife, cut off packing paper of packing while peel off the paper, as shown in the illustration.

**HINT:**

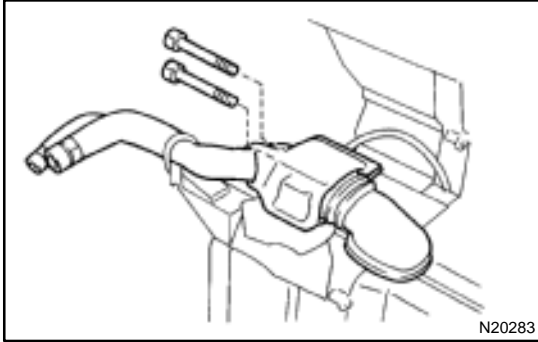
Leave the packing paper untaped on the tube side so that the installation bolt hole for remains visible.

- (d) Apply new packing.



**NOTICE:**

**Do not overtape the packing beyond the expansion valve edge.**



- (e) Lubricate 2 new O-rings with compressor oil and install the expansion valve.
- (f) Install the expansion valve with the tubes to evaporator with the 2 bolts.

**Torque: 5.4 N·m (55 kgf·cm, 48 in.-lbf)**

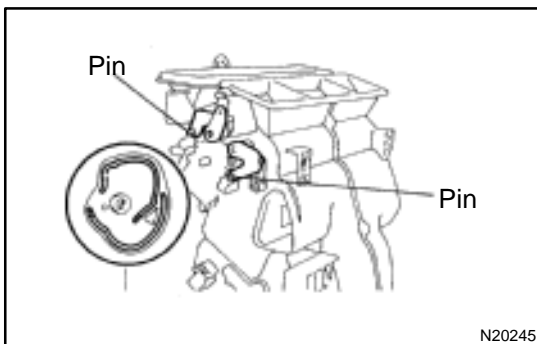
**NOTICE:**

**When installing the expansion valve, take care so that the packing is not jammed with the evaporator.**

- (g) Peel off the remaining packing paper and apply the packing to expansion valve.

**4. INSTALL HEATER RADIATOR**

- (a) Install the heater radiator to heater case.
- (b) Install the heater radiator pipe with 2 clips.
- (c) Install the 3 clamps with the 3 screws.



**5. INSTALL MODE SERVOMOTOR**

- (a) Install the servomotor with the 3 screws.
- (b) Insert the drain of the plate to the pin and install plate.

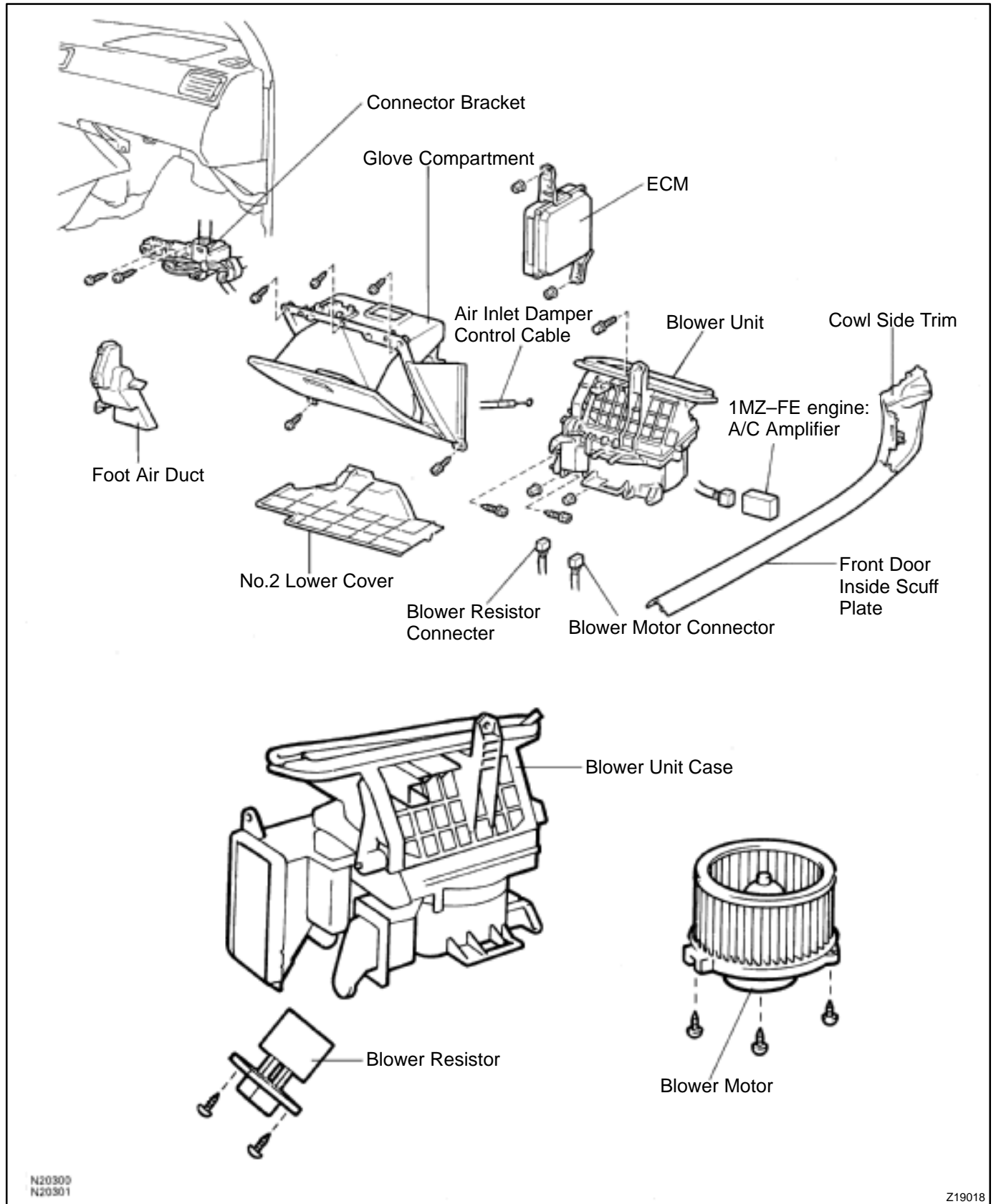


# INSTALLATION

Installation is in the reverse order of removal (See page [AC-27](#)).

# BLOWER UNIT COMPONENTS

AC0LZ-02



## REMOVAL

1. REMOVE COWL SIDE TRIM
2. REMOVE FRONT DOOR INSIDE PLATE LH
3. REMOVE NO. 2 LOWER COVER
4. REMOVE GLOVE COMPARTMENT
5. REMOVE ECM
  - (a) Disconnect the connectors.
  - (b) Remove the 2 nuts and ECM.
6. DISCONNECT AIR INLET DAMPER CONTROL CABLE

### HINT:

At the in time of installation, please refer to following item.

After connection, inspect the air inlet control lever operation.

(See page [AC-87](#)).

7. REMOVE A/C AMPLIFIER.
  - (a) Disconnect the connector.
  - (b) Release the 2 claws and pull out the amplifier.
8. REMOVE CONNECTOR BRACKET SET SCREWS
9. REMOVE BLOWER UNIT
  - (a) Disconnect the connector.
  - (b) Disconnect the thermistor connector clamp.
  - (c) Remove the 2 screws, bolt and nut, then remove the blower unit.

## **DISASSEMBLY**

### **1. REMOVE BLOWER MOTOR**

Remove the 3 screws and blower motor.

### **2. REMOVE BLOWER RESISTOR**

Remove the 2 screws and blower resistor.

## REASSEMBLY

Reassembly is in the reverse order of disassembly (See page [AC-36](#)).

## INSTALLATION

Installation is in the reverse order of removal (See page [AC-35](#)).

# COMPRESSOR AND MAGNETIC CLUTCH

## ON-VEHICLE INSPECTION

ACOM4-02

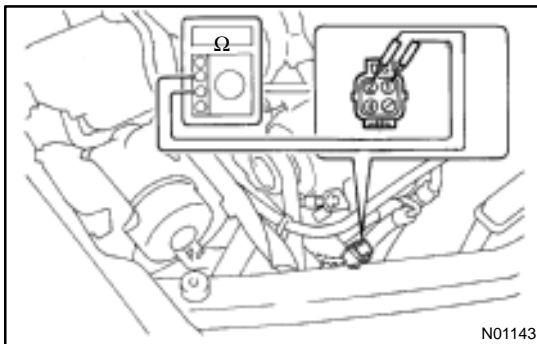
### 1. INSPECT COMPRESSOR FOR METALLIC SOUND

- (a) Start engine.
- (b) Check if there is a metallic sound from the compressor when the A/C switch is on.

If metallic sound is heard, replace the compressor assembly.

### 2. INSPECT REFRIGERANT PRESSURE

See "ON-VEHICLE INSPECTION" of AIR CONDITIONING SYSTEM on page AC-3.



### 3. INSPECT COMPRESSOR LOCK SENSOR RESISTANCE

- (a) Disconnect the connector.
- (b) Measure resistance between terminals 1 and 2.

**Standard resistance: 65 – 125  $\Omega$  at 20 °C (68 °F)**

If resistance is not as specified, replace the compressor assembly.

### 4. INSPECT VISUALLY FOR LEAKAGE OF REFRIGERANT FROM SAFETY SEAL

Using a gas leak detector, check for leakage of refrigerant. If there is any leakage, replace the compressor assembly.

### 5. CHECK FOR LEAKAGE OF GREASE FROM CLUTCH BEARING

### 6. CHECK FOR SIGNS OF OIL ON PRESSURE PLATE OR ROTOR

### 7. INSPECT MAGNETIC CLUTCH BEARING FOR NOISE

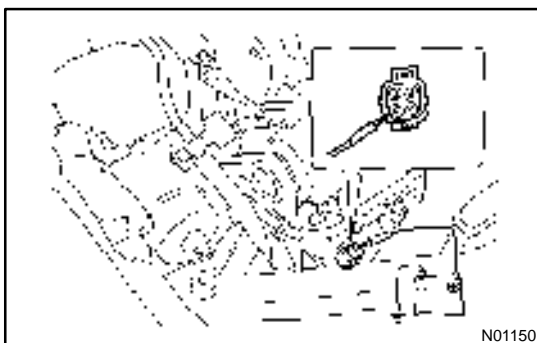
- (a) Start engine.
- (b) Check for abnormal noise from near the compressor when the A/C switch is OFF.

If abnormal noise is being emitted, replace the magnetic clutch.

### 8. INSPECT MAGNETIC CLUTCH OPERATION

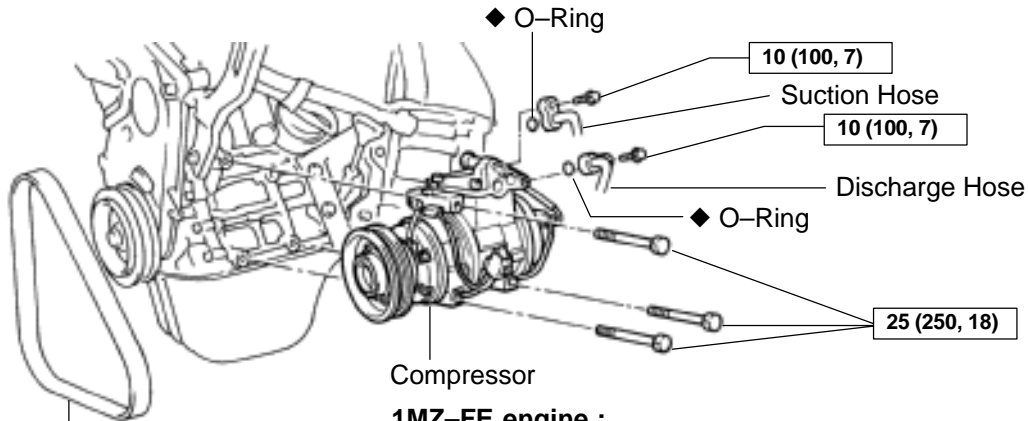
- (a) Disconnect the connector.
- (b) Connect the positive (+) lead from the battery to terminal 4 and the negative (-) lead to the body ground.
- (c) Check that the magnetic clutch is energized.

If operation is not as specified, replace the magnetic clutch.

