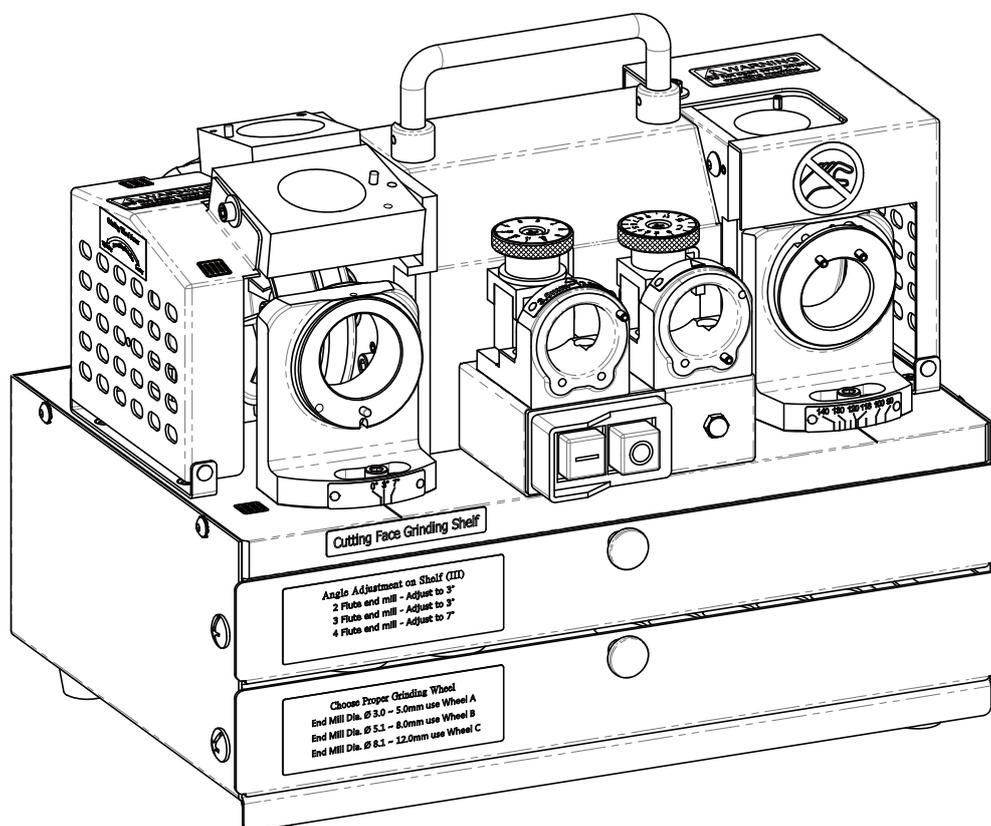


Twist Drill & End Mill Resharpener Operation Manual



Model : GS-61

RECYCLING



Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities.

Contact your local government for information regarding the collection systems available.

If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.

When replacing old appliances with new ones, the retailer is legally obligated to take back your old appliance for disposal at least for free of charge.

Ground, cord-connected tools intended for use on a supply circuit having a nominal rating less than 150 volts:

Warning:

When using electric tools basic safety precautions should always be followed to reduce the risk of fire, electric shock and personal injury including the following.

Read all these instructions before attempting to operate this product and save these instructions.

1. Keep work area clear
 - Cluttered areas and benches invite injuries.
2. Consider work area environment
 - Do not expose tools to rain.
 - Do not use tools in damp or wet locations.
 - Keep work area well lit.
 - Do not use tools in the presence of flammable liquids or gases.
3. Guard against electric shock
 - Avoid body contact with earthed or grounded surfaces (e.g. pipes; radiators, ranges, refrigerators)
4. Keep other persons away
 - Do not let persons, especially children, not involved in the work touch the tool or the extension cord and keep them away from the work area.
5. Store idle tools
 - When not in use, tools should be stored in a dry locked-up place, out of reach of children.
6. Do not force the tool
 - It will do the job better and safer at the rate for which it was intended.
7. Use the right tool
 - Do not force small tools to do the job of a heavy duty tool.
 - Do not use tools for purposes not intended; for example do not use circular saws to cut tree limbs or logs.
8. Dress properly
 - Do not wear loose clothing or jewellery, they can be caught in moving parts.
 - Non-skid footwear is recommended when working outdoors.
 - Wear protective hair covering to contain long hair.

9. Use protective equipment
 - Use safety glasses.
 - Use face or dust mask if working operations create dust.
10. Connect dust extraction equipment
 - If the tool is provided for the connection of dust extraction and collecting equipment, ensure these are connected and properly used.
11. Do not abuse the cord
 - Never yank the cord to disconnect it from the socket. Keep the cord away from heat, oil sharp edges.
12. Secure work
 - Where possible use clamps or a vice to hold the work. It is safer than using your hand.
13. Do not overreach
 - Keep proper footing and balance at all times.
14. Maintain Tools with care.
 - Keep cutting tools sharp and clean for better and safer performance.
 - Follow instruction for lubricating and changing accessories.
 - Inspect tools cords periodically and if damaged have them repaired by and authorized service facility.
 - Inspect extension cords periodically and replace if damaged.
 - Keep handles dry, clean and free from oil and grease.
15. Disconnect tools
 - When not in use, before servicing and when changing accessories such as blades, bits and cutters, disconnect tools from the power supply.
16. Remove adjusting keys and wrenches
 - Form the habit of checking to see that keys and adjusting wrenches are removed from the tool before turning it on.
17. Avoid unintentional starting
 - Ensure switch is in "off" position when plugging in.
18. Use outdoor extension leads
 - When the tool is used outdoors, use only extension cords intended for outdoor use and so marked.

19. Stay alert

- Watch what you are doing, use common sense and do not operate the tool when you are tired.

20. Check damaged parts

- Before further use of tool, it should be carefully checked to determine that it will operate properly and perform its intended function.
- Check for alignment of moving parts, binding of moving parts, breakage of parts, mounting and any other conditions that may affect its operation.
- A guard or other part that is damaged should be properly repaired or replaced by an authorized service centre unless otherwise indicated in this instruction manual.
- Have defective switches replaced by an authorized service centre.
- Do not use the tools if the switch does not turn it on and off.

21. Warning

- The use of any accessory or attachment other than one recommended in this instruction manual may present a risk of personal injury.

22. Have your tool repaired by a qualified person.

- This electric tool complies with the relevant safety rules. Repairs should only be carried out by qualified persons using original spare parts, otherwise this may result in considerable danger to the user.

23. Please use the air spray gun to move away the metal just which remains inside the grinding wheel protection over after finishing the grinding job.

24. Please take a duster to clean the adjustment shelf and two grinding shelf after finishing grinding job.

The sound pressure level of this machine is less 70dB(A) with uncertainty 3dB.

Warning:

1. KEEP GUARDS IN PLACE and in working order.
2. REMOVE ADJUSTING KEYS AND WRENCHES. Form habit of checking to see that keys and adjusting wrenches are removed from tool before turning it on.
3. KEEP WORK AREA CLEAN. Cluttered areas and benches invite accidents.
4. DON'T USE IN DANGEROUS ENVIRONMENT. Don't use power tools in damp or wet locations, or expose them to rain. Keep work area well lighted.
5. KEEP CHILDREN AWAY. All visitors should be kept safe distance from work area.
6. MAKE WORKSHOP KID PROOF with padlocks, master switches, or by removing starter keys.
7. DON'T FORCE TOOL. It will do the job better and safer at the rate for which it was designed.
8. USE RIGHT TOOL. Don't force tool or attachment to do a job for which it was not designed.
9. USE PROPER EXTENSION CORD. Make sure your extension cord is in good.
10. WEAR PROPER APPAREL. Do not wear loose clothing, gloves, neckties, rings, bracelets, or other jewelry which may get caught in moving parts, Nonslip footwear is recommended. Wear protective hair covering to contain long hair.
Exception: The reference to gloves may be omitted from the instructions for a grinder.
11. ALWAYS USE SAFETY GLASSES. Also use face or dust mask if cutting operation is dusty. Everyday eyeglasses only have impact resistant lenses, they are NOT safety glasses.
12. SECURE WORK. Use clamps or a vise to hold work when practical. It's safer than using your hand and it frees both hands to operate tool.
13. DON'T OVERREACH. Keep proper footing and balance at all times.
14. MAINTAIN TOOLS WITH CARE. Keep tools sharp and clean for best and safest performance. Follow Instructions for lubricating and changing accessories.
15. DISCONNECT TOOLS before servicing; when changing accessories, such as blades, bits, cutters, and the like.
16. REDUCE THE RISK OF UNINTENTIONAL STARTING. Make sure switch is in off position before plugging in.
17. USE RECOMMENDED ACCESSORIES. Consult the owner's manual for recommended accessories. The use of improper accessories may cause risk of injury to persons.

18. NEVER STAND ON TOOL. Serious injury could occur if the tool is tipped or if the cutting tool is unintentionally contacted.
19. CHECK DAMAGED PARTS. Before further use of the tool, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function - check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.
20. DIRECTION OF FEED. Feed work into a blade or cutter against the direction of rotation of the blade or cutter only.
21. NEVER LEAVE TOOL RUNNING UNATTENDED. TURN POWER OFF. Don't leave tool until it comes to a complete stop.

