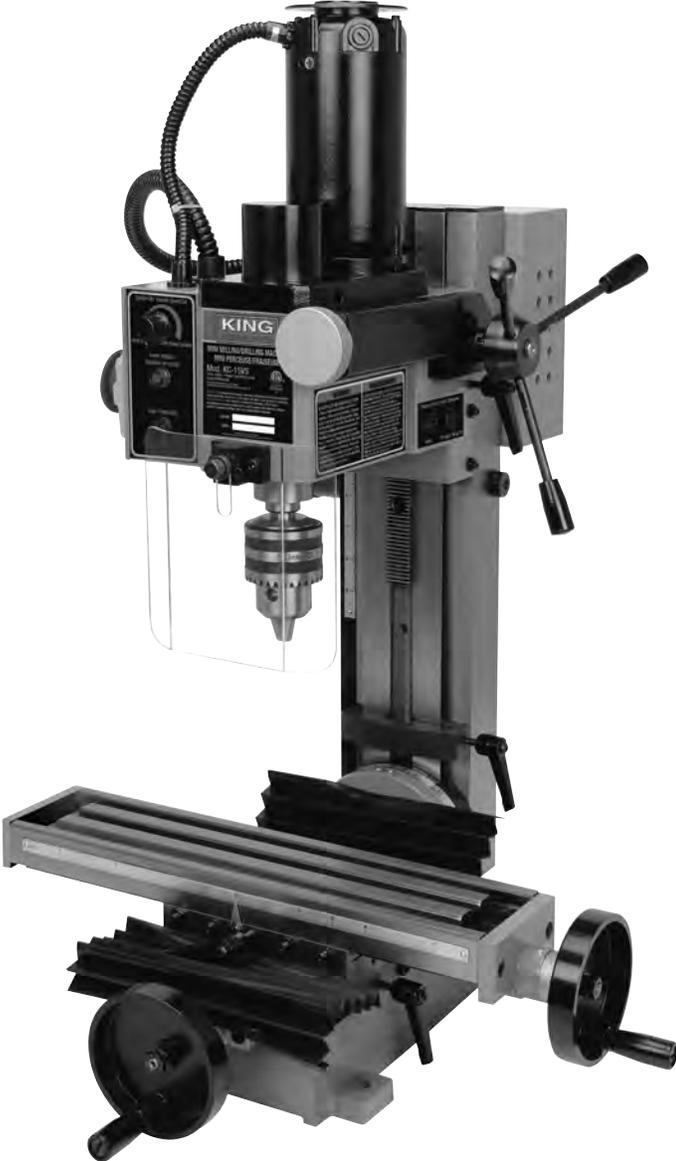




MINI MILLING/DRILLING MACHINE



MODEL: KC-15VS

INSTRUCTION MANUAL

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WARRANTY INFORMATION



**2-YEAR
LIMITED WARRANTY
FOR THIS MINI MILLING/DRILLING MACHINE**

**KING CANADA TOOLS
OFFERS A 2-YEAR LIMITED WARRANTY
FOR COMMERCIAL USE.**

PROOF OF PURCHASE

Please keep your dated proof of purchase for warranty and servicing purposes.

REPLACEMENT PARTS

Replacement parts for this product are available at our authorized King Canada service centres across Canada. Please use the 10 digit part numbers listed in this manual for all part orders where applicable.

PARTS DIAGRAM & PARTS LISTS

Refer to the Parts section of the King Canada web site for the most updated parts diagram and parts list.

LIMITED TOOL WARRANTY

King Canada makes every effort to ensure that this product meets high quality and durability standards. King Canada warrants to the original retail consumer a 2-year limited warranty as of the date the product was purchased at retail and that each product is free from defects in materials. Warranty does not apply to defects due directly or indirectly to misuse, abuse, normal wear and tear, negligence or accidents, repairs done by an unauthorized service centre, alterations and lack of maintenance. King Canada shall in no event be liable for death, injuries to persons or property or for incidental, special or consequential damages arising from the use of our products.

To take advantage of this limited warranty, return the product at your expense together with your dated proof of purchase to an authorized King Canada service centre. Contact your retailer or visit our web site at www.kingcanada.com for an updated listing of our authorized service centres. In cooperation with our authorized service centre, King Canada will either repair or replace the product if any part or parts covered under this warranty which examination proves to be defective in workmanship or material during the warranty period.

NOTE TO USER

This instruction manual is meant to serve as a guide only. Specifications and references are subject to change without prior notice.

KING CANADA INC. DORVAL, QUÉBEC, CANADA H9P 2Y4

www.kingcanada.com



GENERAL & SPECIFIC SAFETY INSTRUCTIONS

VOLTAGE WARNING: Before connecting the machine to a power source (receptacle, outlet, etc.) be sure the voltage supplied is the same as that specified on the nameplate. A power source with voltage greater than specified can result in **SERIOUS INJURY** to the user - as well as damage the machine. If in doubt **DO NOT PLUG IN THE TOOL**. Using a power source with voltage less than the nameplate is harmful to the motor.

