

General Description

STARTING/CHARGING SYSTEMS

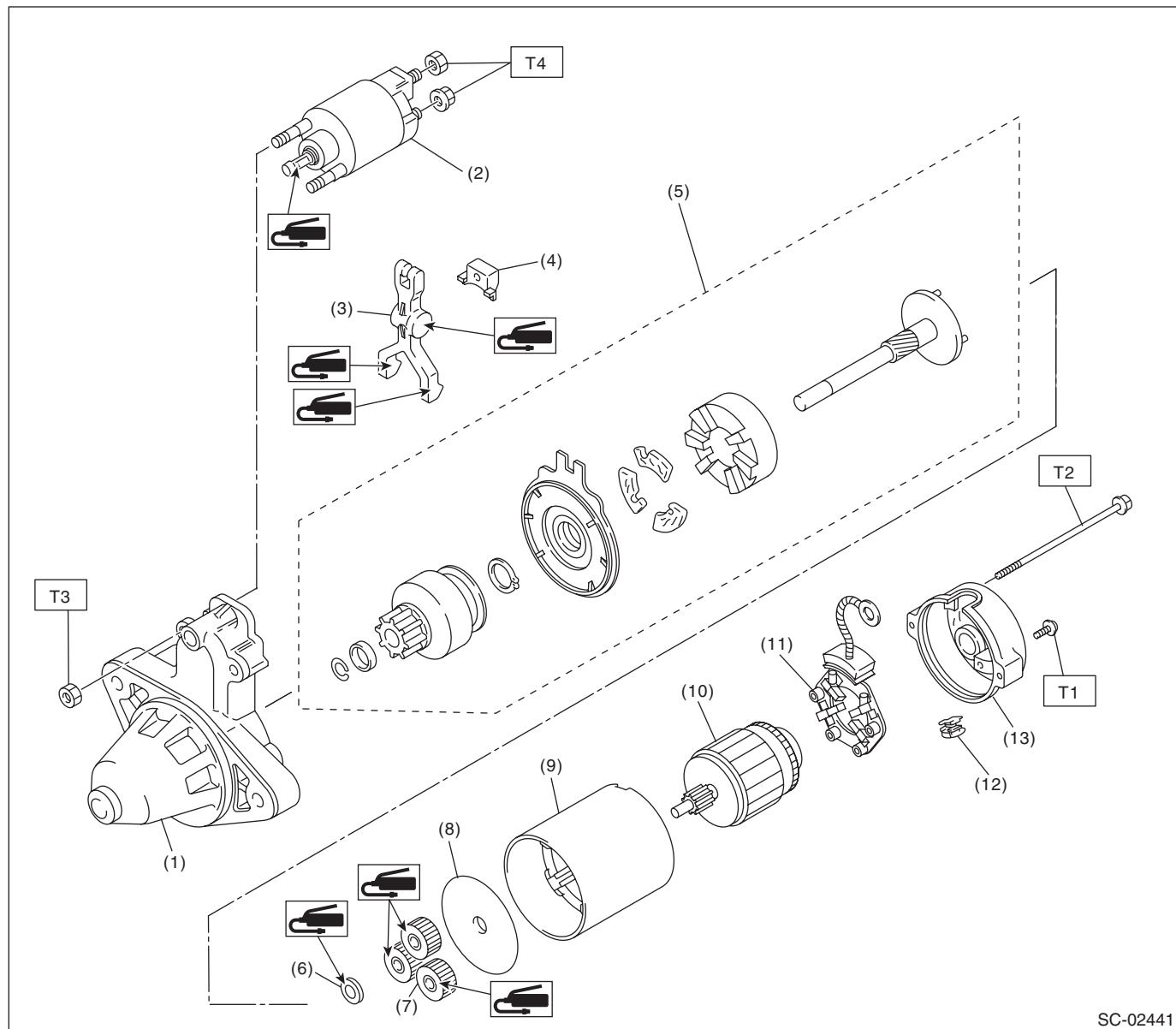
1. General Description

A: SPECIFICATION

Item		Specifications	
Vehicle model		CVT	MT
Starter	Type	Reduction type	
	Model	428000-4790	428000-4780
	Manufacturer	DENSO	
	Voltage and output	12 V — 1.6 kW	
	Direction of rotation	Counterclockwise (when observed from pinion)	
	Number of pinion teeth	9	
	No-load characteristics	Voltage	11 V
		Current	90 A or less
		Rotating speed	1,900 rpm or more
	Load characteristics	Voltage	8 V
		Current	370 A
		Torque	11.1 N·m (1.1 kgf-m, 8.2 ft-lb) or more
	Lock characteristics	Rotating speed	910 rpm or more
		Voltage	3 V
		Current	750 A or less
		Torque	15.5 N·m (1.6 kgf-m, 11.4 ft-lb) or more
Generator	Type	Rotating-field three-phase type, voltage regulator built-in type, with load response control system	
	Model	A3TG6781	
	Manufacturer	Mitsubishi Electric	
	Voltage and output	12 V — 110 A	
