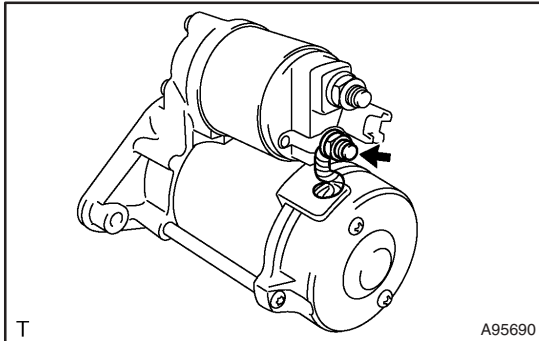
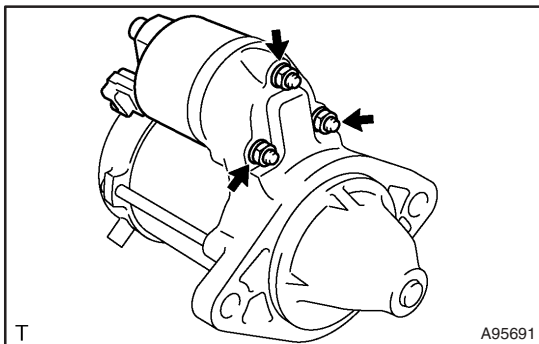


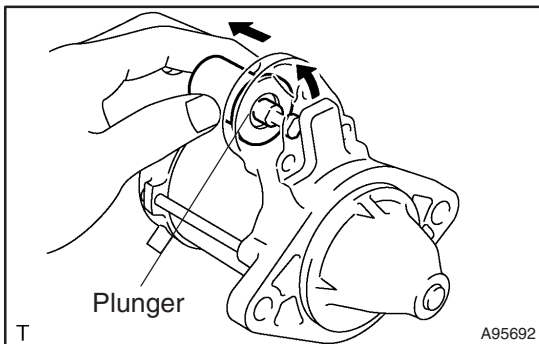
OVERHAUL

**1. REMOVE STARTER MAGNETIC SWITCH ASSY**

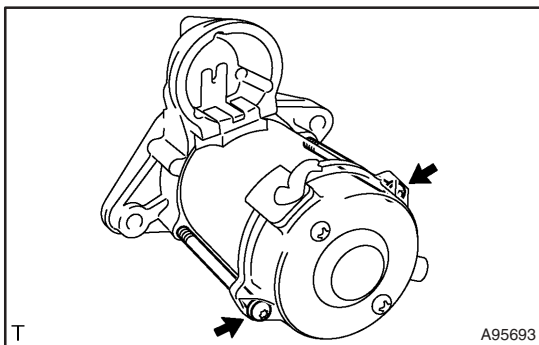
- (a) Remove the nut, then disconnect the lead wire from the starter magnetic switch.



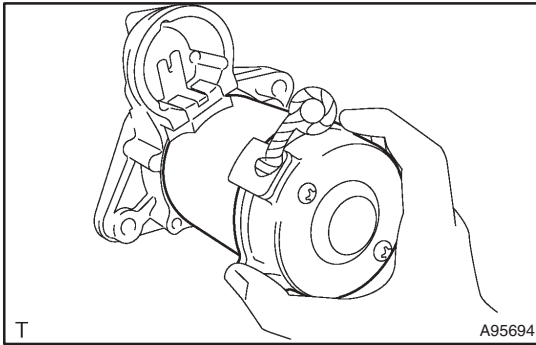
- (b) Remove the 3 nuts from the magnet switch body while holding the starter magnetic switch.
- (c) Remove the starter magnetic switch.
- (d) Remove the return spring.



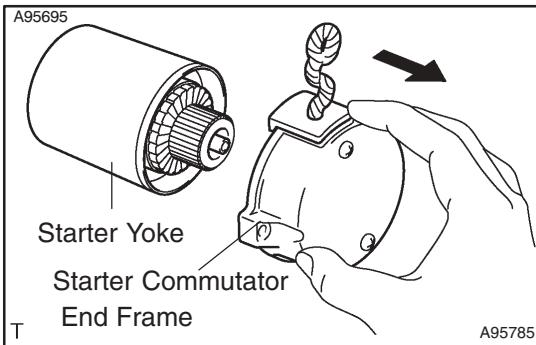
- (e) Pull up the housing side of the plunger, then remove the plunger.

