

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		450 m ³ (15,892 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)		163.9 × 200 × 25.0 mm (6.45 × 7.87 × 0.984 in)	—
Blower motor	Type	Magnet motor 200 W or less	at 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		Specifications
Type of air conditioner		Reheat air-mix type
Cooling capacity		5.1 kW (4,385 kcal/h, 17,402 BTU/h)
Refrigerant		HFC-134a (CH ₂ FCF ₃) [0.5±0.05 kg (0.99±0.11 lb)]
Compressor	Type	Vane rotary, fix volume (CR-14)
	Discharge	144 cm ³ (8.79 cu in)/rev
	Max. permissible speed	7,000 rpm
Magnet clutch	Type	Dry, single-disc type
	Power consumption	47 W
	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	0.21 m ² (2.26 sq ft)
	Core thickness	16 mm (0.63 in)
	Radiation area	5.34 m ² (57.48 sq ft)
Receiver drier	Effective inner capacity	250 cm ³ (15.26 cu in)
Expansion valve	Type	Internal equalizing
Evaporator	Type	Single tank
	Dimensions (W × H × T)	255 × 200 × 48 mm (10 × 7.87 × 1.89 in)
Blower fan	Fan type	Sirocco fan
	Outer diameter × width	150 × 75 mm (5.91 × 2.95 in)
	Power consumption	200 W
Condenser fan (Sub fan)	Motor type	Magnet
	Power consumption	120 W
	Fan outer diameter	320 mm (12.6 in)

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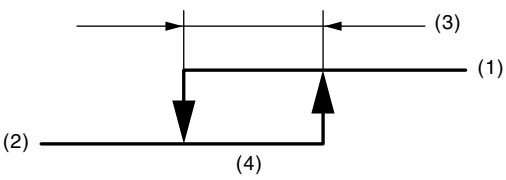
Radiator fan (Main fan)		Motor type	Magnet
		Power consumption	120 W
		Fan outer diameter	320 mm (12.6 in)
Idling speed (A/C ON)		MPFI model	850±100 rpm
Dual switch (Pressure switch)	Low-pressure switch operating pressure	ON → OFF	278±29 kPa (2.83±0.3 kg/cm ² , 40.3±4.2 psi)
		OFF → ON	287 ⁺³⁹ / ₋₂₅ kPa (2.9 ^{+0.4} / _{-0.25} kg/cm ² , 42 ^{+5.7} / _{-3.6} psi)
	High-pressure switch operating pressure	ON → OFF	2,800±100 kPa (29±1 kg/cm ² , 406±15 psi)
		Difference	600±200 kPa (6.12±2 kg/cm ² , 87±29 psi)
Thermo control amplifier working temperature (Evaporator outlet air)		<p style="text-align: right;">AC-00601</p>	
		(1) ON (2) OFF (3) 2.5±0.5°C (36.5±0.9°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	5.1 kW (4,385 kcal/h, 17,402 BTU/h)	
Refrigerant	HFC-134a (CH ₂ FCF ₃) [0.5±0.05 kg (1.10±0.11 lb)]	
Compressor	Type	Vane rotary, fix volume (CR-14)
	Discharge	144 cm ³ (8.79 cu in)/rev
	Max. permissible speed	7,000 rpm
Magnet clutch	Type	Dry, single-disc type
	Power consumption	47 W
	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	0.21 m ² (2.26 sq ft)
	Core thickness	16 mm (0.63 in)
	Radiation area	5.34 m ² (57.48 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)	255 × 200 × 48 mm (10 × 7.87 × 1.89 in)

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Blower fan		Fan type	Sirocco fan
		Outer diameter × width	150 × 75 mm (5.91 × 2.95 in)
		Power consumption	200 W
Condenser fan (Sub fan)		Motor type	Magnet
		Power consumption	120 W (Turbo model), 70 W (Non-turbo model)
		Fan outer diameter	320 mm (12.6 in)
Radiator fan (Main fan)		Motor type	Magnet
		Power consumption	120 W (Turbo model), 70 W (Non-turbo model)
		Fan outer diameter	320 mm (12.6 in)
Idle speed (A/C ON)		MPFI model	850±100 rpm
Dual switch (Pressure switch)	Low-pressure switch operating pressure	ON → OFF	278±29 kPa (2.83±0.3 kg/cm ² , 40.3±4.2 psi)
		OFF → ON	287 ⁺³⁹ / ₋₂₅ kPa (2.9 ^{+0.4} / _{-0.25} kg/cm ² , 42 ^{+5.7} / _{-3.6} psi)
	High-pressure switch operating pressure	ON → OFF	2,800±100 kPa (29±1 kg/cm ² , 406±15 psi)
		Difference	600±200 kPa (6.12±2 kg/cm ² , 87±29 psi)
Thermo control amplifier working temperature (Evaporator outlet air)		 <p style="text-align: right;">AC-00601</p>	
		(1) ON (2) OFF (3) 1.5±0.5°C (35±0.9°F) (4) 3.0±0.5°C (37±0.9°F)	

