DUAL·DRIVE INSTRUCTION MANUAL

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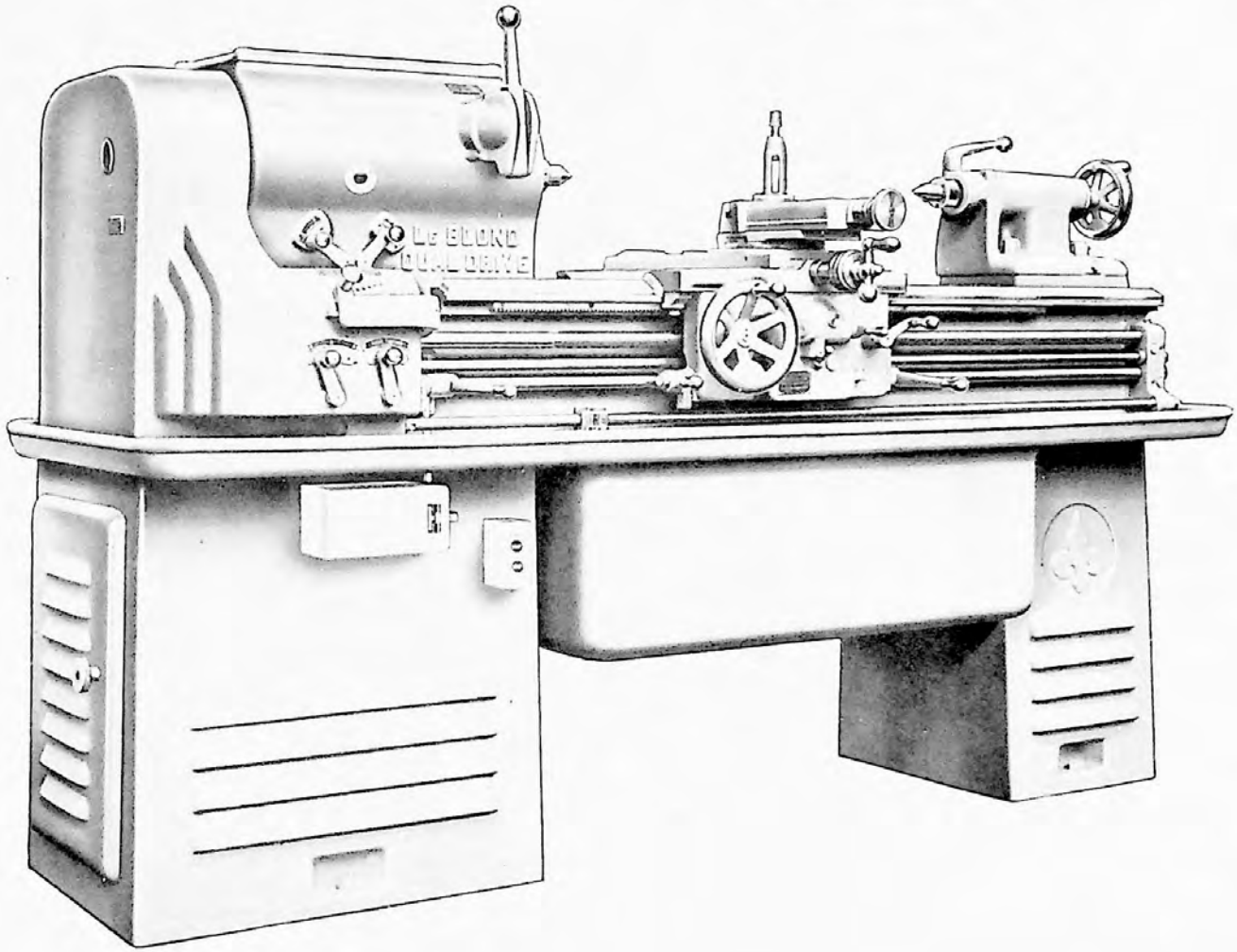


DUAL DRIVE INSTRUCTION MANUAL makes full use of the new exploded parts photo technique ... to make it easy to understand the construction and operation of your Dual Drive ... to assist you in identifying and ordering repair parts quickly and efficiently ... and to aid you in maintaining your Dual Drive for best results.

We were proud to present the Dual Drive lathe to the metal working industry. It is with equal pride that we publish this textbook on Dual Drive construction, operation and maintenance. If it in a small measure fulfills its intended purpose, the months devoted to its preparation will have been well spent. Your comments or questions are invited.

THE R. K. LEBLOND MACHINE TOOL CO., CINCINNATI 8, OHIO, U.S.A.

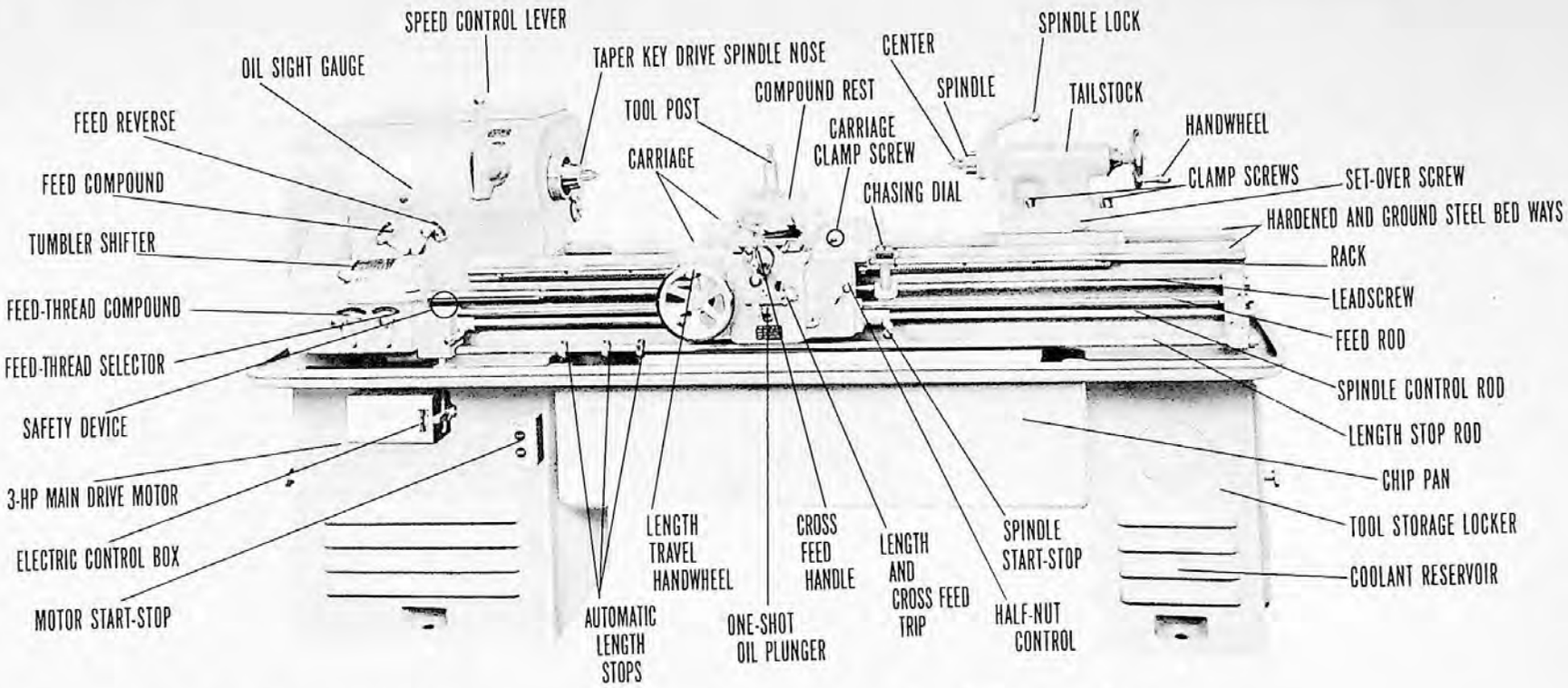
Largest Manufacturer of a Complete Line of Lathes.

INDEX

Third Edition

Price 50¢

DUAL DRIVE . . . a new concept in engine lathe design



Dual Drive. . .the lathe that does double duty. With its combination gear-belt drive headstock, the Dual Drive delivers two ranges of spindle speeds -- one of high speeds for use with carbide tools, and one for heavy stock removal. Here, in one lathe, is the productive capacity of two ordinary lathes.

Twelve spindle speeds, ranging from 28 to 1800 rpm, are controlled by a single lever for utmost simplicity. Hardened and ground steel bed ways are now furnished as standard equipment for extra, longer-lasting accuracy. And the Dual Drive comes equipped with electric brake and apron spindle control. Finally, Dual Drive's clean-lined appearance makes operators proud to handle it. . .makes you proud to own it.

Dual Drive Advantages

- 12 Spindle speeds: 4 high, 8 low and intermediate
- Single lever speed control, with direct reading speed plate and arrow indicator.
- Rapid Speed Selector for selecting cutting speeds for the commonly machined metals.
- Feed box totally enclosed. Drive, tumbler, and cone gears flame hardened. Pressure lubricated automatically.
- Electric brake and apron spindle control.
- Single lever, positive jaw feed control, in both directions. Interlocked to prevent engagement when lead screw is in use.
- Hardened and ground steel bed ways front and rear.
- Multiple automatic length stops.
- Automatic re-setting safety device on feed rod disengages rod and feed mechanism for overload protection.
- Reverse to feed incorporated in headstock.
- 3-hp main drive motor.
- Standard No. L00 taper spindle nose.
- Automatic lubrication through headstock and feed box.
- Hardened alloy steel gears and anti-friction bearings.
- Deep Steel Chip pan.
- Tool storage locker.

GENERAL INSTRUCTION

When you ordered your Dual Drive, you received an acknowledgement of the order specifying a date of shipment. When the lathe left our factory, the transporting agency issued a bill of lading, a receipt indicating that the machine was accepted in good order for shipping.

The lathe becomes your property upon payment of the freight charges and surrender of your bill of lading. Before accepting the shipment, check the lathe to be sure that it has not been damaged in transit. If it has been damaged in any way, the shipment should be conditionally accepted from the transportation company with the provision that it be subject to thorough inspection.

When you have determined the extent of the damage and have placed your claim with the transportation company, we ask that you forward us complete details and our Traffic Department will help you expedite.

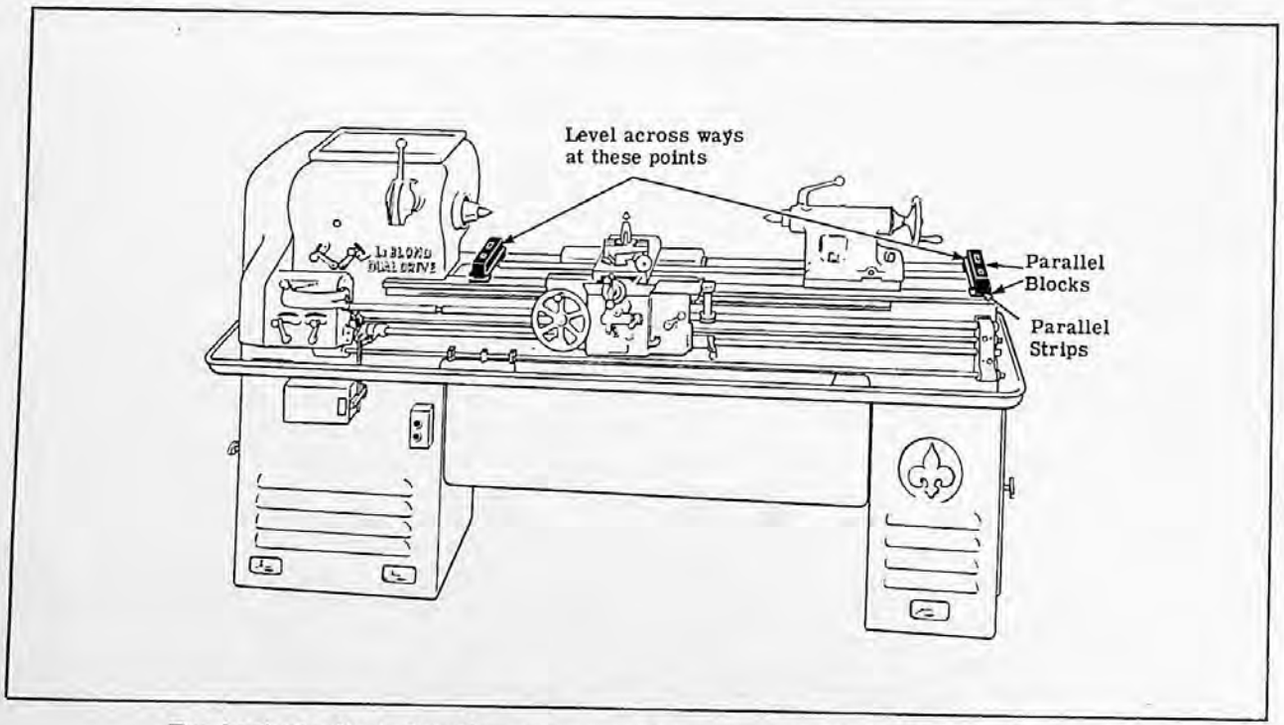
When ordering repair parts, always give us the serial number of your lathe. It's stamped on the cross girth of the bed at the tailstock end. (See illustration page 5).

