



MODEL VTP 13A

1. PRECAUTIONS FOR ASSEMBLING/DISASSEMBLING

The figures in circles ○ represent the item numbers in the separately provided parts list.

1-1. Disassembly

1) Disassembly of motor part

(1) Remove handle cover

Loosen 4 ϕ x 20 ⊕ pan head tapping screw ④⑧; and remove handle cover ④③.

(2) Loosen 4 ϕ x 16 ⊕ pan head tapping screw ④④, and remove holder piece ④⑤. Lift up brush holder ④⑦ with a small-screw driver, and pull it out.

Following the above, pull out at a point near the terminal the stator lead wire which is connected with carbon brush ④⑥.

At this time, it is desirable that carbon brush ④⑥ be pulled out while the brush is pushed into the brush holder ④⑦ to the maximum extent.

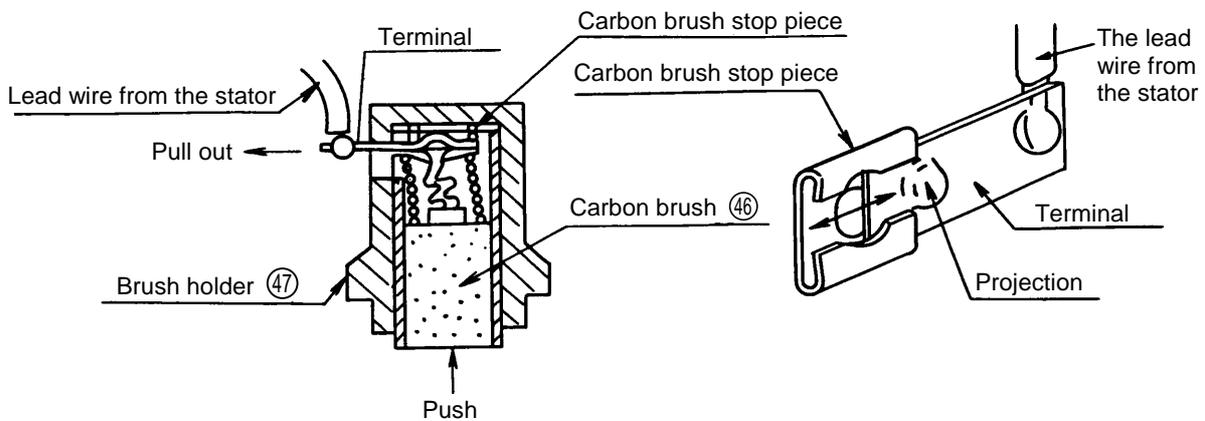


Fig. 2

Fig. 3

(3) Separate the gear cover section from the housing section.

Loosen 5 ϕ x 35 ⊕ pan head tapping screw, and remove gear cover section from housing section. In the next, pull out from the housing ④② the armature assembly ②⑥ which is solid with the inner cover assembly ②③.

(4) Pull out the armature assembly from the inner cover assembly. Receive inner cover assembly (23) with the cylindrical jig, and push the tip of the pinion gear or armature assembly (26) as shown in Fig. 4.

2) Disassembly of speed change -over machine

(1) Shift Plate Removal

Loosen M4 x 12 (+) flat head screw. As this screw is applied with adhesive, it will be loosened easily when the entire gear-cover portion has been warmed. When the screw has been loosened, shift plate (32), shift lock (29), and spring (B) (31) can be removed seeming in a solid body. At this time the spring (B) (31) will come off very easily. Therefore, be careful not to miss the spring (B) (31).

(2) Pull out gears

When the seam between the gear cover (16) and inner cover assembly (23) is patted with a wooden hammer or the like, there will come out from the gear cover such items as second pinion assembly (22), gear assembly (17), spring (19), washers (18) and (20), shift arm (34), and seal plate assembly (23).

