

General Description

COOLING

1. General Description

A: SPECIFICATION

- Non-turbo model

Engine		Non-turbo	
Cooling system		Electric fan + Forced engine coolant circulation system	
Total engine coolant capacity		\varnothing (US qt, Imp qt) AT: approx. 6.5 (6.87, 5.72) MT: approx. 6.6 (6.98, 5.81)	
Water pump	Type		Centrifugal impeller type
	Discharge performance I	Discharge rate	20 \varnothing (5.3 US gal, 4.4 Imp gal)/min.
		Pump speed — Discharge pressure	760 rpm — 2.9 kPa (0.3 mAq)
		Engine coolant temperature	80°C (176°F)
	Discharge performance II	Discharge rate	100 \varnothing (26.4 US gal, 22.0 Imp gal)/min.
		Pump speed — Discharge pressure	3,000 rpm — 49.0 kPa (5.0 mAq)
		Engine coolant temperature	80°C (176°F)
	Discharge performance III	Discharge rate	200 \varnothing (52.8 US gal, 44.0 Imp gal)/min.
		Pump speed — Discharge pressure	6,000 rpm — 225.4 kPa (23.0 mAq)
		Engine coolant temperature	80°C (176°F)
	Impeller diameter		76 mm (2.99 in)
Number of impeller vanes		8	
Pump pulley diameter		60 mm (2.36 in)	
Clearance between impeller and case		0.5 — 1.5 mm (0.020 — 0.059 in)	
Thermostat	Type		Wax pellet type
	Starts to open		80 — 84°C (176 — 183°F)
	Fully opens		95°C (203°F)
	Valve lift		9.0 mm (0.354 in) or more
	Valve bore		35 mm (1.38 in)
Radiator fan	Motor input	Main fan	120 W
		Sub fan	120 W
Fan diameter / Blade		320 mm (12.60 in) / 5 (main fan) 320 mm (12.60 in) / 7 (sub fan)	
Radiator	Type		Down flow
	Core dimensions	Width × Height × Thickness	691.5 × 360 × 16 mm (27.22 × 14.17 × 0.63 in)
	Pressure range in which cap valve is open		Above: 108±15 kPa (1.1±0.15 kg/cm ² , 16±2 psi) Below: -1.0 to -4.9 kPa (-0.01 to -0.05 kg/cm ² , -0.1 to -0.7 psi)
	Fins		Corrugated fin type
Reservoir tank	Capacity		0.5 \varnothing (0.5 US qt, 0.4 Imp qt)

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Coolant	Recommended materials	Item number	Alternative
Coolant	SUBARU coolant	000016218	Phosphoric acid (non-amine) type
Water for dilution	Distilled water	—	Soft water or tap water
Cooling system protecting agent	Cooling system conditioner	SOA345001	None

