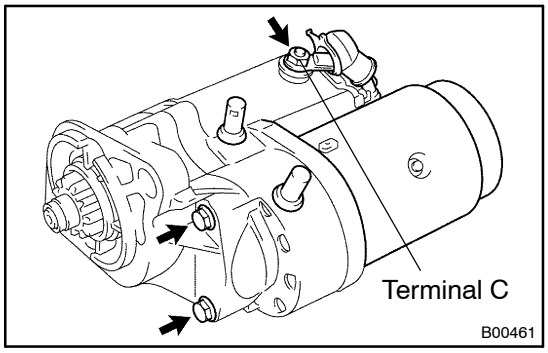
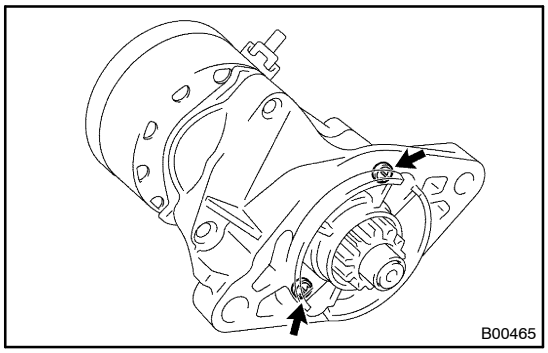
190IV–01

OVERHAUL



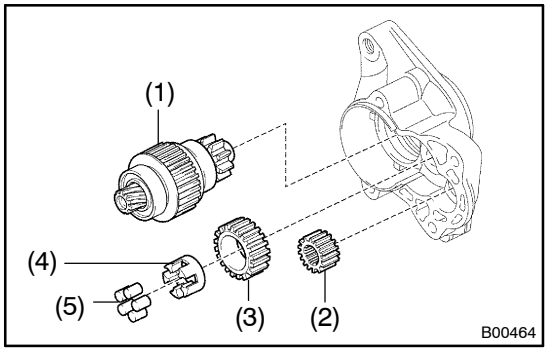
1. REMOVE STARTER YOKE ASSY

(a) Remove the screw and terminal 50 wire.
(b) Remove the nut and disconnect the terminal C wire.
(c) Pull out the starter yoke assy with the armature assy.



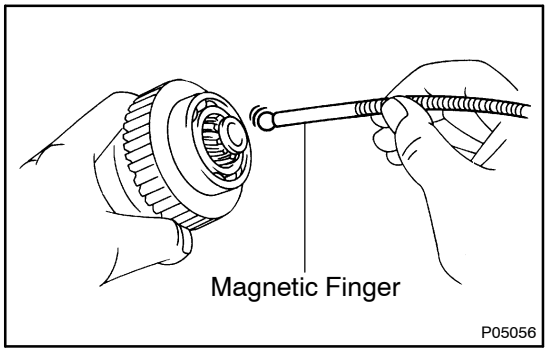
2. REMOVE MAGNET STARTER SWITCH ASSY

(a) Remove the 2 screws and magnet starter switch assy.
(b) Remove the return spring.

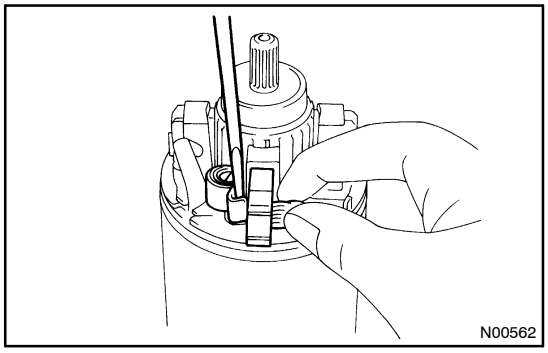


(c) Remove these parts from starter housing.