Setting up your Dual Drive

Remove the crating carefully and leave the skids under the lathe until you have skidded it to your approximate location.

A lathe must set level and solid in order to perform accurately. It will be impossible to keep the machine level and in alignment if the floor is not rigid. Therefore, a solid foundation for the machine is of the utmost importance.

Next remove the lag screws which hold the legs to the skids and remove the skids from under the machine. Loosen the carriage clamp screw -- the carriage has been clamped to the bed to prevent movement during transit. Use kerosene to remove the slushing oil from the various parts of the machine. Then wipe off all the bright or bearing parts with a dry cloth, following with a cloth saturated with clean machine oil to cover all these parts with a protecting film of oil.



For best results in leveling, use a precision ground bulb level made by Pratt & Whitney, Starret, or Queen & Co.

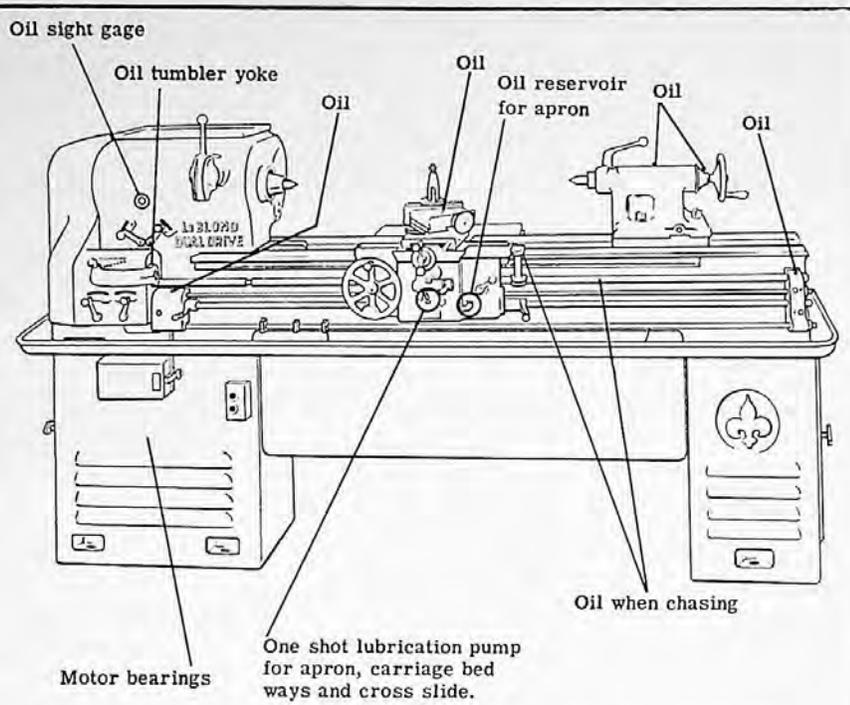
The lathe is then ready to be leveled. Even some of the best mechanics do not realize how important it is that a lathe be absolutely level. Although the bed is heavy, it can be sprung easily, and all the care taken in manufacturing and inspection is wasted if insufficient attention is paid to the important business of setting up the lathe.

Secure a precision ground bulb level for this work, such as is made by Pratt & Whitney, Starret, or Queen & Company. Then place the level on short parallel strips on the front and back ways as near to the headstock as possible, and raise the low side with the leveling screws until the bubble is in the center of the bulb. Then take the level and parellel strips to the tailstock end of the lathe and raise the low side until the level registers the same as at the headstock end. By repeating this several times, both the head and tailstock ends of the bed will be brought into parallelism. The lathe, when properly leveled, will show the same degree of accuracy of alignment as noted on the test card which accompanies each machine.

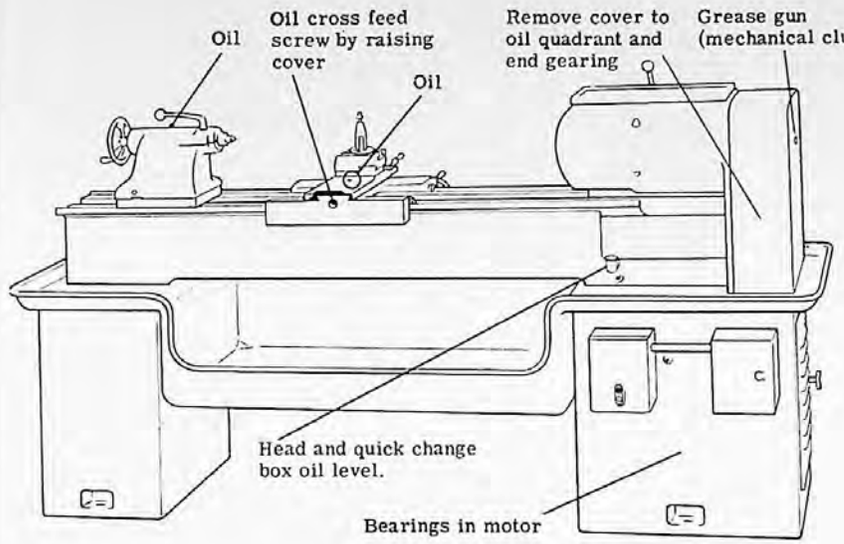
If the lathe rests on a wooden floor, the same lag screws taken from the skids can be used for lagging the machine to the floor. These, however, should not be pulled down so tight that they draw the bed out of level, but only tight enough to keep the lathe from "walking".

If set on a concrete floor, expansion bolts should be used for this purpose. Do not bed the legs in concrete because it may be necessary from time to time to check and correct the machine for level.

The next step is to connect the service lines to the motor. It is important that the voltage and the other specifications of the motor are the same as those of your service lines. The data 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 volt-



Care in oiling your machine regularly will add materially to accurate performance and will lengthen its useful life.



Don't forget oil inlets at rear of machine. Only the best grade of lubricating oil is recommended.

age, frequency (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.

Lubrication

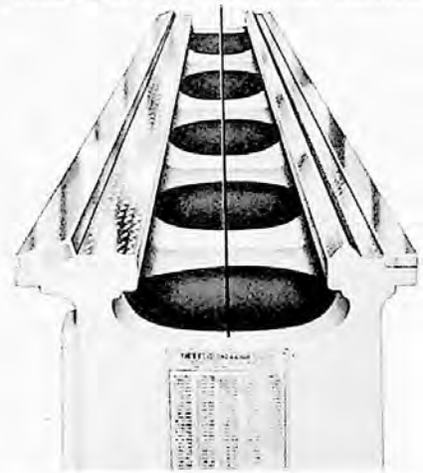
Before you start the lathe consult the lubrication charts above, which show the location of various oil inlets. It is important to use only the best grade of lubricating oil. All of the bearings fit closely and it is absolutely essential that the machine be properly lubricated before it is operated. Use an industrial oil of 500 seconds at 100° F.S.S.U. (equivalent to SAE 30) and fill the headstock to the oil level line indicated in level on rear of lathe and fill all oil holes. The volume of oil required for the headstock is 11 pints; for the apron, 1 pint.

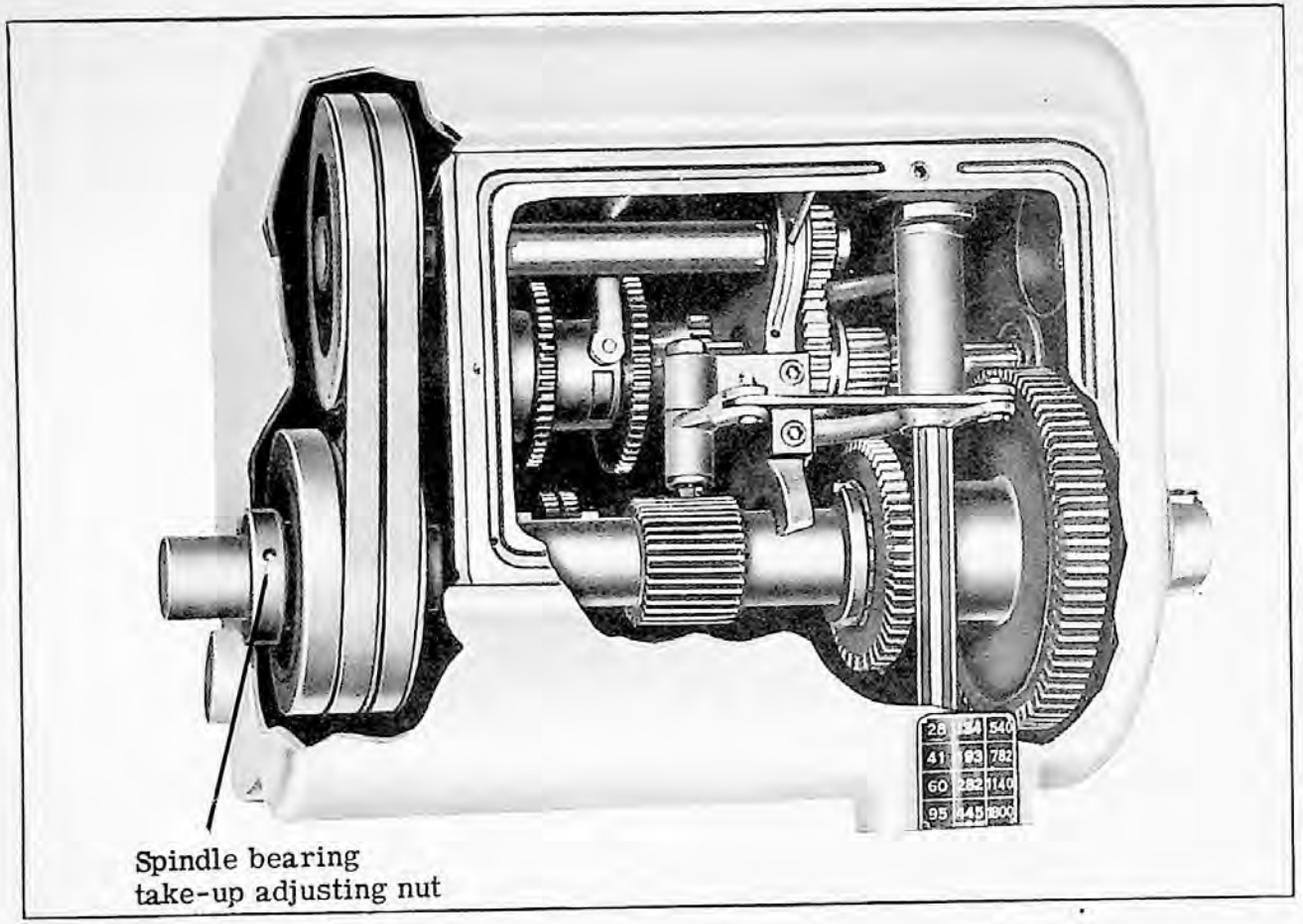
A lathe, like an automobile, depends on the attention it receives during "the running in period". See that all bearings are carefully oiled and watch that none run hot.

Get Acquainted with your Dual Drive

The operator should familiarize himself with the names of the various working parts from the chart on page 3 as the parts are referred to throughout the book by these names. He should also know the functions of the various parts.

When ordering repair parts, always give us the serial number of your lathe. It's stamped on the cross girth of the bed at the tailstock end.





Dual Drive Headstock

The Dual Drive was designed to incorporate the belt feed mechanism and the geared speed drive so as to provide the high speeds required for carbide tooling, and a low speed geared drive range for heavy stock removal. It was also intended to provide a lathe wherein all speeds could be selected by the movement of a single control lever.

To attain the fine finish desired at high spindle speeds, an automatic feed rate change was devised to decrease the rate of feed when the belt range is used.

Referring to head cross section page 10 and exploded view page 8.

The headstock housing supports all of the bearings on which the shafts rotate. The back shaft (Part 148) is supported in the ribbed portion of the headstock by bearings 147 and 142. Externally this shaft is held by bearings 118 and 132 in the clutch and brake housing. The main drive pulley 127 is engaged and disengaged through the clutch unit to provide rotation to the shaft 148. Keyed to the shaft by key 146 is the three-step cluster gear 145. The small pinion 143 is fitted to the splined portion of the shaft adjacent to bearing 142. The intermediate shaft 97 is journaled within the housing on three bearings 98, 95 and 92.

