

TECHNICAL MANUAL

**OPERATOR'S, ORGANIZATIONAL, DIRECT
SUPPORT AND GENERAL SUPPORT
MAINTENANCE MANUAL INCLUDING REPAIR
PARTS LIST**

FOR

**LATHE, ENGINE, FLOOR
MOUNTED: 19-INCH SWING
MODELS 17E5 AND 19E7
(LEBLOND INC.)
(NSN 3416-00-252-7094)**

HEADQUARTERS, DEPARTMENT OF THE ARMY

OCTOBER 1980

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TECHNICAL MANUAL }
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HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, 1 October 1980

**OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT
AND GENERAL SUPPORT MAINTENANCE MANUAL
INCLUDING REPAIR PARTS LIST
FOR
LATHE, ENGINE, FLOOR MOUNTED: 19-INCH SWING
MODELS 17E5 AND 19E7
(NSN 3416-00-252-7094)**

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2, located in the back of this manual direct to: Commander, US Army Armament Materiel Readiness Command, ATTN: DRSAR-MAS, Rock Island, IL 61299. A reply will be furnished directly to you.

NOTE

This manual is published for the purpose of identifying an authorized commercial manual for the use of the personnel to whom this lathe is issued.

Manufactured by: LeBlond Inc.
Madison and Edwards Roads
Cincinnati, Ohio 45208

Procured under Contract No. DAAA09-76-C-6938

This technical manual is an authentication of the manufacturers' commercial literature and does not conform with the format and content specified in AR 310-3, Military Publications. This technical manual does, however, contain available information that is essential to the operation and maintenance of the equipment.

INSTRUCTIONS FOR REQUISITIONING PARTS

NOT IDENTIFIED BY NSN

When requisitioning parts not identified by National Stock Number, it is mandatory that the following information be furnished the supply officer.

- 1 -Manufacturer's Federal Supply Code Number-
- 2 -Manufacturer's Part Number exactly as listed herein.
- 3 -Nomenclature exactly as listed herein, including dimensions, if necessary.
- 4 -Manufacturer's Model Number-17E5 and 19E7
- 5 -Manufacturer's Serial Number (End Item)
- 6 -Any other information such as Type, Frame Number, and Electrical Characteristics, if applicable.
- 7 -If DD Form 1348 is used, fill in all blocks except 4, 5, 6, and Remarks field in accordance with AR 725-50.

Complete Form as Follows:

- (a) In blocks 4, 5, 6, list manufacturer's Federal Supply Code Number-followed by a colon and manufacturer's Part Number for the repair part.
- (b) Complete Remarks field as follows:
 Noun: (nomenclature of repair part)
 For: NSN: 3416-00-252-7094
 Manufacturer: LeBlond, Inc.

Model: 17E5 and 19E7
 Serial: (of end item)

Any other pertinent information such as Frame Number,
 Type. Dimensions, etc.

**Never operate or place the machine under power
with any guard or cover open or removed.**

SAFETY INSTRUCTIONS

Follow these safety rules, and you will receive many years of safe and dependable service. This machine should be operated and equipped in strict accordance with all local, state and federal safety regulations. DON'T neglect your responsibility to see that this machine is operated, maintained, and equipped with total regard for operator safety. No one can be responsible for your neglect but you.

**SAFETY CONSIDERATIONS IN OPERATING A
LATHE**

1. Study this manual before attempting to run the machine.
2. Be alert for loose, worn, or broken parts. Report all of these items and any unusual noise or action of the machine to your supervisor.
3. Keep lathe properly maintained. Perform all maintenance in accordance with this manual.
4. Keep lathe clean. Keep the work areas of the lathe clear of piled up chips, rags, tools, gages, shims, etc.
5. Never wear loose clothing or jewelry which could become entangled in the machine or work piece.
6. Never lay tools on the machine where they might interfere with the operation of the machine or where they might become entangled in the work, chuck or chips.
7. Always check the tightness of the chuck mounting, the rigidity of the work piece mounting and all adjustments and clamps before starting the machine.
8. Be alert whenever operating the machine.
9. Never reach into the work area of the machine while the spindle is turning..... for any reason.
10. Never operate spindle mounted accessories above their rated speeds. If an accessory other than that specifically built for this model lathe is used, check with the manufacturer for its maximum safe operating speed.
11. Never reach across moving parts.
12. Always use impact resisting safety glasses.
13. Lifting equipment should be used for heavy chucks and materials.
14. Chucks should always be started on the lathe spindle by hand, and the chuck wrench removed immediately after the chuck is adjusted or the work removed. Never put an extension bar on the chuck wrench or hit it with a hammer.
15. Filing workpieces being rotated under power is extremely hazardous and is not recommended.
16. All guards should be replaced before the lathe is put into operation after removal for any reason.
17. Shop employees should wear appropriate safety equipment for the conditions prevailing.
18. Continuous spiral chips should be removed with a hooked rod, never with the hand; small chips should be removed with a brush. Remove chips only after the lathe has completely stopped. Do not use air hose to clean any machine tool.
19. Never let bar stock extend through the rear of the spindle uncovered and/or unsupported.
20. Get first aid immediately for any injury.
21. Oil or coolant on the machine shop floor should be cleaned up as soon as they are discovered, to prevent slips and falls.
22. The actual cutting operation can produce sharp edges and considerable heat. Be careful when handling workpiece.
23. The movement of the carriage and cross slide may create pinch points, the operator must avoid these points.
24. After the machine has been shut down, always assume the setup has been tampered with. Recheck the rigidity of the setup.
25. High voltage is used to power this machine. Only authorized electricians should correct any electrical component failure.

It is impossible to foresee all possible uses, mis-uses and applications of this machine. The best protection against injuries is to use common sense and to think before attempting any questionable uses of this machine.

All materials and lifting devices should be of sufficient capacity to handle weight of machine. Refer to machine specifications for correct machine weight.

SAFETY INSTRUCTIONS FOR PROPER USE OF WORK HOLDING DEVICES

(Work holding devices include all devices used for driving, holding and retaining the workpiece so that cutting can be performed.)

The operator should have a general understanding that proper feeds, speeds and depth of cut depend upon (1) the material being cut, (2) whether the cut is continuous or intermittent, (3) the tooling, (4) rigidity of both the work holding device and the workpiece and (5) the clamping force applied by the work holding device to the workpiece.

The operator should also be aware of the fact that the clamping force is affected by (1) the condition of the work holding device, (2) pressure in the actuator (power clamping), (3) the screw on scroll (manual clamping), (4) work rpm, (5) jaw location, (6) jaw weight, and (7) workpiece configuration.

The holding ability of the work holding device is determined by (1) the clamping force, (2) type of surface of the gripping member, which could be line contact, penetrating contact, or area contact, (4) the workpiece configuration and (5) the distance from the chuck face to where jaws contact the workpiece.

The efficiency of the work holding device may be significantly affected by lack of lubrication or lack of periodic cleaning. It is not uncommon for a jawed work holding device to yield only one-half its normal gripping ability when not lubricated or when dirty. This, of course, can affect its ability to hold the part safely, even at actuator pressures calculated to be adequate.

The need for lubrication and cleaning varies significantly with the type of work and material. It is only possible to correlate actuator force to jaw force in a clean, not badly worn, well lubricated, work holding device.

One way to determine the gripping performance is to measure the force at the jaws with a gage.

The gripping members (jaws) are subject to wear and damage during use and as such can become ineffective in holding the workpiece.

Periodic inspection and maintenance, when required, should be performed to insure that proper gripping ability is maintained.

NOTE: It is strongly recommended that only spring-loaded, self-ejecting, safety wrenches be used on all manual chucks.

LARGE CHUCK APPLICATIONS

The industry has investigated the loss of jaw clamping forces at 1200 RPM on a 24" Power Chuck. With the jaws clamping a 24" workpiece, 67% of clamping force is lost at 1200 RPM. While this may be adequate to retain a short (Disc-shaped) part, Engineering considers it definitely hazardous for general workpieces. The user must be aware of the hazards and accept responsibility.

The hazard is reduced in tailstock supported work because the workpiece does not represent a cantilevered load to the chuck.

This loss of jaw force applies to manual as well as power chucks.

All lathes have the same loss of clamping force under the same conditions. This is a characteristic of the chuck and not of the machine.

ELECTRICAL POWER REQUIREMENTS FOR LATHES

The power supply installation (connectors, cables, etc.) should be designed for this service in accordance with local electrical codes. Install ground electrode per Article 250, Sect. 250-83 of National Electrical Code. Use #8 awg wire to connect enclosure ground stud to electrode.

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SPECIFICATIONS FOR LATHE

SIZE	17E5	19E7
Capacity		
Swing over bed & carriage wings	19-1/4"	19-1/4"
Swing over cross slide	12-1/4"	12-1/4"
Distance between centers, base length	54"	54"
Size of tool-forged	5/8" x 1-1/4"	5/8" x 1-1/4"
Size of tool holder	5/8" x 1-3/8"	5/8" x 1-3/8, '8"
Steady rest capacity	1/2" to 6"	1/2" to 6"
Follow rest capacity	1/2" to 3-1/4"	1/2" to 3-3/4"
Face plate, small diameter	9-1/2"	9-1/2"
Face plate, large diameter	17"	17"
Headstock		
Spindle speeds, number	12	12
Spindle speed ranges:		
Low range, rpm.....	25-1000	25-1000
High range, rpm.....	38-1500	38-1500
Spindle bearings number of.....	3	3
Spindle bearing diameters:		
Front.....	3-5/16"	3-5/16"
Center.....	2-7/8"	2-7 '8"
Rear.....	2-9/16"	2-9/16"
Front spindle bearing, precision		
Outside diameter	5-3/8"	5-3/8"
Radial load at 100 rpm, pounds	9239	9239
Thrust load at 100 rpm, pounds	7051	7051
Center spindle, roller bearing		
Outside diameter	4-5 /8"	4-5., '8"
Radial load at 100 rpm, pounds	8510	8510
Rear spindle, ball bearing		
Outside diameter	3-15/16"	3-15/16"
Radial load at 100 rpm, pounds	4070	4070
Spindle size of hole, straight.....	1-49/64"	1-49/64"
Spindle size of hole taper	Amer. Std. 200	Amer. Std. 200
Spindle size of center, Morse	#4	#4
Spindle nose, taper key drive, size	L-1	L-1
Spindle nose, diameter large end of taper	4-1/8"	4-1/8"
Bed		
Length, standard.....	8' 3"	8' 3"
Width	14-3/8"	14-3/8'
Depth	11-1/2"	11-1/2"
Carriage		
Length of bed.....	21"	21"
Bearing surface, square inches	79	79
Bridge width.....	7-7/8"	7-7/8"
Cross slide travel without taper att	11-1/4"	11-1/ 4"
Cross slide travel with taper att	9-5/8"	9-5/8"
Compound rest travel	4-3/8"	4-3/8"
Feeds-Threads		
Feed changes, gear or belt drive	48	48
Feed range, inches per revolution .....	.0018-.104	.0018-. 104
Thread changes gear drive only	48	48
Threads per inch, range	2 to 112	2 to 112
Leadscrew diameter and threads per inch.....	1-3/16", 4	1-3/16", 4
Tailstock		
Spindle diameter.....	2 7/16"	2 7/16"
Center, Morse.....	#4	#4
Spindle travel & set over right or left.....	7", 1"	7", 1"

SPECIFICATIONS FOR LATHE		(Continued)	
SIZE	17E5	19E7	
Taper Attachment			
Minimum taper per foot.....	3-1/2"	3-1/2"	
Turns at one setting.....	15"	15"	
Motor Recommendations			
Maximum hp and rpm.....	5, 1800	7- 1/2, 1800	
Weight & Dimensions (Base Length)			
Net weight, pounds.....	3860	3860	
Domestic shipping weight, pounds.....	4450	4450	
Export shipping weight, pounds.....	4950	4950	
Net weight, each additional 12" of bed pounds.....	220	220	
Floor space required.....	113 x 50"	113 x 50"	
Distance, spindle center to floor.....	42-3/4"	42-3/4"	

SPECIFICATIONS FOR

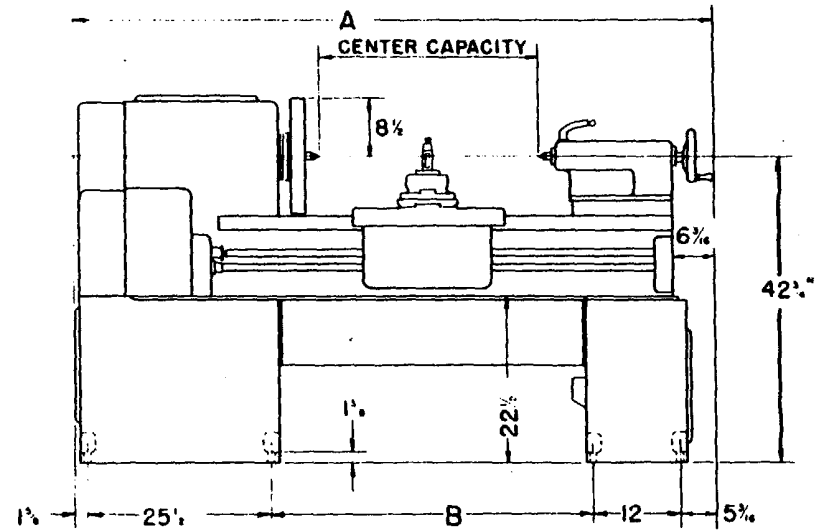
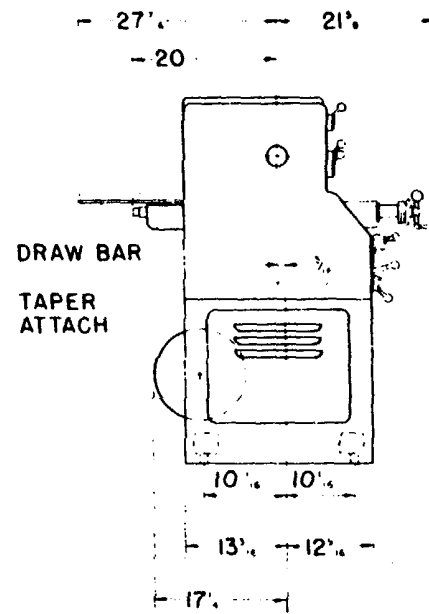
LATHES

Specifications of the 17E5 and 19E7 Engine Lathes apply to Gap Models except for those noted here.	
SIZE	17E5/36 SBG 19E7/36
Capacity	
Swing through gap.....	36"
Center Distance, bed closed.....	30"
Center Distance, bed extended.....	50"
Gap face plate diameter.....	27"
Distance face plate to end of gap.	
Distance spindle nose to end of gap	
Weight and Dimensions (30" center distance)	
Net weight, pounds.....	4370
Domestic shipping weight, pounds.....	4770
Distance spindle center to floor.....	46"
Overall length, bed closed.....	7' 6"
Overall length, bed extended.....	9' 2"
Carriage	
Length on bed.....	22"
Bearing surface, square inches.....	92
Cross slide travel, with or without taper attachment.....	15-1/2"
Bridge width.....	7-7/8"
Bed	
Base length, 30/50 centers closed.....	6' 3-1/4"
Top bed length base machine.....	50-3/8"
Width.....	14-3/8"
Depth, top.....	9-1/2"
Depth, lower.....	9-3/4"

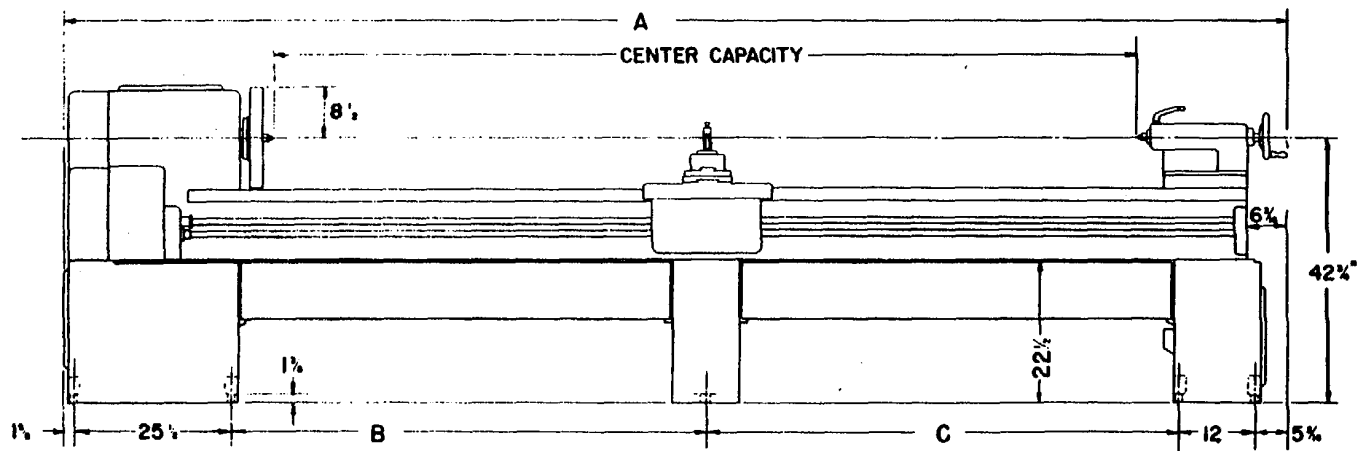
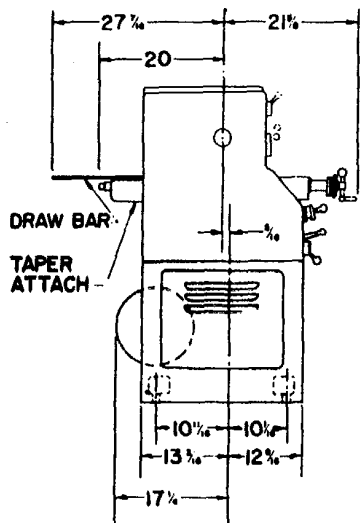
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**17E5 - 19E7
LATHE STANDARD**

CENTER CAPACITY	BED LENGTH	A	B
54"	8' - 3"	112 ³ / ₁₆ "	67 ⁷ / ₈ "



4



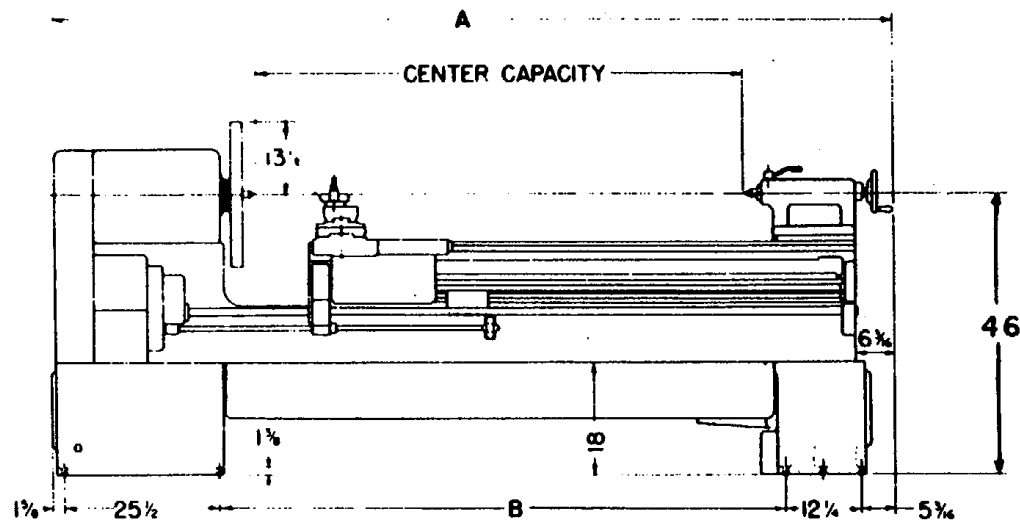
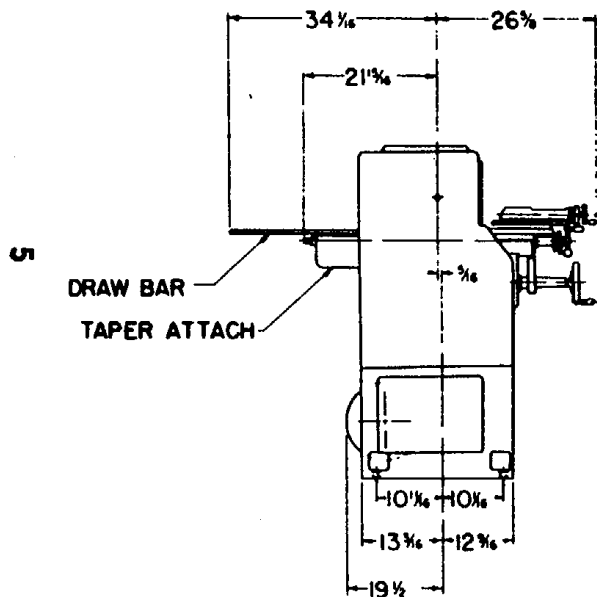
17E5 - 19E7 LATHE WITH CENTER LEG

CENTER CAPACITY	BED LENGTH	A	B	C
78"	10' - 3"	136 3/8"	45 1/8"	45 1/8"
102"	12' - 3"	160 3/8"	57 1/8"	57 1/8"

CENTER CAPACITY	BED LENGTH	A	B	C
126"	14' - 3"	184 3/8"	69 1/8"	69 1/8"
150"	16' - 3"	208 3/8"	81 1/8"	81 1/8"

17E5/36 & 19E7/36 SLIDING BED GAP LATHE

CENTER CAPACITY	BED LENGTH	A CLOSED	A EXTENDED	B
54"	8' - 3 1/4"	9' - 3 1/8"	11' - 11 1/8"	67 1/8"



INSTALLATION

Foundation

The floor upon which your lathe is to be set should be flat and heavy enough to support the weight of the machine without noticeable deflection. If such a floor is not available, it may be necessary to construct a special foundation in order to eliminate frequent need for releveling and re-alignment.

Concrete Floors. In order to minimize machine vibration and deflection, a reinforced concrete floor serves as the best foundation. All lathes require a minimum of 6" reinforced concrete.

Wood Floors. Many shop floors are made of wood block or some other type of vibration dampening material which covers a concrete sub-floor. This material should be taken up and the area filled in with concrete to the floor level.

In case the floor is of timber construction, the usual practice is to cut a hole in the floor and build up with reinforced concrete from the ground.

Second Floor. Your lathe should always be located over a pillar or supporting beams. If no such support is available, one or more pillars should be installed, if your lathe is to remain accurate and level.

Cleaning

For shipment, all oil was drawn from the reservoirs, and all polished and unpainted surfaces were well covered with a slushing compound.

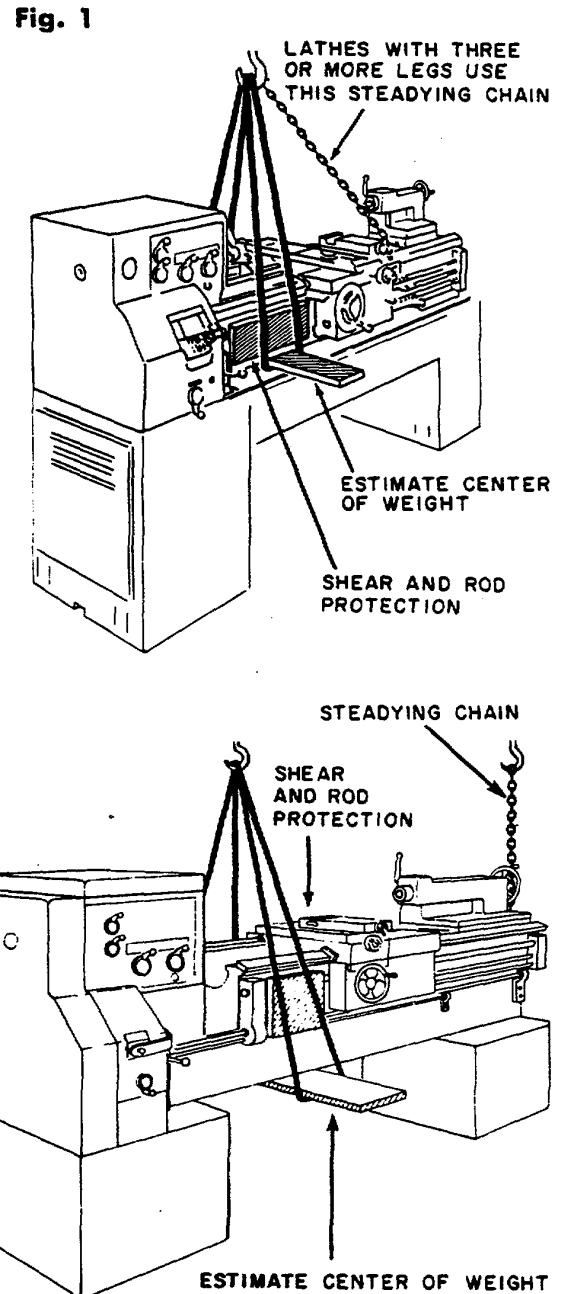
The slushing compound is best removed by washing with kerosene or benzene. Do not use an air hose. Air pressure will drive in between the bearing surfaces any grit and dirt picked up in transit. Raise the cross slide guards, clean the screw and slides, remove the bedway wipers and clean thoroughly. When all the unpainted and polished surfaces are wiped clean, put a light coat of machine oil on them to protect them from rust. Frequent cleaning and oiling of these parts will increase the useful life of your lathe.

Before starting the machine, consult the section on Lubrication for the proper lubrication points and the fillers for the reservoirs. Make sure the machine is properly lubricated before starting in order to avoid damaging any bearing surfaces.

Moving and Lifting

It is usually convenient to leave the machine on the skids when removing the crating. Thus the machine can be moved on the skids to its final location. This is particularly true where crane facilities are not available.

Fig. 1



However, if cranes are available, the following instructions should be followed. For lathes with two legs, insert a heavy board or flat steel bar under the bed at the estimated center of weight. Sling on each end of the board or bar using another board to protect the control rods. Raise the machine slightly to assure proper balance before continuing. (See Figure 1).

For lathes with three or more legs, follow the same procedure but add a chain from the crane hook to a cross girth at the tail end of the lathe. This will help steady the set-up.

NOTE: Make sure the carriage clamp screw is loosened before moving the carriage. The carriage and tailstock may be moved to help balance the lathe for moving by crane.

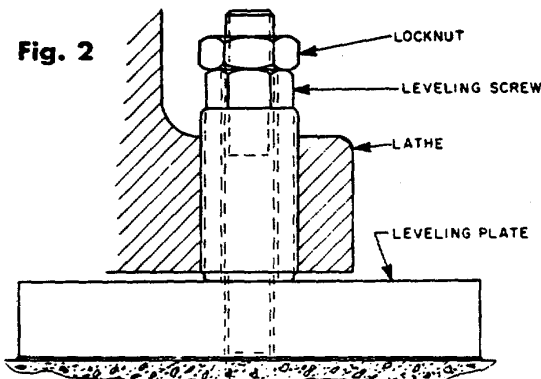
Electrical Connections

It is important that the voltage and other specifications of the motor are the same as those of your service lines. The name plate on the motor specifies the operating voltage and whether the current should be direct (D. C.) or alternating (A. C.). If alternating current is specified, the voltage, frequently (cycles and number of phases) are shown. If there is any doubt about the current and voltage, call your local power and light company and verify the supply. If there is a difference, advise us before connecting, and avoid burning out or otherwise damaging the motor.

Leveling

Your lathe was aligned and accurately checked with the lathe in perfect level. In order to reproduce this accuracy in your shop, it is essential that your lathe be leveled properly. Too much emphasis cannot be placed on the importance of properly leveling your lathe.

In order to hold the level and prevent the leveling screws



from digging into a concrete floor, smooth steel plates are furnished with each machine. Measuring approximately 2-1/2" in diameter, 3/8" thick, and countersunk 1/16" deep for seating the leveling screws, these plates should be surfaced against the concrete. If necessary, chip the concrete before placing the plates under the leveling screws. See Figure 2. Never use a resilient type of vibration dampening device, such as rubber under the leveling screws. These devices make it difficult, if not impossible to maintain accurate level.

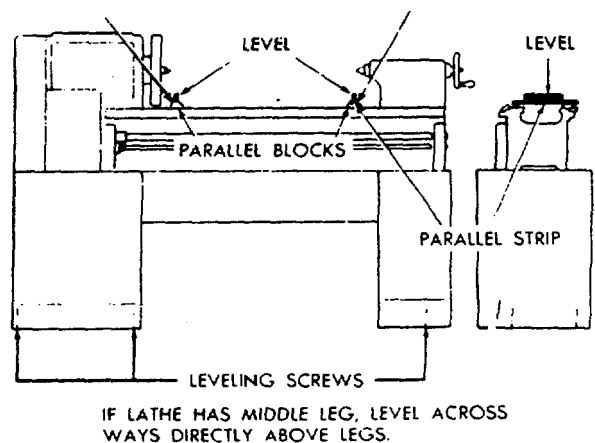
Next, level the lathe by means of leveling screws provide, using a precision level. An ordinary carpenter's level or combination square level is not sensitive enough. See Figure 3.

Proceed as follows: Level across the bedways at both the head and the tailend, using parallel blocks on the front flat and the rear hardened way. NOTE: The rear way of your lathe is .0625" higher than the front flat. Use gauge blocks to make up the difference. Leveling is accomplished by adjusting the leveling screws until the bubble is in the center of the glass bowl. If the bed of the machine has one or more centerlegs, level across them also. The reading must be exactly the same in all positions.

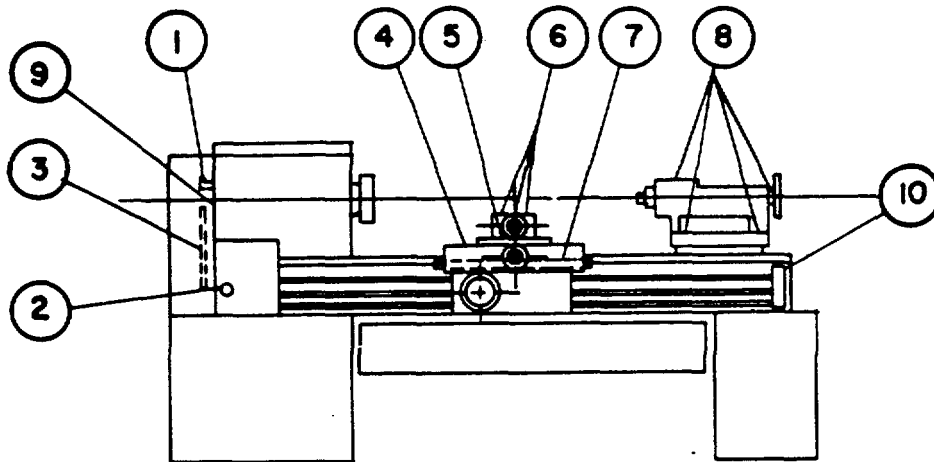
Then, level lengthwise on the rearway at the head and tail ends and at each center leg.

If hold-down bolts are used, draw them to light contact after leveling. Do not tighten bolts excessively as this may twist the bed of the lathe out of level. CAUTION: You should always recheck your level after tightening the hold-down bolts. Never bed the legs of the lathe in concrete as this will preclude any releveling of the machine.

LEVEL ACROSS WAYS AT THESE POINTS Fig. 3



REFER TO MANUAL
LUBRICATION INSTRUCTIONS 13C-3 815C-5 LATHE

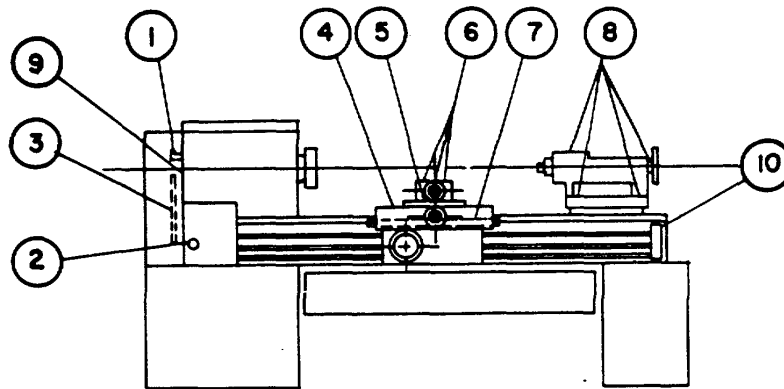


LUBE POINT	QTY	LUBRICATION INSTRUCTIONS
1	1	HEADSTOCK-REMOVE HEAD END COVER. FILL OIL CUP ON SIDE OF HEAD TO LEVEL ON OIL SIGHT GAGE. CHECK SIGHT GAGE DAILY. CAP. 9 QTS. USE SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE NO.H-315).
2	1	QUICK CHANGE BOX-REMOVE HEAD END COVER. FILL THRU PLUG HOLE ON FRONT OF QUICK CHANGE BOX TO LEVEL ON OIL SIGHT GAGE CHECK GAGE DAILY. CAP. 2 QTS. USE SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No.H-315)
3	1	QUADRANT GEAR-REMOVE HEAD END COVER. LUBRICATE QUADRANT GEAR WEEKLY WITH SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No. H-315).
4	1	APRON-FILL OIL RESERVOIR WEEKLY TO LEVEL ON OIL SIGHT GAGE. CAP. 1/2 QT. USE SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No. H-315). EACH DAY BEFORE STARTING LATHE PUMP PLUNGER UNTIL OIL APPEARS IN TELL-TALE HOLE AT RIGHT HAND SHEAR WIPER TO LUBRICATE CARRIAGE, BEDWAYS AND CROSS SLIDE.
5	1	CROSS FEED NUT-REMOVE SCREW ON TOP OF BOTTOM SLIDE AND FILL WITH SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No.H-315). FILL WEEKLY.
6	4	COMPOUND REST-FILL OILERS WEEKLY WITH SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No.H-315).
7	1	TAPER ATTACHMENT-(IF EQUIPPED) FILL OILERS UNDER HINGED COVER WEEKLY. USE SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No.H-315).
8	4	TAILSTOCK-FILL OILERS DAILY. USE SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No.H-315).
9	1	CRAWL SPEED-SERVO-SHIFT MACHINES ONLY. LUBRICATE LINKAGE WEEKLY WITH SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No. H-315).
10	3	BACK BOX-FILL OIL CAP DAILY. LUBRICATE FEED ROD AND CONTROL ROD DAILY. USE SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No. H-315).

