

General Description

STARTING/CHARGING SYSTEMS

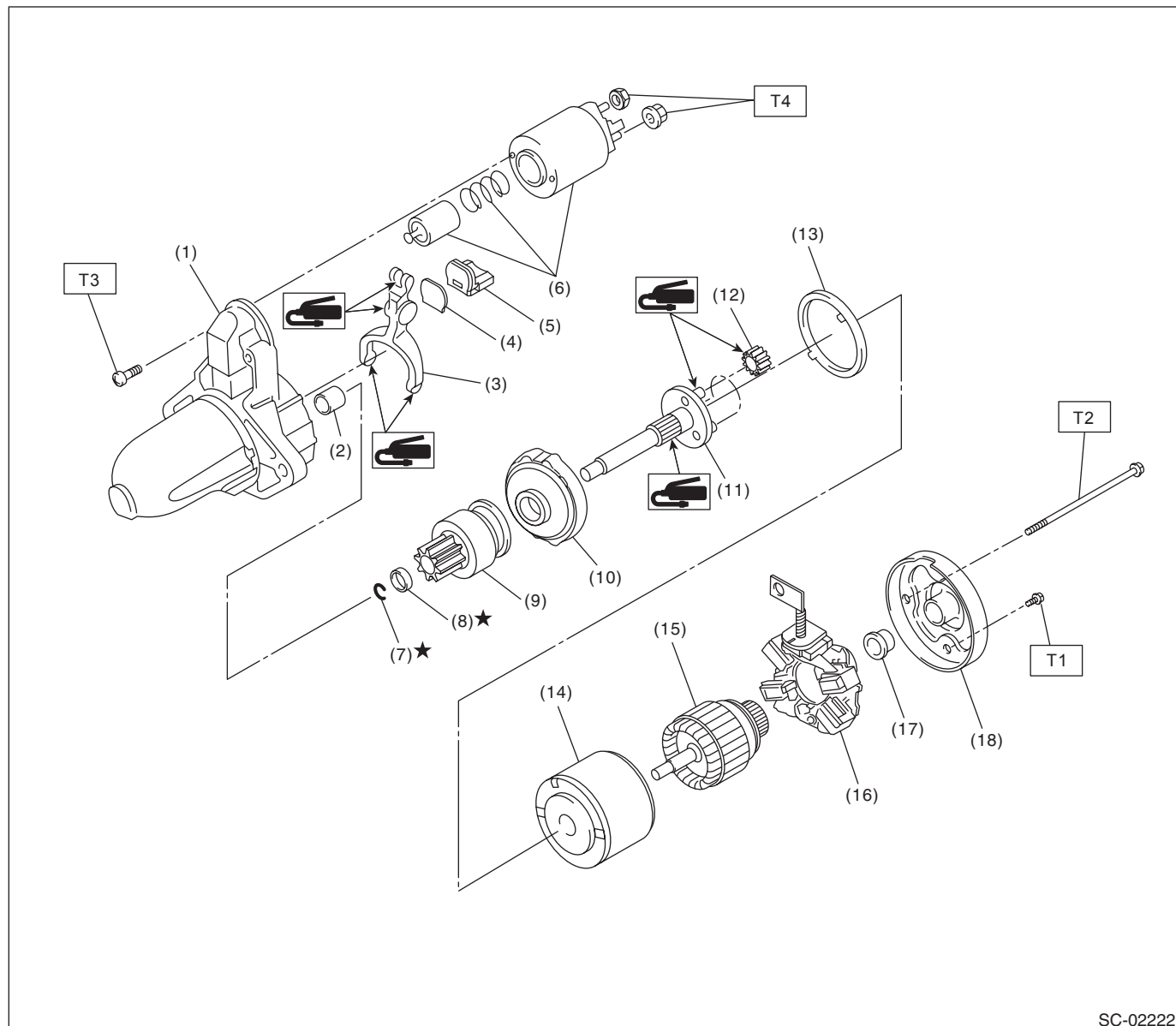
1. General Description

A: SPECIFICATION

Item			Specifications	
Vehicle model			CVT	MT
Starter	Type		Reduction type	
	Model		M000T38571	M000T33176
	Manufacturer		Mitsubishi Electric	
	Voltage and output		12 V — 1.2 kW	12 V — 1.0 kW
	Direction of rotation		Counterclockwise (when observed from pinion)	
	Number of pinion teeth		9	8
	Armature commutator runout	Standard	0.05 mm (0.0020 in)	
		Limit	0.10 mm (0.0039 in)	
	Armature depth of segment mold	Standard	0.50 mm (0.020 in)	
		Limit		
	Brush length	Standard	12.3 mm (0.484 in)	
		Limit	7.0 mm (0.276 in)	
	Brush spring force	Standard	15.9 — 19.5 N (1.62 — 1.99 kgf, 3.57 — 4.38 lbf)	
		Limit	2.5 N (0.25 kgf, 0.56 lbf)	
	No-load characteristics	Voltage	11 V	
		Current	90 A or less	95 A or less
		Rotating speed	2,370 rpm or more	2,500 rpm or more
	Load characteristics	Voltage	7.5 V	7.5 V
		Current	300 A	300 A
		Torque	10.65 N·m (1.1 kgf-m, 7.8 ft-lb) or more	8.84 N·m (0.9 kgf-m, 6.5 ft-lb) or more
		Rotating speed	840 rpm or more	870 rpm or more
