3. Refrigerant Pressure with Manifold Gauge Set

A: PROCEDURE

1. REFRIGERANT GAS PRESSURE INSPECTION

Preparation tool:
Manifold gauge set
Thermometer and hygrometer

1) Prepare the vehicle.

NOTE:
Check that the ambient temperature is 25 — 40°C (77 — 104°F) and that the humidity is 30% — 80%.

- Place the vehicle in the shade and windless condition, and open the front hood.
- Open the front windows and close all doors.

2) Connect the manifold gauge set, and then check the refrigerant pressure.
(1) Connect the manifold gauge set, and start the engine.
(2) Set the vehicle to the following conditions.

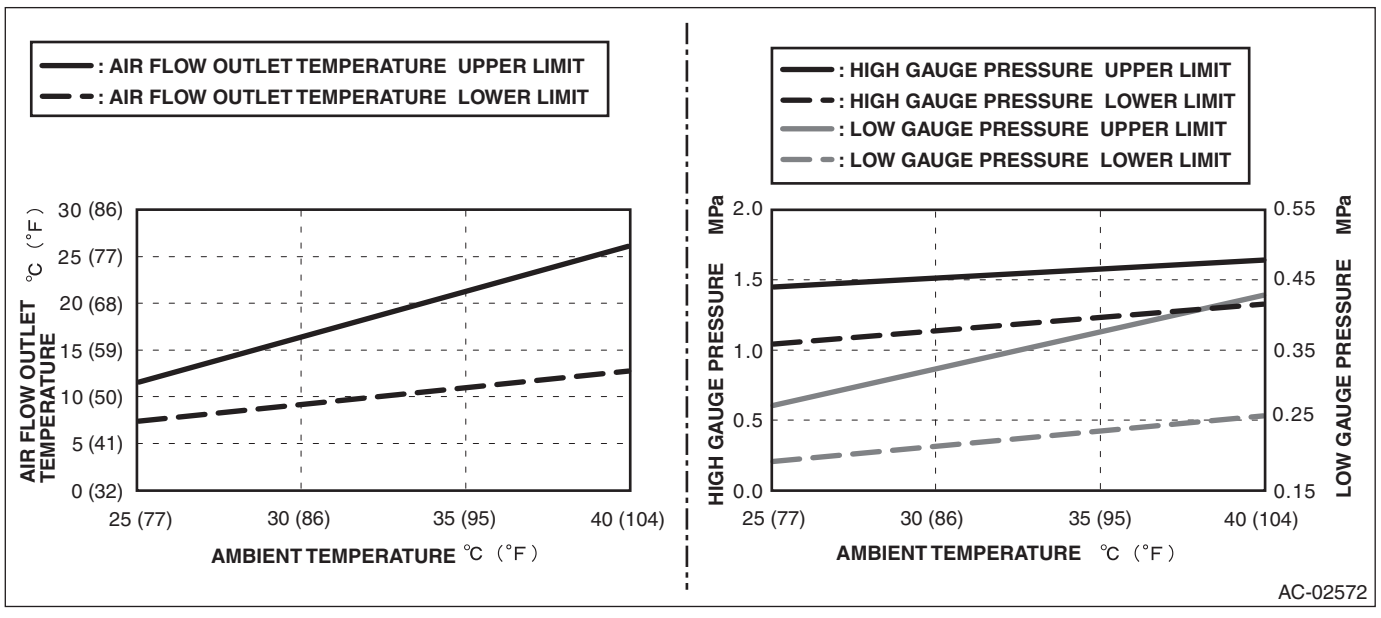
Item	Condition
Engine	Warmed up (Engine coolant temperature indicator light: OFF)
Air vent grille	Shutter is fully open.
A/C switch	ON
Temperature adjustment dial	LO (MAX COOL)
FRESH/RECIRC switch	RECIRC
Air flow control dial or switch	VENT
Fan dial	Auto A/C model: 5/7 level
	Manual A/C model: 3/4 level

(3) In the condition of step (2), idle the engine for 30 minutes.
(4) Read the gauge values on both high pressure side and low pressure side for manifold gauge.