USE OF LUBRICANTS OTHER THAN THOSE SPECIFIED VOID MACHINE WARRANTY.
SEE MAINTENANCE MANUAL FOR DETAILED LUBE INSTRUCTIONS.

SPECIFICATION MIL-L-15017 VISCOSITY 2110H (SAE 20) 014637-00

REFER TO MANUAL
LUBRICATION INSTRUCTIONS 17E-5 8 19E-7 LATHE

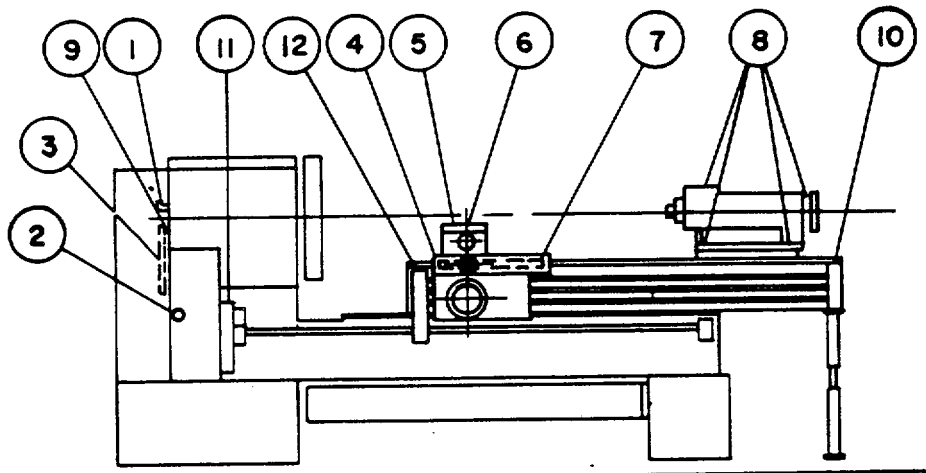


LUBE POINT	QTY	LUBRICATION INSTRUCTIONS
1	1	HEADSTOCK-REMOVE HEAD END COVER. FILL OIL CUP ON SIDE OF HEAD TO LEVEL ON OIL SIGHT GAGE. CHECK SIGHT GAGE DAILY. CAP. 18 QTS. USE SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No. H-315).
2	1	QUICK CHANGE BOX-REMOVE HEAD END COVER. FILL THRU PLUG HOLE ON FRONT OF QUICK CHANGE BOX TO LEVEL ON OIL SIGHT GAGE. CHECK GAGE DAILY. CAP. 2 QTS. USE SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No.H-315).
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6	4	COMPOUND REST-FILL OILERS WEEKLY WITH SAE 20w-20 API CLASS SC ENGINE OIL. (ASLE No.H-315)).
7	1	TAPER ATTACHMENT-(IF EQUIPPED) FILL OILERS UNDER HINGED COVERS WEEKLY. USE SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No. H-315).
8	4	TAILSTOCK-FILL OILERS DAILY. USE SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No.H-315). CRAWL SPEED-SERVO-SHIFT MACHINES ONLY. LUBRICATE LINKAGE
9	1	WEEKLY WITH SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No. H-315).
10	3	BACK BOX-FILL OIL CUP DAILY. LUBRICATE FEED ROD AND CONTROL ROD DAILY. USE SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No. H-315).

USE OF LUBRICANTS OTHER THAN THOSE SPECIFIED VOID MACHINE WARRANTY.
SEE MAINTENANCE MANUAL FOR DETAILED LUBE INSTRUCTION.

SPECIFICATION MIL-L-15017 VISCOSITY 2110H (SAE 20) 0146-00

**REFER TO MANUAL
LUBRICATION INSTRUCTIONS 19E-7 SLIDING BED GAP LATHE**



LUBE POINT	QTY	LUBRICATION INSTRUCTIONS
1	1	HEADSTOCK-REMOVE HEAD END COVER. FILL OIL CUP ON SIDE OF HEAD TO LEVEL ON OIL SIGHT GAGE. CHECK SIGHT GAGE DAILY. CAP. 18QTS. USE SAE 20w-20 API CLASS SC ENGINE OIL. (ASLE No; H-315).
2	1	QUICK CHANGE BOX-REMOVE HEAD END COVER. FILL THRU PLUG HOLE ON FRONT OF QUICK CHANGE BOX TO LEVEL ON OIL SIGHT GAGE. CHECK GAGE DAILY. CAP. 2 QTS. USE SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No. H-315)
3	1	QUADRANT GEAR-REMOVE HEAD END COVER. LUBRICATE QUADRANT GEAR WEEKLY WITH SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No. H-3 15).
4	1	APRON-FTLL OIL RESERVOIR WEEKLY TO LEVEL ON OIL SIGHT GAGE. CAP 1/2 QT. USE SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No. H-315). EACH DKY BEFORE STARTING LATHE PUMP PLUNGER UNTIL OIL APPEARS IN TELL-TALE HOLE AT RIGHT HAND SHEAR WIPER TO LUBRICATE CARRIAGE, BEDWAYS AND CROSS SLIDE.
5	1	CROSS FEED NUT-REMOVE SCREW ON TOP OF BOTTOM SLIDE AND FILL WITH SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE NO.H-315). FILL WEEKLY.
6	4	COMPOUND REST-FILL OILERS WEEKLY WITH SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No.H-315).
7	1	TAPER ATTACHMENT-(IF EQUIPPED) FILL OILERS UNDER HINGED COERS WEEKLY. USE SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No.H-315).
8	4	TAILSTOCK-FILL OILERS DAILY. USE SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No.H-315).
9	1	CRAWL SPEED-SERVO-SHIFT MACHINES ONLY. LUBRICATE LINKAGE WEEKLY WITH SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No. H-315)
10	3	BACK BOX-FILL OIL CUP DAILY. LUBRICATE FEED ROD AND CONTROL ROD DAILY. USE SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No. H-3 15).
11	1	BOTTOM BED FEED BOX-CHECK LEVEL WEEKLY. FILL WITH SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No.H-315).
12	1	TOP BED FEED BOX-CHECK LEVEL WEEKLY. FILL WITH SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No.H-315).
GAP BED-WAYS	2	BEFORE MOVING TOP BED UNDER POWER, CLEAN AND LUBRICATE DRIVE SCREW. BEFORE CLOSING GAP CLEAN AND LUBRICATE BOTTOM WAYS. USE SAE 20W-20 API CLASS SC ENGINE OIL. (ASLE No.H-315)

USE OF LUBRICANTS OTHER THAN THOSE SPECIFIED VOID MACHINE WARRANTY.
SEE MAINTENANCE M ANUAL FOR DETAILED LUBE INSTRUCTIONS.

SPECIFICATION MIL-L-15017 VISCOSITY ZI2110 (SAE 20)

014639-00

OPERATING INSTRUCTIONS AND NOMENCLATURE

To help you understand the lathe, you will find the following a general description, and operational procedure for each of the major units that make up your lathe.

Headstock

The lathe Headstock, Figure 4, provides eight (8) gear-driven spindle speeds and four (4) belt driven spindle speeds for smooth, quiet operation. No gears, other than the feed gears, are in mesh on the spindle when in the belt range. The speeds are easily selected by two levers (A) and (B), and a direct reading colorplate. The spindle is supported by three bearings.

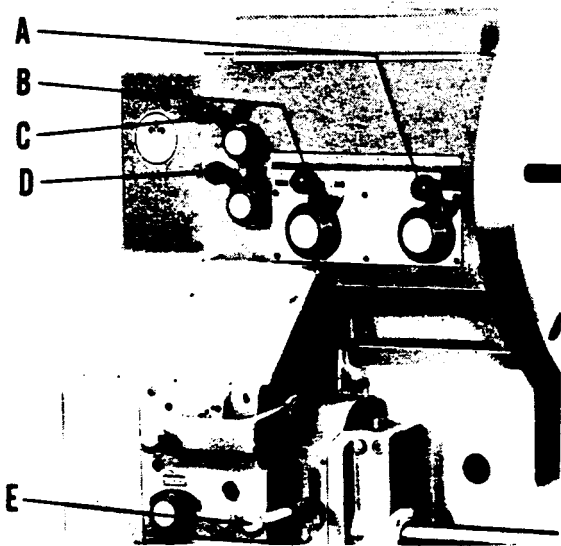


Fig. 4

Electric Brake

The machine is equipped with electric brake; you will find the power pack mounted on the rear of the bed by the headstock leg. This unit contains a rheostat, providing the operator a convenient means for adjusting the braking power.

Along with the electric brake, a five position drum-switch is included. The center position of the spindle control handle (E) applies the brake. A neutral position on either side of the center allows the spindle to coast for jogging, shifting gears or revolving the spindle by hand. The extreme up position of the handle will revolve the spindle forward. The extreme down position of the handle will revolve the spindle in reverse.

The spindle nose is an American Standard Type L taper key drive. The spindle speeds are always increased when moving the shifter levers to the left. The small shifter (C) at the upper left of the Headstock, is the reverse to the feed and leadscrew. The lower shifter (D), on the left of the head, is the feed drive compound, providing coarse and fine feeds and threads. Headstocks have hardened steel gears for long life and trouble-free operation, and all shafts are supported on anti-friction bearings.

Servo-Shift (Fig. 5)

If the lathe is equipped with Servo-Shift, spindle speeds can be changed simply by turning dial (A), to the desired speed, and moving spindle control handle (B) to engage the brake. The headstock gears will be automatically shifted without further attention from the operator. Spindle speeds can be preselected at any time during the cutting operation. The shifting will not take place until the brake is engaged.

During the shifting cycle, always permit the crawl speed mechanism to oscillate the spindle several times before moving the spindle control handle to disengage the brake. This will insure complete gear engagement and prevent the possibility of clashing.

To free wheel the spindle, when inspecting or measuring workpieces, turn Servo-Shift dial (A) to the neutral position marked N.

Note: The amount of spindle oscillation during the shifting cycle will vary according to the speed selected.

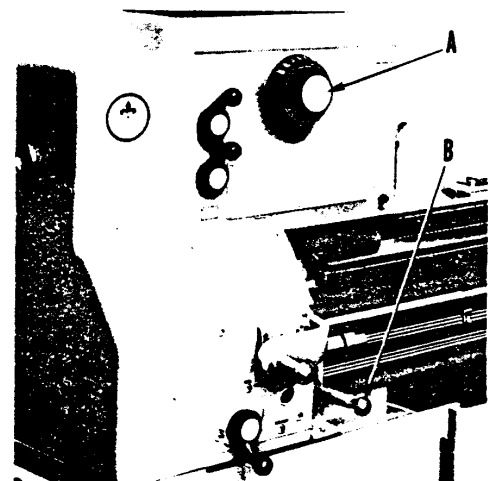
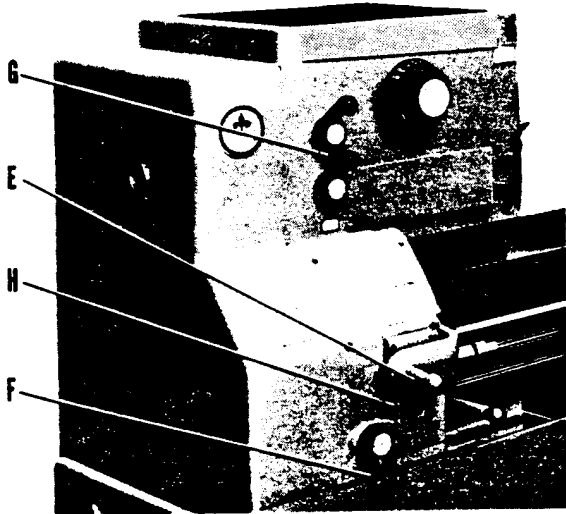


Fig. 5

Fig. 6



The feed drive from the head to the Quick Change Box consists of pick-off gears readily accessible by removing the end cover. This arrangement permits the use of metric translating gears and other gears to obtain special feeds and threads.

Feed Rod and Leadscrew (Fig. 7)

The Feed Rod (H) transmits the power from the Quick Change Box to the apron through a safety overload device (I) located at the Quick Change Box end of the Feed Rod. Should the carriage meet with any obstruction on the bed, the safety device will release and prevent damage to the feed mechanism of the lathe. As soon as the obstruction is removed, the feed safety device engages automatically.

Totally Enclosed Quick Change Box (Fig. 6)

The feed reverse and compounding gears are entirely within the head. A single gear train on the end of the lathe eliminates overhang of the bearings and gives a powerful, quiet drive.

Forty-eight feed and thread changes are obtained by an eight position tumbler(E), a three position compound (F) in the feed box and a two position compound (G) on the headstock. Fine changes of feeds or threads are obtained as indicated on the index plate by pulling out the tumbler handle and depressing to disengage the tumbler gear, then sliding the tumbler along the sleeve to the proper location and lifting the handle to bring the gears into engagement. When the gears are in engagement, the plunger in the handle locks the tumbler in place. A series of slots milled in the shifter lock-plate mounted on the Quick Change Box above the handle and a pin engaging the slots, prevent the tumbler gear from engaging two gears at any one time.

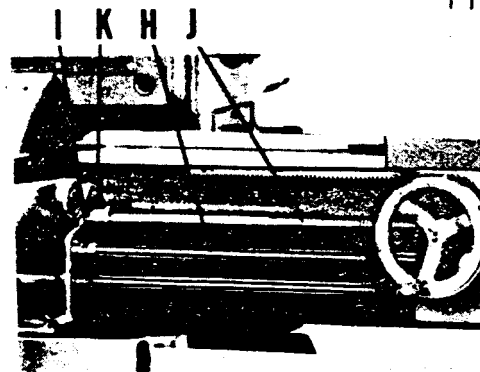
The Direct Reading Index Plate is mounted on the Quick Change Box directly over the tumbler handle. The numbers on the plate refer to threads or feeds that the leadscrew and the gear combination will cut when the tumbler is engaged directly under the number on the index plate. Coarse and Fine refer to the location of the compound feed handle on the head and the letters refer to the position of the compound change lever on the feed box.

The Leadscrew

The Leadscrew(J)is used only for thread cutting and may be disengaged when not in use through a sliding gear (K). This gear is located on the feed box end of the screw and can be engaged with, or disengaged from the feed rod gear by a short sliding movement on the leadscrew. When not chasing threads, disengage the sliding gear so the leadscrew does not revolve.

On some lathes of this type, where splined leadscrews are used to drive the feed, the leadscrew is subject to torsional strains at all times and soon becomes inaccurate. The key engaging the spline in the leadscrew also burrs the edges of the threads which cause the leadscrew to act as a tap constantly wearing the half nuts. The leadscrew remains accurate for the life of the machine as it is not subject to these conditions.

Fig. 7



Apron

The Apron (Figure 8) is a double-walled one piece casting in which all shafts and gears are supported on both ends. This unit is bolted securely to the carriage and contains the controls, gears, and other mechanisms for feeding the carriage and cross slide by hand or power. It also contains the half nuts controlled by lever (L) which engages the leadscrew for thread chasing.

Power is supplied to the apron through the bevel pinion which is driven by a six splined feed rod. Positive jaw clutches are employed to direct the power to the rack pinion for length feed and the cross feed screw for crossfeed.

A single lever (M) is employed to engage both length and cross feeds. An instruction plate mounted to the left of the feed control lever indicates the position for cross and length feed. An interference device prevents the engagement of the half nuts and the feed at the same time. Do not attempt to force the feed control lever or the half nut lever when the other is engaged.

Feed Reverse Lever gives feed reverse control at the apron in addition to normal feed reverse on the headstock. This feature is available on 17E5 and 19E7 models only.

The large hand wheel (N), through a gear reduction, revolves a rack pinion thus providing hand feed to the carriage.

The apron spindle control lever (W) is located on the right side of the apron.

The Carriage and Compound Rest

The carriage, an H-shaped casting, is fitted to and slides on the bedway; thus providing for longitudinal movement of the tool by hand or power.

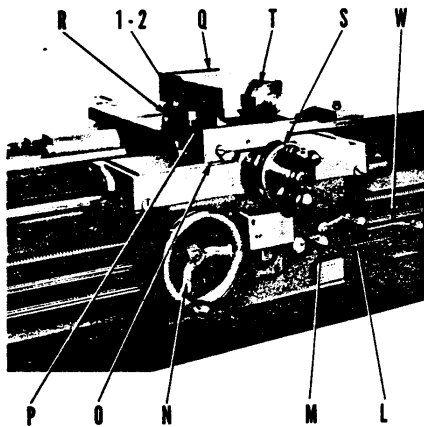


Fig. 8

The cross-slide often referred to as the bottomslide, (O), provides for cross motion of the tool by hand or power.

The swivel, (P), and the topslide, (Q), provide angular hand feed. To adjust the angle of the top slide, loosen nuts (1) and (2), swivel the unit to the desired angle as indicated by the graduation (R), and retighten nuts (1) and (2).

Both the crossfeed dial, (S), and the topslide dial, (T), read in diameter reduction .010 on the crossfeed dial advances or retracts the slide .005, thus reducing or increasing a given diameter by .010. The topslide dial is calibrated in the same manner. However, the angle at which the topslide is set must be taken into consideration when computing tool advances. For this reason it is generally considered good practice to use a cross slide adjustment for sizing when turning.

Very often the topslide is used for controlling the depths of a facing cut by setting the top slide at 90 degrees. Under these conditions, the advance of the tool will be one half that shown on the dial.

It should be pointed out that the topslide dial is graduated in diameter reduction for use in sizing when the taper attachment is in use. The taper attachment bottomslide draw bar, (Figure 16), in its locked position prevents the bottomslide from being moved.

CAUTION: The lathe operator should adjust the topslide flush with the cross-slide for maximum tool support whenever possible. Needless overhang of the topslide will very often result in chatter.

Tailstock

The tailstock unit (Figure 9) is used to support one end of the workpiece and to hold drills, reamers, taps, etc. This unit can be moved on the bedways to accommodate workpieces of different length within the capacity of the lathe. The tailstock consists of a top, bottom, clamp, spindle and handwheel.

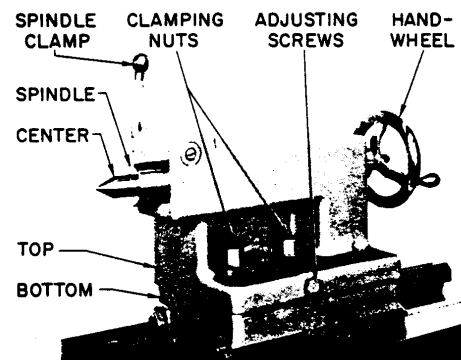


Fig. 9

The tailstock top is fitted to the bottom and held in position with a cross tongue. A side adjustment is provided to keep the center in line with the head, and for turning shallow tapers by offsetting the spindle in relation to the head.

Alignment of Centers

When zero marks are in line on the tailstocks top and bottom, centers are approximately in line. But due to the fact that an error of a .001" misalignment cannot be seen, a more sensitive test must be used for perfect straight turning.

A test bar (Figure 10) should be made with centered barstock; 2" diameter, 24" long and with a 1/4" undercut in the center. By taking a light cut at both ends and measuring with a micrometer, you can determine if the cut is straight or tapered.

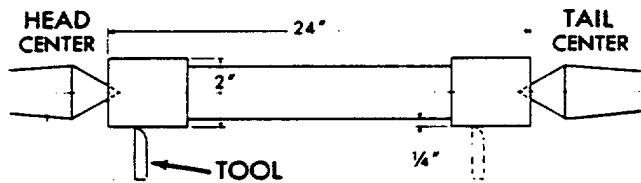


Fig. 10.

If your lathe is cutting shallow tapers, the alignment of the tailstock center with the headstock is out of position. If the diameter is larger at the headstock, the tailstock top must be moved to the back of the lathe. If the diameter is larger at the tailstock, the tailstock top must be moved toward the front of the lathe.

NOTE: Do not attempt to adjust side movement with the bed clamp locked in position. Be sure the clamp is only in snug position; this allows the top to move on the bottom. Always loosen the adjusting screw on the side of the tailstock in the direction you wish to move before turning the other screw to move the tailstock top.

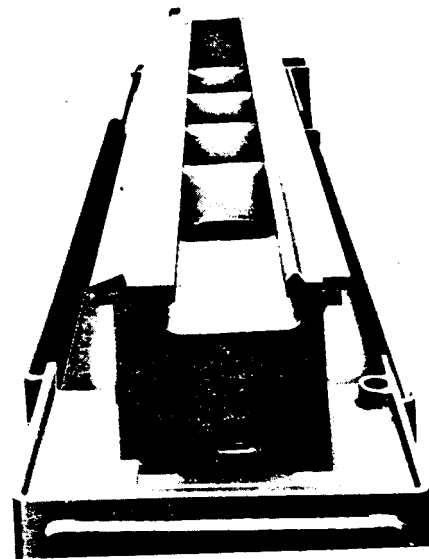
When you have moved it to the desired position, retighten the original screw. These adjusting screws only locate the top on the bottom and should only be tightened to a snug fit.

Bed

The bed (Figure 11) is the foundation of the lathe. It supports the functioning units and provides an accurate guideway for these units which move on it. Rigid in construction, it has been scientifically designed with heavy girths to minimize deflection.

The ways are constructed of hardened and ground high strength steel. Wear is kept to a minimum with a hardness of 62-64 Rockwell C (600 Brinell). These ways are replaceable in event of accidental damage but with ordinary care will outlast the lathe.

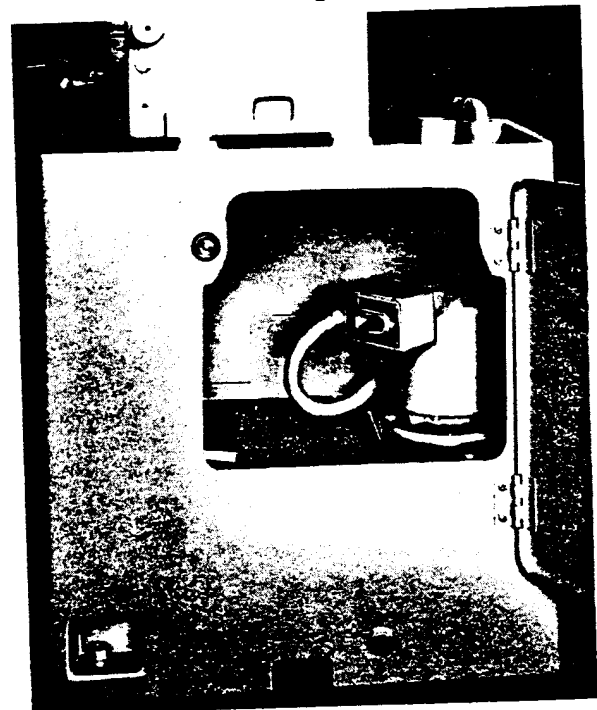
Fig 11



Coolant System

The Regal lathe tail leg is of the completely enclosed type and houses the coolant system, (optional equipment). See Figure 12.

Fig 12



ADDITIONAL INSTRUCTIONS

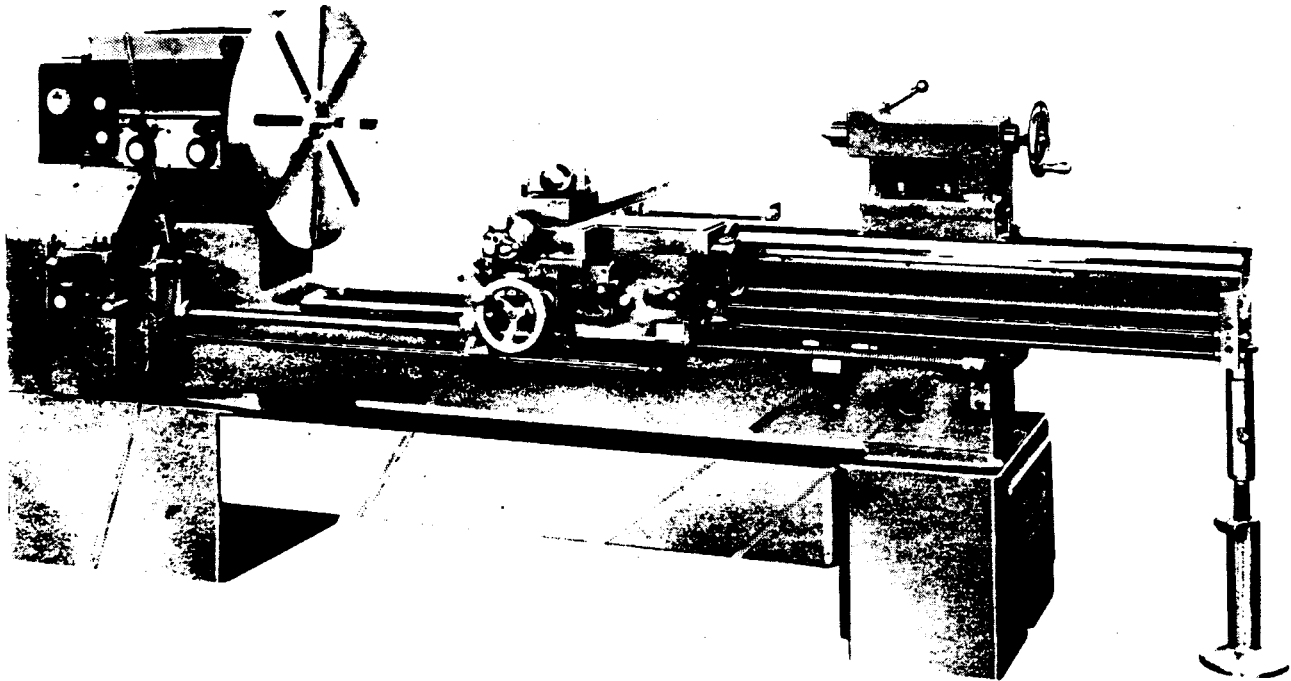
(Fig. 14)

On sliding bed gap lathes additional daily lubrication should be performed at the following points.

- (12) Bottom bed feed box
- (13) Top bed feed box

Before moving top bed under power, wipe drive screw (B) clean from dirt and lightly oil. Always wipe bottom ways clean and oil before closing gap.

Fig. 13.



Sliding Bed Gap Lathe

(Fig. 13)

A sliding bed, a special carriage, apron arrangement and part of the feed mechanism differentiates this lathe from the regular Regal lathe. On the base length of the machine the gap may be opened to a maximum working distance of 20". For every bed increase increment of 12" the center distance will be increased by 18" with the bed fully extended.

Feed is transmitted from the quick change box through transfer box (G) to the gap bed box (H) by means of an extension rod. The extension rod lies along the lower bed in order to keep the gap working area open. This rod is also used to traverse the top bed under power.

Lever (A), Fig. 13 engages the traverse nut to the drive shaft. The top bed slides along a veeway on the bottom bed which keeps it in position.

CAUTION: Before moving the top bed be sure to loosen the clamp nuts found on the bed girths. Do not traverse the top bed in the spindle belt drive and do not exceed the fine feed range when in spindle gear drive.

On sliding bed gap lathes of 66" center distance and longer, one support jack is furnished to support the bed overhang. Raise the jack just enough to relieve the strain resulting from bed overhang but not enough to raise the top bed off the lower bed. Retighten the bed clamps by tightening the bolts next to the vee-way to insure proper alignment.

ATTACHMENTS

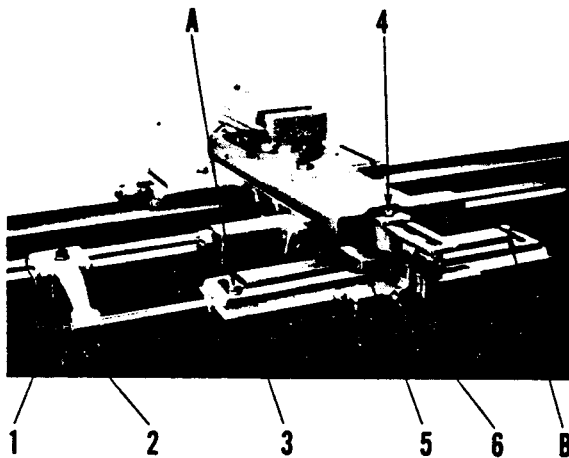
Taper Attachment

The telescopic taper attachment, Figure 14, is ruggedly constructed, accurately machined and simple to operate.

Capacity on the 17E5 and 19E7 is 3-1/2" maximum taper per foot and will turn 15" at one setting.

Fig. 14

Fig. 14



When the carriage is brought into position for taper turning, the bed bracket (1) is locked on the bed ways. The slide rod draw bar is then locked by nut (2). The swivel guide bar (3) is adjusted to the desired taper by loosening nuts (A) and (B), adjusting to the proper taper and retightening nuts (A) and (B). This guide is graduated in inches on one end and degrees on the other.

With the taper bar clamp nut (4) loosened, the tool is moved into position and nut (4) relocked. When the carriage feed is engaged, the bed bracket and connecting rod hold the lower taper bar in a fixed position in relation to the bed and work. Movement of the carriage, slides gibbed block (5) along the taper bar.

The taper attachment bottom slide draw bar, in its locked position, prevents the cross slide from being moved. The compound rest dial is used in sizing for taper turning. For this reason the compound rest should be at the zero setting and square with the carriage. Avoid unnecessary overhang of this slide to prevent chatter. Lock screw (6) should be used during conventional turning.

Chasing Dial

The chasing dial, Figure 15, permits the operator to take a cut, back the tool out and return the carriage to the starting point, set the tool for the next cut and re-engage the half nut to pick up the same lead without stopping or reversing the spindle.

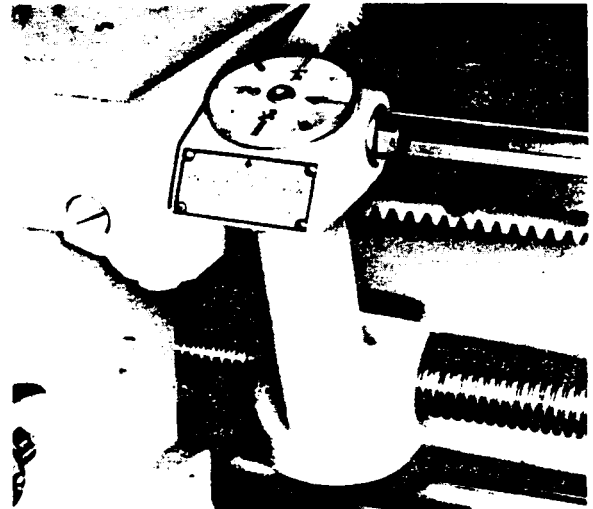


Fig. 15

The chasing or thread indicating dial consists of a worm wheel, which runs in the leadscrew, and a shaft connected to an indicating dial.

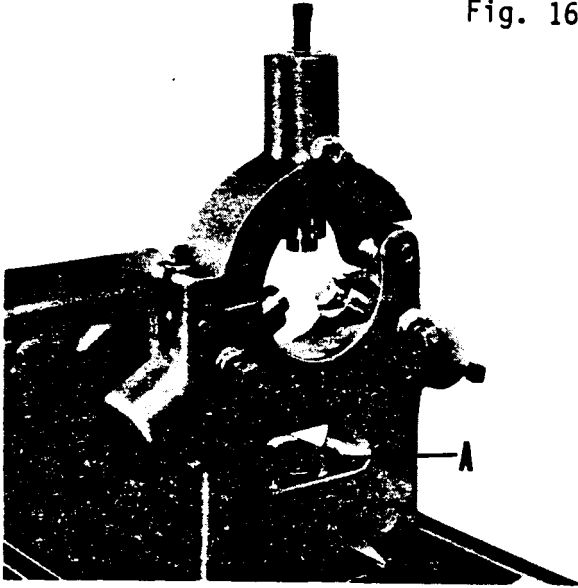
When chasing even numbered threads, the halfnuts may be engaged at any line on the dial, odd numbered threads at any numbered line and half-threads at any odd numbered line.

Steady Rest

The steady rest, Figure 16, provides a fixed support between the head and tailstock for long round work while it is being turned. The rest is also used to support one end of the workpiece when operations such as boring are performed.

Steady rests are clamped in position on the bed by clamp nut (A). Proper position is generally in the center of long workpieces for turning, and on one end for boring. Two types of jaws are generally used on steady rests, plain or bronze type and roller jaws--adjustment of these jaws should be made in the following manner. Always adjust the bottom jaws first.