**2. REMOVE STARTER YOKE ASSY**

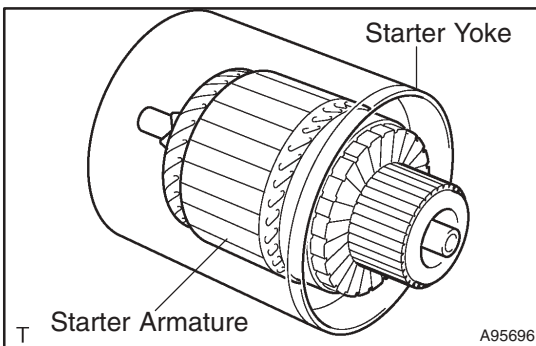
- (a) Using a torx driver T25, remove the 2 through bolts.



- (b) Pull out the starter yoke together with the starter commutator end frame.



- (c) Pull out the starter yoke from the starter commutator end frame.

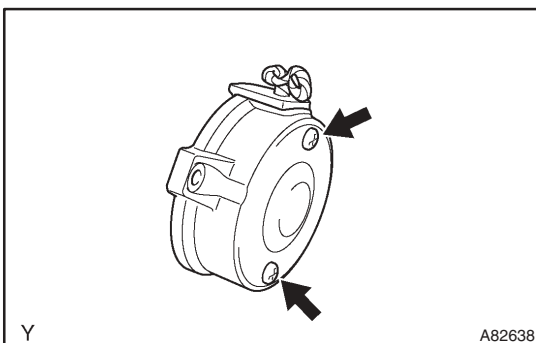
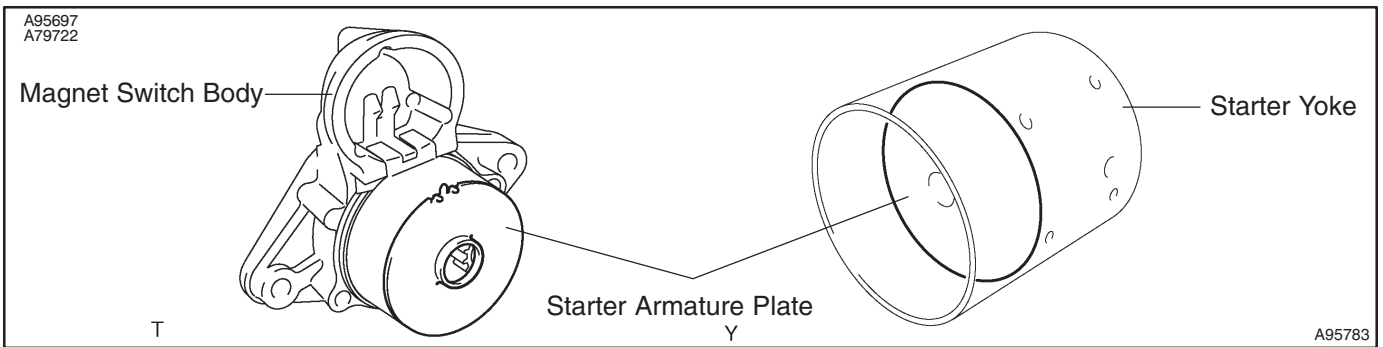


3. REMOVE STARTER ARMATURE ASSY

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

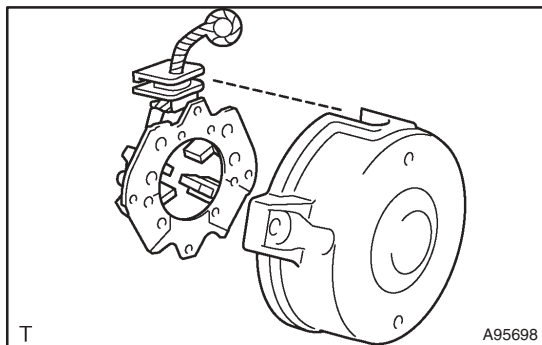
4. REMOVE STARTER ARMATURE PLATE

- (a) Remove the armature plate from the magnet switch body or the starter yoke.