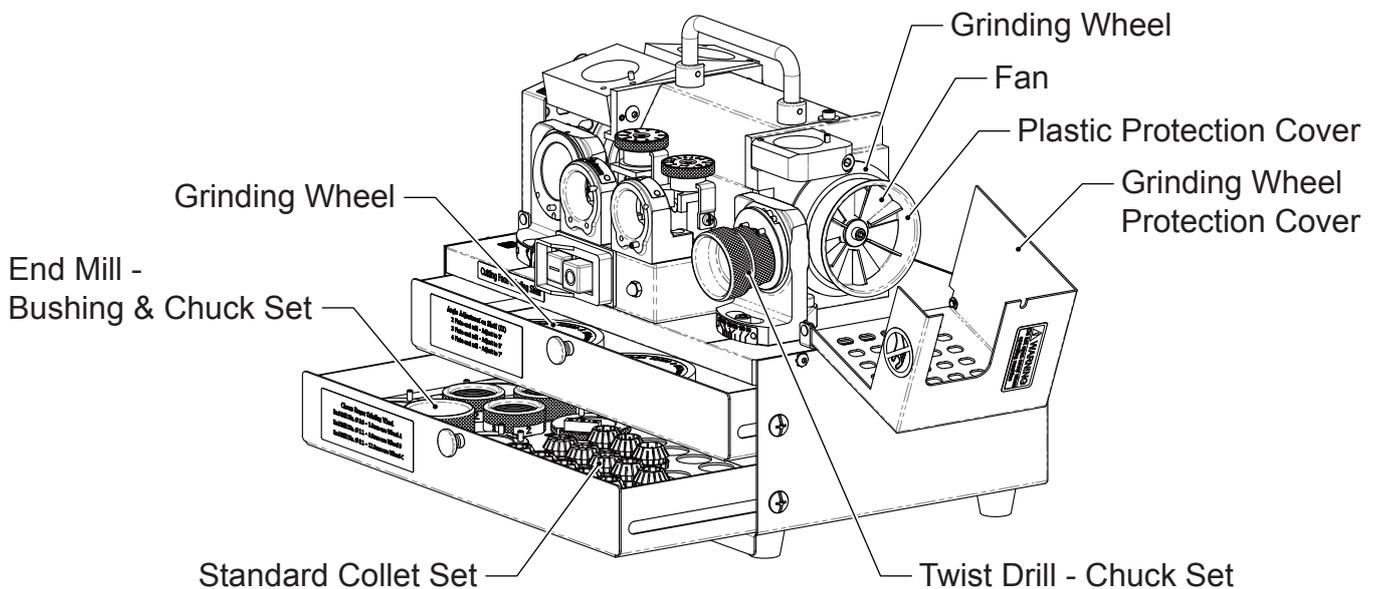
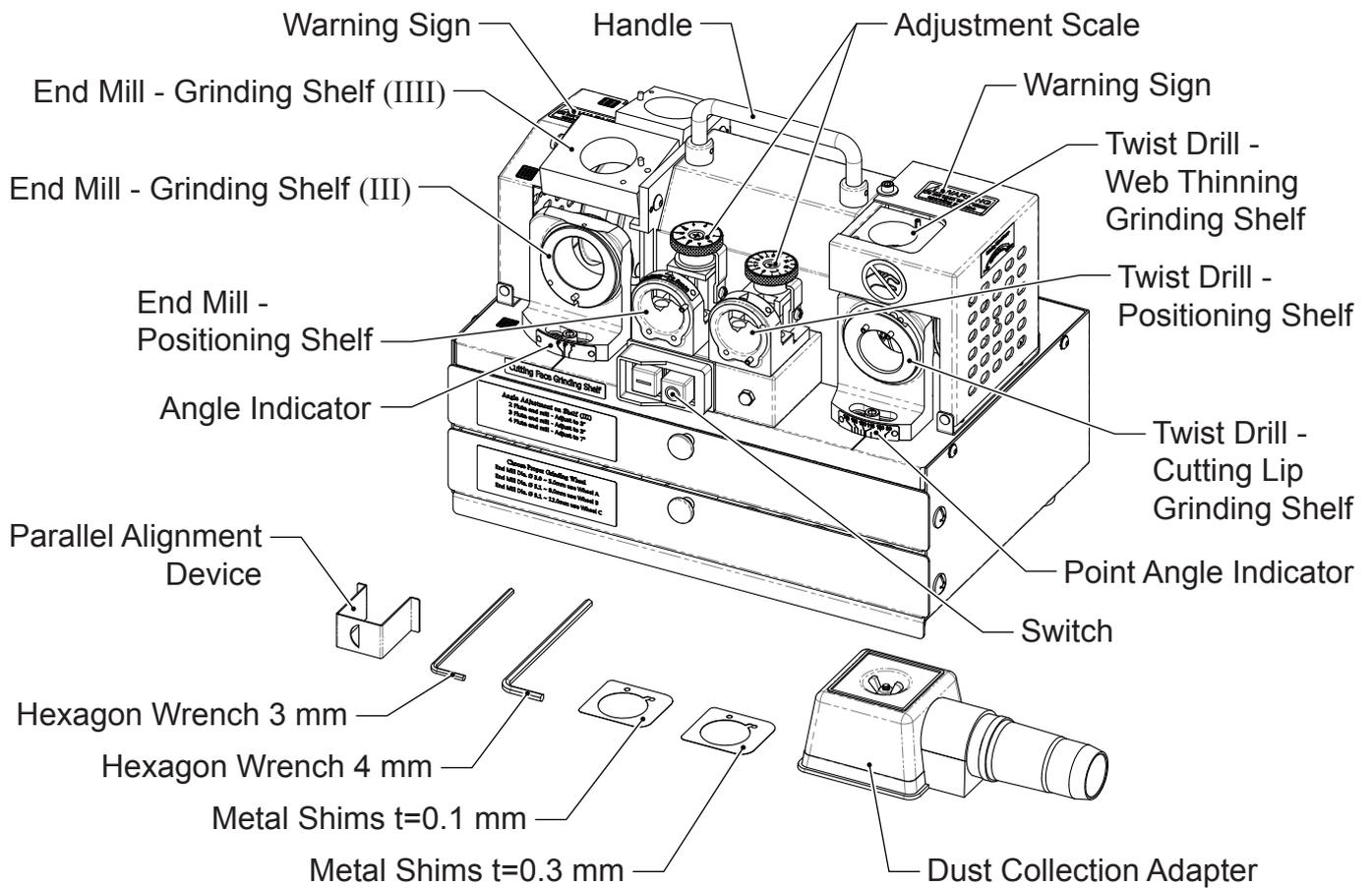
IN DOOR USED!!!

WARNING: DO NOT EXPOSE TO RAIN OR USE IN DAMP LOCATIONS.

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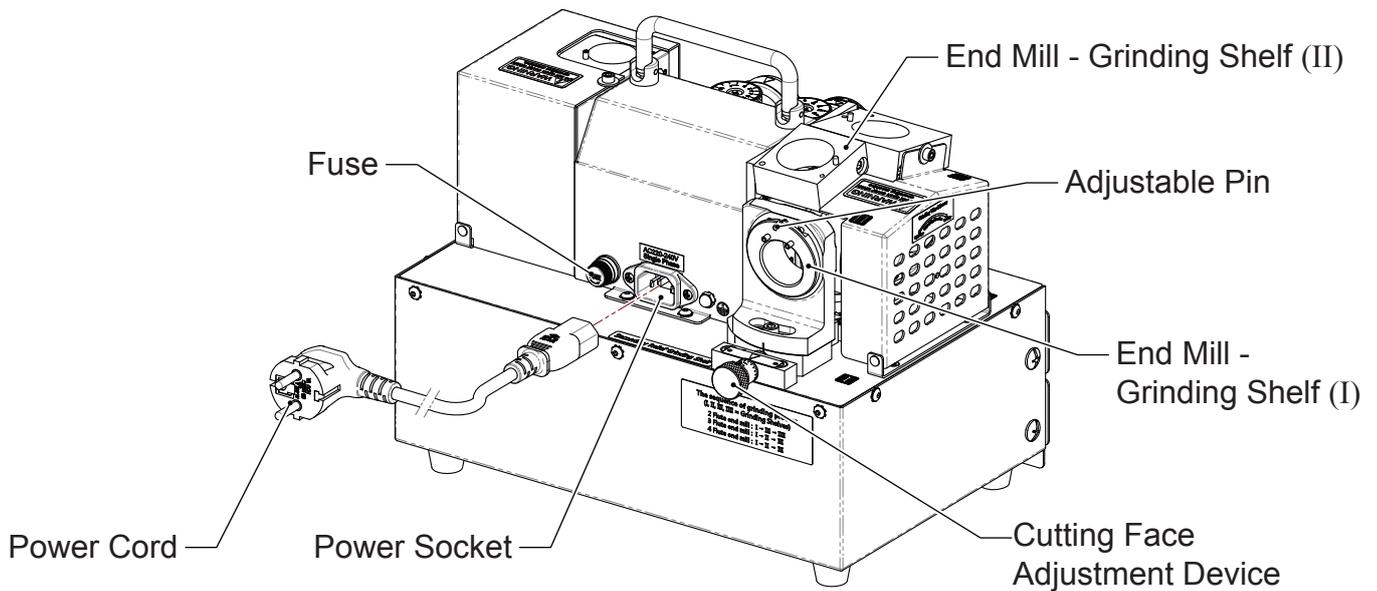
I. Machine Devices Introduction



For Twist Drill diameter: $\Phi 2.0$ mm - $\Phi 13.0$ mm
For End Mill diameter: $\Phi 3.0$ mm - $\Phi 12.0$ mm

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II. Machine Installation Instruction

1) Environmental Condition

- Place the machine on a “flat” and “stable” working table.
- Operate the machine in dry environment and away from liquid.
- Make sure power plug and power cord are installed in proper location.

2) Power Supply

Make sure the local power supply is matching with the voltage specification from the product label.

Please check the switch is in off position before plugging into socket outlet.

3) Motor Direction Test

- ① Plug the power cord into socket outlet.
- ② Check the grinding wheel protection cover is fastened by the screw.
- ③ Quickly switch on and off the machine, then check if the rotating direction of the right side grinding wheel is **counterclockwise**.
- ④ Switch on the machine again and check if any abnormal sound.

(The Machine is equipped with carbon brush DC motor. A slightly grinding sound is considered as normal condition.)