(1)	Starter clutch sub–assy
(2)	Starter armature pinion
(3)	Starter idler pinion
(4)	Retainer
(5)	Clutch roller



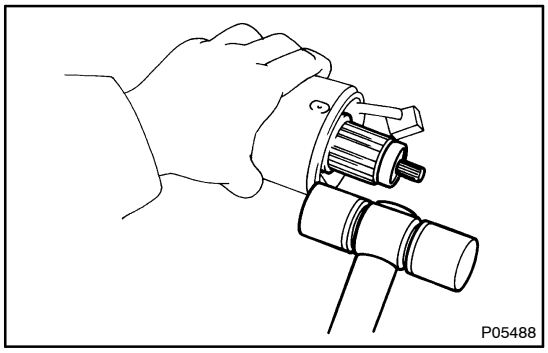
(d) Using a magnetic finger, remove the steel ball.



3. REMOVE STARTER BRUSH HOLDER ASSY

(a) Using a screwdriver, hold the spring back and disconnect the brush.

(b) Disconnect the 4 brushes and remove the brush holder assy.

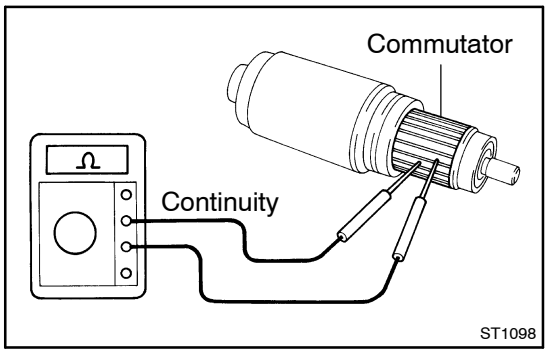


4. REMOVE STARTER ARMATURE ASSY

(a) Using a plastic–faced hammer, tap the end of starter yoke assy and remove the armature assy.

5. INSPECT STARTER ARMATURE ASSY

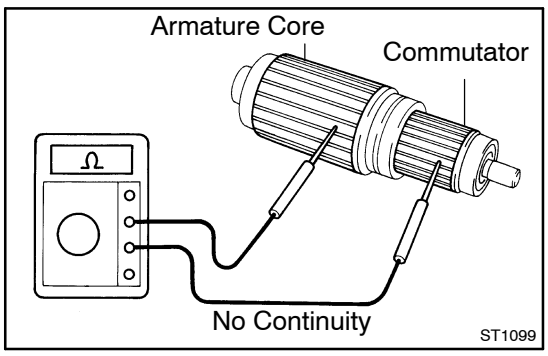
If the surface of the commutator is dirty or burned, polish the part with sandpaper (#400) or replace the armature.



(a) Check the commutator open circuit.

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

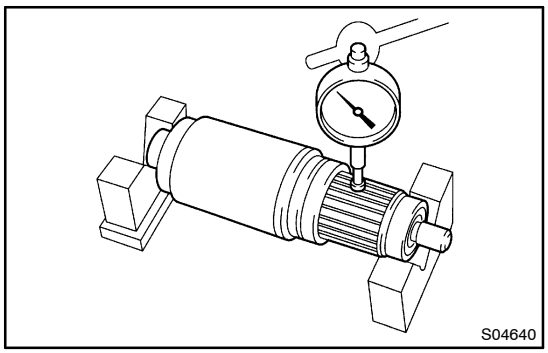
If there is no continuity between any segment, replace the armature assy.



(b) Check the commutator ground.

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

If there is continuity, replace the armature assy.



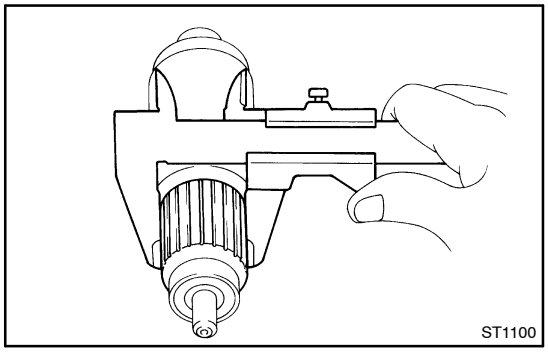
(c) Check the commutator circle runout.

