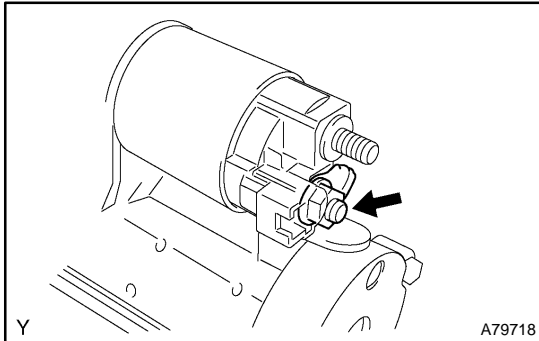
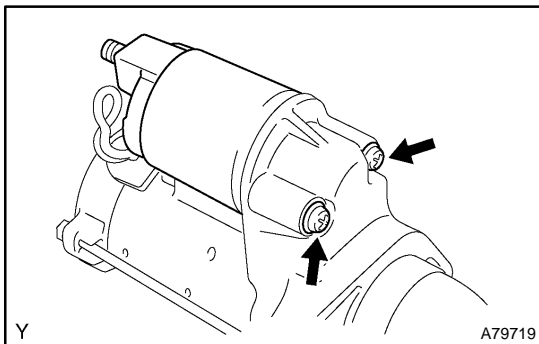


OVERHAUL

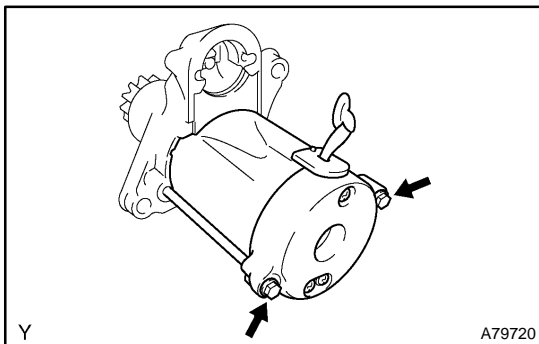


1. REMOVE MAGNETIC SWITCH ASSY

- (a) Remove the nut and disconnect the lead wire from the magnetic switch.

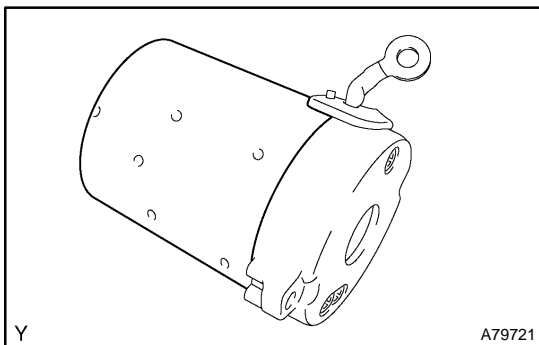


- (b) Remove the 2 screws holding the magnetic switch to the starter drive housing.
(c) Remove the magnetic switch.
(d) Remove the return spring and plunger from starter drive housing.

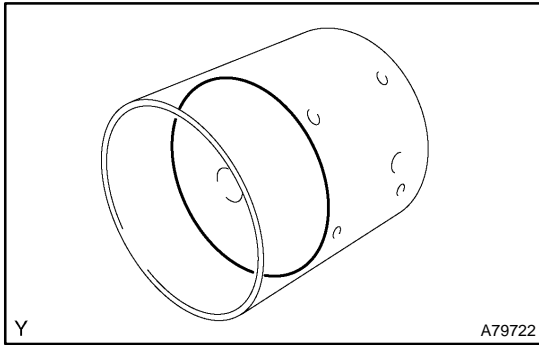


2. REMOVE STARTER FIELD FRAME ASSY

- (a) Remove the 2 through-bolts, and pull out the field frame together with the commutator end frame assy.