	Lock characteristics	Voltage	4 V	4 V
		Current	780 A or less	680 A or less
		Torque	20 N·m (2.0 kgf-m, 14.8 ft-lb) or more	17 N·m (1.7 kgf-m, 12.5 ft-lb) or more
Generator	Type		Rotating-field three-phase type, voltage regulator built-in type, with load response control system	
	Model		A2TL0291	
	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 Δ type	
	Output current		1,500 rpm — 46 A or more 2,500 rpm — 90 A or more 5,000 rpm — 109 A or more	
	Regulated voltage		14.1 — 14.8 V [20°C (68°F)]	
	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 — 48 AH (55D 23L)	

B: COMPONENT

1. STARTER



- (1) Starter housing ASSY
- (2) Sleeve bearing
- (3) Shift lever
- (4) Plate
- (5) Seal rubber
- (6) Magnet switch ASSY
- (7) Snap ring
- (8) Stopper

- (9) Overrunning clutch
- (10) Internal gear ASSY
- (11) Shaft
- (12) Pinion gear
- (13) Seal rubber
- (14) Yoke ASSY
- (15) Armature ASSY
- (16) Brush holder ASSY

- (17) Sleeve bearing
- (18) Starter cover ASSY

Tightening torque: N·m (kgf-m, ft-lb)

T1: 1.4 (0.1, 1.0)

T2: 6 (0.6, 4.4)

