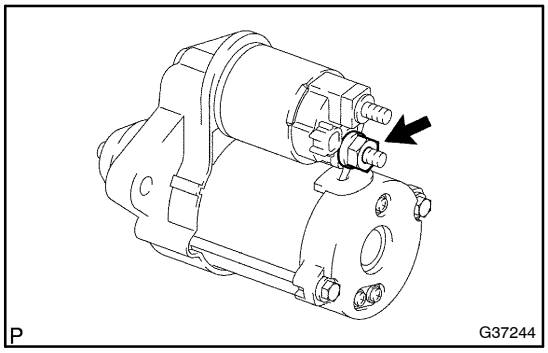
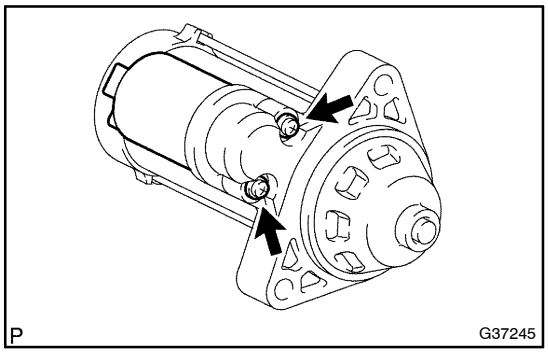
19135–02

# OVERHAUL



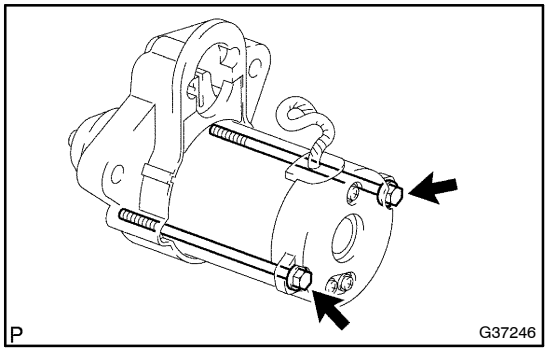

**1. REMOVE REPAIR SERVICE STARTER KIT**

(a) Remove the nut, and disconnect the lead wire from the repair service starter kit.




(b) Remove the 2 screws holding the repair service starter kit to the starter drive housing.

(c) Remove the repair service starter kit.




**2. REMOVE STARTER YOKE ASSY**

(a) Remove the 2 bolts, and pull out the starter yoke assy together with the starter commutator end frame assy.

**3. REMOVE STARTER COMMUTATOR END FRAME ASSY**

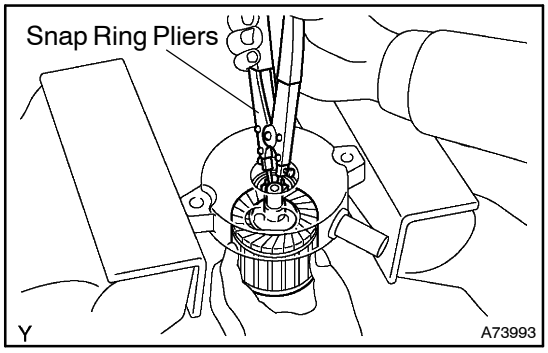
(a) Remove the starter commutator end frame assy from the starter yoke.

**4. REMOVE STARTER ARMATURE PLATE**

(a) Remove the starter armature plate from the starter yoke.

**5. REMOVE STARTER COMMUTATOR END FRAME COVER**

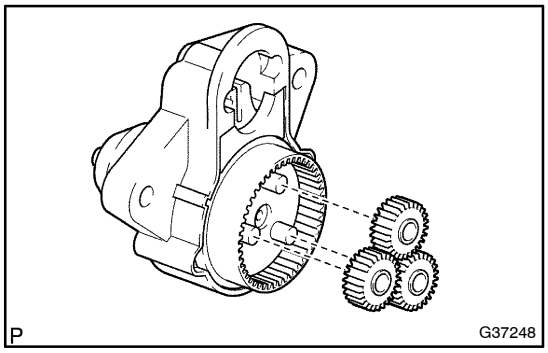
(a) Using a screwdriver, remove the starter commutator end frame cover.




