

GENERAL DESCRIPTION

HVAC SYSTEM (HEATER, VENTILATOR AND A/C)

1. General Description

A: SPECIFICATIONS

1. HEATER SYSTEM

Item		Specifications	Condition
Heating capacity		5.0 kW (4,300 kcal/h, 17,062 BTU/h) or more	<ul style="list-style-type: none"> • 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		280 m ³ (9,888 cu ft)/h	Heat mode (FRESH), FULL HOT at 12.5 V
Max air flow rate		480 m ³ (16,951 cu ft)/h	<ul style="list-style-type: none"> • Temperature control switch: FULL COLD • Blower fan speed: 4th position • Mode selector lever: RECIRC
Heater core size (height × length × width)		134.1 × 224.3 × 32 mm (5.28 × 8.83 × 1.26 in)	—
Blower motor	Type	Auto A/C (Brushless motor) 230 W or less	12.5 V
		Manual A/C (Cylinder motor) 260 W or less	12.5 V
	Fan type and size (diameter × width)	Sirocco fan type 150 × 75 mm (5.91 × 2.95 in)	—

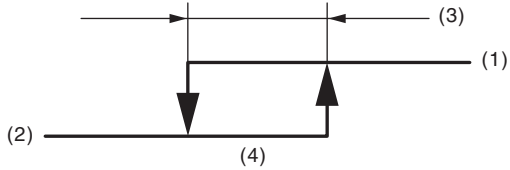
2. A/C SYSTEM

• AUTO A/C MODEL

Item		Specifications
Type of air conditioner		Reheat air-mix type
Cooling capacity		5.0 kW (4,300 kcal/h, 17,064 BTU/h)
Refrigerant		HFC-134a (CH ₂ FCF ₃) [0.6±0.05 kg (1.32±0.11 lb)]
Compressor	Type	Vane rotary, fix volume (DKV-14G)
	Discharge	140 cm ³ (8.54 cu in)/rev
	Max. permissible speed	7,000 rpm
Magnet clutch	Type	Dry, single-disc type
	Power consumption	38 W (DC 12 V-25°C)
	Type of belt	V-belt 4 PK
	Pulley dia. (effective dia.)	125 mm (4.92 in)
	Pulley ratio	1.064
Condenser	Type	Corrugated fin (Sub cool type)
	Core face area	0.234 m ² (2.52 sq ft)
	Core thickness	16 mm (0.63 in)
	Radiation area	5.6 m ² (62.28 sq ft)
Receiver drier	Effective inner capacity	220 cm ³ (13.42 cu in)
Expansion valve	Type	External equalizing
Evaporator	Type	Single tank
	Dimensions (W × H × T)	176.5 × 266 × 60 mm (6.95 × 10.47 × 2.36 in)
Blower fan	Fan type	Sirocco fan
	Outer diameter × width	150 × 75 mm (5.91 × 2.95 in)
	Power consumption	230 W or less at 12.5 V

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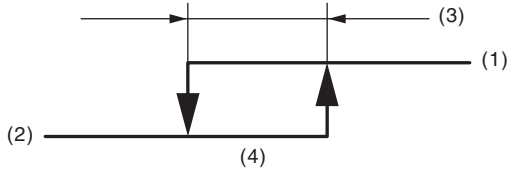
Condenser fan (Sub fan)		Motor type	Magnet
		Power consumption	70 W at 12 V
		Fan outer diameter	320 mm (12.6 in)
Radiator fan (Main fan)		Motor type	Magnet
		Power consumption	70 W at 12 V
		Fan outer diameter	320 mm (12.6 in)
Idling speed (A/C ON)			800±100 rpm
Triple switch (Pressure switch)	Low-pressure switch operating pressure	ON → OFF	177±25 kPa (1.80±0.25 kg/cm ² , 25.60±3.56 psi)
		OFF → ON	206±30 kPa (2.10±0.31 kg/cm ² , 29.86±4.41 psi)
	High-pressure switch operating pressure	ON → OFF	2,940±200 kPa (29.98±2.03 kg/cm ² , 426.32±28.87 psi)
		Difference	590±200 kPa (6.02±2.03 kg/cm ² , 85.6±28.87 psi)
	Middle pressure switch operating pressure	ON → OFF	1370±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)		 <p style="text-align: right;">AC-00601</p>	
		(1) ON (2) OFF (3) 3.0±0.3°C (37±0.4°F) (4) 1.5±0.5°C (35±0.9°F)	

• **MANUAL A/C MODEL**

Item	Specifications	
Type of air conditioner	Reheat air-mix type	
Cooling capacity	5.0 kW (4,300 kcal/h, 17,064 BTU/h)	
Refrigerant	HFC-134a (CH ₂ FCF ₃) [600±50 g (1.32±0.11 lb)]	
Compressor	Type	Vane rotary, fix volume (DKV-14G)
	Discharge	140 cm ³ (8.54 cu in)/rev
	Max. permissible speed	7,000 rpm
Magnet clutch	Type	Dry, single-disc type
	Power consumption	38 W (DC12 V, 25°C)
	Type of belt	V-belt 4 PK
	Pulley dia. (effective dia.)	125 mm (4.92 in)
	Pulley ratio	1.064
Condenser	Type	Corrugated fin (Sub cool type)
	Core face area	0.234 m ² (2.52 sq ft)
	Core thickness	16 mm (0.63 in)
	Radiation area	5.6 m ² (6.26 sq ft)

