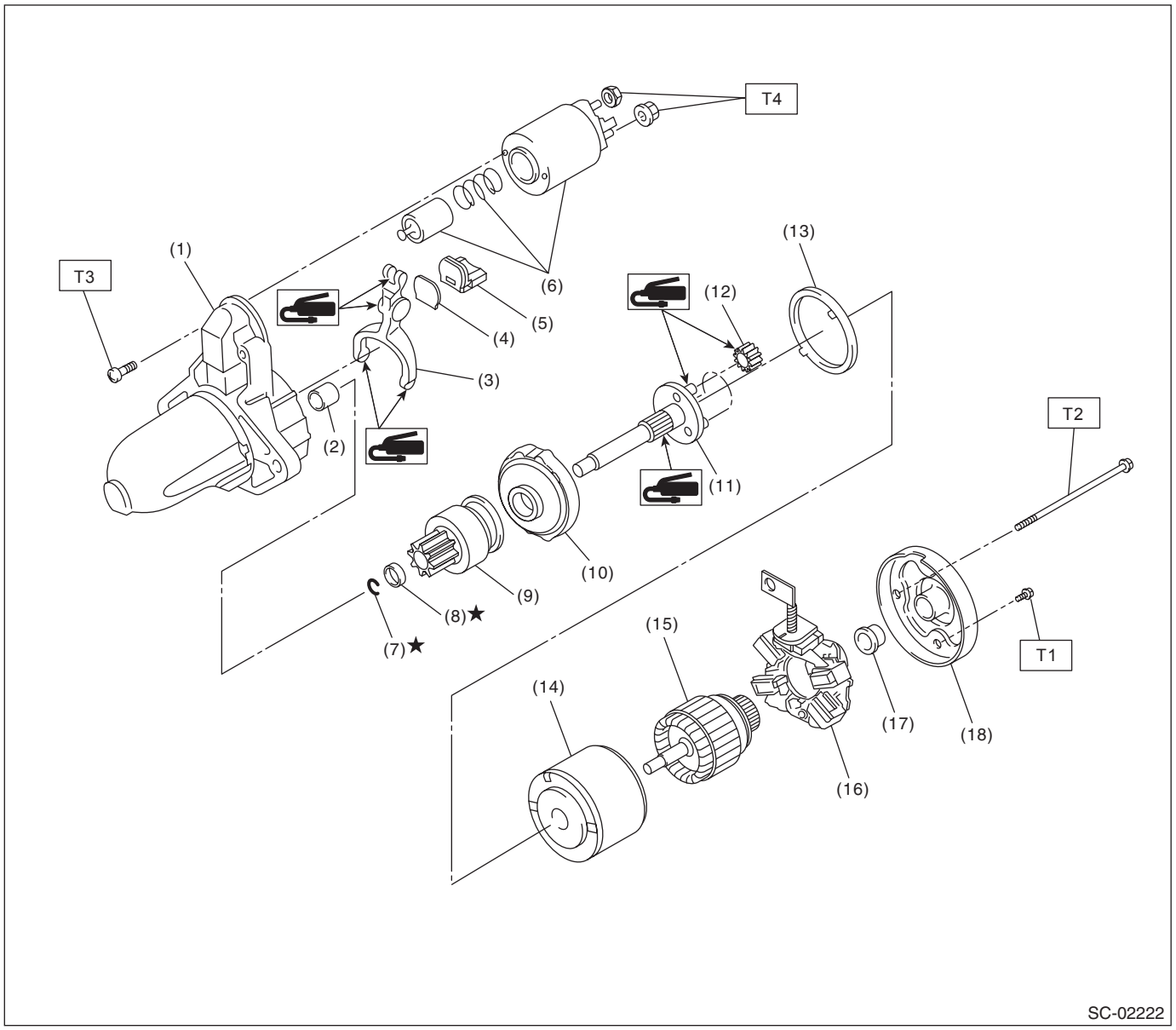
1. General Description

A: SPECIFICATION

Item			Specifications
Vehicle model			CVT
Starter	Type		Reduction type
	Model		M000T38571
	Manufacturer		Mitsubishi Electric
	Voltage and output		12 V — 1.2 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	0.50 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	2,370 rpm or more
	Load characteristics	Voltage	7.5 V
		Current	300 A
		Torque	10.65 N·m (1.1 kgf-m, 7.8 ft-lb) or more
		Rotating speed	840 rpm or more
	Lock characteristics	Voltage	4 V
		Current	780 A or less
		Torque	20 N·m (2.0 kgf-m, 14.8 ft-lb) or more
Integrated starter generator (ISG)	Type		Rotating-field three-phase type, voltage regulator built-in type, with load response control system, with inverter mode and self-diagnosis feature via LIN communication
	Model		iST60C021
	Manufacturer		Valeo
	Voltage and output		12 V — 200A
	Polarity on ground side		Negative
	Direction of rotation		Clockwise (when observed from pulley side)
	Stator connection		3-phase △ type
	Output current		1,500 rpm — 79.7 A or more 2,500 rpm — 166.6 A or more 5,000 rpm — 196.9 A or more
	Regulated voltage		14.1 — 14.5 V [20°C (68°F)]
Battery	Type and capacity	For 12 volt auxiliary	12 V — 48 AH (55D 23L)
		For 12 volt engine restart	12 V — 41 AH (N55-R)
	CCA	For 12 volt auxiliary	390 A
		For 12 volt engine restart	450 A