3) Measure the air vent grille outlet opening temperature, ambient temperature and humidity.

NOTE:
For outlet opening temperature, measure the average temperature of center grille assembly and side grille assembly.

4) Check that the high and low pressures and outlet opening temperature for ambient temperature and humidity is within the standard value described in the chart below.



5) Refer to “DIAGNOSIS WITH SYMPTOM” if the inspection result is not within the standard value. <Ref. to AC-25, INSPECTION WITH PRESSURE SYMPTOMS, INSPECTION, Refrigerant Pressure with Manifold Gauge Set.>

B: INSPECTION

1. INSPECTION WITH PRESSURE SYMPTOMS

Symptoms	Reference
Both high and low pressure sides are low.	<Ref. to AC-25, BOTH HIGH AND LOW PRESSURE SIDES ARE LOW, INSPECTION, Refrigerant Pressure with Manifold Gauge Set.>
Both high and low pressure sides are high.	<Ref. to AC-25, BOTH HIGH AND LOW PRESSURE SIDES ARE HIGH, INSPECTION, Refrigerant Pressure with Manifold Gauge Set.>
Both high and low pressure sides are equal, or high-pressure side is low.	<Ref. to AC-26, BOTH HIGH AND LOW PRESSURE SIDES ARE EQUAL, OR HIGH-PRESSURE SIDE IS LOW, INSPECTION, Refrigerant Pressure with Manifold Gauge Set.>
High-pressure side is high.	<Ref. to AC-26, HIGH-PRESSURE SIDE IS HIGH, INSPECTION, Refrigerant Pressure with Manifold Gauge Set.>
Low-pressure side is low.	<Ref. to AC-27, LOW-PRESSURE SIDE IS LOW, INSPECTION, Refrigerant Pressure with Manifold Gauge Set.>
Low-pressure side is high.	<Ref. to AC-27, LOW-PRESSURE SIDE IS HIGH, INSPECTION, Refrigerant Pressure with Manifold Gauge Set.>

2. BOTH HIGH AND LOW PRESSURE SIDES ARE LOW

	Step	Check	Yes	No
1	**CHECK REFRIGERANT LEAKAGE.** Check the refrigerant for leakage. <Ref. to AC-33, INSPECTION, Refrigerant Leak Check.> NOTE: When the pressure on the high-pressure side is less than 0.69 Mpa: Go to Step 2.	Are there any refrigerant leakage?	Repair the refrigerant leakage.	Go to step **2**.
2	**FILL PROPER AMOUNT OF REFRIGERANT.** Drain the refrigerant completely, and then refill the proper amount of refrigerant. • Recovery: <Ref. to AC-28, PROCEDURE, Refrigerant Recovery Procedure.> • Refill: <Ref. to AC-30, PROCEDURE, Refrigerant Charging Procedure.>	Is the refrigerant pressure within the specified range?	Refrigerant pressure is normal.	Perform appropriate inspection with pressure symptoms.

3. BOTH HIGH AND LOW PRESSURE SIDES ARE HIGH

	Step	Check	Yes	No
1	**FILL PROPER AMOUNT OF REFRIGERANT.** Drain the refrigerant completely, and then refill the proper amount of refrigerant. • Recovery: <Ref. to AC-28, PROCEDURE, Refrigerant Recovery Procedure.> • Refill: <Ref. to AC-30, PROCEDURE, Refrigerant Charging Procedure.>	Is the refrigerant pressure within the specified range?	Refrigerant pressure is normal.	Perform appropriate inspection with pressure symptoms.