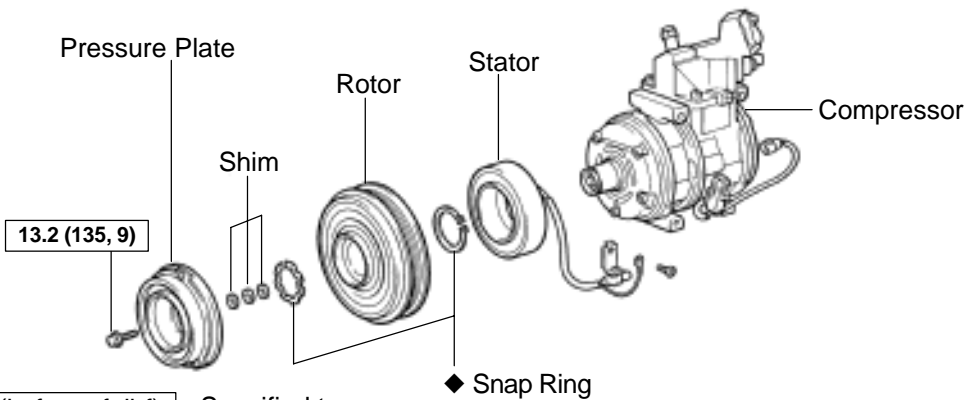
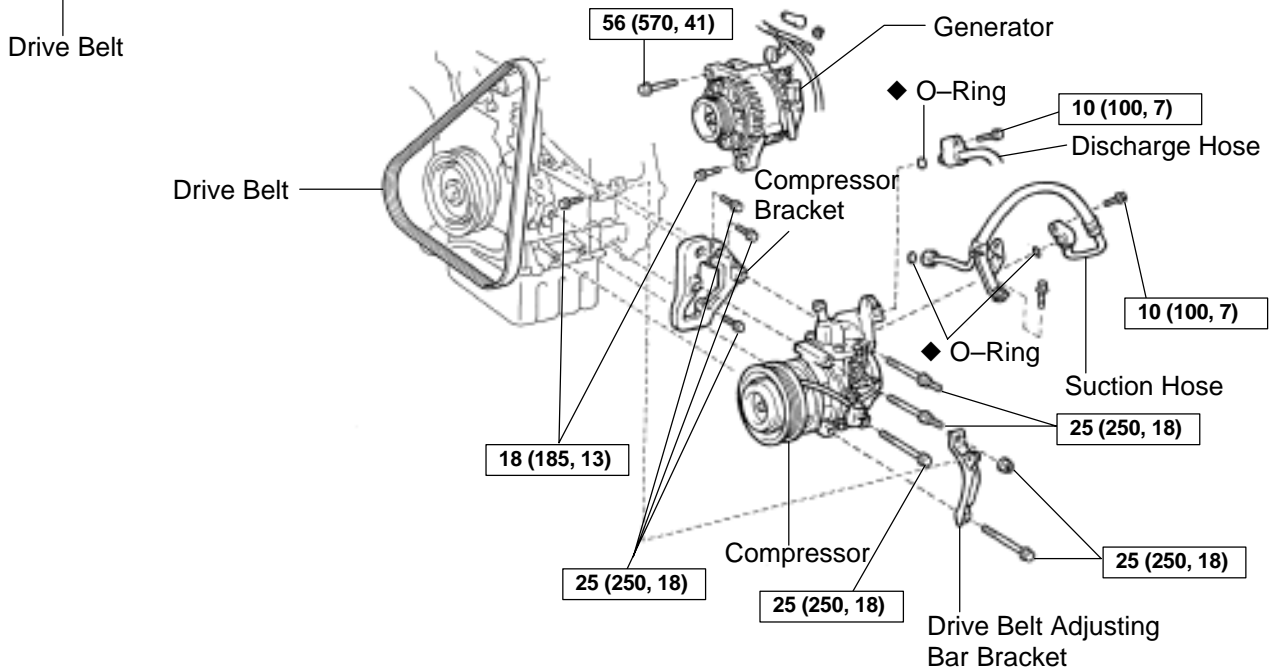


# COMPONENTS

5S-FE engine :



1MZ-FE engine :

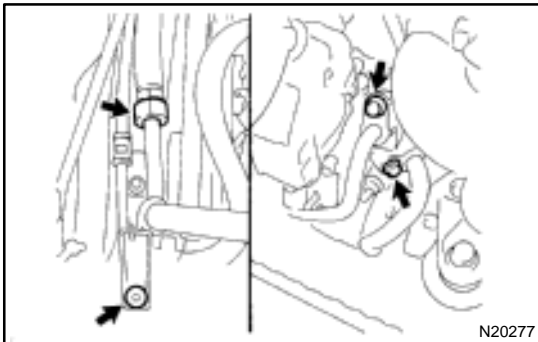


**N·m (kgf·cm, ft·lbf) : Specified torque**  
**◆ Non-reusable part**



## REMOVAL

1. RUN ENGINE AT IDLE SPEED WITH A/C ON FOR APPROX.10 MINUTES
2. STOP ENGINE
3. DISCONNECT NEGATIVE (-) TERMINAL CABLE FROM BATTERY
4. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM
5. REMOVE DRIVE BELT  
(See page AC-17)



### 6. 1MZ-FE engine models: REMOVE SUCTION HOSE

- (a) Remove the suction hose clamping bolt.
- (b) Disconnect the wire harness clamp.
- (c) Loosen the nut and bolts and remove the suction hose.

#### NOTICE:

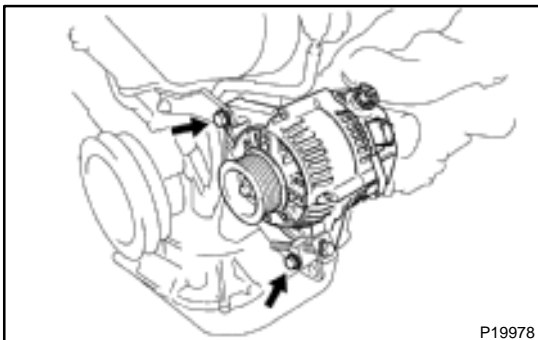
Cap the open fittings immediately to keep moisture or dirt out of the system.

### 7. 1MZ-FE engine models: DISCONNECT DISCHARGE HOSE

Remove the bolt and disconnect the hose.

#### NOTICE:

Cap the open fittings immediately to keep moisture or dirt out of the system.



### 8. 1MZ-FE engine models: REMOVE GENERATOR

- (a) Disconnect the generator connector.
- (b) Remove the nut, and disconnect the generator wire.
- (c) Disconnect the wire harness from the clip.
- (d) Remove the pivot bolt, plate washer, adjusting lock bolt and generator.

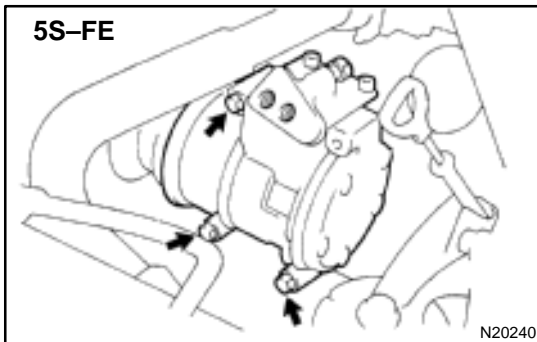


**9. 5S-FE engine models:  
DISCONNECT DISCHARGE AND SUCTION HOSES**

Remove the 2 bolts and disconnect both hoses.

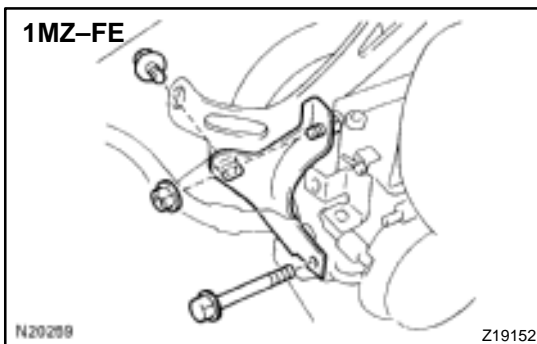
**NOTICE:**

**Cap the open fittings immediately to keep moisture or dirt out of the system.**



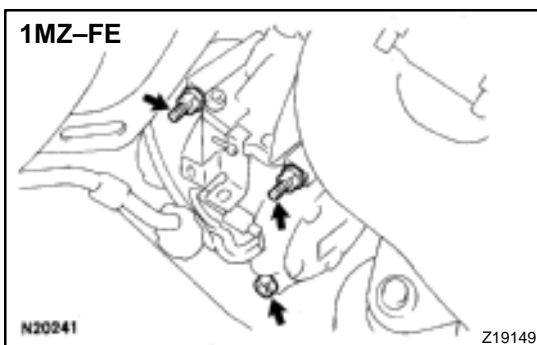
**10. 5S-FE engine models:  
REMOVE COMPRESSOR**

- (a) Disconnect the connector.
- (b) Remove the 3 bolts and compressor.



**11. 1MZ-FE engine models:  
REMOVE COMPRESSOR**

- (a) Disconnect the connector.
- (b) Remove the 2 bolts, nut and drive belt adjusting bar bracket.



- (c) Remove the 3 bolts and compressor.



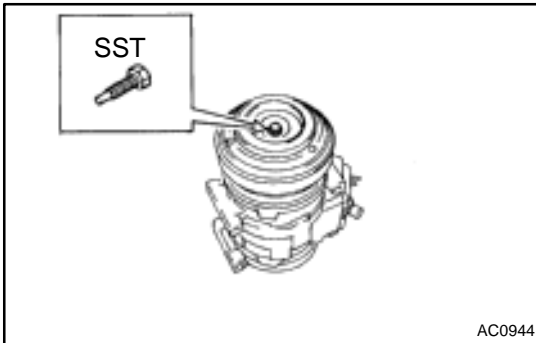
## DISASSEMBLY

### 1. REMOVE PRESSURE PLATE

- (a) Using SST and a socket wrench, remove the shaft bolt.

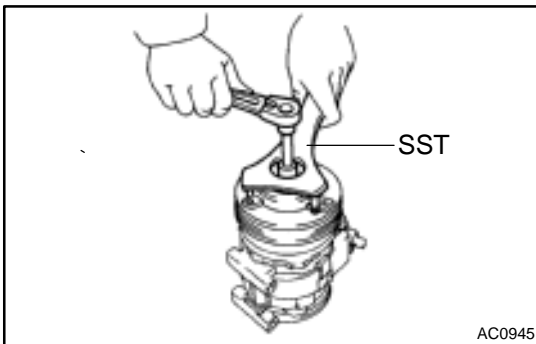
SST 07112-76060

**Torque: 13.2 N·m (135 kgf·cm, 9 ft·lbf)**



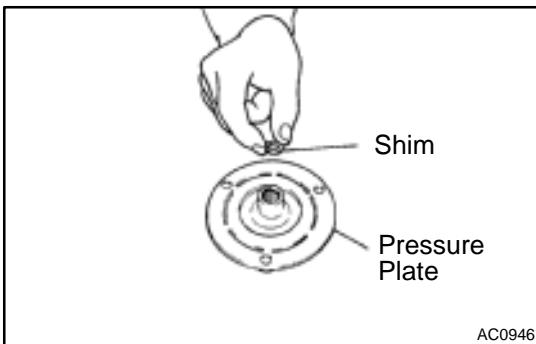
- (b) Install SST on the pressure plate.

SST 07112-66040

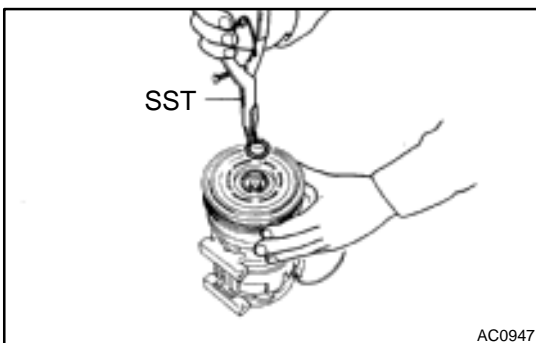


- (c) Using SST and socket wrench, remove the pressure plate.

SST 07112-66040, 07112-76060



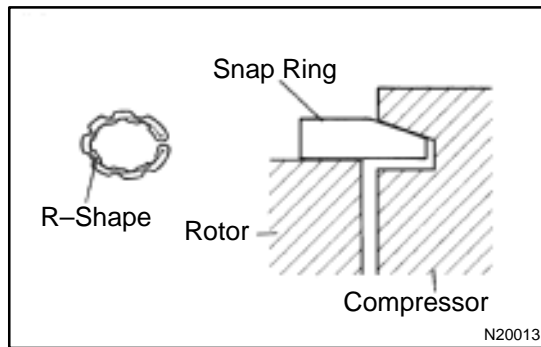
- (d) Remove the shims from the pressure plate.



### 2. REMOVE ROTOR

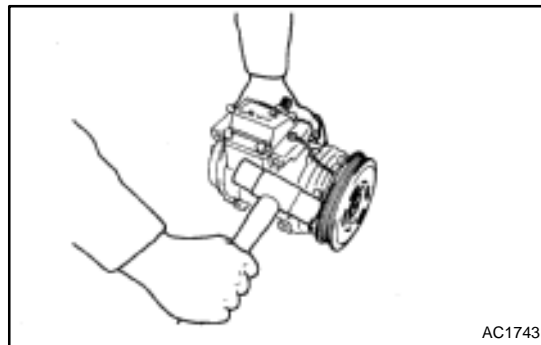
- (a) Using SST, remove the snap ring.

SST 07114-84020

**NOTICE:**

At the time of reassembly, please refer to the following item.

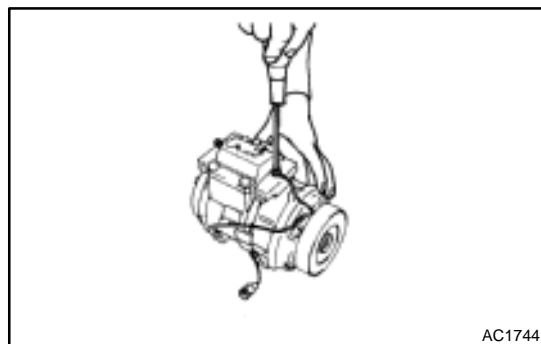
The snap ring should be installed so that beveled side faces up.



