Parts Manual
823081
8/18/2021

10QNPD
Nut Plate Drills

For additional product information visit our website at http://www.ClecoTools.com

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Further Document for Safety Instructions

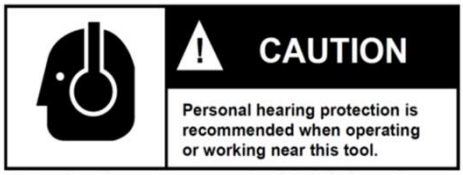
No	Document Type
CE-2009	General Safety Instructions

Safety Recommendations

For your safety and the safety of others, read and understand the safety recommendations and operating instructions before operating any drill motor.

Always wear protective equipment:

For additional information on eye protection, read the latest edition of ANSI Z87.1, Occupational and Educational Eye and Face Protection. This standard is available from the American National Standards Institute, Inc., 11 West 42nd Street, New York, N.Y. 10036.



Hearing protection is recommended in high noise areas (above 85dBA). Close proximity of additional tools, reflective surfaces, process noises, etc., can contribute substantially to the sound level experienced by the operator.

Follow good machine shop practices. Rotating shafts and moving components entangle and entrap, and may result in serious injuries. Never wear long hair, loose-fitting clothes, gloves, ties, or jewelry when working with or near a drill of any type.

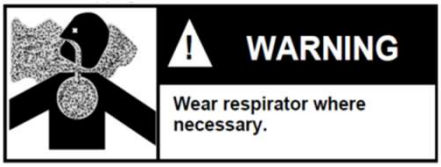
10QNPD Nutplate Drills are designed to operate on 90psig (6.2 bar) maximum air pressure using the proper size hose. Excessive air pressure increases the loads and stresses on tool parts and drills, and may result in breakage. The installation of a filter-regulator-lubricator in the air supply line ahead of the tool is highly recommended.

• Before the tool is connected to the air supply, the throttle should be checked for proper operation (i.e., throttle valve moves freely and returns to closed position).

• Before removing a tool from service or changing drill bits, make sure the air line is shut off and drained of air. This will prevent the tool from operating if the throttle is accidently engaged.

• Cutting tools used with these drill motors are sharp. Handle them carefully to avoid injury.

• The collet and mandrel must be inserted into a properly sized pre-drilled hole before starting the tool. An improperly sized pre-drilled hole prevents the mandrel from engaging the collet and could result in slippage of the tool. An improperly selected collet and mandrel can also result in slippage of the tool.



Drilling or other use of this tool may produce hazardous fumes and/or dust. To avoid adverse health effects, utilize adequate ventilation and/or a respirator. Read the material safety data sheet of any cutting fluids or materials involved in the drilling process.

Some non-ferrus metal chips (or dusts) are combustible. Examples: Aluminum, magnesium, Titanium, and Zirconium. See the material safety data sheets for combustibility of materials drilled. Never collect spark generating material with combustible material. Examples: Collecting both steel and aluminum or steel and titanium.

10QNPD drills can be used with lubricant or cooling systems which must be properly maintained to avoid leakage. Failure to do so can result in serious injuries from slipping on oily surfaces.

Safety Recommendations

Due to the number and variety of tooling applications, the user's methods engineering departments, etc., must consider any hazards that may be associated with each specific application of this product and provide adequate operator protection from inadvertent contact with any moving components. The clamping and feed mechanisms of self-colleting drill motors are exposed for visibility and can move when the air supply is connected or disconnected. To avoid injury, keep fingers and hands away from these areas when handling or operating this tool.

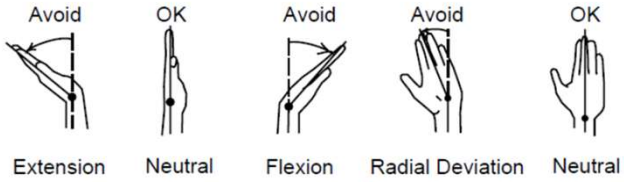
Some individuals are susceptible to disorders of the hands and arms when exposed to vibration and/or tasks which involve repetitive work motions. Those individuals predisposed to vasculatory or circulatory problems may be particularly susceptible. Cumulative trauma disorders such as carpal tunnel syndrome and tendinitis can be caused or aggravated by repetitious, forceful exertions of the hands and arms. These disorders develop gradually over periods of weeks, months, and years. Tasks should be performed in such a manner that the wrists are maintained in a neutral position, which is not flexed, hyperextended, or turned side to side. Stressful postures should be avoided and can be controlled through tool selection and work location.

Any tool operator should be aware of the following warning signs and symptoms so that a problem can be addressed before it becomes a debilitating injury. Any user suffering from prolonged symptoms of tingling, numbness, blanching of fingers, clumsiness or weakened grip, inability to hold objects, nocturnal pain in the hand, or any other disorder of the shoulders, arms, wrists, or fingers should notify their employer so that a review of what steps might be taken to prevent further occurences. These steps might include but are not limited to, repositioning the work piece or redesigning the workstation, reassigning tool users to other jobs, rotating jobs, changing worker pace, and/or changing the type of tool used so as to minimize stress on the operator. Some tasks may require more than one type of tool to obtain the optimum operator/ tool/ task relationship.

The following recommendations will help reduce or moderate the effects of repetitive work motions. The operator of any drill should:

- Use a minimum hand grip force consistent with proper control and safe operation
- Keep body and hands warm and dry
- Avoid anything that inhibits blood circulation

— Smoking Tobacco
— Cold Temperatures
— Certain Drugs

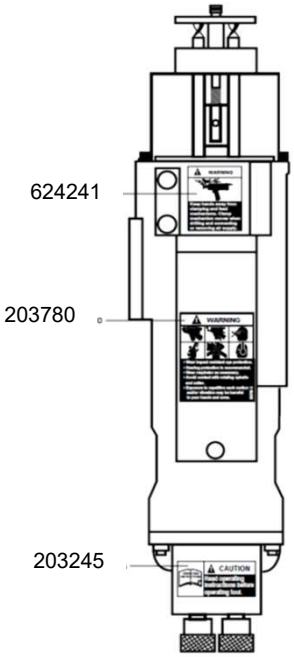


Avoid awkward postures

- Keep wrists as straight as possible
- Interrupt work, activities, or rotate jobs to provide periods free from repetitive work motions.

Safety Labels

The safety labels found on this tool are an essential part of this product. Labels should not be removed. Labels should be checked periodically for legibility. Replace safety labels when missing or when the information can no longer be read. Replacement labels can be ordered by the part numbers shown on this page.



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Cleco Production Tools

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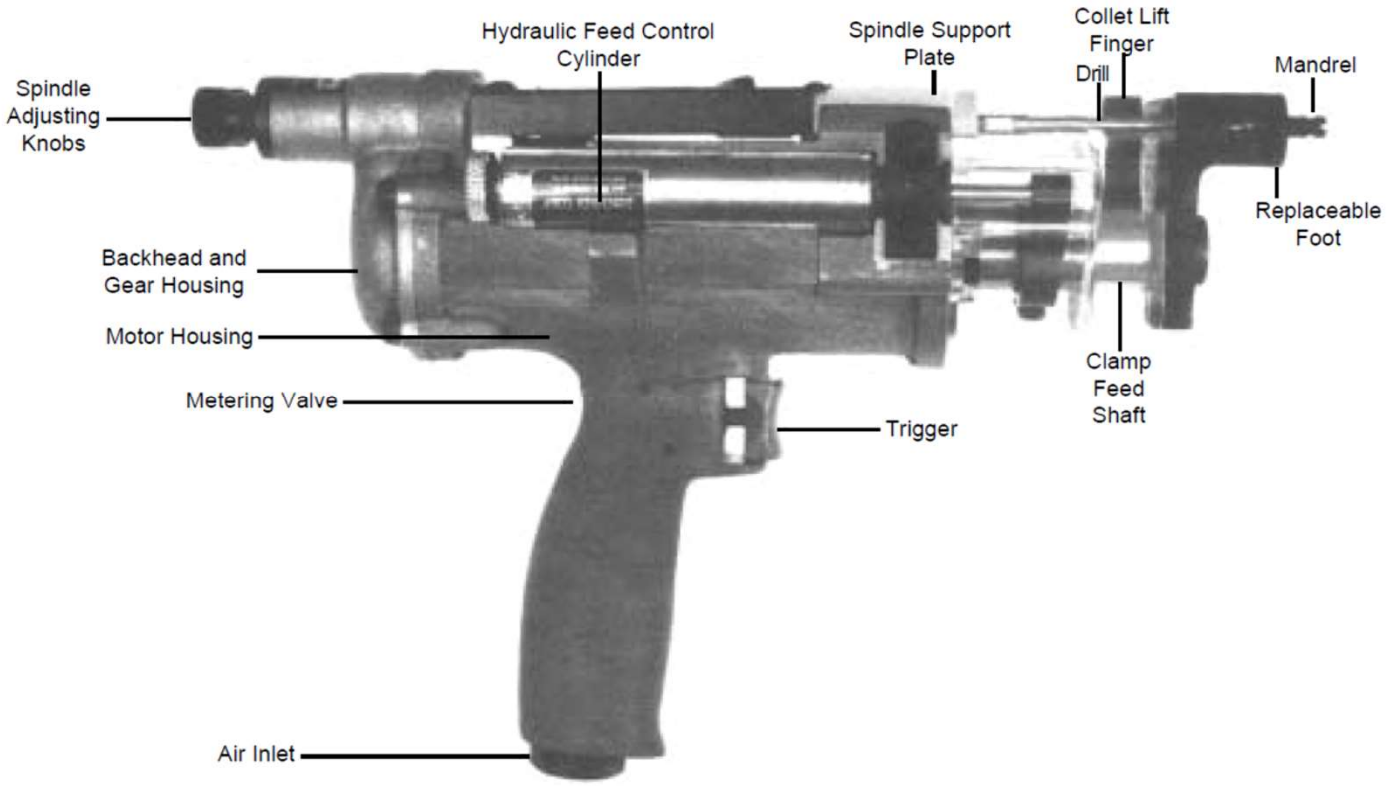
Major Tool Component Nomenclature



Introduction and General Information

The10QNPD nut plate drill motor has been developed for drilling an countersinking the two holes required for attachment of nut plate fasteners.
Utilizing an air/hydraulic feed control piston system, an expanding collet grips the work with 240 lbs. holding force during the complete drilling and countersinking operation. The air powered motor develops .7HP and consumes 19 CFM at 90 psi, the recommended air line pressure. The tool develops 200 lbs. of drilling thrust, and is capable of drilling holes up to .128 in. diameter. Total feed stroke is .6 in.; maximum colleting stroke is .43 in.

Each nut plate drill can be used to drill holes for all three types of nut plate fasteners: single wing, double wing and Mickey Mouse. By simply changing the front bearing support block, lift finger and pressure foot, one tool can be used for all types of nut plate fasteners. This feature eliminates the need for a specific tool to drill and countersink the various nut plate configuration.

Depth Control
Individual spindle adjustment knobs located at the rear of the tool controls the countersink depth accuracy within ± .001 in.(.0254mm).
Depending upon the hardness of the material being drilled, drilling cycle time can be adjusted from 1.5 sec. to 34 sec. by means of an externally mounted feed control valve.
The nut plate drill is available in two geared speed models: 600 rpm, 6,000 rpm. An adjustable throttle control valve located in the handle enables the tool spindle speed to be reduced as much as 50%, allowing the tool rpm to be matched to the material being drilled, thereby providing optimum drill bit life.
An optional externally mounted pneumatic booster pump is available for use on the 600 rpm models. This optional pump increases both thrust and clamping force of the tool by as much as two and one-half times.

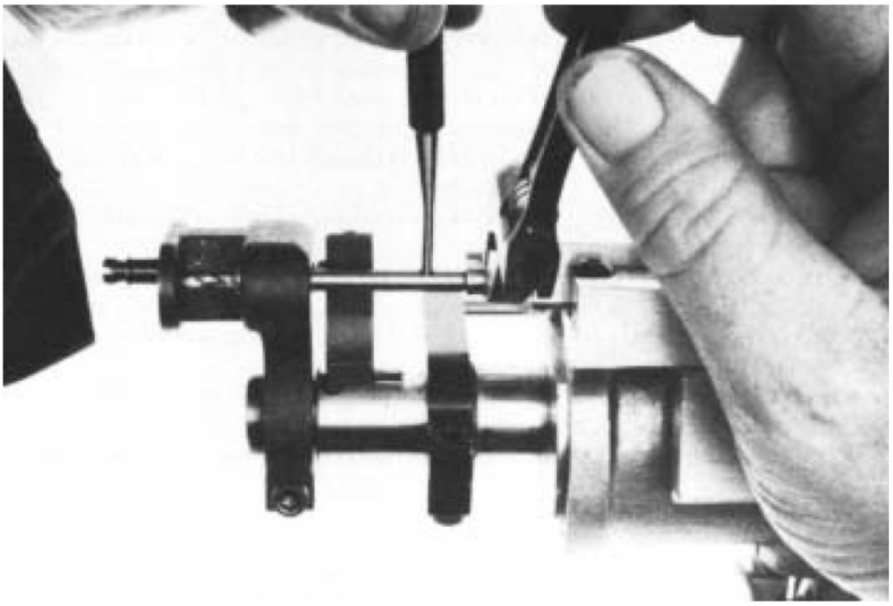
Tool Start-Up
The nut plate drill motor is shipped from the factory equipped to the customer's specifications; spindle RPM, nut plate styles, drill spindle spacing and optional booster pump (if needed). Collets and mandrels can be supplied for customers with start-up nut plate drilling applications.