1. KNOW YOUR MACHINE

Read and understand the owners manual and labels affixed to the machine. Learn its application and limitations as well as its specific potential hazards.

2. GROUND THE MACHINE.

This machine is equipped with an approved 3-conductor cord and a 3-prong grounding type plug to fit the proper grounding type receptacle. The green conductor in the cord is the grounding wire. **NEVER** connect the green wire to a live terminal.

3. KEEP GUARDS IN PLACE.

Keep in good working order, properly adjusted and aligned.

4. REMOVE ADJUSTING KEYS AND WRENCHES.

Form habit of checking to see that keys and adjusting wrenches are removed from the machine before turning it on.

5. KEEP WORK AREA CLEAN.

Cluttered areas and benches invite accidents. Make sure the floor is clean and not slippery due to wax and dust build-up.

6. AVOID DANGEROUS ENVIRONMENT.

Don't use machinery in damp or wet locations or expose them to rain. Keep work area well lit and provide adequate surrounding work space.

7. KEEP CHILDREN AWAY.

All visitors should be kept a safe distance from work area.

8. MAKE WORKSHOP CHILD-PROOF.

Use padlocks, master switches or remove starter keys.

9. USE PROPER SPEED.

A machine will do a better and safer job when operated at the proper speed.

10. USE RIGHT TOOL.

Don't force the machine or the attachment to do a job for which it was not designed.

11. WEAR PROPER APPAREL.

Do not wear loose clothing, gloves, neckties or jewelry (rings,

watch) because they could get caught in moving parts. Non-slip footwear is recommended. Wear protective hair covering to contain long hair. Roll up long sleeves above the elbows.

12. ALWAYS WEAR SAFETY GLASSES.

Always wear safety glasses (ANSI Z87.1). Everyday eyeglasses only have impact resistant lenses, they are **NOT** safety glasses. Also use a face or dust mask if cutting operation is dusty.

13. DON'T OVERREACH.

Keep proper footing and balance at all times.

14. MAINTAIN MACHINE WITH CARE.

Keep machine clean for best and safest performance. Follow instructions for lubricating and changing accessories.

15. DISCONNECT MACHINE.

Before servicing, when changing accessories or attachments.

16. AVOID ACCIDENTAL STARTING.

Make sure the switch is in the "OFF" position before plugging in.

17. USE RECOMMENDED ACCESSORIES.

Consult the manual for recommended accessories. Follow the instructions that accompany the accessories. The use of improper accessories may cause hazards.

18. NEVER STAND ON TOOL.

Serious injury could occur if the machine tips over. Do not store materials such that it is necessary to stand on the machine to reach them.

19. CHECK DAMAGED PARTS.

Before further use of the machine, a guard or other parts that are damaged should be carefully checked to ensure that they will operate properly and perform their intended function. Check for alignment of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other parts that are damaged should be properly repaired or replaced.

20. NEVER LEAVE MACHINE RUNNING UNATTENDED.

Turn power "OFF". Don't leave any machine running until it comes to a complete stop.

SPECIFIC SAFETY INSTRUCTIONS

1. USE GUARD AND WEAR SAFETY GLASSES

To prevent bodily injuries during milling/drilling operations, always use the safety guard and wear safety glasses.

2. NEVER DO "FREEHAND WORK"

Never do any work "Freehand" (hand holding the workpiece rather than workpiece secured to the table). Always secure or clamp workpiece before turning on machine.

3. USER MUST RECEIVE TRAINING BEFORE USE.

The user must know the functions and principals of operation. The user must also be familiar with the safety devices and regulations.

4. YOU ARE ENDANGERING YOURSELF and other personel if you bypass, remove or override a safety device such as the transparent auto-shut-off spindle safety guard. Only use this milling/drilling if all safety devices are working properly, if any are damaged or altered, replace them with identical replacement parts.

5. CLEANING AFTER USE

Do not use your hands to clear metal chips, use protective gloves or a brush.

6. SHARP CUTTING TOOL

Make sure the cutting tool is sharp, not damaged in any way and is properly secured in the chuck.

7. NEVER TURN POWER ON

Never turn power on while the cutting tool is touching the workpiece.

8. SELECT PROPER SPEED

Make sure you select the correct and recommended speed for the type of work and material you are cutting. Let the spindle reach maximum speed before starting a cut.

ELECTRICAL INFORMATION



WARNING

ALL ELECTRICAL CONNECTIONS MUST BE DONE BY A QUALIFIED ELECTRICIAN. FAILURE TO COMPLY MAY RESULT IN SERIOUS INJURY! ALL ADJUSTMENTS OR REPAIRS MUST BE DONE WITH THE MACHINE DISCONNECTED FROM THE POWER SOURCE. FAILURE TO COMPLY MAY RESULT IN SERIOUS INJURY!

POWER SUPPLY

WARNING: YOUR MINI MILLING/DRILLING MACHINE MUST BE CONNECTED TO A 120V, 15-AMP. MINIMUM BRANCH CIRCUIT.

