BEDIENUNGSANLEITUNG
Forstner SPEED Grinder (FSG)

INSTRUCTION MANUAL
Forstner SPEED Grinder (FSG)

NOTICE D'UTILISATION
Forstner SPEED Grinder (FSG)



FISCH®

INSTRUCTION MANUAL Forstner SPEED Grinder (FSG)

EN

Professional grinding equipment for sharpening Forstner bits, TCT hinge boring bits and Universal bits.

General information:

Usually, only qualified grinding and sharpening services can be used for regrinding Forstner bits and TCT hinge boring bits. But even grinding and sharpening services are not always able to professionally regrind a Forstner bit. In many cases, Forstner bits and TCT hinge boring bits are reground by hand using various appliances and gadgets, which are not well suited to the task. This results in inaccurate cutting heights, uneven cutting angles or even damage to the tool.

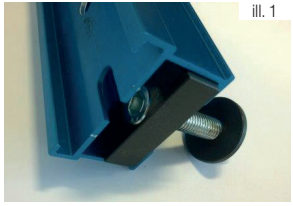
FSG allows you to regrind Forstner bits using a commercial box column drill. The drilling table of the drill must, however, be height-adjustable and pivot laterally.

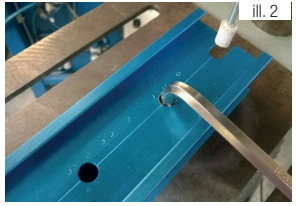
To prevent damage to the cutting bits and injuries to individuals, the device must only be installed with the grinding spindle in standstill. The grinding spindle may only be switched on after completion of drill adjustments. The grinding spindle (drill chuck) must be stopped every time the grinding position is changed or the tool is replaced. The speed should be selected within a range of 500 to 1,000 rpm to keep material removal on the grinding surface at a minimum.

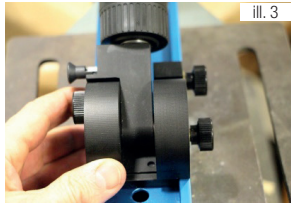
Assembly:

The guide rail (Item 1) is assembled to the drilling table by means of a clamping bar (Item 13), using a cylinder head screw (Item 14), a washer (Item 16) and a wing nut (Item 15). An 8 mm Allen key is used for assembly. The guide rail (Item 1) can be assembled in various positions. (ill. 1, 2)

After assembly, the carriage (Item 2) can be slid onto the rails (Item 1). (ill. 3)


ill. 1


ill. 2

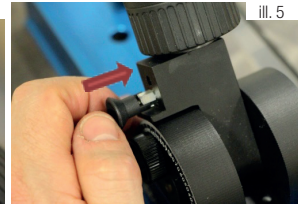

ill. 3

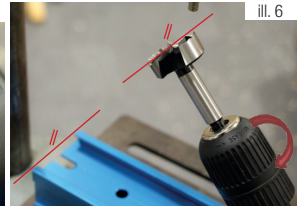
Fixing the Forstner bit:

The Forstner bit is clamped in a 13 mm chuck. The cutter must be clamped along the entire length of the shank. If the Forstner bit has clamping surfaces, the shank must be clamped on the cylindrical part. (ill. 4)

The indexation must be engaged, and the spur is set horizontally (ill. 5, 6). Once the spur is set, the drill is clamped by rotating the chuck.


ill. 4

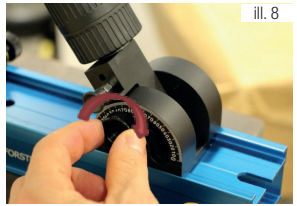

ill. 5


ill. 6

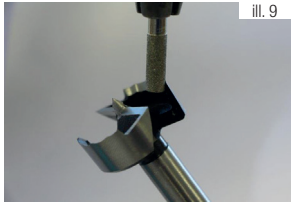
Grinding the cutter:
To grind the cutter, you have to clamp a Ø6 mm (up to Ø20 mm for Forstner bits) or Ø8 mm (> Ø20 mm for Forstner bits) grinding pin in the drill. It is important that the grinding pin is clamped along its entire shank length. FISCH Forstner bits provide a grinding angle of 35° as standard. Set the sleeve fixture (Item 4) to (90°-35°)=55° and fix the sleeve fixture (Item 4) using the knurled screw (Item 10) (ill. 7,8).