After unpacking, examine the customer specified equipment on the tool to verify style and size of components.
Attach air line to 1/4 in. NPT inlet bushing. 1/4 in.quick disconnect plugs are the minimum recommended size for standard units and 3/8 in. quick disconnect fittings are minimum recommended size for units with booster pumps. The recommended air hose size is 3/8 in. inside diameter equipped with in-line filter and lubricator.
With air line attached, pull trigger to start tool and allow tool to run through a full cycle with drills in fully extended position. When trigger is released, drills return to original position and collet extends to open position.
To adjust depth of countersink, turn the spindle adjusting knobs at the rear of the tool to the appropriate depth. Turning the knobs counterclockwise reduces depth; clockwise increases depth.
Testing the tool on a separate piece of material will insure that the tool is operating properly and that the countersink depth has been accurately set.
Use a conventional drill to drill the pilot hole in the material. The size of this pilot hole should match the diameter of the collet and mandrel selected for the tool.
Insert the collet in the pilot hole while holding the pressure foot firmly against the surface to be drilled, and actuate the trigger.
The mandrel will retract and clamp the tool firmly against the work while the two drills will begin feeding into the material. The drilling cycle is complete when the drills have reached the maximum pre-set depth. Releasing the trigger will cause the drills to retract and the collet to release.
The tool is now ready to begin another cycle.

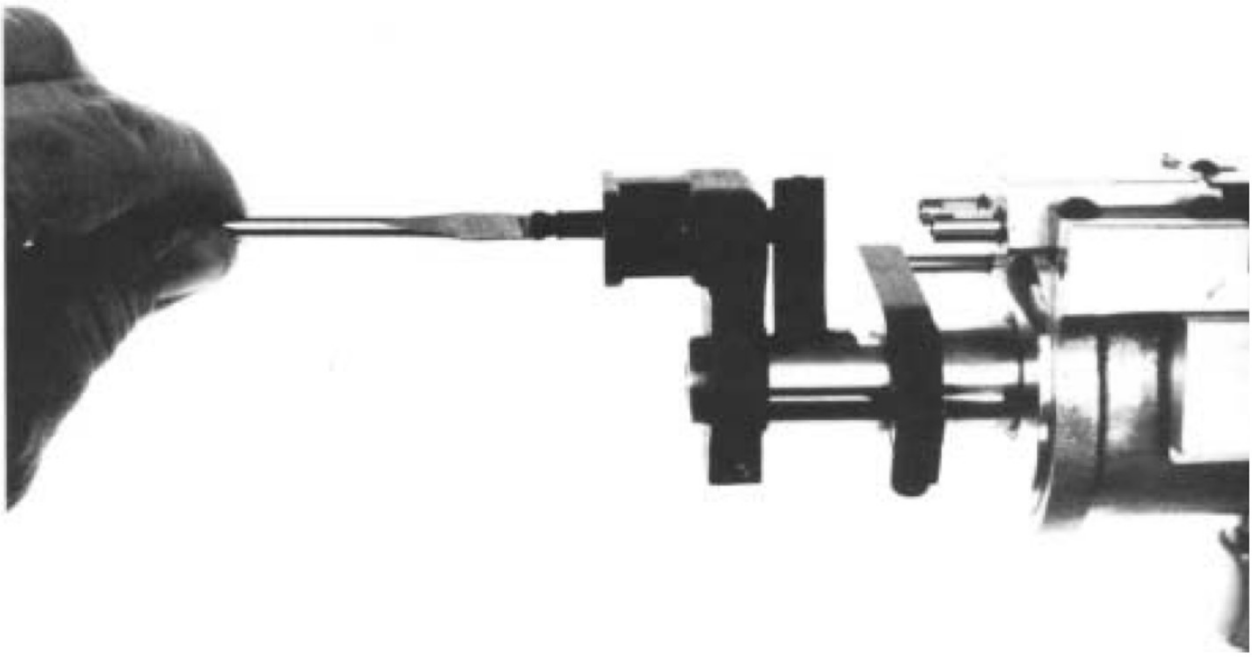
Tool Operation
Optimum performance of the nut plate drill motor requires a supply of clean, 90 psi air at 19CFM. Using an inline lubricator will provide the proper lubrication for the air motor and will significantly increase tool life expectancy. Because O-rings are extensively used to seal systems within the tool, the elimination of foreign particles and other contaminants will reduce the possibility of damage to these parts. Always inspect O-rings for damage or wear, and replace as required. The use of silicone O-ring lubricant is strongly recommended during reassembly. The addition of oil in the air line will also increase motor and valve life as well as the life of the O-rings.

⚠ WARNING **DISCONNECT AIR SUPPLY BEFORE SERVICING. THE CLAMPING AND FEED MECHANISMS ARE EXPOSED.TO AVOID INJURY, KEEP FINGERS AND HANDS AWAY FROM THESE AREAS WHEN HANDLING OR OPERATING TOOLS.**

Pressure Foot Attachment Disassembly



1. Remove the drills from spindles by holding spindles with an adjustable wrench on the flats of the spindles. Insert pin-type tool into hole provided in drill shank and turn drill counterclockwise. (drills are right hand threads)



2. Remove mandrel from lift finger by turning counterclockwise then remove the collet spring.

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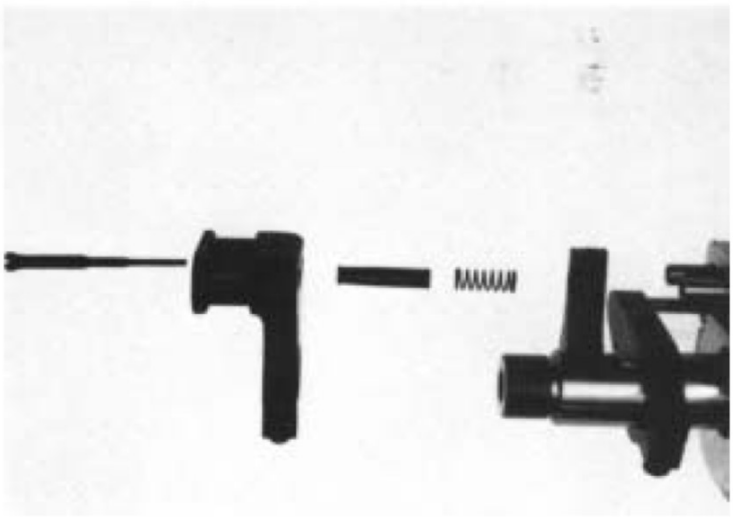
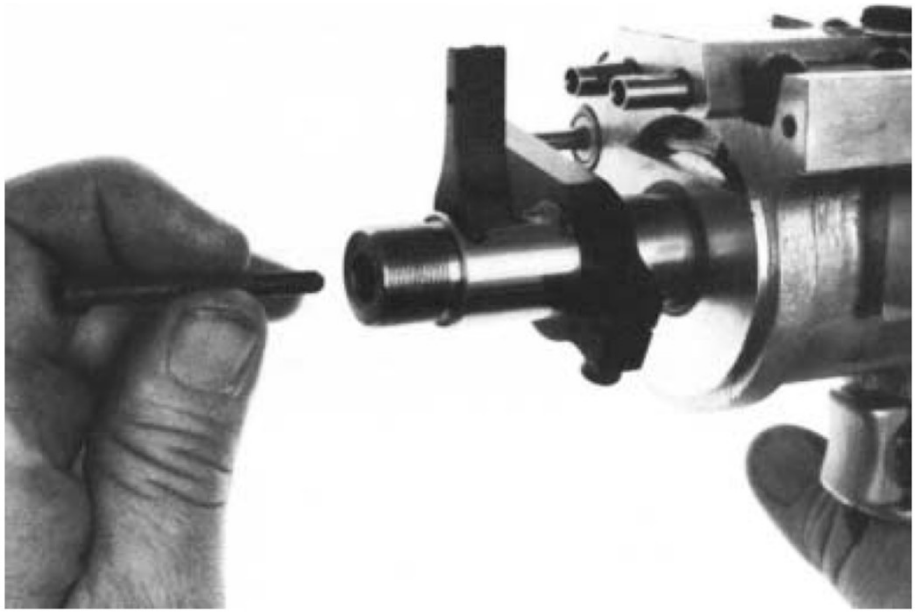
Pressure Foot Attachment Disassembly - Continued



3. Remove pressure foot by loosening clamp screw, then unscrew pressure foot attachment from collet closing piston rod.



4. Remove socket head cap screw 622060 from clamp feed shaft with hex wrench.

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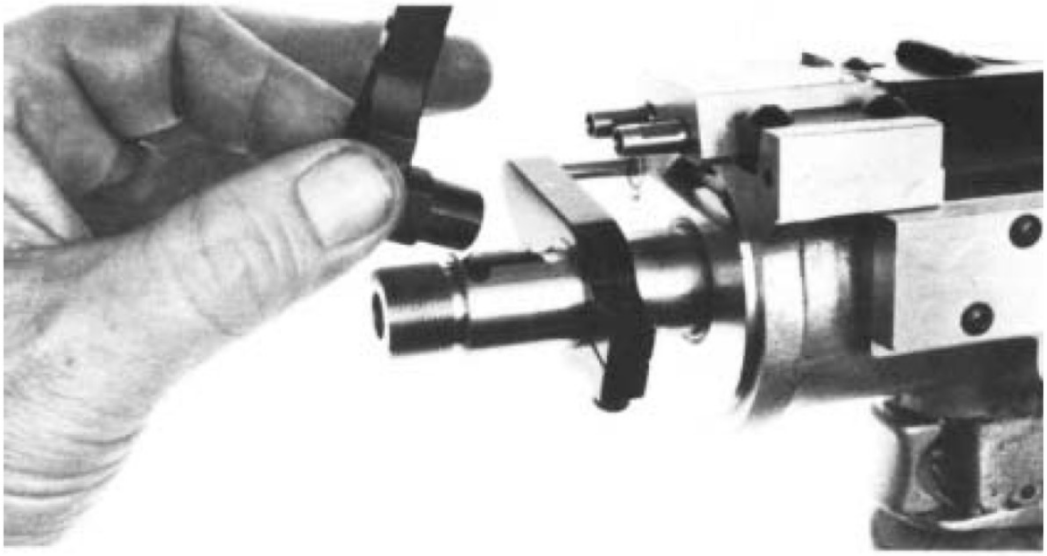
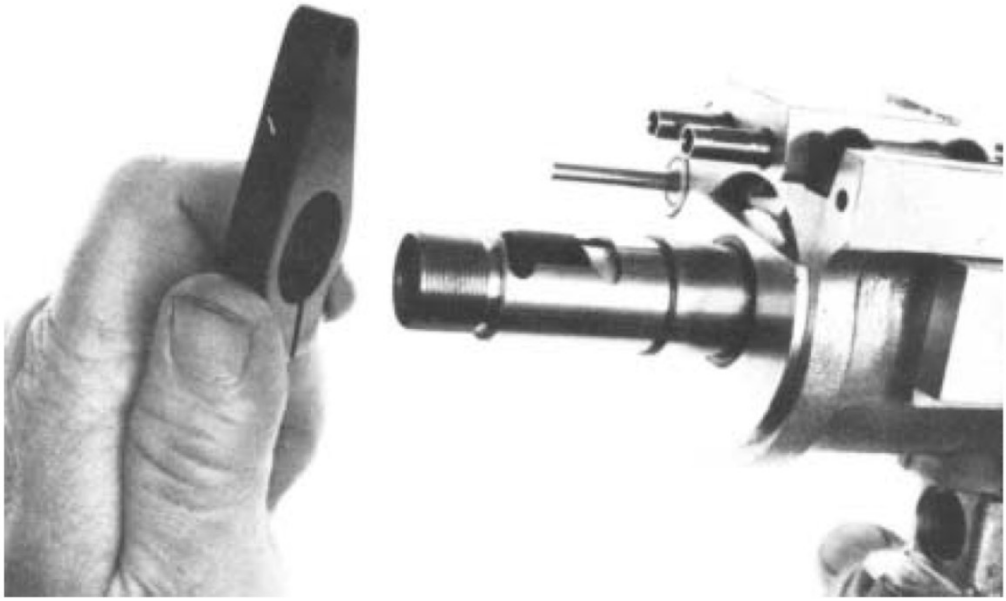
Pressure Foot Attachment Disassembly - Continued



5. **WARNING:** The following steps for removing the retract lift finger can only be used if the tool has not been disassembled in any other way. If back head has been removed, this method cannot be used. Remove retract lift finger by attaching air line to the tool and pulling trigger. At this time the retract lift finger can be lifted up and forward out of the tool. Disconnect air from tool again to proceed with disassembly.



