

# OPERATING INSTRUCTIONS FOR REVERSIBLE TAPPING ATTACHMENT MODEL: HR 1 & 2

This tapping attachment can be used on all types of manually operated machines with rotating non-reversing spindles.

## INSTALLING MORSE TAPER ARBOR:

Clean the mating taper. Then with a twisting motion, insert the arbor in to the tapping attachment. Strike the tang end of the arbor with a plastic hammer to lock it firmly. The hex nut is provided to remove the arbor.

## MOUNTING THE ATTACHMENT TO THE MACHINE:

Mount STOP ARM on the attachment. A Circlip is provides to hold the STOP ARM in place. Now mount the attachment on the machine spindle, ensuring that the taper is free of oil and grease. Extend strong stop bar from machine spindle or machine table to engage short STOP ARM, DO NOT HOLD STOP ARM BY HAND. DO NOT LENGTHEN STOP ARM DO NOT HOLD JOB BY HAND, Clamp the job securely as full power of the machine is transmitted in reverse.

## INSERTING THE TAP

### A. MODEL : HR :

Insert the desired tap into the chuck of the attachment. The square of the tap it fit and centered between adjustable square nuts, which should be finger tip tightened. Then tighten chuck nut which forces collet to hold the tap shank in a firm grip. Slacken Adjustable Square Nuts in order to center the tap. Check that the Adjustable Square Nuts only grip the square portion of the tap. Then firmly tighten the Adjustable Square Nuts.

### B. MODEL : HRF :

The Spindle to the attachment has a quick change device. Press the bush of the adaptor (Model: QA) and insert the tap. Now insert the adaptor with the tap into the spindle of the attachment. To disengage the adaptor, push back the knurled sleeve of the spindle. To disengage the tap, press the bush of the adaptor again.

For each tap with varying shank dimension a different adaptor is required.

## TORQUE SETTING :

The torque adjustment is made by tightening or loosening the Cup nut (1) at the upper end of the attachment. When the desired torque has been determined, the cupnut may be locked in place by a grub screw (5). Proper procedure when beginning tapping operation is to loosen the cupnut so that all the graduations on the body are visible. Then tighten the cupnut progressively until the attachment will drive a sharp tap. When the proper torque is determined for a specific job, this reference point may be noted to save set-up time in future. If later during the operation the clutch slips it is evident that the tap is dull and should be immediately exchanged for a sharp tap but the clutch should not be tightened further.

## THROUGH HOLE TAPPING :

Press the tap lightly against the mouth of the hole. The free axial float is provided in the attachment which will automatically permit the tap to follow its own lead. The operator merely moves the machine's spindle behind the lead of the tap until the desired depth is reached. To reduce the wear of the attachment it is recommended that a short, quick upward movement of the machine spindle be made during transition from forward to

reverse. The tap will return to a forward rotation as soon as it is with-drawn from the hole.

## BOTTOM HOLE TAPPING

From accurate and efficient bottom hole tapping a machine feed stop should be used to allow the attachment's spindle to disengage in neutral before the tap bottoms in the hole. To achieve this, set the machine stop so that machines feed plus the attachment's self feed will equal the desired thread depth.

If clutch should slip before the tap reaches the desired depth, check to see that the hole is of the correct size, not packed with chips, and that the tap is sharp and undamaged. The torque control clutch is designed as safety device to prevent tap breakage in case the tap accidentally hits to the bottom. We do not recommend using the clutch for repetitive bottom hole tapping unless absolutely necessary.

## TAPPING SPEED

The factors to be considered when trying to determine the best tapping speed are :

- \* Material to be tapped.
- \* Pitch of the thread.
- \* Selection of tap :
  - Length of chamfer on tap
  - Rake Angle
  - Standard, spiral or spiral point
- \* The percentage of full thread to be cut.  
The tapping speed must be reduced as the Percentage of full thread to be cut is increased.
- \* Drilled hole with respect to length of the hole to be tapped.
- \* Cutting fluid
- \* Straight or tapered thread to be tapped.

These tapping attachments have been designed to operate at max 800 R.P.M.

## CUTTING FLUID :

The cutting fluid works two ways. Heat generated as the tap proceeds into the hole both by the deformation of the material and by friction. The fluid must dissipate this heat. The fluid must also lubricate so that the friction between the tap, the chips and the hold is minimized.

