STARTING

STARTER ST–1
STARTER RELAY ST–7

REFER TO 3S–FE ENGINE REPAIR MANUAL (Pub No. RM395E)

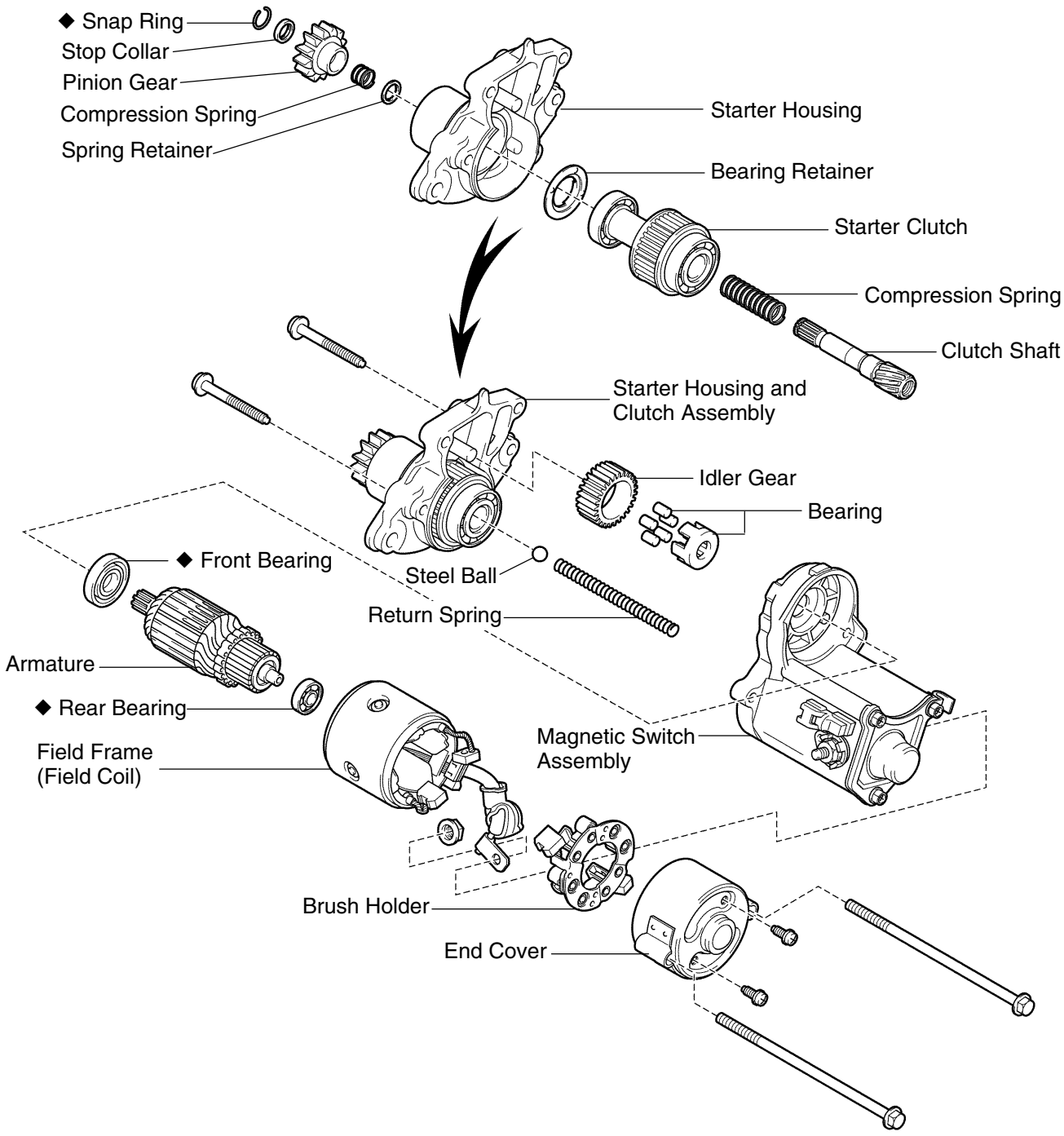
NOTE: The above pages contain only the points which differ from the above listed manual.