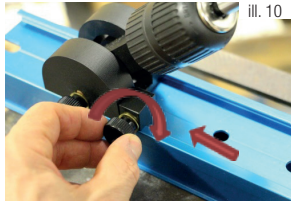
ill. 7


ill. 8

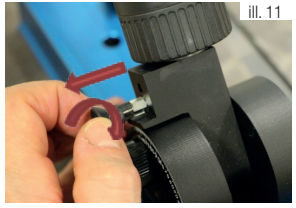
The sleeve fixture (Item 4) must not move. Then, adjust the height of the column drill table so that the grinding pin precisely covers the surface of the cutter (ill. 9).

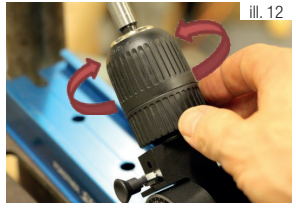

ill. 9

Set the end stop (Item 3) at the carriage and fix the end stop (Item 3) using the knurled screw (Item 6) (ill. 10).


ill. 10

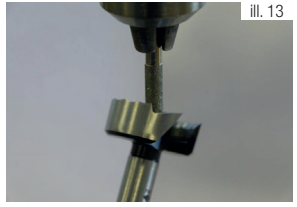
Now loosen the locking pins and turn the lever so that the chuck can spin freely (ill. 11, 12)

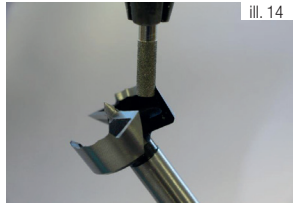

ill. 11


ill. 12

Rotate the cutter along the grinding pin.

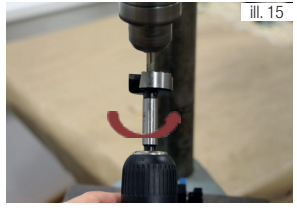
The grinding pin must be tangentially flush with the cutter surface and must not be moved beyond this point during the grinding process, as this causes rounding of the cutter tip which then becomes blunt (ill. 13, 14).

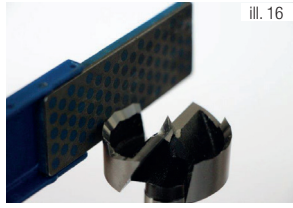

ill. 13


ill. 14

Check the pivoting range of the Forstner bit relative to the grinding pin and ensure that the grinding pin does not collide with the main cutting edge or protrude beyond the cutter contour. If everything is set, the grinding process can begin. Switch on the box column drill (grinding pin with a speed between 500 and 1000 rpm), and lightly hold the drill to the grinding pin. Make sure that the carriage hits the end stop (Item. 3). Then manually turn the cutter in counter-clockwise direction along the cutter surface. Repeat this process until you achieve a sharp edge for the cutter (ill. 15).

Stop the grinding spindle and pivot the drill by 180°. Check that the grinding pin does not collide with the cutter. Repeat the process and regrind the cutter.
During grinding of the cutter, a small drilling burr may occur. It can be removed by applying a diamond file at the outer diameter (ill. 16).

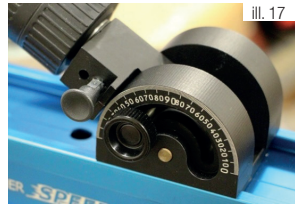

ill. 15

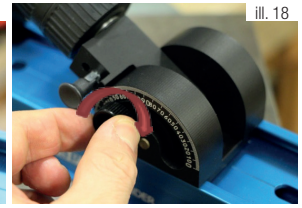

ill. 16

Grinding the cutting surface:

For grinding the cutting spur, a grinding plate with a shank is clamped into the box column drill.

It must be made sure that the grinding plate is clamped along half the shank length. Forstner bits from the brand FISCH have a standard cutting angle of 30°. The cutting angle may deviate for other makes. Set the sleeve fixture (Item 4) to 30° and fix it using the knurled screw (ill. 17, 18).