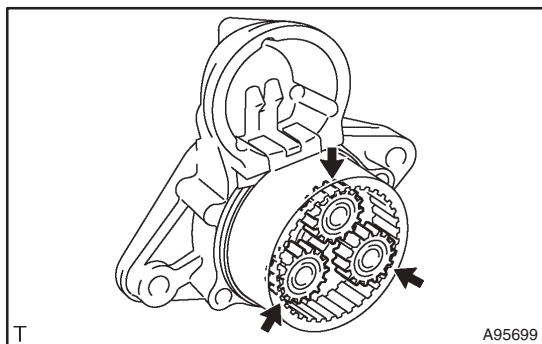


5. REMOVE STARTER BRUSH HOLDER ASSY

- (a) Remove the 2 screws from the commutator end frame.

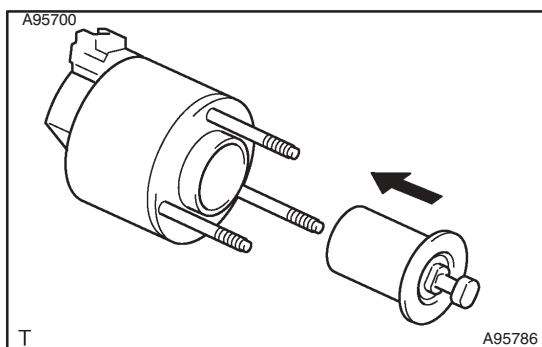


- (b) Remove the claw of the clamp, then remove the brush holder from the commutator end frame.



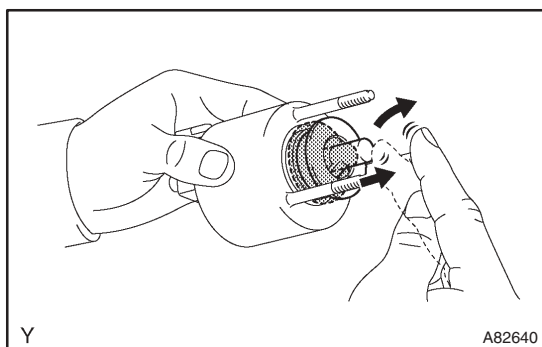
6. REMOVE PLANETARY GEAR

- (a) Remove the 3 planetary gears from the magnet switch body.



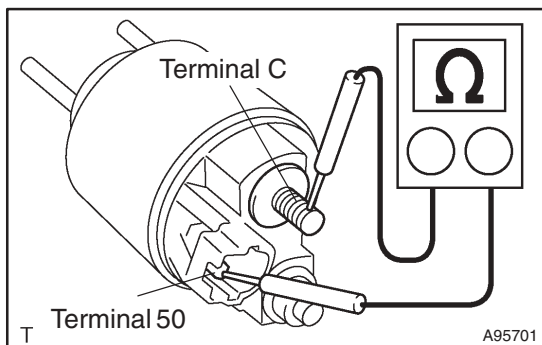
7. INSPECT STARTER MAGNETIC SWITCH ASSY

- (a) Check the plunger.
- (1) Install the plunger onto the switch body.



- (2) Push in the plunger, then check that it returns quickly to its original position.

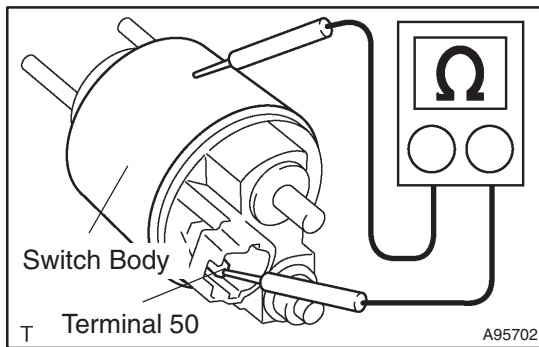
If necessary, replace the starter magnetic switch.



