

Safety and Operation for TC/DC Self Reversing Tapping Attachments



Warning: To avoid serious injury and ensure best results for your tapping operation, please read carefully *all* operator and safety instructions provided for this tapping unit as well as all other safety instructions that are applicable, especially those for your machine.

- Proper Clothing:** The rotating spindle of a machine tool can snag loose fitting clothing, jewelry or long hair. **Never** wear jewelry, long sleeves, neckties, gloves or anything else that could become caught when operating a machine tool. Long hair **must** be restrained or netted to prevent it from becoming entangled in rotating spindle.
- Proper Eye Protection:** **Always** wear safety glasses with side shields to protect your eyes from flying particles. 
- Proper Work Piece Fixturing:** **Never** hold the work piece or the vise it is held in by hand. The workpiece **must** be clamped firmly to the table of the machine so that it cannot move, rotate or lift. 
- Proper Stop Arm/Torque Bar Installation for Self-Reversing Attachments On Conventional Machines.**



Always mount a torque bar to hold the tapping attachments stop arm from rotating. The torque bar **must** be mounted securely to the table or quill of your machine. The torque bar installation **must be stronger** than the largest tap in the capacity range of your tapping attachment. The surface of the torque bar **must be smooth** to allow the stop arm to slide freely when feeding in and out of the hole. Order Tapmatic Torque Bars shown.



Quill Clamp Capacity Ø	Order No.	Max Tap Size
1 1/2"-2 3/8" 38-60 mm	29099	1/2" or M12
2 3/8"-4 1/2" 60-114 mm	290991	3/4" or M20



Torque Bar Assembly	Order No.	Max Tap Size
Table Mount	29097	3/4" or M20
Heavy Duty Table Mount	29096	1 3/4" or M42

Never extend the length of the standard stop arm supplied with your tapping attachment. A lengthened stop arm could break free hitting the operator and causing serious injury.



Never hold the stop arm by hand. On reversal, full power of the machine is transmitted through the stop arm and the operator could be seriously injured.



5. Do not exceed the maximum speed for the tapping head: Speed is a critical factor in tapping. Please always refer to recommended tapping speed chart. Tapmatic torque control reversing tapping attachments employ a planetary gear for increased speed in reverse. The revolutions per minute when reversing out of the hole will be 1.75 times faster than the machine spindle speed. It is strongly recommended that you consider the **Average Tapping Speed** rather than machine speed when calculating cycle time. For example if machine speed is 1500 RPM, reverse speed is 2625 RPM making your Average Tapping Speed 2062 RPM. You must not exceed the maximum allowable speed marked on your tapping attachment.

6. Always be aware of the potential hazards of a machining operation: Sometimes working with your machine can seem routine. You may find that you are no longer concentrating on the operation. A feeling of false security can lead to serious injury. **Always** be alert to the dangers of the machines with which you work. **Always** keep hands, parts of the body, clothing, jewelry and hair out of the areas of operation when the machine spindle is rotating. Areas of operation include the immediate point of machining and all transmission components including the tapping attachment. **Never** bring your hand, other parts of the body or anything attached to your person into any of these areas until the machine spindle is completely stopped.

TAPMATIC

ISO 9001 CERTIFIED: 802 CLEARWATER LOOP, POST FALLS, ID 83854

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7. Be aware of any other applicable safety instructions/requirements especially those for your machine.
8. The tapping attachment housing, drive spindle and tap itself can become hot to the touch after operation. Use caution when removing the attachment from the machine or handling.

Check List For Good Tapping

1. **Never** use this tapping attachment before reading all safety instructions for it as well as the machine it is to be used on.
2. Be sure tap is sharp and of correct design for your application.
3. Be sure tap is in proper alignment with the drilled hole.
4. Be sure the machine speed is correct.
5. Be sure you are following the correct feed rate for the tap based on the pitch of the tap and revolutions per minute.
6. Make sure the drilled hole is the correct size.
7. Be sure the machine stop is set correctly to avoid hitting the bottom of a blind hole. See Controlled Depth Tapping.
8. Be sure to allow for sufficient chip clearance especially when tapping blind holes.
9. Make sure the work piece is clamped rigidly so that it is not able to move, rotate, or lift.
10. Make sure there is enough clearance between the tap and work piece at the starting position and the retract position to be sure the tap is clear of the hole upon retraction. Remember the tapping attachment spindle extends during reversal out of the hole.
11. Make sure to mount a strong torque bar from the table of the machine, or to the non-rotating quill, to prevent the stop arm from rotating. The torque bar must be stronger than the largest tap in the tapping attachments capacity. It must also have a smooth surface so that the stop arm slides freely when feeding in and out of the hole.
12. Make sure to use the proper cutting fluid/lubricant for the application.

