



ND5 DRILL

INSTRUCTION & PARTS

MANUAL

© BAUMFOLDER CORPORATION 2000
All Rights Reserved

WARNING

- Do not operate this machine without all guarding in place.
- Do not make adjustments or perform maintenance on this machine with power on.
- Keep the machine and the work area clean and free of spills to prevent accidents.
- Be sure to replace any safety decals that may have been detached for any reason.

Baumfolder reserves the right to make changes in design or to make additions or improvements in its products without imposing any obligation upon itself to install them on its products previously manufactured. It is recommended that modifications to this equipment not be made without the advice and express written consent of Baumfolder.

Contents

FUNDAMENTAL SAFETY	4
INSTRUCTIONS	4
SECTION 1:	
MAIN ASSEMBLIES	1-1
1 PHASE	2
3 PHASE	8
3 PHASE WITH MOVEABLE TABLE	14
SECTION 2:	
BASE & ENCLOSURE ASSEMBLY	2-1
PAPER DRILL BASE ASSEMBLY	2
ENCLOSURE COVER ASSEMBLY	7
SUPPORT BAR & SHAFT ASSEMBLY	9
LOWER SPRING GUIDE ASSEMBLY	11
SECTION 3:	
HYDRAULIC ASSEMBLY	3-1
1 PHASE HYDRAULIC ASSEMBLY	2
1 PHASE HYDRAULIC ASSEMBLY	2
HYDRAULIC DIAGRAM	8
SECTION 4:	
DRILL & MOTOR ASSEMBLY	4-1
1 PHASE DRILL & MOTOR ASSEMBLY	2
1 PHASE ELECTRICAL ASSEMBLY	8
1 PHASE SCHEMATIC	11
3 PHASE DRILL & MOTOR ASSEMBLY	12
3 PHASE ELECTRICAL ASSEMBLY	18
3 PHASE SCHEMATIC	21
DRILL ASSEMBLY	22
SECTION 5:	
MOVEABLE & STATIONARY TABLES	5-1
STATIONARY TABLE ASSEMBLY	2
MOVEABLE TABLE ASSEMBLY	6
SECTION 6:	
ACCESSORIES	6-1
DRILL SHARPENER ASSEMBLY	2
SECTION 7:	
LABELS	7-1
LABELS	2

ND-5 PAPER DRILL

Your new ND-5 Paper Drill has been designed to provide you with years of useful service, provided it is installed, maintained and operated according to the instructions contained in this manual.

The ND-5 Paper Drill has the capability for five drill heads, and is available with either a stationary (ST) or moveable (MT) table. Drill bits are available in sizes ranging from 1/8" to 1/2" in diameter.

SAFETY INSTRUCTIONS

All guards, warning labels, lubrication and caution tags were placed on this machine for your safety. Take time to become familiar with all of them. These items must not be removed from this machine.

The operation and maintenance of this machine should be clearly understood. Besides exercising standard safety practices, operators, maintenance personnel and any other personnel involved with this drill, should be specifically instructed on proper maintenance and safe operation of this machine.

All safety mechanisms are provided for your protection and must not be altered.

WARNING

Do not operate this machine without all guards in place.

Do not make any adjustments or perform any maintenance on this machine with power on.

Keep the machine and the work area clean and free of spills, to prevent accidents.

Be certain to replace any safety decals that may have been detached for any reason.

INSTALLATION INSTRUCTIONS

This machine is shipped inside a protective wood frame. The following parts are packaged inside the machine at the factory:

Waste Can	Wood Blocks
Back gage Bar	Drill Sharpener
Back gage Blocks	Side Gage
Tools	Instruction Manual

Carefully remove the wood frame and remove one of the side covers to find these items. Be sure to check off the parts received against the packing list. Examine the machine carefully for any physical signs of shipping damage.

The machine is fastened to the skid with four bolts. Remove these bolts and then carefully position the machine on the floor. Level the machine to prevent rocking during operation.

BACK GAGE INSTALLATION

Place the back gage bar at the rear of the table top. Insert the two clamp knobs through the clearance holes provided in the bar. Screw the clamps onto the bottom of the threaded rod that extends from the clamp knobs. Place the two back gage blocks on the bar so that the thumbscrews are pointing toward the rear of the machine. Set the bar using the scales on the right and left sides of the table.

