BODY SECTION

This service manual has been prepared to provide SUBARU service personnel with the necessary information and data for the correct maintenance and repair of SUBARU vehicles.
This manual includes the procedures for maintenance, disassembling, reassembling, inspection and adjustment of components and diagnostics for guidance of experienced mechanics.
Please peruse and utilize this manual fully to ensure complete repair work for satisfying our customers by keeping their vehicle in optimum condition. When replacement of parts during repair work is needed, be sure to use SUBARU genuine parts.

All information, illustration and specifications contained in this manual are based on the latest product information available at the time of publication approval.

BODY SECTION

HVAC SYSTEM (HEATER, VENTILATOR AND A/C)

AC

1. General Description

A: SPECIFICATION

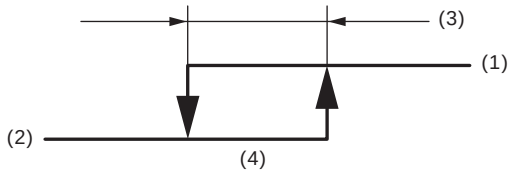
1. HEATER SYSTEM

Item		Specification	On condition
Heating capacity		5.2 kW (4,471 kcal/h, 17,743 BTU/h) or more	• Mode selector switch: HEAT • Temperature control switch: FULL HOT • Temperature difference between hot water and inlet air: 65°C (149°F) • Hot water flow rate: 360 ℓ (95.1 US gal, 79.2 Imp gal)/h
Air flow rate		370 m^3 (13,066 cu ft)/h	Heat mode (FRESH), FULL HOT at 12.5 V
Max air flow rate		460 m^3 (16,245 cu ft)/h	• Temperature control switch: FULL COLD • Blower fan speed: Auto A/C: 6th position Manual A/C: 4th position • Mode selector lever: RECIRC
Heater core size (height × length × width)		264 × 110 × 27 mm (10.4 × 4.33 × 1.06 in)	—
Blower motor	Type	Magnet motor 220 W or less	12 V
	Fan type and size (diameter × width)	Sirocco fan type 150 × 75 mm (5.91 × 2.95 in)	—

2. A/C SYSTEM

• Auto A/C model

Item		Specification
Type of air conditioner		Reheat air-mix type
Cooling capacity		5.3 kW (4,557 kcal/h, 18,084 BTU/h)
Refrigerant		HFC-134a (CH_2FCF_3) [0.4±0.03 kg (0.88±0.07 lb)]
Compressor	Type	Scroll, constant volume (SCSA 08C)
	Discharge	74.5 cc (4.55 cu in)/rev
	Max. permissible speed	9,000 rpm
Magnet clutch	Type	Dry, single-disc type
	Power consumption	35 W
	Type of belt	H4 model: V-belt 4 PK H6 model: V-belt 6 PK
	Pulley dia. (effective dia.)	93 mm (3.7 in)
	Pulley ratio	1.43
Condenser	Type	Corrugated fin (Sub cool type)
	Core face area	0.186 m^2 (2.002 sq ft)
	Core thickness	16 mm (0.63 in)
	Radiation area	5.49 m^2 (59.09 sq ft)
Receiver drier	Effective inner capacity	190 cm^3 (11.6 cu in)
Expansion valve	Type	Internal equalizing
Evaporator	Type	Single tank
	Dimensions (W × H × T)	298.6 × 151 × 38 mm (11.76 × 5.94 × 1.50 in)
Blower fan	Fan type	Sirocco fan
	Outer diameter × width	150 × 75 mm (5.91 × 2.95 in)
	Power consumption	220 W

Condenser fan (Sub fan)		Motor type	Magnet
		Power consumption	H4 model: 90 W H6 model: 160 W
		Fan outer diameter	H4 model: 300 mm (11.8 in) H6 model: 320 mm (12.6 in)
Radiator fan (Main fan)		Motor type	Magnet
		Power consumption	H4 model: 90 W H6 model: 160 W
		Fan outer diameter	H4 model: 300 mm (11.8 in) H6 model: 320 mm (12.6 in)
Idling speed (A/C ON)		MPFI model	800±100 rpm
Triple switch (Pressure switch)	Low-pressure switch operating pressure	ON → OFF	196±20 kPa (2.00±0.20 kg/cm^2, 28.4±2.9 psi)
		OFF → ON	225^{+25}_{-29} kPa ($2.29^{+0.25}_{-0.30}$ kg/cm^2, $32.6^{+3.6}_{-4.2}$ psi)
	High-pressure switch operating pressure	ON → OFF	$3{,}140^{+50}_{-200}$ kPa ($32.02^{+0.51}_{-2.04}$ kg/cm^2, $455.4^{+7.25}_{-29.0}$ psi)
		OFF → ON	2,550±200 kPa (26.00±2.04 kg/cm^2, 369.8±29.0 psi)
	Middle-pressure switch operating pressure	ON → OFF	1,370±120 kPa (13.97±1.22 kg/cm^2, 198.65±17.35 psi)
		OFF → ON	1,770±100 kPa (18.05±1.02 kg/cm^2, 256.81±14.50 psi)
Thermo-control amplifier working temperature (Evaporator outlet air)		 AC-00601 (1) ON (2) OFF (3) 1±0.5°C (33.8±0.9°F) (4) $4^{+1.5}_{0}$°C ($39.2^{+2.7}_{0}$°F)	

- Manual A/C model

Item		Specification
Type of air conditioner		Reheat air-mix type
Cooling capacity		5.3 kW (4,557 kcal/h, 18,084 BTU/h)
Refrigerant		HFC-134a (CH_2FCF_3) [0.4±0.03 kg (0.88±0.07 lb)]
Compressor	Type	Scroll, constant volume (SCSA 08C)
	Discharge	74.5 cc (4.55 cu in)/rev
	Max. permissible speed	9,000 rpm
Magnet clutch	Type	Dry, single-disc type
	Power consumption	35 W
	Type of belt	V-belt 4 PK
	Pulley dia. (effective dia.)	93 mm (3.7 in)
	Pulley ratio	1.43

Condenser		Type	Corrugated fin (Sub cool type)
		Core face area	0.186 m^2 (2.002 sq ft)
		Core thickness	16 mm (0.63 in)
		Radiation area	5.49 m^2 (59.09 sq ft)
Receiver drier		Effective inner capacity	250 cm^3 (15.26 cu in)
Expansion valve		Type	Externally equalizing
Evaporator		Type	Single tank
		Dimensions (W × H × T)	298.6 × 151 × 38 mm (11.7 × 5.94 × 1.50 in)
Blower fan		Fan type	Sirocco fan
		Outer diameter × width	150 × 75 mm (5.91 × 2.95 in)
		Power consumption	220 W
Condenser fan (Sub fan)		Motor type	Magnet
		Power consumption	90 W
		Fan outer diameter	300 mm (11.8 in)
Radiator fan (Main fan)		Motor type	Magnet
		Power consumption	90 W
		Fan outer diameter	300 mm (11.8 in)
Idling speed (A/C ON)		MPFI model	800±100 rpm
Triple switch (Pressure switch)	Low-pressure switch operating pressure	ON → OFF	196±20 kPa (2.00±0.20 kg/cm^2, 28.4±2.9 psi)
		OFF → ON	225^{+25}_{-29} kPa ($2.29^{+0.25}_{-0.30}$ kg/cm^2, $32.6^{+3.6}_{-4.2}$ psi)
	High-pressure switch operating pressure	ON → OFF	$3{,}140^{+50}_{-200}$ kPa ($32.02^{+0.51}_{-2.04}$ kg/cm^2, $455.4^{+7.25}_{-29.0}$ psi)
		OFF → ON	2,550±200 kPa (26.00±2.04 kg/cm^2, 369.8±29.0 psi)
	Middle-pressure switch operating pressure	ON → OFF	1,370±120 kPa (13.97±1.22 kg/cm^2, 198.65±17.35 psi)
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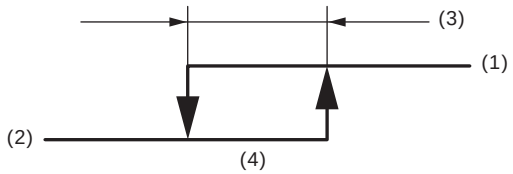
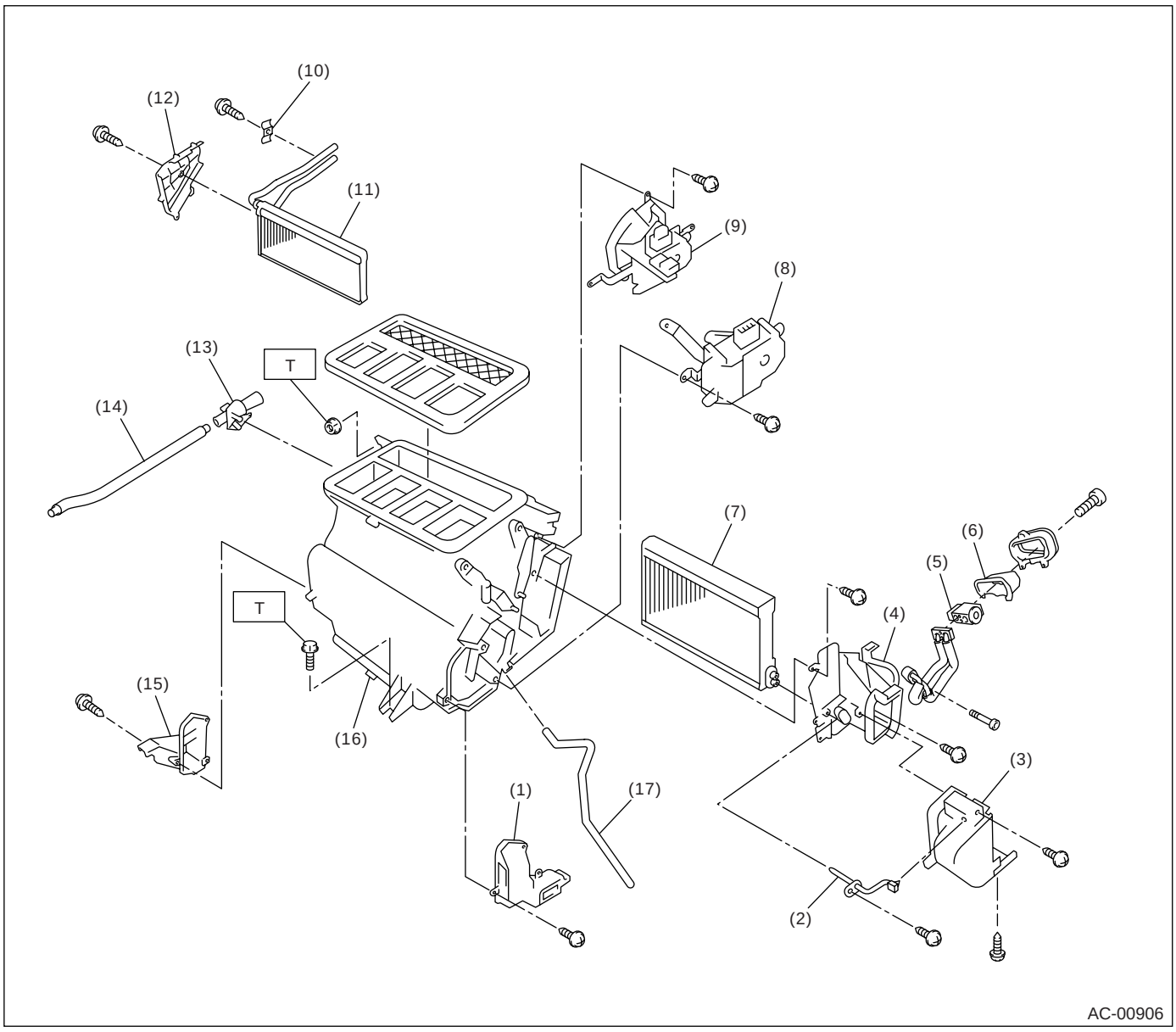
Thermo control amplifier working temperature (Evaporator outlet air)		 AC-00601 (1) ON (2) OFF (3) 1±0.5°C (33.8±0.9°F) (4) $4^{+1.5}_{0}$°C ($39.2^{+2.7}_{0}$°F)	

B: COMPONENT

1. HEATER COOLING UNIT

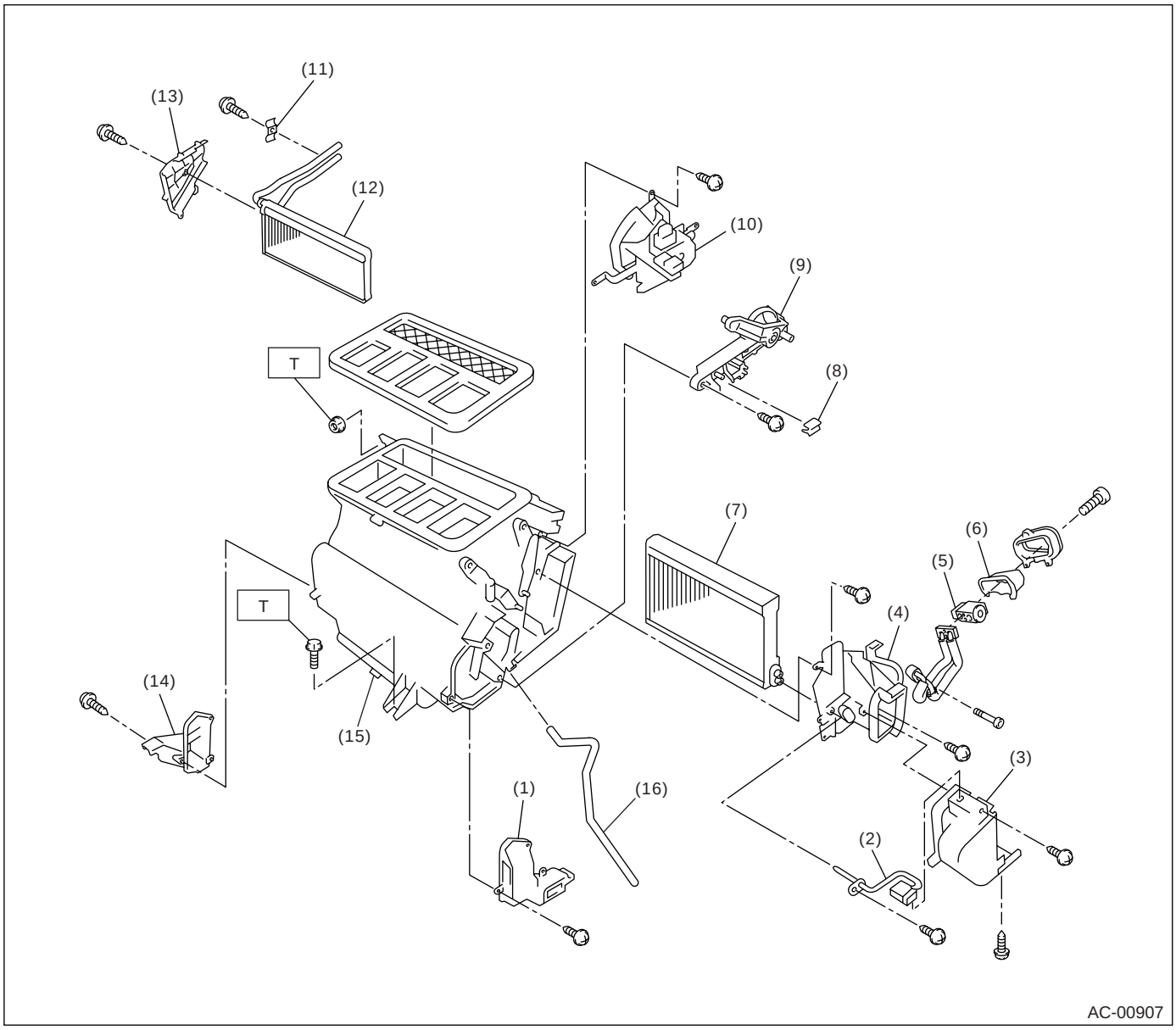
- Auto A/C model



(1) Foot duct (RH)
(2) Evaporator center
(3) Pipe cover
(4) Evaporator cover
(5) Expansion valve
(6) Packing
(7) Evaporator
(8) Mix actuator
(9) Mode actuator
(10) Heater pipe clamp
(11) Heater core
(12) Heater core cover
(13) Aspirator
(14) Aspirator hose
(15) Foot duct (LH)
(16) Unit ASSY
(17) Drain hose

