

- (c) Using a screwdriver, hold the spring back and disconnect the 4 brushes from the brush holder.
- (d) Remove the brush holder from the armature.

4. REMOVE STARTER ARMATURE ASSEMBLY

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

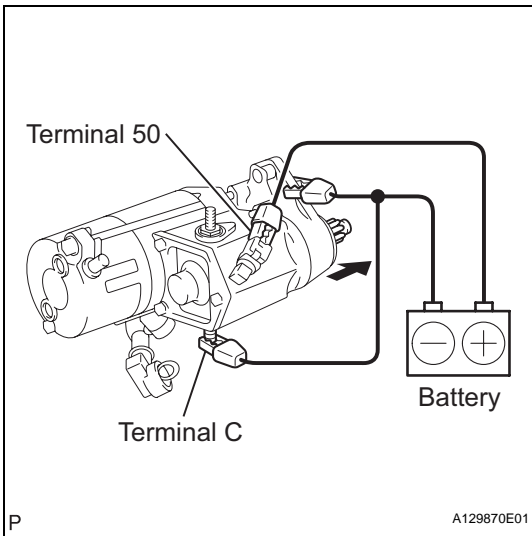
INSPECTION

1. INSPECT STARTER ASSEMBLY

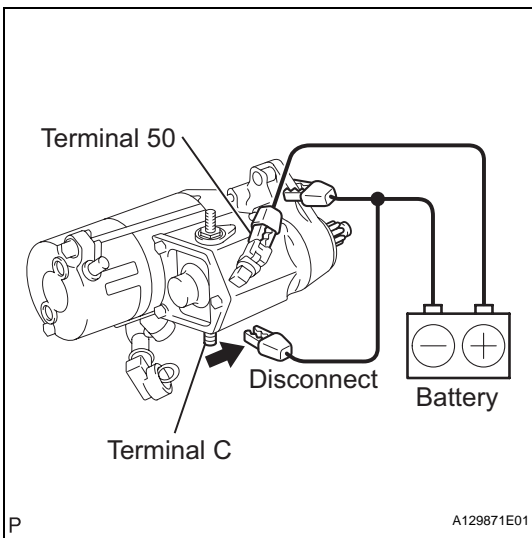
NOTICE:

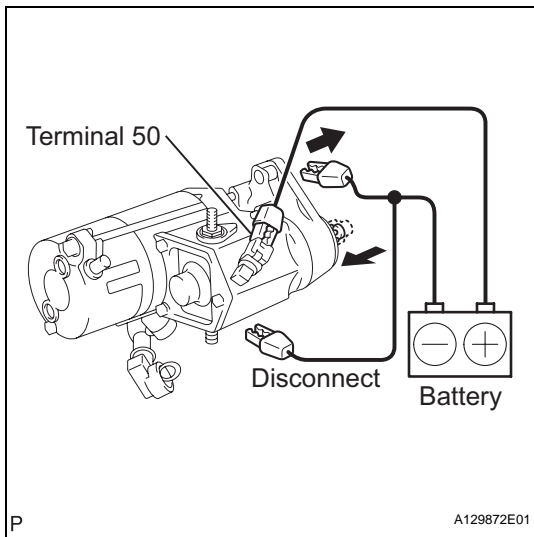
These tests must be performed within 3 to 5 seconds to prevent burnout of the coil.

- (a) Perform the pull-in test.
 - (1) Remove the nut, then disconnect the lead wire from terminal C.
 - (2) Connect the battery to the starter magnetic switch as shown in the illustration. Check that the clutch pinion gear is extended. If the clutch pinion gear does not move, replace the magnet starter switch.



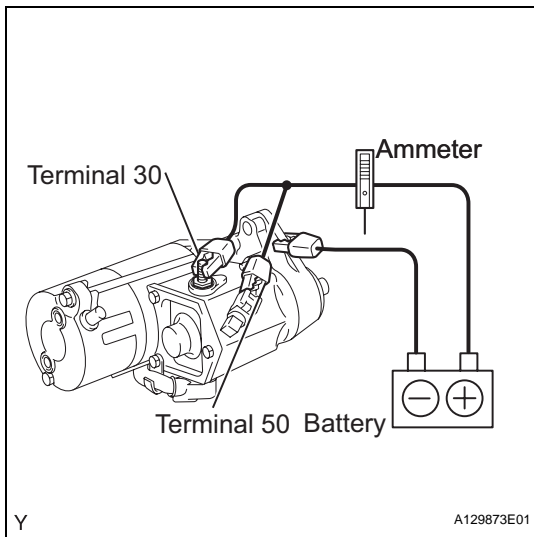
- (b) Perform the hold-in test.
 - (1) Disconnect the negative (-) lead from terminal C. Check that the clutch pinion gear is extended. If the clutch pinion gear returns inward, replace the starter magnet starter switch.





