SERRATING/GROOVING TOOL

NW SERIES
1NW-2MT/ 3NW-3MT/ 4NW-4MT/6NW-5MT

Operation and Maintenance Guide

INDEX

FEATURES:

- Changing of pilot nose and cutter allows one tool to cover a range of hole diameters.
- Simple to change cutter for different groove shapes.
- Location and depth of cut easy to adjust.
- Only light pressure required to cut precision grooves.
- Ready to fit CNC drill machines, lathes and boring machines.
- The life of the cutter extendable by re-sharpening.

TECHNICAL DETAILS:

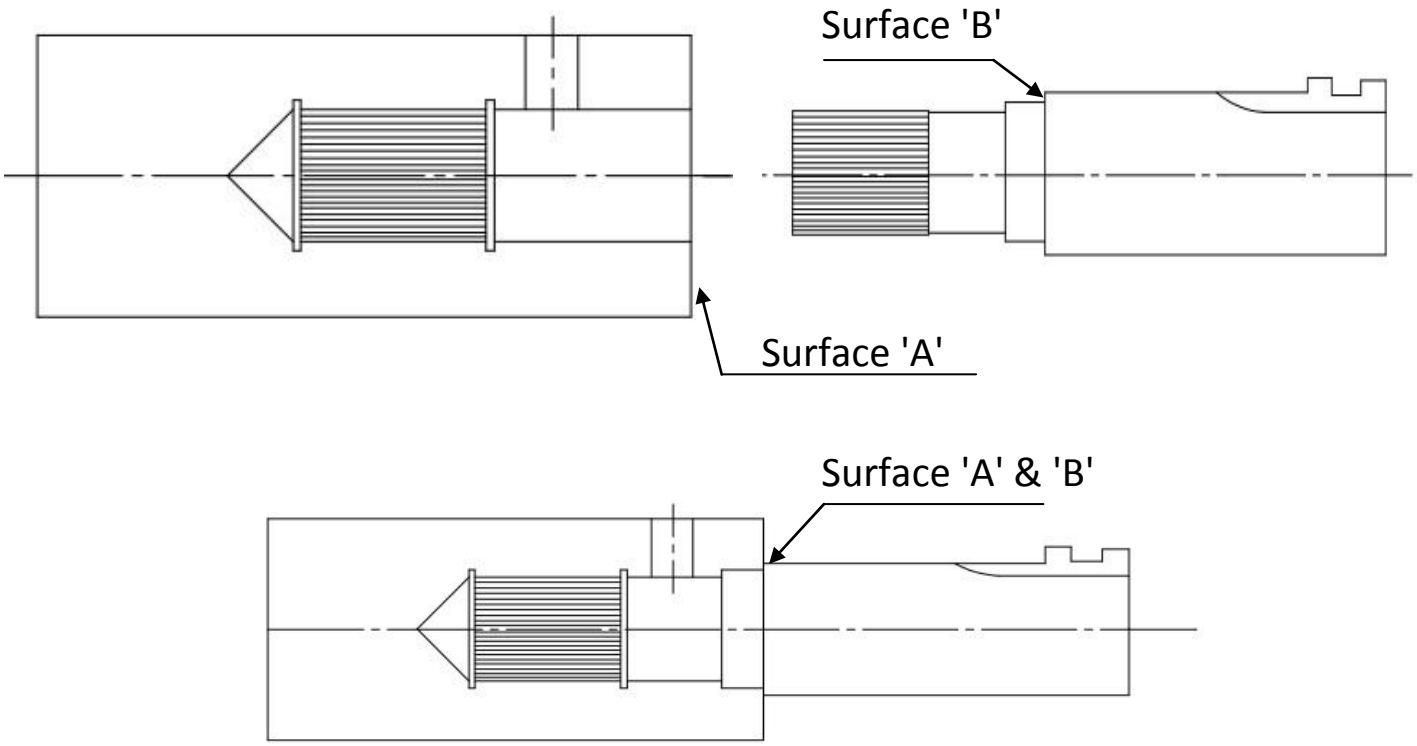
Description	1NW-2MT	3NW-3MT	4NW-4MT	6NW-5MT
Bore Range (mm/ inch)	9-32 3/8-1.1/4	16-45 5/8-1.3/4	19-48 3/4-1.7/8	38-102 1.1/2-4
Pilot Nose Model No.	1NW-PN	3NW-PN	4NW-PN	6NW-PN
Circular form cutter Model No.	1NW-CF	3NW-CF	4NW-CF	6NW-CF
Tool Bit Holder Model No.	1NW-TBH	3NW-TBH	4NW-TBh	6NW-TBH
Spare Tool Bit Model No.	1NW-TB	3NW-TB	4NW-TB	6NW-TB