The shaft between the bearings 95 and 98 is splined and the four-cluster shifting gear 96 is splined internally to fit the shaft so that the cluster gear may be brought in to mesh with the small pinion 143, or one of the three steps on the gear 145.

The compound gear 93 slides on the splined portion of the shaft between bearings 92 and 95. The compound gear is moved into any one of three positions as follows:

(a) The small pinion may be engaged with the large bull gear 69 which is keyed to the spindle.

(b) Alternately, this gear may be shifted so that the teeth on the large diameter of the gear engage the teeth on the gear 68.

(c) Or, further this gear may be shifted so as to engage the teeth on gear 83 to engage high speed shaft 87.

When the gear 93 is engaged with the gear 69, the four slow, powerful back gear drive speeds are provided as required for heavy roughing cuts and for turning work of relatively large diameter.

When the gear 93 is engaged with gear 68, four intermediate gear-driven spindle speeds are provided and, finally, when gear 93 is engaged with gear 83, four belt speeds are provided to the spindle.

Since the spindle and shaft 87 are at a constant distance from each other, it has been necessary to provide a means for adjusting the tension of the vee-belts 222. The pulley 58 is made with a flange, forming a side of one vee groove. A ring 55 fits the outside diameter of the pulley hub and is triangular in cross section to form the adjacent faces of the vee grooves. This ring has a keyway on its inner surface into which fits the protruding end of the pin 55A in the adjacent surface of the pulley. This provides axial adjustment of the ring but prevents it from rotating.

A second ring 54 has one side beveled to form the remaining side of the second pulley groove. This ring is threaded on the pulley and may be locked in a selected position by screw 53.

When it is desired to tighten the belts, the screw 53 is removed and the ring 54 is turned clockwise on the pulley. This decreases the effective width of the pulley grooves and causes the belts 222 to

ride at a greater radial distance from the spindle. Since pulley 88 is splined to shaft 87, its longitudinal position is determined by this adjustment and thus the belts run true at all times. The belt may be removed by disassembling the rings 54 and 55.

Referring to head details page 11.

The spindle speed control lever 34 is used for selecting the various spindle speeds. The spindle control lever 34 is supported in housing 44 by pin 36 which is the fulcrum for the axial movement of shaft 33 against the restraining action of the detent assembly (ball 40, cup 46, spring 39 and screw 38). The axial force is transmitted from 34 through pin 37 to shaft 33 which is secured to shaft 28 by pin 29.

The shaft 28 carries at its rear end, a spool 22 within which rides the pin 52 fixed to one end of the bell crank 49. This bell crank is pivoted on the vertical pin 48, the other end of the crank 49 extends downward and forward and terminates in a forked end straddling the slot in the four-step gear 96 on shaft 97. The forked ends of the arm have two pins 51 on which are pivoted shoes 50 riding in the slot. Due to this construction, as the shaft 28 is axially translated by a force applied to the lever 34, the bell crank 49 is pivoted and the gear 96 is axially slid along shaft 97 to bring about selectively the engagement of these gears with their mating gears 145 or 143 on shaft 148. When the lever 34 is given a rotary motion, it carries housing 44 with it against the restraining action of the detent (ball 45, cup 46, and spring 47), thus causing shaft 28 to rotate. The shaft 28 has a splined portion on which is located the corresponding splined shifter 25. This shifter has a downward extending yoke with arms straddling gear 93. The two pins 26 are secured in the ends of these arms and support shoes 27 which engage in the slot on gear 93. Thus as the lever 34 and the shaft 28 are rotated, gear 93 is axially moved along the shaft 97 to select one of its three positions as previously mentioned.

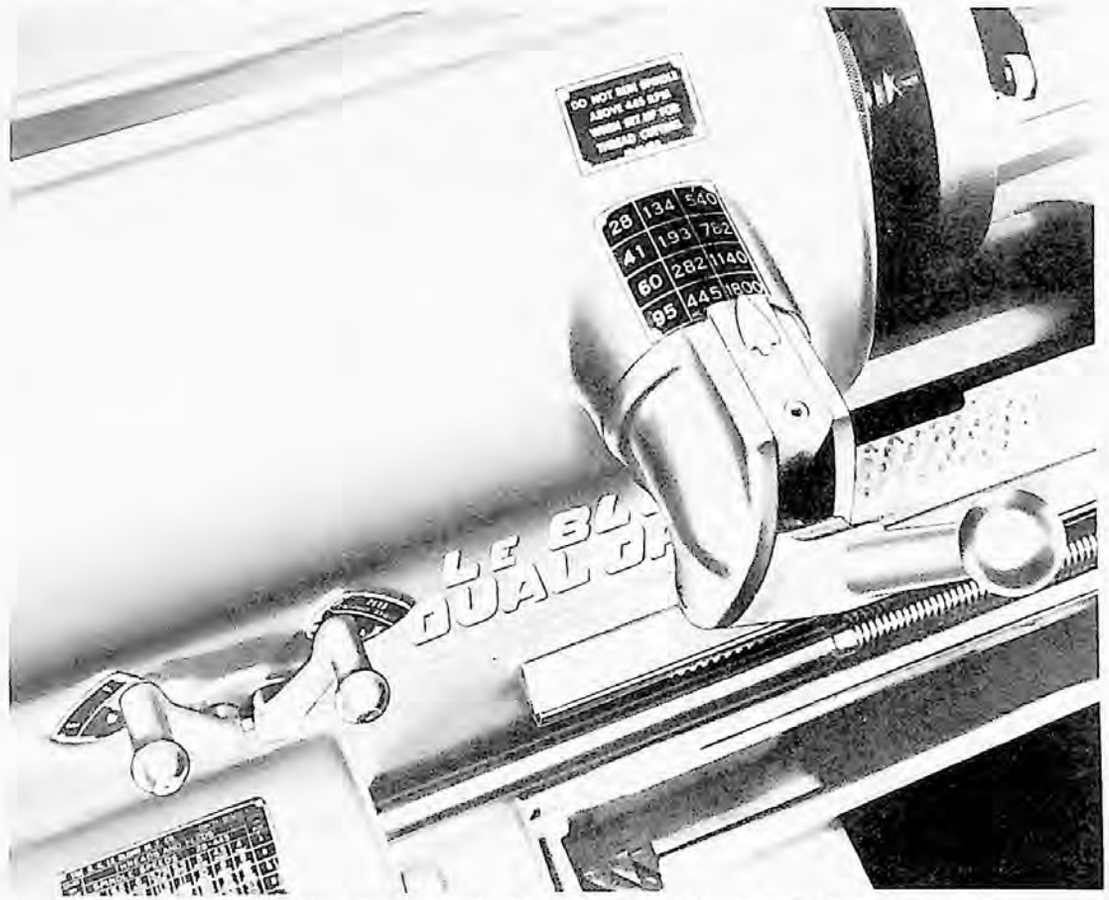
In order to indicate the speeds selected, a pointer 32 is secured to the lever 34 so that its end moves over the direct reading spindle speed selecting chart showing the various speeds determined for each pivotal and axial adjustment of the shaft and lever.

A pick-off gear 185 is provided for the drive to the feed box of the lathe. This gear is fixed on the shaft 183 by key 184. This shaft is the feed shaft or output shaft for the power feed take-off for actuating the cutting tool of the lathe through the quick change box mechanism. The forward end of this shaft is splined and carries shifting gear 178 and a non-shifting gear 177. Shaft 170 carries the cluster gear 168 and the pinion 168A; thus the drive may come from 168A to the large section of 178 or from 168 to the small gear section of 178.

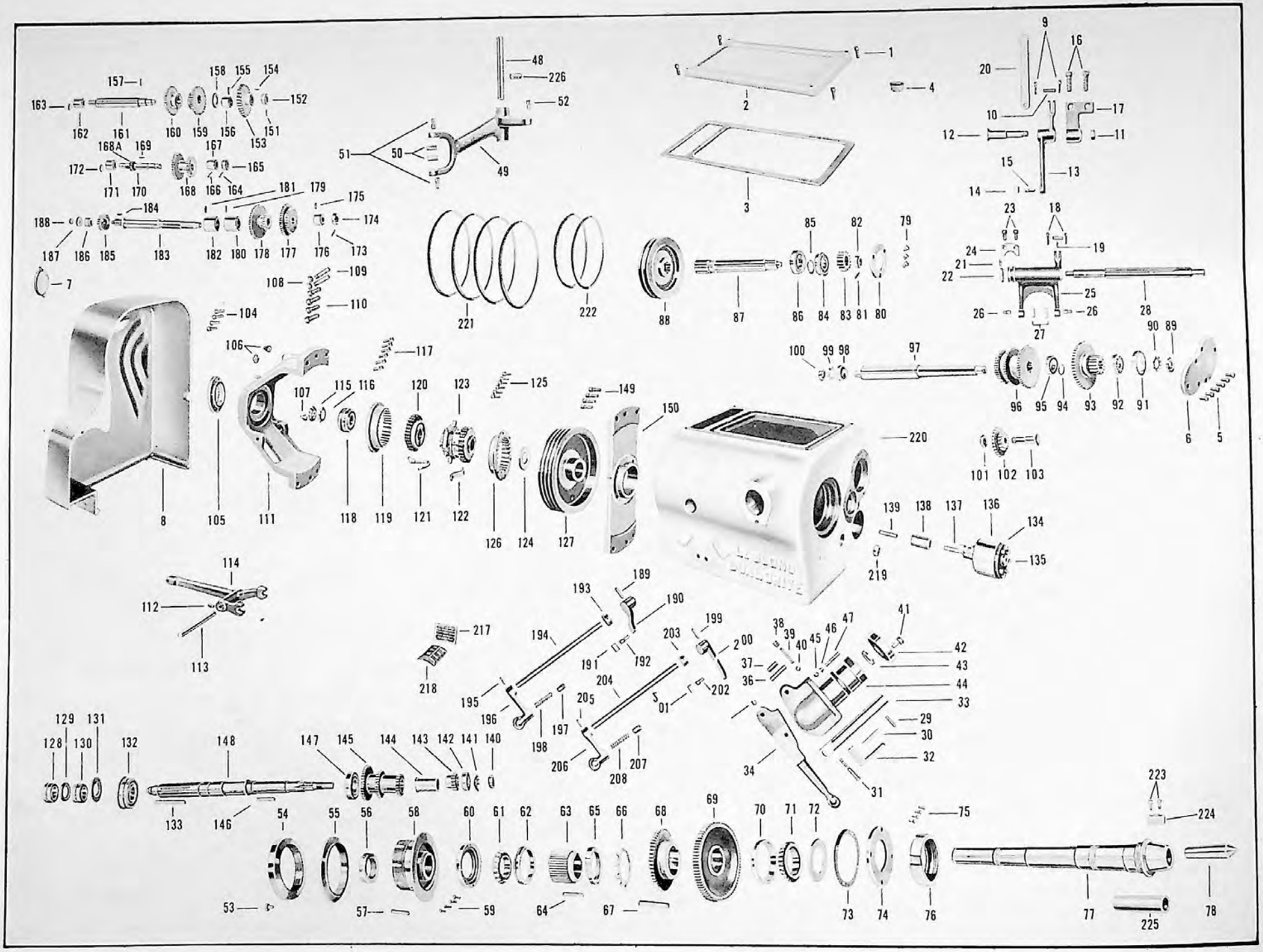
Shaft 161 carries the feed reversal shifting gear 159, low gear speed and intermediate gear speed shifting feed gear 160 and fixed gear 153.

The low gear and intermediate gear feed rates are taken from the spindle thru gear 63 thru 160 to drive shaft 161. Gear 159 drives shaft 170 through gear 168 or for reversal of feed the drive is from 159 to the large diameter of 177 and thence to shaft 170 through gear 168. Shaft 183 is driven from shaft 170 by means of the meshing of 168 and the small diameter of 178 for the coarse feeds or from 168 A to the large diameter of 178 for the fine feeds.

When lever 34 is moved to bring the belt speeds into effect by meshing gear 93 with gear 83, gear 93 is also brought into mesh with the idler gear 103 while gear 160 is automatically disengaged from 63. Idler gear 103 drives shaft 161 through fixed gear 153. The drive from this point to gear 185



Controls for selecting proper spindle speeds and feeds and threads are all conveniently centralized at the headstock.



on shaft 183 is the same as in the case for the gear-driven feeds. Gear 160 is disengaged from gear 63 by means of roller 14 on pin 15 in bell crank 13. Bracket 17 carries the bell crank by means of stud 12 and is secured to the head stiffening rib by means of screws 16. The bell crank is connected to shifter 25 by means of link 20, so that as the shifter is rotated to move gear 93, it also imparts a rotary motion to the bell crank and moves gear 160 out of mesh with 63.

The feed reverse gear 159 is moved through roller 202 on arm 200 on shaft 204. This shaft is positioned by means of the spring-loaded detent in handle 206.