III. Dust Collection Adapter Assembly Steps

- 1) Thread the hex nut onto the suitable position of the threaded rod, align the end of the threaded rod containing the hex nut to the tapped hole of grinding wheel cover, and turn the threaded rod clockwise to thread the rod into the grinding wheel cover and tighten lightly. (Fig. 3-1)

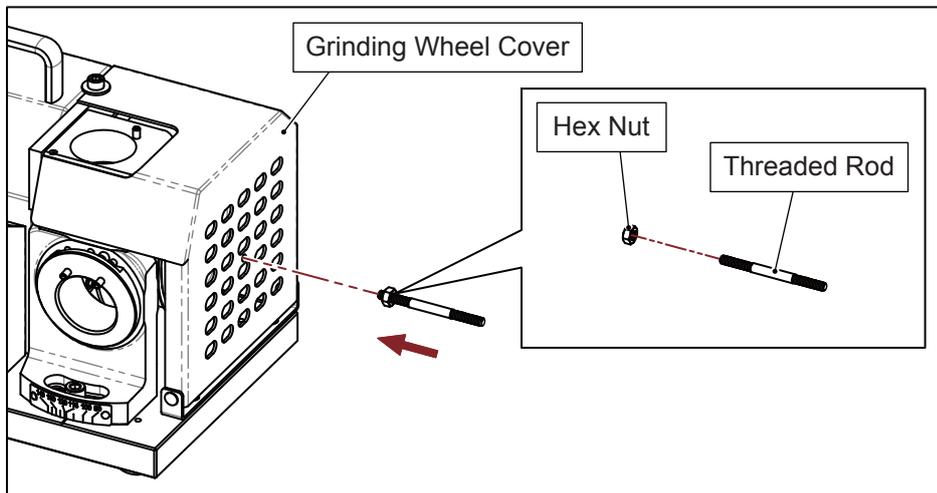


Fig. 3-1

- 2) Align the hole in the center of the dust collection adapter to threaded rod. Push the dust collection adapter to the end. (Fig. 3-2)
- 3) Assemble the washer and wing nut and tighten the wing nut to secure the dust collection adapter. (Fig. 3-3)

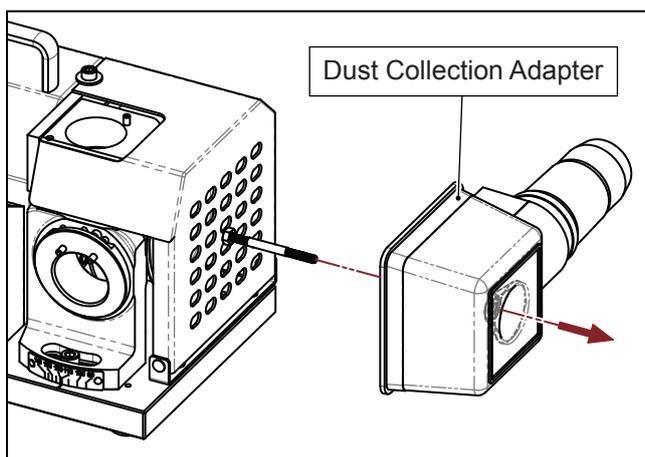


Fig. 3-2

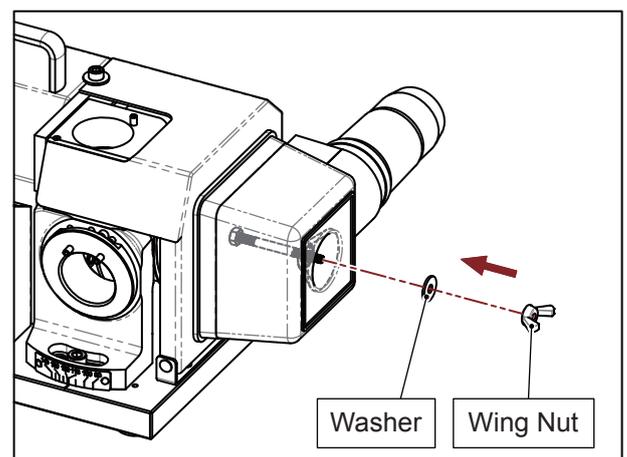


Fig. 3-3

IV. Twist Drill Grinding Introduction (Right side of Machine)

1. Twist Drill - Choose of Grinding Wheel & Collet

- 1) Please unplug the power cord before changing grinding wheel.
- 2) Determine the material of the drill and choose the proper grinding wheel.
 - HSS material drill use CBN grinding wheel (Standard).
 - Carbide / Tungsten material drill use SD grinding wheel (Optional).
- 3) According to the drill diameter and choose the proper collet.
Eg: 4.1 - 5.0 mm drills, use 5 mm collet ; 5.1 - 6.0 mm drills, use 6 mm collet.

2. Twist Drill - Chuck Set Assembly Steps

- 1) Make sure there are no dust or scraps inside the clamping nut, collet and collet holder.
- 2) Put the collet into collet holder by 45° angle. (Fig. 4-1)

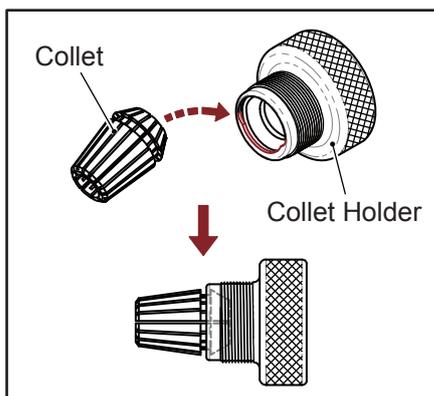


Fig. 4-1

- 3) Screw in a little bit by clamping nut (Fig. 4-2 step ①), then insert the drill through the collet holder (Fig. 4-2 step ②), and push in until the drill is out of the clamping nut about 5 mm. (Fig. 4-3)

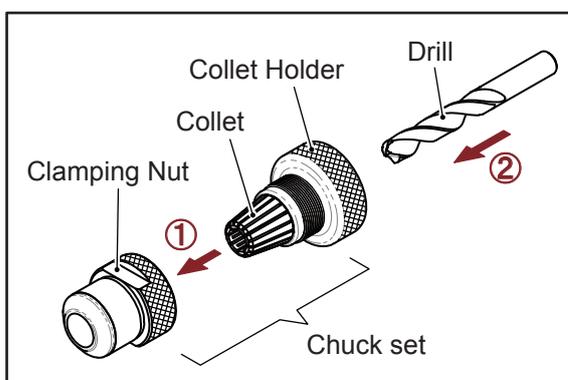


Fig. 4-2

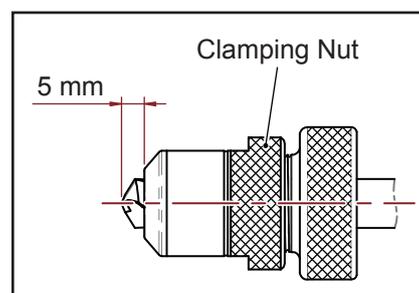


Fig. 4-3

✘ Please do not fully tighten the chuck set, keep the drill is still able to be adjusted.

3. Twist Drill - The use of the Positioning Shelf

1) Preset the scale of the positioning shelf. (Fig. 4-4)

- ① Turn it by clockwise to the end.
- ② Turn it by counterclockwise at "0".

2) Adjust the scale according to the drill diameter.

Eg: 4.1 - 5.0 mm drills, set at 5 ; 5.1 - 6.0 mm drills, set at 6.

- If the length of a drill is shorter than original length after re-sharpening many times, the scale should be increased until the cutting edge is parallel with slot of clamping nut.
- For grinding **High Spiral Drill Bit**, please increase the scale more than its diameter.
- For grinding **Deep Hole Drills**, the scale is adjusted to 2 times of the drill diameter.
Eg: Deep Hole Drill, diameter at 5 mm, the scale should adjust above 10.

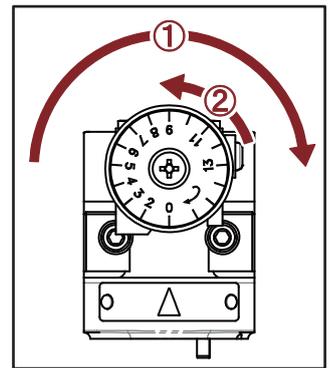


Fig. 4-4

3) Align slot of the clamping nut to the pin on the positioning shelf, then insert the chuck set into the positioning shelf and fit them with no gaps, then turn the chuck set clockwise until it stops by the pin. (Fig. 4-5)

4) Push the drill to the end and slowly turn it clockwise until it stops by the position block. (Fig. 4-6 step ①)

5) Turn the collet holder clockwise and tighten the chuck set to secure the drill. (Fig. 4-6 step ②)

6) Gently turn the chuck set counterclockwise and take it out.

7) After taking out the chuck set, make sure the drill's cutting edge is parallel to the slot of clamping nut. (Fig. 4-7)

- ✘ The cutting edge can be angled towards the slot of clamping nut but no more than 5° (Fig. 4-8), but the cutting edge cannot be angled away from the slot of clamping nut.