Tightening torque: N·m (kgf-m, ft-lb)
T: 7.5 (0.76, 5.5)

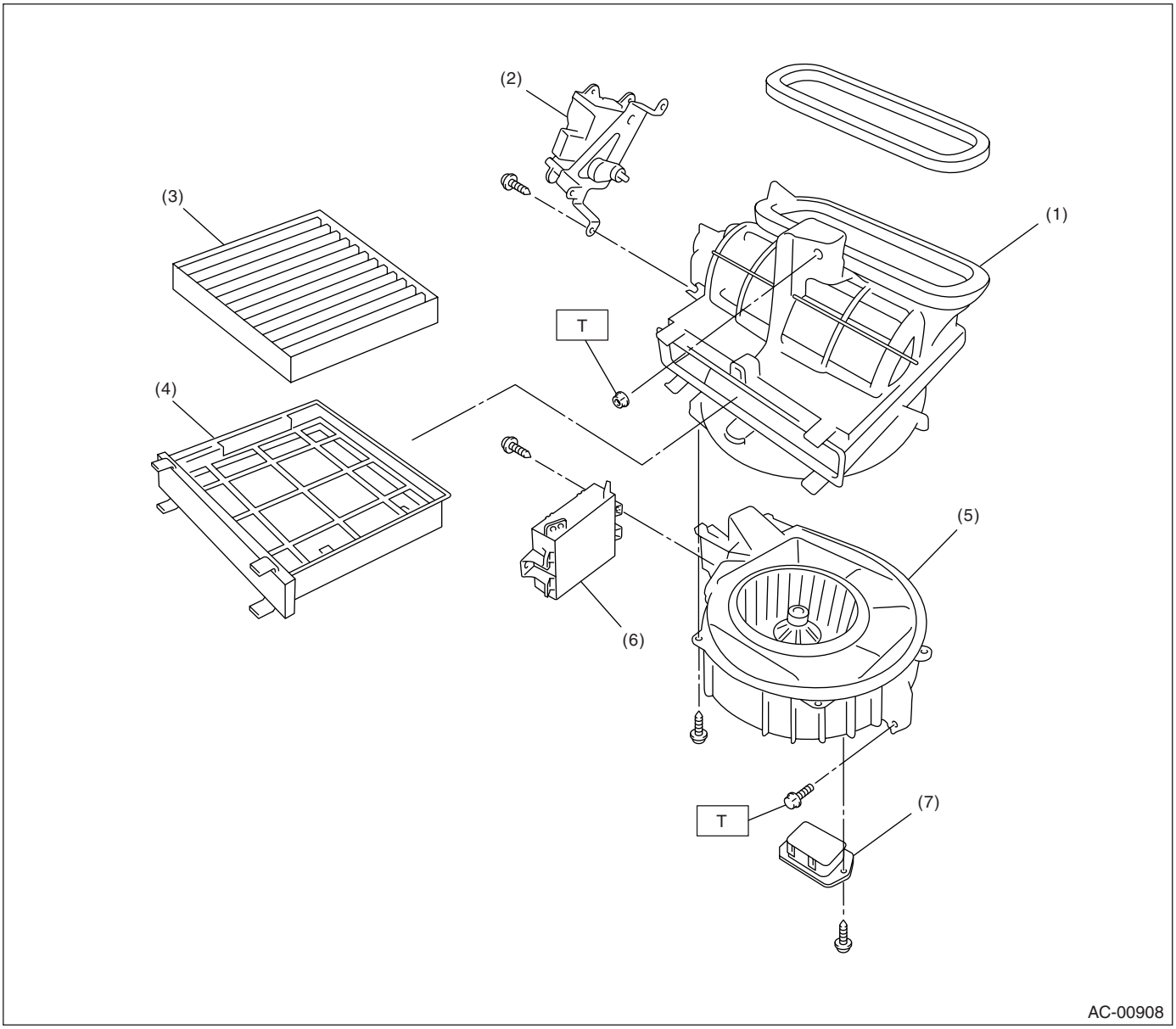
- Manual A/C model



(1) Foot duct (RH)
(2) Thermo amplifier
(3) Pipe cover
(4) Evaporator cover
(5) Expansion valve
(6) Packing
(7) Evaporator
(8) Clip
(9) Air mix door linkage
(10) Mode actuator
(11) Heater pipe clamp
(12) Heater core
(13) Heater core cover
(14) Foot duct (LH)
(15) Unit ASSY
(16) Drain hose

Tightening torque: N·m (kgf-m, ft-lb)
T: 7.5 (0.76, 5.5)

2. BLOWER MOTOR UNIT

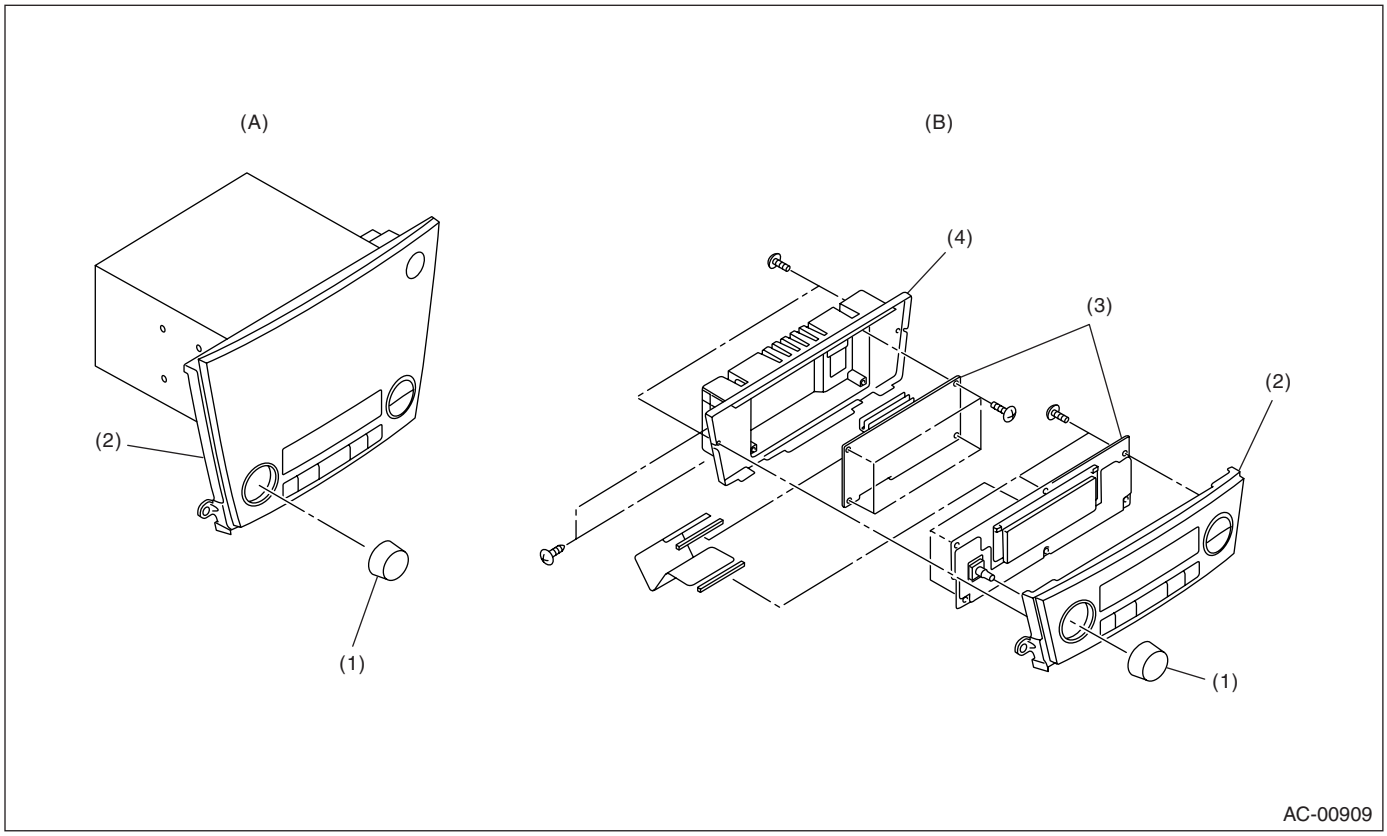


(1) Upper case
(2) Intake door actuator
(3) Filter (Auto A/C model)
(4) Filter cover
(5) Blower motor ASSY
(6) Control unit (Auto A/C model)
(7) Power transistor (Auto A/C model)
Blower resistor (Manual A/C model)

Tightening torque: N·m (kgf-m, ft-lb)
T: 7.5 (0.76, 5.5)

3. CONTROL PANEL

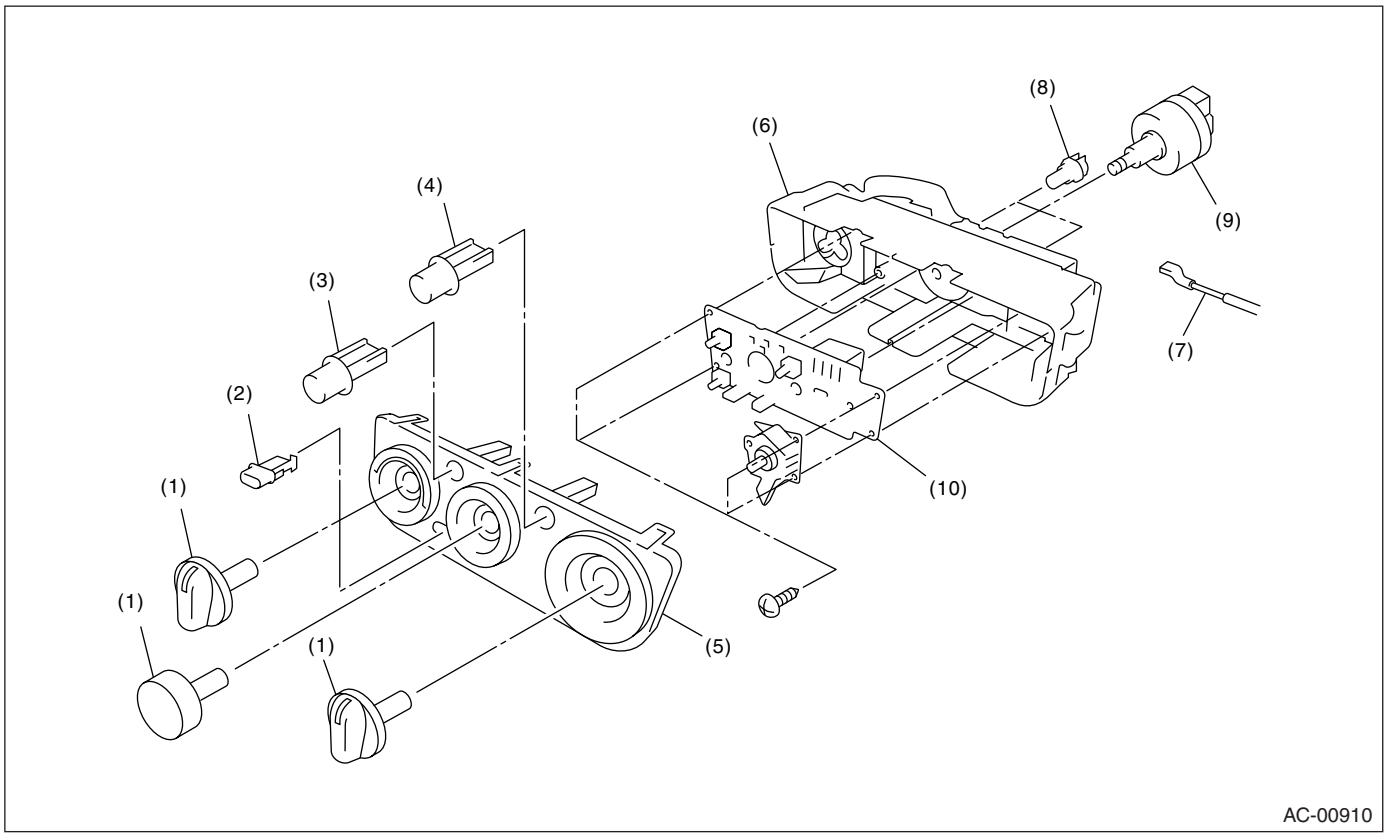
- Auto A/C model



(A) For integrated audio
(B) For McIntosh audio

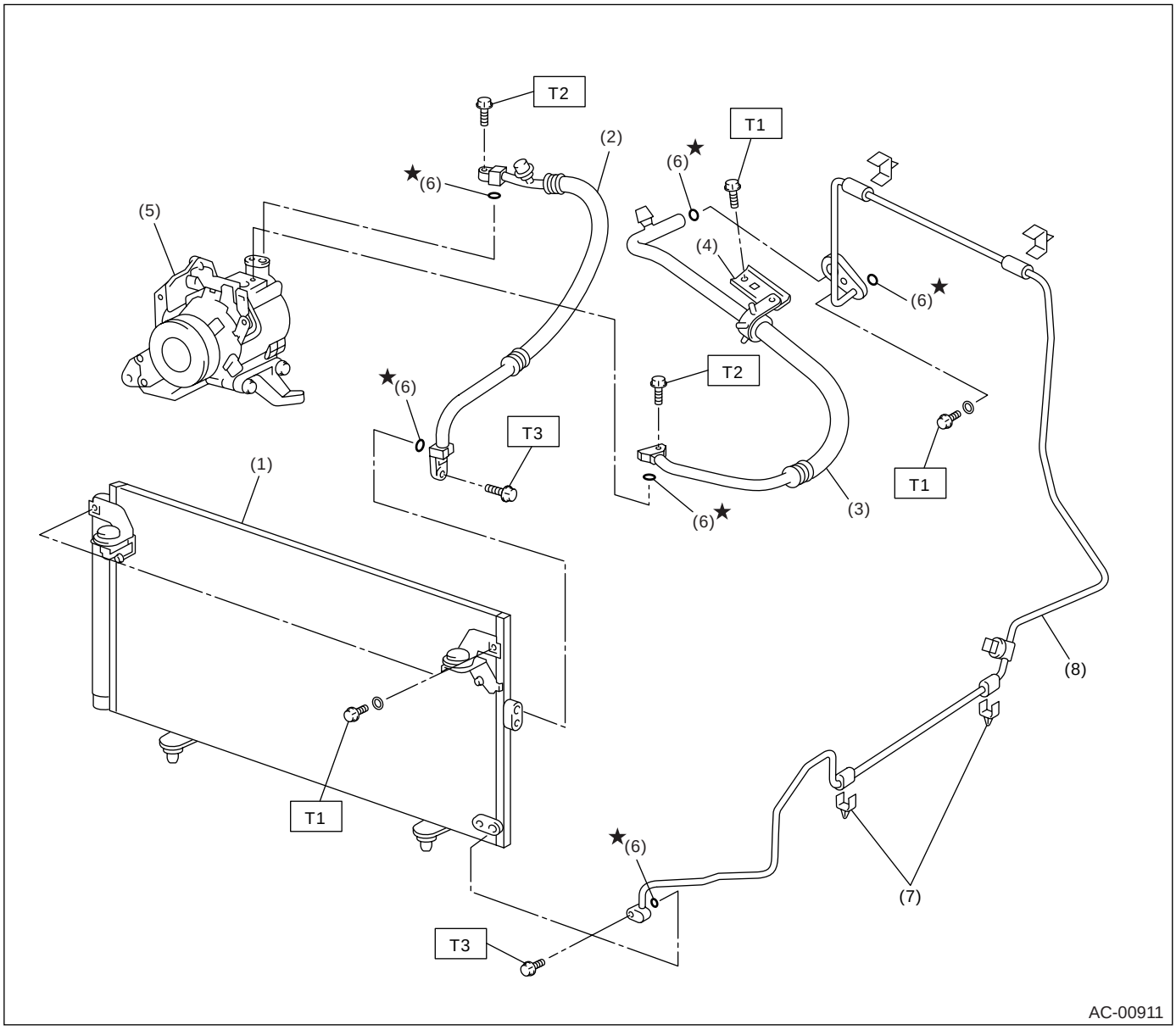
(1) Temperature control dial
(2) Control panel assembly
(3) Board
(4) Heater control base