The "coarse-fine feed" compound gear 178 is moved through roller 192 on arm 190 on shaft 194 while the position of the gear is controlled by the spring-loaded detents in handle 196.

The uni-directional pump 136 is driven by shaft 148 through the coupling 138 and operates whenever the spindle is rotating in the forward direction. When the spindle is to be operated in reverse for short periods, it is advisable to run the spindle in the forward direction intermittently in order to provide an oil film on the gear teeth and bearings. Should it be desired to operate continuously in reverse, it would be advisable to rotate pump flange 135, 90° from its present position.

ADJUSTMENTS

Spindle take up

To tighten the spindle, loosen the set screws in nut 56 and rotate the nut clockwise relative to the spindle, thus moving pulley 58 against bearing 61 until a slight drag is felt when the spindle is rotated by hand with the speed lever in a neutral position.

DUAL DRIVE HEADSTOCK PARTS

No.	Name
1	Socket head screw
2	Head cover
3	Head cover gasket
4	Pipe plug
5	Socket head cap screw
6	Front cover
7	Oiler cover
8	Feed gear and clutch cover
9	Cotter pin
10	Pin
11	Hex Nut
12	Stud
13	Shifter lever
14	Shifter lever shoe
15	Shifter lever roller stud
16	Socket head cap screw
17	Shifter bracket
18	Cotter pin
19	Pin
20	Shifter link
21	Taper threaded pin
22	Shoe
23	Socket head screw
24	Yoke retainer plate
25	Gear shifter
26	Shifter lever shoe stud
27	Shifter lever shoe
28	Shaft
29	Taper pin
30	Key
31	Socket head screw
32	Speed indicator pointer
33	Speed lever shaft
34	Speed indicator lever
35	Set screw
36	Straight pin
37	Straight pin
38	Plug
39	Spring
40	Ball
41	Set screw
42	Adjusting nut
43	Victoprene seal
44	Speed lever bracket
45	Ball
46	Plug
47	Spring
48	Pin
49	Cluster gear shifter
50	Shifter lever shoe
51	Shifter lever shoe stud
52	Straight pin
53	Screw
54	Belt tightener
55	Pulley ring
56	Lock nut
57	Key
58	High speed spindle pulley
59	Filister head screw
60	Spindle rear bearing flange
61	Timken #3 bearing, cone
62	Timken.#3 bearing, cup
63	Gear, spindle feed
64	Key
65	Nut
66	Washer
67	Key
68	Spindle gear
69	Spindle face gear
70	Timken #3 bearing, cup
71	Timken #3 bearing, cone
72	Spindle oil slinger
73	Spindle front flange gasket
74	Spindle bearing front flange
75	Socket head cap crew
76	Draw nut
77	Spindle
78	Center
79	Filister head screw
80	Flange
81	Taper pin
82	Nut
83	Pinion
84	Fafnir bearing
85	Reliance snap ring
86	Fafnir bearing
87	Shaft
88	Pulley
89	Lock nut
90	Lock washer
91	Spacer
92	Fafnir bearing
93	Inter. Shaft slide pinion
94	Reliance snap ring
95	Fafnir bearing
96	Inter. shaft cluster gear
97	Intermediate shaft
98	Fafnir bearing
99	Lock washer
100	Lock nut
101	Hex nut
102	Idler gear
103	Idler gear stud
104	Socket head screw
105	Bearing cap
106	Oiler
107	Oiler
108	Nut
109	Taper pin
110	Socket head screw
111	Clutch bracket
112	Set screw
113	Clutch shifter arm shaft
114	Clutch shifter arm
115	Lock nut
116	Washer
117	Socket head screw
118	Norma Hoffman bearing
119	Driving ring
120	Brake unit
121	Clutch yoke oil tube
122	Clutch yoke oil tube support
123	Single 1-1/8 bore clutch
124	Drive pulley thrust collar
125	Socket head screw
126	Driving ring
127	Drive pulley
128	20th Century bearing
129	Drive pulley bearing spacer
130	20th Century bearing
131	Drive pulley thrust collar
132	Norma Hoffman bearing
133	Key
134	Socket head screw
135	Tuthill pump
136	Pump adaptor
137	Pump motor shaft
138	Coupling
139	Key
140	S.K.F. lock nut
141	S.K.F. lock washer
142	Fafnir bearing
143	Drive shaft small gear
144	Gear spacer
145	Drive shaft large gea
146	Key
147	Fafnir bearing
148	Drive shaft
149	Socket head screw
150	Clutch plate
151	Taper pin
152	Collar
153	Reverse drive gear
154	Woodruff key
155	Straight pin
156	Front bush
157	Straight pin
158	Thrust collar
159	Sliding gear
160	Sliding gear
161	Feed reverse shaft
162	Rear bush
163	Expansion plug
164	Taper pin
165	Collar
166	Straight pin
167	Front bush
168	Inter. feed shaft gear
169	Key
170	Inter feed shaft
171	Rear bush
172	Expansion plug
173	Taper pin
174	Collar
175	Straight pin
176	Front bush
177	Feed reverse idler gear
178	Feed shaft sliding gear
179	Straight pin
180	Middle bush
181	Straight pin
182	Rear bush
183	Feed shaft
184	Key
185	Feed gear
186	Feed shaft change gear collar
187	Washer
188	Hex Nut
189	Taper pin
190	Shifter lever
191	Shifter lever shoe
192	Shifter lever shoe stud
193	Collar
194	Shifter shaft
195	Taper pin
196	Shifter lever handle
197	Shifter handle plunger
198	Spring
199	Taper pin
200	Shifter lever
201	Shifter shaft lever shoe
202	Shifter shaft lever stud
203	Collar
204	Shifter shaft
205	Taper pin
206	Shifter lever handle
207	Shifter handle plunger
208	Spring
215	Feed index plate
216	Feed rev. index plate
217	Thread cutting instruction plate
218	Spindle speed plate
219	Steel plug
220	Head casting
221	Vee-belts main drive
222	Vee-belts spindle drive
223	Screw
224	Key
225	Bush
226	Screw

Spindle drive belt adjustment.

Type 1. Remove screw 53 and rotate ring 54 relative to the pulley 58, thus forcing one belt against and up on ring 55 which in turn forces the other belt against and up the flange, thus increasing the pulley pitch diameter over which the belts operate.

To take off the belts, remove screw 53 and ring 54. Take off the exposed belt, remove ring 55 which uncovers the second belt.

Type 2. Tighten the two screws that move the hub of ring 55 axially on pulley 58. Remove screw 53 and rotate ring 54 clockwise relative to the hub of 55.

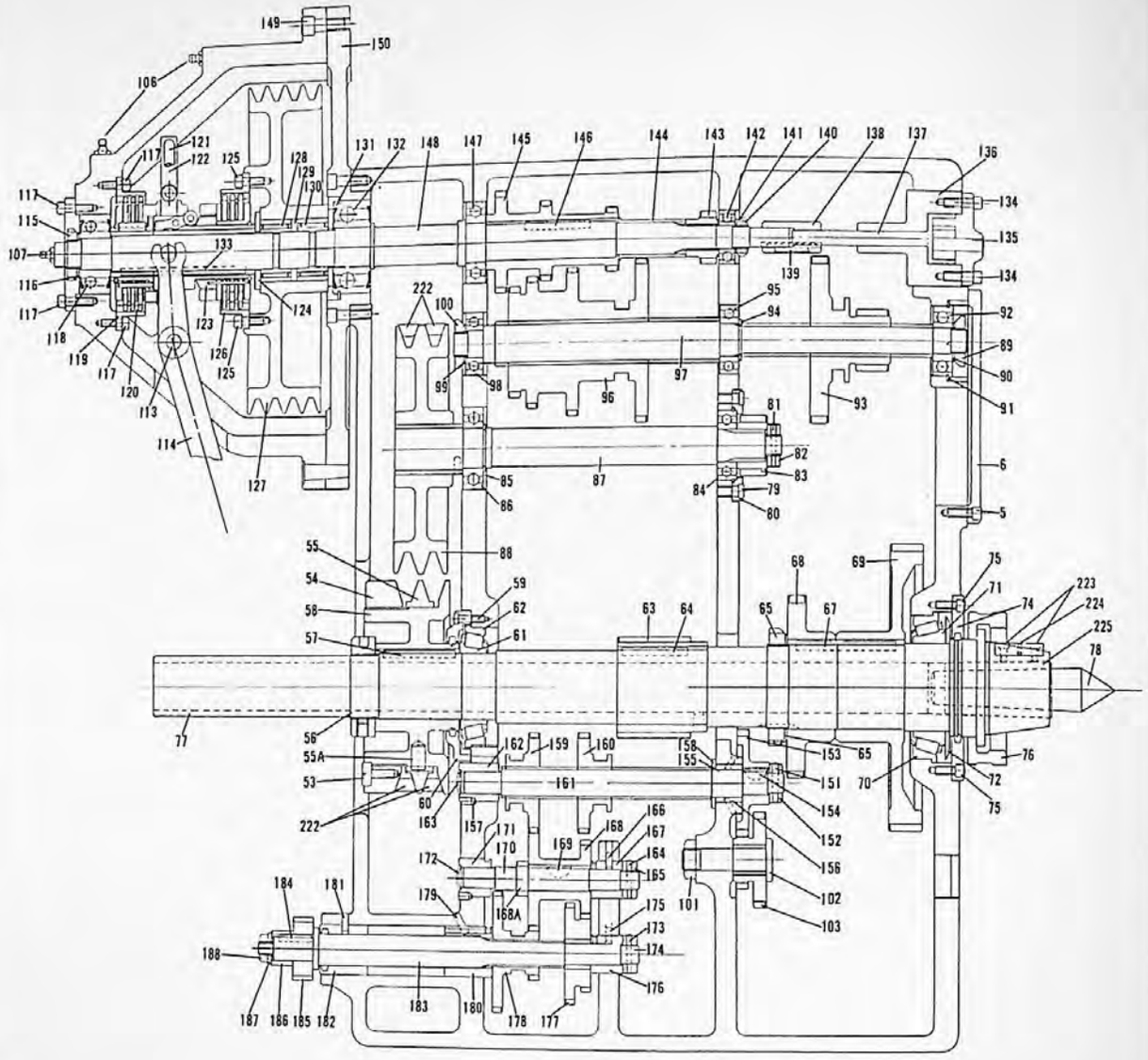
To take off belts, remove screw 53, ring 54 and take off exposed belt. Remove the two screws holding 55 on 58 and remove 55, after which the second belt may be removed.

ELECTRIC BRAKE

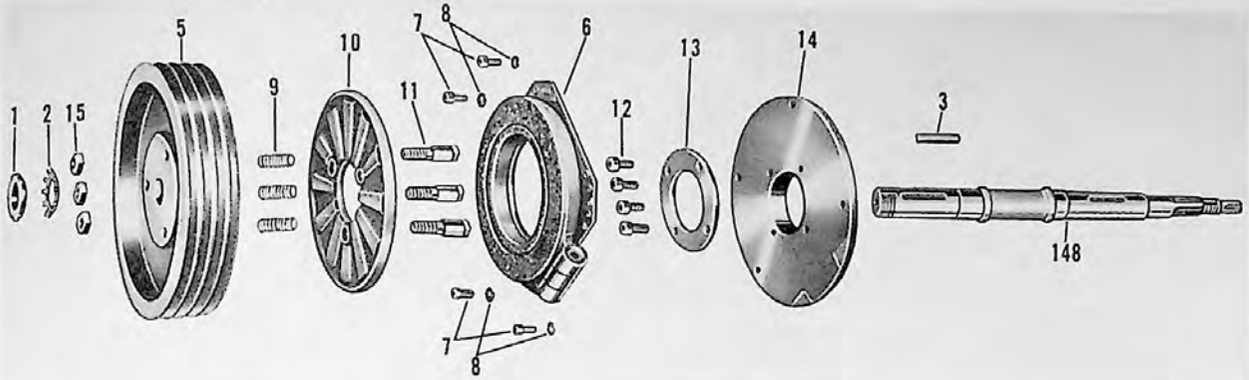
The electric brake -- furnished on models with serial numbers 226 and 272 on up -- operates instantly, is unmatched for heat dissipation, has fewer parts, and requires little power.

This type of brake is self-adjusting. No mechanical adjustment is needed. A very light spring pressure upon the armature causes it to follow up any wear on the two friction surfaces. Therefore, no attention is necessary for the life of the unit. Grooving and scoring of the armature segments and magnet face does not indicate a worn out condition. This is a perfectly normal wear pattern. The groove machined in the face of the magnet will tell visually the condition of the brake. When wear has reached the bottom of this groove, replacement should be made.

Electric brake parts are shown on opposite page, control parts on pages 20-21.