References for this safety information include but are not limited to: American National Standards Institute, [ANSI B11.8-1983](#), Coastal Video Communications Corporation [Machine Guarding](#) Copy right 1994, Society of Manufacturing Engineers Tool and [Manufacturing Engineers Handbook Volume 1 Machining](#) Library of Congress Catalog No 82-060312

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This tapping attachment can be used on all types of manually operated machines with rotating spindles. It can also be used in many automated applications. **IMPORTANT** Always follow all instructions from your machine manufacturer.

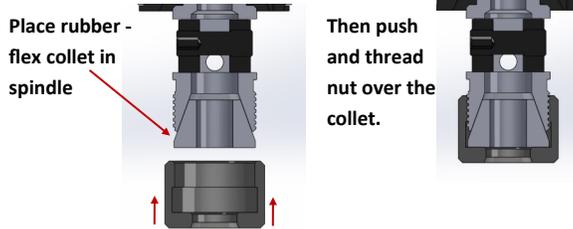
Installing the Arbor into the tapping attachment: Clean the thread or taper of both the arbor and the mount of the tapping head. Then install the arbor into the mount securely.

If it is a taper mount, twist the arbor as you push it into the tapping heads mount. Then use a mallet to give a sharp blow to the end of the arbor, to seat it into the taper mount of the tapping head.

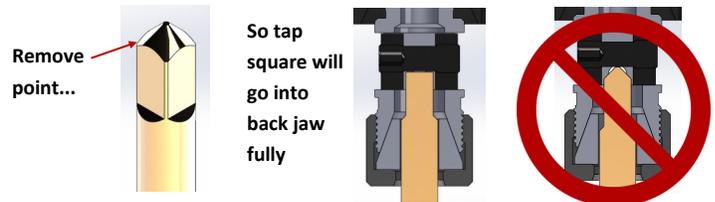
To remove a taper mount arbor, give the arbor several sharp blows on the side using a mallet.



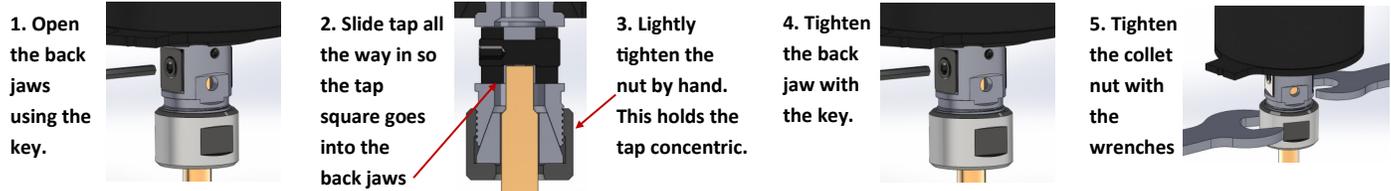
Installing a Rubber Flex Collet into the tap chuck nut:



If the tap has a male center, it should be ground off:

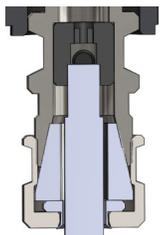


Tightening the back jaws and the nut:



Note: In order to insure the tap runs concentrically, and avoid damage to back jaws or collet, it is important to follow the above steps.

30X and 30TC/DC



The smaller models do not have an adjustable back jaw. Instead they have a fixed tap jaw with three slots. Simply slide the tap into the jaw fully so that the tap square fits into the correct slot in the tap jaw. Please note that the two set screws are only for driving and retaining the tap jaw. They are not intended to tighten against the tap square.

Installing the stop arm:



In order for the Tapping Head to reverse, the stop arm must be prevented from rotating.

See also Proper Stop Arm/Torque Bar Installation on page 1.

Use the retaining ring to mount the stop arm to the gear carrier at the bottom of the housing.