Instructions for fixing of pilot nose & Cutter.

- Snap on pilot nose with retainer ring & tighten with 3 set screw.

- Insert form cutter or tool bit holder. Tighten the set screw

- Adjust collar & nut for location & depth of cut.

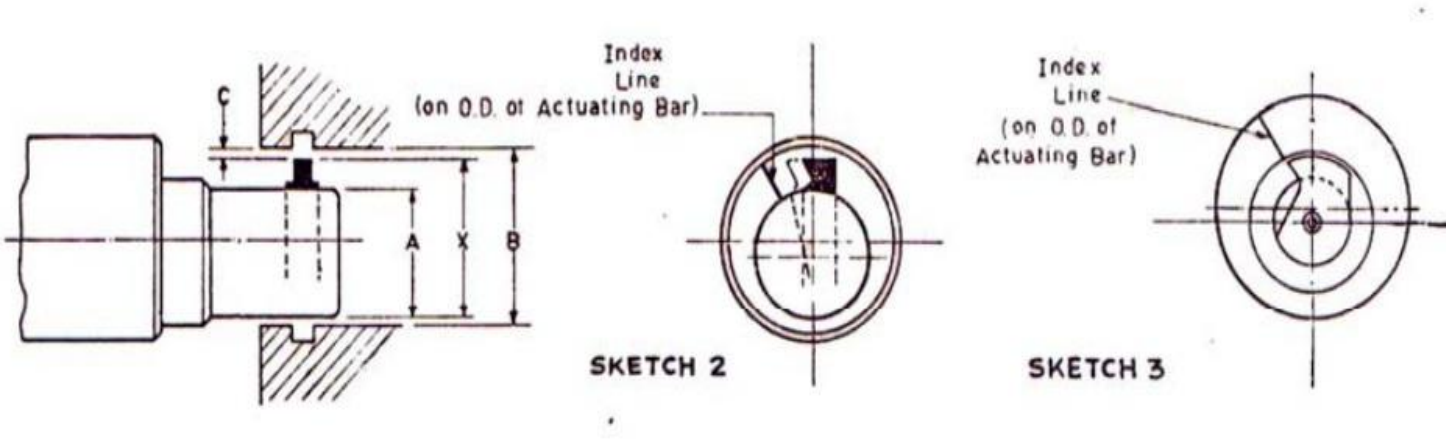


Sketch 1

While inserting the circular form cutter or tool bit holder it must go inside the Helical Shaft socket such that surfaces 'A' & 'B' must touch.

Insert the cutter inside the helical shaft by gentle push or if necessary by light hammering till surfaces 'A' & 'B' meet.

Instructions for setting of cutting tools.



For average works recommended clearance between Cutting tool and work hole ('C' in sketch 2) is 0.6 to 0.8 millimeters.

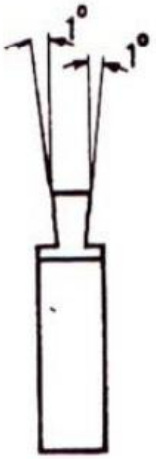
Special Circular form Cutters need only be set with this clearance and in relation to index line (scribed on O.D. of all necessary tool helical shaft) as shown in sketch 3.