Be sure to use large quantities of cutting fluid under pressure for tapping. The higher the cutting speed, the deeper the hole and the tougher the material, the more cutting fluid you will need.

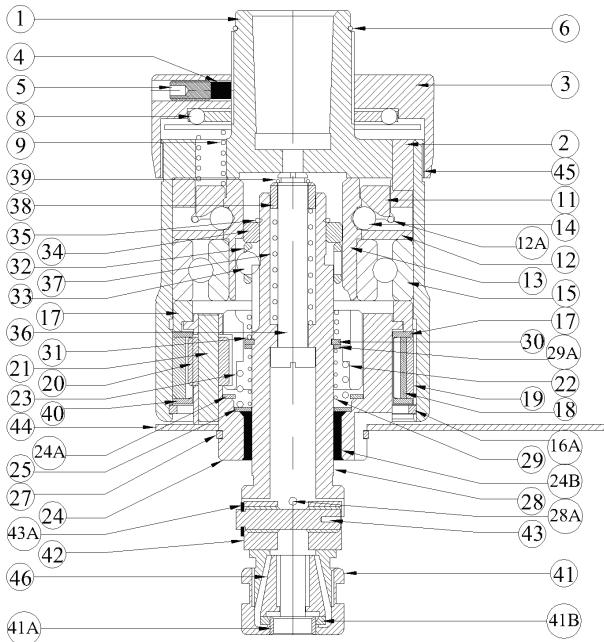
## LUBRICATION :

This attachment is prepacked at the factory and only needs periodic additions of grease to maintain proper lubrication. Approximately every 600 Hrs partially disassemble the attachment and clean ball bearing and gears. Add a small amount of grease and reassemble. Do not over lubricate. Excess grease will create internal friction and overheating.

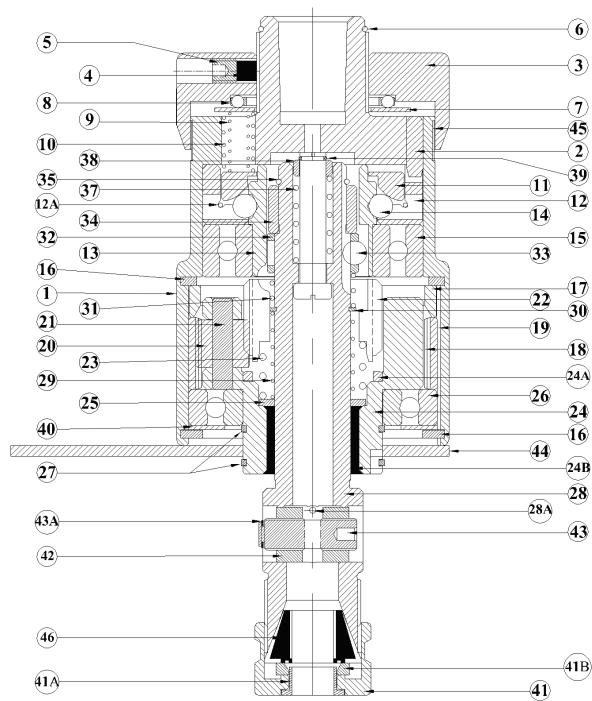
## SERVICE OVERHAUL AND REPAIR

Since overhaul and repair are time causing for someone not familiar with the attachment. We recommend that they be sent to us. We will be glad to get your tapping attachment operational again in shortest possible time.