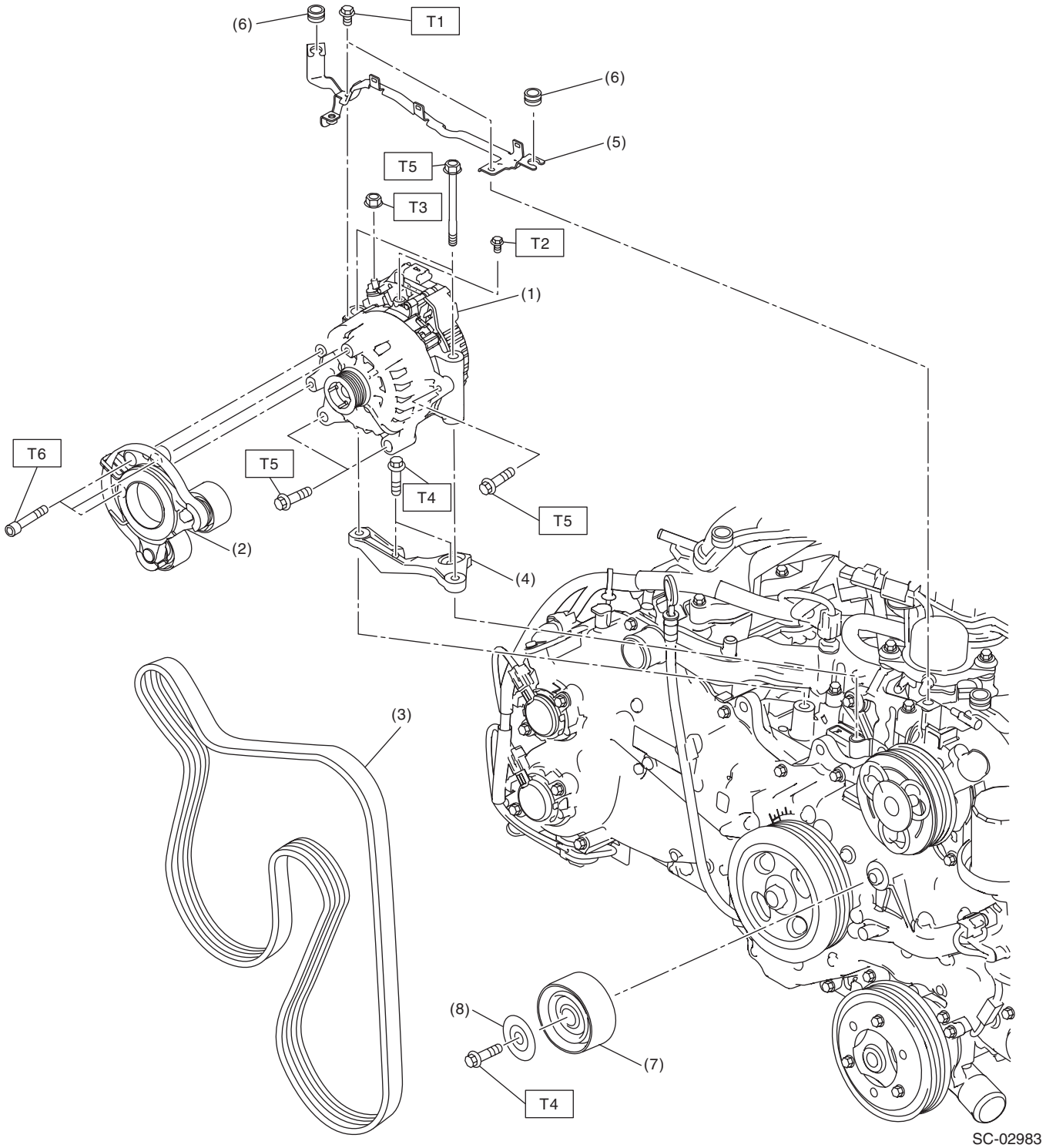
B: COMPONENT

1. STARTER



(1)	Starter housing ASSY	(9)	Overrunning clutch	(17)	Sleeve bearing
(2)	Sleeve bearing	(10)	Internal gear ASSY	(18)	Starter cover ASSY
(3)	Shift lever	(11)	Shaft		
(4)	Plate	(12)	Pinion gear	***Tightening torque: N·m (kgf-m, ft-lb)***	
