



Edition : 2
Date: (10/26)

Instruction Manual

TOOL & CUTTER GRINDER TM-6025Q

Order Code: (G198)

MACHINE DETAILS

MACHINE

Tool & Cutter Grinder

MODEL NO.

TM-6025Q

SERIAL NO.

DATE OF MANF.

IMPORTED BY

AUSTRALIA



www.machineryhouse.com.au

NEW ZEALAND



www.machineryhouse.co.nz

NOTE:

This manual is only for your reference. At the time of the compiling of this manual every effort to be exact with the instructions, specifications, drawings, and photographs of the machine was taken. Owing to the continuous improvement of the TM Toolmaster machine, changes may be made at any time without obligation or notice. Please ensure the local voltage is the same as listed on the specification plate before operating any electric machine.

SAFETY SYMBOLS:

The purpose of safety symbols is to attract your attention to possible hazardous conditions



WARNING Indicates a potentially hazardous situation causing injury or death



CAUTION Indicates an alert against unsafe practices.

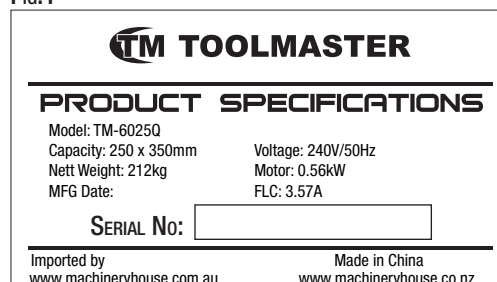
Note: Used to alert the user to useful information



NOTE:

In order to see the type and model of the machine, please see the specification plate. Usually found on the back of the machine. See example (Fig.1)

Fig.1



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1.1 SPECIFICATIONS

Order Code	G198
MODEL	TM-6025Q
Maximum Grinding Capacity Diameter (mm)	250
Longitudinal Travel X Axis (mm)	400
Cross Travel Y Axis (mm)	150
Vertical Head Travel Z Axis (mm)	140
Swivel Head Capacity (deg)	0 - 360
Grinding Wheel Speed (rpm)	4200 / 7000
Centre Height (mm)	135
Centre Distance (mm)	210
Spindle Head Tape (MT)	4
Table Size (mm)	680 x 130
Motor Power (kW / hp)	0.56 / 0.75
Voltage / Amperage (v / amp)	240 / 10
Nett Weight (kg)	212

1.2 INCLUDED ACCESSORIES

- End mill grinding attachment
- Drill grinding attachment
- Tool rest attachment
- 4MT Dividing attachment
- 22, 27, 32mm, arbors
- 4MT arbors and lathe tool holders
- 5C collets 6,8,10,12,16,20,25mm
- Lathe tool grinding holder
- 1 x Diamond dish grinding wheel
(MOUNTED ON MACHINE)



1.3 IDENTIFICATION

Become familiar with the names and locations of the controls and features shown below to better understand the instructions when mentioned later in this manual.



A	Grinding wheel motor	F	Table
B	Motorized Head	G	Table stops
C	Diamond Wheel	H	Hand wheel for cross slide
D	3 Jaw Chuck	I	Longitudinal Hand Wheel
E	Rotary Scale	J	Hand Wheel moves the grinding wheel up and down

2.1 GENERAL METALWORKING MACHINE SAFETY

DO NOT use this machine unless you have read this manual or have been instructed in the use of this machine in its safe use and operation



WARNING!

This manual provides safety instructions on the proper setup, operation, maintenance, and service of this machine. Save this manual, refer to it often, and use it to instruct other operators. Failure to read, understand and follow the instructions in this manual may result in fire or serious personal injury—including amputation, electrocution, or death.

The owner of this machine is solely responsible for its safe use. This responsibility includes, but is not limited to proper installation in a safe environment, personnel training and authorization to use, proper inspection and maintenance, manual availability and comprehension of the application of the safety devices, integrity, and the use of personal protective equipment.

The manufacturer will not be held liable for injury or property damage from negligence, improper training, machine modifications or misuse.



Safety glasses must be worn at all times in work areas. Earmuffs should be worn if the work area is noisy.



Sturdy footwear must be worn at all times in work areas.



Gloves should NOT be worn when operating machinery. Should only be worn when handling the material.



Long and loose hair must be contained with a net or under a hat.

OWNER'S MANUAL. Read and understand this owner's manual before using the machine.

DISCONNECT POWER FIRST. If using power, always disconnect the machine from power supply before making adjustments, or servicing the machine. This prevents any risk of injury from unintended startup or contact with live electrical equipment

TRAINED OPERATORS ONLY. Operators that have not been trained have a higher risk of being seriously injured. Only allow trained or supervised people to use this machine. When the machine is not being used, disconnect the power to the machine to prevent unauthorized use—especially around children. Make the workshop safe.



CAUTION!

It is impossible to cover all possible hazards. All workshop environments are different. These are designed as a guide to be used to compliment training and as a reminder to users prior to equipment use. Always consider safety first, as it applies to the individual working conditions.

2.1 GENERAL METALWORKING MACHINE SAFETY Cont.

WEARING PROPER APPAREL Do not wear clothing, apparel or jewellery that can become entangled in moving parts. Always tie back or cover long hair. Wear non-slip footwear to avoid accidental slips, which could cause loss of operating control.

HEARING PROTECTION. Always wear hearing protection when operating or observing loud machinery. Extended exposure to this noise without hearing protection can cause permanent hearing loss.

REMOVE ADJUSTING TOOLS. Tools left on machinery can become dangerous projectiles upon startup. Never leave hex keys, wrenches, or any other tools on machine. Always verify removal before starting!

USE CORRECT TOOL FOR THE JOB. Only use the tool for its intended purpose. Do not force the machine or its attachments to do a job for which they were not designed. Never make unapproved modifications. Modifying the machine or using it differently than intended may result in malfunction or mechanical failure that can lead to personal injury or death!

AWKWARD POSITIONS. Keep proper footing and balance at all times when operating machine. Do not overreach! Avoid awkward hand positions that make operating control difficult. This could increase the risk of accidental injury

GUARDS & COVERS. Guards and covers reduce accidental contact with moving parts or flying debris. Make sure they are properly installed, undamaged, and working correctly.

DUST PROTECTION. Only use safety equipment that has been approved by an appropriate standards agency. Breathing protection must be approved for specific hazards in the work area.

FORCING MACHINERY. Do not force the machine. It will do the job safer and better at the rate for which it was designed.

NEVER STAND ON MACHINE. Serious injury may occur if the machine is tipped or if the cutting tool is unintentionally contacted

STABLE MACHINE. Unexpected movement during operation greatly increases risk of injury or loss of control. Before starting, verify machine is stable and if using a mobile base it is locked in position.

UNATTENDED OPERATION. To reduce the risk of accidental injury, turn the machine OFF and ensure all moving parts have completely stopped before walking away. Never leave the machine running while unattended.

MAINTAIN WITH CARE. Follow all maintenance instructions and lubrication schedules to keep the machine in good working condition. A machine that is improperly maintained could malfunction, leading to serious personal injury or death.

CHECK DAMAGED PARTS. Regularly inspect the machine for any condition that may affect the safe operation. Immediately repair or replace damaged or parts that are incorrectly fitted before operating.

CHILDREN & BYSTANDERS. Keep children and bystanders at a safe distance from the work area. Stop using machine if they become a distraction.

USE PROPER EXTENSION CORD. Make sure any extension cord being used is in good condition and the right amperage for the machine. Your extension cord must also contain a ground wire and plug pin. Always repair or replace extension cords if they become damaged.



WARNING!

DO NOT operate any machine before it is fully assembled and all guards have been fitted and secured. Failure to do so may cause death or injury.

2.2 SPECIFIC SAFETY FOR UNIVERSAL GRINDERS

DO NOT use this machine unless you have been instructed in its safe use and operation and have read and understood this manual



Safety glasses must be worn at all times in work areas.



Long and loose hair must be contained.



Gloves must not be worn when using this machine.



Sturdy footwear must be worn at all times in work areas.



Close fitting/protective clothing must be worn.



Dust masks must be worn when using abrasive grinding wheels.

PRE-OPERATIONAL SAFETY CHECKS.

- ✓ Locate and ensure you are familiar with all machine operations and controls.
- ✓ Ensure all guards are fitted, secure and functional. Do not operate if guards are missing or faulty.
- ✓ Check workspaces and walkways to ensure no slip/trip hazards are present.
- ✓ Ensure the wheel is secure and is not damaged and that the work piece is secured and safe.
- ✓ Check that the wheel is running true and are not glazed or loaded.
- ✓ Check for cracks in the wheel and report any you find.

OPERATIONAL SAFETY CHECKS

- ✓ Stand to the side of the wheel when starting up.
- ✓ Let the wheel gain maximum speed before starting to grind.
- ✓ Only one person may operate this machine at any one time.
- ✓ Slowly move the workpiece across the face of the wheel in a uniform manner.

ENDING OPERATIONS AND CLEANING UP

- ✓ Switch off the machine when work is completed.
- ✓ Clean up and absorb any coolant spills immediately.
- ✓ Leave the machine in a safe, clean and tidy state.

DON'T

- ✗ Do not use faulty equipment. Immediately report any suspect machinery.
- ✗ Do not hold workpiece with gloves, cloth, apron or pliers.
- ✗ Do not grind non-ferrous metals.
- ✗ Do not hold small objects by hand.
- ✗ Never leave the machine running unattended.
- ✗ Do not bend down near the machine while it is running.
- ✗ Never force the workpiece against a wheel.

POTENTIAL HAZARDS AND INJURIES

- | | |
|---|--|
| ☐ Hot metal. | ☐ Sparks. |
| ☐ Sharp edges and burrs. | ☐ Wheels 'run on' after switching off. |
| ☐ Eye injuries. | ☐ Hair/clothing getting caught in moving machine parts. |



WARNING!

Machines are safeguarded to protect the operator from injury or death with the placement of guards. Machines must not be operated with the guards removed or damaged.

3. POWER SUPPLY

3.1 ELECTRICAL INSTALLATION

Place the machine near an existing power source. Make sure all power cords are protected from traffic, material handling, moisture, chemicals, or other hazards. Make sure there is access to a means of disconnecting the power source. The electrical circuit must meet the requirements for 240V.

NOTE : *The use of an extension cord is not recommended as it may decrease the life of electrical components on your machine.*

ELECTRICAL REQUIREMENTS

Nominal Voltage.....	240V
Cycle.....	50 Hz
Phase.....	Single Phase
Power Supply Circuit.....	10 Amps
Full Load Current.....	3.57 Amps

(Full load current rating is also on the specification plate on the motor.)

3.2 FULL-LOAD CURRENT RATING

The full-load current rating is the amperage a machine draws when running at 100% of the output power. Where machines have more than one motor, the full load current is the amperage drawn by the largest motor or a total of all the motors and electrical devices that might operate at one time during normal operations.

Full-Load Current Rating for this machine at 240V is 3.57 Amps

It should be noted that the full-load current is not the maximum amount of amps that the machine will draw. If the machine is overloaded, it will draw additional amps beyond the full-load rating and if the machine is overloaded for a long period of time, damage, overheating, or fire may be caused to the motor and circuitry.

This is especially true if connected to an undersized circuit or a long extension lead. To reduce the risk of these hazards, avoid overloading the machine during operation and make sure it is connected to a power supply circuit that meets the requirements.



4. SET-UP

4.1 UNPACKING

This machine was carefully packaged for safe transport. When unpacking, separate all enclosed items from packaging materials and inspect them for shipping damage. If items are damaged, please contact your distributor.

NOTE: Save all the packaging materials until you are completely satisfied with the machine and have resolved any issues with the distributor, or the shipping agent.

When unpacking, check the packing list to make sure that all parts shown are included. If any parts are missing or broken, please contact your distributor.



4.2 CLEAN - UP

The unpainted surfaces of the machine have been coated with a waxy oil to protect them from corrosion during shipment. Remove the protective coating with a solvent cleaner or a citrus based degreaser.

Optimum performance from your machine will be achieved when you clean all moving parts or sliding contact surfaces that are coated with rust preventive products.

It is advised to avoid chlorine based solvents, such as acetone or brake parts cleaner, as they will damage painted surfaces and strip metal should they come in contact. Always follow the manufacturer's instructions when using any type of cleaning product.