- ✘ You could also choose to use the parallel alignment device to check the parallelism. (See chapter "IV-5. The use of the Parallel Alignment Device")

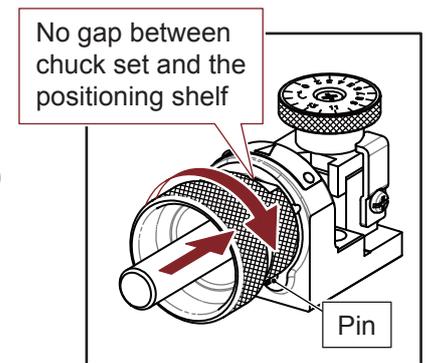


Fig. 4-5

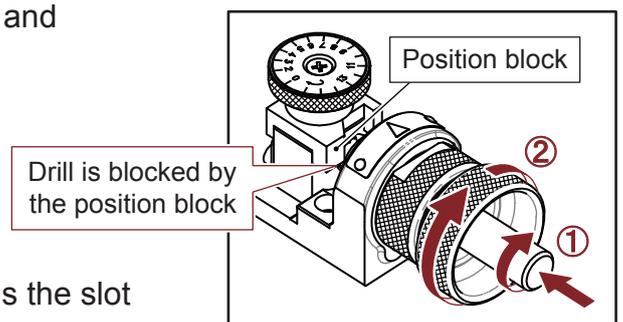


Fig. 4-6

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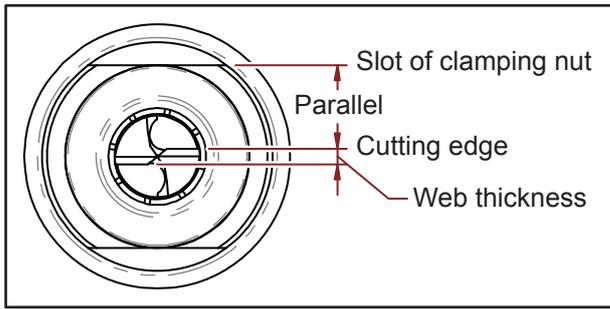


Fig. 4-7

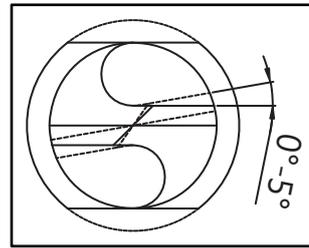


Fig. 4-8

- ✘ If the drill's cutting edge is not parallel to the slot of clamping nut, adjust the scale and reposition the drill. (Fig. 4-9)

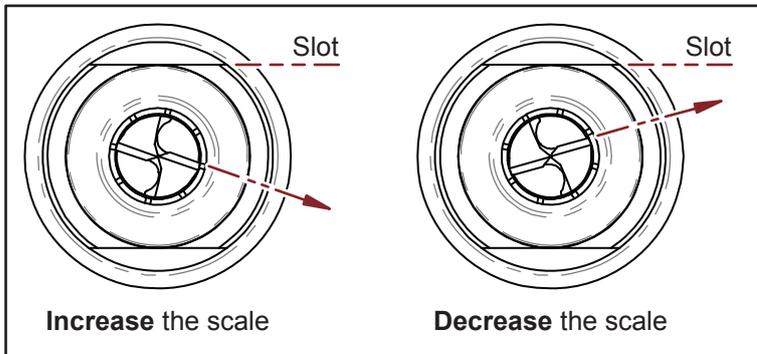


Fig. 4-9

- ✘ Make sure the positioning result is correct before starting the grinding procedure.

4. Twist Drill - Grinding Process

- ✘ Please verify the point angle of the drill and adjust the angle of the Cutting Lip Grinding Shelf before starting the grinding procedure. (Point angle 90° - 140° is available for the grinding shelf adjustment.)

Turn the power switch on and wait about 10 seconds until the motor rotation is stable.

1) Cutting Lip Grinding (Fig. 4-10)

- ✘ While grinding, please do not hold the drill shank, it may influence the drill position and caused the missing of accuracy.

① Insert the chuck set into the cutting lip grinding shelf, the slot of clamping nut must fit with the two pins on the shelf, push the chuck set gently and turn it clockwise and counterclockwise until the grinding noise stops.

② Take the chuck set out, turn it to the other side and grind the drill in the same way.

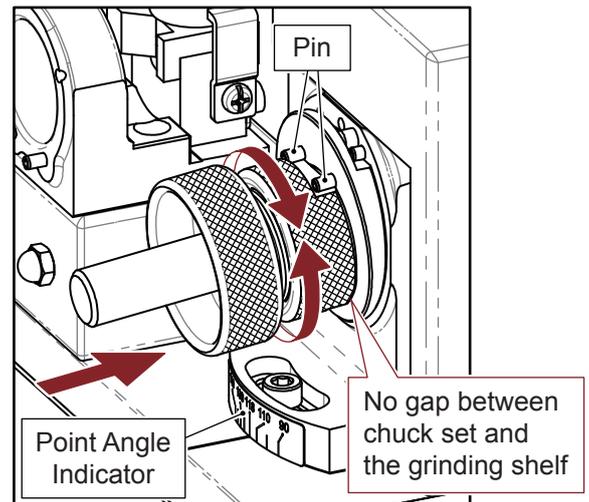


Fig. 4-10

2) Web Thinning (Fig. 4-11)

- ✘ Align the center part of the clamping nut slot to the pin on the Web Thinning Grinding Shelf when inserting or taking out the chuck set.

① Insert the chuck set into the web thinning grinding shelf, and grind the drill by turning clockwise and counterclockwise until the grinding noise stops.

② Take the chuck set out, turn it to the other side and grind the drill in the same way.

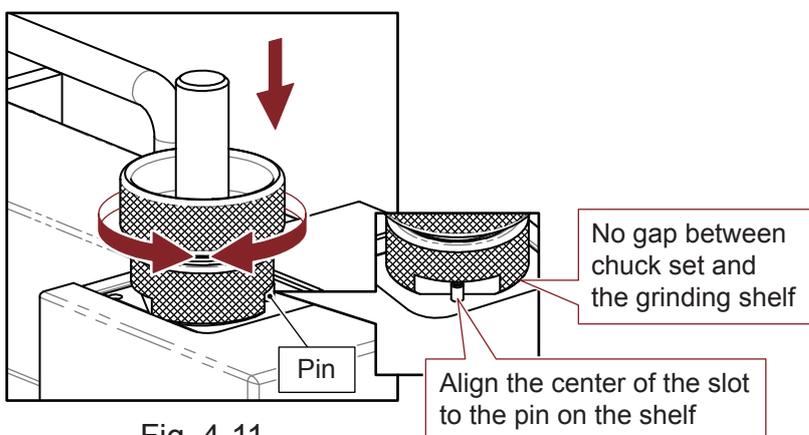


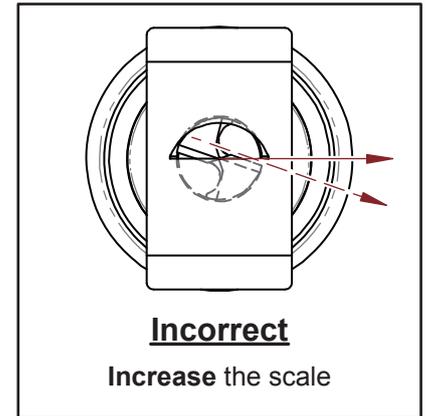
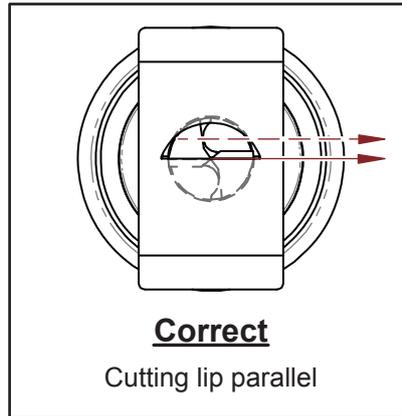
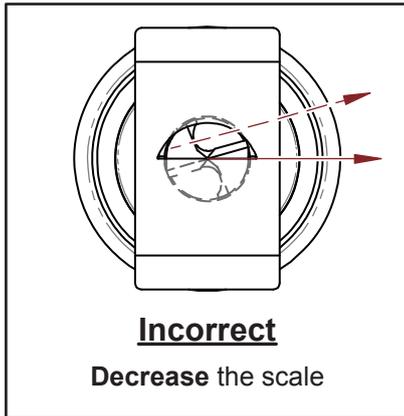
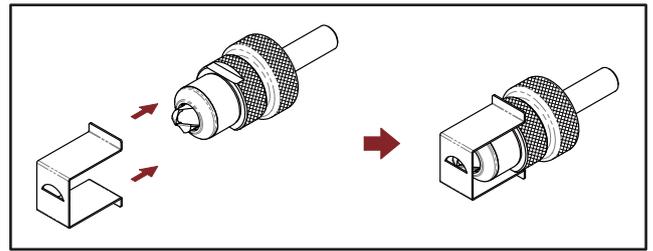
Fig. 4-11

- ✘ There are 0.1 mm shim and 0.3 mm shim for adjusting the size of web thickness. (See chapter “IV-6. The use of Metal Shims”)

5. Twist Drill - The use of the Parallel Alignment Device

Align the parallel device with the two slots of the clamping nut, then connect them as shown in the picture on the right.

Verify the parallelism of the drill's cutting lip with the flat figure of the hole on the parallel device.



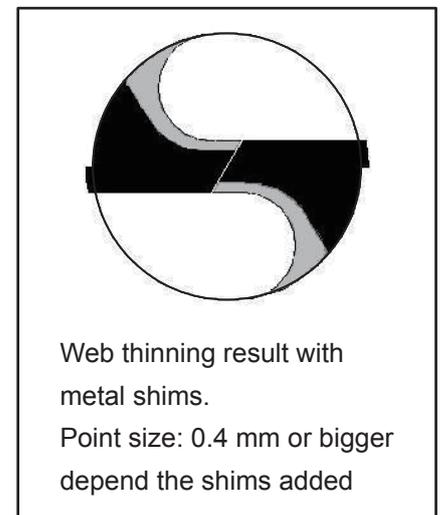
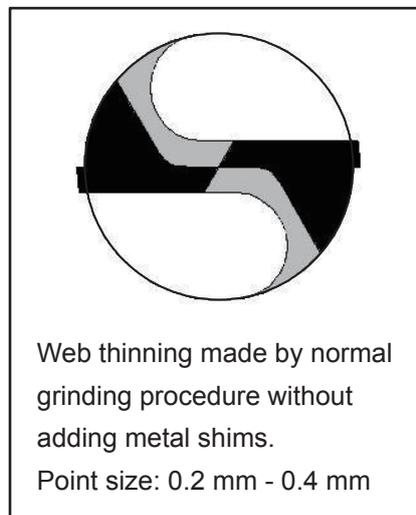
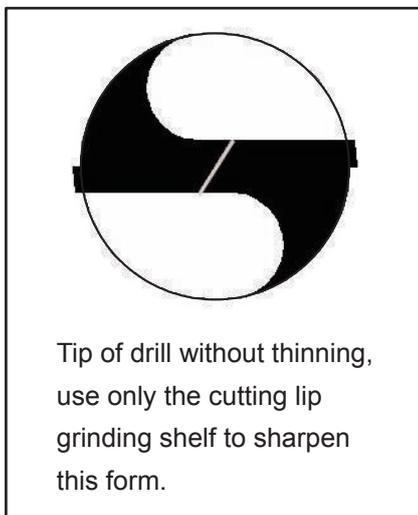
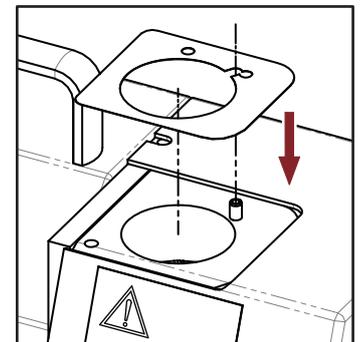
6. Twist Drill - The use of Metal Shims

There are 3 pieces metal shims as standard accessories.