Fig. 16

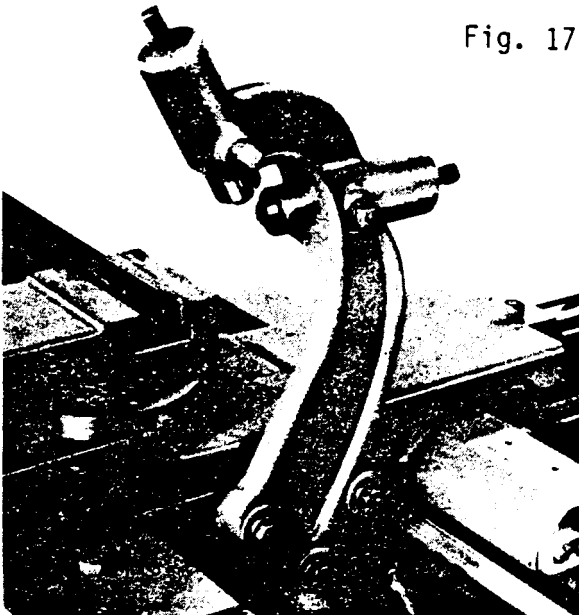


These jaws should be positioned to keep the workpiece running true. The top jaw is then brought into light contact with the workpiece to support the upward thrusting action that occurs when the work is revolving. Be sure to keep oil on the contact area between the jaw tips and the work. Scoring is usually caused by the top jaw being too tightly clamped and lack of oil. Chatter is generally caused by the top jaw being too loose.

Follow Rests

The follow rest, Figure 17, is used to support

Fig. 17



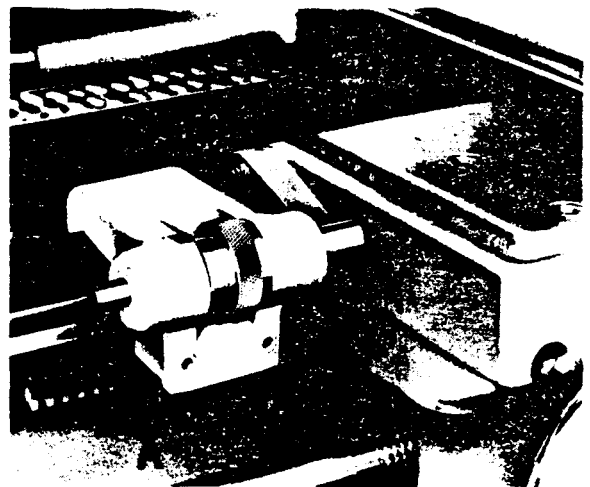
between-center work against the forces of the cut being taken. It is bolted to the carriage and moves with it. This rest is very useful in turning long small diameter work and is a necessity when chasing threads on long screws. Without a follow rest the screw would be inaccurate, due to its springing away from the tool.

The follow rest is adjusted to the workpiece in the following manner. First, the cut is started and turned approximately 3". The jaws are then set to the turned diameter after which the cut can be taken across the entire length of the work. When adjusting the jaws to the work, make sure they support but do not bind or twist the workpiece.

Micrometer Carriage Stop

The micrometer carriage stop, Figure 18, permits the operator to bring the carriage to the same position accurately on the bed.

Fig 18



The stop is clamped on the front bed way with nut (A). The design of the clamp prevents marring the hardened way while in use. A micrometer screw with hardened ends is turned by a large knurled collar which has been graduated for direct reading in thousandths of an inch. The carriage is brought up against the end of the stop by hand. Never run the carriage against the stop with power feed.

MAINTENANCE AND ADJUSTMENTS

General Instructions

The following general rules will keep your machine in best running condition and prevent down time for maintenance and repair.

1. Keep general work area clean.
2. Do not remove guards,-they are put on for safety and to keep dirt out of the lathe.
3. Make sure the tailstock has been clamped before turning between centers.
4. Don't use the lathe for a work bench, Lathes have been wrecked by a wrench lying on the ways between the carriage and head.
5. Always keep the spindle nose, face plate, chucks and centers clean and dry. Dirt and grit between a face plate and the spindle nose may cause run out.
6. Headstock and tailstock spindle holes as well as centers must be free from dirt before inserting centers.
7. Tighten spindle lock nut securely before starting lathe.
8. Use lubricant on dead tailstock centers.
9. Keep tool tight in tool holder.
10. Before chasing threads, wipe leadscrew free from dirt and lightly oil.
11. Check direction of feed before engaging the tool to the workpiece.
12. Always disconnect the power before leaving lathe.

Be sure lathe is properly lubricated at all times and oil reservoirs are filled. See section on Lubrication Instructions.

From time to time the lathe may need minor adjustments. Read the proper section for making these adjustments before performing adjusting operations. Never tear a machine down leaving a box of parts for a service man. He is experienced in trouble shooting and chances are he will save you time and money by doing this work himself. Often corrections can be made without tearing machine down.

TROUBLESHOOTING CHART		
TROUBLE	PROBABLE CAUSE	CORRECTION
Vibration	Loose leveling screws Torn or mismatched vee belts Work or chuck out of balance operating at high spindle speeds Motor out of balance	Set all screws so they bear evenly on leveling plates. Replace vee belts with matched set. Balance chuck or reduce spindle speed. Contact local representative of motor manufacturer.
Chatter	Tool bit improperly ground or not on center Tool overhang too great Using improper surface feet Feed rate too high or too low Gibs of cross slide or compound rest loose Spindle bearings worn	Regrind tool bit or adjust tool holder so that area of contact between tool bit and work is decreased. Avoid extreme negative rake angle. Keep point of tool bit as close as possible to tool holder. Reduce or increase spindle speed. Reduce or increase feed. Adjust gibs. Adjust spindle bearings.

continued on next page

TROUBLESHOOTING CHART

TROUBLE	PROBABLE CAUSE	CORRECTION
Chatter (cont'd)	Work improperly supported Vibration Spindle bearing loose	Adjust tailstock center. Use steady rest or follow rest on long slender shafts. Minimize tailstock barrel extension. See "Vibration" trouble above. Adjust spindle bearings.
Work not turned straight	Headstock and tailstock centers not aligned Work improperly supported Bed not level Tool not on center when using taper attachment	Align tailstock center. Use steady rest or follow rest. Reduce overhang from chuck. Relevel bed, using precision level. Put tool on center.
Work out of round	Work loose between centers or centers are excessively worn--work centers out of round Loose headstock spindle bearings.	Adjust tailstock center. Re grind centers. Lap work centers. Adjust headstock spindle bearings
Cross slide or compound rest movement does not coincide with dial movement of respective adjusting screw.	Gib setting too tight or too loose is too long and slender	Adjust gibs. Use steady rest or follow rest.

Headstock Spindle Bearing Adjustment (fig. 19)

When adjusting the spindle bearing, use small face plate on spindle nose. Remember that a slight drag should be felt when the bearing is adjusted correctly.

1. Remove the head cover.
2. Locate the two hex head set screws (1) on the center bearing nut. Loosen.
3. Tighten (or loosen) the center bearing nut (2). This is the adjusting nut.
4. Tighten the two hex head set screws (1) on the adjusting nut.
5. Replace the head cover and bolt firmly to prevent oil leakage.

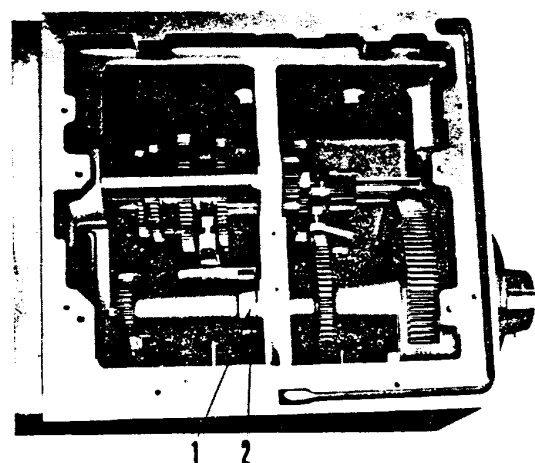


Fig 19

Servo-Shift Pressure Adjustment

The Servo-Shift pressure is factory set at 200 to 300 P.S.I. This pressure is maintained through a fixed bleed-off orifice and must not be re-adjusted in the field.

Belt Tension Adjustment (Fig. 20)

The motor is mounted on a hinged plate in the back of the headstock leg. The hinged plate is adjusted by means of turnbuckle (A, in the leg to regulate the tension on the V-belts. Belts should have approximately 1/2" spring to provide enough tension to take the cuts without slipping. Too much tension on the belts will cause a strain on the motor and drive shaft bearings, causing excessive wear. Oil on the belts will cause slippage. Adjust belts only enough to just prevent slipping under heavy cutting. Small amount of slippage on motor startup is normal.

Leadscrew Adjustment (Fig. 21)

The leadscrew has been properly adjusted before the machine has been shipped. With normal care, no adjustment will be necessary for many years.

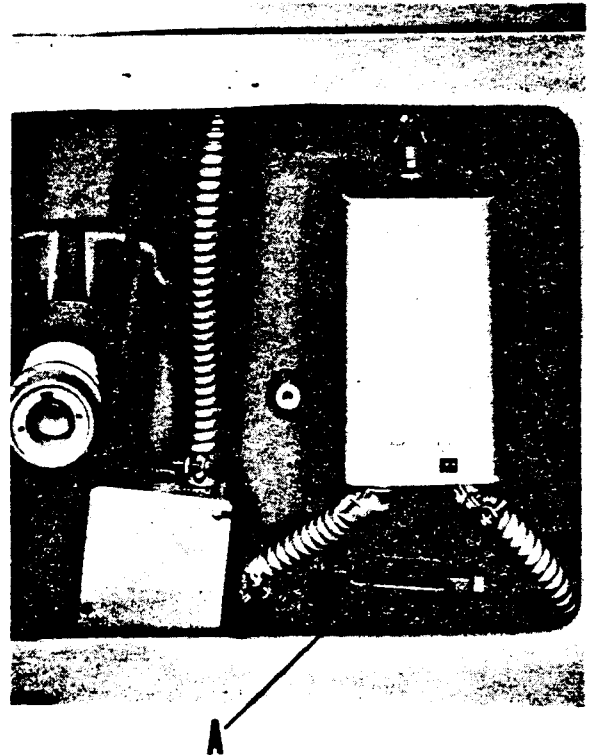
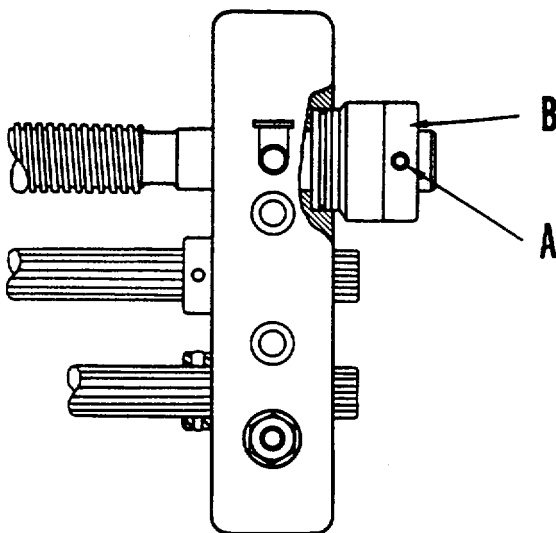


Fig 20

Fig. 21.



NOTE: The-leadscrew is used only for chasing on lathes. Under all other operations, it should be disengaged. Excessive wear to the leadscrew and half nut takes place when the leadscrew is not cleaned before chasing when it has not been used for some time. Always clean leadscrew with a small, stiff brush to remove dirt and grit under these conditions, rinse with kerosene, and relubricate with machine oil.

For Adjustment:

1. Loosen set screw (A).
2. Tighten the adjusting nut (B) until there is no end play in the leadscrew.
3. Retighten set screw (A).

Cross Slide and Top Slide Gib Adjustment (Fig. 22)

Fig. 22

If the gibs on the cross slide and top slide are loose, the compound rest will wobble slightly causing inaccurate work. To adjust these gibs follow this procedure:

1. Loosen the gib screw (E) at the small end of the gib.
2. Tighten adjusting screw (F) at the large end of the gib, until a slight drag is felt when the slide is moved. Retighten screw (E).

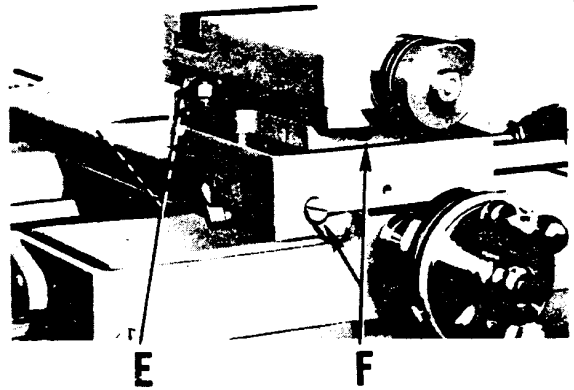


Fig. 23

Carriage Rear Gib Adjustment (Fig. 23)

The carriage rear gib is adjusted by moving it vertically upward. To adjust the gib, loosen two hex screws (A) which hold the gib against the rear wall of the carriage. Tighten the two screws (B) that move the gib vertically upwards until a slight drag is felt as the carriage is moved along the bed. Tighten the hex screws.

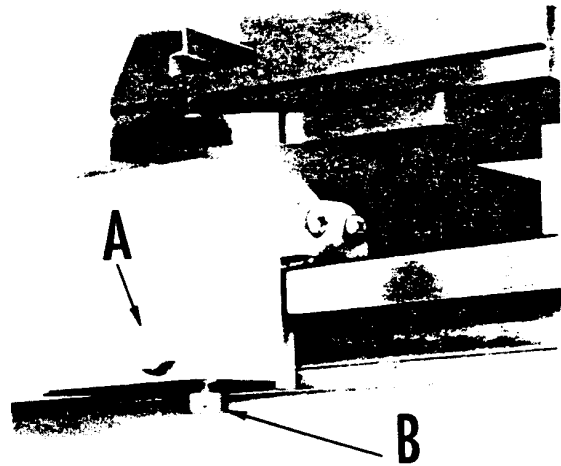
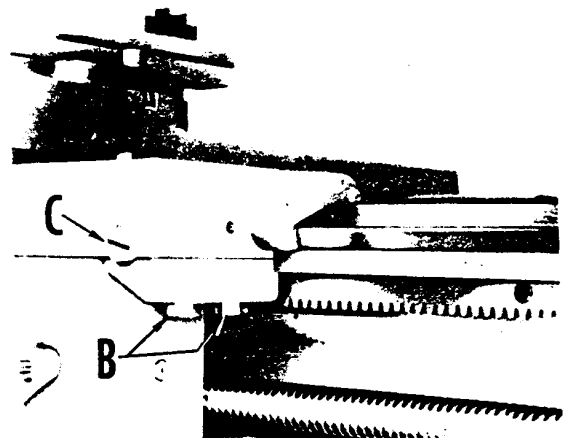


Fig. 24

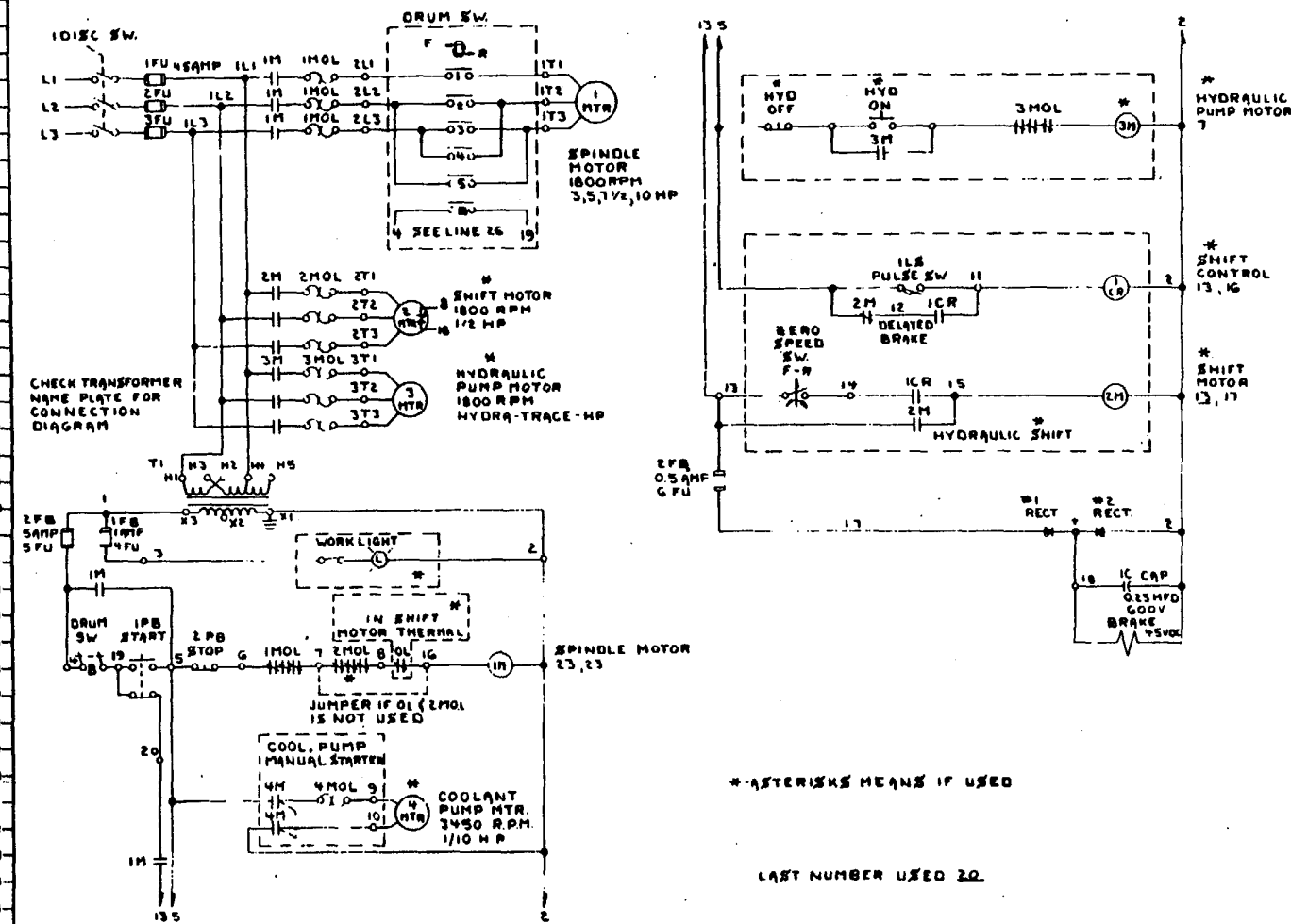
Carriage Front Gib Adjustment (Fig. 24)

There are two gibs located at both sides of the carriage front. Screws (B) hold the gib bracket to the carriage from underneath. The gib adjusting screws (C) are found at the front edge of the carriage. When adjusting the front carriage gibs:

1. Loosen two gib bracket screws (B).
2. Adjust gib adjusting screws until there is a slight drag when the carriage is moved along the bed.
3. Repeat with the other front gib.



EE3071-01



- SEQUENCE OF OPERATION**
1. MOVE SPINDLE CONTROL HANDLE TO (BRAKE) CENTER POSITION
 2. PRESS START PUSHBUTTON, WHICH ENERGIZES "1M"
 3. MOVE SPINDLE CONTROL HANDLE TO THE EXTREME "UP" POSITION, WHICH CLOSSES CONTACTS, 21, 21 AND 25 ON DRUM SWITCH, STARTING MOTOR AND SPINDLE IN FORWARD.
 4. MOVE SPINDLE CONTROL HANDLE TO THE EXTREME "DOWN" POSITION, WHICH CLOSSES CONTACTS 21, 22 AND 27 ON DRUM SWITCH, STARTING MOTOR AND SPINDLE IN REVERSE.
- HYDRAULIC SHIFT**
- TURNING DIAL CLOSER PULSE SW. "1LS" MOMENTARILY ENERGIZES "1CR". MOVING SPINDLE CONTROL HANDLE TO CENTER POSITION CLOSSES CONTACT "2" ON DRUM SWITCH, ENERGIZING BRAKE AND STOPPING SPINDLE AND MOTOR. ZERO SPEED SWITCH CLOSURE, ENERGIZES 2M, STARTS SHIFT MOTOR AND RE-ENERGIZES "1CR".

*-ASTERISKS MEANS IF USED

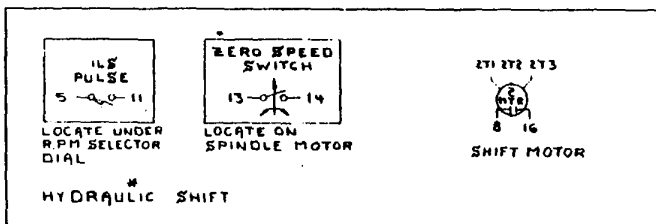
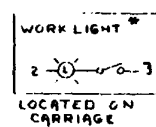
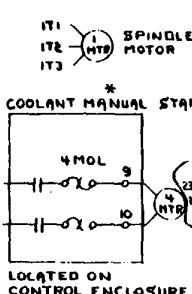
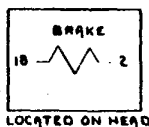
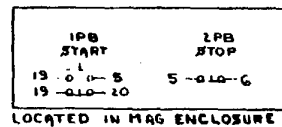
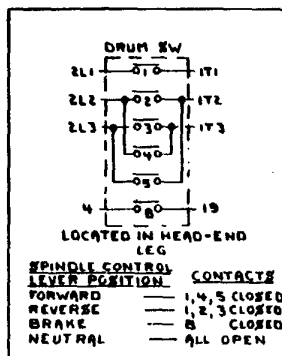
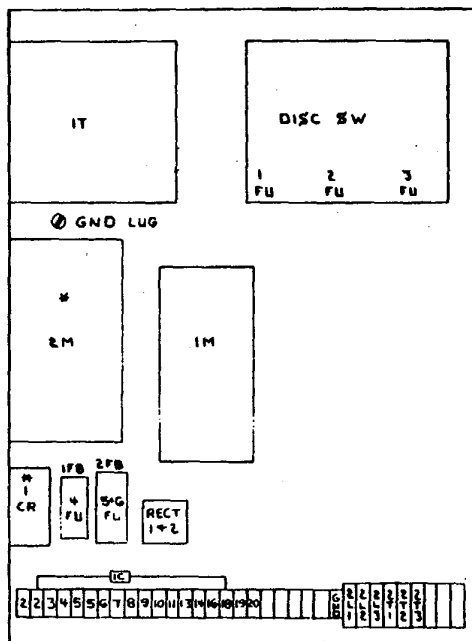
LAST NUMBER USED 20.

1LS-CLOSED MOMENTARILY WHEN A SPINDLE SPEED IS SELECTED BY TURNING DIAL

DRUM SW. CONTACTS "B" CLOSED IN BRAKE POSITION ONLY.

ZERO SPD. SW. IS OPEN WHEN THE SPINDLE MOTOR IS RUNNING, CLOSED WHEN STOPPED.

EE 3071-01



SYMBOL	QTY	DESCRIPTION	MFR	MFR NO	LEBNO
1	1	BARRIER PLATE	AB	1492-N18	E04144-00
1	1	TRANSFORMER	WEST	1FD 988	E03462-00
3	3	FUSE	BUSSE	FMS-4B	E07949-00
1	1	AUX. CONTACTS	WEST.	LSG	E03566-00
1	1	PUSH BUTTON-BLACK	WEST	ST 50	E10017-00
1	1	PUSH BUTTON-BLACK	WEST	ST 2 818	E08670-00
1	1	NAME PLATE	"START"	07E210	E02871-00
1	1	PUSH BUTTON-RED	WEST	07E210	E08671-00
1	1	NAME PLATE	"STOP"	07E210	E08672-00
1	1	ENCLOSURE	21"X14"X7"		E08689-00
24	24	TERMINAL BLOCK	A-B	1492-C4775	E01637-00
1	1	NYG STRIP	A-B	1492-N11	E01659-00
1	1	PANEL	20"X13"		E08660-00
9	9	TERMINAL BLOCK	A-B	1492-F1109	E03466-00
1	1	BARRIER PLATE	A-B	1492-N16	E01658-00
2	2	RETAINING CLIPS	A-B	1492-N17	E01660-00
1	1	CAPACITOR	HALLOW-GEM	4025	E01730-00
1	1	FUSE BLOCK-2P	BUSSE	4522	E01827-00
1	1	FUSE 0.5AMP	BUSSE	MDL-72	E01764-00
1	1	FUSE 5AMP	BUSSE	MDL-5	E01771-00
1	1	FUSE 1AMP	BUSSE	MDL-1	E05857-00
1	1	FUSE BLOCK	BUSSE	4467	E01821-00
2	2	RECTIFIER	SAWYER-TRAMM	20080	E01810-00
1	1	TRANSFORMER	WEST	1F0898	E01044-00
1	1	TRANSFORMER	WEST	1F1033	E05283-00
1	1	STARTER N.R. S.E.	WEST	A200MCA06	E03080-00
1	1	GND LUG	BURNDY	KP48C	E01829-00
1	1	DISC SW	HANDLE	478444621	E03881-00
1	1	DISC SW	SHAFY	453078141	E03708-00
1	1	DISC SW	CONNECT SW	311028004	E03768-00
1	1	DISC SW	FUSE CLIP 50A,600V	313030011	E01801-00
1	1	2M	AUX. CONTACT	L-5GG	E08781-00
1	1	2M	STARTER N.R. S.E.00	A200MCA06	E03504-00
1	1	1CR	CONTROL RELAY	BF 20F	E01930-00

*-ASTERISKS MEANS IF USED

INSTRUCTIONS FOR ORDERING PARTS

When ordering repair parts, the following information must be given for best service:

1. Serial number of the lathe. This can be found on the front flat at the tailstock end of the bed.
2. The name of the part, the key number of the part, and the page number on which the part appears in the block.

In the Repair Parts Section the 13C3 lathe is taken as the basic machine in working up the lists. Therefore, some parts on lathe of other sizes will not be identical with the illustrations.

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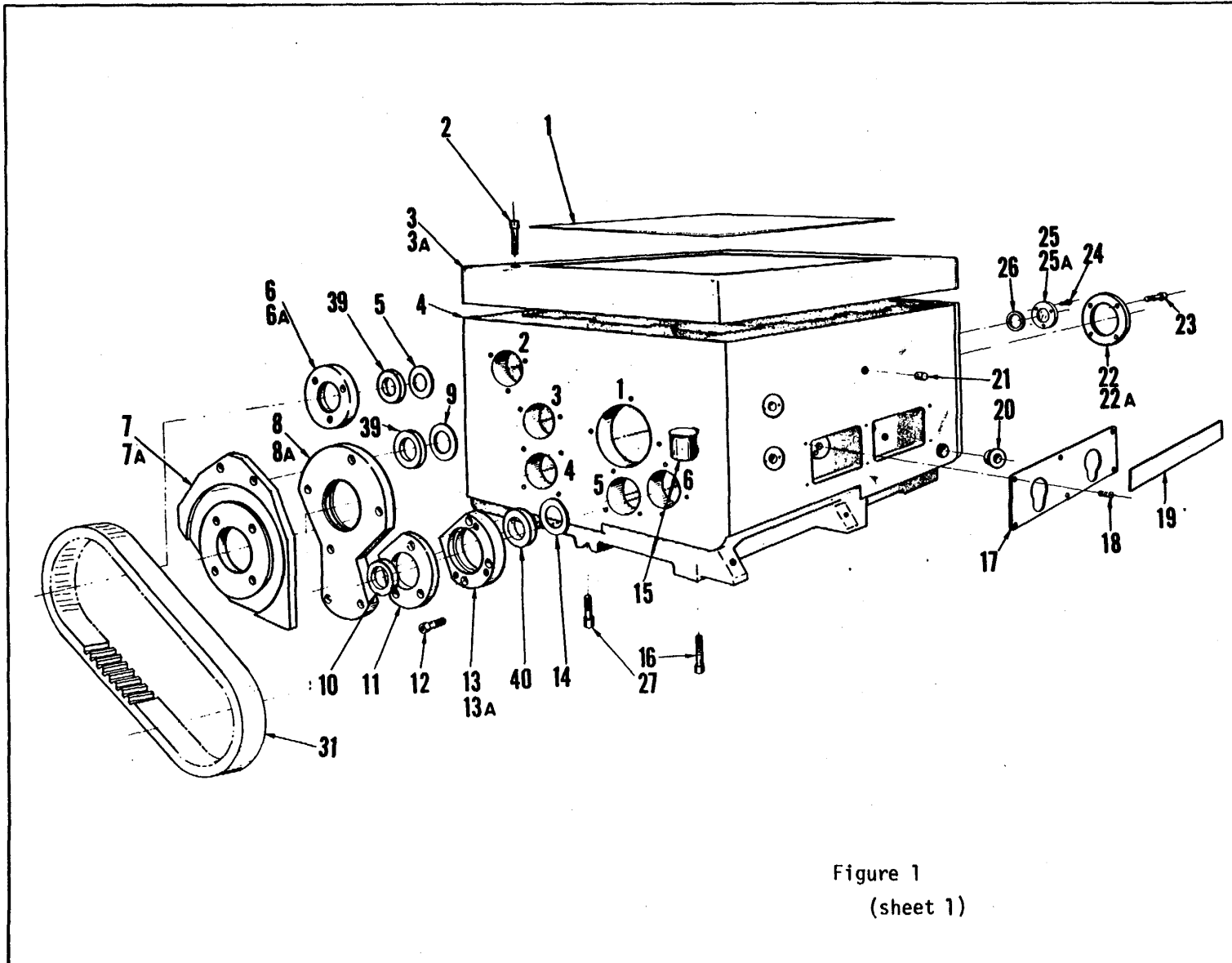
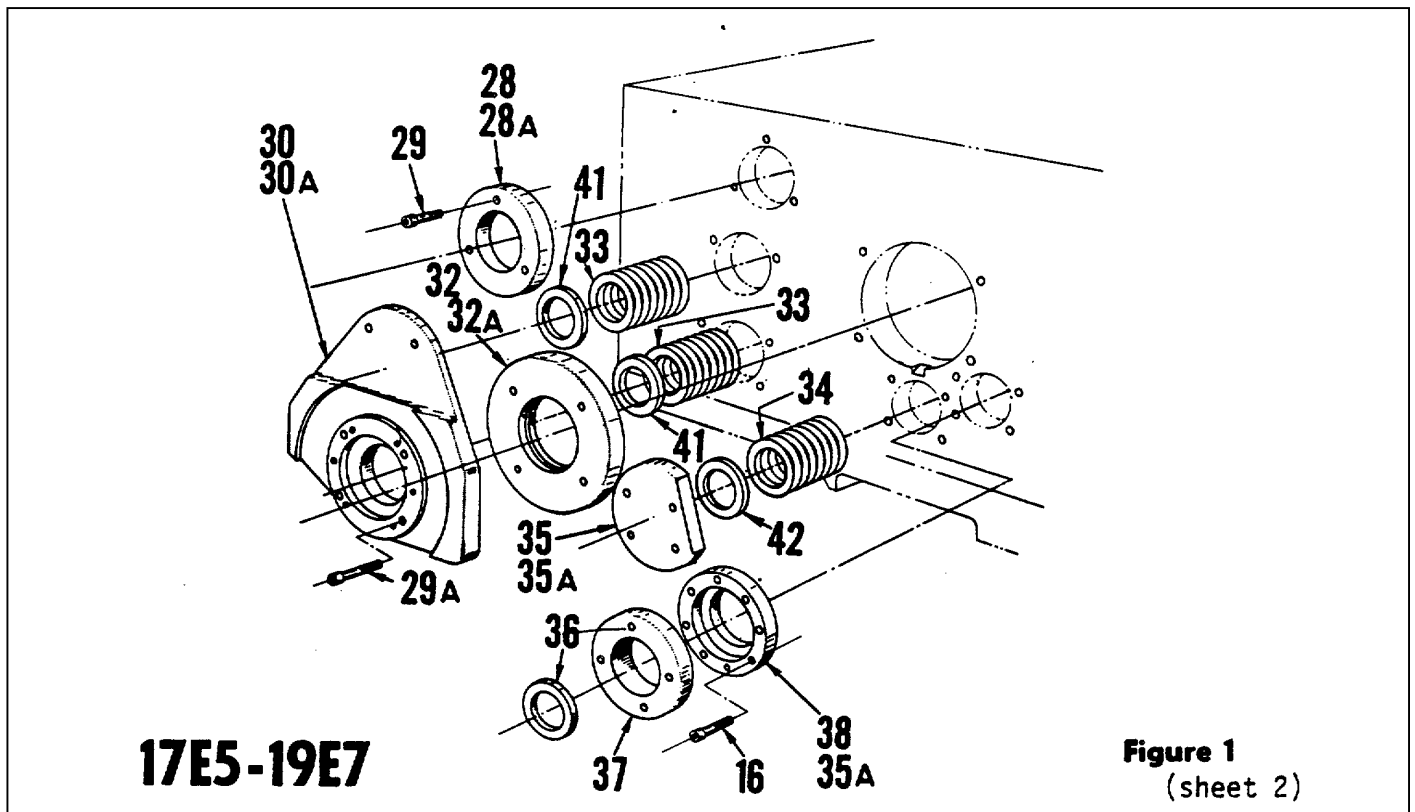


