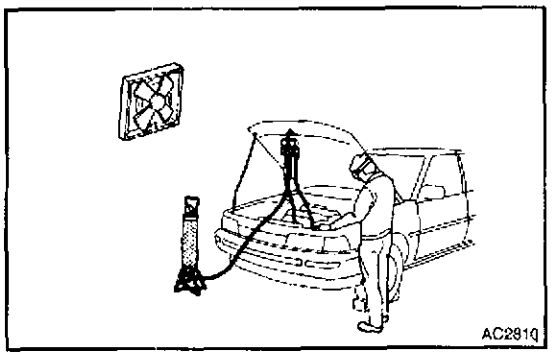
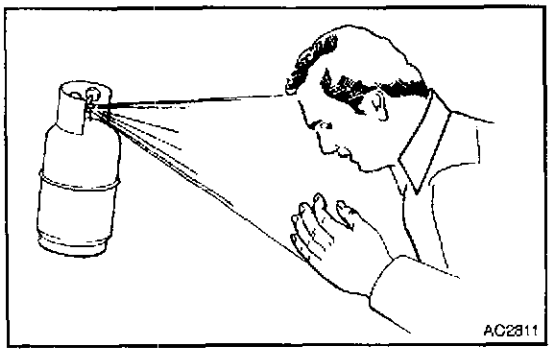


AIR CONDITIONING SYSTEM

PRECAUTION

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



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.

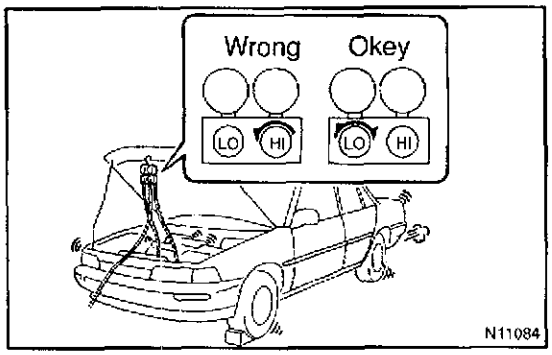
CAUTION:

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**



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.

AC

9. SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

The HILUX 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.

AC0J8–01

TROUBLESHOOTING

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	1. HTR Fuse	–
	2. Heater main relay	AC–89
	3. Blower motor	AC–77
	4. Blower resistor	AC–80
	5. Blower speed control switch	AC–106
	6. Wire harness	–
No air temperature control	1. Engine coolant volume	–
	2. Heater control assembly	AC–101
No compressor operation	1. Refrigerant volume	AC–5
	2. A.C Fuse	–
	3. Magnetic clutch	AC–42
	4. Compressor	AC–42
	5. Pressure switch	AC–86
	6. Heater main relay	AC–89
	7. Blower speed control switch	AC–106
	8. *1 A/C switch	AC–99
	*2 A/C variable resistor set switch	AC–106
	9. A/C amplifier	AC–93
	10. Thermistor	AC–82
	11. Wire harness	–
Compressor operates intermittently	1. Refrigerant volume	AC–5
	2. Pressure switch	AC–86
	3. *1 A/C switch	AC–99
	*2 A/C variable resistor set switch	AC–106
	4. Thermistor	AC–82
	5. Wire harness	–
No cool air comes out	1. Refrigerant volume	AC–5
	2. Refrigerant pressure	AC–5
	3. Drive belt	AC–18
	4. Magnetic clutch	AC–42
	5. Compressor	AC–42
	6. Pressure switch	AC–86
	7. Thermistor	AC–82
	8. *1 A/C switch	AC–99
	*2 A/C variable resistor set switch	AC–106
	9. A/C amplifier	AC–93
	10. Heater control assembly	AC–101
	11. Wire harness	–
Cool air comes out only at high engine rpm	1. Refrigerant volume	AC–5
	2. Drive belt	AC–18
	3. Magnetic clutch	AC–42
	4. Compressor	AC–42
	5. Condenser	AC–63
	6. Receiver	AC–59
	7. Expansion valve	AC–73
	8. Evaporator	AC–68
	9. Thermistor	AC–82
	10. *1 A/C switch	AC–99
	*2 A/C variable resistor set switch	AC–106
	11. Wire harness	–

