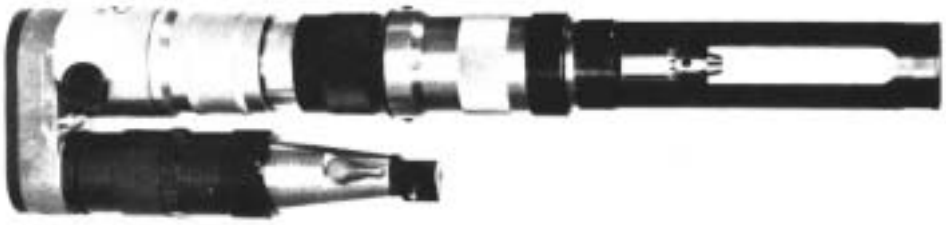
COOPER Tools

Operation & Service Manual

823164 **1/02**

Quackenbush®

158QGDB- S400 & S600
POSITIVE FEED DRILLS



Houston Operation
7007 Pinemont
Houston, TX 77040

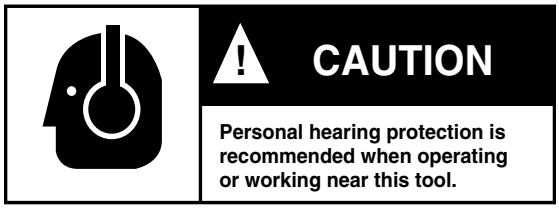
Recoules Operation
Zone industrielle - B.P. 28
Avenue Maurice Chevalier
77831 Ozoir-la-Ferriere Cedex France

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 and face protection, refer to Federal OSHA Regulations, 29 Code of Federal Regulations, Section 1910.133., Eye and Face Protection, and American National Standards Institute, ANSI Z87.1, Occupational and Educational Eye and Face Protection. Z87.1 is available from the American National Standards Institute, Inc. 11 West 42nd Street, New York, NY 10036.



Hearing protectors are required in high noise areas, 85 dBA or greater. The operation of other tools and equipment in the area, reflective surfaces, process noises and resonant structures can substantially contribute to, and increase the noise level in the area. For additional information on hearing protection, refer to Federal OSHA Regulations, 29 Code of Federal Regulations, Section 1910.95, Occupational Noise Exposure, and American National Standards Institute, ANSI S12.6, Hearing Protectors.

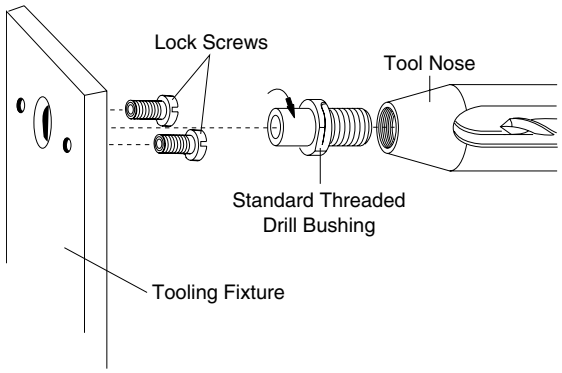
Follow good machine shop practices. Rotating shafts and moving components entangle and entrap, and may result in serious injuries. Never wear long hair, loose-fitting clothes, gloves, ties, or jewelry when working with or near a drill of any type.

Quackenbush drills are designed to operate on 90psig (6.2 bar) maximum air pressure using the proper 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.

CAUTION

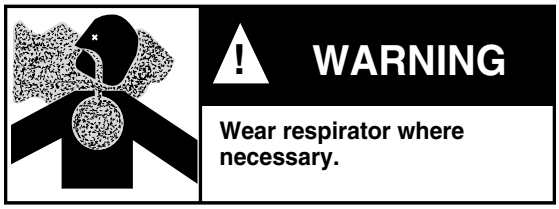
- Before the tool is connected to the air supply, the throttle should be checked for proper operation (i.e., throttle valve moves freely and returns to closed position).
- Before removing a tool from service or changing drill bits, make sure the air line is shut off and drained of air. This will prevent 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.

CAUTION Before mounting any positive feed drill, check the lock screws in the tooling fixture and drill bushing. Make sure both are in good condition and securely tightened.



Positive feed drills can exert high torques and high thrust loads. If failure of the lock screws or drill bushing occurs, the drill may suddenly spin and back away from the drill fixture.

Always remove chuck key or drill drift before operating 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.

CAUTION 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.

Safety Recommendations

Quackenbush drills are often 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.

Nose pieces usually used with these drills are generally slotted for visibility and access to chuck and cutter.

Keep fingers and hands away from slots in the tool nose at all times. Rapid spindle retraction occurs automatically on most models after drilling cycle and can be activated manually even with the air supply disconnected on some models.

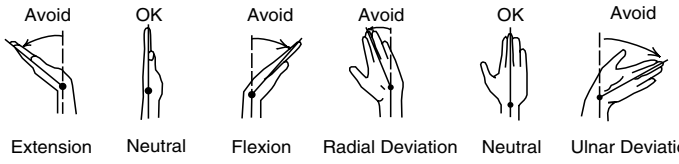
CAUTION Due to the multitude and variety of tooling applications, the User's Methods Engineering, Standard Tooling Engineering, and/or Safety Engineering Departments, etc., must consider any hazards that may be associated with each specific application of this product and provide adequate operator protection from inadvertent contact with any moving components.

