NAKANISHI

PST Series

PST-50, 60

OPERATION MANUAL

OM-K0233E Rev.A

Thank you for purchasing PST Series Spindle.

PST Series spindles are designed for precise cutting.

Please read this Operation Manual carefully before use, in order to ensure proper usage and care.

1 ⚠ Caution in Handling

①PST series are not hand tool. Use PST Series installing it on a lathe, NC lathe, a specially engineered machine and/or automated machine etc.

②In case of using grindstone, attach a cover for safe.

③Use protect cover around PST series and wear protect eye glasses while in operation since it runs.

Do not touch on the spindle while it is running.

④Please be especially careful not to hit or crash the bearing caps as this will create unbalanced rotation causing excessive vibration, heat build up and wear.

⑤In case you install grindstone to the spindle with grindstone flange, the grindstone should be well balanced for safety and precision.

⑥Do not exceed spindle speed, refer to 4. Allowable Max. Speed.

2 Features

①Spindle body is precision ground stainless steel (SUS-416) making mounting extremely easy.

②Spindle has a labyrinth debris protection system built in and for extreme, conditions positive air pressure protection is available.

③Outer diameter is 50mm or 60mm. Both clockwise and rotation are available upon your request.

3 Dimensions

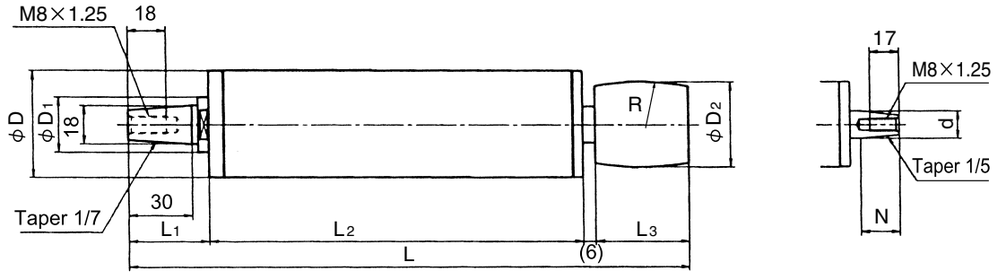

Fig. 1

Table-1

Model	φD	φD1	φD2	R	L	L1	L2	L3	φd	N
PST50-180	50	25.8	40	125	269	38	180	45	17	23.5
PST50-240	50	25.8	40	125	329	38	240	45	17	23.5
PST60-200	60	29.8	45	140	295.2	39.2	200	50	18	26
PST60-260	60	29.8	45	140	355.2	39.2	260	50	18	26

4 Allowable Max. speed

Table-2

Model	Specification	Allowable Max. speed
PST50-180R	Clockwise	9,000
PST50-180L	Counter-clockwise	9,000
PST50-240R	Clockwise	9,000
PST50-240L	Counter-clockwise	9,000

Model	Specification	Allowable Max. speed
PST60-200R	Clockwise	8,000
PST60-200L	Counter-clockwise	8,000
PST60-260R	Clockwise	8,000
PST60-260L	Counter-clockwise	8,000

5 How to attach the grindstone

①Attach grindstone with the grindstone flange, and fix them by spanner.

②Clean the taper of spindle and the inner taper of grindstone flange to remove all dust.

③Insert the grindstone flange taper to the spindle 1/7 taper.

④Mount the spanner on the spindle, set the fixing bolt to the grindstone flange, then fasten it with 6mm hexagon spanner.

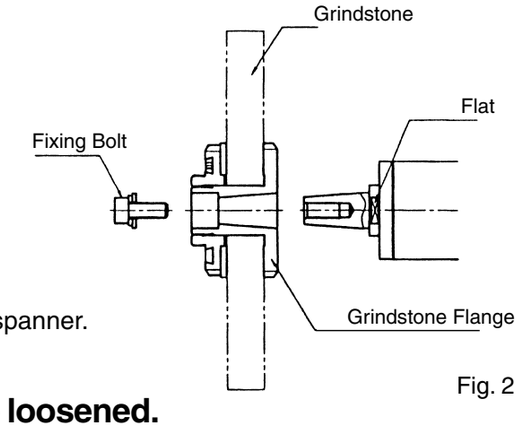

Fig. 2

⚠ Caution : Fasten the bolt tightly not to be loosened.