SIDE GAGE INSTALLATION

Slide the side gage assembly into the T-slot provided in the table top. Slide the side gage to a location desired on the table scale and tighten the knob by hand.

WASTE CAN INSTALLATION

Hang the waste can on the two shoulder screws at the top of the rear of the machine base.

TOOLS

A convenient accessories drawer has been provided on the rear right hand corner of the machine base. A removable tray is furnished for storing drill bits in a bath of lubricant while they are not in use. All other tools can be placed in the other compartment for quick, convenient access.

HYDRAULIC SYSTEM

Checking the hydraulic oil level in the reservoir is done by removing the right hand side cover and removing the four screws that fasten the lid to the reservoir. The return line hose may remain connected. The oil level must be just below the port located near the top on the side of the reservoir. Do not fill above this port!

ELECTRICAL SYSTEM

Check the black serial number tag on the left rear corner of the machine base for voltage/phase/hertz and amperage required. This tag also lists the time delay fuse amperage and the wire size for the supply conductor.

Check the proper rotation of the drill head drive shaft. The rotation must be the same as indicated by the arrow decal located on the side of the belt guard on the left hand side of the machine. If the shaft is turning in the opposite direction, change two of the wires in the incoming power cable of the machine, choosing from the red, black and/or white wires. If the drill head shaft is rotating in the opposite direction of the arrow, the hydraulic system will not be able to create any pressure.

STARTING

Two electric motors provide the power for this machine; one is for the hydraulic power system and the other is for the spindle. The electric motor for the hydraulic system drives a hydraulic pump that creates the force to push the drill heads down. The spindle motor drives the drill head spindles through a set of belts and pulleys.

The two motors are started separately by pushing the corresponding start button indicated by the appropriate symbols on the pushbutton panel. This feature is needed for setting drill bits, for round cornering and slotting. This allows the hydraulic system to be running while the spindle is not.

Both motors are turned off by a red mushroom stop pushbutton located on the left side of the panel. This is a safety feature that stops the entire machine.

WARNING

This machine is equipped with a safety interlock system which prevents the spindle motor from being started when the hinged top cover is raised, and automatically turns the spindle motor off if the cover is raised after the spindle motor is turned on. This safety feature is provided to prevent accidental contact with moving parts. This feature must not be altered or tampered with.

OPERATION

A maximum of five drilling heads can be used on this machine with 1/4" drill bits and smaller. A maximum of four drill heads with 3/8" drill bits and a maximum of three drill heads with 1/2" drill bits.

NOTE: Use drill extensions on all drill bits that have a threaded hole in the top of the drill bit.

SETTING DRILL HEADS

- A) Raise the hinged top cover.
- B) Insert the drill bits into the drill head spindles. Use drill extensions on all bits that have a threaded hole in the top end.
- C) Make sure that the retainer on the spindle is down over the horseshoe lock washer.
- D) Move the drill heads to the desired locations by loosening the clamp screws, then move to the left or right of zero on the scale in front of the drill heads. The line that extends down from the diamond logo on the cover plate is to be used to line up with the graduations on the scale. Then lock the drill heads in place.
- E) Adjust the spindles to their uppermost position by loosening the set-screw located in the front of the drill head in the clamp block at the top. Turn the knurled caps on top of the drill heads in a counterclockwise direction until they are at their uppermost position.
- F) Turn on the hydraulic power system by pressing the green pushbutton that is below the symbol showing a drill bit with a vertical double arrow. **DO NOT TURN ON THE SPINDLE MOTOR.**
- G) Depress the foot pedal and hold it down. The drill heads will come down. Adjust all drill heads individually by turning the knurled knob on top of the drill heads clockwise until they just cut through a single piece of 20lb paper.
- H) Remove your foot from the foot pedal and the drill heads will come back up. Tighten the set-screw in the drill heads as referred to in step (E). **CAUTION: Do not over-tighten.** To lock more than finger tight is unnecessary and will cause damage to the threads on the spindle sleeve.
- I) Lower the hinged cover before turning the spindles on.

