

# General Description

## STARTING/CHARGING SYSTEMS

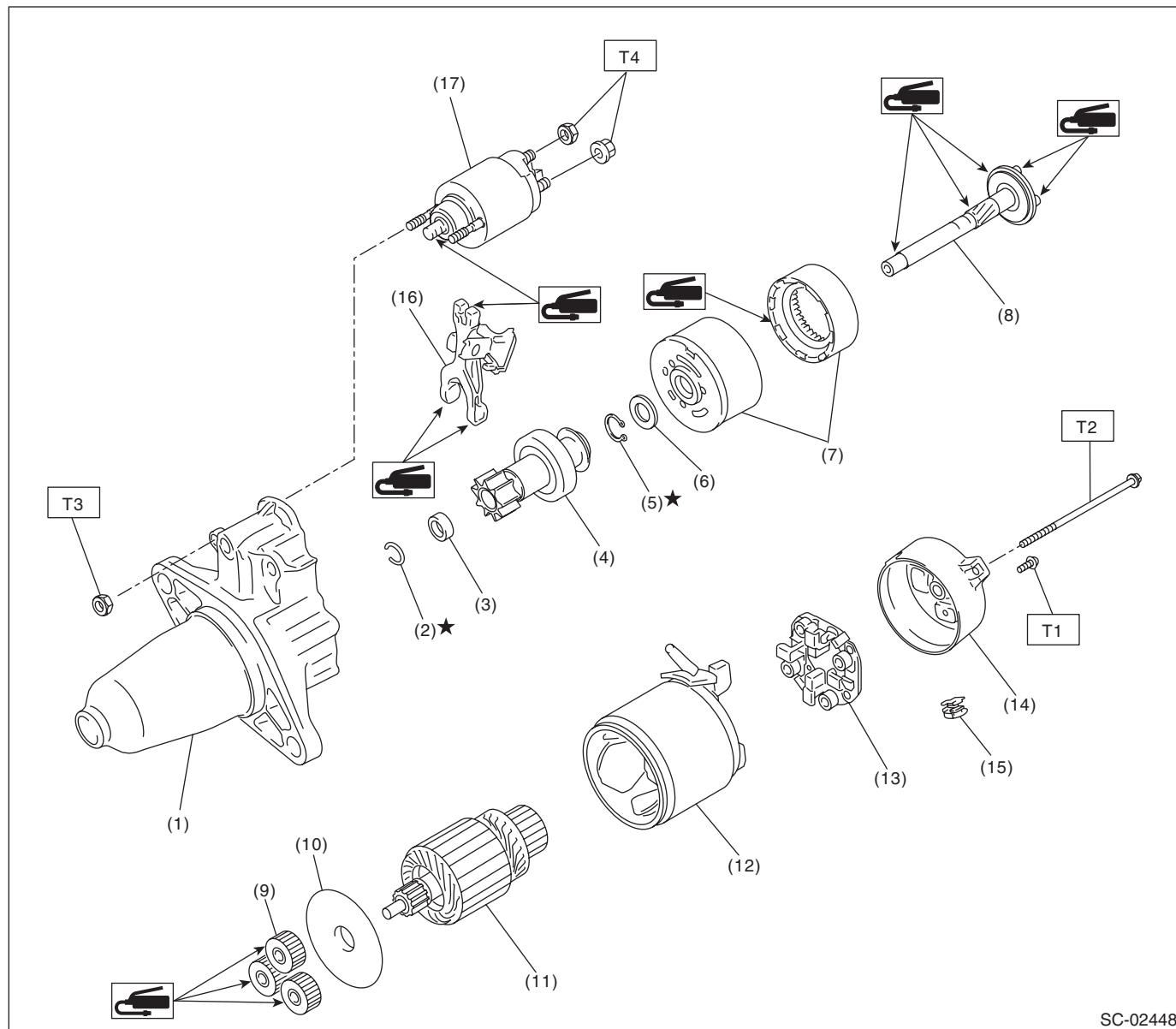
### 1. General Description

#### 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
	Lock characteristics	Rotating speed 860 rpm or more
		Voltage 4 V
		Current 515 A or less
		Torque 16 N·m (1.6 kgf-m, 11.8 ft-lb) or more
Generator	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)
	Brush length	Standard 18.5 mm (0.728 in)
		Limit 5.0 mm (0.197 in)
Battery	Type and capacity	12 V — 48 AH (55D23L)
	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)**