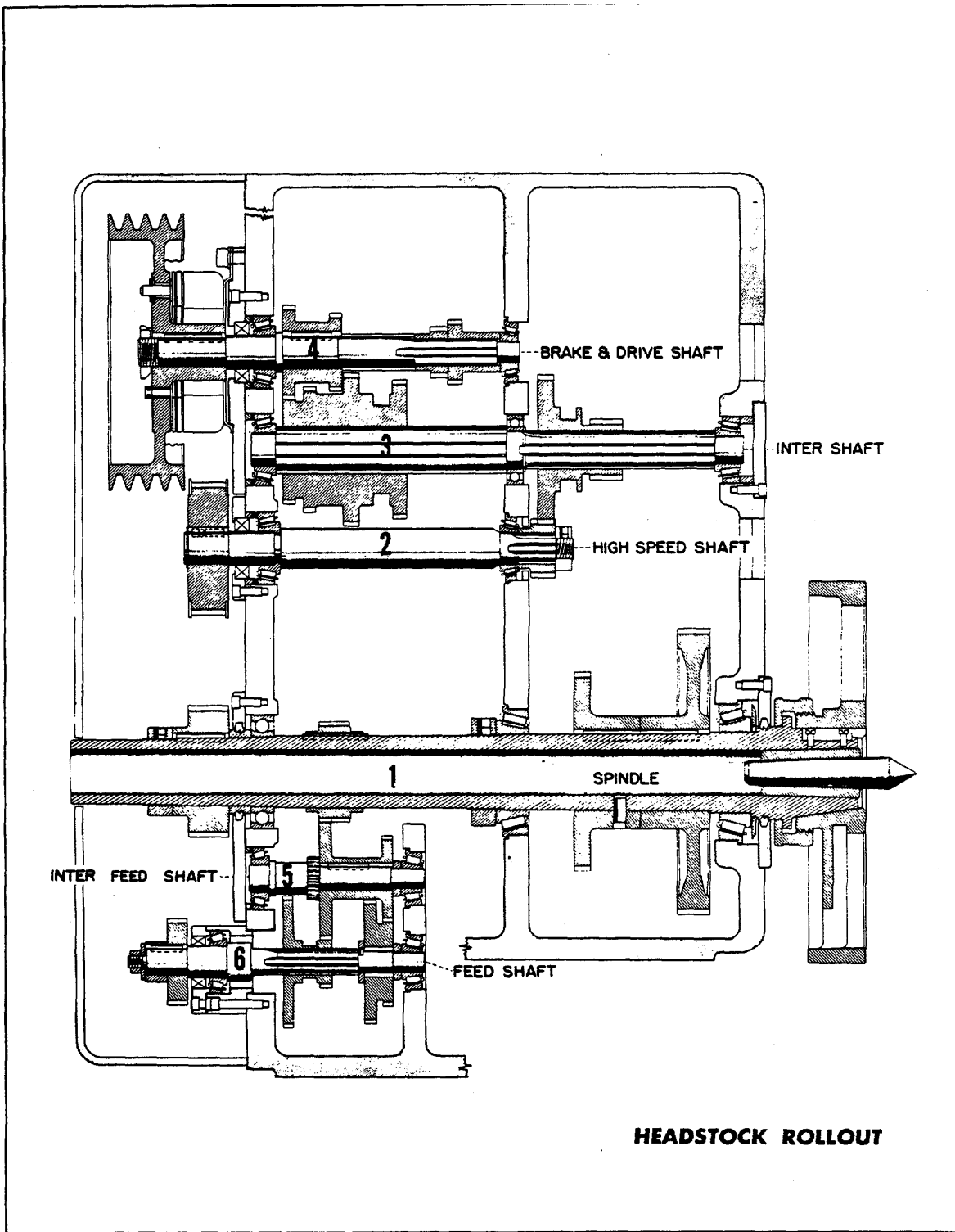
Figure 1
(sheet 1)



HEADSTOCK CASTING

Key No.	Part Name	Qty.	Key No.	Part Name	Qty.
1- 1	Mat, Head Cover	1	1-22	Flange, Spindle Front	1
1- 2	Screw, Socket Head	8	1-22A	Gasket, Spindle Front Flange	1
1- 3	Cover, Head Top	1	1-23	Screw, Socket Head	4
1- 3A	Gasket, Head Cover	1	1-24	Screw, Socket Head	3
1- 4	Head	1	1-25	Plug, Inter. Shaft Front	1
1- 5 *	Collar, High Speed Shaft Matching	1	1-25A	Gasket, Inter. Shaft Front	1
1- 6 *	Flange, High Speed Shaft Rear	1	1-26	Spacer, Inter. Shaft	1
1- 6A *	Gasket, High Speed Shaft Flange	1	1-27	Screw	2
1- 7 *	Flange, Drive Shaft	1	1-28	Flange, High Speed Shaft Rear	1
1- 7A *	Gasket, Drive Shaft Flange	1	1-28A	Gasket, High Speed Shaft Flange	1
1- 8 *	Flange, Spindle Rear	1	1-29	Screw, Socket Head	2
1- 8A *	Gasket, Spindle Rear Flange	1	1-30	Flange, Drive Shaft	1
1- 9 *	Collar, Drive Shaft Matching	2	1-30A	Gasket, Drive Shaft	1
1-10 *	Seal, Victoprene Oil	1	1-31	Belt, Timing	1
1-11 *	Cap, Fd. Shaft Brg. Sleeve	1	1-32	Flange, Rear Spindle	1
1-12 *	Screw, Socket Head	3	1-32A	Gasket, Spindle Rear Flange	1
1-13 *	Sleeve, Fd. Shaft Brg	1	1-33	Shim, Drive Shaft Matching	16
1-13A *	Gasket, Fd. Shaft Brg. Sleeve	1	1-34	Shim, Inter. Feed Shaft Match	8
1-14 *	Collar, Interfd. Shaft Matching	1	1-35	Cover, Inter. Feed Shaft Brg	1
1-15	Oiler	1	1-35A	Gasket, Feed Shaft Sleeve	3
1-16	Screw	2	1-36	Seal, Victoprene Oil	1
1-17	Cover, Head Front	1	1-37	Cap, Feed Shaft Brg. Sleeve	1
1-18	Screw, Button Hd. Soc. Type	6	1-38	Sleeve, Feed Shaft Bearing	1
1-19	Plate, Spindle Speed (Specify Speed	1	1-39 *	Spacer	2
	Range)	1	1-40 *	Spacer	1
1-20	Window Unit, Bijur Oil Level Type	1	1-41	Spacer	2
1-21	Plug, C.I.	1	1-42	Spacer	1

* Not applicable to 19-inch lathe.



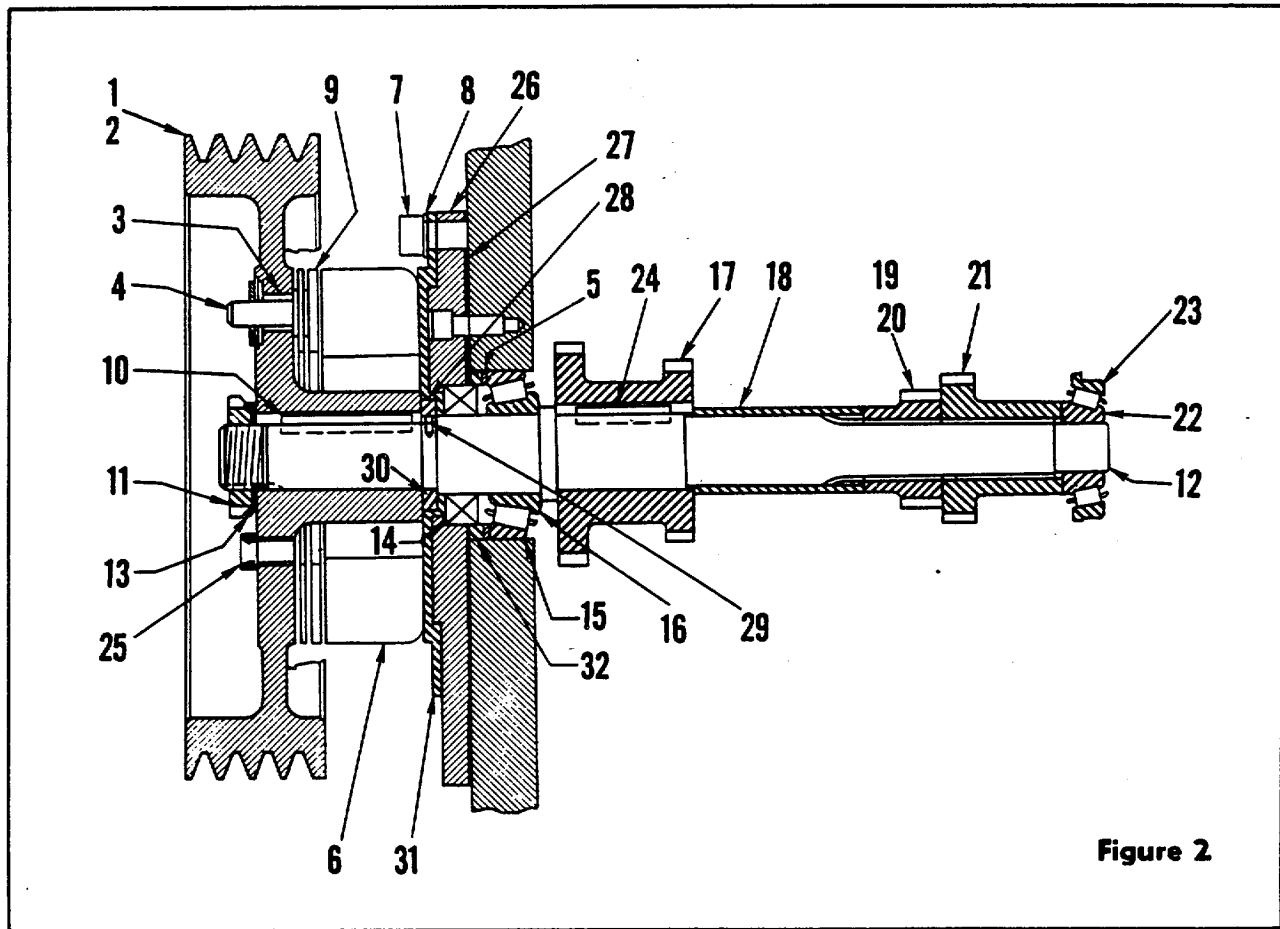


Figure 2

BRAKE & DRIVE SHAFT

Key No.	Part Name	Qty.	Key No.	Part Name	Qty.
2-1	Pulley, Drive	1	2-16	Cone, Bearing #2	1
2-2	Brake, Dyna-Torque	1	2-17	Gear, Drive Shaft Large	1
	Electric, Outside Mounting	1	2-18	Collar, Drive Shaft Spacing	1
2-3	Ollite Bushing	3	2-19	Gear, Drive Shaft Small	1
2-4	Dyna-Torque Accessory Group Including Drive Pins	1	2-20	Key, Flat	1
2-5	Spacer, Bearing	1	2-21	Gear, Drive Shaft Inter	1
2-6	Magnet, 90 Volt	1	2-22	Cone, Bearing #2	1
2-7	Screw	4	2-23	Cup, Bearing #2	1
2-8	Washer	4	2-24	Key, Flat	1
2-9	Armature	1	2-25	Screw	3
2-10	Key, Flat	1	2-26	Flange	1
2-11	Nut, Lock	1	2-27	Gasket	1
2-12	Shaft, Drive	1	2-28	Collar	1
2-13	Washer, Lock	1	2-29	Pin	1
2-14	Seal, Victoprene Oil	1	2-30	Sleeve	1
2-15	Cup, Bearing #2	1	2-31	Mounting Plate	1
			2-32	Spacer	1

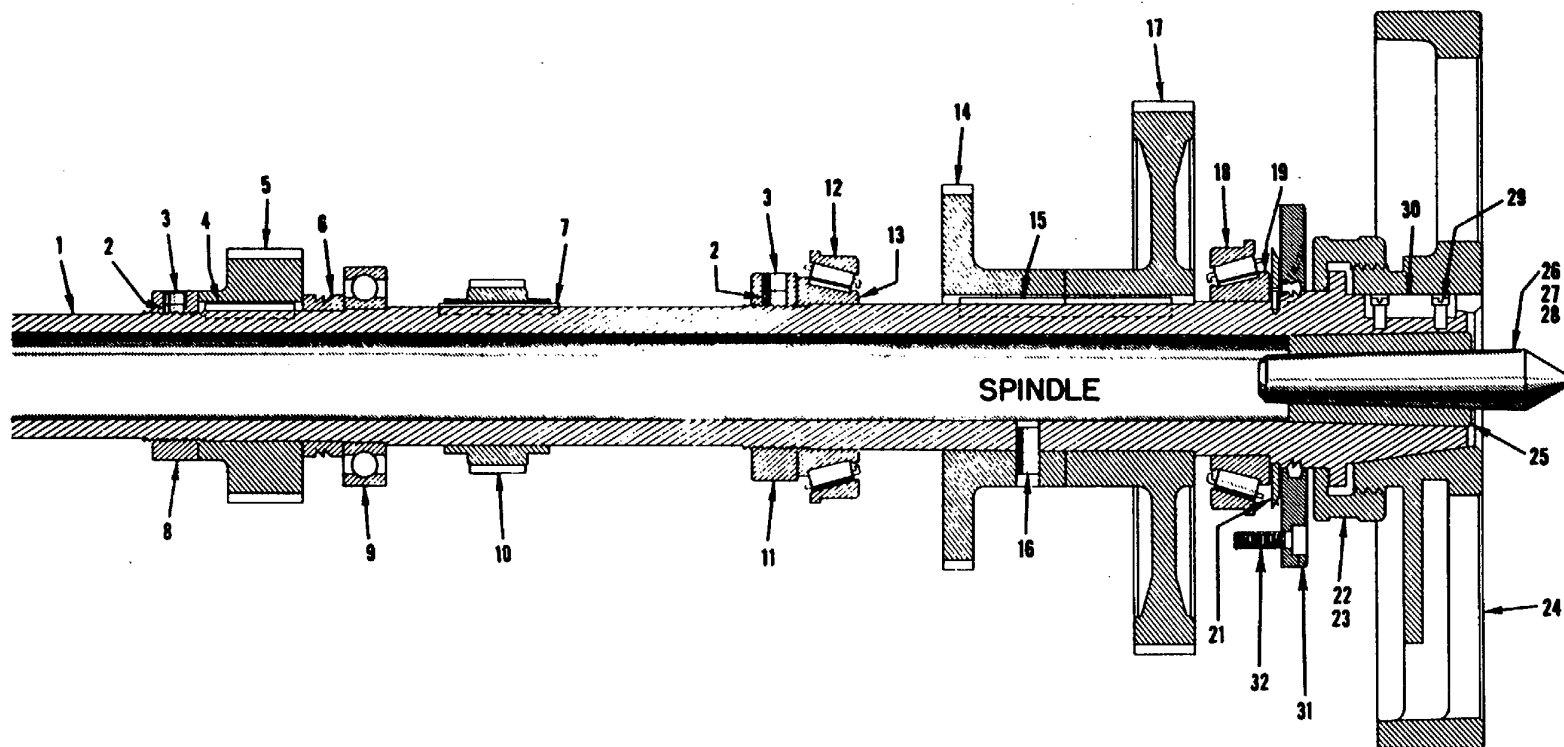


Figure 3

SPINDLE

Key No.	Part Name	Qty.	Key No.	Part Name	Qty.
3- 1	Spindle	1	3-21	Slinger, Spindle Oil	1
3- 2	Plug	2	3-22	Nut, Draw	1
3- 3	Screw, Set	2	3-23	Wrench, Spanner (for Draw Nut)	1
3- 4	Key, Flat	1	3-24	Plate, Small Face	1
3- 5	Pulley, High Speed Spindle	1		Plate, Large Face 12" Diam.....	1
3- 6	Collar, Spindle Thrust.....	1		14" Diam.....	1
3- 7	Key, Flat	1		Plate, Large Chuck 7" Diam.....	1
3- 8	Nut, Lock	1		Plate, Extra Large Chuck 10-1/4" Diam	1
3- 9	Bearing, MRC Ball.....	1		Plate, Large Chuck 8" Diam.....	1
3-10	Gear, Spindle Feed Reverse	1		Plate, Medium Chuck 6" Diam	1
3-11	Nut, Lock	1		Plate, Small Face	1
3-12	Cup, Bearing #3	1		Plate, Large Face 16" Diam.....	1
3-13	Cone, Bearing #3	1		18" Diam.....	1
3-14	Gear, Spindle	1	3-25	Plate, Small Chuck 6" Diam	1
3-15	Key, Flat	1	3-26	Plate, Medium Chuck 7" Diam	1
3-16	Pin, Straight	1	3-27	Plate, Extra Large Chuck 11-1/2" Diam	1
3-17	Gear, Spindle Face	1		13-1/4" Diam	1
3-18	Cup, Bearing #3	1		Plate, Large Chuck 8" Diam.....	1
3-19	Cone, Bearing #3	1		9" Diam.....	1
			3-25	Bush, Spindle Center	1
			3-26	Center, Spindle	1
			3-27	Center, Spindle Half.....	1
			3-28	Rod, Center Knockout.....	1
			3-29	Screw, Fillister Head	2
			3-30	Key, Spindle Nose	1
			3-31	Flange.....	1
			3-32	Screw.....	4

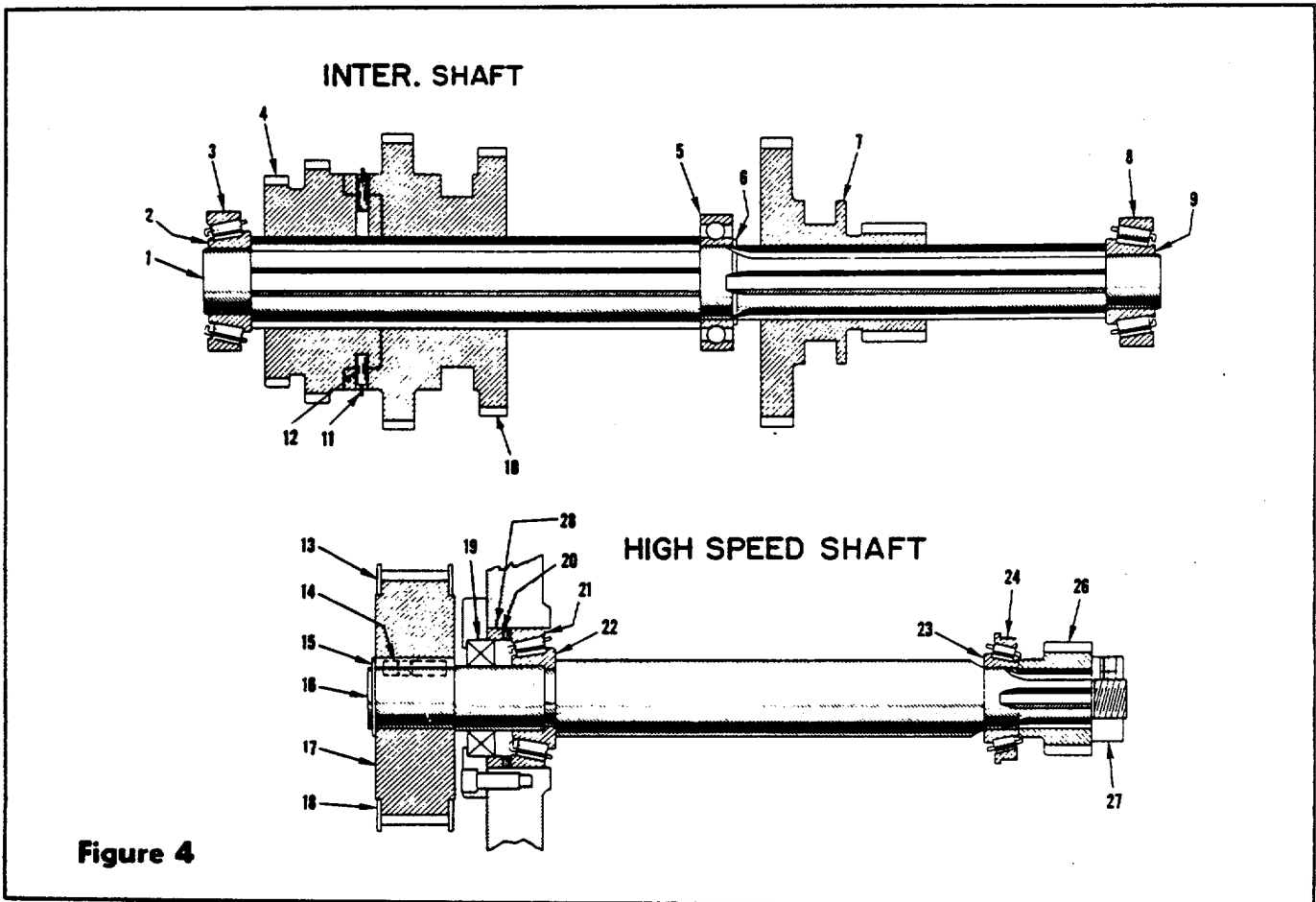
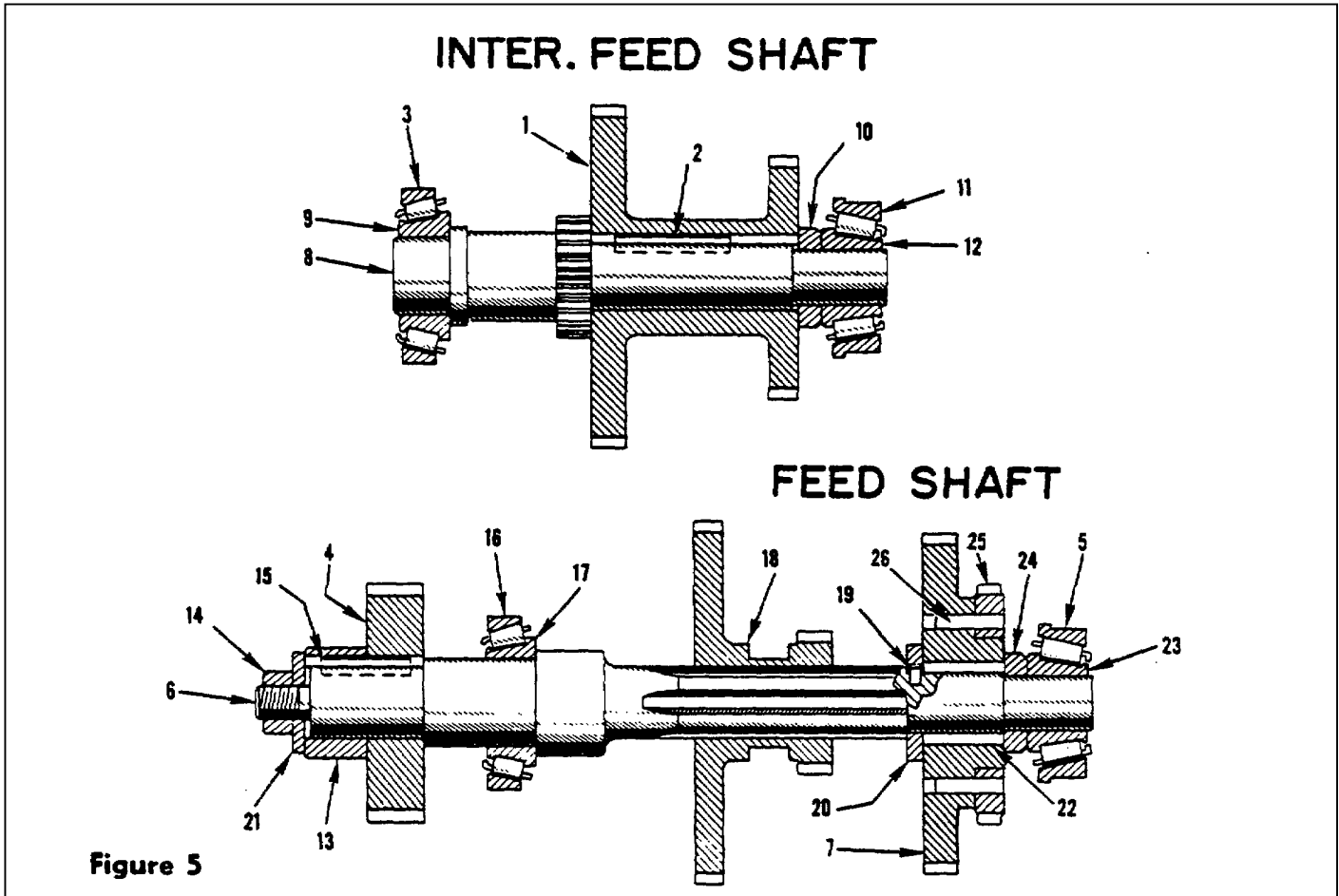


Figure 4

INTERMEDIATE SHAFT-HIGH SPEED SHAFT

Key No.	Part Name	Qty.	Key No.	Part Name	Qty.
4-1	Shaft, Intermediate	1	4-15	Ring, Truarc	1
4-2	Cone, Bearing #2	1	4-16	Shaft, High Speed	1
4-3	Cup, Bearing #2	1	4-17	Pulley, High Speed Shaft	1
4-4	Gear, Intermediate Shaft Cluster	1	4-18	Screw, Flat Head Socket	8
4-5	Bearing, MRC Ball	1	4-19	Seal, Victoprene Oil	1
4-6	Ring, Truarc	1	4-20	Shim, High Speed Shaft Matching	1
4-7	Gear, Intermediate	1	4-21	Cup, Bearing #2	1
4-8	Cup, Bearing #2	1	4-22	Cone, Bearing #2	1
4-9	Cone, Bearing #2	1	4-23	Cone, Bearing #2	1
4-10	Gear	1	4-24	Cup, Bearing #2	1
4-11	Ring, Snap	1			
4-12	Pin	2	4-26	Pinion, High Speed Shaft	1
4-13	Flange, High Speed Shaft Pulley	2	4-27	Nut, Lock	1
4-14	Key, Flat	1	4-28	Spacer	1



INTERMEDIATE FEED SHAFT- FEED SHAFT

Key No.	Part Name	Qty.	Key No.	Part Name	Qty.
5-1	Gear, Intermediate Feed Shaft	1	5-14	Nut. Hex	1
5-2	Key, Flat	1	5-15	Key. Flat.....	1
5-3	Cup, Bearing #2	1	5-16	Cup Bearing #2.....	1
5-4	Gear, Feed Change	1	5-17	Cone Bearing #2.....	1
5-5	Cup, Bearing *2.....	1	5-18	Gear. Feed Shaft Sliding	1
5-6	Shaft, Feed.....	1	5-19	Pin. Straight.	1
5-7	Gear, Feed Reverse Idler	1	5-20	Collar, Feed Reverse Idler Gear	1
5-8	Shaft, Intermediate Feed	1		Collar. Thrust	1
5-9	Cone, Bearing #2.....	1	5-21	Washer, Spec	1
			5-22	Bush, Feed Reverse Idler Gear	1
5-10	Collar, Spacing	1			
	Collar, Thrust.....	1	5-23	Cone, Bearing #2.....	1
5-11	Cup, Bearing #2.....	1	5-24	Collar. Spacing	1
5-12	Cone, Bearing #2.....	1	5-25	Gear.....	1
5-13	Collar, Feed Shaft Change Gear	1	5-26	Pin.....	2

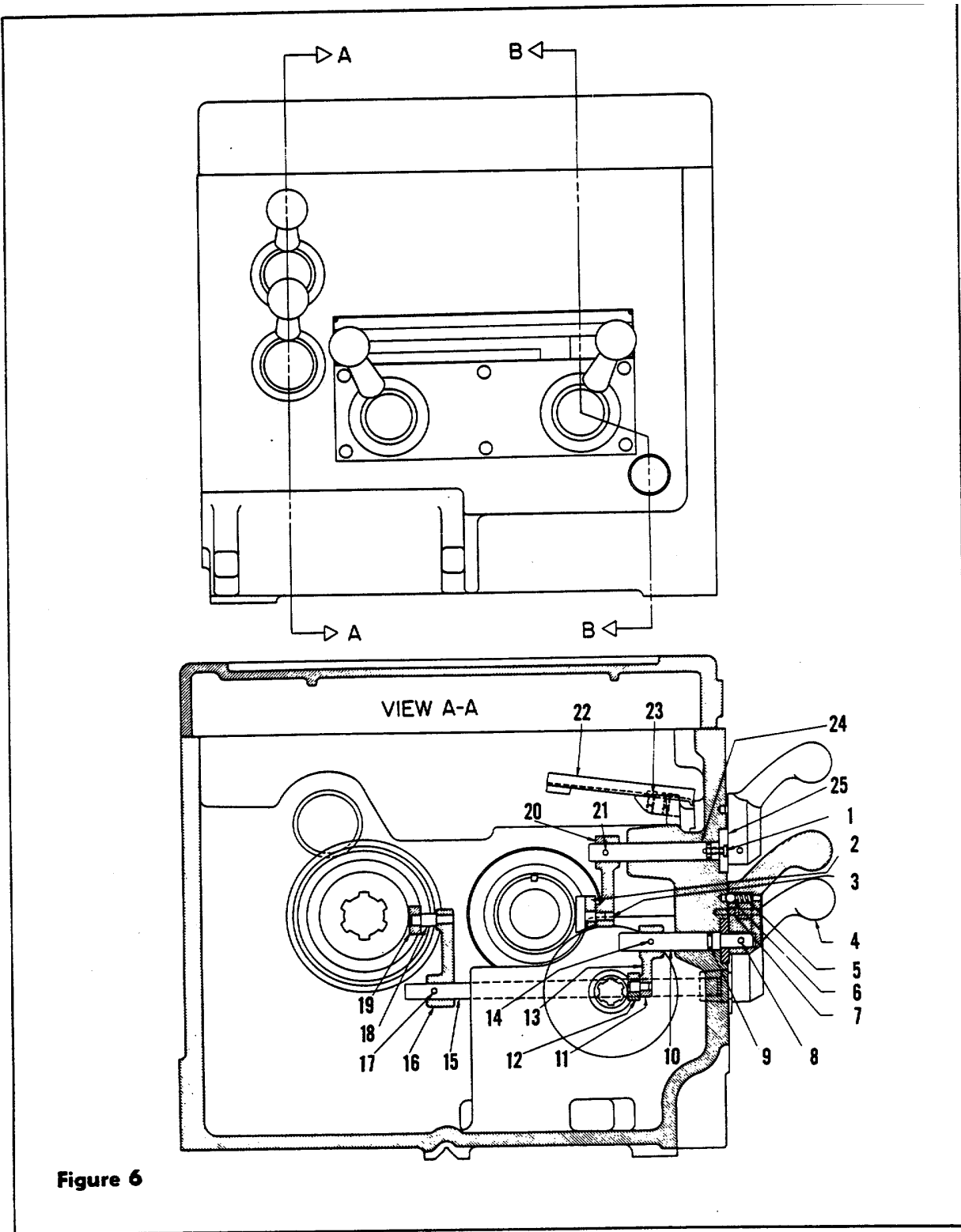
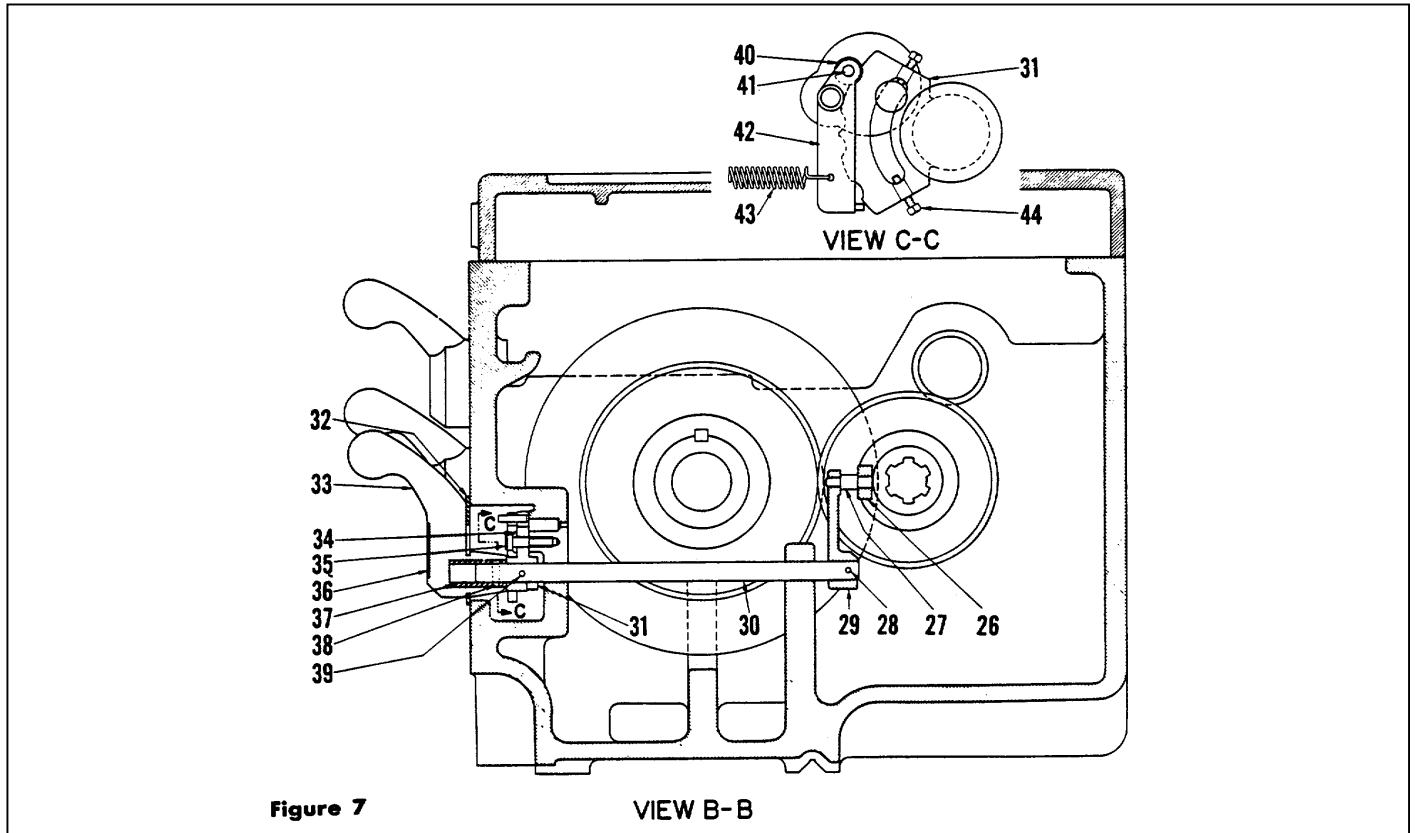