Tool Bit Holder (Sketch 2) can be set with proper clearance from the formula shown in chart no.2

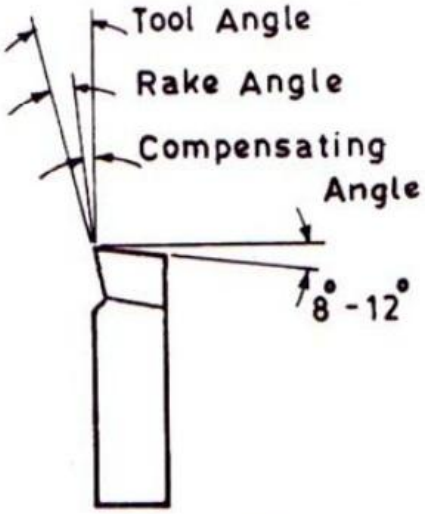
Model No.	X = Setting Diameter	
1NW-2MT	X={(A+B)/2} + 1.6C	A= Dia of Tool Bit Holder.
3NW-3MT	X={(A+B)/2} + 2.4C	B= Dia. Of Work Hole.
4NW-4MT	X={(A+B)/2} + 3.2C	X= Setting Dia.
6NW-5MT	X={(A+B)/2} + 4.8C	Note: All dim. are in MM

Chart No.2

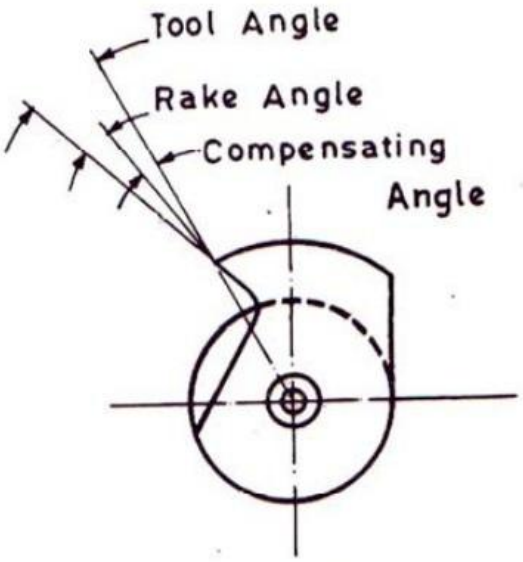
Instructions for Grinding of Cutting tools.