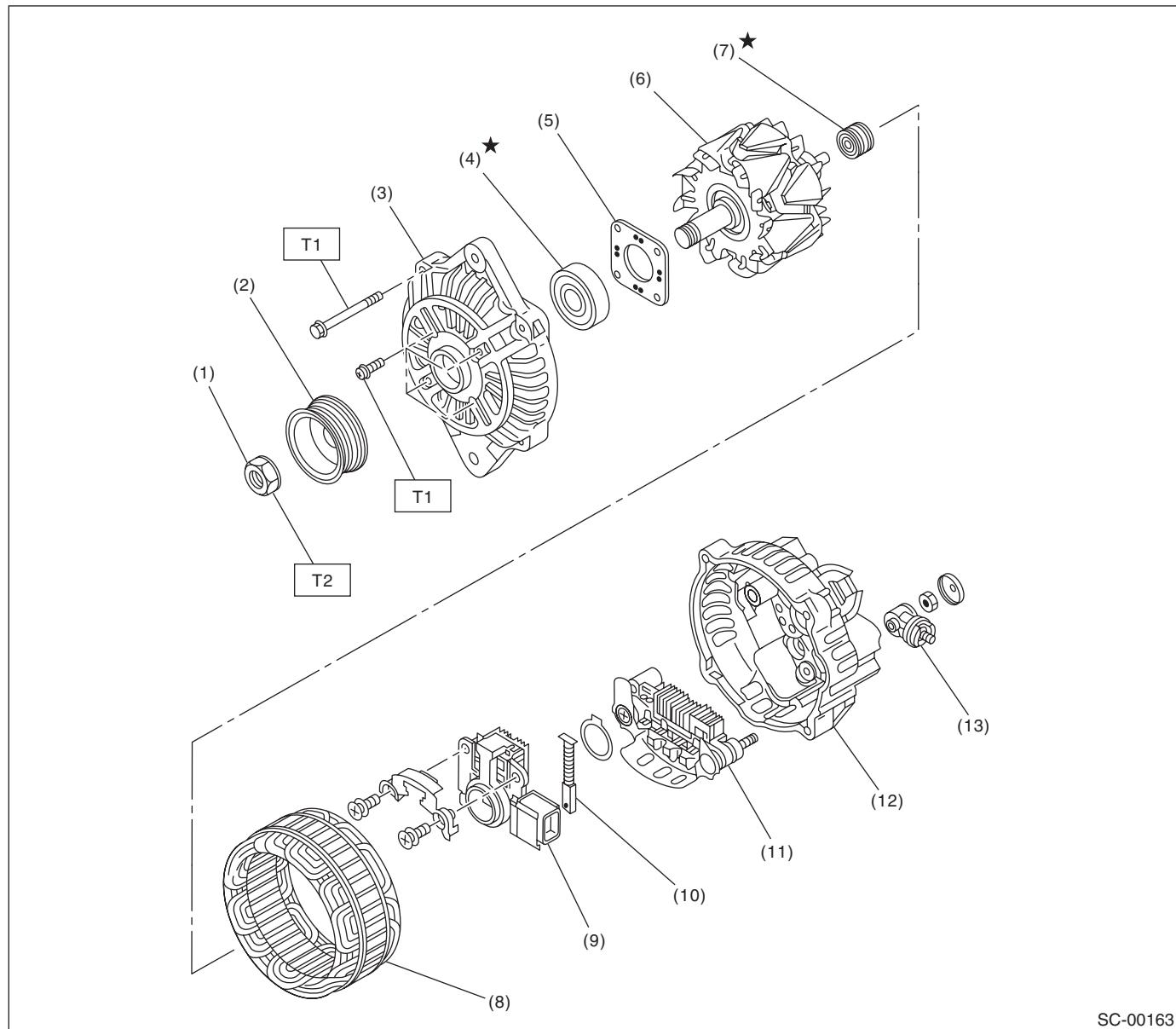
**T3: 7.5 (0.8, 5.5)**

**T4: 10 (1.0, 7.4)**

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## STARTING/CHARGING SYSTEMS