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Receiver drier		Effective inner capacity	220 cm ³ (13.42 cu in)
Expansion valve		Type	External equalizing
Evaporator		Type	Single tank
		Dimensions (W × H × T)	176.5 × 266 × 60 mm (6.95 × 10.47 × 2.36 in)
Blower fan		Fan type	Sirocco fan
		Outer diameter × width	150 × 75 mm (5.91 × 2.95 in)
		Power consumption	260 W or less at 12.5 V
Condenser fan (Sub fan)		Motor type	Magnet
		Power consumption	70 W at 12 V
		Fan outer diameter	320 mm (12.6 in)
Radiator fan (Main fan)		Motor type	Magnet
		Power consumption	70 W at 12 V
		Fan outer diameter	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	177±25 kPa (1.80±0.25 kg/cm ² , 25.60±3.56 psi)
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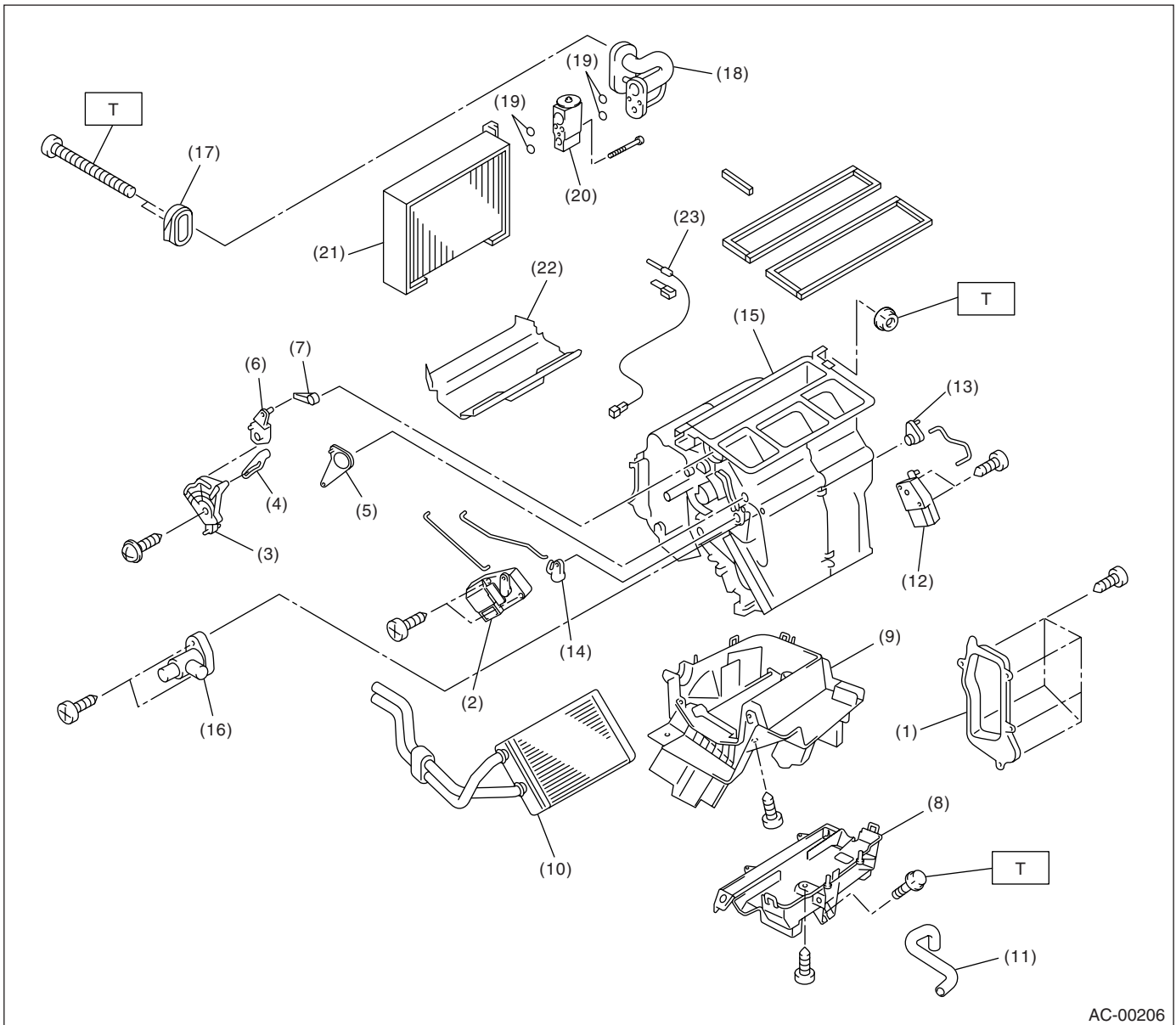
GENERAL DESCRIPTION

HVAC SYSTEM (HEATER, VENTILATOR AND A/C)

B: COMPONENT

1. HEATER COOLING UNIT

• AUTO A/C MODEL



- | | | |
|----------------------------|--------------------------|------------------------|
| (1) Evaporator cover | (10) Heater core | (19) O-ring |
| (2) Mode actuator | (11) Drain hose | (20) Expansion valve |
| (3) Mode main lever | (12) Mix actuator | (21) Evaporator |
| (4) Ventilation door lever | (13) Mix door lever | (22) Evaporator lining |
| (5) Foot door lever | (14) Foot door lever (B) | (23) Evaporator sensor |
| (6) Mode actuator link | (15) Upper case | |
| (7) Defroster lever | (16) Aspirator | |
| (8) Foot duct | (17) Packing | |
| (9) Lower case | (18) Cooling unit pipe | |

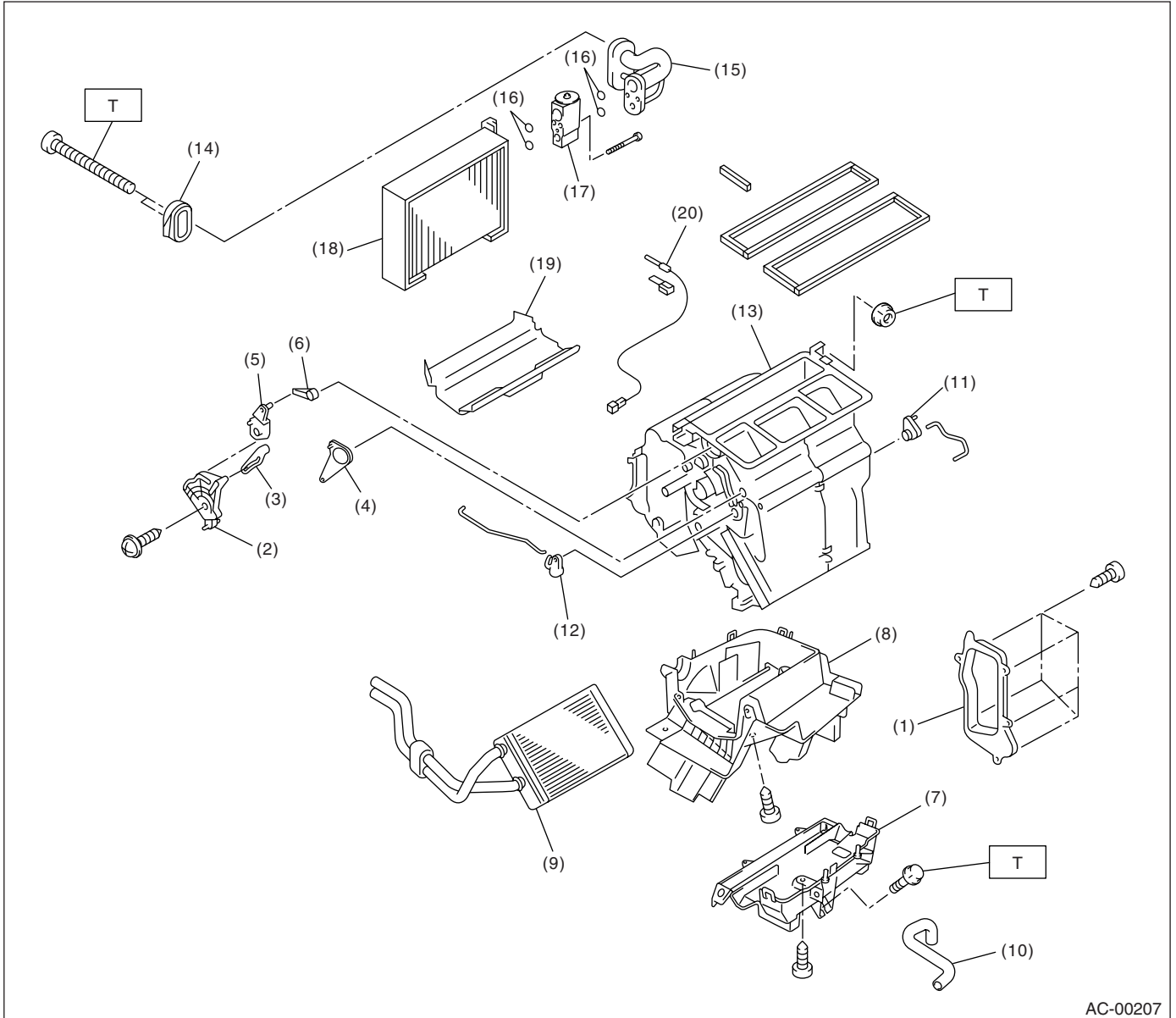
Tightening torque: N-m (kgf-m, ft-lb)