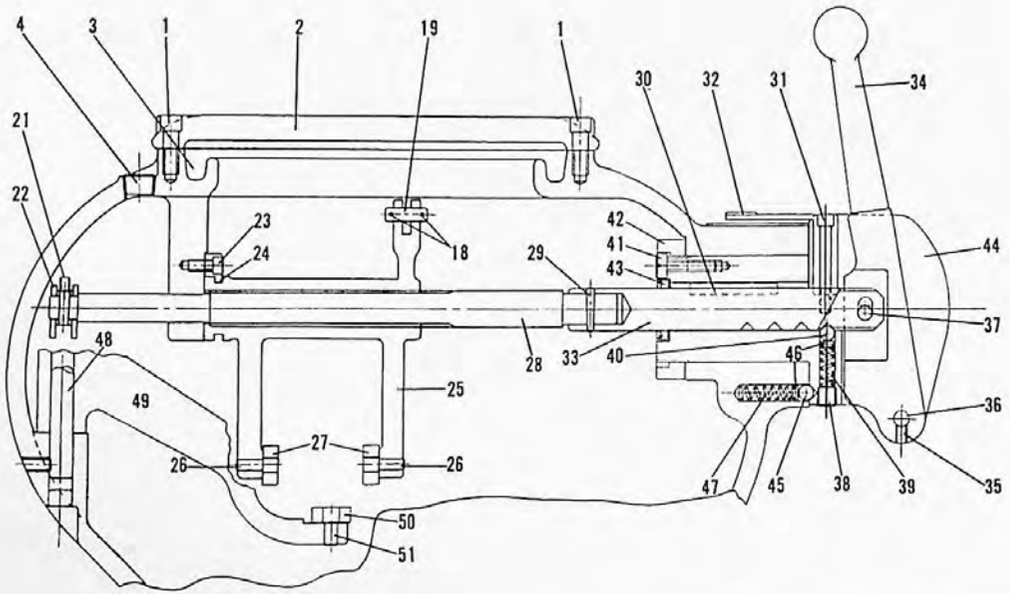
HEADSTOCK CROSS SECTION

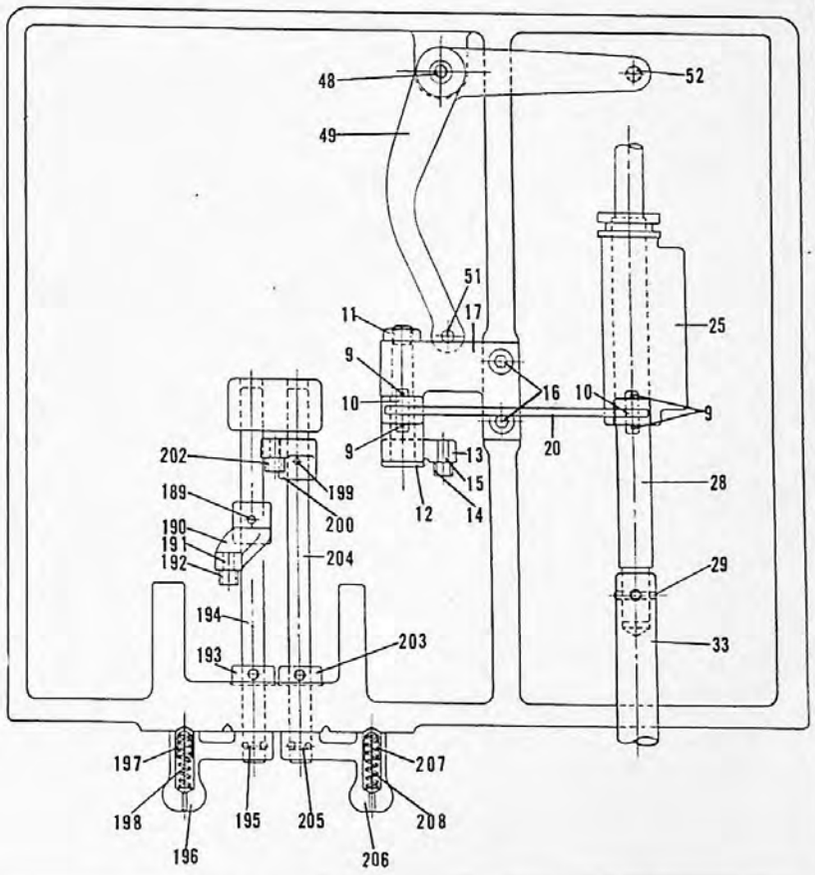


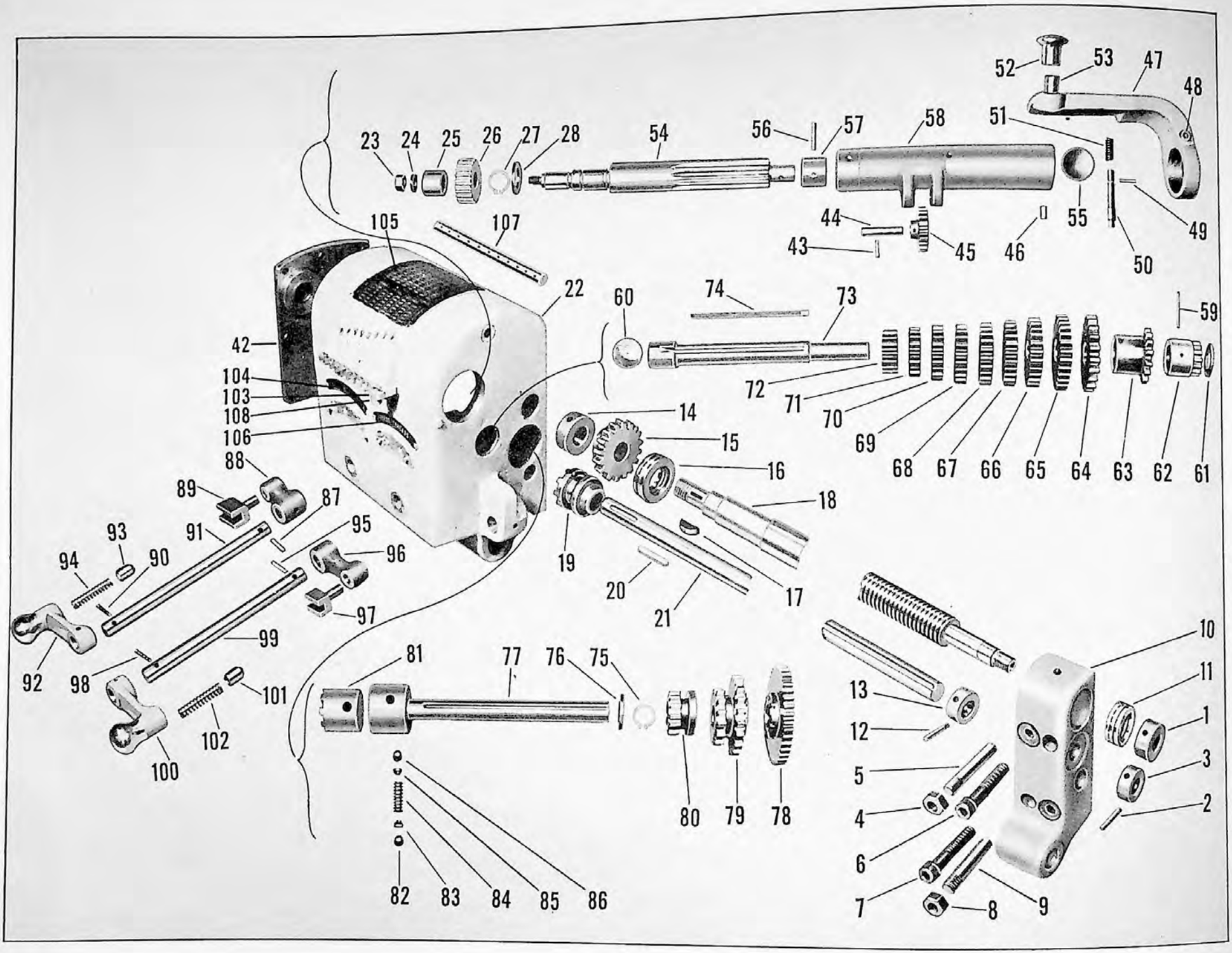
ELECTRIC BRAKE PARTS

1	Locknut	10	Armature
2	Lock washer	11	Armature drive pins
3	Key		
148	Drive shaft	12	Flange mounting screws
5	Pulley	13	Plate
6	Magnet	14	Brake flange
7	Magnet mounting screws	15	Nuts
8	Lock washers		

HEADSTOCK DETAILS



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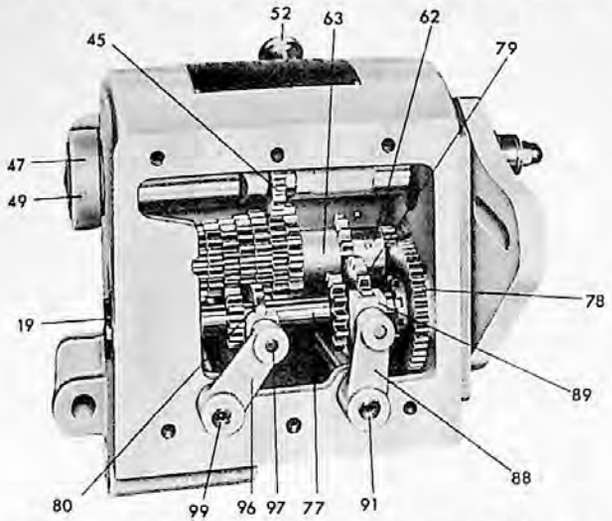
TOTALLY ENCLOSED, AUTOMATICALLY LUBRICATED QUICK CHANGE BOX



The totally enclosed quick change box effectively keeps out dirt, chips and coolant. It is driven by the idler gear (also referred to as the quadrant gear) from the feed gear 185 on the head. The quick change gear 26 is mounted on the end of the quick change box and carries the drive through the gears that compose the quick change box to the leadscrew and the feed rod.

By means of the tumbler gear handle the tumbler gear 45 can be rocked into engagement with any of the quick change gears in the cone. Shaft 77 is driven from the cone shaft through either the gears 64 to 79, the gears 63 to 79, or from gear 62 through 78 to 79 by means of the clutch on the faces of 78 and 79.

Shaft 77 drives the leadscrew when gear 80 is meshed with gear 15 on the leadscrew. A direct reading index plate is mounted on the quick change box directly under the tumbler arm 47. The numbers on the plate refer to the threads per inch that the leadscrew and the gear combinations will cut and to the feed per revolution of the spindle that is obtained when the tumbler is engaged directly over a vertical row on the index plate. The coarse and fine references refer to the location of the "E, F" compound feed handle on the headstock, and "A, B and C" refers to the position of the compound lever on the quick change box thus giving a horizontal intersection of the vertical row under the tumbler arm.

Ample provision has been made for oiling all of the bearings and the alloy steel gears of the quick change box from the pump which is mounted in the head of the lathe.

To Remove Box From Lathe

Drain the oil from the head end of the bed, remove connection between length stop rod and clutch 19 on feed rod by removing pin 14, page 15. Remove collar 3 from left end of rod 8, page 15. Remove nut 1 and back box 10, and the cover plate on the rear of the bed. Nut 14 is then removed from the leadscrew after which the feed rod, leadscrew and stop rod may be pulled out of the quick change box. The four screws holding the bed are reached through the opening in the rear of the bed.