GROUNDING

This Mini Milling/Drilling Machine must be grounded. If it should malfunction or breakdown, grounding provides a path of least resistance for electric current, to reduce the risk of electric shock. This Mini Milling/Drilling Machine is equipped with a cord having an equipment-grounding conductor. The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.

WARNING: TO MAINTAIN PROPER GROUNDING OF YOUR MINI MILLING/DRILLING MACHINE, DO NOT REMOVE OR ALTER THE PLUG GROUNDING PRONG IN ANY MANNER.

Not all outlets are properly grounded. If you are not sure if your outlet is properly grounded, have it checked by a qualified electrician.

WARNING: IF NOT PROPERLY GROUNDED, THIS MINI MILLING/DRILLING MACHINE CAN CAUSE ELECTRICAL SHOCK, PARTICULARLY WHEN USED IN DAMP LOCATIONS. TO AVOID SHOCK OR FIRE, IF THE POWER CORD IS WORN OR DAMAGED IN ANY WAY, HAVE IT REPLACED IMMEDIATELY.

120V OPERATION

Your Mini Milling/Drilling Machine comes wired for 120V operation. The plug and the required wall outlet are illustrated in Fig.1.

EXTENSION CORDS

WARNING! IT IS NOT RECOMMENDED TO USE AN EXTENSION CORD, BUT IF IT IS NECESSARY, READ THE FOLLOWING.

The use of any extension cord will cause some loss of power. Depending on the length of extension cord needed, use the table (Fig.2) to determine the minimum wire gauge (A.W.G-American Wire Gauge). Use only 3-wire extension cords which have 3-prong grounding type plugs and 3-hole receptacles which accept the tool's plug.

For circuits that are further away from the electrical circuit box, the wire thickness must be increased proportionately in order to deliver ample voltage to the Mini Milling/Drilling Machine motor. The smaller the gauge of the extension cord, the thicker it will be in diameter. Refer to Fig.2 for wire length and size.

Starting and Stopping the Mini Milling/Drilling Machine

This Mini Milling/Drilling Machine comes with a front and side control panel as shown in Fig.3. Plug the power cord in an appropriate 120V wall outlet, the power indicator light (A) Fig.3 will light up green. This indicates the machine has power.

To start the Mini Milling/Drilling Machine, turn the On/Variable Speed dial (B) clockwise, keep turning the dial to set the desired spindle speed.

To stop the Mini Milling/Drilling Machine, turn the On/Variable Speed dial (B) counterclockwise until the spindle comes to a stop.

This Mini Milling/Drilling Machine comes with an Emergency Stop Button (C). To stop the Mini Milling/Drilling Machine push the Emergency

Stop Button (C). When the Emergency Stop Button (C) is used, the On/Variable Speed dial (B) must be reset to the off position to allow the machine to be turn on again.

Fault Indicator Light

This Mini Milling/Drilling Machine comes with a fault indicator light (D). If a problem occurs and the machine is put under excessive load, the fault indicator light (D) will light up. Stop machine and unplug machine, then inspect unit. Reduce load on cutting tool and restart.

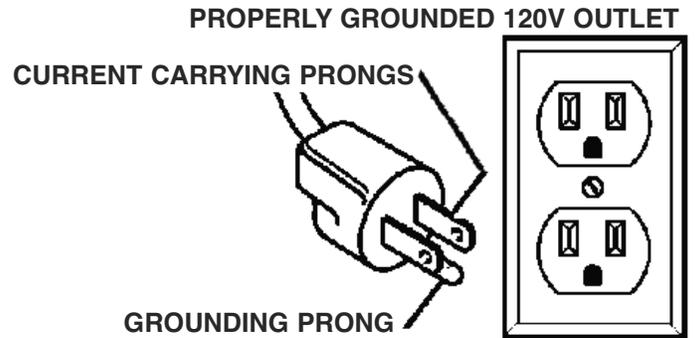


FIGURE 1

Tool's Amperage Rating	Cord Size in A.W.G.				Wire Sizes in mm ²			
	Cord Length in Feet				Cord Length in Meters			
	25	50	100	150	15	30	60	120
3-6	18	16	16	14	.75	.75	1.5	2.5
6-8	18	16	14	12	.75	1.0	2.5	4.0
8-10	18	16	14	12	.75	1.0	2.5	4.0
10-12	18	16	14	12	1.0	2.5	4.0	-
12-16	14	12	-	-	-	-	-	-