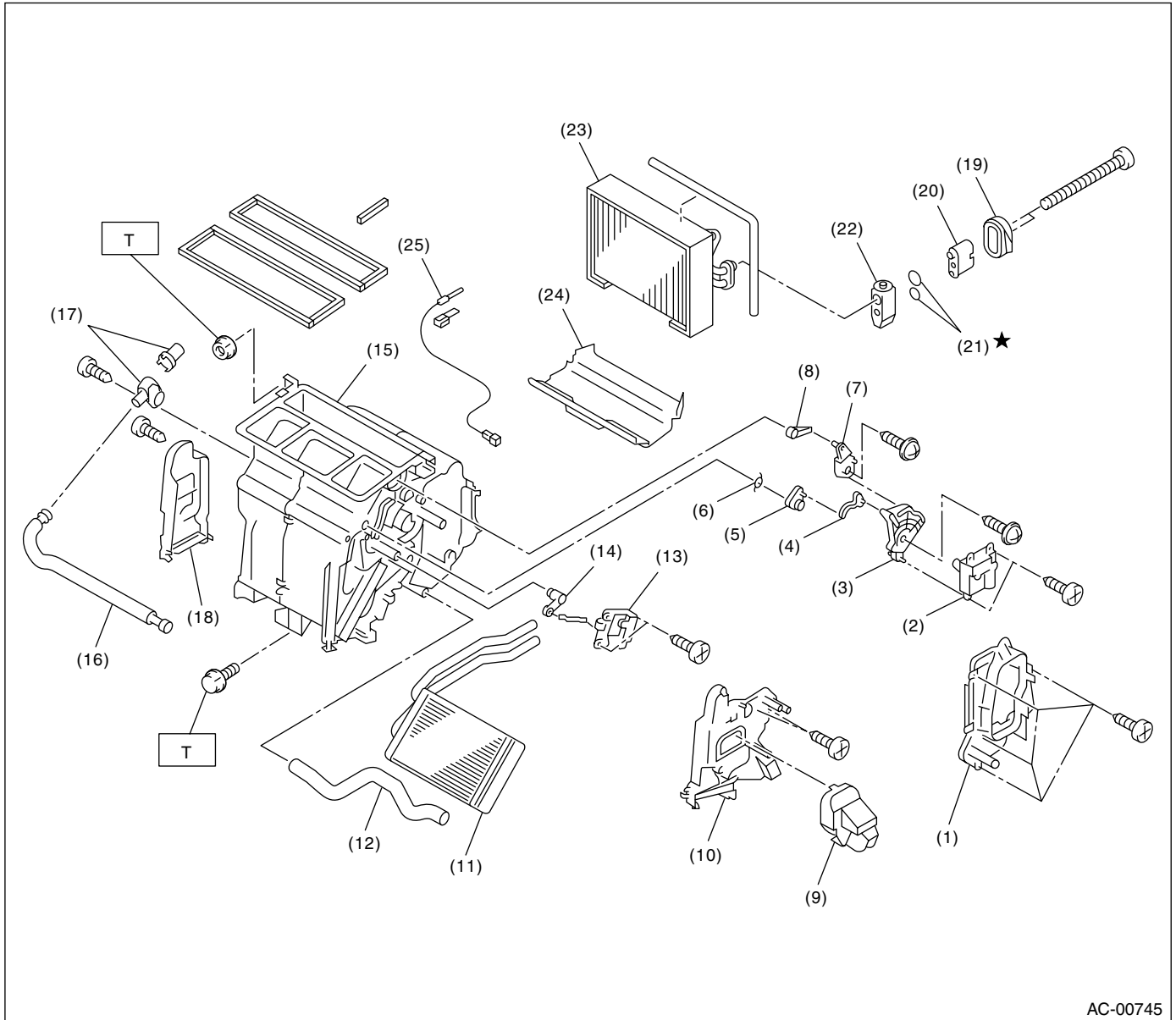
GENERAL DESCRIPTION

HVAC SYSTEM (HEATER, VENTILATOR AND A/C)

B: COMPONENT

1. HEATER COOLING UNIT

• AUTO A/C MODEL



AC-00745

- | | |
|-------------------------|-------------------------|
| (1) Unit cover | (11) Heater core |
| (2) Mode actuator | (12) Drain hose |
| (3) Side link | (13) Mix actuator |
| (4) Mode actuator lever | (14) Mix actuator lever |
| (5) Foot lever | (15) Unit assembly |
| (6) Spring | (16) Aspirator hose |
| (7) Mode actuator link | (17) Aspirator |
| (8) Defroster lever | (18) Foot duct |
| (9) Foot nozzle | (19) Packing |
| (10) Unit duct cover | (20) Cooling unit block |

- | |
|-----------------------|
| (21) O-ring |
| (22) Expansion valve |
| (23) Evaporator |
| (24) Evaporator cover |
| (25) Thermistor |

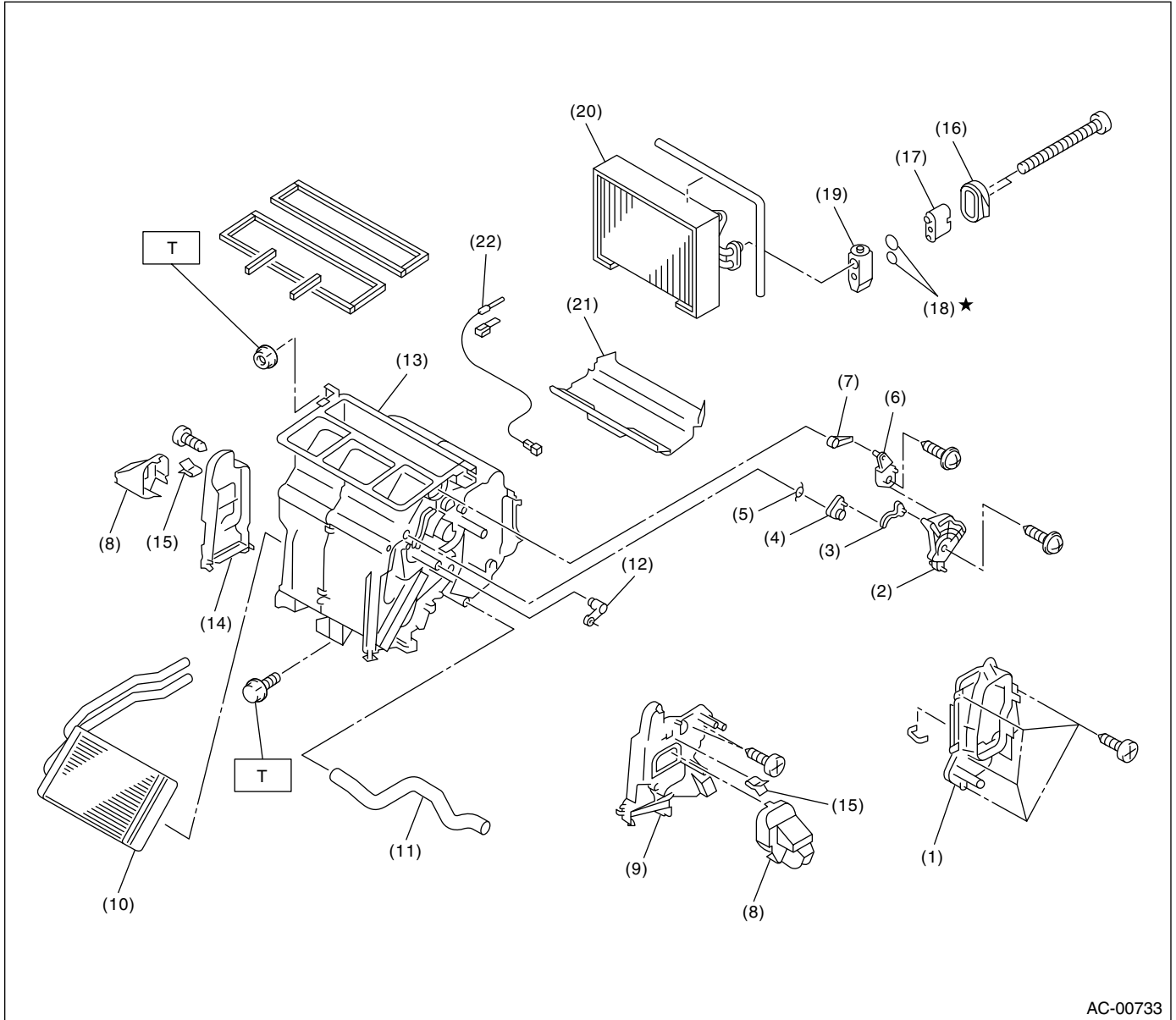
Tightening torque: N·m (kgf·m, ft·lb)