- 2 pieces of 0.1 mm metal shims.
- 1 piece of 0.3 mm metal shim.

Align the hole of the shim to the pin on the web thinning grinding shelf then put it on as shown in the picture on the right.

Adding one shim of 0.1 mm will expand 0.2 mm of the point size, adding 0.3 mm shim will expand 0.6 mm of the point size and so on.



V. End Mill Grinding Introduction (Left side of Machine)

1. End Mill - Choose of Grinding Wheel & Accessories & Collet

- 1) Please unplug the power cord before changing grinding wheel.
- 2) Determine the material of end mill and choose the proper grinding wheel.
 - Carbide / Tungsten material end mill use SD grinding wheel (Standard).
 - HSS material end mill use CBN grinding wheel (Optional).
- 3) According to end mill's cutting diameter and choose proper grinding wheel.
 - Grinding Wheel A is for grinding the diameter from $\Phi 3.0 - \Phi 5.0$ mm.
 - Grinding Wheel B is for grinding the diameter from $\Phi 5.1 - \Phi 8.0$ mm.
 - Grinding Wheel C is for grinding the diameter from $\Phi 8.1 - \Phi 12.0$ mm.
- 4) Determine the number of flute and choose the proper bushing and chuck set.
- 5) According to end mill's diameter and choose the proper collet.

2. End Mill - Chuck Set Assembly Steps

- 1) Make sure there are no dust or scraps inside the clamping nut, collet and collet holder.
- 2) Put the collet into collet holder by 45° angle. (Fig. 5-1)
- 3) Screw in a little bit by clamping nut (Fig. 5-2 step ①), then insert end mill shank into the clamping nut (Fig. 5-2 step ②) until end mill is out of the clamping nut about 5 mm. (Fig. 5-3)
 - ✘ Please do not fully tighten the chuck set, keep end mill is still able to be adjusted.

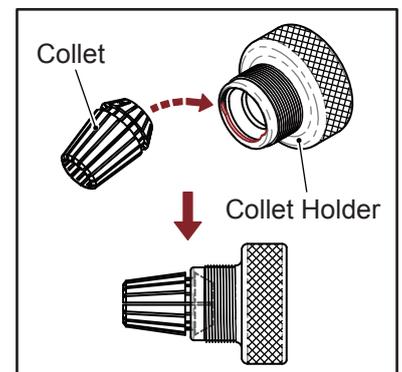


Fig. 5-1

- 4) Turn the longer cutting edge of end mill to be parallel with the Slot No.1 of the clamping nut. (See page 17, Fig. 5-6)

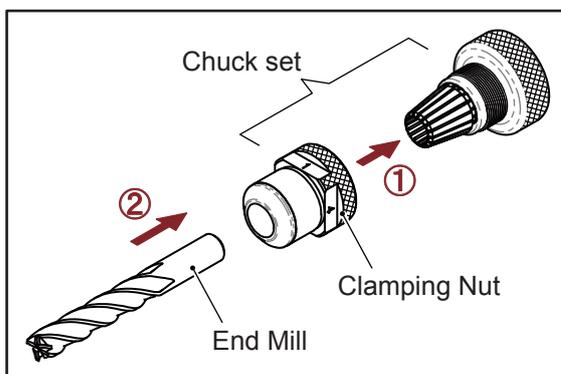


Fig. 5-2

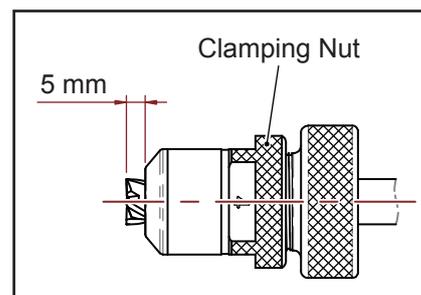


Fig. 5-3

3. End Mill - The use of the Positioning Shelf

1) Preset the scale of the positioning shelf. (Fig. 5-4)

- ① Turn it by clockwise to the end.
- ② Turn it by counterclockwise at "0".

2) Determine end mill's material and adjust the scale.

- Adjustment for carbide material end mill.
According to end mill's cutting diameter.

Eg: 10.0 mm end mill, set at 10.

- Adjustment for HSS material end mill.

Need to decrease 1-3 scales according to end mill's cutting diameter.

Eg: 8.0 mm end mill, set at 5-7.

3) Align Slot No.1 of the clamping nut to the pin on the positioning shelf, then insert the chuck set into the positioning shelf and fit them with no gaps, then turn the chuck set clockwise until it stops by the pin. (Fig. 5-5 step ①)

4) Push end mill to the end and slowly turn it clockwise until end mill's longer cutting edge stops by the position block. (Fig. 5-5 step ②)

5) Turn the collet holder clockwise and tighten the chuck set to secure end mill. (Fig. 5-5 step ③)

6) Gently turn the chuck set counterclockwise and take it out.

7) After taking out the chuck set, make sure end mill's longer cutting edge is parallel to the Slot No.1 of clamping nut (Fig. 5-6), if it is not parallel, adjust the scale and reposition end mill (Fig. 5-7).

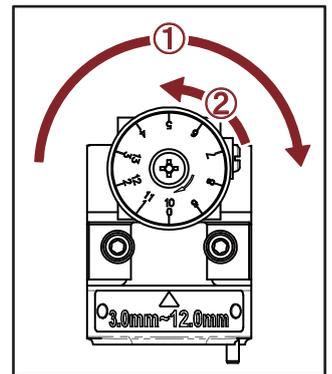


Fig. 5-4

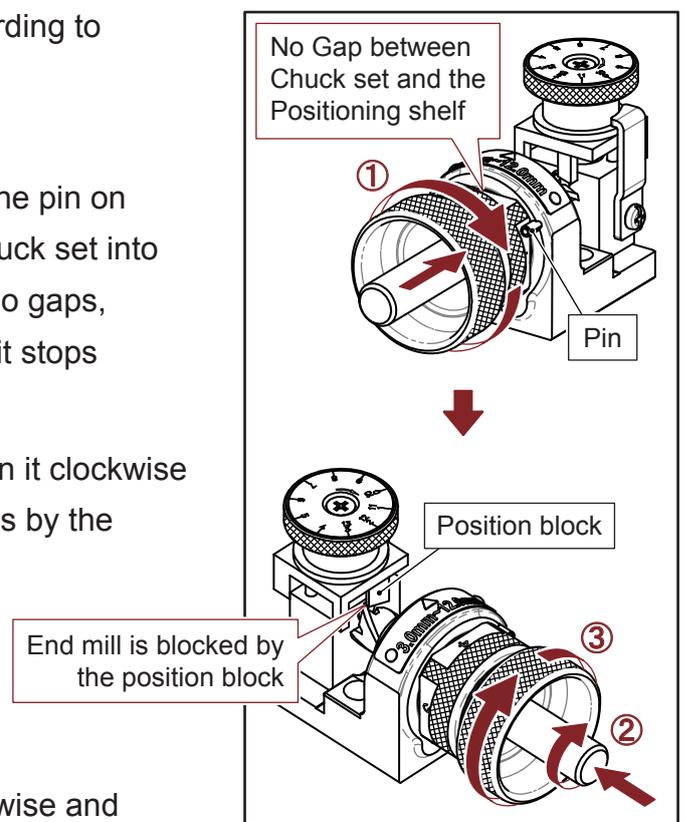


Fig. 5-5

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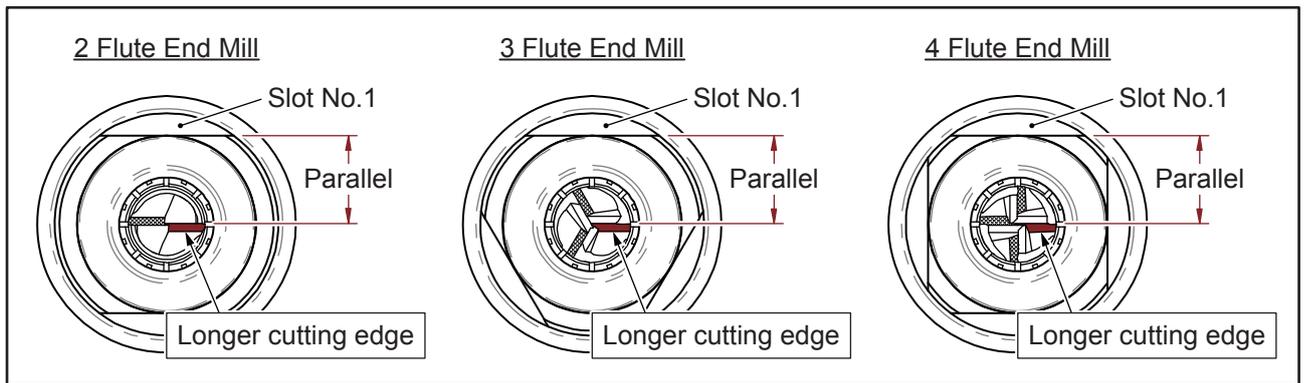


Fig. 5-6

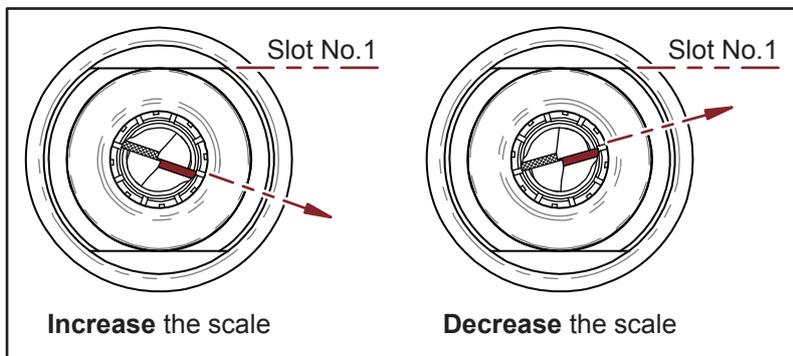


Fig. 5-7

✘ Make sure the positioning result is correct before starting the grinding procedure.