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Tapping Speeds: The following speed recommendations are for reference only. Please consult tap manufacturer for your specific tap. **Do not exceed the maximum speed for tapping attachment shown on the housing.**

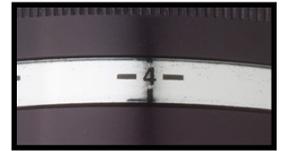
Material	Low Carbon Steel	High-Carbon Steel	Tool Steel Hard	SS 303, 304, 316	SS 410, 430, 17-4 Hard	SS 17-4 Anneal.	Titan. Alloys	Ni Alloys	Alum Alloys	Alum Die cast	Magn.	Brass, Bronze	Copper	Cast Iron
M/min (ft/min)	10-20 (33-66)	8-12 (26-39)	4-6 (13-20)	6-12 (20-39)	3-5 (10-16)	6-12 (20-39)	4-8 (13-26)	3-5 (10-16)	15-25 (49-82)	10-15 (33-49)	15-25 (49-82)	15-25 (49-82)	8-12 (26-39)	10-20 (33-66)

$$\text{RPM} = \frac{\text{M/min}}{\text{Tap Diameter in mm}} \times 318.5$$

$$\text{RPM} = \frac{\text{ft/min}}{\text{Tap Diameter inch}} \times 3.82$$

Setting the pre-selective torque control:

The torque control helps prevent tap breakage, especially when tapping blind holes. Tightening the cap down to the higher number settings on the reference scale increases torque. To set the torque, use a new tap and begin with a low number (low torque) setting. Try to tap the hole.



Clutch adjustment cap

When the clutch slips, there will be no sound from the fiber disc clutch. Stop the machine and tighten the cap further. Repeat this process until you can drive a sharp tap to depth. Give the cap a half turn more and lock it using the set screw in

the side of the cap. This system saves the tap from breaking if you accidentally go too deep in a blind hole. It also warns you when your tap is becoming dull so that you can replace it before it breaks. Make note of the reference number to save time when the same job comes up again.



Self-Feed: Every tapping attachment has a self-feed. What is self-feed? Self feed is the additional depth that the tap will go into the hole after you feed to the stop on your machine. See the next page for the self-feed distances for the TCDC models.

Setting the stop on your machine for tapping: Please note that the tap will continue to go deeper into the hole by the self-feed distance. The total tapping depth will be based on the depth you set with your machine stop **plus** the self-feed of the tapping attachment. For example if you would like a tapping depth of 10mm and the tapping attachment's self-feed is equal to 3 to 4mm, start by setting the machine stop to allow the tap to enter the hole just 6mm. After tapping your first hole, check the depth and make any necessary adjustments to the machine stop. **Always set the machine stop to avoid tapping too deep and hitting the bottom of the hole. The torque control is intended to only be a safety back up in case you accidentally go too deep.**



Tapping Holes: When tapping, it is not necessary to apply any pressure as you feed in. The tap will follow it's own pitch in and out of the hole. Just follow along with the tap, keeping up with it as it enters the hole. After you reach the machine stop, lift up on the feed handle to retract the tap. The tapping attachment will automatically reverse the taps rotation when you retract. Please note that the speed increases by 1.75 to 1 in reverse, so you will need to feed out of the hole almost twice as fast as you did feeding in. Be sure to keep up with the tap as it exits the hole. If you are feeding too slowly going in or out, the tap will stop and start and you will hear a clicking sound. This clicking sound is not the clutch slipping. If this occurs you need to feed faster to keep up with the tap. Please note that if the clutch slips because the torque is not set high enough there will not be a sound coming from the clutch.

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TC/DC Models Only: Setting the Hard Start/Depth control collar: Below are figures showing the different settings that can be used.

When adjusting the position of the depth control collar, always turn by increments of one complete revolution, so that locking set screw is aligned with the flat on the spindle.

Line these up

Secure the collar position with screw.



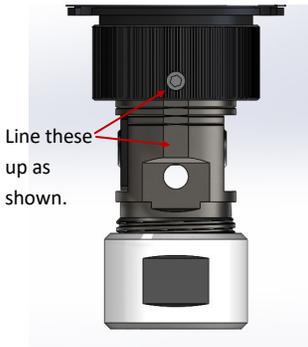
Cushion Setting: For normal tapping it can be helpful to have compression or cushion when starting the tap into the hole. This is also needed for re-entering a previously tapped hole.

Self Feed for tapping in this position is...

30TC/DC= 3 to 4mm

50TC/DC= 6 to 7mm

70TC/DC= 9 to 10mm



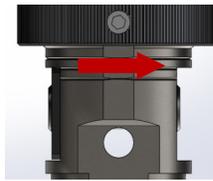
Line these up as shown.