T: 7.4 (0.75, 5.4)

GENERAL DESCRIPTION

HVAC SYSTEM (HEATER, VENTILATOR AND A/C)

• MANUAL A/C MODEL



- | | | |
|---------------------|-------------------------|-----------------------|
| (1) Unit cover | (10) Heater core | (19) Expansion valve |
| (2) Side link | (11) Drain hose | (20) Evaporator |
| (3) Mode lever | (12) Mix lever | (21) Evaporator cover |
| (4) Foot lever | (13) Unit assembly | (22) Thermistor |
| (5) Spring | (14) Foot duct | |
| (6) Mode link | (15) Clip | |
| (7) Defroster lever | (16) Packing | |
| (8) Foot nozzle | (17) Cooling unit block | |
| (9) Unit duct cover | (18) O-ring | |

Tightening torque: N·m (kgf·m, ft·lb)

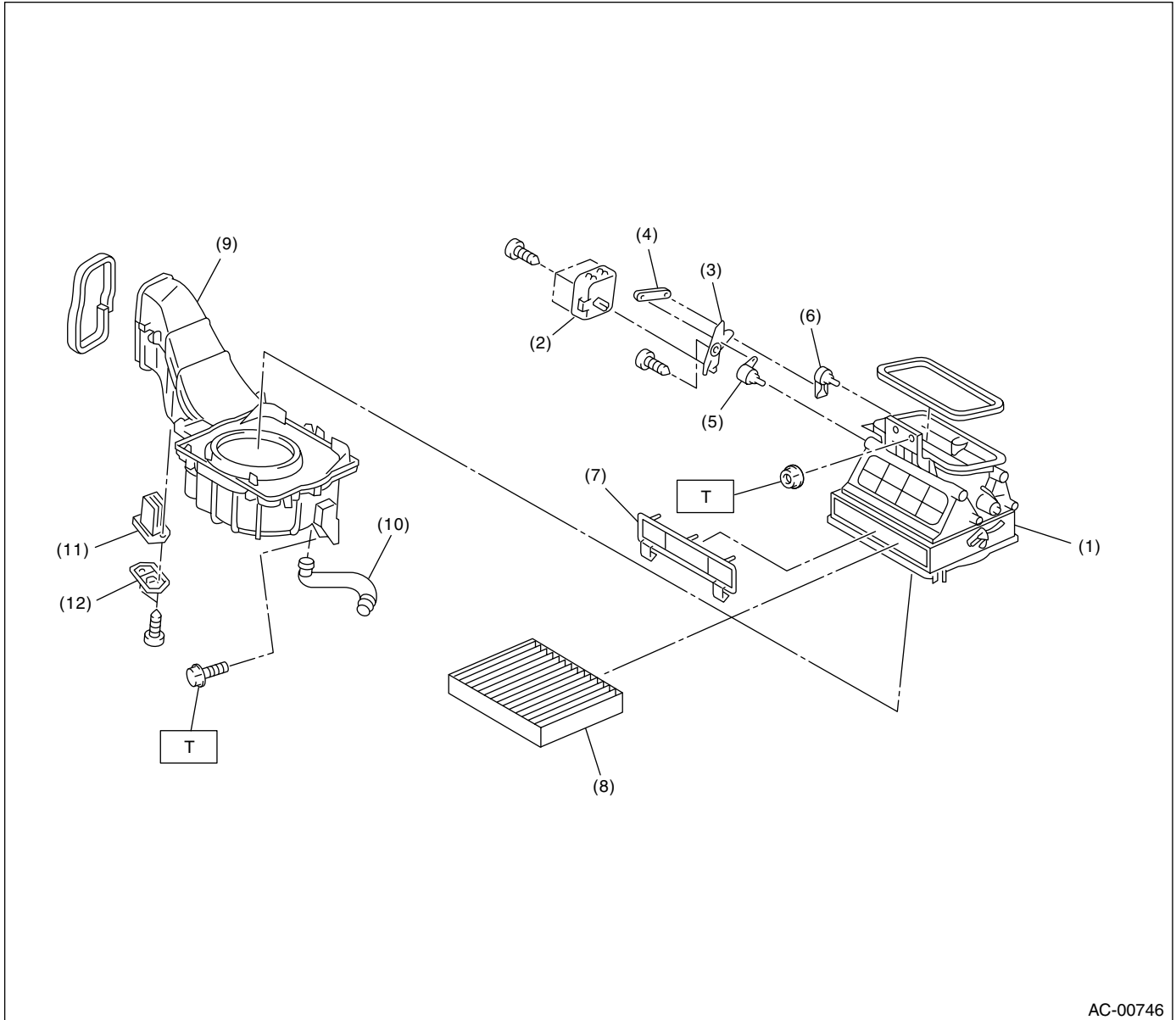
T: 7.4 (0.75, 5.4)

GENERAL DESCRIPTION

HVAC SYSTEM (HEATER, VENTILATOR AND A/C)

