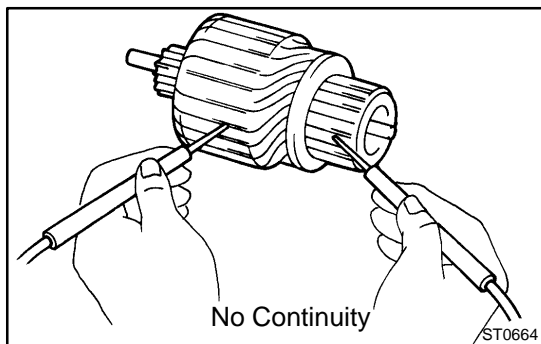


INSPECTION

1. INSPECT ARMATURE COIL COMMUTATOR FOR OPEN CIRCUIT

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.



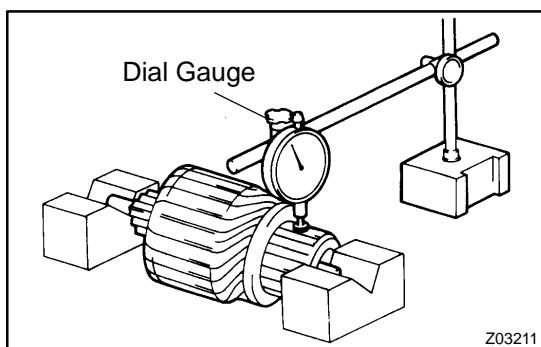
2. INSPECT ARMATURE COIL COMMUTATOR FOR GROUND

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

If there is continuity, replace the armature.

3. INSPECT COMMUTATOR FOR DIRTY AND BURNT SURFACES

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



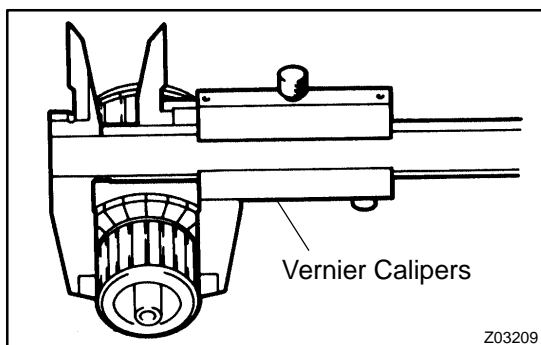
4. INSPECT COMMUTATOR CIRCLE RUNOUT

(a) Place the commutator on V-blocks.

(b) 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 on a lathe.



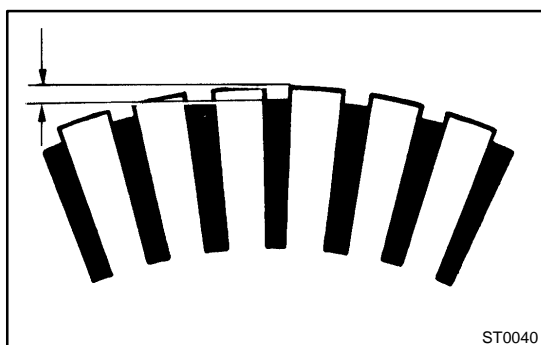
5. INSPECT COMMUTATOR DIAMETER

Using vernier calipers, measure the commutator diameter.

Standard diameter: 28.0 mm (1.102 in.)

Minimum diameter: 27.0 mm (1.063 in.)

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



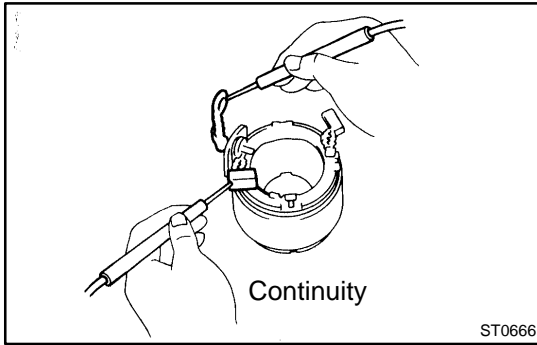
6. INSPECT COMMUTATOR UNDERCUT DEPTH

Check that the undercut depth is clean and free of foreign materials. Smooth out the edge.

Standard undercut depth: 0.6 mm (0.024 in.)

Minimum undercut depth: 0.2 mm (0.008 in.)

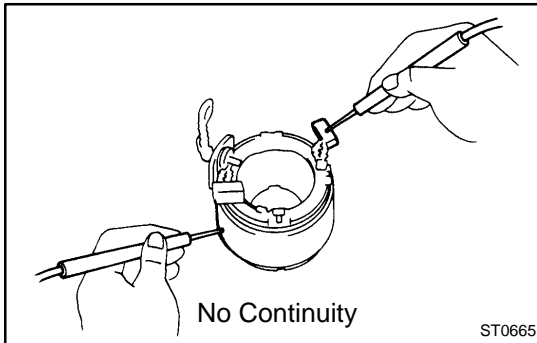
If the undercut depth is less than minimum, correct it with a hacksaw blade.