## MODEL HR1



## MODEL HR2



# NOMENCLATURES

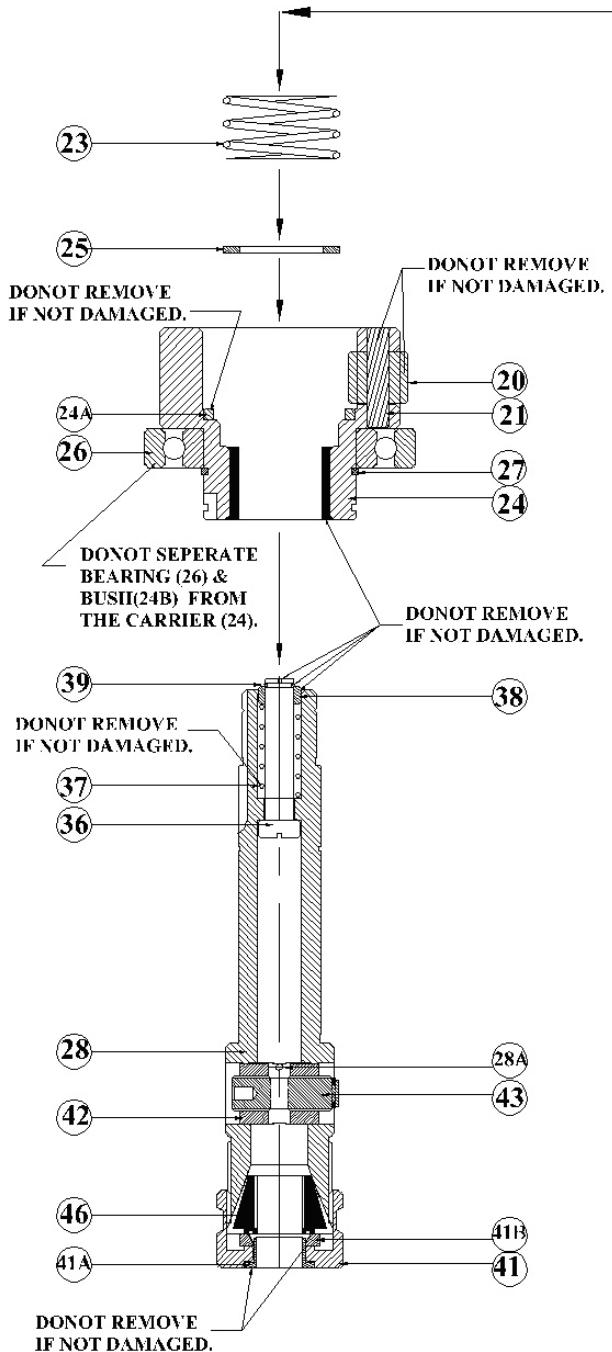
## Ordering Numbers

Part No.	Part Name	HR1	HRF1	HR2	HRF2
1.	Body	1 HR1 (a)	1 HR1 (a)	2 HR2 (a)	1 HR2 (a)
2.	Pin for Body	1 HR1 (a) (3Nos.)	1 HR1 (a) (3Nos.)	2 HR2 (a)(3Nos.)	1 HR2 (a)(3Nos.)
3.	Cup Nut	3 HR1	3 HR1	3 HR2	3 HR2
4.	Pin for Cup Nut	4 HR1	4 HR1	4 HR2	4 HR2
5.	Grub Screw	5 HR1	5 HR1	5 HR2	5 HR2
6.	Lockring for Cup Nut	6 HR1	6 HR1	6 HR2	6 HR2
7.	Washer for Cup Nut	7 HR1	7 HR1	7 HR2	7 HR2
8.	Thrust Bearing	8 HR1	8 HR1	8 HR2	8 HR2
9.	Pressure Spring Outer	9 HR1 (6 Nos.)	9 HR1 (9 Nos.)	9 HR2 (9 Nos.)	9 HR2 (9 Nos.)
10.	Pressure Spring Inner	-	10 HR1 (9 Nos.)	10 HR2 (9 Nos.)	10 HR2 (9 Nos.)
11.	Pressure Plate	11 HR1	11 HR1	11 HR2	11 HR2
12.	Clutch Drive	12 HR1	11 HR1	11 HR2	11 HR2
12.A	Lockring for Clutch Drive	12A HR1	12A HR1	12A HR2	12A HR2
13.	Forward Driver	13 HR1 (c)	13 HR1 (c)	13 HR2 (c)	13 HR2 (c)
14.	Balls for Forward Driver	14 HR1 (6 Nos.)	14 HR1 (6 Nos.)	14 HR2 (6 Nos.)	14 HR2 (6 Nos.)
15.	Ball Bearing for Forward Driver	15 HR1 (c)	15 HR1 (c)	15 HR2 (c)	15 HR2 (c)
16.	Circlip for Body	-	-	16 HR2 (2 Nos.)	16 HR2 (2 Nos.)
17.	Spacer	17 HR1	17 HR1	17 HR2	17 HR2
17A.	Fiber Ring	17A HR1	17A HR1	-	-
18.	Gear Ring	18 HR1	18 HR1	18 HR2	18 HR2
19.	Key for Gear Ring	19 HR1	19 HR1	19 HR2	19 HR2
20.	Pinion	20 HR1 (b) (3 Nos.)	20 HR1 (b) (3 Nos.)	20 HR2 (b) (3 Nos.)	20 HR2 (b) (3 Nos.)
21.	Pin for Pinion	21 HR1 (b) (3 Nos.)	21 HR1 (b) (3 Nos.)	21 HR2 (b) (3 Nos.)	21 HR2 (b) (3 Nos.)
22.	Reverse Gear	22 HR1	22 HR1	22 HR2	22 HR2
23.	Spring for Reverse Gear	23 HR1	23 HR1	23 HR2	23 HR2
24.	Carrier	24 HR1 (b)	24 HR1 (b)	24 HR2 (b)	24 HR2 (b)
24.A.	Ring for Carrier	24A HR1 (b)	24A HR1 (b)	24A HR2 (b)	24A HR2 (b)
24.B.	Bush for Carrier	24B HR1	24B HR1	14B HR2 (b)	24B HR2 (b)
25.	Washer for Carrier	25 HR1 (b)	25 HR1 (b)	25 HR2 (b)	15 HR2 (b)
26.	Ball Bearing for Carrier	-	-	26 HR2 (b)	26 HR2 (b)