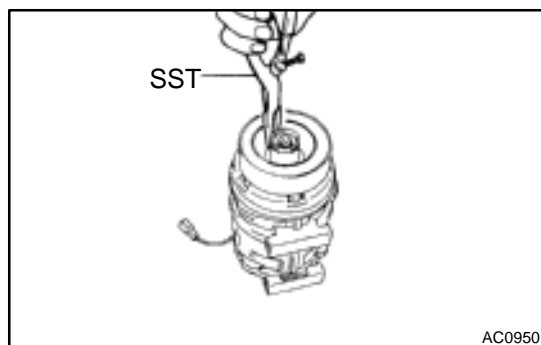
(b) Using a plastic hammer, tap the rotor off the shaft.

**NOTICE:**

Be careful not to damage the pulley when tapping on the rotor.

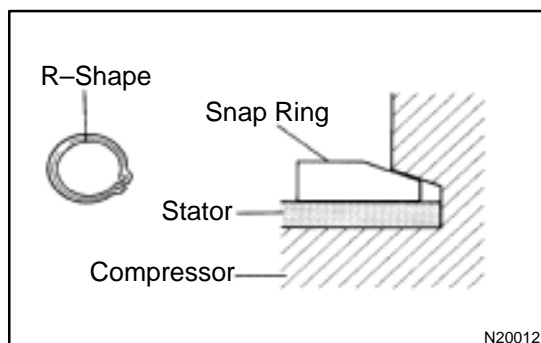
**3. REMOVE STATOR**

(a) Disconnect the stator lead wire from the compressor housing.



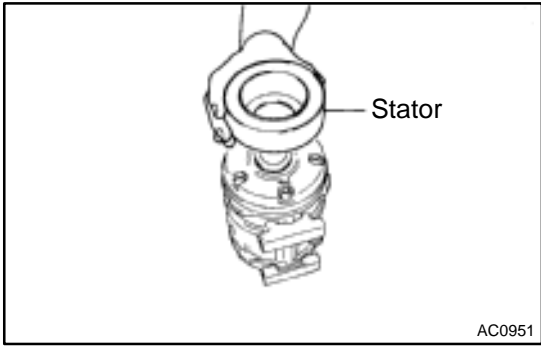
(b) Using SST, remove the snap ring.

SST 07114-84020

**NOTICE:**

At the time of reassembly, please refer to the following item.

The snap ring should be installed so that its beveled side faces up.

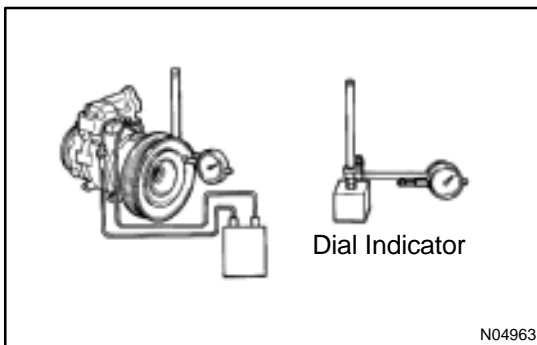


(c) Remove the stator.

AC0951

## REASSEMBLY

Reassembly is in the reverse order of disassembly  
(See page AC-43).



### AFTER REASSEMBLY, CHECK MAGNETIC CLUTCH CLEARANCE

- Set the dial indicator to the pressure plate of the magnetic clutch.
- Connect the magnetic clutch lead wire to the positive (+) terminal of the battery.
- Check the clearance between the pressure plate and rotor when connecting the negative (-) terminal to the battery.

#### Standard clearance:

**0.5 ± 0.15 mm (0.020 ± 0.0059 in.)**

If the clearance is not within the standard clearance, adjust the clearance using shims to obtain the standard clearance.

#### Shim thickness:

**0.1 mm (0.004 in.)**

**0.3 mm (0.012 in.)**

**0.5 mm (0.020 in.)**

## INSTALLATION

### 1. 5S-FE engine models:

#### INSTALL COMPRESSOR

- (a) Install the compressor with 3 bolts.

**Torque: 25 N·m (250 kgf-cm, 18 ft-lbf)**

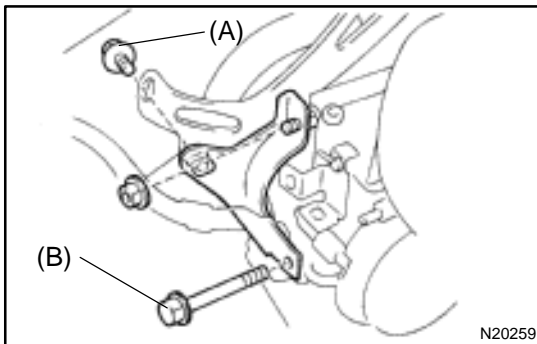
- (b) Connect the connector.

### 2. 1MZ-FE engine models:

#### INSTALL COMPRESSOR

- (a) Install the compressor with 3 bolts.

**Torque: 25 N·m (250 kgf-cm, 18 ft-lbf)**



- (b) Install the drive belt adjusting bar bracket with 2 bolts and nut.

**Torque:**

**Bolt (A): 25 N·m (250 kgf-cm, 18 ft-lbf)**

**Bolt (B): 18 N·m (185 kgf-cm, 13 ft-lbf)**

**Nut: 25 N·m (250 kgf-cm, 18 ft-lbf)**

- (c) Connect the connector.

### 3. 5S-FE engine models:

#### CONNECT DISCHARGE AND SUCTION HOSE

Connect the both hoses with the 2 bolts.

**Torque: 10 N·m (100 kgf-cm, 7 ft-lbf)**

#### NOTICE:

**Hoses should be connected immediately after the caps have been removed.**

#### HINT:

Lubricate 2 new O-rings with compressor oil and install the tubes.

### 4. 1MZ-FE engine models:

#### INSTALL GENERATOR

- (a) Mount generator on the generator bracket with the pivot bolt and adjusting lock bolt. Do not tighten the bolts yet.

- (b) Connect the generator connector.

- (c) Connect the generator wire with the nut.

**5. 1MZ-FE engine models:****CONNECT DISCHARGE HOSE**

Connect the discharge hose with the bolt.

**Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)**

**NOTICE:**

**Hoses should be connected immediately after the caps have been removed.**

**HINT:**

Lubricate a new O-ring with compressor oil and install the tube.

**6. INSTALL SUCTION HOSE**

- (a) Install the suction hose and tighten the bolt and nut.

**Torque:**

**Piping joint: 32 N·m (330 kgf·cm, 24 ft·lbf)**

**Block joint: 10 N·m (100 kgf·cm, 7 ft·lbf)**

**HINT:**

Lubricate 2 new O-rings with compressor oil and install the hose.

- (b) Install the suction hose clamping bolt.

- (c) Connect the wire harness clamp.

**7. INSTALL AND CHECK DRIVE BELT**

(See page [AC-18](#), [AC-16](#))

**8. CONNECT NEGATIVE (-) TERMINAL CABLE TO BATTERY****9. EVACUATE AIR FROM REFRIGERATION SYSTEM AND CHARGE SYSTEM WITH REFRIGERANT**

**Specified amount: 800 ± 50 g (28.22 ± 1.76 oz.)**

**10. INSPECT FOR LEAKAGE OF REFRIGERANT**

Using a gas leak detector, check for leakage of refrigerant.

If there is leakage, check the tightening torque at the joints.

**11. INSPECT A/C OPERATION**



# RECEIVER

## ON-VEHICLE INSPECTION

ACOMA-01

### INSPECT FITTINGS FOR LEAKAGE

Using a gas leak detector, check for leakage.

If there is leakage, check the tightening torque at the joints.

## REMOVAL

### 1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

HINT:

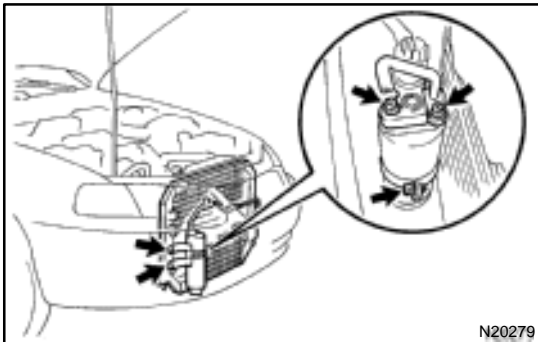
At the time of installation, please refer to the following item.

Evacuate air from refrigeration system.

Charge system with refrigerant and inspect for leakage of refrigerant.

**Specified amount: 800 ± 50 g (28.22 ± 1.76 oz.)**

### 2. REMOVE RADIATOR UPPER SUPPORT SEAL



### 3. DISCONNECT 2 LIQUID TUBES FROM RECEIVER

Remove the 2 bolts and both tubes.

**Torque: 5.4 N·m (55 kgf·cm, 48 in.-lbf)**

**NOTICE:**

**Cap the open fittings immediately to keep moisture or dirt out of the system.**

HINT:

At the time of installation, please refer to the following item.

Lubricate 2 new O-rings with compressor oil and install the tubes.

### 4. REMOVE RECEIVER

(a) Remove the holder bolt and pull out receiver downward.

HINT:

At the time of installation, please refer to the following item.

If receiver was replaced, add compressor oil to compressor.

**Add 20 cc (0.71 fl.oz.)**

**Compressor oil: ND-OIL 8 or equivalent**

(b) Remove the 2 bolts and holder.

## INSTALLATION

Installation is in the reverse order of removal (See page [AC-50](#)).

# CONDENSER

AC0MD-01

## ON-VEHICLE INSPECTION

### 1. INSPECT CONDENSER FINS FOR BLOCKAGE OR DAMAGE

- ◆ If the fins are clogged, wash them with water and dry with compressed air.

#### NOTICE:

**Be careful not to damage the fins.**

- ◆ If the fins are bent, straighten them with a screwdriver or pliers.

### 2. INSPECT CONDENSER AND FITTINGS FOR LEAKAGE

Using a gas leak detector, check for leakage of refrigerant.

If there is leakage, check the tightening torque at the joints.

## REMOVAL

### 1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

HINT:

At the time of installation, please refer to the following item.

Evacuate air from refrigeration system.

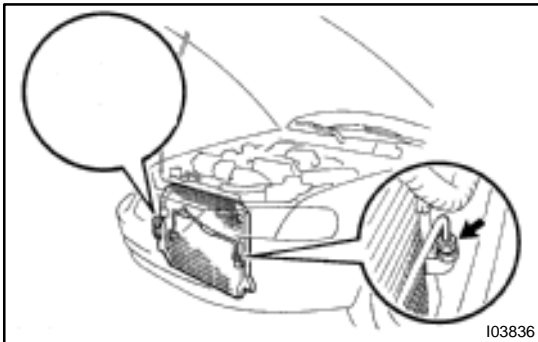
Charge system with refrigerant and inspect for leakage of refrigerant.

**Specified amount: 800 ± 50 g (28.22 ± 1.76 oz.)**

### 2. REMOVE UPPER RADIATOR SUPPORTS

### 3. REMOVE RECEIVER AND HOLDER

(See page [AC-50](#))



### 4. DISCONNECT DISCHARGE HOSE

Loosen the nut and disconnect the discharge hose.

**Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)**

**NOTICE:**

**Cap the open fittings immediately to keep moisture or dirt out of the system.**

HINT:

At the time of installation, please refer to the following item.

Lubricate a new O-ring with compressor oil and install the tube.

### 5. REMOVE LIQUID TUBE

Loosen the nut and remove the liquid tube.

**Torque: 14 N·m (140 kgf·cm, 10 ft·lbf)**

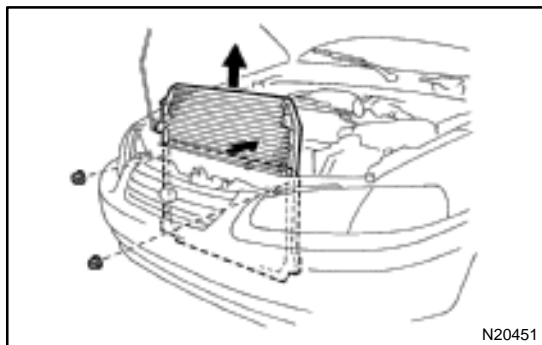
**NOTICE:**

**Cap the open fittings immediately to keep moisture or dirt out of the system.**

HINT:

At the time of installation, please refer to the following item.

Lubricate a new O-ring with compressor oil and install the tube.

**6. REMOVE CONDENSER**

- (a) Remove the 2 nuts from condenser upper mountings.
- (b) Push the radiator toward the engine.
- (c) Push the condenser toward the radiator and pull it upward.

**HINT:**

At the time of installation, please refer to the following item.  
If condenser is replaced, add compressor oil to the compressor.

**Add 40–50 cc (1.4–1.7 fl.oz.)**

**Compressor oil: ND-OIL 8 or equivalent**

## INSTALLATION

Installation is in the reverse order of removal (See page [AC-53](#)).

## HEATER RADIATOR REMOVAL

### 1. DRAIN ENGINE COOLANT FROM RADIATOR

HINT:

It is not necessary to drain out all the coolant.