(1) Place the armature on the V–blocks.

(2) Using a dial gauge, measure the circle runout.

Maximum circle runout: 0.05 mm (0.0020 in.)

If the circle runout is greater than maximum, correct it with sandpaper (#400) or replace the armature assy.

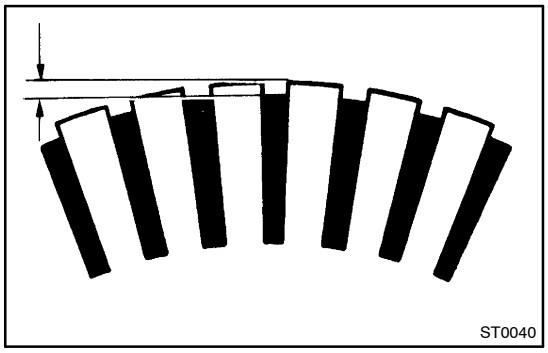


(d) Using vernier calipers, measure the commutator diameter.

Diameter:

Standard	35.0 mm (1.378 in.)
Minimum	34.0 mm (1.339 in.)

If the diameter is less than the minimum, replace the armature assy.



(e) Measure the undercut depth of commutator.

Depth:

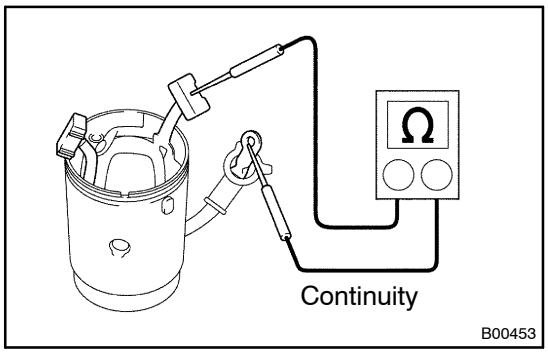
Standard	0.7 mm (0.028 in.)
Minimum	0.2 mm (0.008 in.)

If the undercut depth is less than the minimum, correct it with a hacksaw blade.

(f) Inspect the bearings.

(1) Check that the bearing rotates smoothly.

If necessary, replace them.

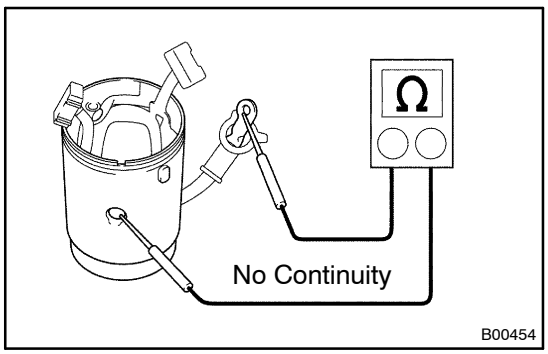


6. INSPECT STARTER YOKE ASSY

(a) Inspect for open circuit.

(1) Check that there is continuity between the terminal C wire and brushes.

If there is no continuity, replace the starter yoke.