STARTER

COMPONENTS

ST07G–01

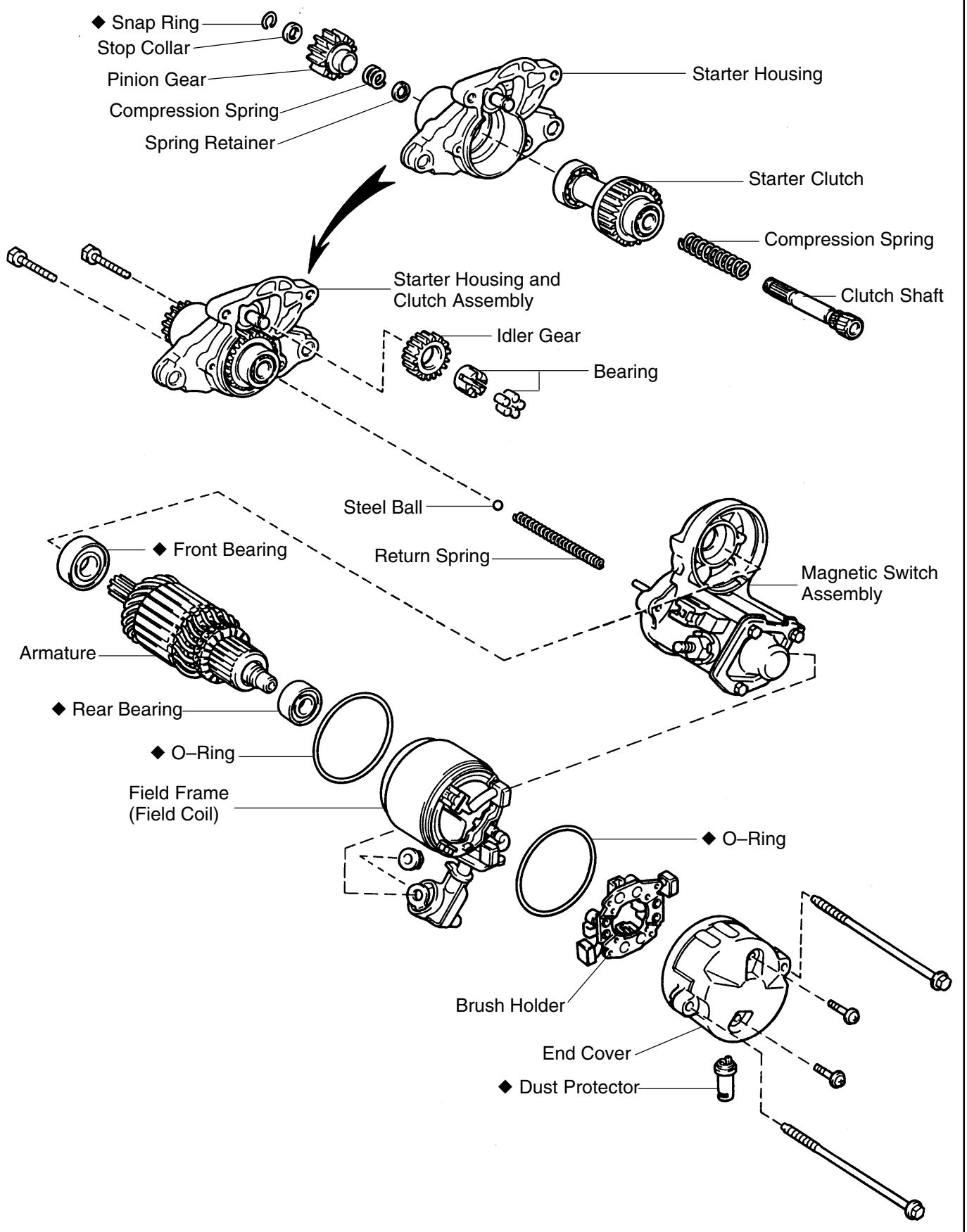
1.0 kW



◆ Non–reusable part

B03514

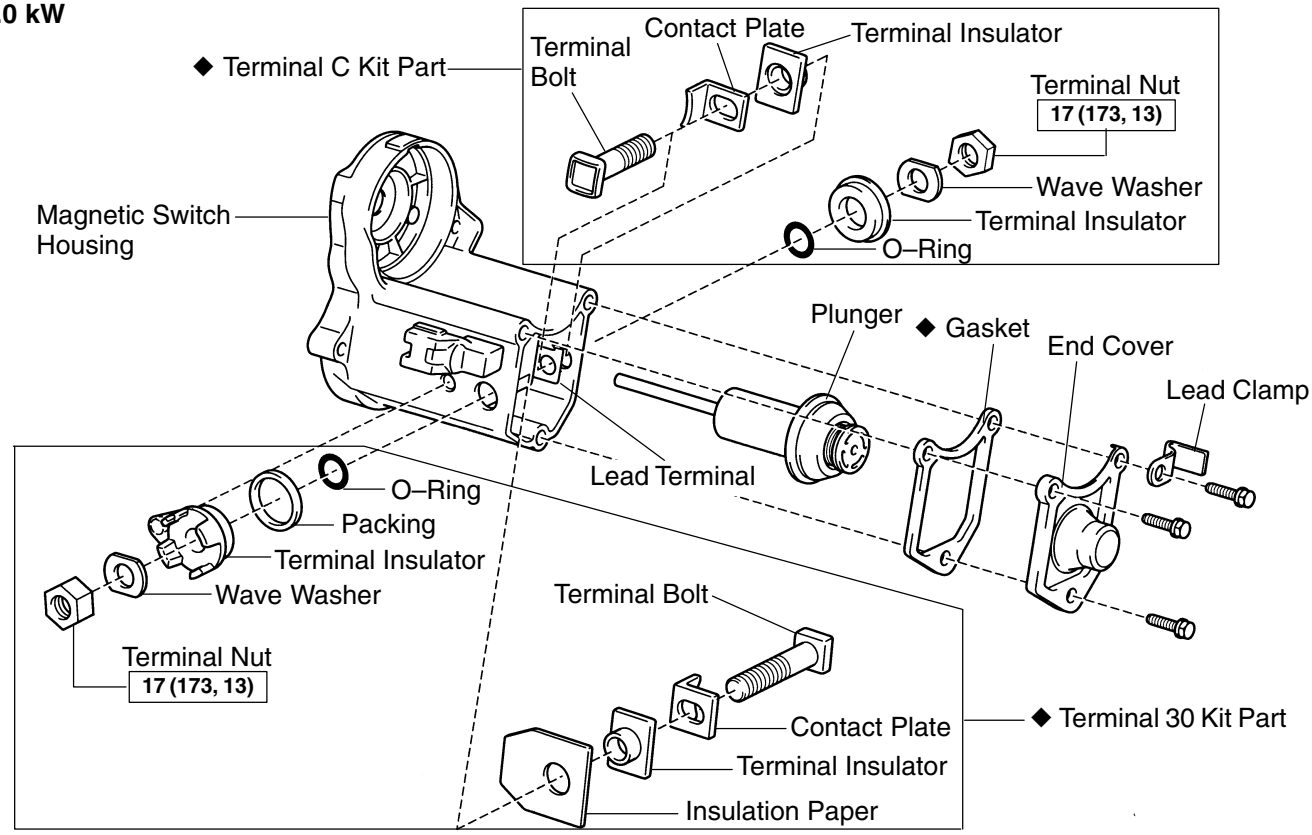