6. Remove feed adjustment foot 625031 by removing lift finger screw 833106 and sliding adjustment foot off clamp feed shaft.

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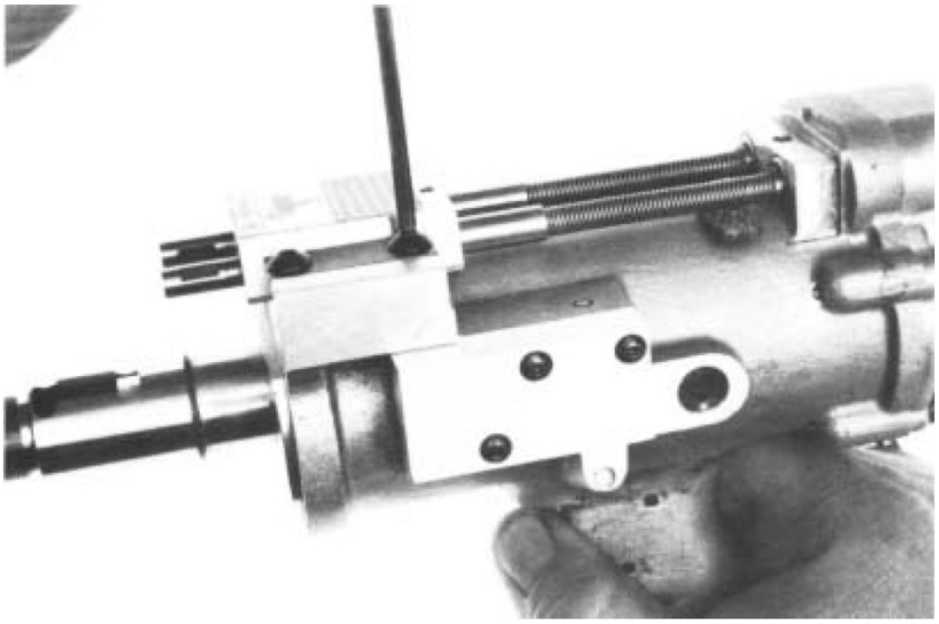
Spindle and Back Head Disassembly

1. Remove button head screw 619684 and 622063 from front and rear of spindle cover 625063.



2. Remove two button head cap screws 622059 from support wedge 622082.

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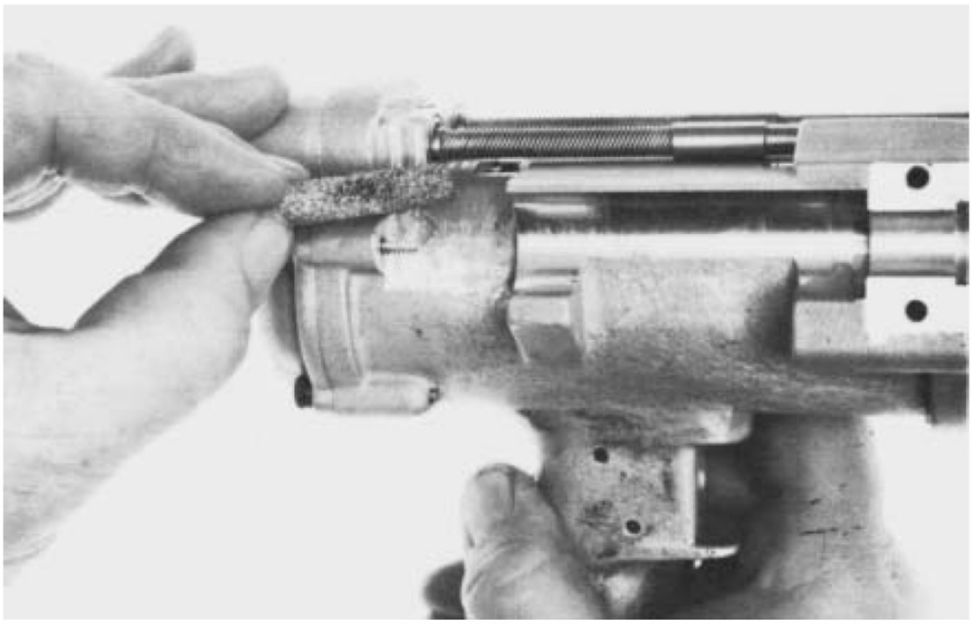
Spindle and Back Head Disassembly - Continued

3. Remove support plate from spindles.



4. Remove muffler 625052.

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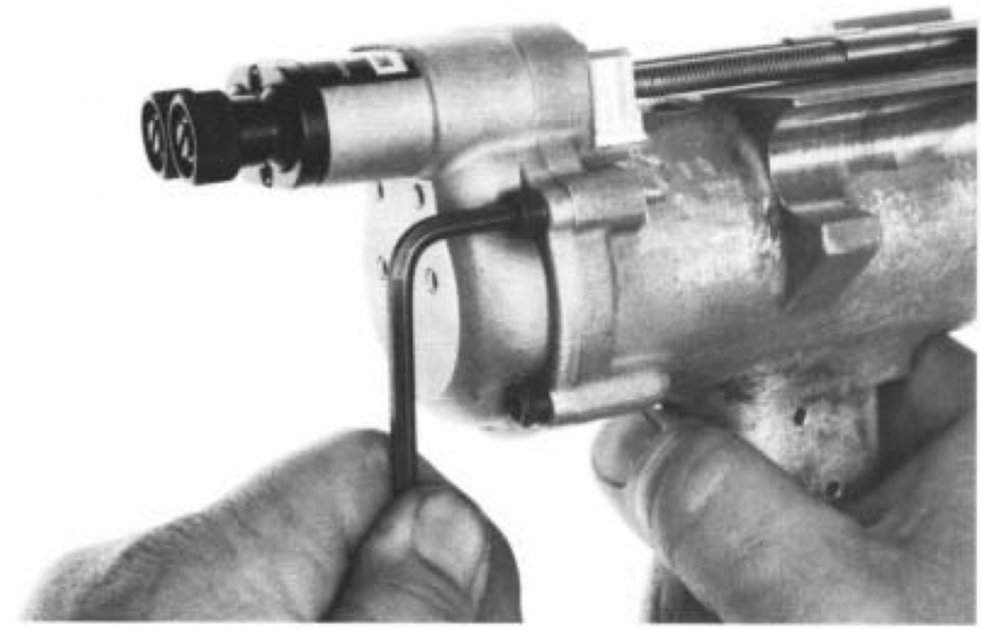
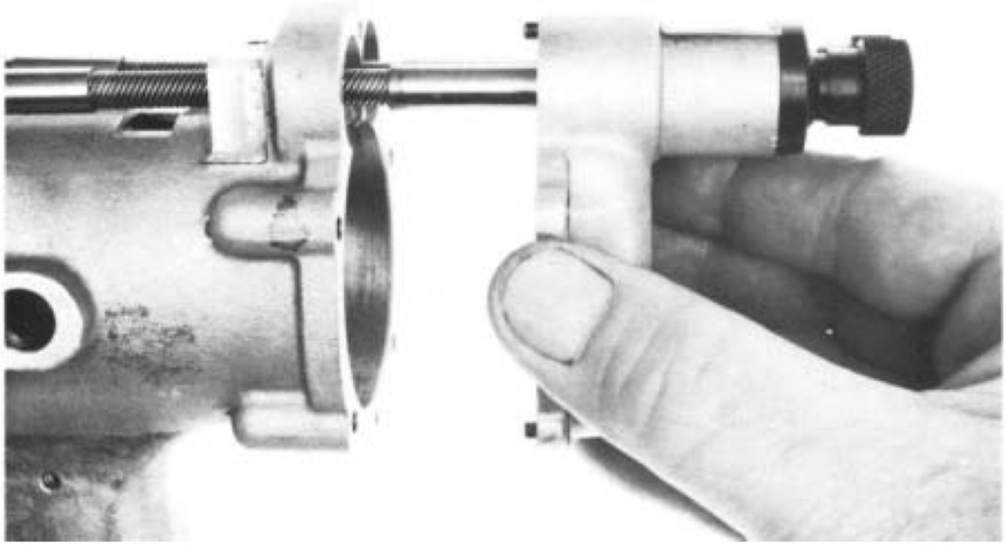
Spindle and Back Head Disassembly - Continued



5. Remove four socket head cap screws 847688 from back head 625020.



6. Remove back head and spindle assemblies from motor housing. NOTE: Four idler gears are held in position by idler gear shafts in the back head, and are retained by the gear plate 622101.

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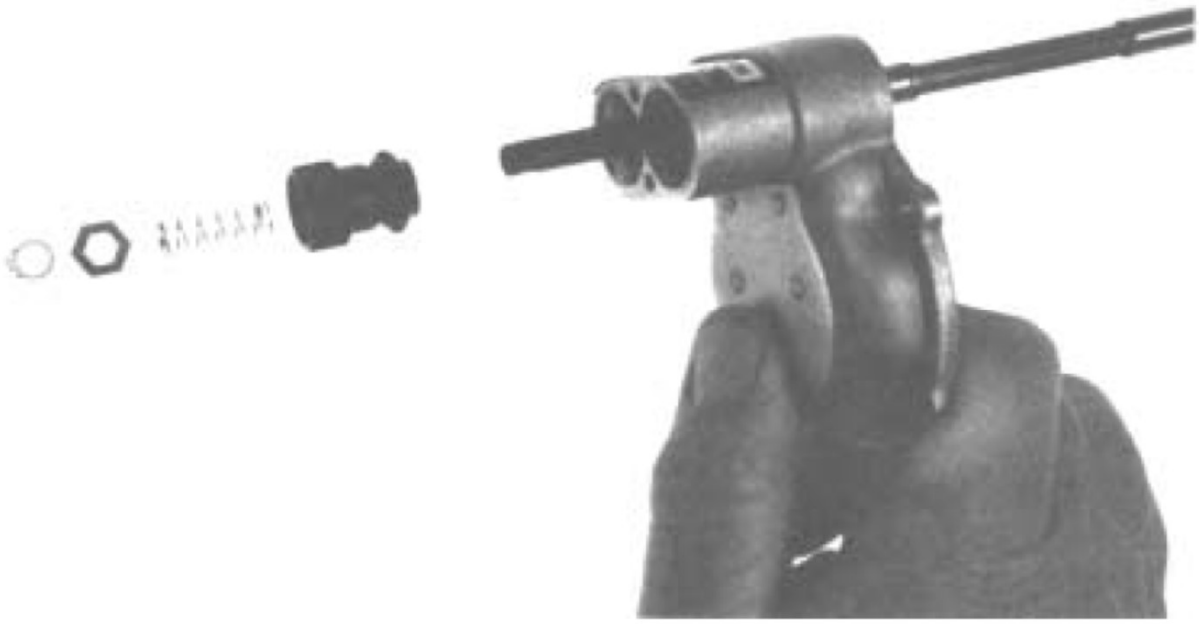
Spindle and Back Head Disassembly - Continued



7. Remove retainer ring 625467 to release spindle adjustment nut 625027, adjustment knob spring 622140 and adjustment knob 625023.