4.3 SITE PREPARATION

When selecting the site for the machine, consider the largest size of workpiece that will be processed through the machine and provide enough space around the machine for operating the machine safely. Consideration should be given to the installation of auxiliary equipment. Leave enough space around the machine to open or remove doors/covers as required for the maintenance and service as described in this manual.

It is recommended that the machine is anchored to the floor to prevent tipping or shifting. It also reduces vibration that may occur during operation.

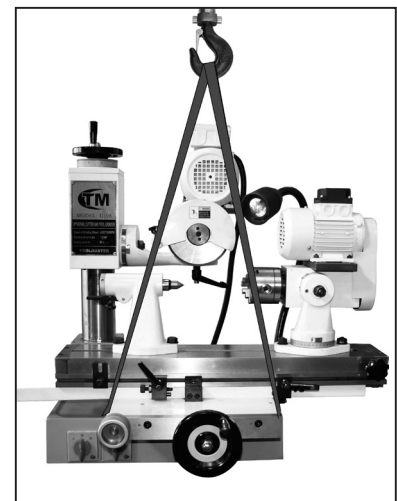
4.4 LIFTING INSTRUCTIONS



WARNING *This machine is extremely heavy. Serious personal injury may occur if safe moving methods are not followed. To be safe, you will need assistance and power equipment when moving the shipping crate and removing the machine from the crate.*



On the day that the machine arrives, make sure that a forklift or lifting device, with sufficient capacity is available to unload the machine from the vehicle. Ensure access to the chosen site is clear and that doors and ceilings are sufficiently high and wide enough to receive the machine.



4.5 ASSEMBLY

The machine must be fully assembled before it can be operated. First clean any parts that are coated in rust preventative to ensure the assembly process can proceed smoothly.

Column Height.

Note: The machine comes with the main column lowered in the base.

Before lifting machine as per manual instructions with sling, ensure the column is securely locked in the base. (Fig. 4.1)

To do this, tighten the ratchet lever at the rear the machine to clamp column from sliding out. After the machine is set up in place, the column assembly can be lifted higher into a second operation position. The position used, depends on the job at hand. With assistance due to the weight of the column assembly, undo the ratchet lever and the assembly should be able to swivel freely. It can also be lifted up in base to its higher position. To do this, slide it up above the top position grub screw, then screw the grub screw in to stop the column sliding back down. Tighten up the ratchet lever.

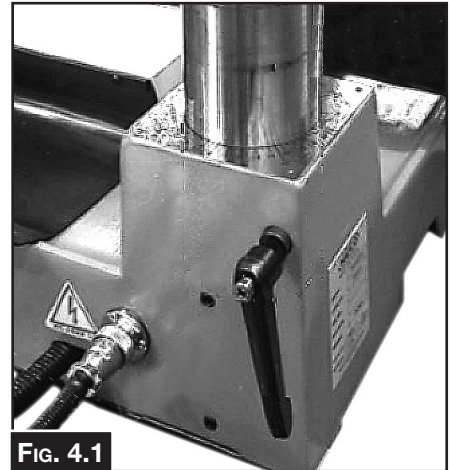


FIG. 4.1

Handles

Locate the handles and screw them into the cross slide hand wheel and the vertical hand wheel. (Fig. 4.2)

Once the handles have been attached, adjust the lock nut so that the handle can turn, but are not loose.

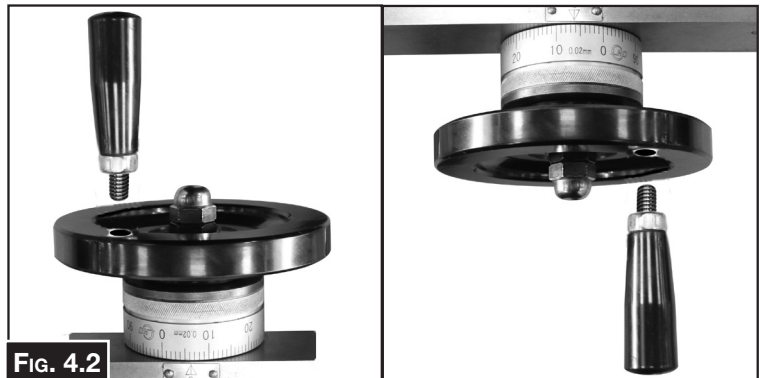


FIG. 4.2

5. OPERATION

This machine may perform many types of operations that are beyond the scope of this manual. Many of these operations may be dangerous or deadly if performed incorrectly.

The instructions in this section are written with the understanding that the operator has the necessary knowledge and skills to operate this machine. If at any time you are experiencing difficulties performing any operation, stop using the machine! **Above all, your safety should come first!**

5.1 OPERATION OVERVIEW

This overview purpose is to provide a novice machine operator with a basic understanding of how the machine is used during operation, and so that if the machine controls or components are mentioned later in this manual, it will be easy to understand. The overview is not intended to be an instructional guide and is only generic in nature. To learn more about the specific operation, read this entire manual and seek additional training from an experienced machine operator. Another source of information may be found in video's on websites or by reading trade magazines.

5.1 OPERATION OVERVIEW Cont.

Tool Mounting: Clamp the cutting tool securely in a collet, chuck, or between the headstock and tailstock centers.

Wheel Selection: Choose an abrasive wheel (such as aluminum oxide for high-speed steel or diamond for carbide) suited to the tool material.

Axis and Angle Adjustment: Swivel the work table or tilt the wheel head to align the tool's cutting edge and achieve precise primary and secondary clearance angles.

Setting Stops: Adjust travel limits and tooth rests to feed the tool smoothly against the wheel face without over-grinding.

Grinding Execution: Engage the spindle and feed the workpiece incrementally across or into the rotating wheel while monitoring sparks and edge dimensions.

5.2 MOUNTING THE WHEEL

- A. If selecting a wheel not supplied with the machine, refer to a wheel speed chart to insure that the speed is correct for the wheel shape and size. (Please contact a grinding wheel dealer for this information).
- B. Supplied is a Diamond wheel suitable for HSS and carbide grinding. We also recommend that the machine use a 5 " flared cup, aluminum oxide, grinding wheel. The best grade is vitrified bonded 60 grit. Dress the wheel with a dressing stick. Dish the face about 10 °, and smooth the periphery and your wheel is ready to work.
- C. Check grinding wheel to ensure the wheel is not cracked.
- D. Never alter the bore of the grinding wheel or force a wheel onto spindle.
- E. Apply one clean, smooth blotter on each side of the wheel under each flange.
- F. Stand away from the front and the back of the wheel when first starting the grinding wheel. Before commencing to grind, run the wheel for at least one minute to test the wheel.
- G. Always store the grinding wheel at a dry and moderate temperature place.
- H. Please follow the instruction of the mounting and dressing of the grinding wheel in this manual.
- I. Do not wear rings, wrist watches, or loose long-sleeve shirts when operating this machine.

To Change The Wheel:

- 1. **Unplug the machine:** Turn off and unplug the tool and cutter grinder to prevent accidental start-up.
- 2. **Inspect the new wheel:** (Aluminium Oxide) Perform a ring test on the new wheel by gently tapping it with a non-metallic object to listen for a clear ring (indicating it is free of cracks).
- 3. **Check blotters:** Ensure clean, smooth blotters or paper washers are placed on both sides of the grinding wheel under the flanges.
- 4. **Lock the spindle:** Use appropriate spanner wrenches on the spindle flats to secure the shaft.
- 5. **Remove the lock screw:** Loosen the wheel retaining screw.
- 6. **Take off the flange and wheel:** Remove the outer flange and carefully slide the old wheel off the spindle boss or hub. Never force a wheel or alter its bore size.
- 7. Slide the new wheel gently onto the spindle. Do not force it onto the shaft and secure and test run for at least one minute before starting any work.



5.3 WHEEL DRESSING

1. For an aluminium Oxide wheel you can use a dressing stick to manually dress the edge of the cup wheel with a sharp 10 ° angle. This should be done before using the machine,
2. The other method is to use a diamond dresser to dress the wheel. The procedures is below.

(1) Lower the wheel head until the spindle centre is slightly higher than the diamond nib.

2) Mount the dividing attachment on the table and insert the lathe tool holder. Secure the diamond dresser using the clamp screws. Tilt the diamond to an angle of 85 degrees to the wheel to be dressed.

(3) Cross feed the table until the diamond nib is within 1mm of the wheel. Start the spindle, and lower the head until you hear the diamond just touch the wheel. Traverse the table slowly across the wheel to dress it.

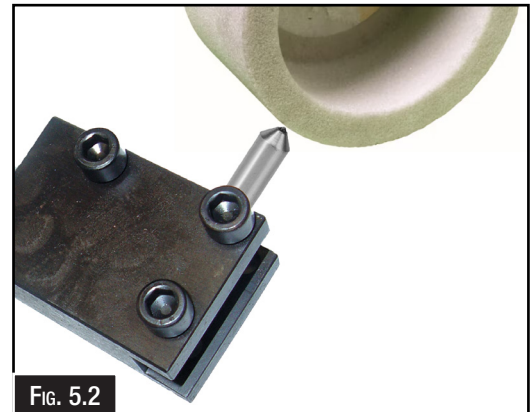


FIG. 5.2

NOTE! The down feed rate each time should not be over 0.001 ". Heavy cuts will dislodge the diamond.

Dressing will allow the periphery of the wheel to be concentric to the spindle and will help balance the wheel and remove vibration.

(4) Re-sharpen the cutting surface of the grinding wheel frequently or when the finish is poor.

5.4 RELIEF ANGLES.

a. Relief Angle.

The relief is defined as the amount of stock removed from the tooth behind the cutting edge, so the cutter can cut freely clear the material after the cutting edge touches the work piece.

The relief Angle is very important for a cutter. If the angle is too small a drag force will be generated when the tooth is ground. If the angle is too large, then rapid wear will occur at the cutting edge and it will tend to chatter when cutting. Preference should be given to the smaller relief angles rather than the larger relief angles The larger relief angles will not cut accurately while the smaller angles will still work accurately.

The correct relief angle is determined by a number of factors.

It is usually determined mainly by the type and size of the cutter and the hardness of the material to be cut. For example, to machine soft materials such as brass, the relief angle can be larger than what is required for machining hard materials, such as cast iron or steel. The relief angle of small diameter cutters should be larger. The proper relief angle must be determined by results. If the Relief Angle on the cutter has given you a good result it should be recorded for future reference. The general ranges of relief angles for typical tools and materials are listed below.

Cutter	Tool Material	Work Material		
		Steel	Cast Iron	Non Ferrous
Peripheral or O.D. Cutting Edge	High Speed Steel	5 ° - 10 °	5 ° - 10 °	7 ° - 12 °
	Cast Alloys	4 ° - 6 °	4 ° - 6 °	5 ° - 10 °
	Cemented Carbides	4 ° - 6 °	4 ° - 6 °	5 ° - 10 °
Side And Face Cutters	All	1 ° - 4 °	1 ° - 4 °	2 ° - 7 °

Smaller diameter cutters require larger relief angles

5.4 RELIEF ANGLES Cont.

b. Land Width

The land is the flat area behind the cutting edge. Usually the width of the land is from 0.78mm to 1.6mm depend on the type and size of cutters.

Due to repeatably grinding, the width of the land will become wider, and will cause the heel of the tooth to drag on the work.

To reduce the width of the land, the primary or secondary clearances are ground at the back of the cutting edge as shown in the relief angle of the tooth face. It is unnecessary to consider the relief angle, when grinding formed cutters and involute gear cutters which are resharpened by radial grinding, the cutting relief angle can be maintained unchanged.

Relief on New Cutter

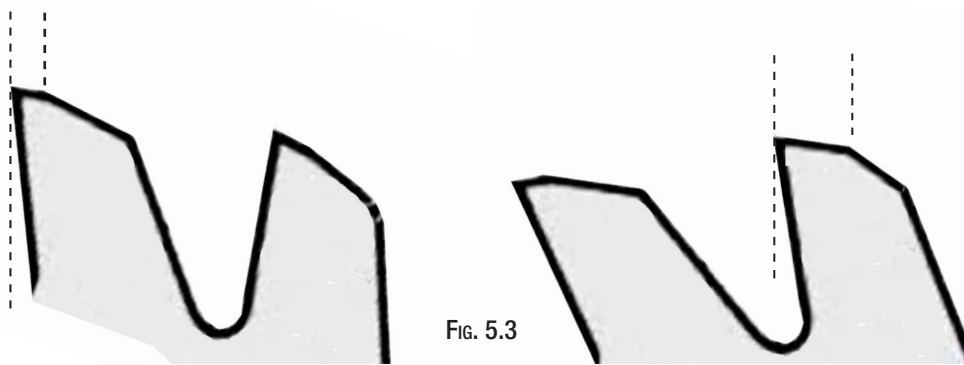


Fig.5.3 -Width of land increases with repeated sharpening, causing interference with the clearance angle as shown by dotted lines on the land width.

c. The determination of the relief angle.