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 may 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.

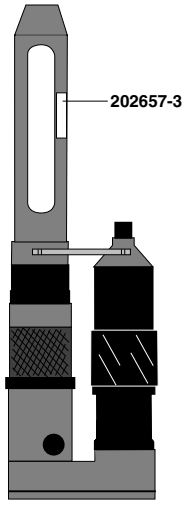
Any tool operator should be aware of the following warning signs and symptoms so that a problem can be addressed before it becomes a debilitating injury. Any user suffering from prolonged symptoms of tingling, numbness, blanching of fingers, clumsiness or weakened grip, inability to hold objects, nocturnal 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 occurances. These steps might include but are not limited to, repositioning the workpiece 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.



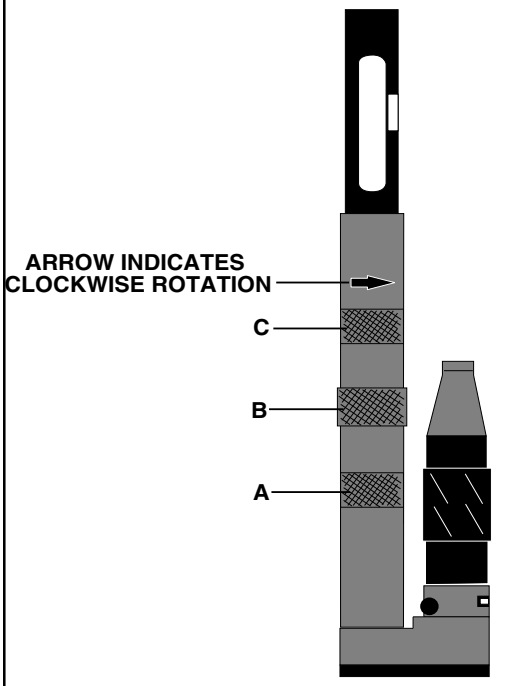
Safety Labels

The safety labels found on these tools 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. Safety labels should always be placed on any tool nose before installing on tool. Replacement labels can be ordered using number below.

READ SAFETY RECOMMENDATIONS BEFORE OPERATING OR SERVICING TOOL.

OPERATING INSTRUCTIONS

OPERATING INSTRUCTIONS



Three rotatable collars A, B and C control the adjustment and operation of the drill.

Collar A (Rear Stroke Adjustment) adjusts the retracted position of the spindle.

Collar B manually starts forward motion of the spindle, and manually retracts the spindle.

Collar C (Forward Stroke Adjustment) limits forward motion of spindle, and automatically retracts the spindle.

ADJUSTMENT AND OPERATION

Lock unit into drill fixture. Turn collar B clockwise, disengaging positive feed mechanism

Rotate collar A counterclockwise, advancing drill tip close to the work.

Start motor, and rotate collar B counterclockwise maintaining steady pressure on collar until feed mechanism is engaged, starting drilling operation. The operation can be stopped at any time by rotating collar B clockwise, disengaging positive feed mechanism and retracting spindle.

To adjust unit for depth control rotate collar C. (Clockwise rotation increases length of stroke.) On retraction of spindle rotate collar B clockwise allowing it to move back longitudinally resetting feed mechanism.

LUBRICATION

An automatic in-line filter-lubricator is highly recommended to increase tool life as well as keeping the tool in sustained operation The tool should be greased after every 40 hours of operation with a good No. 2 grade Moly grease using a low pressure grease gun.

SERVICE INSTRUCTIONS

DRILL HEAD DISASSEMBLY

To disassemble the tool, loosen the No. 619421 lock nut and remove the motor unit. Remove the nose (Left Hand Threads), then remove the drill chuck and adapter, No. 619400. Remove the No. 619398 snap ring to allow the No. 619389 spring cover and spring, No. 619394, to be slipped off. Loosen the two screws, No. 617385, and remove the forward stop collar. Remove the No. 619384 screw and rotate the No. 619420 feed collar past the cam section and pull it off toward the front. Remove the No. 619465 set screws and with a face spanner wrench loosen, but do not remove No. 619614 bearing retainer (Left Hand Threads). Use an appropriate wrench on the flats on the forward end of the shaft housing and unscrew it from the No. 619363 gear body (Left Hand Threads). The No. 619614 bearing retainer can now be unscrewed the rest of the way for removal of the spindle spring. The extension spindle with associated parts can now be removed. Remove the No. 619390 stop collar snap ring and remove the return stop collar. Remove the gear cover screws and remove the No. 612795 gear cover. This will allow removal of the spindle gear, gear spacer, No. 619403, and idler gear. The drive shaft with mating parts can now be removed through the rear of the tool. Remove the three No. 865405 bolts and pull back the No. 619742 gear housing from the No. 619363 gear body. Remove the No. 843179 snap ring from the lead screwdriver through the rear of the gear body and press the lead screwdriver from the No. 864471 ball bearing. Remove snap ring No. 812233 and remove the ball bearing from the gear body. Remove the No. 812233 snap ring from the front of the lead screw and pull the extension spindle and ball bearing from the lead screw. Remove the No. 843179 snap ring to remove the ball bearing from the extension spindle. To remove the worm wheel and cross shaft, No. 619378, remove the snap rings, No. 619376, No. 619016, and plugs, No. 619404, No. 619118, from each end of the gear body and press the cross shaft out through the side with the larger opening. Remove the No. 619016 snap ring and press the No. 619382 pinion and shaft out of the gear housing. The various assemblies can be broken down into their individual components for inspection and replacement of parts if necessary.