(3) Disassembly of percussion generator section

1 Remove drill chuck
 Drill chuck (2) is fixed against spindle (3) by means of UNF 1/2-20 screw (right-handed screw). Therefore, use J-78 ring assembly so that the body part of the drill chuck be

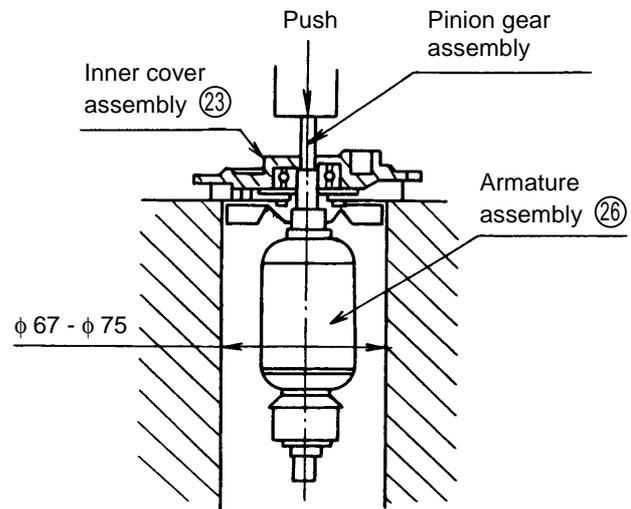


Fig. 4

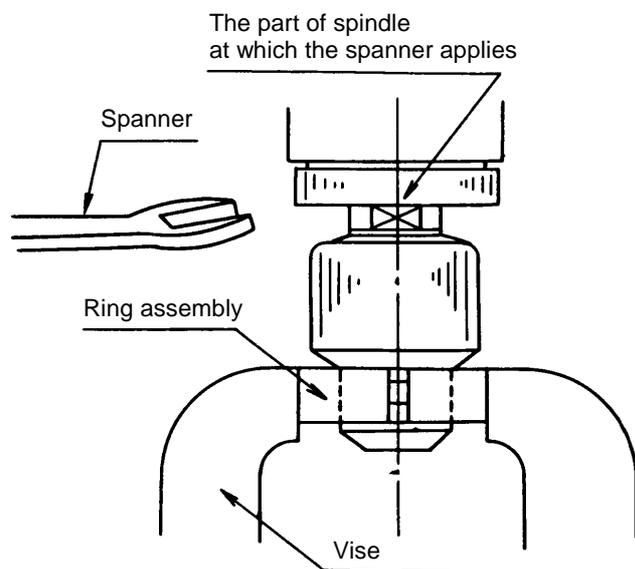


Fig. 5

embraced by the ring assembly, then fix the body with a vise, as shown in Fig. 5.

At this time, insert the pin of the ring assembly into the opening for the handle of the body part.

In the next place, apply a 17 mm spanner on the past of spindle ③ at which the spanner applies and rotate the part so that the drill chuck assembly comes off loose.

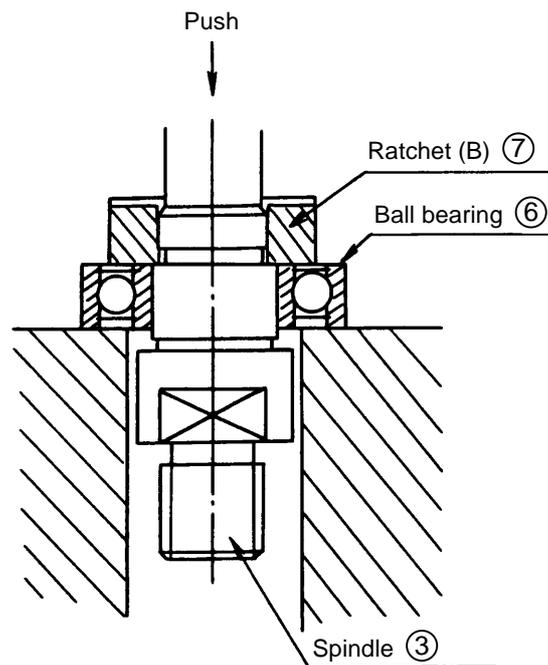


Fig. 6

2 Pull out the spindle

Remove the C type retaining ring for D32 opening which retains dust seal ⑤. Pat with wood hammer the inner cover side edge surface of spindle ③, and pull out dust seal ⑤ and spindle ③. The spindle ③ is combined with ball bearing ⑥ and ratchet (B) ⑦ in a solid body.

3 Pull out Ratchet (B)

Pull out ratchet (B) ⑦ using a jig like the one shown in Fig. 6.