**6. REMOVE STARTER ARMATURE ASSY**

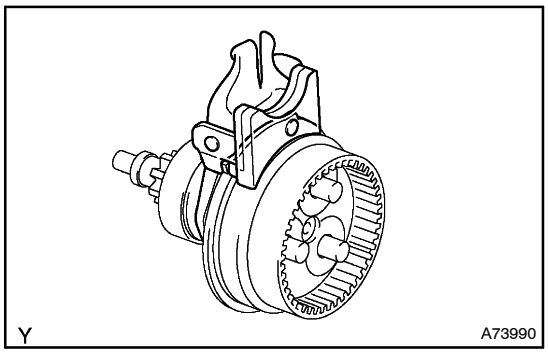
(a) Using snap ring pliers, remove the snap ring and plate washer.

(b) Remove the starter armature assy from the commutator end frame .




**7. REMOVE PLANETARY GEAR**

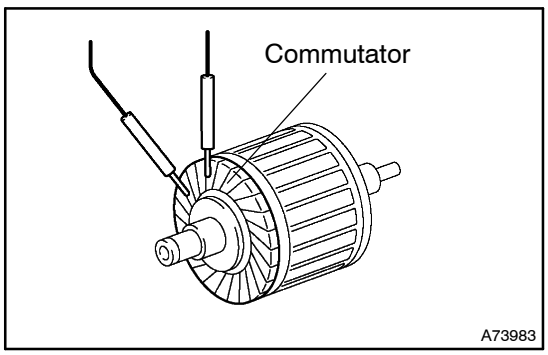
(a) Remove the 3 planetary gears.




**8. REMOVE STARTER CENTER BEARING CLUTCH SUB–ASSY**

(a) Remove the starter center bearing clutch sub–assy and starter drive lever set pin from the starter drive housing.

(b) Remove the starter drive lever set pin from the starter center bearing clutch sub–assy.



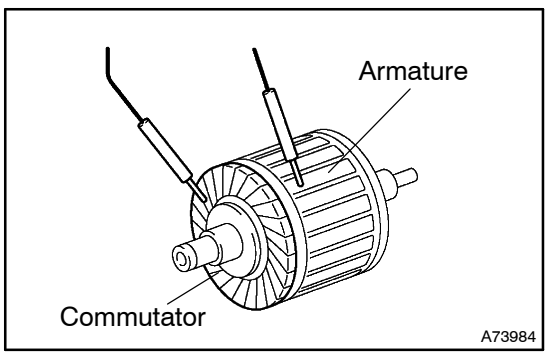

**9. INSPECT STARTER ARMATURE ASSY**

(a) Check the resistance

(1) Using an ohmmeter, check that there is resistance between the segments of the commutator.

**Standard: 1 Ω or lower**

If the standard is not met, replace the starter armature.



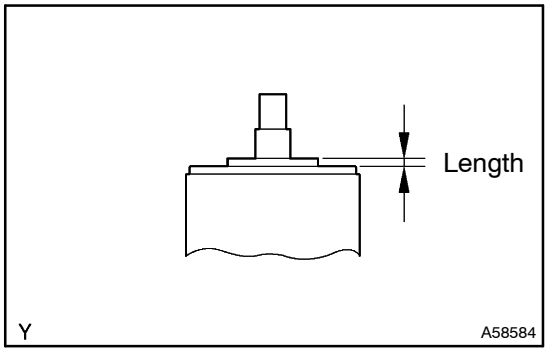

(2) Using an ohmmeter, check that there is no resistance between the commutator and armature coil core.

**Standard: 10 kΩ or higher**

If the standard is not met, replace the starter armature.

