

REFRIGERATION SYSTEM

INSTALLATION OF MANIFOLD GAUGE SET

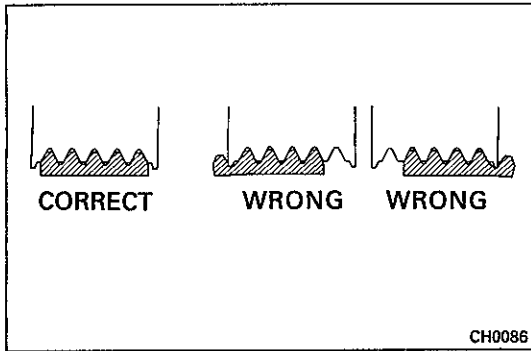
1. CLOSE BOTH HIGH AND LOW HAND VALVES
2. CONNECT CHARGING HOSES TO CHARGING VALVES
 - (a) Connect the low pressure hose to the low pressure charging valve and the high pressure hose to the high pressure charging valve.
 - (b) Tighten the hose nuts by hand.

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

INSPECTION OF IDLE SPEED

1. WARM UP ENGINE
2. INSPECT IDLE SPEED

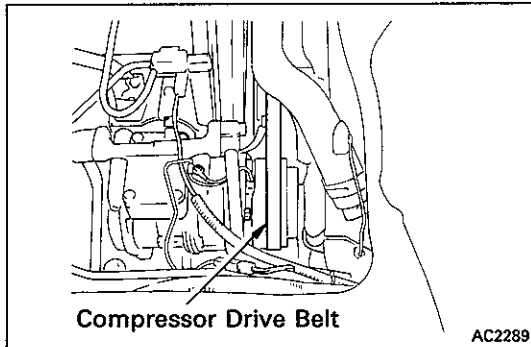
Engine	Transmission	Idle (rpm)	Magnetic Clutch	A/C Idle-up (rpm)
1RZ	M/T	750 ± 50	ON	950 ± 50
2RZ	A/T	800 ± 50	ON	950 ± 50
2RZ-E		800 ± 50	ON	950 ± 50
2L	M/T	700 ± 50	ON	950 ± 50
3L	A/T	800 ± 50	ON	



INSPECTION OF DRIVE BELT

1. MAKE SURE THAT DRIVE BELT IS INSTALLED CORRECTLY

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



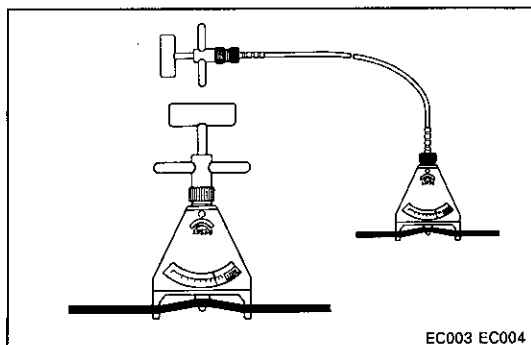
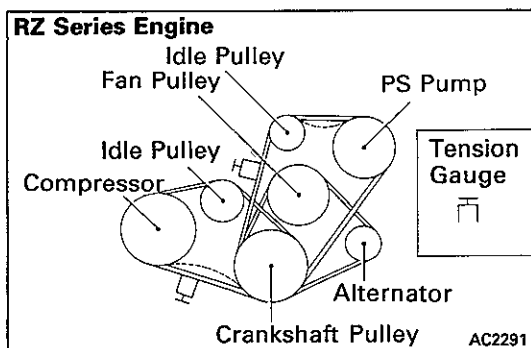
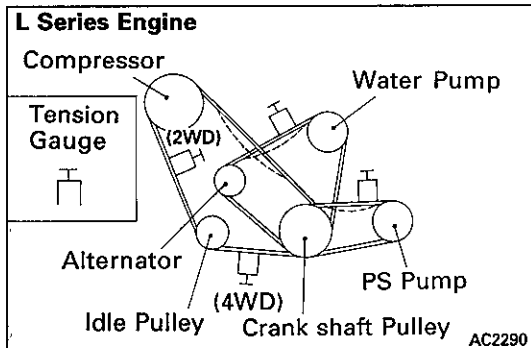
2. INSPECT DRIVE BELT TENSION

Drive belt tension at 10 kg (22.0 lb, 98N): mm (in.)

Engine	New belt	Used belt
L Series	12 – 15 (0.47 – 0.59)	15 – 21 (0.59 – 0.83)
RZ Series	10 – 13 (0.39 – 0.51)	13 – 18 (0.51 – 0.71)

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.