- (b) Check the pull-in coil for open circuit.
- (1) Using an ohmmeter, measure the resistance between terminals 50 and C.

Standard: Below 1 Ω

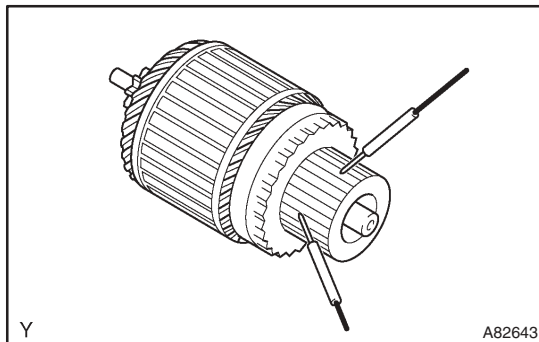
If the standard is not met, replace the starter magnetic switch.



- (c) Check if the hold-in coil has an open circuit.
 (1) Using an ohmmeter, measure the resistance between terminal 50 and the switch body.

Standard: Below 1.5 Ω

If the standard is not met, replace the starter magnetic switch.

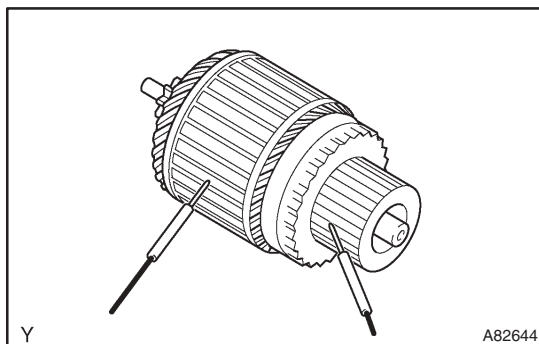


8. INSPECT STARTER ARMATURE ASSY

- (a) Check the commutator for open circuit.
 (1) Using an ohmmeter, measure the resistance between the segments of the commutator.

Standard: Below 1 Ω

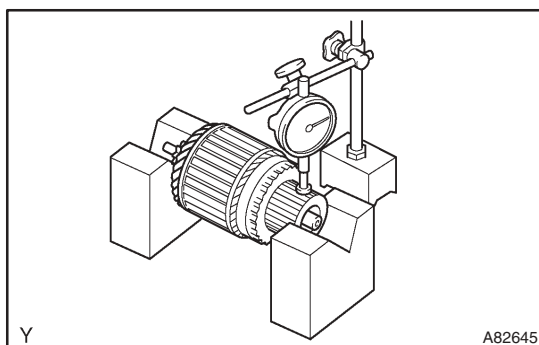
If the standard is not met, replace the starter armature.



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

Standard: 10 k Ω or higher

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



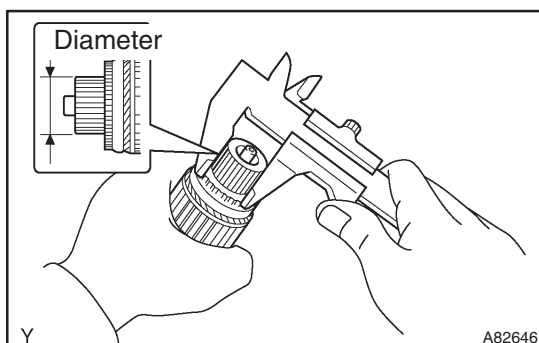
- (c) Check the appearance.
 If the surface is dirty or burnt, smooth the surface with 400-grit sandpaper.

- (d) Check for the commutator circuit runout.
 (1) Place the commutator on V-blocks.
 (2) Using a dial indicator, measure the circle runout.

Standard runout: 0.02 mm (0.0008 in.)

Maximum runout: 0.05 mm (0.0020 in.)

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



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

Standard diameter: 29 mm (1.142 in.)

Minimum diameter: 28 mm (1.102 in.)