2. BLOWER MOTOR UNIT

• AUTO A/C MODEL



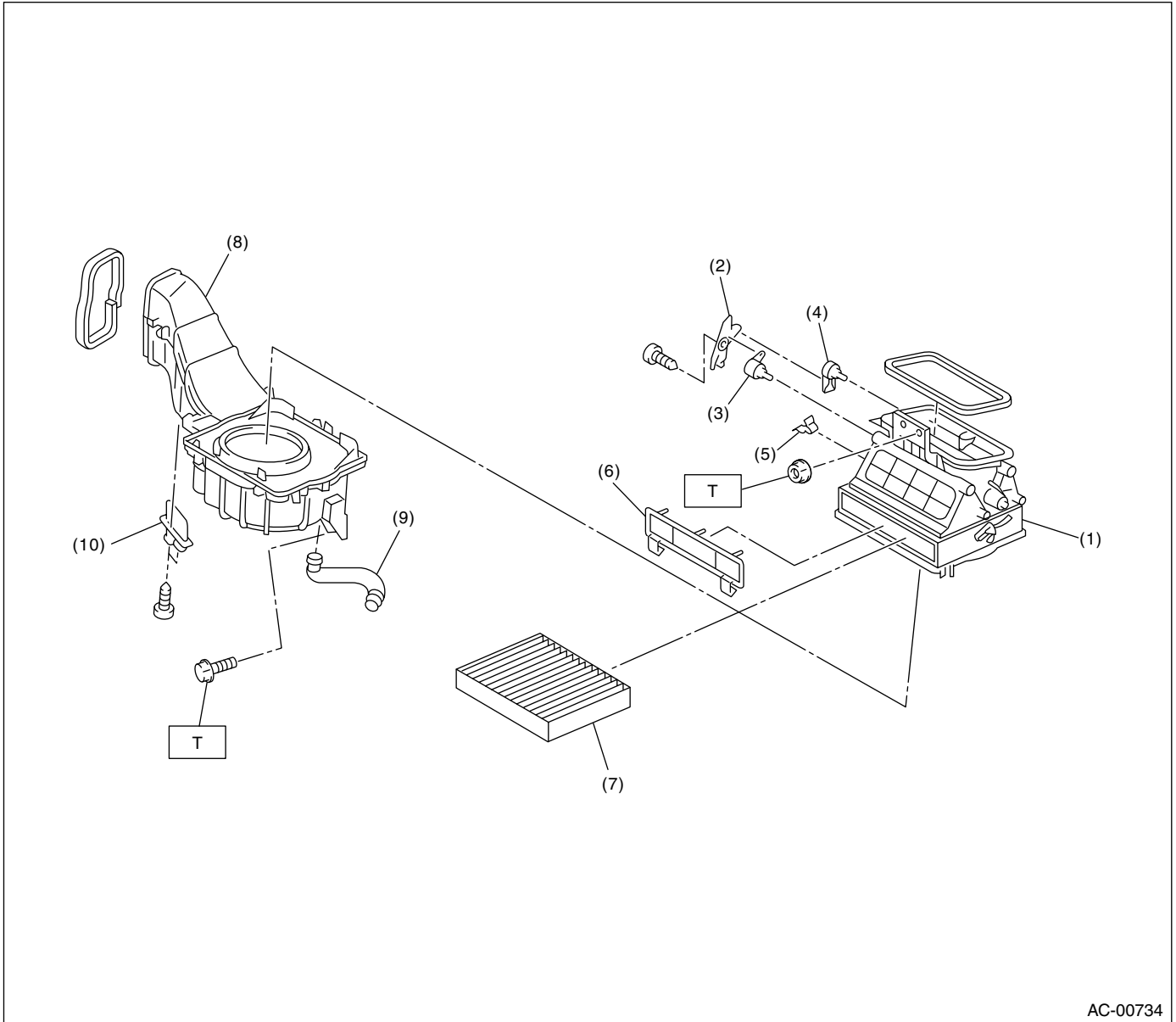
- | | | |
|-------------------------|---------------------------|-----------------------------|
| (1) Upper case | (6) Blower link lever C | (11) Power transistor |
| (2) Servo motor | (7) Filter cover | (12) Power transistor cover |
| (3) Blower link | (8) Filter | |
| (4) Blower link lever A | (9) Blower motor assembly | |
| (5) Blower link lever B | (10) Hose | |

Tightening torque: N·m (kgf·m, ft·lb)
T: 7.4 (0.75, 5.4)

GENERAL DESCRIPTION

HVAC SYSTEM (HEATER, VENTILATOR AND A/C)

• MANUAL A/C MODEL



- | | |
|-------------------------|---------------------------|
| (1) Upper case | (6) Filter cover |
| (2) Blower link | (7) Filter |
| (3) Blower link lever A | (8) Blower motor assembly |
| (4) Blower link lever B | (9) Hose |
| (5) Clip | (10) Blower resistor |

Tightening torque: N·m (kgf·m, ft·lb)

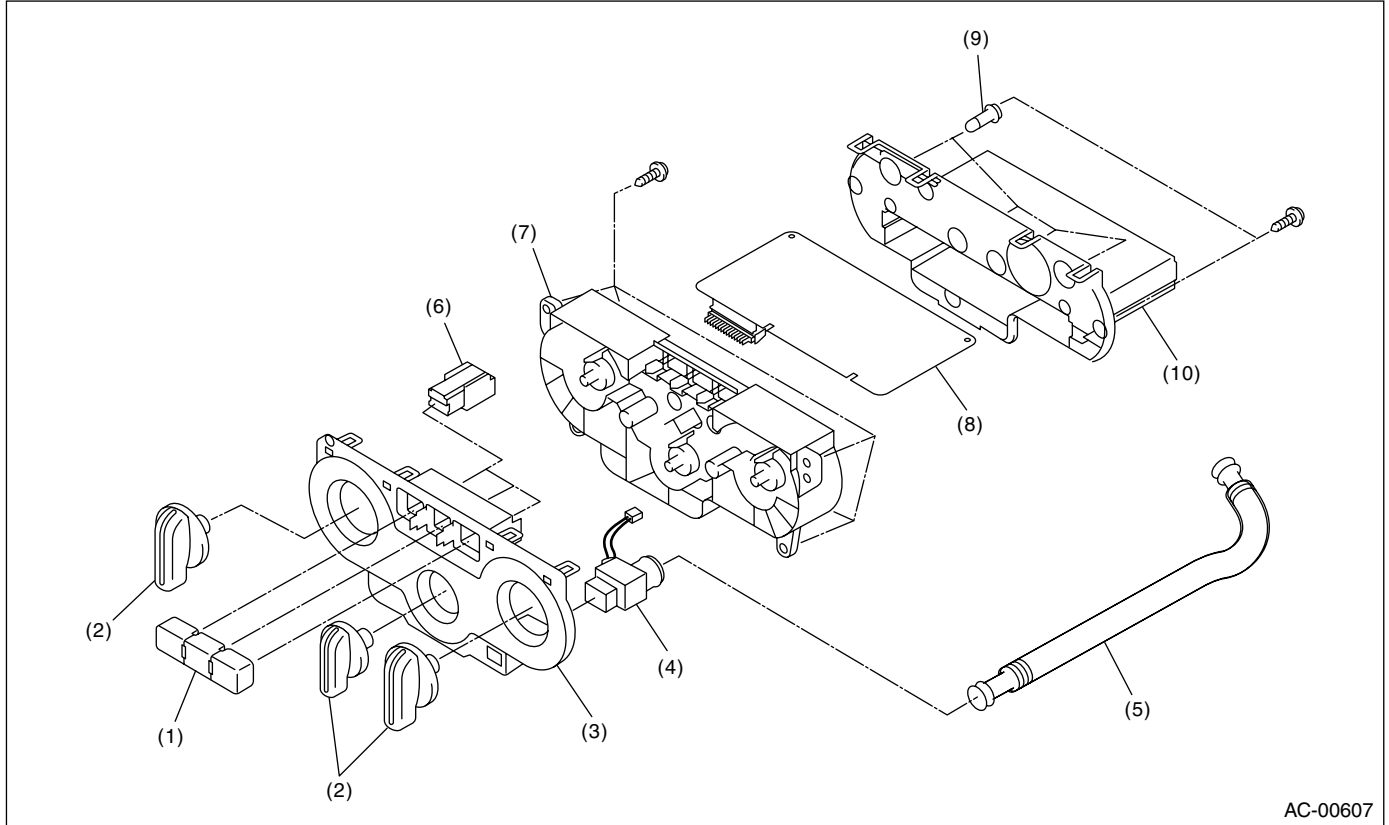
T: 7.4 (0.75, 5.4)