1.2 kW



◆ Non–reusable part

S08049

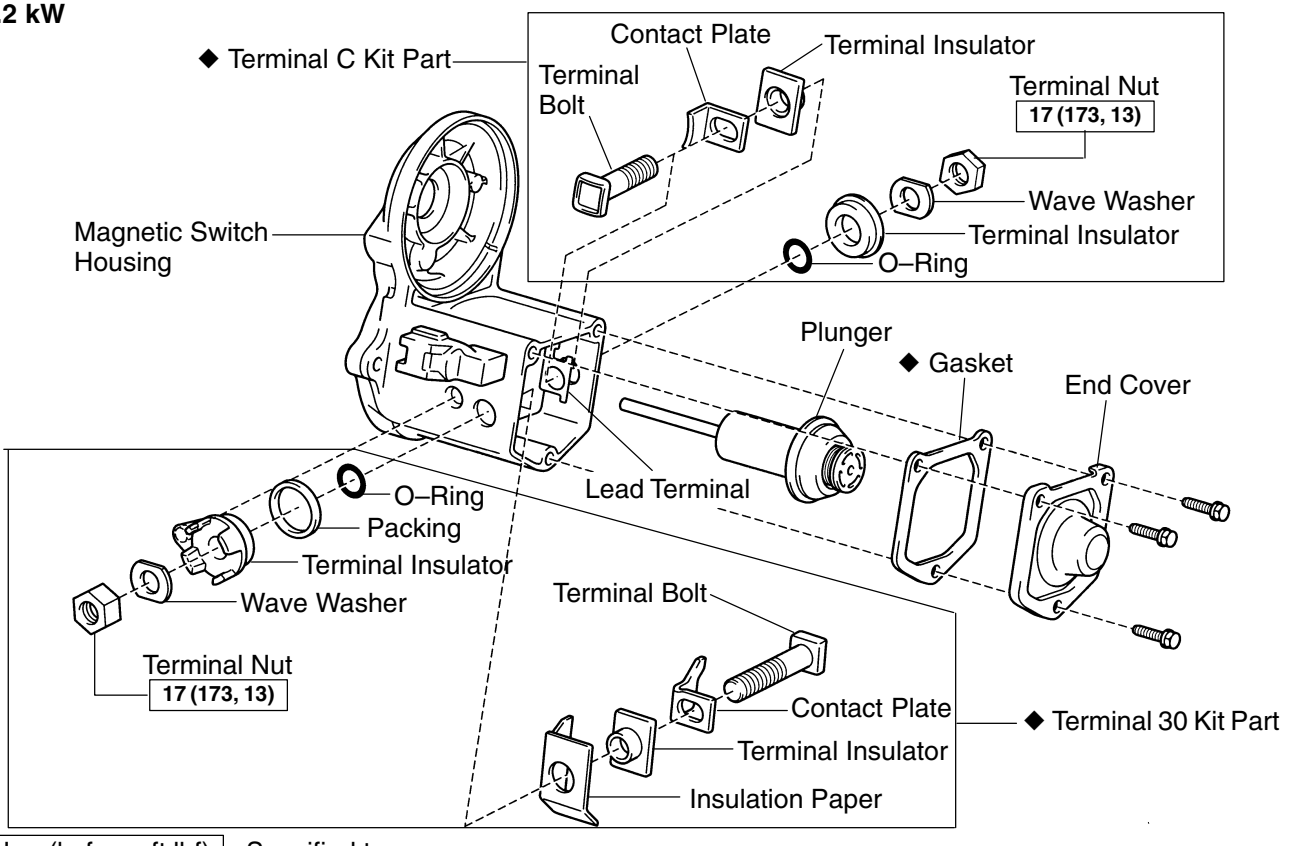
1.0 kW



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part

S07751

1.2 kW



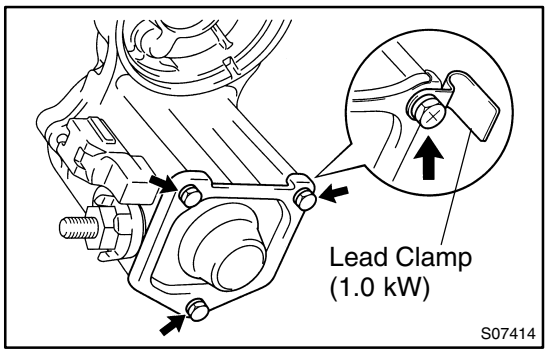
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part