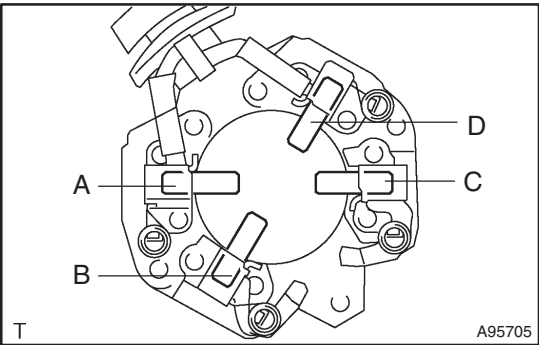
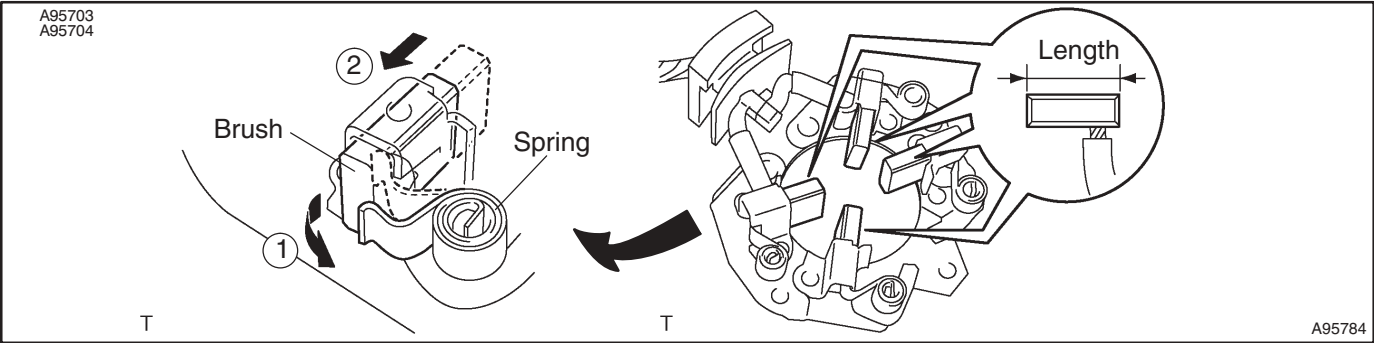
If the diameter is less than minimum, replace the armature.

9. INSPECT STARTER BRUSH HOLDER ASSY

- (a) Remove the claw of the spring, then remove the 4 brushes.
- (b) Using vernier calipers, measure the brush length.

Standard length: 15.5 mm (0.610 in.)
Minimum length: 9.0 mm (0.354 in.)

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



- (c) Check the brush holder.
(1) Using an ohmmeter, measure the resistance between the brushes.

Standard:

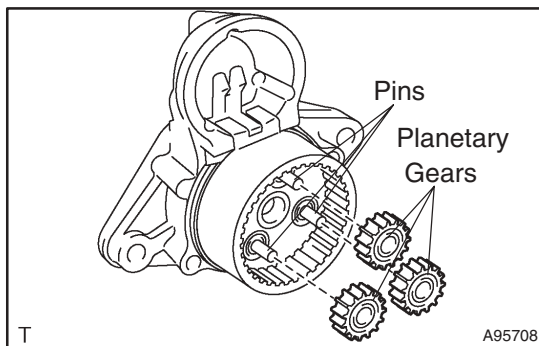
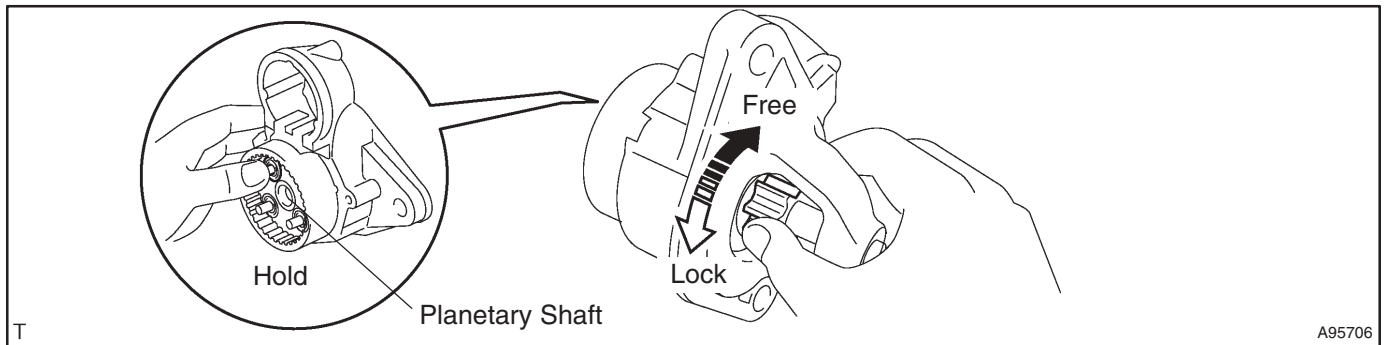
TesterConnection	SpecifiedCondition
A - B	10 kΩ or higher
A - C	10 kΩ or higher
A - D	Below 1 Ω
B - C	Below 1 Ω
B - D	10 kΩ or higher
C - D	10 kΩ or higher