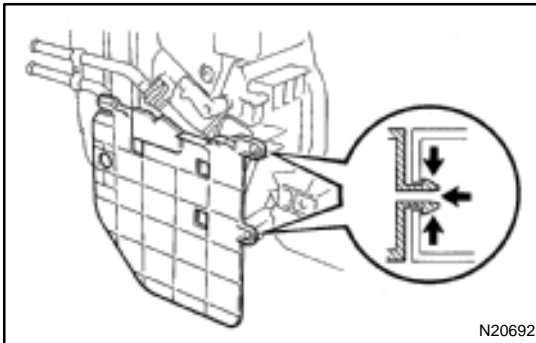
### 2. DISCONNECT WATER HOSES FROM A/C UNIT (See page AC-27)

### 3. REMOVE NO. 1 LOWER INSTRUMENT PANEL

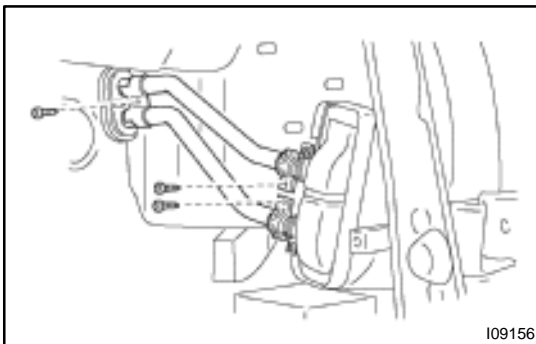
### 4. REMOVE LH INSTRUMENT LOWER PANEL

### 5. REMOVE HEATER RADIATOR

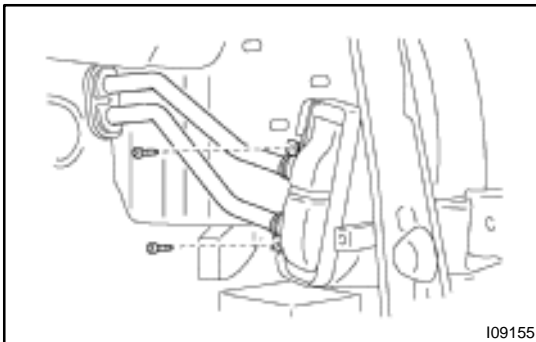
(a) Release the 3 claws and pull out the heater protector.



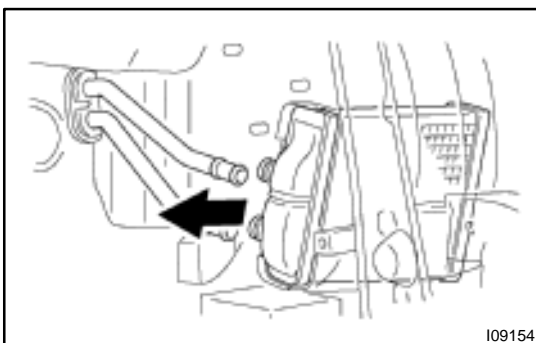
(b) Remove the 3 screws 3 plate.



(c) Remove the 2 screws and 2 clamps and disconnect the 2 heater radiator pipes.



(d) Remove the heater radiator.





## **INSPECTION**

### **INSPECT FINS FOR BLOCKAGE**

If the fins are clogged, clean them with compressed air.

## INSTALLATION

Installation is in the reverse order of removal (See page [AC-56](#)).

# EXPANSION VALVE

ACMM-02

## ON-VEHICLE INSPECTION

1. CHECK QUANTITY OF GAS DURING REFRIGERATION CYCLE
2. SET ON MANIFOLD GAUGE SET (See page [AC-19](#))
3. RUN ENGINE

Run the engine at 1,500 rpm for at least 5 minutes.

Then check that the high pressure reading is 1.37 – 1.57 MPa (14 – 16 kgf/cm<sup>2</sup>, 199 – 228 psi).

4. CHECK EXPANSION VALVE

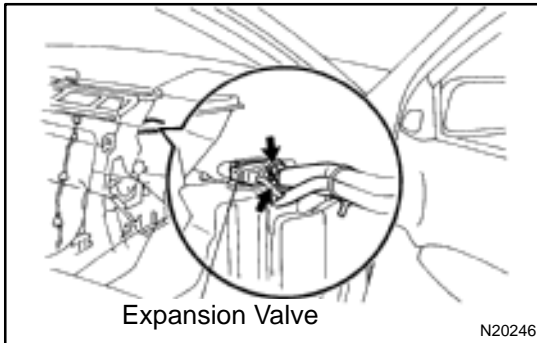
If the expansion valve is faulty, the low pressure reading will drop to 0 kPa (0 kgf/cm<sup>2</sup>, 0 psi).

HINT:

When the low pressure drops to 0 kPa (0 kgf/cm<sup>2</sup>, 0 psi), check the receiver's IN and OUT sides is no temperature difference.

## REMOVAL

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM
2. DISCONNECT LIQUID AND SUCTION TUBES FROM A/C UNIT (See page [AC-27](#))
3. REMOVE BLOWER UNIT (See page [AC-35](#))



Expansion Valve

N20246

4. REMOVE EXPANSION VALVE

- (a) Remove the piping clamp.
- (b) Pry out the packing.

HINT:

Do not reuse the packing.

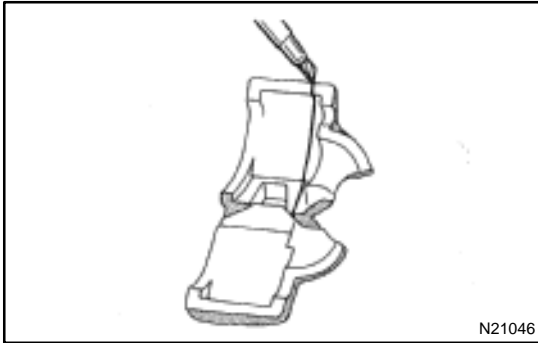
- (c) Using a hexagon wrench, remove the 2 bolts and separate the expansion valve and evaporator.

## INSTALLATION

### 1. INSTALL LIQUID TUBE AND SUCTION TUBE TO EXPANSION VALVE

HINT:

Lubricate 4 new O-rings with compressor oil and install the tubes.

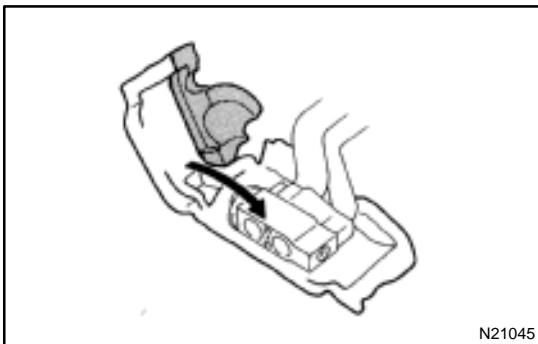


### 2. INSTALL NEW PACKING ON EXPANSION VALVE

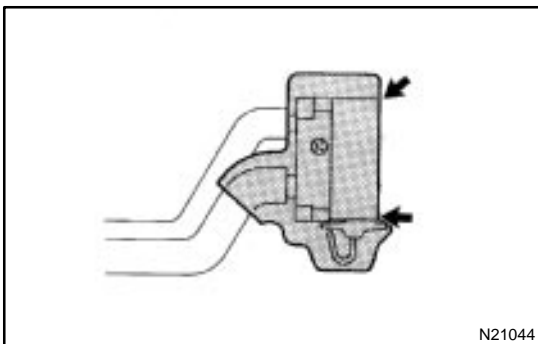
- (a) Cut off packing paper and peel off the packing paper, as shown in the illustration.

HINT:

Leave the packing paper untaped on the tube side so that the installing bolt hole for remains visible.

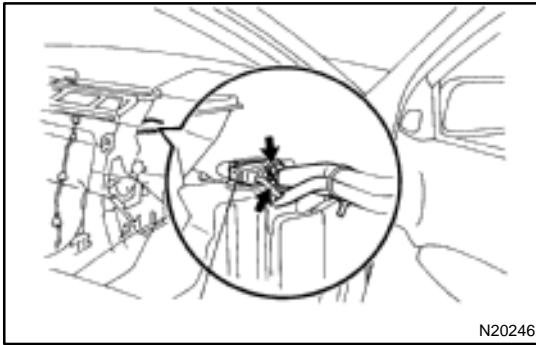


- (b) Apply the packing on the expansion valve.



**NOTICE:**

Do not overtape the packing beyond the expansion valve edge.

**3. INSTALL EXPANSION VALVE**

- (a) Install the expansion valve with the 2 bolts.

**Torque: 5.4 N·m (55 kgf·cm, 48 in.-lbf)**

**NOTICE:**

**When installing the expansion valve, take care so that the packing is not jammed with the evaporator.**

**HINT:**

Lubricate 2 new O-rings with compressor oil and install O-rings on the expansion valve.

- (b) Peel off the remaining packing paper and apply the packing to expansion valve.

**4. INSTALL BLOWER UNIT (See page AC-38)****5. INSTALL GLOVE COMPARTMENT**

(See page BO-81)

**6. CONNECT LIQUID TUBE AND SUCTION TUBES TO A/C UNIT (See page AC-33)****7. EVACUATE AIR FROM REFRIGERATION SYSTEM AND CHARGE SYSTEM WITH REFRIGERANT**

**Specified amount: 800 ± 50 g (28.22 ± 1.76 oz.)**

**8. INSPECT FOR LEAKAGE OF REFRIGERANT**

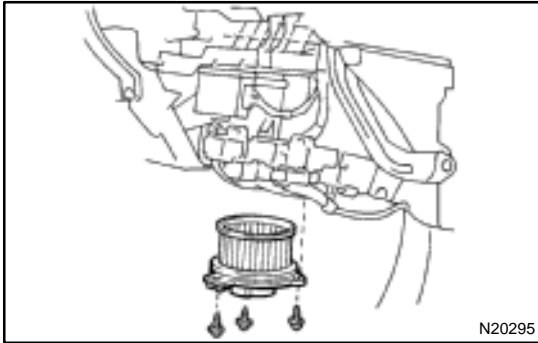
Using a gas leak detector, check for leakage of refrigerant.

If there is leakage, check the tightening torque at the joints.

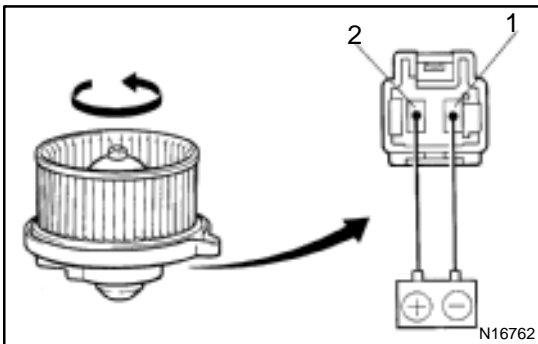
# BLOWER MOTOR INSPECTION

AC221-01

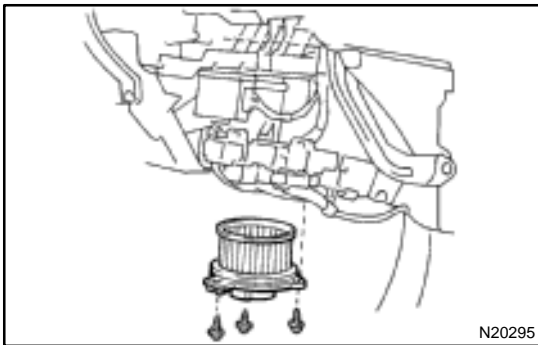
1. REMOVE GLOVE COMPARTMENT  
(See page [BO-75](#))



2. REMOVE BLOWER MOTOR
  - (a) Disconnect the connector.
  - (b) Remove the 3 screws and blower motor.



3. INSPECT BLOWER MOTOR OPERATION  
Connect the positive (+) lead from the battery to terminal 2 and the negative (-) lead to terminal 1, then check that the motor operations smoothly.  
If operation is not as specified, replace the blower motor.



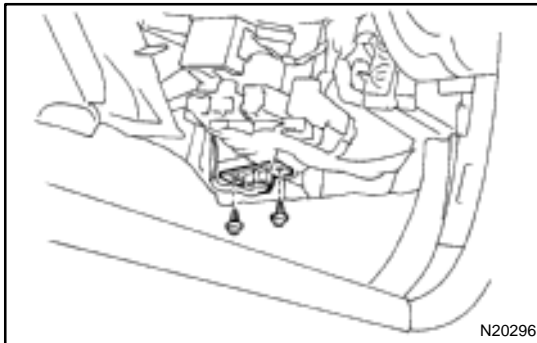
4. INSTALL BLOWER MOTOR
  - (a) Install the blower motor with the 3 screws.
  - (b) Connect the connector.

