

## GENERAL DESCRIPTION

STARTING/CHARGING SYSTEMS

### 1. General Description

#### A: SPECIFICATIONS

Item		Designation		
		MT	AT	
Starter	Type	Reduction type		
	Model	228000-7131	228000-7141	
	Manufacturer	NIPPONDENSO TENNESSEE		
	Voltage and output	12 V — 1.0 kW	12 V — 1.4 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	3,000 rpm or more	2,900 rpm or more
	Load characteristics	Voltage	8 V	
		Current	280 A or less	370 A or less
		Torque	9.8 N·m (1.0 kgf-m, 7.2 ft-lb)	13.7 N·m (1.4 kgf-m, 10.1 ft-lb)
		Rotating speed	900 rpm or more	880 rpm or more
	Lock characteristics	Voltage	5 V	
		Current	800 A or less	1,050 A or less
Torque		27.5 N·m (2.8 kgf-m, 20.3 ft-lb) or more		
Generator	Type	Rotating-field three-phase type, Voltage regulator built-in type		
	Model	A002TB2891ZC		
	Manufacturer	MITSUBISHI ELECTRIC		
	Voltage and output	12 V — 90 A		
	Polarity on ground side	Negative		
	Rotating direction	Clockwise (when observed from pulley side.)		
	Armature connection	3-phase Y-type		
	Output current	1,500 rpm — 36 A or more		
		2,500 rpm — 65A or more		
5,000 rpm — 86 A or more				
Regulated voltage	14.1 - 14.8 V [20°C (68°F)]			
Battery	Reserve capacity	amps min.	90	110
	Cold cranking	amp.	430	490