POWER UNIT DISASSEMBLY

To disassemble the motor unit, clamp it in a vertical position in a soft-jawed vise on the flats on the No. 613275 motor housing and unscrew the internal gear, No. 613285, from the housing. The planet cage, No. 613284, with attached components can be removed through the rear of the internal gear. Using a suitable bearing puller, the rear planet bearing, No. 613281, can be removed. Clamp the planet cage in a vise and unscrew the motor gear (Left Hand Threads), and

remove the front planet bearing, No. 864471, and No. 613278 planet cage washer. This will allow the planet pins, No. 613279, and planet wheels, No. 613280, to be removed for inspection. To remove the motor unit, invert the tool and loosen the No. 613283 handle nut and remove the No. 611233 handle assembly. The complete motor can now be gently slipped out through the rear of the motor housing. Clamp the exposed end of the rotor shaft lightly in a soft-jawed vise and unscrew the governor (Left Hand Threads).

NOTE: The govenor should not be disassembled as it may be ordered as a sub-assembly only. The rear bearing plate, No. 613241, cylinder, No. 613225, rotor, No. 613234, and rotor blades can now be removed. Remove the No. 843618 rotor bearing snap ring and remove the No. 613274 rotor shaft. When removing the No. 613294 rotor bearing retainer from the front bearing plate, it has LEFT HAND THREADS.

To disassemble the handle, remove the No. 812231 snap ring and gently push the throttle valve out of the bushing. Unscrew the swivel nut for cleaning and inspection of the screen.

REASSEMBLY

The power unit is reassembled in the reverse order of disassembly. Degrease all parts and inspect for wear or damage before reassembly. During reassembly all parts should receive a generous coating of No. 2 Moly grease. If rotor blades are worn as much as 1/16" below the rotor surface, they should be replaced. NOTE: The beveled edge of the blade is trailing edge. The rotor, No. 613234, and the cylinder, No. 613225, should have the "L" to the rear to insure correct rotation. As the internal gear and components are assembled, the tang end of the planet pins must be toward the front of the planet cage so that the planet cage washer will lock them in place.

Assembly steps below should be followed when reassembling the drill head. All working parts should receive a thin coat of Lubriko T-517 grease during reassembly. The cavities in and around the lead screwdriver should be packed with grease to aid in cushioning the spindle return cycle.

Install bearing, No. 619072, helical gear, No. 619425, and pin, No. 845409, on the pinion and shaft, No. 619382. Install in the gear body, No. 619363, with a suitable press tool. Press the bearing, No. 619072, in the housing by pressing against helical gear, No. 619425 Install bearing, No. 844833, and retainer, No. 619016. Install bearing, No. 86447 1, and retainer, No. 81 2233, per drawing.

Put needle bearing, No. 619432, keys, No. 842240, spur gear, No. 619429, and spacer, No 619399, on the lead screwdriver. Install in bearing in gear body Install retainer, No. 843179.

Install gear housing, No. 619742, on gear body with cross shaft at right angle to gear housing.

Install bearing, No. 844966, retainer ring, No. 812232, and worm desired on drive shaft. Install in gear housing. Install back gears and cover per drawing.

Install worm wheel desired for desired feed on cross shaft, No. 619378, two (2) steel balls, No. 842274, two (2) pins, No. 619816, thrust washer, No. 619379, pin, No. 845409, gear, No. 619425, spacer, No. 619380, clutch spring, No. 619395 (as shown in drawing), and bearing, No. 619377. Install in gear body. Put in plug, No. 619404, retainer ring, No. 619376, bearing, No. 844833, plug, No. 619118, and retainer ring, No 619016.

Rotate drive shaft by hand to check for smooth operation of gears.

Install half nut spring, No. 619413, and pin, No. 619154, in shaft housing. Put "O"-ring, No. 833949, bumper ring, No. 619622, stops, No. 619418 (stops assembled to contact lead screw simultaneously), collar and retainer ring, No. 619390, on shaft housing.

Install bearing, No. 864471, retainer ring, No. 843179, on the extension spindle. Install lead screw desired and retaining ring, No. 812233. Install keys, No. 619401, in lead screwdriver.

Install extension spindle assembly in shaft housing and assemble to gear body sub-assembly. Tighten housing hand tight.

Install spindle spring in the shaft housing. Press needle bearing, No. 619641, and seal, No. 619642, in bearing retainer, No. 619614. Install in the shaft housing, hand tight. Torque housing to 260 ft. lbs. in gear body. Torque bearing retainer to 250 ft. lbs. Put in set screws, No. 619465, and torque to 60 inch-lbs.