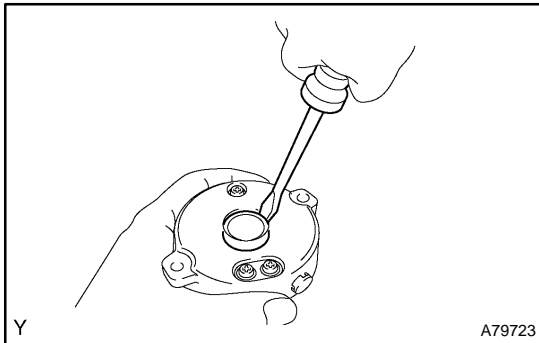


- (b) Remove the field frame from the commutator end frame.



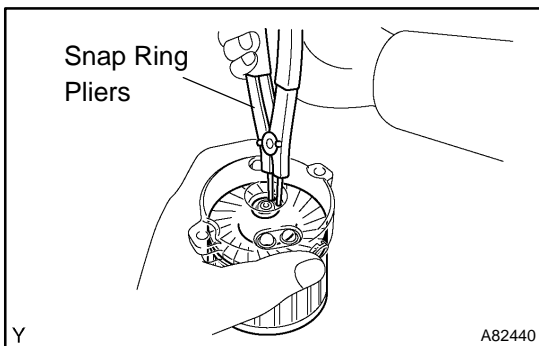
3. REMOVE STARTER ARMATURE PLATE

- (a) Remove the armature plate from the field frame.



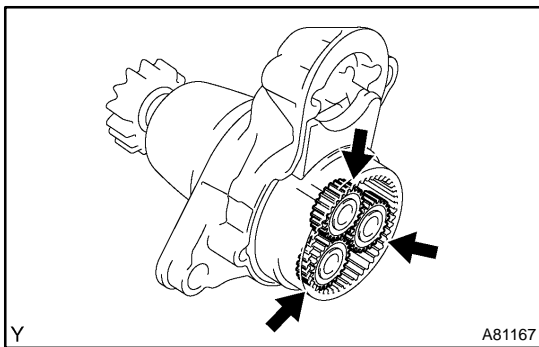
4. REMOVE STARTER COMMUTATOR END FRAME COVER

- (a) Using a screwdriver, remove the commutator end frame cover.



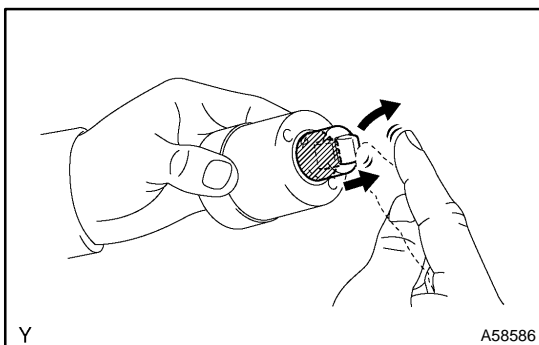
5. REMOVE STARTER ARMATURE ASSY

- (a) Using snap ring pliers, remove the snap ring and plate washer.
(b) Remove the armature from the commutator end frame.



6. REMOVE PLANETARY GEAR

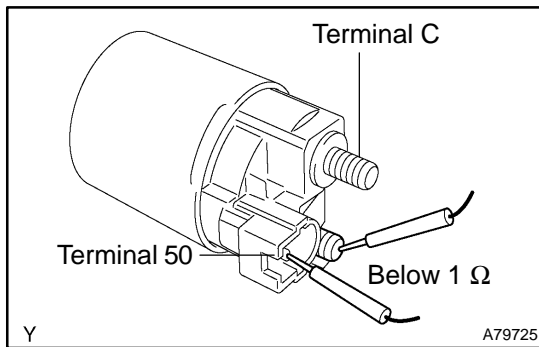
- (a) Remove the 3 planetary gears from the starter drive housing assy.