GENERAL DESCRIPTION

HVAC SYSTEM (HEATER, VENTILATOR AND A/C)

3. CONTROL UNIT

• AUTO A/C MODEL



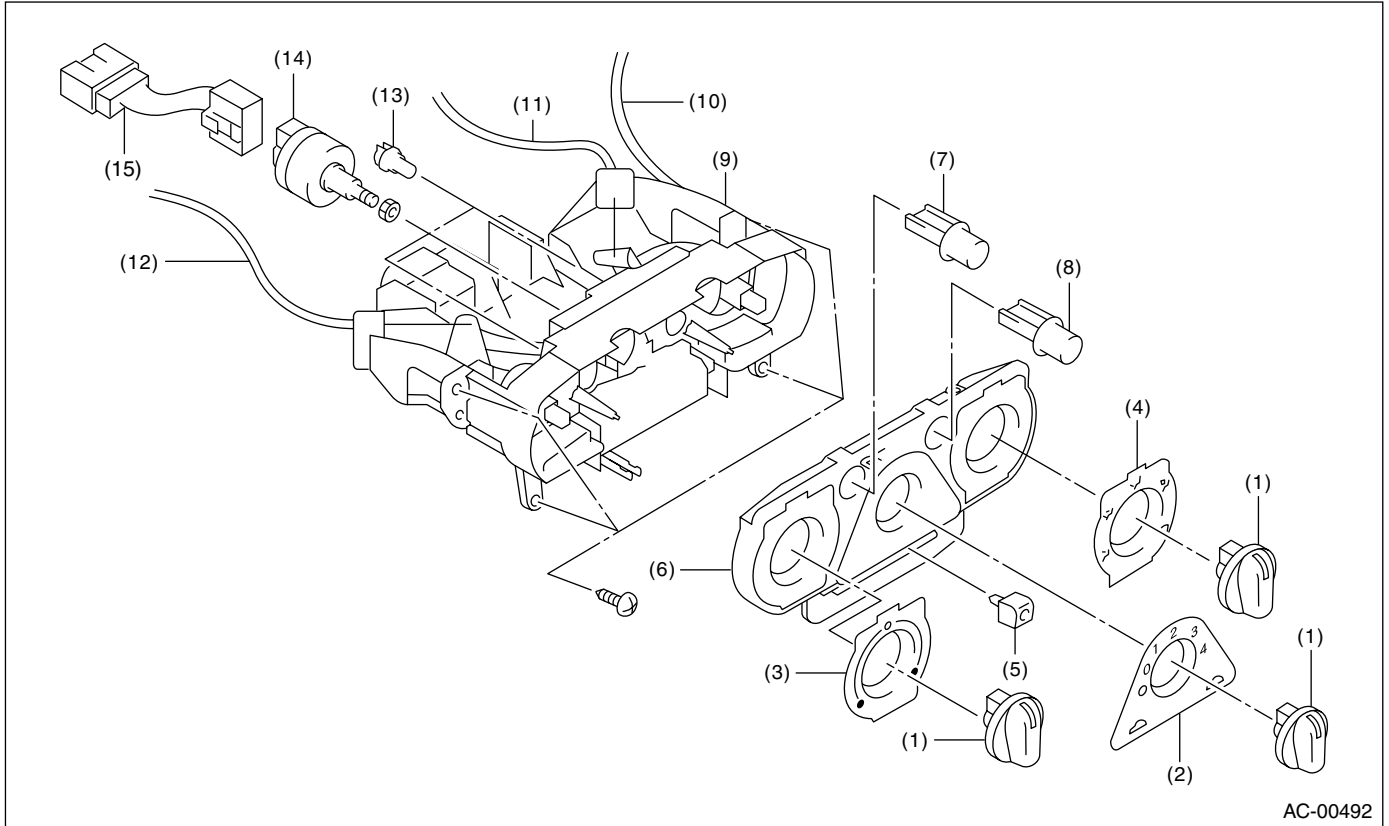
AC-00607

- | | | |
|-----------------------|-----------------------------|-------------------|
| (1) Switch | (5) Aspirator hose | (9) Bulb |
| (2) Control lever | (6) Switch assembly | (10) Control case |
| (3) Control panel | (7) Control base | |
| (4) In-vehicle sensor | (8) Electronic control unit | |