Insufficient cooling	1. Refrigerant volume	AC–5
	2. Drive belt	AC–18
	3. Magnetic clutch	AC–42
	4. Compressor	AC–42
	5. Condenser	AC–63
	6. Receiver	AC–59
	7. Expansion valve	AC–73
	8. Evaporator	AC–68
	9. Refrigerant lines	AC–23
	10. Pressure switch	AC–86
	11. A/C amplifier	AC–93
	13. Heater control assembly	AC–101
2RZ–FE and 3RZ–FE Engine Models: No engine idle–up when A/C switch ON	1. A/C amplifier	AC–93
	2. Engine (and ECT) ECU	–
	3. Wire harness	–
Except 2RZ–FE and 3RZ–FE Engine Models: No engine idle–up when A/C switch ON	1. A/C amplifier	AC–93
	2. Vacuum switching valve (VSV)	AC–91
	3. Wire harness	–
No warm air comes out	1. Engine coolant volume	–
	2. Heater control assembly	AC–101
	3. Heater radiator	AC–71

*1: A/C models
*2: Boost ventilator with cooler models

AC0J9-01

ON–VEHICLE INSPECTION

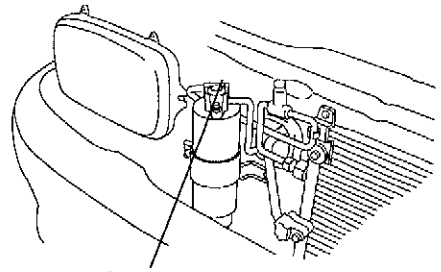
1. INSPECT REFRIGERANT VOLUME

Observe the sight glass on the liquid tube.

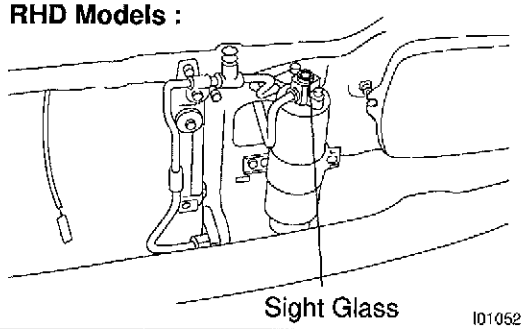
Test conditions:

- 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

LHD Models :



RHD Models :



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 conditioner 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 conditioner 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

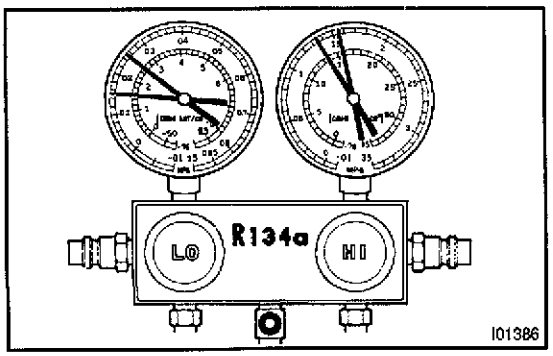
This is a method in which the trouble is located by using a manifold gauge set. Read the manifold gauge pressure when these conditions are established.

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^2)

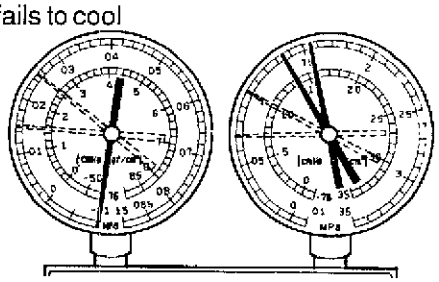
High pressure side:

1.37 – 1.57 MPa (14 – 16 kgf/cm^2)

AC

(2) Moisture present in refrigeration system.

Condition : Periodically cools and then fails to cool

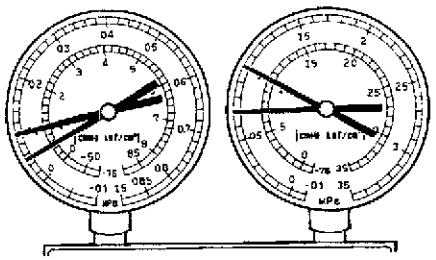


I01387

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 is restored after a time when the ice melts	• Drier in oversaturated state • Moisture in refrigeration system freezes at expansion valve orifice and blocks circulation of refrigerant	(1) Replace receiver (2) Remove moisture in cycle through repeatedly evacuating air (3) Charge proper amount of new refrigerant