In general, the setting of the relief angle is first to bring the center of the wheel and cutter, and the toothiest blade end, all on the same height, then raise or lower the wheel head to the proper distance to get the desired relief angle. When the straight wheel is used the moving distance is determined by the diameter of the wheel. While the cup wheel is used the relief angle is determined by the diameter of the cutter.

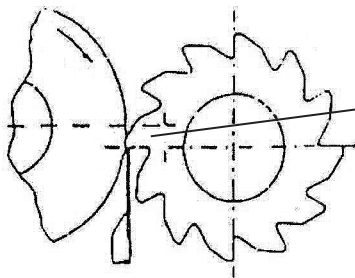


Fig.5.4 - Developing the relief angle when using a straight wheel

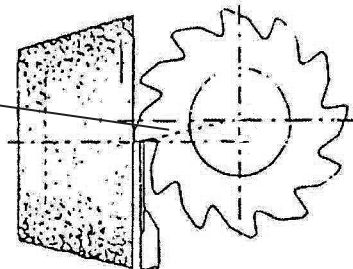


Fig.5.5 - Developing the relief angle when using a cup wheel



WARNING!

Abrasive sparks from grinding can cause serious and permanent eye damage. Always use a face shield and safety glasses together to insure best eye protection.

5.4 RELIEF ANGLES Cont.

1. Toothrest setting, when the straight wheel is used.

As shown in Fig. 5.4 and Fig. 5.5 on the previous page, the center distance between the grinding wheel and cutter is determined by the relief angle. The setting method is as follows:

- (1) Select the appropriate grinding device for the job and mount it on the table.
Set the center of the grinding wheel at the same height with the center of the cutter. This can be done by using a height gauge.
- (2) Mount the tooth rest on the table. Set the blade end of the tooth rest at the same height with the center of the cutter. This again can be done by using a height gauge.
- (3) Lower or raise the wheel head the calculated distance "C" to get the desired relief angle. (Lower or Raise is determined by the rotation direction).

The distance "C" can be calculated by the following formula:

Wheel Diameter (inches) X relief angle (degrees) x 0.0087

Example:

Using a 6" diameter straight grinding wheel.

7 degrees of the relief angle is required

$$C = 6 \text{ " } \times 7 \text{ } \times 0.0087 = 0.565$$

2. The setting of tooth rest, when the cup wheel is used:

As shown in Fig. 5.6 a cup wheel is used to sharpen a cutter. The setting procedure of tooth rest is as follows:

- (1) Mount the tooth rest on the wheel head. Set the blade end at the same height as the center of the cutter by height gauge.
- (2) Raise or lower the wheel head the calculated distance C using the following formula.

C-cutter diameter x Relief Angle X 0.0087

Example:

Using a 4 " cup grinding wheel.

Sharpening a 3 " diameter cutter.

The relief angle required is 5 degrees, distance C is as following.

$$C = 5 \text{ } \times 3 \text{ " } \times 0.0087 = 0.130 \text{ "}$$

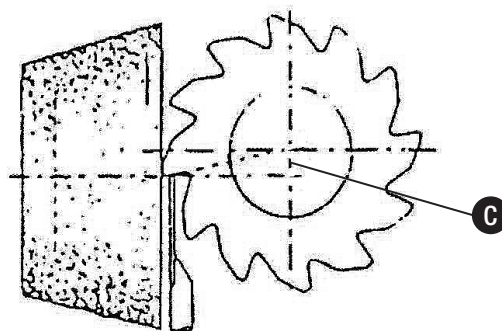


FIG. 5.6

5.5 GRINDING END MILLS AND SLOT DRILLS

GRINDING THE CUTTING EDGE:

Place the End Mill and Slot Drill attachment on the grinder. Select the suitable 5C collet to hold the shank of the End Mill or Slot Drill. Put the 5C collet into the sleeve along the key way, and then rotate the knurled sleeve to lock the cutter in the collet.

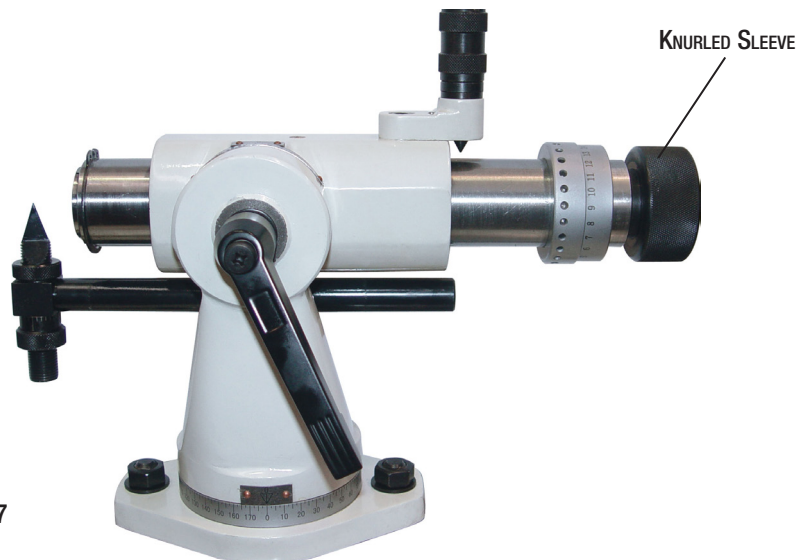


FIG. 5.7

1. **Inspect and Prep the Tool:** Clean the end mill thoroughly with a wire brush or solvent to remove resin, chips, and oil.
2. **Inspect for damage.** If the flutes are badly chipped, you may need to cut off the damaged end using a cutoff wheel before sharpening.
3. **Set Up the Grinder:** Mount the correct wheel based on the tool material (Diamond for carbide, CBN/Aluminum Oxide for HSS).
4. **Mount the end mill:** into the end mill fixture using a precise collet. Indicate the tool using a dial indicator to ensure it runs completely true.
 - a. Select the suitable 5C collet to hold the shank of the End Mill or Slot Drill.
 - b. Put 5C collet into the sleeve along the key way, and then rotate the knurled sleeve to lock it firmly. (Fig. 5.8)

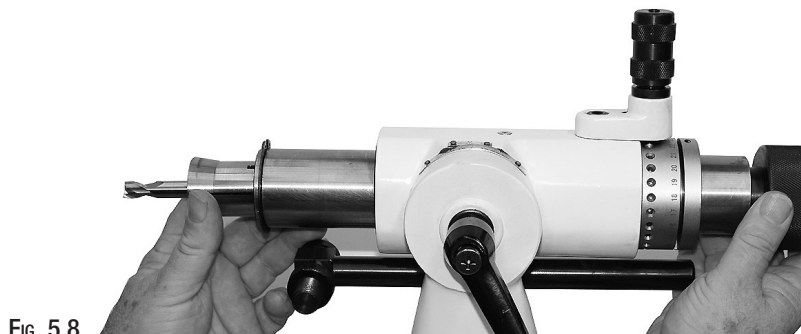


FIG. 5.8



WARNING!

Abrasive wheels are designed to operate at a maximum speed. Exceeding the speed could cause the wheel or disk to break or de-laminate, resulting in injury or serious eye damage.

5.5 GRINDING END MILLS AND SLOT DRILLS Cont.

Grinding 1st Relief Angle

1. Set the end mill grinding attachment to the correct position.
2. Pull the sleeve all the way back, then adjust one of the flutes on the the tooth rest
3. Push the index ring forward. Insert the spring locating pin into the index holes according to the quantity of blades. Then remove the tooth rest, as Figure 5.9.

FIG. 5.9



4. Adjust the Grinding wheel's center to be on the same level of cutter's center. The grinding wheel center should be lifted up by a short amount of distance-C as shown in Figure 5.10. Please refer to page 15 (C) for calculation method of C.

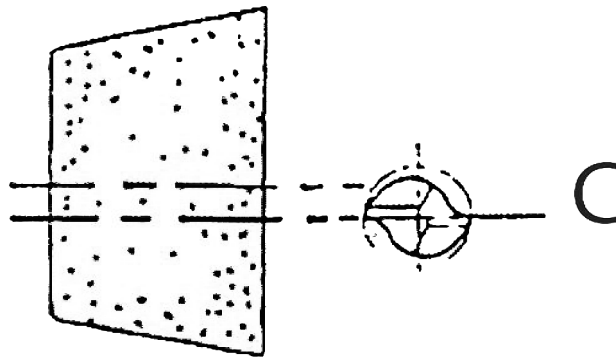


FIG. 5.10

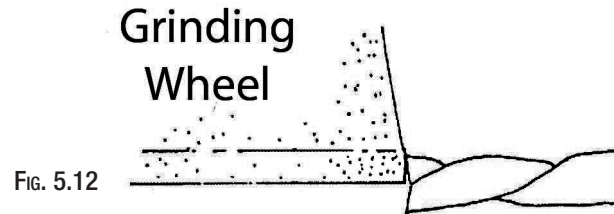
- (5) Loosen the base of the End Mill Grinding Attachment so that it can be swiveled and adjust it 1° - 5° as in required. (Fig. 5.11)



FIG. 5.11

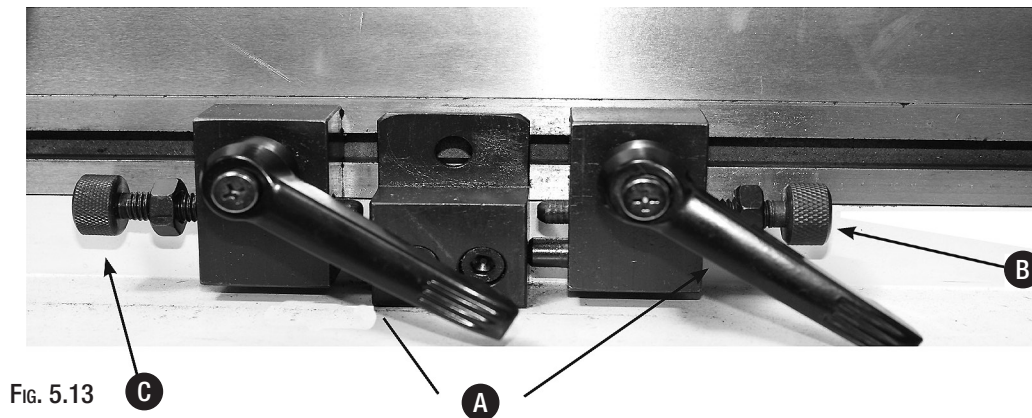
5.5 GRINDING END MILLS AND SLOT DRILLS Cont.

- (6) Adjust the table and saddle to position the cutter end. Touch the first Relief Side and grinding wheel's edge slightly as Fig. 5.12.



- (7) Switch on the grinding wheel (clockwise), and rotate the cross feed hand wheel to start grinding. Rotate Knob B & C for feeding. Rotate B forward while C backwards. (Fig. 5.13)

Important : Never surpass the cutter's center during grinding. Do the in feed grinding after all the cutting edges have been ground.



- (8) To grind another blade move the saddle away from the grinding wheel, release the index pin. Then rotate the index plate until the correctly selected index number appears, then insert the index pin into the slot beside the number. as Fig. 5.14. Repeat steps (6)—(8) to grind each tooth.



WARNING!

Before connecting the grinder to the power, rotate the wheels by hand to ensure that the wheels clear the tool rests and guards

5.5 GRINDING END MILLS AND SLOT DRILLS Cont.

(9) After grinding the 1st Relief Angle then do the grinding for 2nd Relief Angle, The lift level- C needed is shown as Fig. 5.15.