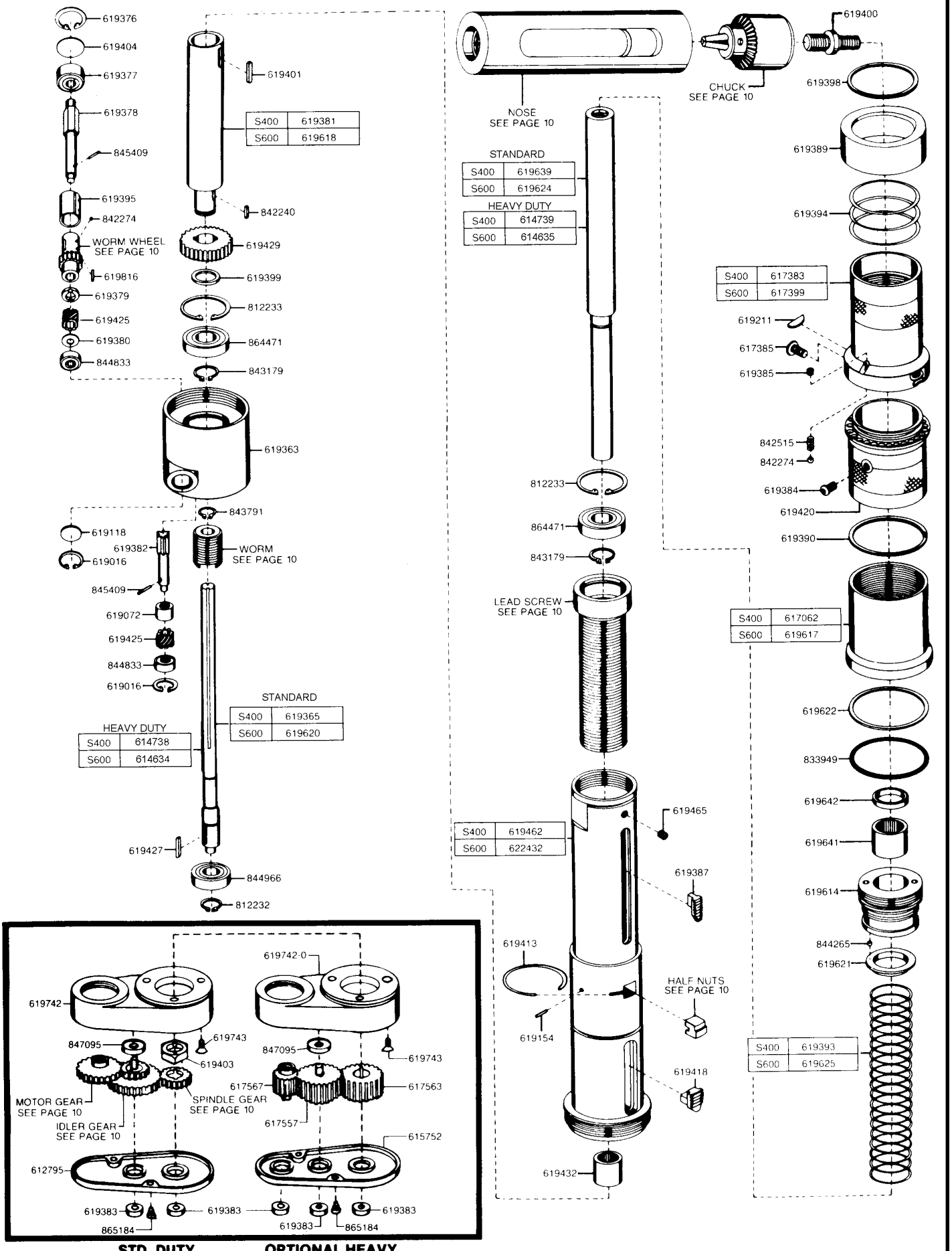
Install half nuts in shaft housing per drawing. Compress half nuts and install cam collar, No. 619420. Install screw, No. 619384, in cam collar.

Install screw, No. 619385, spring, No. 842515, and ball, No. 842274, in forward stop collar. Put stop, No. 619387, in the shaft housing and install collar with stop as shown in drawing. Install keys, No. 619211, and screws, No. 617385.

Install spring, No. 619394, spring cover, No. 619389, and retainer, No. 619398.

Install the correct motor gear on power unit, and install power unit in gear housing. No. 619742.

After the tool is assembled, place a few drops of 10W oil In the air inlet before attaching the air hose. This will insure immediate lubrication of all motor parts as soon as the air is applied.