**SC(H4SO)-2**

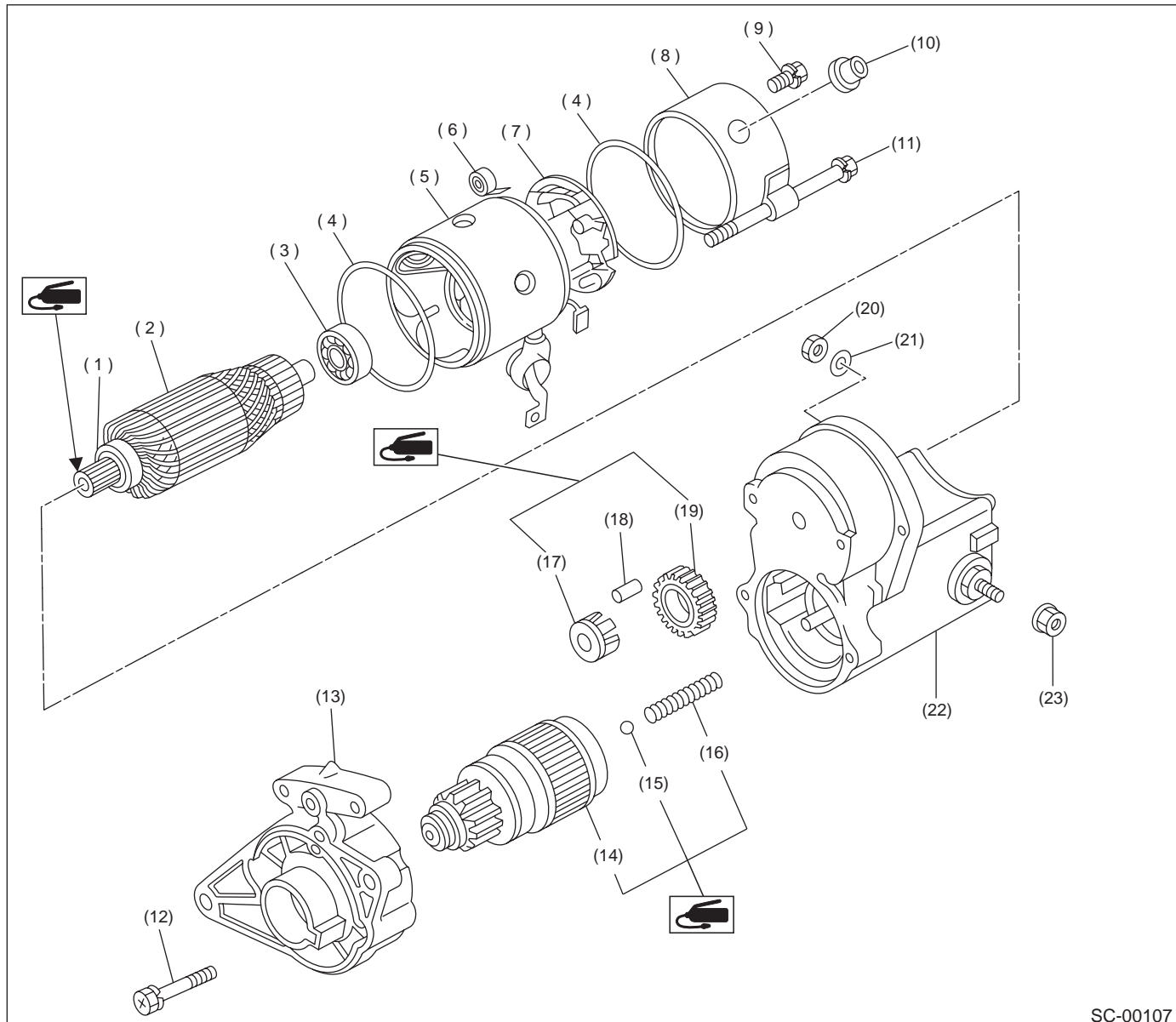
## GENERAL DESCRIPTION

STARTING/CHARGING SYSTEMS

### B: COMPONENT

#### 1. STARTER

- MT VEHICLES



SC-00107

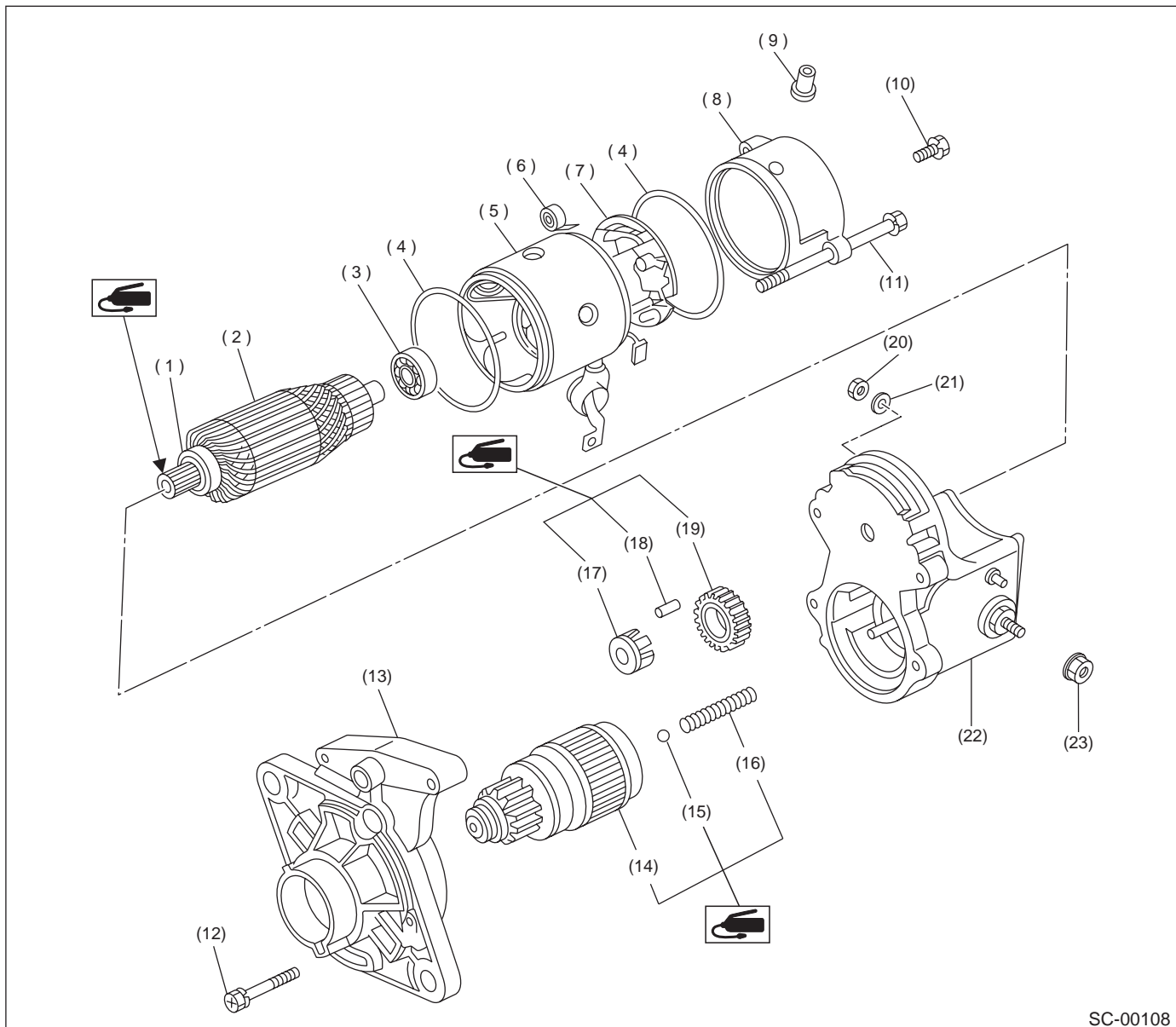
- |                        |                         |                      |
|------------------------|-------------------------|----------------------|
| (1) Front ball bearing | (9) Screw               | (17) Retainer        |
| (2) Armature           | (10) Cover              | (18) Roller          |
| (3) Rear ball bearing  | (11) Through bolt       | (19) Idle gear       |
| (4) O-ring             | (12) Screw & washer     | (20) Nut             |
| (5) Yoke               | (13) Starter housing    | (21) Spring washer   |
| (6) Brush spring       | (14) Overrunning clutch | (22) Magnetic switch |
| (7) Brush holder       | (15) Steel ball         | (23) Nut             |
| (8) End frame          | (16) Spring             |                      |