QUICK CHANGE BOX PARTS

No.	Name	
1	Adjusting nut	
2	Taper pin	
3	Feed rod collar	
4	Nut	
5	Draw pin	
6	Screw	
7	Screw	
8	Nut	
9	Draw pin	
10	Back box	
11	Ball thrust bearing	
12	Taper pin	
13	Feed rod collar	
14	Block nut	
15	Leadscrew gear	
16	Ball thrust bearing	
17	Key	
18	Leadscrew	
19	Feed rod clutch	
20	Key	
21	Feed rod	
22	Quick change box	
23	Hex nut	
24	Washer	
25	Collar	
26	Feed gear	
27	Snap ring	
28	Drive shaft collar	
29	Quadrant	See Page 14
30	Quadrant gear bush	
31	Quadrant gear bolt	
32	Oilite gear bush	
33	Quadrant gear	
34	Nut	
35	Washer	
36	Oiler	
37	Nut	
38	Washer	See Page 14
39	Screw	
40	Nut	
41	Screw	
42	Quick change box plate	
43	Pin	
44	Tumbler gear shaft	
45	Tumbler gear	
46	Pin	
47	Yoke shifter arm	
48	Screw	
49	Pin	
50	Knob plunger	
51	Spring	
52	Yoke shifter knob	
53	Knob sleeve	
54	Drive gear	
55	Plug	
56	Pin	
57	Drive gear bush	
58	Yoke	
59	Pin	
60	Plug	
61	Spacer collar	
62	Cone shaft collar	
63	15T 9P gear	
64	21T 9P gear	
65	Cone 28T gear	
66	Cone 26T gear	
67	Cone 24T gear	
68	Cone 23T gear	
69	Cone 22T gear	
70	Cone 20T gear	
71	Cone 18T gear	
72	Cone 16T gear	
73	Cone shaft	
74	Cone shaft key	
75	Snap ring	
76	Collar	
77	Feed spline shaft	
78	Clutch gear	
79	Sliding gear	
80	Lead screw sliding gear	
81	Clutch	
82	Ball	
83	Plug	
84	Spring	
85	Plug	
86	Ball	
87	Pin	
88	Shifter lever	
89	Shifter shoe	
90	Pin	
91	Compound shifter shaft	
92	Shifter handle	
93	Shifter handle plunger	
94	Spring	
95	Pin	
96	Shifter Lever	
97	Shifter shoe	
98	Pin	
99	Feed thread selector shifter shaft	
100	Shifter handle	
101	Shifter handle plunger	
102	Spring	
103	Shifter arm locating plate	
104	Index plate	
105	Feed change plate	
106	Feed & thread plate	
107	Oil distributor	
108	Stop pin	

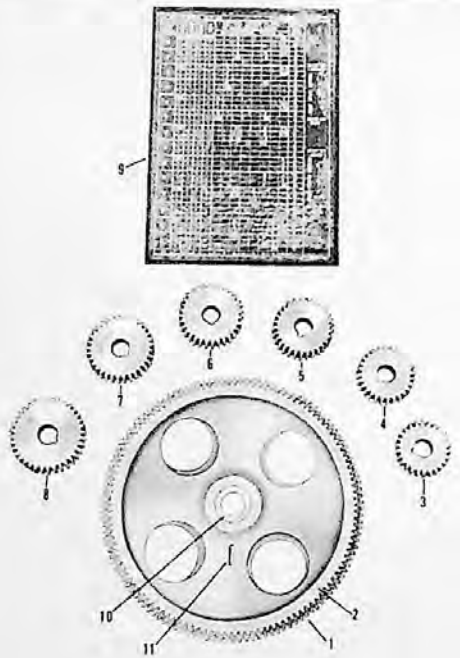
LEADSCREW

The leadscrew (part 18, page 12) is used for thread cutting, and is driven by leadscrew gear 15 in the quick change box. Leadscrew slip gear 80 has a sliding fit on shaft 77 and can be engaged through the handle 100, the shaft 99 and the arm and shoe 96-97 or disengaged from the feed gear train by a short sliding movement. When not chasing threads, disengage the sliding gear so that the leadscrew does not revolve. On other lathes, where a splined leadscrew is used to drive the apron, the leadscrew is subjected to torsional strains at all times and may become inaccurate or the key engaging the spline (keyway) in the leadscrew may burr up the edges of the threads, and the leadscrew then acts as a tap, constantly wearing the half-nut. The leadscrew on the Dual Drive remains accurate for the life of the machine, as it is not subject to these conditions.

The headstock end of the leadscrew runs in a bearing inside the quick change box, the tailstock end runs in the back box 10. Ball thrust bearings 11 and 16 are provided at head and tail ends to take thrust in either direction. End play is eliminated by the tail end adjusting nut 1. Care must be taken to keep the leadscrew free from end play or the threads on the work piece will be spoiled when the lathe is reversed if you do not back the tool away from the work. To take up end play, loosen the set screw in the adjusting nut 1 and turn the nut clockwise till a slight drag is felt when the leadscrew is turned by hand, then re-tighten the set screw.

The Dual Drive is equipped with a left-hand threaded leadscrew which may be rotated in either direction by means of the feed reverse mechanism in the headstock. This reduces the number of gears in mesh between the spindle and the leadscrew. The thrust of the leadscrew is taken at the feed box end of the screw, and as most threads cut are right-hand, the leadscrew is in tension under this condition. The back box supports both the leadscrew and the feed rod on the tailstock end of the lathe. The leadscrew takes a bearing in back box, but it takes no thrust other than the preload at this point.

When cutting threads, it is good practice to put a few drops of oil on the leadscrew. This not only lubricates the parts but will also keep them from rusting. Oil bearings in the back box daily.



METRIC TRANSLATING GEARS-PARTS

1	Gear, compound large	9	Plate, index
2	Gear, compound small	10	Bush, oilite
3-8	Gears, change	11	Pin, straight

FEED ROD

The feed rod (part 21, page 12) transmits power from the quick change box to the apron. Many lathes of this class are not provided with a separate feed rod, but use a splined leadscrew for both turning and chasing, and thus the leadscrew is always in use. On the Dual Drive, however, a separate feed rod is provided to transmit power for turning and facing. The feed rod is connected to the final drive shaft through a feed rod safety device (81 to 86, page 12).

FEED ROD SAFETY DEVICE

The Dual Drive, because of its extensive use in shops where it is operated by comparatively inexperienced persons, is equipped with a feed rod safety device, which releases when the load on the feed rod becomes too great for the machine.

At a predetermined factor of safety the spring-ball clutch releases the feed rod, and automatically engages it again when the load is released. Thus, if the carriage runs into the headstock, the balls (parts 82 and 86, page 12) will compress the spring 84 which releases the shaft and saves the feed mechanism from breakage. As soon as the feed is disengaged at the apron, the safety device again engages and resumes turning the feed rod.

QUADRANT PARTS

(See illustration above and on page 12)

29	Quadrant	36	Oiler
30	Quad. gear bush	37	Nut
31	Quad. gear bolt	38	Washer
32	Oilite gear bush	39	Screw
33	Quadrant gear	40	Nut
34	Nut	41	Screw
35	Washer		

MULTIPLE AUTOMATIC LENGTH STOPS

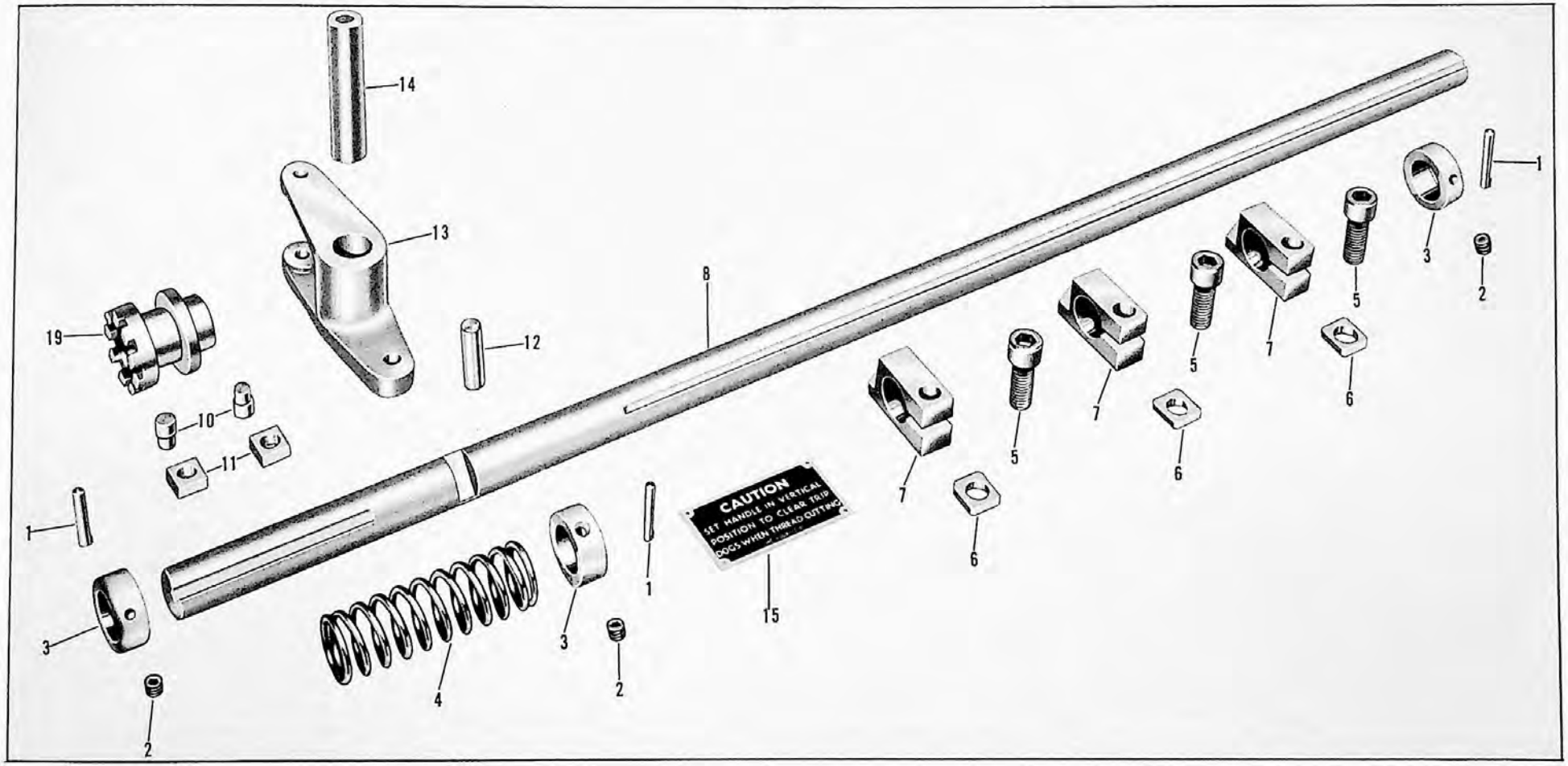
When handle (part 71, page 18) on the left side of the apron is lowered, it will contact the stops (part 7, page 15) on the rod 8 causing it to move to the left and thus disengage the feed rod clutch 19 by means of the bell crank 13. When the feed has been stopped at the point where the stop 7 has been set, it may be re-engaged by lifting the trip handle 71 which permits the rod to snap to the right to re-engage the feed rod clutch. The carriage will then advance up the bed to the point where the next stop has been set.

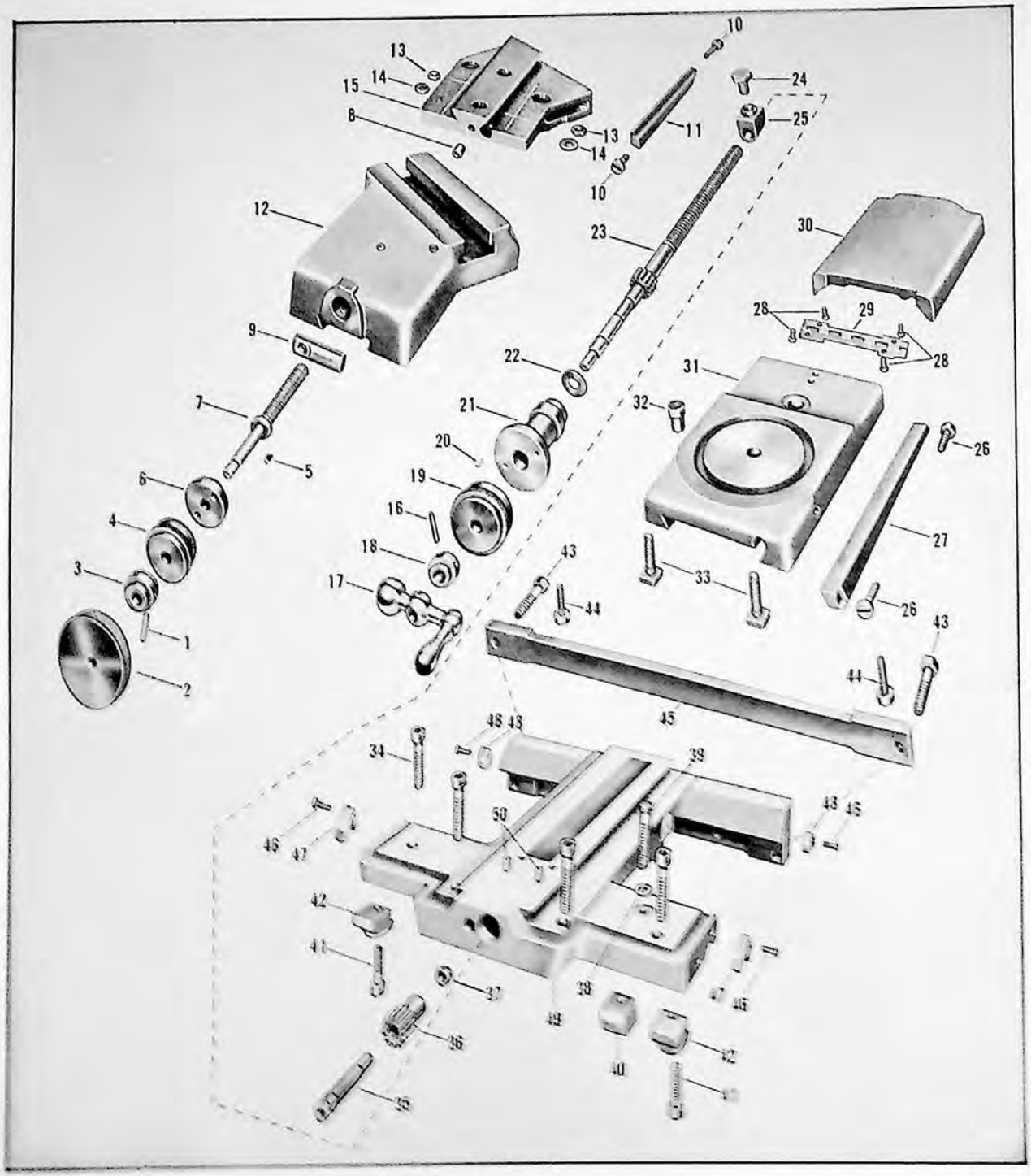
LENGTH STOPS PARTS

1	Taper pin	10	Shoulder pin
2	Dog point screws	11	Shifter shoes
3	Collar	12	Pin
4	Spring	13	Clutch throw-out yoke
5	Screw	14	Yoke pin
6	Trip dog key	15	Instruction plate
7	Trip dogs	19	Feed rod clutch
8	Length stop shaft		