619376
619404
619377
619378
845409
619395
842274
WORM WHEEL SEE PAGE 10
619816
619379
619425
619380
844833
619401
S400 619381
S600 619618
842240
619429
619399
812233
864471
843179
619363
843791
619118
619382
619016
WORM SEE PAGE 10
845409
619072
619425
844833
619016
STANDARD
S400 619365
S600 619620
HEAVY DUTY
S400 614738
S600 614634
619427
844966
812232
NOSE SEE PAGE 10
CHUCK SEE PAGE 10
619400
619398
619389
619394
S400 617383
S600 617399
619211
617385
619385
842515
842274
619384
619420
619390
S400 617062
S600 619617
619622
833949
619642
619641
619614
844265
619621
S400 619393
S600 619625
STANDARD
S400 619639
S600 619624
HEAVY DUTY
S400 614739
S600 614635
812233
864471
843179
LEAD SCREW SEE PAGE 10
S400 619462
S600 622432
619465
619387
619413
619154
HALF NUTS SEE PAGE 10
619418
619432
619742
619742-0
847095
619743
619403
847095
619743
617567
617563
617557
MOTOR GEAR SEE PAGE 10
IDLER GEAR SEE PAGE 10
SPINDLE GEAR SEE PAGE 10
615752
612795
619383
619383
865184
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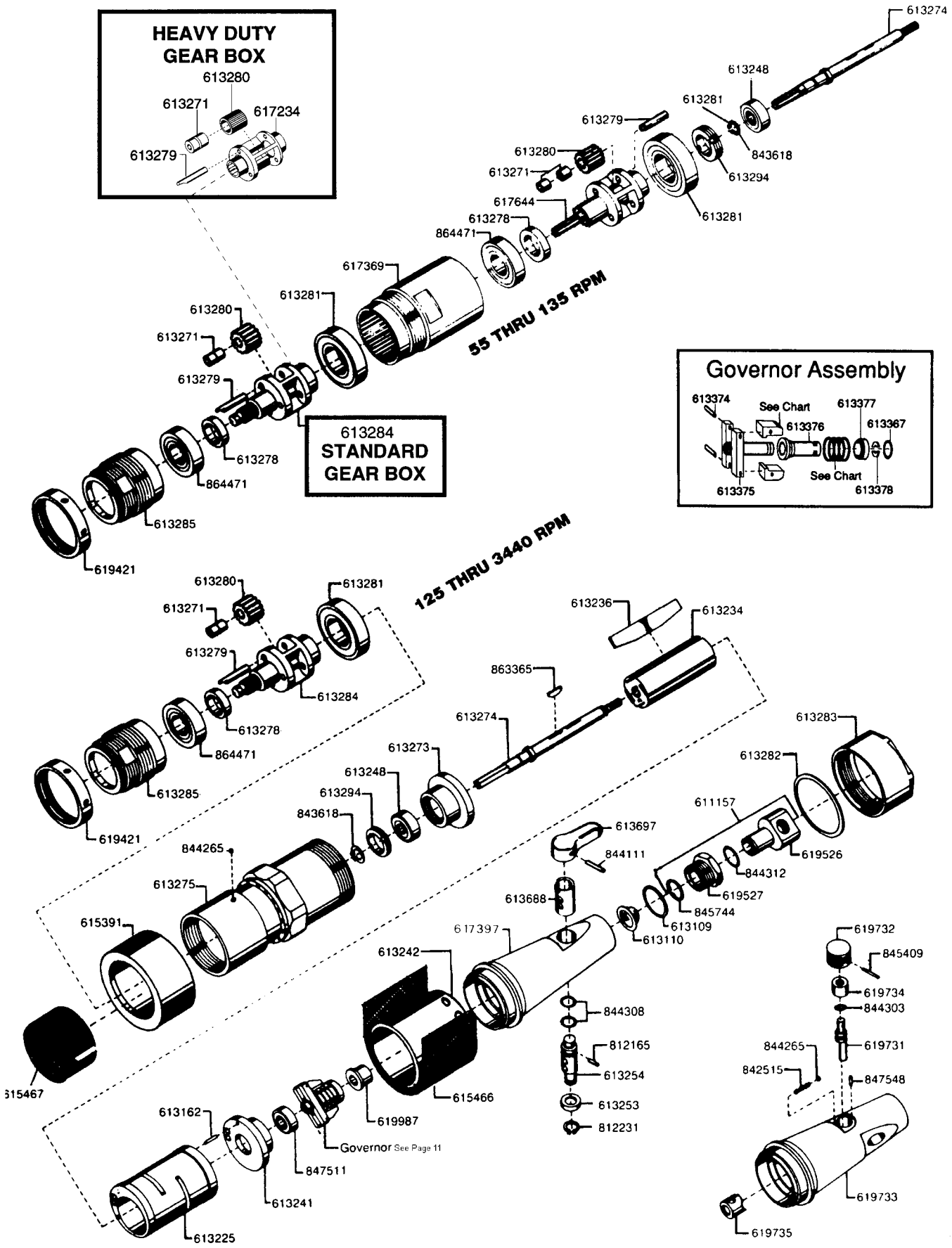
865184
STD. DUTY GEAR BOX
OPTIONAL HEAVY DUTY GEAR BOX