(5)	Seal rubber	(13)	Seal rubber	***T1:***	***1.4 (0.1, 1.0)***
(6)	Magnet switch ASSY	(14)	Yoke ASSY	***T2:***	***6 (0.6, 4.4)***
(7)	Snap ring	(15)	Armature ASSY	***T3:***	***7.5 (0.8, 5.5)***
(8)	Stopper	(16)	Brush holder ASSY	***T4:***	***10 (1.0, 7.4)***

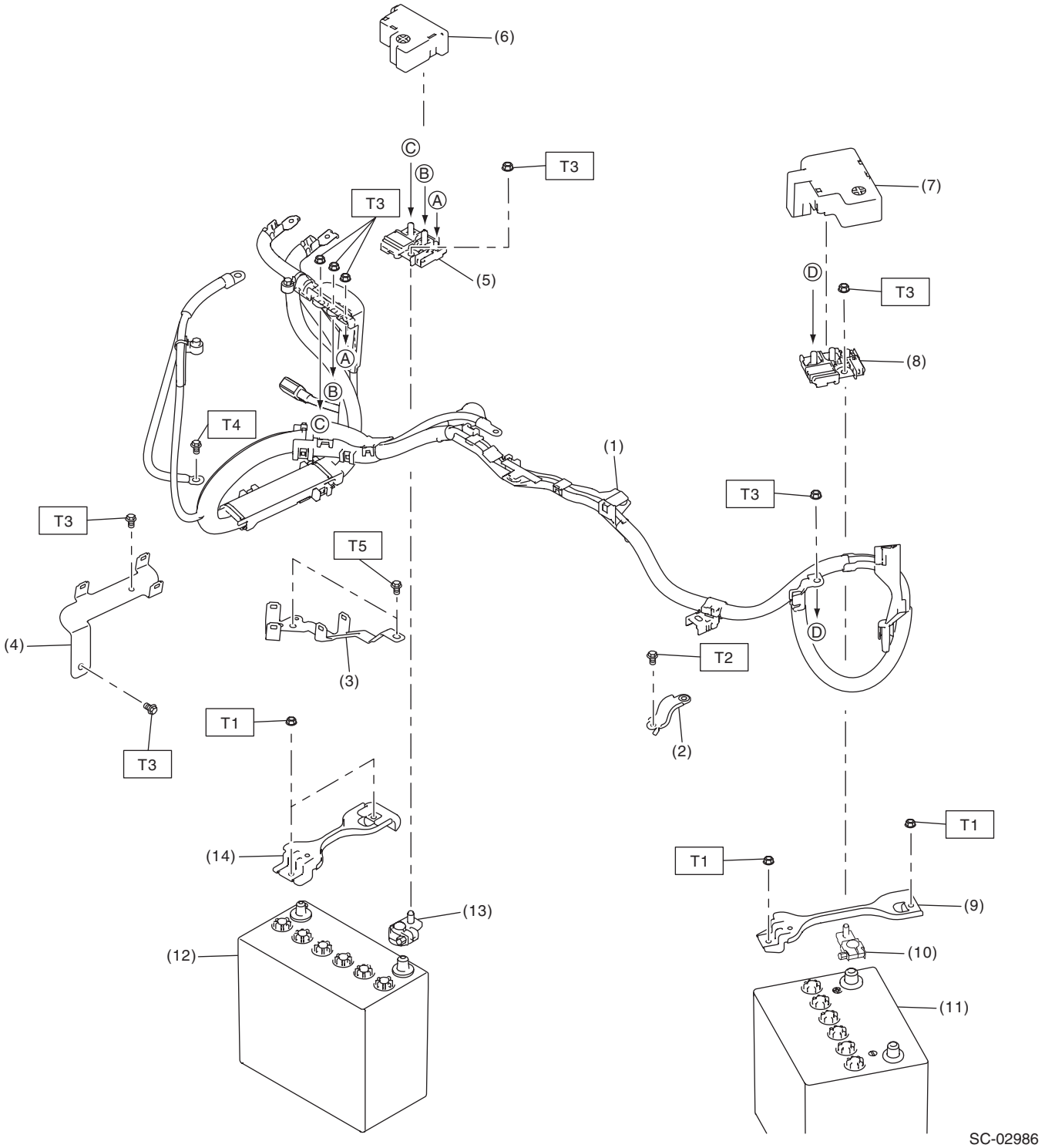
2. INTEGRATED STARTER GENERATOR (ISG) & ISG BRACKET