S07410

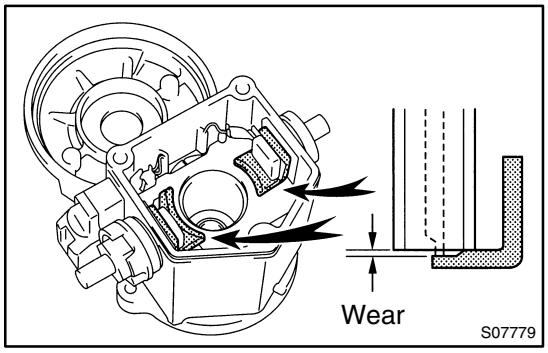
ST07H–01

REPLACEMENT

1. REPLACE MAGNETIC SWITCH TERMINAL KIT PARTS



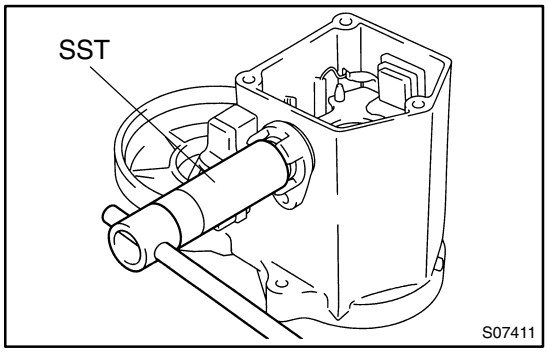
(a) Remove the 3 bolts, lead clamp (1.0 kW), end cover, gasket and plunger.



(b) Using vernier calipers, measure the contact plate for depth of wear.

Maximum wear: 0.9 mm (0.035 in.)

If the depth of wear is greater than the maximum, replace the contact plate.



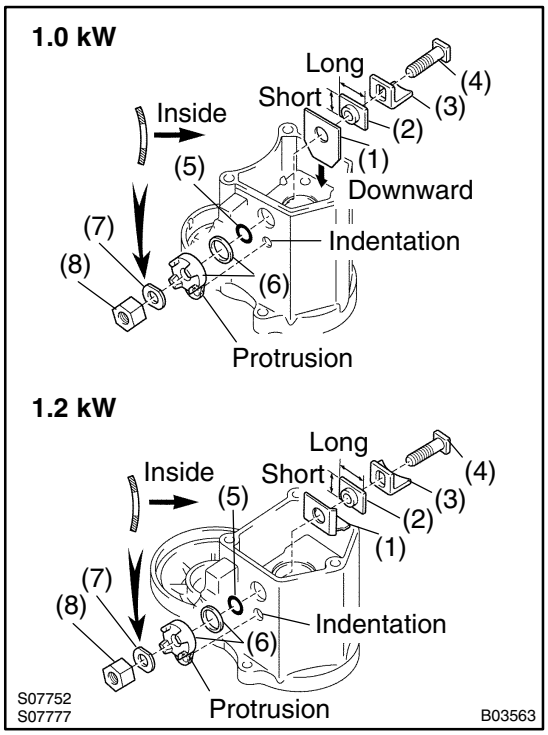
(c) Remove the terminal kit parts.

(1) Using SST, loosen the terminal nuts.

SST 09810–38140

(2) Terminal C:
Remove the terminal nut, wave washer terminal insulator (outside), O–ring, terminal bolt, contact plate and terminal insulator (inside).

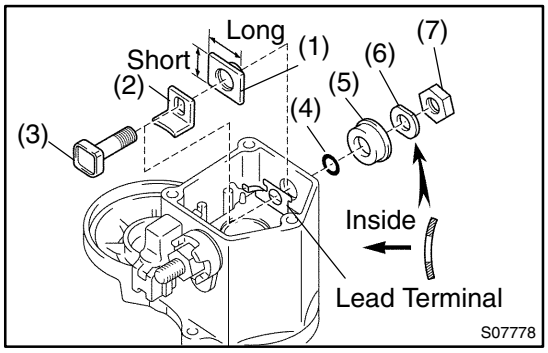
(3) Terminal 30:
Remove the terminal nut, wave washer, terminal insulator (outside), packing, O–ring, terminal bolt, contact plate, terminal insulator (inside) and insulation paper.