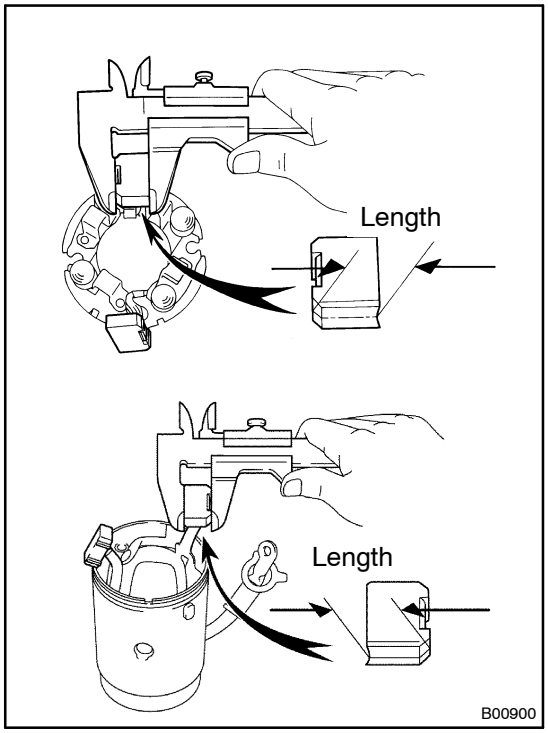


(b) Inspect for ground.

(1) Check that there is no continuity between the terminal C wire and starter yoke body.

(2) Check that there is no continuity between the brushes and starter yoke body.

If there is continuity, replace the starter yoke assy.



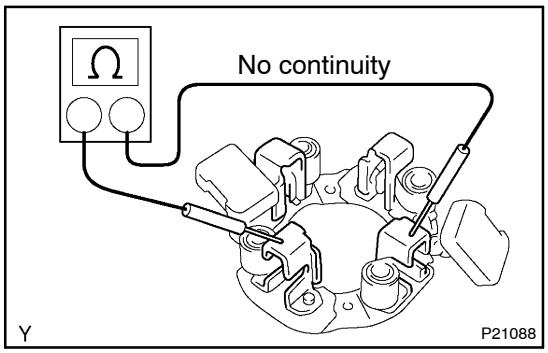
7. INSPECT BRUSH

(a) Using vernier calipers, measure the brush length.

Brush length:

Standard	16.5 mm (0.650 in.)
Minimum	9.0 mm (0.354 in.)

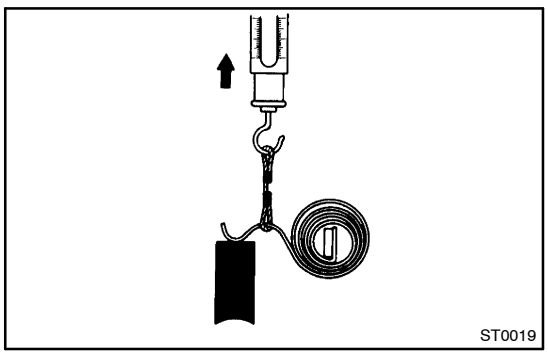
If the length is less than the minimum, replace the brush holder and starter yoke assy.



8. INSPECT STARTER BRUSH HOLDER ASSY

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

If there is continuity, replace the brush holder.

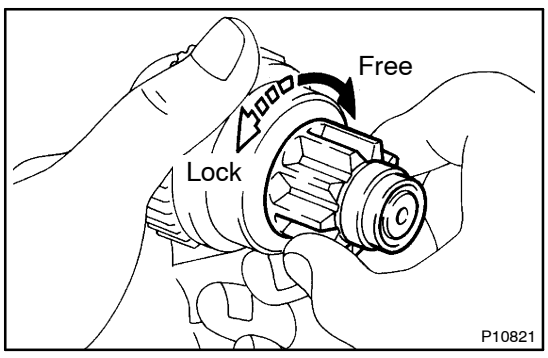


(b) Using a pull scale, measure the brush spring load.

Spring load:

Standard	26.5 – 32.3 N (2.7 – 3.3 kgf, 6.0 – 7.3 lbf)
Minimum	17.6 N (1.8 kgf, 4.0 lbf)

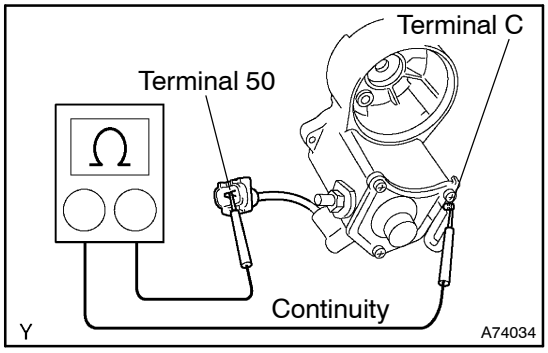
If the spring load is less than the minimum, replace the brush springs.