(3) Insufficient cooling

Condition: Insufficient cooling



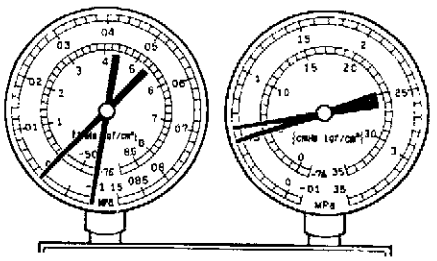
I01388

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure low on both low and high pressure sides • Bubbles seen in sight glass continuously • Insufficient cooling performance	Gas leakage at some place in refrigeration system	• Insufficient refrigerant in system • Refrigerant leaking	(1) Check for gas leakage with gas leak detector and repair if necessary (2) Charge Proper amount of refrigerant (3) If indicated pressure value is near 0 when connected to gauge, create the vacuum after inspecting and repairing the location of the leak

AC

(4) Poor circulation of refrigerant

Condition: Insufficient cooling

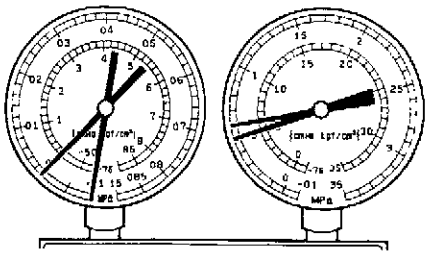


I01389

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure low in both low and high pressure sides • Frost on tube from receiver to unit	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)



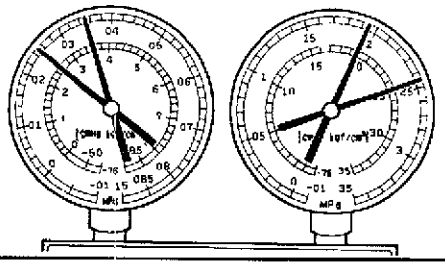
I01449

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
• Vacuum indicated on low pressure side, very low pressure indicated on high pressure side • Frost or dew seen on piping before and after receiver/ drier or expansion valve	• Refrigerant flow obstructed by moisture or dirt in refrigeration system • Refrigerant flow obstructed by gas leakage from expansion valve and heat sensing tube	Refrigerant does not circulate	(1) Check heat sensing tube and expansion valve (2) Clean out dirt in expansion valve by blowing with air (3) Replace receiver (4) Evacuate air and charge new refrigerant to proper amount (5) For gas leakage from heat sensing tube, replace expansion valve

AC

(6) Refrigerant overcharged or insufficient cooling of condenser

Condition: Insufficient cooling

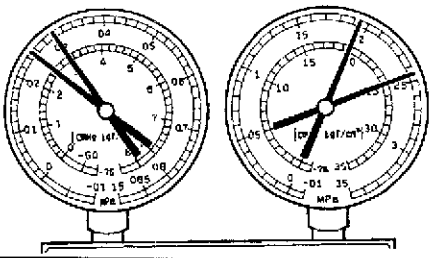


I01390

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure too high on both low and high pressure sides • No air bubbles seen through the sight glass even when the engine rpm is lowered	• Unable to develop sufficient performance due to excessive • Insufficient cooling of condenser	• Excessive refrigerant in cycle → refrigerant overcharged • Condenser cooling insufficient → condenser fins clogged of cooling fan faulty	(1) Clean condenser (2) Check cooling fan with fluid coupling operation (3) If (1) and (2) are in normal state, check amount of refrigerant Charge proper amount of refrigerant

(7) Air present in refrigeration system

Condition: Insufficient cooling



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

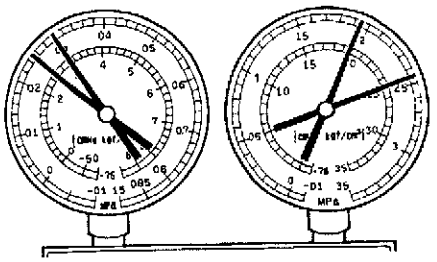
I01392

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure too high on both low and high pressure sides • The low pressure piping hot to the touch • Bubbles seen in sight glass	Air entered in refrigeration system	• Air present in refrigeration system • Insufficient vacuum purging	(1) Check compressor oil to see if it is dirty or insufficient (2) Evacuate air and charge new refrigerant