	Polarity on ground side	Negative	
	Direction of rotation	Clockwise (when observed from pulley side)	
	Stator connection	3-phase Y-type	
	Output current	1,500 rpm — 49 A or more 2,500 rpm — 89 A or more 5,000 rpm — 102 A or more	
		14.1 — 14.8 V [20°C (68°F)]	
		Regulated voltage	
	Rotor slip ring outer diameter	Standard	22.7 mm (0.894 in)
		Limit	22.1 mm (0.870 in)
	Brush length	Standard	18.5 mm (0.728 in)
		Limit	5.0 mm (0.197 in)
Battery	Type and capacity	12 V — 52 AH (75D 23R)	

B: COMPONENT

1. STARTER



SC-02441

(1) Starter housing	(8) Starter plate
(2) Magnet switch ASSY	(9) Yoke
(3) Shift lever	(10) Armature
(4) Starter seal	(11) Brush holder ASSY
(5) Overrunning clutch ASSY	(12) Drain duct
(6) Washer	(13) Starter cover
(7) Planetary gear	

Tightening torque: N·m (kgf·m, ft·lb)

T1: 1.4 (0.1, 1.0)

T2: 6 (0.6, 4.4)

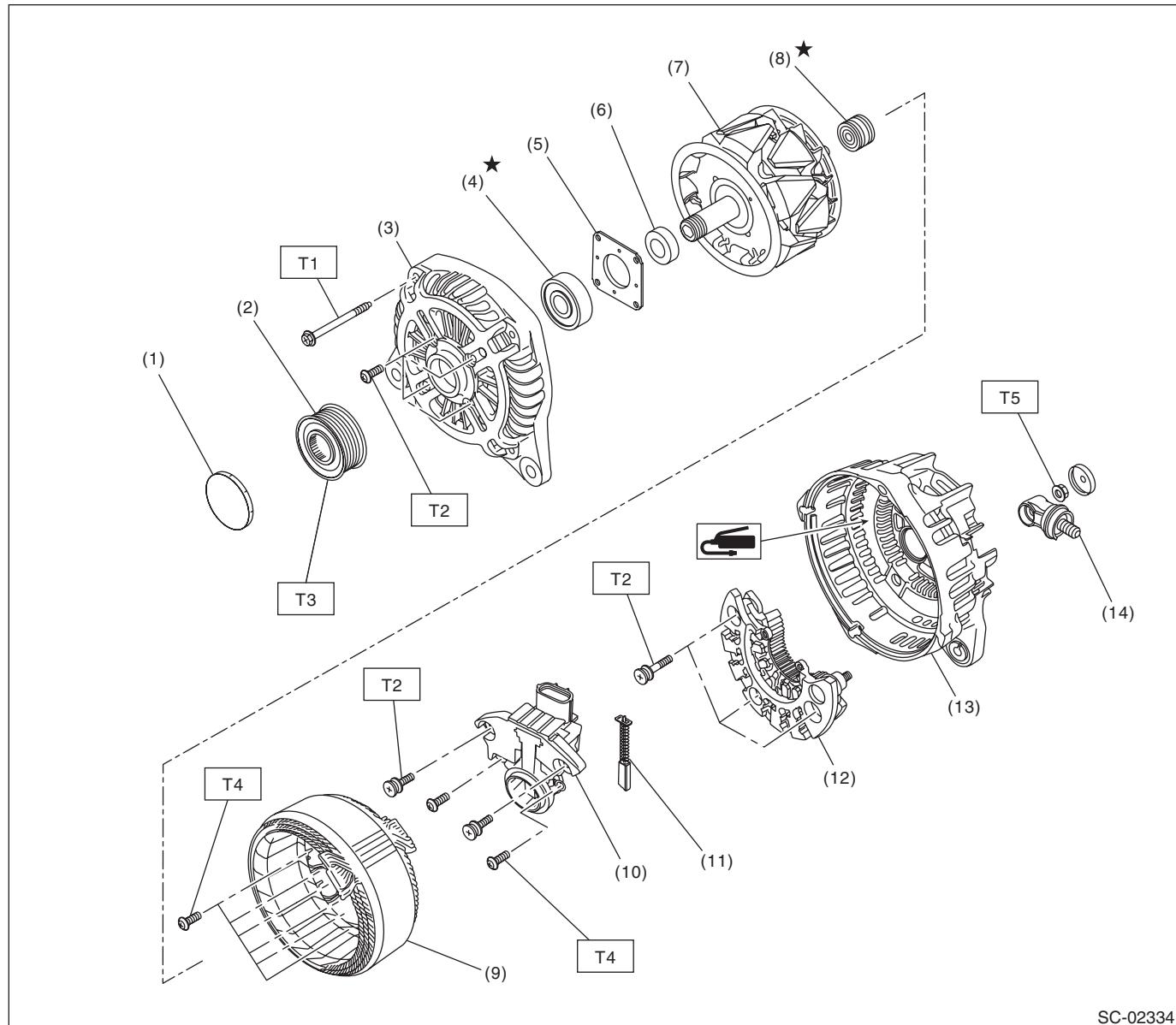
T3: 7.5 (0.8, 5.5)