9. INSPECT STARTER CLUTCH SUB–ASSY

(a) Check that the starter clutch operates.

If the starter clutch is does not operate, replace it.

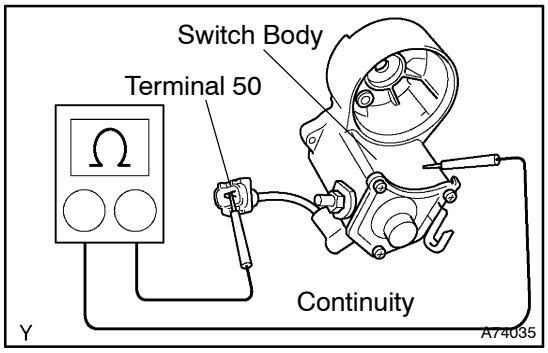


10. INSPECT MAGNET STARTER SWITCH ASSY

(a) Check the pull–in coil continuity.

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

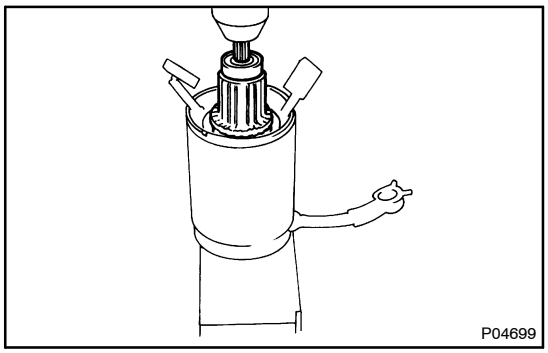
If there is no continuity, replace the magnet starter switch assy.



(b) Check the holding coil continuity.

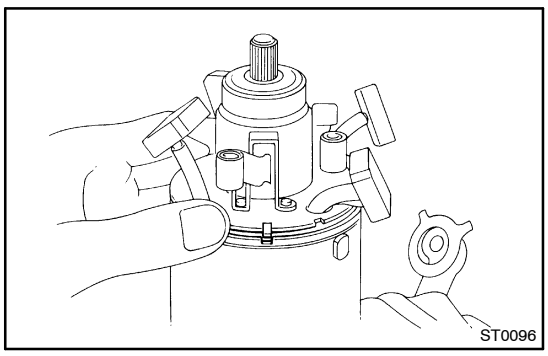
(1) Using an ohmmeter, check that there is continuity between terminals 50 and switch body.

If there is no continuity, replace the magnet starter switch assy.



11. INSTALL STARTER ARMATURE ASSY

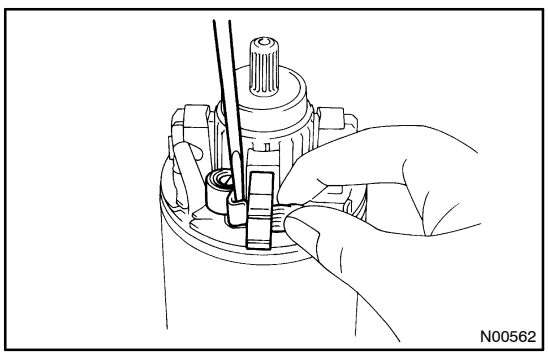
(a) Using a press, install the armature assy.



12. INSTALL STARTER BRUSH HOLDER ASSY

(a) Align the claw of the brush holder with the claw groove of the starter yoke assy.

(b) Place the brush holder on the starter yoke assy.



(c) Using a screwdriver, hold the brush spring back.

(d) Connect the brush into the brush holder.

(e) Connect the 4 brushes.