- Manual A/C model



(1) Dial
(2) A/C switch
(3) FRESH/RECIRC switch
(4) Rear window defogger switch
(5) Heater control panel
(6) Heater control base
(7) Temperature control cable
(8) Valve
(9) Fan switch ASSY
(10) Switch base

4. AIR CONDITIONING UNIT

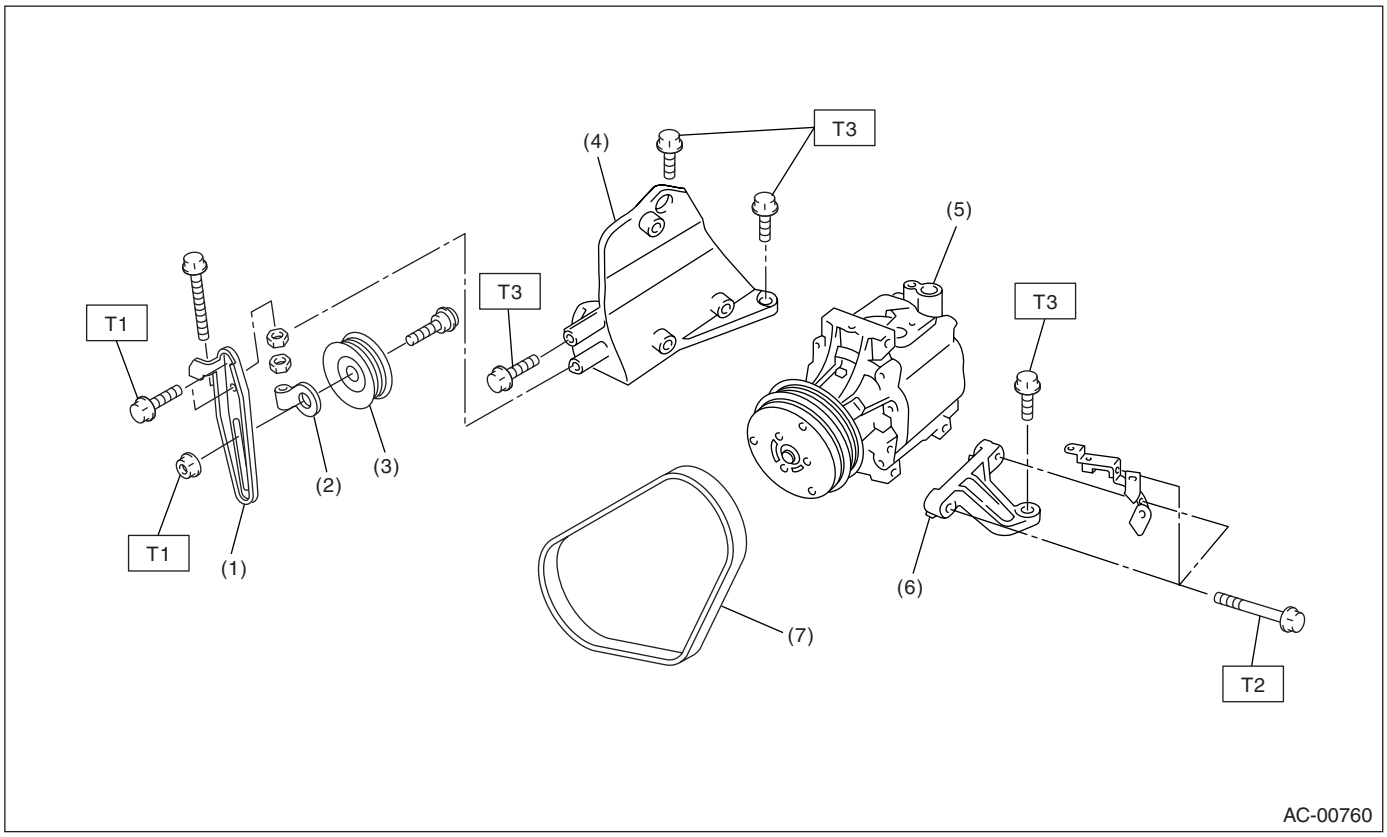


(1)	Condenser	(5)	Compressor
(2)	Hose (High-pressure)	(6)	O-ring
(3)	Hose (Low-pressure)	(7)	Clamp
(4)	Bracket	(8)	Tube

Tightening torque: N·m (kgf-m, ft-lb)
T1: 7.5 (0.76, 5.5)
T2: 10 (1.0, 7.4)
T3: 5 (0.5, 3.7)

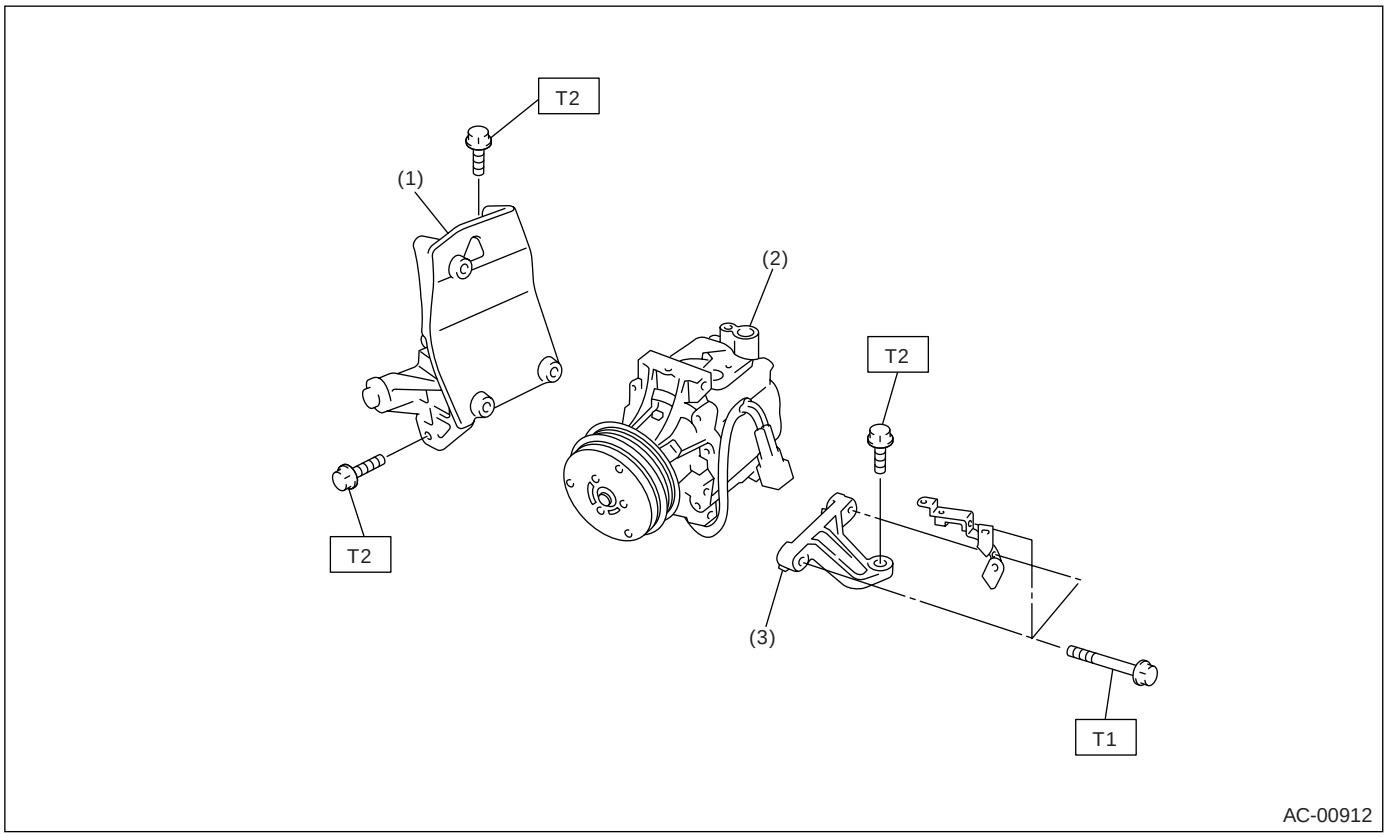
5. COMPRESSOR

- H4 model



(1)	Idler pulley bracket	(5)	Compressor	***Tightening torque: N·m (kgf-m, ft-lb)***
(2)	Idler pulley adjuster	(6)	Compressor lower bracket	***T1: 23.0 (2.35, 17.0)***
(3)	Idler pulley	(7)	V-Belt	***T2: 28.9 (2.95, 21.3)***
(4)	Compressor upper bracket			***T3: 36 (3.7, 26.6)***

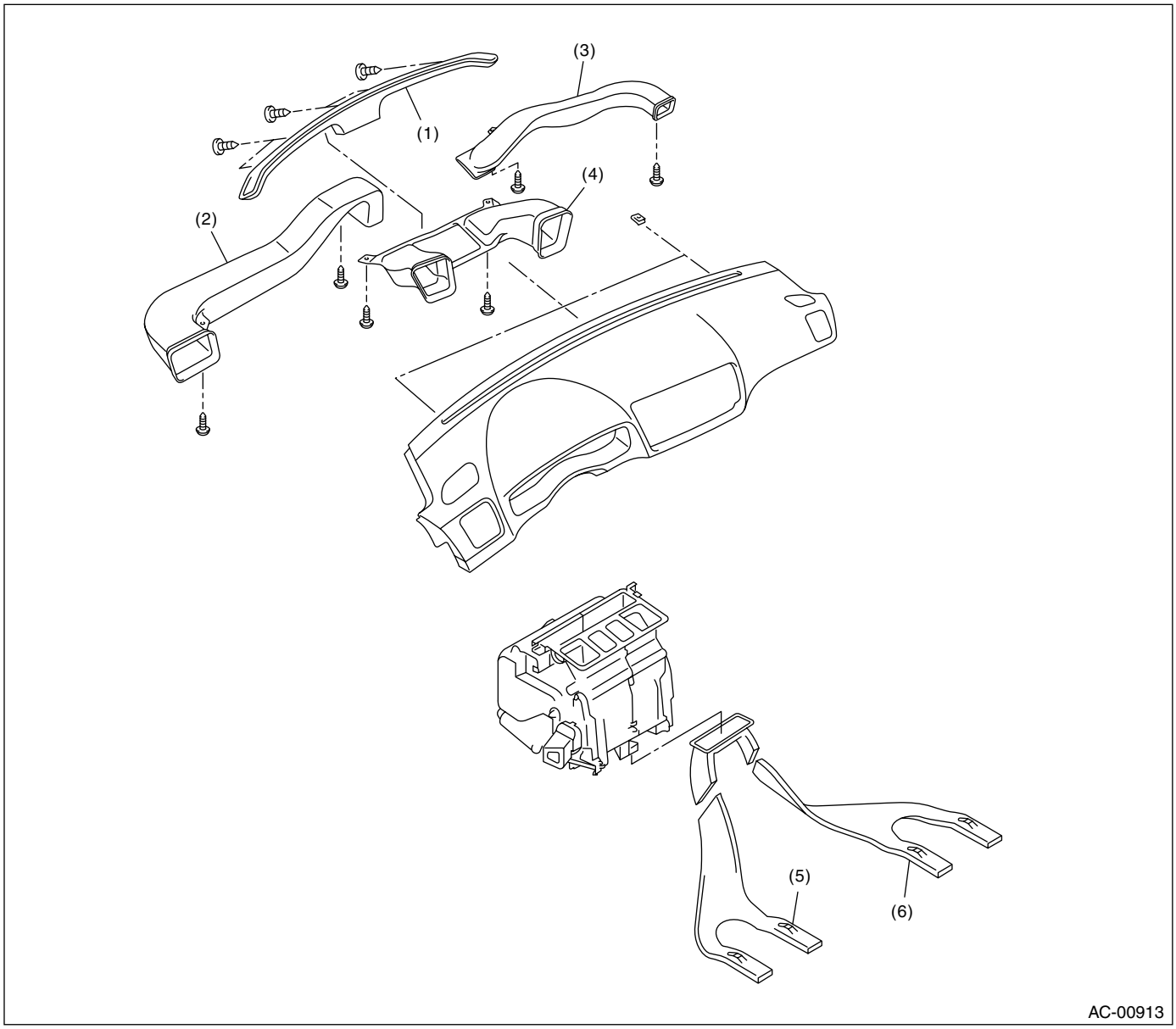
- H6 model



(1) Compressor upper bracket
(2) Compressor
(3) Compressor lower bracket

Tightening torque: N·m (kgf-m, ft-lb)
T1: 28.9 (2.95, 21.3)
T2: 36 (3.7, 26.6)

6. HEATER DUCT

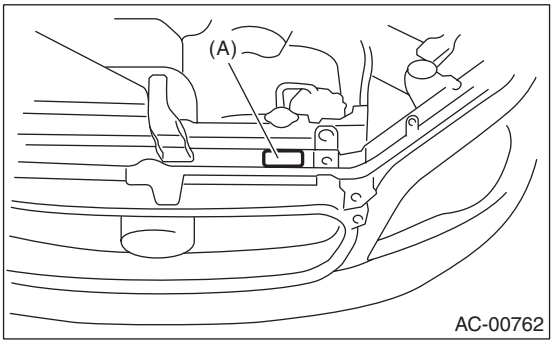


(1) Front defroster nozzle
(2) Side ventilation duct (LH)
(3) Side ventilation duct (RH)
(4) Center ventilation duct
(5) Rear heater duct (LH)
(6) Rear heater duct (RH)

C: CAUTION

1. HFC-134a A/C SYSTEM

• The cooling system components for the HFC-134a system such as the refrigerant and compressor oil are different from the conventional CFC-12 system components and they are incompatible with each other.
• Vehicles with the HFC-134a system can be identified by the label (A) attached to the vehicle.
Before maintenance, check which A/C system is installed to the vehicle.