5. INSTALL GLOVE COMPARTMENT  
(See page [BO-81](#))

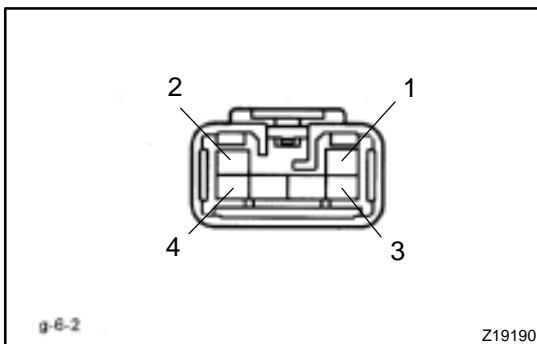
# BLOWER RESISTOR INSPECTION

AC222-01

1. REMOVE GLOVE COMPARTMENT  
(See page [BO-75](#))



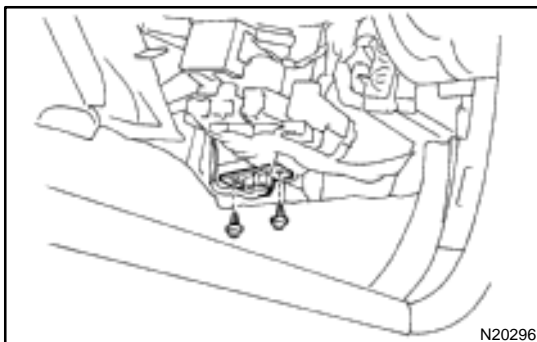
2. REMOVE BLOWER RESISTOR
  - (a) Disconnect the connector.
  - (b) Remove the 2 screws and blower resistor.



3. INSPECT BLOWER RESISTOR RESISTANCE

Tester connection	Condition	Specified condition
2 – 4	Constant	Approx. 0.38 $\Omega$
2 – 3	Constant	Approx. 1.12 $\Omega$
1 – 3	Constant	Approx. 1.74 $\Omega$

If resistance is not as specified, replace the blower resistor.



4. INSTALL BLOWER RESISTOR
  - (a) Install the blower resistor with the 2 screws.
  - (b) Connect the connector.

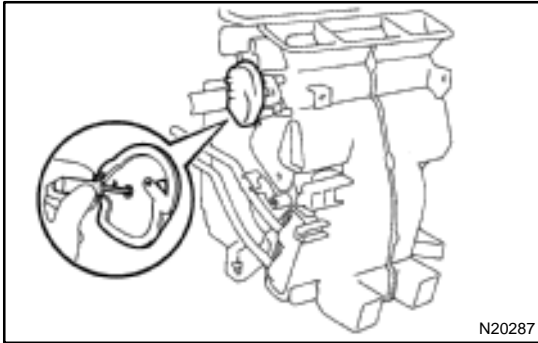
5. INSTALL GLOVE COMPARTMENT  
(See page [BO-81](#))



# AIR OUTLET SERVOMOTOR INSPECTION

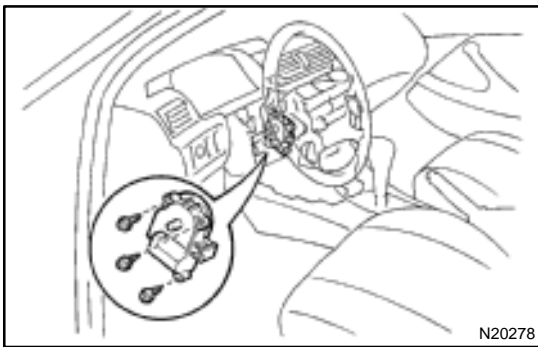
AC223-01

1. REMOVE NO. 1 LOWER INSTRUMENT PANEL
2. REMOVE LH INSTRUMENT LOWER PANEL  
(See page [BO-75](#))

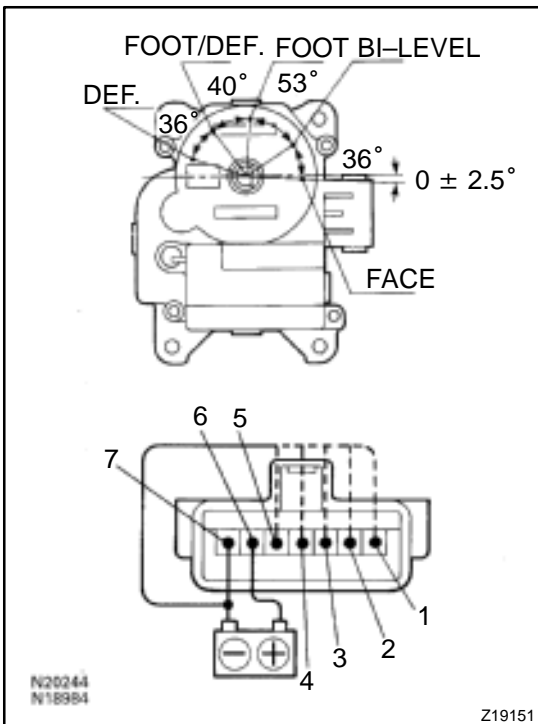


### 3. REMOVE SERVOMOTOR

- (a) Release the claw and pull out the plate.



- (b) Disconnect the connector.
- (c) Remove the 3 screws and servomotor.

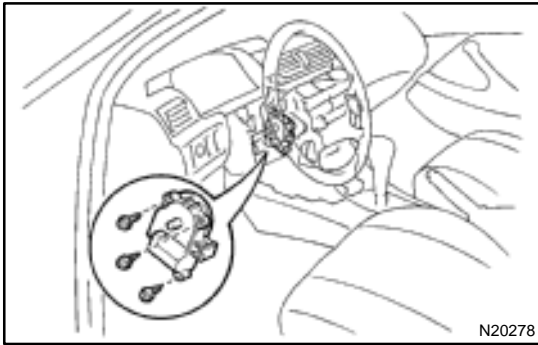


### 4. INSPECT SERVOMOTOR OPERATION

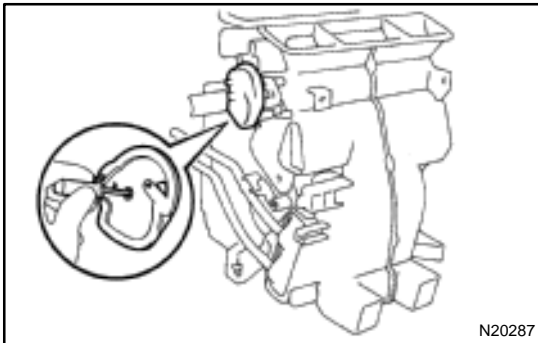
- (a) Connect the positive (+) lead from the battery to terminal 6 and the negative (-) lead to terminal 7.
- (b) Connect the negative (-) lead from the battery to each terminal and check that the shaft rotates at each position, as shown in the illustration.

Connected terminal	Position
5	DEF.
4	FOOT/DEF.
3	FOOT
2	B/L
1	FACE

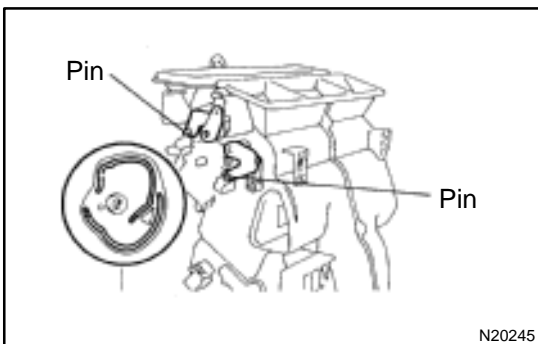
If operation is not as specified, replace the servomotor.

**5. INSTALL SERVOMOTOR**

- (a) Install servomotor with the 3 screws.
- (b) Connect the connector.



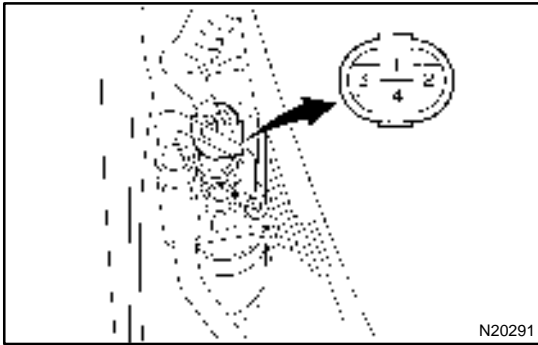
- (c) Install the plate, then restrain the claw.



- (d) Insert the drain of plate to the lever pin.

**6. INSTALL LH INSTRUMENT LOWER PANEL**

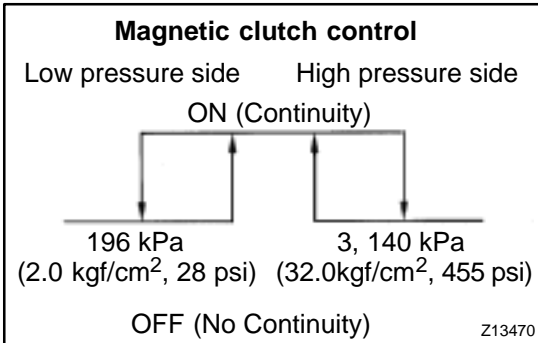
- 7. INSTALL NO. 1 LOWER INSTRUMENT PANEL**  
(See page [BO-81](#))



# PRESSURE SWITCH ON-VEHICLE INSPECTION

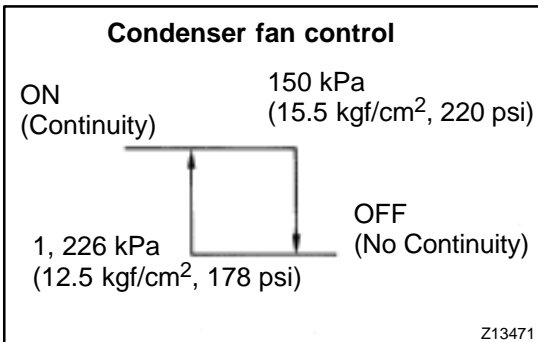
AC0N2-02

1. SET ON MANIFOLD GAUGE SET  
(See page AC-19)
2. DISCONNECT CONNECTOR FROM PRESSURE SWITCH
3. RUN ENGINE AT APPROX. 1,500 RPM



4. **Magnetic clutch control:**  
**INSPECT PRESSURE SWITCH OPERATION**
  - (a) Connect the positive (+) lead from the ohmmeter to terminal 4 and negative (-) lead to terminal 1.
  - (b) Check continuity between terminals when refrigerant pressure is changed, as shown in the illustration.

If operation is not as specified, replace the pressure switch.



5. **Condenser fan control:**  
**INSPECT PRESSURE SWITCH OPERATION**
  - (a) Connect the positive (+) lead from the ohmmeter to terminal 2 and negative (-) lead to terminal 3.
  - (b) Check continuity between terminals when refrigerant pressure is changed, as shown in the illustration.

If operation is not as specified, replace the pressure switch.
6. STOP ENGINE AND REMOVE MANIFOLD GAUGE SET
7. CONNECT CONNECTOR TO PRESSURE SWITCH

## REMOVAL

### 1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

HINT:

At the time of installation, please refer to the following item.

Evacuate air from refrigeration system.

Charge system with refrigerant and inspect for leakage of refrigerant.

**Specified amount: 800 ± 50 g (28.22 ± 1.76 oz.)**



### 2. REMOVE PRESSURE SWITCH FROM LIQUID TUBE

Disconnect the connector and remove the pressure switch.

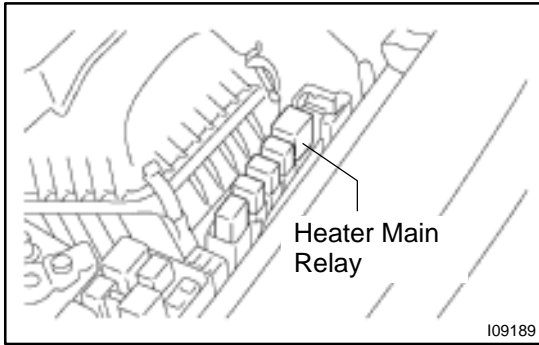
**Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)**

HINT:

- ◆ Lock the switch mount on the tube with an open end wrench, being careful not to deform the tube, and remove the switch.
- ◆ At the time of installation, please refer to the following item.  
Lubricate a new O-ring with the compressor oil and install the switch.

# INSTALLATION

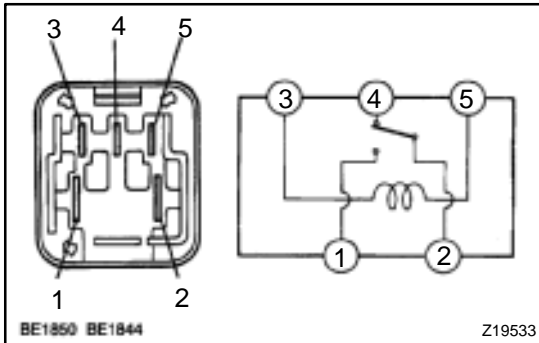
Installation is in the reverse order of removal (See page [AC-68](#)).