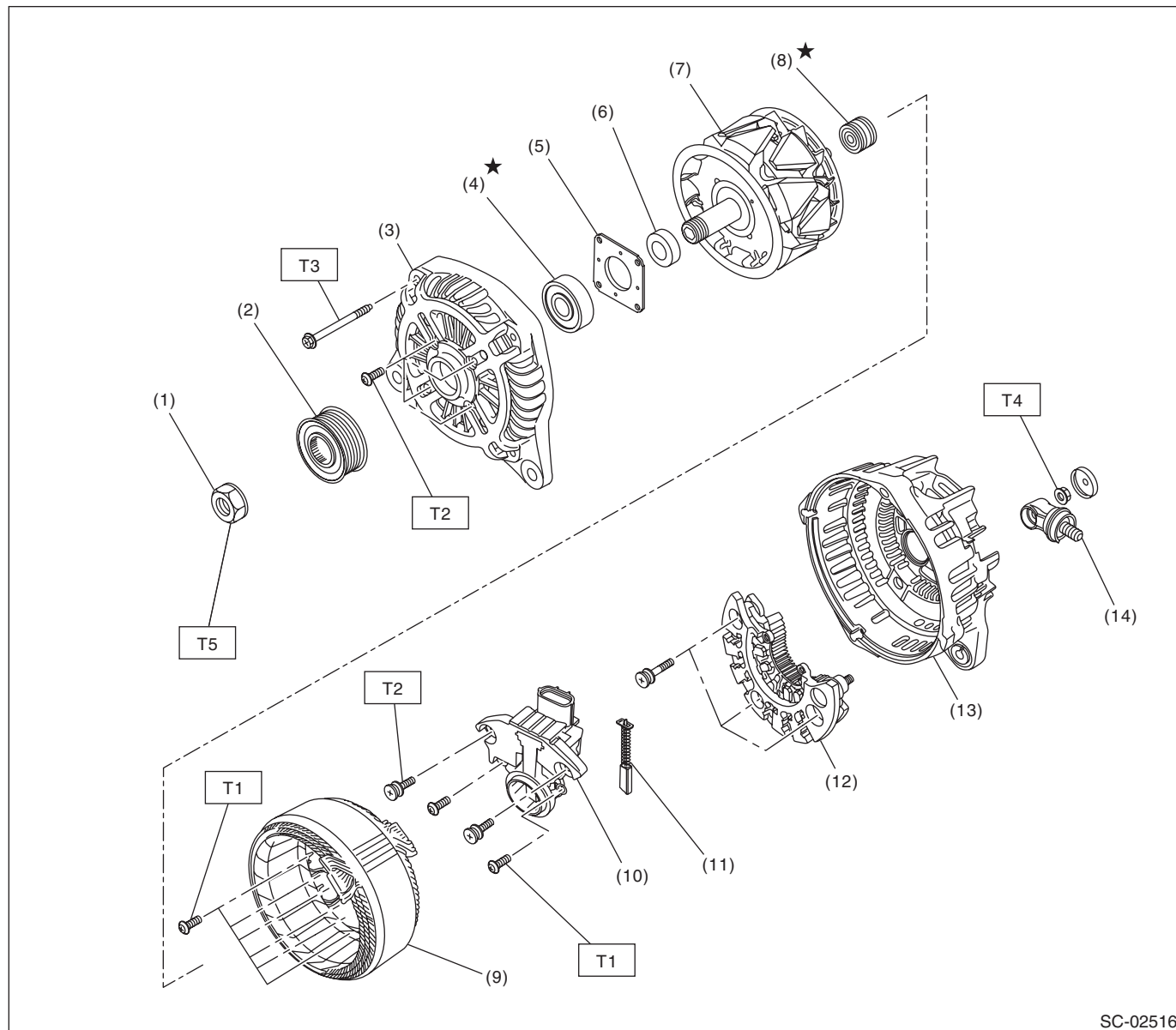
T3: 7.5 (0.8, 5.5)

T4: 10 (1.0, 7.4)

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2. GENERATOR



SC-02516

- | | |
|----------------------|-------------------|
| (1) Nut | (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: 2 (0.2, 1.5)