8. Remove the spindle adjustment screw 625026 by screwing the spindle clockwise through the backhead assembly 625020.

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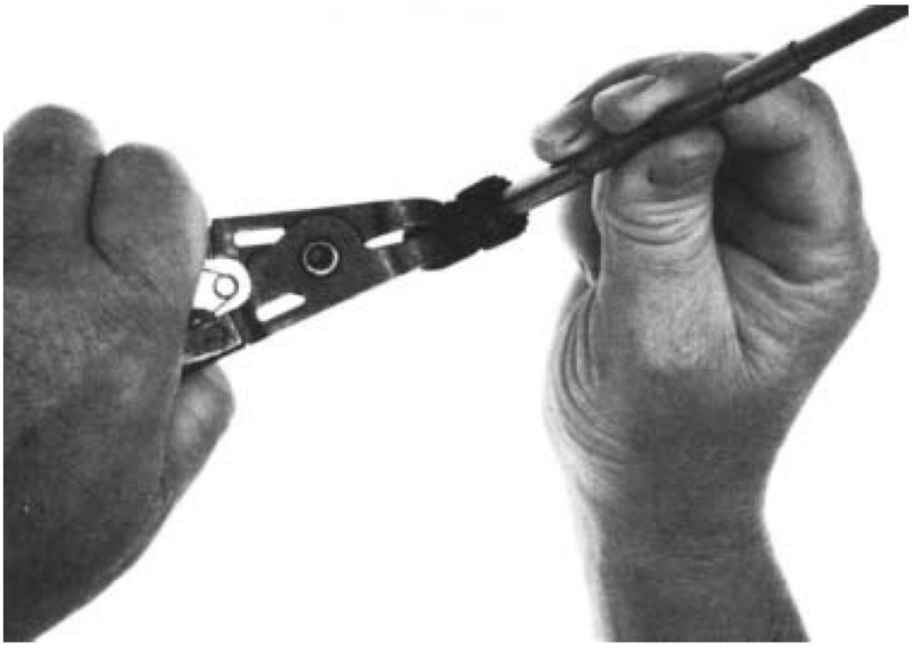
Spindle and Back Head Disassembly - Continued

9. Remove two socket head cap screws 622774 from spindle adjustment plate 625019 and remove plate.



10. Remove retainer ring 623685 with bent internal pliers. Pull off spindle adjustment screw 625026 to expose bearings.

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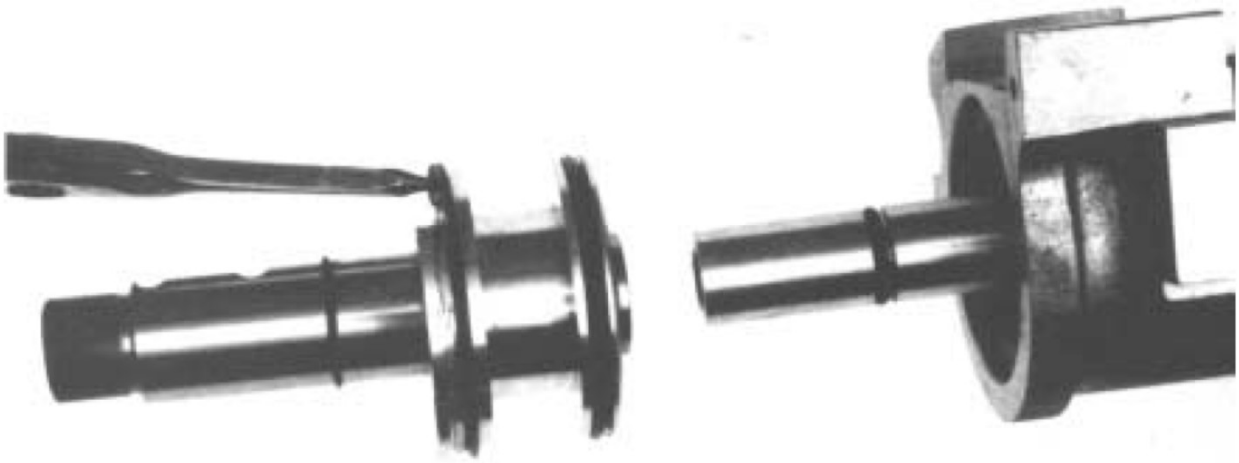
Spindle and Back Head Disassembly - Continued

11. Remove button head screw 625068 to release spindle bearings 863582 and shims. Remove retainer ring 833774 to release spindle gear 622097 and key 622057.

Feed Mechanism Disassembly



1. Front enclosure retainer ring 622061 must be compressed with internal pliers and aligned properly to prevent interference with retainer ring groove in housing to allow the clamp feed shaft 625030 and front enclosure 625029 to be pulled out. Note: The "O"-rings and suction is tight.

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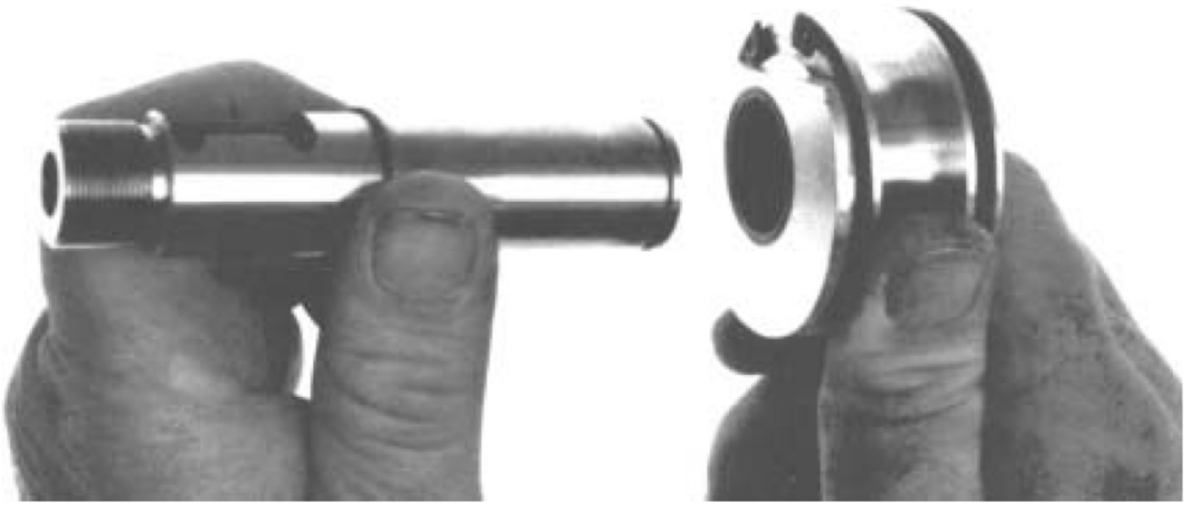
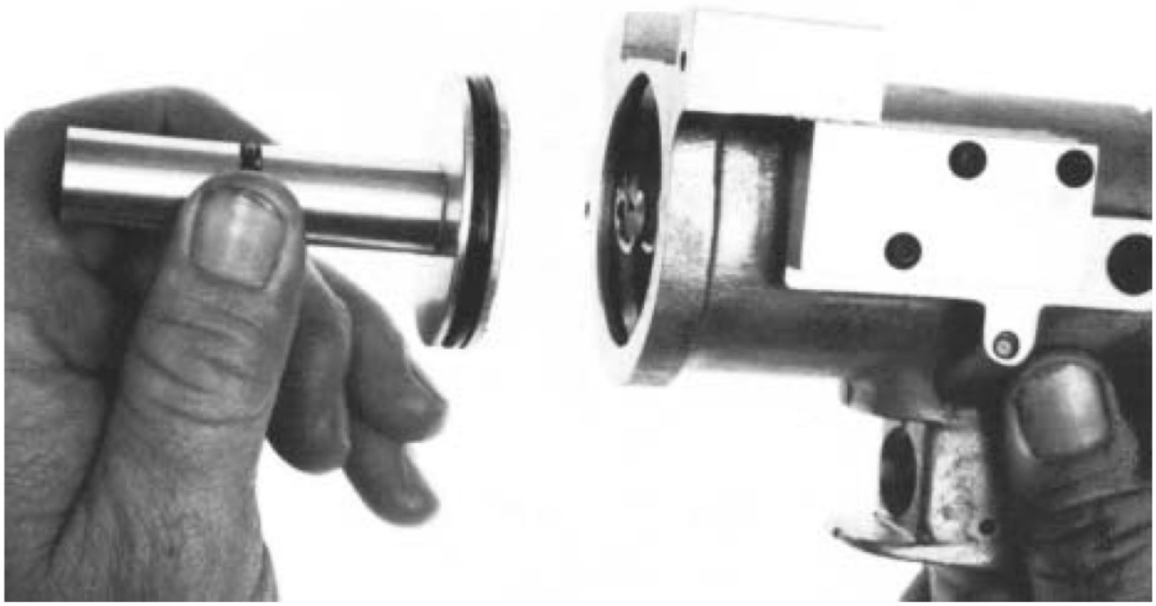
Feed Mechanism Disassembly - Continued



2. Remove clamp feed shaft spiral ring 623595 and slide clamp feed shaft 625030 out of front enclosure 625029.



3. Remove collet piston 625042 from housing.

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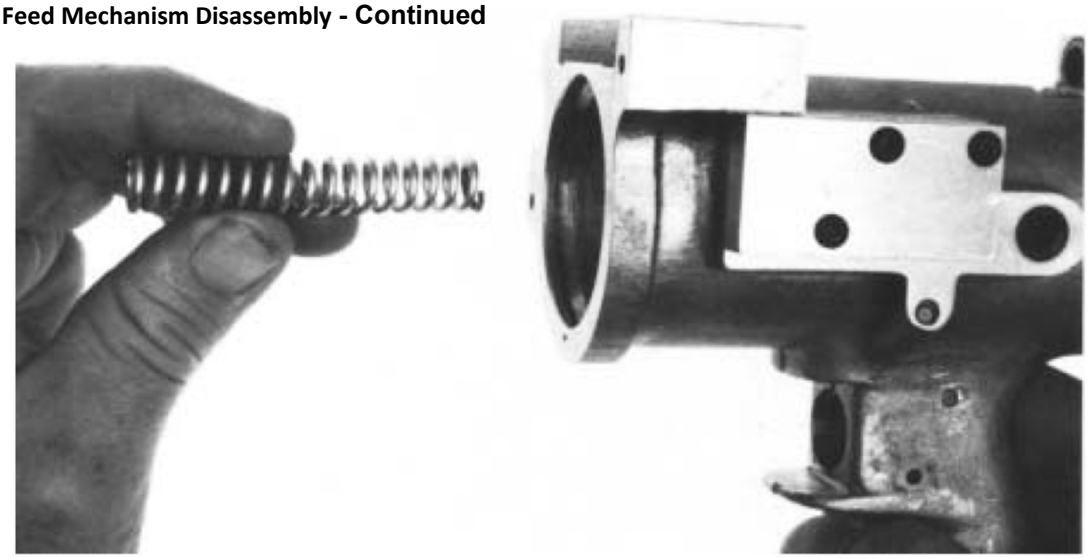
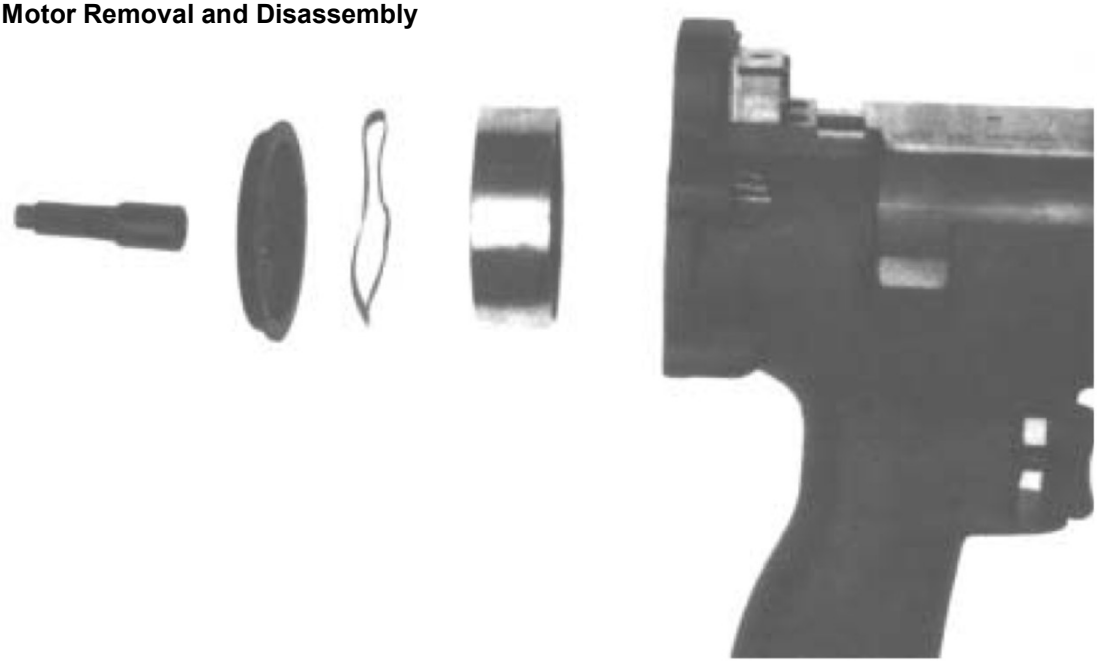
Feed Mechanism Disassembly - Continued