Hard Start: Use this position for more accurate depth control. Turn the collar until it just contacts the bottom of the housing/gear carrier. Push up against the Rubber Flex spindle and it should not compress. **Self Feed for tapping in this position is...**

30TC/DC approx. 3mm

50TC/DC approx. 6mm

70TC/DC approx. 9mm



Reduced Self Feed:

Self Feed can be reduced by turning the collar up further, beyond Hard Start. The Rubber-Flex spindle will be extended, and this reduces the self feed. Reducing the

Self Feed is helpful when tapping shallow depth holes. Below are the recommended adjustments for each model.

30TC/DC Adjust 1 revolution further, **beyond Hard Start...**

Self Feed approx. 2mm

50TC/DC Adjust 1 revolution further...Self Feed approx. 4.5mm

Adjust 2 revolutions...Self Feed approx. 3mm

70TC/DC Adjust 1 revolution further... Self Feed approx. 7.5mm

Adjust 2 revolutions...Self Feed approx. 6mm

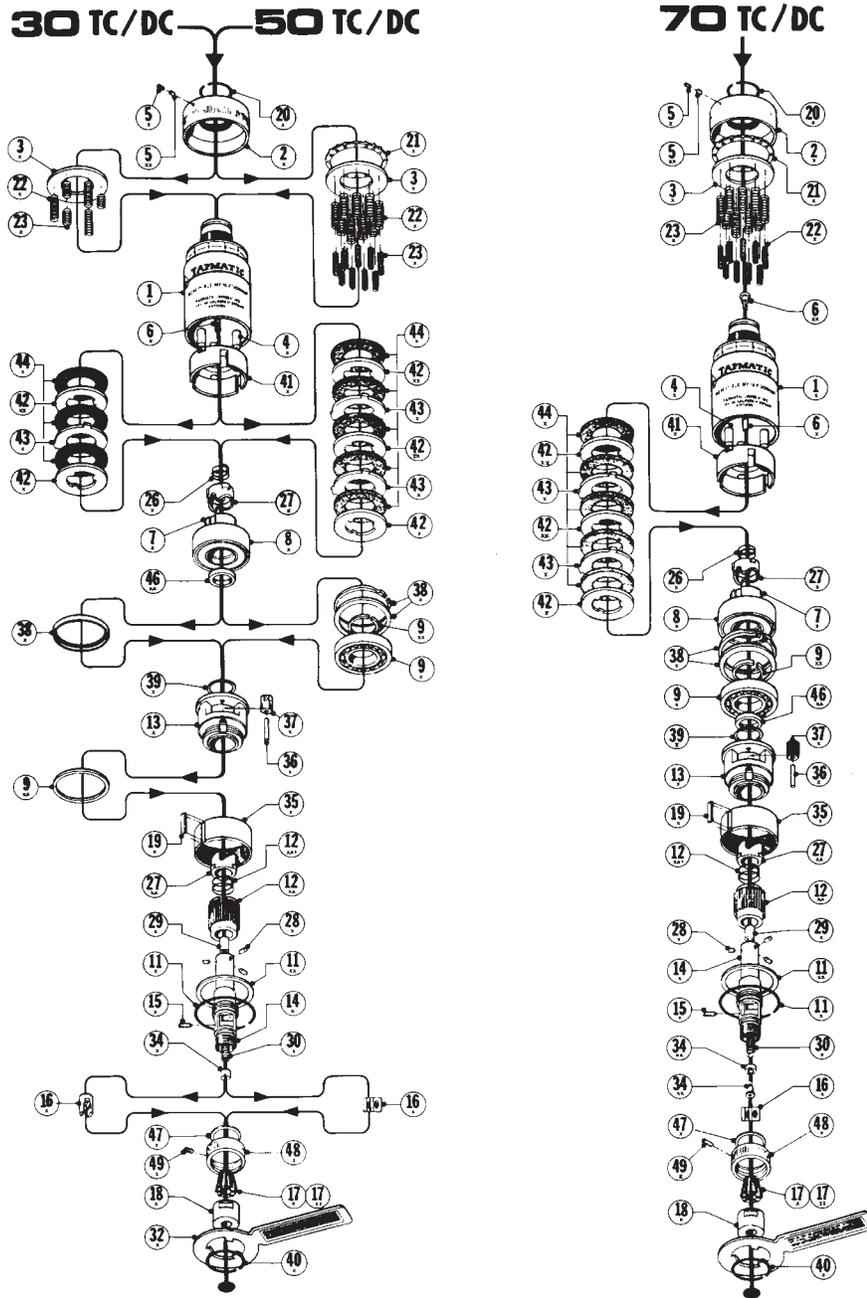
Adjust 3 revolutions... Self Feed approx. 4.5mm

Note! Adjusting further than the above recommendations can eliminate the tapping attachments forward drive.