AC

(8) Expansion valve improperly Mounted/ Heat sensing tube defective (Open too wide)

Condition: Insufficient cooling



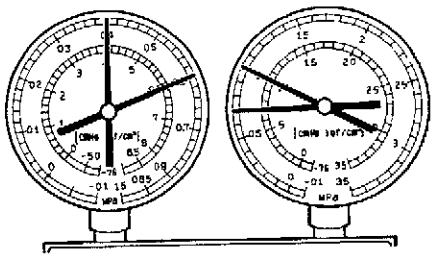
I01450

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure too high on both low and high pressure sides • Frost or large amount of dew on piping on low pressure side	Trouble in expansion valve or heat sensing tube not installed correctly	• Excessive refrigerant in low pressure piping • Expansion valve opened too wide	(1) Check heat sensing tube installed condition (2) Check expansion valve Replace if defective

(9) Defective compression compressor

AC

Condition : Does not cool



I01393

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
• Pressure too high on low high pressure sides • Pressure too low to on high pressure side	Internal leak in compressor	• Compression defective • Valve leaking or broken sliding parts	Repair or replace compressor

3. 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^2, 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.

4. 2RZ–FE and 3RZ–FE Engine Models: INSPECT IDLE–UP SPEED

(a) Warm up engine.

(b) Inspect idle–up speed when these conditions are established:
- Idle speed at correctly
- Blower speed control switch at "HI" position
- A/C switch ON
- Temperature control lever at "COOL" position
- Magnetic clutch engaged

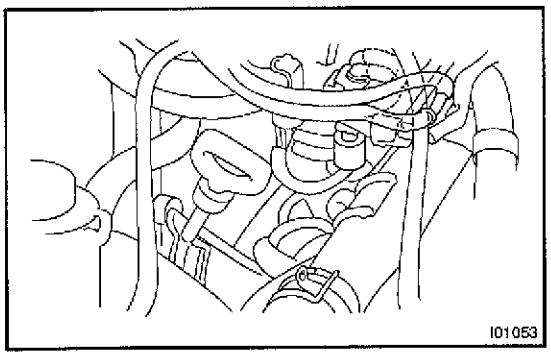
Standard idle–up speed: 900 ± 50 rpm

If idle–up speed is not as specified, check the idle control system.

5. 1RZ, 1RZ–E and 3RZ–F Engine:
INSPECT IDLE–UP SPEED

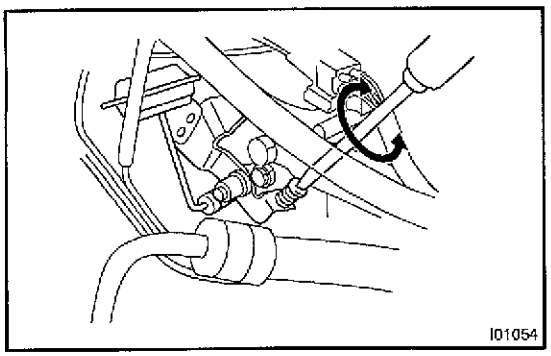
(a) Warm up engine.

(b) Set vehicle in these conditions:
- Idle speed at correctly
- Steering wheel straight ahead
- Put gear shift in neutral



(c) Inspect idle–up speed.
(1) Disconnect the 2 vacuum hoses from the VSV and connect them directly to each other, as shown in the illustration.
(2) Check idle–up speed.

Standard idle–up speed:
1RZ Engine: 1,300 ± 50 rpm
1RZ–E Engine: 950 ± 50 rpm
3RZ–F Engine: 1,300 ± 50 rpm

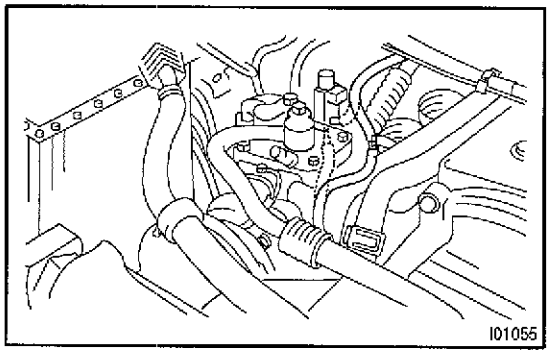


If the idle speed is not as specified, adjust the idle–up speed by tuning the adjusting screw on the idle–up actuator.