TOOL BITS



SKETCH 4

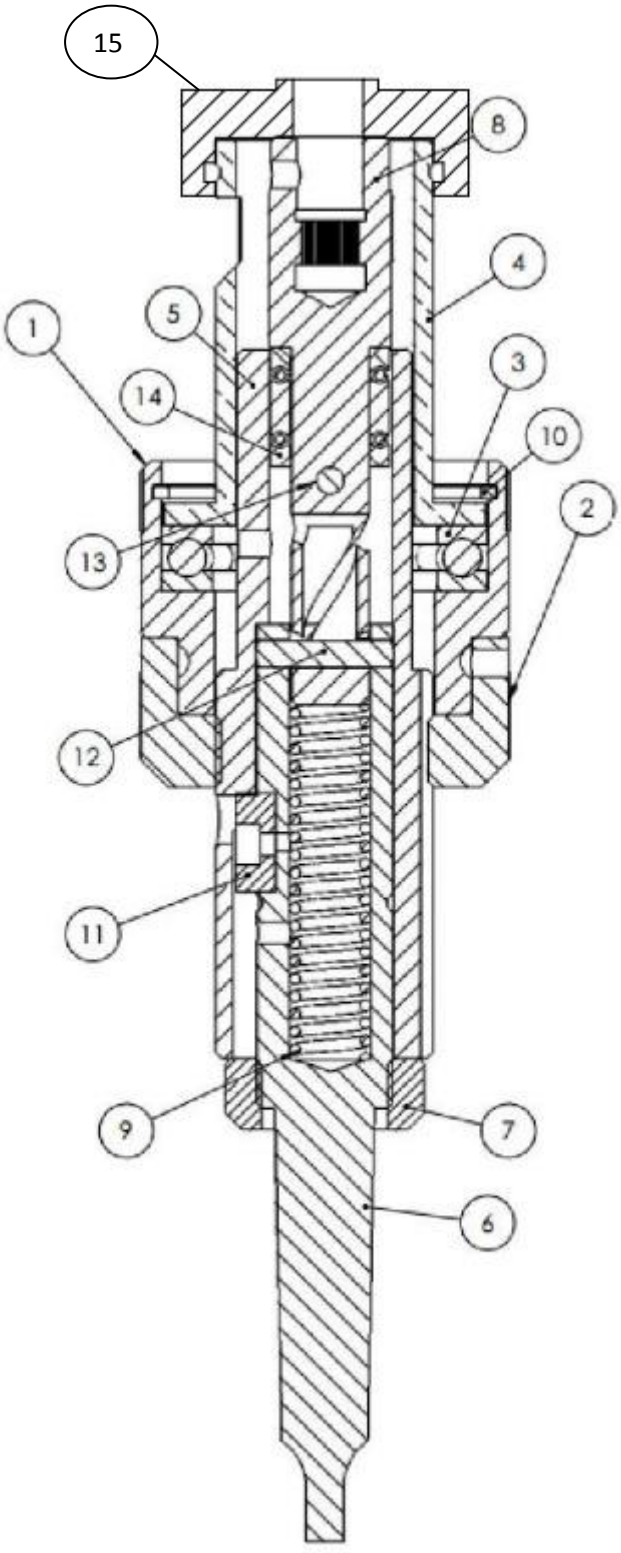


CIRCULAR FORM CUTTER

The Rake Angles and surface speeds are for broad general use and should be modified for specific conditions.

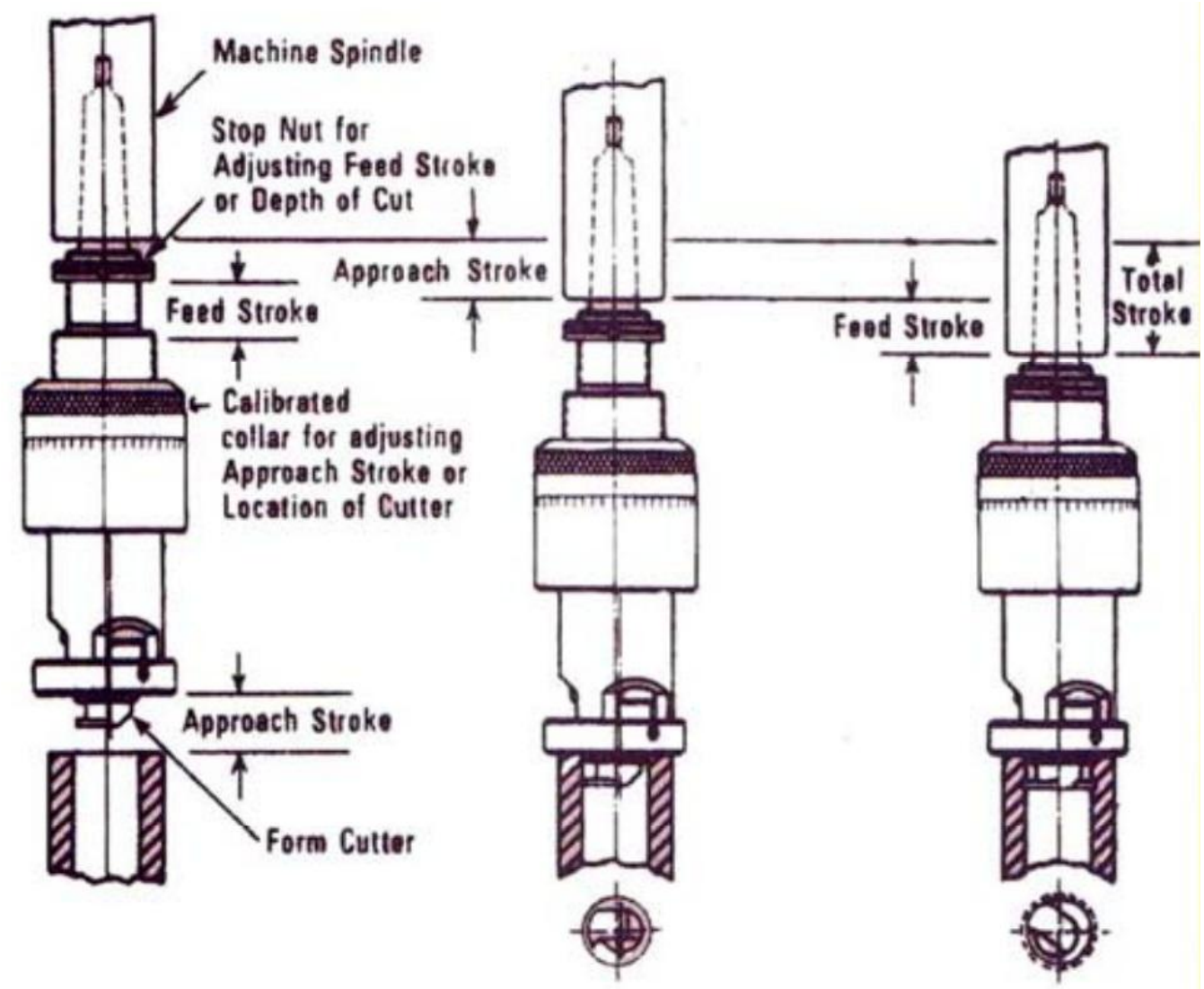
The feed of the cutter is determined by width of cut, desired finish and tolerance consistent with maximum life of cutter between grinds.