(1) Integrated starter generator (ISG)
(2) V-belt tensioner ASSY
(3) V-belt
(4) ISG bracket
(5) Collector cover bracket
(6) Cushion
(7) Idler pulley
(8) Idler pulley cover

Tightening torque: N·m (kgf-m, ft-lb)
T1: 6.4 (0.7, 4.7)
T2: 7.5 (0.8, 5.5)
T3: 15.5 (1.6, 11.4)
T4: 36 (3.7, 26.6)
T5: <Ref. to SC(H4DO(HEV))-35, INSTALLATION, Integrated Starter Generator (ISG).>
T6: <Ref. to ME(H4DO(w/o HEV))-134, HEV MODEL, INSTALLATION, V-belt.>

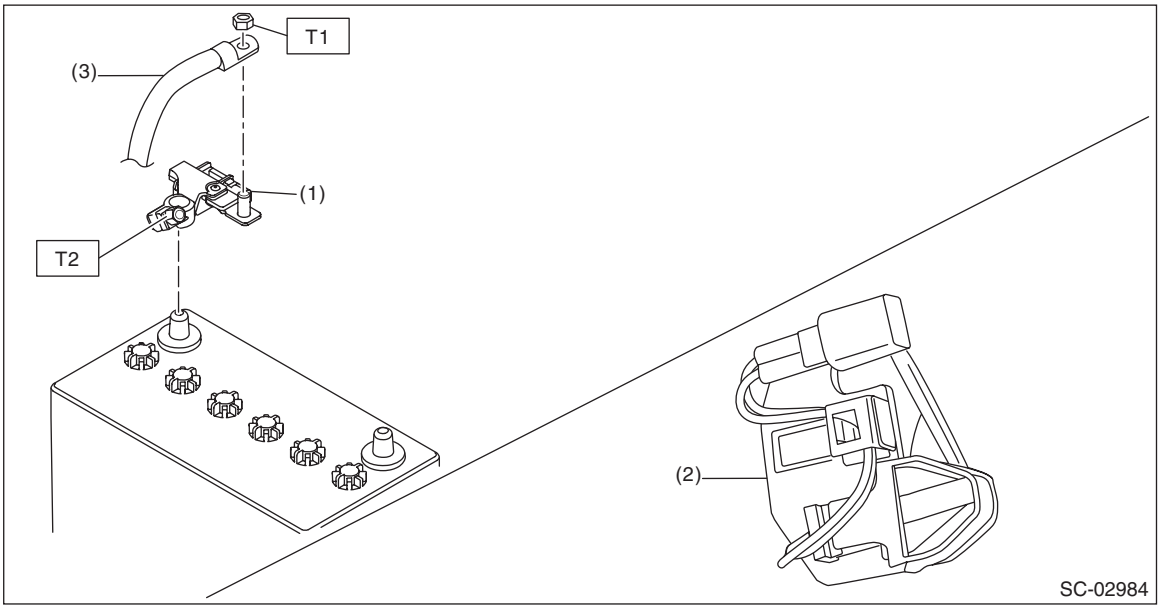
3. BATTERY CABLE ASSY



(1) Battery cable ASSY
(2) Battery cable stay
(3) Battery cable bracket No. 1
(4) Battery cable bracket No. 2
(5) Slow blow fuse (12 volt engine restart battery)
(6) Terminal boot (12 volt engine restart battery)
(7) Terminal boot (12 volt auxiliary battery)
(8) Slow blow fuse (12 volt auxiliary battery)
(9) Battery holder (12 volt auxiliary battery)
(10) Terminal base (12 volt auxiliary battery)
(11) 12 volt auxiliary battery
(12) 12 volt engine restart battery
(13) Terminal base (12 volt engine restart battery)
(14) Battery holder (12 volt engine restart battery)