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- Turbo model

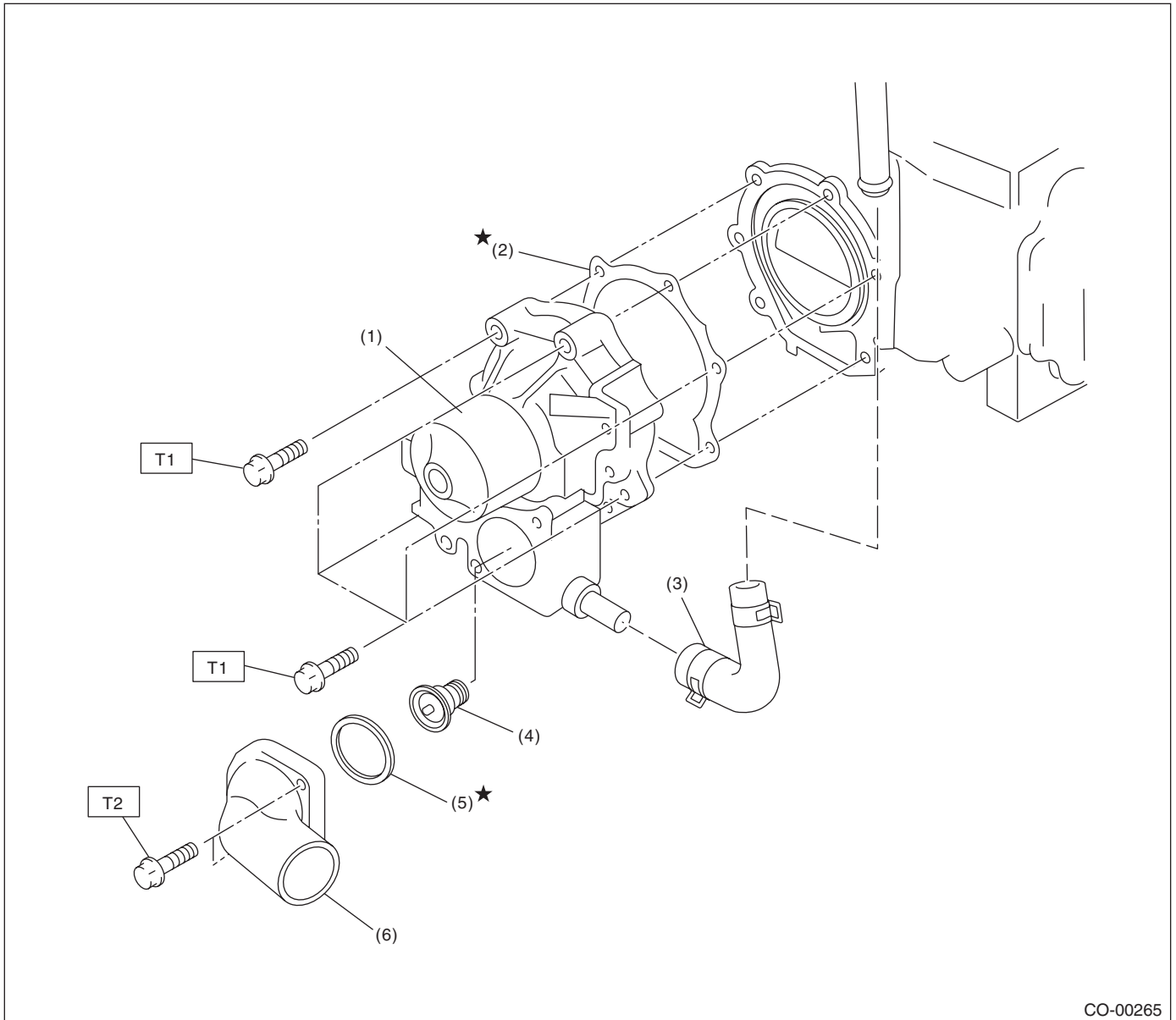
Engine		DOHC Turbo	
Cooling system		Electric fan + Forced engine coolant circulation system	
Total engine coolant capacity		\varnothing (US qt, Imp qt) AT: 7.3 (7.71, 6.42) MT: 7.4 (7.82, 6.51)	
Water pump	Type		Centrifugal impeller type
	Discharge performance I	Discharge rate	20 \varnothing (5.3 US gal, 4.4 Imp gal)/min.
		Pump speed — Discharge pressure	760 rpm — 2.9 kPa (0.3 mAq)
		Engine coolant temperature	80°C (176°F)
	Discharge performance II	Discharge rate	100 \varnothing (26.4 US gal, 22.0 Imp gal)/min.
		Pump speed — Discharge pressure	3,000 rpm — 49.0 kPa (5.0 mAq)
		Engine coolant temperature	80°C (176°F)
	Discharge performance III	Discharge rate	200 \varnothing (52.8 US gal, 44.0 Imp gal)/min.
		Pump speed — Discharge pressure	6,000 rpm — 225.4 kPa (23.0 mAq)
		Engine coolant temperature	80°C (176°F)