Part List:



Sr.No.	Part Name
1	Adjusting collar
2	Adjusting Nut
3	Thrust Bearing.
4	Bronze Shell
5	Body
6	MT Shank
7	Lock Nut
8	Helical Shaft
9	Compression Spring.
10	Circlip
11	Key
12	Dowel Pin
13	Pin
14	Ring Set
15	Pilot Nose

How It Works.



Tool in Position For Loading - Start of Approach Stroke.

Tool in Position For Recess - Start of Feed Stroke.

Cut Completed-End of feed stroke.

Recommended set up Procedure for Recessing Tools on drill Machine.

- Select a pilot nose (15) to suit the hole diameter and the grooving tool model.
- Mount the Pilot Nose on the Bronze shell (4) and tighten the screws.
- Select a cutter that should suit the hole diameter and the required groove configuration.

- Gently push in the cutter into the helical shaft bore (8) and tighten the grub screw.
- Set feed stroke from layout or gauge. loosen the set screw & adjust the lock nut (7) for this setting and tighten the set screw.
- Determine the approach stroke. Establish clearance for loading. Caution: Rapid approach must end as pilot nose contacts work face.
- Make a test cut.
- If undercut diameter (D1) is too large, turn the nut (7) in direction of machine rotation to shorten feed stroke.
- If D1 is too small turn the nut in direction opposite to the machine rotation to lengthen (D1).
- If undercut position (L1) is too long and make adjustment bt rotating the Adjusting collar (1) in clockwise or anti-clockwise direction as per requirement of groove depth from surface of tube plate.

Cutter speed (RPM) :

The correcr cutter speed (rpm) according to the diameter of hole, material of workpiece etc. is necessary.

The cutter speeds (rpm) and rates of feed (mm/rev.) given in the table here are recommended for the standard cutter used for machining work-places of various materials and hole diameters.

