

# GENERAL DESCRIPTION

STARTING/CHARGING SYSTEMS

## 1. General Description

### A: SPECIFICATIONS

Item		Designation		
		MT	AT	
Starter	Type	Reduction type		
	Model	228000-7131	228000-7141	
	Manufacturer	DENSO CORPORATION		
	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	A2TB2891ZC		
	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	min. 90	110	
	Cold cranking ampere	A 430	490	

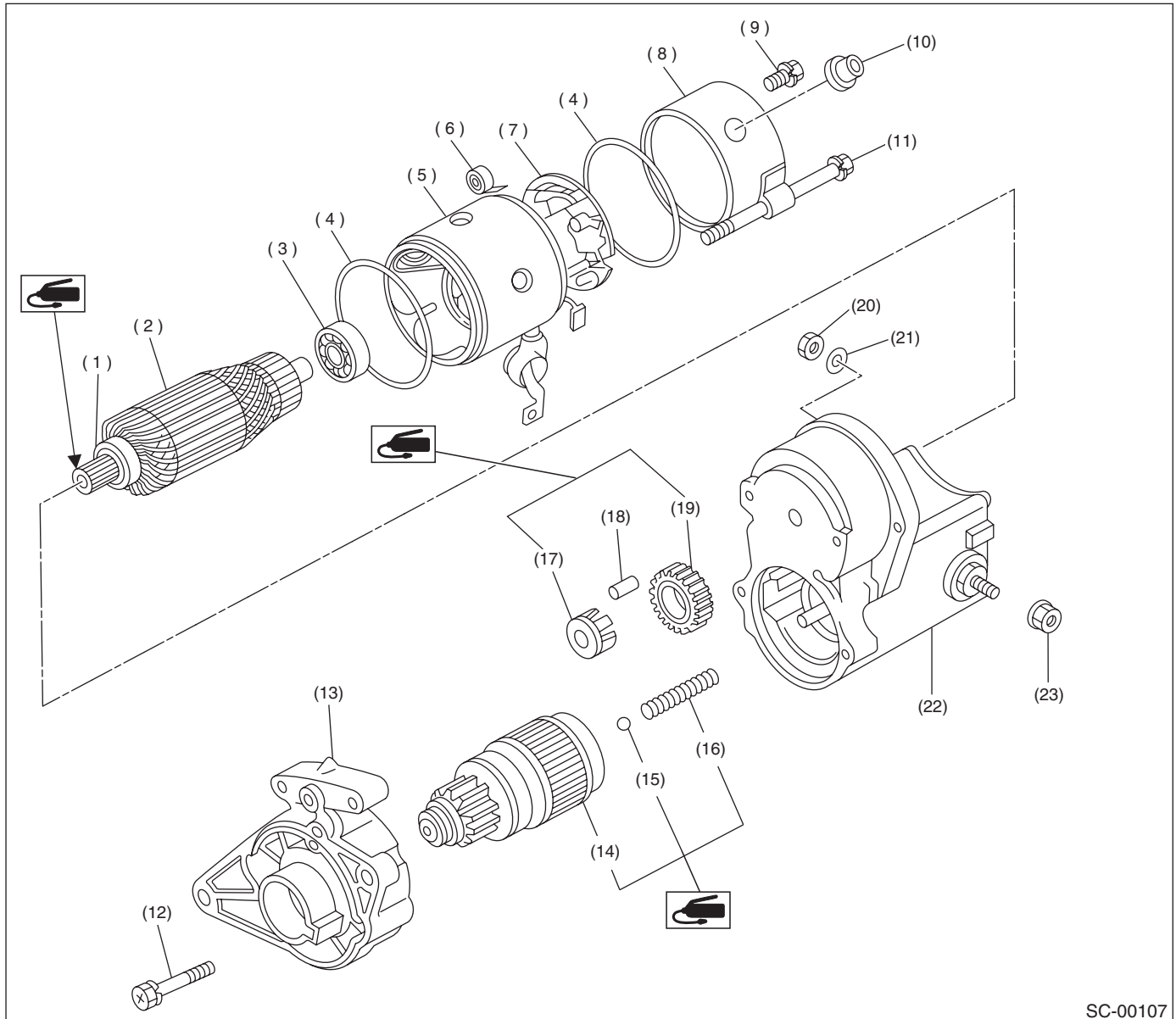
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## B: COMPONENT