6. 2L, 2L–T, 3L and 5L Engine:
INSPECT IDLE–UP SPEED

(a) Warm up engine.

(b) Set vehicle in these conditions:
- Injection timing set correctly
- Steering wheel straight ahead
- Put gear shift in neutral



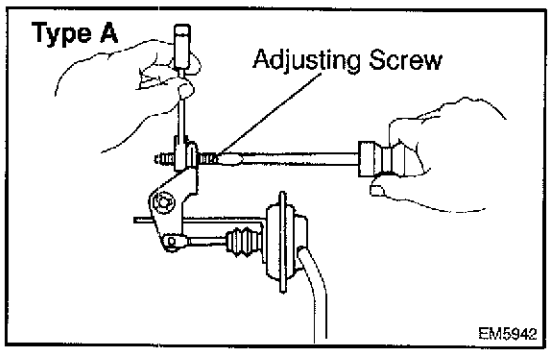
(c) Inspect idle–up speed.

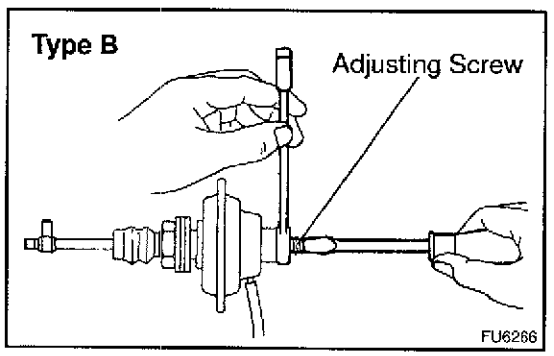
(1) Disconnect the 2 vacuum hoses from the VSV and connect them directly to each other, as shown in the illustration.

(2) Check idle–up speed.

Standard idle–up speed:
Except 3L Engine Models for G.C.C. Countries :
950 ± 50 rpm
3L Engine Models for G.C.C. Countries :
1,100 ± 50 rpm

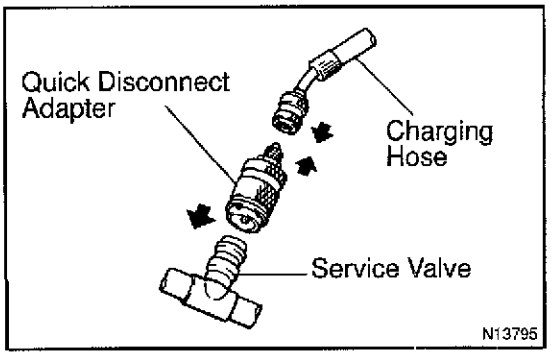
If the idle–up speed is not as specified, loosen the lock nut and adjust the idle–up speed by tuning the adjusting screw on the idle–up actuator.





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EVACUATING



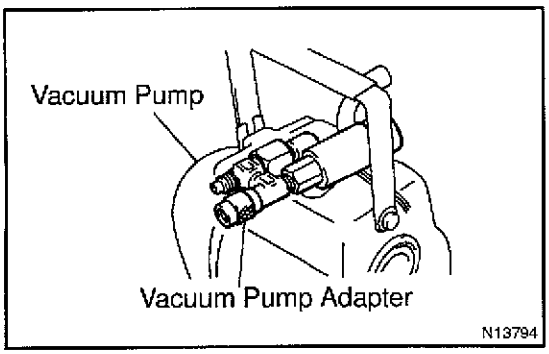
1. CONNECT QUICK DISCONNECT ADAPTER TO CHARGING HOSES