FIGURE 2

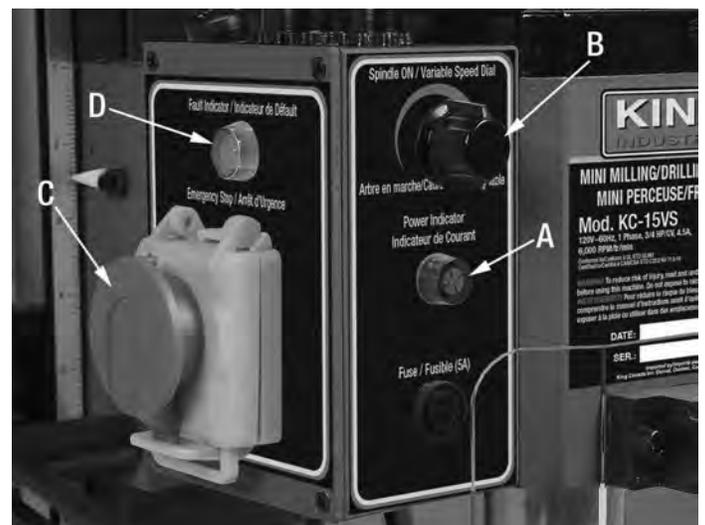
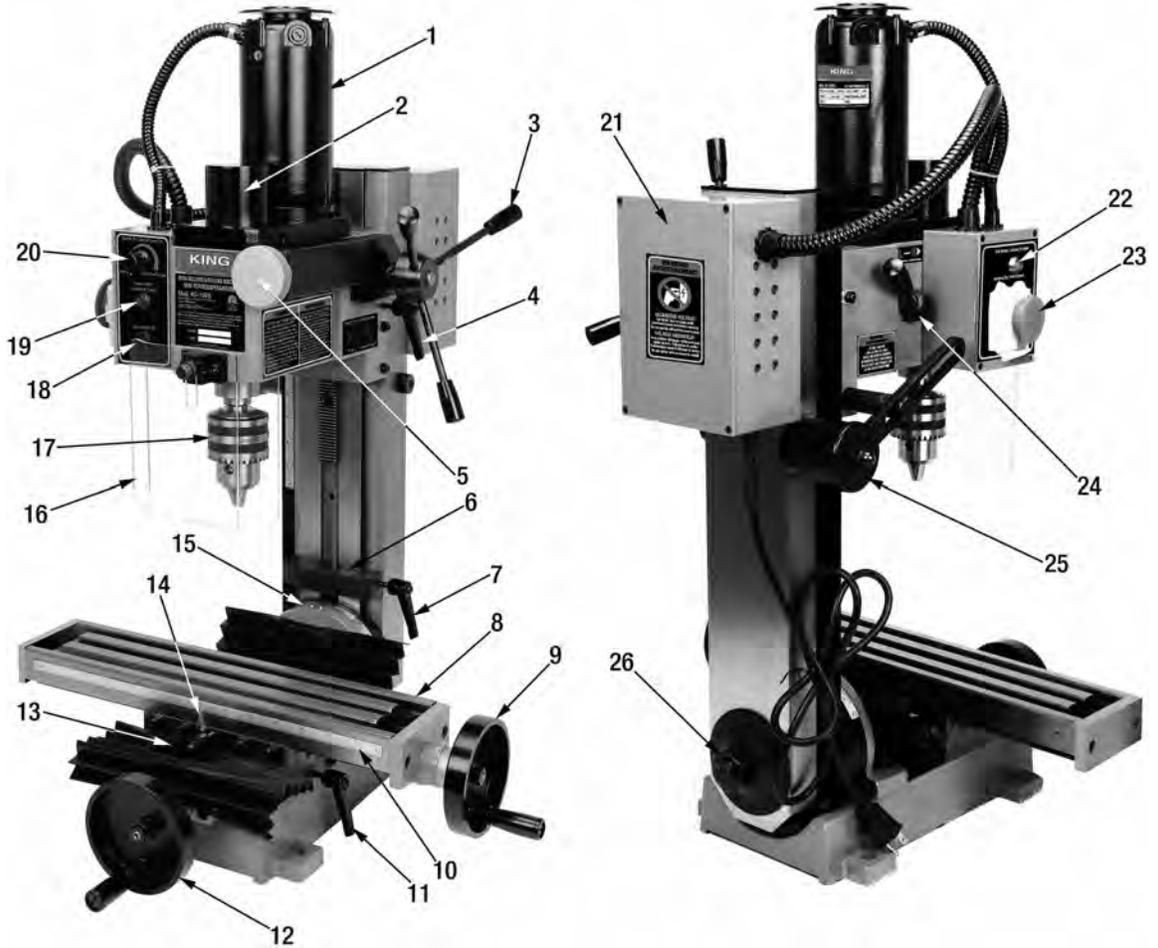


FIGURE 3



GETTING TO KNOW YOUR MINI MILLING/DRILLING MACHINE

1. DC motor
2. Spindle cover
3. Downfeed handle (1 of 3)
4. Head locking lock handle
5. Micro adjust downfeed handwheel
6. Depth stop
7. Depth stop lock handle
8. Milling/drilling table
9. Longitudinal travel handwheel
10. Longitudinal travel scale
11. Transversal travel lock handle
12. Transversal travel handwheel
13. Longitudinal travel lock handle
14. Pointer
15. Head angle scale
16. Guard
17. 1/2" chuck
18. Fuse/fuse holder
19. Power indicator light
20. On/Spindle speed dial
21. Electrical box
22. Fault indicator light
23. Emergency stop button
24. Low/High speed range selector lever
25. Spring return
26. Head/column fixing hex. nut