(c) Check the operation.

- (1) Disconnect the negative (-) lead from the starter body. Check that the clutch pinion gear returns.
If the clutch pinion gear does not return inward, replace the magnet starter switch.



(d) Perform the no-load performance test.

- (1) Connect the lead wire to terminal C. Make sure that the lead is not grounded.

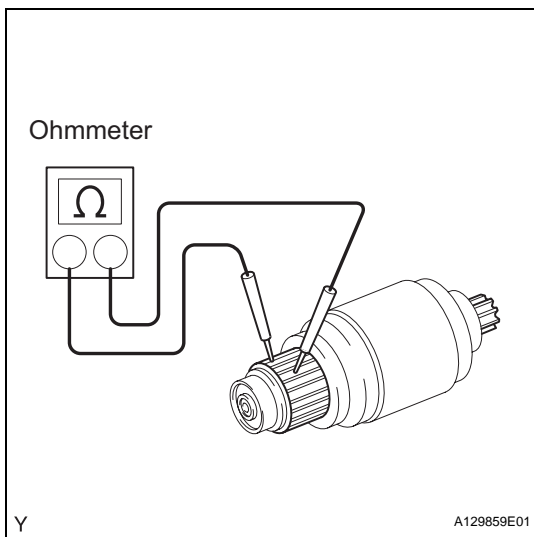
Torque: 5.9 N*m (60 kgf*cm, 52 in.*lbf)

- (2) Clamp the starter in a vise.
- (3) Connect the battery and an ammeter to the starter as shown in the illustration.
- (4) Check that the starter rotates smoothly and steadily while the pinion gear is moving outward. Then measure the current.

Standard current:

100A or less at 11.5V

If the result is not as specified, replace the stator.



2. INSPECT STARTER ARMATURE ASSEMBLY

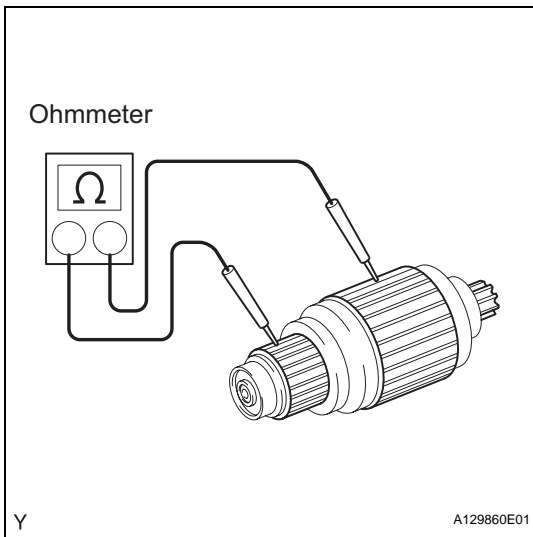
(a) Check the commutator for an open circuit.

- (1) Using an ohmmeter, measure the resistance between the segments of the commutator.

Standard resistance:

1 Ω or lower

If the result is not as specified, replace the starter armature.



- (b) Check the commutator for ground.
 (1) Using an ohmmeter, measure the resistance between the commutator and armature coil core.

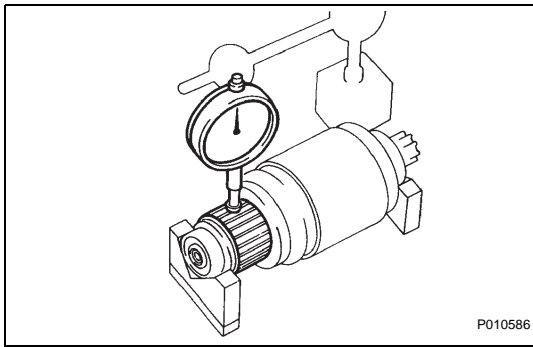
Standard resistance:

10 kΩ or higher

If the result is not as specified, replace the starter armature.