**SC(H4SO)-3**

## GENERAL DESCRIPTION

### STARTING/CHARGING SYSTEMS

- AT VEHICLES



SC-00108

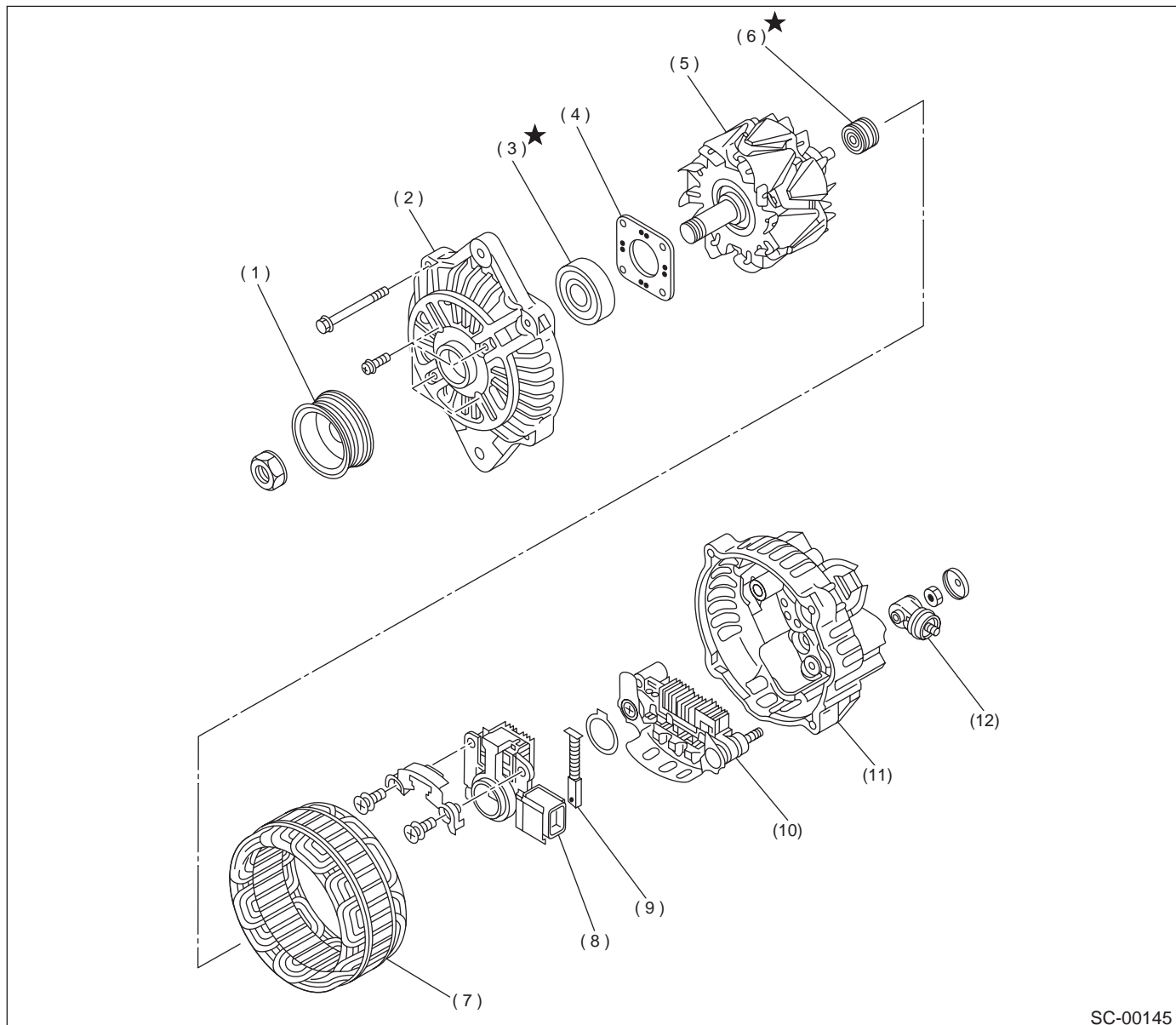
- |                        |                         |                      |
|------------------------|-------------------------|----------------------|
| (1) Front ball bearing | (9) Cover               | (17) Retainer        |
| (2) Armature           | (10) Screw              | (18) Roller          |
| (3) Rear ball bearing  | (11) Through-bolt       | (19) Idle gear       |
| (4) O-ring             | (12) Screw & washer     | (20) Nut             |
| (5) Yoke               | (13) Starter housing    | (21) Spring washer   |
| (6) Brush spring       | (14) Overrunning clutch | (22) Magnetic switch |
| (7) Brush holder       | (15) Steel ball         | (23) Nut             |
| (8) End frame          | (16) Spring             |                      |

**SC(H4SO)-4**

## GENERAL DESCRIPTION

STARTING/CHARGING SYSTEMS

### 2. GENERATOR



SC-00145

- (1) Pulley
- (2) Front cover
- (3) Ball bearing
- (4) Bearing retainer

- (5) Rotor
- (6) Bearing
- (7) Stator coil
- (8) IC regulator with brush

- (9) Brush
- (10) Rectifier
- (11) Rear cover
- (12) Terminal

**SC(H4SO)-5**

## GENERAL DESCRIPTION

### STARTING/CHARGING SYSTEMS

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#### **C: CAUTION**

- Wear working clothing, including a cap, protective goggles, and protective shoes during operation.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust or dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly, and replacement.
- Be careful not to burn your hands, because each part in the vehicle is hot after running.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or safety stands at the specified points.
- Before disconnecting electrical connectors of sensors or units, be sure to disconnect ground cable from battery.