# HEATER MAIN RELAY INSPECTION

AC224-01

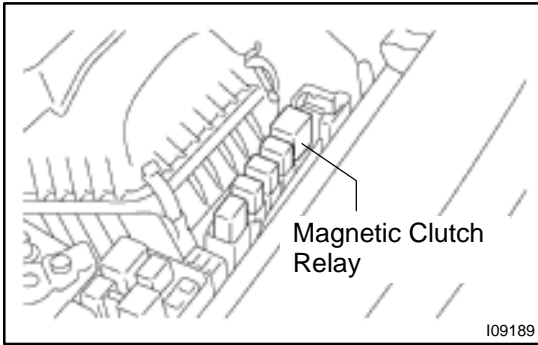
1. REMOVE HEATER MAIN RELAY FROM ENGINE ROOM RELAY BLOCK NO. 1



2. INSPECT HEATER MAIN RELAY (Marking: HTR RLY) CONTINUITY

Condition	Tester connection	Specified condition
Constant	1 – 3 2 – 4	Continuity
Apply B+ between terminals 1 and 3.	4 – 5	Continuity

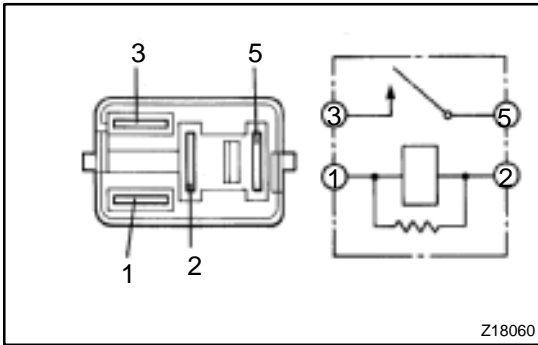
If continuity is not as specified, replace the relay.



# MAGNETIC CLUTCH RELAY INSPECTION

AC225-01

1. REMOVE MAGNETIC CLUTCH RELAY FROM ENGINE ROOM RELAY BLOCK NO. 1

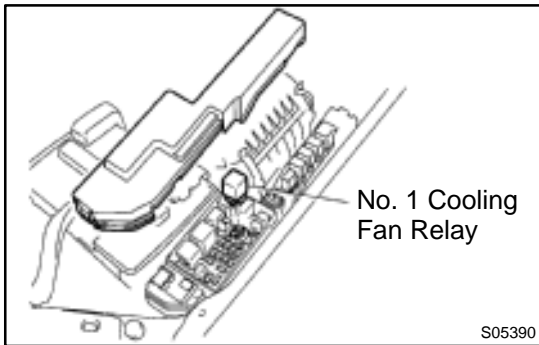


2. INSPECT HEATER MAIN RELAY (Marking: MG CLT RLY) CONTINUITY

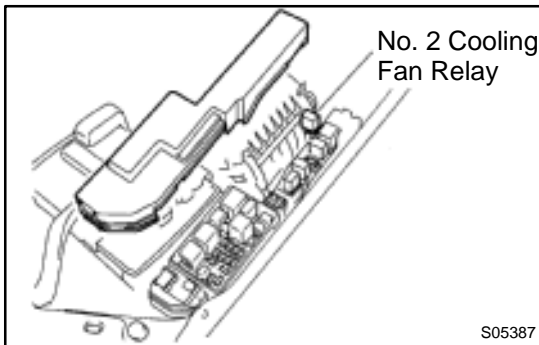
Condition	Tester connection	Specified condition
Constant	1 – 2	Continuity
Apply B+ between terminals 1 and 2.	3 – 5	Continuity

If continuity is not as specified, replace the relay.

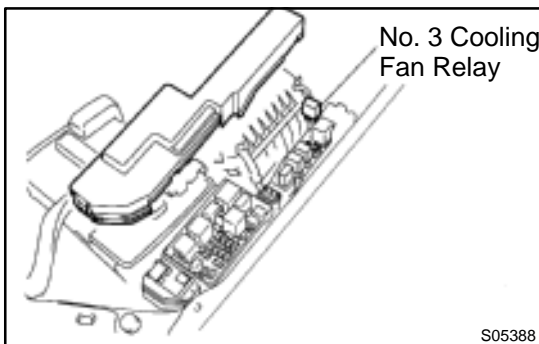
# COOLING FAN RELAY INSPECTION



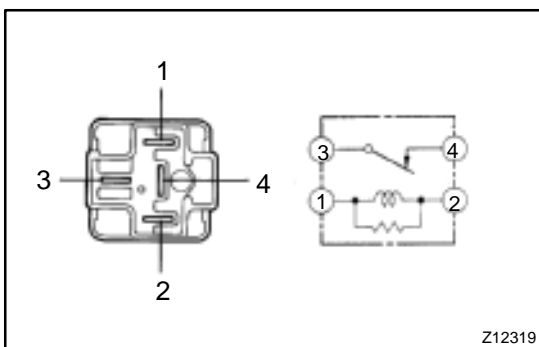
1. REMOVE NO. 1 COOLING FAN RELAY FROM ENGINE ROOM JUNCTION BLOCK NO. 2



2. REMOVE NO. 2 COOLING FAN RELAY FROM ENGINE ROOM RELAY BLOCK NO. 1



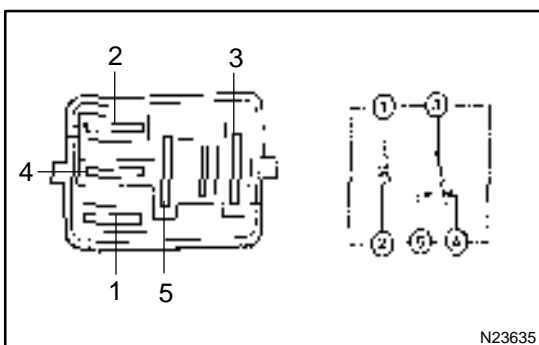
3. REMOVE NO. 3 COOLING FAN RELAY FROM ENGINE ROOM RELAY BLOCK NO. 1



4. INSPECT NO. 1 COOLING FAN RELAY (Marking: FAN RLY NO. 1) CONTINUITY

Condition	Tester connection	Specified condition
Constant	1 – 2 3 – 4	Continuity
Apply B+ between terminals 1 and 2.	3 – 4	Continuity

If continuity is not as specified, replace the relay.

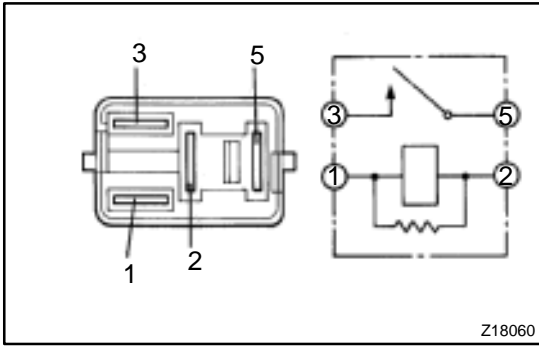


5. INSPECT NO. 2 COOLING FAN RELAY (Marking: FAN RLY NO. 2) CONTINUITY

Condition	Tester connection	Specified condition
Constant	1 – 2 3 – 4	Continuity
Apply B+ between terminals 1 and 2.	3 – 5	Continuity

If continuity is not as specified, replace the relay.





**6. INSPECT NO. 3 COOLING FAN RELAY  
(Marking: FAN RLY NO. 3) CONTINUITY**

Condition	Tester connection	Specified condition
Constant	1 – 2	Continuity
Apply B+ between terminals 1 and 2.	3 – 5	Continuity

If continuity is not as specified, replace the relay.

# CONDENSER FAN ON-VEHICLE INSPECTION

AC0N6-02

## 1. INSPECT CONDENSER FAN OPERATION

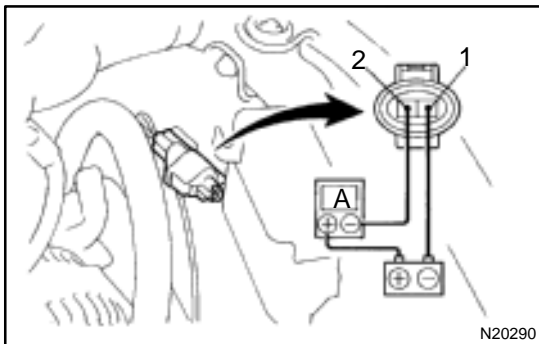
Inspect the fan operation, as shown in the chart below.

Test conditions:

- ◆ Ignition switch ON
- ◆ Blower speed control switch position "HI"
- ◆ A/C switch ON

Condition	Fan operation (Fan speed)
Engine coolant temperature 83°C (181°F) or below	Not rotate
Engine coolant temperature 98°C (208°F) or above	Rotate
Refrigerant pressure is less than 1,520 kPa (15.5 kgf/cm <sup>2</sup> , 220 psi)	Not rotate (Low Speed)
Refrigerant pressure is 1,520 kPa (15.5 kgf/cm <sup>2</sup> , 220 psi) or above	Rotate (High Speed)

If operation is not as specified, proceed next inspection.



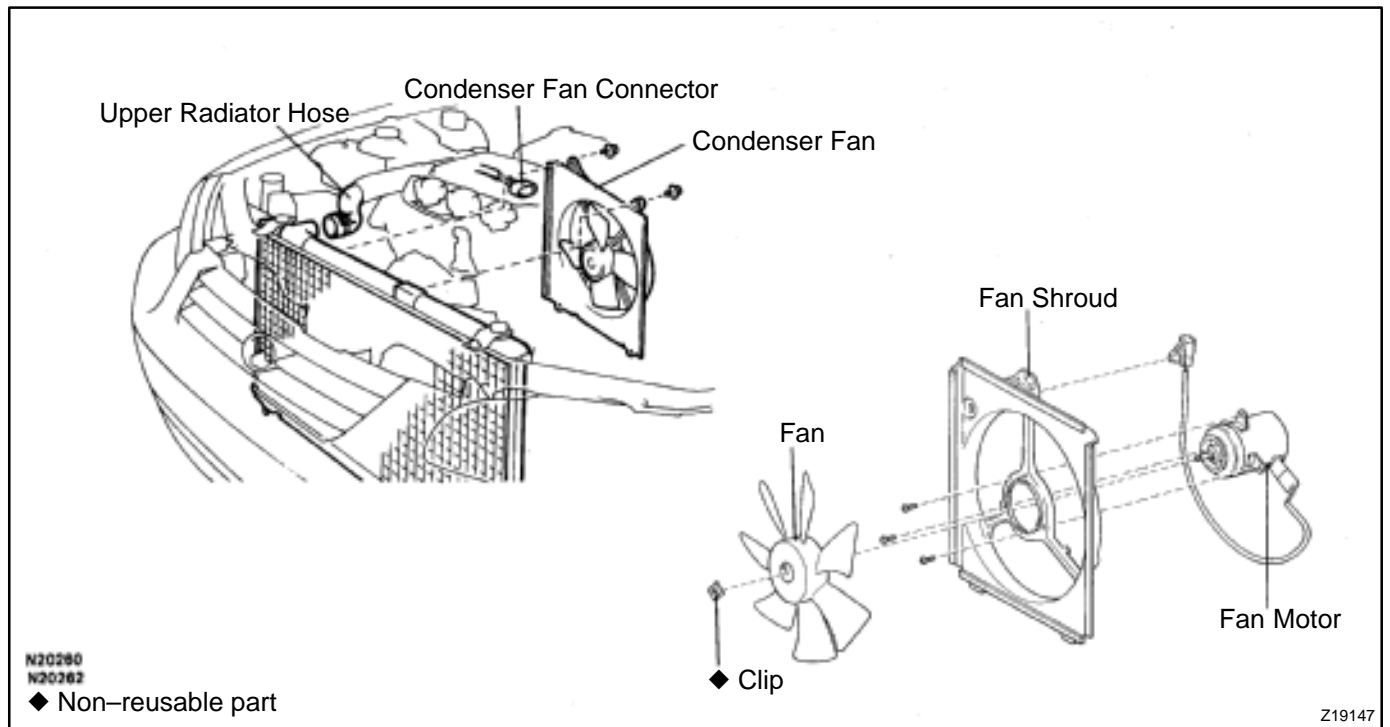
## 2. INSPECT CONDENSER FAN MOTOR OPERATION

- (a) Disconnect the fan connector.
- (b) Connect the battery and ammeter to the connector, as shown in the illustration.
- (c) Check that the fan rotates smoothly, and then check that the reading on the ammeter.

**Specified amperage: 10.1 ± 1.8 A at 20 °C (68 °F)**

- ◆ If operation is not as specified, replace the fan motor.
- ◆ If operation is as specified, check the pressure switch, cooling fan relays and engine coolant temp. switch.

# COMPONENTS



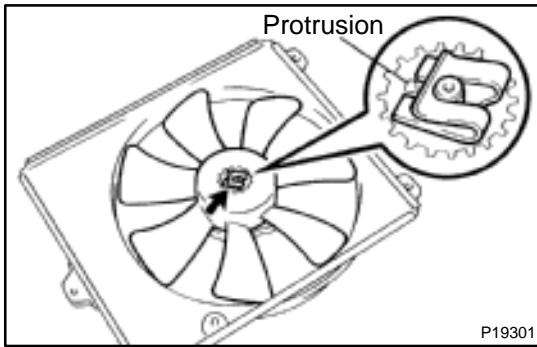
## REMOVAL

1. **1MZ-FE engine models only:**  
**DRAIN ENGINE COOLANT FROM RADIATOR**

HINT:

It is not necessary to drain out all the coolant.

2. **1MZ-FE engine models only:**  
**DISCONNECT UPPER RADIATOR HOSE**
3. **REMOVE CONDENSER FAN**
  - (a) Disconnect the connector.
  - (b) Remove the 4 bolts and fan.



## DISASSEMBLY

### 1. REMOVE FAN

Remove the clip and fan.

#### NOTICE:

**When removing the clip and fan, do not apply too much force to the motor shaft. And do not scratch the motor shaft.**

#### HINT:

Install a new clip from the side opposite the protrusion on the fan.

### 2. REMOVE FAN MOTOR

- (a) Disconnect the lead wire from the fan shroud.
- (b) Remove the 3 screws and fan motor.

