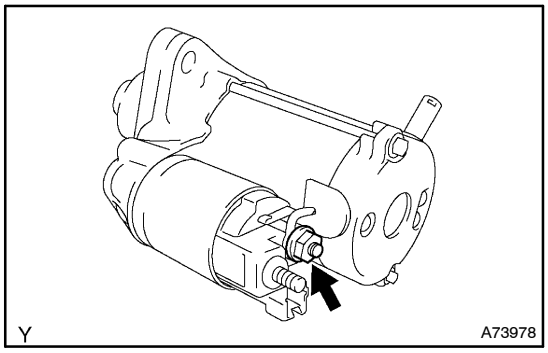
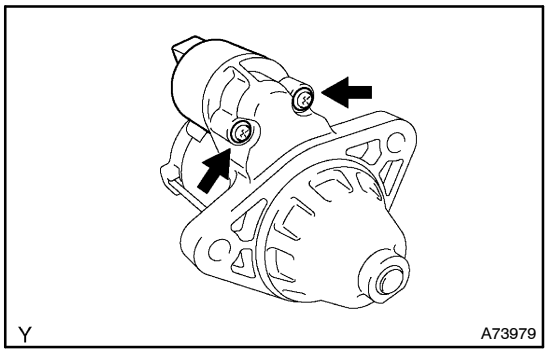
190IQ–01

OVERHAUL



1. REMOVE REPAIR SERVICE STARTER KIT

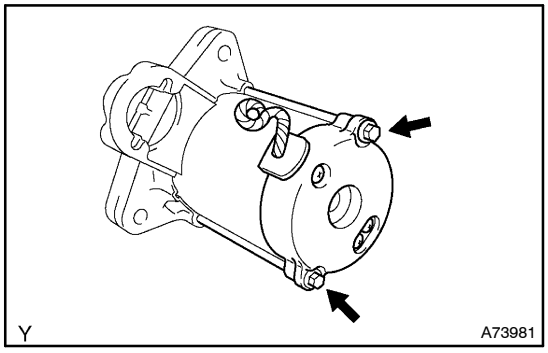
(a) Remove the nut, and disconnect the lead wire from the repair service starter kit.



(b) Remove the 2 screws holding the repair service starter kit to the starter housing.
(c) Remove the repair service starter kit.
(d) Remove the return spring and plunger.

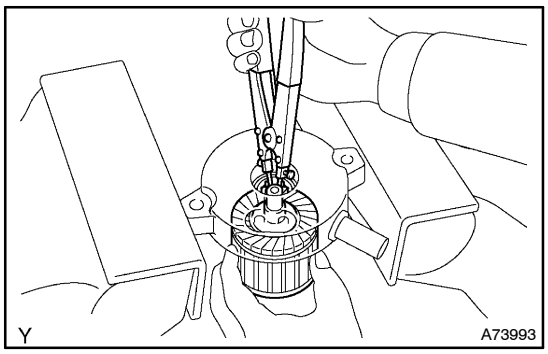
2. REMOVE STARTER COMMUTATOR END FRAME COVER

(a) Using a screwdriver, remove the cover.



3. REMOVE STARTER ARMATURE ASSY

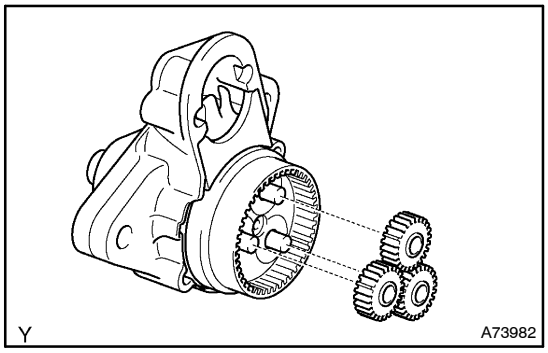
(a) Remove the 2 through bolts, and pull out the starter yoke assy together with the commutator end frame assy.
(b) Remove the starter yoke assy.



(c) Using snap ring pliers, remove the snap ring and plate washer.
(d) Remove the starter armature assy from commutator end frame assy.