Figure 6



HEADSTOCK SHIFTER SECTIONS

Key No.	Part Name	Qty.	Key No.	Part Name	Qty.
6- 1	Screw, Phillips Head.....	4	6-23	Screw, Machine	2
6- 2	Shoe, Shifter.....	1	6-24	Shaft, Fd. Rev. Gear Shifter	1
6- 3	Pin, Shoulder	1	6-25	Collar, Shifter Retainer	1
6- 4	Handle, Shifter	2	7-26	Shoe, Shifter Lever	1
6- 5	Spring, Detent.....	2	7-27	Pin, Shifter	1
6- 6	Ball	2	7-28	Pin, Taper Draw	1
6- 7	Pin	4	7-29	Lever, Shifter	1
6- 8	Pin, Taper	2	7-30	Shaft, Inter. Shaft Slid. Back Gear Shift.....	1
6- 9	Ring, O	2	7-31	Shifter, Ret. Yoke.....	2
6-10	Shaft, Feed Comp. Shifter	1	7-32	Cover. Head Front	1
6-11	Pin, Shoulder	1	7-33	Handle. Shifter	2
6-12	Shoe, Shifter Lever.....	1	7-34	Washer, Nylon	2
6-13	Lever, Shifter	1	7-35	Screw.....	2
6-14	Pin, Taper	1	7-36	Plate, Shift Handle	2
6-15	Shaft, Inter. Shaft Slid. Cluster Gear Shifter	1	7-37	Collar	2
6-16	Lever, Shifter	1	7-38	Pin, Taper	2
6-17	Pin, Taper Draw.....	1	7-39	Pin, Taper	2
6-18	Pin, Shifter	1	7-40	Roller, Det.....	2
6-19	Shoe, Shifter Lever.....	1	7-41	Pin.....	2
6-20	Lever, Shifter	1	7-42	Arm	2
6-21	Pin, Taper	1	7-43	Spring	1
6-22	Scoop, Face Gear Oil	1	7-44	Screw.....	2

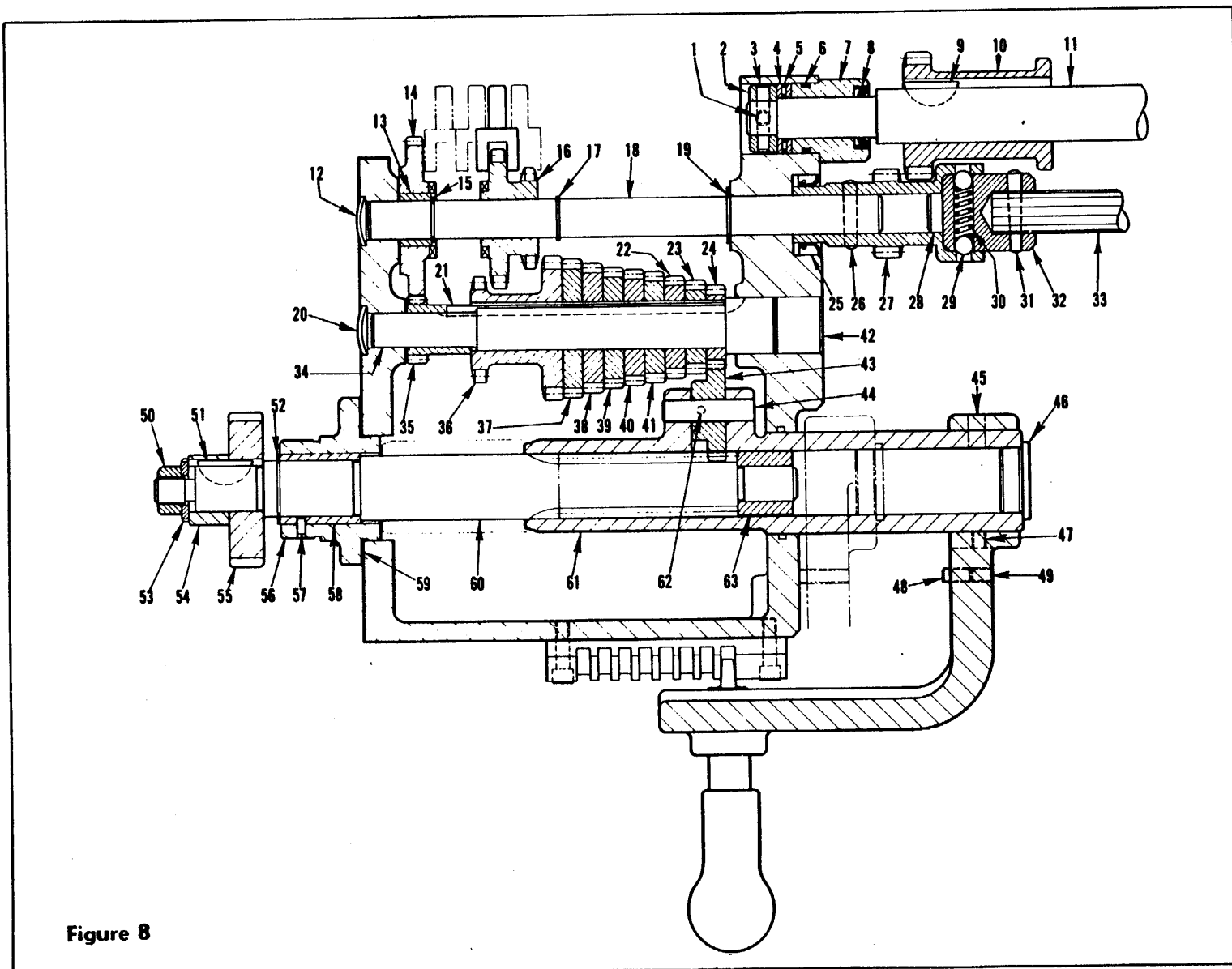
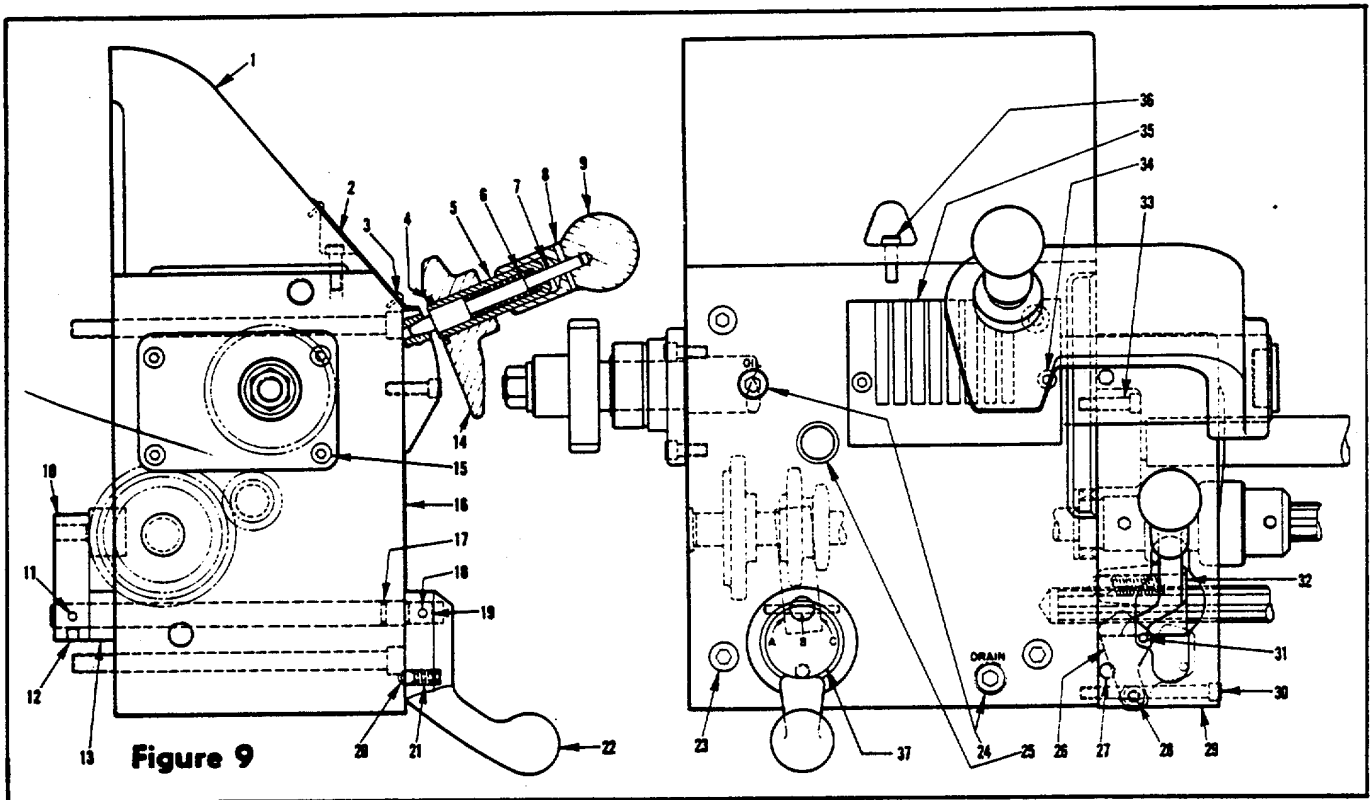


Figure 8

QUICK CHANGE BOX

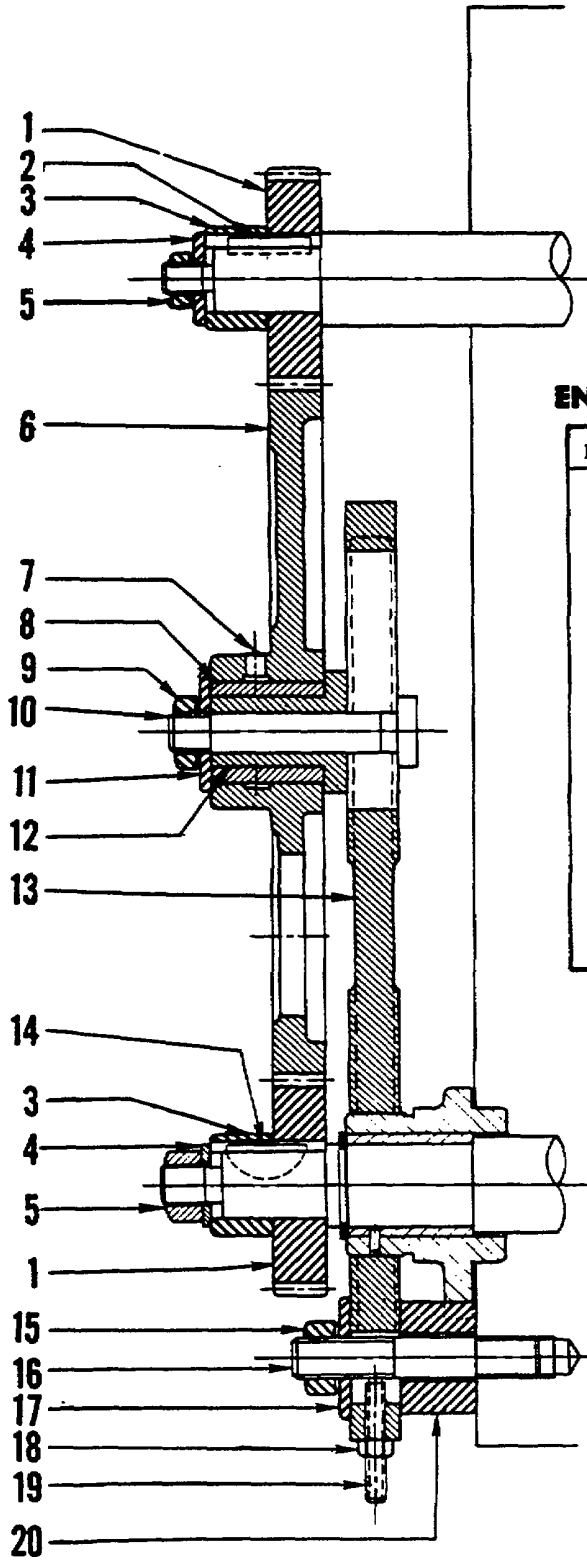
Feed Shaft - Feed Rod - Lead Screw Intermediate Shaft - Cone Shaft

Key No.	Part Name	Qty.	Key No.	Part Name	Qty.
8- 1	Screw - Set.....	1	8-33	Feed Rod	1
8- 2	Collar	1	8-34	Cone Shaft	1
8- 3	Pin, Taper	1	8-35	15T. Gear	1
8- 4	Bearing Race.....	2	8-36	15T., 21T. Gear.....	1
8- 5	Bearing	1	8-37	28T. Cone Gear	1
8- 6	O Ring	1	8-38	26T. Cone Gear	1
8- 7	Bushing, Lead Screw	1	8-39	24T. Cone Gear	1
8- 8	Seal	1	8-40	23T. Cone Gear	1
8- 9	Key	1	8-41	22T. Cone Gear	1
8-10	Pinion, Lead Screw	1	8-42	Plug.....	1
8-11	Lead Screw	1	8-43	Tumbler Gear.....	1
8-12	Plug, Expansion	1	8-44	Shaft, Tumbler Gear	1
8-13	Bushing, Clutch Gear	1	8-45	Pill.....	1
8-14	Gear. Clutch	1	8-46	Plug, Flange.....	1
8-15	Ring, Retaining.....	1	8-47	Screw, Set.....	1
8-16	Gear	1	8-48	Screw. Set.....	1
8-17	Ring. Retaining.....	1	H-49	Screw, Set.....	1
8-18	Feed Shaft.....	1	8-50	Nut	1
8-19	Ring. Retaining.....	1	8-51	Key.....	1
8-20	Plug. Expansion	1	8-52	Ring, Retaining	1
8-21	Key, Cone Gear.....	1	8-53	Washer	1
8-22	20T. Cone Gear.....	1	8-54	Collar.....	1
8-23	18T. Cone Gear.....	1	8-55	36T. Gear.....	1
8-24	16T. Cone Gear.....	1	8-56	Bushing, Box.....	1
8-25	Seal	1	8-57	Pin.....	1
8-26	Pill,.....	1	8-58	Bearing, Plain.....	1
8-27	Gear. Safety Clutch	1	8-59	Gasket.....	1
8-28	Plug.	1	8-60	Drive Gear.....	1
8-29	Ball	2	8-61	Yoke.....	1
8-30	Spring.....	1	8-62	Pin, Taper	1
8-31	Pin, Taper.....	1	8-63	Bushing	1
8-32	Collar. Safety Clutch.....	1			



QUICK CHANGE BOX CASTING

Key No.	Part Name	Qty.	Key No.	Part Name	Qty.
9- 1	Cover, Quick Change Box Top	1	9-20	Ball.....	1
9- 2	Index Plate.....	1	9-21	Spring	1
9- 3	Pin	4	9-22	Handle, Shifter	1
9- 4	Ring, Retaining	1	9-23	Screw.....	4
9- 5	Sleeve.....	1	9-24	Pipe Plug	2
9- 6	Spring	1	9-25	Window, Oil Sight	1
9- 7	Plunger, Index	1	9-26	Latch, Safety.....	1
9- 8	Pin, Taper	1	9-27	Pin.....	2
9- 9	Handle, Shifter.....	1	9-28	Screw.....	1
9-10	Arm, Shifter.....	1	9-29	Cover, Slip Gear	1
9-11	Pin, Taper	1	9-30	Screw.....	2
9-12	Screw, Set	1	9-31	Pin.....	1
9-13	Spacer	1	9-32	Handle, Spindle Control	1
9-14	Arm, Shifter.....	1	9-33	Screw.....	2
9-15	Screw.....	4	9-34	Screw.....	2
9-16	Quick Change Box.....	1	9-35	Block, Tumbler Lock	1
9-17	O Ring	1	9-36	Screw.....	1
9-18	Pin, Taper	1	9-37	Plate, Feed Comp.....	1
9-19	Shaft, Shifter.....	1			



END GEARING AND QUADRANT ASSEMBLY

Key No.	Part Name	Qty.
10- 1	Gear, Feed Change.	1
10- 2	Key	1
10- 3	Collar, Feed Shaft Change Gear	1
10- 4	Washer, Spec.	1
10- 5	Nut, Hex	1
10- 6	Gear, Quadrant 120 Teeth (Specify 12 or 14 Pitch)	1
10- 7	Oiler	1
10- 8	Bushing, Oilite	1
10- 9	Nut	1
10-10	Bolt, Quadrant T-Slot	1
10-11	Washer	1
10-12	Bushing, Quadrant Gear	1
10-13	Quadrant	1
10-14	Key	1
10-15	Nut	3
10-16	Stud	2
10-17	Washer	3
10-18	Nut	1
10-19	Screw, Set	1
10-20	Spacer, Quadrant	2

Figure 10

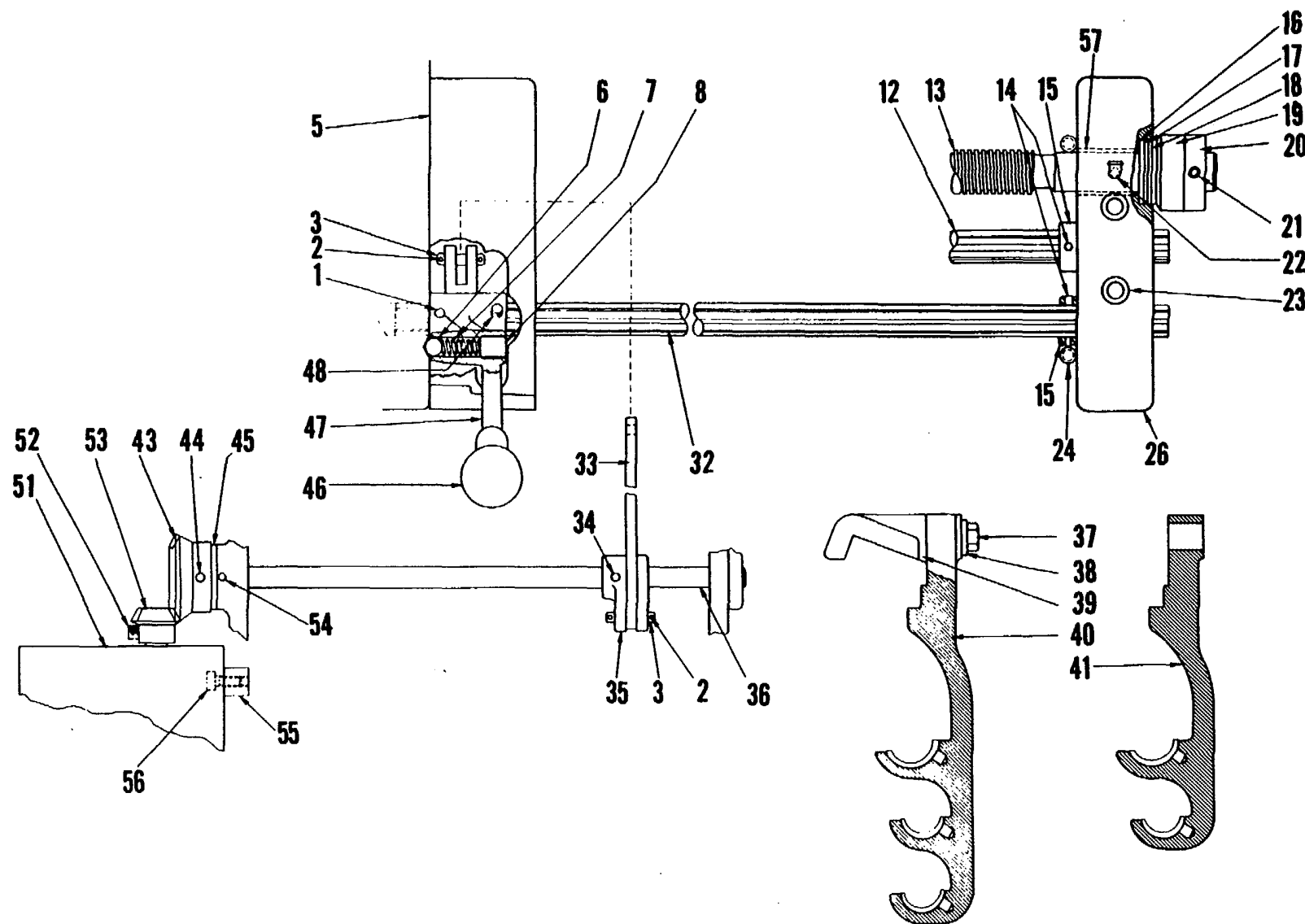


Figure 11

SPINDLE CONTROL

Key No.	Part Name	Qty.	Key No.	Part Name	Qty.
11- 1	Screw, Set	1	11-32	Control Rod.....	1
11- 2	Cotter Pin	4	11-33	Link	1
11- 3	Pin	2	11-34	Taper Pin	1
11- 5	Cover, Slip Gear	1	11-35	Shifter.....	1
11- 6	Ball	1	11-36	Control Rod.....	1
11- 7	Spring.....	1	11-37	Screw	1
11- 8	Set Screw	1	11-38	Washer	1
11-12	Feed Rod.....	1	11-39	Block	1
11-13	Lead Screw	1	11-40	Support	1
11-14	Taper, Pin.....	2	11-41	Support	1
11-15	Collar	2	11-43	Bevel Gear	1
11-16	Bearing Race.....	1	11-44	Taper Pin	1
11-17	Bearing	1	11-45	Washer	1
11-18	Bearing Race.....	1	11-47	Spindle Control Handle	1
11-19	Collar	1	11-48	Draw Pin	1
11-20	Nut.....	1	11-51	Switch	1
11-21	Set Screw	1	11-52	Set Screw.....	1
11-22	Oil Cup	1	11-53	Bevel Gear	1
11-23	Screw	2	11-54	Pin.....	1
11-24	Draw Pin.....	2	11-55	Spacer.....	1
11-26	Back Box	1	11-56	Screw	1
11-30	Snap Ring.....	1	11-57	Bushing	1
11-31	Sleeve	4			

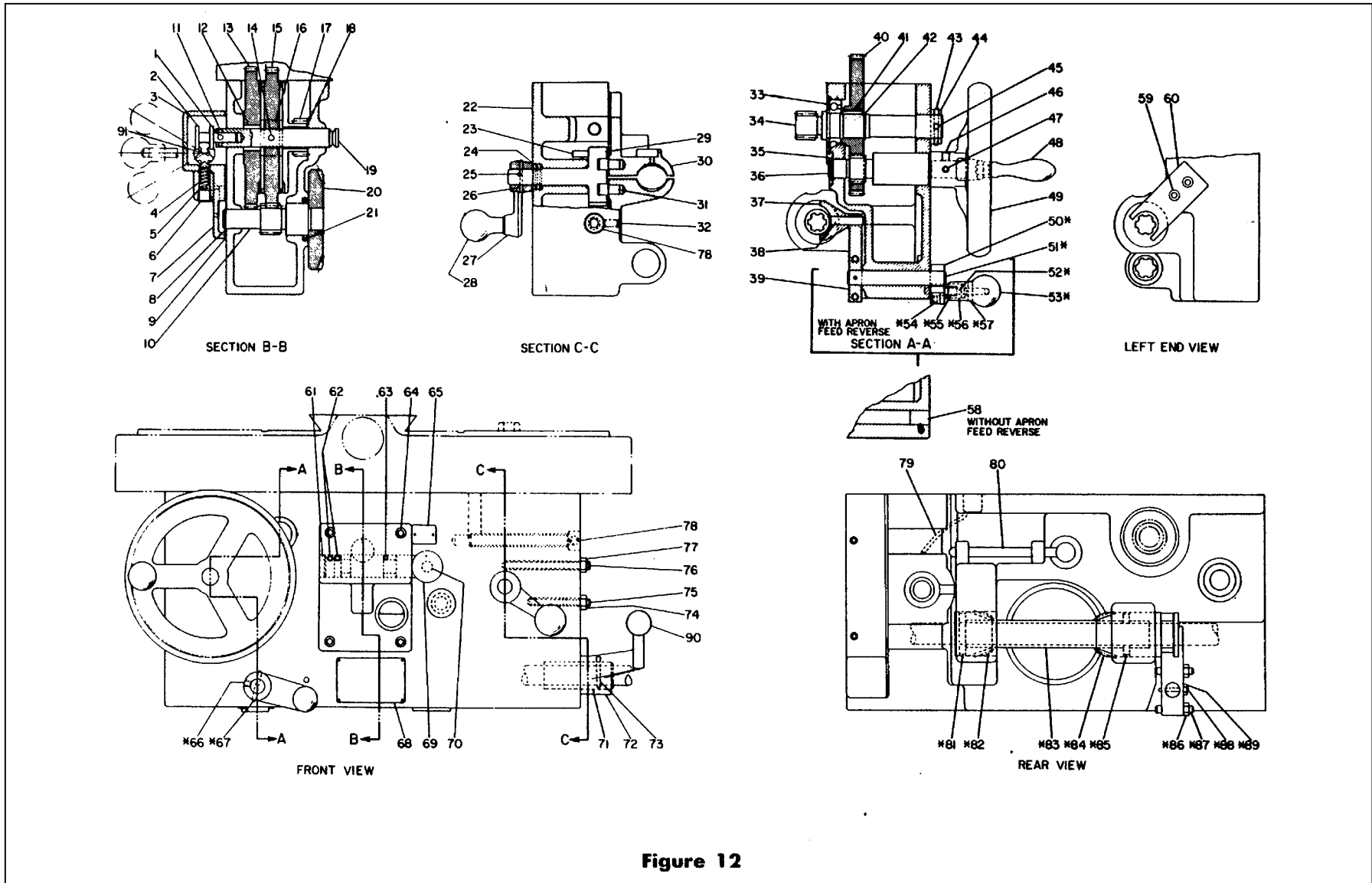


Figure 12

APRON ASSEMBLY

Key No.	Part Name	Qty.	Key No.	Part Name	Qty.	Key No.	Part Name	Qty.
12- 1	Screw.....	1	12-31	Pin.....	2	12-61	Plug.....	1
12- 2	Stud.....	1	12-32	Screw.....	2	12-62	Screw.....	4
12- 3	Housing.....	1	12-33	Bearing- Ball.....	1	12-63	Pin.....	1
12- 4	Plunger.....	1	12-34	Pinion - Rack.....	1	12-64	Screw.....	2
12- 5	Spring.....	1	12-35	Ring - Truarc.....	1	12-65	Plate.....	1
12- 6	Plug.....	1	12-36	Stud- First.....	1	*12-66	Screw.....	1
12- 7	Window.....	1	12-37	Shoe.....	1	*12-67	Pin - Taper.....	1
12- 8	Ring - Truarc.....	1	12-38	Pin.....	1	12-68	Plate.....	1
12- 9	Gasket.....	1	12-39	Lever.....	1	12-69	Knob.....	1
12-10	Shaft.....	1	12-40	Gear.....	1	12-70	Rod.....	1
12-11	Pin, Taper.....	1	12-41	Key.....	1	12-71	Sleeve.....	1
12-12	Bushing.....	1	12-42	Ring - Truarc.....	1	12-72	Handle.....	1
12-13	Gear.....	1	12-43	Pin - Taper.....	1	12-73	Pin - Taper.....	1
12-14	Pin.....	1	12-44	Collar.....	1	12-74	Nut.....	1
12-15	Gear.....	1	12-45	Screw.....	1	12-75	Screw.....	1
12-16	Pin.....	4	12-46	Screw.....	1	12-76	Screw.....	1
12-17	Gear.....	1	12-47	Pin - Taper.....	1	12-77	Nut.....	1
12-11	Bushing.....	1	12-48	Handle.....	1	12-78	Screw.....	2
12-19	Shaft.....	1	12-49	Handwheel.....	1	12-79	Tubing- Copper.....	1
12-20	Gear.....	1	*12-50	Handle.....	1	12-80	Pin - Interference.....	1
12-21	Seal.....	1	*12-51	Shaft.....	1	*12-81	Pin.....	2
12-22	Apron.....	1	*12-52	Plunger.....	1	*12-82	Pinion.....	1
12-23	Pin.....	1	*12-53	Knob.....	1	*12-83	Sleeve.....	1
12-24	Spring.....	1	*12-54	Pin.....	1	*12-84	Pinion - Shifter.....	1
12-25	Screw.....	1	*12-55	Spring.....	1	*12-85	Pin.....	2
12-26	Pin.....	1	*12-56	Sleeve.....	1	*12-86	Nut.....	2
12-27	Handle.....	1	*12-57	Pin - Taper.....	1	*12-87	Screw.....	2
12-28	Knob.....	1	12-58	Plug - Without Feed Reverse.....	1	*12-88	Pin - Draw.....	1
12-29	Cam.....	1	12-59	Screw.....	2	*12-89	Nut.....	1
12-30	Hal Nut.....	1	12-60	Block - Trip.....	1	12-90	Knob.....	1
12-91	Shaft.....	1						

* Used With Apron Feed Reverse Only

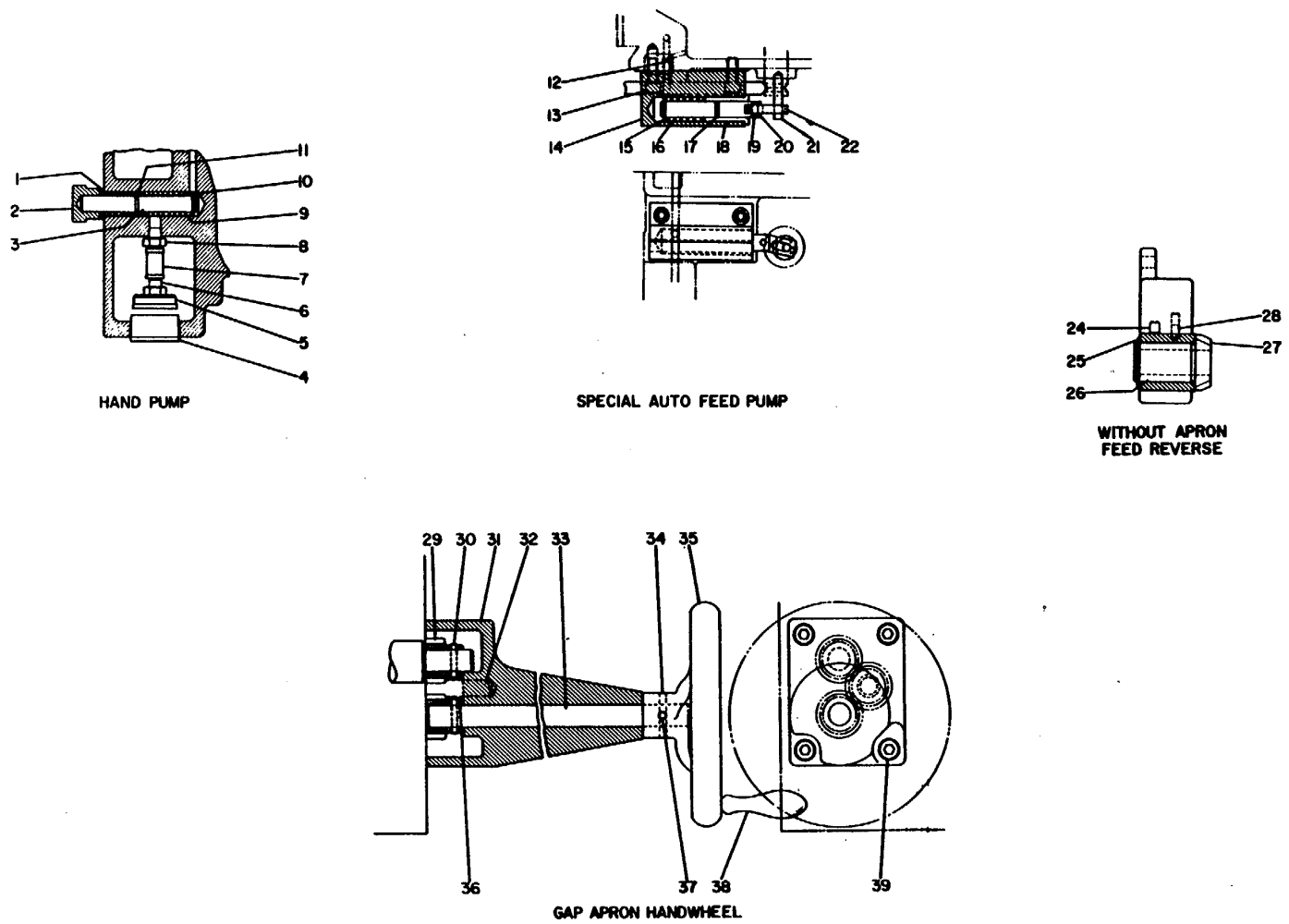


Figure 12A

APRON ASSEMBLY

Key No.	Part Name	Qty.	Key No.	Part Name	Qty.
12A- 1	Bushing	1	12A-21	Pin.....	1
12A- 2	Knob	1	12A-22	Connector	1
12A- 3	Piston	1	12A-24	Screw	1
12A- 4	Plug	1	12A-25	Ring - Truacr	1
12A- 5	Filter	1	12A-26	Bushing - Pinion	1
12A- 6	Nipple	1	12A-27	Pinion - Bevel.....	1
12A- 7	Coupling	1	12A-28	Pin.....	1
12A- 8	Valve - Check	1	12A-29	Pinion	1
12A- 9	Spring.....	1	12A-30	Pin - Taper	1
12A-10	Ring - Truarc	1	12A-31	Housing.....	1
12A-11	Cup Huva	1	12A-32	Pin	1
12A-12	Screw	1	12A-33	Shaft.....	1
12A-13	Screw	2	12A-34	Pin - Tape.	1
12A-14	Block - Pump	1	12A-35	Handwheel	1
12A-15	Ring - Truarc	1	12A-36	Bearing - Bronze	2
12A-16	Spring.....	1	12A-37	Screw	1
12A-17	Ring- O	1	12A-38	Handle.....	1
12A-18	Bushing	1	12A-39	Screw	4
12A-19	Pin	1	12A-40	Pin.....	2
12A-20	Piston	1			

