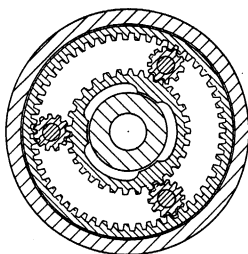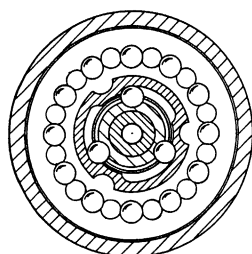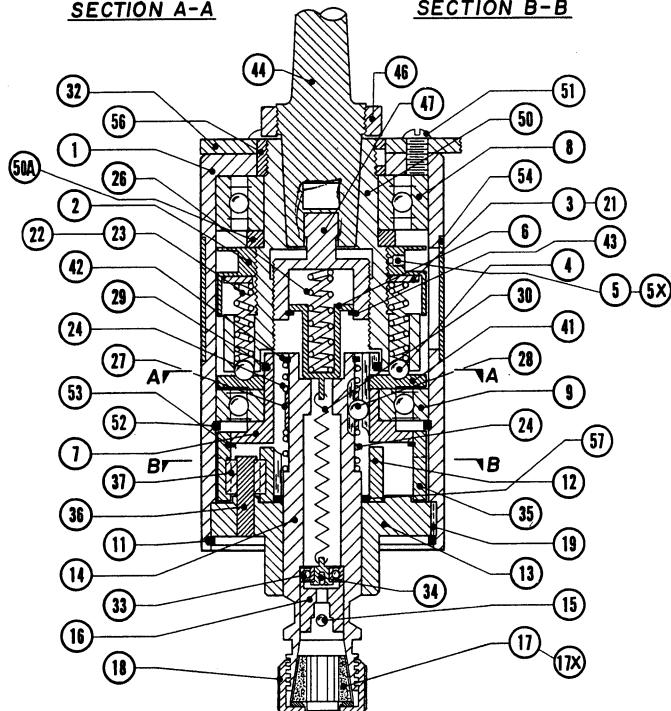# "U" SERIES REVERSING TAPPING ATTACHMENTS

SECTION A-A   SECTION B-B

U TYPE
INSTRUCTIONS FOR DISASSEMBLY

1. Remove tap chuck nut #18 and collet #17.
2. Remove retainer screw #15 and shake out tap or back jaw #16.
3. Pull out spring hanger #34 using spring puller provided with accessories and disconnect return spring #30. Spring hook provided with accessories may be used for this purpose.
4. Remove truarc ring #11 and withdraw drive spindle #14 and gear carrier #13.
5. Remove truarc ring #53 and withdraw ring gear #35. Place housing #1 on bench so that open bore is up.
6. Remove truarc ring #52 (rotate housing to expose plier holes) and withdraw clutch sleeve #7.
7. Invert housing #1 and remaining components over clean receptacle, clutch spring #22 and clutch balls #4 will drop out. Withdraw mount #50 assembly.

INSTRUCTIONS FOR ASSEMBLY
Reverse procedures for disassembly.
PATENTED
Tapmatic's ball feed tapping attachments are covered by four U.S. patents and their equivalents worldwide.

