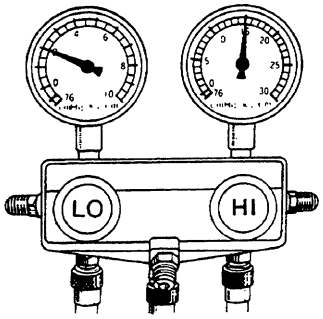
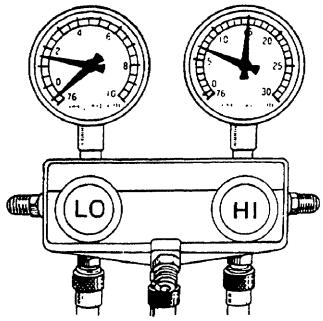
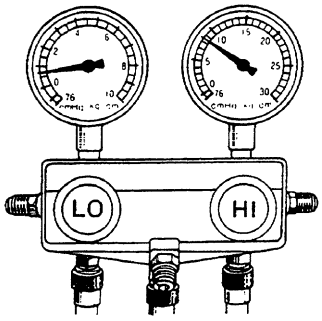
REFRIGERATION SYSTEM

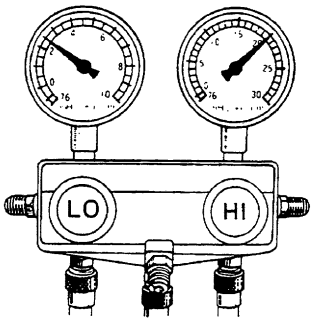
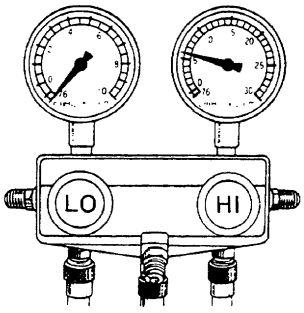
INSPECTION OF REFRIGERATION SYSTEM WITH MANIFOLD GAUGE SET

This is a method in which the trouble is located by using a manifold gauge set. (See "Installation of Manifold Set" on page AC–14.) Read the manifold gauge pressure when the following conditions are established:

(a) Temperature at the air inlet with the switch set at RECIRC is 30 – 35°C (86 – 95°F)
(b) Engine running at 2,000 rpm
(c) Blower fan speed control switch set at high speed
(d) Temperature control switch set at max cool side

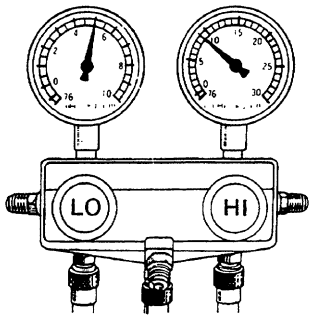
HINT: It should be noted that the gauge indications may vary slightly due to ambient temperature conditions.

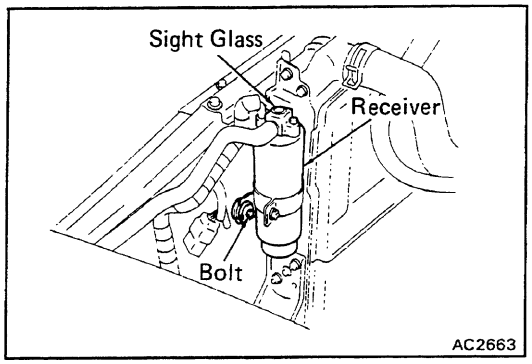
No.	Gauge reading kg/cm² (psi, kPa)	Condition	Probable cause	Remedy
1	LO: 1.5—2.0 (21—28, 147—196) HI: 14.5—15.0 (206—213, 1,422—1,471)  AC0067	Normal cooling	Normally functioning system	
2	During operation, pressure at low pressure side sometimes becomes a vacuum and sometimes normal  AC0068	Periodically cools and then fails to cool	Moisture present in refrigeration system	(1) Replace receiver (2) Remove moisture in system through repeatedly evacuating air (3) Charge with refrigerant to proper amount
3	Pressure low at both low and high pressure sides  AC0069	• Insufficient cooling • Bubbles seen in sight glass	Insufficient refrigerant	(1) Using gas leak tester, check for leakage (2) Charge refrigerant to proper amount
		• Insufficient cooling • Frost on tubes from receiver to unit	Refrigerant flow obstructed by dirt in receiver	Replace receiver