4. End Mill - The use of the Cutting Face Adjustment Device

This device is to adjust the width of the cutting face. (Fig. 5-8)

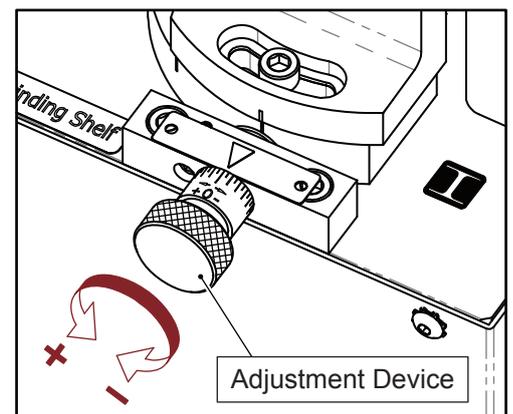
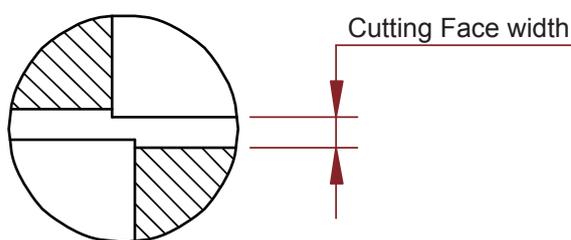


Fig. 5-8

- 1) Please turn it to “-” direction to the end then set to “0”.
- 2) Turn to “+” direction to decrease the cutting face width.
Turn to “-” direction to increase the cutting face width.

5. End Mill - 2 Flute End Mill Grinding Preparations

1) Secondary Relief Grinding Shelf (I) (Fig. 5-9)

- ① Move the adjustable pin on the Shelf (I) from the bottom to top.
- ② Adjust the cutting face adjustment device to “0”, after finishing the whole sharpening procedure, then adjust this device according to your needs. (See chapter “V-4. The use of the Cutting Face Adjustment Device”)

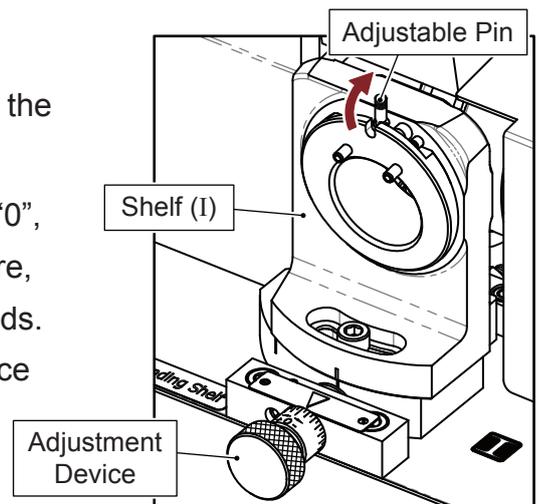


Fig. 5-9

2) Cutting Face Grinding Shelf (III) (Fig. 5-10)

- ① Adjust the Shelf (III) to 3° .
 - ② Insert 2&3 Flute Cutting Face Bushing into the Shelf (III), align No.1 of the bushing to the pin on the shelf, then insert it to the end.
- ✘ The ● green mark of the bushing should align to the ● green mark on the shelf when inserting the chuck set.

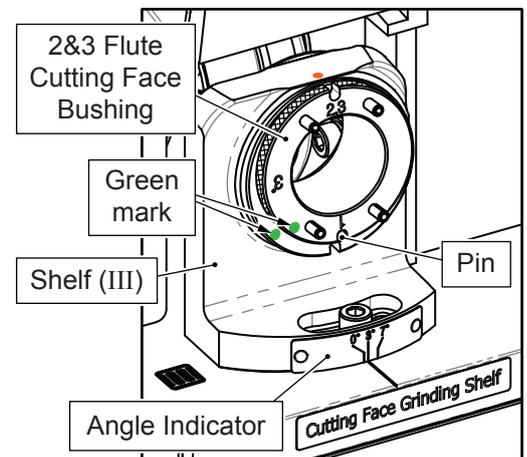


Fig. 5-10

3) End Gash Grinding Shelf (III) (Fig. 5-11)

Insert 2 Flute End Gash Bushing into the Shelf (III), align No.1 of the bushing to the pin on the shelf, then insert it to the end.

- ✘ The ○ white mark of the bushing should align to the ○ white mark on the shelf when inserting the chuck set.

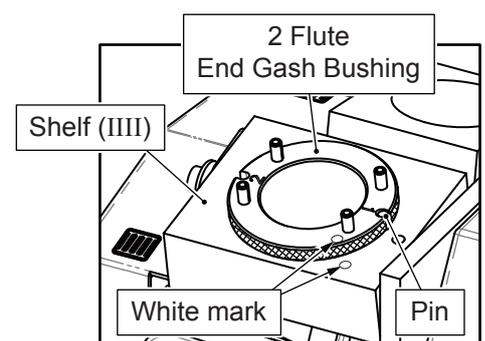


Fig. 5-11

6. End Mill - 2 Flute End Mill Grinding Process

Grinding procedure: I, III, IIII

Turn the power switch on and wait about 10 seconds until the motor rotation is stable.

✘ Make sure each mill's flute is fully grinded before continuing for the grinding of the next flute.

1) 2 Flute Secondary Relief Grinding (I) (Fig. 5-12)

Insert the chuck set into the Shelf (I), align Slot No.1 of the clamping nut to the two pins on the shelf, push the chuck set gently and turn it clockwise and counterclockwise until the grinding noise stops.

Turn the chuck set to grind the Slot No.2 in the same way.

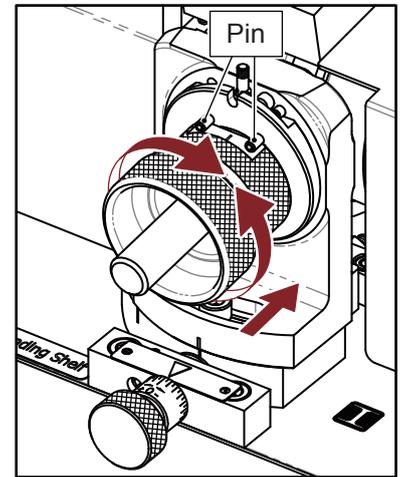


Fig. 5-12

2) 2 Flute Cutting Face Grinding (III) (Fig. 5-13)

① Insert the chuck set into the bushing on the Shelf (III), align Slot No.1 to the two pins where marked as No.1, push the chuck set gently until the grinding noise stops.

② Take the chuck set out and turn the bushing to No.(2·3), align No.(2·3) to the pin on the shelf, then insert it to the end.

③ Insert the chuck set into the bushing, align Slot No.2 to the two pins where marked as No.(2·3), push the chuck set gently until the grinding noise stops.

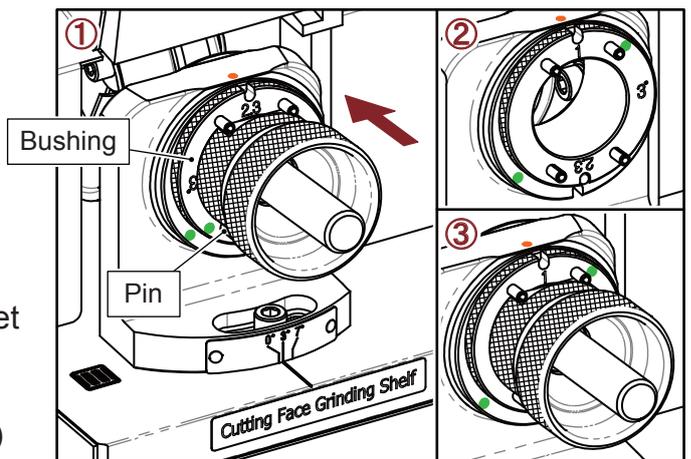


Fig. 5-13

3) 2 Flute End Gash Grinding (IIII) (Fig. 5-14)

① Insert the chuck set into the bushing on the Shelf (IIII), align Slot No.1 to the two pins where marked as No.1, push the chuck set gently until the grinding noise stops.

② Take the chuck set out and turn the bushing to No.2, align No.2 to the pin on the shelf, then insert it to the end.

③ Insert the chuck set into the bushing, align Slot No.2 to the two pins where marked as No.2, push the chuck set gently until the grinding noise stops.

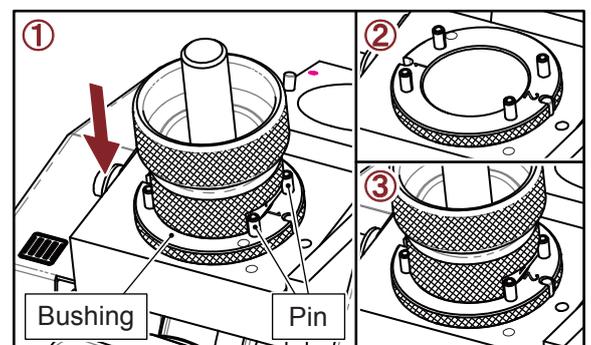


Fig. 5-14

7. End Mill - 3 Flute End Mill Grinding Preparations

1) Secondary Relief Grinding Shelf (I) (Fig. 5-15)

- ① Move the adjustable pin on the Shelf (I) from the bottom to top.
- ② Adjust the cutting face adjustment device to "0", after finishing the whole sharpening procedure, then adjust this device according to your needs. (See chapter "V-4. The use of the Cutting Face Adjustment Device")

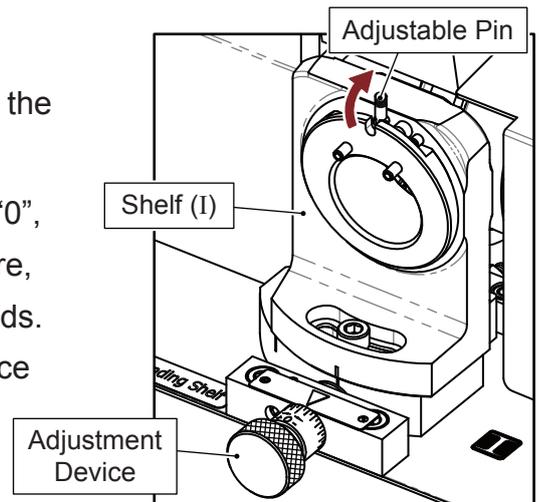


Fig. 5-15

2) End Gash Grinding Shelf (II) (Fig. 5-16)

Insert 3&4 Flute End Gash Bushing into the Shelf (II), align No.(I·II) of the bushing to the pin on the shelf, then insert it to the end.