GENERAL DESCRIPTION

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• MANUAL A/C MODEL

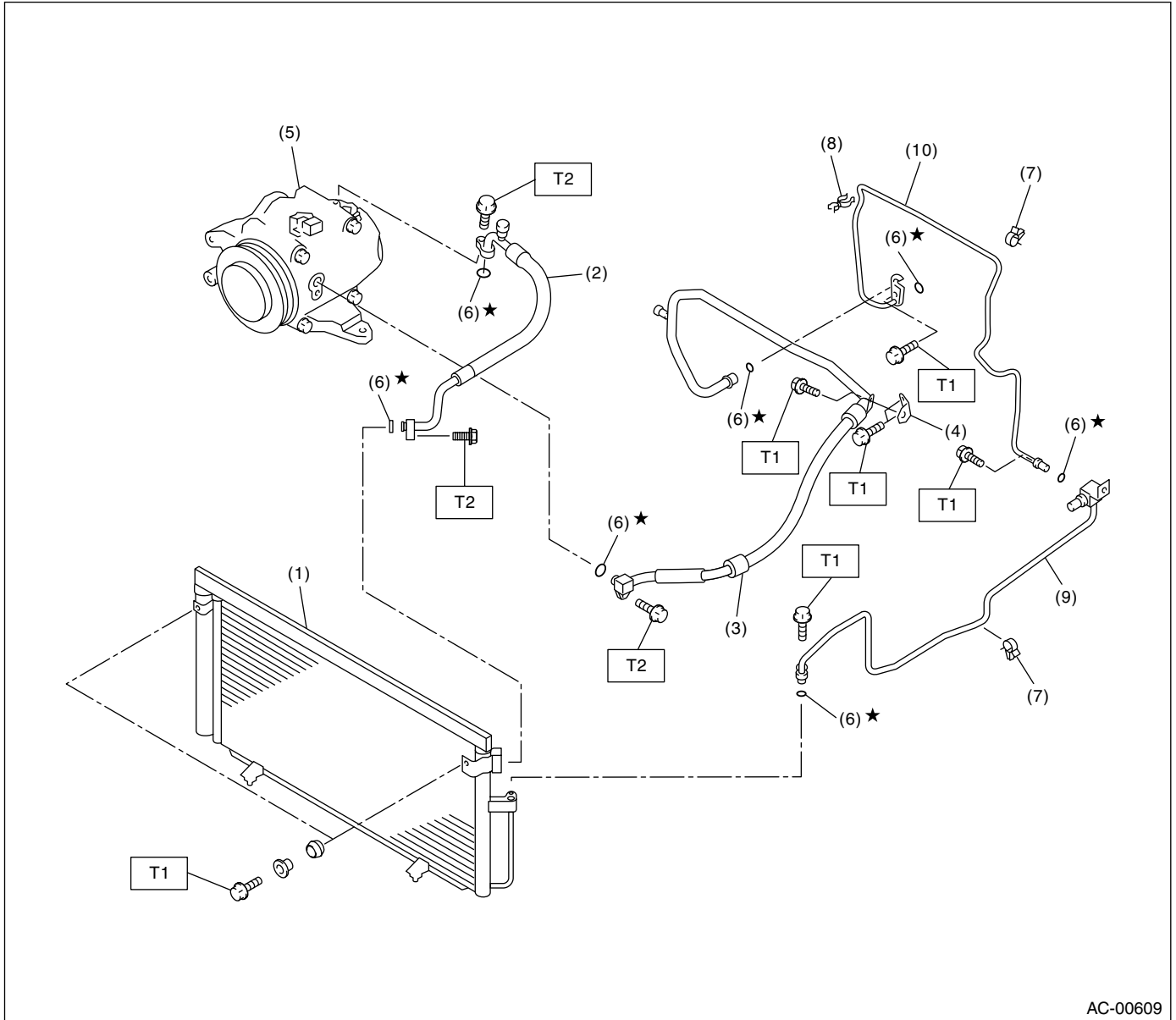


- | | | |
|---------------------------------|---------------------------------|------------------------|
| (1) Dial | (6) Heater control panel | (11) Mode cable |
| (2) Fan control plate | (7) A/C switch | (12) Temperature cable |
| (3) Temperature control plate | (8) Rear window defogger switch | (13) Bulb |
| (4) Mode control plate | (9) Heater control base | (14) Fan switch ASSY |
| (5) FRESH/RECIRC switching knob | (10) Intake cable | (15) Harness |

GENERAL DESCRIPTION

HVAC SYSTEM (HEATER, VENTILATOR AND A/C)

4. AIR CONDITIONING UNIT



AC-00609

- | | |
|--------------------------|---------------------------|
| (1) Condenser | (6) O-ring |
| (2) Hose (High-pressure) | (7) Clamp A |
| (3) Hose (Low-pressure) | (8) Clamp B |
| (4) Bracket | (9) Tube (To condenser) |
| (5) Compressor | (10) Tube (To evaporator) |

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

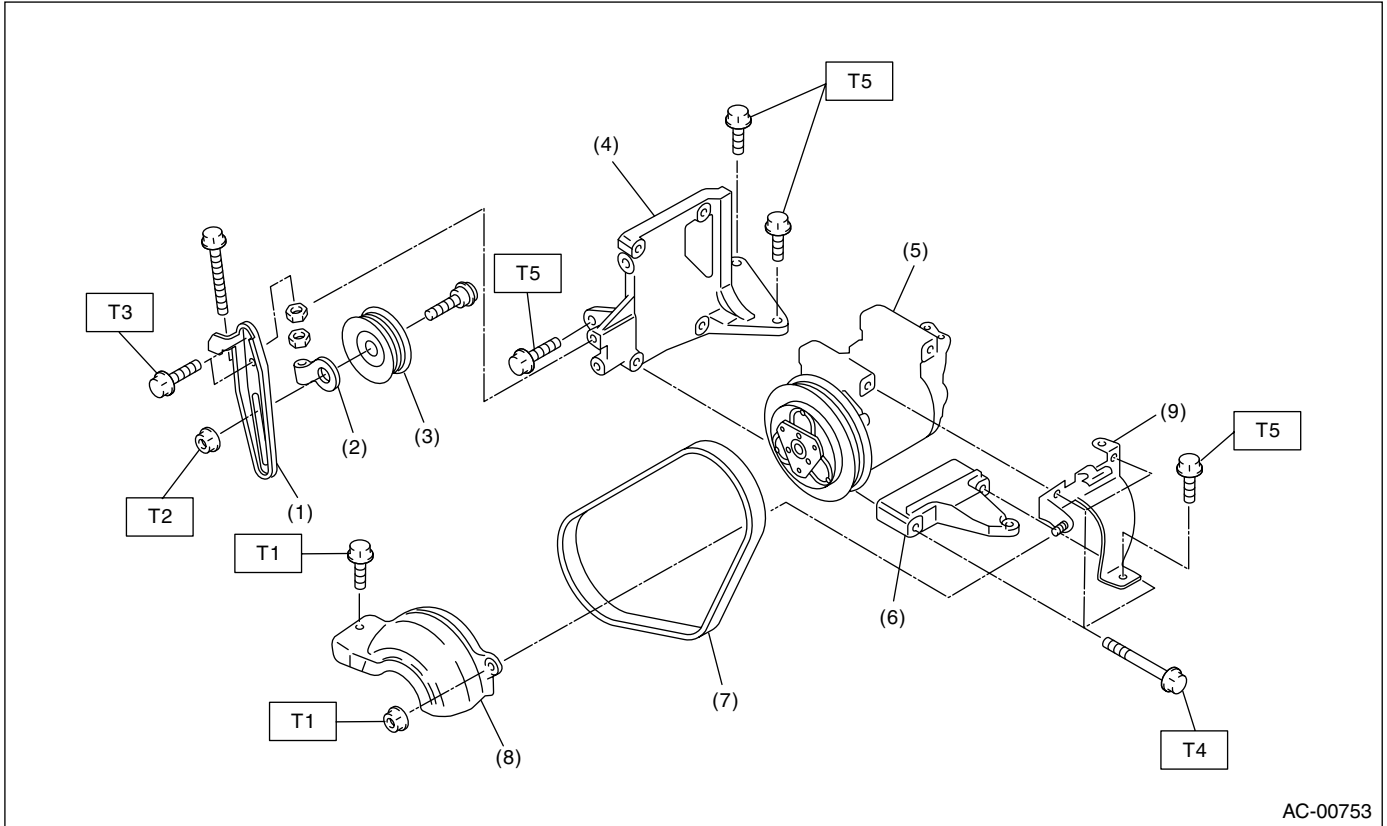
T1: 7.4 (0.75, 5.4)

T2: 15 (1.5, 10.8)

GENERAL DESCRIPTION

HVAC SYSTEM (HEATER, VENTILATOR AND A/C)

5. COMPRESSOR



AC-00753

- | | |
|------------------------------|-----------------------------------|
| (1) Idler pulley bracket | (7) V-belt |
| (2) Idler pulley adjuster | (8) Compressor belt cover |
| (3) Idler pulley | (9) Compressor belt cover bracket |
| (4) Compressor upper bracket | |
| (5) Compressor | |
| (6) Compressor lower bracket | |

Tightening torque: N·m (kgf·m, ft·lb)