(d) Temporarily install these new terminal 30 kit parts:
- (1) Insulation paper
- (2) Terminal insulator (inside)
- (3) Contact plate
- (4) Terminal bolt
- (5) O–ring
- (6) Packing and terminal insulator (outside)
  Install the packing to the terminal insulator, and install them.

HINT:
Match the protrusion of the insulator with the indentation of the housing.
- (7) Wave washer
- (8) Terminal nit

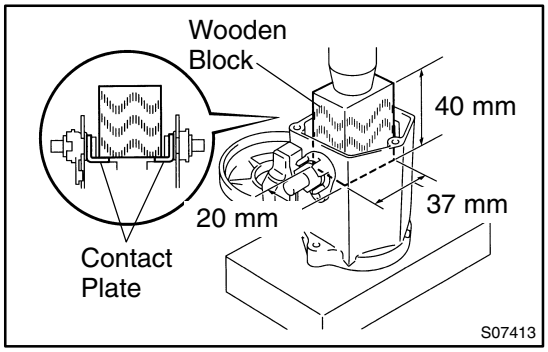
NOTICE:
Be careful to install the installation paper, terminal insulator (inside) and wave washer in the correct direction.



(e) Temporarily install these new terminal C kit parts:
- (1) Terminal insulator (inside)
- (2) Contact plate
- (3) Terminal bolt
- (4) O–ring
- (5) Terminal insulator (outside)
- (6) Wave washer
- (7) Terminal nut

NOTICE:
Be careful to install the terminal insulator (inside) and wave washer in the correct direction.

(f) Temporarily tighten the terminal nuts.



(g) Tighten terminal nuts.
- (1) Put a wooden block on the contact plate and press it down with a hand press.

Dimensions of wooden block:
20 x 37 x 40 mm (0.79 x 1.46 x 1.57 in.)
Press force: 981 N (100 kgf, 221 lbf)

NOTICE:

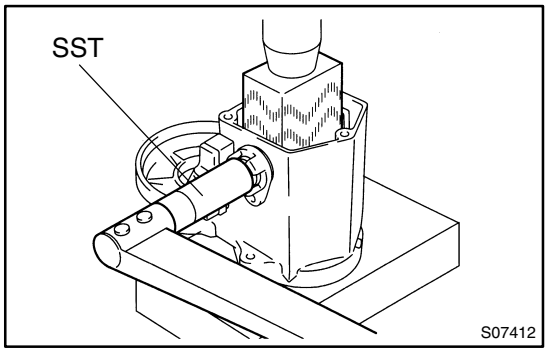
- **Check the diameter of the hand press ram. Then calculate the gauge pressure of the press when 981 N (100 kgf, 221 lbf) of force is applied.**
  Gauge pressure:

$$(kgf/cm^2) = \frac{100\ kgf}{\left(\frac{\text{Ram diameter (cm)}}{2}\right)^2 \times 3.14\ (\pi)}$$

$$(psi) = \frac{221\ lbf}{\left(\frac{\text{Ram diameter (in.)}}{2}\right)^2 \times 3.14\ (\pi)}$$

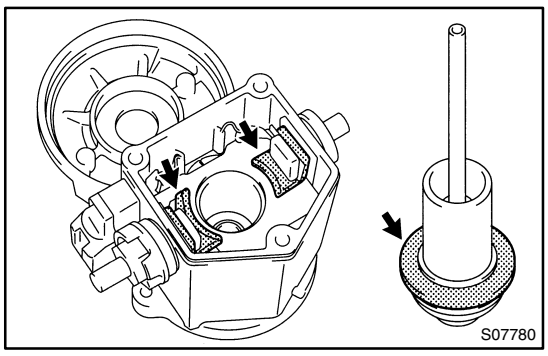
  (kPa) = (kgf/cm^2) x 98.1
  (kPa) = (psi) x 6.9

- **If the contact plate is not pressed down with the specified pressure, the contact plate may tilt due to coil deformation or the tightening of the nut.**