2. COMPRESSOR OIL

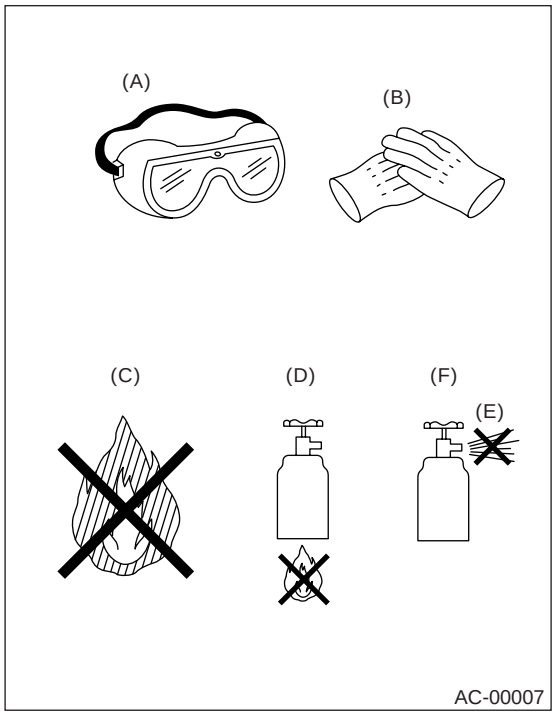
• HFC-134a compressor oil has no compatibility with that of CFC-12 system.
• Use only Denso Oil 8 which is a manufacturer-authorized compressor oil for HFC-134a system.
• Do not mix multiple compressor oils.
If CFC-12 compressor oil is used in the HFC-134a A/C system, the compressor may become stuck due to poor lubrication, or the refrigerant may leak due to swelling of rubber parts.
On the other hand, if HFC-134a compressor oil is used in a CFC-12 A/C system, the durability of the A/C system will be lowered.
• HFC-134a compressor oil is very hygroscopic. When replacing or installing/removing A/C parts, immediately isolate the oil from atmosphere using a plug or tape. In order to avoid moisture, store the oil in a container with its cap tightly closed.

3. REFRIGERANT

• The CFC-12 refrigerant cannot be used in the HFC-134a A/C system. The HFC-134a refrigerant, also, cannot be used in the CFC-12 A/C system.
• If an incorrect or no refrigerant is used, it will result in poor lubrication and the compressor itself may be damaged.

4. HANDLING OF REFRIGERANT

• The refrigerant boils at approx. −30°C (−22°F). When handling it, be sure to wear protective goggles and protective gloves. Direct contact of the refrigerant with skin may cause frostbite.
If the refrigerant gets into your eye, avoid rubbing your eyes with your hands. Wash your eye with plenty of water, and receive medical treatment from an eye doctor.
• Do not heat a service can. If a service can is directly heated, or put into boiling water, the inside pressure will become extremely high. This may cause the can to explode. If a service can must be warmed up, use hot water in 40°C (104°F) max.
• Do not drop or impact a service can. (Observe the precautions and operation procedure described on the refrigerant can.)
• When the engine is running, do not open the high-pressure valve of manifold gauge. The high-pressure gas will back-flow resulting in an explosion of the can.
• Provide good ventilation and do not work in a closed area.
• In order to prevent global warming, avoid releasing HFC-134a into the atmosphere. Using a refrigerant recovery system, discharge and reuse it.

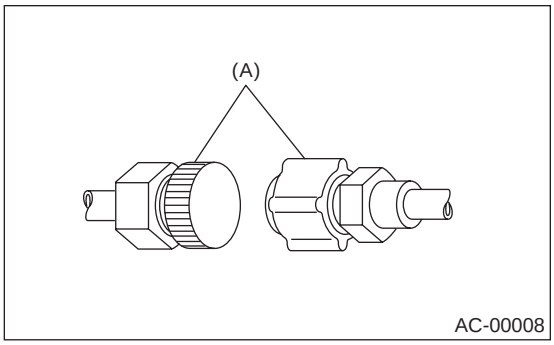


(A) Goggles
(B) Gloves
(C) Avoid open flame
(D) No direct heat on container
(E) Do not discharge
(F) Loosen

5. O-RING CONNECTIONS

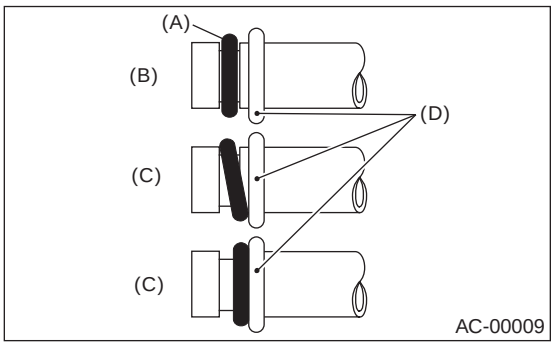
• Always use a new O-ring.
• In order to keep the O-rings free of lint which will cause a refrigerant gas leak, perform operations without gloves and cloth.

• Apply compressor oil to O-rings to avoid sticking, before installation.
• Use a torque wrench to tighten the O-ring fittings. Over-tightening will result in damage of O-ring and tube end distortion.
• If the operation is interrupted before completing a pipe connection; recap the tubes, components and fittings with a plug or tape to prevent foreign matter from entering.



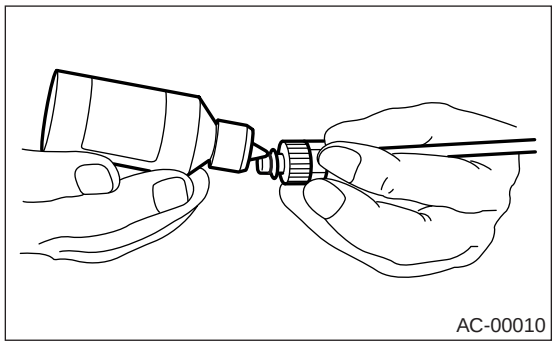
(A) Seal

• Visually check the surfaces and mating surfaces of O-rings, threads and connecting points. If a failure is found, replace the applicable parts.
• Install the O-rings at right angle to tube beads.



(A) O-ring
(B) OK
(C) NG
(D) Bead

• Use compressor oil specified in the service manual to lubricate the O-rings.
Apply oil to the top and sides of O-rings before installation.
Apply compressor oil to the bead of tube.



• After tightening, use a clean cloth to remove excess compressor oil from the connections and any oil which may have run on the vehicle body or other parts.
• If any leakage is suspected after tightening, do not further tighten the connections, but disconnect the connections, remove the O-rings, and check the O-rings, threads, and connections.

D: PREPARATION TOOL

CAUTION:
When working on vehicles with HFC-134a system, only use HFC-134a specified tools and parts. Do not mix with those of CFC-12. If HFC-134a and CFC-12 refrigerant or compressor oil is mixed, it will result in poor lubrication and the compressor itself may be destroyed.
In order to prevent the mixture of HFC-134a and CFC-12 parts and liquid, the tool and screw type and the type of service valves used are different. The gas leak detectors for the HFC-134a and CFC-12 systems must also not be interchanged.

	HFC-134a	CFC-12
Tool & screw type	Millimeter size	Inch size
Valve type	Quick joint type	Screw-in type

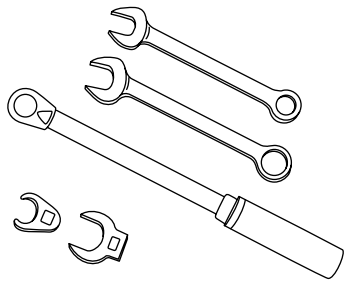
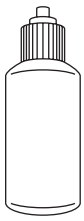
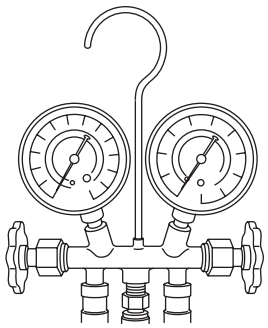
ILLUSTRATION	Tools and Equipment
 AC-00213	Wrench Various **WRENCHES** will be required to service any A/C system. 7 to 40 N·m (0.7 to 4.1 kgf-m, 5 to 30 ft-lb) torque wrench and various crow-foot wrenches will be needed. Open end or flare nut wrenches will be needed to hold the tube and hose fittings.
 AC-00012	Applicator bottle A small **APPLICATOR BOTTLE** is recommended to apply compressor oil to the various parts. It can be available at a hardware or drug store.
 AC-00013	Manifold gauge set A **MANIFOLD GAUGE SET** (with hoses) can be available at either a refrigerant supplier or an automotive equipment supplier.

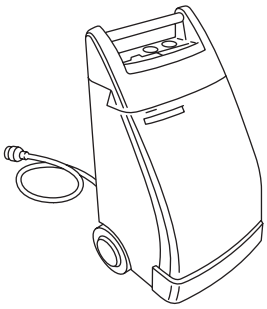
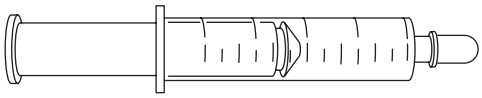
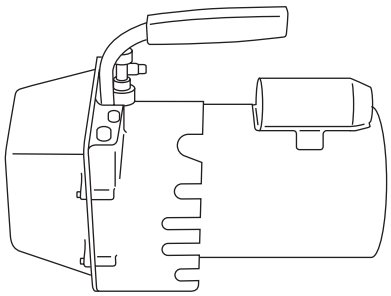
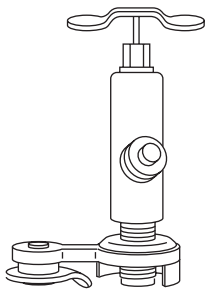
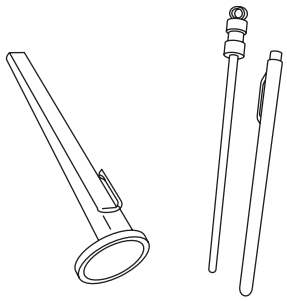
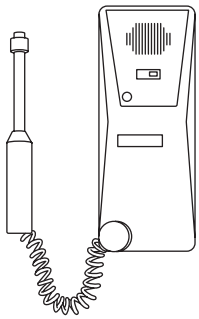
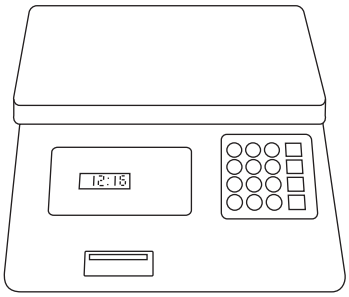
ILLUSTRATION	Tools and Equipment
 AC-00014	Refrigerant recovery system A **REFRIGERANT RECOVERY SYSTEM** is used for the recovery and reuse of A/C system refrigerant after contaminants and moisture have been removed from the refrigerant.
 AC-00015	Syringe A graduated plastic **SYRINGE** will be needed to add oil back into the system. A syringe can be available at a pharmacy or drug store.
 AC-00016	Vacuum pump A **VACUUM PUMP** is necessary (for a good working condition), and may be available at either a refrigerant supplier or an automotive equipment supplier.
 AC-00017	Can tap A **CAN TAP** for the 397 g (14 oz.) can is available at an automotive equipment supplier.

ILLUSTRATION	Tools and Equipment
 AC-00018	Temperature gauge A Pocket **THERMOMETER** is available at either a industrial hardware store or a refrigerant suppliers.
 AC-00019	Electronic leak detector An **ELECTRONIC LEAK DETECTOR** can be available at either a specialty tool supplier or an A/C equipment supplier.
 AC-00020	Weight scale A **WEIGHT SCALE** such as an electronic charging scale or a bathroom scale with digital display will be needed, if a 13.6 kg (30 lb) refrigerant container is used.

2. Refrigerant Pressure with Manifold Gauge Set

A: PROCEDURE

1) Place the vehicle in the shade and windless condition.
2) Connect the manifold gauge set.
3) Open the front windows and close all doors.
4) Open the front hood.
5) Increase the engine to 1,500 rpm.
6) Turn on the A/C switch.
7) Turn the temperature control switch to MAX COOL.
8) Put in RECIRC position.
9) Turn the blower control switch to HI.
10) Read the gauge.

Standard:
Low pressure: 127 — 196 kPa (1.3 — 2.0 kg/cm^2, 18 — 28 psi)
High pressure: 1,471 — 1,667 kPa (15 — 17 kg/cm^2, 213 — 242 psi)
Ambient temperature: 30 — 35°C (86 — 95°F)

B: INSPECTION

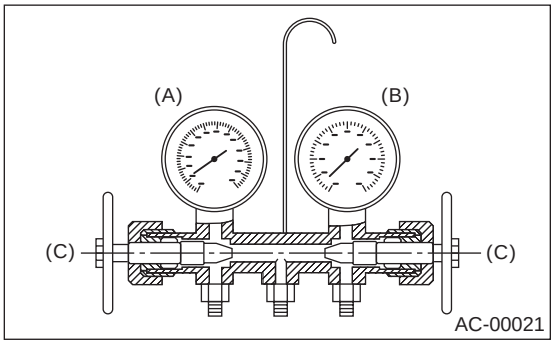
Symptom	Probable cause	Repair order
High-pressure side is unusually high.	• Defective condenser fan motor • Clogged condenser fin • Too much refrigerant • Air inside the system • Defective receiver dryer	• Replace the fan motor. • Clean the condenser fin. • Discharge refrigerant. • Replace the receiver dryer. • After evacuating again, charge an appropriate amount of refrigerant.
High-pressure side is unusually low.	• Defective compressor • Not enough refrigerant • Clogged expansion valve • Expansion valve frozen temporarily by moisture.	• Replace the compressor. • Check for leaks. • Replace the expansion valve. • Fully evacuate the expansion valve.
Low-pressure side is unusually high.	• Defective compressor • Defective expansion valve • Too much refrigerant	• Replace the compressor. • Replace the expansion valve. • Discharge refrigerant.
Low-pressure side is unusually low.	• Not enough refrigerant • Clogged expansion valve • Expansion valve frozen temporarily by moisture. • Saturated receiver dryer	• Check for leaks. • Replace the expansion valve. • Replace the receiver dryer.

3. Refrigerant Recovery Procedure

A: PROCEDURE

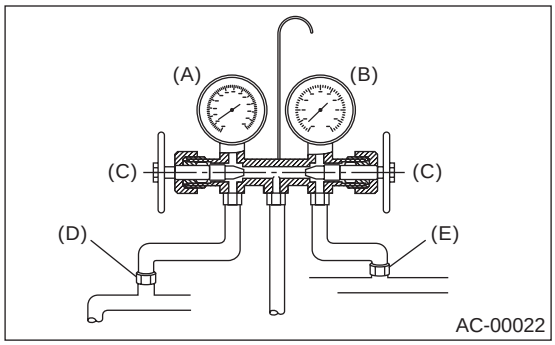
CAUTION:
• During operation, be sure to wear protective goggles and protective gloves.
• Connect the refrigerant recovery system with the manifold gauge set to discharge the refrigerant from the A/C system and reuse it.
• When reusing the discharged refrigerant, keep service cans on hand. Because the discharge rate with the recovery system is approx. 90%, service cans are necessary to charge the refrigerant.
• Follow the detailed operation procedure described in the operation manual attached to the refrigerant recovery system.

1) Perform the compressor oil return operation. <Ref. to AC-25, PROCEDURE, Compressor Oil.>
2) Stop the engine.
3) Make sure the valves on low-/high-pressure sides of manifold gauge set are fully closed.



(A) Low-pressure gauge (Compound pressure gauge)
(B) High-pressure gauge
(C) Close

4) Install the low-/high-pressure hoses to the service ports on the low-/high-pressure sides of the vehicle respectively.



(A) Low-pressure gauge (Compound pressure gauge)
(B) High-pressure gauge
(C) Close
(D) Low-pressure side service port
(E) High-pressure side service port

5) Connect the center hose to the refrigerant recovery system.
6) Follow the operation manual to activate the refrigerant recovery system.

