

General Description

STARTING/CHARGING SYSTEMS

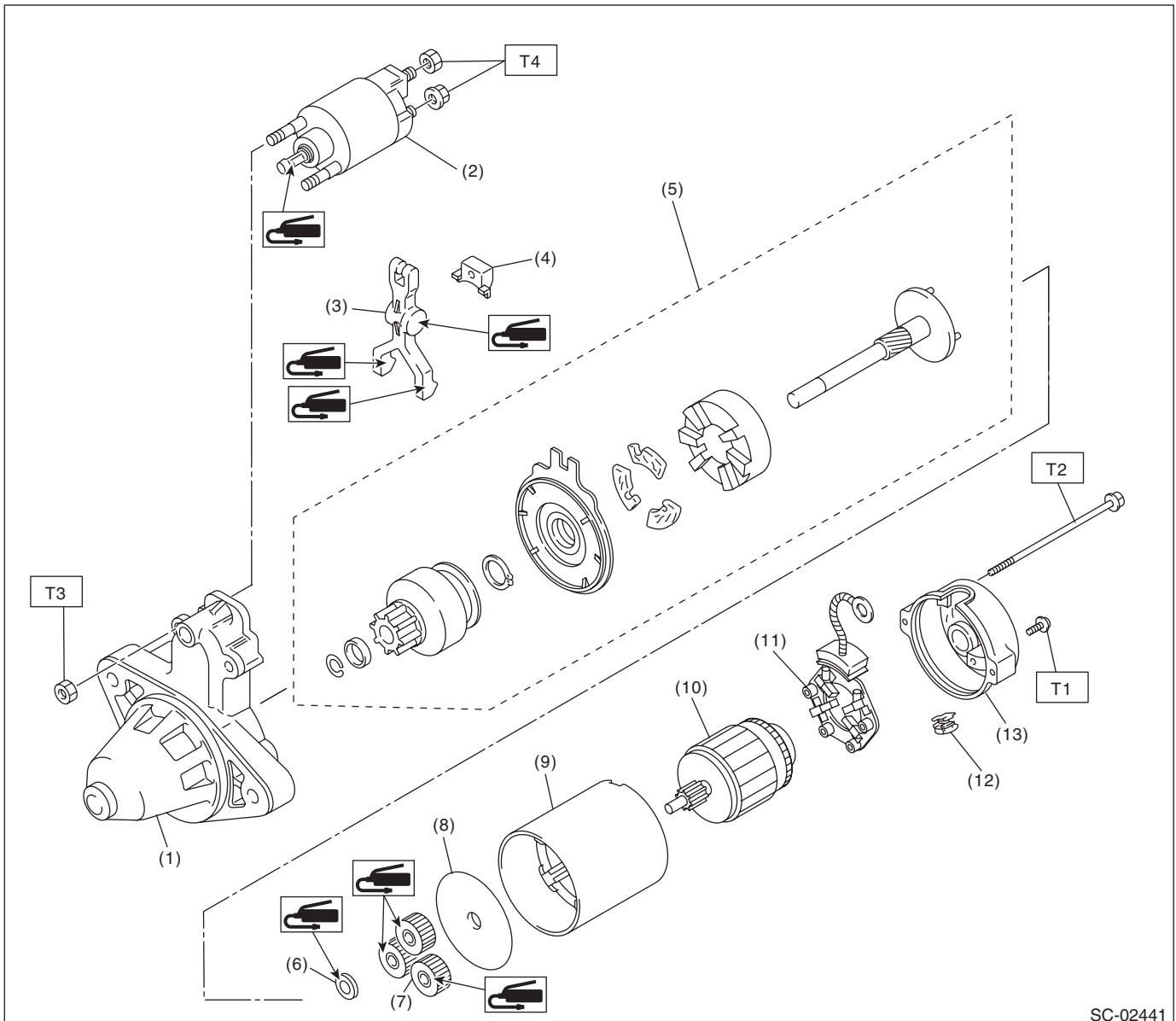
1. General Description

A: SPECIFICATION

Item		Specifications		
Vehicle model		CVT	MT	
Starter	Type	Reduction type		
	Model	438000-0540	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	
		Rotating speed	910 rpm or more	
	Lock characteristics	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		
	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 — 52 AH (75D 23R)		
	CCA	490A		

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)