27.	Circlip for Carrier	27 HR1	27 HR1	27 HR2 (2 Nos.)	27 HR2 (1 Nos.)
28.	Spindle	28 HR1	-	28 HR2	-
28.A.	Pin for Spindle	28A HR1	-	28A HR2	-
29.	Expansion Spring	29 HR1	29 HR1	29 HR2	29 HR2
30.	Lockring for Spindle	30 HR1	30 HR1	30 HR2	30 HR2
31.	Spring for Ball Carrier	31 HR1	31 HR1	31 HR2	31 HR2
32.	Ball Carrier	32 HR1	32 HR1	32 HR2	32 HR2
33.	Ball for Ball Carrier	33 HR1 (3 Nos.)	33 HR1 (3 Nos.)	33 HR2 (3 Nos.)	33 HR2 (3 Nos.)
34.	Washer for Spindle	34 HR1	34 HR1	34 HR2	34 HR2
35.	Lockring for Washer	35 HR1	35 HR1	35 HR2	35 HR2
36.	Stud for Spindle	36 HR1	36 HR1	36 HR2	36 HR2
37.	Comp. Spring for Stud	37 HR1	37 HR1	37 HR2	37 HR2
38.	Washer for Stud	38 HR1	38 HR1	38 HR2	38 HR2
39.	Lockring for Stud	39 HR1	39 HR1	39 HR2	39 HR2
40.	Thrust Washer	40 HR1	40 HR1	40 HR2	40 HR2
41.	Chuck Nut	41 HR1 (d)	-	41 HR2 (d)	-
41A.	Bush for Chuck Nut	41A HR1 (d)	-	41A HR2 (d)	-
41B.	Washer for Chuck Nut	41B HR1 (d)	-	41B HR2 (d)	-
42.	Square Nuts	42 HR1 (1 Set)	-	42 HR2 (1 Set)	-
43.	L R Stud	43 HR1	-	43 HR2	-
43.A.	E-Type Circlip	43A HR1	-	43A HR2	-
44.	Stop Arm	44 HR1	44 HR1	44 HR2	44 HR2
45.	Torque Strip	45 HR1 (a)	45 HR1 (a)	45 HR2 (a)	45 HR2 (a)
46.	Collet	S161	-	S212	-
	Collet	S171	-	S222	-
47.	Spanner	47 HR1 (1 Set)	-	47 HR2 (1 Set)	-
48.	Allen Key	48 HR1	48 HR1	48 HR2	48 HR2
49.	Arbor				
	(a) JT33/MT1	49 (a) HR1	49 (a) HR1		49 (c) HR2
	(b) JT33/MT2	49 (b) HR1	49 (b) HR1		49 (d) HR2
	(c) JT6/MT2	-	-	49 (c) HR2	49 (c) HR2
	(d) JT6/MT3	-	-	49 (d) HR2	49 (d) HR2
50.	Nut for Arbor	50 HR1	50 HR1	50 HR2	50 HR2
51.	Spindle	-	51 HRF1	-	51 HRF1
52.	Pressure Block	-	52 HRF1	-	52 HRF1
53.	Spring for Pressure Block	-	53 HRF1	-	53 HRF1
54.	Locking for Pressure Block	-	54 HRF1	-	54 HRF1
55.	Balls	-	55 HRF1 (3 Nos.)	-	55 HRF1 (3 Nos.)
56.	Kn. Sleeve	-	56 HRF1	-	56 HRF1
57.	Spring for Kn. Sleeve	-	57 HRF1	-	57 HRF1
58.	Locking for Kn. Sleeve	-	58 HRF1	-	58 HRF1