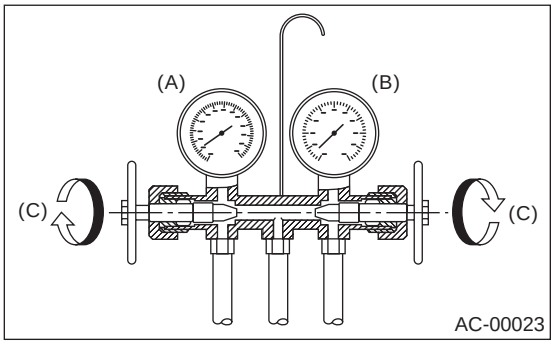
4. Refrigerant Charging Procedure

A: PROCEDURE

CAUTION:
• During operation, be sure to wear protective goggles and protective gloves.
• Before charging the refrigerant, evacuate the system to remove small amounts of moisture remaining in the system.
The moisture in the system can be completely evacuated only under the minimum vacuum level. The minimum vacuum level affects the temperature in the system.
• The list below shows the vacuum values necessary to boil water in various temperature. In addition, the vacuum levels indicated on the gauge are approx. 3.3 kPa (25 mmHg, 0.98 inHg) lower than those measured at 304.8 m (1,000 ft) above sea level.

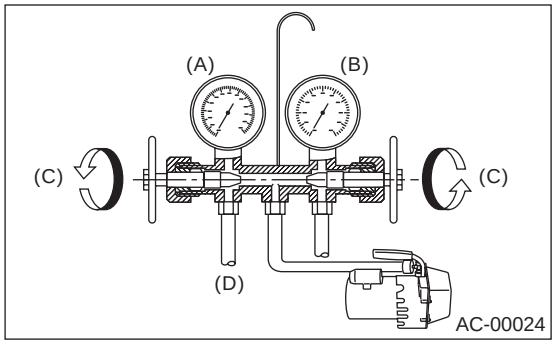
Vacuum level required to boil water (at sea level)	
Temperature	Vacuum
1.7°C (35°F)	100.9 kPa (757 mmHg, 29.8 inHg)
7.2°C (45°F)	100.5 kPa (754 mmHg, 29.7 inHg)
12.8°C (55°F)	99.8 kPa (749 mmHg, 29.5 inHg)
18.3°C (65°F)	99.2 kPa (744 mmHg, 29.3 inHg)
23.9°C (75°F)	98.5 kPa (739 mmHg, 29.1 inHg)
29.4°C (85°F)	97.2 kPa (729 mmHg, 28.7 inHg)
35°C (95°F)	95.8 kPa (719 mmHg, 28.3 inHg)

1) Close the valves on low-/high-pressure sides of the manifold gauge.



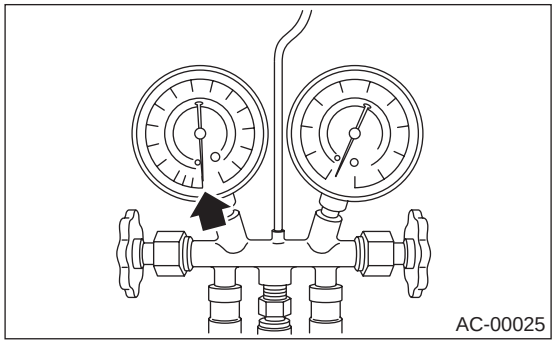
(A) Low-pressure gauge (Compound pressure gauge)
(B) High-pressure gauge
(C) Close

2) Install the low-/high-pressure hoses to the corresponding service ports on the vehicle respectively.
3) Connect the center hose of the manifold gauge set with the vacuum pump.
4) Carefully open the valves on the low-/high-pressure sides to activate the vacuum pump.

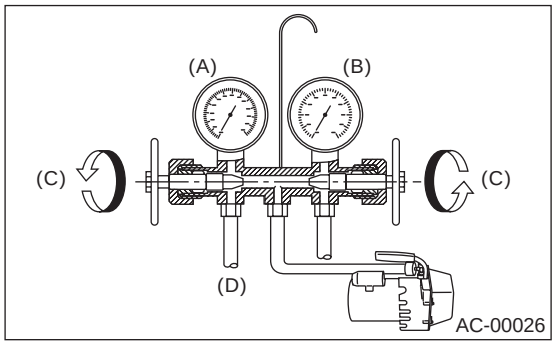


(A) Low-pressure gauge (Compound pressure gauge)
(B) High-pressure gauge
(C) Slowly open
(D) Vacuum pump turn on

5) After the low-pressure gauge reaches 100.0 kPa (750 mmHg, 29.5 inHg) or higher, evacuate the system for approx. 15 minutes. (Continue evacuation).

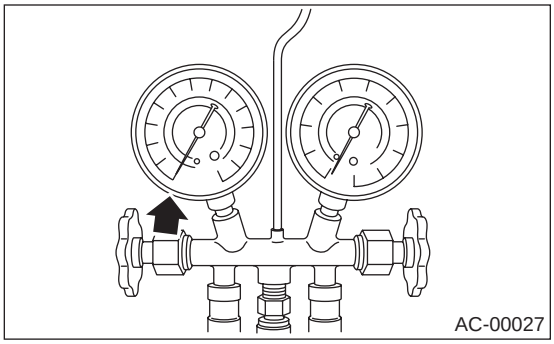


6) After 15 minutes of evacuation, if the reading shows 100.0 kPa (750 mmHg, 29.5 inHg) or higher, close the valves on the both sides to stop the vacuum pump.

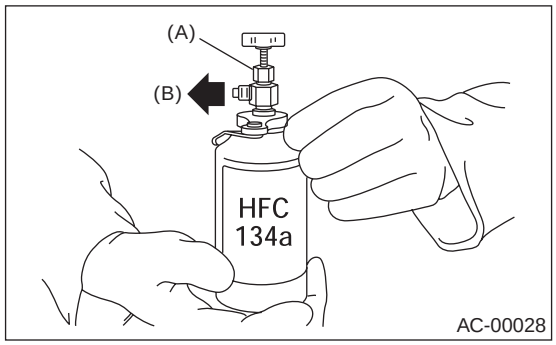


(A) Low-pressure gauge (Compound pressure gauge)
(B) High-pressure gauge
(C) Close
(D) Vacuum pump turn off

7) Note the low-pressure gauge reading.

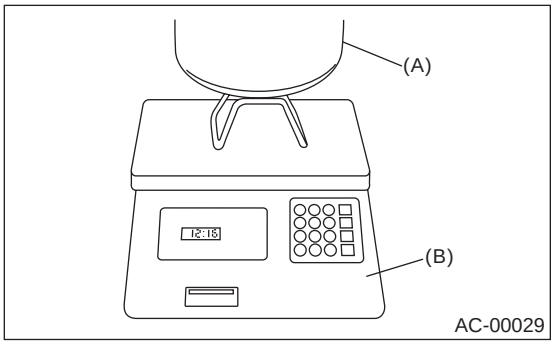


8) Leave it at least 5 minutes, and then check the low-pressure gauge reading for any changes.
When a gauge indicator shows near to zero point, it is a sign of leakage. Check pipe connector points, repair them, make sure there is no leakage by air bleeding.
9) Following the can tap operation manual instructions, install it to the refrigerant can.



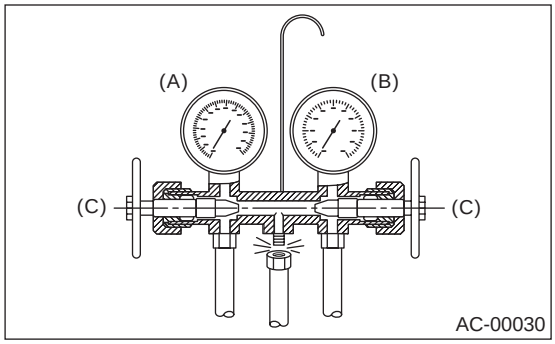
(A) Tap valve
(B) Center manifold hose

10) Disconnect the center manifold hose from the vacuum pump, and connect the hose to the tap valve.
11) When a 13.6 kg (30 lb) refrigerant container is used, measure the refrigerant amount in use using a weight scale.



(A) Refrigerant container (HFC-134a)
(B) Weight scale

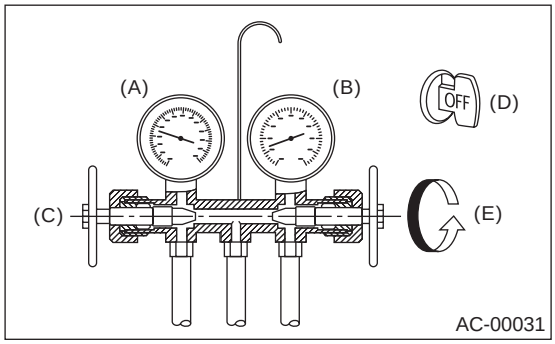
12) Confirm that all the 3 hoses are tightly connected to the manifold gauge set.



(A) Low-pressure gauge (Compound pressure gauge)
(B) High-pressure gauge
(C) Close

13) Open the valve on the HFC-134a source.
14) Loosen the center hose connection on the manifold gauge set (if applicable, press a purge valve on the manifold gauge set) only for a couple of seconds to allow the air in the center hose to escape by the refrigerant.
15) Carefully open the high-pressure valve with the engine stopping.

CAUTION:
Do not open the low-pressure valve.



(A) Low-pressure gauge (Compound pressure gauge)
(B) High-pressure gauge
(C) Close
(D) Ignition switch OFF
(E) Slowly open

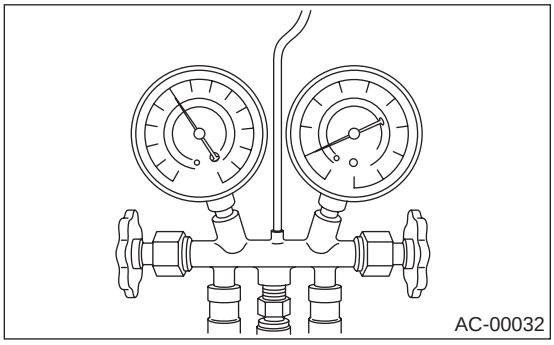
CAUTION:
Never run the engine during charging from the high-pressure side.

16) Close the high-pressure valve when the low-pressure gauge reaches 98 kPa (1 kg/cm^2, 14 psi).
Using a leak tester, check the system for leaks.
If any leakage is found after the refrigerant recovery is completed, repair the applicable area.

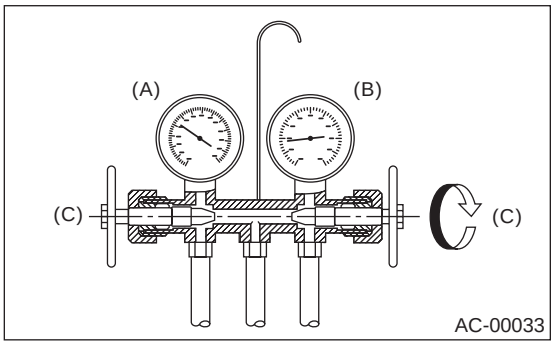
17) After confirming that there are no leaks with the leak test, charge the required amount of refrigerant.

CAUTION:
Never run the engine during charging from the high-pressure side.

18) Close the high-pressure valve when;
• the readings of low- / high-pressure gauges become almost equal, after the charging speed is reduced,
• the HFC-134a source becomes empty, or the system is filled with the gas.



19) If the HFC-134a source is empty, close the high-pressure valve, close the valve on the can tap, and replace the HFC-134a source with a new one to restart the operation.

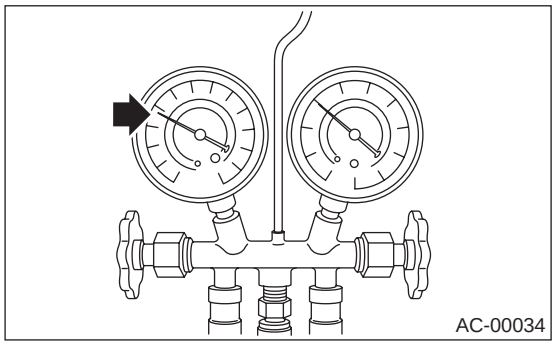


(A) Low-pressure gauge (Compound pressure gauge)
(B) High-pressure gauge
(C) Close

20) Confirm that both the low-/high-pressure valves can be closed. Start the engine with the A/C switch OFF.
21) Quickly repeat ON-OFF cycles a few times to prevent initial compressor damage.
22) Set up the vehicle to the following status:
• A/C switch ON
• Engine running at 1,500 rpm
• Blower speed setting to “HI”
• Temperature setting to “MAX COOL”
• Air inlet setting to “RECIRC”
• Window open

23) While reading the low-pressure gauge, carefully open the low-pressure valve with the refrigerant source connected and the service hose purged.

CAUTION:
Never open the high-pressure valve with the engine running. The high-pressure gas will backflow resulting in an explosion of the can.



24) Adjust the refrigerant flow to maintain the pressure on the low-pressure side at 276 kPa (2.81 kg/cm^2, 40 psi) max.
25) After the system is fully charged, close the low-pressure valve.
26) Close the valve on the refrigerant source.

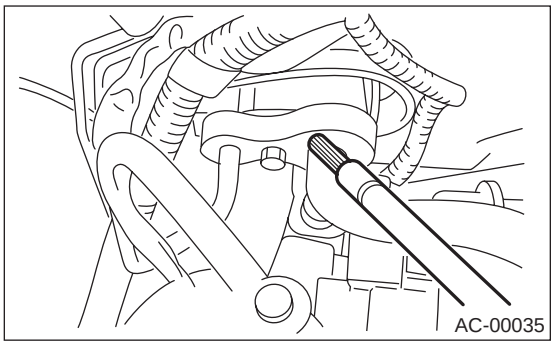
Refrigerant amount		
Refrigerant	Minimum	Maximum
HFC-134a	370 g (0.82 lb)	430 g (0.95 lb)

27) Disconnect the hose from the service port, and install the service port cap.

5. Refrigerant Leak Check

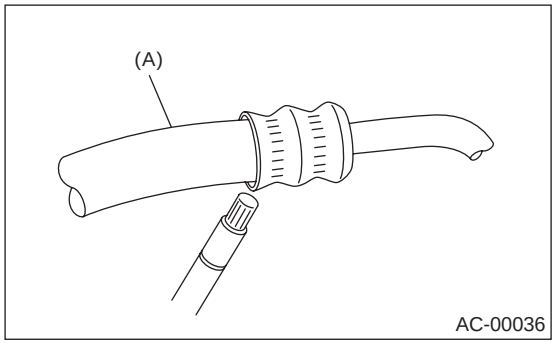
A: INSPECTION

1) Operate the A/C system for approx. 10 minutes, and confirm that the high-side pressure shows at least 690 kPa (7.03 kg/cm^2, 100 psi). Then stop the engine to start the leak test.
2) Starting from the connection between high-pressure pipe and evaporator, check the system for leaks along the high-pressure side through the compressor. The following items must be checked thoroughly.
3) Check the joint and seam between pressure switch (dual switch) and high-pressure pipe.
4) Check the connections between condenser and pipes, and welded joints on the condenser.
The leak tester may detect the oil on the condenser fins as a leak.
5) Check the joint between compressor and hoses.
6) Check the machined area of compressor and other joints on the compressor.
7) Check the compressor shaft seal at the area near the center of compressor clutch pulley.
Some shaft seals show a slight amount of leakage about 3 g (0.1 oz.) per year. This is not a problem.
8) Starting from the connection between low-pressure pipe and evaporator, check the system for leakage along the low-pressure side through the compressor. The following items must be checked thoroughly.
- Connection between 2 parts
- Connection between pipe and plate



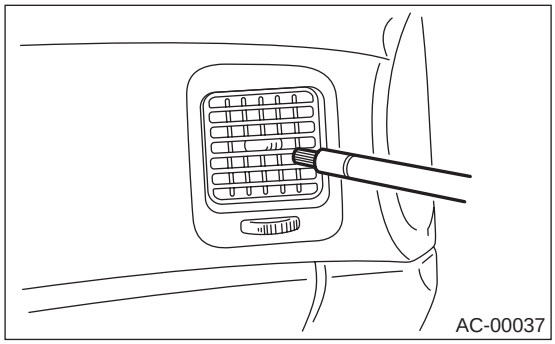
9) Visually check the rubber area of the flexible hose for cracks.
Check the entire length of the flexible hose, especially the connection with the metal hose end.