SPECIFICATIONS

MODEL	KC-15VS
Drilling capacity in cast-iron	1/2"
Drilling capacity in steel	1/2"
Max. distance spindle nose to table	11-1/4"
Swing	12-3/4"
Spindle taper	R8
Spindle stroke	7"
Variable speeds	2 (0-1,100 / 0-2,500) RPM
Face mill capacity	1-1/8"
End mill capacity	5/8"
Max. longitudinal travel	8-1/2"
Cross travel	4"
Working area of the table	3-5/8" x 15-3/4"
Size of T-slot on table	7/16"
Motor	4.5 Amp., 6,000 RPM
Voltage	120V, 1 phase, 60 Hz
Assembled dimensions (LxWxH)/weight	19-1/2" x 18-3/4" x 30" / 110 lbs
Package dimensions (LxWxH)/weight	21-1/4" x 15-3/4" x 27-1/2" / 135 lbs

ASSEMBLY & TEST RUN



UNPACKING, CLEANING AND MOUNTING TO WORKBENCH OR STAND

Remove all contents from the packing. Lift the Mini Milling/Drilling Machine using handling equipment or get the help of an assistant and place it on level workbench or stand. Make sure the workbench or the stand is sturdy enough to support the weight of this Mini Milling/Drilling Machine (110 lbs). Secure the base to the workbench or stand using the 4 mounting holes (A) Fig.4 and hex. bolts/nuts (hardware not included).

The unpainted surfaces of the Mini Milling/Drilling Machine are coated with a rust preventive oil which needs to be removed before starting assembly. Use a solvent cleaner that will not damage painted surfaces.

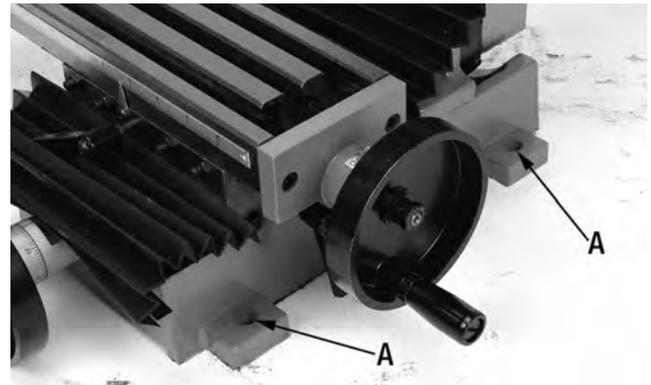


FIGURE 4

INSTALLING HANDWHEEL HANDLES

1. The adjustment handwheels (A & B) Fig.5 come installed to the machine. The handwheel handles (C & D) Fig.5 must be installed.
2. Screw in handle bolt with a flat screwdriver.



FIGURE 5

TEST RUN

Once the Mini Milling/Drilling Machine is secured to workbench or stand and handwheel handles are installed, it is necessary to do a test run to make sure everything is working as intended:

WARNING! Do not change the speed range (Low/High speed range lever) while the machine is running! If warning is not respected you risk damaging the spindle.

1. Make sure all tools and accessories have been removed from the machine.
2. Connect the power cord to an appropriate 120V wall outlet. The power indicator light (A) Fig.7 will light up.
3. Place the Low/High speed range lever (A) Fig.6 in the Low position (towards the left) as shown.
4. Turn the On/Variable Speed dial (B) Fig.7 clockwise to start the machine. Let the machine run at low speed for approximately 10 minutes. Make sure the machine is running smoothly without any excessive noises or vibration. If you hear any unusual noises or if the machine vibrates excessively, shut the machine off immediately. This can be done by turning the On/Variable Speed dial completely counterclockwise or press the emergency button (C).
5. Increase the speed, let the machine run for another 10 minutes.
6. Increase the speed once again, let the machine run for another 10 minutes.
7. Stop the machine by pressing the emergency stop button. Reset the On/Variable Speed dial by turning it counterclockwise to the off position.
8. Shift the Low/High speed range lever (A) Fig.6 in the High position (towards the right). Repeat steps 4-7.



FIGURE 6

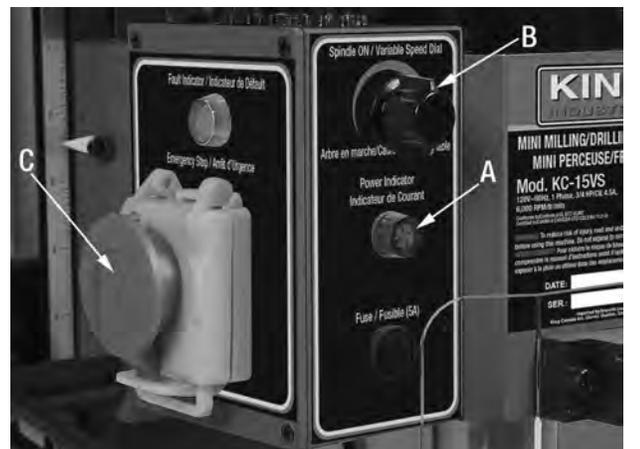


FIGURE 7

FAST DOWNFEED & MICRO DOWNFEED CONTROLS

This Mini Milling/Drilling Machine comes with two methods of downfeed, fast and micro. Fast feed method is normally used for drilling operations, and the micro feed method is normally used for milling operations.