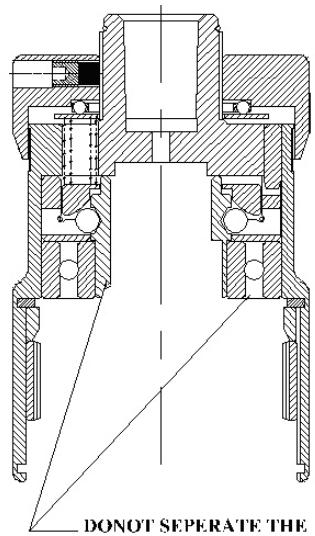
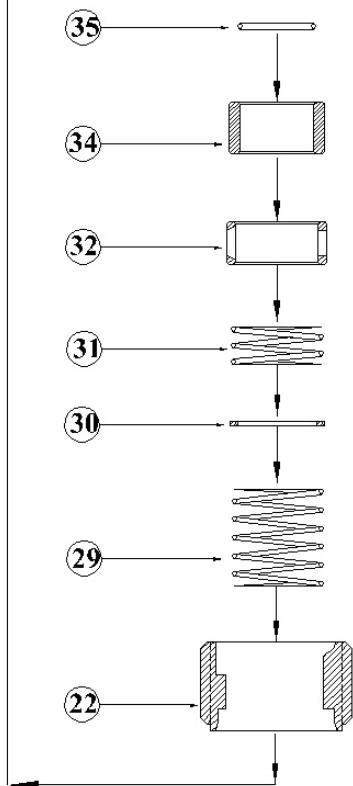
**Note:** Following parts are only available as an assembly.

- (a) Body (1) with Part No. (2) and (45)
- (b) (i) HR1/HRF1 Carrier (24) with Part No. (17A), (20), (21), (24A), (24B), (25).  
     (ii) HR2/HRF2 Carrier (24) with Part No. (20), (21), (24A), (24B), (25), (26), (27).
- (c) Bearing (15) with Part No. (13)
- (d) Chuck nut (41) with Part No. (41A) and (41B)

## ASSEMBLY PROCEDURE



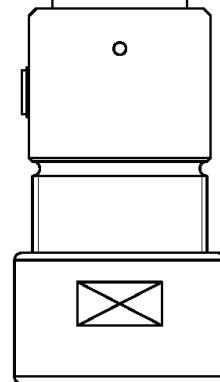
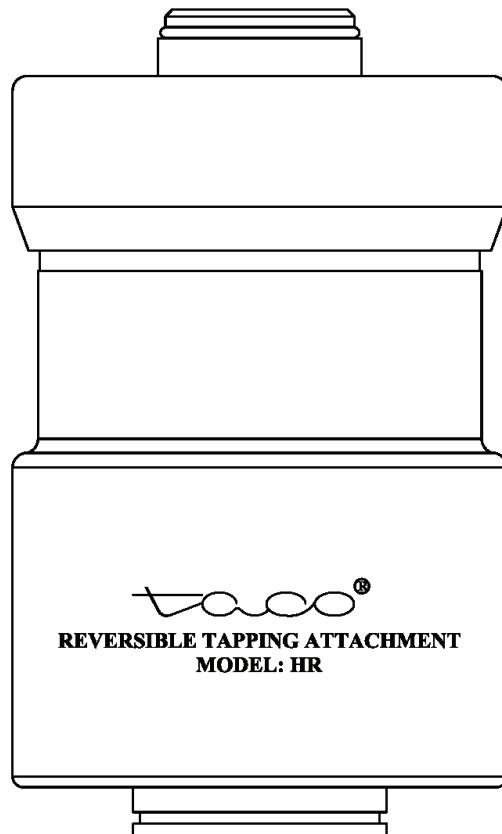
**MODEL HR**