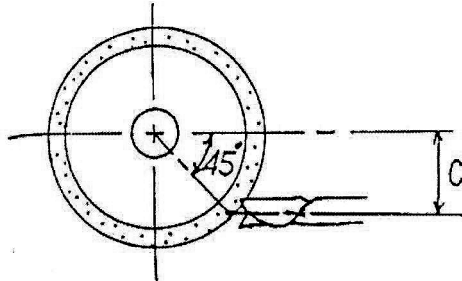


FIG. 5.15

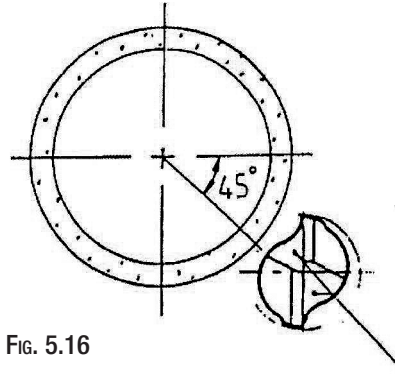


FIG. 5.16

Axial Relief angle

(10) Grinding methods as step (6)–(8).

(11) The width rate between 1st Relief and 2nd Relief face is around 1:2.

(12) The grinding angle of Axial Relief Angle is usually ground by forming a 45° angle between grinding wheel's center and cutter's centre. After the 2nd Relief grinding is finished the rest could be ground by the same steps. (Fig. 5.16)

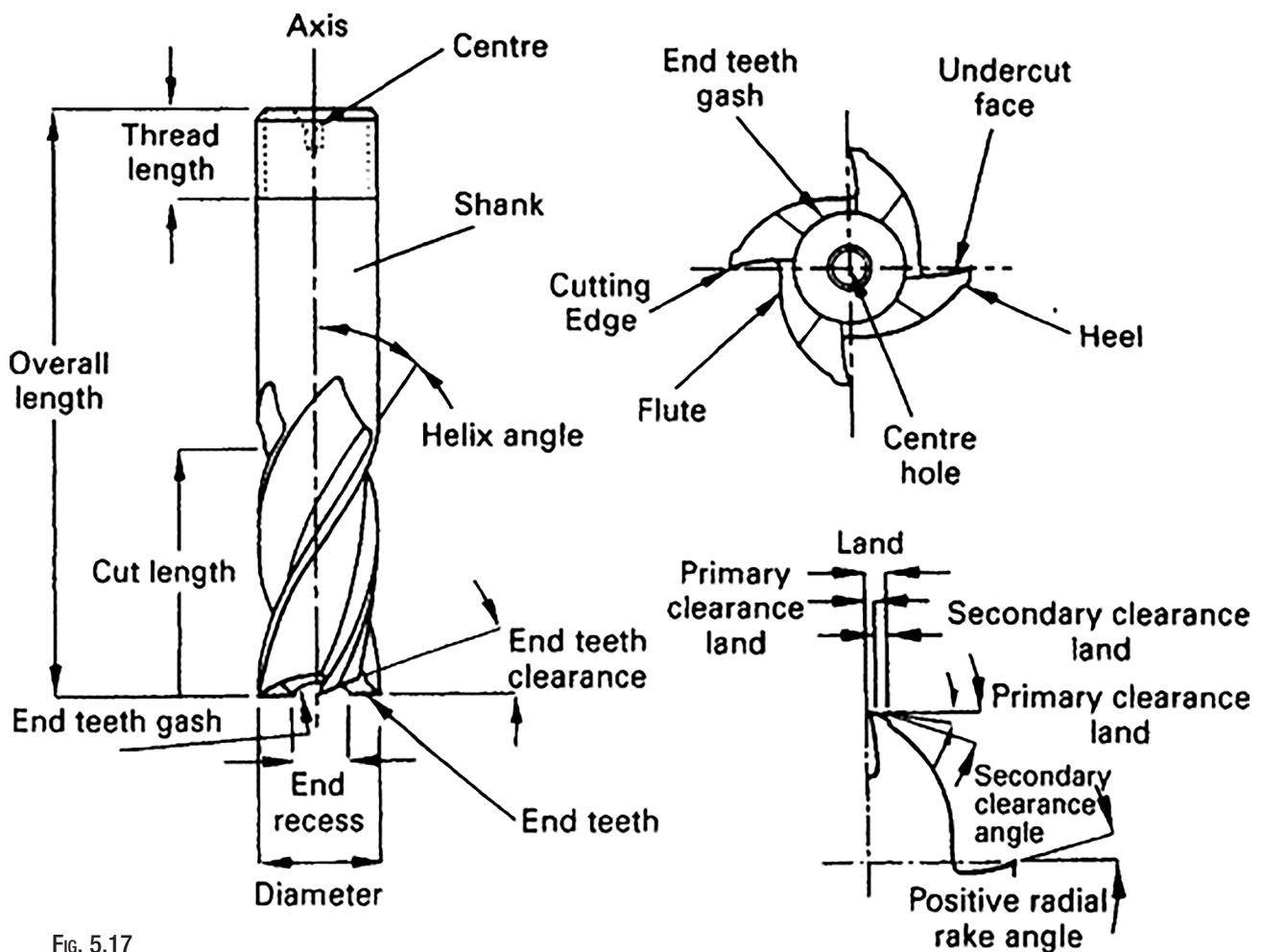


FIG. 5.17

5.5 GRINDING END MILLS AND SLOT DRILLS Cont.

GRINDING THE FLUTES:

NOTE: You should only sharpen an end mill on its diameter (the periphery or flutes) when the side cutting edges show signs of wear, such as edge rounding, chipping, or loss of dimensional finish, provided the reduced diameter still fits your part tolerance

A. Sharpen the Periphery / Outer Diameter (Optional) Sharpening the sides (flutes) is much more difficult because you must follow the helical spiral of the tool. Use a finger guide: Set up a mechanical tooth rest (a flexible steel finger) positioned right underneath the cutting edge. Match the primary relief: Set the clearance angle (usually 8° to 10° for the OD).

B. Guide the helix: Rest the flute against the finger guide. Manually push and rotate the end mill across the spinning grinding wheel, letting the helix slide smoothly over the guide finger. Repeat precisely: Grind every flute using identical machine settings to keep the tool balanced.

Note: Sharpening the outer diameter reduces the total diameter of your tool. You must measure the new diameter with a micrometer and note the change in diameter.

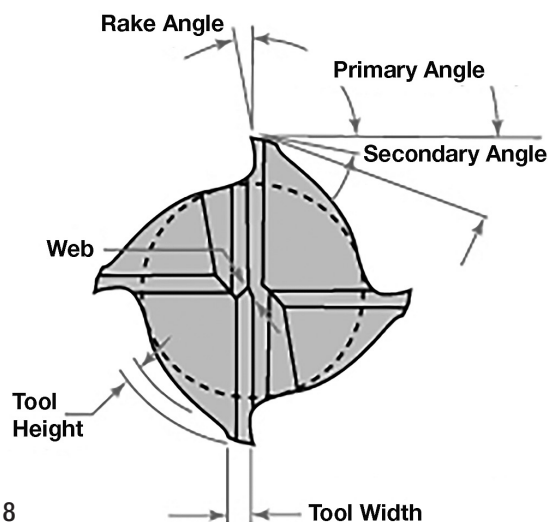


FIG. 5.18



Relief Angles by Tool Diameter (Sharpening Standard)

Smaller tools require larger relief angles to prevent the back or “heel” of the smaller radius from dragging along the freshly cut surface.

Tool Diameter (Inches)	Primary Relief Angle (1st Land)	Secondary Clearance Angle (2nd Land)
Over 1/2" (≥ 12.7 mm)	$8^\circ - 10^\circ$	$17^\circ - 18^\circ$
1/4" to 1/2" (6.35 – 12.7 mm)	$8^\circ - 10^\circ$	25° minimum

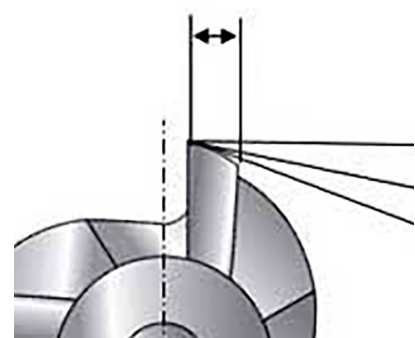
Land Width

The land is the flat area behind the cutting edge. Usually the width of the land is from 0.78mm to 1.6mm depend on the type and size of cutters.

Due to repeatably grinding, the width of the land will become wider, and will cause the heel of the tooth to drag on the work surface.

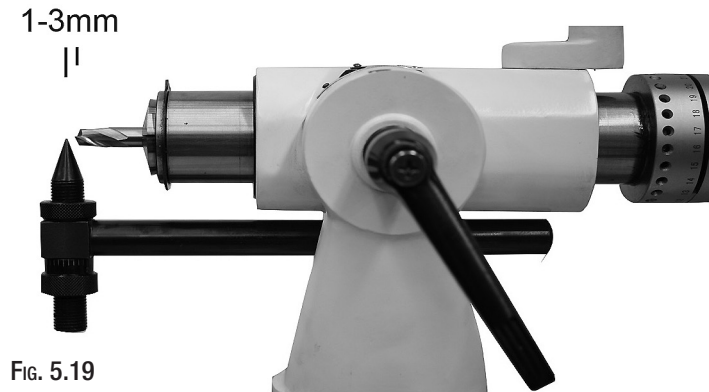
To reduce the width of the land, the primary or secondary clearances are ground at the back of the cutting edge. It is unnecessary to consider the relief angle, when grinding formed cutters and involute gear cutters.

Radial Land



5.5 GRINDING END MILLS AND SLOT DRILLS Cont.

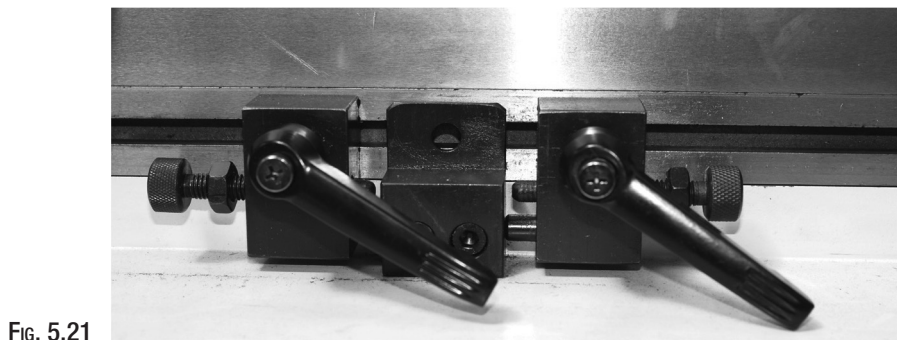
1. Loosen the positioning screw of the tooth rest, and then adjust the tooth rest to the position where the cutter will not touch the pointer when the sleeve is pulled all the way back.



2. Rotate the tooth rest into the inner edge of the cutter blade, and position it as close as possible to the edge to be ground making sure that there is clearance and the finger will not touch the grinding wheel. Move the tooth rest until the tooth rest's upmost point and the cutter's center are on the same line horizontally



3. Adjust the grinding wheel's center a little higher than cutter's center point. Adjust the table position to have tooth rest's tip to just clear the wheel edge and then adjust lock knob that secures the tooth rest. Lock the table with the Micro Adjustment screws to secure the table-firmly in longitudinally plane.



4. Move the spindle backwards and then push the spindle forward for a distance of the length of the flutes to ensure that all the flute length can be ground. Set the travel stops on the table so that the only travel will be the length of the flutes.

5.5 GRINDING END MILLS AND SLOT DRILLS Cont.

5. Activate grinding motor in clockwise direction.
6. Rotate cross feed Hand wheel till cutter touches the grinding wheel and generates sparks. Pull the sleeve slightly backwards, so that the cutter is ground. Rotate the sleeve as you move it forward and back naturally, being sure to never let the cutter part from the tooth rest. Don't force the cutter to rotate.

NOTE! Always have the grinding wheel traveling in the direction that will push the cutter onto the tooth rest.

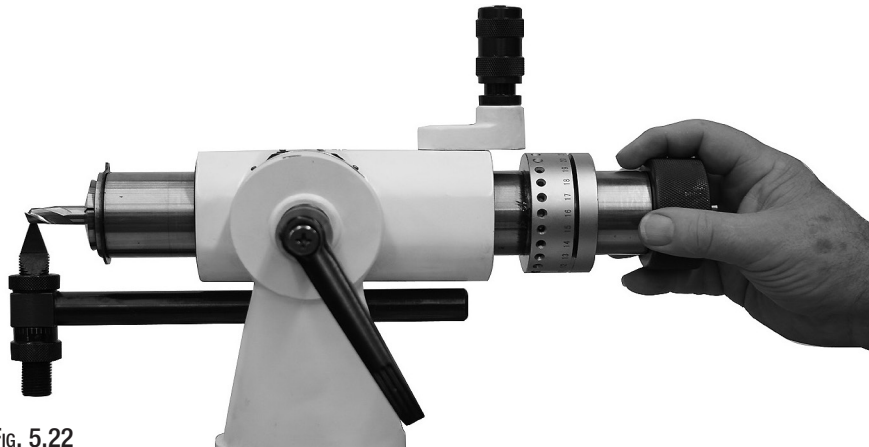


FIG. 5.22

7. When the flute is ground pull the cutter back away from the grinding wheel and off the tooth rest, and then rotate the sleeve to the next blade. Push the cutter forward to the start point and making sure that the flute is located on the tooth rest and start grinding. After all the blades are ground, rotate the in-feed hand-wheel away from the grinding wheel. Turn OFF the motor when finished.