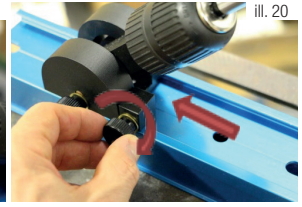

ill. 17


ill. 18

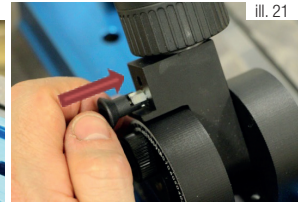
The sleeve fixture (Item 4) must not move. Then, adjust the height of the column drill table so that the grinding plate forms accurate contact with the cutting surface. The grinding plate must be adjusted such that the spur is ground to the centre point (ill. 19).


ill. 19

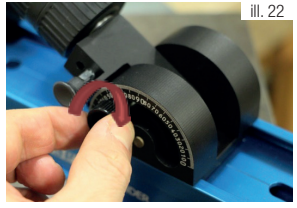
Set the end stop (Item 3) at the carriage and fix it using the knurled screw (Item 6) (ill. 20).


ill. 20

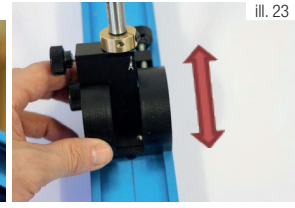
Place the locking pin (Item 11) to the fixed position, so that the chuck is engaged a full 90° (ill. 21).


ill. 21

Open the knurled screw (Item 10). Now, the cutting surface of the drill is loosely positioned on the grinding plate.


ill. 22

Once it has been adjusted and set, you can begin grinding. Switch on the drilling machine (grinding plate with a speed between 500 and 1000 rpm) and press down the spur carefully and lightly to form contact with the grinding plate. The grinding effect can be increased by linear movement of the carriage towards the end stop and back. Make sure that the drill does not fall off the grinding plate, as this might damage the spur. If grinding of the spur is completed, switch off the drilling machine and pivot the chuck 180°. Ensure that the locking pin engages once more. Repeat the grinding process on for the drill's second cutting surface (ill. 22, 23).


ill. 23

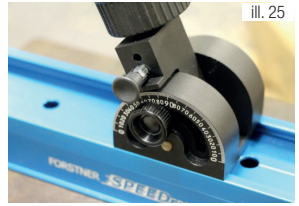

ill. 24

During grinding of the spur, a small drilling burr may occur. It can be removed by applying a diamond file to the free surface (ill. 24).

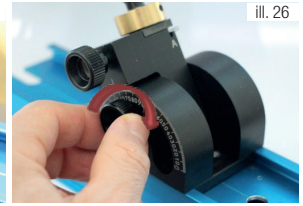
Grinding the centre point

For grinding the centre point, a Ø8mm grinding pin is clamped into the drill.

It must be made sure that the grinding pin is clamped into the drill chuck with the entire length of its shank. FISCH Forstner bits provide a point angle of 25° as standard. With other cutter makes, the point angle may deviate from this value. Set the sleeve fixture (Item 4) to (90°-25°)=65° and fix the sleeve fixture (Item 4) using the knurled screw (Item 10) (ill. 25, 26)



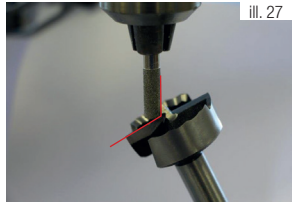
ill. 25

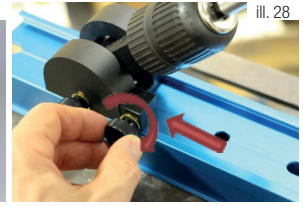

ill. 26

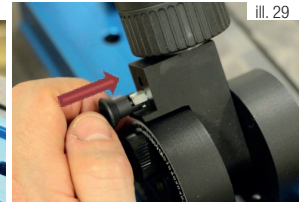
The cutter tip (centre point) must be applied to the grinding pin such that they form continuous contact along their entire surfaces. If this is not the case, open the chuck (Item 12), and turn the drill until it has continuous contact with the grinding pin. Then close the chuck (Item 12) once more.

The sleeve fixture (Item 4) must not move. Then, adjust the height of the column drill table so that the grinding pin forms accurate contact with the centre point surface. The cutting pin must be adjusted such that the centre point is ground to the spur. Therefore, begin grinding in the position directly next to the free surface (see image) (ill. 27). Set the end stop at the carriage and fix the end stop using the knurled screw (Item 6) (ill. 28).

