Maintenance Procedure

Spindle Motor for FP-21T model 40/U & FP-21T Precision model 40

MITS Electronics

MITS ELECTRONICS
Apr 7, 2009

Thank you for purchasing our PCB prototyping machines.
To ensure correct operation, please read this manual carefully to learn how to handle the spindle motor provided with the PCB prototyping machine.

[Before using the spindle motor]

"FP-21T model 40/U" and "FP-21T Precision model 40" are model designed for processing accuracy.

Especially "FP-21T model 40/U" and "FP-21T Precision model 40" have a unique feature of its spindle motor, which has advantages of very low runout and longer service life.
However, this spindle motor is very delicate because of its characteristic of high precision.
Therefore, we would like to ask you to operate the machine with the following notes.

1. Please use ϕ 1.0mm – ϕ 1.5mm routing bits for contour routing.

   We recommend you to use routing bits of ϕ 1.5mm or less than ϕ 1.5mm, because ϕ 2.0mm will place a much heavier burden on the collet of the spindle motor.

2. Please perform the periodical maintenance

   Pleases perform the appropriate maintenance on the spindle motor and the collet so that particles in the collet may deteriorate the collet's accuracy or holding force of a tool.
   Please refer to "Spindle motor / Collet Chuck Maintenance Procedure" for maintenance.

Please ensure to use this spindle motor in accordance with the following instructions.

Spindle motor / Collet Chuck

Maintenance Procedure

Preparation: Prior to starting spindle motor/Collet chuck maintenance, please make sure that a dummy tool is installed. If a ringed dummy tool is installed, please replace it with a ringless dummy tool. For your safety, never conduct maintenance with a tool installed. Make sure that a ringless dummy tool is installed before starting maintenance.

① Removing the pressure foot

Fig. 1

Disconnect the pressure air hose from the pressure foot as shown in Fig. 1.

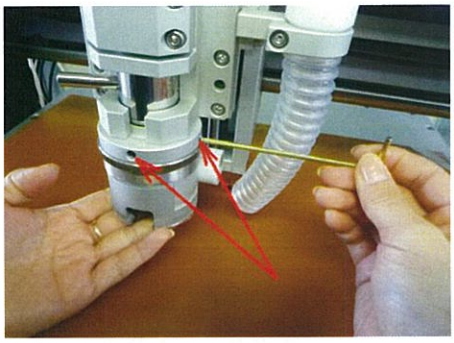

Fig. 2

Fig. 3

Then, loosen two set screws shone above using an Allen wrench. There is one set screw at the front of the pressure foot, and the other at the right side of the pressure foot as shown in Fig. 2. Then, remove the pressure foot as shown in Fig. 3.

② Removing chips and particles

Fig. 4

Clean the spindle motor and surrounding area with a brush. Remove chips and particles with a vacuum cleaner.

! CAUTION ! :

Never blow air at the spindle motor and the Collet chuck.

③ Removing the Collet chuck

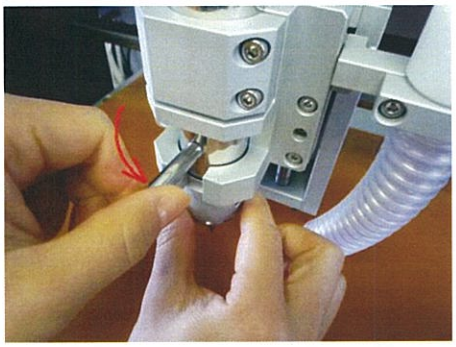

Fig. 5

First, turn the tool replacement lever counter clockwise viewed from above as shown in Fig. 5.

Do not remove the dummy tool. Keep the dummy tool installed on the spindle motor.