T1: 7.4 (0.75, 5.4)

T2: 22.6 (2.3, 16.6)

T3: 23.0 (2.35, 17.0)

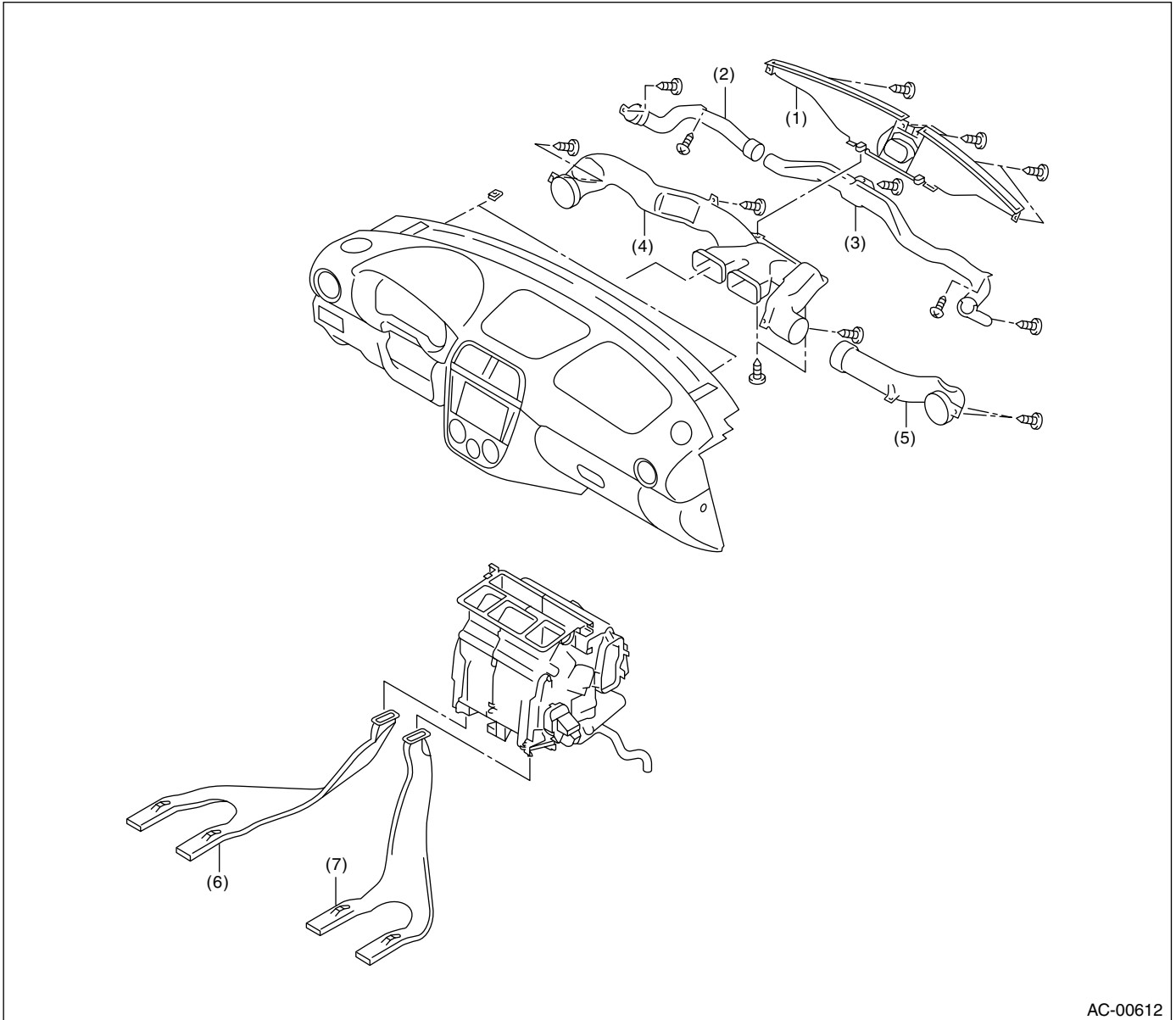
T4: 28.9 (2.95, 21.3)

T5: 35 (3.6, 26)

GENERAL DESCRIPTION

HVAC SYSTEM (HEATER, VENTILATOR AND A/C)

6. HEATER DUCT



AC-00612

- | | | |
|------------------------------|--------------------------------|---------------------------|
| (1) Front defroster nozzle | (4) Side ventilation duct (LH) | (7) Rear heater duct (RH) |
| (2) Side defroster duct (LH) | (5) Side ventilation duct (RH) | |
| (3) Side defroster duct (RH) | (6) Rear heater duct (LH) | |

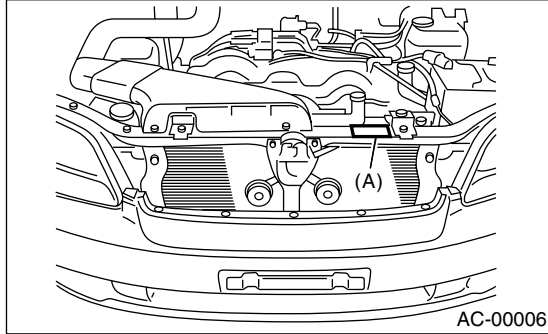
GENERAL DESCRIPTION

HVAC SYSTEM (HEATER, VENTILATOR AND A/C)

C: CAUTION

1. HFC-134a A/C SYSTEM

- Unlike the old conventional CFC-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

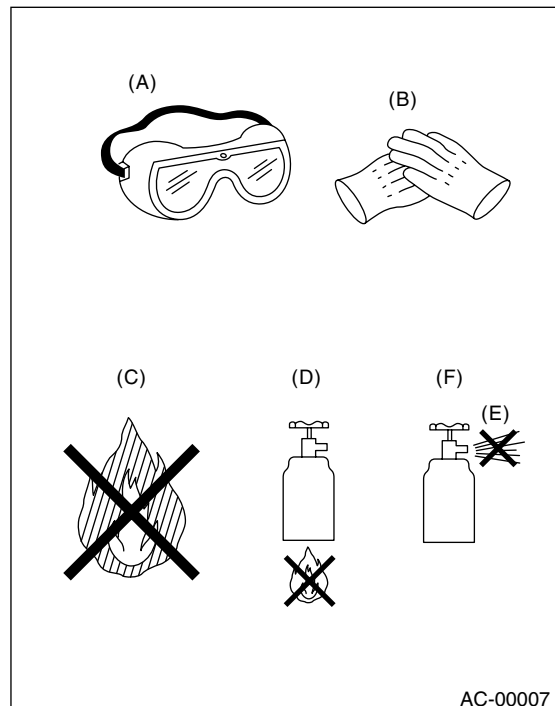
- HFC-134a compressor oil has no compatibility with that for R12 system.
 - Use only the manufacturer-authorized compressor oil for the HFC-134a system; only use DH-PR.
 - Do not mix multiple compressor oils.
- If CFC-12 compressor oil is used in a HFC-134a A/C system, the compressor may become stuck 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 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 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 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, 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.



