



RADIAL MILLING/DRILLING & TAPPING MACHINE



MODEL: KC-35

INSTRUCTION MANUAL

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WARNING: FAILURE TO FOLLOW THESE RULES MAY RESULT IN SERIOUS PERSONAL INJURY

As with all machinery there are certain hazards involved with operation and use of the machine. Using the machine with respect and caution will considerably lessen the possibility of personal injury. However, if normal safety precautions are overlooked or ignored, personal injury to the operator may result.

This machine was designed for certain applications only. We strongly recommends that this machine NOT be modified and/or used for any application other than for which it was designed. If you have any questions relative to its application DO NOT use the machine until you contact with us and we have advised you.

SAFETY RULES FOR ALL TOOLS

A. USER:

1. **WEAR PROPER APPAREL.** No loose clothing, gloves, rings, bracelets, or other jewelry to get caught in moving parts. Nonslip foot wear is recommended. Wear protective hair covering to contain long hair.

2. **ALWAYS WEAR EYE PROTECTION.** Refer to ANSLZ87.1 standard for appropriate recommendations.

Also use face or dust mask if cutting operation is dusty.

3. **DONT OVERREACH.** Keep proper footing and balance at all times.

4. **NEVER STAND ON TOOL.** Serious injury could occur if the tool is tipped or if the cutting tool is accidentally contacted.

5. **NEVER LEAVE TOOL RUNNING UNATTENDED. TURN POWER OFF.** Don't leave tool until it comes to a complete stop.

6. **DRUGS, ALCOHOL, MEDICATION.** Do not operate tool while under the influence of drug, alcohol or any medication.

B. USE OF MACHINE:

1. **DON'T FORCE TOOL.** It will do the job better and be safer at the rate for which it was designed.

2. **USE RIGHT TOOL.** Don't force tool or attachment to do a job for which it was not designed.

3. **SECURE WORK.** Use clamps or a vise to hold work when practical. It's safer than using your hand frees both hands to operate tool.

4. **USE RECOMMENDED ACCESSORIES.** Consult the owner's manual for recommended accessories. The use of improper accessories may cause hazards.

5. **AVOID ACCIDENTAL STARTING.** Make sure switch is in "OFF" position before plugging in power cord.

C. ADJUSTMENT:

MAKE all adjustments with the power off. In order to obtain the machine. precision and correct ways of adjustment while assembling, the user should read the detailed instruction in this manual.

D. WORKING ENVIRONMENT:

1. **KEEP WORK AREA CLEAN.** Cluttered areas and benches invite accidents.

2. **DON'T USE IN DANGEROUS ENVIRONMENT.** Don't use power tools in damp or wet locations, or expose them to rain. Keep work area well-lighted.

3. **KEEP CHILDREN AND VISITORS AWAY.** All children and visitors should be kept a safe distance from work area.

E. MAINTENANCE

1. **DISCONNECT** machine from power source when making repairs.

2. **CHECK DAMAGED PARTS.** To read every details of trouble shooting, repair it very carefully and make sure the operator won't get injurt and damage the machine.

Thank you for purchasing the KC-35 Radial Milling/Drilling machine. If properly cared for and operated, this machine can provide you with years of accurate service. Please read this manual carefully before using your machine.

1. SPECIFICATION

MODEL		KC-35	
Drilling capacity		40mm (1.57")	
Face mill capacity		76mm (3")	
End mill capacity		20mm (3/4")	
Swing		980mm (38.6")	
Max. distance spindle nose to table		600mm (23.6")	
Spindle taper		MT3 or R8	
Spindle stroke		130mm (5")	
Diameter of Spindle sleeve		75mm (3")	
Head swivel		180°	
Diameter of column		115mm (4-1/2")	
Overall height (w/o stand)		1092mm (43")	
Machine stand height		610mm (24")	
Length		813mm (32")	
Width		559mm (22")	
Motor		1-1/2HP	
Spindle speed (r.p.m.)	5 S	50Hz	145~ 2600 4/8P 300~ 2600 4P
		60Hz	170~ 3000 4/8P 340~ 3000 4P
Right and left travel of table		380mm (15")	
Working area of table		550mm X 500mm (22" X 20")	
Gross weight		290 kgs (640 Lbs)	
Measurement (w/o stand)		584 X 864 X 1143mm	
Standard accessories : Chuck arbor, Drill chuck, Punch key, Paint (Can)			

2. BASIC & OPTIONAL FEATURES

- (1) Wide range of applications: Milling, Drilling
- (2) Sturdy construction and not limited to skilled operators
- (3) Standard forward and reverse switch
- (4) Convenient control for arm
- (5) Radial head movement
- (6) Tapping is optional by request
- (7) Step-pulley head
- (8) Deluxe stand is optional by request

3. MOUNTING MACHINE

- (1) Be sure to fix the head on the column and put the hanger on the head before moving machine. While moving machine, please keep its balance and safety.
- (2) Do not mount machine at the sunshine place to avoid the deformity of machine and the loss of accuracy.
- (3) Check to see if the motor turning in clockwise direction before connecting the electric distribution line.
- (4) Mount machine to a sturdy table or base. It is advisable that the table you choose be well constructed to avoid any vibration during operation.
- (5) Four holes are provided on the machine base for mounting. Before tightening bolts make sure the work table on the machine is level lengthwise and crosswise. Use shims if necessary.