CAUTION:
Carefully check the external surface of hoses and tubes at approx. 25 mm (0.98 in) per second.

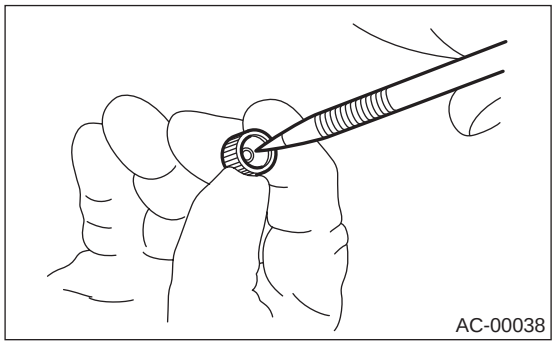


(A) Flexible hose

10) Disconnect the drain hose from heater case, and check the hose end for at least 10 seconds.
After the test is finished, reconnect the drain hose.
11) Turn the ignition key to ON position, and run the blower at high speed for approx. 1 minute. Stop the blower to check the ventilation grille on the instrument panel. While moving the tester closer to the grille, run the blower for 1 or 2 seconds, then stop it. Check the grille at that point for at least 10 seconds.



12) Check the valve in the service port.
13) Visually check the rubber seal in the service port cap.



6. Compressor Oil

A: PROCEDURE

NOTE:
Before making repairs, perform the oil return operation to return the compressor oil in circulation with the refrigerant to the compressor.

1) Increase the engine to 1,500 rpm.
2) Turn ON the A/C switch.
3) Turn the temperature control switch to MAX COOL.
4) Put in RECIRC position.
5) Turn the blower control switch to HI.
6) Leave in this condition for 10 minutes.

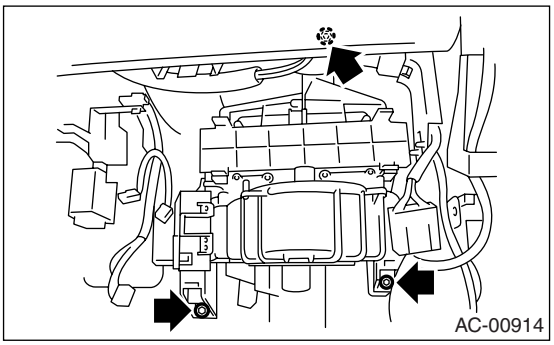
B: REPLACEMENT

NOTE:
• If a component has been replaced, add an appropriate amount of compressor oil (same as the amount of remaining oil in removed component).
• When replacing the compressor, the new compressor will already have the specified amount of oil in it. Install the new compressor after removing the same amount of oil that is remaining in the compressor removed.

7. Blower Motor Unit Assembly

A: REMOVAL

1) Disconnect the ground cable from battery.
2) Remove the glove box. <Ref. to EI-51, REMOVAL, Glove Box.>
3) Disconnect the connectors of A/C control module, intake door actuator, blower motor, power transistor and blower resistor.
4) Loosen the bolt and nut to remove blower motor unit assembly.



B: INSTALLATION

Install in the reverse order of removal.

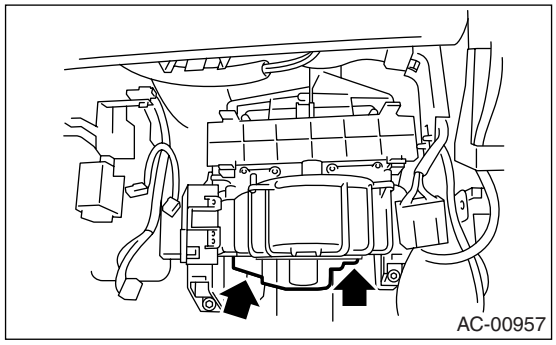
Tightening torque:

Refer to "COMPONENT" of "General Description". <Ref. to AC-5, HEATER COOLING UNIT, COMPONENT, General Description.> <Ref. to AC-7, BLOWER MOTOR UNIT, COMPONENT, General Description.>

8. Blower Motor

A: REMOVAL

1) Disconnect the ground cable from battery.
2) Remove the glove box lower cover. <Ref. to EI-51, REMOVAL, Glove Box.>
3) Disconnect the connector of blower motor.
4) Loosen the screw to remove blower motor.

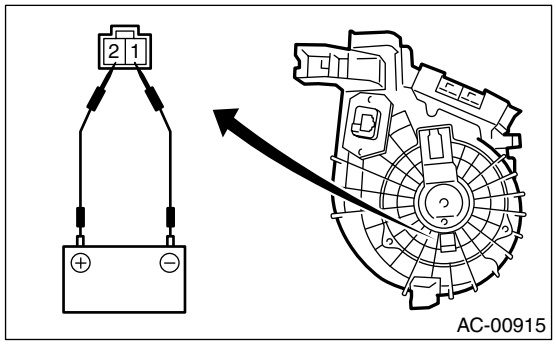


B: INSTALLATION

Install in the reverse order of removal.

C: INSPECTION

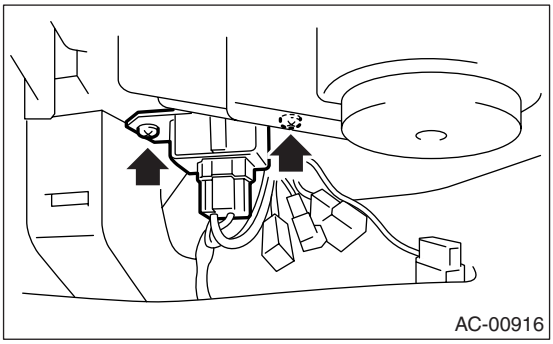
Connect the battery positive (+) terminal to terminal No. 2 of blower motor, and negative (–) terminal to terminal No. 1. Check the blower motor for smooth rotation.



9. Power Transistor (Auto A/C Model)

A: REMOVAL

1) Remove the glove box lower cover on passenger side. <Ref. to EI-51, REMOVAL, Glove Box.>
2) Disconnect the power transistor connector.
3) Remove two screws, and then remove the power transistor.



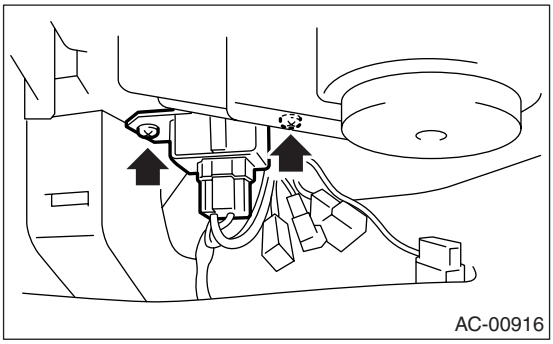
B: INSTALLATION

Install in the reverse order of removal.

10.Blower Resistor (Manual A/C Model)

A: REMOVAL

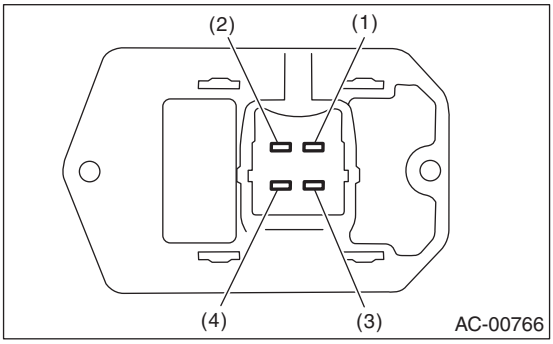
1) Remove the glove box lower cover on passenger side. <Ref. to EI-51, REMOVAL, Glove Box.>
2) Disconnect the blower resistor connector.
3) Remove two screws, and then remove the blower resistor.



B: INSTALLATION

Install in the reverse order of removal.

C: INSPECTION



Measure the blower resistor resistance.

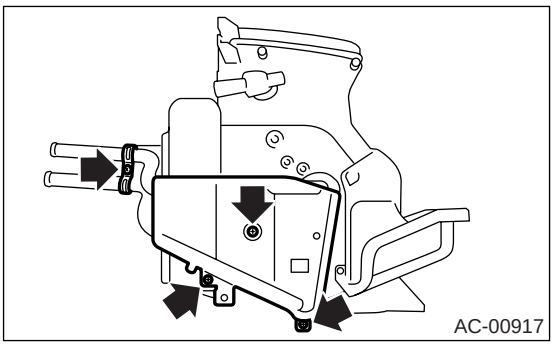
Terminal No.	Standard
4 and 2	Approx. 0.44 Ω
4 and 3	Approx. 1.12 Ω
4 and 1	Approx. 2.92 Ω

If NG, replace the blower resistor.

11.Heater Core

A: REMOVAL

1) Remove the heater and cooling unit. <Ref. to AC-36, REMOVAL, Heater and Cooling Unit.>
2) Remove the screws and remove the heater core cover and pipe clamp.



3) Remove the heater core.

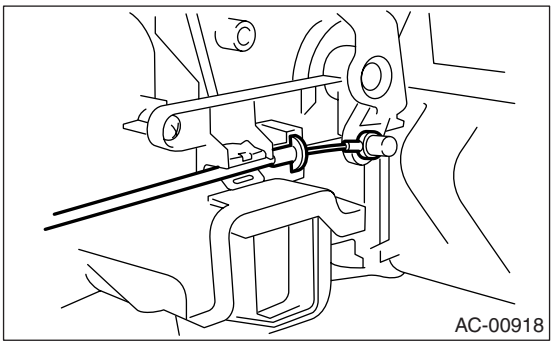
B: INSTALLATION

Install in the reverse order of removal.

12.Control Unit (Manual A/C Model)

A: REMOVAL

1) Disconnect the ground cable from battery.
2) Remove the glove box. <Ref. to EI-51, REMOVAL, Glove Box.>
3) Remove the control wires.



4) Remove the integrated panel. <Ref. to ET-5, REMOVAL, Audio.>
5) Loosen the screw to remove the control unit from bracket.

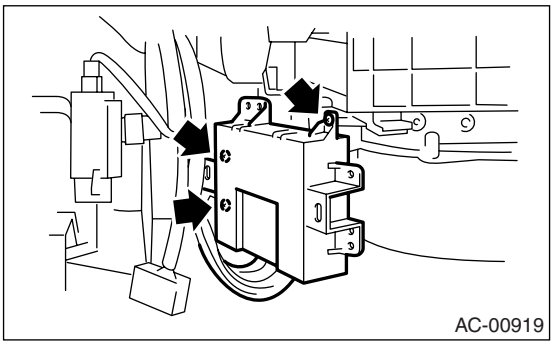
B: INSTALLATION

Install in the reverse order of removal.

13.Control Unit (Auto A/C Model)

A: REMOVAL

1) Disconnect the ground cable from battery.
2) Remove the glove box. <Ref. to EI-51, REMOVAL, Glove Box.>
3) Remove the screw, disconnect the connector and remove the control unit.



B: INSTALLATION

Install in the reverse order of removal.

14.Compressor

A: INSPECTION

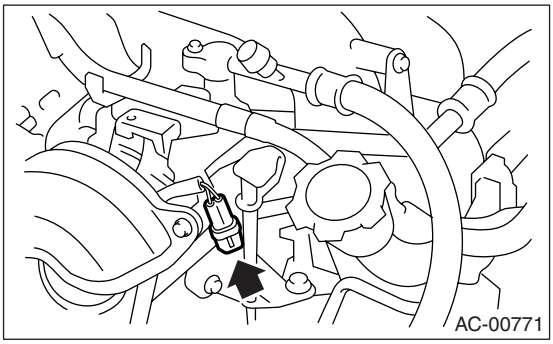
1. MAGNETIC CLUTCH CLEARANCE

Check the clearance of entire circumference around the drive plate and pulley.

Standard:
0.45±0.15 mm (0.0177±0.0059 in)

2. MAGNETIC CLUTCH OPERATION

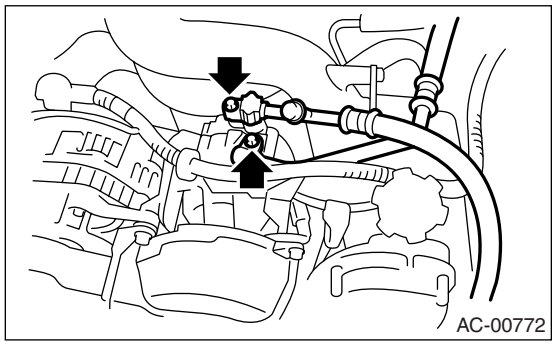
1) Disconnect the compressor connector.
2) Connect the battery positive (+) terminal to terminal No. 1 of compressor connector, and negative (–) terminal to terminal No. 2.



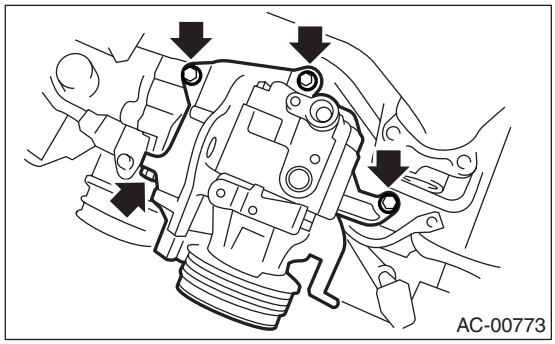
3) Check the magnet clutch engagement.
If NG, replace the compressor.

B: REMOVAL

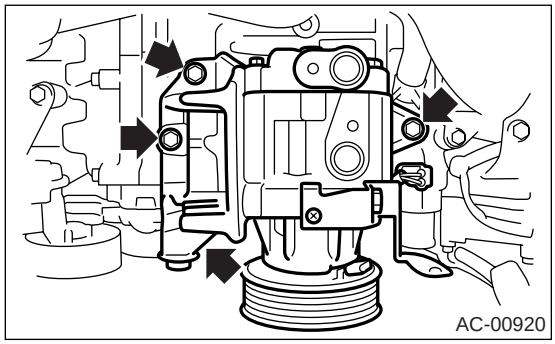
1) Perform the compressor oil return operation. <Ref. to AC-25, PROCEDURE, Compressor Oil.>
2) Turn the A/C switch to OFF and stop the engine.
3) Using the refrigerant recovery system, discharge refrigerant. <Ref. to AC-20, PROCEDURE, Refrigerant Recovery Procedure.>
4) Disconnect the ground cable from battery.
5) Remove the V-belts. <Ref. to ME(H4SO 2.0)-38, REMOVAL, V-belt.> <Ref. to ME(H4DOTC)-39, REMOVAL, V-belt.> <Ref. to ME(H6DO)-33, REMOVAL, V-belt.>
6) Remove the generator. <Ref. to SC(H4SO 2.0)-14, REMOVAL, Generator.> <Ref. to SC(H6DO)-14, REMOVAL, Generator.>
7) Remove the bolt and remove the low-pressure hose and high-pressure hose.



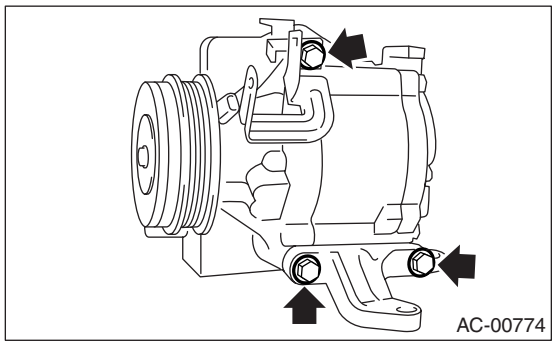
8) Disconnect the compressor harness from body harness.
9) Remove the bolts and remove compressor bracket.
- H4 model



- H6 model



10) Remove the bolts, and then remove the bracket from compressor.