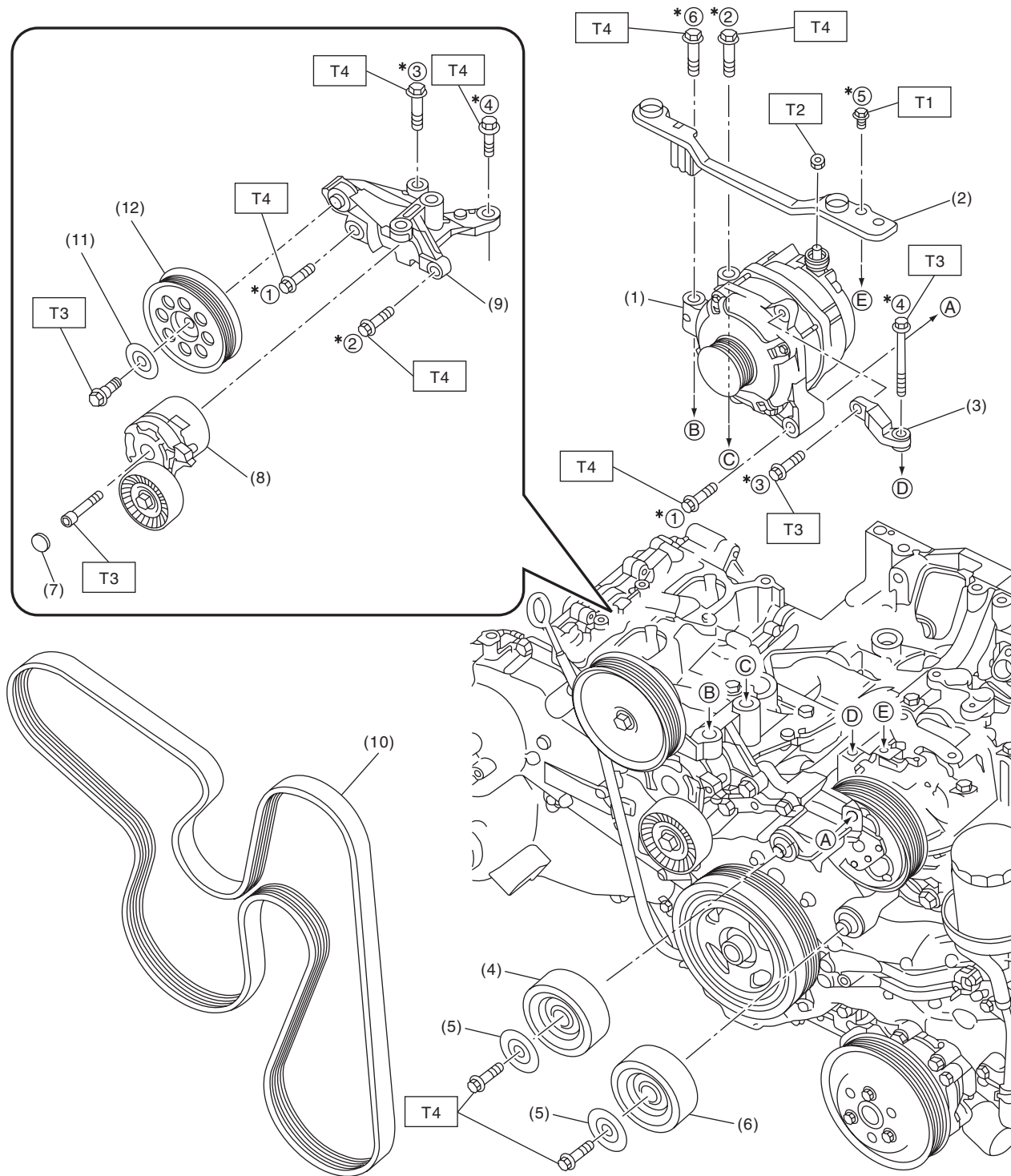
T2: 3.9 (0.4, 2.9)

T3: 4.4 (0.4, 3.2)

T4: 8.9 (0.9, 6.6)

T5: 108 (11.0, 79.8)

3. GENERATOR BRACKET



SC-02584

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|--------------------------|---------------------------|
| (1) Generator | (7) Cap |
| (2) V-belt cover bracket | (8) V-belt tensioner ASSY |
| (3) Generator bracket | (9) Generator bracket |
| (4) Idler pulley A | (10) V-belt |
| (5) Idler pulley cover A | (11) Idler pulley cover B |
| (6) Idler pulley B | (12) Idler pulley C |

Tightening torque:N·m (kgf-m, ft-lb)

T1: 8.5 (0.9, 6.3)

T2: 16 (1.6, 11.8)

