

General Description

STARTING/CHARGING SYSTEMS

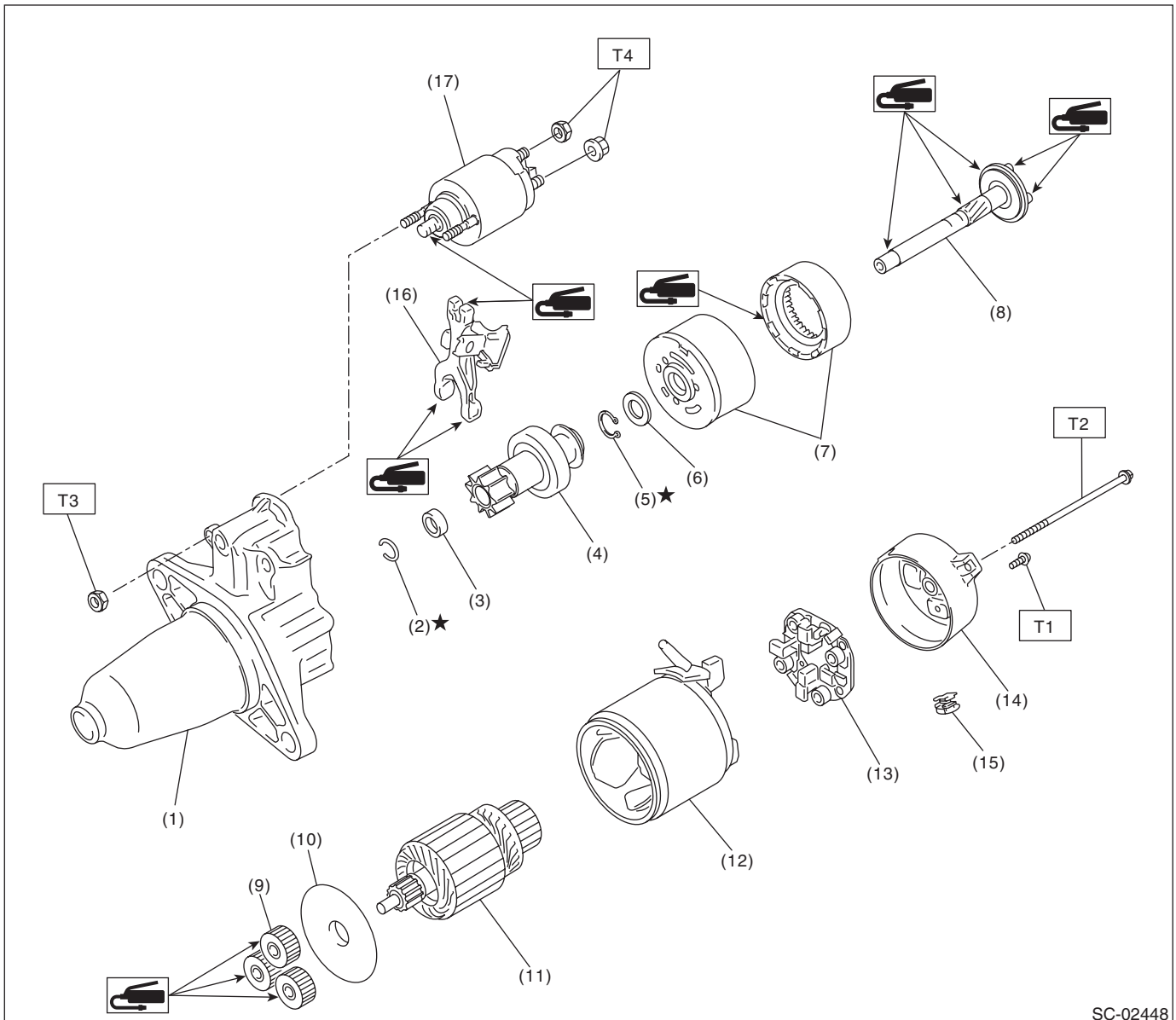
1. General Description

A: SPECIFICATION

Item			Specifications
Starter	Type		Reduction type
	Model		428000-5760
	Manufacturer		DENSO
	Voltage and output		12 V — 1.0 kW
	Direction of rotation		Counterclockwise (when observed from pinion)
	Number of pinion teeth		9
	Armature commutator runout	Standard	0.05 mm (0.0020 in)
		Limit	0.10 mm (0.0039 in)
	Armature depth of segment mold	Standard	0.5 mm (0.020 in)
	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
		Rotating speed	2,860 rpm or more
	Load characteristics	Voltage	8 V
		Current	280 A
		Torque	9.3 N·m (0.9 kgf-m, 6.9 ft-lb) or more
		Rotating speed	860 rpm or more
Generator	Lock characteristics	Voltage	4 V
		Current	515 A or less
		Torque	16 N·m (1.6 kgf-m, 11.8 ft-lb) or more
	Type		Rotating-field three-phase type, voltage regulator built-in type, with load response control system
	Model		A3TG6591
	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 — 50 A or more 2,500 rpm — 91 A or more 5,000 rpm — 105 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)
Battery	Brush length	Standard	18.5 mm (0.728 in)
		Limit	5.0 mm (0.197 in)
	Type and capacity		12 V — 48 AH (55D23L)
Battery	CCA		390 A