4 Remove ratchet (A).

Ratchet (A) ⑧ is fixed against gear cover ⑩ with M20 left handle screw. Therefore, it can be loosened when J-94 special driver is set matchingly to the groove provided on the side opposite to the ratchet tooth part as shown in Fig. 7 and rotated anticlockwise.

Be careful sufficiently of the gear cover ⑩ not to deform it when it is fixed.

5 Remove Change Ring

As change ring ⑨ is fixed against gear cover ⑯ with M34 x 2 diameter screws, it can be removed by rotating the screw anti-clockwise.

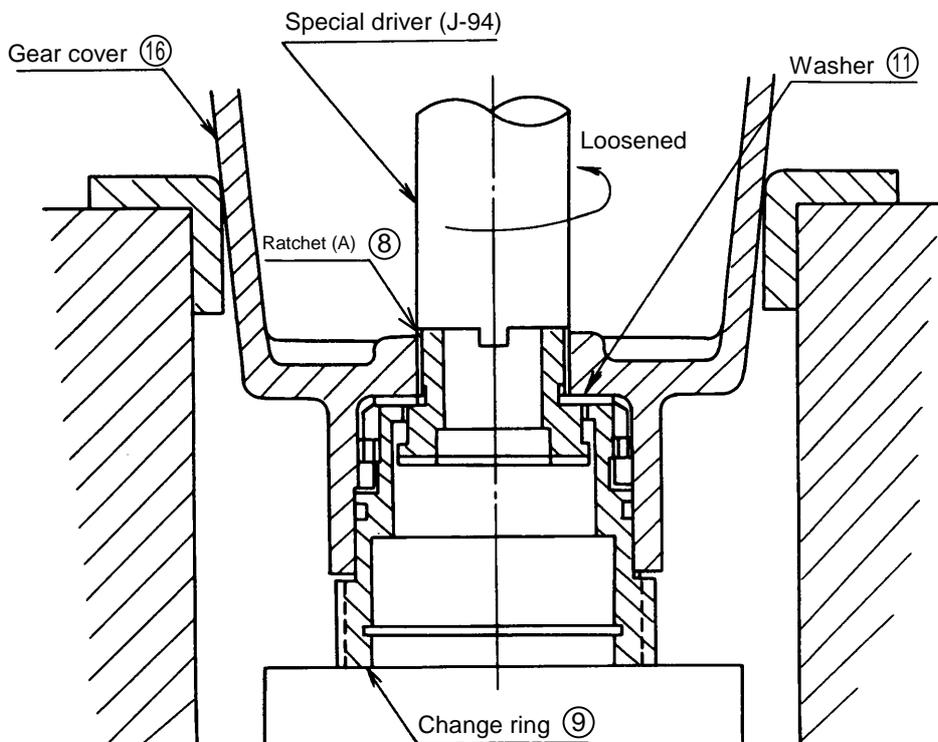


Fig. 7

1-2. Assembly

Accomplish assembly through reversing the disassembly procedures. Therefore, here are explained the points on which special attention needs to be exercised.

1) Assembly of percussion generator section

(1) Be careful to set washers ⑪ prior to screwing in change ring ⑨. Confirm that sufficient greasing has been made on the O-Ring ⑩ to be equipped with change ring ⑨. (MOLUB ALLOY #777-1)

(2) In screwing-in ratchets (A) ⑧, use J-94 special driver to screw-in to the groove on the opposite side by rotating the ratchet surface clockwise after having confirmed that one or two threads have properly meshed in (so that the ratchet surfaces should be least tilted.).

Be sure to confirm at this time that grooved edge surface of ratchet (A) protrudes from the screwed surface of the gear cover by about 1 mm (3/64") which is the sign that the ratchets have been screwed in completely.

2) Assembly of speed change-over mechanism section

- (1) Insert seal plate assembly ③③ into the sliding part of the shift arm ③④ within gear cover.

Be careful at this time that the direction toward which the seal plate assembly be inserted and the direction toward which the surface of the sponge faces should be as shown in Fig. 8.