MOVEABLE TABLE INSTRUCTIONS

The moveable table is a unique feature that allows the operator to drill several holes without moving the stock by hand. Every MT paper drill is equipped with an adjustable step bar that has five adjustable stops. The moveable table can become a stationary table by using the table lock plunger located in the front of the machine under the table.

OPERATION

A) It is best when setting up a job to begin with the table locked in its center position and work outward from the zero mark on the scales. The zero marks on the drill head scale, table scale, and step bar scale, are all in line when the table is locked in the center position. To lock the table in the center position, turn the knob under the front of the table so that it will slide the plunger up into the hole provided in the tie bar when the hole passes over the plunger.

B) The five table stops are located in the front of the machine underneath the table top. The stops are set by aligning the indicator at the top of each stop with the scale located behind them. The stops are moved by loosening the set screws in the stops and sliding them to their desired location. Once the stops have been located and tightened in position, you may release the table from the locked position by pulling the knob below the table down and giving it a quarter turn.

C) After the table is unlocked from the center position, you will see that the table will move to the left and stop when it comes to the closest stop on the adjustable step bar. To move on to the next stop, simply pull up on the flat black handle on the left hand side of the table, and drop it back down so the next stop will be found.

D) If you have an indexing job that you do quite often, optional special pre-cut step bars are available. Installation of a pre-cut step bar is quite simple. Remove the adjustable step bar by removing the two socket head cap screws and spacers. Mount the pre-cut step bar in the same place, using the same two socket head cap screws, the two spacers are not needed. Adjust the latch plunger that is directly below the pre-cut bar so that the teeth in the bar make contact with the beveled plunger. A 24mm open end wrench is required to loosen the plunger assembly.

Simply turn the assembly until the proper height is made and retighten the nut.

ROUND CORNERING AND SLOTING INSTRUCTIONS

A) Raise hinged top cover.

B) Remove the hand wheel on the right hand side of the drill head drive shaft by loosening the set screw in the hub of the knob and sliding it off the shaft.

C) Remove the right hand drill shaft bracket by loosening the hex head screws on the top of the right hand drill shaft bracket. Remove the button head screw that holds the scale to the bracket. Slide the bracket off the right end of the drill head drive shaft.

D) Remove, all drill heads.

E) Slide the round cornering / slotting head on the shaft and the drill head support rail to the desired position and lock in place.

F) Insert the cutting tool required in the square hole at the bottom of the head. Make sure that the tool is adjusted all the way up. This is done by loosening the four socket head cap screws on the front of the head and raising the knurled head screws. Push the tool up as far as it will go and tighten the four socket head cap screws just enough to hold the knife in place.

G) Remove the waste chute from the machine. This is done by removing the shoulder screw on the right side of the support rail casting and sliding the left mounting tab off of the roll pin on the left hand side of the support rail casting.

H) Mount the right hand support bracket back on the drill head support rail and drill head drive shaft. Replace the scale and fasten it to the bracket as it was before. Tighten the hex head screw on top of the bracket. Mount the hand knob back onto the end of the drill head shaft and tighten the set screw against the bottom of the key way.

I) Turn on the hydraulic power system and bring the head down. Using the knurled head screw, adjust the cutting tool down to the wood block. Do not turn on the spindle motor. It is not needed at any time during round cornering and/or slotting. The cutting tool should be adjusted so that it makes a slight impression on the wood block.

J) Lock the cutting tool securely by tightening the four socket head cap screws. Lightly tighten the set screw on the right side of the slotting head to secure the knurled head screw in place.

K) Either remove or slide the standard side gage to the right or left end of the table top.

L) Fasten the mounting block and cornering guide together. Mount the assembly to the back gage bar as shown in Figure 1, using the existing back gage blocks as supports at each end.

M) Use the impression in the wood block to set the corner guide. Use the back gage bar clamps to adjust the guide knob shown in Figure 1 to make slight adjustments to the left or right.

