

END MILL RE-SHARPENER EMG-413

OPERATING INSTRUCTIONS



–TABLE OF CONTENTS–

| | |
|-----------------------|---------|
| A.SAFETY INSTRUCTIONS | ----- 1 |
| B.NAMES OF COMPONENTS | ---- 2 |
| C.OPERATIONS | ----- 3 |
| D.REPLACING THE WHEEL | ----- 5 |
| E.MAINTENANCE | -----6 |

- ⊙ For your own safety, be sure to read the operation manual thoroughly and follow the correct handling and operation procedures before operating the re-sharpener. Please keep this manual in a proper place where you can refer to it whenever necessary.
- ⊙ Thank you for your purchase of Earth-Chain products.
- ⊙ Patent protected. Violators will be prosecuted. Patent No.: M321829.
- ⊙ Any change regarding the appearance and design of this End Mill Re-Sharpener machine are not allowed without prior written permission from Earth-Chain Corporation.



EARTH-CHAIN
Power that works.

Web-site: www.earth-chain.com.tw

A. SAFETY INSTRUCTIONS

1. Guard and Clothing

- (1) Please always wear goggles when operating the machine.
- (2) Please wear face or dust mask in case the injury to respiratory organs.
- (3) Do not wear:
 - ① The operator should not tie a tie to avoid the tie getting caught in moving parts and injure the neck.
 - ② The operator with long-sleeved shirt, please button the button of cuffs to avoid the sleeves getting caught in moving parts and injure hands.
 - ③ Do not wear the gloves in case get caught in moving parts and injure the operator or damage the machine.
 - ④ Please wear protective hair covering to contain long hair to avoid any hazards.

2. Place of installation

- (1) Please install the machine on a hard, level surface.
- (2) Do not install the machine to below locations:
 - ① Wet location can result in a risk of an electric shock.
 - ② Sources of heat such as coal or gas could cause explosion or fire due to grinding spark.
 - ③ Location with dust or steel chips could shorten the life of the machine.
 - ④ Uneven or weak surface, the machine could fall from the surface due to the vibration.
 - ⑤ Location with chemicals could injure respiratory organs.

3. When in use

- (1) Use the plug provided. If it will not fit the outlet, have the proper plug installed by a qualified electrician.
- (2) Keep your face from the machine a proper distance when operating the machine in case any chips injure the face.
- (3) Prevent any objects fall into the sharpening port in case the diamond wheel been stuck and cause hazards.
 - (4) Do not put finger into the sharpening port in case injure the fingers.
- (5) Be sure the switch is in "off" position before plugging it in.
- (6) The electric cord should not be pressed on any objects when operating the machine in case break the cord and cause the risk of feeling electricity. .
- (7) Switch off and unplug the machine immediately when there is any abnormal noise or odor during operation.
- (8) Equipped temperature sensor, the machine will stop automatically when the motor is over heat around 80°C to 90°C. When it happens, be sure to switch off and unplug the machine immediately, and then re-start the machine after the motor cooled. (The motor will resume running automatically after the motor cooled in unplugged position thus could cause any danger.)

4. After use

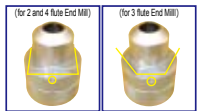
- (1) Switch off and unplug the machine.
- (2) Do not move the machine before the wheel stops in case injures the hand.
- (3) Do not force the wheel to stop running by any external force or tools.
- (4) Wipe off and dispose of grinding dust whenever finish the job to prevent accumulation, and to extend the usage life.
- (5) If don't wipe off and dispose of grinding dust, the accumulation of dust could cause fire and damage the machine easily.

5. Maintenance

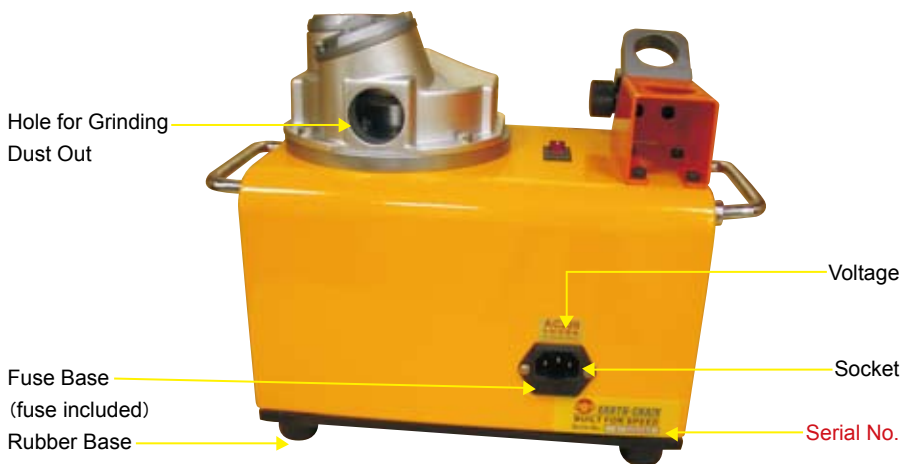
- (1) Switch off the machine and unplug the machine before changing accessories or cleaning the machine.
- (2) Do not clean the machine with water. Using the pressurized air, blow the outer surface and the grinding dust out of machine from the grinding port #1.
- (3) Don not wipe the machine with organic solvents in case eroding the machine. (Wipe with dry cloth.)
- (4) Wheels should be replaced when worn-down. (Use SDC diamond wheel for carbide End Mill; Use CBN diamond wheel for HSS End Mill.)