DRILL HEAD - PARTS LIST

Part No.	Name of Part	Qty. S400	Qty. S600
612795	Gear Cover	1	-
614634	S600 Drive Shaft (Heavy Duty)	-	1
614635	S600 Drive Shaft (Heavy Duty)	-	1
614738	S400 Drive Shaft (Heavy Duty)	1	-
614739	S400 Extension Spindle (Heavy Duty)	1	-
617062	Return Stop Collar	1	-
617383	Forward Stop Collar	1	-
617385	Key Retainer Screw	2	2
617399	Forward Stop Collar	-	1
619016	Retainer Ring	2	2
619072	Pinion Shaft Needle Bearing	1	1
619118	Plug (Small)	1	1
619154	Spring Retainer Pin	1	1
619211	Collar Retainer Key	2	2
619363	Gear Body	1	1
619365	S400 Drive Shaft (Standard)	1	-
619376	Plug Retainer Ring (Large)	1	1
619377	Cross Shaft Bearing	1	1
619378	Cross Shaft	1	1
619379	Thrust Washer	1	1
619380	Spacer	1	1
619381	Lead Screw Driver	1	-
619382	Pinion & Shaft	1	1
619383	Needle Bearing	2	2
619384	Collar Screw	1	1
619385	Spring Retainer Screw	1	1
619387	Forward Stop	1	1
619389	Spring Cover	1	1
619390	Stop Collar Retainer Ring	1	1
619393	Spindle Spring	1	-
619394	Spring	1	1
619395	Clutch Spring	1	1
619398	Spring Cover Retainer Ring	1	1
619399	Spacer	1	1
619400	Spindle Adaptor	1	1
619401	Driver Key	2	2
619403	Gear Spacer	1	1
619404	Plug (Large)	1	1
619413	Half-Nut Spring	1	1
619418	Return Stops (Matched Pair)	1	1
619420	Feed Collar	1	1
619425	Helical Gear	2	2
619427	Spindle Gear Key	2	2
619429	Lead Screw Driver Gear	1	1
619432	Driver Needle Bearing	1	1
619462	Shaft Housing	1	-
619465	Set Screw	2	2
619614	Bearing Retainer	1	1
619617	Return Stop Collar	-	1
619618	Lead Screw Driver	-	1
619620	S600 Drive Shaft (Standard)	-	1
619621	Spindle Spring Thrust Washer	1	1
619622	Bumper Ring	1	1
619624	S600 Extension Spindle (Standard)	-	1
619625	Spindle Spring	1	1
619639	S400 Extension Spindle (Standard)	1	-
619641	Spindle Needle Bearing	1	1
619642	Grease Seal	1	1
619742	Gear Housing	1	1
619743	Gear Housing Screw	3	3
619816	Worm Roller	2	2
622432	Shaft Housing	-	1
812232	Bearing Retainer Ring	1	1
812233	Bearing Retainer Ring	2	2
833949	"O"- Ring 2-3/8" x 2-3/4"	1	1
842240	Driver Gear Key	2	2
842274	Steel Ball	3	3
842515	Spring	1	1
843179	Bearing Retainer Ring	2	2
843791	Worm Retainer Ring	1	1
844265	Steel Ball	3	3
844833	Ball Bearing	2	2
844966	Drive Shaft Bearing	1	1
845409	Helical Gear Pin	2	2
847095	Idler Gear Bearing	1	1
864471	Ball Bearing	2	2
865184	Gear Cover Screw	2	2

Optional Heavy Duty Gear Box

Part No.	Name of Part	Qty. S400	Qty. S600
615752	Gear Cover	1	1
617557	Idler Gear	1	1
617563	Spindle Gear	1	1
617567	Motor Gear	1	1
619383	Needle Bearing	3	3
619427	Key (Existing in std. gear box)	2	2
812232	Retainer Ring (Existing in std. gear box)	1	1
847095	Ball Bearing (Existing in std. gear box)	1	1


HEAVY DUTY
GEAR BOX
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843618
613294
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613280
613271
617644
613278
864471
617369
613281
613280
613271
613279
55 THRU 135 RPM
613284
STANDARD
GEAR BOX
613278
864471
613285
619421
Governor Assembly
613374
See Chart
613377
613376
613367
See Chart
613375
613378
125 THRU 3440 RPM
613280
613271
613281
613279
613284
613278
864471
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613697
844111
613688
617397
613242
844308
812165
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613253
812231
615466
619987
Governor See Page 11
847511
613241
613225
613162
315467
619732
845409
619734
844303
619731
844265
842515
847548
619733
619735