	Impeller diameter		76 mm (2.99 in)
Number of impeller vanes		8	
Pump pulley diameter		60 mm (2.36 in)	
Clearance between impeller and case		0.5 — 1.5 mm (0.020 — 0.059 in)	
Thermostat	Type		Wax pellet type
	Starts to open		76 — 80°C (169 — 176°F)
	Fully opens		91°C (196°F)
	Valve lift		9.0 mm (0.354 in) or more
	Valve bore		35 mm (1.38 in)
Radiator fan	Motor input	Main fan	120 W
		Sub fan	120 W
	Fan diameter / Blade		320 mm (12.60 in) / 5 (main fan) 320 mm (12.60 in) / 7 (sub fan)
Radiator	Type		Down flow
	Core dimensions	Width × Height × Thickness	691.5 × 360 × 16 mm (27.22 × 14.17 × 0.63 in)
	Pressure range in which cap valve is open	Coolant filler tank side	Above: 108±15 kPa (1.1±0.15 kg/cm ² , 16±2 psi) Below: -1.0 to -4.9 kPa (-0.01 to -0.05 kg/cm ² , -0.1 to -0.7 psi)
		Radiator side	Above only: 137±14.7 kPa (1.40±0.15 kgf/cm ² , 20±2.1 psi)
	Fins		Corrugated fin type
Reservoir tank	Capacity		0.5 \varnothing (0.5 US qt, 0.4 Imp qt)