B. NAMES OF COMPONENTS

1. Front

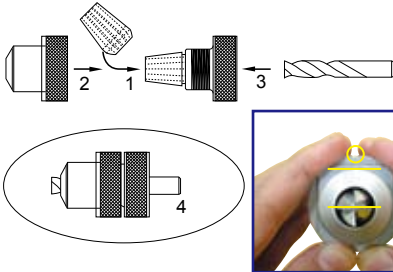


2. Back



C. OPERATIONS—(1)

1.



● Set up the end mill to the ER collet holder

★ Please follow up steps 1, 2, 3, 4 to set up the end mill to the collet holder. (without tightening) ***See Picture #1

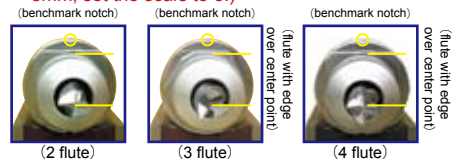
- ① Determine diameter and flute of your end mill, and then select the proper collet and collet holder.
- ② Insert collet into collet holder and tighten nut slightly.
- ③ Insert end mill into collet holder and juts out 35mm or so from the collet holder.
- ④ Find out the flute with edge over center point and have it to be parallel with the benchmark notch.

2.



● Align end mill—①

★ Set alignment knob to the proper number according to the diameter of the end mill. (e.g. End mill dia. 8mm, set the scale to 8.)



★ The flute with edge over center point should be parallel with the benchmark line. ***See Picture #2

3.



● Aligning end mill—②

- ① Pointing holder's benchmark notch at triangle mark of alignment base and insert it to the base.
- ② Loosen holder, lower the holder to the base, and screw the nut clockwise. At the same time, rotate the flute with edge over center point clockwise until it touches the alignment block.
- ③ Tighten the ER nut until the end mill is supported but free to turn. Pull out the holder counterclockwise, tighten up the holder after confirmed the flute is parallel with the notch. If it's not parallel, please repeat the alignment steps. *** See Picture #3

4.

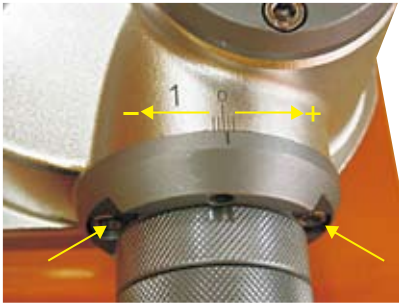


● Primary edge re-sharpening

- ① Switch on machine.
- ② Pointing ER holder at the notch of primary edge re-sharpening port (# 1).
- ③ Insert the holder into the port #1 with a slight push motion for grinding.
- ④ Change to another flute, repeat the above steps until the sharpening for all flutes' edges is complete. *** See Picture #4

C. OPERATIONS—(2)

5.



● Relief settings

- ① If the relief needs to be adjust, please use provided 4mm hex wrench to loosen the screws in the sharpening port#1.
- ② Rotate clockwise (+) to increase, rotate counterclockwise (-) to decrease. Tighten after relief setting. ***See Picture #5

6.



● Secondary clearance angle sharpening—① (for 4 flute)

- ① Pointing ER holder at screw of **secondary clearance angle sharpening port (#2)**, insert it into the port with a slight push motion to sharpen until grinding noise disappear.
- ② Change to another flute, repeat the above steps until the sharpening for all flutes' edges is complete. ***See Picture #6

7.



(for 2 flute)



(for 3 flute)



● Secondary clearance angle sharpening—② (for 2 & 3 flute)

- ① If you need to sharpen the secondary clearance angle completely, loosen the screws in the secondary clearance angle port, and then rotate left and right repeatedly for clearance.
Attn: The rotate ranges for 2 flute and 3 flute are different. For 2 flute, rotate the holder left and right in whole rotation; for 3 flute, only rotate left and right in half rotation till the middle mark on the sharpening port# 2, and rotate the benchmark notch side only. *** See Picture #7
- ② To sum up, the grinding should start from the flute pointed at the benchmark notch.

8.



● End gash sharpening

- ① Pointing ER holder at upper screw of end gash sharpening port (#3), insert it into the port with a slight push motion. For **precise and average grinding**, hold tight the upper part of the ER holder with one hand and move the lower part at both sides with another hand to sharpen until grinding noise disappear.
- ② Take out the holder with end mill and change to another flute, repeat the above steps until the sharpening for all flutes' end gashes is complete.
- ③ Take out the end mill from the holder and inspect it. ***See Picture #8

D. REPLACING THE WHEEL

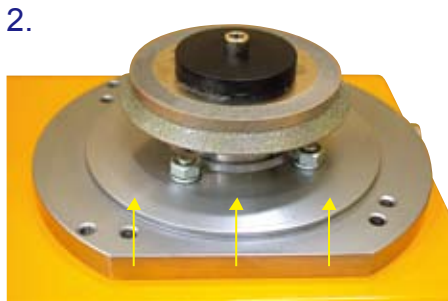
1.