Lubrication: This unit is pre-lubricated at the factory and ready for use. After 600 hours we recommend partially disassembling, cleaning and applying new grease. We recommend using a high quality NLGI 2 type of grease. We recommend returning the Tapping Attachment to Tapmatic for maintenance and repair, but if you would like to do this at your own facility, please follow the instructions shown on the next page. Please let us know if we can be of help.

Cutting Tool Lubrication: For the best results and longest life for your cutting tools, be sure to use the proper cutting fluid / lubricant based on your application and the type of material the work piece is made from.

Parts Listing: 30, 50 & 70TC/DC Self-Reversing Tapping Units



30TC/DC Wrench Set			50TC/DC Wrench Set			70TC/DC Wrench Set		
Qty.	Order No.	Description	Qty.	Order No.	Description	Qty.	Order No.	Description
1	50332	332X Stop Arm	1	56532	5032XB Stop Arm	1	50732	732X Stop Arm
1	50340	340X Stop Arm Ring	1	56540	5040XB Stop Arm Ring	1	50740	740X Stop Arm Ring
1	27078	5/64" Hex Key	1	28075	3/4" Wrench	1	27078	5/64" Hex Key
1	28050	1/2" Wrench	1	28097	31/32" Wrench	1	27224	4mm Hex Key
1	28062	5/8" Wrench	1	27223	3mm Hex Key	1	28097	31/32" Wrench
1	29030	30 Series Spanner Wrench (Thread Mounts Only)	1	27078	5/64" Hex Key	1	28131	1 5/16" Wrench
			1	29050	50 Series Spanner Wrench (Thread Mounts Only)	1	29085	#5 Hook
						1	29090	Spring Puller
						1	29070	70 Series Spanner Wrench (Thread Mounts Only)