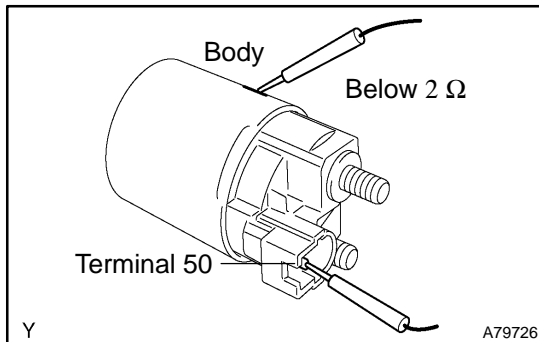
7. INSPECT MAGNETIC SWITCH ASSY

- (a) Check the plunger.
(1) Push in the plunger and check that it returns quickly to its original position.

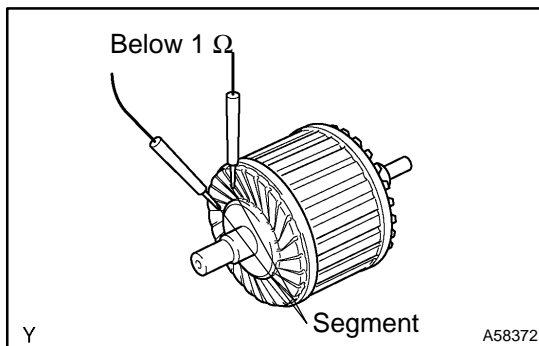
If necessary, replace the magnetic switch.



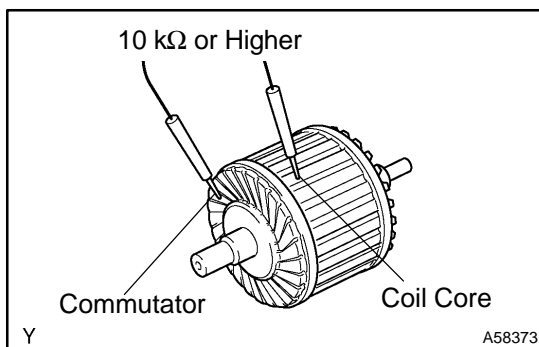
- (b) Check if the pull-in coil has an open circuit.
 (1) Check the resistance between terminals 50 and C.
Standard: Below 1 Ω
 If the the result is not as specified, replace the magnetic switch.



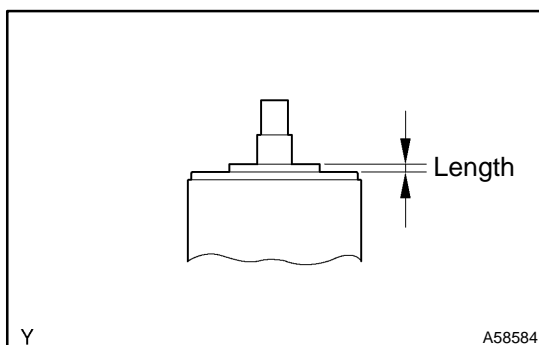
- (c) Check if the hold-in coil has an open circuit.
 (1) Check the resistance between terminal 50 and the switch body.
Standard: Below 2 Ω
 If the the result is not as specified, replace the magnetic switch.



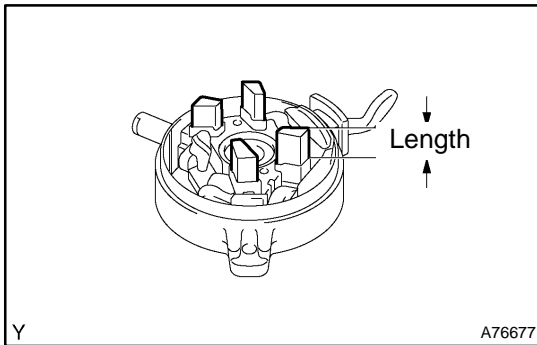
- 8. INSPECT STARTER ARMATURE ASSY**
 (a) Check if the commutator has an open circuit.
 (1) Check the resistance between the segments of the commutator.
Standard: Below 1 Ω
 If the result is not as specified, replace the armature assy.