Important : Do not let in-feed amount exceed 0.025mm (0.001 ") each time

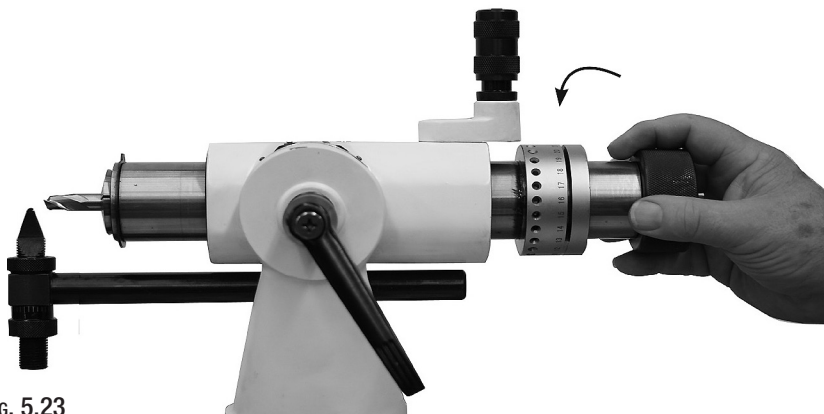


FIG. 5.23

8. The decision whether to grind the 1st Relief Angle first or the 2nd Relief Angle First does not really matter, but when the decision is made all the blades have to be ground on that relief angle before grinding another Relief Angle. Grinding method as step (4)—(7)
9. Width rate between 1st Relief Angle and the 2nd Relief Angle face is allowed on a ratio of around 1:2
10. After all the grinding steps are done release the cutter and the 5C collet from the sleeve. Tapping gently on the sleeve slightly could release the 5C collet with less effort.

5.6 DIVIDING ATTACHMENT

The dividing attachment is supplied with 3 arbors 32mm, 22mm and a lathe tool holder. The indexing plates allow any angle to be set up to provide the desired result.



FIG. 5.24

SHARPENING SIDE AND FACE CUTTERS

Sharpening side and face cutters on a universal tool and cutter grinder involves restoring both the periphery (side teeth) and the face (end/corner teeth) using the machine's tooth rest (follower finger) and appropriate relief angles.

1. Preparation and Setup

- **Wheel Choice:** Use a soft-grade grinding wheel (such as aluminum oxide for high-speed steel) to allow a free-cutting action and prevent overheating the cutting edges.
- **Layout/Marking:** Apply blueing or a black marker pen to the tooth faces to easily visualize where the wheel makes contact and check for even cleanup.
- **Mounting:** Mount the side and face cutter securely on a suitable arbor or work head on the dividing attachment mounted on the universal tool and cutter grinder

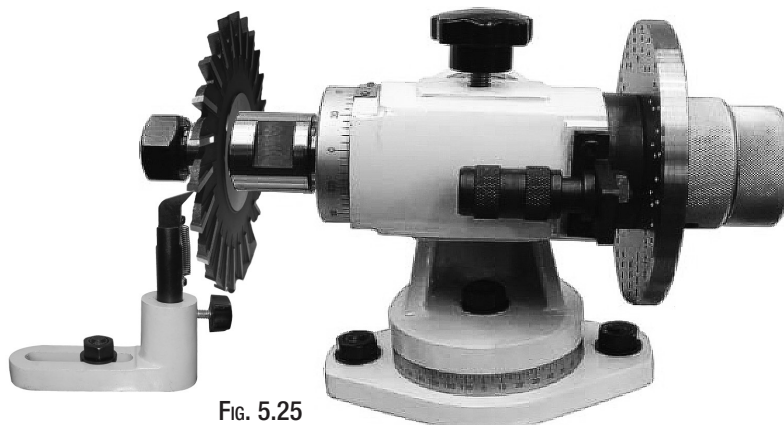


FIG. 5.25

5.6 DIVIDING ATTACHMENT Cont.

2. Sharpening the Periphery (Side Teeth)

- **Conventional Grinding Method:** Set the grinding wheel to spin towards the cutting edge (conventional grinding). This keeps the tooth firmly seated against the tooth rest and prevents the cutter from spinning or catching.
- **Positioning the Tooth Rest:** Place the adjustable tooth rest (follower finger) in contact with the back of the tooth being ground to act as a locator and indexing guide.
- **Setting the Relief Angle:**
 - Tilt the wheel head or adjust the height of the tooth rest relative to the wheel center to introduce the desired primary relief angle (typically around 5° to 7°, depending on cutter size and material).
 - Aim for a primary relief land width of about 1 mm to 1.5 mm.
- **Grinding Pass:** Feed the table smoothly across the wheel face, maintaining contact with the tooth rest. Take light passes (a couple of thousandths of an inch at a time) to avoid thermal damage.
- **Indexing:** Drop or move the cutter away from the wheel, index to the next tooth using the finger, and repeat the process around the entire circumference.

Secondary Relief: If the primary land becomes too wide after multiple sharpenings, grind a secondary clearance angle behind the primary land.

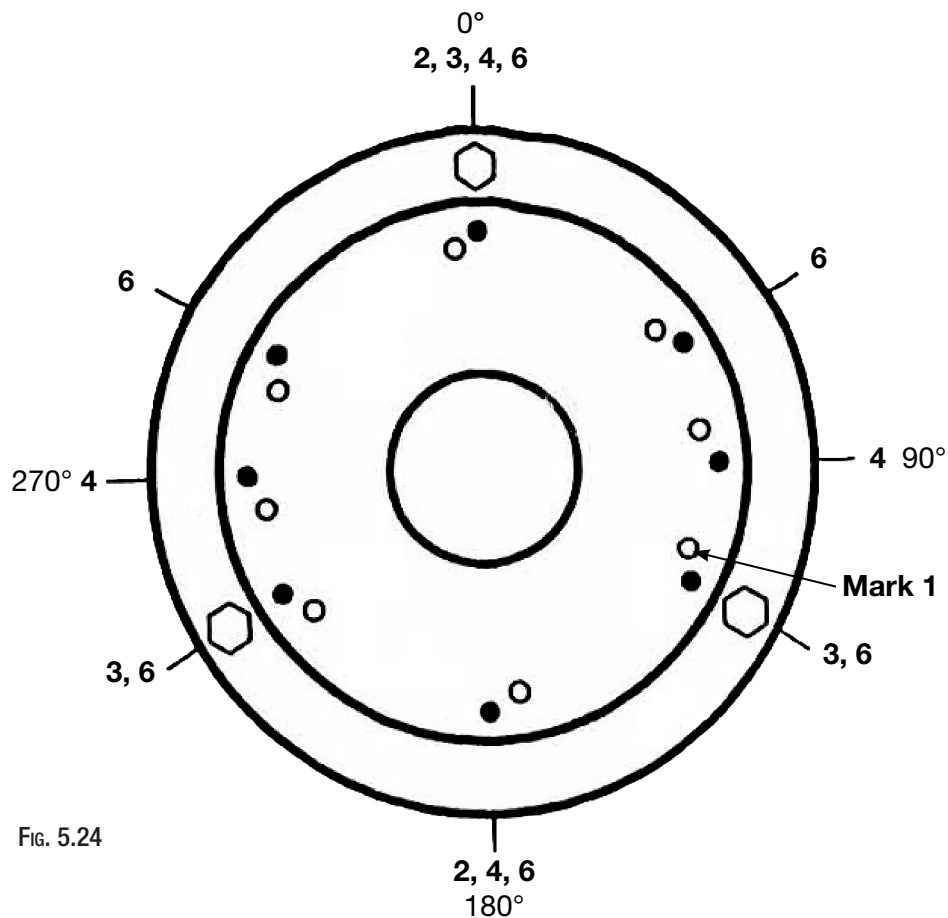
3. Sharpening the Face (End/Corner Teeth)

- Adjust the work head/swivel axis so the face-cutting edges are presented squarely or at the required corner-bevel angle to the grinding wheel face.
- Re-position the tooth rest against the back of the face-tooth, set the appropriate end-relief clearance, and stroke the table across the face of the wheel.
- Inspect the teeth for uniform contact and remove any fine burrs with a light oil-stone if necessary

5.7 DRILL GRINDING ATTACHMENT



5.7 DRILL GRINDING ATTACHMENT Cont.



INTRODUCTION

Before grinding any cutters, you must set up the attachment to suit the type of cutter or drill you want to sharpen.

The first thing to set is the cam pins (Fig. 5.24), These are found on the back of the chuck.

The numbers on the above picture show you the position the cam pins will need to be placed according to the number of flutes of the drill as outlined in the example below.

1. If you would like to grind a standard 2 flute drill, you must screw the cam pins into the two positions marked with a "2"
2. If you would like to grind a tap with 3 flutes, you must screw the 3 cam pins into the three positions that are marked with a "3".

In the above diagram there are two circles of holes an outer circle marked with "●" and inner circle marked with "○"

Mark "●"(outside) : Means this is the locations for the cam pins to be placed for grinding drills, step drills, and Taps.

Marls "○"(inside) ; Means these are the locations for the cam pins in for grinding counter- sink drills.

Mark "1" is for grinding the single flute counter sink drills,

5.7 DRILL GRINDING ATTACHMENT Cont.

1. SETTING UP THE ATTACHMENT

It is important that the attachment is set up correctly on the machine before any operations are attempted. The Drill grinding attachment should be placed on the table of the machine and be lined up accurately with the center line of the grinding wheel. (Fig. 5.25)



FIG. 5.25

2. GRINDING PREPARATION:

If the drill is badly damaged it may be wise to first, grind the rear bevel of the drill, This can make grinding process faster and reduces the chance of excessive heat being applied to the cutting edge. This will ensure that there is no effect to the hardness and the metal characteristic of the drill. (see Fig. 5.26)

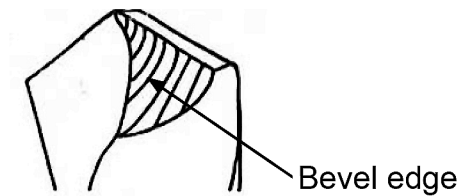


FIG. 5.26

A. SETTING THE DRILL

1. Insert the drill into the chuck (No.1) If the drill is over 6mm it should protrude 20mm out from the jaws of the chuck. (Fig. 5.27)

If the drill is under 6mm, then it should protrude only 10mm out of chuck.