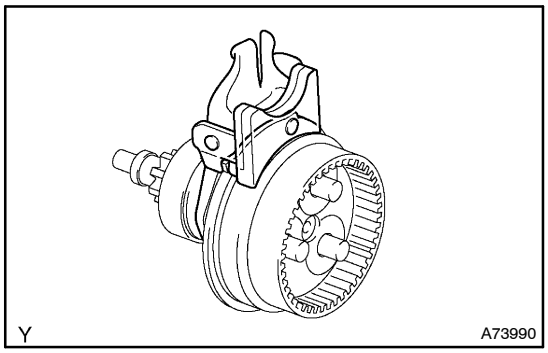
4. REMOVE STARTER ARMATURE PLATE

(a) Remove the plate from the field frame.



5. REMOVE PLANETARY GEAR

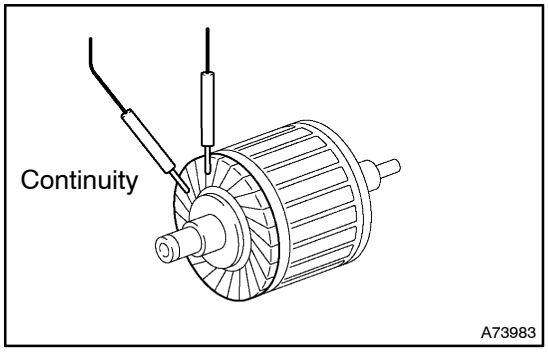
(a) Remove the 3 planetary gears.



6. REMOVE STARTER CENTER BEARING CLUTCH SUB–ASSY

(a) Remove the starter ctr bearing clutch w/ drive lever set pin from the starter drive housing.

(b) Remove the drive lever set pin from the starter ctr bearing clutch.

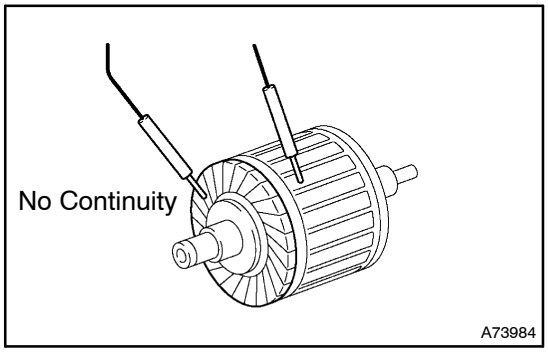


7. INSPECT STARTER ARMATURE ASSY

(a) Inspect the commutator for open circuit.

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

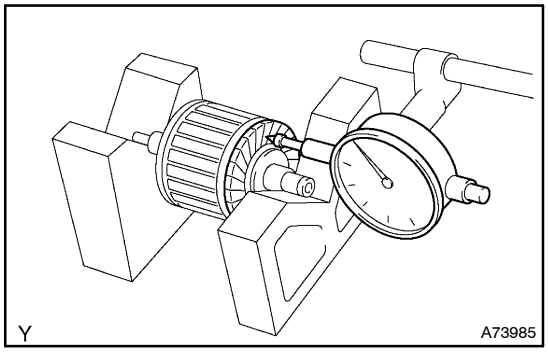
If there is no continuity between any segments, replace the armature.



(b) Inspect the commutator for ground.

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

If there is continuity, replace the armature.



(c) Inspect the commutator for dirty and burn on surface.

If the surface is dirty or burnt, correct it with sandpaper (No.400) or a lathe.

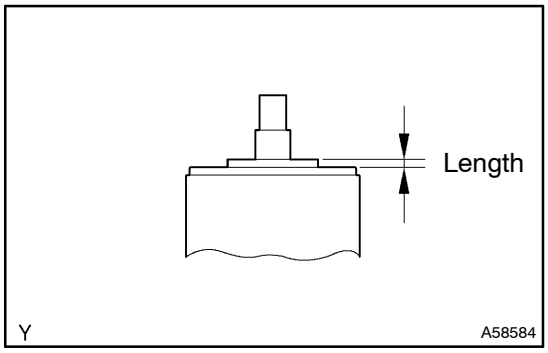
(d) Inspect for the commutator circuit runout.

(1) Place the commutator on V–blocks.

(2) Using a dial indicator, measure the circuit runout.

Maximum circle runout: 0.05 mm (0.0020 in.)

If the circle runout is greater than maximum, replace the armature.