COMPOUND REST

The compound rest and bottom slide unit consists of compound rest bottom slide (part 31, page 16), compound rest swivel slide 15, compound rest top slide 12, cross feed dirt guard 30, cross feed nut 25, and all other parts 1 to 33 inclusive as shown on page 16 . The bottom slide is fitted to the dovetailed cross slide of the carriage and is equipped with an angular gib 27 to provide means of adjustment for wear. A similar gib 11 is provided for the top slide. These gibs are used to adjust for wear by backing out the gib screws 10 or 26 at





the small end of the gib and tightening the companion screw against the large end of the gib. Both gibs should be maintained in a position that gives a slight drag to their respective slides. Cross feed nut 25 is attached to the bottom slide and fits on cross feed screw 23. The bottom slide gets its movement on the carriage through the cross feed screw and nut.

The compound rest swivel slide is fitted on top of the bottom slide and swings around to the angle selected. It is clamped in position by two T-slot bolts 33 whose heads are in a circular T-slot in the bottom slide. The swivel slide is graduated in degrees so that the compound rest can be set accurately to the desired angle. This feature is used when turning angles on bevel gears, boring holes having steep tapers, and turning and grinding centers where the angle is too steep to use the taper attachment.

The micrometer dial 4 is graduated to read direct in thousandths of an inch so that when the top slide is set parallel to the bed ways, accurate counter boring and step facing may be accomplished.

Note: Straight compound rests have been furnished on special order. If replacement parts are required for the straight type rest, please mention this when ordering.

CARRIAGE

The carriage travels along the bed and is guided by the shear in front and a flat way in rear. The carriage is moved by means of the gear train in the apron to which it is attached. Bed ways are protected by shear wipers (47 and 48, at left) to prevent chips and dirt getting between the carriage and the bed.

The cross feed bush 21 forms the bearing for the cross feed screw 23. On the front end of the screw is a micrometer dial 19 which is graduated to read in thousandths of an inch diameter reduction so that the operator may read diameter from the dial. Carriage clamp screw 39 is used to clamp the carriage to the bed for facing and cutting-off oper-

ations. Before engaging the longitudinal feed, be certain that the clamp screw is loose and that the carriage can be moved freely by hand.

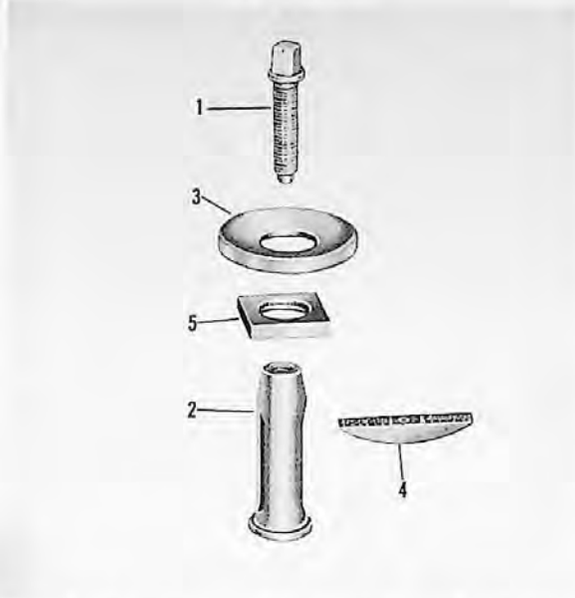
Raise the compound rest dirt guard 30 over the cross feed screw and oil the screw. Also see that the dovetailed cross slide is cleaned and oiled daily. Oil the felt in the shear wipers. When working with cast iron, remove the wipers weekly and clean them in gasoline or kerosene.

The carriage back gib 45 is adjusted by loosening screws 43 and tightening screws 44 until the carriage has a slight drag on the bed. Screws 43 are then locked to hold the gib in this position. The front gibs 42 are brought up to touch the bed by scraping metal off the gib surface that contacts the under side of the carriage wing.

COMPOUND REST AND CARRIAGE PARTS

No.	Name	No.	Name
1	Top slide screw knob pin	25	Cross feed nut (metric available)
2	Top slide screw knob	26	Gib screws
3	Nut	27	Bottom slide gib
4	Graduated collar hub (metric available)	28	Filister screws
5	Key	29	Dirt guard hinge
6	Top slide screw bush	30	Dirt guard
7	Top slide screw	31	Bottom slide
8	Set screw	32	Shoulder pin
9	Top slide screw nut	33	T-slot bolts
10	Gib screws	34	Socket head screws
11	Top slide gib	35	Idler pinion stud
12	Top slide (straight slide available)	36	Idler pinion
13	Hex nut	37	Spacing collar
14	Washer	38	Washer
15	Swivel slide	39	Carriage clamp screw
16	Taper pin	40	Carriage clamp
17	Balcrank handle	41	Hex cap screws
18	Nut	42	Carriage front gibs
19	Graduated collar hub (metric available)	43	Hex cap screws
20	Key	44	Gib screws
21	Cross feed bush	45	Carriage rear gib
22	Thrust collar	46	Round head machine screws
23	Cross feed screw (metric available)	47	Front shear wipers (right or left)
24	Cross feed nut screw	48	Rear shear wipers
		49	Carriage
		50	Plugs

TOOL POST



The tool post assembly comprises the tool post itself with component parts as follows: tool post screw 1, body 2, washer 3, wedge 4, and collar 5. The washer fits the T-slot in the compound rest top slide. The washer and wedge elevate and lower the point of the tool, and the screw is used for clamping.

When placing a tool in the tool post, be sure there are no chips between the washer and the compound rest, or between the wedge and the washer to prevent the tool securing a firm foundation. Also see that the tool does not extend out of the tool post more than is necessary. The compound rest top slide should not extend over the bottom slide when taking heavy cuts, and the tool post should be located as near the center of the top slide as possible. Failure to observe the above precautions will often cause chatter. Do not tighten the tool post screw with a long wrench, but use the wrench provided for that purpose.

Clean and lubricate the compound rest slides weekly, and put a few drops of oil on the compound rest screw.

TOOL POST PARTS

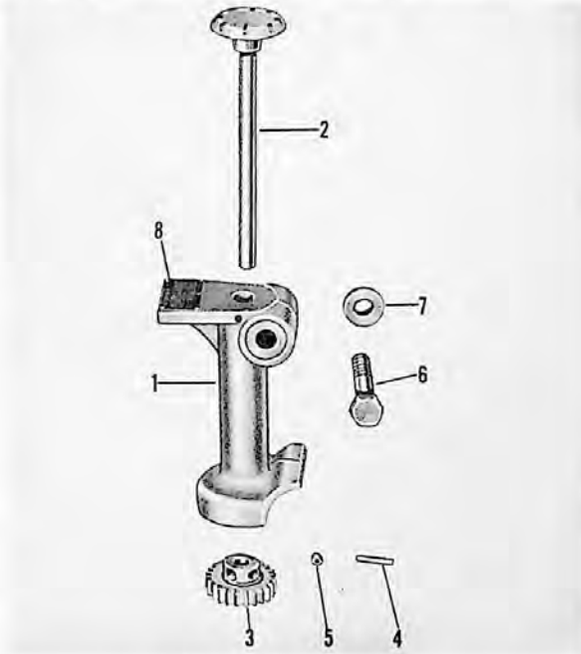
1	Screw	3	Washer	5	T-slot collar
2	Tool post	4	Wedge		

CHASING DIAL

The chasing dial thread pick-up comprises bracket 1 which carries a worm wheel 3 which meshes with the leadscrew, and a shaft connecting the worm with the indicator dial 2. The chasing dial is mounted on a stud projecting from the right hand side of the carriage. When not in use, it is advisable to disengage the worm wheel from the leadscrew.

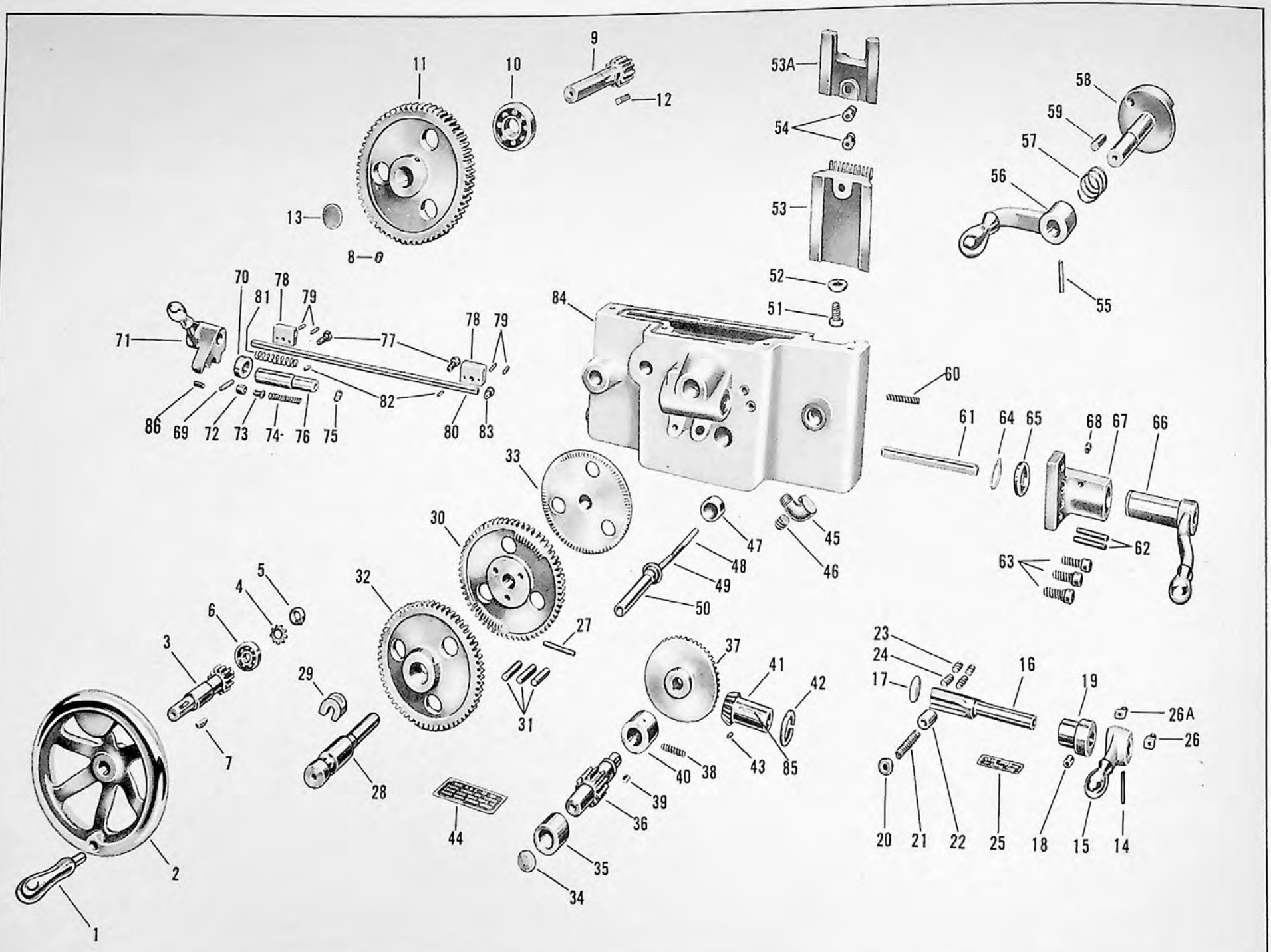
The dial is marked with numbered lines and halves as illustrated. When chasing an even number of threads, the half-nut may be engaged at any line on the dial; for odd threads, at any numbered line; and at any half revolution for half-threads.