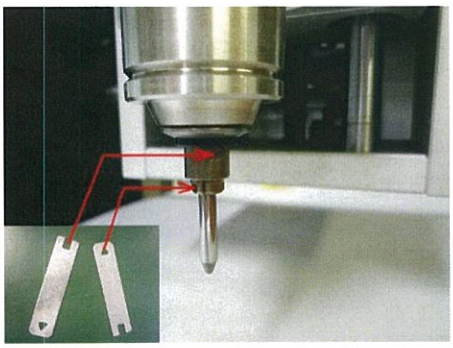

Fig. 6

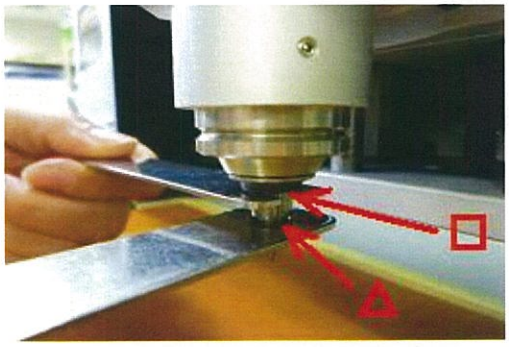

Fig. 7

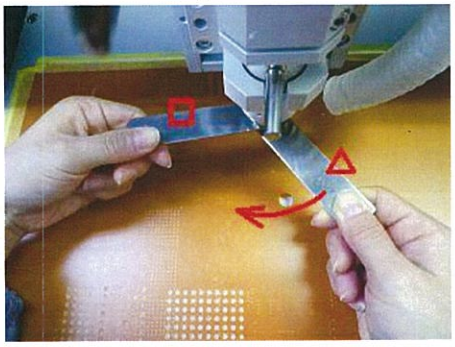

Fig. 8

Using the special wrenches, apply rectangular jaw to upper notch and triangular hole to the bottom of the Collet chuck as shown in Figures 6 and 7. Hold the rectangular one, and turn the triangular one clockwise viewed from above as shown in Fig. 8.

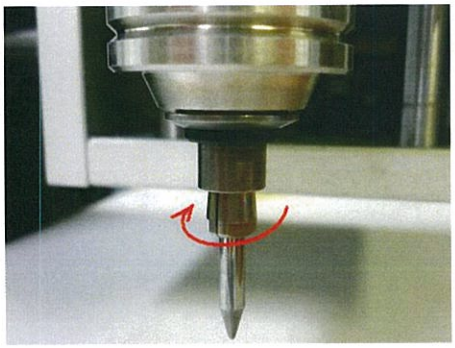

Fig. 9

Fig. 10

Once it is loosened, the Collet can be easily rotated with your fingers. Turn it clockwise viewed from above to remove it from the spindle motor as shown in Figures 9 and 10.

④ Cleaning Collet Chuck

Fig. 11

Fig. 12

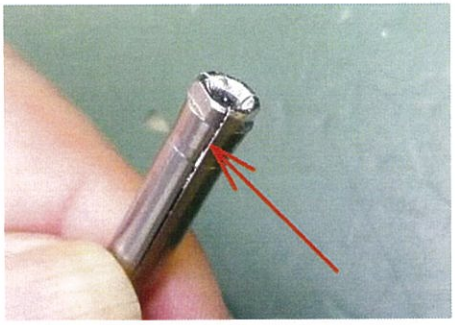

Fig. 13

With a small brush, clean particles and chips from the inner surface of the Collet chuck. (Fig. 11) Wipe it cleanly with a thin cotton swab. (Fig. 12) Make sure that no particles and chips are left between the slits of the Collet chuck. (Fig. 13) Apply small amount of alcohol to the cotton swab, and remove oil/grease from inner/out surfaces of the Collet Chuck.

⑤ Cleaning spindle motor housing

Fig. 14

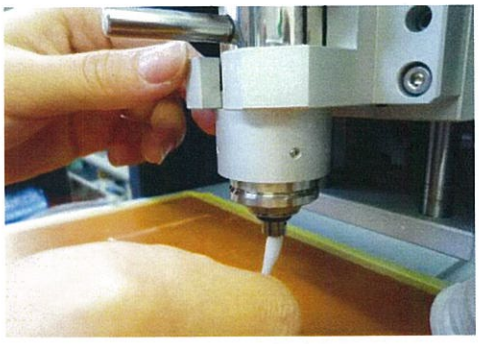

Fig. 15

Clean inner side of the spindle motor as shown in Fig. 14 and Fig. 15 above. Use a small brush to remove particles on the inner surface, then use a cotton swab to clean it. Apply small amount of alcohol on the cotton swab and remove oil from the inner surface of the spindle motor.