7. INSPECT FIELD FRAME (FIELD COIL) FOR OPEN CIRCUIT

Using an ohmmeter, check that there is continuity between the lead wire and field coil brush lead.

If there is no continuity, replace the field frame.

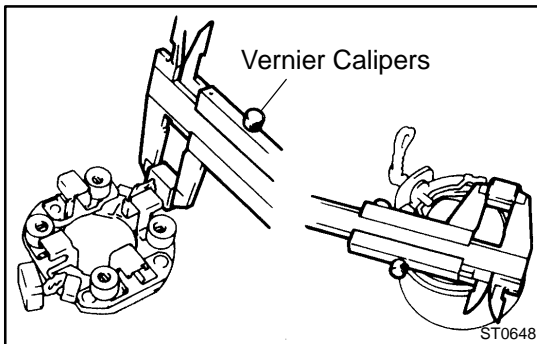


8. INSPECT FIELD FRAME (FIELD COIL) GROUND

Check the field coil for ground.

Using an ohmmeter, check that there is no continuity between the field coil end and field frame.

If there is continuity, repair or replace the field frame.



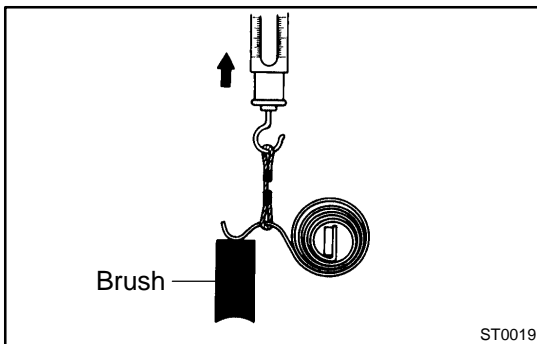
9. INSPECT BRUSH LENGTH

Using vernier calipers, measure the brush length.

Standard length: 14.0 mm (0.551 in.)

Minimum length: 9.0 mm (0.354 in.)

If the length is less than minimum, replace the brush (field frame side) or brush holder, and dress with an emery cloth.



10. INSPECT BRUSH SPRINGS

Check the brush spring load.

Take the pull scale reading the instant the brush spring separates from the brush.

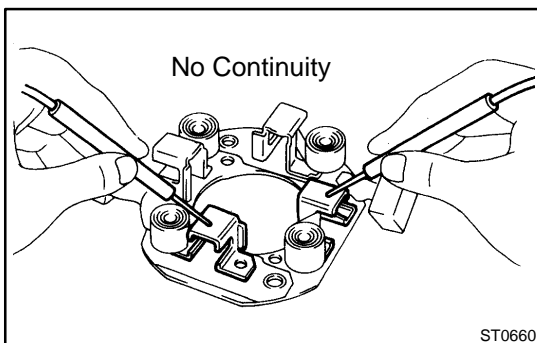
Spring installed load:

13.7 - 17.6 N (1.4 - 1.8 kgf, 3.1 - 4.0 lbf)

Minimum spring installed load:

8.8 N (0.9 kgf, 2.0 lbf)

If the installed load is not as specified, replace the brush springs.



11. INSPECT BRUSH HOLDER

Check the brush holder insulation.

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

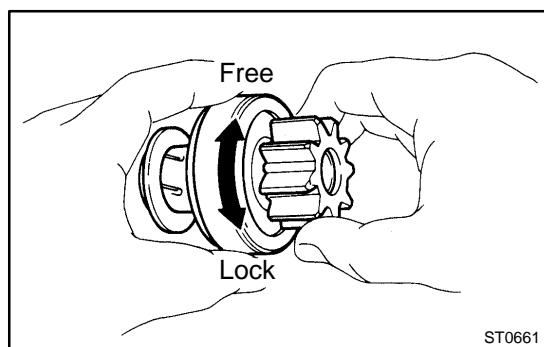
If there is continuity, repair or replace the brush holder.

12. INSPECT CLUTCH AND GEAR

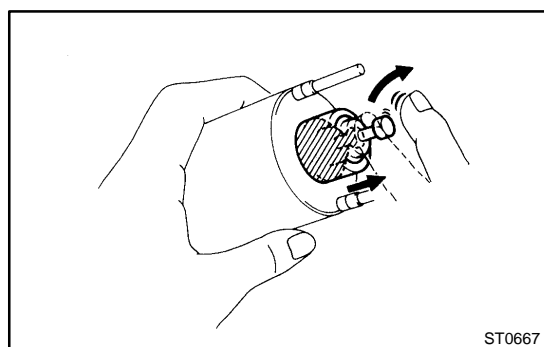
- (a) Check the gear teeth on the planetary gear, internal gear and starter clutch for wear or damage.