● Removing the wheel cover

- ① Unplug the machine.
- ② Loosen the three screws in the wheel cover counterclockwise with 4mm Allen key. *** See Fig. #1

2.



● Cleaning the grinding dust

- ① Make sure the temperature of the wheel goes down to normal temperature.
- ② Open the upper cover, clean the grinding dust with pressurized air and wipe outside with dry cloth. *** See Fig. #2

3.



● Removing the washer

- ① Hold the wheel with left hand and loosen the screw counterclockwise with 4mm Allen key with right hand.
- ② Take out the black washer.
- ③ Take out the wheel from the motor hub slightly. *** See Fig. #3

4.



● Replacing the wheel

- ① Take a new proper wheel (1D:Ø4-5mm; 2D:Ø6-13mm).
 - ② To re-install the wheel, reverse steps taken to remove wheel. *** See Fig. #4,3,2,1
- ★ The motor hub is very precise, it will be damaged by excessive force and affect the position of wheel accordingly.

⚠ Caution

1. Determine the material of end mill before grinding. Please use **SDC diamond wheel for carbide end mill**; please use **CBN diamond wheel for HSS end mill**.
2. Determine the flute of the end mill and use the proper collet holder; EMG-413 is suitable for 2, 3, and 4 flute end mill.
3. Aligning end mill is the most important among the steps, make sure to complete this step before grinding.
4. **This machine is guaranteed for one year under normal operating (expendable parts and wheels are exceptions)**, please inform the serial no. (See back picture in page2) when the machine need to be repaired.
5. For end millØ4-5mm, be sure with very slight push motion while grinding the primary edge due the outer diameter of wheel is smaller.
6. The motor cannot run continuously over 1 hour.

E. MAINTENANCE

● 1-1 Cleaning screws in collet holders



- ① Clean the collet holder with the pressurized air toward to the inner and outer threads.
- ② Using pressurized air, blow the dust out of the bearing. Clean the dust in bearing with air gun. ***See Picture #1-1

● 1-2 Cleaning nuts of collet holders



- ① Clean nut with pressurized air toward to the inner thread.
- ② Clean the outer diameter of nut with pressurized air.
- ③ Wipe the outer diameter of nut with dry cloth. ***See Picture #1-2

● 1-3 Cleaning collets



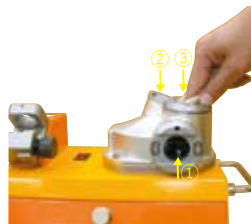
- ① Clean the outer diameter of collets with pressurized air.
- ② Clean the interstices of collet with pressurized air.
- ③ Clean thoroughly with dry cloth. ***See Picture #1-3

● 2-1 Cleaning the outside machine



- ① Clean the body and alignment base with pressurized air.
- ② Clean the wheel cover with pressurized air.
- ③ Wipe the outer machine and rubber base with clean dry cloth. ***See Picture #2-1

● 2-2 Cleaning sharpening ports



- ① Using the pressurized air, blow the grinding dust out of machine from the grinding port #1.
- ② Wipe the three sharpening ports with clean dry cloth.
- ③ Wipe the three ports with diluted antirust oil. ***See Picture #2-2

● 3-1 Removing the fuse



- ① Use a flat-head screw driver to push out the cover slightly from inward to outward.
 - ② Take out the fuses and replace a new one. (2 fuses included)
- ★ One fuse for backup, the other one for use. ***See Picture #3-1

● 3-2 Replacing the fuse



- ① After change the new fuse, push the cover into the original position slightly with a click to get the fixed position.
- ② Switch on the machine to check whether everything is regular. ***See Picture #3-2

⚠ Caution

1. Switch off the machine and unplug the machine before changing accessories or cleaning the machine. Place the machine at a safe location after use, do not place it at any high location to avoid it falling and damage the machine.
2. Be sure to do every cleaning well to maintain the life of machine, especially for the three sharpening ports. If not, the accessories may be worn down and affect the precision of grinding.
3. Equipped with fuse, be sure to select the proper voltage. Please change the fuse by yourself if plug the improper voltage. *** See Picture #3-1, 3-2
4. The rubber base should not be placed at any amycitic object to avoid unstable the machine.

END MILL Re-sharpener

EASY

FAST

PRECISION



EMG-413



10 pcs ER collets
2 pcs collet holders



SDC Wheel for ϕ 4mm- ϕ mm



SDC Wheel for ϕ mm- ϕ 13mm

2 pcs SDC Wheels included (For carbide End Mill only)



EARTH-CHAIN

Power that works.