If the standard is not met, replace the starter brush holder.

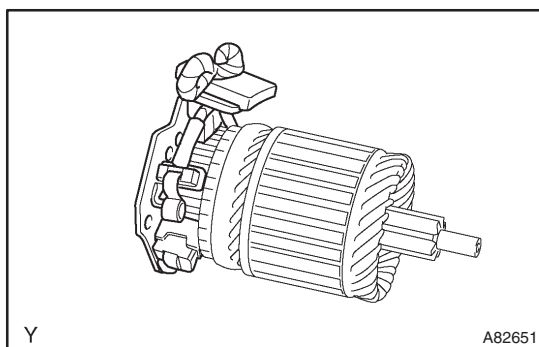
10. INSPECT MAGNET SWITCH BODY

- (a) Check the starter clutch.
- (1) Hold the planetary shaft so that it may not rotate.
 - (2) 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.

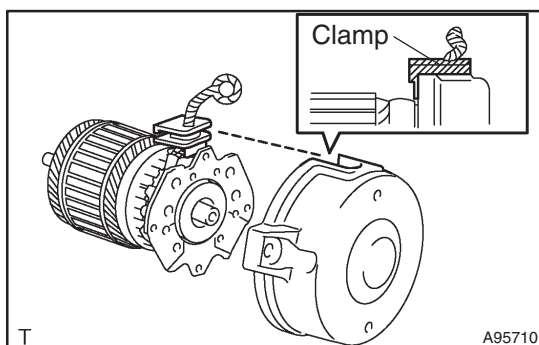
If necessary, replace the magnet switch body.

**11. INSTALL PLANETARY GEAR**

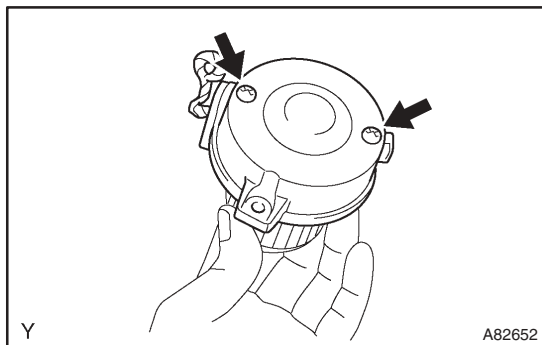
- (a) Apply grease to the planetary gears and pin parts of the planetary shaft.
- (b) Install the 3 planetary gears.

**12. INSTALL STARTER BRUSH HOLDER ASSY**

- (a) Install the brush holder onto the starter armature assy.

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

- (a) Fit the clamp of the brush holder into the starter commutator end frame.