- (b) Check if the commutator is grounded.
 (1) Check the resistance between the commutator and armature coil core.
Standard: 10 kΩ or higher
 If the result is not as specified, replace the armature assy.
 (c) Check the commutator for contamination and burns on its surface.
 If the surface is dirty or burnt, correct it with sandpaper (No.400) or a lathe.



- (d) Using a vernier caliper, measure the commutator's length.
Specified length: 3.1 to 3.8 mm (0.122 to 0.150 in.)
 If the length is greater than the maximum, replace the starter armature.

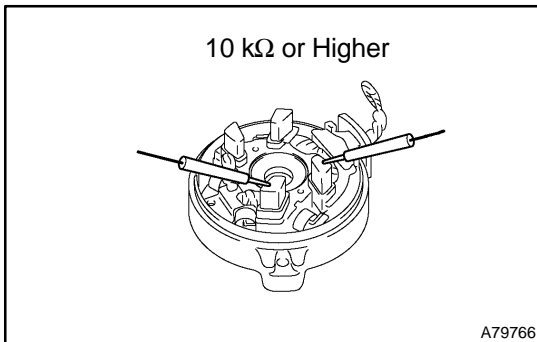


9. INSPECT STARTER COMMUTATOR END FRAME COVER

- (a) Using a vernier caliper, measure the brush length.

Specified length: 4.0 to 9.0 mm (0.158 to 0.359 in.)

If the length is less than the minimum, replace the end frame assy.

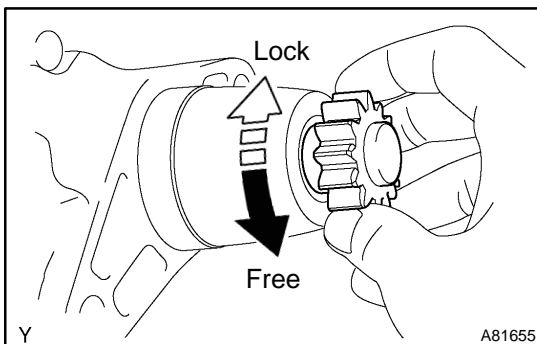


- (b) Check the brush insulation.

- (1) Check the resistance between the positive (+) and negative (-) brush.

Standard: 10 kΩ or higher

If the result is not as specified, repair or replace the end frame assy.

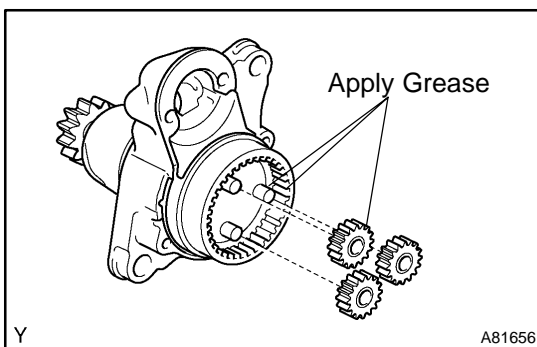


10. INSPECT AND ADJUST CLUTCH & BEARING CENTER

- (a) Check the starter clutch.

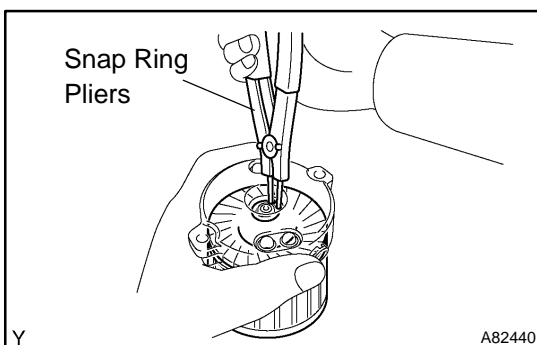
- (1) Rotate the clutch pinion gear counterclockwise and check that it turns freely. Try to rotate the clutch pinion gear clockwise and check that it locks.