T: 7.5 (0.76, 5.5)

GENERAL DESCRIPTION

HVAC SYSTEM (HEATER, VENTILATOR AND A/C)

• MANUAL A/C MODEL



AC-00207

- | | | |
|------------------------|-------------------------|------------------------|
| (1) Evaporator cover | (9) Heater core | (17) Expansion valve |
| (2) Mode main lever | (10) Drain hose | (18) Evaporator |
| (3) Vent door lever | (11) Mix actuator lever | (19) Evaporator lining |
| (4) Foot door lever | (12) Foot door lever | (20) Evaporator sensor |
| (5) Mode actuator link | (13) Upper case | |
| (6) Defroster lever | (14) Packing | |
| (7) Foot duct | (15) Cooling unit pipe | |
| (8) Lower case | (16) O-ring | |

Tightening torque: N·m (kgf·m, ft·lb)

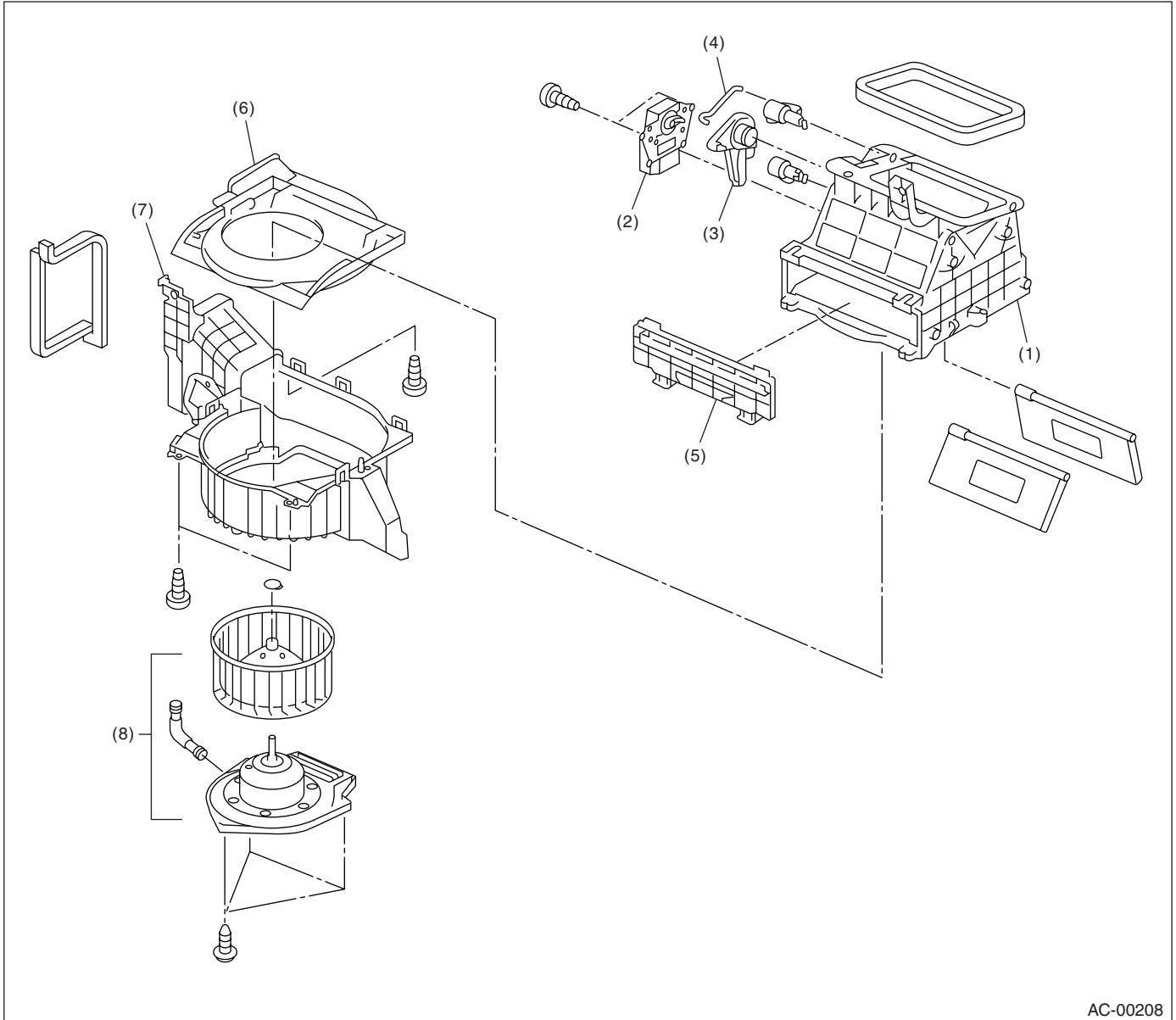
T: 7.5 (0.76, 5.5)

GENERAL DESCRIPTION

HVAC SYSTEM (HEATER, VENTILATOR AND A/C)