Coolant	Recommended materials	Item number	Alternative
Coolant	SUBARU coolant	000016218	Phosphoric acid (non-amine) type
Water for dilution	Distilled water	—	Soft water or tap water
Cooling system protecting agent	Cooling system conditioner	SOA345001	None

B: COMPONENT

1. WATER PUMP

Non-turbo model



CO-00265

- | | |
|-------------------------|----------------------|
| (1) Water pump ASSY | (4) Thermostat |
| (2) Gasket | (5) Gasket |
| (3) Heater by-pass hose | (6) Thermostat cover |

Tightening torque:N·m (kgf-m, ft-lb)

T1: First 12 (1.2, 8.9)

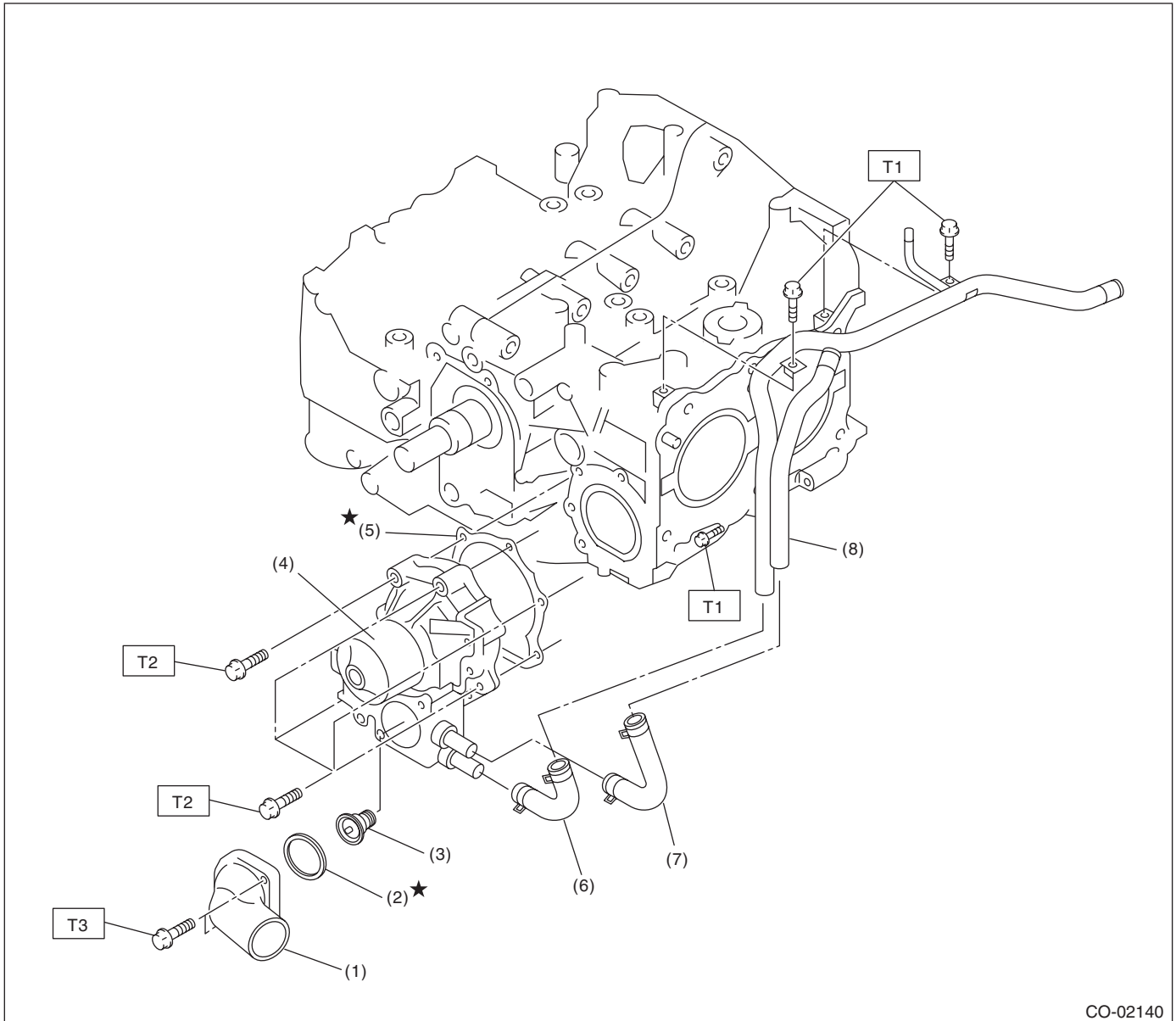
Second 12 (1.2, 8.9)

T2: 12 (1.2, 8.9)

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Turbo model



CO-02140

- | | |
|----------------------|---------------------------------|
| (1) Thermostat cover | (5) Gasket |
| (2) Gasket | (6) Heater by-pass hose |
| (3) Thermostat | (7) Coolant filler by-pass hose |
| (4) Water pump ASSY | (8) Water by-pass pipe |

Tightening torque: N·m (kgf·m, ft·lb)

T1: 6.4 (0.65, 4.7)