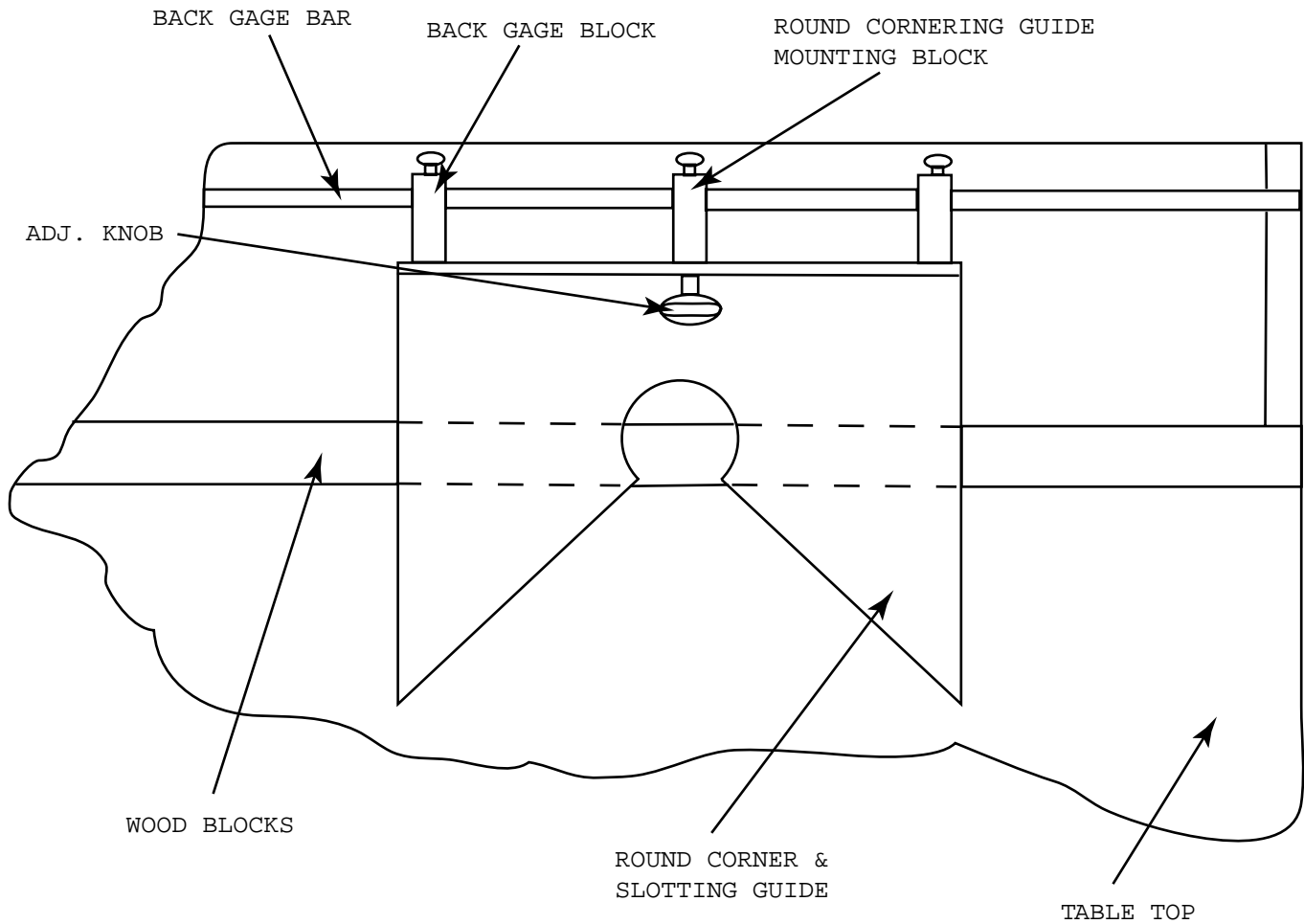


FIGURE 1

ROUND CORNER AND SLOTTING GUIDE

IMPORTANT NOTES

1. For best results and to avoid knife breakage, no more than 1/2 inch of paper should be cut at any one time.
2. Turn the machine off when making adjustments.
3. Replace any guards that were removed before you use the machine.

DRILL HEAD AND BIT TIPS

1. KEEP DRILLS SHARPENED

A dull drill bit can be a major cause of drill bit breakage. Sharpening and cleanliness help prolong bit life. Imperfections in drilling indicate dull drills. A dirty drill bit will clog and will cause pressure build up that can split or break the drill bit. Clean the drill bits of all chips after each use and apply a light film of oil to the inside and outside. When drilling coated stock, the chips frequently are compacted into slugs inside the drill bit, it is important that the drills be cleaned out immediately before the drill cools or the slugs will become a solid mass that will cause the drills to break the next time they are used.