4. Remove collet piston spring 625033.

Motor Removal and Disassembly



1. Remove the pinion gear 625061, gear plate spacer 625058, wavy washer 625872 and gear plate 622101 from housing.

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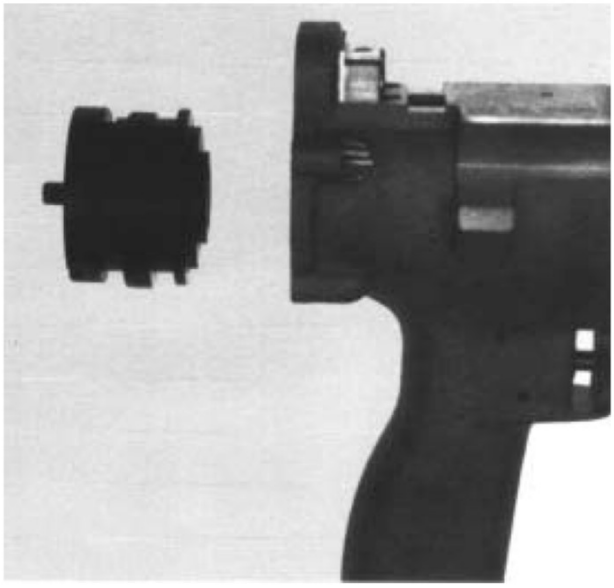
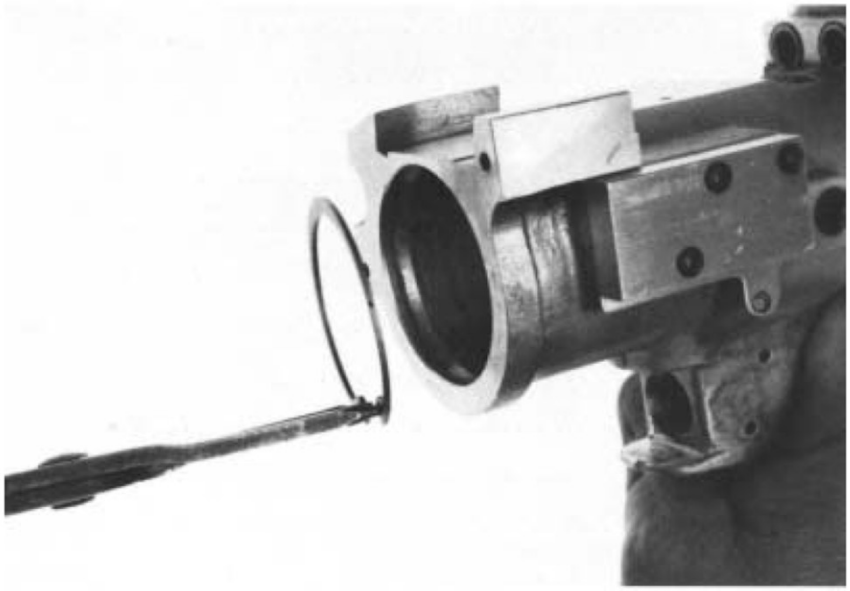


3. Remove motor from housing noting the orientation of the motor in the housing. Refer to page 27 for motor alignment.



4. Remove rear bearing plate support retainer ring 622065.

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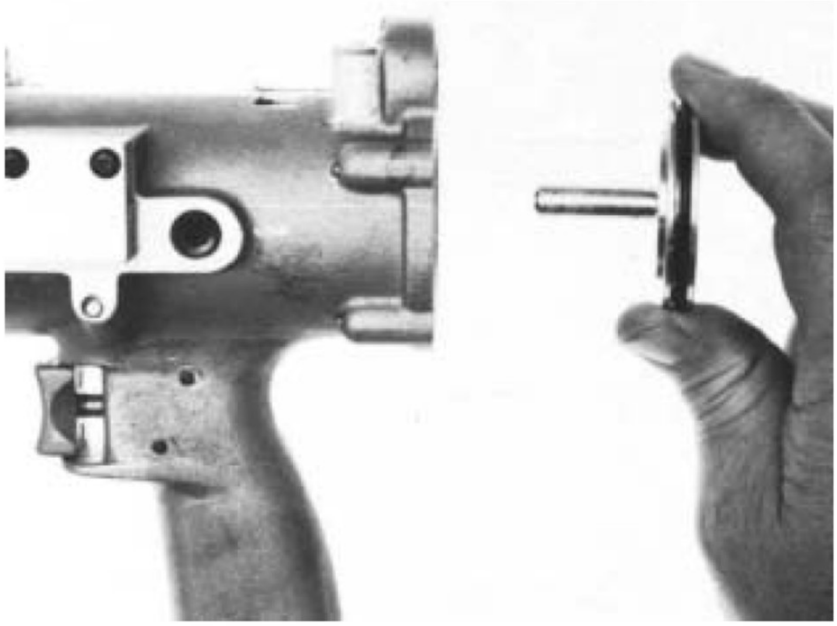
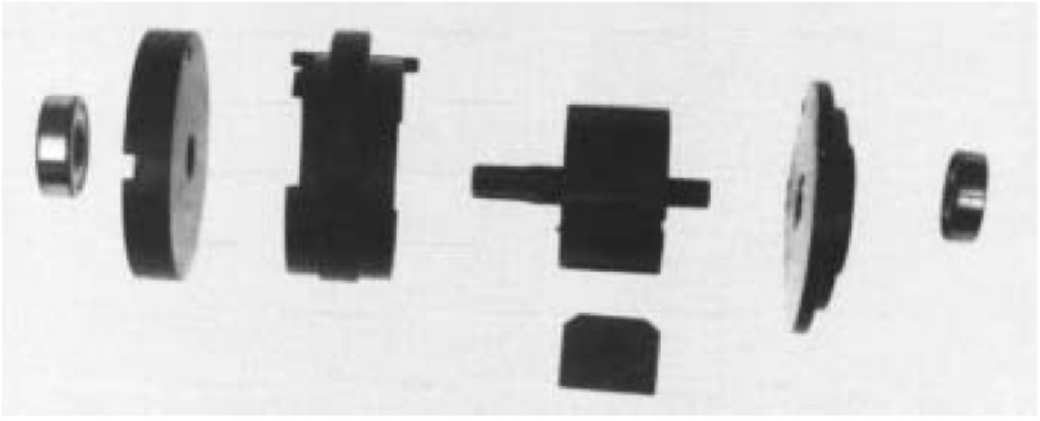


5. Remove rear bearing plate support 625045 with soft faced mallet.



6. The motor can be disassembled by tapping on the spline shaft of the rotor 625049 with a soft faced mallet. The rotor can be driven out of the rear bearing plate 625047 with a punch and hammer. When reassembling the motor, the rear bearing plate should be driven onto the rotor shaft first. Allow about .0015" clearance between the rotor and bearing plate. Refer to page 26 for rotor blade and motor air inlet alignment.

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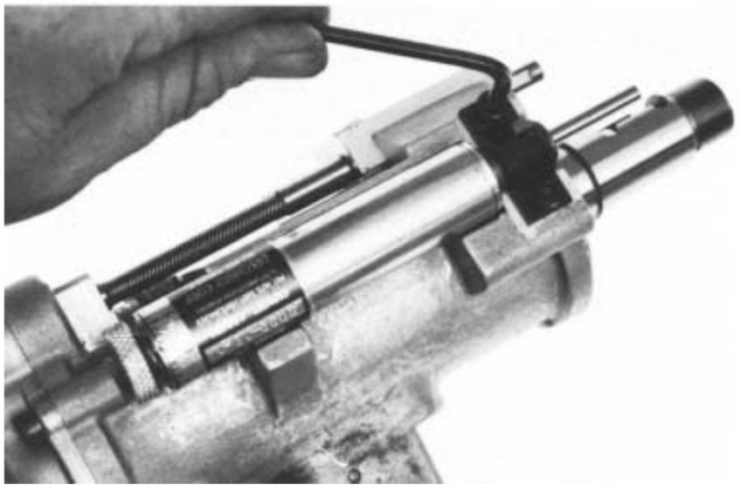
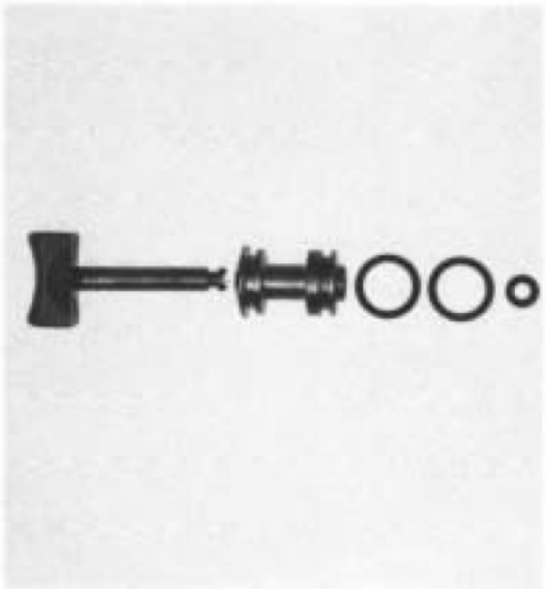
Hydraulic Feed Control Piston Removal



1. Remove the socket head cap screws 883731 and the complete assembly and feed control piston support 625043.

Trigger Assembly Removal



1. Drive dowel pin 844083 out with punch and hammer. Pull complete assembly out of handle. Remove "O"-ring 869712 to remove trigger 203075 from trigger casing 203083.

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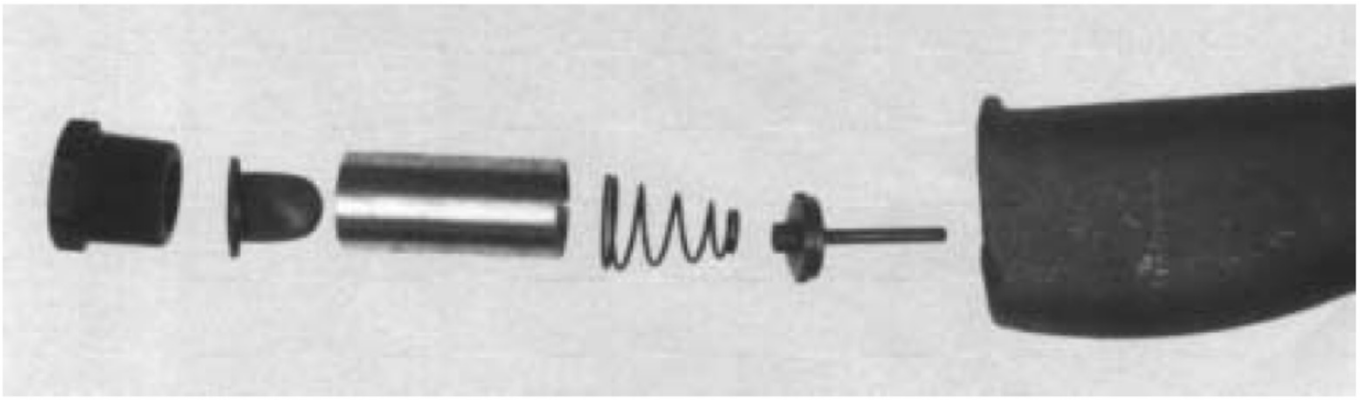
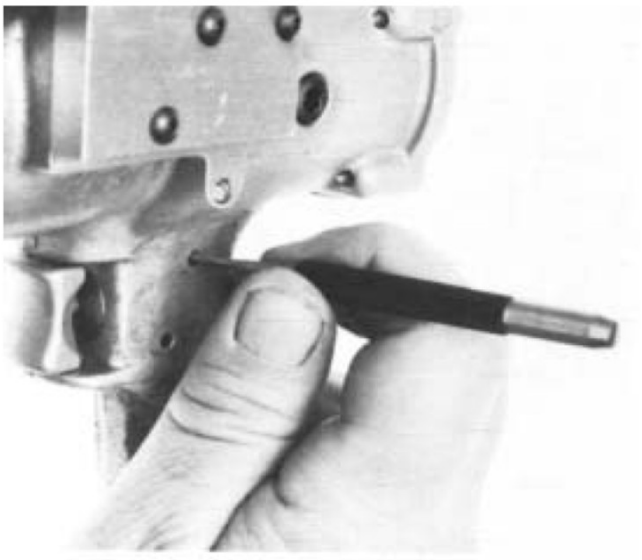
Throttle Valve Assembly Removal



1. Set handle in vertical position and remove inlet bushing 833471, then lift out inlet screen 869548, inlet spacer 625070, throttle valve spring 863072 and throttle valve 625028.