B: COMPONENT

1. STARTER



SC-02448

- | | |
|--------------------------|-------------------------|
| (1) Starter housing ASSY | (9) Pinion gear |
| (2) Snap ring | (10) Starter plate |
| (3) Stopper | (11) Armature |
| (4) Overrunning clutch | (12) Yoke ASSY |
| (5) Snap ring | (13) Brush holder ASSY |
| (6) Washer | (14) Starter cover ASSY |
| (7) Internal gear ASSY | (15) Drain duct |
| (8) Shaft | (16) Shift lever |

- (17) Magnet switch ASSY

Tightening torque: N·m (kgf-m, ft-lb)

T1: 1.4 (0.1, 1.0)

T2: 6 (0.6, 4.4)

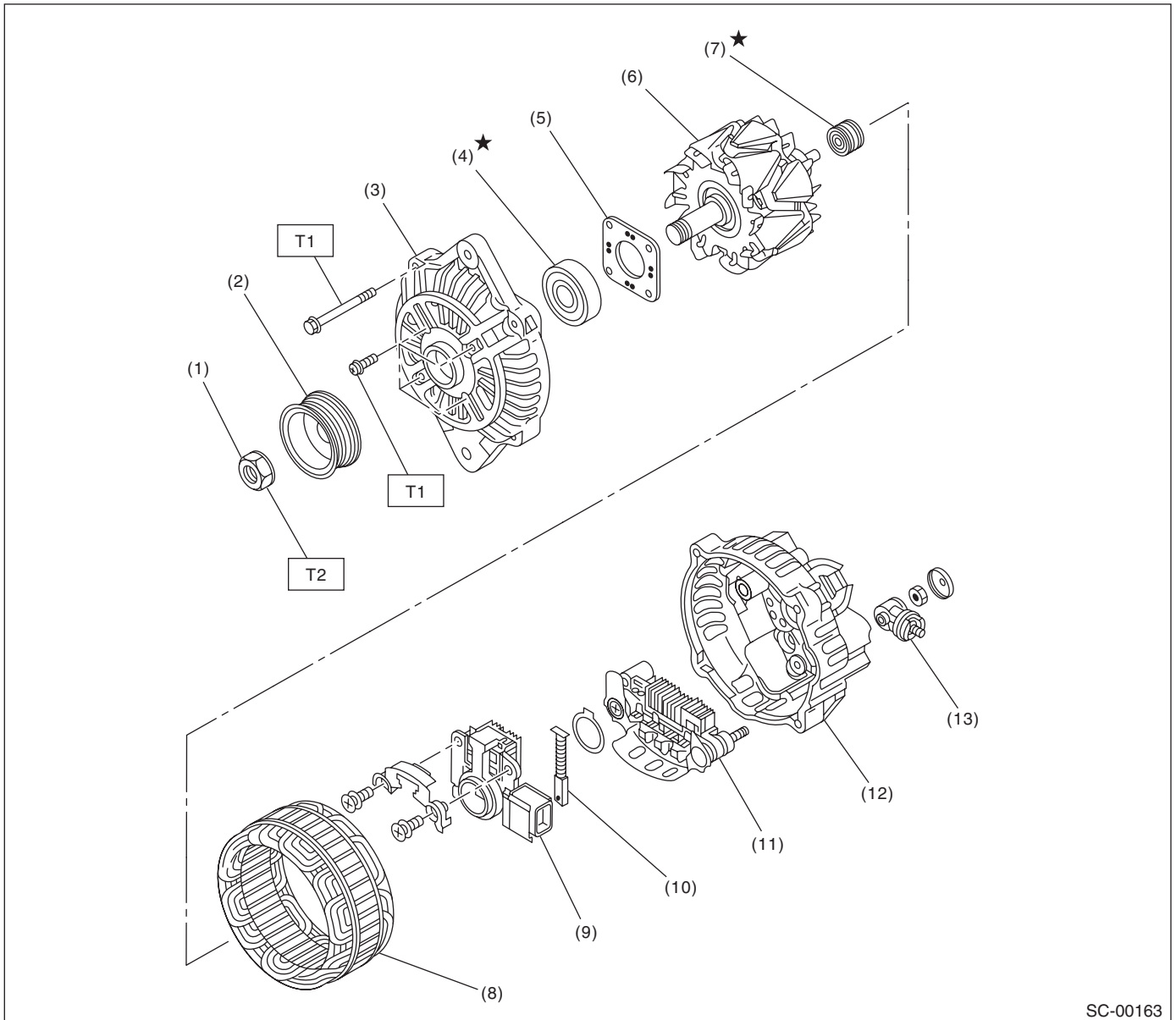
T3: 7.5 (0.8, 5.5)