If necessary, replace the clutch & bearing center.



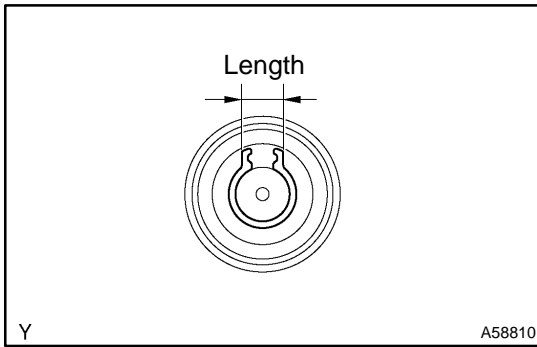
11. INSTALL PLANETARY GEAR

- (a) Apply grease to the planet gears and pin parts of the planetary shaft.
- (b) Install the 3 planetary gears.

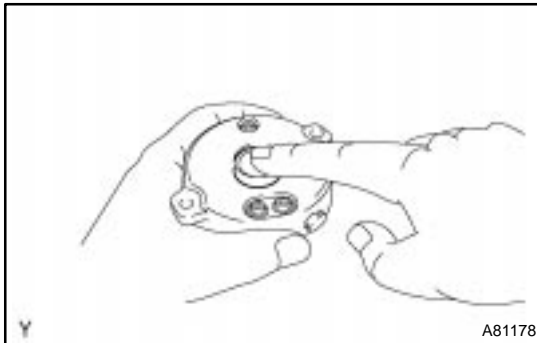


12. INSTALL STARTER ARMATURE ASSY

- (a) Apply grease to the plate washer and the armature shaft.
- (b) Install the starter armature to the starter commutator end frame.
- (c) Using snap ring pliers, install the plate washer and a new snap ring.

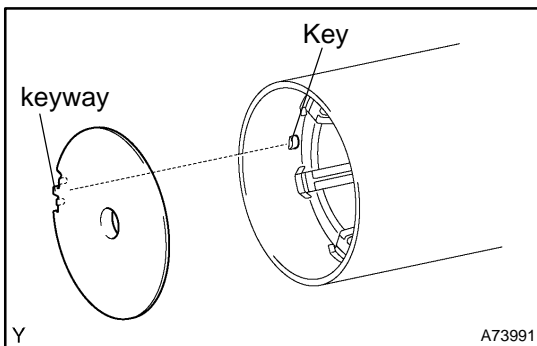


- (d) Using a vernier caliper, measure length of the snap ring.
Maximum length: 5.0 mm (0.197 in.)
 If the length is greater than the maximum, replace it with a new snap ring.



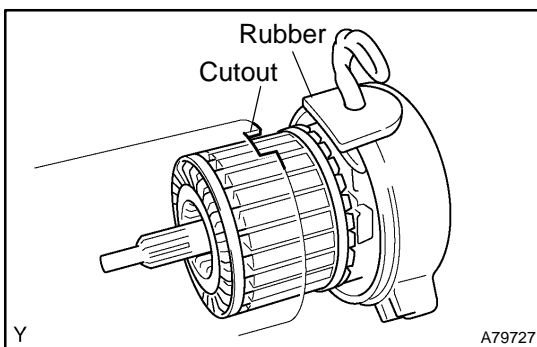
13. INSTALL STARTER COMMUTATOR END FRAME COVER

- (a) Install the end frame cover to the commutator end frame.



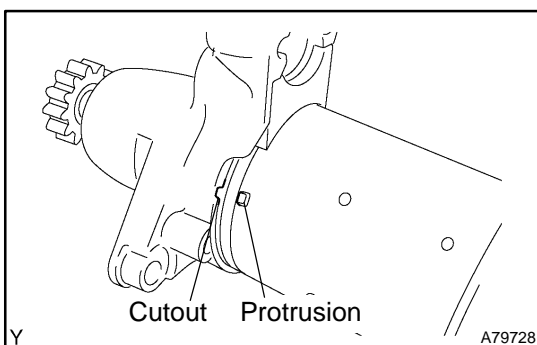
14. INSTALL STARTER AMATURE PLATE

- (a) Insert the armature plate to the starter field frame.
 (b) Align the keyway of the starter plate with the key inside the starter field frame, and install the starter plate.