- ✘ The ● pink mark of the bushing should align to the ● pink mark on the shelf when inserting the chuck set.

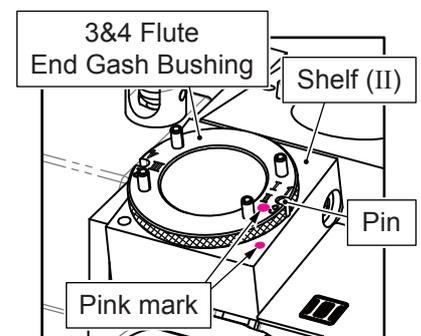


Fig. 5-16

3) Cutting Face Grinding Shelf (III) (Fig. 5-17)

- ① Adjust the Shelf (III) to 3° .
- ② Insert 2&3 Flute Cutting Face Bushing into the Shelf (III), align No.1 of the bushing to the pin on the shelf, then insert it to the end.

- ✘ The ● green mark of the bushing should align to the ● green mark on the shelf when inserting the chuck set.

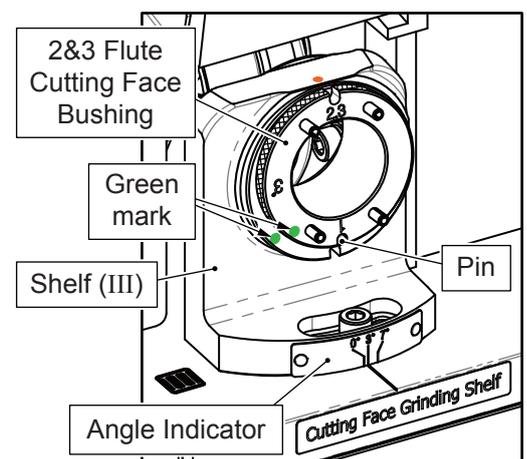


Fig. 5-17

8. End Mill - 3 Flute End Mill Grinding Process

Grinding procedure: I, II, III

Turn the power switch on and wait about 10 seconds until the motor rotation is stable.

✘ Make sure each mill's flute is fully grinded before continuing for the grinding of the next flute.

1) 3 Flute Secondary Relief Grinding (I) (Fig. 5-18)

Insert the chuck set into the Shelf (I), align Slot No.1 of the clamping nut to the two pins on the shelf, push the chuck set gently and turn it clockwise and counterclockwise until the grinding noise stops. Turn the chuck set to grind the Slot No.2 and Slot No.3 in the same way.

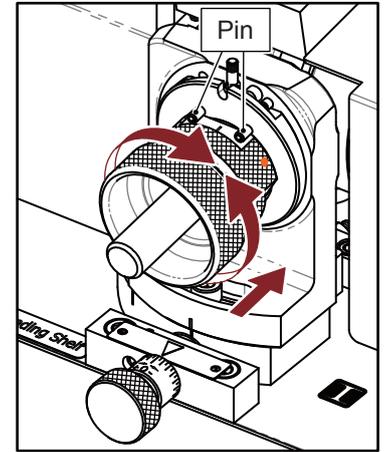


Fig. 5-18

2) 3 Flute End Gash Grinding (II) (Fig. 5-19)

① Insert the chuck set into the bushing on the Shelf (II), align Slot No.1 to the two pins where marked as No.(I·II), push the chuck set gently until the grinding noise stops. Turn the chuck set to grind the Slot No.2 in the same way.

② Take the chuck set out and turn the bushing to No.(III), align No.(III) to the pin on the shelf, then insert it to the end.

③ Insert the chuck set into the bushing, align Slot No.3 to the two pins where marked as No.(III), push the chuck set gently until the grinding noise stops.

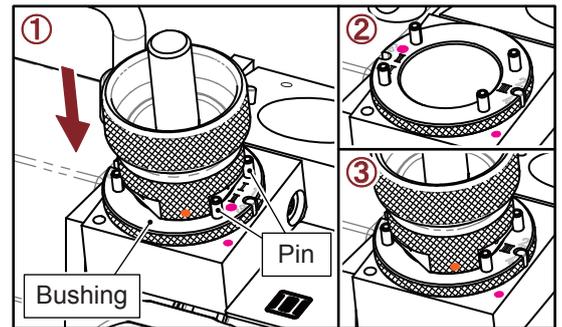


Fig. 5-19

3) 3 Flute Cutting Face Grinding (III) (Fig. 5-20)

✘ The ● orange mark of the clamping nut should align to the ● orange mark on the Shelf (III) when inserting the chuck set.

① Insert the chuck set into the bushing on the Shelf (III), align Slot No.1 to the two pins where marked as No.1, push the chuck set gently until the grinding noise stops.

② Take the chuck set out, turn the bushing to No.(2·3), align No.(2·3) to the pin on the shelf, then insert it to the end.

③ Insert the chuck set into the bushing, align Slot No.2 to the two pins where marked as No.(2·3), push the chuck set gently until the grinding noise stops. Turn the chuck set to grind the Slot No.3 in the same way.

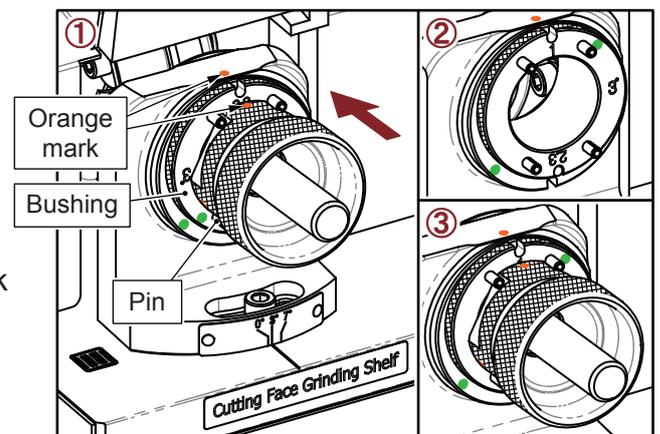


Fig. 5-20

9. End Mill - 4 Flute End Mill Grinding Preparations

1) Secondary Relief Grinding Shelf (I) (Fig. 5-21)

- ① Move the adjustable pin on the Shelf (I) from the top to bottom.
- ② Adjust the cutting face adjustment device to “0”, after finishing the whole sharpening procedure, then adjust this device according to your needs. (See chapter “V-4. The use of the Cutting Face Adjustment Device”)

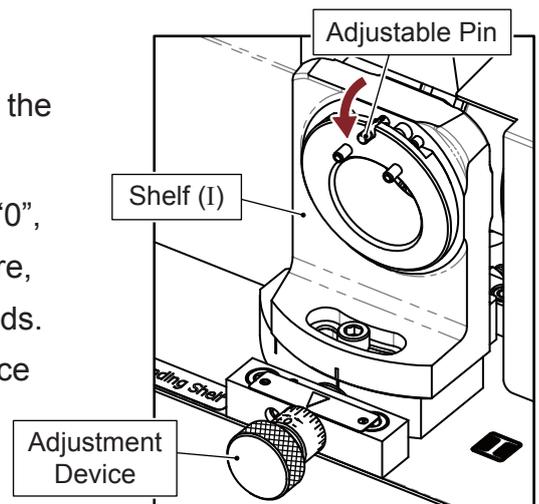


Fig. 5-21

2) End Gash Grinding Shelf (II) (Fig. 5-22)

Insert 3&4 Flute End Gash Bushing into the Shelf (II), align No.(1·3) of the bushing to the pin on the shelf, then insert it to the end.

- ✘ The ● pink mark of the bushing should align to the ● pink mark on the shelf when inserting the chuck set.

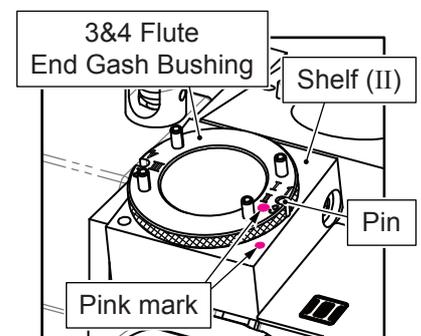


Fig. 5-22

3) Cutting Face Grinding Shelf (III) (Fig. 5-23)

- ① Adjust the Shelf (III) to 7°.
- ② Insert 4 Flute Cutting Face Bushing into the Shelf (III), align No.1 of the bushing to the pin on the shelf, then insert it to the end.

- ✘ The ● green mark of the bushing should align to the ● green mark on the shelf when inserting the chuck set.

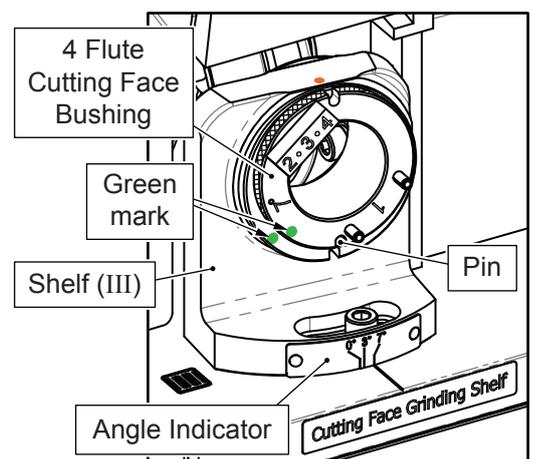


Fig. 5-23

10. End Mill - 4 Flute End Mill Grinding Process

Grinding procedure: I, II, III

Turn the power switch on and wait about 10 seconds until the motor rotation is stable.