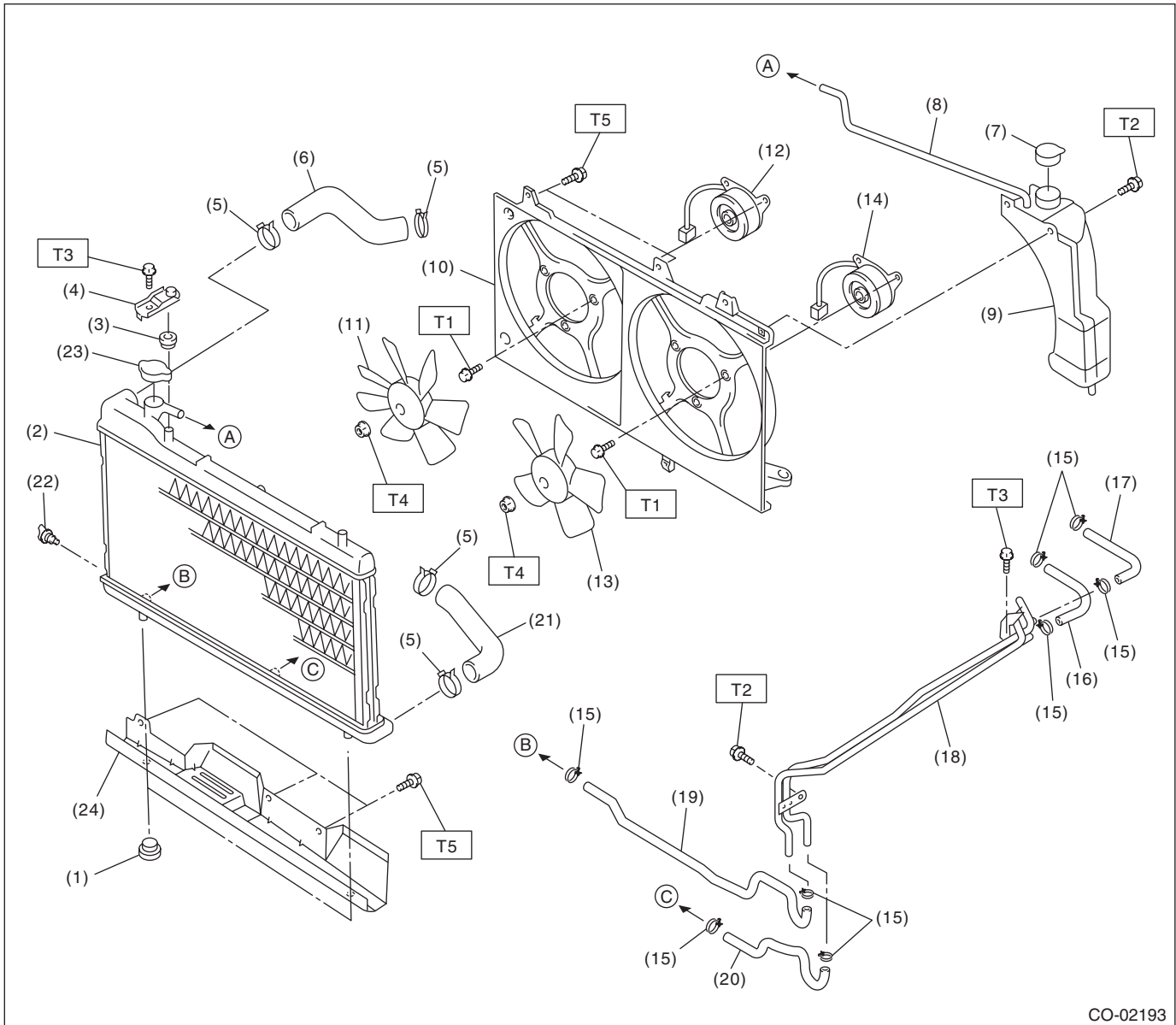
T2: First 12 (1.2, 8.9)

Second 12 (1.2, 8.9)

T3: 12 (1.2, 8.9)

2. RADIATOR AND ELECTRIC FAN

Non-turbo model



CO-02193

- | | | |
|---------------------------------------|--------------------------------|--------------------------------------|
| (1) Radiator lower cushion | (12) Radiator sub fan motor | (22) Radiator drain plug |
| (2) Radiator | (13) Radiator main fan | (23) Radiator cap |
| (3) Radiator upper cushion | (14) Radiator main fan motor | (24) Radiator under cover (AT model) |
| (4) Radiator upper bracket | (15) ATF hose clamp (AT model) | |
| (5) Clamp | (16) ATF hose A (AT model) | |
| (6) Radiator inlet hose | (17) ATF hose B (AT model) | |
| (7) Engine coolant reservoir tank cap | (18) ATF pipe (AT model) | |
| (8) Over flow hose | (19) ATF hose C (AT model) | |
| (9) Engine coolant reservoir tank | (20) ATF hose D (AT model) | |
| (10) Radiator fan shroud | (21) Radiator outlet hose | |
| (11) Radiator sub fan | | |

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

T1: 4.4 (0.45, 3.3)

T2: 7.5 (0.76, 5.5)