2. LUBRICATE DRILLS

Use the drill lubricant sticks that are provided with your drill to assure better chip passage and to avoid overheating of the drills. Touch the side of the drill bit near the cutting edge with the end of the lubricant stick. Try to coat the inside of the bit as well. Squeaking, slight burning or smoking is a common sign that lubrication is needed.

3. SET THE DRILLS CORRECTLY

Do not cut too deeply into the wood blocks. The drills should just touch the block enough to make an impression and cleanly drill through the bottom sheet. Do not set the drills deeper into the blocks after drilling, move the blocks or flip them over or turn them end for end to get a new cutting surface. The use of chipboard (cardboard) below the lift when drilling can sometimes improve the hole quality.

4. CHECK BELTS

Loose belts can slip and cause overheating of drills. Tighten if necessary, but be careful not to over tighten.

5. CHECK FOR RUNOUT OR WOBBLE

Drill head spindles that are worn or bent as a result of mis-adjustment can cause drill breakage. Have the spindles replaced immediately.

6. INSPECT DRILL SHARPENER

Check the cutting edges of the carbide cutting tool for nicks and sharpness. Don't let the drill drop on the cutting tool or the cutting edge will be damaged on the tool. Use gentle pressure when sharpening. Too much pressure will spread the mouth of the drill, causing breakage. Only a few turns will sharpen the drill.

7. USE DRILL EXTENSIONS

Drill extensions help chips flow up into the spindle and out of the ejection slot. There are two sizes of extensions: the black extension fits 1/8" through 5/32" drills; the gray extensions fit 3/16", 7/32", and 1/4" drills. The larger diameter drills do not need extensions. Extensions help prevent drill breakage, especially when drilling coated stock.

8. REMOVE DRILLS FROM HEADS WHEN FINISHED

Depending upon atmospheric conditions, if the drills are left in the spindles overnight or for the weekend, they may rust. If this occurs, they will be extremely difficult to remove.

9. LUBRICATE HEADS

A) Drill heads should be greased approximately once every five working days with Lubriplate #1200-2 General Purpose Grease or equivalent. Use only two squeezes of a small grease gun. The grease zerk for the drill heads is located on the rear of the head. To grease the heads, drop the waste chute out of the way by removing the shoulder screw on the right side of the support rail casting and slide the waste chute off of the roll pin on the left side.

B) Put three to four drops of light oil in the top of each drill head spindle once every four working hours, and once every time before the drill is started. Use Marvel No. 005 Lubricating oil or equivalent.

SPECIFICATIONS

ELECTRICAL:

Motors: 1 hp pump
2 hp spindle

Available in: 208-220V/1 phase/60 hz at 20 amps
208-220V/3 phase/60 hz at 10 amps

Electrical safety interlock that prevents spindles from rotating when hinged cover is raised.

Separate start pushbuttons for the spindle drive motor and the hydraulic power unit.

One stop button turns off the entire machine.

Indicator light is provided that tells the operator when a motor is overloaded.

Motor contactors have automatic reset feature.

Front cover is hinged for quick and easy access.

HYRAULIC:

1 1/2 qprn pump at 1800 rpm

1 gallon reservoir

Preset relief valve protects system

Oil: Anti-wear hydraulic oil
Mobil DTE 24
Mobil DTE 25
Mobil DTE 26
Energol HLP-32
Energol HLP-46

MAINTENANCE CHECKLIST

Daily: 1. Sharpen drill bits
2. Lubricate drill bits
3. Lubricate drill head spindles

Weekly: 1. Grease drill heads

Monthly: 1. Check hydraulic reservoir oil level
2. Check drive tightness

Yearly: 1. Change hydraulic reservoir oil

DRILLING:

Maximum number of drilling heads: 5

Drill bit sizes available: 1/8" to 1/2"

Max drilling capacity: 5 heads with 1/4" drill bits - 2" max.
4 heads with 3/8" drill bits - 2" max.
3 heads with 1/2" drill bits - 2" max.