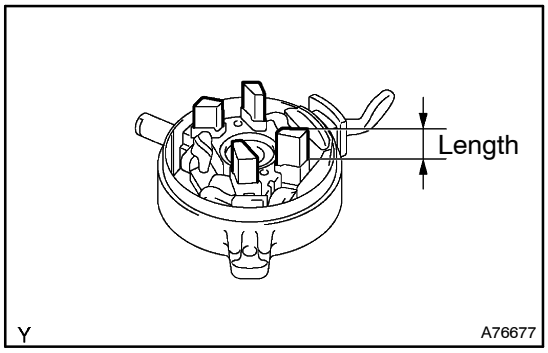
(b) Check the commutator surface for dirt or burn.

If the surface is dirty or burnt, smooth the surface with 400–grit sandpaper or lather.




(c) Using vernier calipers, measure the commutator length.
**Standard length: 3.1 mm (0.122 in.)**
**Maximum length: 3.8 mm (0.150 in.)**

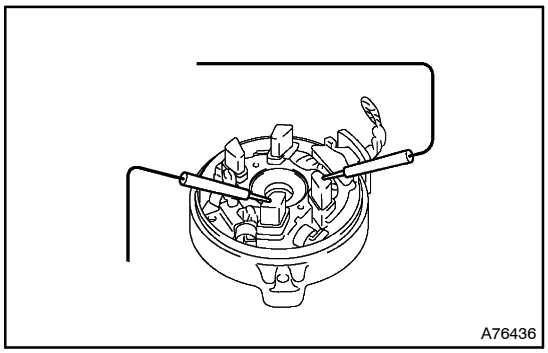
If the length is greater than the maximum, replace the starter armature assy.




**10. INSPECT STARTER COMMUTATOR END FRAME ASSY**

(a) Using vernier calipers, measure the brush holder length.
**Standard length: 9.0 mm (0.354 in.)**
**Maximum length: 4.0 mm (0.158 in.)**

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



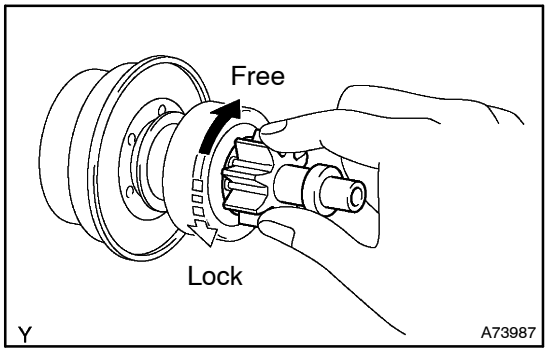

(b) Check the resistance.
(1) Using an ohmmeter, measure the resistance between the positive (+) and negative (–) brushes.
**Standard: 10 kΩ or higher**

If the resistance is not as specified, repair or replace the brush holder.

**11. INSPECT STARTER CENTER BEARING CLUTCH SUB–ASSY**

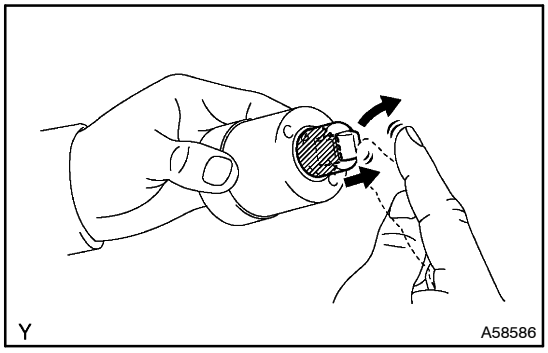
(a) Check the gear teeth on the planetary gear, internal gear and starter clutch for wear or damage.

If any of the gears is damaged, replace the starter center bearing clutch sub–assy.




(b) Check the starter clutch pinion gear.
(1) Hold the starter clutch and rotate the pinion gear clockwise, and check that it turns freely. Try to rotate the pinion gear counterclockwise and check that it locks.

If necessary, replace the starter center bearing clutch sub–assy.