2. REMOVE CAPS FROM SERVICE VALVES ON REFRIGERANT LINES

3. SET ON MANIFOLD GAUGE SET

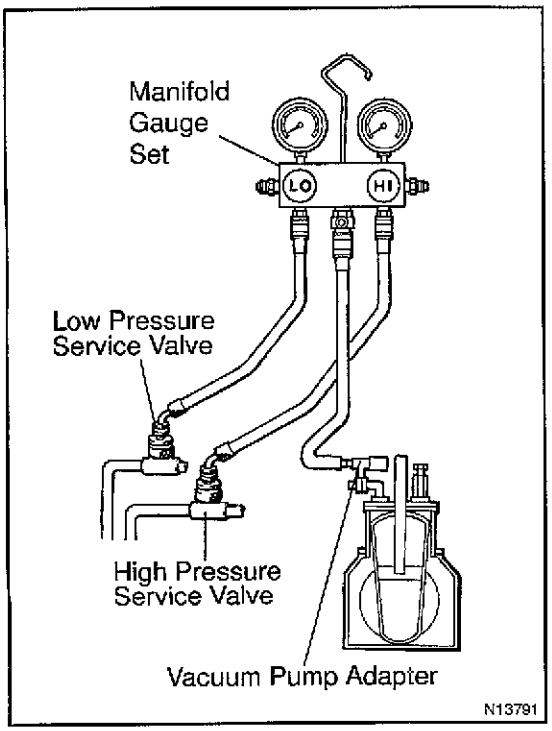
(a) Close both hand valves of manifold gauge set.

(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:

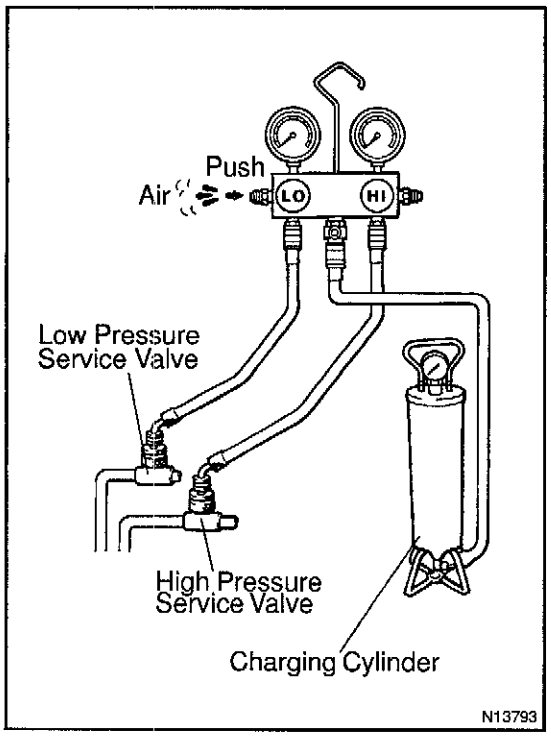
If the reading 750 mmHg (30 in. Hg) or more, close both hand valves of manifold gauge set and stop the vacuum pump. Check the system for leaks and repair necessary.

(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.

AC0JE-01

CHARGING



1. INSTALL CHARGING CYLINDER

(a) Charge the proper amount of refrigerant into the charging cylinder.

(b) Connect the center hose to the charging cylinder.

CAUTION:

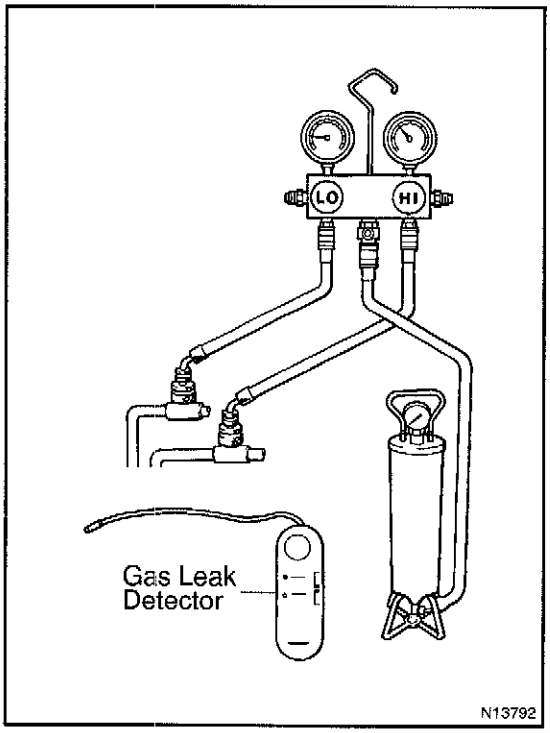
Do not open both high and low hand valves of manifold gauge set.

HINT:

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

(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.