T4: 10 (1.0, 7.4)

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2. GENERATOR



SC-00163

- (1) Pulley nut
- (2) Pulley
- (3) Front cover
- (4) Ball bearing
- (5) Bearing retainer
- (6) Rotor

- (7) Bearing
- (8) Stator coil
- (9) IC regulator
- (10) Brush
- (11) Rectifier
- (12) Rear cover

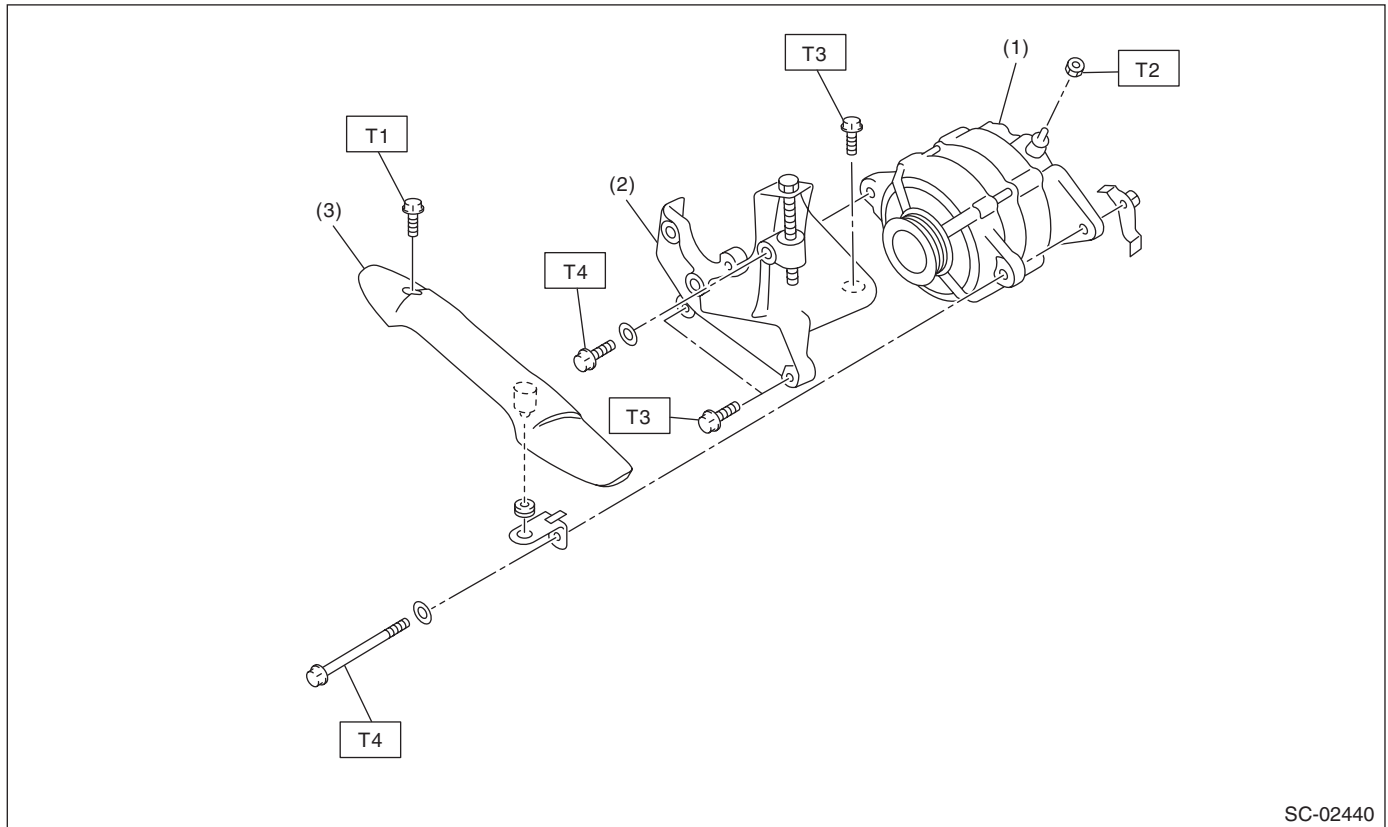
- (13) Terminal B

Tightening torque: N·m (kgf-m, ft-lb)

T1: 4.7 (0.5, 3.5)

T2: 108 (11.0, 79.8)

3. GENERATOR BRACKET



SC-02440

- | | |
|---------------------------------|------------------|
| (1) Generator | (3) V-belt cover |
| (2) Power steering pump bracket | |

Tightening torque: N·m (kgf-m, ft-lb)

T1: 13 (1.3, 9.6)

T2: 16 (1.6, 11.8)

T3: 22 (2.2, 16.2)

T4: 25 (2.5, 18.4)

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C: CAUTION

- Prior to starting work, pay special attention to the following:
 1. Always wear work clothes, a work cap, and 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.