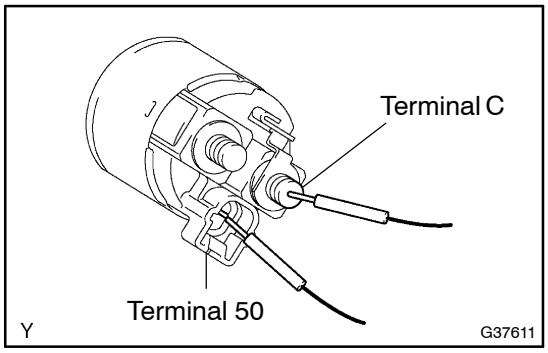



**12. INSPECT REPAIR SERVICE STARTER KIT**

(a) Check the plunger.

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

If necessary, replace the repair service starter kit.

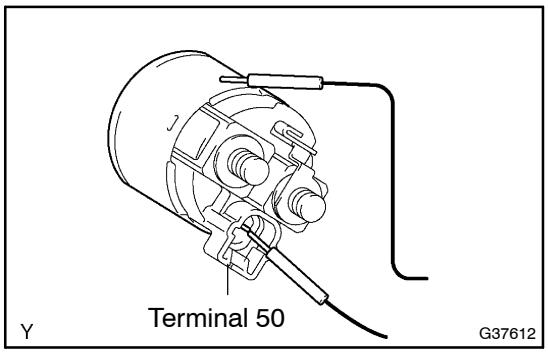



(b) Check the resistance.

(1) Using an ohmmeter, check that there is resistance between terminals 50 and C.

**Standard: 1 Ω or lower**

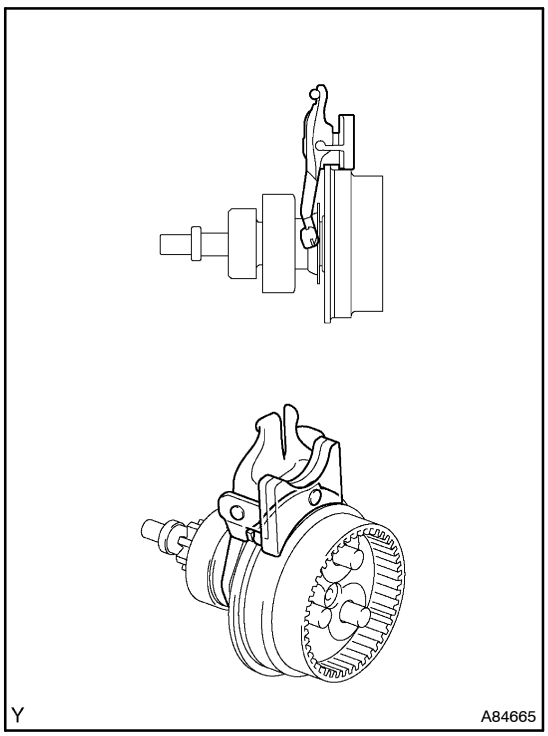
If the standard is not met, replace the magnet switch body.




(2) Using an ohmmeter, check that there is resistance between terminal 50 and the switch body.

**Standard: 2 Ω or lower**

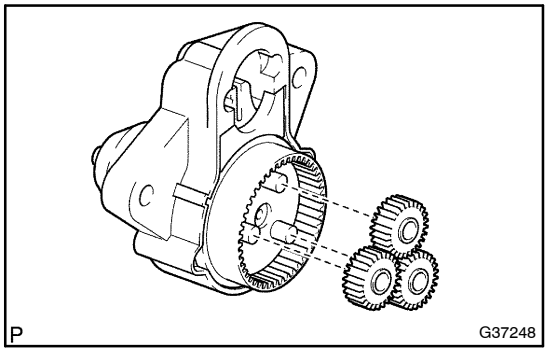
If the standard is not met, replace the magnet switch body.




**13. INSTALL STARTER CENTER BEARING CLUTCH SUB–ASSY**

(a) Install the drive lever set pin to the starter center bearing clutch sub–assy.

(b) Install the starter center bearing clutch and drive lever set pin to the starter drive housing.