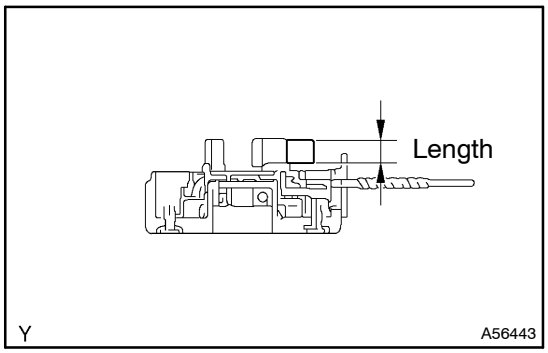


(e) Using vernier calipers, measure the commutator length.

Standard length: 3.3 mm (0.130 in.)

Maximum length: 4.0 mm (0.158 in.)

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



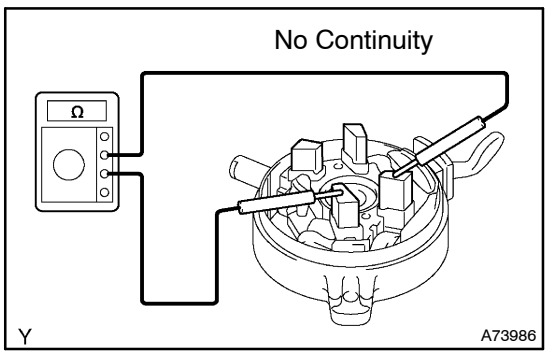
8. INSPECT STARTER COMMUTATOR END FRAME ASSY

(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 minimum, replace the starter commutator end frame assy.



(b) Inspect the brush holder.

(1) Using an ohmmeter, check that there is no continuity between the positive (+) and negative (–) brush holders.

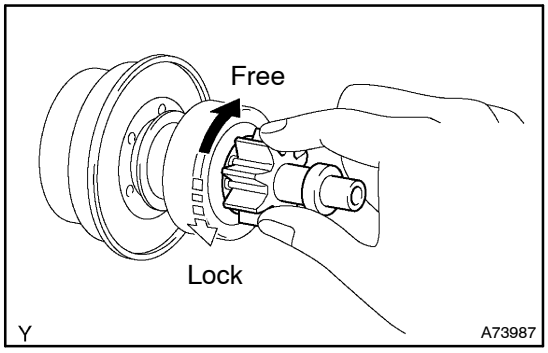
If the there is continuity repair or replace the starter commutator end frame assy.

9. INSPECT STARTER CENTER BEARING CLUTCH SUB–ASSY

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

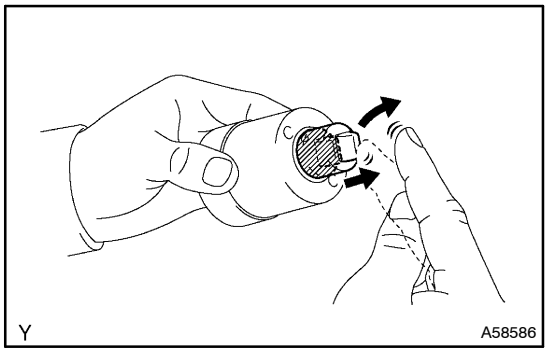
If the gear is damaged, replace it.

If damaged, replace the gear or clutch assembly. If damaged, also check the drive plate ring gear for wear or damage.



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

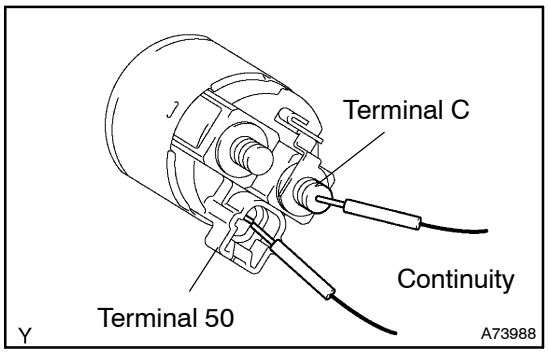
If necessary, replace the center bearing clutch sub–assy.



10. INSPECT REPAIR SERVICE STARTER KIT

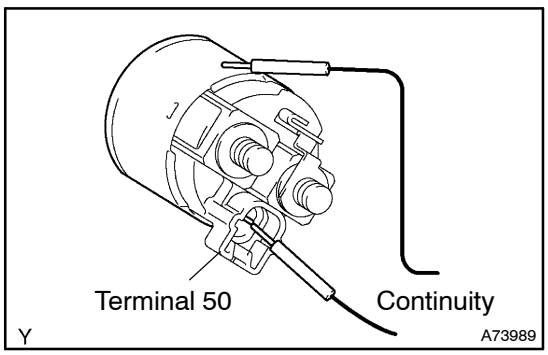
(a) Inspect the plunger.
  (1) Push in the plunger and check that it returns quickly to its original position.