T3: 18 (1.8, 13.0)

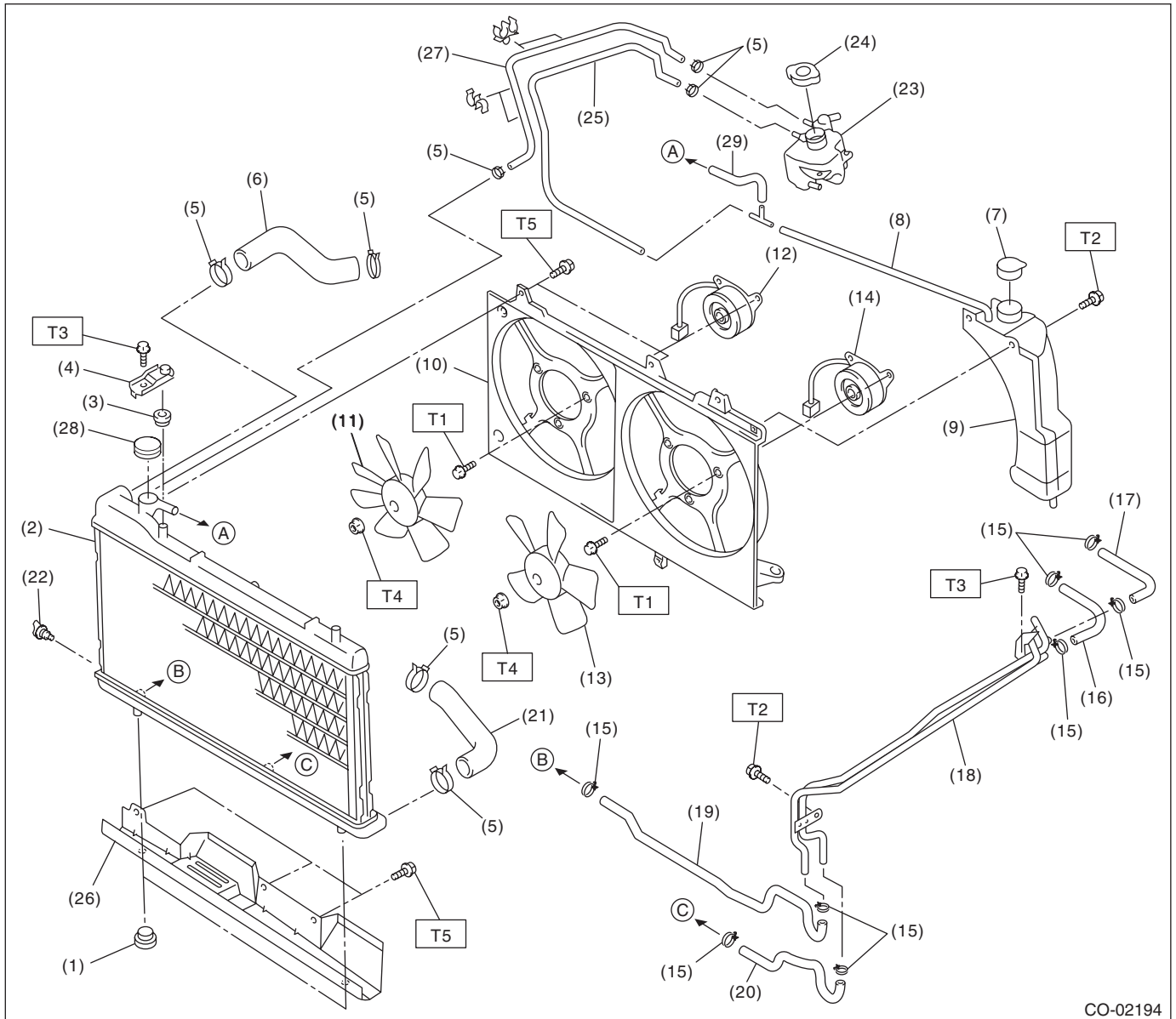
T4: 3.4 (0.35, 2.5)