### 2. GENERATOR



- (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

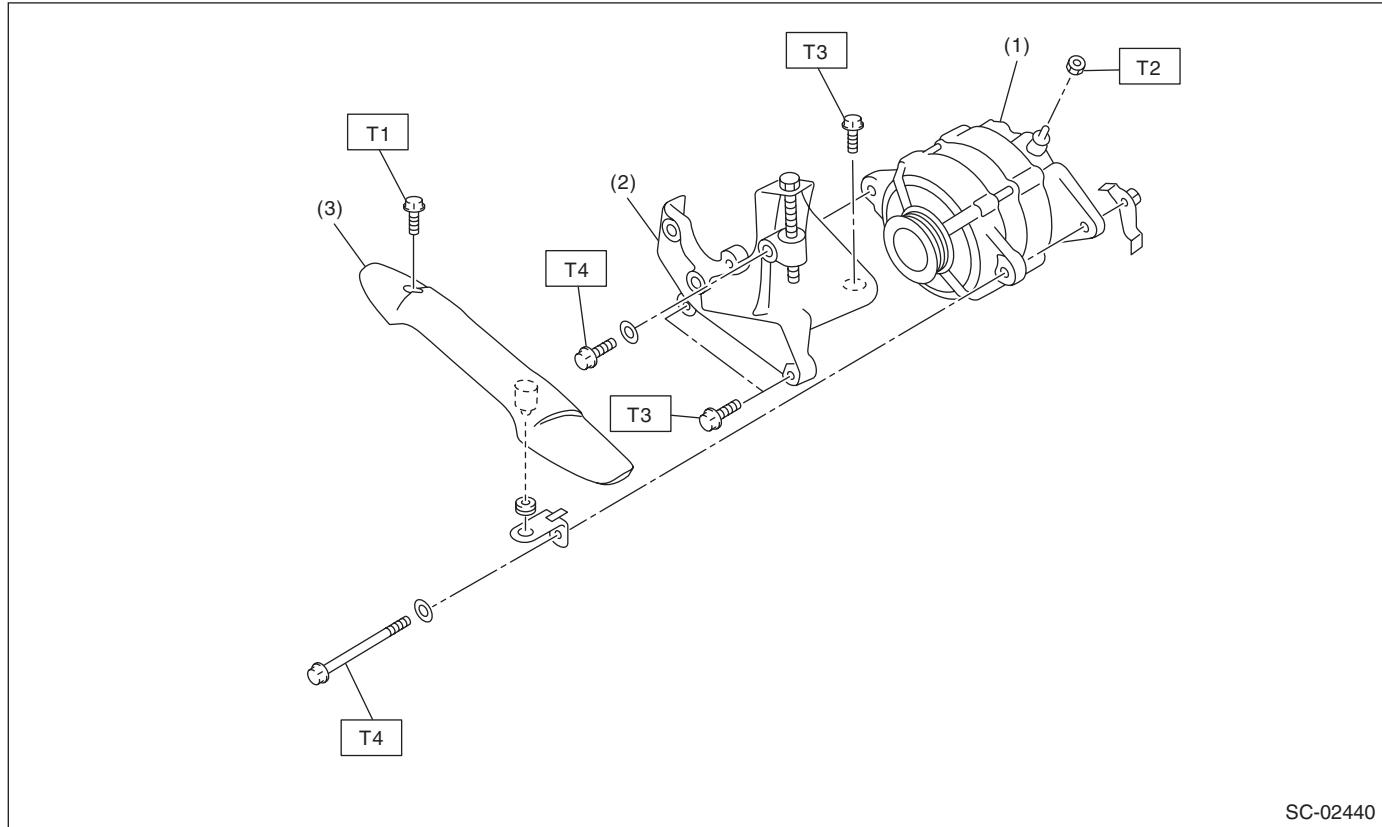
- (13) Terminal B

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

**T1: 4.7 (0.5, 3.5)**

**T2: 108 (11.0, 79.8)**

### 3. GENERATOR BRACKET



(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.