2. BLOWER MOTOR UNIT

• AUTO A/C MODEL



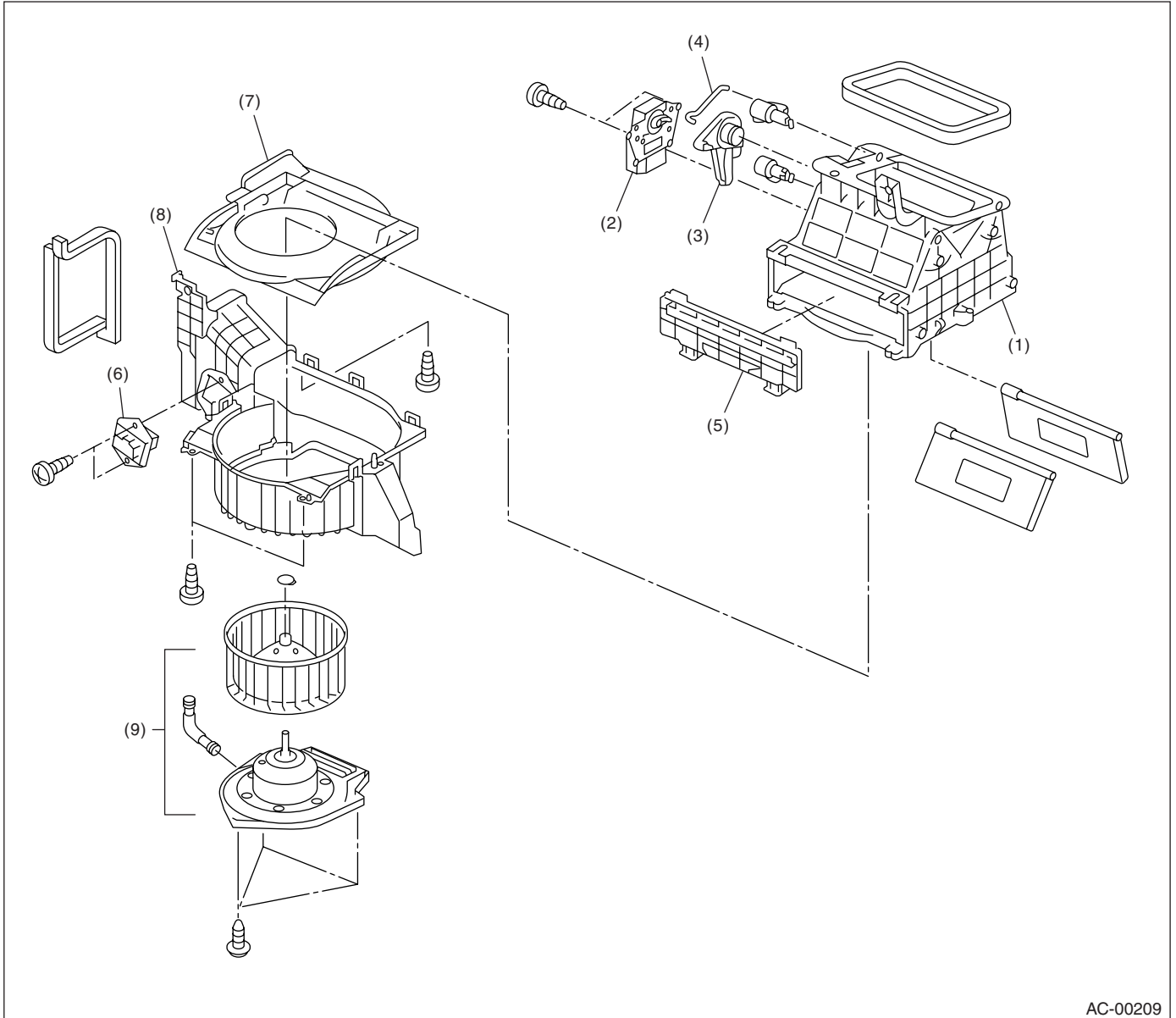
AC-00208

- | | | |
|-------------------------------|------------------|-----------------------|
| (1) Upper case | (4) Link lever | (7) Lower case |
| (2) Air inlet select actuator | (5) Filter cover | (8) Blower motor ASSY |
| (3) Air inlet select link | (6) Cover | |

GENERAL DESCRIPTION

HVAC SYSTEM (HEATER, VENTILATOR AND A/C)

• MANUAL A/C MODEL



AC-00209

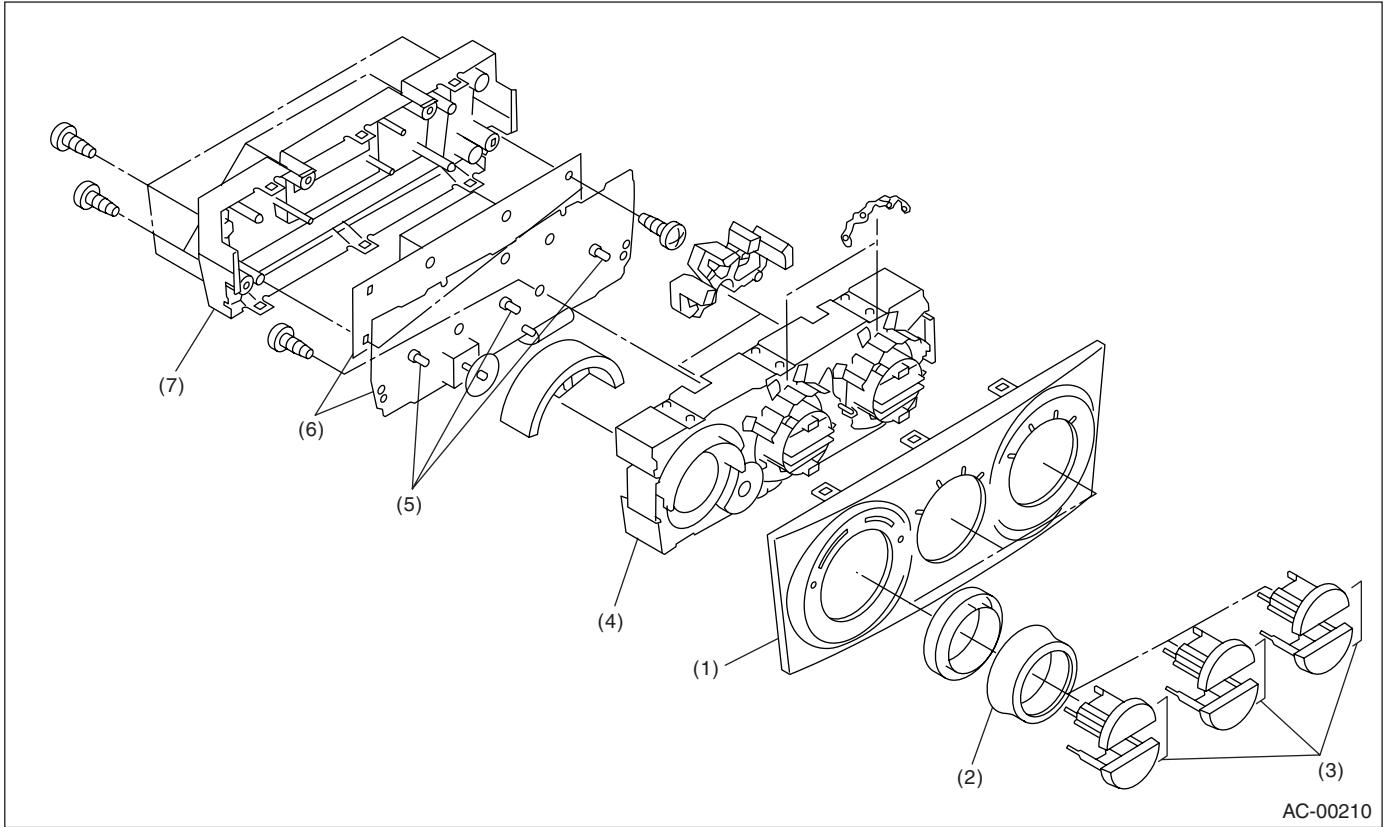
- | | | |
|-------------------------------|---------------------|-----------------------|
| (1) Upper case | (4) Link rod | (7) Cover |
| (2) Air inlet select actuator | (5) Filter cover | (8) Lower case |
| (3) Air inlet select link | (6) Blower resistor | (9) Blower motor ASSY |

GENERAL DESCRIPTION

HVAC SYSTEM (HEATER, VENTILATOR AND A/C)