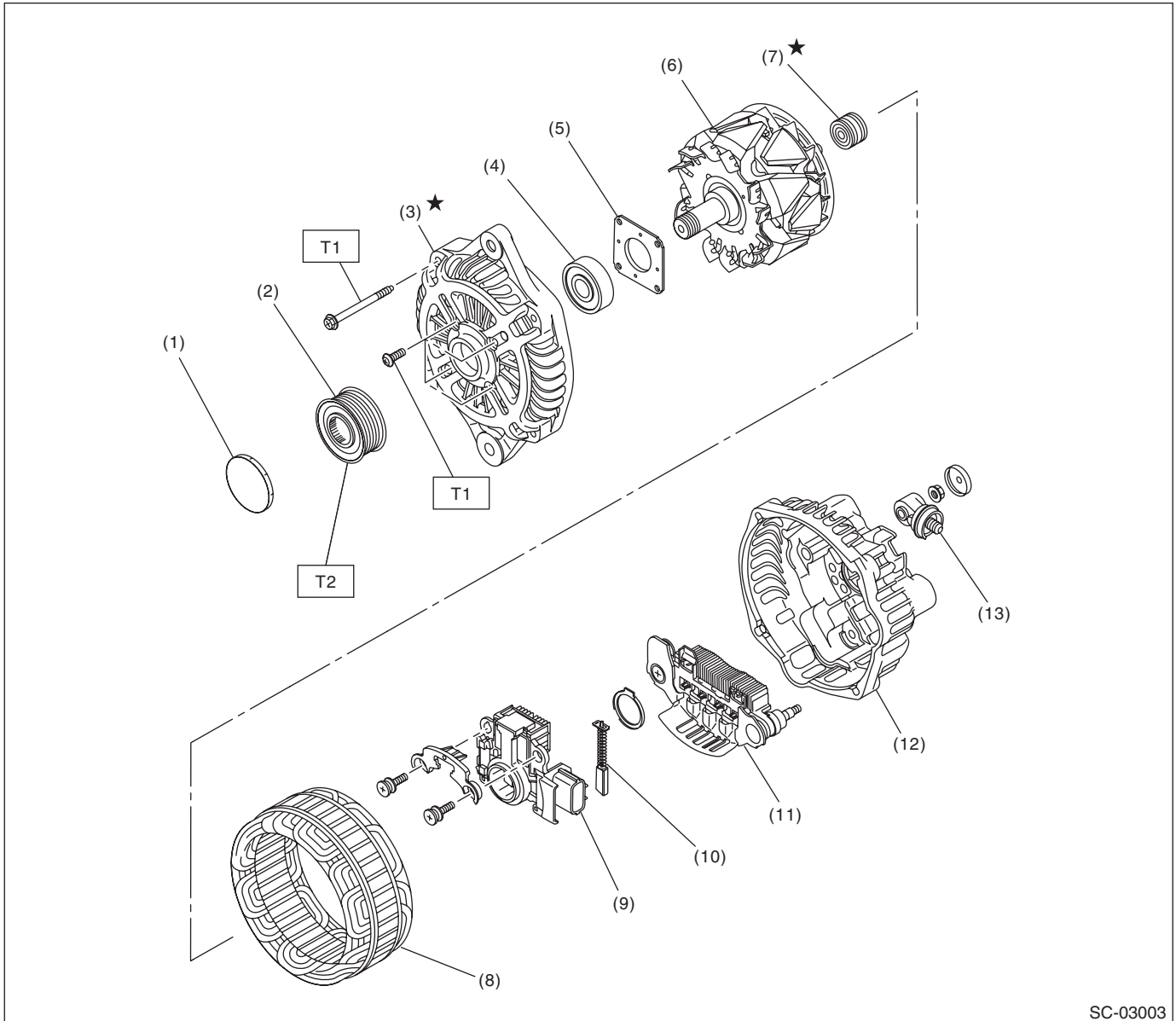
T3: 7.5 (0.8, 5.5)

T4: 10 (1.0, 7.4)