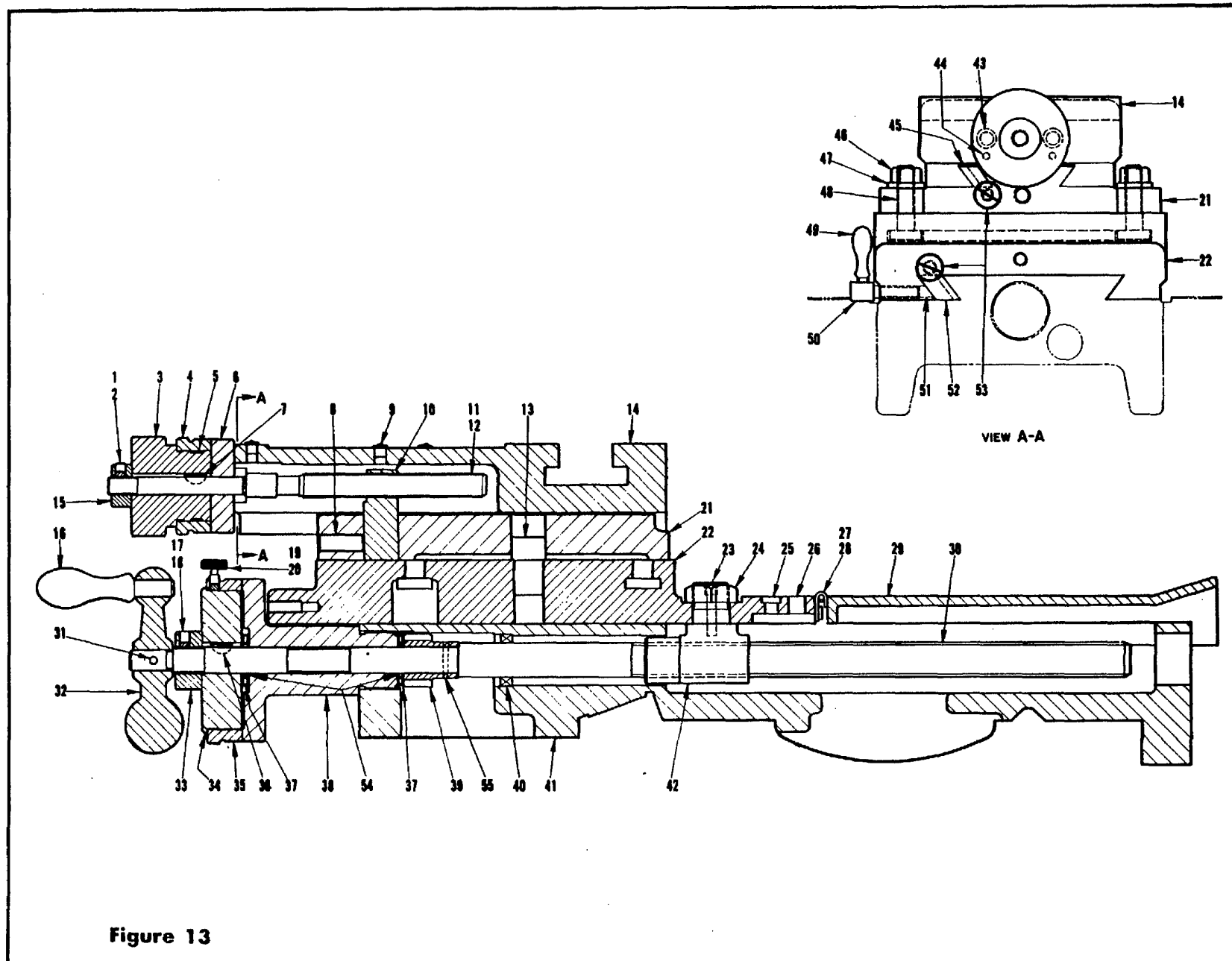


Figure 13

COMPOUND REST

Key No.	Part Name	Qty.	Key No.	Part Name	Qty.
13- 1	Screw, Set	1	13-28	Screw, Special Socket Head.....	4
13- 2	Plug	1	13-29	Guard, Dirt	1
13- 3	Bushing, Graduated Collar	1	*13-30	Screw, Crossfeed (English)	1
13- 4	Collar, Graduated (English)	1		(Metric)	1
	(Metric).....	1	*13-31	Pin, Taper	1
13- 5	Spring.....	1	*13-32	Handle.....	1
13- 6	Bushing, Top Slide	1	*13-33	Nut, Lock.....	1
13- 7	Key	1	*13-34	Hub, Graduated Collar	1
13- 8	Screw, Set	1	*13-35	Collar, Graduated (English)	1
13- 9	Oiler	4		(Metric)	1
13-10	Nut, Top Slide (English)	1	*13-36	Key.....	1
	(Metric).....	1	*13-37	Bearing, Needle	2
13-11	Screw, Top Slide (English)	1	*13-38	Bushing, Crossfeed	1
	(Metric).....	1	*13-39	Pinion, Crossfeed Screw.....	1
13-12	Collar.....	1	*13-40	Clipper Seal	1
13-13	Pin, Shoulder.....	1	*13-41	Carriage	1
13-14	Slide, Top	1	*13-42	Nut, Crossfeed Screw (English)	1
13-15	Nut, Lock	1		(Metric).....	1
*13-16	Handle.....	1	13-43	Screw, Top Slide Bushing	2
*13-17	Screw, Set	1	13-44	Pin, Spiral.....	2
*13-18	Plug	1	+13-45	Gib, Top Slide	1
*13-19	Screw	1	13-46	Nut, Hex	2
*13-20	Plug	1	13-47	Washer	2
13-21	Slide, Swivel	1	13-48	Bolt, T-Slot	2
13-22	Slide, Bottom	1	13-49	Handle.....	1
*13-23	Screw, Set.....	1	13-51	Plug.....	1
13-25	Plug (Not used when Taper Attachment is furnished)	1	+13-52	Gib, Bottom Slide	1
13-26	Plug (Not used when Taper Attachment is furnished)	1	13-53	Screw, Gib	4
13-27	Hinge, Dirt Guard	1	13-54	Bearing, Pilot.....	2
13-55	Pin, Taper.....	1			

* These parts are not applicable.

* Gibs are furnished slightly oversize, Customer to lit an cut to suit on assembly.

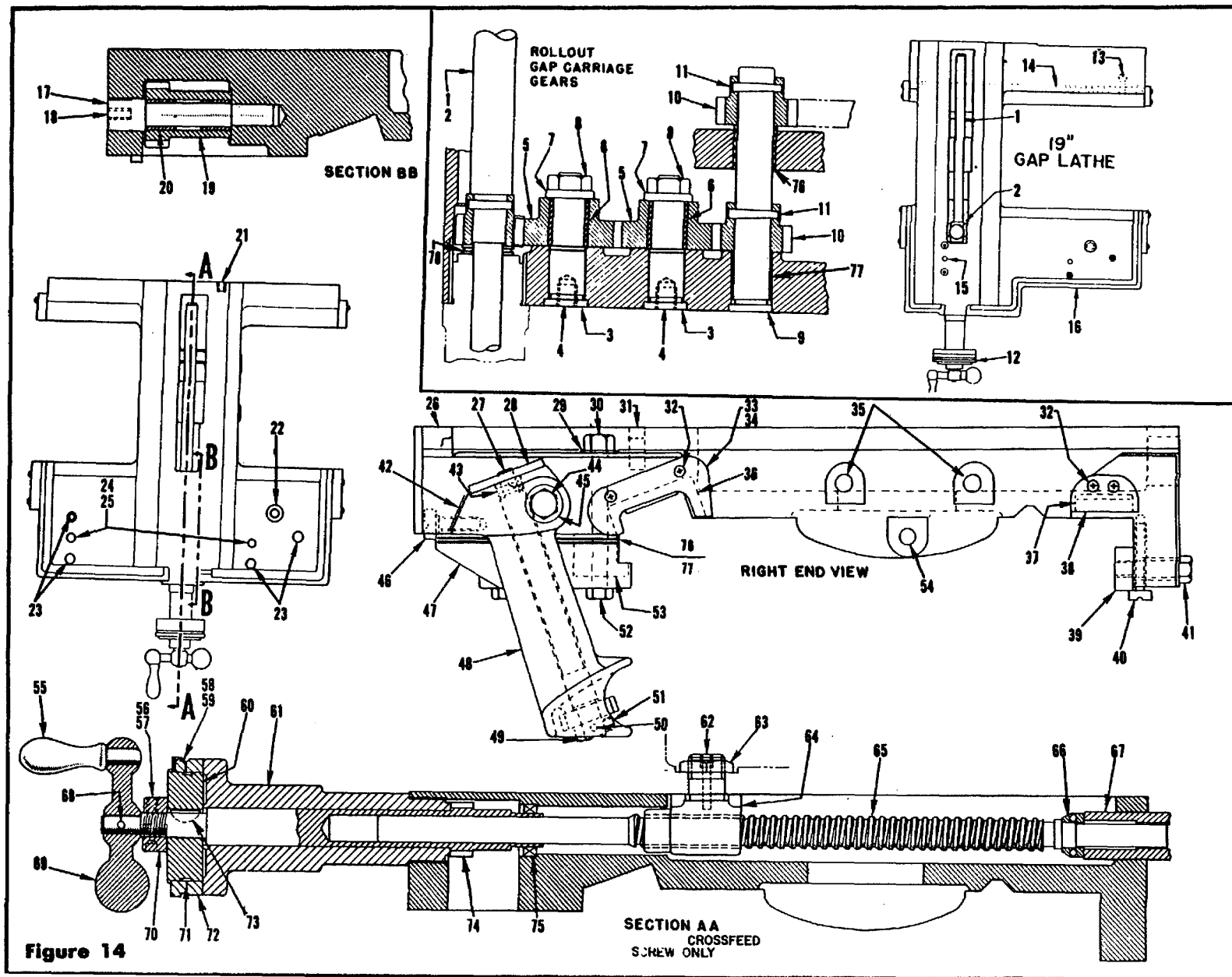


Figure 14

**17ES AND 19E7 PLAIN AND SLIDING BED GAP LATHES
ROLL-OUT OF GAP LATHE CARRIAGE & CROSS FEED SCREW**

Key No.	Part Name	Qty.	Key No.	Part Name	Qty.	Key No.	Part Name	Qty.
14- 1	Screw, Cross Feed (Without Taper Attachment - English).....	1	14- 3	Stud, Cross Feed Intermediate Gear.....	2	14-12	Collar, Graduated (With or Without Taper Attachment- English)	1
	(Without Taper Attachment - Metric).....	1	14- 4	Plug, Pipe.....	2			
	(With Taper Attachment - English).....	1	14- 5	Gear, Cross Feed Intermediate	2			
	(With Taper Attachment - Metric).....	1	14- 6	Bush, Cross Feed Intermediate Gear.....	2			
14- 2	Nut, Cross Feed (With or Without Taper Attachment - English)	1	14- 7	Washer.....	2	14-13	Screw, Hex Cap.....	2
	(With or Without Taper Attachment - Metric)	1	14- 8	Nut, Hex	2	14-14	Gib, Rear	1
			14- 9	Shaft, Cross Feed Driving	1	14-15	Pin, Taper.....	1
			14-10	Gear, Cross Feed Driving.....	2	14-16	Carriage.....	1
			14-11	Pin, Taper.....	2	14-76	Bushing, Shaft Cross Feed	1
						14-77	Bushing, Shaft Cross Feed	1
						14-78	Bearing, Cross Feed.....	2

CARRIAGE AND CHASING DIAL

Key No.	Part Name	Qty.	Key No.	Part Name	Qty.	Key No.	Part Name	Qty.
14-17	Stud, Idler Pinion	1	14-40	Screw, Gib.....	2	14-61	Bush, Cross Feed (English)	1
14-18	Screw, Set.....	1	14-41	Screw, Hex Cap.....	2		(Metric).....	1
14-19	Pinion, Idler.....	1	14-42	Plate, Chasing Dial Instruction.....	1	14-62	Screw, Set	1
14-20	Bush, Oiler.....	2	14-43	Pin, Taper.....	1	14-63	Nut, Special Hex	1
14-21	Pipe, Plug	1	14-44	Screw, Cap.....	1	14-64	Nut, Cross Feed Screw (English)	1
14-22	Screw.....	1	14-45	Washer.....	1		(Metric)	1
14-23	Screw.....	4	14-46	Screw, Gib.....	2	14-65	Cross Feed Screw (English)	1
14-24	Pin	2	* 14-47	Gib, Carriage Front.....	2		(Metric)	1
14-25	Plug	1	14-48	Bracket, Dial.....	1	14-66	Bearing, Thrust (W/Taper Attach)	1
14-26	Carriage.....	1	14-49	Wheel, Chasing Dial Worm	1	14-67	Shoe, Carriage (W/Taper Attach).....	1
14-27	Shaft Bracket.....	1	14-50	Pin, Taper.....	1	14-68	Pin, Taper.....	1
14-28	Dial	1	14-51	Screw, Set.....	1	14-69	Handle	1
14-29	Washer	1	14-52	Screw, Hex Cap.....	4	14-70	Nut, Lock	1
14-30	Screw, Hex Cap.....	1	14-53	Clamp, Carriage	1	14-71	Spring	1
14-31	Plug	1	14-54	Screw	1	14-72	Collar, Graduated (English).....	1
14-32	Screw, Round Head Mach	8		The following parts are for 17" and 19" Cross Feed Screw Only			(Metric).....	1
14-33	Wiper, Shear Front Right Hand	1				14-73	Key	1
14-34	Wiper, Shear Front Left Hand	1	14-55	Handle.....	1	14-74	Sleeve, Pinion.....	1
14-35	Screw.....	2	14-56	Screw, Set.....	2	14-75	Clipper Seal	1
*14-36	Neoprene.....	2	14-57	Plug	2	14-76	Shim - .002	A.R.
*14-37	Neoprene.....	2	14-58	Screw	1	14-76	Shim - .005	A.R.
14-38	Wiper, Shear Rear	2	14-59	Plug.....	1			
*14-39	Gib,. Carriage Rear.....	2	14-60	Bush, Graduated Collar	1			

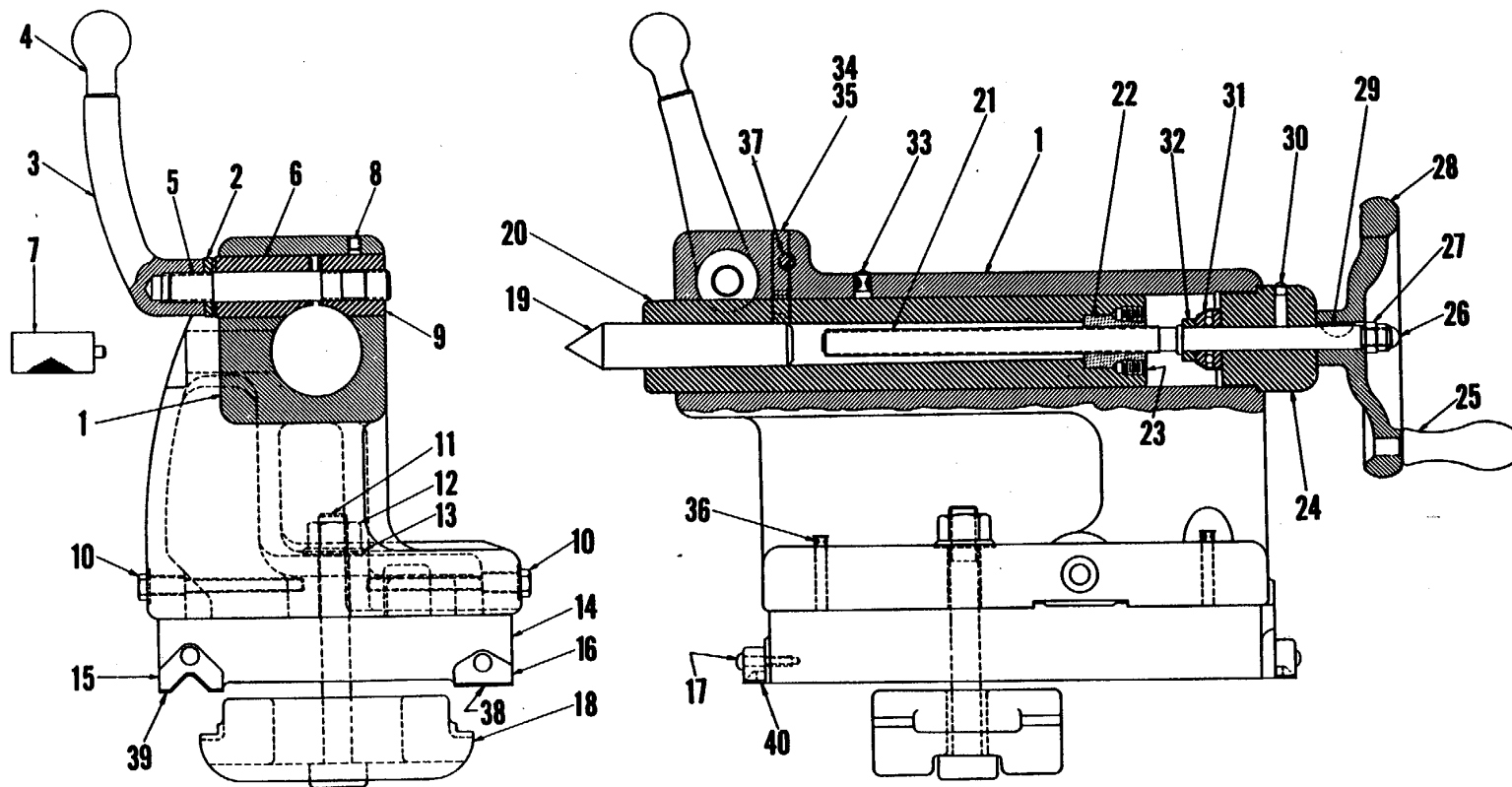
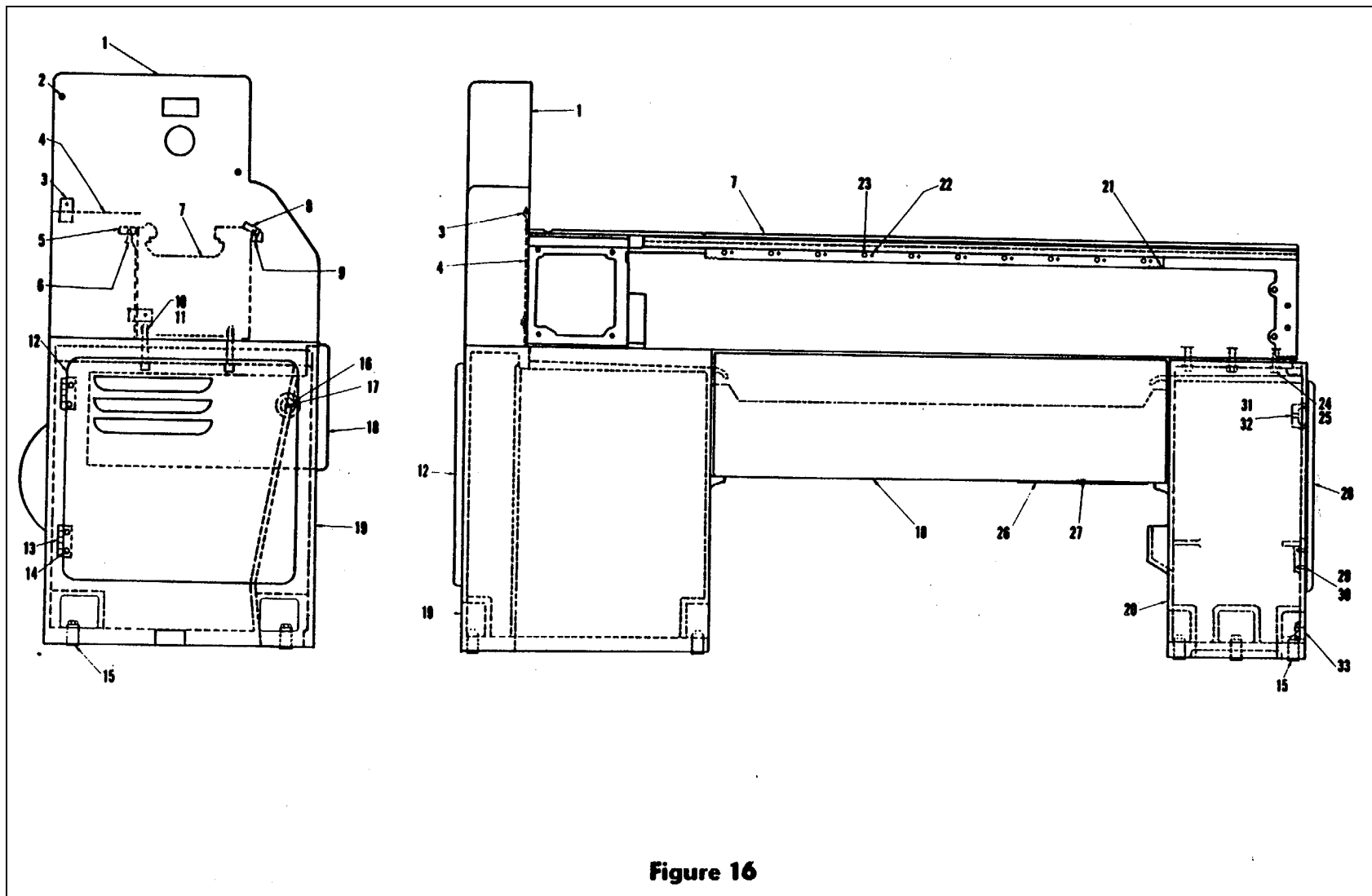


Figure 15

TAILSTOCK

Key No.	Part Name	Qty.	Key No.	Part Name	Qty.
15- 1	Top, Tailstock	1	15-21	Screw, Spindle	1
15- 2	Washer	1	15-22	Nut, Tailstock	1
15- 3	Handle, Binder.....	1	15-23	Screw, Set.....	2
15- 4	Handle, Ball	1	15-24	Cap, Tailstock	1
15- 5	Stud. Tailstock.....	1	15-25	Handle, Ball.....	1
15- 6	Bushing, Upper Binder	1	15-26	Nut, Acorn	1
15- 7	Key, Plug.....	1	15-27	Nut, Hex	1
15- 8	Pin Stop.....	1	15-28	Handwheel	1
15- 9	Bushing, Lower Binder	1	15-29	Key, Woodruff	1
15-10	Screw, Hex Cap.....	1	15-30	Oiler	1
15-11	Bolt, Rough.....	1	15-31	Bearing, Ball.....	1
15-12	Nut, Hex	1	15-32	Collar, Spindle Screw.....	1
15-13	Washer	1	15-33	Oiler	1
15-14	Bottom, Tailstock.....	1	15-34	Screw, Set.....	2
15-15	Wiper, Rear Shear	2	15-35	Plug, Brass.....	2
15-16	Wiper, Front Shear	2	15-36	Oiler	2
15-17	Screw	4	15-37	Pin Stop	1
15-18	Clamp, Tailstock.....	1	* 15-38	Front Neoprene.....	1
15-19	Center, Spindle.....	1	* 15-39	Rear Neoprene	1
15-20	Spindle, Tailstock	1	15-40	Felt.....	2

* Neoprene is furnished slightly oversize. Customer to fit and cut to suit on assembly.



BED, PAN, LEGS & HEAD END COVER

Key No.	Part Name	Qty.	Key No.	Part Name	Qty.
16- 1	Cover, Feed Gear.....	1	16-18	Pan (Specify Center Capacity).....	1
16- 2	Screw, Socket Head Cap	3	16-19	Leg, Head End Cabinet.....	1
16- 3	Screw, Hex Head Cap.....	3	16-20	Leg, Tail End Cabinet	1
16- 4	Plate, Head Feed Cover Back	1	16-21	Rack, (Specify Center Capacity)	Var No
16- 5	Shear, Rear (Specify Center Capacity)	1	16-22	Pin, Taper	Var No
16- 6	Screw	Var No	16-23	Screw	Var No
16- 7	Bed, (Specify Length)	1	16-24	Screw, (Tail End Leg to Bed)	6
16- 8	Shear, Front (Specify Center Capacity).....	1	16-25	Washer	6
16- 9	Screw	Var No	16-26	Plate, (1 - For Each Dry Pan).....	1
16-10	Screw, (Head End Leg To Bed).....	4	16-27	Screw, (2 - For Each Dry Pan)	2
16-11	Washer	4	16-28	Door, Tail End Leg	1
16-12	Door, Head End Leg.....	1	16-29	Hinge, Door.....	2
16-13	Hinge, Door	2	16-30	Screw	4
16-14	Screw	4	16-31	Magnet, Alnico Carboly	1
16-15	Screw, Leveling (Head and Tail Legs).....	7	16-32	Screw, Machine Flat Head	1
16-16	Magnet, Alnico Corboloy	1	16-33	Plug, Pipe.....	1
16-17	Screw, Brass Machine Flat Head	1			

IMPORTANT-Include serial number of your lathe when ordering repair parts.

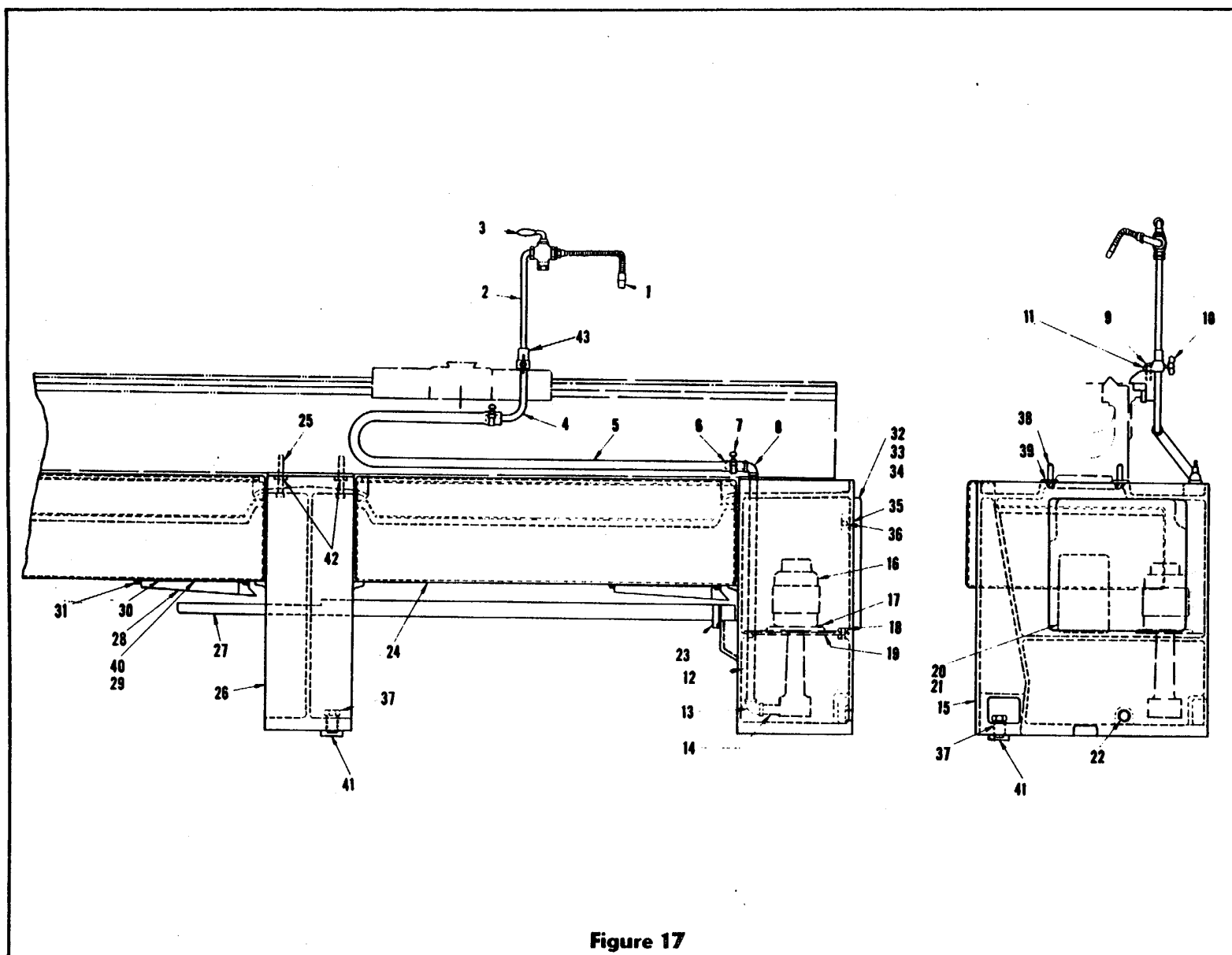


Figure 17

**TAIL CABINET LEG, CENTER LEG TROUGH,
COOLANT PUMP WITH PIPING**

Key No.	Part Name	Qty.	Key No.	Part Name	Qty.
17- 1	Spout, Flexible Coolant	1	17-22	Plug, Pipe.....	1
17- 2	Pipe, Distributor	1	17-23	Screw, Blinding Head Machine	4
17- 3	Cock, Stop	1	17-24	Pan, (Specify Center Capacity)	1-3
17- 4	Pipe, Distributor	1	17-25	Screw, Socket Hd Cap (Middle Leg to Bed).....	4
17- 5	Hose, Rubber (Cut to Suit)	1	17-26	Leg, Middle	1-2
17- 6	Nipple	1	17-27	Trough, Coolant (Specify Length)	1
17- 7	Clamp, Hose.....	2	17-28	Spout, Drain	1
17- 8	Elbow, 90°	1	17-29	Screw, (Each Strainer).....	2
17- 9	Screw, Hex Cap.....	1	17-30	Gasket, Drain Spout.....	1
17-10	Screw, Thumb	1	17-31	Screw	9
17-11	Bracket	1	17-32	D o or	1
17-12	Pipe, (Cut to Suit)	1	17-33	Hinge, Door.....	2
17-13	Elbow, Reducing 90°	1	17-34	Screw	4
17-14	Nipple	1	17-35	Magnet, Alnico	1
17-15	Leg, Tail End Cabinet.....	1	17-36	Screw, Brass Machine Flat Head.....	1
17-16	Pump, (Specify HP, voltage & Cycles)	1	17-37	Screw, Leveling (Specify Middle or Tail Leg)	Var No
17-17	Screw, (Pump to Plate)	4	17-38	Screw	1
17-18	Screw, Hex Cap.....	2	17-39	Washer	1
17-19	Plate, Pump Support	1	17-40	Strainer	1
17-20	Cover, Reservoir Hole (With Pump)	1	17-41	Leveling Plate	Var No
17-21	Cover, Reservoir Hole (Without Pump)	1	17-42	Washers (Middle Leg).....	2
17-43	Coupling	1			

IMPORTANT-Include serial number of your lathe when ordering repair parts.