No.	Gauge reading kg lcm2 (psi, kPa)	Condition	Probable cause	Remedy
4	Pressure too high at both low and high pressure side	Insufficient cooling	Insufficient cooling of condenser	(1) Clean condenser (2) Check fan motor operation
5			Refrigerant over charged	Check amount of refrigerant HINT: Vent out refrigerant throuh gauge manifold low pressure side by gradually opening valve
6			Air present in system	(1) Replace receiver (2) Check compressor oil to see if dirty or insufficient (3) Evacuate air and charge with new refrigerant
7	AC0070	• Insufficient cooling • Frost or large amount of dew on piping at low pressure side	Expansion valve improperly mounted, heat sensing tube defective (Opens too wide)	(1) Check heat sensing tube installation condition (2) If (1) is normal, check expansion valve (3) Replace if defective
8	Vacuum indicated at low pressure side, very low pressure indicated at high pressure  AC0156	• Does not cool (Cools from time to time in some cases) • Frost or dew seen on piping before and after receiver or expansion valve	Refrigerant does not circulate	Alow to stand for some time and then restart operation to determine if trouble is caused by moisture or dirt If caused by moisture refer to procedures step 2 on page AC–11 If caused by dirt, remove expansion valve and clean off dirt by blowing with air. If not able to remove dirt, replace valve Evacuate air and charge with new refrigerant to proper amount For gas leakage from heat sensing tube, replace expansion valve

HINT at No.6

These gauge indications are shown when the refrigeration system has been opened and the refrigerant charged without evacuating air.

No.	Gauge reading kg/cm ^{2} (psi, kPa)	Condition	Probable cause	Remedy
9	Pressure too high at low pressure side, pressure too low at high pressure side  AC0157	Does not cool	Insufficient compression	Repair or replace compressor



AC2663

INSPECTION OF REFRIGERANT VOLUME

1. **RUN ENGINE AT APPROX. 1,500 RPM**
2. **OPERATE A/C AT MAXIMUM COOLING FOR A FEW MINUTES**
3. **INSPECT AMOUNT OF REFRIGERANT**
   Observe the sight glass on the liquid tube.

Item	Symptom	Amount of refrigerant	Remedy
1	Bubbles present in sight glass	Insufficient*	Check for gas leakage with gas leak tester
2	No bubbles present in sight glass	None, sufficient or too much	Refer to items 3 and 4
3	No temperature difference between compressor inlet and outlet	Empty or nearly empty	Evacuate and charge system. Then check for gas leakage with gas leak tester
4	Temperature between compressor inlet and outlet is noticeably different	Proper 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	Discharge excess refrigerant to specified amount
6	When air conditioner is turned off, refrigerant foams and then stays clear	Proper	Refer to items 3 and 4

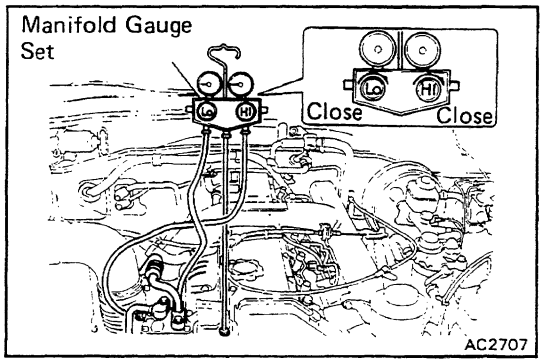
*: Bubbles in the sight glass with ambient temperatures higher can be considered normal if cooling is sufficient.

DISCHARGING OF REFRIGERANT IN REFRIGERATION SYSTEM

(See Air Conditioning Fundamentals and Repairs Pub. No. 36950E)

EVACUATING OF AIR IN REFRIGERATION SYSTEM AND CHARGING WITH REFRIGERANT

(See Air Conditioning Fundamentals and Repairs Pub. No. 36950E)_



INSTALLATION OF MANIFOLD GAUGE SET

1. **CLOSE BOTH HIGH AND LOW HAND VALVES**
2. **CONNECT CHARGING HOSES TO CHARGING VALVES**
   (a) Connect the low pressure hose to the low pressure charging valve and the high pressure hose to the high pressure charging valve.
   (b) Tighten the hose nuts by hand.

NOTICE: Do not apply compressor oil to the seats of the connection.