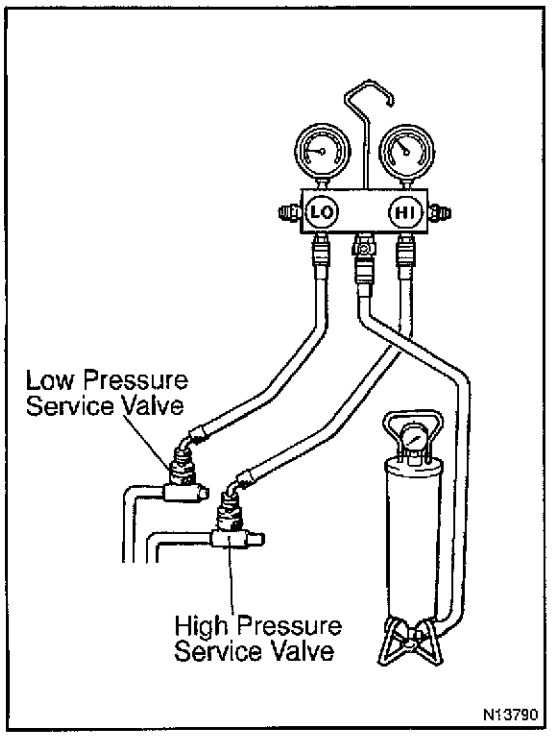
(b) When the low pressure gauge indicates 98 kPa (1 kgf/cm^2, 14 psi) close the high pressure hand valve.

(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 a 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.

4. SET OFF MANIFOLD GAUGE SET

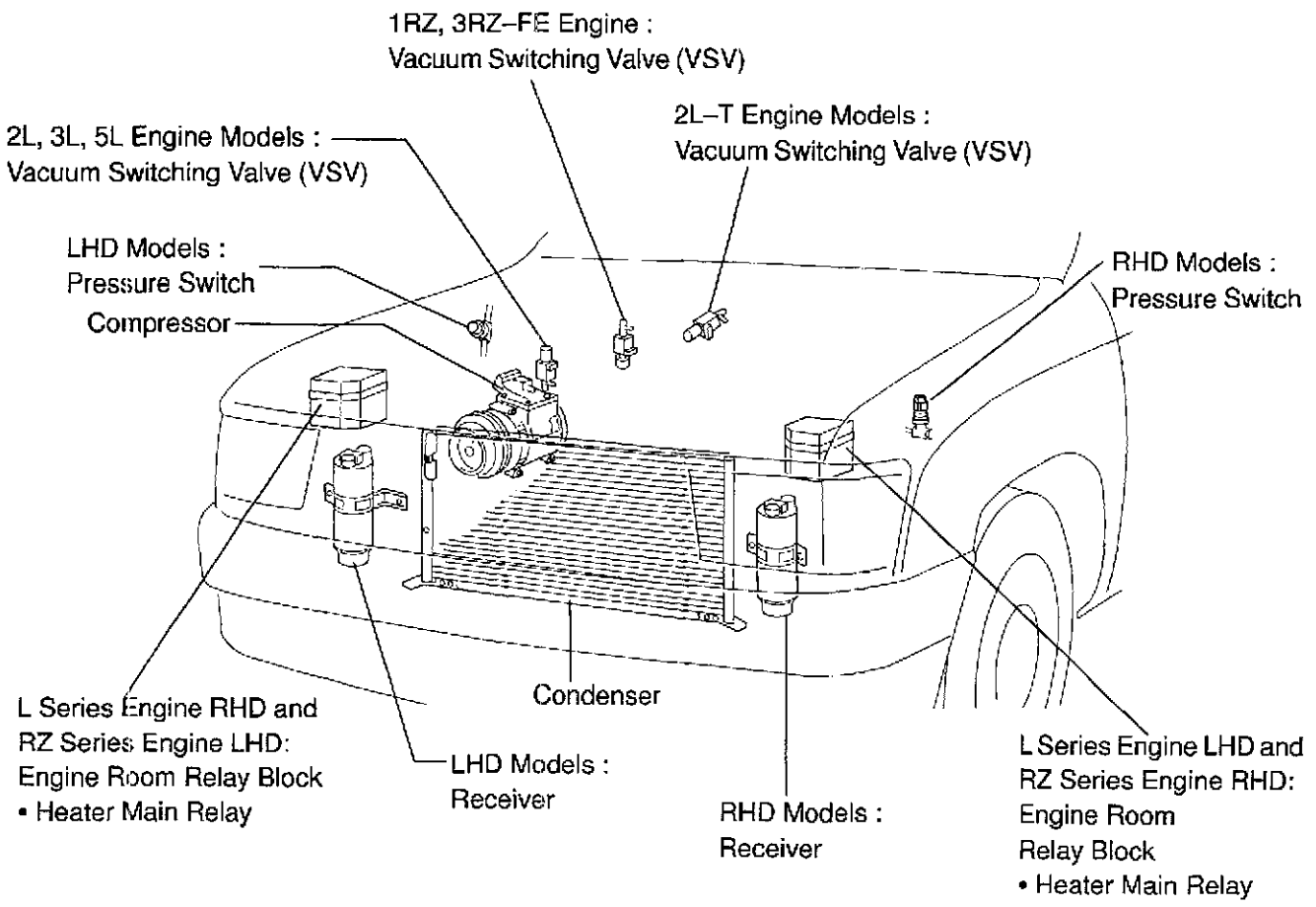
(a) Close both hand valves of manifold gauge set.