### 1. STARTER

- MT MODELS



SC-00107

- (1) Front ball bearing
- (2) Armature
- (3) Rear ball bearing
- (4) O-ring
- (5) Yoke
- (6) Brush spring
- (7) Brush holder
- (8) End frame

- (9) Screw
- (10) Cover
- (11) Through bolt
- (12) Screw & washer
- (13) Starter housing
- (14) Overrunning clutch
- (15) Steel ball
- (16) Spring

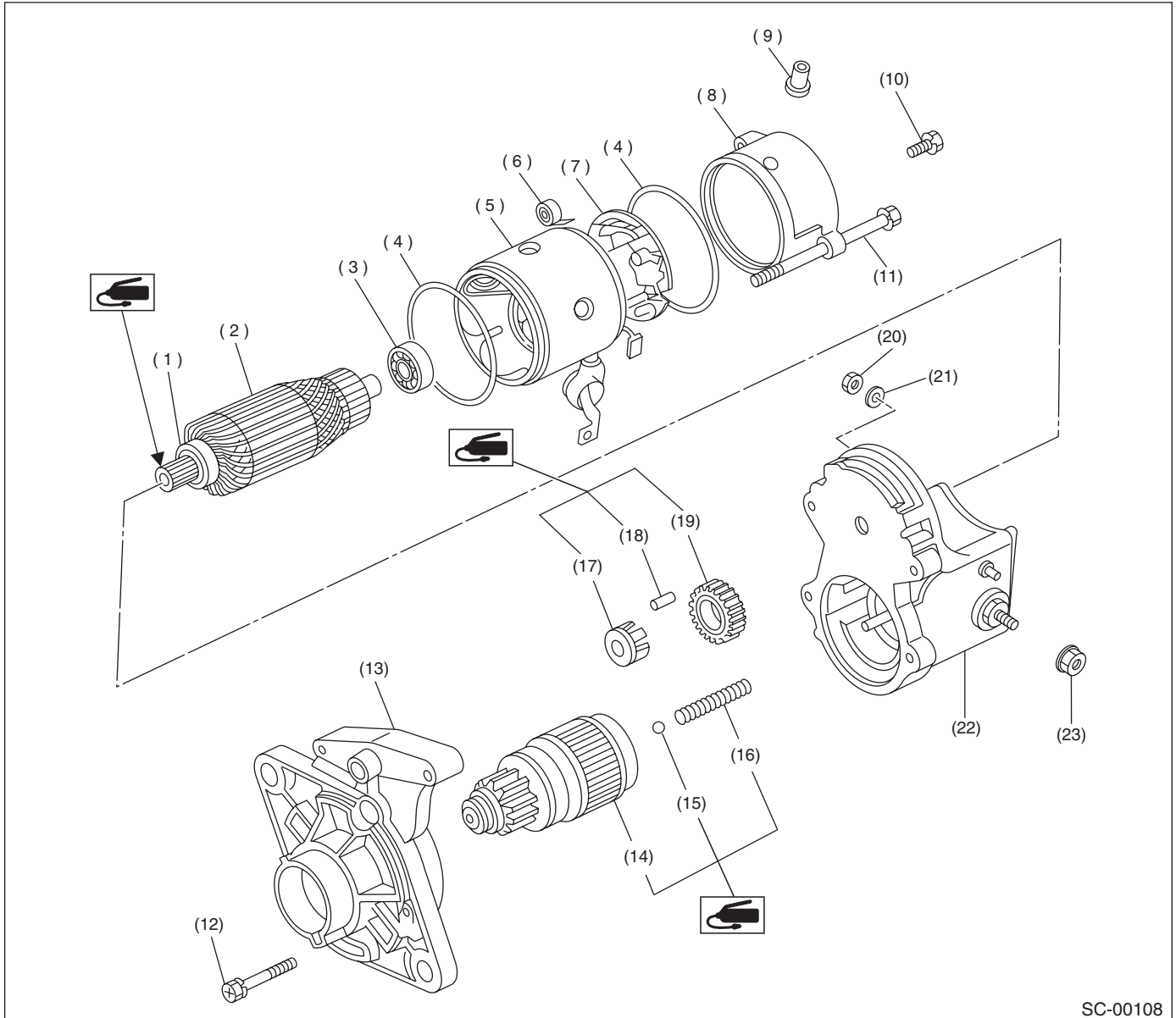
- (17) Retainer
- (18) Roller
- (19) Idle gear
- (20) Nut
- (21) Spring washer
- (22) Magnetic switch
- (23) Nut