If the gear is damaged, replace it.

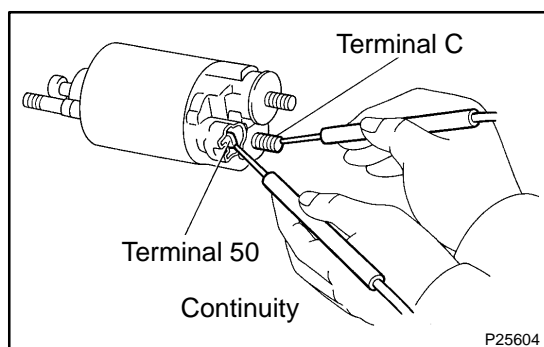
If the starter clutch teeth are damaged, replace the starter clutch and also inspect the flywheel ring gear for wear or damage.



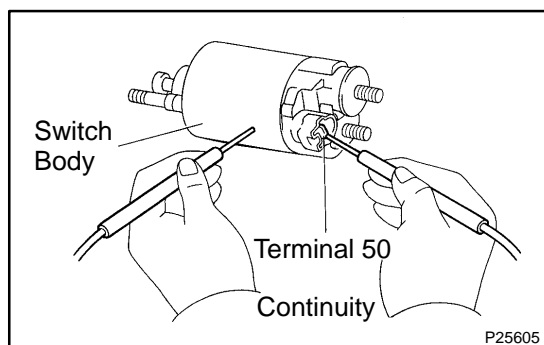
- (b) Check the starter clutch.
Rotate the clutch pinion gear clockwise and check that it turns freely. Try to rotate the clutch pinion gear counter-clockwise and check that it locks.
If necessary, replace the starter clutch.

**13. INSPECT MAGNETIC SWITCH**

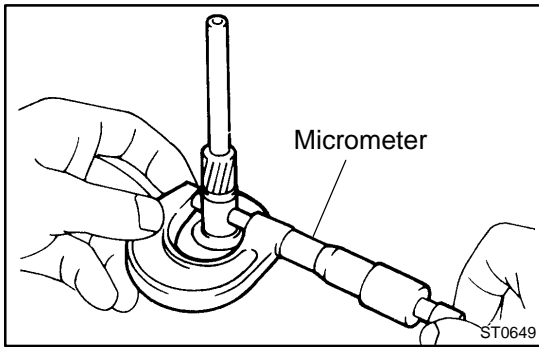
- (a) Check the plunger.
Push in the plunger and release it. Check that it returns quickly to its original position.
If necessary, replace the magnetic switch.



- (b) Check the pull-in coil for open circuit.
Using an ohmmeter, check that there is continuity between terminals 50 and C.
If there is no continuity, replace the magnetic switch.



- (c) Check the hold-in coil for open circuit.
Using an ohmmeter, check that there is continuity between terminal 50 and the switch body.
If there is no continuity, replace the magnetic switch.

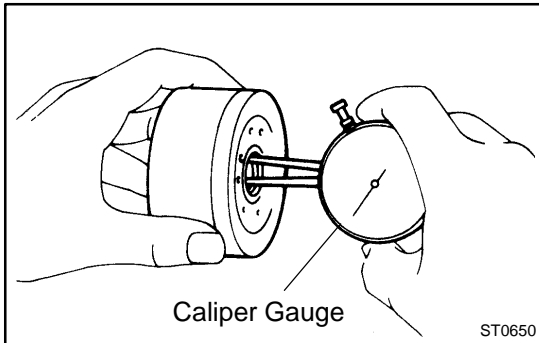
**14. INSPECT BEARING**

- (a) Check the planetary carrier shaft.

Using a micrometer, measure the outer diameter of the surface in contact with the center bearing of the planetary carrier shaft.

Standard shaft diameter:

14.980 - 15.000 mm (0.5898 - 0.5906 in.)



- (b) Check the center bearing.

- (1) Using a caliper gauge, measure the inside diameter of the center bearing.

Center bearing inside diameter:

15.008 - 15.050 mm (0.5908 - 0.5925 in.)

- (2) Subtract the planetary carrier shaft diameter from the bearing inside diameter measurement.

Standard center bearing oil clearance:

0.01 - 0.06 mm (0.0004 - 0.0024 in.)

Maximum center bearing oil clearance:

0.2 mm (0.0078 in.)

If the clearance is greater than maximum, replace the planetary carrier shaft and center bearing.