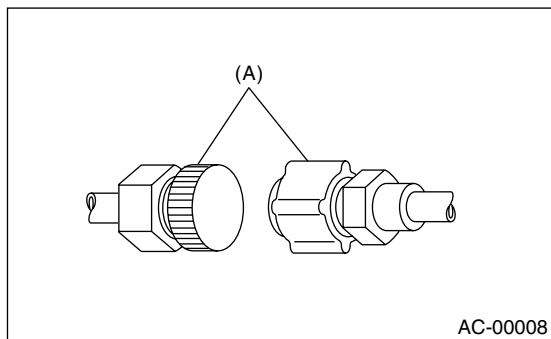
- (A) Goggles
- (B) Gloves
- (C) Avoid open flame
- (D) No direct heat on container
- (E) Do not discharge
- (F) Loosen

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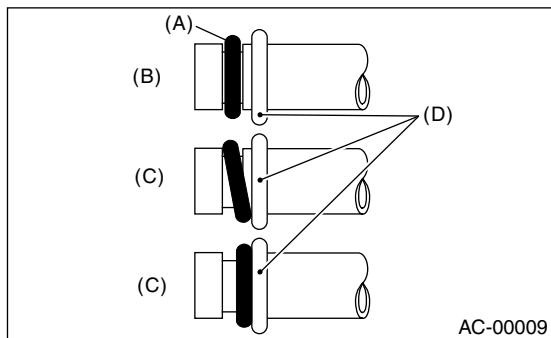
5. O-RING CONNECTIONS

- 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.



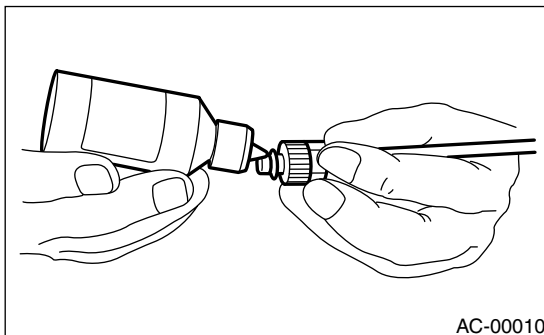
(A) Seal

- 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 beards.



- (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

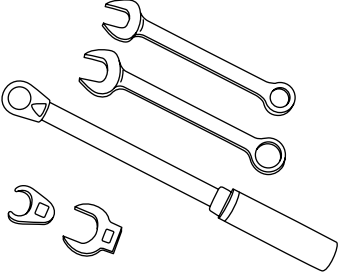
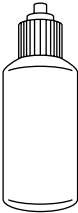
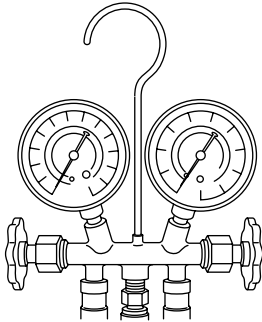
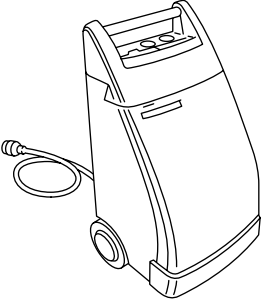
CAUTION:

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

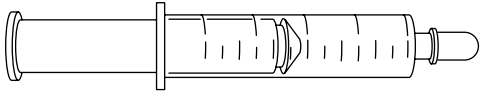
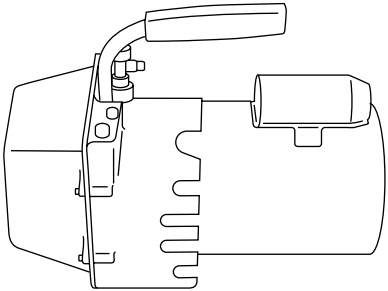
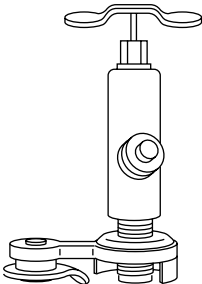
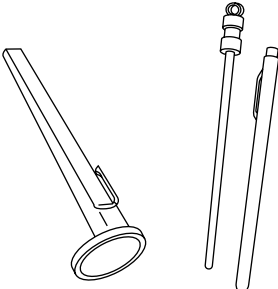
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Description	Tools and Equipment
 <p style="text-align: right;">AC-00213</p>	<p>Wrench</p> <p>Various WRENCHES will be required to service any A/C system. A 7 to 40 N·m (0.7 to 4.1 kgf-m, 5 to 30 ft-lb) torque wrench with various crowfoot wrenches will 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>

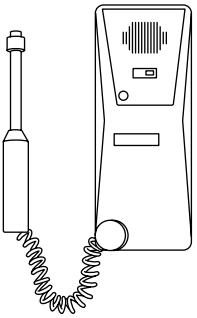
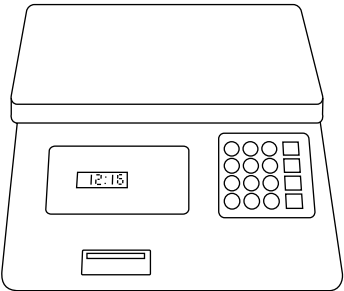
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Description	Tools and Equipment
 <p data-bbox="602 533 698 554">AC-00015</p>	<p data-bbox="743 199 829 220">Syringe</p> <p data-bbox="743 233 1471 285">A graduated plastic SYRINGE will be needed to add oil back into the system. The syringe can be found at a pharmacy or drug store.</p>
 <p data-bbox="602 905 698 926">AC-00016</p>	<p data-bbox="743 569 899 590">Vacuum pump</p> <p data-bbox="743 602 1484 688">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 data-bbox="602 1276 698 1297">AC-00017</p>	<p data-bbox="743 938 829 959">Can tap</p> <p data-bbox="743 972 1484 1024">A CAN TAP for the 397 g (14 oz) can is available from an auto supply store.</p>
 <p data-bbox="602 1654 698 1675">AC-00018</p>	<p data-bbox="743 1308 889 1329">Thermometer</p> <p data-bbox="743 1341 1455 1394">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 data-bbox="604 533 698 554">AC-00019</p>	<p data-bbox="743 197 993 218">Electronic leak detector</p> <p data-bbox="743 228 1464 285">An ELECTRONIC LEAK DETECTOR can be obtained from either a specialty tool supply or an A/C equipment supplier.</p>
 <p data-bbox="604 905 698 926">AC-00020</p>	<p data-bbox="743 569 883 590">Weight scale</p> <p data-bbox="743 602 1487 686">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>