Vertical drill bit adjustment in drill heads: 5/16"

Maximum center to center distance of heads: 10"

Minimum center to center distance of heads: 1.5"

Maximum distance from center of drill to back gage: 5.83"

Maximum distance between holes (MT): 23.13"

Min. distance between holes (MT): Adjustable stops: .38"
Fixed gages: .25"

Floor space required for ST drill: 36" x 26"

Floor space required for MT drill: 36" x 49.5"

Machine height: 59"

Shipping weight (approximate): 850 lbs.

ROUND CORNERING & SLOTTING:

Maximum lift height: 1/2"

Round corner cutters available: 3/16"r., 3/8"r., 1/2"r.

Slotting cutters available: 30°, 45°, 60°, straight slit

VALUE ADDED STANDARD FEATURES:

Hand drill sharpener and sharpening stone

Tool and accessories drawer with removable tray

Tools for removing heads from machine

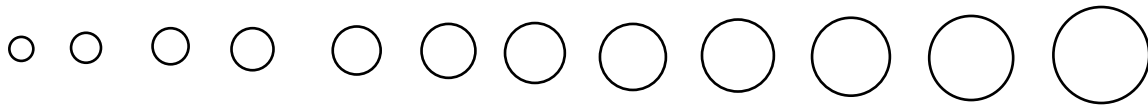
"Drill Ease" drill bit lubricant sticks

Enclosed waste chute eliminates excessive chips on the floor

Large capacity, and easily removable waste can

Safety interlock hinged cover stops rotation when cover is up

ACTUAL DRILL SIZES



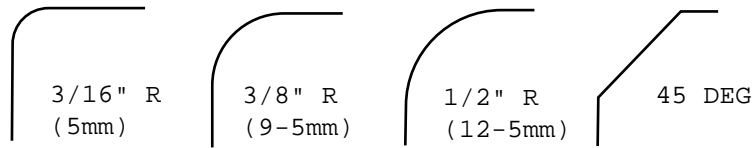
DIAMETER: INCHES/(METRIC)

1/8"	5/32"	3/32"	7/32"	1/4"	9/32"	5/16"	11/32"
3-1mm	4mm	5mm	5-5mm	6mm	7mm	8mm	9-

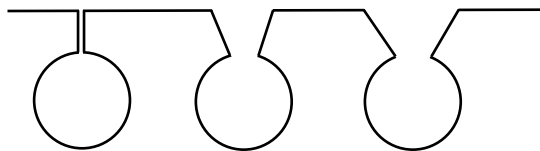
CAPACITY: INCHES/(METRIC)

1"	1-1/8"	1-1/2"	1-3/4"	2"	2"	2"	2"
25mm	25mm	35mm	40mm	50mm	50mm	50mm	50mm

SHAPES OF ROUND CORNERS



SLOTTED HOLES PRODUCED



Drill bits, corner shaping cutters and slotted hole cutters are available through Baumfolder or your local Baumfolder dealer.

TROUBLESHOOTING

PROBLEM

1) Drill heads
won't come down

POSSIBLE SOLUTIONS

a) Check motor rotation of drive shaft with arrow on belt guard. Switch two wires of the incoming electrical cable to correct rotation.

b) Relief valve may need adjusting. Contact the BM Dealer or Baumfolder office where you purchased your ND-5 drill for assistance.

2) Spindles stall

a) Dull drills, sharpen or replace

b) Check for low voltage

c) Check for belt drive tightness

d) Check for plugged drill bits

3) Drill head won't
come back up

a) Check for broken lift springs. Contact the BND Dealer or Baumfolder office where you purchased your ND-5 drill for assistance.

b) Oil guide shafts and pry up head

4) Insufficient
hydraulic pressure

a) Check oil level

b) Check voltage

c) Check relief valve. Contact the BND Dealer or Baumfolder office where you purchased the ND-5 drill for assistance.

5) Frequent drill
bit breakage

a) Dull drills; sharpen. Or
replace

b) Use drill extensions

c) Cutting too deep in wood
blocks, reset properly

d) Excessive wobble of bits,
replace spindles

e) Drill less stock height (covered
stock)

f) Clean out drill bits after end of
each use.