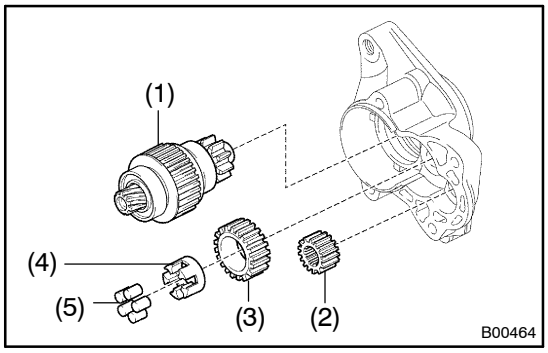
NOTICE:

Check that the positive (+) lead wires are not grounded.

(f) Install a new O–ring to the groove of the starter yoke.

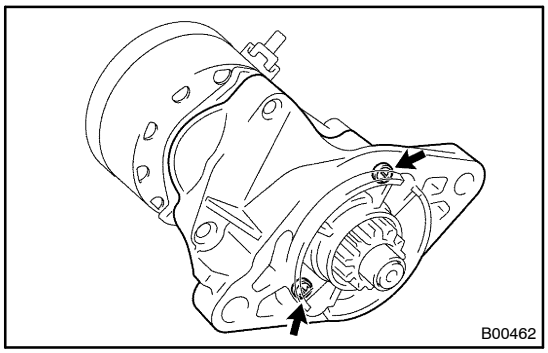
13. INSTALL MAGNET STARTER SWITCH ASSY

(a) Apply grease to the steel ball, return spring.
(b) Install the steel ball into the magnet starter switch hole.
(c) Insert the return spring into the magnet starter switch hole.

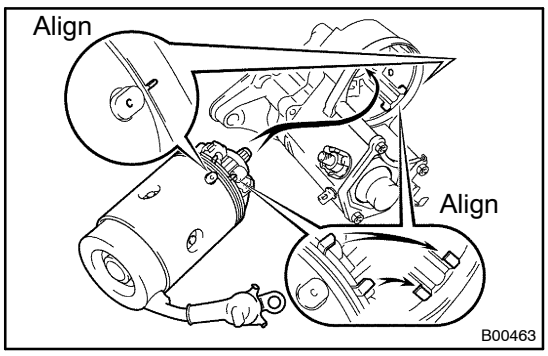


(d) Place there parts in position on the starter housing.

(1)	Starter clutch sub–assy
(2)	Starter armature pinion
(3)	Starter idler pinion
(4)	Retainer
(5)	Clutch roller

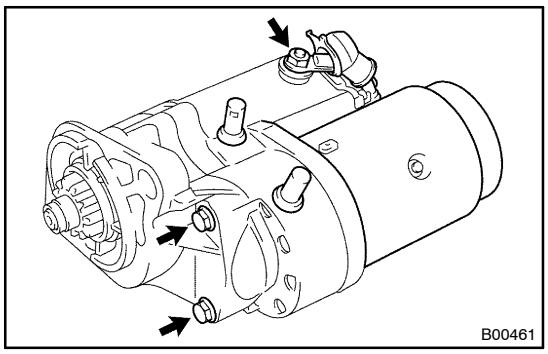


(e) Install the starter housing to the magnet magnet switch assy with the 2 screws.
Torque: 9.3 N·m (95 kgf·cm, 82 in.·lbf)



14. INSTALL STARTER YOKE ASSY

(a) Install a new O–ring to the groove of the through bolt.
(b) Align the claws of the brush holder with the grooves of the magnet starter switch.
(c) Install the starter yoke assy with the armature assy.
(d) Align the punch mark of the starter yoke with the line of the magnet starter switch.



(e) Install a new O–ring to the through bolt.
(f) Install the 2 long bolts.
Torque: 12.7 N·m (130 kgf·cm, 9 ft·lbf)
(g) Connect the terminal C wire with the nut.
Torque: 5.9 N·m (60 kgf·cm, 52 in.·lbf)