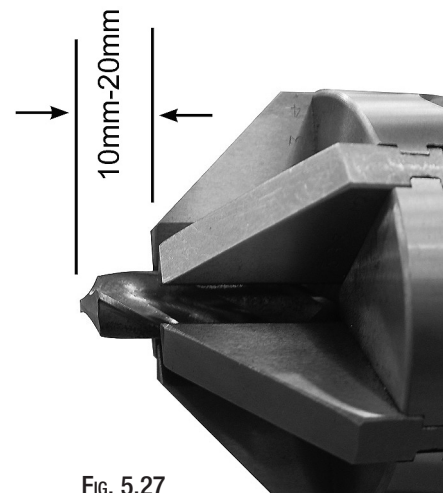
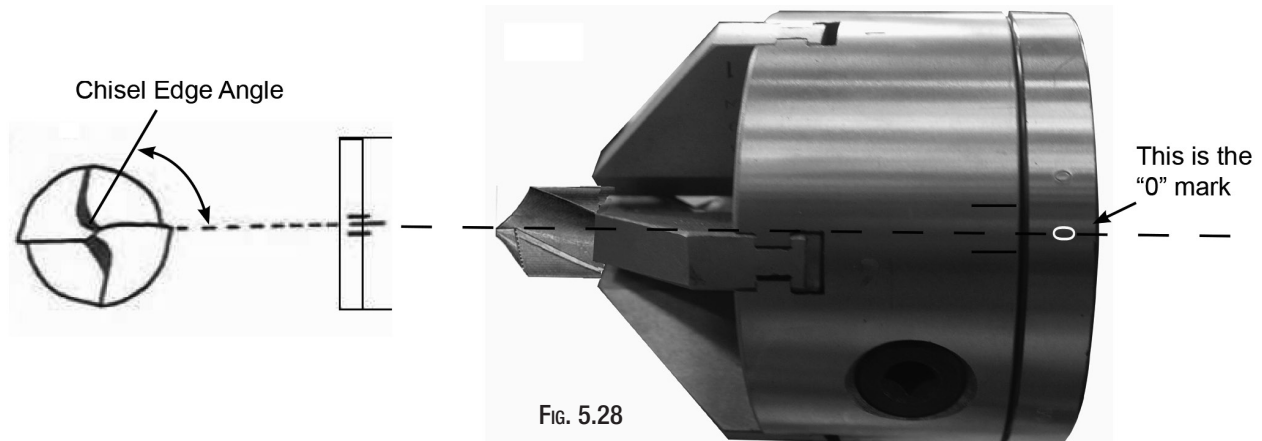


FIG. 5.27

5.7 DRILL GRINDING ATTACHMENT Cont.

- To ensure that the cam action is align with the cutting edge of the drill, the drill needs to be clamped in the chuck so that the cutting edge is lined up between the two line marked on the chuck. These lines may be faint but can be found by looking for a "0" on the back plate of the chuck (see the following Fig. 5.28) Once in position then, lock the chuck tightly with the key.



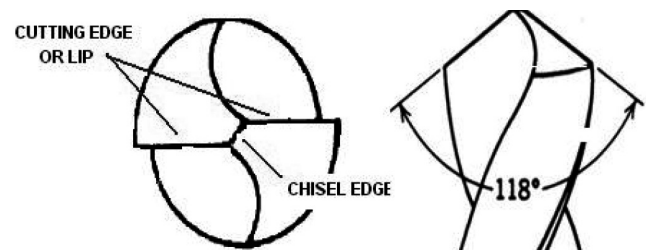
B. SET THE CUTTING POINT ANGLE

The cutting point angle of the drill needs to be selected. The cutting point angle is usually referred to as an included angle. (Fig. 5.29)

There are three drill point angles widely used.

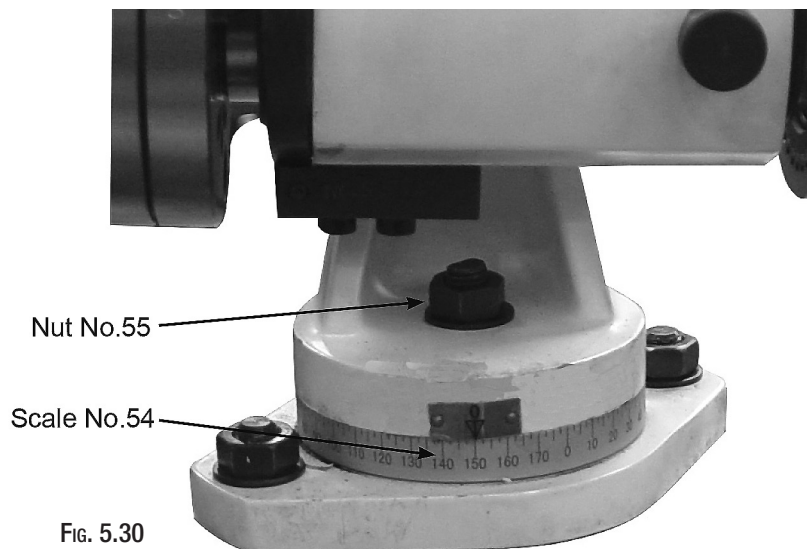
118° angle is used for general purpose drilling of metal.

135° is used for harder steels and stainless steel. 114° is used for wood and plastics.



To set the cutting point angle make sure that the attachment is located in the table slot.

Undo the nut and set the desired angle on the scale (No.54). When you have set the angle then tighten the nut. (Fig. 5.30)



5.7 DRILL GRINDING ATTACHMENT Cont.

C. SET THE RELIEF ANGLE OF CUTTING POINT (ADJUST LIP CLEARANCE ANGLE)

The relief angle or Lip Clearance, is controlled by the amount of angle given to the cam. (No.13)

The cam is adjustable at one end and is pivoted at the other end. This allows for the cam movement to be varied according to the relief angle desired. There are two Knurled Lock Nuts (No.44), which can make the cam (No.13) to move back and forward. (Fig. 5.31)

The more the Cam (No.13) moves forward, the larger the lip clearance will be and the more the Cam (No.13) moves backward, the smaller the Lip clearance or relief will be.

1. Set the amount of cam movement (No.13) by adjusting the knurled lock nuts (No.44) to set the relief angle. This function is not graduated but more cam movement means more relief.

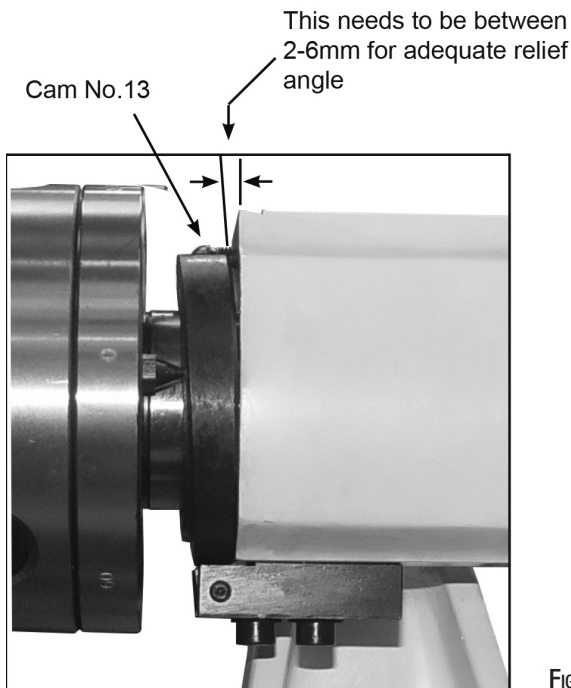
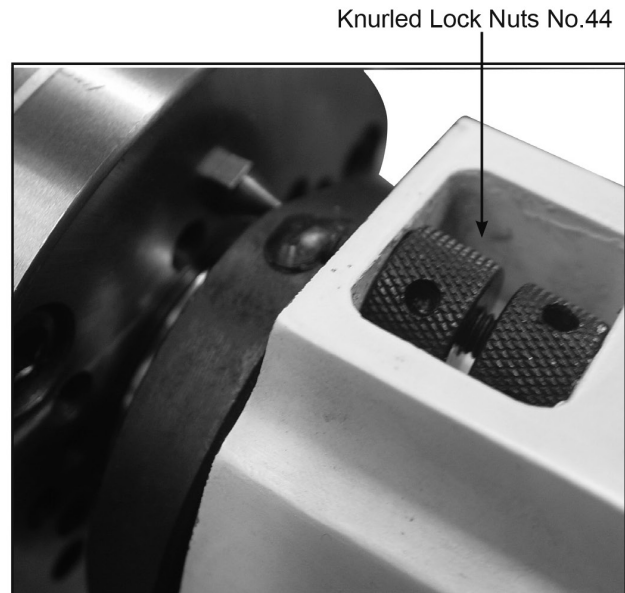


FIG. 5.31

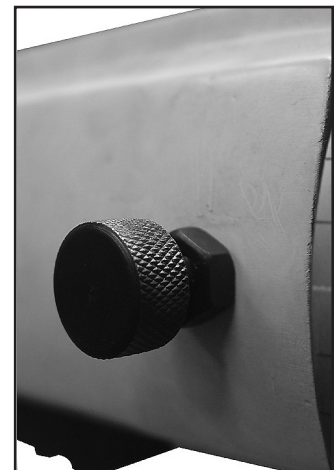


D. ADJUSTING THE SPINDLE FLOAT

The knurled knob (No.57) can be used to lock the spindle or can be adjusted to allow the spindle to float. By adjusting this knob the amount of spindle end float or the distance it can float can be limited. (Fig. 5.32)

It should be set so that the cam pins and cam can interact easily. It should not allow the spindle to float more than is require for the cam and cam pins to interact easily.

FIG. 5.32



5.7 DRILL GRINDING ATTACHMENT Cont.

E. PREPARE FOR GRINDING

Move the attachment so that the drill is in the suitable position to the surface of the grinding wheel. (Fig. 5.33)

1. Turn on the power, and revolve the hand-wheel (No.3) slowly with one hand. Do not put lateral pressure on the spindle, but allow the spring (No.16) on the spindle to hold the cam pins against the cam.
2. Keep rotating the hand wheel (No.3) when the grinding wheel starts and gradually feed the drill towards the wheel until grinding takes place.

F. GRINDING THE CUTTING EDGE RELIEF ANGLE

The cutting edge is also known as the "LIP". (Fig. 5.34) The lip relief angle measures the clearance behind the cutting lip. Move the drill to a suitable position to the surface of the grinding wheel.

1. Turn on the power, and rotate the hand-wheel (No.3) slowly with one hand and with the other hand, slowly feed the drill into the wheel making sure that no lateral pressure is placed on the spindle, so that the spring (No.16) on the spindle holds the cam pins against the cam.
2. Continue until both sides of the drill have been restored to the original state. Be-careful not to overheat the drill.

G. SHARPENING THE CUTTING EDGE

In most cases the above operation will be sufficient, but for production use the second clearance angle may be needed. This is shown by the distance between "A" and "B" (Fig. 5.35)

1. Loosen Handle (No.53) a little. Then adjust the angle of the fixture, by raising about 10—15° or the angle required. (Fig. 5.36)
2. Now insert the de-tent pin (No.56) into the hole on the cylinder (No.16) at the rear of the shaft. The drill must be now set using a height gauge so that the cutting edge is horizontal with the table and in line with the center line of the wheel.
3. There are two series of matching graduations with holes around the outside in the cylinder. If the drill has two-fluted edges, you must find the equal positions of the opposite sides of the cylinder. For example, if you adjust the position to the "6" on one side, then you must rotate the cylinder to the other "6" of the other side. This will grind each side evenly and grind the cutting edge the same on both flutes, (Fig. 5.37)
4. Take a light cut across the wheel by using the cross feed screw then rotate the cylinder and place the indent pin in the opposing number and repeat a light cut. Repeat the process until there is a small flat across the cutting edge.

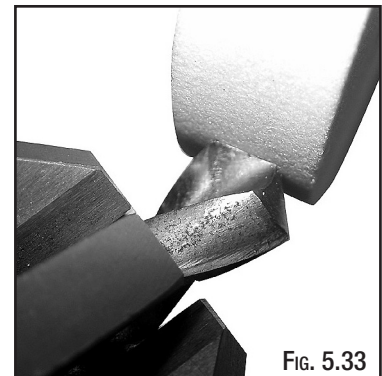


FIG. 5.33

Lip or cutting edge relief angle

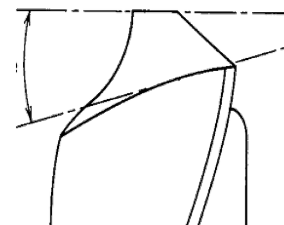


FIG. 5.34

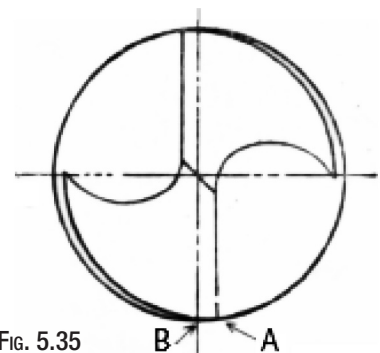


FIG. 5.35

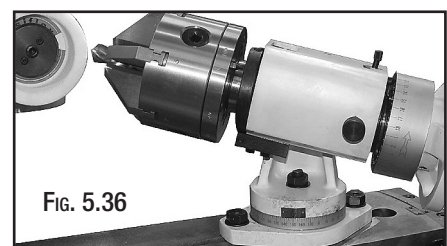


FIG. 5.36

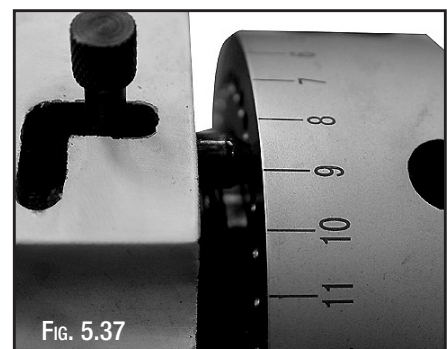


FIG. 5.37

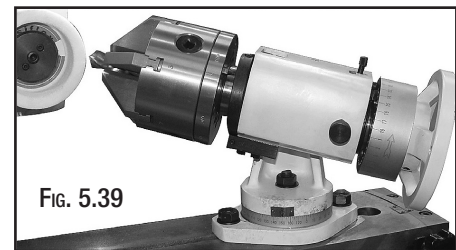
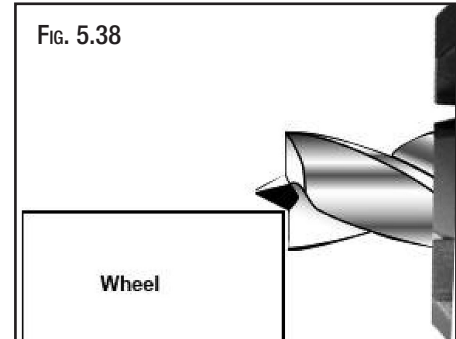
5.7 DRILL GRINDING ATTACHMENT Cont.