T4: 10 (1.0, 7.4)

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2. GENERATOR



SC-02334

(1) Cap	(8) Bearing
(2) Pulley	(9) Stator coil
(3) Front cover	(10) IC regulator
(4) Ball bearing	(11) Brush
(5) Bearing retainer	(12) Rectifier
(6) Spacer	(13) Rear cover
(7) Rotor	(14) Terminal B

Tightening torque: N·m (kgf·m, ft·lb)

T1: 4.4 (0.4, 3.2)

T2: 3.9 (0.4, 2.9)

T3: 80 (8.2, 59.0)

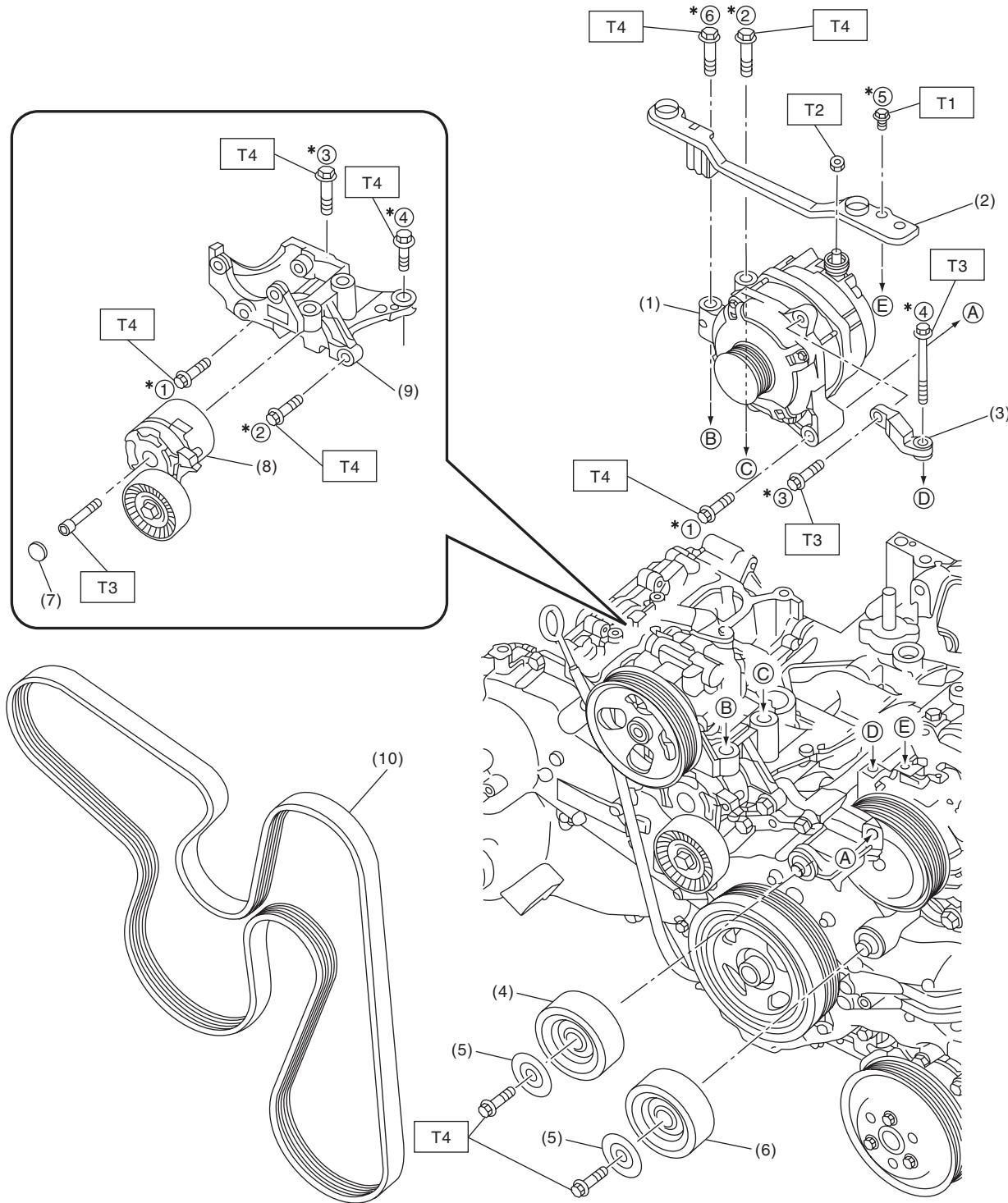
T4: 2 (0.2, 1.5)

T5: 8.9 (0.9, 6.6)

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3. GENERATOR BRACKET



SC-02722

(1) Generator	(6) Idler pulley B
(2) V-belt cover bracket	(7) Cap
(3) Generator bracket	(8) V-belt tensioner ASSY
(4) Idler pulley A	(9) Power steering pump bracket
(5) Idler pulley cover	(10) V-belt

Tightening torque: N·m (kgf·m, ft·lb)

T1: 8.5 (0.9, 6.3)

T2: 16 (1.6, 11.8)

T3: 25 (2.5, 18.4)

T4: 36 (3.7, 26.6)

* Tighten the generator and V-belt cover brackets in the numerical order.

* Tighten the power steering pump bracket in the numerical order.

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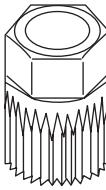
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C: CAUTION

- Prior to starting work, pay special attention to the following:
 1. Always wear work clothes, a safety cap, protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
 2. Protect the vehicle using a seat cover, fender cover, etc.
 3. Prepare the service tools, clean cloth, containers to catch grease and oil, etc.
- Vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- When performing a repair, identify the cause of trouble and avoid unnecessary removal, disassembly and replacement.
- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery.
- Always use the jack-up point when the shop jacks or rigid racks are used to support the vehicle.
- Remove contamination including dirt and corrosion before removal, installation, disassembly or assembly.
- Keep the removed parts in order and protect them from dust and dirt.
- All removed parts, if to be reused, should be reinstalled in the original positions with attention to the correct directions, etc.
- Bolts, nuts and washers should be replaced with new parts as required.
- Be sure to tighten the fasteners including bolts and nuts to the specified torque.

D: PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST18366AA000	18366AA000	ADAPTER PULLEY	Used for removing and installing generator pulley.

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.