If necessary, replace the repair service starter kit.



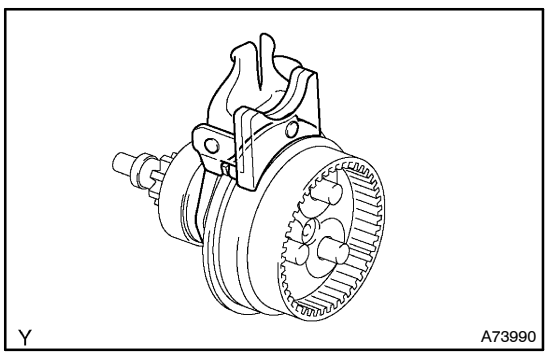
(b) Inspect the pull–in coil for open circuit.
  (1) Using an ohmmeter, check that there is continuity between terminal 50 and C.

If there is no continuity, replace the repair service starter kit.



(c) Inspect whether the hold–in coil has an open circuit.
  (1) Using an ohmmeter, check that there is continuity between terminal 50 and the switch body.

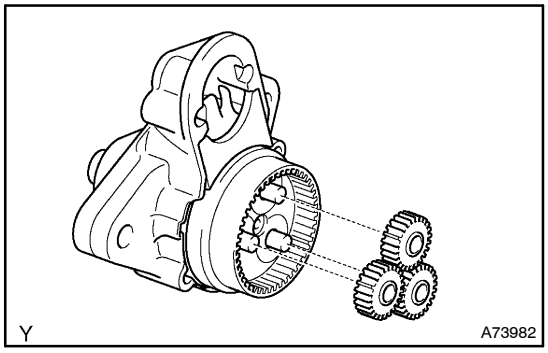
If there is no continuity, replace the repair service starter kit.



11. INSTALL STARTER CENTER BEARING CLUTCH SUB–ASSY

(a) Install the drive lever set pin to the starter ctr bearing clutch.

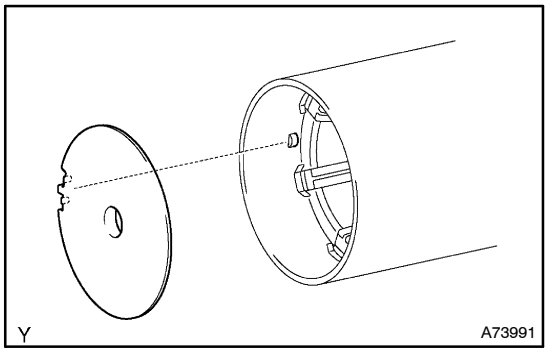
(b) Install the starter ctr bearing clutch w/ drive lever set pin to the starter drive housing.



12. INSTALL PLANETARY GEAR

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

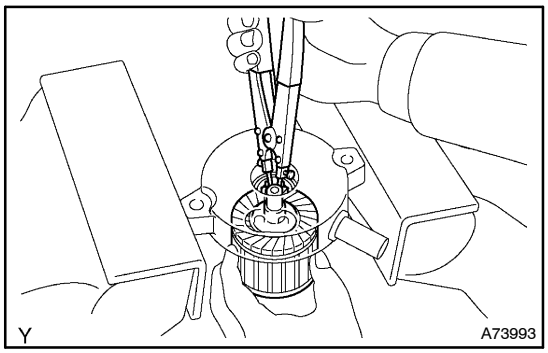
(b) Install the 3 planetary gears.



13. INSTALL STARTER ARMATURE PLATE

(a) Insert the starter armature plate to the starter yoke assy.

(b) Align the cutout of the plate with the protrusion inside the starter yoke, and install the plate.