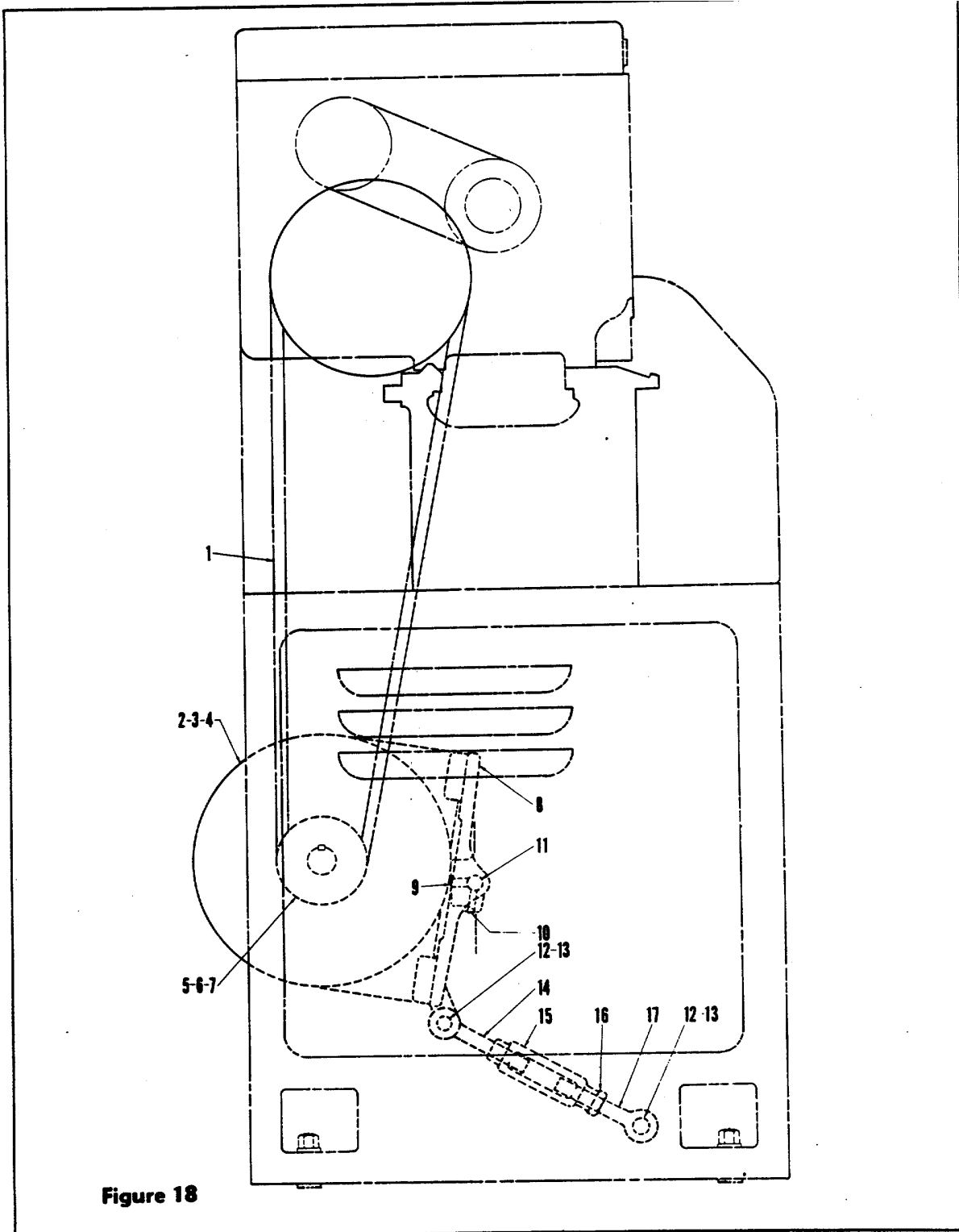


Figure 18

**MOTOR DRIVE &
MOUNTING ASSEMBLY**

Key No.	Part Name	Qty.
18- 1	V-Belt, Gates	3
18- 2	Motor, A-C New Nema Frame Number Specify Current. Voltage, Horsepower, Phase & Cycle	1
18- 3	Screw	4
18- 4	Washer	4
18- 5	Pulley, Motor Specify Cycle, Horsepower & Speed Range Desired	1
18- 6	Key 1	
18- 7	Screw, Set	1
18- 8	Plate, Motor	1
18- 9	Screw, Set	1
18-10	Screw, Set	1
18-11	Stud, Motor Plate.....	1
18-12	Pin, Link	2
18-13	Pin, Cotter	4
18-14	Bolt Eye, Left Hand Thread	1
18-15	Turnbuckle.....	1
18-16	Nut, Hex.	1
18-17	Bolt Eye, Right Hand Thread.....	1

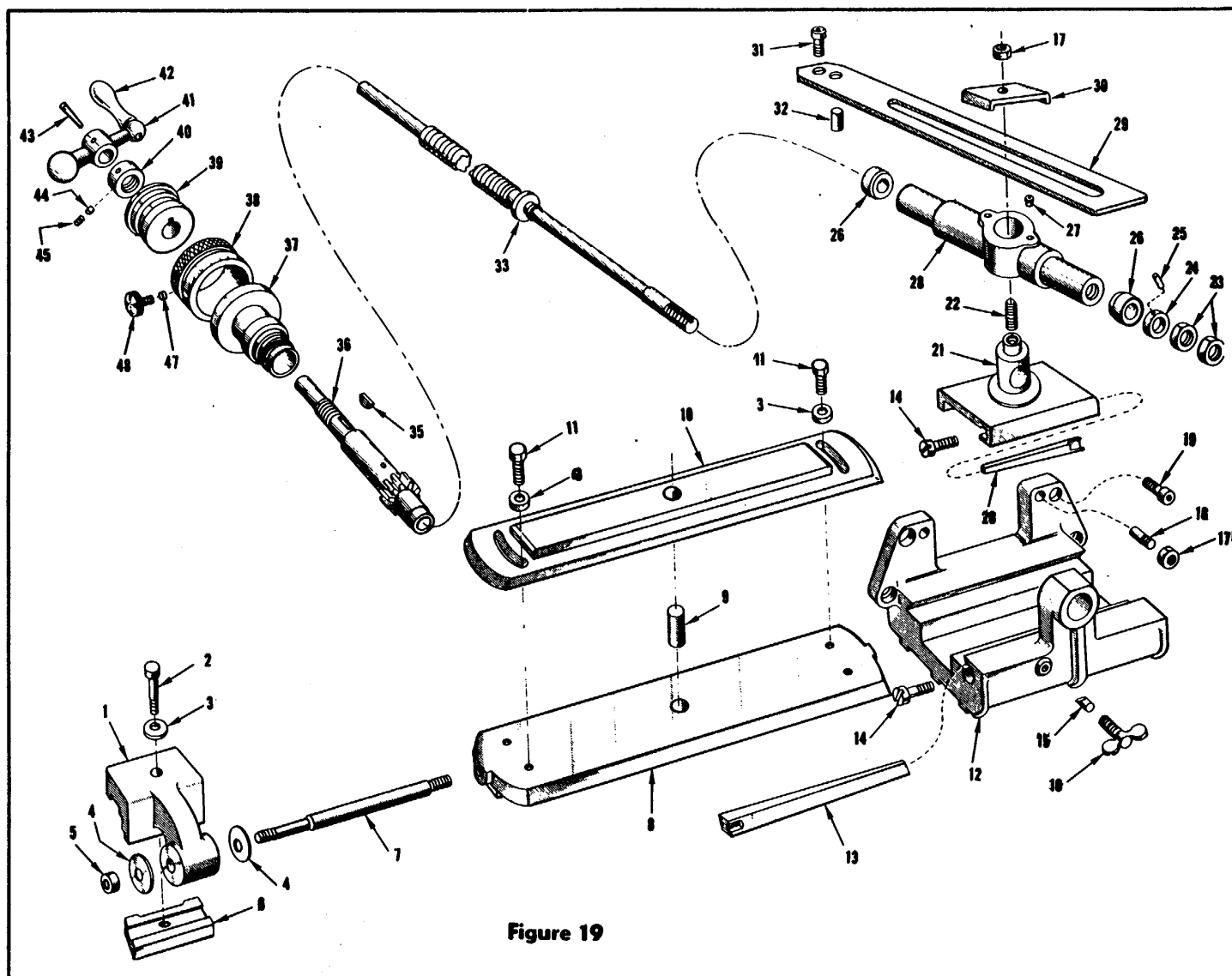
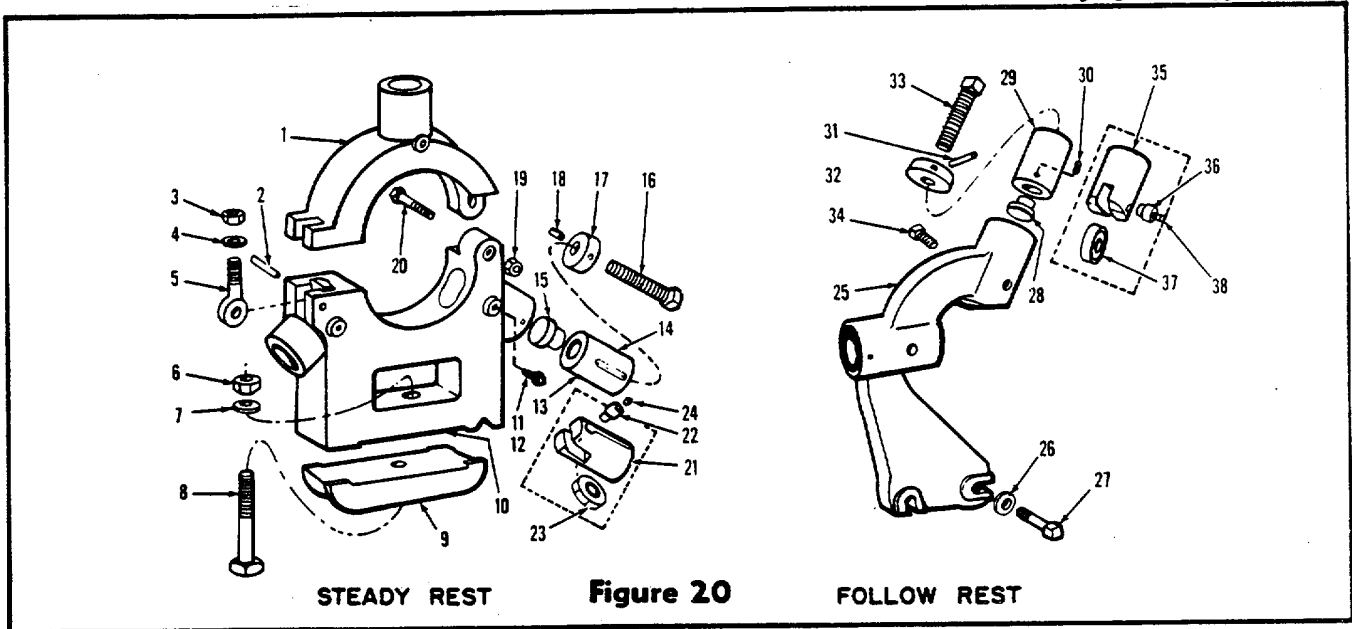


Figure 19

TAPER ATTACHMENT

Key No.	Part Name	Qty.	Key No.	Part Name	Qty.
19- 1	Bracket, Bed	1	19-27	Oilier	2
19- 2	Screw, Hex Hd. Cap	1	19-28	Shoe, Carriage	1
G*					
19- 3	Washer	3	19-29	Bar, Taper Attachment Draw.....	1
19- 4	Washer	2	19-30	Plate, Guide Bar Clamp	1
19- 5	Nut, Hex	1	19-31	Screw, Sock Hd. Cap.....	1
19- 6	Clamp, Bed Bracket	1	19-32	Pin	1
19- 7	Rod, Bed Bracket Clamp.....	1	19-33	Screw, Cross Feed (English)	1
19- 8	Slide, Taper Attachment.....			1 (Metric)	
19- 9	Plug, Guide Bar Swivel.....				
19-10	Bar, Guide (English)		19-35	Key	1
	Bar, Guide (Metric)		19-36	Sleeve, Cross Feed Pinion (English)	1
19-11	Screw, Hex Cap.....	2		Sleeve, Cross Feed Pinion (Metric)	1
19-37	Bush, Cross Feed Screw (English)	1			
19-12	Bracket, Taper Attachment Slide.....	1	19-37	Bush, Cross Feed Pinion (English)	1
	Bush, Cross Feed Screw (Metric).....			Bush, Cross Feed Pinion (Metric)	1
*19-13	Gib, Slide		19-38	Collar, Graduated (English)	1
19-14	Screw, Gib	4		Collar, Graduated (Metric)	1
19-15	Plug, Slide Gib 1-2	1	19-39	Hub, Graduated Collar (English).....	1
19-16	Screw, Thumb	1		Hub, Graduated Collar (Metric)	1
19-17	Nut, Hex	3	19-40	Nut, Lock	1
19-18	Pin, Draw	2	19-41	Handle .Ball	1
19-19	Screw, Sock. Hd. Cap	4	19-41	Handle, Ball	1
*19-20	Gib, Guide Bar Shoe	1	19-43	Pin, Taper.	1
19-21	Shoe, guide Bar ho.....	1	19-44	Plug	2
19-22	Stud, Carriage Shoe.....	1	19-45	Screw	2
19-23	Nut, HexLock				
19-45	Screw.	2			
19-22	Stud, Carriage Shoe	1			
19-23	Nut, Hex Lock	2	19-47	Plug	1
19-24	Collar , Cross feed Screw.....	1	19-48	Screw	1
19-25	Pin, Straight				
19-26	Bearing. Thrust.....	2			

*Gibs are furnished slightly oversize. Customer to fit and cut to suit on assembly.



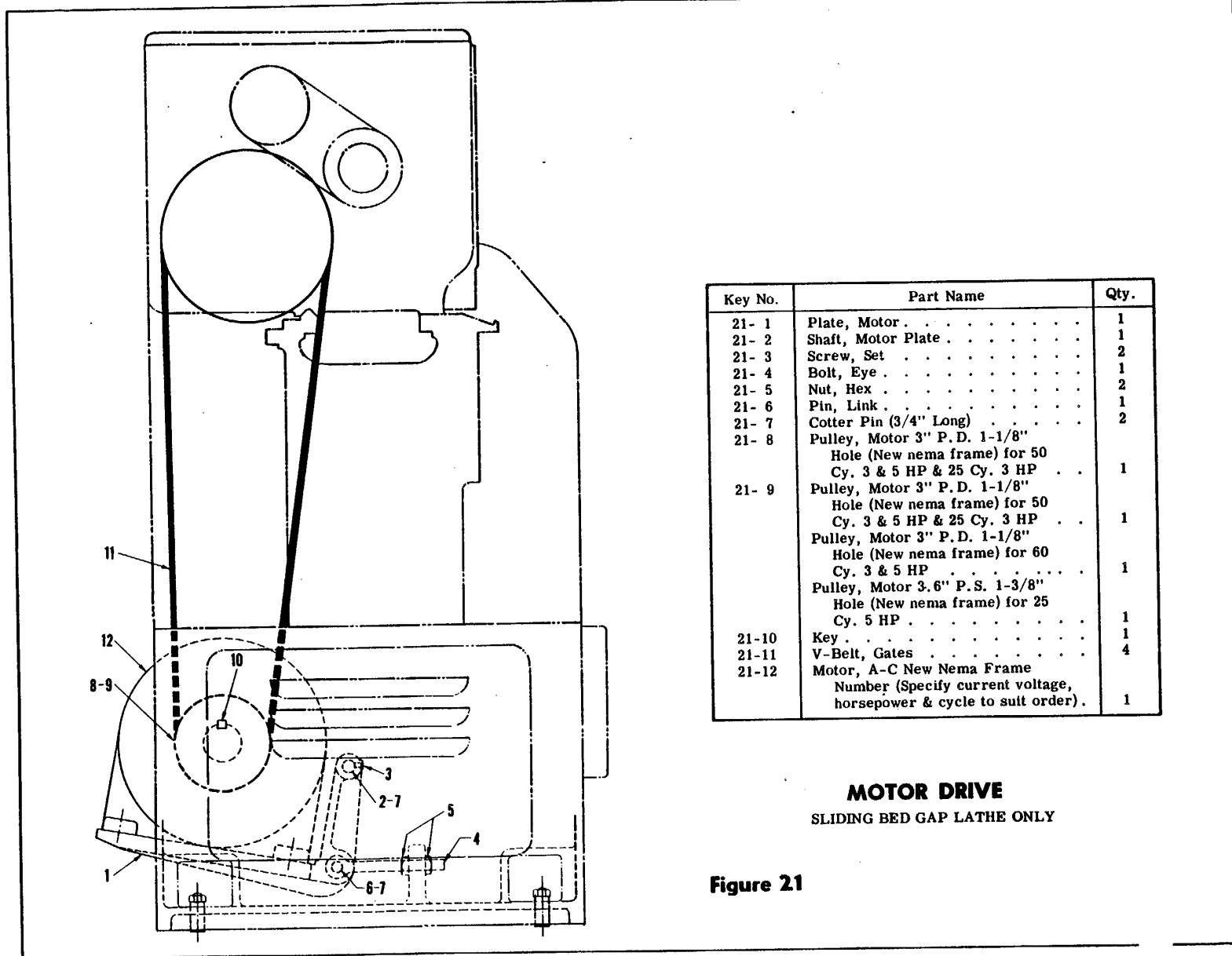
STEADY REST CAPACITY

17E5 & 19E7 1/2" to 6"

FOLLOW REST CAPACITY

17E5 & 19E7 1/2" to 3 3/4"

Key No.	Part Name	Qty.	Key No.	Part Name	Qty.
20-1	Top, Steady Rest.....	1	20-20	Screw, Hex Cap	1
20-2	Pin, Straight	1	20-21	Jaw, Roller	3
20-3	Nut	1	20-22	Stud	3
20-4	Washer	1	20-23	Roller	3
20-5	Bolt, Eye	1	20-24	Oilier	3
20-8	Nut	1	20-25	Rest, Follow.	1
20-7	Washer	1	20-26	Washer	2
20-8	Bolt, Rough	1	20-27	Screw, Hex Cap	2
20-9	Clamp, Steady Rest.....	1	20-28	Tip, Bronze	2
20-10	Bottom, Steady Rest.....	1	20-29	Jaw, Follow Rest	2
20-11	Screw, Sq. Hd. Set (Brz. Tip Jaws)	3	20-30	Screw, Set	2
20-12	Screw, Sq. Hd. Set (Roller Jaws)	3	20-31	Pin, Straight	4
20-13	Screw, Set	3	20-32	Collar, Jaw Adj. Screw	2
20-14	Jaw, Steady Rest	3	20-33	Screw, Sq. Hd. Set	2
20-15	Tip, Bronze	3	20-34	Screw, Sq. Hd. Set	2
20-16	Screw, Sq. Hd. Set	3	20-35	Jaw, Roller	2
20-17	Collar, Jaw Adj. Screw.....	3	20-36	Stud	2
20-18	Pin, Straight	6	20-37	Roller	2
20-19	Nut	1	20-38	Oilier	2



Key No.	Part Name	Qty.
21- 1	Plate, Motor	1
21- 2	Shaft, Motor Plate	1
21- 3	Screw, Set	2
21- 4	Bolt, Eye	1
21- 5	Nut, Hex	2
21- 6	Pin, Link	1
21- 7	Cotter Pin (3/4" Long)	2
21- 8	Pulley, Motor 3" P.D. 1-1/8" Hole (New nema frame) for 50 Cy. 3 & 5 HP & 25 Cy. 3 HP . . .	1
21- 9	Pulley, Motor 3" P.D. 1-1/8" Hole (New nema frame) for 50 Cy. 3 & 5 HP & 25 Cy. 3 HP . . .	1
	Pulley, Motor 3" P.D. 1-1/8" Hole (New nema frame) for 60 Cy. 3 & 5 HP	1
	Pulley, Motor 3.6" P.S. 1-3/8" Hole (New nema frame) for 25 Cy. 5 HP	1
21-10	Key	1
21-11	V-Belt, Gates	4
21-12	Motor, A-C New Nema Frame Number (Specify current voltage, horsepower & cycle to suit order).	1

MOTOR DRIVE
SLIDING BED GAP LATHE ONLY

Figure 21

GEARED FEED, TRAVERSE DRIVE AND SWITCH CONTROL ASSEMBLIES 17E5 AND 1917 SLIDING BED GAP

Key No.	Part Name	Qty.	Key No.	Part Name	Qty.
22-1	Spacer	1	22-72	Brg	1
22-2	Plate, Bottom Bed Bracket	1	22-73	Plug	1
22-3	Screws, Soc. Hd. Cap.	14	22-74	Lever, Upper	1
22-4	Screw, Soc. Hd. Cap.	1	22-75	Key	1
22-5	Screw, Soc. Hd. Cap.	5	22-76	Ball, Brg	1
22-6	Screw, Soc. Hd. Cap.	3	22-77	Ball, Brg	1
22-7	Screw, Soc. Hd. Cap.	1	22-79	Ring, Snap Truarc	1
22-8	Screw, Soc. Hd. Cap. ....	.2	22-80	Lever, Lower	1
22-9	Screw, Soc. Hd. Cap.	4	22-81	Gear, Drive Shaft	1
22-10	Screw, Soc. Hd. Cap.	2	22-82	Stud, Idler	1
22-11	Pin, Taper	2	22-83	Race, Inner	1
22-12	Pin, Taper	1	22-84	Brg.	1
22-13	Nut	2	22-85	Gear, Idler	1
22-14	Pin, Taper	1	22-86	Stud, Feed Rod Drive.....	1
22-15	Pin, Taper	1	22-87	Race, Inner	1
22-16	Pin, Taper	1	22-88	Brg	1
22-17	Pin, Taper	1	22-89	Gear, Feed Rod Drive	1
22-18	Pin, Taper	3	22-90	Plug, Expansion	1
22-19	Pin, Taper	4	22-91	Collar	1
22-20	Gear, Idler	1	22-93	Nut	5
22-21	Plug, Idler Gear	1	22-95	Shoe, Shifter	1
22-22	Brg.,	1	22-96	Lever, Shifter	1
22-23	Gear, Drive Shaft Feed.....	1	22-97	Knob	1
22-24	Washer	1	22-98	Sleeve	1
22-25	Nut	1	22-99	Spring (Cut to Suit).	1
22-26	Pin, Cotter .....	.1	22-100	Plunger	1
22-27	Pin, Cotter	9	22-101	Handle, Feed Rev	1
22-29	Pin, Link	4	22-102	Shaft, Shifter.	1
22-30	Lever, Switch Control.....	.1	22-103	Screw	2
22-32	Screw, Set	2	22-104	Screw	1
22-33	Screw	1	22-105	Clamp, Brg	2
22-34	Screw, Set	4	22-106	Pin, Draw	3
22-35	Screw, Set	2	22-107	Oilier	1
22-36	Screw, Set	2	22-108	Pipe, Plug	1
22-37	Gear, Switch Control.....	1	22-109	Screw	2
22-39	Rod, Control	1	22-110	Plug	4
22-40	Spacer	1	22-111	Link	1
22-41	Collar, Brg	1	22-112	Cover. Switch	1
22-42	Sleeve, Drive Shaft.....	1	22-113	Plug, Shoulder	1
22-43	Brg., Ball Duplex.....	1	22-114	Oilier.....	1
22-44	Shaft, Feed Drive (Spec. Bed Length)	1	22-115	Rod, Feed (Spec. Bed Length).	1
22-45	Seal, Oil	1	22-116	Stud, Brkt. , Swivel (W O Apron Control).....	1
22-46	Cover, Brg.	1	22-117	Stud, Brkt., Swivel (W Apron Control)	1
22-47	Key	3	22-118	Bracket, Drive Shaft Support.....	1
22-48	Stud, Idler	1	22-119	Bracket, Trav. Unit	1
22-49	Collar	1	22-120	Box, Back.	1
22-50	Washer	1	22-121	Plug	2
22-51	Screw, -Hex. Hd. Cap.....	1	22-122	Brkt., Drive Shaft End.....	1
22-52	Brg.,	2	22-123	Lug, Stop Collar	1
22-53	Pinion, Feed Drive	1	22-124	Collar, Stop	1
22-54	Seal, Oil	1	22-125	Collar, Soft	2
22-55	Brkt., Bottom Bed Feed	1	22-126	Brkt., Lower	1
22-56	Plate, Top Bed Brkt	1	22-127	Handle, Upper Nut	1
22-57	Brkt., Top Bed Feed .....	.1	22-128	Nut, Upper Half	1
22-58	Link	1	22-129	Nut, Lower Half..	1
22-59	Brg	1	22-130	Stud, Nut Swivel	1
22-60	Race, Brg	1	22-131	Rod, Upper Control (Spec. Bed Length).....	1
22-61	Race, Brg	1	22-132	Cover, Slip Gear	1
22-62	Pilot, Brg. Guide	1	22-133	Screws, Binding Hd	6
22-63	Brg., Needle Orange.....	1	22-134	Screws, Binding Hd.....	1
22-64	Pin, Straight	1	22-135	Screw, Binding Hd	1
22-65	Screw, Lead (Spec. Bed Length).....	1	22-136	Shaft. Gear	1
22-66	Seal, Oil	1	22-137	Bracket, Switch	1
22-67	Ball	2	22-138	Crank, Shifter	1
22-69	Spring, Feed Rod Dr. Collar.....	1	22-139	Gear, 32T-16P	1
22-70	Collar, Feed Drive.....	1	22-140	Gear, 16T-16P	1
22-71	Race, Inner	1	22-141	Cover, Switch	1

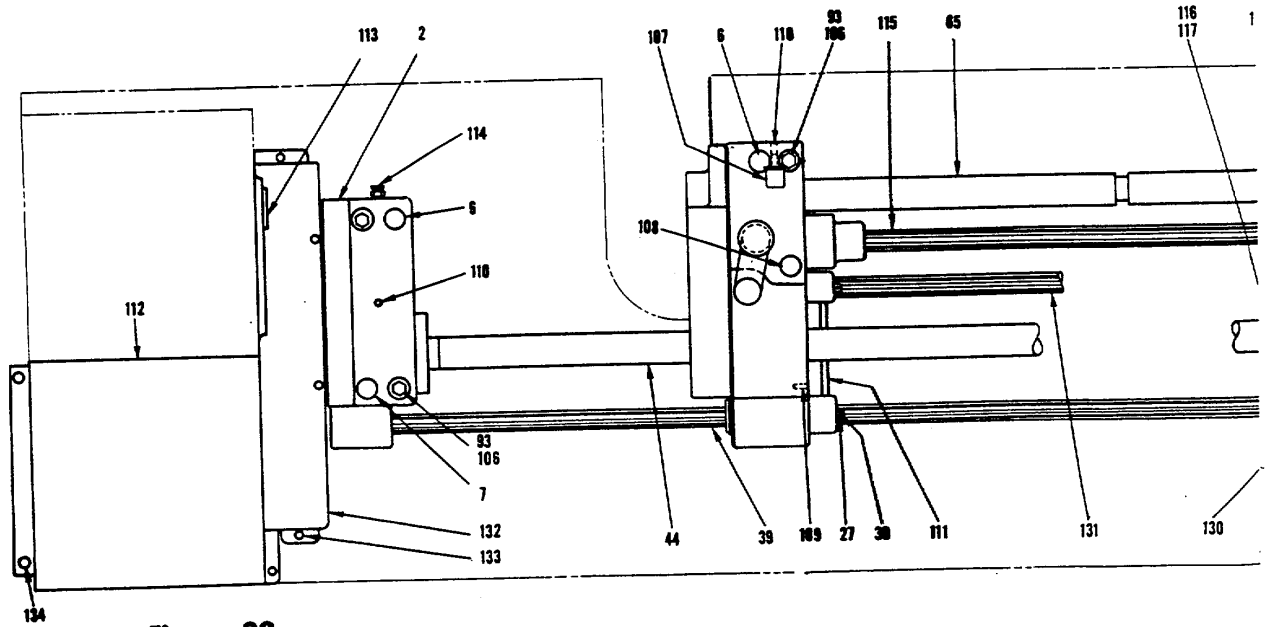
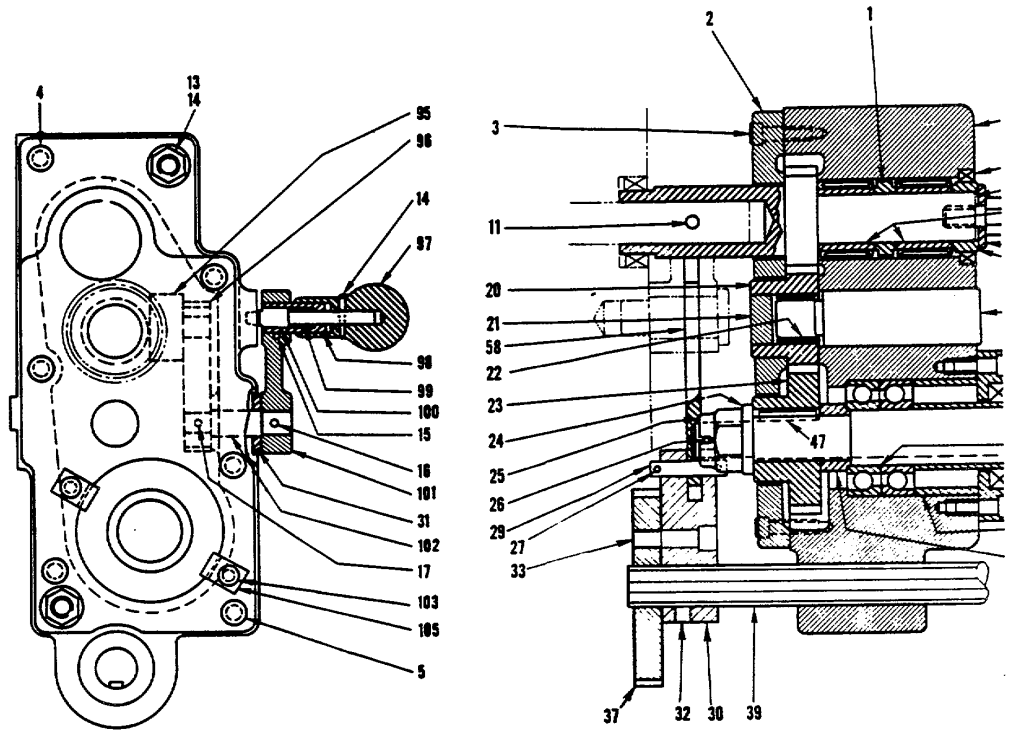
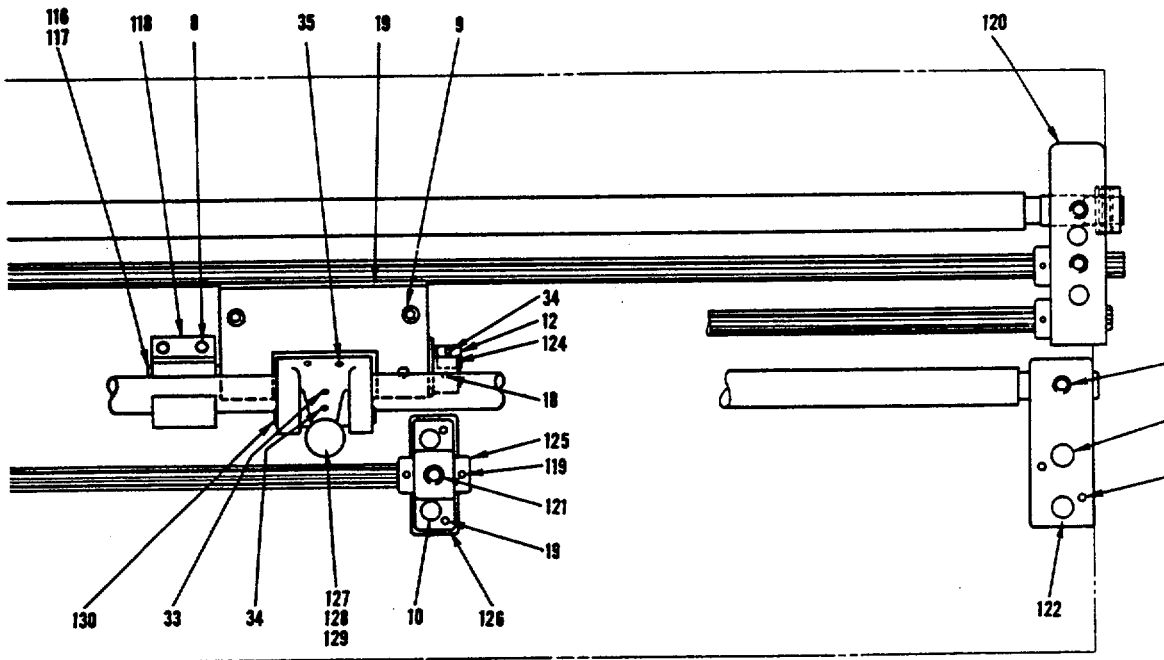
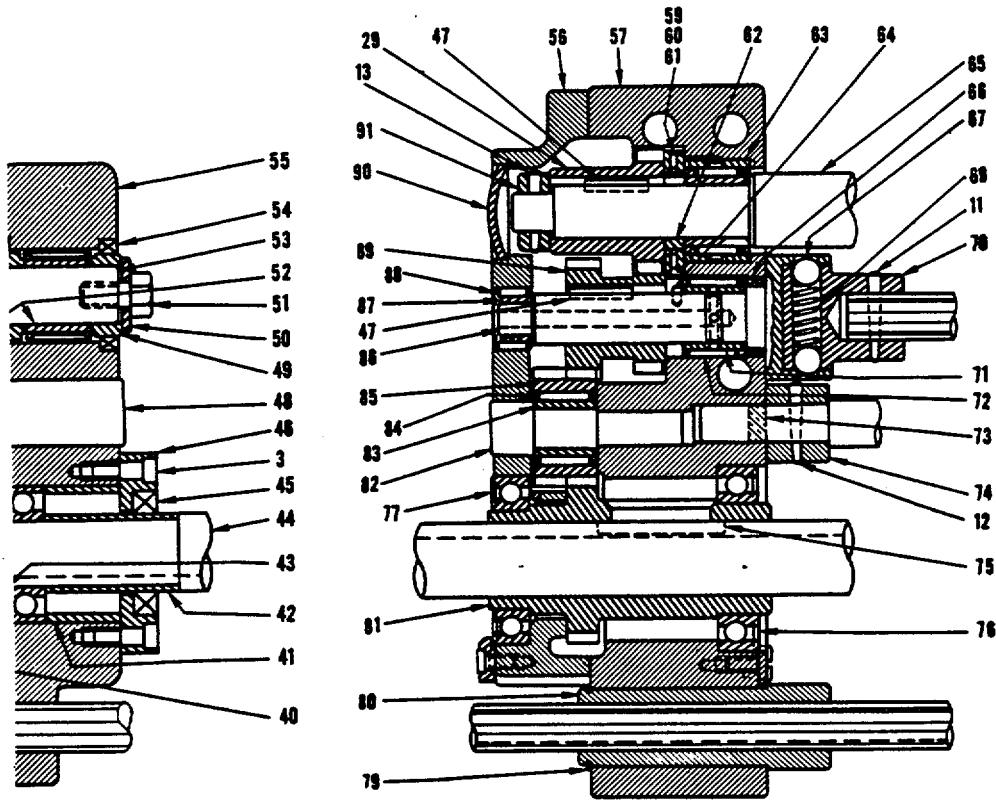
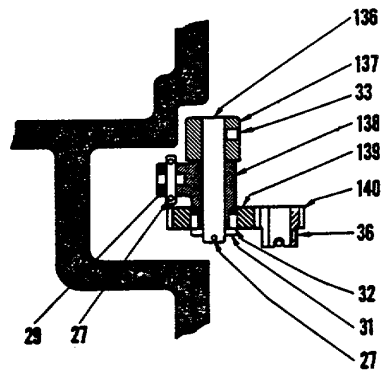
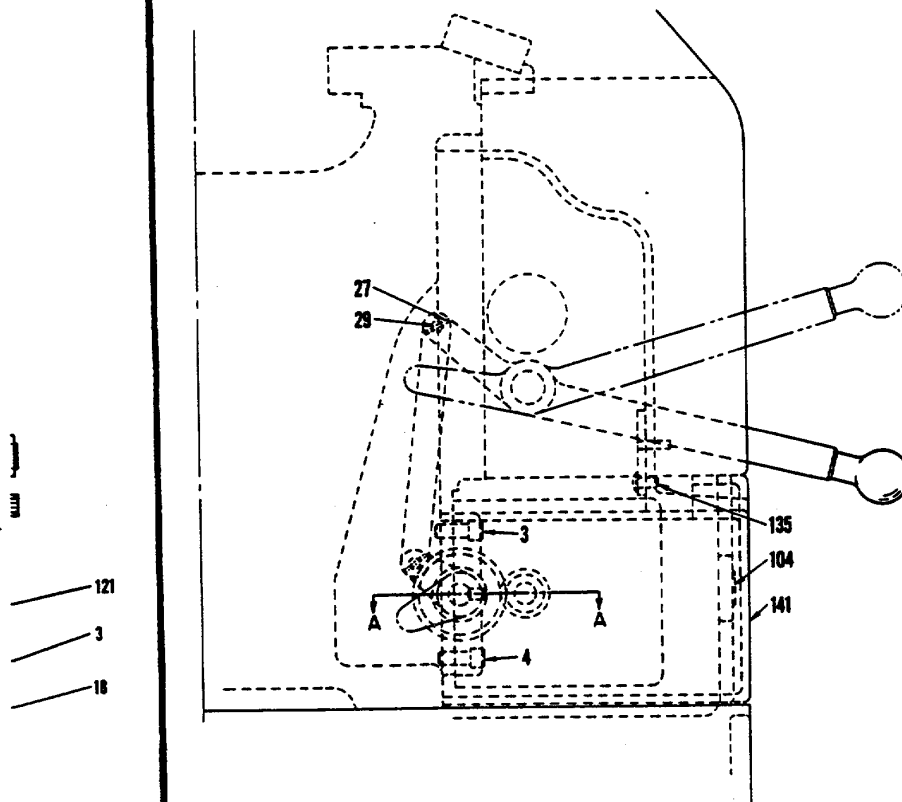