6 How to remove the grindstone flange

①Remove the bolt at spindle.

②Screw-in the flange remover into the grindstone flange, then loosen the bolt to remove the grindstone flange.

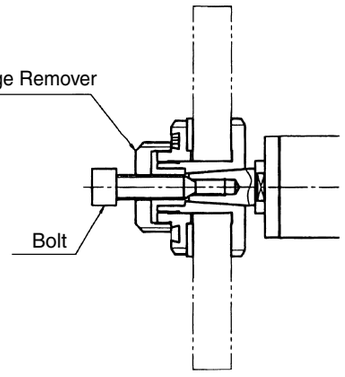

Fig. 3

7 Balancing the grindstone

①Attach the grindstone with the spindle, and dressing the grindstone.

②Remove the grindstone from spindle, then set it on the balancer grinding machine by using mandrel optional.

③On the balancer, adjust the balance weight to be balanced.

④Once balanced, attach the grindstone with the spindle.

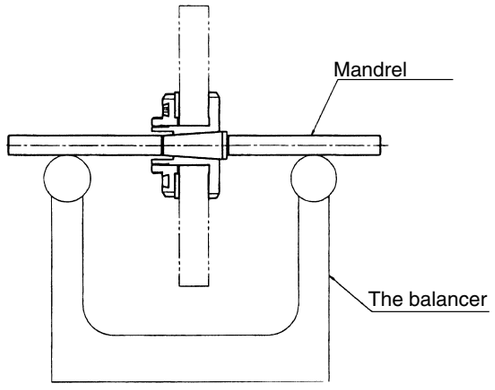

Fig. 4

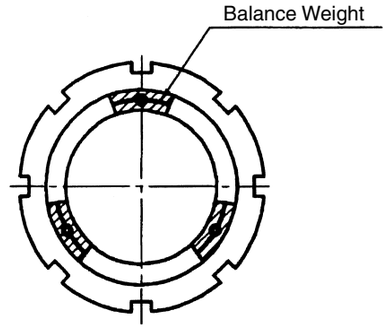

Fig. 5

8 Installation of spindle

When installing spindle on a holder, it is not recommendable to fix the spindle with a fastening bolt directly as shown in Fig. 6 because the sheath is deformed and creates rotating malfunction, heat generation, etc. Therefore, the installation as shown in Fig. 7 is recommended. In case it is impossible, install it as shown in Fig. 8.

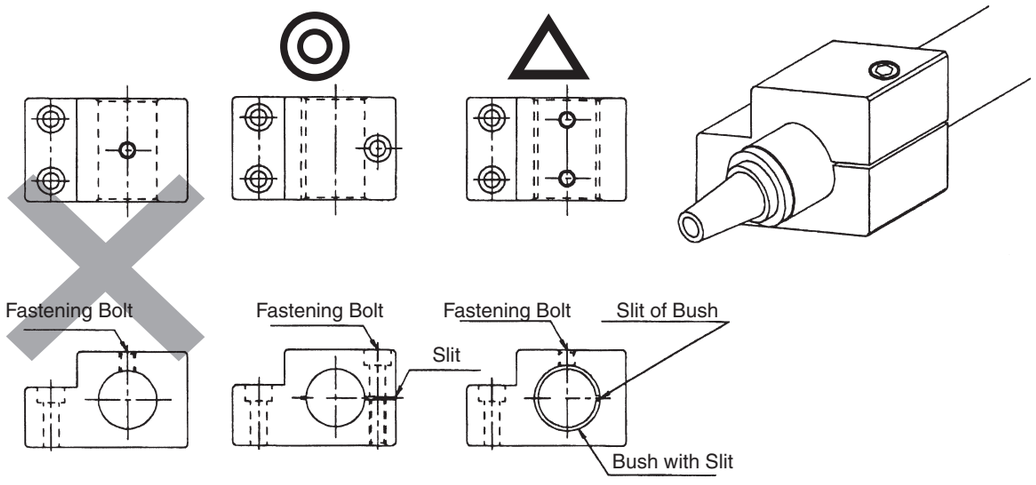

Fig. 6

Fig. 7

Fig. 8

9 How to supply air for debris protection

Use a standard screw driver to remove the screw and screw in a M5×0.8 thread quick disconnect fitting.
For spindles with 2 sealing screws you can use either location.
Supply clean, dry air between 0.1-0.2 MPa pressure.
(Please use caution as contaminated air will void warranty.)