**14. INSTALL PLANETARY GEAR**

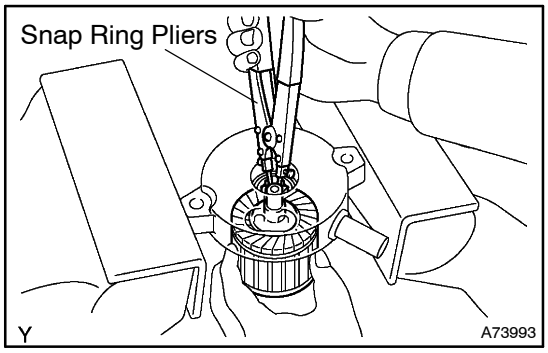
(a) Apply grease to the planetary gears and pin parts of the planetary shaft.

(b) Install the 3 planetary gears.

**15. INSTALL STARTER ARMATURE ASSY**

(a) Apply grease to the plate washer and armature shaft.

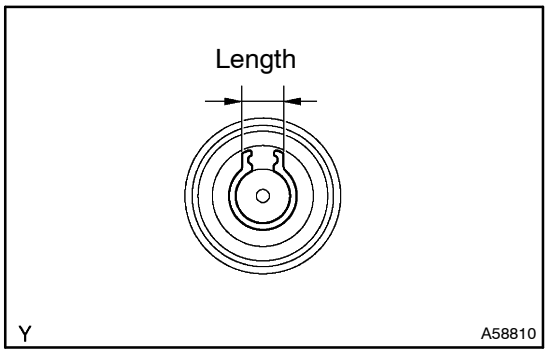
(b) Install the armature shaft to the starter commutator end frame.




(c) Using snap ring pliers, install the plate washer and a new snap ring.

**NOTICE:**

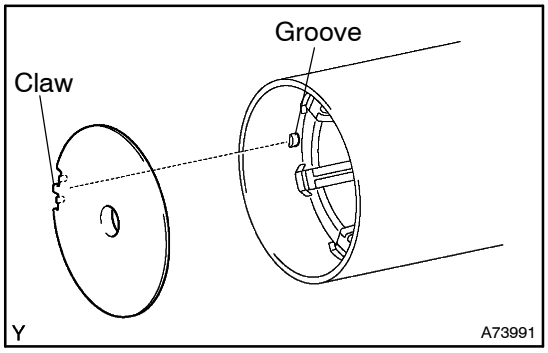
- **Be sure to install the snap ring in the armature shaft groove securely.**
- **Be sure to properly install the snap ring because it easily expands.**




(d) Using vernier calipers, measure the snap ring.
**Maximum length: 5.0 mm (0.197 in.)**

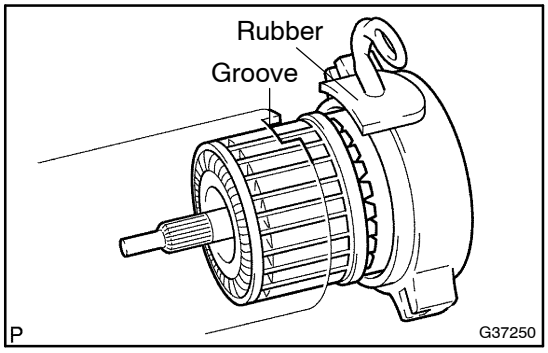
If the length is greater than the maximum, replace the snap ring.

**16. INSTALL STARTER COMMUTATOR END FRAME COVER**




**17. INSTALL STARTER ARMATURE PLATE**

(a) Align the claw of the armature plate with the groove inside the starter yoke, and install the starter armature plate.



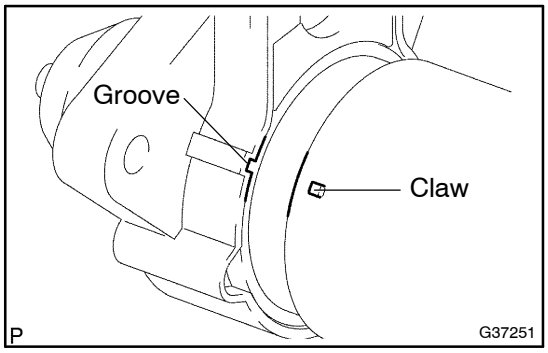

**18. INSTALL STARTER COMMUTATOR END FRAME ASSY**

(a) Align the starter commutator end frame rubber with the groove of the starter yoke.