- (c) Check whether the commutator surface is dirty or burnt.

If necessary, smooth the surface with sandpaper (No. 400) or a lathe.



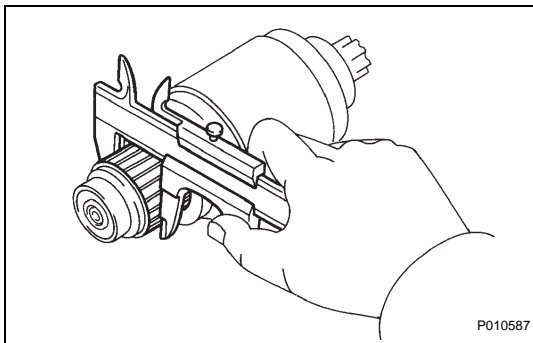
- (d) Check the commutator for runout.

- (1) Place the commutator on V-blocks.
 (2) Using a dial gauge, measure the runout.

Maximum runout:

0.05 mm (0.0020 in.)

If the runout is greater than the maximum, correct it on a lathe.



- (e) Using vernier calipers, measure the commutator diameter.

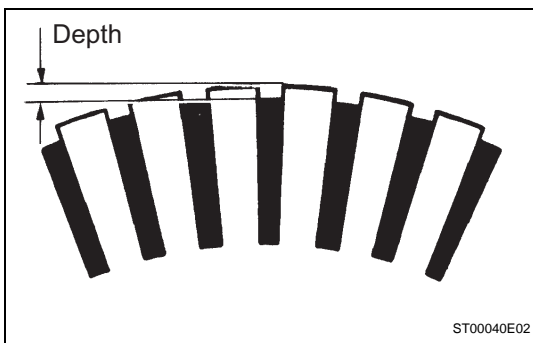
Standard diameter:

35.0 mm (1.378 in.)

Minimum diameter:

34.0 mm (1.339 in.)

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



- (f) Check that the undercut portion between the segments is free of foreign objects. Measure its depth.

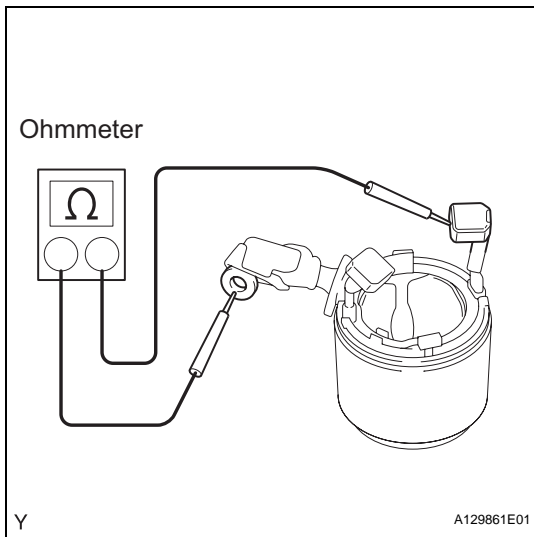
Standard undercut depth:

0.7 mm (0.028 in.)

Minimum undercut depth:

0.2 mm (0.008 in.)

If the under-cut depth is less than the minimum, correct it with hacksaw blade.



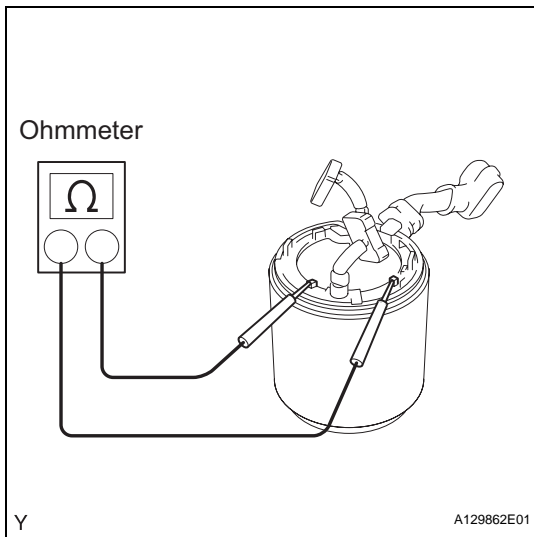
3. INSPECT STARTER YOKE ASSEMBLY

- (a) Check the starter yoke for an open circuit.
 (1) Using an ohmmeter, measure the resistance between the lead wire and brushes.