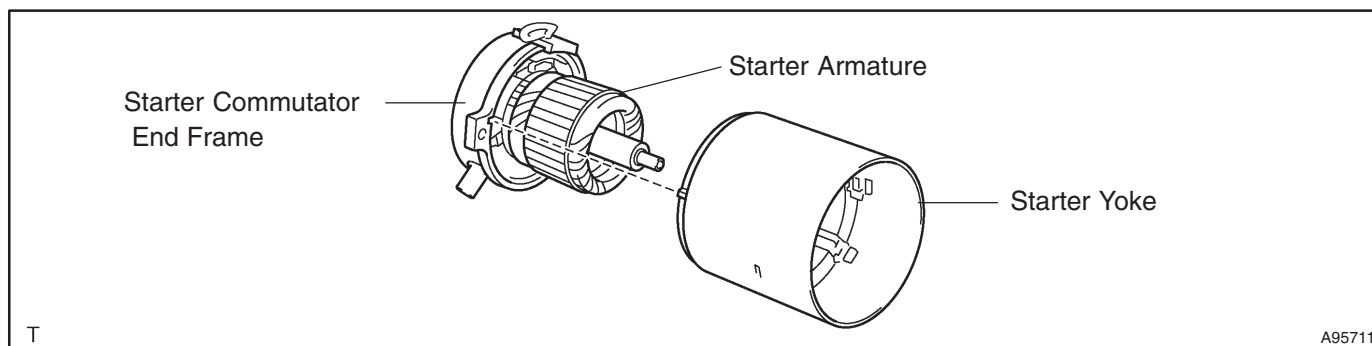
- (b) Install the commutator end frame with the 2 screws.

14. INSTALL STARTER ARMATURE ASSY

- (a) Align the rubber with the convex cutout of the starter yoke.
 (b) Install starter armature with the brush holder onto the starter yoke.

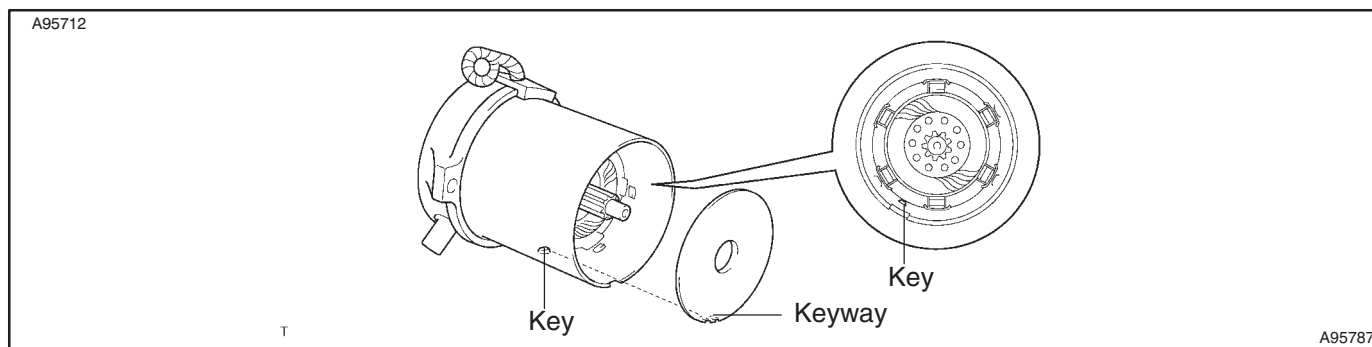
HINT:

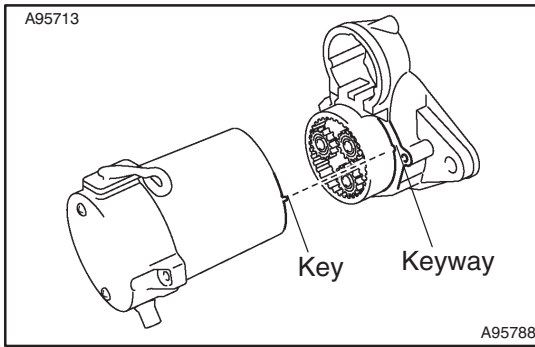
Support the starter armature so that it may not be pulled out from the starter brush holder by magnetic force of the starter yoke.