1. Before making any adjustments or using the downfeed handles, loosen head lock lock handle (A) Fig.8.
2. For fast feed method, simply grab one of the downfeed handles (B) Fig.8 and turn it to raise or lower the head quickly.
3. For micro feed method, push in the downfeed handle hub (A) Fig.9 towards the head until the teeth (B) engage the hub teeth. Once the teeth are engaged, the micro feed handwheel (C) can then be turned to set the desired depth.



FIGURE 8

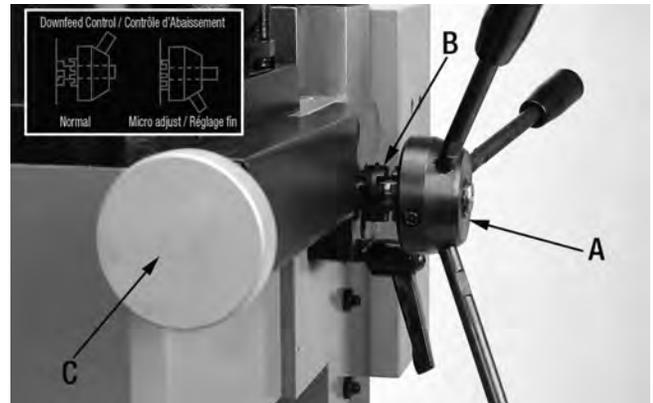


FIGURE 9

MILLING TABLE TRAVEL

This Mini Milling/Drilling Machine comes with a milling table which can be moved on the X-axis (transversal travel) and Y-axis (longitudinal travel). The milling table is controlled by the front and side handwheels.

1. Before making any X-axis (transversal travel) adjustments to the milling table, loosen X-axis lock handle (A) Fig.10.
2. To adjust the position of the milling table in the X-axis (transversal travel), turn front handwheel (B) Fig.10.
3. Before making any Y-axis (longitudinal travel) adjustments to the milling table, loosen Y-axis lock handle (C) Fig.10.
4. To adjust the position of the milling table in the Y-axis (longitudinal travel), turn side handwheel (D) Fig.10.

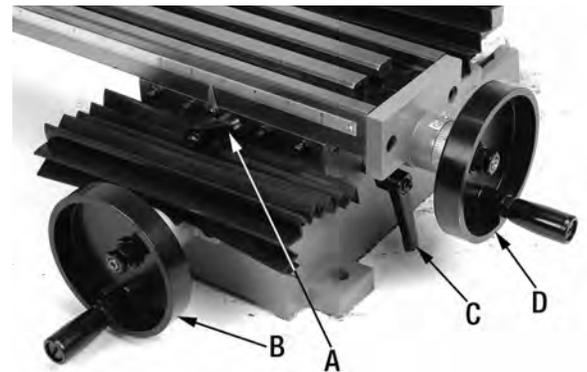


FIGURE 10

TILTING HEAD/COLUMN

This Mini Milling/Drilling Machine comes with head/column assembly which can be tilted up to 45° to the right or left.

WARNING! This Mini Milling/Drilling Machine must be bolted to a workbench or a stand before attempting to tilt the head/column assembly. If this warning is not respected, machine will tip over and cause possible damage to machine.

1. With one hand hold the head/column assembly, with your other hand, loosen the large hex. nut (A) Fig.11 using the large 36mm wrench (B).
2. Position the head/column assembly in the desired angle, using the angle scale in front of the column as a guide. Once positioned in the desired angle, retighten the large hex. nut (A).

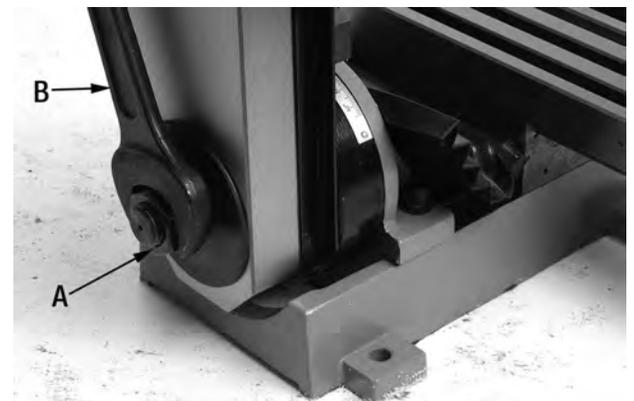


FIGURE 11

ADJUSTMENTS & OPERATION



SPINDLE SPEED & CUTTING REFERENCE CHART

This Mini Milling/Drilling Machine comes with two variable speed ranges (Low = 0-1100 RPM / High = 0-2500 RPM). It is very important to select the correct RPM cutting speed for the different materials to cut and for personal safety. To change speed range:

1. Stop machine before attempting to change the L/H speed selector lever (A) Fig.12.
2. With machine stopped, pivot the L/H speed selector lever (A) to the desired setting.
3. Turn the On/Variable Speed dial (B) Fig.7 clockwise to start the machine and set desired speed.