Standard resistance:

1 Ω or lower

If the result is not as specified, replace the starter yoke.



- (b) Check the shunt coil for an open circuit.

- (1) Using an ohmmeter, measure the resistance between shunt coil terminals A and B.

Standard resistance:

1.5 to 1.9 Ω at 20°C (68°F)

If the result is not as specified, replace the starter yoke.

4. INSPECT BRUSH

- (a) Check the brush length.

- (1) Using vernier calipers, measure the brush length.

Standard length:

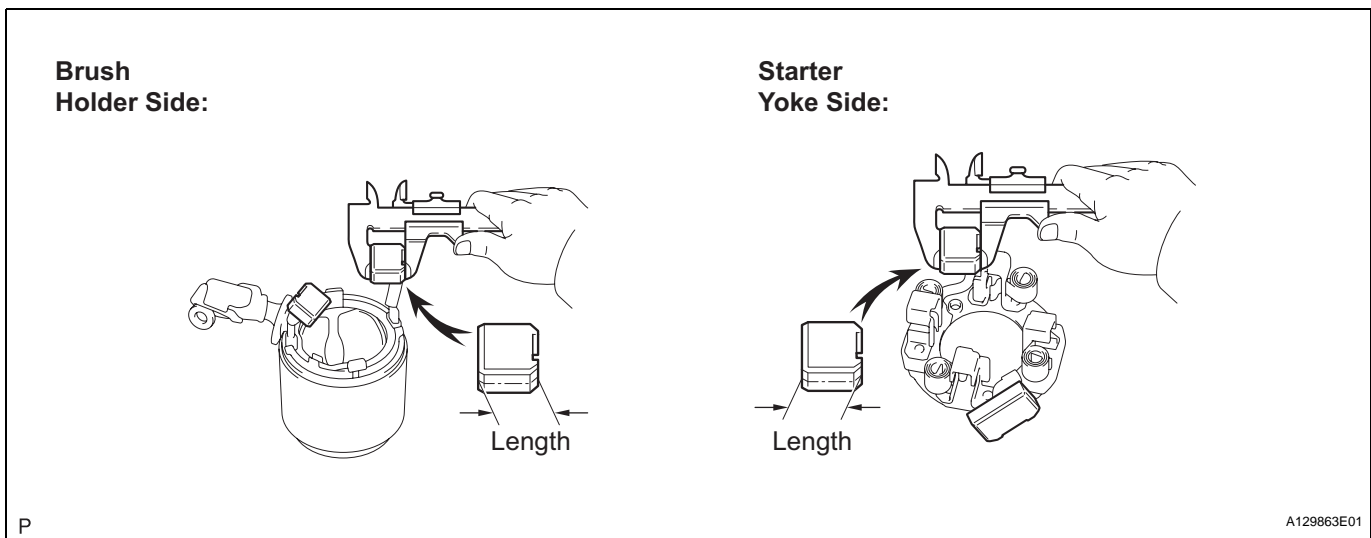
15 mm (0.591 in)

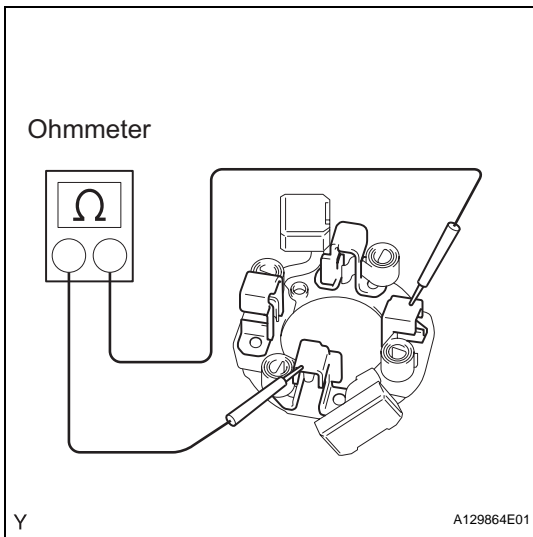
Minimum length:

9.0 mm (0.354 in)

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

ST





5. INSPECT STARTER BRUSH HOLDER ASSEMBLY

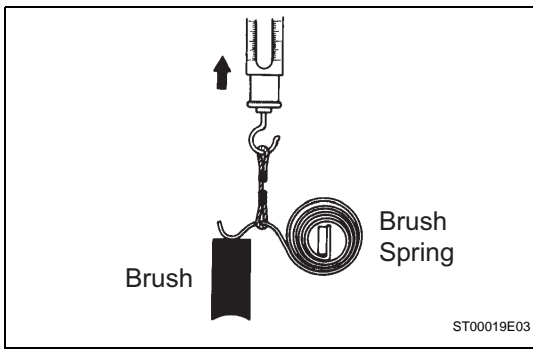
(a) Check the brush holder insulation.