Use the locking pin (Item 11) to set the chuck (Item 12) to one of the four fixed positions (ill. 29).

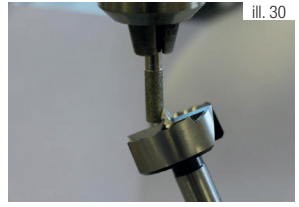

ill. 27

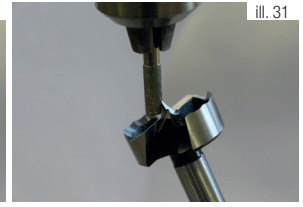

ill. 28


ill. 29

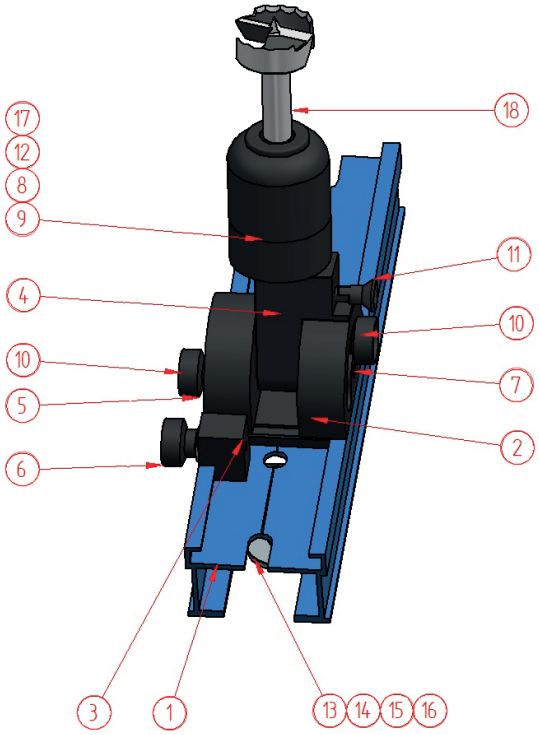
If everything is set and fixed, the grinding process can be started. Switch on the drill (grinding pin with a speed between 500 and 1000 rpm) and press down the cutter point carefully and lightly to form contact with the grinding pin (ill. 30, 31).

The grinding effect can be increased by linear movement of the carriage towards the end stop and back. If the first side of the centre point is completed, switch off the drill move the chuck (Item 12) a further 90° (ill. 29). Repeat the process for all four sides of the centre point.


ill. 30

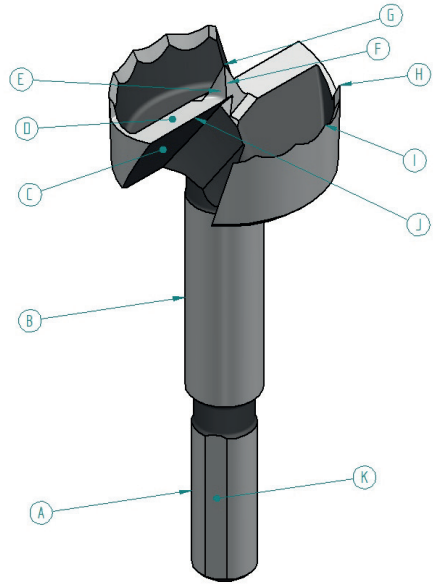

ill. 31

Construction of the Forstner Speed Grinder



Item	Mat. name
1	Rails
2	Carriage
3	End stop
4	Sleeve fixture
5	Brass disc
6	Knurled screw
7	Pin
8	Slide bush
9	Countersunk screw M5x20
10	Knurled screw M5x18
11	Locking pin
12	Chuck Ø13
13	Clamping bar
14	Cylinder head screw
15	Wing nut
16	Washer
17	Slide bush with collar
18	Forstner bit
19	Grinding pin Ø6 mm
20	Grinding pin Ø8 mm
21	Grinding plate Ø40 mm
22	Diamond file

Forstner bit components



Item	name
A	Shank (cylindrical)
B	Central shank
C	Cutting surface
D	Free surface
E	Centre point sides (cutter)
F	Centre point sides (staggered)
G	Centre point
H	Cutter edge
I	Cutter
J	Cutting edge
K	Cutting surface