4. CLEANING & LUBRICATING

- (1) Your machine has been coated with a heavy grease to protect it in shipping. This coating should be completely removed before operating the machine. Commercial degreaser, kerosene or similar solvent may be used to remove the grease from the machine, but avoid getting solvent on belts or other rubber parts.
- (2) After cleaning, coat all bright work with a light lubricant. Lubricate all points in Fig. 1 with a medium consistency machine oil.
- (3) Lubricating points as shown in arrows.

5. USE OF MAIN MACHINE PARTS

- (1) Grip (See Fig. 1)
- (2) Forward/Reverse switch
- (3) Handle rod for hand wheel
- (4) Hand wheel
- (5) Indicator
- (6) Lock handle
- (7) Rack handle rod

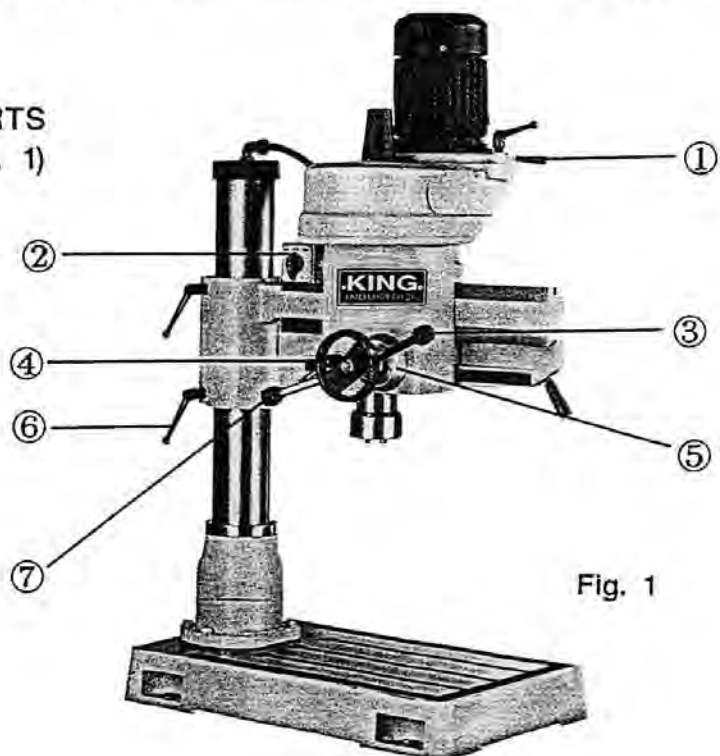


Fig. 1

6. PRECAUTION FOR OPERATION

Check all parts for proper condition before operation; if normal safety precautions are noticed carefully, this machine can provide you withstanding of accurate service.

(1) Before Operation

- (a) Fill the lubricant.
- (b) In order to keep the accurate precision, the table must be free from dust and oil deposits.
- (c) Check to see the tools are correctly set and the workpiece is set firmly.
- (d) Be sure the speed is not set too fast.
- (e) Be sure everything is ready before use.

(2) After Operation

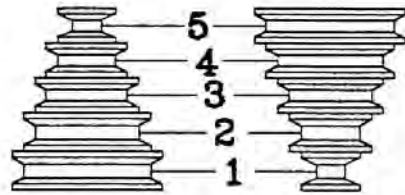
- (a) Turn off the electric switch.
- (b) Turn down the tools.
- (c) Clean the machine and coat it with lubricant.
- (d) Cover the machine with cloth to keep out the dust.

7. PREPARING FOR DRILLING

- (1) To raise and lower the head, loosen the two lock handle, rotate the head handle to desired height. Then lock the lock handle well.
- (2) To travel and backward the machine head, loose the leaf handle (for head locking) at the back side of the arm. Rotate the hand wheel for moving the machine head to desired position. Then lock the leaf handel well.
- (3) When machine head is in fixed position, turn on the power. Spindle will go down for drilling by rotating handle rod for hand wheel in clockwise direction. Spindle will go back to original position by loosing the handle rod for hand wheel, or rotating handle rod in counter clockwise.