General Description

STARTING/CHARGING SYSTEMS

2. GENERATOR



SC-03003

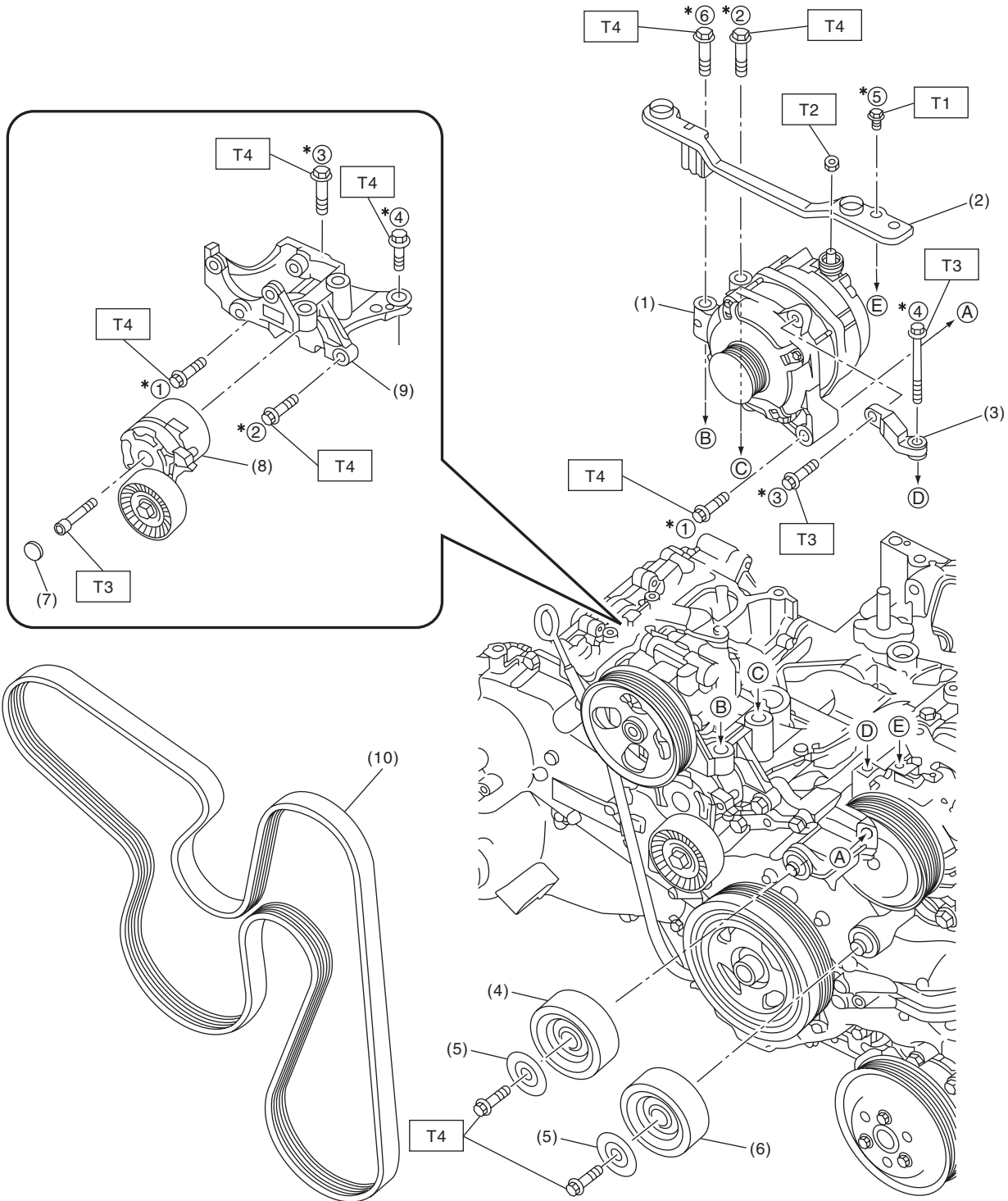
- | | | |
|----------------------|------------------|-----------------|
| (1) Cap | (7) Bearing | (13) Terminal B |
| (2) Pulley | (8) Stator coil | |
| (3) Front cover | (9) IC regulator | |
| (4) Ball bearing | (10) Brush | |
| (5) Bearing retainer | (11) Rectifier | |
| (6) Rotor | (12) Rear cover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

Tightening torque: N·m (kgf·m, ft·lb)

T1: 4.7 (0.5, 3.5)

T2: 80 (8.2, 59.0)

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: 6.4 (0.7, 4.7)

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.

General Description

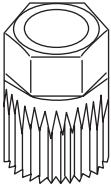
STARTING/CHARGING SYSTEMS

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. 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.