3. CONTROL UNIT

• AUTO A/C MODEL

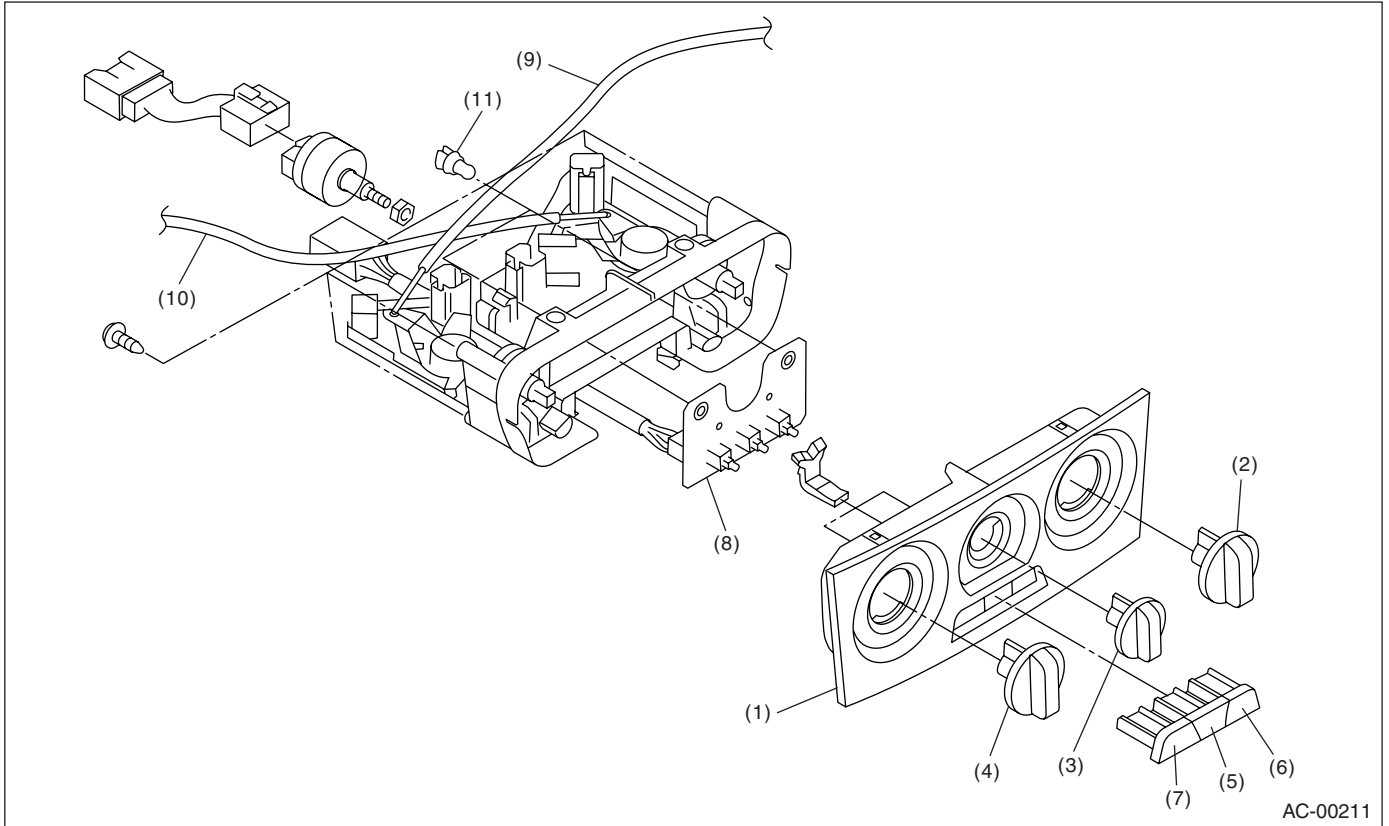


- | | | |
|------------------|--------------------------|-------------------------|
| (1) Panel | (4) Control case (front) | (7) Control case (rear) |
| (2) Control dial | (5) Bulb | |
| (3) Switch | (6) Control unit circuit | |

GENERAL DESCRIPTION

HVAC SYSTEM (HEATER, VENTILATOR AND A/C)