✘ Make sure each mill's flute is fully grinded before continuing for the grinding of the next flute.

1) 4 Flute Secondary Relief Grinding (I) (Fig. 5-24)

Insert the chuck set into the Shelf (I), align Slot No.1 of the clamping nut to the two pins on the shelf, push the chuck set gently until the grinding noise stops. Turn the chuck set to grind the Slot No.2, Slot No.3 and Slot No.4 in the same way.

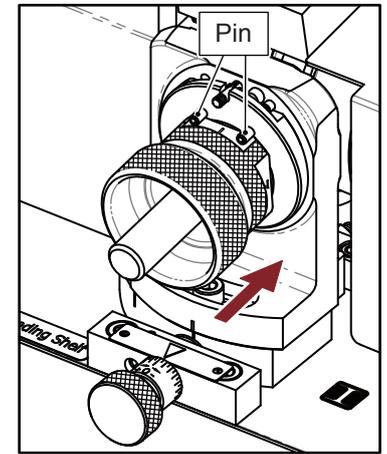


Fig. 5-24

2) 4 Flute End Gash Grinding (II) (Fig. 5-25)

① Insert the chuck set into the bushing on the Shelf (II), align Slot No.1 to the two pins where marked as No.(1·3), push the chuck set gently until the grinding noise stops. Turn the chuck set to grind the Slot No.3 in the same way.

② Take the chuck set out and turn the bushing to No.(2·4), align No.(2·4) to the pin on the shelf, then insert it to the end.

③ Insert the chuck set into the bushing, align Slot No.2 to the two pins where marked as No.(2·4), push the chuck set gently until the grinding noise stops. Turn the chuck set to grind the Slot No.4 in the same way.

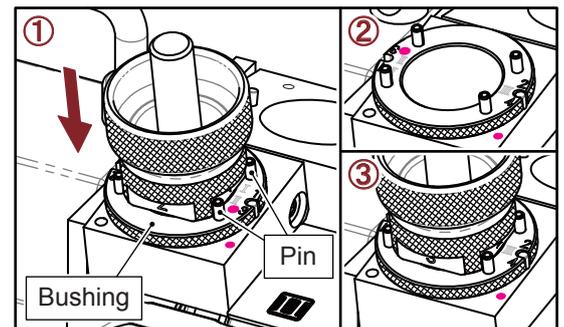


Fig. 5-25

3) 4 Flute Cutting Face Grinding (III) (Fig. 5-26)

① Insert the chuck set into the bushing on the Shelf (III), align Slot No.1 to the two pins where marked as No.1, push the chuck set gently until the grinding noise stops.

② Take the chuck set out and turn the bushing to No.(2·3·4), align No.(2·3·4) to the pin on the shelf, then insert it to the end.

③ Insert the chuck set into the bushing, align Slot No.2 to the flat key where marked as No.(2·3·4), push the chuck set gently until the grinding noise stops. Turn the chuck set to grind the Slot No.3 and Slot No.4 in the same way.

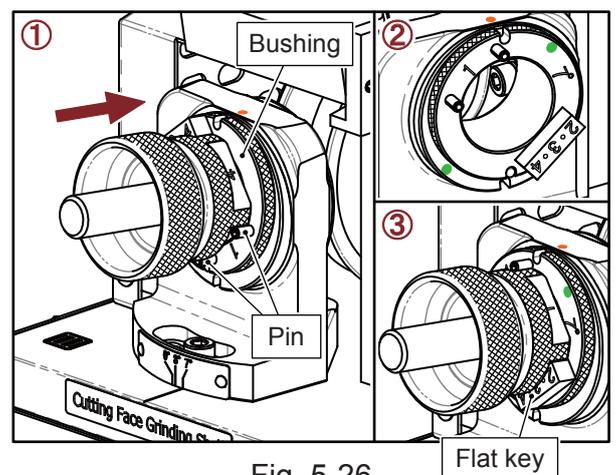


Fig. 5-26

VI. Machine Maintenance and Clean

1) Replacement of Grinding Wheel

- ✘ Do not exchange our grinding wheel with other grinding wheel from other supplier!
- ① Unplug the power cord and make sure the power is off.
- ② Confirm the screw direction on the grinding wheel cover before changing the grinding wheel. (Fig. 6-1)
- ③ Loosen the screw from the grinding wheel cover to open the cover. (Fig. 6-2)
- ④ Loosen the screw from the grinding wheel to take off the grinding wheel. (Fig. 6-3)
- ⑤ Use clean cloth to clean the flange and the contact surface of the grinding wheel.
- ⑥ Replace the new grinding wheel and fasten the screw. (Fig. 6-3)
 - ✘ Tighten the wheel screw until the fan can't be moved separately, do not over tighten.
- ⑦ Close the grinding wheel cover and secure with screw.

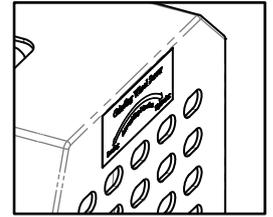


Fig. 6-1

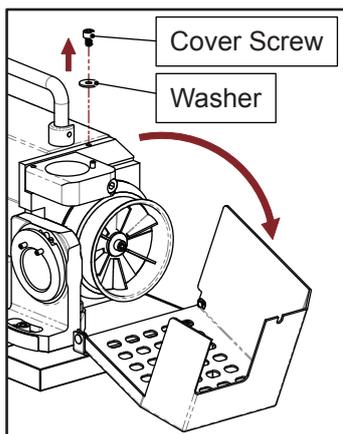


Fig. 6-2

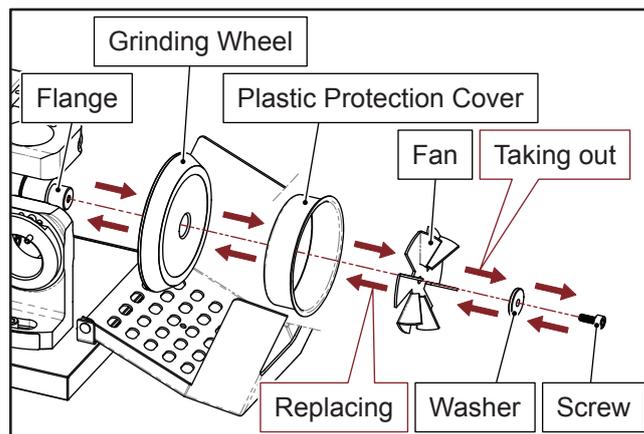


Fig. 6-3

2) Cleaning

- ① Unplug the power cord and make sure the power is off.
- ② Disassemble the chuck set after use.
- ③ Use the air press gun to clean the scraps and dust out of all grinding shelves and all the accessories. (Fig. 6-4) (Fig. 6-5)
 - ✘ Please wear protection glass while using the air press gun.
- ④ Use clean cloth to clean each contact port and all the accessories, then put them back in order. (Fig. 6-4) (Fig. 6-5)

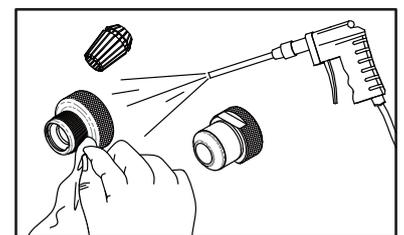


Fig. 6-4

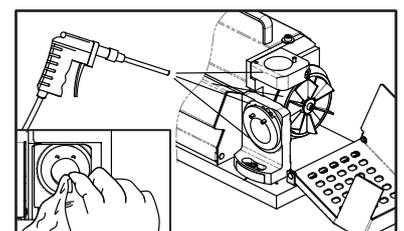


Fig. 6-5

VII. Troubleshooting

1) Drill / End mill is positioned but incorrect result.

- Check the cutting edge of the drill / end mill is clean without scraps / iron ash.
- Check the scale of the positioning shelf.
 - ✘ Must turn the scale to the end by clockwise first and set the scale at "0".
- Check the contact surface of positioning shelf is clean without scraps.
- Check the position block, if it is damaged, please contact your agent for replacement.
- Check the position block is clean without scraps / iron ash.

2) Positioning result is correct but failed accuracy after grinding.

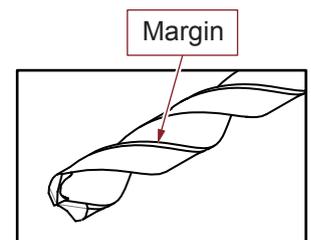
✘ If encountered any of the following problems, please reposition the drill and regrind.

① Problem with grinding shelf :

- Check the angle of the Cutting Lip Grinding Shelf / Grinding Shelf (III).
 - ✘ After adjusting the angle, must fasten the set screw of the grinding shelf.
- Check the contact surface of grinding shelf is clean without scraps / iron ash.

② Problem with drill / end mill :

- Check the margin of the drill, damaged margin should be cut off.
- If the drill is deformed or has unequal land, may affects the grinding accuracy.
- Check the cutting edge of end mill, damaged cutting edge should be cut off.
- If end mill is deformed or has unequal flute, may affects the grinding accuracy.



③ Problem with accessories :

- Check the cleanliness of chuck set (collet / collet holder / clamping nuts).
- Check the contact surface of bushing is clean without scraps / iron ash.
- While changing grinding wheel, the flange and the center hole of grinding wheel should be kept clean.

④ Problem with drill / end mill grinding :

- Do not apply too much pressure to grinding shelf.
- Make sure to fully turn to the end when turning the chuck set clockwise and counterclockwise.
- For drill's web thinning, when inserting or taking out the chuck set, the center part of the clamping nut slot should align to the pin on the grinding shelf.

3) In case of product or component damage, switch off the machine and disconnect the power cord. Contact your local authorized supplier for repair or replacement.