PART NUMBERS FOR ORDERING PARTS

IDENT. NO.	PART NAME	U3	U5	U7
1	Housing	64301	64501	64701
2	Clutch Adjustment Cap	64302A (1)	64502A (1)	64702
3	Spring Plate	60303	60503	60703
4	Clutch Balls	60304 (12 set)	60504 (14 set)	60704
5	Lock Set Screws	50305 (2)	50305A (2)	50305A
5X	Lock Set Screw Plug	503051	503051	503051
6	Spring Hanger	64306	64506	64706
7	Clutch Sleeve	64307	64507	64707
8	Ball Bearing (Input)	60308	50708	60708
9	Clutch Bearing (narrow)	51305	50709	60709
11	Truarc Ring	61311	61511	61711
12	Reversing Sleeve	60312	60512	60712
13	Gear Carrier	61313	61513	61713
14	Drive Spindle	60314	60514	60714
15	Back Jaw Retainer Screw	50315 (2 set)	50315	50315
16	Tap Jaw or Back Jaw	60316	56516	50716
17	Rubber Flex Collet (small)	21300	22100	24100
17X	Rubber Flex Collet (large)	21400	22200	24500
18	Tap Chuck Nut	50318	56518	50718
19	Key	64319	64519	64519
21	Adjustment Thrust Bearing	—	60521	60721
22	Clutch Spring	60322 (12 set)	60522 (14 set)	60522
24	Ball Driver Spring	60324 (2 set)	60524 (2 set)	60724
26	Cushion Spring	64326	64526	64726
26A	Cushion Spring (Inner)	—	645261	647261
26B	Cushion Spring (Inner)	—	—	647262
27	Ball Retainer	60327	60527	60727
28	Feed Balls	60328 (3 set)	60528 (3 set)	60728
29	Clutch Retaining Ring	60329	60529	60729
30	Return Spring	60330	60530	60730
32	Stop Arm	51321A (3)	51721A (3)	61732A (3)
33	Spring Bearing	60333	50734	50934
34	Lower Spring Hanger	60334	50706	50706
35	Ring Gear	61335	61535	61735
36	Gear Pins	60336 (3 set)	60536 (3 set)	60736
37	Planet Gears	60337 (3 set)	60537 (3 set)	60737
41	Clutch Driver	60341	60541	60741
42	Spirolox Ring	60342	60542	60742
43	Retaining Ring	64343	64543	64743
44	½" Straight Shank Arbor	64344	—	—
44-1	#1 Morse Taper Arbor	643441	—	—
44-2	#2 Morse Taper Arbor	643442	645442	—
44-3	#3 Morse Taper Arbor	—	645443	647443
44-4	#4 Morse Taper Arbor	—	—	647444
46	Hex Nut	64346	64546	64746
47	Depth Control	64347	64547	64747
50	Mount	64350	64550	64750
50A	Bearing Spacer	643501	645501	647501
51	Stop Arm Screws	51302 (3 set)	51502 (3 set)	52502 (4 set)
52	Truarc Ring	64352	50611	60711
53	Truarc Ring	61353	61553	61753
54	Spring Clip	64354	64554	64754
56	Bearing Lock	64356	64556	64756
57	Thrust Washer	61357	61557	61757

(1) Clutch Adjustment Cap Ident. #2 only available as an assembly with Ident. #5 and #5X.
(2) Lock Set Screw Ident. #5 comes with Ident. #5X.
(3) Stop Arm Ident. #32 only supplied with Ident. #51.
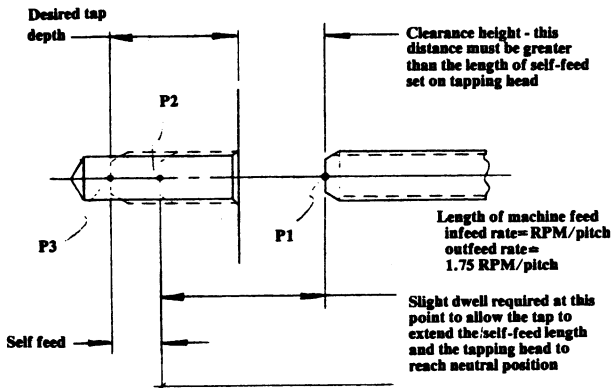

TAPMATIC CORPORATION

PROGRAMMING TECHNIQUES FOR N/C TAPPING!

COMMON PROBLEMS

(1) The tapping head starts and stops during entry or retraction cycle; the feed rate too slow causing the tapping head to enter neutral. (2) Threads pulled out caused by over extension of the tapping head in retract mode; increase RPM, slow down the rate of retraction.

N/C Programming for Tapmatic Ball-Feed "A" Type Positive Drive Tapping Attachments, with 1.75 x 1 Reverse Ratio
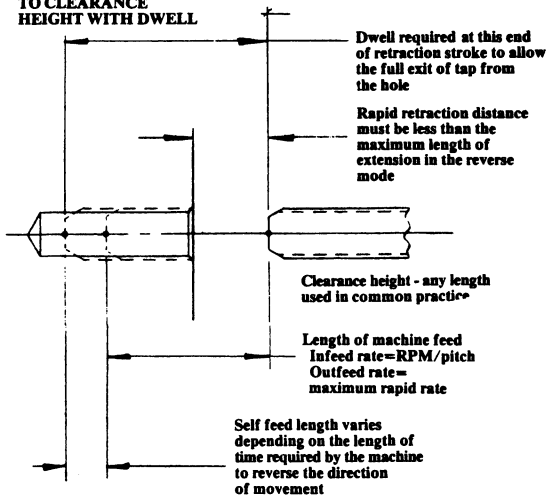
FIG.1 FEED IN - FEED OUT WITH DWELL

Desired tap depth

P2

P3

P1

Self feed

Clearance height - this distance must be greater than the length of self-feed set on tapping head

Length of machine feed infeed rate=RPM/pitch outfeed rate= 1.75 RPM/pitch

Slight dwell required at this point to allow the tap to extend the self-feed length and the tapping head to reach neutral position

PROGRAMMING METHODS BASIC CYCLE, FEED IN — FEED OUT (fig. 1)

(1) Rapid to position over hole at clearance height. (P1). (2) Advance spindle at infeed rate the desired length of machine feed. (P2). (3) At this point the tapping head will self feed a predetermined amount until the drive mechanism reaches neutral. A slight dwell at this point will insure completion of self feed, accurately controlling the depth of thread. (4) Retract spindle at out feed rate back to the original machine clearance height. (5) Reposition to a new hole and repeat the cycle.