• MANUAL A/C MODEL

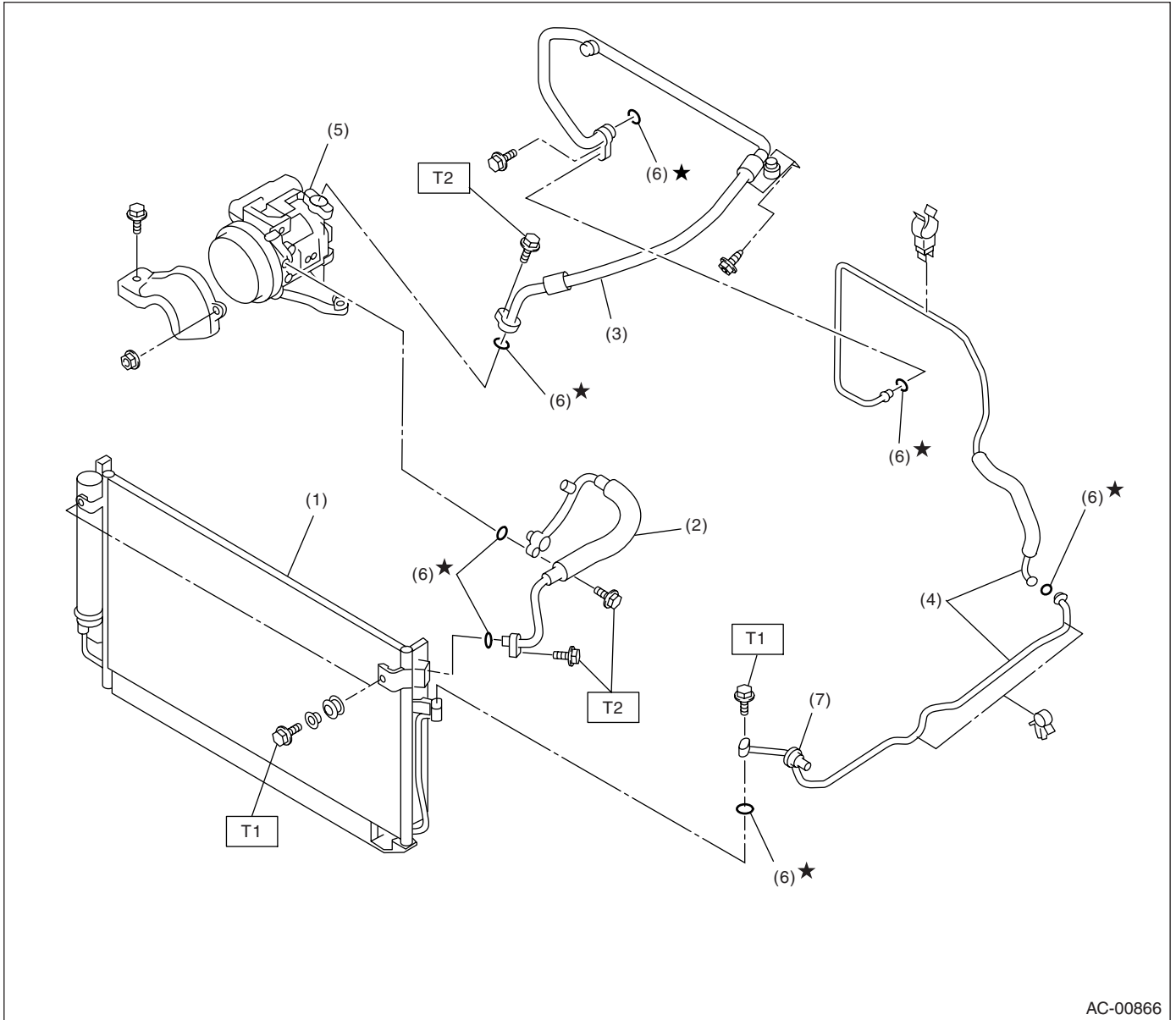


- | | | |
|------------------------------|-----------------------------|--------------------------------|
| (1) Panel | (5) A/C button | (9) Mode control cable |
| (2) Temperature control dial | (6) Air inlet select button | (10) Temperature control cable |
| (3) Fan dial | (7) Rear defogger button | (11) Bulb |
| (4) Mode control dial | (8) Switch circuit board | |

GENERAL DESCRIPTION

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4. AIR CONDITIONING UNIT



- (1) Condenser
- (2) Hose (High-pressure)
- (3) Hose (Low-pressure)
- (4) Pipe

- (5) Compressor
- (6) O-ring
- (7) Triple pressure switch

Tightening torque: N·m (kgf·m, ft·lb)

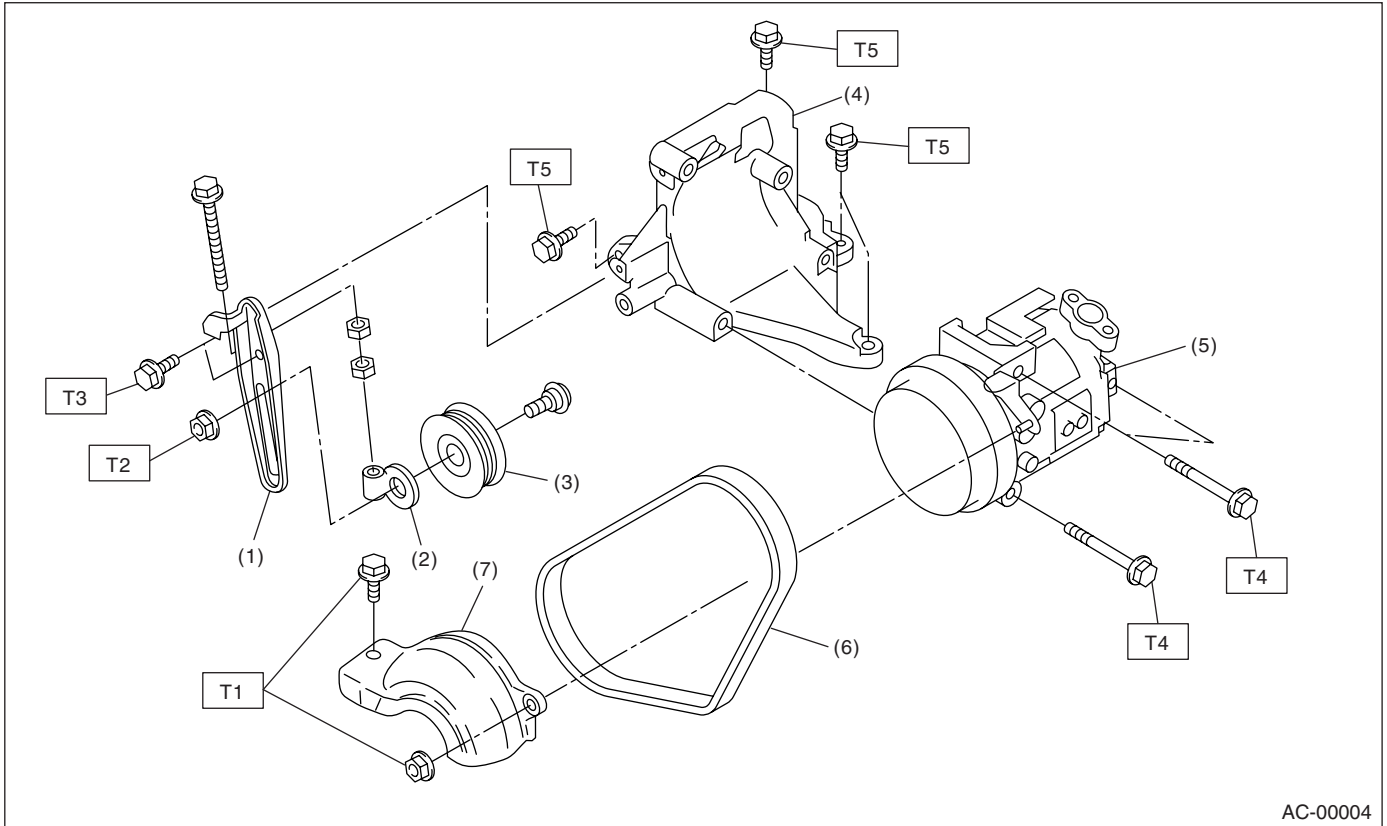
T1: 7.4 (0.75, 5.4)

T2: 15 (1.5, 10.8)

GENERAL DESCRIPTION

HVAC SYSTEM (HEATER, VENTILATOR AND A/C)

5. COMPRESSOR



AC-00004

- (1) Idler pulley bracket
- (2) Idler pulley adjuster
- (3) Idler pulley
- (4) Compressor bracket
- (5) Compressor
- (6) V-belt

- (7) Compressor belt cover (Non-turbo model)

Tightening torque: N-m (kgf-m, ft-lb)

T1: 4.0 (0.40, 2.95)

T2: 22.6 (2.3, 16.6)

T3: 23.0 (2.35, 17.0)