Parts Listing: 30, 50 & 70TC/DC Self-Reversing Tapping Units

IDENT	PART NAME	30TC/DC	50TC/DC	70TC/DC
1	Housing - #6JT	54301 B (1)	54501 B (1)	-
1	Housing - DINB16	54301 G (1)	54501 G (1)	-
1	Housing - #33JT	54301 E (1)	54501 E (1)	-
1	Housing - DIN B 12	54301 F (1)	-	-
1	Housing - 5/16-24	54301 H (1)	-	-
1	Housing - 3/8-24	54301 I (1)	54501 I (1)	-
1	Housing - 1/2-20	54301 J (1)	54501 J (1)	54701 J (1)
1	Housing - 5/8-16	54301 K (1)	54501 K (1)	54701 K (1)
1	Housing - 3/4-16	54301 L (1)	54501 L (1)	54701 L (1)
1	Housing - 7/8-20	-	-	54701 M (1)
1	Housing - #3JT	-	-	54701 C (1)
2X	Clutch Adjustment Cap	50302 A (2)	56502 A (2)	50702 A (2)
3X	Spring Plate	50303	56503	50703
4X	Driver Pins	50304 (3 required)	50704 (3 required)	50704 (3 required)
5X	Lock Set Screw	50305 A (3)	50305 A (3)	50305 A (3)
5XX	Lock Set Screw Plug	503051	503051	503051
6X	Guide Spindle	503061	56506	51720
6XX	Upper Spring Hanger	-	-	60334
7X	Clutch Sleeve	50307	50507	50707
8X	Clutch Bearing	50308	56508	50708
9X	Gear Carrier Bearing (Ball)	-	50509	50709
9XA	Gear Carrier Bearing (Nylon)	503091	-	-
9XX	Truarc Ring	-	505091	507091
11X	Retaining Ring	50311	50511	50711
11XX	Gear Washer	503111	505111	507111
12XA	Reversing Sleeve	503121 (4)	505121 (4)	507121 (4)
12 XA I	Reversing Driver Spring	51312	505122	507122
13X	Gear Carrier	503131	54513	54713
14X	Drive Spindle	54314 A (5)	54514 A (5)	54714 A (5)
15X	Back Jaw Retainer Screw	50715 (2 required)	50715	50715
16X	Back Jaw or Tap Jaw	503161	56516	50716
17X	Rubber Flex Collet (small)	21600	22100	24100
17XX	Rubber Flex Collet (large)	21700	22200	24000
18X	Tap Chuck Nut	50318	56518	50718
19X	Key	50319	50319	50719
20X	Stop Ring	50320	56520	50720
21X	Adjustment Thrust Bearing	-	565211+68439 (12 req)	64521+682205 (8 req)
22X	Clutch Spring (large)	50322 (3 required)	50722 (9 required)	50722 (9 required)
23X	Clutch Spring (small)	50323 (3 required)	50723 (9 required)	50723 (9 required)
26X	Cushion Spring	50326	565261	50726
27X	Spring Cup Driver	503271	506271	507271
27XA	Reversing Driver	503272	506272	507272
28X	Drive Pins	50328 (3required)	56528 (3 required)	50728 (3 required)
29X	Guide Spindle Bearing	50329	56529	50729
30X	Return Spring	51328	51528	51628
31X	Drive Spindle Bearing	-(4)	-(4)	-(4)
32X	Stop Arm	50332	56532	50732
33X	Guide Spindle Washer	50333	-	-
34X	Guide Spindle Nut	503341	56534	-
34XA	Spring Bearing	-	-	50734
34XX	Spring Bearing Hanger	-	-	50706
35X	Ring Gear	50335	50535	50735
36X	Gear Pins	50336 (3 required)	50536 (3 required)	50736 (3 required)
37X	Planet Gears	50337 (3 required)	50537 (3 required)	50737 (3 required)
38X	Spacer (and Truarc Ring)	50338	54538 and 56511	54738 and 50611
39X	Thrust Washer	50339	50539	50739
40X	Truarc Ring	50340	56540	50740
41X	Clutch Driver	50341	56541	50741
42X	Primary Internal Clutch Plate	50342	56542	50742
42XX	Internal Clutch Plate	503421	565421 (2 required)	507421 (2 required)
43X	External Clutch Plate	50343	56543 (2 required)	50743 (2 required)
44X	Clutch Discs	50344 (3 required)	56544 (5 required)	50744 (5 required)
46XA	Reversing Sleeve Bushing	503461	505461	507461
47X	Friction Washer	50347	50547	50747
48X	Depth Control Collar	50348	50548	50748
49X	Lock Set Screw	50305	50305	50305

- (1) Housing only available as an assembly with Ident. #4X and #6X.
 (2) Clutch Adjustment Cap only available as an assembly with Ident #5X and #5XX.
 (3) Lock Set Screw comes with Ident. #5XX.
 (4) Reversing Sleeve and Drive Spindle Bearing available only as an assembly.
 (5) Drive Spindle only available as an assembly with Ident. #29X.

INSTRUCTIONS FOR DISASSEMBLY

- Remove stop ring (#20X) and unscrew clutch adjustment cap (#2X).
- Hold unit in vertical position and remove adjustment thrust bearing (#21X). (Models 50 & 70TC/DC.)
- Lift off spring plate (#3X).
- Carefully invert unit over a clean receptacle. Clutch springs (#22X & 23X) will drop out.
- Remove tap chuck nut (#18X) and collet (#17X).
- Remove back jaw retainer screw (#15X).
- Remove back jaw (#16X).
- Remove return spring (#30X) by threading spring puller (supplied with unit) into tapped hole in part (#34XX), and pulling out to expose spring for removal with spring hook (also supplied with unit). (Model 70TC/DC.)
- Unscrew guide spindle nut (#34X) and remove return spring (#30X). (Models 30 & 50TC/DC.)
- Remove truarc ring (#40X) and stop arm (#32X).
- Remove truarc ring (#11X) and gear washer (#11XX).
- Lift out drive spindle (#14X) and reversing sleeve (#12XA) subassembly from unit.
- Lift out spacers (#46XA) and (#38X).
- Lift out clutch sleeve (#7X), clutch driver (#41X), clutch plates (#42X, 42XX, 43X) and clutch discs (#44X).
- Lift out cushion spring (#26X) and spring cup driver (#27X).
- Remove driver pins (#28X) from drive spindle (#14X).
- Press drive spindle (#14X) out of reversing sleeve (#12XA) subassembly.
- Do not disassemble planetary gear reversing subassembly (#13X).