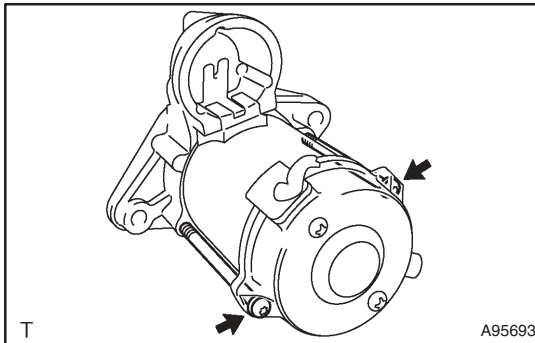
15. INSTALL STARTER ARMATURE PLATE

- (a) Insert the starter armature plate onto the starter yoke.
 (b) Align the keyway of the starter plate with the key inside the starter yoke, then install the starter plate.



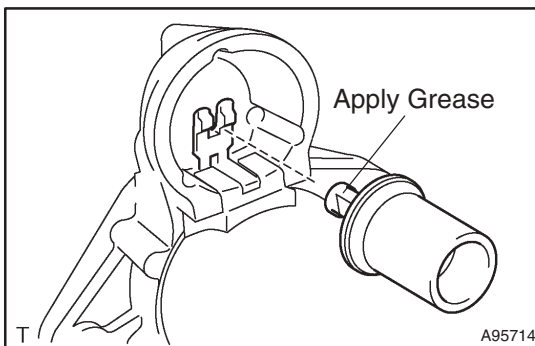
**16. INSTALL STARTER YOKE ASSY**

- (a) Align the key of the starter yoke with the keyway located on the magnet switch body.

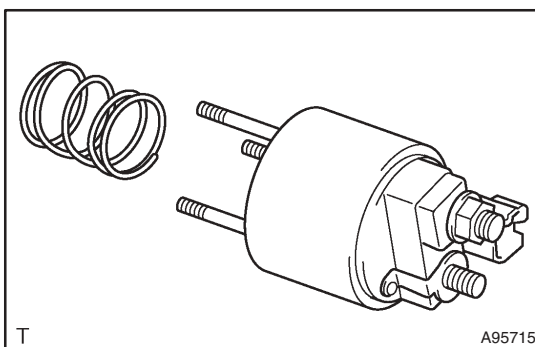


- (b) Using a torx driver T25, install the starter yoke using the 2 through bolts.

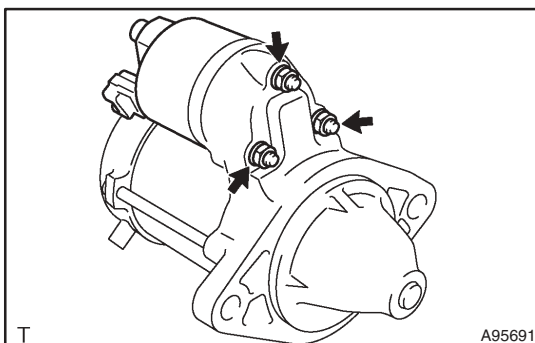
Torque: 6.0 N·m (61 kgf·cm, 53 in.-lbf)

**17. INSTALL STARTER MAGNETIC SWITCH ASSY**

- (a) Apply grease to the hook.
(b) Connect the plunger and hook of the starter housing to the drive lever.

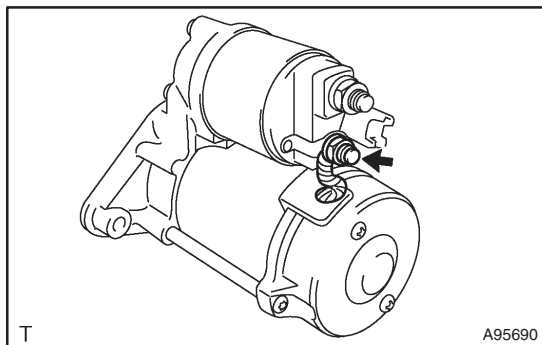


- (c) Install the plunger and return spring.



- (d) Install the starter magnetic switch with the 3 nuts.

Torque: 2.3 N·m (24 kgf·cm, 21 in.-lbf)



- (e) Connect the lead wire to the starter magnetic switch, then fasten it with the nut.

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