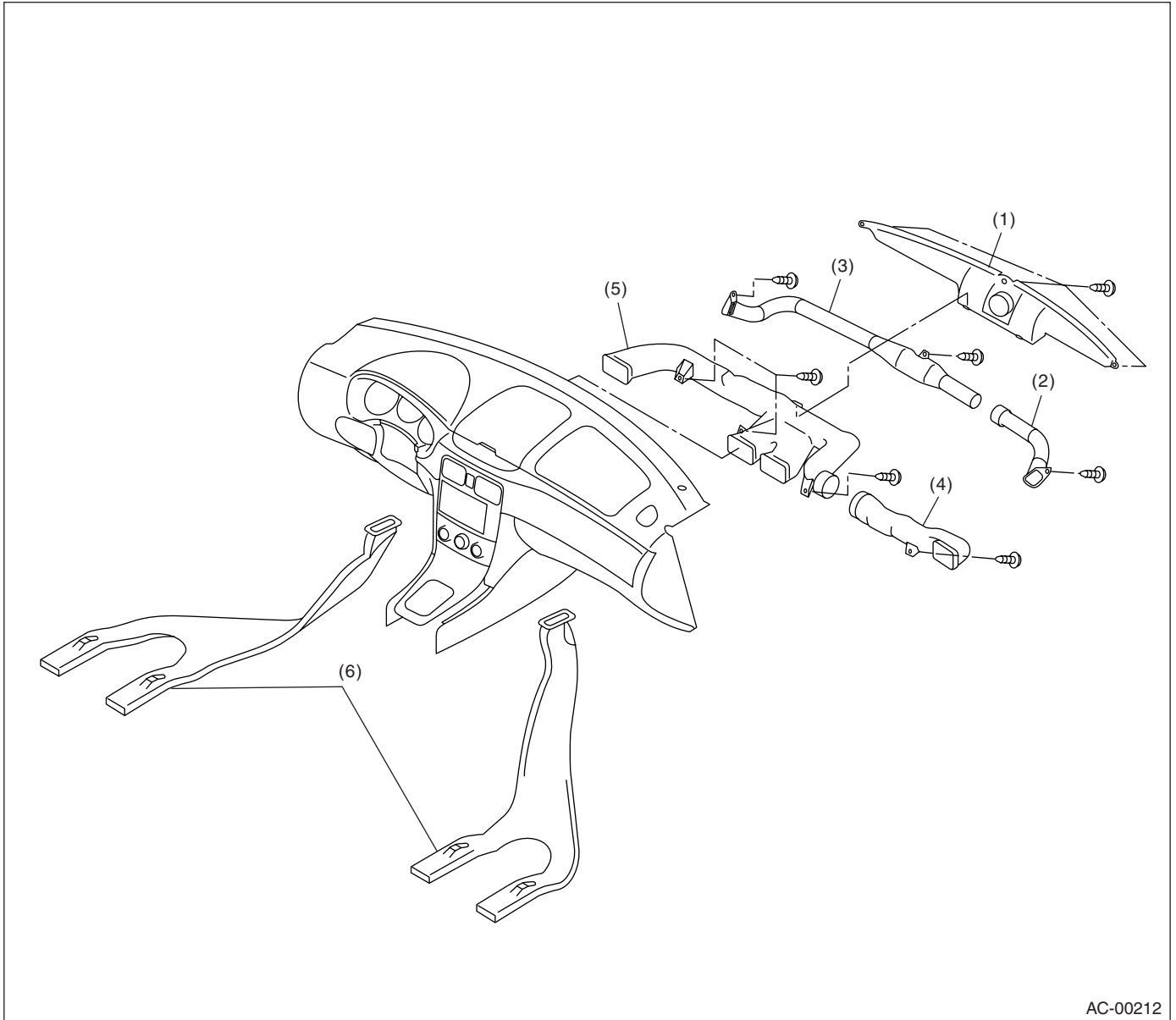
T4: 28.9 (2.95, 21.3)

T5: 35 (3.6, 26)

GENERAL DESCRIPTION

HVAC SYSTEM (HEATER, VENTILATOR AND A/C)

6. HEATER DUCT



AC-00212

(1) Front defroster nozzle
(2) Side defroster duct (LH)

(3) Side defroster duct (RH)
(4) Side ventilation duct (LH)

(5) Side ventilation duct (RH)
(6) Rear heater duct

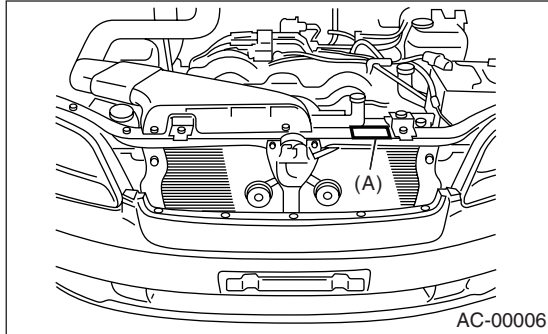
GENERAL DESCRIPTION

HVAC SYSTEM (HEATER, VENTILATOR AND A/C)

C: CAUTION

1. HFC-134a A/C SYSTEM

- Unlike the old conventional HFC-12 system components, the cooling system components for the HFC-134a system such as the refrigerant and compressor oil are incompatible.
- 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 in the vehicle.



2. COMPRESSOR OIL

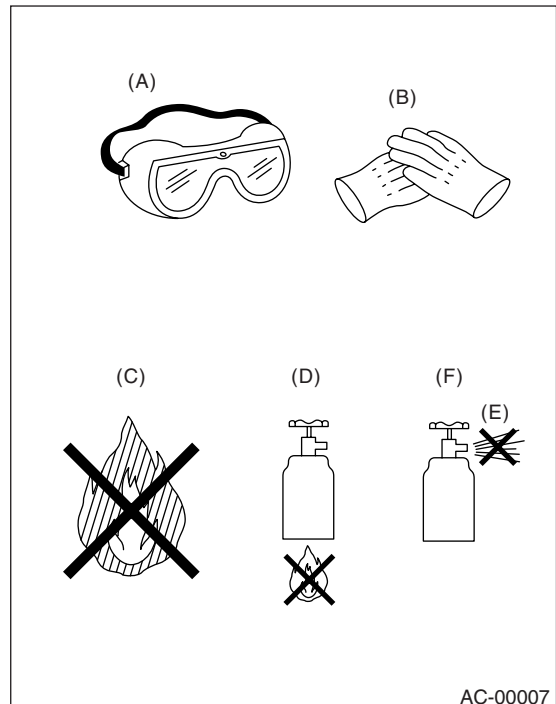
- HFC-134a compressor oil has no compatibility with that for R12 system.
- Use only the manufacturer-authorized compressor oil for the HFC-134a system; only use ZXL200PG.
- Do not mix multiple compressor oils. If HFC-12 compressor oil is used in a HFC-134a A/C system, the compressor may become stuck 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 HFC-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 the 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 HFC-12 refrigerant cannot be used in the HFC-134a A/C system. The HFC-134a refrigerant, also, cannot be used in the HFC-12 A/C system.
- If an incorrect or no refrigerant is used, poor lubrication will result 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 safety 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 the 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.