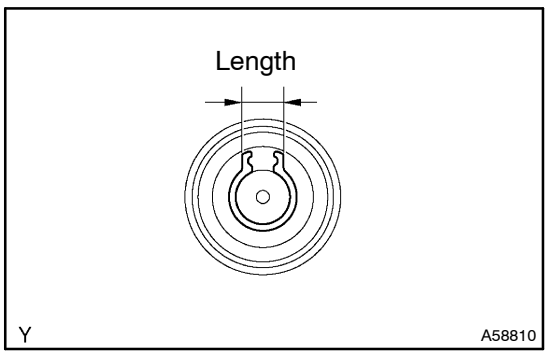


14. INSTALL STARTER ARMATURE ASSY

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

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

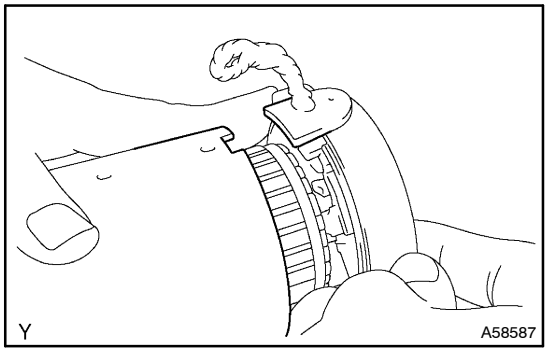
(c) Using snap ring pliers, install the plate washer and new snap ring.



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

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

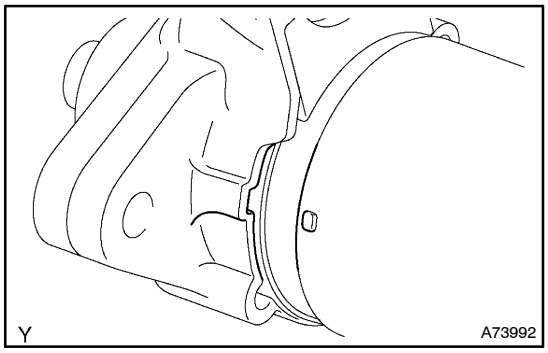
15. INSTALL STARTER COMMUTATOR END FRAME COVER



16. INSTALL STARTER YOKE ASSY

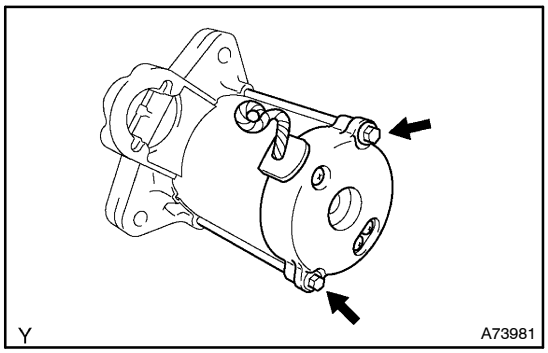
(a) Align the starter commutator rubber end frame with the cutout of starter yoke.

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

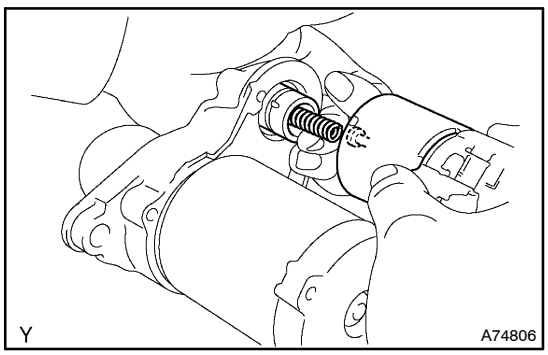


17. INSTALL STARTER COMMUTATOR END FRAME ASSY

(a) Align the starter yoke assy with the cutout of starter housing.



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



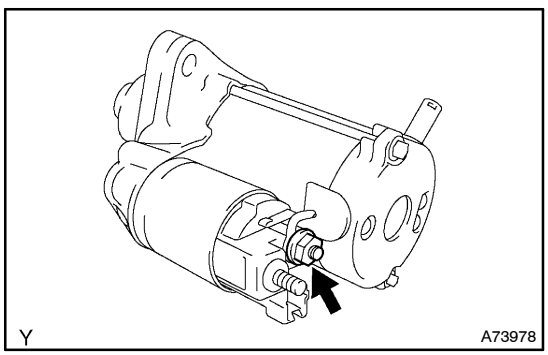
18. INSTALL REPAIR SERVICE STARTER KIT

(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 plunger and return spring.

(d) Install the repair service starter kit with the 2 screws.
Torque: 7.5 N·m (76 kgf·cm, 66 in.·lbf)



(e) Connect the lead wire to the terminal with the nut.
Torque: 10 N·m (102 kgf·cm, 7.4 ft·lbf)