(b) Install the starter commutator end frame to the starter yoke.

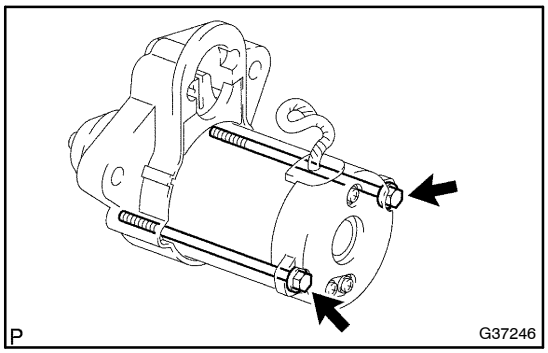
**NOTICE:**

**The magnet of the starter yoke may attract the starter armature when the starter commutator end frame is installed, causing the magnet break.**




**19. INSTALL STARTER YOKE ASSY**

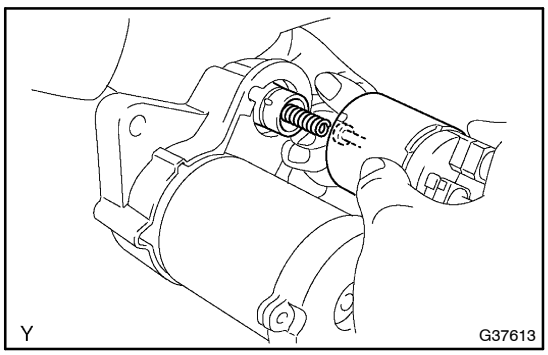
(a) Align the claw of the starter yoke assy with the groove inside the starter drive housing.



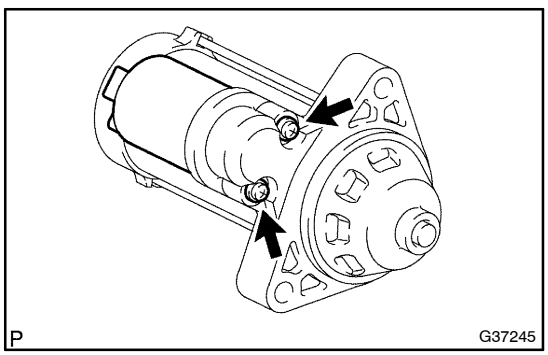

(b) Install the starter yoke assy with the 2 bolts.
**Torque: 6.0 N·m (61 kgf·cm, 53 in.·lbf)**

**20. INSTALL REPAIR SERVICE STARTER KIT**

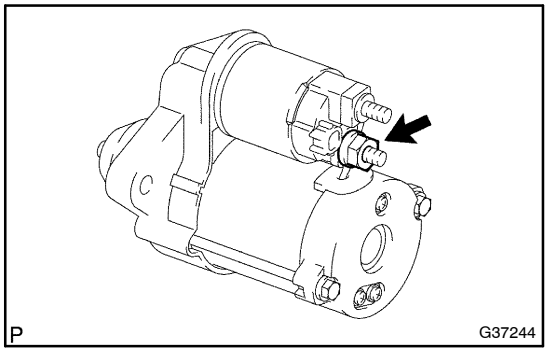
(a) Apply grease to the plunger and hook.




(b) Hang the plunger hook of the repair service starter kit to the drive lever.




(c) Install the repair service starter kit with the 2 screws.
**Torque: 7.5 N·m (77 kgf·cm, 66 in.·lbf)**




(d) Connect the lead wire to the terminal with the nut.
**Torque: 10 N·m (102 kgf·cm, 7 ft·lbf)**