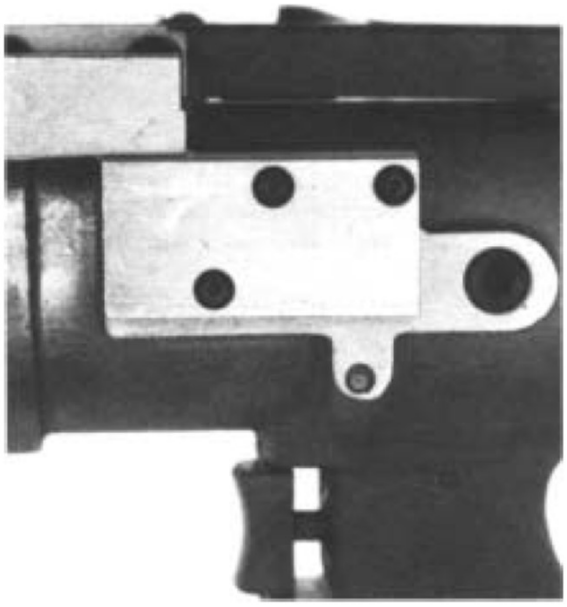
Metering Valve Removal



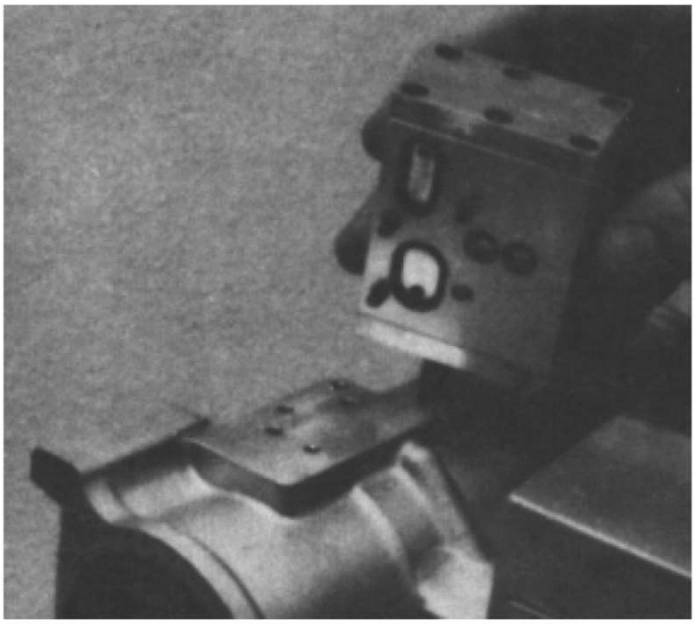
1. Drive dowel pin 844083 out with punch and hammer. With narrow screwdriver, unscrew metering valve 625071.

⚠ WARNING **DISCONNECT AIR SUPPLY BEFORE SERVICING. THE CLAMPING AND FEED MECHANISMS ARE EXPOSED.TO AVOID INJURY, KEEP FINGERS AND HANDS AWAY FROM THESE AREAS WHEN HANDLING OR OPERATING TOOLS.**

Mounting Air Booster Pump



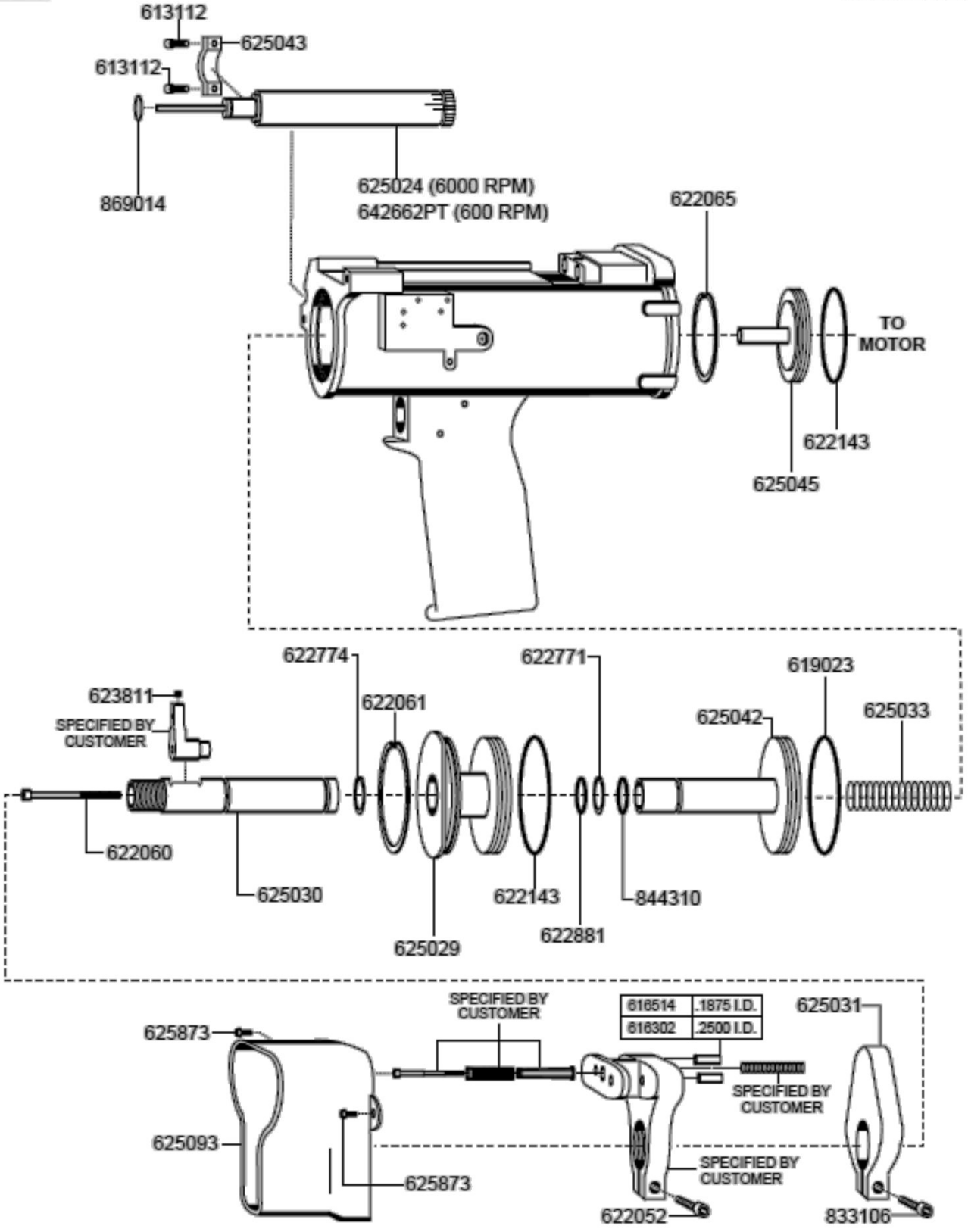
1. To install optional air booster pump, remove the cover plate 621439 by unscrewing three button head screws 622053.



2. Mount optional air booster pump assembly 621482 with three socket head cap screws and O-rings supplied with air booster pump kit. NOTE: The booster pump is recommended for use only in the 600 rpm model tool.