FIGURE 12

Refer to Fig.13 for recommended spindle speeds for different materials to cut.

Recommended Cutting Speeds	
Workpiece Material	Cutting Speed
Aluminum & alloys	300
Brass & Bronze	150
Copper	100
Cast Iron, soft	80
Cast Iron, hard	50
Mild Steel	90
Cast Steel	80
Alloy Steel, hard	40
Tool Steel	50
Stainless Steel	60
Titanium	50
Plastics	300-800
Wood	300-500

FIGURE 13

R8 SPINDLE TAPER AND R8 COLLET

This Mini Milling/Drilling Machine comes with an R8 spindle taper which accepts R8 collets. Make sure the machine is disconnected from the power source before attempting to adjust, remove or install taper/collet or chuck.

Installing 1/2" chuck on R8/JT#33 collet or optional cutting tool:

1. Clean the chuck and R8/JT#33 collet. Slide the chuck (A) Fig.14 onto supplied R8/JT#33 collet (B), or slide optional cutting tool onto appropriate R8 collet (depending on your cutting tool).
2. Slide cutting tool and collet assembly all the way into the R8 spindle taper.
3. Hold the cutting tool and collet assembly with one hand, and with the other tighten the drawbar (A) Fig.15 using a wrench as shown. Do not overtighten drawbar, it could damage the spindle taper and it will also be more difficult to remove during removal.



FIGURE 14

Removing 1/2" chuck and R8/JT#33 collet or optional cutting tool:

1. Insert lock bar (B) Fig.15 into the small hole on the side of the head as shown. Turn spindle taper by hand until the lock bar slides into the slot of the spindle taper, this will prevent the spindle taper from turning.
2. Loosen the drawbar (A) with a wrench, do not loosen completely.
3. Hold the cutting tool and collet assembly with one hand, and with the other tap the top of the drawbar with a mallet to dislodge the R8 collet.
4. Completely undo the drawbar and remove the cutting tool and collet assembly.

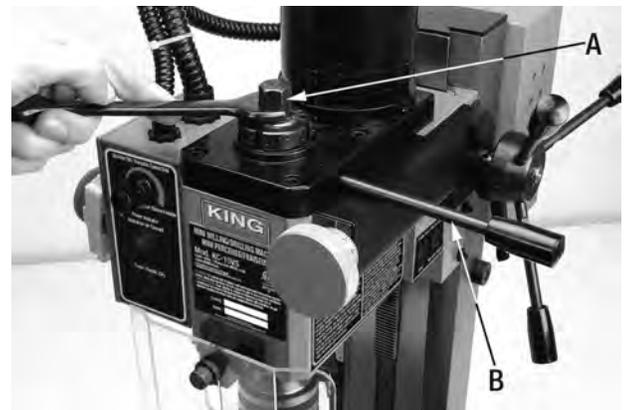


FIGURE 15

USING THE DEPTH STOP

This Mini Milling/Drilling Machine comes with a depth stop which limits the distance the head can travel while down feeding. The depth stop is mainly used when repeat drilling to specific depth is required. To adjust depth stop:

1. Loosen depth stop lock handle (A) Fig.16.
2. With the cutting tool installed in the chuck, lower the head until the bottom of the cutting tool reaches the desired depth of cut. Lock the head in this position using the head locking lock handle (B).
3. Raise the depth stop (C) up against the head and retighten lock handle (A).

MAINTENANCE

WARNING! FOR YOUR OWN SAFETY, TURN MACHINE OFF AND REMOVE THE PLUG FROM THE POWER SOURCE BEFORE PERFORMING MAINTENANCE, CLEANING OR LUBRICATION WORK.

This Mini Milling/Drilling Machine must be kept clean and greased/lubricated regularly. Here are some basic rules for maintaining your machine.

1. Remove all chips from the machine before leaving machine. Always use work gloves to remove metal chips.
2. A coat of automotive wax applied to the milling table will help keep the surface clean and prevent rust.
3. Regularly inspect worm gears, leadscrews, power cord, loose hex. nuts or bolts. Periodic lubrication of spring loaded handles and threaded parts will make these parts easier to operate. Apply light grease every month to leadscrews and column gear rack.

REPLACING MOTOR BRUSHES

This Mini Milling/Drilling Machine comes with a DC motor which has carbon brushes. The carbon brushes eventually need to be replaced. To replace carbon brushes:

1. Unscrew carbon brush cap (A) Fig.17.
2. Remove the carbon brush assembly (B) and replace it with a new one.
3. Repeat steps 1-2 for the second carbon brush on the opposite side of the motor.