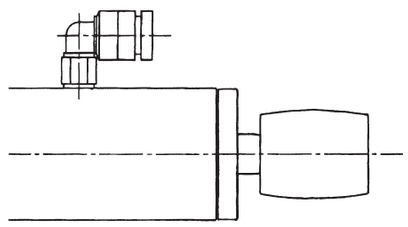

Fig. 9

10 Guidance for belt installation

For high speed operation increase belt tension to prevent slipage. During normal speed operation please reduce belt tension to increase rear bearing life.
If the motor pulley and spindle pulley are offset high speed rotation will produce excess vibration, causing heating build up and reduced life expectancy.
Please limit pulley center to center offset to less than 0.2mm.

11 Break-in procedures

PST Series spindles are high speed spindles, but the following break-in procedures are necessary.
During shipping and storage grease settling will occur. If the spindle is rotated at high speed quickly.
Uneven grease coverage will cause heat build up and bearing damage.
After initial fixturing please follow the break-in procedures to insure optimal life expectancy.
Please follow the break-in schedule in table 2.

Table-3 Break-in schedule

Step	1	2	3	4
Maximum allowable speed	30%	60%	80%	100%
Duration	15 minute	10 minute	10 minute	15 minute
Checkpoint	No abnormal noise	Spindle case should be less than 20˚C. If case temperature exceeds 20˚C, please shut down for 20 minutes. After 20 minute cool down period restart from step 1. If overheating continues please check spindle fixture.	Same as step 2.	Spindle outer case approximately 20˚C.

12 Pulley removal procedures

Remove the pulley set screw, use a pulley removal tool to remove pulley. Please male a plate to insert between the pulley removal tool jaws and the pulley to aid in removal.

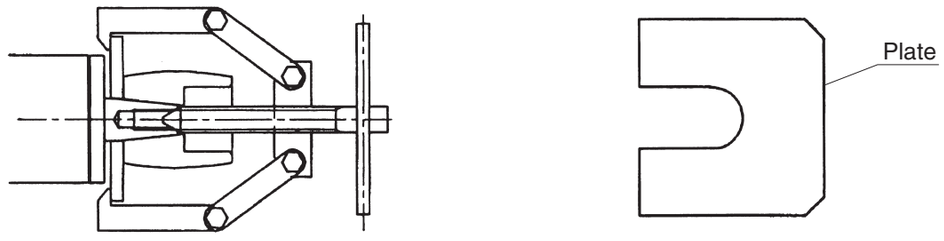

Fig. 10

13 Cautions when using grindstone

①The recommendable peripheral speed of vitrified grindstone is within the range of 600 to 1,800m/min.

$$\text{Peripheral speed} = \frac{\pi \times D \times N}{1{,}000}$$

D= Grindstone Diameter
N= Grindstone rpm.

⚠ **Danger : Do not use beyond the peripheral speed of 2,000m/min. because it is dangerous.**

②Do not use a poor quality and run-out grindstone with cracks and scratches.
③Try to use a grindstone after dressing is made.
④The grindstone should be well-balanced.
⑤Do not give an excessive shock and do not disassemble uselessly.

14 Trouble shooting

Table-4

Phenomenon	Probable Cause	Corrective Action
Noise and abnormal vibration	Foreign substance sticking in bearings	Replace bearings at service center
	Bearings worn out	
	Imbalance of grindstone	Grindstone to be balanced
	Installation mistake of grindstone	Clean the surface and re-install.
	In correct installation of belt	Adjust or replace
No rotation	Bearings broken	Replace with new bearings at service center

※Specifications may be changed without notice.

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