- (2) Pass the gear assembly ①⑦

through the spindle and put it on after having had the gear assembly in such a state that the gear assembly ①⑦ is sandwiched between shift arms ③④. At this time, the shift arm ③④ should be inserted in such a state that it is piled in layers with the seal plate assembly at the shift arm sliding part within the gear cover. (The sponge part is squashed upon insertion). Be careful also about long or short of the shift arm ③④ arm part.

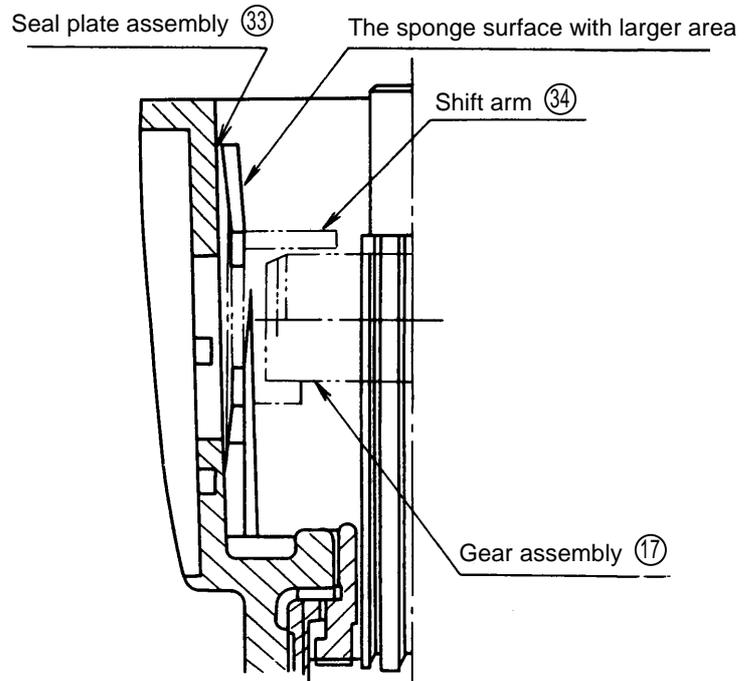


Fig. 8

- (3) Insert the shift plate, which is a solid body consisting of a shift lock ②⑨ and $\phi 3 \times 12$ roll pin ③⑩, into the shift plate sliding part equipped in the external part of gear cover ①⑥. Be careful at this time not to leave spring (B) ③① neglected. Bring the tapped penetration hole of shift plate and tapped hole of the shift arm to match properly to each other and fix them together with an M4 x 12 ④ flat head screw ②⑧. Exercise care at this time not have the seal plate assembly ③③ bitten between shift arm ③④ and boss of shift plate ③②. Adhesive STB1406 (Nejilock No. 2) shall be applied to M4 x 17 ④ flat head screw. Be careful at this time not to apply the adhesive excessively if so that the adhesive flows out to the sliding part to cause wrong operation. Upon completion of tightening of the screws, confirm that the claw portion of shift lock ③⑩ are hooked in the groove of gear cover ①⑥ after the shift plate has been moved several times.

3) Wiring Work

- (1) In connecting the lead wire terminal to carbon brush (46), the wire insertion shall be exercised toward the direction as are shown in Fig. 3 of the section pertaining to dis-assembly.
- (2) Exercise internal wiring as shown in Fig. 9, and take sufficient care in that no lead wire be bitten-in while the fitting of handle cover is carried out.