FIG. 2 FEED IN - RAPID OUT TO CLEARANCE HEIGHT WITH DWELL

Dwell required at this end of retraction stroke to allow the full exit of tap from the hole

Rapid retraction distance must be less than the maximum length of extension in the reverse mode

Clearance height - any length used in common practice

Length of machine feed Infeed rate=RPM/pitch Outfeed rate= maximum rapid rate

Self feed length varies depending on the length of time required by the machine to reverse the direction of movement
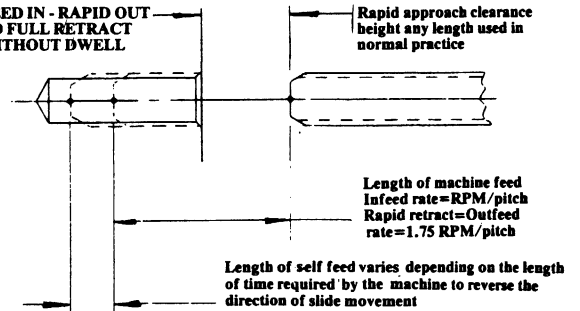
DRILL CYCLE WITH RAPID RETRACT TO CLEARANCE PLANE FEED IN —RAPID OUT (fig. 2)

(1) Rapid to position over hole at clearance height. (2) Advance spindle at infeed rate the desired length of machine feed. Approximate feed length = clearance height + desired tap depth – ½ the self feed length. (3) Rapid retract to clearance height. Dwell is required at this point to allow the tap enough time for a complete exit from the hole. (4) Reposition to a new hole and repeat the cycle.

FIG. 3
FEED IN - RAPID OUT TO FULL RETRACT WITHOUT DWELL

Rapid approach clearance height any length used in normal practice

Length of machine feed Infeed rate=RPM/pitch Rapid retract=Outfeed rate=1.75 RPM/pitch

Length of self feed varies depending on the length of time required by the machine to reverse the direction of slide movement
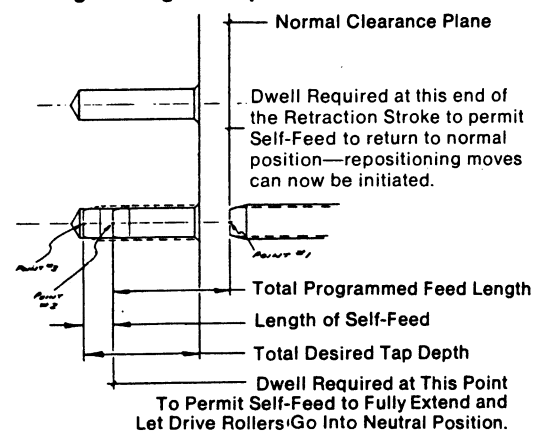
DRILL CYCLE WITH RAPID RETRACT TO THE UPPER LIMIT OF QUILL STROKE. FEED IN — RAPID OUT (fig. 3)
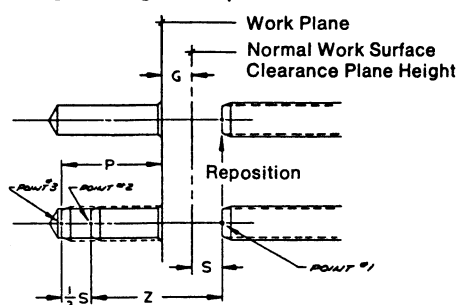
Machines which perform a drill cycle in this manner may be programmed using the same steps as used in method #2. Greater care must be taken in determining proper tool length and in choices of feeds and spindle speeds. The overall tool length of the tapping head usually is the longest tool in a given set up, consequently a clearance height can be established similar to that of method #2 and the programming may then be identical. Also, if the reversing RPM is high enough, it is possible to retract the quill at a rapid rate while having the tap exit the part before the maximum extension limit is reached.

N/C Programming for Tapmatic Tapping Attachments, with 1 x 1 Reverse Ratio

Programming technique with dwell:

Normal Clearance Plane

Dwell Required at this end of the Retraction Stroke to permit Self-Feed to return to normal position—repositioning moves can now be initiated.

Total Programmed Feed Length

Length of Self-Feed

Total Desired Tap Depth

Dwell Required at This Point To Permit Self-Feed to Fully Extend and Let Drive Rollers Go Into Neutral Position.

Programming technique without dwell:

Work Plane

Normal Work Surface

Clearance Plane Height

G

P

Reposition

S

½S   Z

Z = Total Programmed Feed Length = (G+S+P)−½S
S = Preselected Self-Feed Length
P = Desired Tap Depth