- When the grinding procedure has been done or the angle needs to be changed, move the drill away from the grinding wheel. This is to avoid the Chuck (No.1) from touching the grinding wheel while No.53 lever is loosened.

H. SHARPENING A BRAD POINT DRILL (Clearance angle)

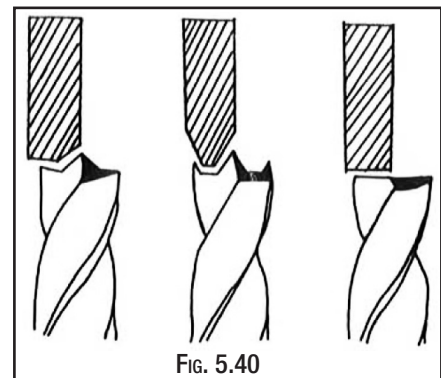
Set up the attachment as in A, B, C

- Loosen No.55 and align No. 52 about the line of 90°.
- Loosen No.53, raise the chuck (No.1) about 12°
- Lock the drill into the chuck (No.1), making sure you have aligned the drill correctly between the faint lines on the chuck.
- Loosen the knurled nut (No.57) to allow the shaft to rotate but at the same time not allowing the shaft to float more than is needed to operate the cam pins No.14 against the cam No.13 correctly.
- While turning the hand-wheel (No.3) move the drill in towards the wheel. Set the drill to aim for the external diameter and the back of the grinding wheel. Start to grind by rotating the hand-wheel (No.3.) Make sure the center point is not damaged. (Fig. 5.38)



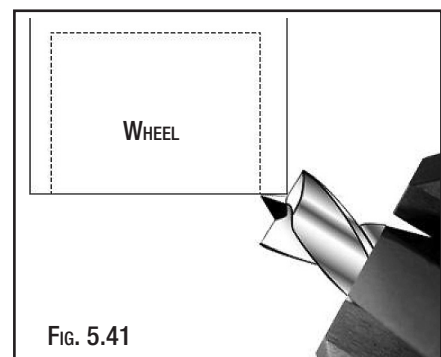
I. SHARPENING THE CUTTING EDGE

- Line up the drill cutting edge parallel to the table and insert the die-tent pin (No.57) into the hole on the cylinder (No.15)
- Loosen handle (No.53) and raise the chuck (No.1) about 12°.
- Use the longitudinal feed of the grinding wheel and the cross feed of the slide rest to control the feeding of sharpening the cutting edge. After taking a light cut, change to the opposite number of (No.15) and grind it again until there is a small flat on the cutting edge. Form the wheel to suit the profile desired. (Fig.17)



J. SHARPENING THE CENTRE POINT

- Line up the drill cutting edge parallel to the table and insert the die-tent pin (No.57) into the hole on the cylinder
- Loosen handle (No.53) and raise the chuck (No.1) about 12°.
- Use the longitudinal feed of the grinding wheel and the cross feed of the slide rest to control the feeding of sharpening the cutting edge. After taking a light cut, change to the opposite number on the cylinder (No.16) and grind it again until there is a small flat on the cutting edge. (Fig.18)



WARNING!

When operating a grinder it is important to wear appropriate safety gear to protect yourself from injury. This includes safety glasses or goggles, or a face shield to protect your eyes from flying debris.

5.7 DRILL GRINDING ATTACHMENT Cont.

K. GRINDING STEP DRILLS

1. Grinding the step.
 - a. Lock No.57 into No.12 to allow the shaft to rotate. No.13 does not rotate with the shaft.
 - b. Push No.12 forward about 10mm, until half of the screw No.57 sits in the groove in No.12. This allows the spindle No.12 to turn freely so the step diameter can be ground to size. (Fig. 5.42)
2. If a second cutting edge has to be ground as the first layer, the chuck No.1 must be fitted with Cam pins No.14 (two pieces). It is important to align the second cutting edge. After that, you can finish step drill grinding.
3. Please see the following figure for reference. (Fig. 5.43)

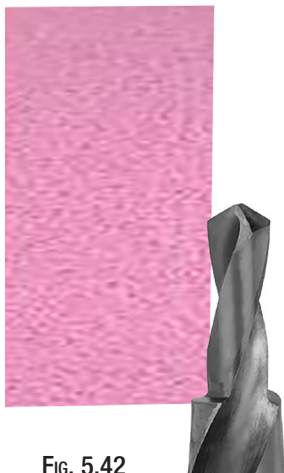


FIG. 5.42



FIG. 5.43

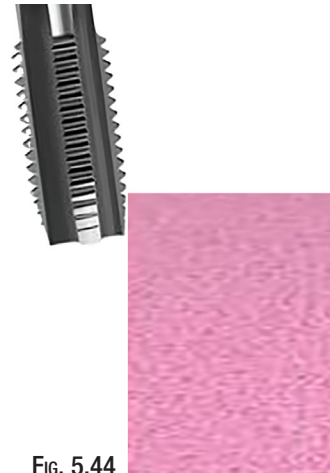


FIG. 5.44

TAP GRINDING

Taps can be found with 2 flutes, three-fluted edge, four-fluted edge, five-fluted edge and six-fluted edge.

1. If equip with three-fluted edge tape, then the cam pins need to be changed to another set of o.14 Cam pins (3 pieces) and insert them into holes marked as “3” in the No.1 chuck. Then, you can grind the three-fluted edge tap as per “F”.
2. If equip with four-fluted edge tape, then the cam pins need to be changed to another set of No.14 Cam pins (4 pieces) and insert them into holes marked as “4” in the back of the chuck. Then you can grind the four-fluted edge tap.
3. Use the same process to grind five-fluted and six-fluted edge taps.
4. Make the forepart of tap feed into the proper position at the surface of grinding wheel. (Fig. 5.44)
5. Rotate (No.3) handle slowly by one hand when the grinding wheel starts (remember do not pause), and then slowly feed the tap towards the wheel with the other hand . Keep feeding until the tap touches the grinding wheel and sparks appear.



WARNING!

Abrasive wheels are designed to operate at a maximum speed. Exceeding the speed could cause the wheel or disk to break or de-laminate, resulting in injury or serious eye damage.

5.7 DRILL GRINDING ATTACHMENT Cont.

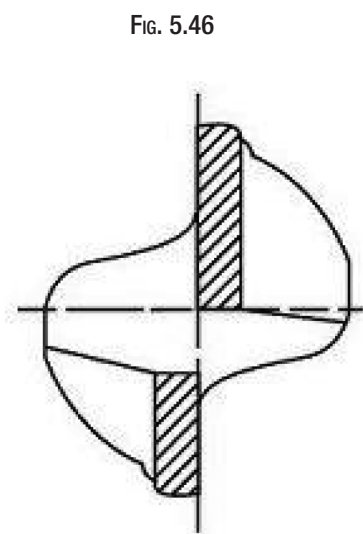
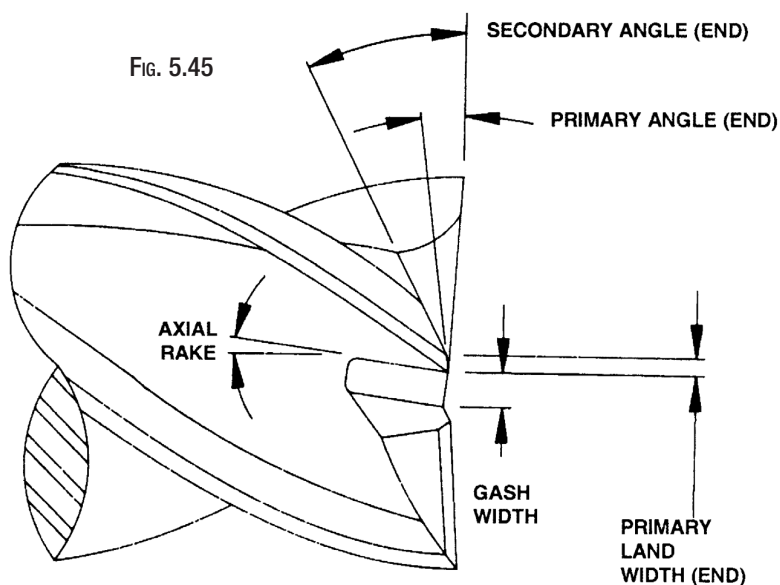
END MILL LIP GRINDING

1. Turn off the grinding machine and loosen No.53 a little, and move the head to the angle you need for grinding the lip relief angle.
2. Place the de-tent pin No.56 in one of the holes in the cylinder No.16 at the rear of the shaft. These are used to control the positions of the cutting edges. Set up the cutter with a height gauge so that the cutting edge or lip is parallel to the table. Then clamp the cutter.

There are a series of numbers between 0° and 180° . The same series of numbers are in 180° - 360° . If the end mill has two-flutes, you must find the equal positions in the opposite range.

For example, if you have the die-tent pin in position "6" on one side, then you must rotate the cylinder No.16 to the position "6" on the opposite side. This method ensures each lip is correctly ground with the edges being the same height.

3. When the grinding procedure has been done, then the angle needs to be changed. The cutting edge has to be moved so that it clears the grinding wheel. This is to avoid the chuck touching the grinding wheel while No.63 lever was loosened.
4. If you grind the end mill with three-fluted edge, you should divide the holes on the cylinder No.16 into three equal partitions.
5. If you grind the end mill with four-fluted edges, you should divide No.16 into four equal partitions.
6. The cutting edge of the end mill has two angles.(Fig. 5.45) The angles are the primary angle, and the secondary angle. A third process is the central gash point. The angles can be changed whenever you need by loosening No.53.
7. If the cutter can plunge cut, the only other process may be to relieve the gash width. A center cut cutter is one where one side of the cutter has its cutting edge to the center with clearance between the remaining cutting edges. (See Fig. 5.46) This clearance needs to be maintained



6. MAINTENANCE

6.1 SCHEDULE

Maintenance on a universal tool and cutter grinder involves daily cleaning, regular lubrication of sliding surfaces, coolant system management, and periodic mechanical checks to ensure high-precision sharpening.

Daily Maintenance

- Clean the machine: Wipe down all surfaces, remove metal swarf, and clear abrasive dust from the worktable, head, and base.
- Lubricate slides: Manually oil all slides, guide ways, and moving friction parts using the manufacturer-specified way oil.
- Check the coolant system: Inspect coolant levels, clean out sludge tanks, and ensure filters are free of debris.
- Inspect attachments: Check work head, chuck, tool rest, and fixtures for alignment and wear.
- Run idle: Start the machine and listen for abnormal noises or check for excessive vibration before loading a tool.

Weekly Maintenance

- Flush and service coolant: Drain or flush the coolant reservoir to prevent bacteria growth and clogging. (Optional Accessory)
- Inspect belts and drive components: Check V-belt tension on the spindle and motor drives for slipping or cracking.
- Clean internal components: Use compressed air to carefully clear dust out from hard-to-reach mechanical assemblies and electrical enclosures.
- Calibrate fixtures: Verify and re-calibrate indexing heads, radius-grinding attachments, and angular settings.
- Tighten fasteners: Check and snug up any nuts, bolts, and locking levers that may loosen from machine vibration.