ADJUSTING GIBS

After hours of usage, the movement of the milling table and the head over the slide ways will cause normal wear and play, and may need to be adjusted. To adjust gib screws to eliminate gib play:

1. To adjust the X-axis gib, loosen 4 hex. nuts (A) Fig.18. Move the table in the X-axis and tighten all 4 set screws (B). When the set screws are correctly adjusted you will feel resistance. Once adjusted retighten hex. nuts (A).
2. To adjust the Y-axis gib, loosen 2 hex. nuts (C) Fig. 18. Move the table in the Y-axis and tighten all 2 set screws (D). When the set screws are correctly adjusted you will feel resistance. Once adjusted retighten hex. nuts (C).
3. To adjust the head gib, loosen 2 hex. nuts (E) Fig. 18. Raise and lower the head and tighten all 2 set screws (F). When the set screws are correctly adjusted you will feel resistance. Once adjusted retighten hex. nuts (E).

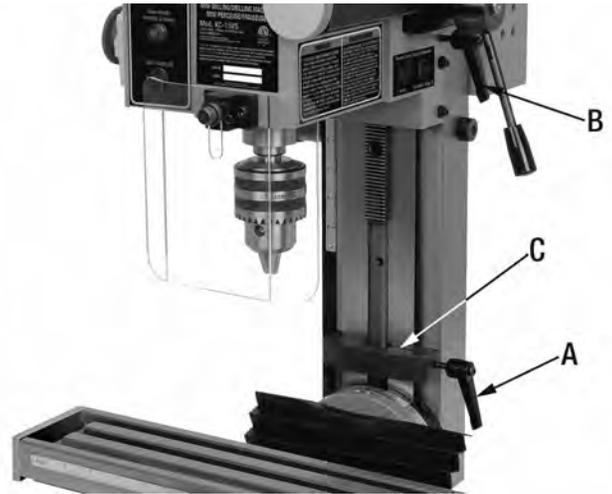


FIGURE 16

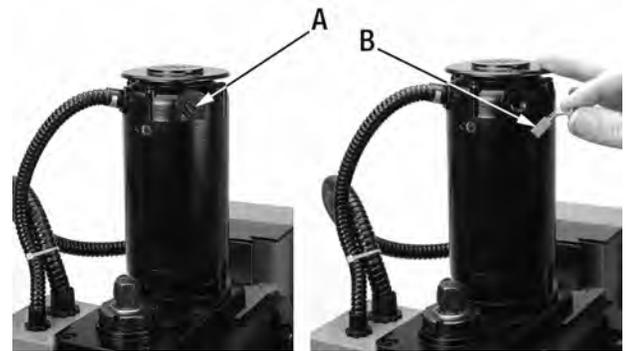


FIGURE 17

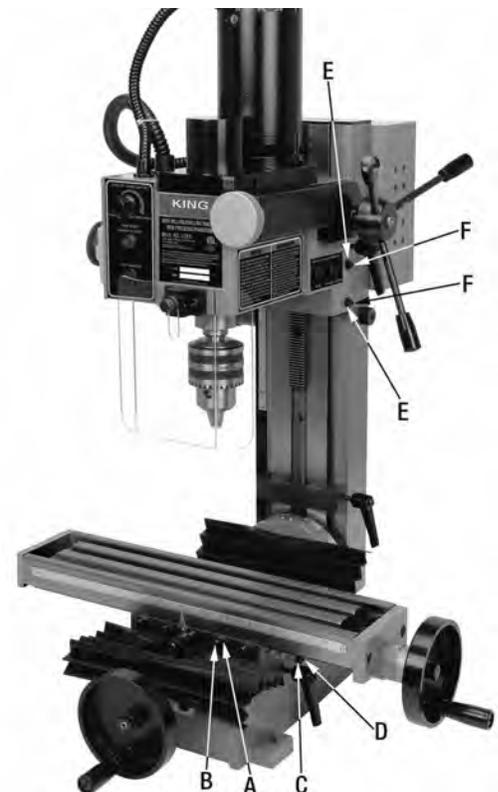


FIGURE 18

REPLACING FUSE

This Mini Milling/Drilling Machine comes with a 5A fuse installed to the front of the control panel of the machine. To replace fuse:

1. Unscrew fuse cover (A) Fig.19.
2. Remove fuse (B), replace with identical fuse and reinstall fuse cover.

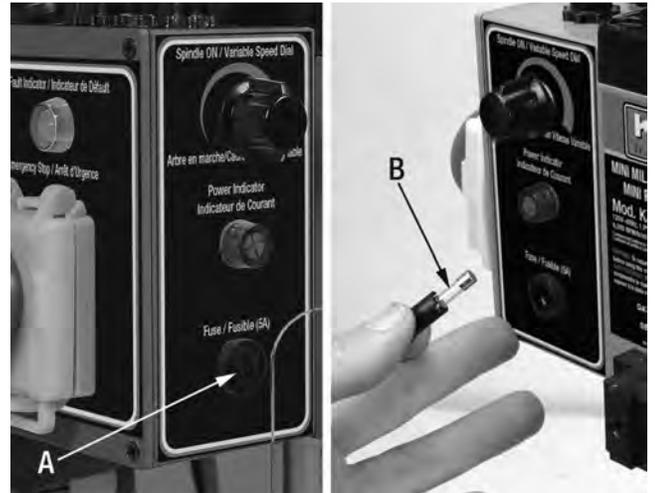


FIGURE 19