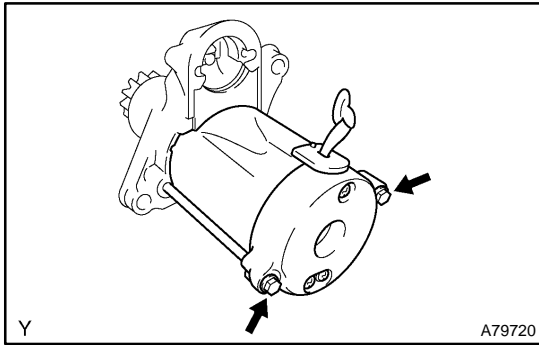
15. INSTALL STARTER COMMUTATOR END FRAME ASSY

- (a) Align the rubber of the end frame with the cutout of the field frame.
 (b) Install the end frame to the field frame.

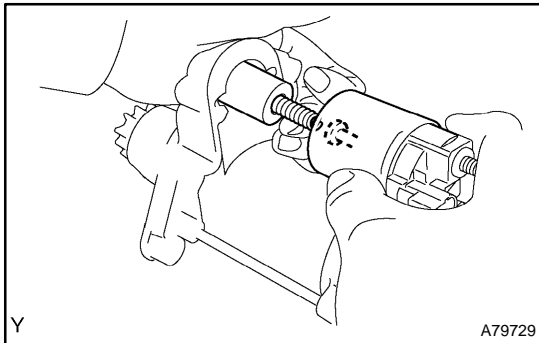


16. INSTALL STARTER FIELD FRAME ASSY

- (a) Align the protrusion of the starter field frame with the cut out of the starter drive housing.

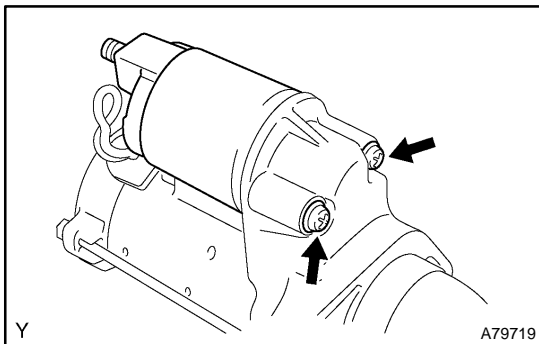


- (b) Install the field frame with the 2 through bolts.
Torque: 6.0 N·m (61 kgf·cm, 53 in.-lbf)

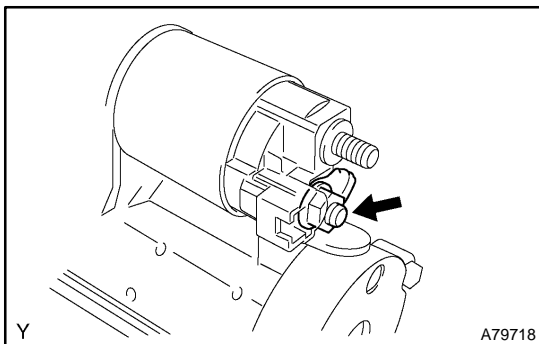


17. INSTALL MAGNETIC SWITCH ASSY

- (a) Apply grease to the plunger and the hook.
(b) Hang the plunger hook of the magnetic switch to the drive lever.
(c) Install the plunger and the return spring.



- (d) Install the magnetic switch with the 2 screws.
Torque: 7.5 N·m (76 kgf·cm, 66 in.-lbf)



- (e) Connect the lead wire to the magnetic switch with the nut.
Torque: 10 N·m (102 kgf·cm, 7 ft.-lbf)