EN

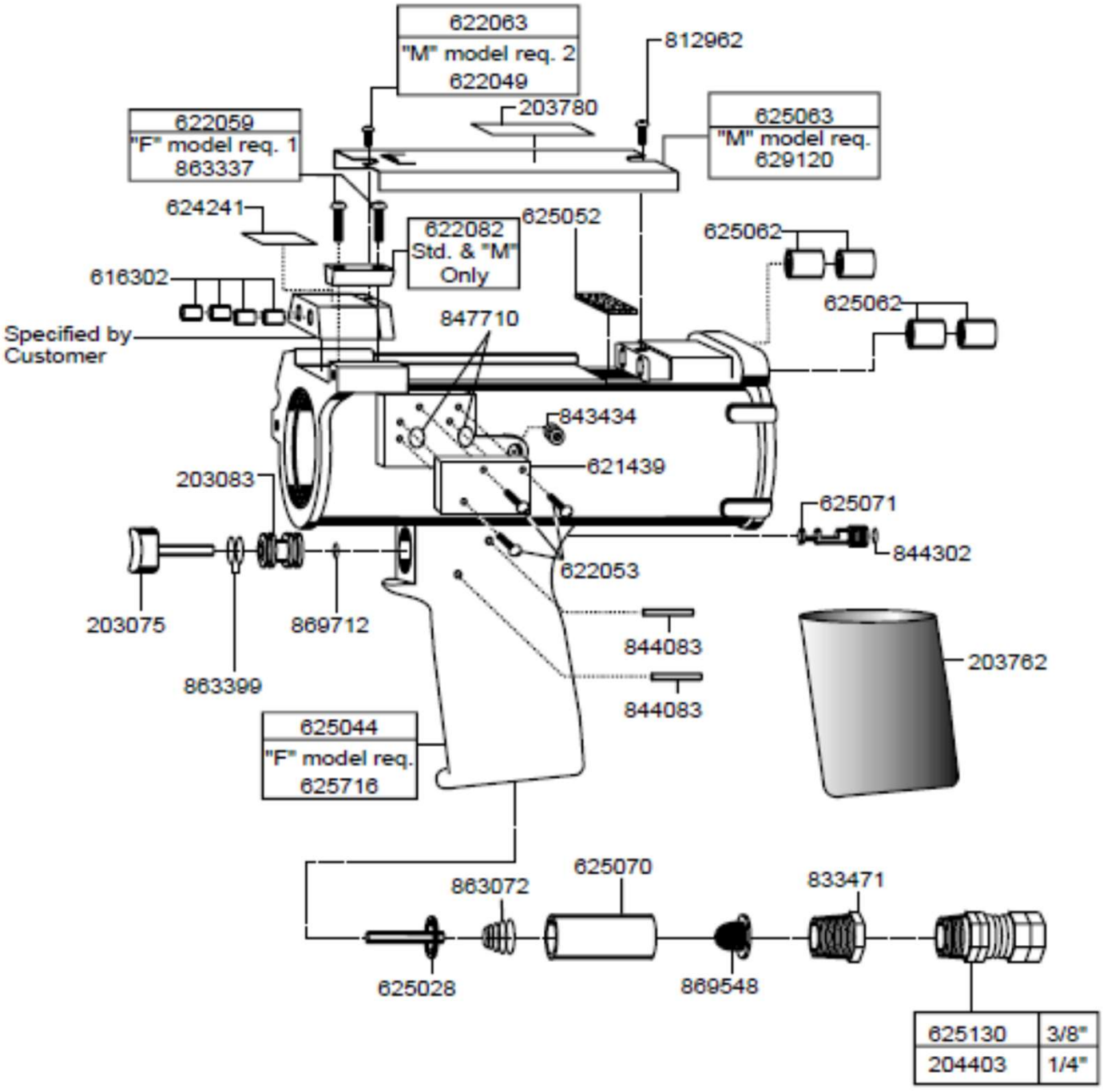
CLAMPING & FEED ASSEMBLY



CLAMPING & FEED ASSEMBLY PARTS LIST

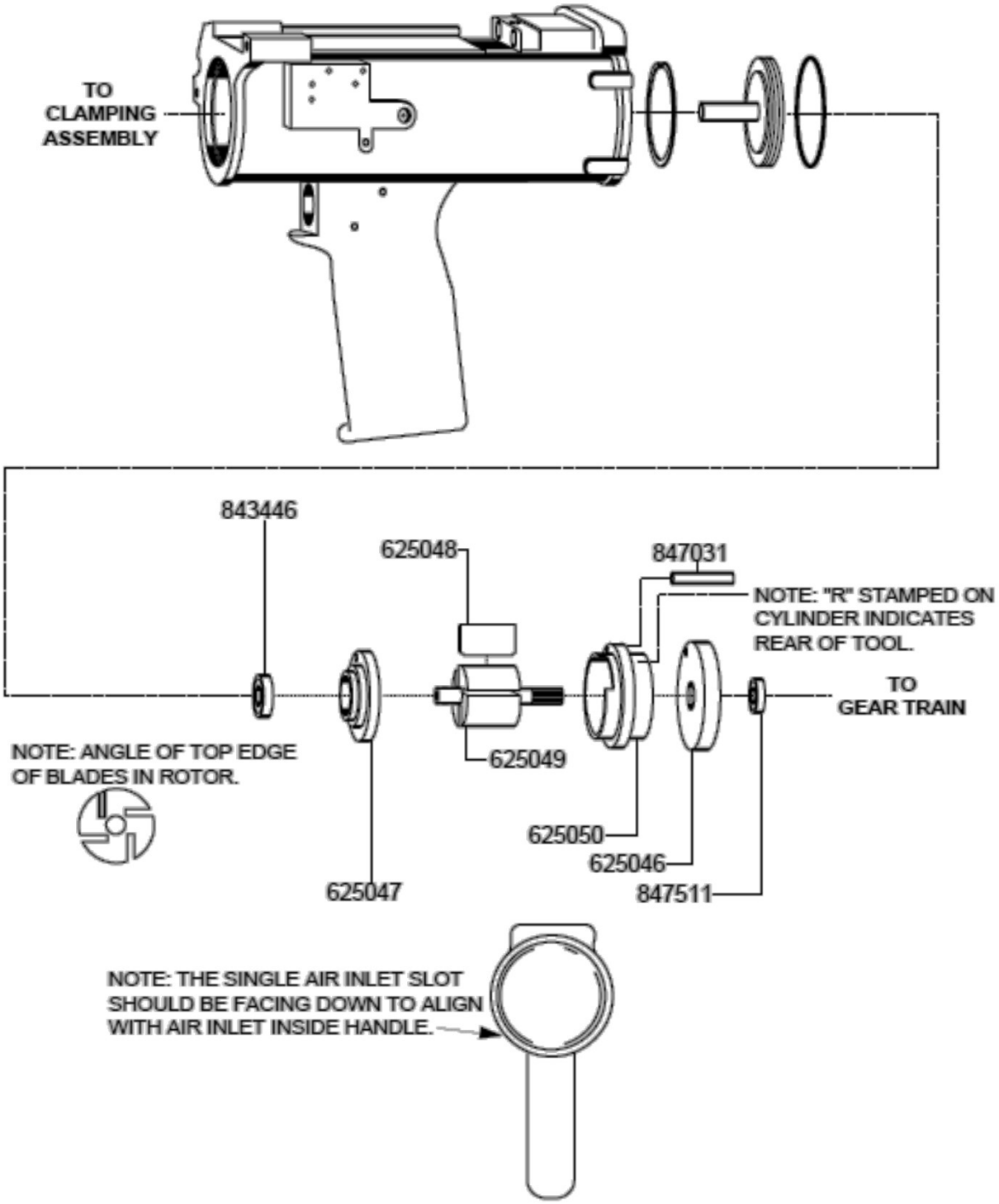
MODEL NO.	DESCRIPTION	QTY
613112	Feed Adjustment Support Screw	2
616302	Pressure Foot Bushing .2500 I.D.	2
616514	Pressure Foot Bushing .1875 I.D.	2
619023	"O"-Ring 1-3/4" x 2"	1
622052	Pressure Foot Screw (Included in Pressure Foot)	1
622060	Lift Finger Screw	1
622061	Front Enclosure Retainer Ring	1
622065	Rear Bearing Plate Support Retainer Ring	1
622143	"O"-Ring 1-13/16" x 2"	2
622771	Clamp Feed Shaft Spiral Ring	2
622881	"O"-Ring 55/64" x 1-9/64"	1
623811	Set Screw (Included in Lift Finger)	1
625024	Feed Control Piston	1
625029	Front Enclosure	1
625030	Clamp Feed Shaft	1
625031	Feed Adjustment Foot	1
625033	Collet Piston Spring	1
625042	Collet Piston	1
625043	Feed Control Piston Support	1
625045	Rear Bearing Plate Support	1
625093	Foot Guard	1
625873	Foot Guard Screw	2
833106	Feed Adjustment Foot Screw	1
844310	"O"-Ring 1/2" x 11/16"	1
869014	Feed Adjustment Spiral Ring	1

HANDLE ASSEMBLY



MODEL NO.	DESCRIPTION	QTY.
203075	Trigger	1
203083	Trigger Casing	1
203762	Grip Sleeve	1
203780	Warning Label	1
204403	Swivel Fitting 1/4"	1
616302	Support Block Bushing	4
621439	Cover Assembly	1
622053	Cover Assembly Screw	3
622059	Support Wedge Screw	2
622063	Spindle Cover Screw (Small)	1
622082	Support Wedge	1
624241	Warning Label	1
625028	Throttle Valve	1
625044	Handle	1
625052	Muffler Pad	1
625062	Spindle Needle Bearing (included in 625044)	4
625063	Spindle Cover	1
625070	Inlet Spacer	1
625071	Metering Valve	1
625130	Swivel Fitting 3/8"	1
625716	"L" Model Handle	1
629120	"M" Model Spindle Cover	1
812962	Spindle Cover Screw (Large)	1
833471	Inlet Bushing	1
843434	Handle Pipe Plug	1
844083	Dowel Pin	2
844302	"O"-Ring 3/16" x 5/16"	1
847710	"O"-Ring 1/2" x 5/8"	2
863072	Throttle Valve Spring	2
863337	Support Wedge Screw ("L" model req. only 1)	2
863399	"O"-Ring 7/16" x 9/16"	2
869548	Inlet Screen	1
869712	"O"-Ring 1/16" x 3/16"	1

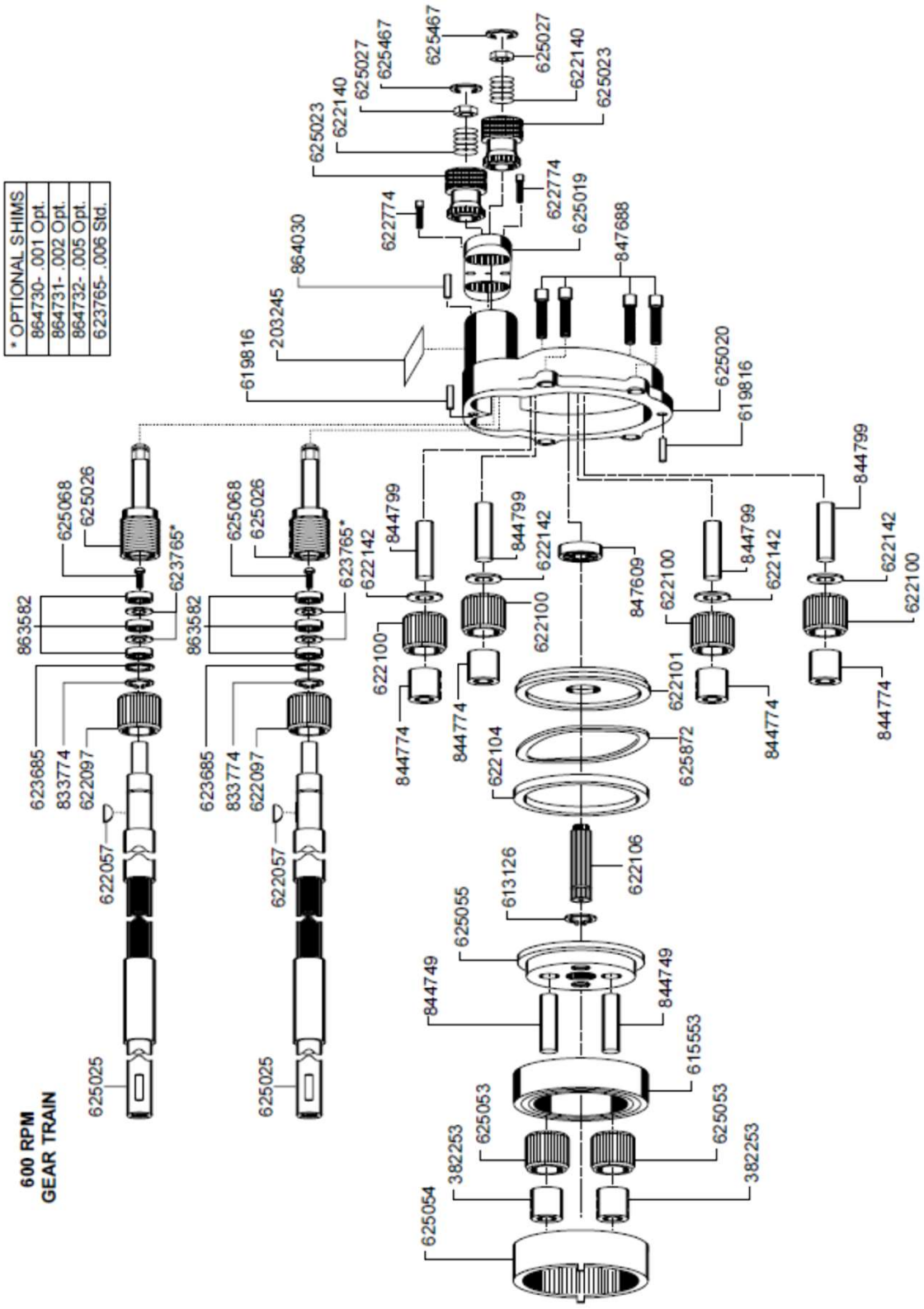
MOTOR ASSEMBLY



MOTOR ASSEMBLY PARTS LIST

MODEL NO.	DESCRIPTION	QTY.
625046	Front Bearing Plate	1
625047	Rear Bearing Plate	1
625048	Rotor Blade	4
625049	Rotor	1
625050	Cylinder (incl. 847031)	1
843446	Rear Rotor Ball Bearing	1
847031	Cylinder Pin	1
847511	Front Rotor Ball Bearing	1