8. SPEED CHANGING AND BELT ADJUSTMENT

- (1) Turn off the power.
- (2) Remove motor side plate (right & left) by loosening set screw A (Part No. 66).
- (3) Loosen motor base screw B & C (Part No. 59, 60), move the grip D by clockwise direction to loose the motor belt.
- (4) Select the suitable R. P. M., according to speed chart (Fig. 2). Then place the belt on desired pulley step. Hold the grip D toward counter-clockwise direction for pulling belt to tight.
- (5) Tighten two screw B & C.
- (6) Cover the side plates, tighten the screw A.



Speeds 8P		BELT
50Hz	60Hz	
145	170	1
275	330	2
440	530	3
690	830	4
1300	1500	5

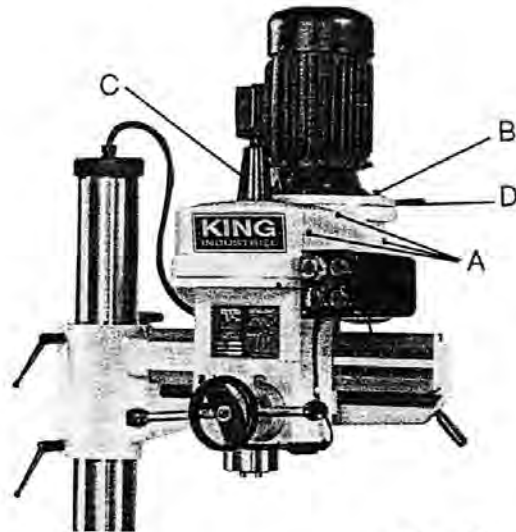


Fig. 2

9. TO CHANGE TOOLS

- (1) Removing Face Mill or Drill Chuck Arbor
Loosen the arbor bolt at the top of the spindle shaft approximately 2 turns with a wrench. Rap the top of the arbor bolt with a mallet.
After taper has been broken loose, holding chuck arbor on hand and turn detach the arbor bolt with the other hand.
- (2) To Install Face Mill or Cutter Arbor
Insert cutter and cutter arbor into the taper of spindle. Tighten arbor bolt detach securely, but do not overtighten.
- (3) Removing Taper Drills
 - (a) Turn down the arbor bolt and insert the taper drill into the spindle shaft.
 - (b) Turn the rapid down handle rod down until the oblong hole in the rack sleeve appears. Line up this hole with the hole in the spindle. Insert key punch key through holes and strike lightly with a mallet. This will force the taper drill out.

10. ORDERING REPLACEMENT PARTS

Complete parts list is attached. If parts are needed, contact your local distributor.

11. OPTIONAL ACCESSORIES

Each of machine is equipped with a MT # 3 spindle taper or a R-8 spindle taper (examples below). Contact your local distributor or a major cutting tool distributor to obtain any of these accessories.

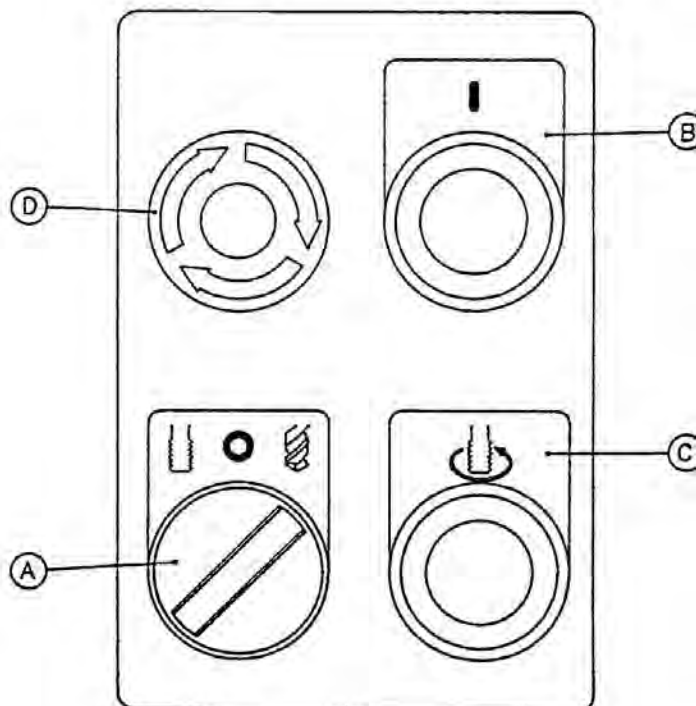
Taper Drills	Deluxe Stand	Inverter Switch
Reamers	52 Pcs Clamping Kit	Work Lamp
End Mills	Face Milling Cutter	Collect Chuck
Cutter Arbor	7 Pcs Milling Chuck	Cooling System
Taps	K-Type Milling Vise	3 1/2" Angle Vise
Collets	NT # 30 Spindle Taper	3" Face Mill Cutter
Adapters and Sleeves	Tapping Switch For 3 Ph Motor	3-Way Angle Milling Vise
Box Working Table	Emergency Switch For 3Ph Motor	1/2" Drill Chuck
Cross Working Table	Magnetic Switch For 1 or 3 Ph	

12. TAPPING EQUIPMENT

This machine can be equipped with an electric switch for tapping operation clockwise or counterclockwise, and the working depth also can be adjusted by the limit switch. (Electric switch will be installed according to your requirement, and you must pay the cost only.)