C: INSTALLATION

1) Install in the reverse order of removal.
2) Replace the O-rings on low-/high-pressure hoses with new ones, then apply compressor oil.
3) When replacing the compressor, adjust amount of compressor oil. <Ref. to AC-25, PROCEDURE, Compressor Oil.>
4) Charge refrigerant. <Ref. to AC-21, PROCEDURE, Refrigerant Charging Procedure.>

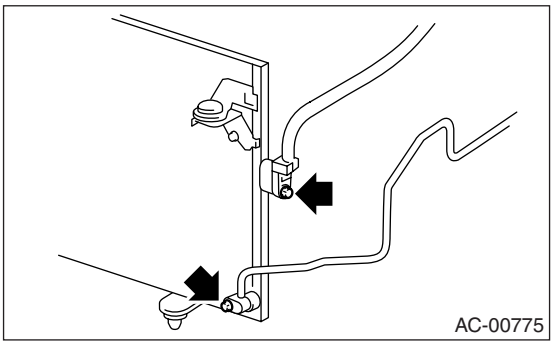
Tightening torque:

Refer to "COMPONENT" of "General Description". <Ref. to AC-10, AIR CONDITIONING UNIT, COMPONENT, General Description.> <Ref. to AC-11, COMPRESSOR, COMPONENT, General Description.>

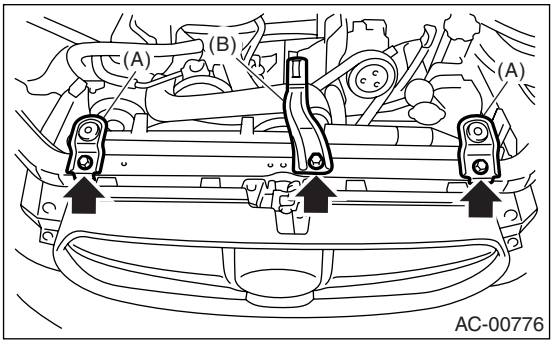
15.Condenser

A: REMOVAL

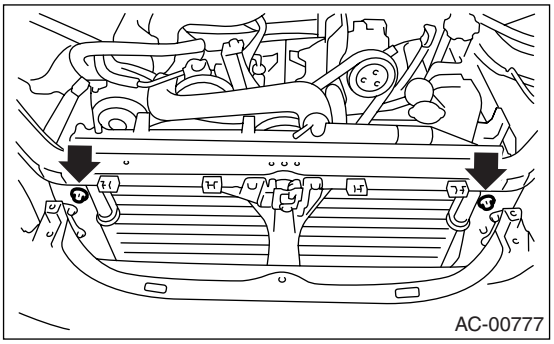
1) Using the refrigerant recovery system, discharge refrigerant. <Ref. to AC-20, PROCEDURE, Refrigerant Recovery Procedure.>
2) Disconnect the ground cable from battery.
3) Disconnect the pressure hose and pipe from condenser.



4) Remove the radiator bracket (A) and hood stay (B).



5) Remove the front grille. <Ref. to EI-24, REMOVAL, Front Grille.>
6) Remove two bolts. While lifting condenser, pull it out through the space between radiator and radiator panel.

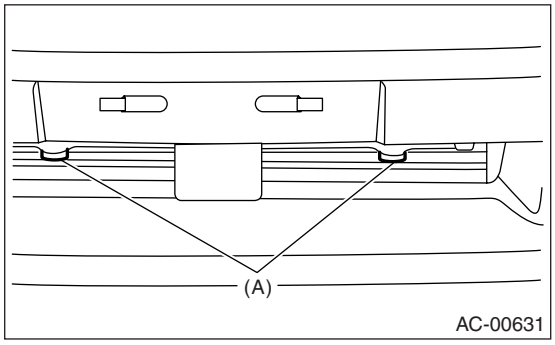


CAUTION:
• Be careful not to damage the condenser fins. If a damaged fin is found, repair it using a thin screwdriver.
• If the condenser is replaced, add an appropriate amount of compressor oil to the compressor. <Ref. to AC-25, REPLACEMENT, Compressor Oil.>

B: INSTALLATION

1) Install in the reverse order of removal.

CAUTION:
Replace the O-rings on hoses or pipes with new ones, and then apply compressor oil. Confirm that lower guide of condenser (A) has been fitted into holes on radiator panel.



2) Charge refrigerant. <Ref. to AC-21, PROCEDURE, Refrigerant Charging Procedure.>

Tightening torque:
Refer to "COMPONENT" of "General Description". <Ref. to AC-10, AIR CONDITIONING UNIT, COMPONENT, General Description.> <Ref. to CO(H4SO 2.0)-5, RADIATOR AND RADIATOR FAN, COMPONENT, General Description.>

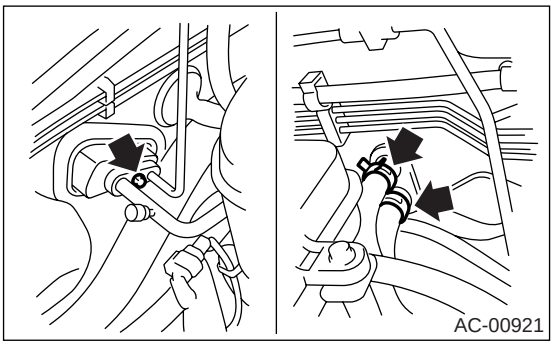
C: INSPECTION

1) Check no dust or insects are found on the condenser fins. Air-blow or flush fins with water as needed.
2) Inspect for oil leakage from condenser. If a failure is found, replace the condenser with a new one.

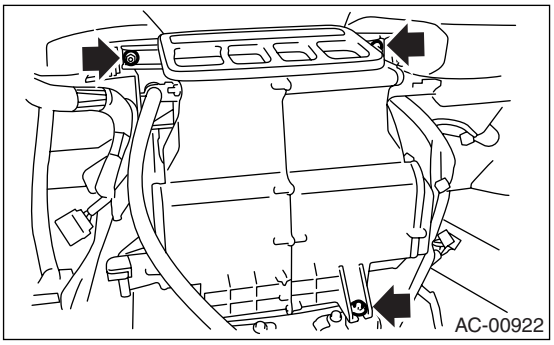
16.Heater and Cooling Unit

A: REMOVAL

1) Disconnect the ground cable from battery.
2) Using the refrigerant recovery system, discharge refrigerant. <Ref. to AC-20, PROCEDURE, Refrigerant Recovery Procedure.>
3) Drain coolant from the radiator.
4) Remove the bolts securing expansion valve and pipe in engine compartment. Release the heater hose clamps in engine compartment to remove the hoses.



5) Remove the instrument panel. <Ref. to EI-56, REMOVAL, Instrument Panel Assembly.>
6) Remove the support beam.
7) Remove the blower motor unit assembly. <Ref. to AC-26, REMOVAL, Blower Motor Unit Assembly.>
8) Disconnect the actuator connector.
9) Remove the bolt and nuts to remove the heater and cooling unit.



B: INSTALLATION

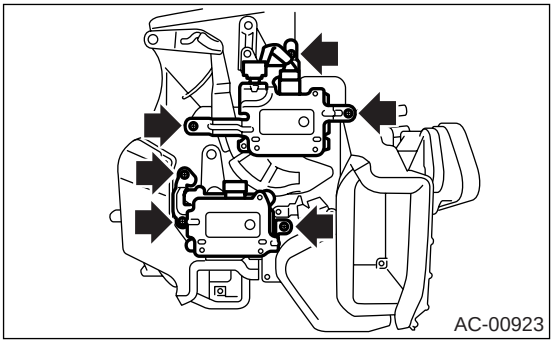
1) Install in the reverse order of removal.
2) Charge refrigerant. <Ref. to AC-21, PROCEDURE, Refrigerant Charging Procedure.>

Tightening torque:
Refer to "COMPONENT" of "General Description". <Ref. to AC-5, HEATER COOLING UNIT, COMPONENT, General Description.>

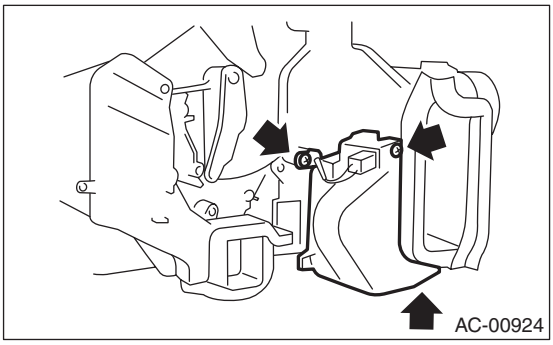
17.Evaporator

A: REMOVAL

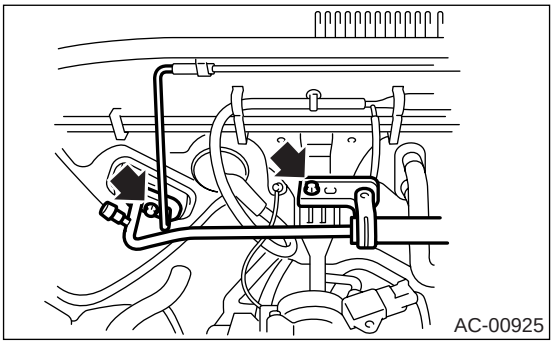
1) Remove the blower motor unit assembly. <Ref. to AC-26, REMOVAL, Blower Motor Unit Assembly.>
2) Disconnect the connector, remove the screw and then remove the air-mix door actuator and mode door actuator.



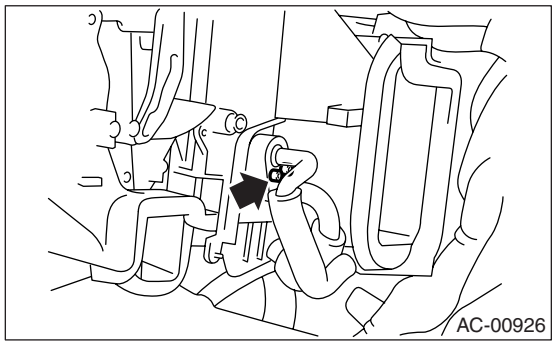
3) Disconnect the connector, remove the screw and remove the pipe cover and evaporator sensor.



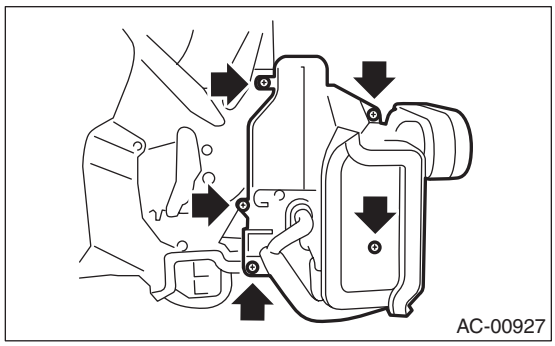
4) Remove the bolts securing expansion valve and pipe in engine compartment.



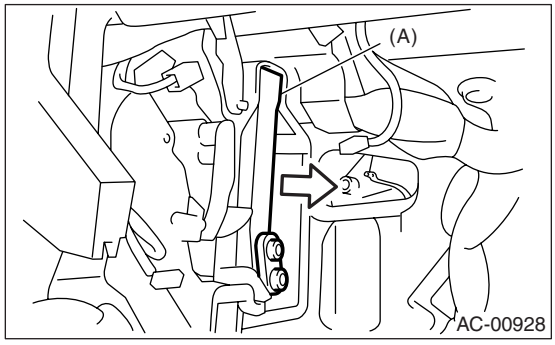
5) Remove the bolt which holds the pipe to evaporator.



6) Remove the screws and clip to remove the evaporator cover.



7) Pull out the evaporator (A) in the direction of arrow.



CAUTION:
If the evaporator is replaced, add an appropriate amount of compressor oil to evaporator. <Ref. to AC-25, REPLACEMENT, Compressor Oil.>

B: INSTALLATION

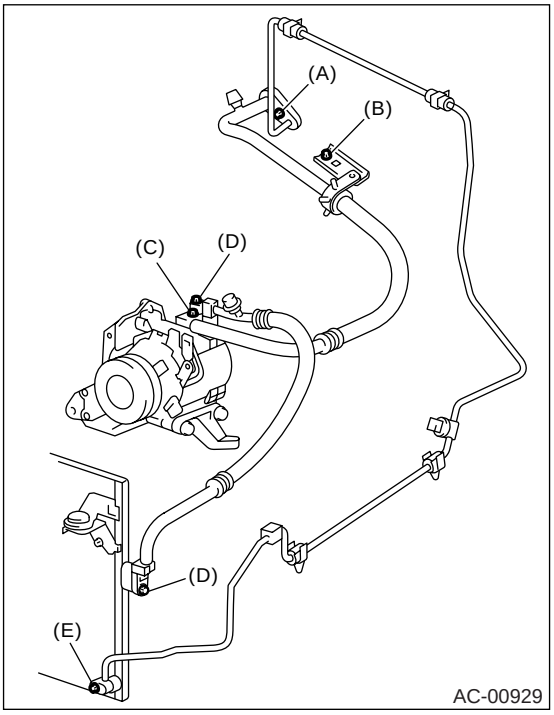
Install in the reverse order of removal.

18.Hose and Tube

A: REMOVAL

CAUTION:
• When disconnecting/connecting hoses, do not apply an excessive force to them. Confirm that no torsion and excessive tension is charged after installing.
• Seal the disconnected hose with a plug or vinyl tape to prevent foreign matter from entering.

1) Disconnect the ground cable from battery.
2) Using the refrigerant recovery system, discharge refrigerant. <Ref. to AC-20, PROCEDURE, Refrigerant Recovery Procedure.>
3) Remove the evaporator unit mounting bolt (A) and low-pressure hose bracket bolt (B).
4) Remove the low-pressure hose attaching bolts (C).
5) Disconnect the low-pressure hose from evaporator unit.
6) Disconnect the low-pressure hose from compressor.
7) Remove the low-pressure hose from vehicle.
8) Remove the high-pressure hose attaching bolt (D).
9) Disconnect the high-pressure hose from compressor.
10) Disconnect the high-pressure hose from condenser.
11) Remove the high-pressure hose from vehicle.
12) Remove the high-pressure attaching bolt (E).
13) Remove the high-pressure tube from vehicle.



B: INSTALLATION

CAUTION:
• When disconnecting or connecting the hoses, do not apply excessive force to them. Confirm that no torsion and excessive tension is charged after installing.
• Seal the disconnected hose with a plug or vinyl tape to prevent foreign matter from entering.

1) Install in the reverse order of removal.
2) Charge refrigerant. <Ref. to AC-21, PROCEDURE, Refrigerant Charging Procedure.>

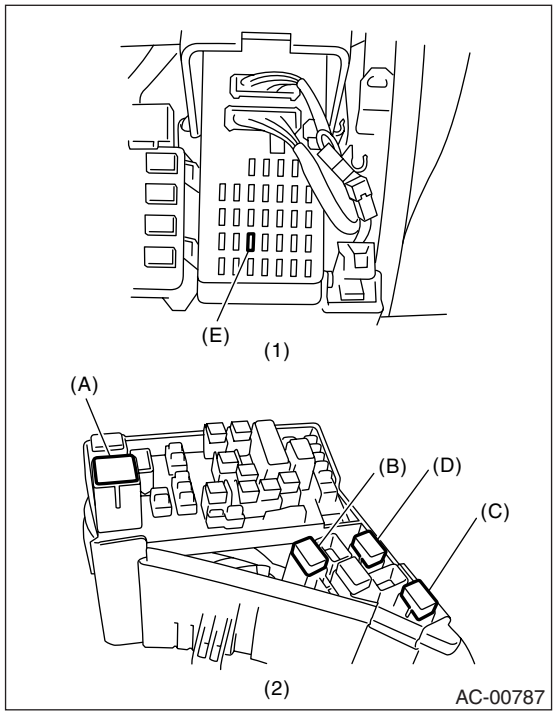
Tightening torque:
Refer to "COMPONENT" of "General Description". <Ref. to AC-10, AIR CONDITIONING UNIT, COMPONENT, General Description.>

C: INSPECTION

Check the hoses for cracks, damage and expansion. If any fault is found, replace them with new ones.