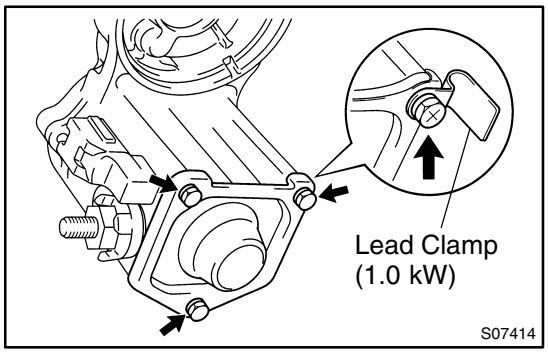


(2) Using SST, tighten the nuts to the specified torque.
SST 09810–38140
Torque: 17 N·m (173 kgf·cm, 13 ft·lbf)

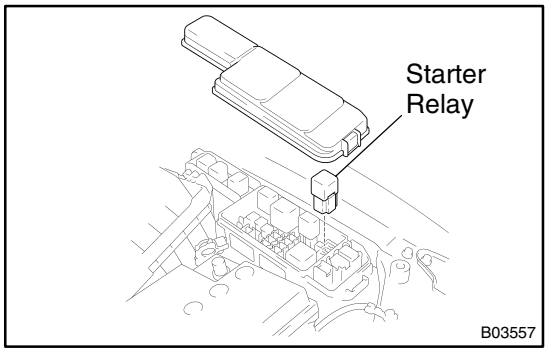
NOTICE:
If the nut is over tightened, it may cause cracks on the inside of the insulator.



(h) Clean the contact surfaces of the remaining contact plate and plunger with a dry shop rag.



(i) Reinstall the plunger, a new gasket, the end cover and lead clamp (1.0 kW) with the 3 bolts.
Torque:
3.6 N·m (37 kgf·cm, 32 in.·lbf) for 1.0 kW
2.5 N·m (25 kgf·cm, 22 in.·lbf) for 1.2 kW



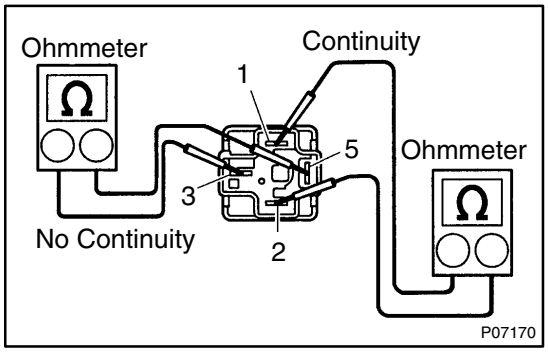
STARTER RELAY

ST07I–01

INSPECTION

1. REMOVE RELAY BOX COVER

2. REMOVE STARTER RELAY



3. INSPECT STARTER RELAY

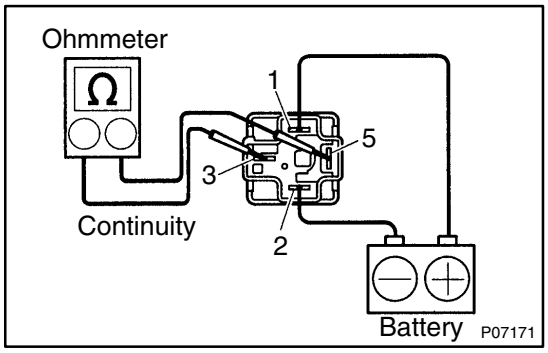
(a) Inspect the relay continuity.

(1) Using an ohmmeter, check that there is continuity between terminal 1 and 2.

If there is no continuity, replace the relay.

(2) Check that there is no continuity between terminals 3 and 5.

If there is continuity, replace the relay.



(b) Inspect the relay operation.

(1) Apply battery voltage across terminals 1 and 2.

(2) Using an ohmmeter, check that there is continuity between terminals 3 and 5.

If there is no continuity, replace the relay.

4. REINSTALL STARTER RELAY

5. REINSTALL RELAY BOX COVER