OPERATION FOR TAPPING SWITCH:

- (1) Turn the select switch (A) (see Fig. 3) to " TAPPING " position when you want to do tapping work.
- (2) Handling down the quill and setting up the stroke of tapping depth by graduated rod.
- (3) Check the proper speed of spindle for your tapping condition.
- (4) Push down the start button (B) (see Fig. 3) and begin to tap.
- (5) If anything fails, put down the emergency stop (D) (see Fig. 3) and the machine will stop immediately.
- (6) Release the emergency stop (D) and the push down the reversing button (C), the tap will go reversely back out.
- (7) After finishing your tapping work, Remember to turn the select switch (A) to " NEUTRAL " position.



13. TROUBLE SHOOTING

- (1) No running after switch on:
 - (a) Main switch interruption while volts irregular - Adjust input voltage and draw back the main switch.
 - (b) Break down of fuse in switch box - Replace with new one.
 - (c) In case of too much current, the overload relay jumps away automatically - Press the overload relay, and it will return to the correct position.
- (2) Motor Overheat and No Power:
 - (a) Overload - Decrease the load of feed.
 - (b) Lower voltage - Adjust to accurate voltage.
 - (c) Spoiled contact point of magnetic switch - Replace with new one.
 - (d) Break down of overload relay - Connect it or replace with new one.
 - (e) Motor is poor - Replace with new one.
 - (f) Break down of fuse or poor contact with wire (it is easily to spoil motor while short circuit) - Switch off power source at once and replace fuse with new one.
 - (g) The tension of pulley V-belt too tight - Adjust for proper tension of V-Belt.
 - (h) If this machine with the tapping attachment, there is an aid plum screw fix on the motor mount in order to avoid the motor pulleys shake while turning.
- (3) The temperature of spindle bearing is too hot:
 - (a) Grease is insufficient - Fill the grease.
 - (b) The spindle bearing is fixed too tight - Turning with no speed and feel the tightness with hand.
 - (c) Turning with high speed for a long time - Turn it to lightly cutting.
- (4) Lack of power with main spindle revolving:
 - (a) The tension of V-belt too loose - Adjust for proper tension of V-belt.
 - (b) Motor has burned out - Change a new motor.
 - (c) Fuse has burned out - Replace with new one.
- (5) Shake of spindle and roughness of working surface has taken place during performance:
 - (a) The gap of spindle bearing too wide - Adjust the gap in proper or replace bearing with new one.
 - (b) Spindle loosening up and down - Make two of inner bearing covers on the top tight each other. Do not overtighten two inner bearing covers with the taper bearing; it is ok as long as no gap between them.
 - (c) The gap of taper sliding plate too Wide - Adjust the tension of bolt in proper.
 - (d) Loosening of chuck - Fasten chuck.
 - (e) Cutter is dull - Resharpen it.
 - (f) Workpiece has not hold firmly - Be sure to tighten workpiece.
- (6) Without accuracy in performance:
 - (a) Imbalance of heavy workpiece - Must be considerate of the principle of balance while holding workpiece.
 - (b) Often use of hammer to strike workpiece - Forbidden to use hammer to strike workpiece.
 - (c) Unaccurate horizontal table - Check and maintain table for keeping accurate horizontal after a period of use.

14. MAINTAINING

That's easier to keep machine in good condition or best performance by means of maintaining it at any time than remedy it after it is out of order.

(1) Daily Maintenance (by operator)

- (a) Fill the lubricant before starting machine everyday.
- (b) If the temperature of spindle caused overheating or strange noise, stop machine immediately to check it for keeping accurate performance.
- (c) Keep work area clean; release vise, cutter, workpiece from table; switch off power source; take chip or dust away from machine and follow instructions lubricating or coating rust-proof oil before leaving.

(2) Weekly Maintenance

Check to see if sliding surface and turning parts lack of lubricant. If the libricant is insufficant, fill it.

(3) Monthly Maintenance

- (a) Adjust the accurate gap of slide both on cross and longitudinal feed.
- (b) Lubricate bearing, rack, and worm shaft to avoid wear.

(4) Yearly Maintenance

- (a) Adjust table to horizontal position for maintenance of accuracy.
- (b) Check electric cord, plugs, switches at least once a year to avoid loosening or wearing.

PARTS DIAGRAM & PARTS LISTS

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