⑥ Installing the Collet chuck

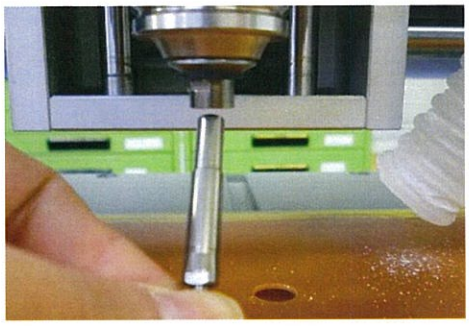

Fig. 16

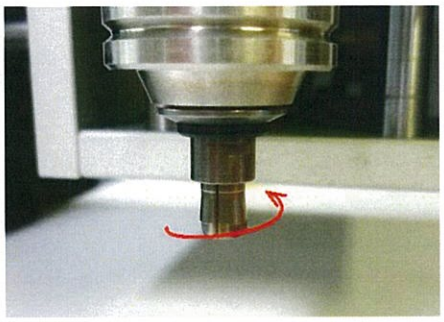

Fig. 17

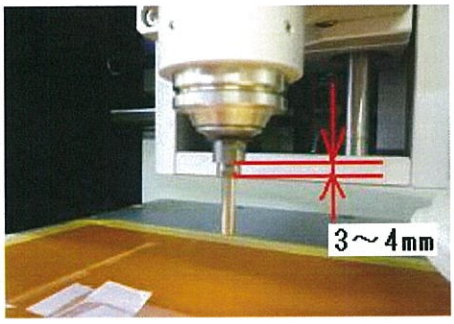

Fig. 18

After cleaning the Collet chuck, install it on the spindle motor. Insert the Collet chuck to the spindle motor as shown in Fig. 16. Turn it counter clockwise viewed from above with your fingers until there is 3 to 4 mm remaining as shown in Fig. 18. Insert a dummy tool to the Collet chuck, then turn it counter clockwise viewed from above. If it becomes tight for hand tightening, use the triangular hole of the special wrench to further rotate it.

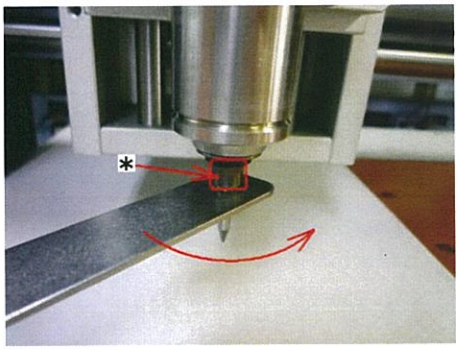

Fig. 19

It is not necessary to use the other wrench with a rectangular jaw. Keep turning the Collet chuck until it becomes tighter. You will feel it become heavier when the section shown with an asterisk (*) in Fig. 19 starts rotating with the Collet chuck. Turn 180 degrees more from this point.

! CAUTION !

DO NOT TURN the tool replacement lever until the Collet Chuck is securely installed.

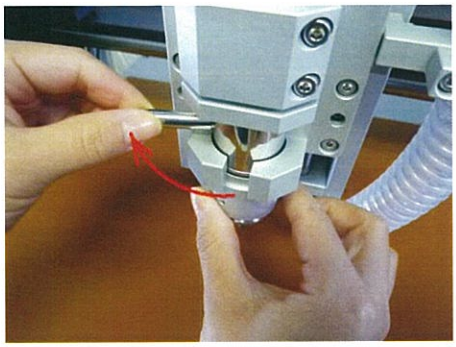

Fig. 20

Turn the tool replacement lever to clockwise viewed from above.

Open and close Collet chuck several times to make sure that you can replace tools normally.

⑦ Installing the pressure foot

Fig. 21

Install the pressure foot as shown in Fig. 21. Tighten two set screws with an Allen wrench. Finally, attach the pneumatic air hose.

! CAUTION !

The spindle motor and the Collet Chuck are very high precision component. It is very important to conduct daily inspection and cleaning. Particles, chips, oil, grease and other contaminants between the Collet Chuck and a tool may result in degradation of accuracy or in an extreme case, a breakage of a tool. Please make sure to inspect and clean following the maintenance procedure prior to use.