T5: 4.9 (0.50, 3.6)

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Turbo model



CO-02194

(1) Radiator lower cushion	(13) Radiator main fan	(25) Overflow hose B
(2) Radiator	(14) Radiator main fan motor	(26) Radiator under cover (AT model)
(3) Radiator upper cushion	(15) ATF hose clamp (AT model)	(27) Air breather hose
(4) Radiator upper bracket	(16) ATF hose A (AT model)	(28) Radiator cap
(5) Clamp	(17) ATF hose B (AT model)	(29) Overflow hose C
(6) Radiator inlet hose	(18) ATF pipe (AT model)	
(7) Engine coolant reservoir tank cap	(19) ATF hose C (AT model)	
(8) Overflow hose A	(20) ATF hose D (AT model)	
(9) Engine coolant reservoir tank	(21) Radiator outlet hose	
(10) Radiator fan shroud	(22) Radiator drain plug	
(11) Radiator sub fan	(23) Engine coolant filler tank	
(12) Radiator sub fan motor	(24) Engine coolant filler tank cap	

Tightening torque: N·m (kgf·m, ft·lb)

T1: 4.4 (0.45, 3.3)

T2: 7.5 (0.76, 5.5)

T3: 18 (1.8, 13.0)

T4: 3.4 (0.35, 2.5)

T5: 4.9 (0.50, 3.6)

C: CAUTION

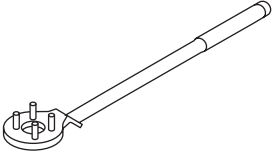
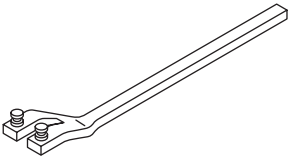
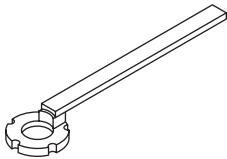
- Wear appropriate work clothing, including a cap, protective goggles and protective shoes when performing any work.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust and dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly and replacement.
- Vehicle components are extremely hot after driving. Be wary of receiving burns from heated parts.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or rigid racks at the specified points.
- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from the battery.

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D: PREPARATION TOOL

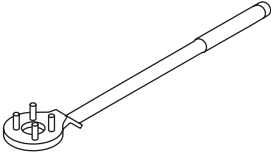
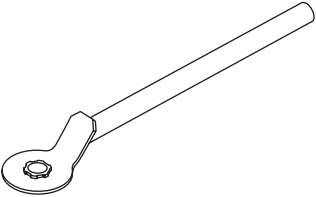
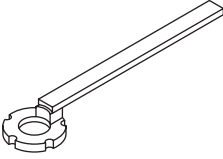
1. NON-TURBO MODEL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-499977100</p>	499977100	CRANK PULLEY WRENCH	Used for stopping crank pulley when loosening and tightening crank pulley bolts.
 <p style="text-align: center;">ST18231AA010</p>	18231AA010	CAM SPROCKET WRENCH (For LH)	<ul style="list-style-type: none"> • Used for removing and installing cam sprocket (LH). • CAM SPROCKET WRENCH (499207100) can also be used.
 <p style="text-align: center;">ST-499207400</p>	499207400	CAM SPROCKET WRENCH (For RH)	Used for removing and installing cam sprocket (RH).

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2. TURBO MODEL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p data-bbox="337 562 467 590">ST-499977100</p>	499977100	CRANK PULLEY WRENCH	Used for stopping crank pulley when loosening and tightening crank pulley bolts.
 <p data-bbox="337 919 467 947">ST-499977500</p>	499977500	CAM SPROCKET WRENCH	Used for removing and installing cam sprocket. (Intake)
 <p data-bbox="337 1270 467 1297">ST-499207400</p>	499207400	CAM SPROCKET WRENCH	Used for removing and installing cam sprocket. (Exhaust)