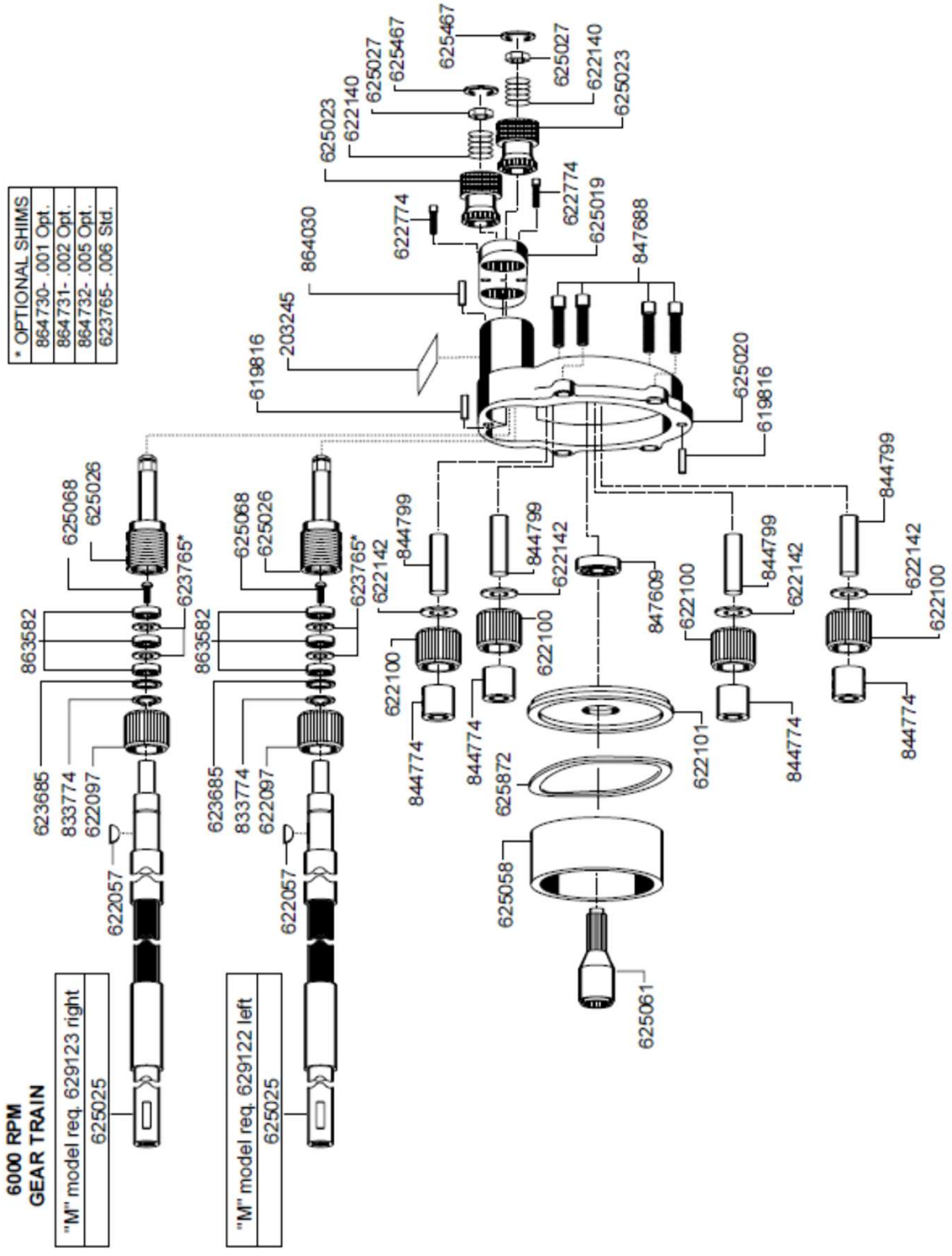
600 RPM GEAR TRAIN



600 RPM GEAR TRAIN PARTS LIST

MODEL NO.	DESCRIPTION	QTY.
203245	Caution Label (included in 625020)	1
382253	Planet Wheel Bearing	2
613126	Gear Pinion Spur Retainer Ring	1
615553	Carrier Bearing	1
619816	Backhead Dowel Pin (included in 625020)	2
622057	Spindle Key	2
622097	Spindle Gear	2
622100	Idler Gear	4
622101	Gear Plate	1
622104	Planet Carrier Spacer	1
622106	Gear Pinion Spur	1
622140	Adjustment Knob Spring	2
622142	Idler Gear Spacer	4
622774	Hex Head Cap Screw	2
623685	Spindle Bearing Retainer Ring	2
623765	Spindle Bearing Spacer .006" (Standard)	Variable
625019	Spindle Adjustment Plate	1
625020	Backhead (includes 619816, 864030, 847609)	1
625023	Spindle Adjustment Knob	2
625025	Spindle	2
625026	Spindle Adjustment Screw	2
625027	Spindle Adjustment Nut	2
625053	Planet Wheel	2
625054	Internal Gear	1
625055	Planet Carrier	1
625068	Spindle Bearing Retainer Screw	2
625467	Spindle Adjustment Knob Retainer Ring	2
625872	Wavy Washer	3
833774	Spindle Gear Retainer Ring	2
844749	1st Reduction Idler Gear Pin	2
844774	Idler Gear Bearing	4
844799	Idler Gear Pin (4 included in 625020)	4
847609	Backhead Bearing (inclued in 625020)	1
847688	Backhead Bolt	4
863582	Spindle Bearing	6
864030	Dowel Pin	1
864730	Spindle Bearing Spacer .001" (Opt.)	Variable
864731	Spindle Bearing Spacer .002" (Opt.)	Variable
864732	Spindle Bearing Spacer .005" (Opt.)	Variable

6000 RPM GEAR TRAIN



6000 RPM GEAR TRAIN PARTS LIST

MODEL NO.	NAME OF PART	QTY.
203245	Caution Label (included in 625020)	1
619816	Backhead Dowel Pin (included in 625020)	2
622057*	Spindle Key	2
622097*	Spindle Gear	2
622100	Idler Gear	4
622101	Gear Plate	1
622140	Adjustment Knob Spring	2
622142	Idler Gear Spacer	4
622774	Hex Head Cap Screw	2
623685*	Spindle Bearing Retainer Ring	2
623765	Spindle Bearing Spacer .006" (Standard)	Variable
625019	Spindle Adjustment Plate	1
625020	Backhead (includes 619816, 864030, 847609)	1
625023	Spindle Adjustment Knob	2
625027	Spindle Adjustment Nut	2
625025	Spindle	2
625026*	Spindle Adjustment Screw	2
625058	Gear Plate Spacer	1
625061	Pinion Gear	1
625068*	Spindle Bearing Retainer Screw	2
625467	Spindle Adjustment Knob Retainer Ring	2
625872	Wavy Washer ("F" model requires only 1)	3
629122*	Spindle Left ("M" model only)	1
629123*	Spindle Right ("M" model only)	1
833774*	Spindle Gear Retainer Ring	2
844774	Idler Gear Bearing	4
844799	Idler Gear Pin (4 included in 625020)	4
847609	Backhead Bearing (inclued in 625020)	1
847688	Backhead Bolt	4
863582*	Spindle Bearing	6
864030	Dowel Pin	1
864730	Spindle Bearing Spacer .001" (Opt.)	Variable
864731*	Spindle Bearing Spacer .002" (Opt.)	Variable
864732	Spindle Bearing Spacer .005" (Opt.)	Variable

"M" model spindle subassemblies may be purchased using part numbers: Left spindle - 631863, Right spindle - 631865

* Parts included in subassemblies.

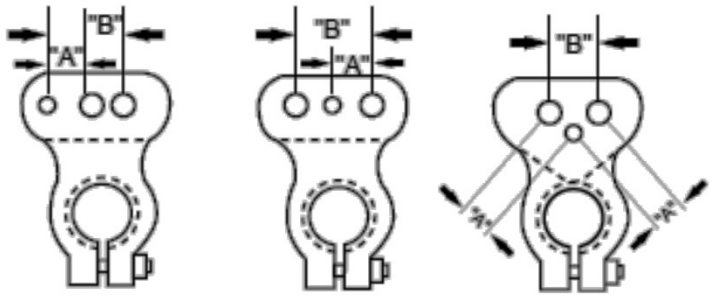
Cleco Production Tools

NUT PLATE DRILL REQUIRED ORDERING INFORMATION

10 Q NPD - RPM - X XXX/XXXX - XXXX X - X

- 10 — Motor Series
- Q — Quackenbush
- NPD — Nut Plate Drill
- RPM — 600 / 6000
- X — Pressure Foot Style: 1= Single Wing, 2= Double Wing, 3= Mickey Mouse
- XXX — "A" Collet to first Rivet hole spacing
- XXXX — "B" Spindle to spindle spacing in inches .312 min. to 1.125 max.* (in .001 increments) See foot selection guide
- X — Collet diameter
- X — Collet length - (See below): 1= 23 length, 2= 40 length, 3= 63 length, 4= 90 length
- X — Drill series (See chart below)

* Note: For a spacing greater than 1.000", Fixed spacing will be provided.

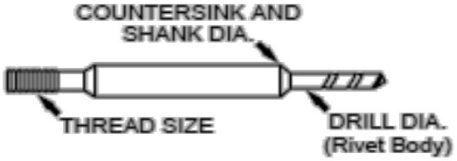


SINGLE WING FOOT DOUBLE WING FOOT MICKEY MOUSE FOOT

		SINGLE WING	DOUBLE WING	MICKEY MOUSE
A	Min.	.344 in.	—	.212 in.
	Max.	.500 in.	—	.538 in.
B	Min.	.312 in.	.343 in.	.300 in.
	Max.	1.000 in.	1.125 in. *	1.000 in.

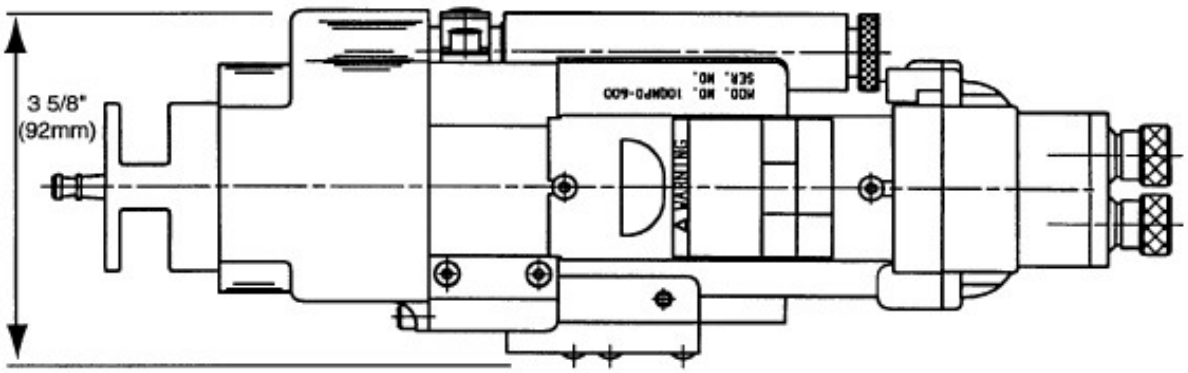
DRILL SERIES CHART				
DRILL SERIES	CUTTER NUMBER	SHANK & C-SINK DIA.	DRILL DIA.	THD. SIZE
1	QD51	.1250	.067	#3-56
2	QDS51	.187	.067	#8-32
3	QD40	.187	.098	#8-32
4	QDS40	.250	.098	#8-32
5	QD30	.250	.1285	#8-32

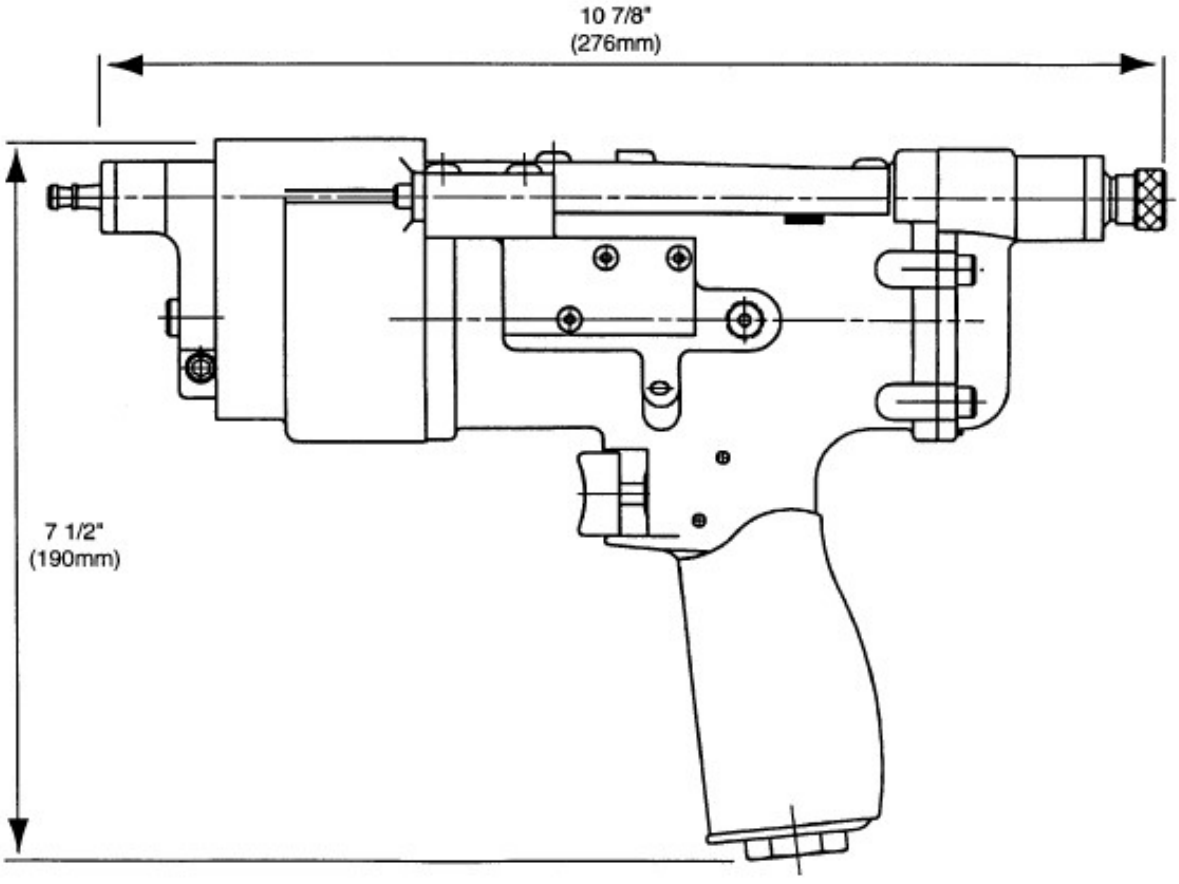
COLLET GRIP RANGE (Thickness of drilled material)		
COLLET LENGTH CODE	MINIMUM	MAXIMUM
1= -23 length	.02	.27
2= -40 length	.27	.52
3= -63 length	.52	.77
4= -90 length	.77	1.02



DRILL BITS NOT FURNISHED

Stroke and Size Information
Feed Stroke: .60" (15mm); Clamp Stroke: 7/16" (11mm)





POWER TOOLS SALES & SERVICE CENTERS

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Contact the nearest Cleco® Sales & Service Center for the appropriate facility to handle your service requirements.

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Service Center

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Fax: +1 (248) 391-6295

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Apex Tool Group
670 Industrial Drive
Lexington, SC 29072
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Phone: +1 (919) 387-0099
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Viaidad El Pueblito #103
Parque Industrial Querétaro
Querétaro, QRO 76220
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