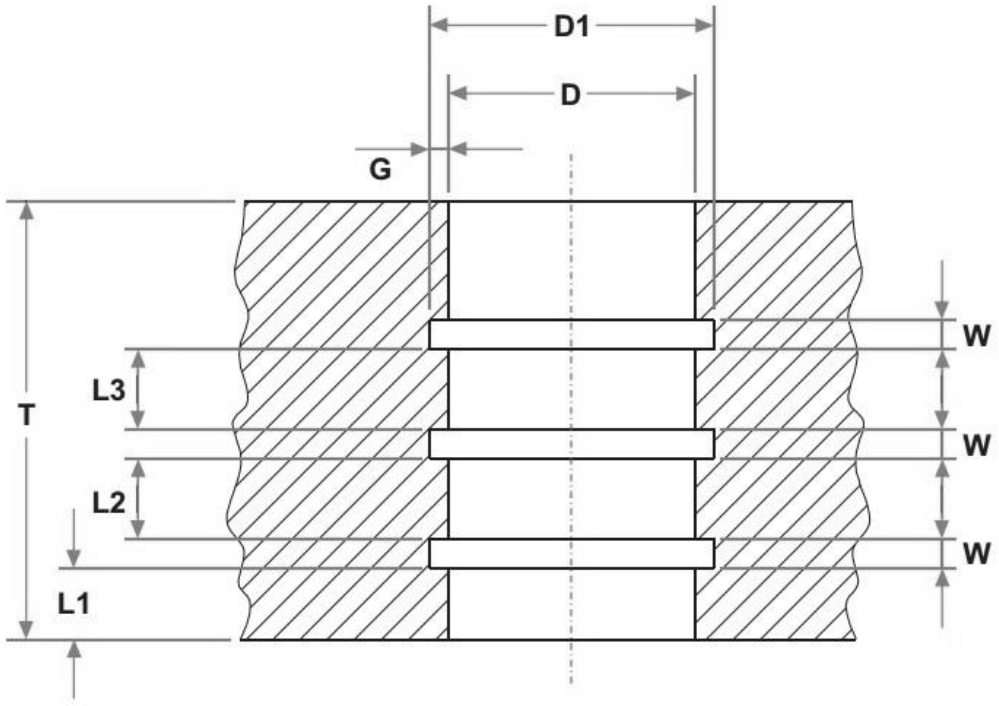
		Revolutions per minute					
Workpiece	**Tool Type**	**Stainless**	**Hard**	**Cast**	**Cast**	**Copper**	**Aluminum**
Hole Dia.	**Number**	**steel**	**steel**	**Iron**	**Steel**	**Alloy**	
10	2 MT	235	300	530	600	750	1320
15	3 MT	170	210	375	420	530	1060
20	4 MT	118	150	265	300	375	750
25	4 MT	106	118	210	235	300	600
30	4 MT	85	106	190	210	265	530
35	4 MT	75	95	170	190	210	420
40	5 MT	67	85	150	170	190	375
45	5 MT	60	75	132	150	170	335
50	5 MT	53	67	118	132	150	300
55	5 MT	47.5	60	106	118	132	265
60	5 MT	37.5	47.5	85	95	118	235
70	5 MT	33.5	42	75	85	105	210
80	5 MT	30	37.5	67	75	95	190
Rate of feed (mm/rev.)		0.10	0.10	0.15	0.15	0.20	0.20

Operation :

- Insert the tool into the hole in the workpiece.
- Rotate the tool.
- Apply pressure and out the required groove in the workpiece.
- When the end face of the thimble reaches the zero point on the scale sleeve maintain the pressure for 20 or 30 seconds.
- withdraw the tool from the workpiece.

The machining operation is now completed.

How to order:



Please give following details in your order.

1. Recessing material details:

a. Type

b. Hardness

2.Bore Details:	
a. Bore Dia. after drilling.	ф D
b. Bore Dia. after reaming with tolerance.	ф D
c. Tube plate thickness.	T
3. groove Details:	
a. Distance of first groove from top surfaces.	L1
b. Total no. of grooves.	N
c. Spacing of grooves.	L2 & L3
d. Groove width.	W
e. Dia. of grooves.	ф D1
f. Groove undercut depth.	G