Figure 22





SECTION A-A



Sheet 3 of 3

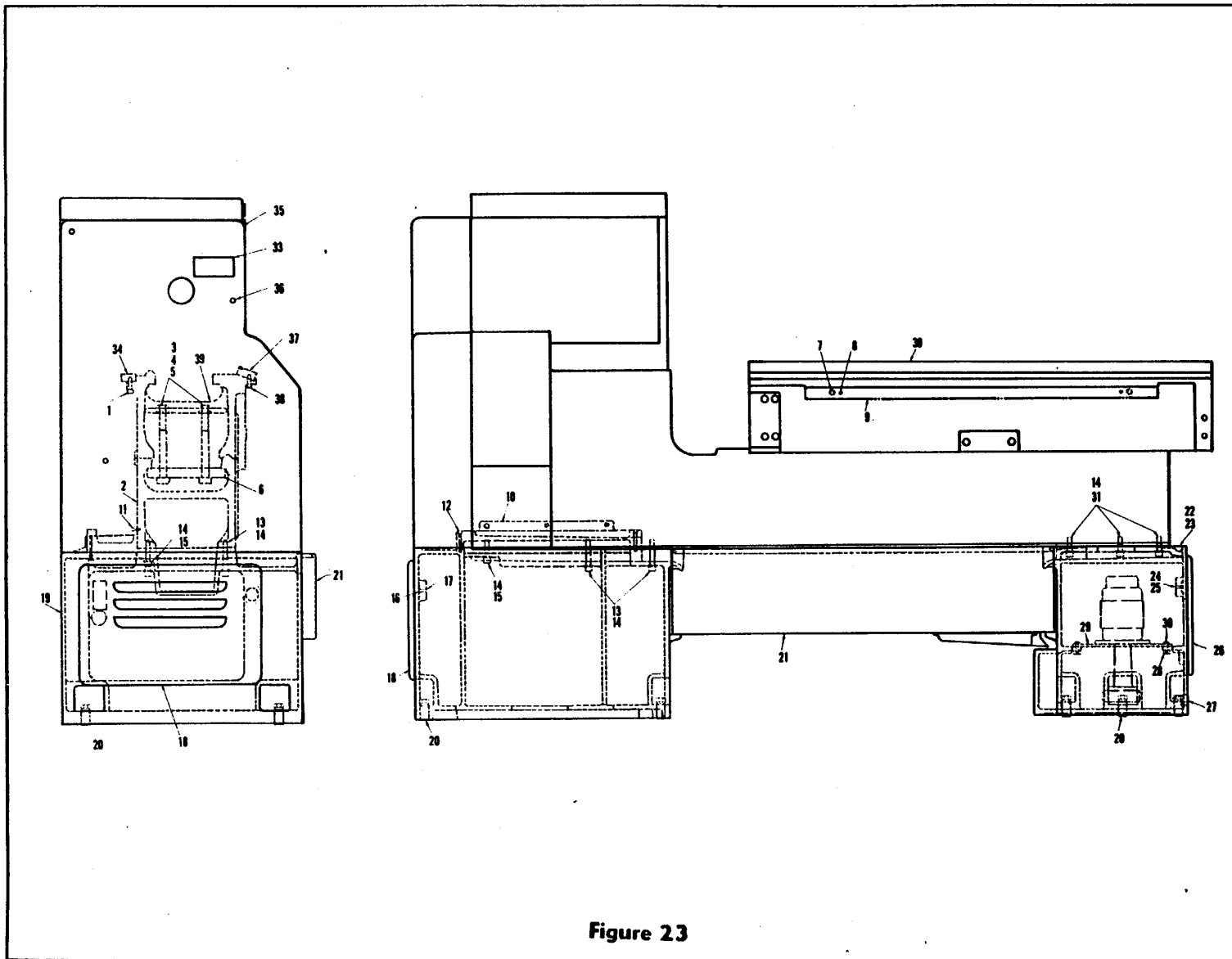
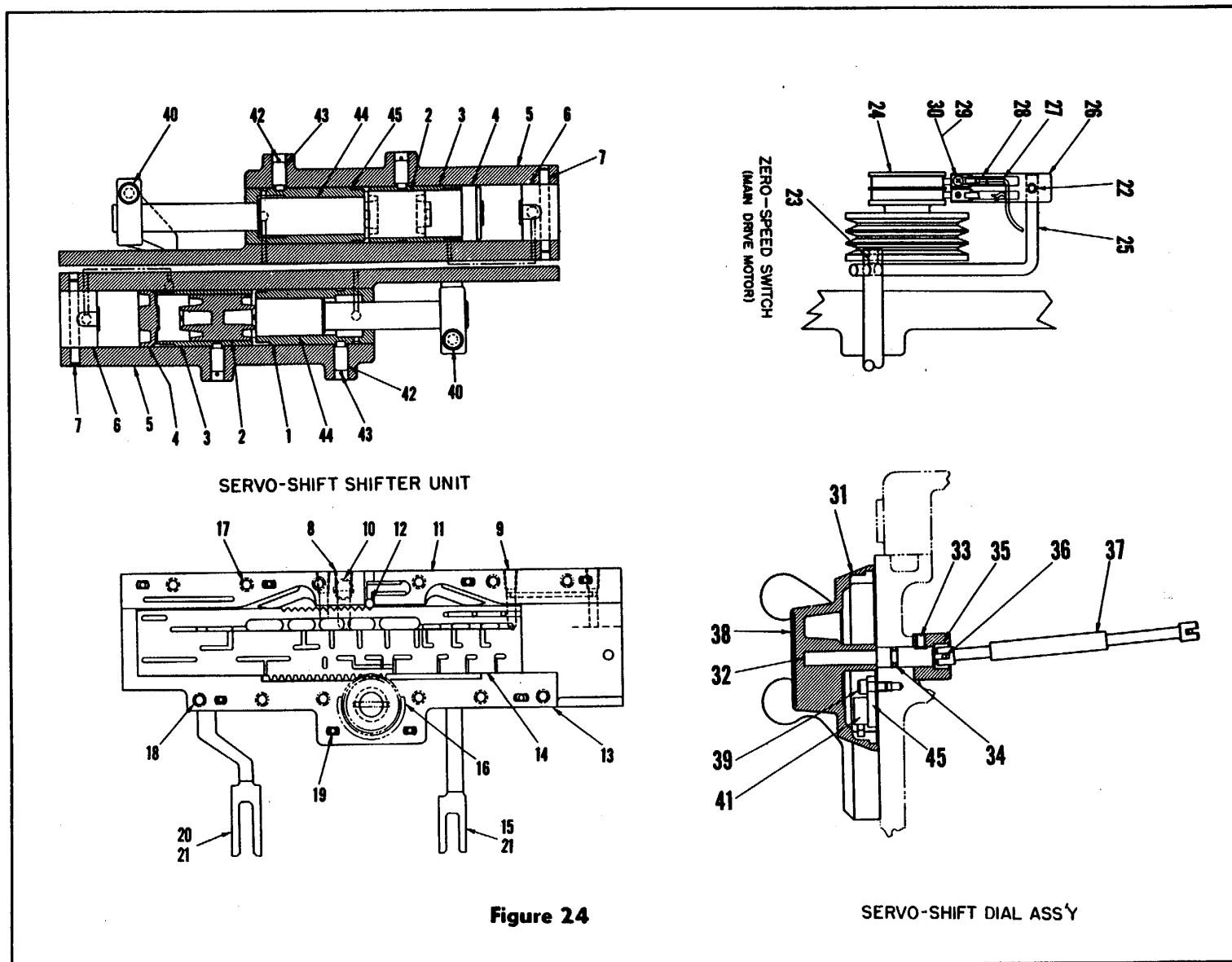
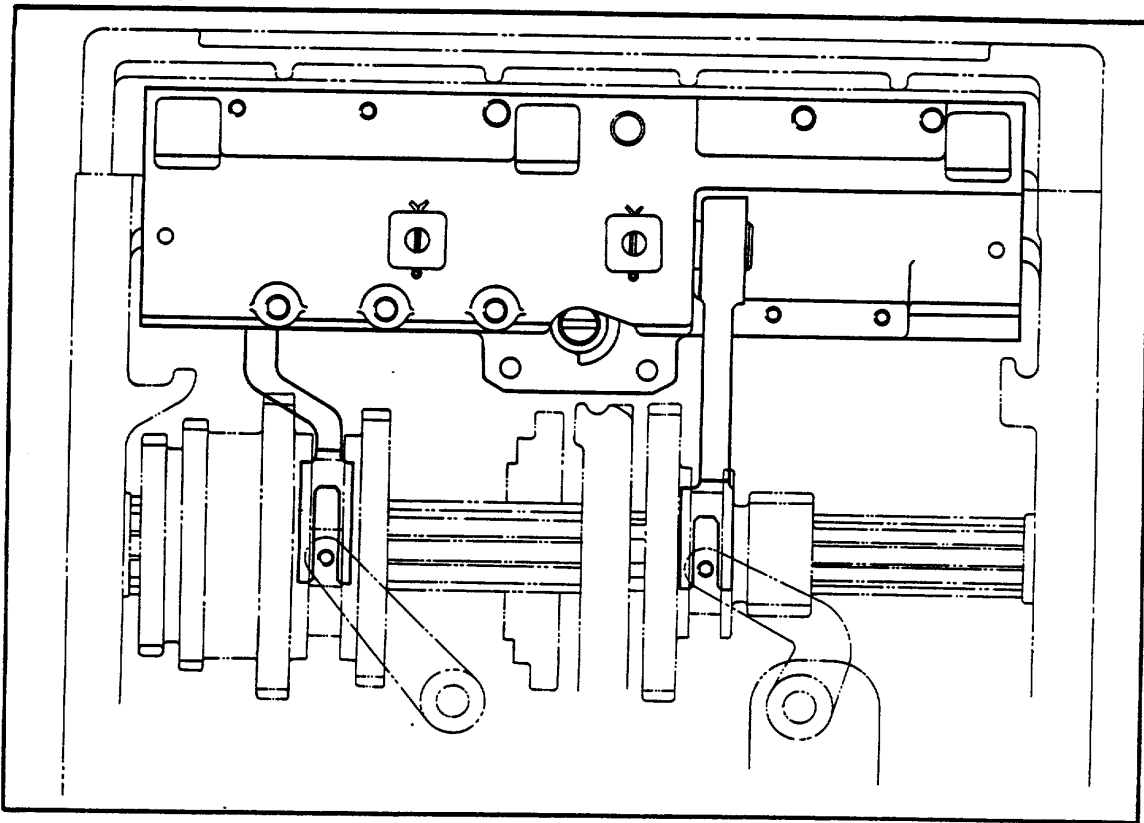


Figure 23

**BED, PAN, LEGS & HEAD END COVER
SLIDING BED GAP LATHES**

Key No.	Part Name	Qty.	Key No.	Part Name	Qty.
23- 1	Screw, (S. B.G. - Specify Bed Length)	Var. No	23-20	Screw, Leveling	4
23- 2	Bed, Bottom (S. B.G. - Specify Length)	1	23-21	Pan, (Specify Center Capacity)	1
23- 2A	Bed, (P. G.G. - Specify Length) Not Shown	1	23-22	Leg, Tail End Cabinet.	1
23- 3	Bolt, S.B.G	Var .No	23-23	Screw	4
23- 4	Nut, S.B.G	Var. No	23-24	Magnet, Alnico	1
23- 5	Washer, S. B. G	Var. No	23-25	Screw, Brass Machine Flat Head.....	1
23- 6	Clamp, S. B. G	Var. No	23-26	Door	1
23- 7	Screw	Var. No	23-27	Plug, Pipe	1
23- 8	Pin, Taper	Var. No	23-28	Clamp, Pump Plate	2
23- 9	Rack, Specify Center Capacity	1	23-29	Plate, Pump 1	
23-10	Cover, Head End Leg.....	1	23-30	Screw, Hex Head Cap.....	2
23-11	Screw	3	23-31	Screw	3
23-12	Screw	2	23-32	Block, Gap (P. B.G. only) Not Shown.	1
23-13	Screw	3	23-33	Oiling Instruction Plate.	1
23-14	Washer	7	23-34	Shear, Rear (Specify Center Capacity).....	1
23-15	Screw	1	23-35	Cover, Feed Gear	1
23-16	Magnet, Alnico Carboloy	1	23-36	Screw, Socket Head Cap.	3
23-17	Screw, Brass Machine Flat Head	1	23-37	Shear, Front (Specify Center Capacity)	1
23-18	Door	1	23-38	Screw, (S. B. G. - Specify Bed Length)	Var. No.
23-19	Leg, Head End Cabinet	1	23-39	Bed, Top (S. B.G. - Specify Length).....	1





**SERVO-SHIFT
ZERO-SPEED SWITCH, SHIFTER UNIT, DIAL ASSEMBLY**

Key No.	Part Name	Qty.	Key No.	Part Name	Qty.
24- 1	Sleeve	1	24-24	Switch, Zero Speed	1
24- 2	Piston, Long	1	24-25	Arm, Brush Holder	1
24- 3	Liner.	1	24-26	Brush Holder	1
24- 4	Piston, Short	1	24-27	Brush Spring	2
24- 5	Cylinder	1	24-28	Brush	2
24- 6	Retainer	1	24-29	Binding Head Screw	2
24- 7	Pin, Oversize Dowel	1	24-30	Shake Proof Washer	2
24- 8	Plug, Pipe	1	24-31	Speed Selector Dial(Specify Speed Range)	1
24- 9	Plug, Pipe ..	3	24-32	Dial Shaft	1
24-10	Plug, Pipe	1	24-33	Setscrew	1
24-11	Spacer, Upper Cylinder	1	24-34	O Ring	1
24-12	Roller, Detent	1	24-35	Coupling	1
24-13	Spacer, Lower Cylinder.	1	24-36	Pin	1
24-14	Slide, Valve	1	24-37	Coupling Shaft	1
24-15	Fork, C Cylinder.....	1	24-38	Speed Dial	1
24-16	Pinion, Valve Slide (With Pin)	1	24-39	Screw	1
24-17	Screw, Socket Cap	6	24-40	Screw	2
24-18	Screw, Socket Cap	6	24-41	Micro-Switch	1
24-19	Pin, Straight	2	24-42	Pin, Cotter	2
24-20	Fork, B Cylinder.....	1	24-43	Pin, Locating	2
24-21	Screw, Socket Cap	2	24-44	Piston, Rod	1
24-22	Setscrew	1	24-45	Bracket, Switch	1
24-23	Setscrew	1			

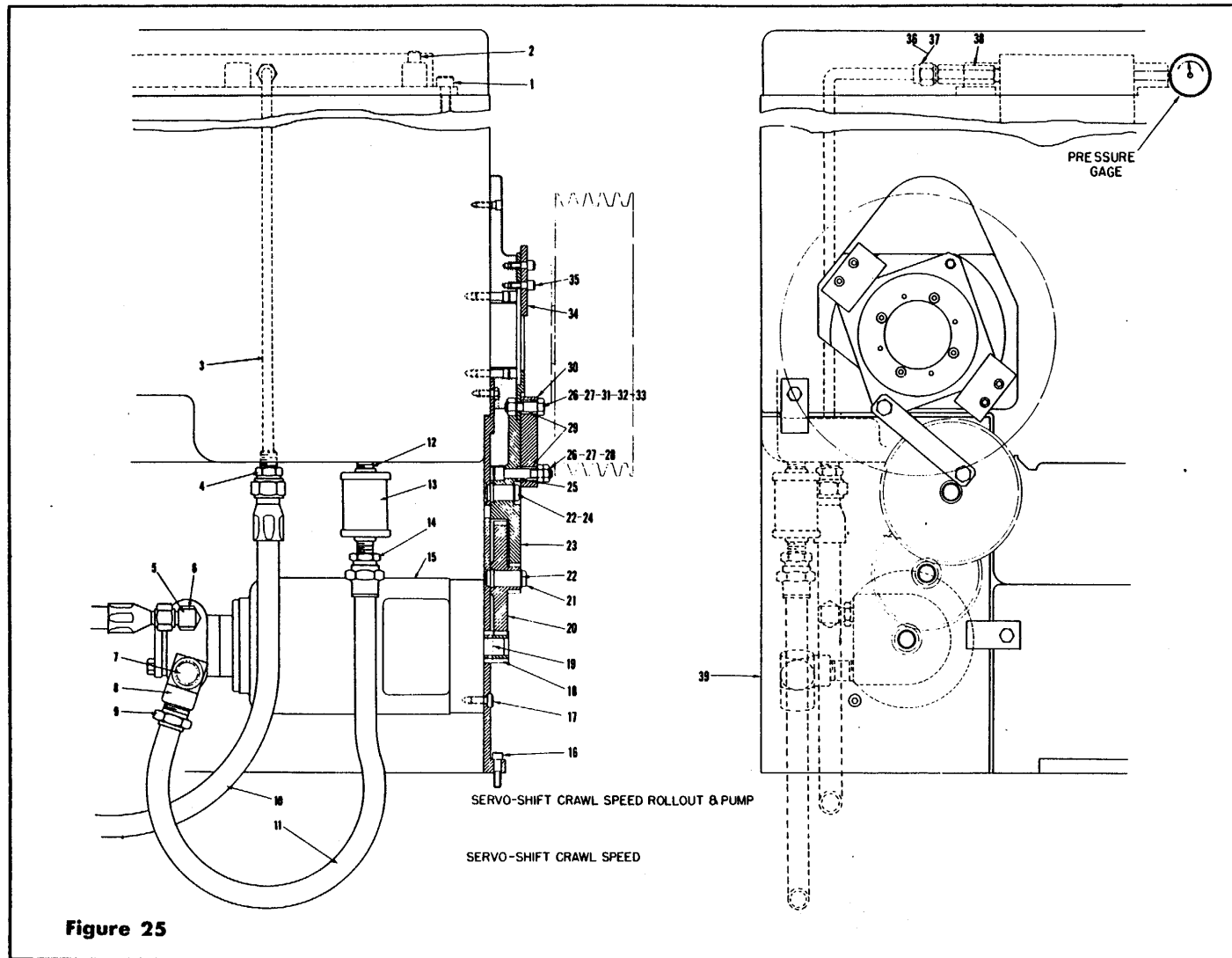


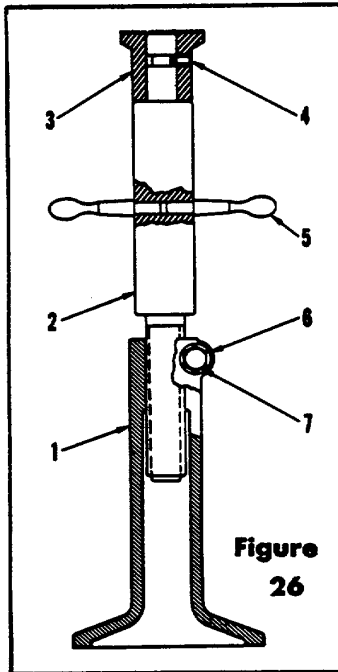
Figure 25

SERVO-SHIFT CRAWL SPEED ROLLOUT

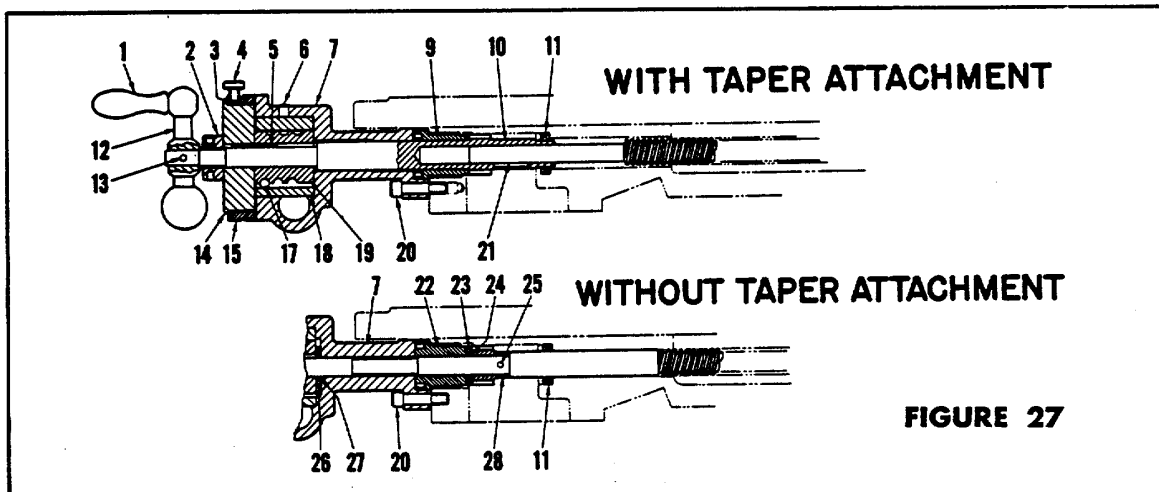
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Key No.	Part Name	Qty.	Key No.	Part Name	Qty.
25- 1	Screw, Socket Cap	4	25-21	Stud.	1
25- 2	Screw, Socket Cap	6	25-22	Ring, Snap	2
25- 3	Tubing, 3/8" (Cut to Suit)	1	25-23	Gear, Crank Drive	1
25- 4	Straight Connection	1	25-24	Stud.	1
25- 5	Elbow, 90°	1	25-25	Bushing	1
25- 6	Bushing, Reducing	1			
25- 7	Nipple	1	25-27	Nut, Jam	2
25- 8	Elbow	1	25-28	Screw, Socket Cap	1
25- 9	Fitting, Pipe Male.....	1	25-29	Bushing	2
25-10	Hose Assembly	1	25-30	Arm, Crank	1
25-11	Hose Assembly	1	25-31	Screw, Hex Head 1	
24-12	Nipple	1	25-32	Nut, Hex	1
25-13	Filter	1	25-33	Lockwasher	1
25-14	Fitting Straight	1	25-34	Plate, Brake Retainer	2
25-15	Motor Driven Pump, ILPF Model A.	1	25-35	Screw, Socket Cap	4
25-16	Screw, Socket Cap	1	25-36	Nut, Hyd	1
25-17	Screw, Socket Cap	4	25-37	Sleeve, Hyd	1
25-18	Pinion, Motor	1	25-38	Coupling, Extra Long.	1
25-19	Pin, Roll	1	25-39	Plate, Head Feed Cover Plate	
25-20	Gear, Cluster	1		(Specify Engine, Plain Bed, or Sliding Bed Gap)	1

BED JACK UNIT
Sliding Bed Gap Lathe Only



Key No.	Part Name	Qty.
26-1	Jack Base	1
26-2	Jack Screw.....	1
26-3	Jack Screw Cap	1
26-4	Set Screw.....	1
26-5	Ball Handle.....	2
26-6	Washer	1
26-7	Screw	1



BALL CHASING STOP

Key No.	Part Name	Qty.	Key No.	Part Name	Qty.
27-1	Ball Handle	1	27-15	Collar, Graduated	1
27-2	Nut	1	27-17	Ball	1
27-3	Plug	1	27-18	Bushing, Cross Stop Friction	1
27-4	Screw	1	27-19	Bushing, Cross Stop	1
27-5	Key	1	27-20	Screw	1
27-6	Oilier	1	27-21	Key	1
27-7	Bushing, Cross Feed	1	27-22	Sleeve - Adapter	1
27-9	Sleeve, Adapter.....	1	27-23	Bearing, Thrust	1
27-10	Sleeve, Cross Feed Pinion	1	27-24	Pilot, Bearing	1
27-11	Seal, Clipper	1	27-25	Pin	1
27-12	Handle, Crank	1	27-26	Bearing, Thrust	1
27-13	Pin	1	27-27	Pilot, Bearing	1
27-14	Hub, Graduated Collar.....	1	27-28	Pinion	1

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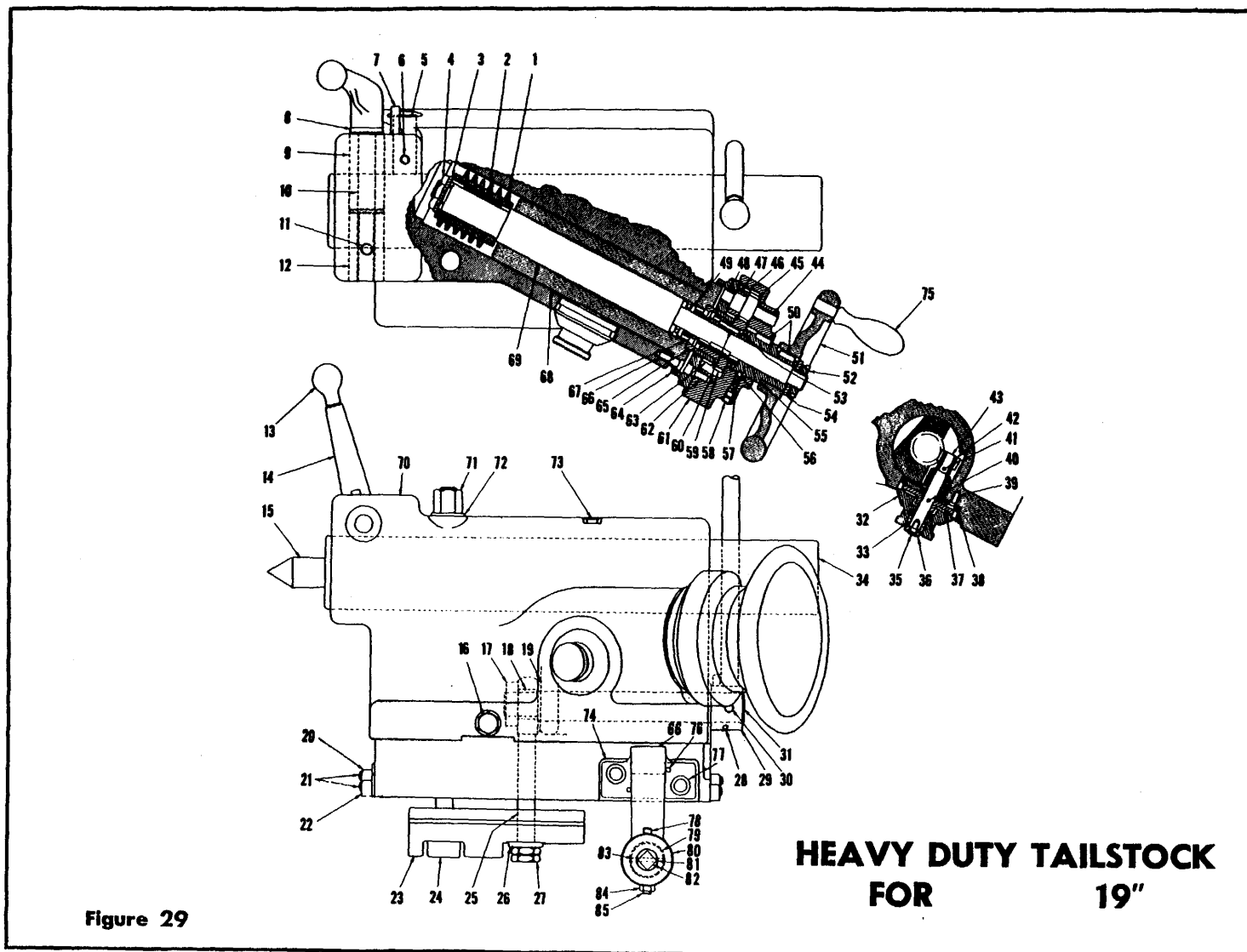


Figure 29

HEAVY DUTY TAILSTOCK FOR 19"

Key No.	Part Name	Qty.	Key No.	Part Name	Qty.
29-1	Worm	1	29-43	Shaft	1
29-2	Key	1	29-44	Bearing	1
29-3	Washer	1	29-45	Gear	1
29-4	Nut	1	29-46	Gear	1
29-5	Plug	1	29-47	Pin	3
29-6	Screw	3	29-48	Bearing	1
29-7	Pin	1	29-49	Bearing	1
29-8	Washer	1	29-50	Key	2
29-9	Bushing	1	29-51	Handwheel	1
29-10	Stud	1	29-52	Washer & Nut	1
29-11	Screw	1	29-53	Bushing	1
29-12	Bushing	1	29-54	Collar	1
29-13	Ball	2	29-55	Bush	1
29-14	Handle	1	29-56	Ball	1
29-15	Center	1	29-57	Spring	1
29-16	Screw	2	29-58	Screw	2
29-17	Screw	1	29-59	Gear	1
29-17A	Nut	1	29-60	Key	2
29-18	Bearing	1	29-61	Carrier	1
29-19	Spacer	1	29-62	Screw	4
29-20	Wiper	2	29-63	Gear	1
29-21	Screw	4	29-64	Plate	1
29-22	Wiper	2	29-65	Clutch	
29-23	Clamp	1	29-66	Bracket	1
29-24	Bolt	1	29-67	Screw	4
29-25	Eyebolt	1	29-68	Bushing	1
29-26	Washer	1	29-69	Shaft	1
29-27	Nut	2	29-70	Top	1
29-28	Screw	1	29-71	Nut	1
29-29	Handle	1	29-72	Washer	1
29-30	Pin	1	29-73	Oilers	2
29-31	Shaft	1	29-74	Bottom	1
29-32	Dial	1	29-75	Handle	1
29-33	Spring	1	29-76	Pin	2
29-34	Spindle	1	29-77	Screw	2
29-35	Screw	1	29-78	Oilier	1
29-36	Washer	1	29-79	Bushing	1
29-37	Clutch	1	29-80	Collar	1
29-38	Bushing	1	29-81	Pinion	1
29-39	Screw	3	29-82	Crank	1
29-40	Pin	1	29-83	Pin	1
29-41	Pin	1	29-84	Nut	1
29-42	Worm	1	29-85	Screw	1

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Chief of Staff

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