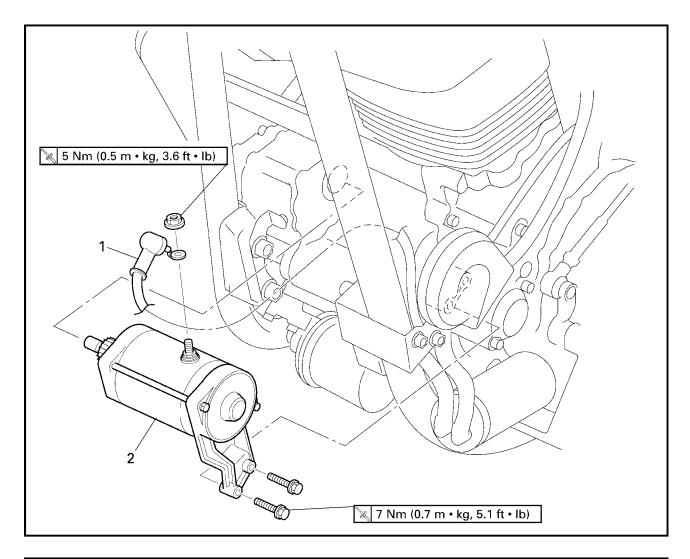
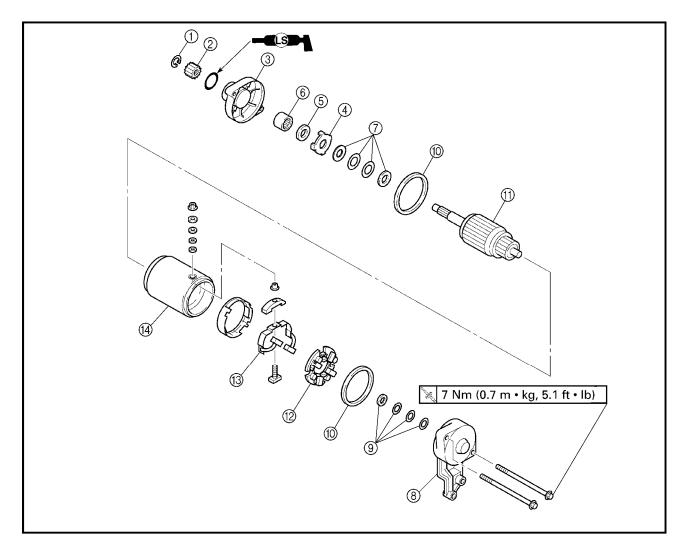
# STARTER MOTOR

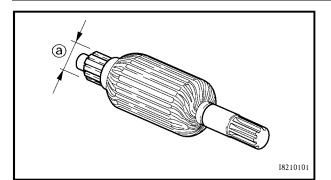


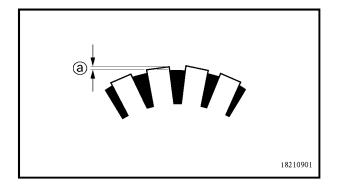
Order	Job/Part	Q'ty	Remarks
	Removing the starter motor		Remove the parts in the order listed.
1	Starter motor lead	1	
2	Starter motor assembly	1	
			For installation, reverse the removal
			procedure.

EB803501



Order	Job/Part	Q'ty	Remarks
	Disassembling the starter motor		Remove the parts in the order listed.
1	Circlip	1	
2	Starter motor	1	
3	Starter motor rear cover	1	
4	Lock washer	1	
(5)	Oil seal	1	
6	Bearing	1	
7	Washer set	1	
8	Starter motor front cover	1	
9	Washer set	1	
10	O-ring	2	
11)	Armature assembly	1	
12	Brush seat (along with the brushes)	1	
13	Brush holder (along with the brushes)	1	
14)	Starter motor yoke	1	
			For assembly, reverse the disassembly
			procedure





EB803511

# **CHECKING THE STARTER MOTOR**

- 1. Check:
- commutator  $\mbox{Dirt} \rightarrow \mbox{Clean with 600 grit sandpaper}.$
- 2. Measure:
- commutator diameter (a)
   Out of specification → Replace the starter motor.