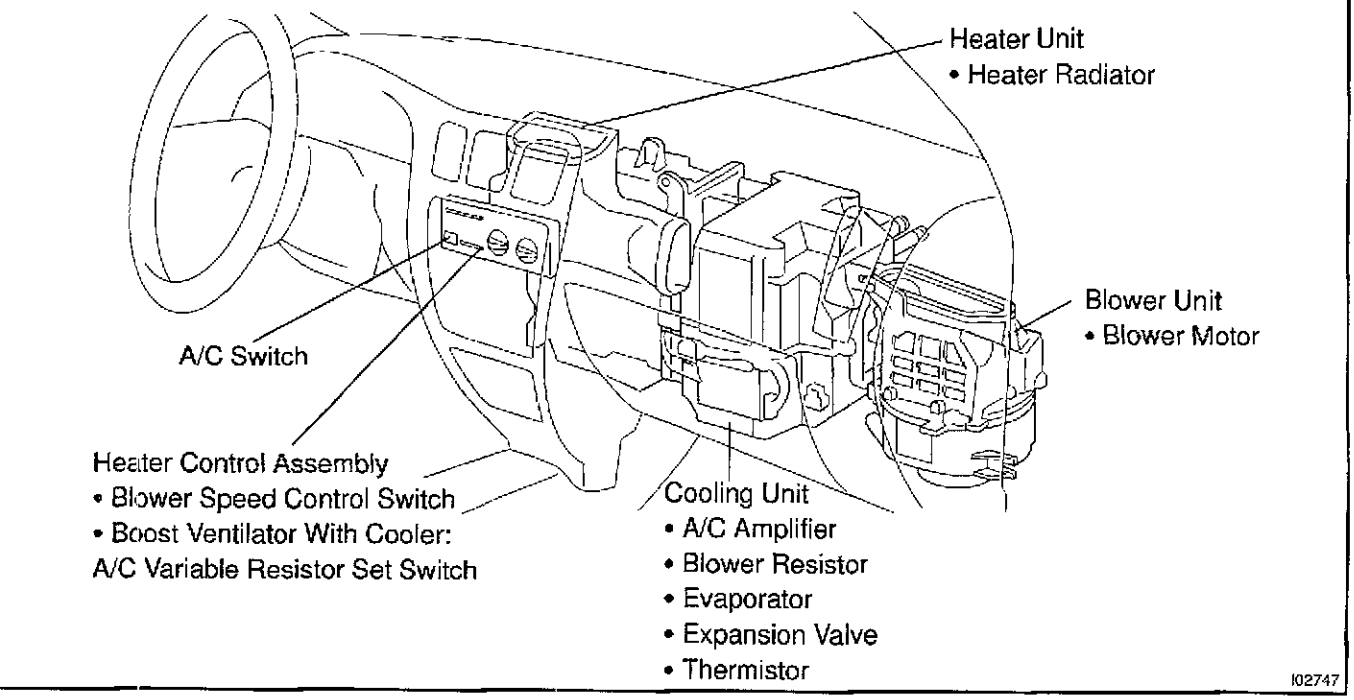
(b) Disconnect the quick disconnect adapters from the service valves.

5. INSTALL CAPS TO SERVICE VALVES ON REFRIGERANT LINES

AC0JC-01

LOCATION





I02747