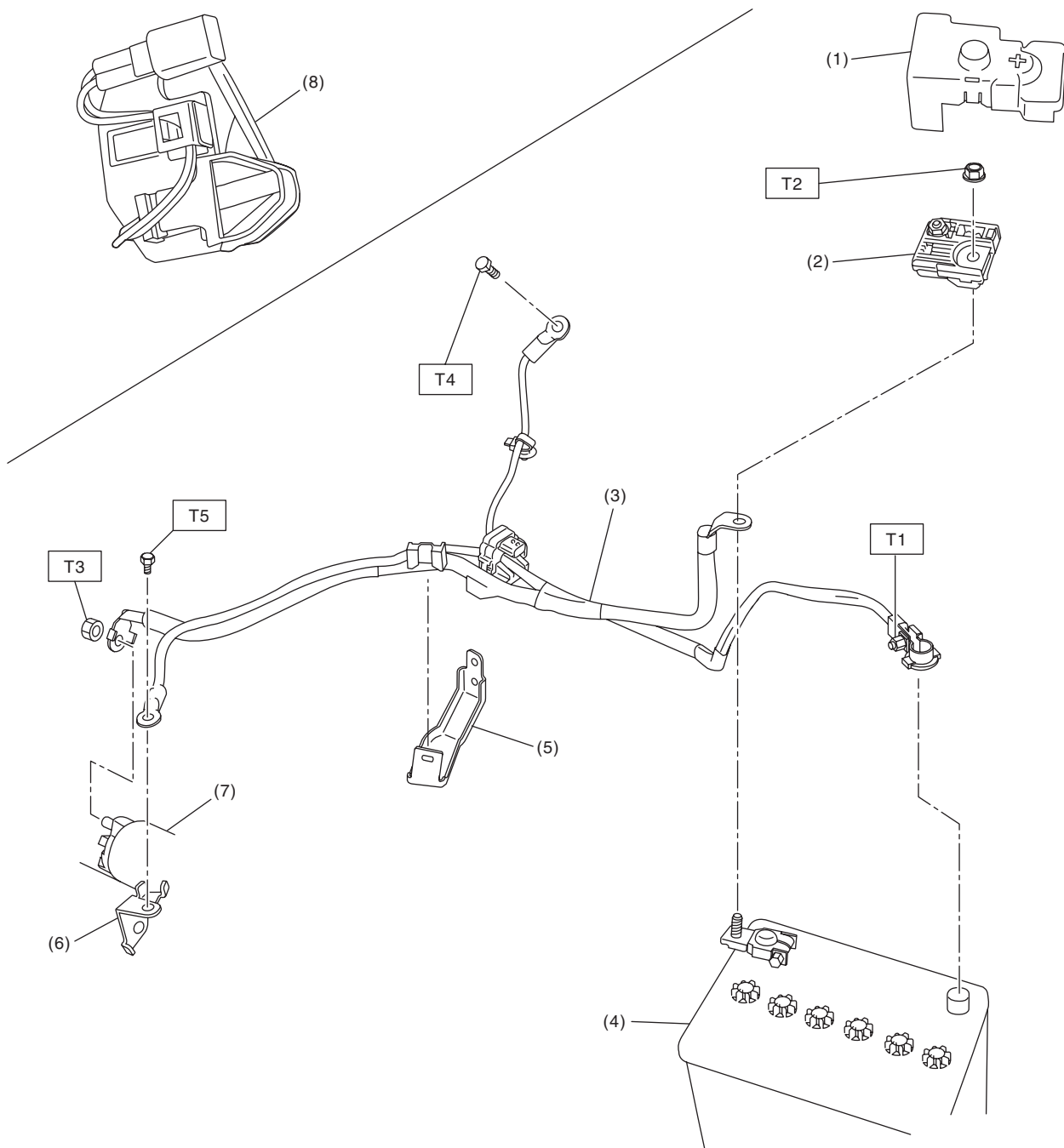
T3: 25 (2.5, 18.4)

T4: 36 (3.7, 26.6)

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

* Tighten the generator bracket in the numerical order as shown in the figure.

4. BATTERY CURRENT & TEMPERATURE SENSOR



SC-02563

- | | |
|---------------------------|--------------------------------|
| (1) Terminal boot | (7) Starter |
| (2) Terminal fuse ASSY | (8) Battery temperature sensor |
| (3) Battery cable ASSY | |
| (4) Battery | |
| (5) Battery cable bracket | |
| (6) Battery cable stay | |

Tightening torque:N·m (kgf-m, ft-lb)

- T1: 6 (0.6, 4.4)**
T2: 7.5 (0.8, 5.5)
T3: 11 (1.1, 8.1)
T4: 13 (1.3, 9.6)
T5: 14 (1.4, 10.3)

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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. GENERAL TOOL

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