Minimum commutator diameter 27 mm (1.06 in)

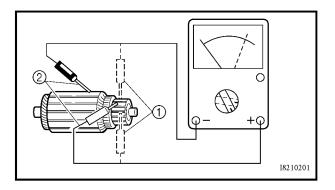
- 3. Measure:
- mica undercut ⓐ
   Out of specification → Scrape the mica to the proper measurement with a hacksaw blade which has been grounded to fit the commutator.



Mica undercut 0.7 mm (0.03 in)

### NOTE: -

The mica must be undercut to ensure proper operation of the commutator.



- 4. Measure:
- armature assembly resistances (commutator and insulation)
   Out of specification → Replace the starter
- a. Measure the armature assembly resistances with the pocket tester.



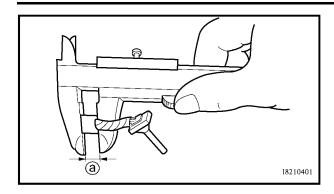
Pocket tester YU-03112



Armature assembly Commutator resistance ①  $0.025 \sim 0.035~\Omega$  at 20 °C (68 °F) Insulation resistance ② Above 1 M $\Omega$  at 20 °C (68 °F)

b. If any resistance is out of specification, replace the starter motor.



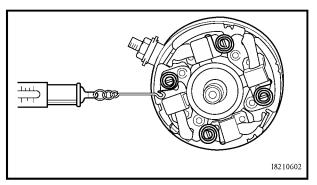


# 5. Measure:

 brush length @ Out of specification  $\rightarrow$  Replace the brushes as a set.



Minimum brush length 5 mm (0.20 in)



# 6. Measure:

· brush spring force Out of specification → Replace the brush springs as a set.

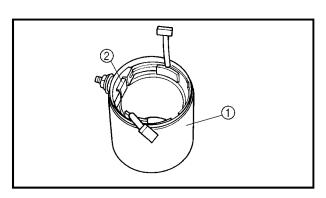


**Brush spring force** 7.65 ~ 10.01 N

(765 ~ 1,001 gf, 27.0 ~ 35.3 oz)

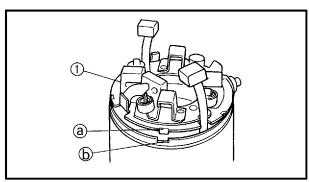
# 7. Check:

- gear teeth Damage/wear → Replace the gear.
- 8. Check:
- bearing
- oil seal Damage/wear → Replace the defective part(s).



# **ASSEMBLING THE STARTER MOTOR**

- 1. Install:
- starter motor yoke ①
- bush holder ②

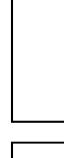


# 2. Install:

• brush seat ①

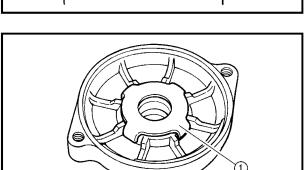
# NOTE: \_

Align the tab @ on the brush seat with the slot (b) in the starter motor rear cover.

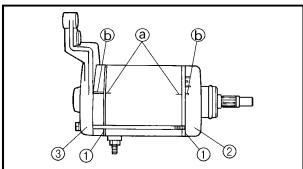




armature assembly



- 4. Install:
- bearing
- oil seal
- lock washer ①

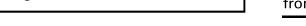


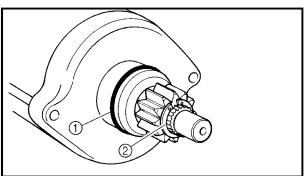
- 5. Install:
- O-rings (1) New
- starter motor rear cover 2
- starter motor front cover ③
- bolts

7 Nm (0.7 m · kg, 5.1 ft · lb)

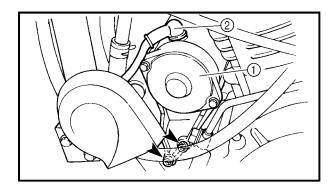


Align the match marks (a) on the starter motor yoke with the match marks (b) on the front and rear covers.





- 6. Install:
- starter motor gear 1
- circlip ②



# **INSTALLING THE STARTER MOTOR**

- 1. Install:
- starter motor 1

🗽 7 Nm (0.7 m · kg, 5.1 ft · lb)

- 2. Connect:
- starter lead 2

**№** 5 Nm (0.5 m · kg, 3.6 ft · lb)