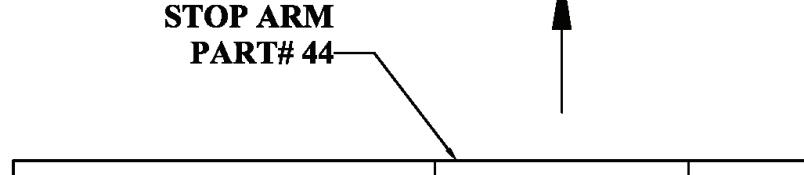
INSERT THE COMPONENTS AS SHOWN ON LEFT.

THEN THIS SUB-ASSEMBLY SHOULD BE FITTED IN THE ATTACHMENT SHOWN ABOVE.

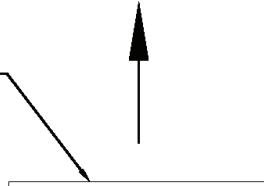
## PROCEDURE FOR MOUNTING THE STOP-ARM



**STOP ARM  
PART# 44**



**CIRCLIP FOR CARRIER  
PART# 44**



## Recommended Cutting Speed

Material	Rake Angle	Cutting Speed Speed feet/min Type Tap. - HSS	Cutting Fluid
Steel carbon 0.10 – 0.50 % C 0.50 – 1.10 %C	10° - 15°	20 – 50 20 – 40	Oil emulsion Or Sulphur-base oil
Steel-Chromium Nickel	10° - 15°	10 – 30	Heavy Sulphur-base oil
Steel-Chromium-Molybdenum	10° - 15°	10 – 30	Heavy Sulphur-base oil
Steel-stainless	10° - 15°	10 – 23	Heavy Chloride base oil Sulphur-base oil
Monel Metal	10° - 15°	10 – 23	Heavy Chloride base oil
Steel-cast	10° - 15°	15 – 50	Soluble oil or Sulphur-base oil
Iron-cast	3° - 7°	30 – 80	Dry or Soluble oil
Brass Drawn	10° - 15°	60 – 100	Soluble oil or light base oil
Brass Cast	0° - 5°	60 – 100	Soluble oil or light base oil
Bronze	5° - 10°	35 – 60	Dry
Aluminum Drawn	20° - 30°	60 – 100	Kerosene or Soluble oil
Aluminum Cast	10° - 15°	60 – 100	Kerosene or Soluble oil
Duralumin	10° - 20°	60 – 100	Dry
Bakelite	0° - 5°	30 – 65	Dry
Plastics, Soft	20° - 30°	60 – 70	Dry

The above information are subject to Tapping Speed instructions

## INSTRUCTIONS FOR DISASSEMBLY

1. Remove locking (6) and unscrew cup nut (3).
2. Hold unit in vertical position and remove thrust bearing (8), washer (7)
3. Carefully invert unit over a clean receptacle, pressure springs (9 & 10) will drop out.
4. From the lower end remove Chuck nut (41), Collet (46) if necessary then, remove "E" type Circlip, stud (43A) and Loosen L-R stud (43) to remove Nuts (42) (For Model HR).
5. Remove Circlip (27), stop arm (44), Circlip (16) and bearing cover (40).Do not remove Circlip (27) which holds bearing.
6. Lift out complete gear – carrier sub-assembly with spindle unit.
7. Remove gear ring (18), key (19) and spacer (17).
8. Remove locking (35), washer (34) ball carrier (32), balls (33) and spring (31).
9. Lift out reverse gear (22) and spring (23).
10. Remove locking (30) expansion spring (29), washer (25) for relieving spindle unit from carrier sub-assembly.
11. Remove Circlip (16) for disassembling clutch sub-assembly, invert the Body over a clean receptacle. Lift off pressure plate (11), balls (14), and clutch driver (12). (For reassembly) pack grease in clutch sub-assembly so pressure plate (11) will stay in place while reassembling the clutch bearing assembly.
12. Do not disassemble ball bearings (15&25).
13. Do not disassemble pinion (20) – carrier (24) sub assembly.

## INSTRUCTIONS FOR ASSEMBLY

1. Clean and lubricate all parts requiring lubrication thoroughly.
2. Reverse procedure for disassembly.