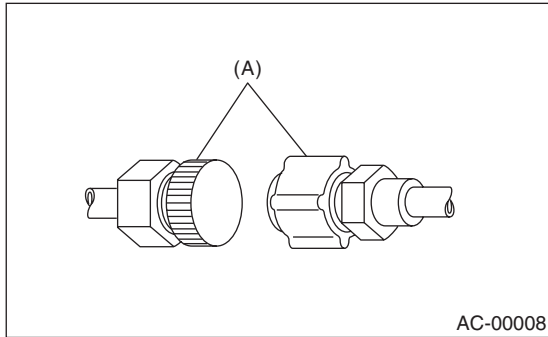
- (A) Goggles
- (B) Gloves
- (C) Avoid open flame
- (D) No direct heat on container
- (E) Do not discharge
- (F) Loosen

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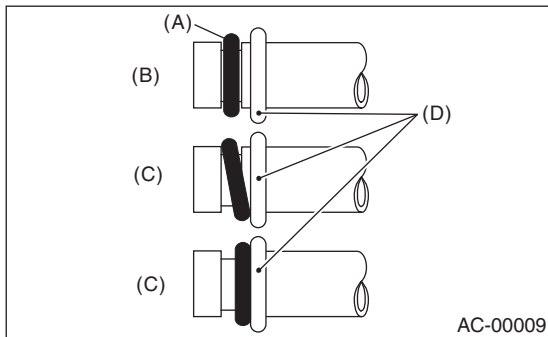
5. O-RING CONNECTIONS

- Use new O-rings.
- In order to keep the O-rings free of lint which will cause a refrigerant gas leak, perform operations without gloves and shop cloths.
- Apply the compressor oil to the O-rings to avoid sticking, then install them.
- Use a torque wrench to tighten the O-ring fittings: Over-tightening will damage the 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 contamination from entering.



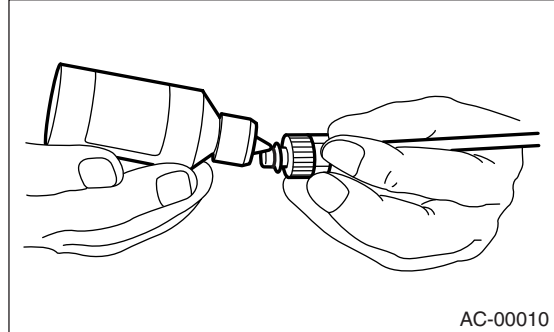
(A) Seal

- 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 the tube beads.



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

- Use the oil specified in the service manual to lubricate the O-rings. Apply the oil to the top and sides of the O-rings before installation. Apply the oil to the area including the O-rings and tube beads.



- After tightening, use a clean shop cloth to remove excess 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 retighten the connections, disconnect the connections, remove the O-rings, and check the O-rings, threads, and connections.

D: PREPARATION TOOL

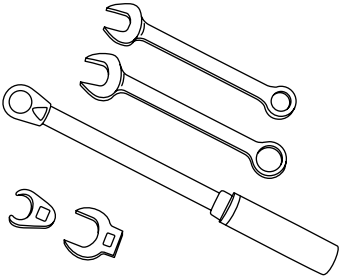
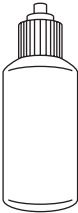
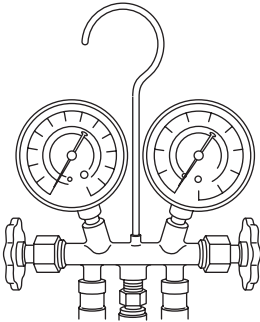
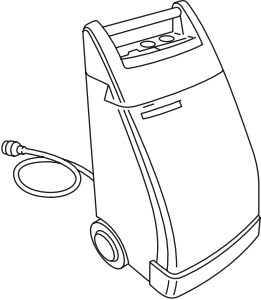
CAUTION:

When working on vehicles with the HFC-134a system, only use HFC-134a specified tools and parts. Do not mix with CFC-12 tools and parts. If HFC-134a and CFC-12 refrigerant or compressor oil is mixed, poor lubrication will result and the compressor itself may be destroyed. In order to help prevent mixing 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

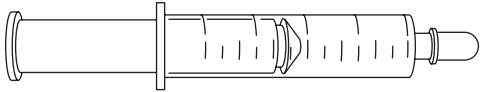
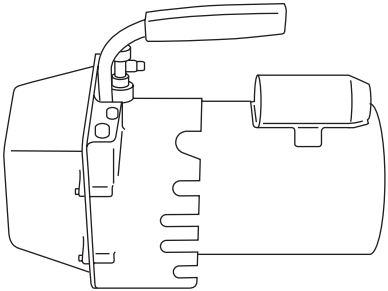
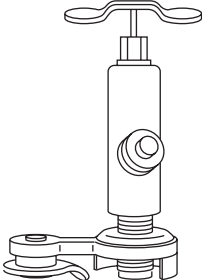
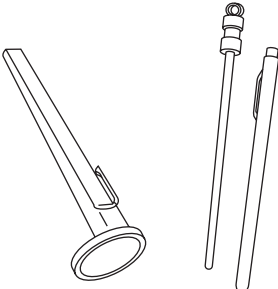
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Description	Tools and Equipment
 <p style="text-align: right;">AC-00213</p>	<p>Wrench</p> <p>Various WRENCHES will be required to service any A/C system. A 7 to 40 N·m (0.7 to 4.1 kgf-m, 5 to 30 ft-lb) torque wrench with various crow-foot wrenches will be needed. Open end or flare nut wrenches will be needed for back-up on the tube and hose fittings.</p>
 <p style="text-align: right;">AC-00012</p>	<p>Applicator bottle</p> <p>A small APPLICATOR BOTTLE is recommended to apply refrigerant oil to the various parts. They can be obtained at a hardware or drug store.</p>
 <p style="text-align: right;">AC-00013</p>	<p>Manifold gauge set</p> <p>A MANIFOLD GAUGE SET (with hoses) can be obtained from either a commercial refrigeration supply house or from an auto shop equipment supplier.</p>
 <p style="text-align: right;">AC-00014</p>	<p>Refrigerant recovery system</p> <p>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.</p>

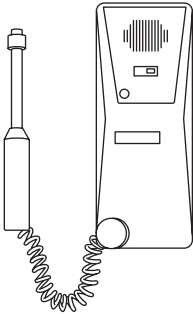
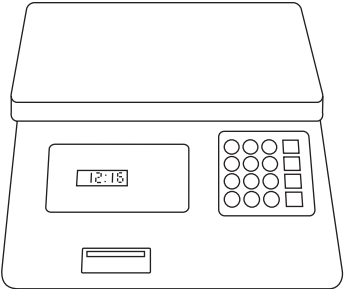
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HVAC SYSTEM (HEATER, VENTILATOR AND A/C)

Description	Tools and Equipment
 <p>AC-00015</p>	<p>Syringe</p> <p>A graduated plastic SYRINGE will be needed to add oil back into the system. The syringe can be found at a pharmacy or drug store.</p>
 <p>AC-00016</p>	<p>Vacuum pump</p> <p>A VACUUM PUMP (in good working condition) is necessary, and may be obtained from either a commercial refrigeration supply house or an automotive equipment supplier.</p>
 <p>AC-00017</p>	<p>Can tap</p> <p>A CAN TAP for the 397 g (14 oz) can is available from an auto supply store.</p>
 <p>AC-00018</p>	<p>Thermometer</p> <p>Pocket THERMOMETERS are available from either industrial hardware store or commercial refrigeration supply houses.</p>

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HVAC SYSTEM (HEATER, VENTILATOR AND A/C)

Description	Tools and Equipment
 <p>AC-00019</p>	<p>Electronic leak detector</p> <p>An ELECTRONIC LEAK DETECTOR can be obtained from either a specialty tool supply or an A/C equipment supplier.</p>
 <p>AC-00020</p>	<p>Weight scale</p> <p>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.</p>