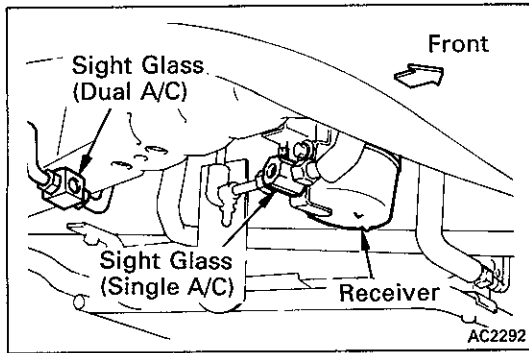
(Reference)

Using SST, check the drive belt tension.

SST 09216-00020 and 09216-00030

kg

Engine	New belt	Used belt
L Series	50 ± 12	30 ± 10
RZ Series	50 ± 12	30 ± 10



INSPECTION OF REFRIGERANT VOLUME

1. **RUN ENGINE AT APPROX. 2,000 RPM**
2. **OPERATE A/C AT MAXIMUM COOLING FOR A FEW MINUTES**
3. **INSPECT AMOUNT OF REFRIGERANT**
Observe the sight glass on the receiver.

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	Empty, proper 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 the air conditioner is turned off, refrigerant in sight glass stays clear	Too much	Discharge the excess refrigerant to specified amount
6	When the air conditioner is turned off, refrigerant foams and then stays clear	Proper	Refer to items 3 and 4

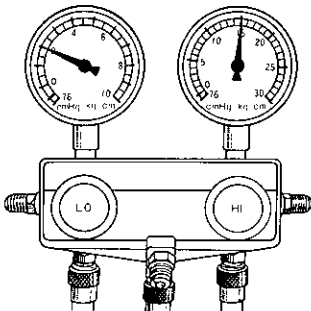
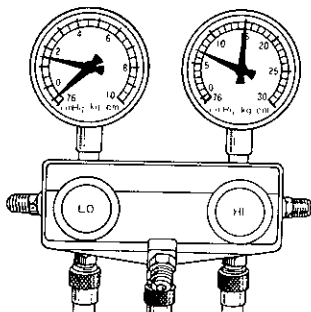
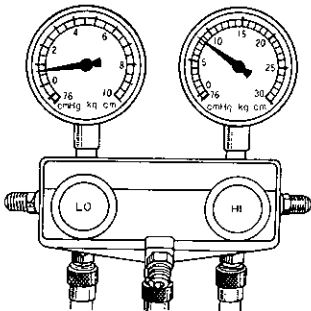
*: Bubbles in the sight glass with ambient temperatures higher can be considered normal if cooling is sufficient.

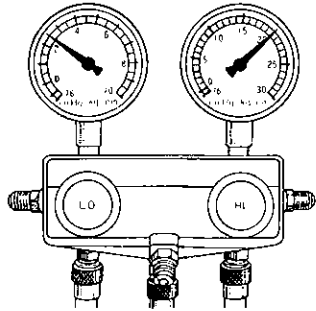
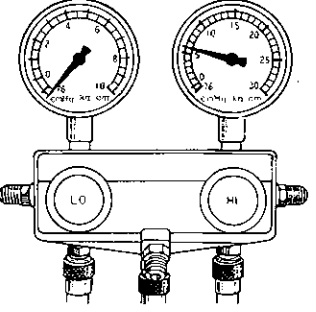
INSPECTION OF REFRIGERATION SYSTEM WITH MANIFOLD GAUGE SET

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

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

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

No.	Gauge reading kg/cm ² (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) 	Normal cooling	Normally functioning system	
2	During operation, pressure at low pressure side sometimes becomes a vacuum and sometimes normal 	Periodically cools and then fails to cool	Moisture present in refrigeration system	(1) Replace receiver (2) Remove moisture in system through repeated evacuating air (3) Charge with refrigerant to proper amount
3	Pressure low at both low and high pressure sides 	<ul style="list-style-type: none"> Insufficient cooling Bubbles seen in sight glass 	Insufficient refrigerant	(1) Using gas leak tester, check for leakage (2) Check refrigerant to proper amount
		<ul style="list-style-type: none"> Insufficient cooling Frost on tubes from receiver to unit 	Refrigerant flow obstructed by dirt in receiver	Replace receiver

No.	Gauge reading kg/cm ² (psi, kPa)	Condition	Probable cause	Remendy
4	Pressure too high at both low and high pressure side	Insufficient cooling of condenser	Insufficient cooling	(1) Clean condenser (2) Check fan motor operation
5		Insufficient cooling	Refrigerant over charged	Check amount of refrigerant HINT: Vent out refrigerant through 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		<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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	Allow 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-20. 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 charged with refrigerant without vacuum purging.

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