4. BOTH HIGH AND LOW PRESSURE SIDES ARE EQUAL, OR HIGH-PRESSURE SIDE IS LOW

	Step	Check	Yes	No
1	**CHECK REFRIGERANT LEAKAGE.** Check the refrigerant for leakage. <Ref. to AC-33, INSPECTION, Refrigerant Leak Check.> NOTE: When the pressure on the high-pressure side is less than 0.69 Mpa: Go to Step 2.	Are there any refrigerant leakage?	Repair the refrigerant leakage.	Go to step **2**.
2	**FILL PROPER AMOUNT OF REFRIGERANT.** Drain the refrigerant completely, and then refill the proper amount of refrigerant. • Recovery: <Ref. to AC-28, PROCEDURE, Refrigerant Recovery Procedure.> • Refill: <Ref. to AC-30, PROCEDURE, Refrigerant Charging Procedure.>	Is the refrigerant pressure within the specified range?	Refrigerant pressure is normal.	Inspect the compressor. <Ref. to AC(diag)-34, COOL AIR DOES NOT COME OUT WHEN PRESSING THE A/C SWITCH. FOG CANNOT BE CLEARED. (COMPRESSOR DOES NOT OPERATE.), DIAGNOSTIC PROCEDURE WITH PHENOMENON, Diagnostics with Phenomenon.>

5. HIGH-PRESSURE SIDE IS HIGH

	Step	Check	Yes	No
1	**CHECK CONDENSER.** Check the condenser. <Ref. to AC-59, INSPECTION, Condenser.>	Is condenser normal?	Go to step **2**.	Clean or replace the condenser.
2	**CHECK RADIATOR FAN.** Check the radiator fan system. <Ref. to CO(H4DO(w/o HEV))-10, Radiator Fan System.>	Is radiator fan system normal?	Go to step **3**.	Repair or replace the faulty parts of the radiator fan system.
3	**FILL PROPER AMOUNT OF REFRIGERANT.** Drain the refrigerant completely, and then refill the proper amount of refrigerant. • Recovery: <Ref. to AC-28, PROCEDURE, Refrigerant Recovery Procedure.> • Refill: <Ref. to AC-30, PROCEDURE, Refrigerant Charging Procedure.>	Is the refrigerant pressure within the specified range?	Refrigerant pressure is normal.	Check the high-pressure hose and condenser for deformation or clogging, and replace if defective.

6. LOW-PRESSURE SIDE IS LOW

	Step	Check	Yes	No
1	**CHECK REFRIGERANT LEAKAGE.** Check the refrigerant for leakage. <Ref. to AC-33, INSPECTION, Refrigerant Leak Check.> NOTE: When the pressure on the high-pressure side is less than 0.69 Mpa: Go to Step 2.	Are there any refrigerant leakage?	Repair the refrigerant leakage.	Go to step **2**.
2	**FILL PROPER AMOUNT OF REFRIGERANT.** Drain the refrigerant completely, and then refill the proper amount of refrigerant. • Recovery: <Ref. to AC-28, PROCEDURE, Refrigerant Recovery Procedure.> • Refill: <Ref. to AC-30, PROCEDURE, Refrigerant Charging Procedure.>	Is the refrigerant pressure within the specified range?	Refrigerant pressure is normal.	Go to step **3**.
3	**REPLACE EXPANSION VALVE.** Replace the expansion valve. <Ref. to AC-69, REMOVAL, Expansion Valve.>	Is the refrigerant pressure within the specified range?	Refrigerant pressure is normal.	Inspect the compressor. <Ref. to AC(diag)-34, COOL AIR DOES NOT COME OUT WHEN PRESSING THE A/C SWITCH. FOG CANNOT BE CLEARED. (COMPRESSOR DOES NOT OPERATE.), DIAGNOSTIC PROCEDURE WITH PHENOMENON, Diagnostics with Phenomenon.>

7. LOW-PRESSURE SIDE IS HIGH

	Step	Check	Yes	No
1	**FILL PROPER AMOUNT OF REFRIGERANT.** Drain the refrigerant completely, and then refill the proper amount of refrigerant. • Recovery: <Ref. to AC-28, PROCEDURE, Refrigerant Recovery Procedure.> • Refill: <Ref. to AC-30, PROCEDURE, Refrigerant Charging Procedure.>	Is the refrigerant pressure within the specified range?	Refrigerant pressure is normal.	Go to step **2**.
2	**REPLACE EXPANSION VALVE.** Replace the expansion valve. <Ref. to AC-69, REMOVAL, Expansion Valve.>	Is the refrigerant pressure within the specified range?	Refrigerant pressure is normal.	Replace the evaporator. <Ref. to AC-63, REMOVAL, Evaporator.>