19.Relay and Fuse

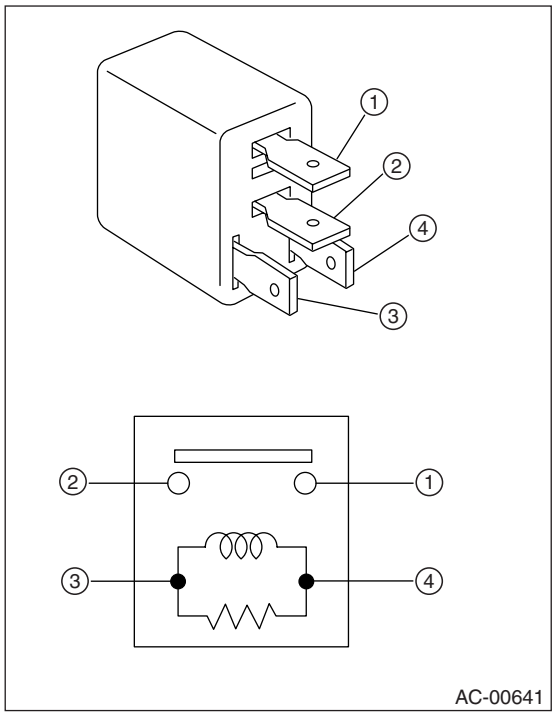
A: LOCATION



(1) Joint box
(2) Main fuse box

Main Fan Relay 1	(A)
Main Fan Relay 2	(B)
Sub Fan Relay	(C)
A/C Relay	(D)
A/C Fuse	(E)

B: INSPECTION



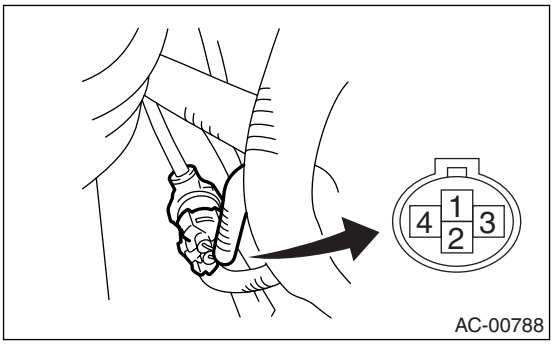
(3) — (4): Continuity exists
(1) — (2): Continuity does not exist

While applying battery voltage to the terminal between (3) and (4), check continuity between (1) and (2).
If no continuity exists, replace the relay with a new one.

20.Pressure Switch (Triple Pressure Switch)

A: INSPECTION

1) Connect the manifold gauge to the service valve on the high-pressure side.
2) Remove the pressure switch harness connector. Using a circuit tester, inspect the ON-OFF operation of pressure switch.

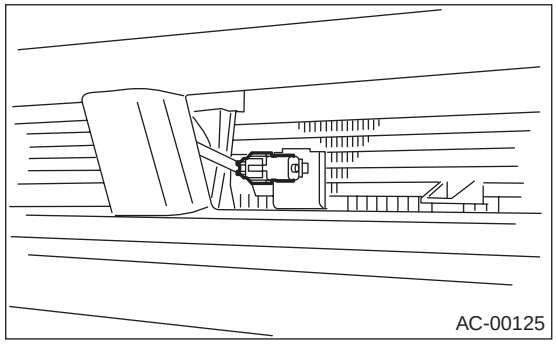


	Terminal No.	Operation	Standard kPa (kg/cm^2, psi)
High and low pressure switch	1 and 2	Turns OFF.	Increasing to $3{,}140^{+50}_{-200}$ ($32.02^{+0.51}_{-2.04}$, $455.4^{+7.25}_{-29.0}$)
			Decreasing to 196±20 (2.00±0.20, 28.4±2.9)
		Turns ON.	Increasing to 225^{+25}_{-29} ($2.29^{+0.25}_{-0.30}$, $32.6^{+3.6}_{-4.2}$)
			Decreasing to 2,550±200 (26.00±2.04, 369.8±29.0)
Middle pressure switch	3 and 4	Turns OFF.	Decreasing to 1,370±120 (14±1, 199±14)
		Turns ON.	Increasing to 1,770±100 (18±1, 256±14)

21. Ambient Sensor (Auto A/C Model)

A: REMOVAL

1) Open the front hood.
2) Disconnect the ground cable from battery.
3) Disconnect the ambient sensor connector.
4) Remove the ambient sensor from the radiator lower panel.



B: INSTALLATION

Install in the reverse order of removal.

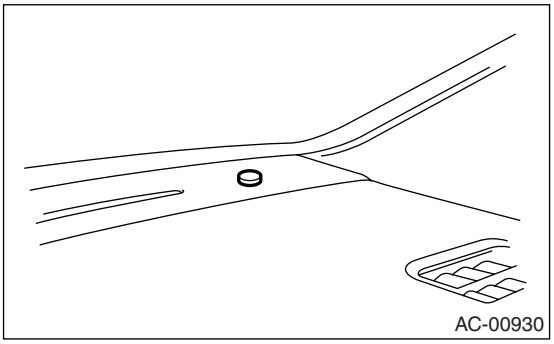
C: INSPECTION

<Ref. to AC(diag)-30, AMBIENT SENSOR, Diagnostic Procedure for Sensors.>

22.Sunload Sensor (Auto A/C Model)

A: REMOVAL

1) Disconnect the ground cable from battery.
2) Disconnect the connector and remove the sunload sensor.



CAUTION:
Be careful not to damage the interior trims when removing the sensor.

B: INSTALLATION

Install in the reverse order of removal.

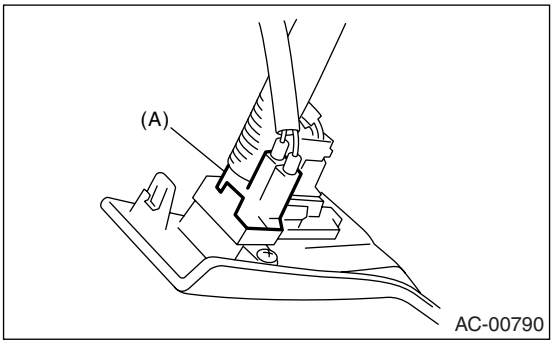
C: INSPECTION

<Ref. to AC(diag)-36, SUNLOAD SENSOR, Diagnostic Procedure for Sensors.>

23.In-Vehicle Sensor (Auto A/C Model)

A: REMOVAL

1) Disconnect the ground cable from battery.
2) Remove the instrument panel lower cover. <Ref. to EI-50, REMOVAL, Instrument Panel Lower Cover.>
3) Disconnect the connector and aspirator hose, remove the pawl and remove the in-vehicle sensor (A) from instrument lower cover.



CAUTION:
Be careful not to damage the sensors and interior trims when removing.

B: INSTALLATION

Install in the reverse order of removal.

C: INSPECTION

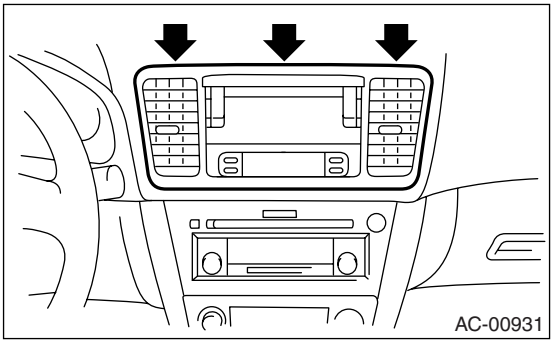
<Ref. to AC(diag)-32, IN-VEHICLE SENSOR, Diagnostic Procedure for Sensors.>

24.Air Vent Grille

A: REMOVAL

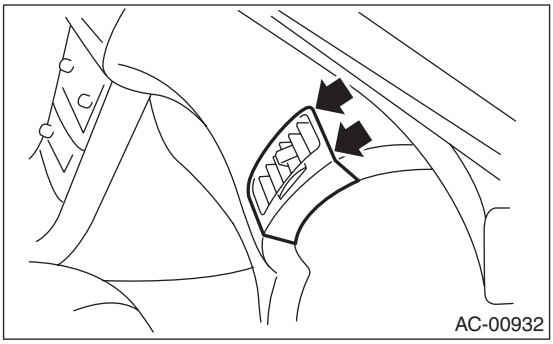
1. CENTER GRILLE

1) Disconnect the ground cable from battery.
2) Remove the three pawls and connector to remove center air vent grill.



2. SIDE GRILLE

Remove the two pawls to remove side air vent grill.



B: INSTALLATION

Install in the reverse order of removal.

C: INSPECTION

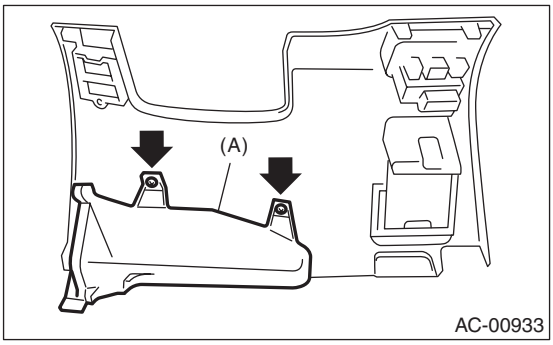
1) Check the direction and amount of air can be adjusted smoothly.
2) Check the adjustment can be kept in each position.

25.Heater Duct

A: REMOVAL

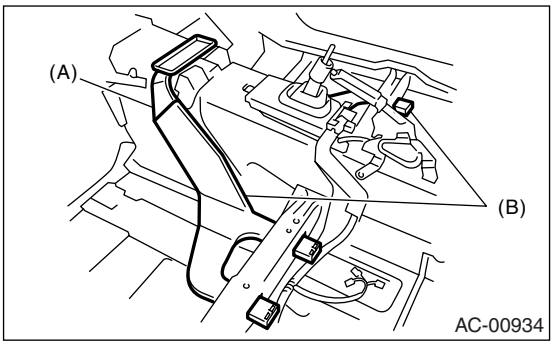
1. FRONT HEATER DUCT

1) Remove the instrument panel lower cover. <Ref. to EI-50, REMOVAL, Instrument Panel Lower Cover.>
2) Remove the screws and detach the front heater duct (A).



2. REAR HEATER DUCT

1) Remove the heater cooling unit. <Ref. to AC-36, REMOVAL, Heater and Cooling Unit.>
2) Remove the front seats. <Ref. to SE-7, REMOVAL, Front Seat.>
3) Remove the front side sill cover.
4) Pull off the floor mat to remove the rear center heater duct (A) and rear heater duct LH, RH (B).



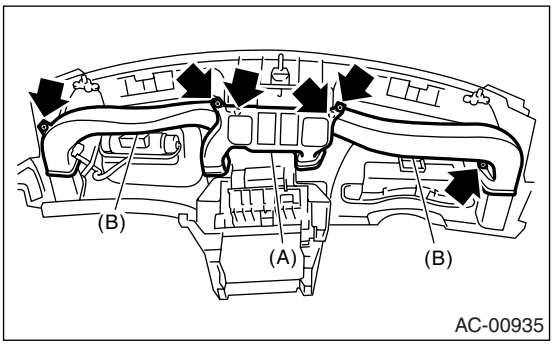
B: INSTALLATION

Install in the reverse order of removal.

26.Heater Vent Duct

A: REMOVAL

1) Remove the instrument panel. <Ref. to EI-50, REMOVAL, Instrument Panel Lower Cover.>
2) Remove the screws and detach the center vent duct (A).
3) Remove the screws and detach the center vent duct (B).
4) Remove the insulator, remove the screws and detach the defroster duct.



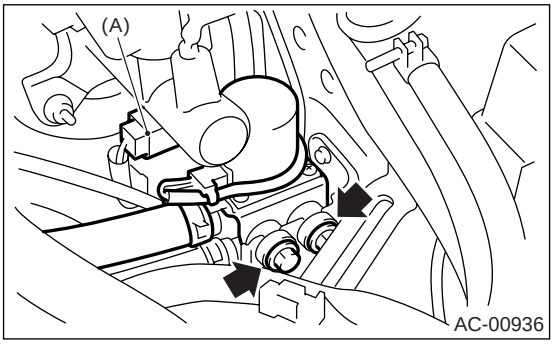
B: INSTALLATION

Install in the reverse order of removal.

27.Heater Cock Solenoid Valve

A: REMOVAL

1) Drain the engine coolant. <Ref. to CO(H4SO 2.0)-13, DRAINING OF ENGINE COOLANT, REPLACEMENT, Engine Coolant.>
2) Disconnect the harness connector (A) of the heater cock solenoid valve.
3) Remove the two bolts to remove the heater cock solenoid from the bracket.



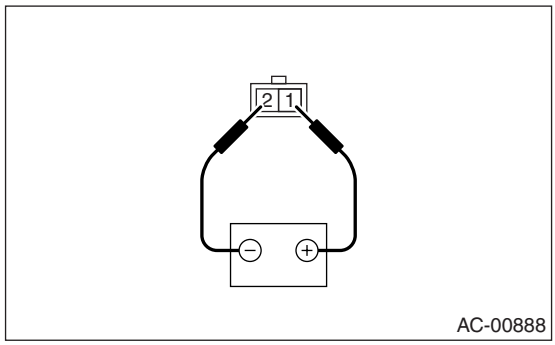
4) Pull out the heater cock solenoid. Loosen the hose clamp and disconnect the two heater hoses.

B: INSTALLATION

Install in the reverse order of removal.

C: INSPECTION

1) Remove the heater cock solenoid valve. <Ref. to AC-47, REMOVAL, Heater Cock Solenoid Valve.>
2) Connect the positive terminal of battery to No. 1 terminal of heater cock solenoid valve, and the ground terminal to No. 2 terminal. Check that the heater cock solenoid valve opens and closes normally.



If any failure is found, replace the heater cock solenoid valve.

28.General Diagnostic Table

A: INSPECTION

Symptom		Repair order
Blower motor	Doesn't operate.	Fuse
		Blower motor relay
		Blower motor
		Blower motor resistor
		Blower switch
		Wire harness
	Noise	Blower motor
Compressor	Doesn't operate.	Refrigerant
		Fuse
		Air conditioning relay
		Magnet clutch
		Compressor
		Pressure switch
		A/C switch
		Blower switch
		Wire harness
	Noise	V-Belt
		Magnet clutch
		Compressor
Cold air not emitted.		Refrigerant
		V-Belt
		Magnet clutch
		Compressor
		Pressure switch
		A/C switch
		Blower switch
		Wire harness
		Heater duct
		Heater vent duct
Warm air not emitted.		Engine coolant
		Blower switch
		Heater core
		Heater cock solenoid valve
Temperature of air from vents does not change.		Engine coolant
		Air mix actuator (Auto A/C)
		Wire harness (Auto A/C)
		Temperature control cable (Manual A/C)
Unable to switch blow vents.		Mode actuator (Auto A/C)
		Air flow switch (Auto A/C)
		Wire harness (Auto A/C)
		Mode cable (Manual A/C)
Unable to switch suction vents.		Air inlet select switch (Auto A/C)
		FRESH/RECIRC actuator (Auto A/C)
		Wire harness (Auto A/C)
		Intake cable (Manual A/C)