Tightening torque: N·m (kgf-m, ft-lb)
T1: 3.5 (0.4, 2.6)
T2: 6.4 (0.7, 4.7)
T3: 7.5 (0.8, 5.5)
T4: 13 (1.3, 9.6)
T5: 19 (1.9, 14.0)

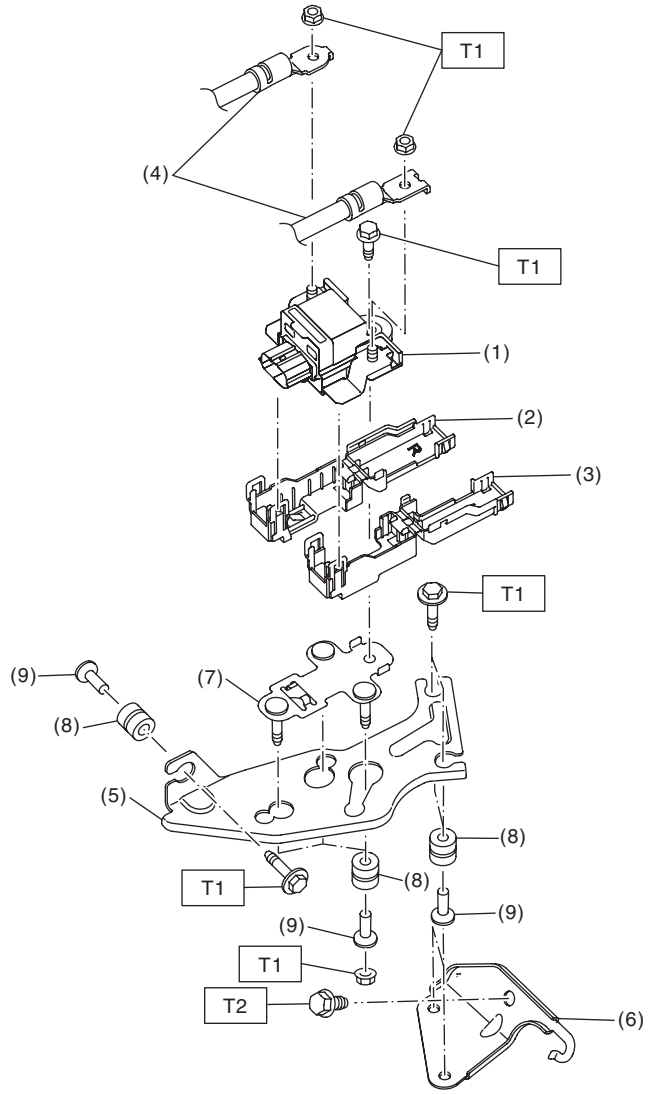
4. 12V ENGINE RESTART BATTERY SENSOR & BATTERY TEMPERATURE SENSOR



(1) 12V engine restart battery sensor
(2) Battery temperature sensor
(3) Ground terminal

Tightening torque: N·m (kgf-m, ft-lb)
T1: 7.5 (0.8, 5.5)
T2: <Ref. to SC(H4DO(HEV))-61, INSTALLATION, Battery Sensor.>

5. 12V BATTERY RELAY



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(1) 12V battery relay
(2) 12V battery relay cover RH
(3) 12V battery relay cover LH
(4) Battery cable ASSY
(5) 12V battery relay bracket No. 1
(6) 12V battery relay bracket No. 2
(7) 12V battery relay bracket No. 3
(8) Cushion
(9) Collar

Tightening torque: N·m (kgf-m, ft-lb)
T1: 7.5 (0.8, 5.5)
T2: 33 (3.4, 24.3)

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. NOTE: • For measuring standby current, prepare a circuit tester that can measure by 1 mA unit. • For measuring standby current in the models with keyless access, prepare an analog type circuit tester.