REPLACEMENT OF FRICTION WASHER #47X

- Remove tap chuck nut (#18X).
- Unscrew depth control collar all the way off.
- Using small screwdriver, flip out used washer (#47X) and insert new one.

INSTRUCTIONS FOR ASSEMBLY

- Clean and lubricate all parts requiring lubrication thoroughly. Do not get clutch parts wet or oily.
- Place internal clutch plate (#42X) on clutch sleeve (#7X), then clutch disc (#44X), then external clutch plate (#43X), then another clutch disc (#44X), then internal clutch plate (#42XX), and so forth, until you have all plates and discs on clutch sleeve, then line up external dogs so that you can slip clutch driver (#41X) over complete subassembly.
- Place cushion spring (#26X) and spring cup driver (#27X) in clutch sleeve (#7X).
- Insert clutch sleeve (#7X) and clutch driver (#41X) subassembly into housing (#1X), making sure that 3 holes in clutch driver mate with 3 pins in housing (#1X).
- Insert spacers (#46XA) and (#38X) into housing (#1X).
- Press drive spindle (#14X) into reversing sleeve (#12XA) subassembly and insert drive pins (#28X).
- Insert complete subassembly into housing (#1X) utilizing key (#19X).
- Insert gear washer (#11XX) and snap in truarc ring (#11X).
- Hook return spring (#30X) to spring hanger (#6X) and insert this subassembly into neck end of housing (#1X) making certain spring hanger is seated properly. (Model 70TC/DC.)
- Use spring hook (supplied with unit) to expose return spring (#30X) and attach spring bearing hanger (#34XX) with bearing (#34XA) mounted. (Model 70TC/DC.)
- Thread spring puller (supplied with unit) into tapped hole in spring hanger (#34XX) and carefully lower assembly into drive spindle (#14X) until bearing (#34XA) seats itself, then unscrew spring puller. (Model 70TC/DC.)
- Insert return spring (#30X) into drive spindle (#14X) and screw guide spindle nut on to guide spindle (#6X). (Models 30 & 50TC/DC.)
- Place back jaws (#16X) in drive spindle (#14X) and install back jaw retainer screw (#15X).
- Insert collet (#17X) into tap chuck nut (#18X) and screw tap chuck nut (#18X) on to drive spindle (#14X).
- Insert clutch springs (#22X & 23X) into unit.
- Place spring plate (#3X) on springs.
- Place adjustment thrust bearing (#21X) on spring plate (#3X). Models 50 & 70TC/DC.)
- Screw on clutch adjustment cap (#2X).
- Install stop ring (#20X).
- Install stop arm (#32X) and snap on truarc ring (#40X).



TC/DC Self Reversing Tapping Attachments

Repair Service is available at....

Attention: Repair Department
Tapmatic Corporation
802 Clearwater Loop
Post Falls, ID 83854

To Expedite Repair: Return tool direct to Tapmatic Corporation. Tapmatic will inspect the tool and advise you of the repair costs by fax or email before the repair is completed.

Important: Be sure to return tool complete with collet nut, and if applicable stop arm and back jaw, because otherwise these missing parts would be added to every non-warranty repair.

Cost Notification: Tapmatic will FAX or E-mail a cost notification to you, soliciting your approval before repairs are completed. If it is determined that a tool cannot be repaired, at the customer's request, Tapmatic will return the disassembled parts. We are not able to reassemble a tool using damaged or worn out parts.

Optional Return Procedure: Tools may also be returned for repair through your local Tapmatic Distributor. They will ship the tool to us and include instructions for the repair and return. You may already have an open account with them which facilitates the handling of invoicing.

Priority Service: Tapmatic services tools returned for repair in the order in which they are received. All tools will be evaluated and repaired within three weeks from the date they arrive subject to receiving the customer's approval to proceed with the repair.

Priority is given to tools shipped to us by overnight or second day.

If a repair is sent to us by UPS ground or similar service, it can also be given priority. Just call and let us know you need priority service and advise if you would like the tool returned to you by overnight or second day. In the interest of fairness to all our customers, we ask that you approve shipment by overnight or second day before we agree to upgrade your repair order to priority service. Typical turn around, not including shipping time, for priority repairs is 3 days subject to receiving the customer's approval to proceed with the repair.

If we can answer any questions please call our toll free number:

800 395-8231

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