## REASSEMBLY

Reassembly is in the reverse order of disassembly (See page [AC-77](#)).

# INSTALLATION

Installation is in the reverse order of removal (See page [AC-76](#)).

# AIR CONDITIONING CONTROL ASSEMBLY

AC0NC-01

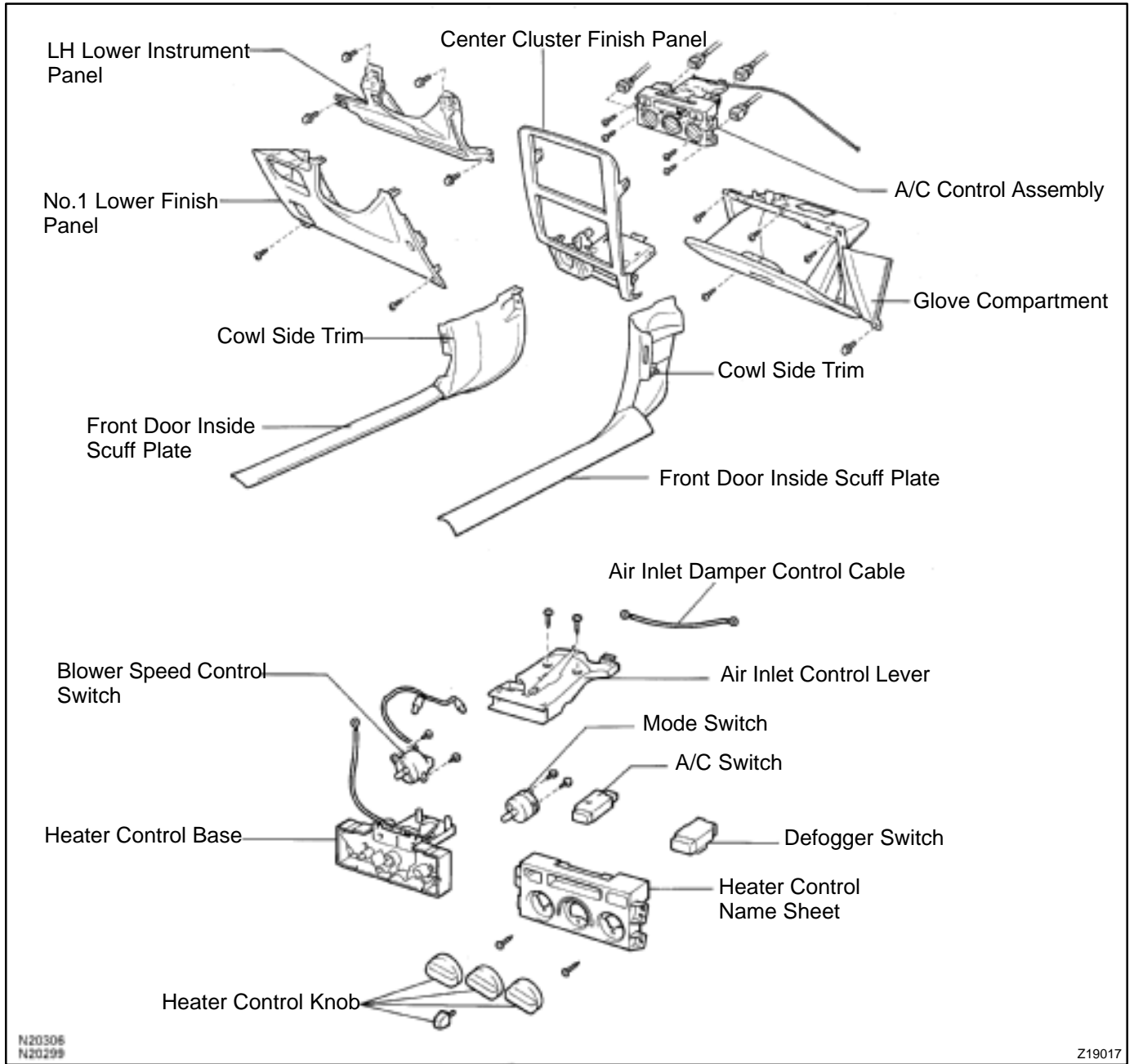
## ON-VEHICLE INSPECTION

### INSPECT A/C CONTROL DIAL AND LEVER OPERATION

Move the control dial and lever left and right and check for stiffness and binding through the full range of the levers.

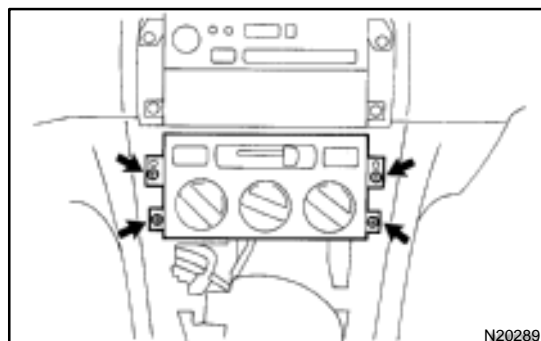
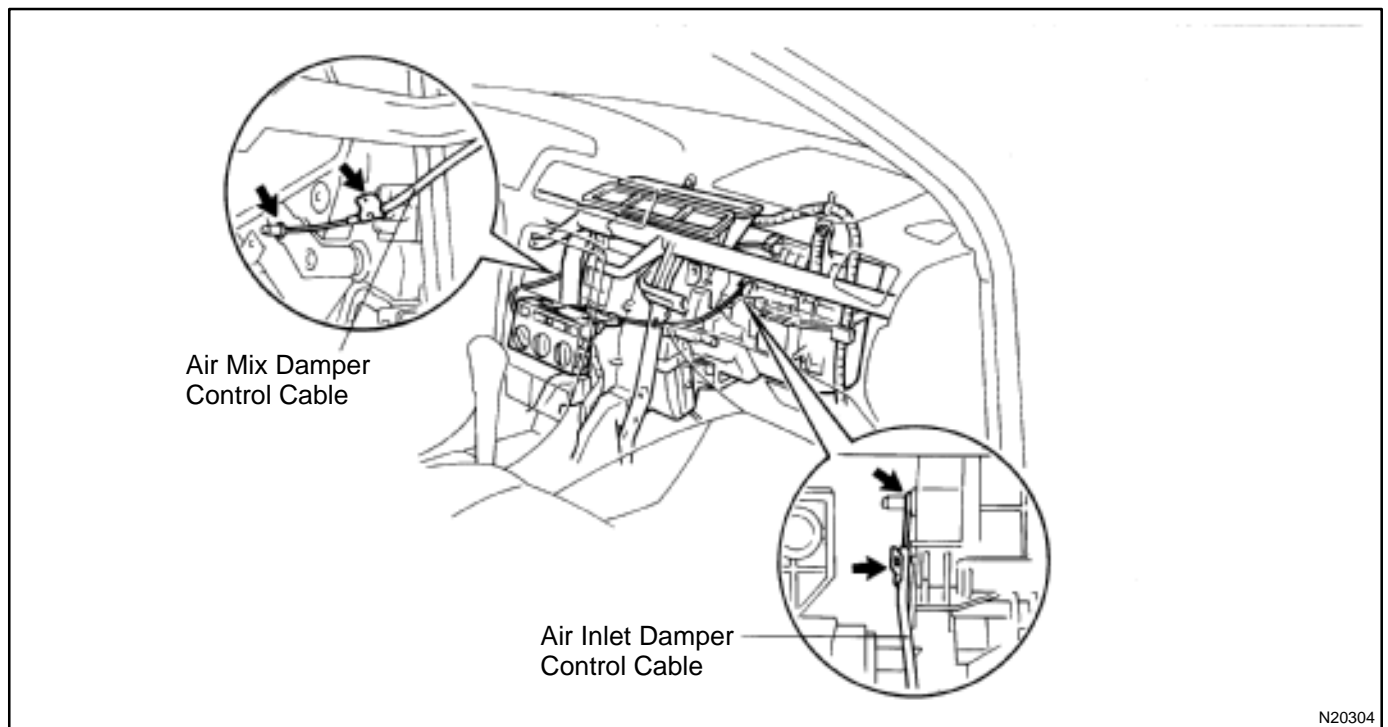


# COMPONENTS



## REMOVAL

1. REMOVE COWL SIDE TRIM LH AND RH
2. REMOVE FRONT DOOR INSIDE SCUFF PLATE LH AND RH
3. REMOVE NO. 2 LOWER COVER
4. REMOVE GLOVE COMPARTMENT
5. REMOVE NO. 1 LOWER INSTRUMENT PANEL
6. REMOVE LH LOWER INSTRUMENT PANEL
7. REMOVE CENTER CLUSTER FINISH PANEL
8. DISCONNECT A/C CONTROL CABLES



### 9. REMOVE A/C CONTROL ASSEMBLY

Remove the 4 screws and pull out the A/C control assembly, then disconnect the connector.

## DISASSEMBLY

### 1. REMOVE A/C SWITCH AND DEFOGGER SWITCH

Using a screwdriver, release the claw and pull out the switch backward.

HINT:

Tape the screwdriver tip before use.

### 2. REMOVE HEATER CONTROL KNOBS

### 3. REMOVE HEATER CONTROL CABLE

### 4. REMOVE BLOWER SPEED CONTROL SWITCH

Remove the 2 screws and pull out the switch.

### 5. REMOVE MODE SWITCH

Remove the 2 screws and pull out the switch.

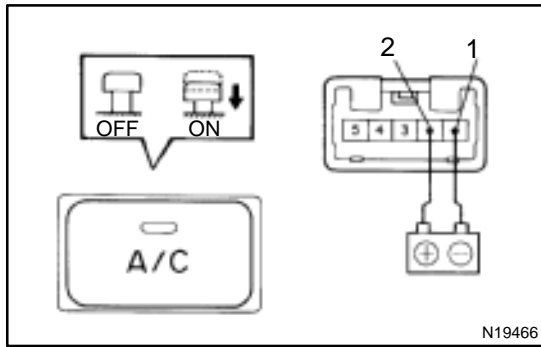
### 6. REMOVE HEATER CONTROL NAME SHEET

(a) Remove the 2 screws.

(b) Using a screwdriver, release the 4 claws and heater control name sheet.

HINT:

Tape the screwdriver tip before use.

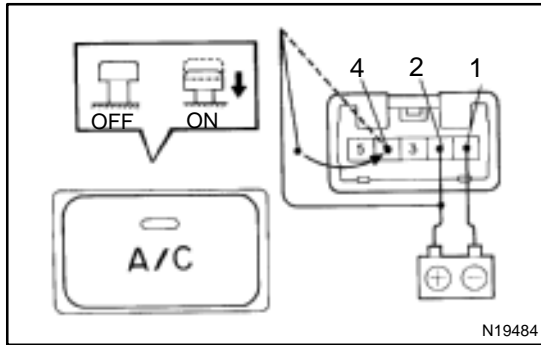


## INSPECTION

### 1. INSPECT A/C INDICATOR OPERATION

- (a) Connect the positive (+) lead from the battery to terminal 2 and the negative (-) lead to terminal 1.
- (b) Push the A/C button in and then check that the indicator lights up.

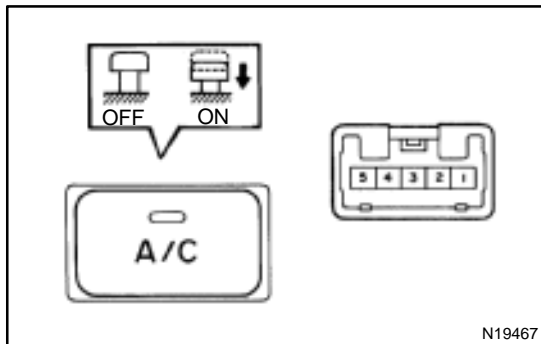
If operation is not as specified, replace the switch.



### 2. INSPECT DIMMING OPERATION

- (a) Connect the positive (+) lead from the battery to terminal 2 and the negative (-) lead to terminal 1 while press the switch.
- (b) Connect the positive (+) lead from battery to terminal 4 and then check that the indicator dims.

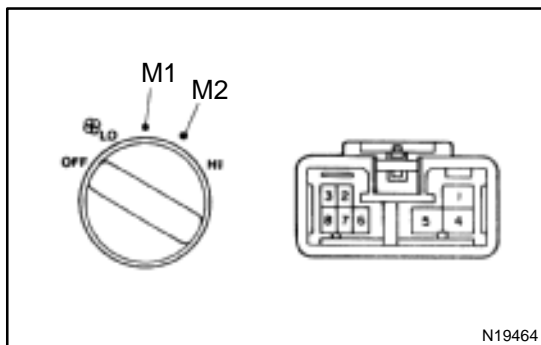
If operation is not as specified, replace the switch.