- (1) Using an ohmmeter, measure the resistance between the positive (+) and negative (-) brush holders.

Standard resistance:

10 k Ω or higher

If the result is not as specified, replace the brush holder assembly.



(b) Check the brush spring load.

- (1) Take the pull scale reading as soon as the brush spring separates from the brush.

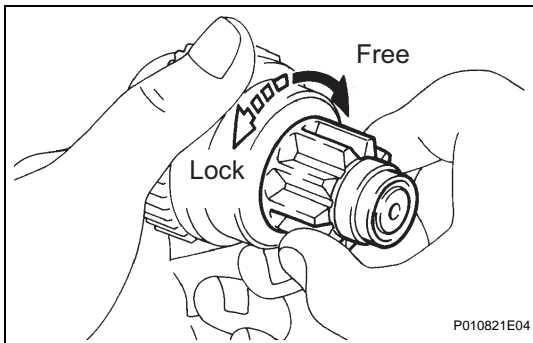
Standard spring load:

21.5 to 27.5 N (2.2 to 2.8 kgf, 4.8 to 6.2 lbf)

Minimum spring load:

12.7 N (1.3 kgf, 2.9 lbf)

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

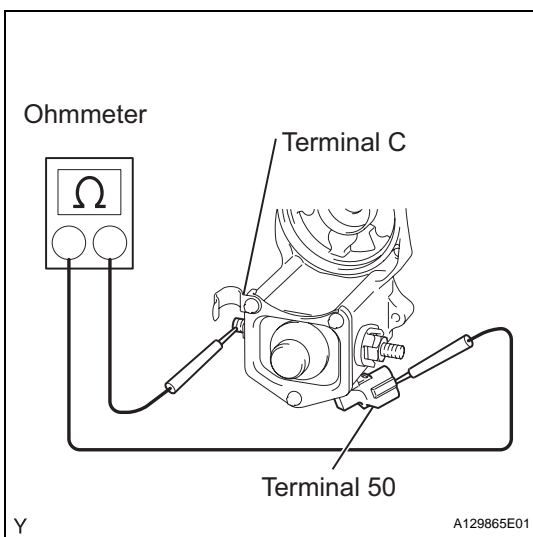


6. INSPECT STARTER CLUTCH SUB-ASSEMBLY

(a) Check the clutch pinion gear.

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

If necessary, replace the starter clutch.



7. INSPECT MAGNET STARTER SWITCH ASSEMBLY

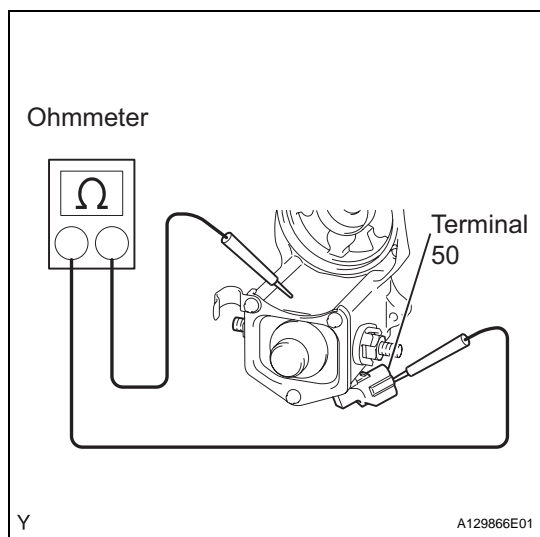
(a) Check the pull-in coil for an open circuit.

- (1) Using an ohmmeter, measure the resistance between terminal 50 and C.

Standard resistance:

1 Ω or lower

If the result is not as specified, replace the magnet starter switch.



- (b) Check the holding coil for an open circuit.
- (1) Using an ohmmeter, measure the resistance between terminals 50 and the switch body.
- Standard resistance:**
2 Ω or lower
- If the result is not as specified, replace the magnet starter switch.