PART LIST - POWER UNITS

Part No.	Name of Part	Qty.	Part No.	Name of Part	Qty.
611157	Swivel Assembly	1	617234	Planet Cage	1
613109	Gasket	1	617369	Planet Housing	1
613110	Screen	1	617397	Backhead (Incl. 613688. 619987)	1
613162	Cylinder Pin	1	617644	Planet Cage	1
613225	Cylinder	1	619421	Lock Nut	1
613234	Rotor	1	619526	Swivel Body	1
613236	Rotor Blade	4	619527	Swivel Bushing	1
613241	Rear Bearing Plate	1	619731	Governor Jet Cam	1
613242	Sleeve	1	619732	Knob	1
613248	Front Rotor Bearing	1	619733	Handle (Incl. 613688, 842515,	
613253	Throttle Valve Washer	1		844265, 847548)	1
613254	Throttle Valve (Incl. 812165)	1	619734	Cam Bushing	1
613271	Planet Wheel Bearing	6*	619735	Governor Jet	1
613273	Front Bearing Plate	1	619987	Governor Jet	1
613274	Rotor Shaft	1	812165	Stop Pin	1
613275	Motor Housing	1	812231	Retainer Ring	1
613278	Planet Cage Washer	1*	842515	Spring	1
613279	Planet Wheel Pin	3*	843618	Retainer Ring	1
613280	Planet Wheel	3*	844111	Trigger Pin	1
613281	Rear Planet Gage Bearing	1*	844265	Steel Ball (1/8")	2
613282	Clamp Ring	1	844303	"O"-Ring 3/16" x 5/16"	1
613283	Handle Nut	1	844308	"O"-Ring -3/8" x 9/16"	2
613284	Planet Gage	1	844312	"O"-Ring 5/8" x 13/16"	1
613285	Planet Housing	1	845409	Knob Pin	1
613294	Bearing Retainer Nut	1	845744	Swivel Retainer Ring	1
613688	Throttle Valve Bushing	1	847511	Rear Rotor Bearing	1
613697	Trigger	1	847548	Knob Stop Pin	1
615391	Exhaust Deflector	1	863365	Rotor Shaft Key	1
615466	Wire Screen (Inner)	1	864471	Planet Cage Bearing	1
615467	Wire Screen (Outer)				

* 55 thru 135 RPM models require twice the quantity shown.

The complete backhead can be purchased as a subassembly using the following part numbers:

Standard - Part No. 611259

Variable Speed - Part No. 611476

SPINDLE SPEEDS

R.P.M.	GOVERNOR	MOTOR GEAR	IDLER GEAR (inc's gear pin)	SPINDLE gear	POWER UNITS
3440 2870 2100 1740 1460	611236 611237 611238 611239 611240	619604 POWER UNIT 30T	619603 25T 40T	619436 SPACER 619403-0 25T	611692 611693 611694 611695 611696
1100 900 660 540 450	611236 611237 611238 611239 611240	619434 POWER UNIT 15T	619439 40T 20T	619436 25T SPACER 619403-0	611692 611693 611694 611695 611696
640 535 400 320 265	611236 611237 611238 611239 611240	619434 POWER UNIT 15T	619961 40T 32T	619960 SPACER 619403-0 33T	611692 611693 611694 611695 611696
310 250 185 150 125	611236 611237 611238 611239 611240	619434 POWER UNIT 15T	619439 40T 20T	619438 SPACER 619403-0 45T	611692 611693 611694 611695 611696
135 110 95 80 55	611236 611237 611238 611239 611240	617567 POWER UNIT 12T	617557 32T	617563 20T	621464 621463 621462 621461 621460

SPINDLE FEEDS

FEED	WORM	WORM WHEEL	S400 LEAD SCREW	S600 LEAD SCREW	HALF NUTS	CROSS SHAFT SUB-ASSY.
.0005	619626	619627	619515	619638	619516	611163
.001	619626	619627	619409	619615	619408	611163
.002	619367	619368	619409	619615	619408	611148
.003	619371	619372	619515	619638	619516	611150
.004	619369	619370	619409	619615	619408	611149
.006	619371	619372	619409	619615	619408	611150
.008	619373	619374	619409	619615	619408	611151
.012	619371	619372	619496	619647	619495	611150
.016	619373	619374	619496	619647	619495	611151

NOSES

S400	THREAD	S600
621236	1"—14 L.H.	621244
621237	1-1/4"—12 L.H.	621245
621238	1-1/2"—12 L.H.	621246
614751	2"—16 L.H.	614757

CHUCK & MORSE TAPER ADAPTORS

PART NO.	NAME OF PART
619406	No. 3 Morse Taper
619405	No. 2 Morse Taper
619533	No. 1 Morse Taper
849121	Chuck Key
849415	1/2" Cap. Chuck

POWER UNIT & GOVERNOR CHARTS

1460 thru 3440 RPM

POWER UNIT CODE NO.	GOVERNOR	GOVERNOR SPRING	GOVERNOR WEIGHT	SPINDLE RPM
611692	611236	613370	613373	3440
611693	611237	613371	613373	2870
611694	611238	613370	613372	2100
611695	611239	613369	613372	1740
611696	611240	613368	613372	1460

450 thru 1100 RPM

POWER UNIT CODE NO.	GOVERNOR	GOVERNOR SPRING	GOVERNOR WEIGHT	SPINDLE RPM
611692	611236	613370	613373	1100
611693	611237	613371	613373	900
611694	611238	613370	613372	660
611695	611239	613369	613372	540
611696	611240	613368	613372	450