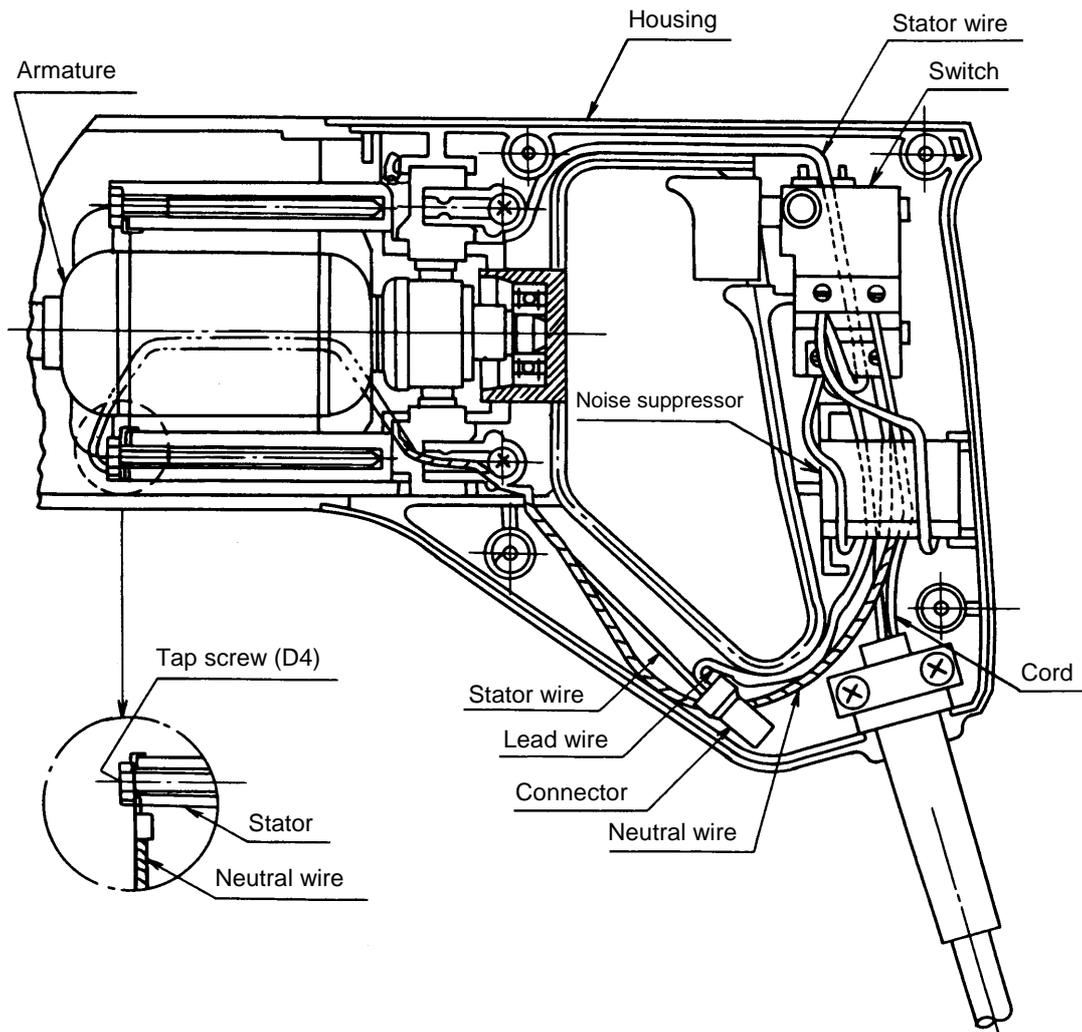


Fig. 9

1-3 Type of lubricants and adhesives and parts in which these are used.

1) Lubricant

- (1) Within gear cover (gear lubrication)

Hitachi motor grease No. 29, 40 gr. (1.40 oz)

- (2) Where percussion is generated

Ratchet (A) (8)

MOLUB Alloy Grease #777-1

Ratchet (B) (7)

Apply 5 gr. (0.18 oz)

(3) Armature Pinion Gear

Hitachi Motor Grease No. 29

Apply sufficiently down even to tooth bottom

(4) Change-over section between percussion and rotation

M34 x 2 diameter screw of change O ring

MOLUB Alloy Grease #777-1

(5) Ball bearing ⑳

Hitachi Motor Grease No. 29

(fill-in the grease)

2) Adhesive

M4 x 12 ⊕ flat head screw ㉔

(Shift play section)

TB1406 (Nejilock No. 2 in old name)

Use adhesive carefully not to have it flow out internally or not to have it adhered on other objects.

1-4 Clamping torque

(1) Ratchet (A) Left handed screw

20 - 50 kg-cm (17.4-43.3 lbs-in)

(2) Tapping screw M4 ㉔ ㉔

15 - 25 kg-cm (13.0-21.7 lbs-in)

Tapping screw M5 ㉓

25 - 35 kg-cm (21.7-30.4 lbs-in)

(3) M4 ⊕ flat head screw ㉔ ㉔

15 - 25 kg-cm (13.0-21.7 lbs-in)