### 3. INSPECT A/C SWITCH CONTINUITY

Condition/Circuit	Tester connection	Specified condition
OFF	–	No continuity
ON	2 – 5	Continuity
Illumination circuit	3 – 4	Continuity

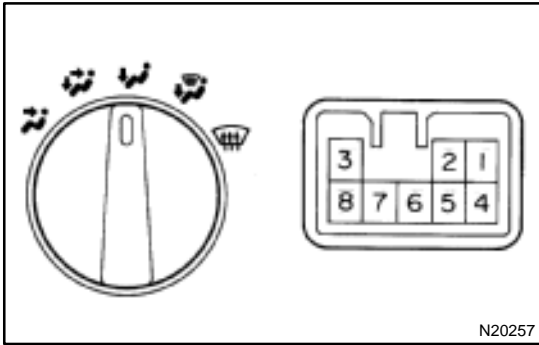
- ◆ Switch continuity:  
If continuity is not as specified, replace the switch.
- ◆ Illumination circuit:  
If continuity is not as specified, replace the bulb.



### 4. INSPECT BLOWER SPEED CONTROL SWITCH CONTINUITY

Position/ Circuit	Tester connection	Specified condition
OFF	–	No continuity
LO	1 – 3	Continuity
M1	1 – 3 – 4	Continuity
M2	1 – 3 – 8	Continuity
HI	1 – 3 – 5	Continuity
Illumination circuit	6 – 7	Continuity

If continuity is not as specified, replace the switch.



**5. INSPECT MODE SWITCH CONTINUITY**

Switch position	Tester connection	Specified condition
FACE	1 – 6	Continuity
B/L	1 – 5	Continuity
FOOT	1 – 4	Continuity
FOOT/DEF.	1 – 3	Continuity
DEF.	1 – 2 7 – 8	Continuity

If continuity is not as specified, replace the switch.

**6. INSPECT REAR DEFOGGER SWITCH OPERATION**  
 (See page [BE-56](#))

## REASSEMBLY

Reassembly is in the reverse order of disassembly (See page [AC-83](#)).

## INSTALLATION

Installation is in the reverse order of removal

(See page AC-82).

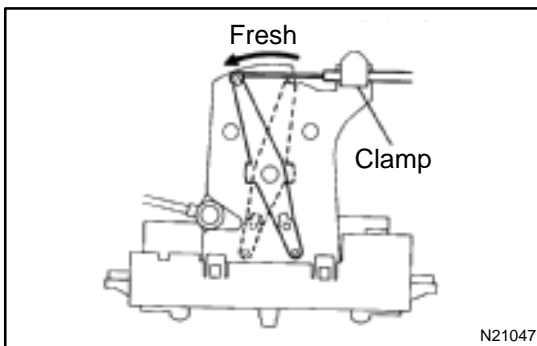
### 1. AFTER INSTALLATION INSPECT A/C CONTROL LEVER AND DIAL OPERATION

Move the control dial and lever left and right and check for stiffness and binding through the full range of the lever and dial. If there is stiffness or binding, proceed next step.

### 2. ADJUST A/C CONTROL CABLES

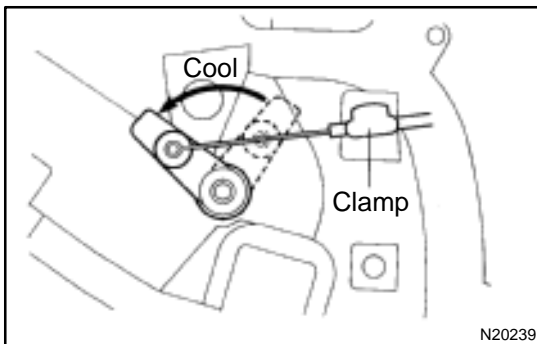
(a) Set A/C control assembly in these conditions:

- (1) Air inlet control lever in "FRESH" position
- (2) Temperature control dial in "MAX. COOL" position.



(b) Adjust air inlet control cable.

- (1) Pull out the inner of air inlet cable and hit the link of blower unit on the link stopper.
- (2) Set the cable connector to lever pin and clamp the cable outer.



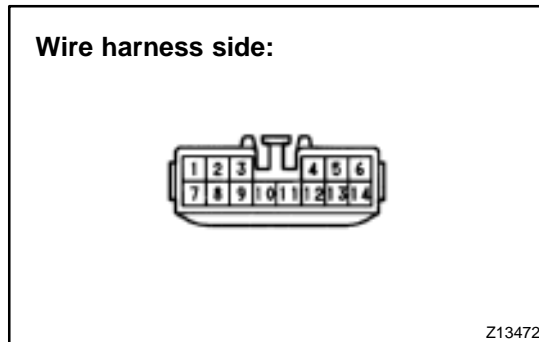
(c) Adjust air mix control cable.

Set the cable connector to air mix link pin on left side of A/C unit and clamp the cable outer on.

# AIR CONDITIONING AMPLIFIER ON-VEHICLE INSPECTION

AC0NJ-02

1. REMOVE GLOVE COMPARTMENT  
(See page [BO-75](#))



2. INSPECT AMPLIFIER CIRCUIT

- (a) Disconnect the amplifier connector and inspect the connector on wire harness side, as shown in the chart below.

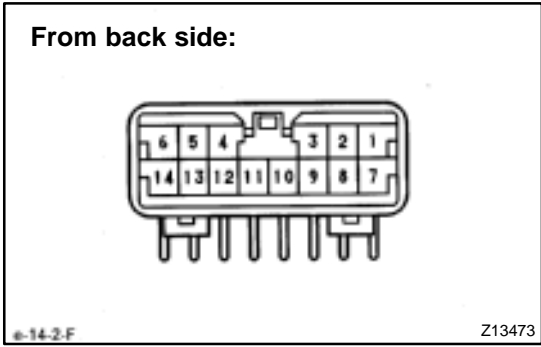
Test conditions:

- ◆ Ignition switch ON
- ◆ Blower speed switch HI
- ◆ Temperature control lever Max. Cool

Tester connection	Condition	Specified condition
5 – Ground	Constant	Continuity
9 – 13	Evaporator temperature at 25°C (77°F)	Approx. 1.5 kΩ
14 – 13	Constant	65 – 125 Ω at 25°C (77°F)
8 – Ground	A/C switch ON	Battery positive voltage
8 – Ground	A/C switch OFF	No voltage
8 – Ground	Mode switch DEF. position	Battery positive voltage
10 – Ground	A/C switch ON	Below 4.0 V
10 – Ground	A/C switch OFF	No voltage

If circuit is as specified, try replacing the amplifier with a new one. If the circuit is not as specified, inspect the circuits connected to other parts.





(b) Connect the connector to amplifier and inspect wire harness side connector from the back side, as shown in the chart below.

Test conditions:

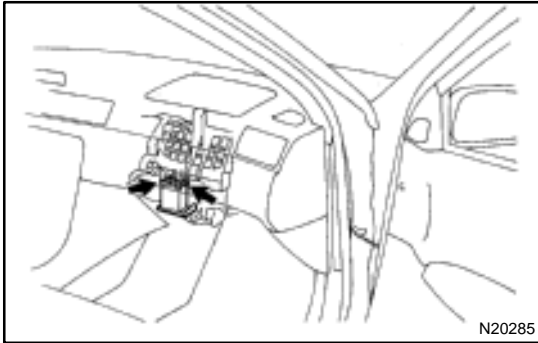
- ◆ Running engine at idle speed
- ◆ Blower speed switch HI
- ◆ A/C switch ON
- ◆ Temperature control lever Max Cool
- ◆ Set on manifold gauge set

Tester connection	Condition	Specified condition
1 – Ground	Magnetic clutch is not engaged	Below 1.0 V
1 – Ground	Magnetic clutch is engaged	No voltage
7 – Ground	Magnetic clutch is not engaged	Below 1.0 V
7 – Ground	Magnetic clutch is engaged	Battery positive voltage
2 – Ground	Refrigerant pressure 196 – 1,340 kPa	Battery positive voltage
2 – Ground	Refrigerant pressure less than 196 or more than 3,140 kPa	No voltage
12 – Ground	Refrigerant pressure 196 – 1,340 kPa	Below 1.0 V
12 – Ground	Refrigerant pressure less than 196 or more than 3,140 kPa	Battery positive voltage
12 – Ground	Engine coolant temp. 83°C (181°F) or below	Battery positive voltage
12 – Ground	Engine coolant temp. 93°C (199°F) or above	Below 1.0 V

If circuit is as specified, try replacing the amplifier with a new one. If the circuit is not as specified, inspect the circuits connected to other parts.

## REMOVAL

1. **REMOVE GLOVE COMPARTMENT**  
(See page [BO-75](#))



2. **REMOVE A/C AMPLIFIER**
  - (a) Disconnect the connector.
  - (b) Release the 2 claws and pull out the amplifier.

## INSTALLATION

Installation is in the reverse order of removal (See page [AC-90](#)).

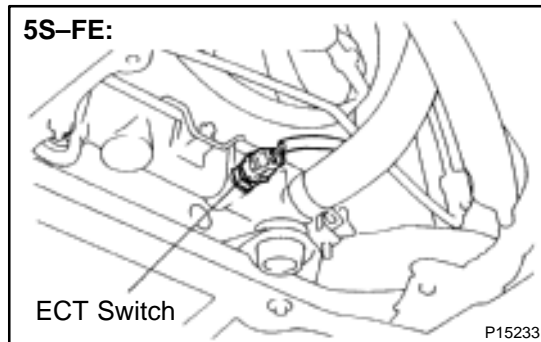
# ENGINE COOLANT TEMPERATURE (ECT) SWITCH INSPECTION

AC227-01

## 1. DRAIN ENGINE COOLANT FROM RADIATOR

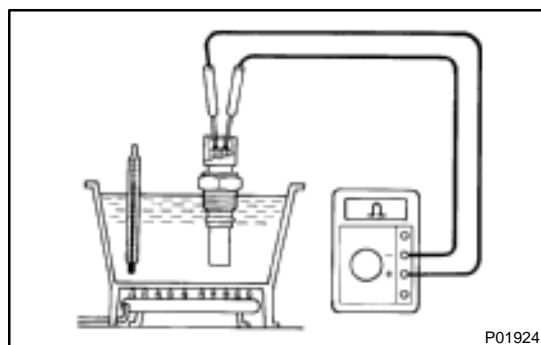
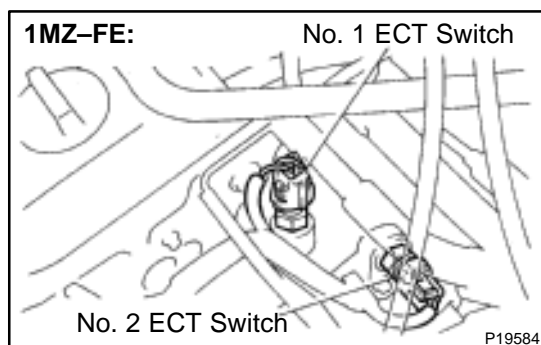
HINT:

It is not necessary to drain out all the coolant.



## 2. REMOVE ECT SWITCHES

- (a) Disconnect the connector.
- (b) Remove the ECT switch.



## 3. 5S-FE engine:

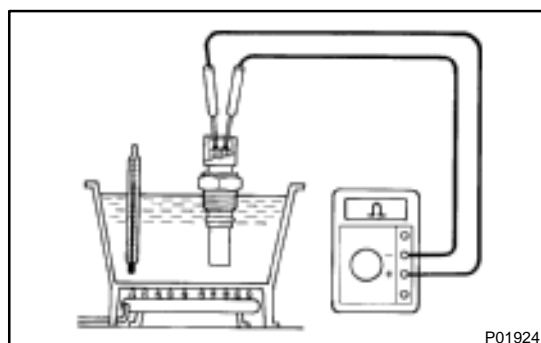
### INSPECT ECT SWITCH CONTINUITY

- (a) Using an ohmmeter, check that no continuity exists between the terminals when the coolant temperature is above 93°C (199°F).

If continuity exists, replace the switch.

- (b) Using an ohmmeter, check that continuity exists between the terminals when the coolant temperature is below 83°C (181°F).

If no continuity exists, replace the switch.



## 4. 1MZ-FE engine:

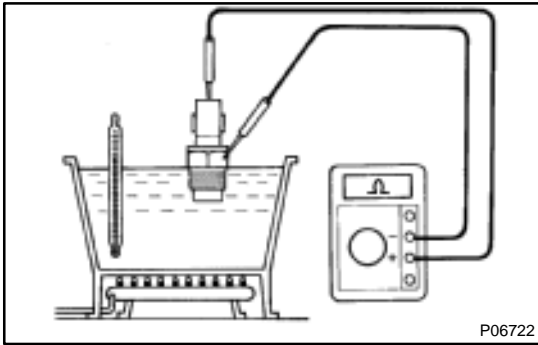
### INSPECT No. 1 SWITCH CONTINUITY

- (a) Using an ohmmeter, check that no continuity exists between the terminals when the coolant temperature is above 98°C (208°F).

If continuity exists, replace the switch.

- (b) Using an ohmmeter, check that continuity exists between the terminals when the coolant temperature is below 88°C (190°F).

If no continuity exists, replace the switch.

**5. 1MZ-FE engine:****INSPECT No. 2 SWITCH CONTINUITY**

- (a) Using an ohmmeter, check that no continuity exists between the terminal and switch body when the coolant temperature is above 93°C (199°F).

If continuity exists, replace the switch.

- (b) Using an ohmmeter, check that continuity exists between the terminals when the coolant temperature is below 83°C (181°F).

If no continuity exists, replace the switch.

**6. INSTALL ECT SWITCHES**

- (a) Install the ECT switch.

HINT:

Lubricate a new O-ring with soapy water and install the switch.

- (b) Connect the connector.