265 thru 640 RPM

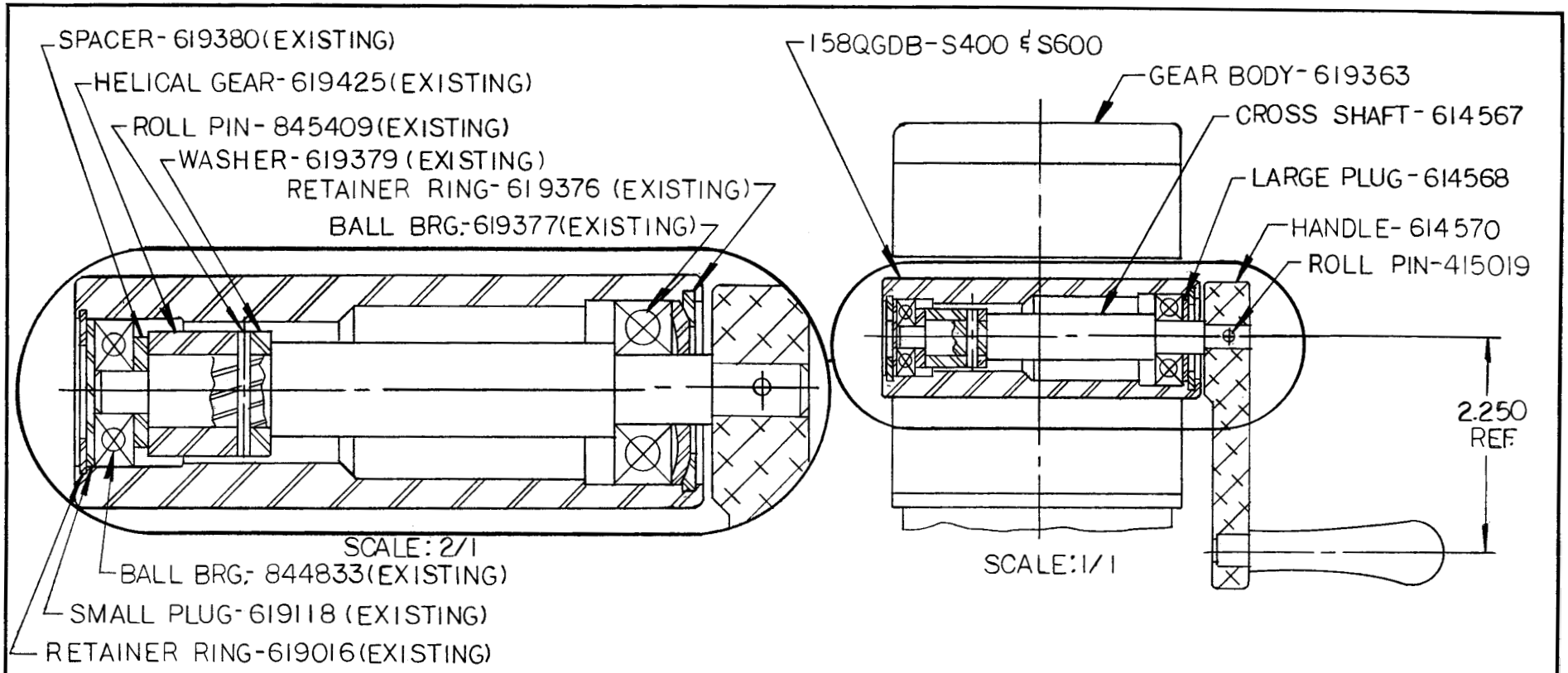
POWER UNIT CODE NO.	GOVERNOR	GOVERNOR SPRING	GOVERNOR WEIGHT	SPINDLE RPM
611692	611236	613370	613373	640
611693	611237	613371	613373	535
611694	611238	613370	613372	400
611695	611239	613369	613372	320
611696	611240	613368	613372	265

125 thru 310 RPM

POWER UNIT CODE NO.	GOVERNOR	GOVERNOR SPRING	GOVERNOR WEIGHT	SPINDLE RPM
611692	611236	613370	613373	310
611693	611237	613371	613373	250
611694	611238	613370	613372	185
611695	611239	613369	613372	150
611696	611240	613368	613372	125

55 thru 135 RPM

POWER UNIT CODE NO.	GOVERNOR	GOVERNOR SPRING	GOVERNOR WEIGHT	SPINDLE RPM
611692	611236	613370	613373	135
611693	611237	613371	613373	110
611694	611238	613370	613372	95
611695	611239	613369	613372	80
611696	611240	613368	613372	



CALL OUT OF EXISTING PARTS IN STANDARD CROSSFEED IS FOR REFERENCE ONLY TO INDICATE ALL PARTS NECESSARY FOR HAND FEED INSTALLATION.

MATERIAL:
CARB. DEPTH TO .40% C:
HARDEN TO R/C:
HT. TRT. PROCEDURE:

BREAK SHARP EDGES
FINISH
CONC
SQUARENESS

REV. NO.	DATE	BY	CK.	REV. NO.	DATE	BY	CK.
				C	11/9/81	SH	

TOLERANCES
FRACTIONAL ± .015
DECIMAL ± .005
ANGLES ± 1/2°
FINISH 125 MAX.

HAND FEED KIT
158QGDB-S400, 600, & 700
MATERIAL SPECIFICATION

DATE 11-9-81
DRN. BY SH
CKD. BY
DIST
SCALE NOTED
DWG. NO. 621153

NOTES

NOTES

NOTES

COOPER Tools

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