Periodic / Monthly Maintenance

- Inspect grinding wheels: Check wheels for cracks, chips, or out-of-balance conditions; dress or replace wheels as needed.
- Apply anti-rust protection: Coat unpainted precision cast-iron surfaces and joint areas with a light layer of anti-rust or machine oil.
- Check spindle and bearings: Monitor spindle run-out and temperature during extended runs to catch bearing wear early.



WARNING!

Make sure the machine is turned OFF and the cord is disconnected from the power source before installing/removing and servicing any component of the machine.

TOOL & CUTTER GRINDER TM-6025Q

Order Code: (G198)

The following section covers the spare parts diagrams and lists that were current at the time this manual was originally printed. Due to continuous improvements of the machine, changes may be made at anytime without notification.

HOW TO ORDER SPARE PARTS

1. Have your machines model number, serial number & date of manufacture on hand, these can be found on the specification plate mounted on the machine.
2. A scanned copy of your parts list/diagram with required spare part/s identified.

NOTE: SOME PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

3. Go to www.machineryhouse.com.au/contactus and fill out the inquiry form attaching a copy of scanned parts list.



WARNING!

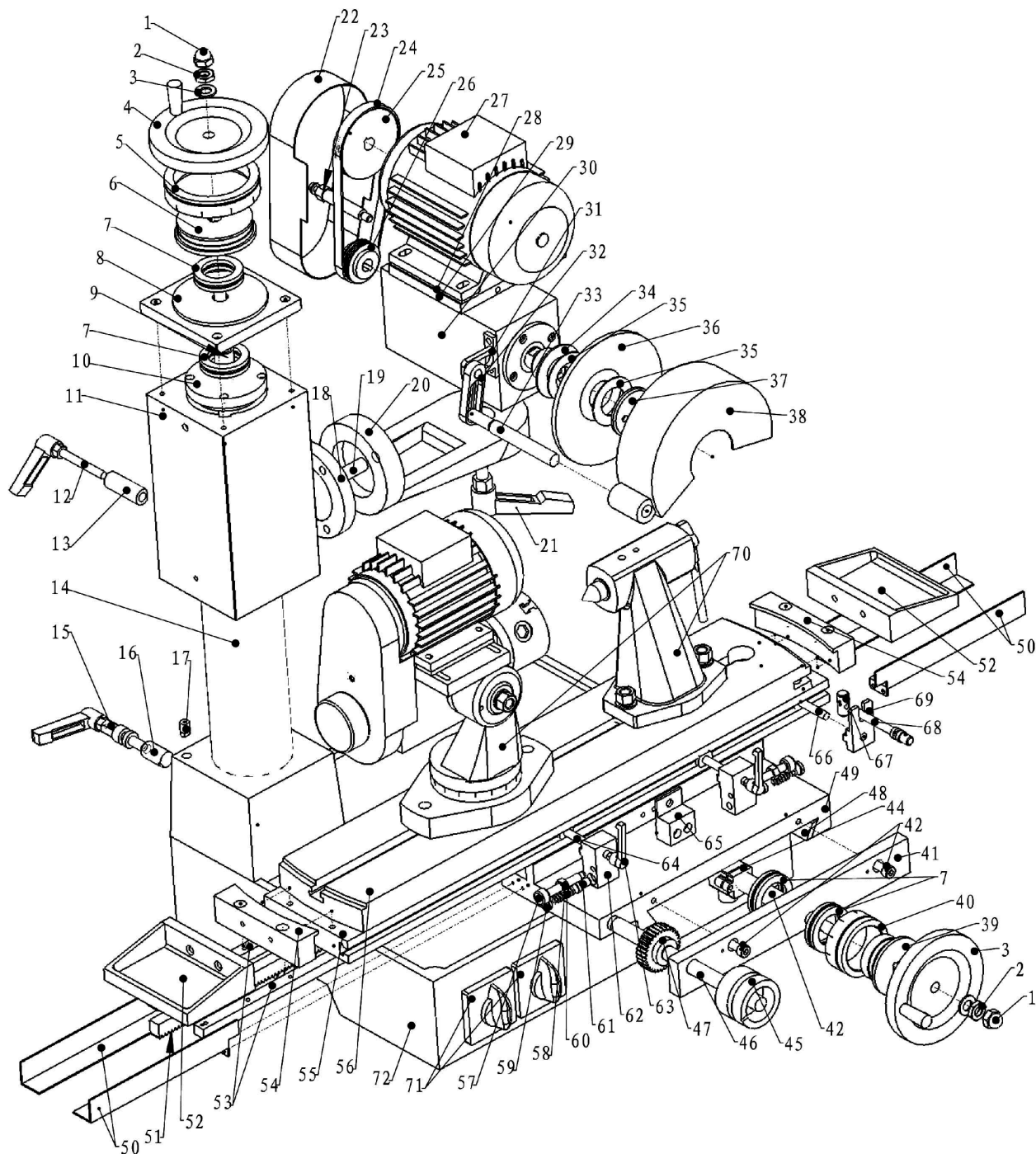
*Electricity is dangerous and could cause death.
All electrical work must be carried out by a qualified electrician.*



CAUTION!

It is impossible to cover all possible hazards Every workshop environment is different. These are designed as a guide to be used to compliment training and as a reminder to users prior to equipment use. Always consider safety first, as it applies to the individual working conditions.

MACHINE PARTS DIAGRAM

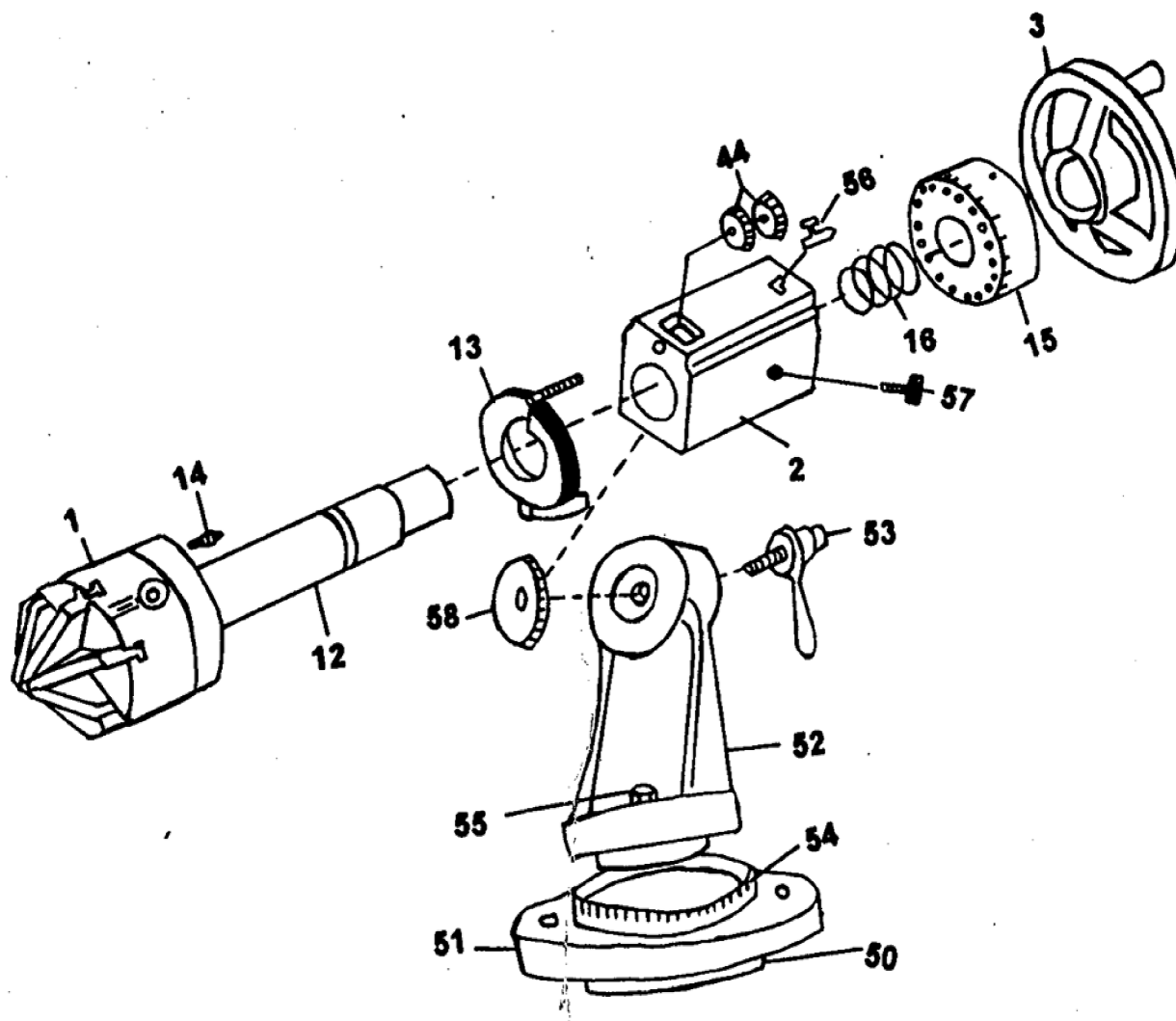


PARTS LIST

ITEM	DESCRIPTION	ITEM	DESCRIPTION
1	Cap Nut M12	41	Supporting Plate
2	Hexagonal Nut M12	42	Hexagon Socket Head Cap Screws M8x2;
3	Flat Gasket 12	43	Lead Screw
4	Standard Spring Gasket 12x125	44	Nut
5	Dial	45	Hand-Wheel
6	Bush Ring	46	Hand-Wheel Axle
7	Thrust Ball Bearing 51007	47	Gear
8	Spindle Tube Cover	48	Inlaid Strip
9	Elevating Screw	49	Cross Slide Platform
10	Screw Base	50	Dust-proof Board
11	Spindle Sleeve	51	Gear
12	Adjustable Locking Handle M8x110	52	Enclosure
13	Spindle Sleeve Locking Block	53	Linear Guide
14	Spindle	54	Pressure Plate
15	Spindle Locking Block	55	Operating Table
16	Spindle Locking Block	56	Rotary Work-table
17	Retaining Axle	57	Support-Locking Bolt
18	Motor Rotary Plate	58	Hexagonal Nut M8
19	Spindle Screw	59	Adjustable Bolt
20	Motor Turning Chassis	60	Compressed Spring
21	Adjustable Locking Handle M12x30	61	Positive Stop Part
22	Belt Wheel Cover	62	Spring Positive Stop
23	Pole	63	Adjustable Locking Nut Handle M8
24	Poly V-Belt	64	T-Shaped Screw
25	Driving Pulley	65	Locking Base
26	Driven Pulley	66	T-Shaped Screw
27	Motor	67	Copper Nut
28	Shock Absorption Rubber Gasket	68	Small Size Lead Screw
29	Motor Junction Board	69	Stand
30	High-Speed Grinding Head Assembly	70	Grinding Machine Accessories
31	Bracket	71	Power Switch
32	Junction Board	72	Base
33	Grinding Wheel Cover Shank		
34	Grinding Wheel Flange		
35	Paper Gasket		
36	Disc Grinding Wheel 32x150		
37	Grinding Wheel Hold-down Disc		
38	Grinding Wheel Enclosure		
39	Scale Inner Liner		
40	Scale Circle		

NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

DRILL GRINDING PARTS DIAGRAM



PARTS LIST

Index No.	Part No.	Description	Size	Qty
1	K003	6-Jaw Chuck	4"	1
2	K001	Main		1
3	K002	Hand-Wheel		1
12	K004	Chuck Shaft		1
13	K005	Double Cams		1 Set
14	K014	Grinding Needles		6
15	K013	Dividing Head		1
16	K011	Spring		1
44	K009	Adjusting Nut		2
50	P007	Key		1
51	P001	Base Dish		1
52	P002 / P003	Main Column		1
53	T014	Handle	M12 x 45L	1
54	P005	Graduated Dial		1
55		Hexagon Nut	M12 x 55l	1
56	K010	Fixed Set		1
57	K008	Screw		1
58	P006	Graduated Dial		1

NOTE: SOME INDIVIDUAL PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY



ENVIRONMENT PROTECTION

Recycle unwanted materials instead of disposing of them as waste. All tools, accessories and packaging should be sorted, taken to a recycling centre and disposed of in a manner which is compatible with the environment. When the product becomes completely unserviceable and requires disposal, drain any fluids (if applicable) into approved containers and dispose of the product and fluids according to local regulations.

IMPORTED BY



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