SC(H4SO)-3

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## STARTING/CHARGING SYSTEMS

### • AT MODELS



SC-00108

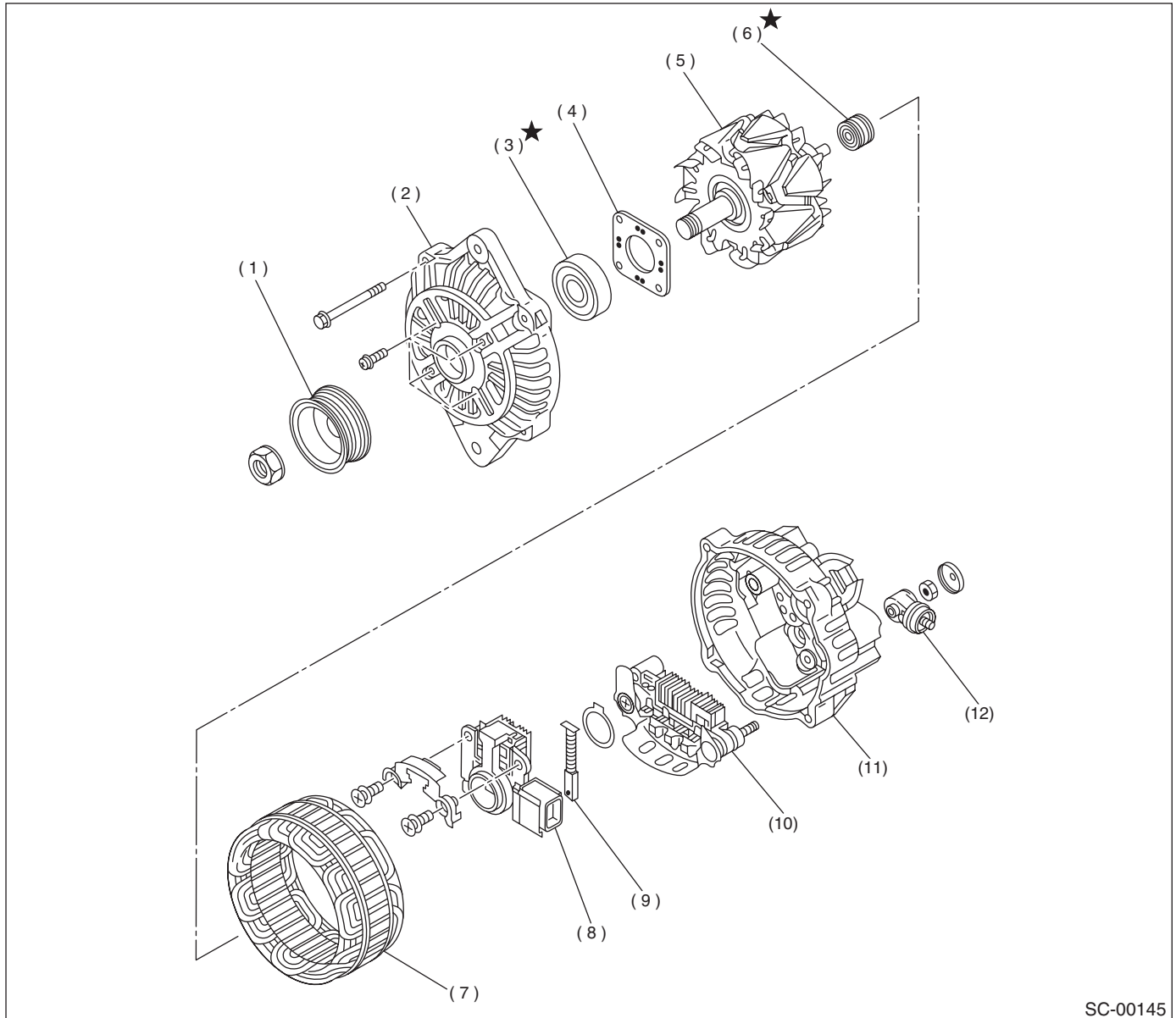
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## 2. GENERATOR



SC-00145

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

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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.