When using the chasing dial the operator can take a cut, back the tool out of the work and return the carriage to the starting position, set the tool for the next cut, and re-engage the half-nut without stopping or reversing the lathe spindle.



CHASING DIAL PARTS

1	Bracket	5	Screw
2	Shaft and index dial	6	Hex screw
3	Worm wheel	7	Washer
4	Pin	8	Instruction plate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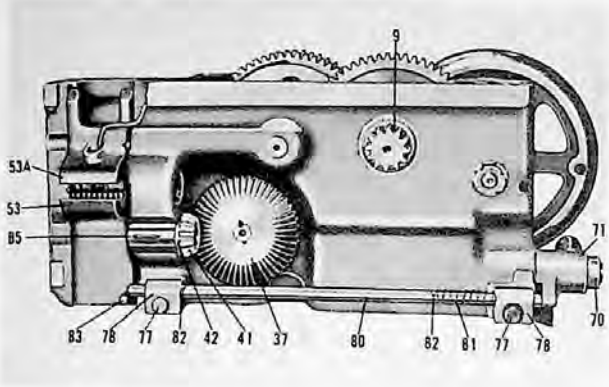


The apron is a one-piece double wall casting in which all shafts are supported on both ends. The splined feed rod passes through the feed bevel pinion 41. A key (part 85, at left) in the bevel pinion engages the spline (keyway) on the feed rod. Bevel gear 37 is always in engagement with the bevel pinion which slides on the feed rod. Feed handle 15 controls both cross and length feed, and is interlocked to prevent simultaneous engagement of cross and length feed. When the feed handle is moved to the right to clear the safety lug and pressed down, it slides gears 30 and 32 into engagement. Gear 32 is always in mesh with the cross feed idler pinion (part 36, page 16).

The carriage and the cross slide move forward or back depending on the direction of the feed reverse lever on headstock. When the feed reverse lever on the head is in the left-hand or "forward" position, the cross slide moves to the front, toward the operator. When the feed handle is move to the left, past the safety lug and pulled up with the feed reverse lever in the same position, the carriage moves toward the headstock. These directions are reversed if the feed reverse lever is moved to the right or "reverse" position.

When the feed trip is in the neutral position, the shifter interference pin 61 is out of the half-nut 53A and allows the half-nuts to be closed on the leadscrew by handle 56 to chase threads.

When the feed handle is moved up or down, safety rod 61 moves to the right and locks the upper half-nut so it cannot be moved. When the half-nuts are closed, the safety rod is in the slot in shaft 28 and prevents movement of the feed handle. Manual movement of the carriage is by means of handwheel 2 engaging pinion 3 with gear 11 which is secured to the rack pinion 9.

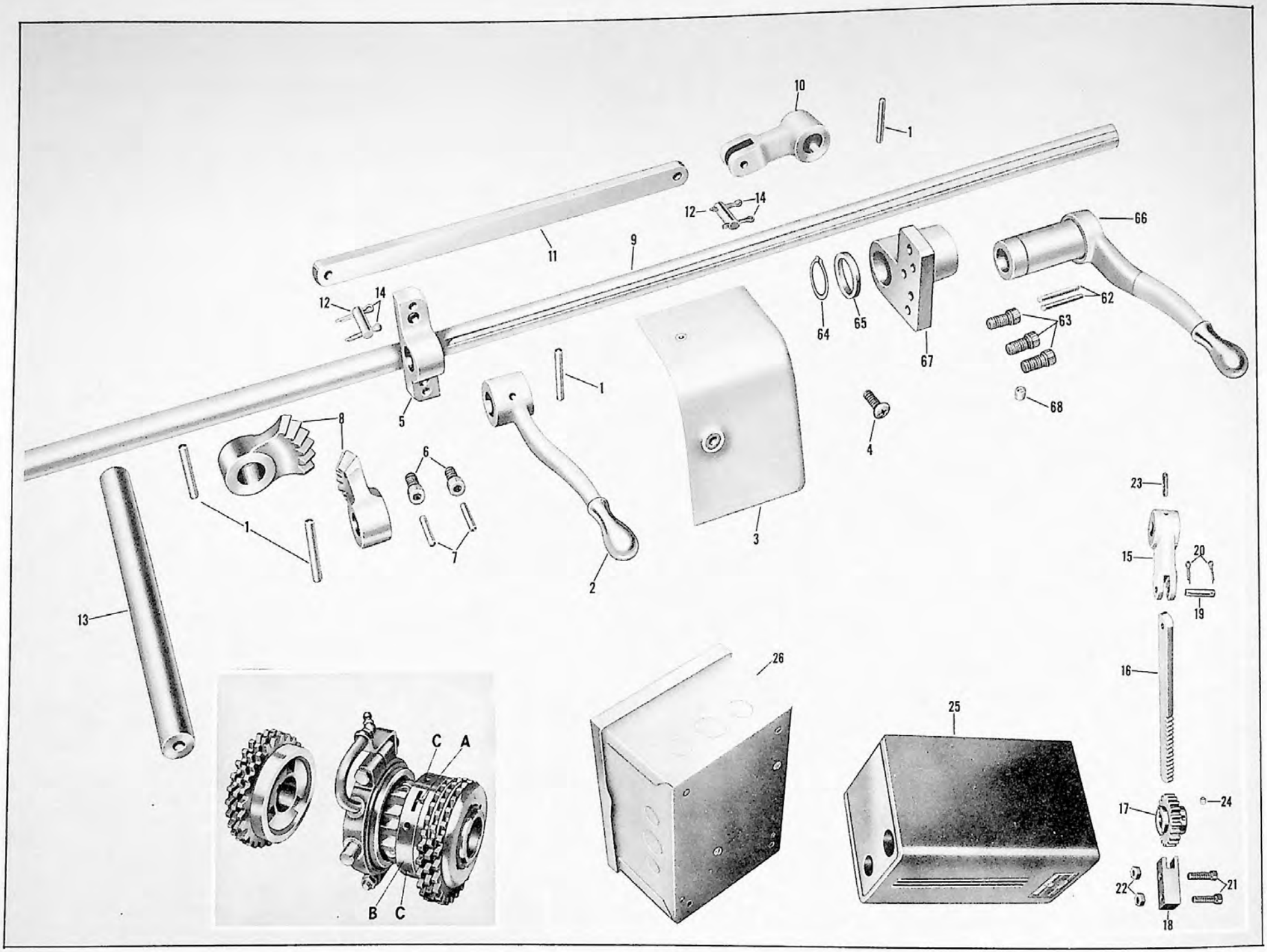
Screw 60 controls the closed position of the half-nuts 53 and 53A by acting as a stop for pin 59 in cam 58. Thus, wear of the halfnuts may be compensated for by retracting screw 60 till the backlash between the halfnuts and the leadscrew has been eliminated.

A one-shot lubricating system forces oil to all bearings by means of plunger 50.

A safety (parts 77-82, at left) has been provided in back of the apron to prevent closing the half-nuts when the handle 71 is down to contact the trip dogs. This safety will also operate to prevent the trip handle from dropping when the half-nuts are engaged.

APRON PARTS

No.	Name
1	Ball handle
2	Handwheel
3	First stud
4	SKF lock washer
5	SKF lock nut
6	Ball bearing
7	Key
8	Headless screw
9	Rack wheel stud
10	Ball bearing
11	Rack wheel
12	Key
13	Plug
14	Taper pin
15	Clutch shifter handle
16	Clutch shifter shaft
17	Plug
18	Headless screw
19	Clutch shifter shaft bush
20	Headless screw
21	Spring
22	Length & cross feed shifter plunger
23	Trip headless set screws
24	Trip headless set screws
25	Feed direction plate
26-26A	Length & cross feed shifter handle stop pins
27	Taper pin
28	Rack wheel gear shaft
29	Clutch shifter shoe
30	Sliding inter. gear
31	Gear spacing pins
32	Cross feed clutch gear
33	Longitudinal cross feed gear
34	Plug
35	Bevel gear shaft front bush
36	Bevel gear shaft
37	Bevel gear
38	Headless screw
39	Woodruff key
40	Bevel gear shaft rear bush
41	Bevel pinion
42	Bevel pinion thrust collar
43	Straight pin
44	Instruction plate
45	Oiler
46	Pipe plug
47	Oil cylinder pipe plug
48	Oil cylinder spring guide rod
49	Oil plunger spring
50	Oil plunger
51	Nut box stop screw
52	Washer
53	(Bottom) English nut box
53A	(Top) English nut box
54	Nut box cam pins
55	Taper pin
56	Half-nut handle
57	Spring
58	Nut box cam
59	Straight pin
60	Headless screw
61	Shifter interference pin
62	Taper pins
63	Screws
64	Snap ring
65	Spacing collar
66	Apron clutch control handle
67	Apron clutch control rod bracket
68	Oiler
69	Taper pin
70	Collar
71	Handle (multiple automatic length stop)
72	Bush
73	Pin
74	Spring
75	Set screw
76	Stud
77	Multiple automatic length stop interference block screws
78	Multiple automatic length stop interference block
79	Multiple automatic length stop block pins
80	Multiple automatic length stop interference rod
81	Multiple automatic length stop interference spring
82	Interference rod stop pins
83	Shoulder pin
84	Apron casting
85	Bevel gear key
86	Stop pin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CLUTCH AND BRAKE

The multiple disc clutch and brake -- furnished on models with serial numbers 2 to 225 and 227 to 272 inclusive -- is compact in size with high torque capacity and suitable high wear-life to stand up under rapid cycle operation. It is operated by the two convenient handles (parts 2 and 66, at left) on the control rod which actuates head shifter arm (part 114, page 8) through a linkage mechanism.

When the brake (part 120, page 8) is engaged it is maintained in the "On" position by the detent on the rear of the machine under the headstock (detent parts 1-13, page 20). Due to its simplicity and rugged construction this brake will require no adjustment.

The clutch (part 123, pages 8 and 20) is provided with a simple single point adjustment. With the clutch in the disengaged position, pull pin "A" back and turn it into either cross slot. Turn adjusting ring "B" clockwise with a spanner wrench or pin in holes "C". Since the clutch is sensitive, do not move ring "B" more than the distance between a pair of holes "C"; release pin "A" from the cross slot and move ring "B" until pin "A" drops into the closest locking hole.

APRON CONTROL ROD

CLUTCH AND BRAKE TYPE

The apron control rod (part 9, at left) actuates the clutch and brake shifter fork through handles 2 or 66, segment gears 8, shaft 13, arm 10 and link 11. The detent arrangement on shaft 13 at the rear of the machine provides means for locating the rod in "on", "neutral" and "brake" positions.

ELECTRIC BRAKE TYPE

Motion is transferred from rod 9 through arm 15 and link 16 to pinion 17 on the drum switch 25 which is mounted on the head end leg under the pan. This switch controls the forward, reverse, neutral and braking of the spindle.

APRON CONTROL ROD PARTS

FRICTION CLUTCH CONTROL

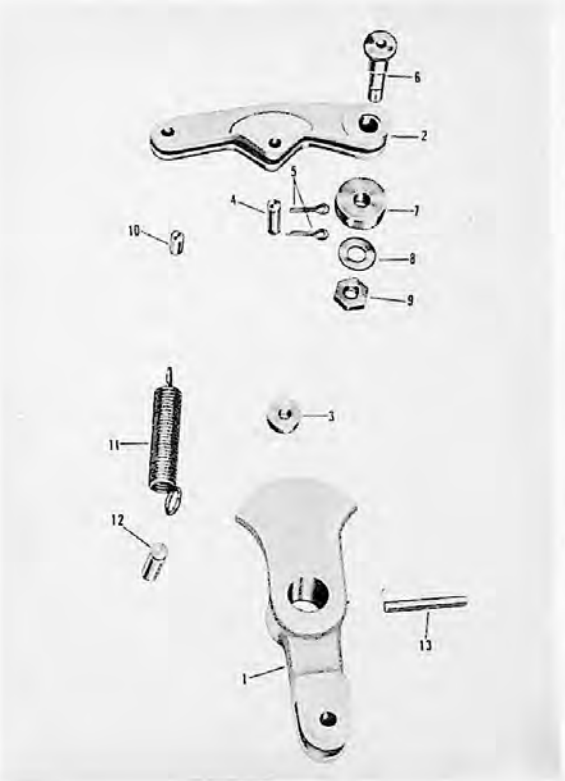
1 Taper pin
2 Head control handle
3 Cover
4 Cover screw
5 Control rod support bracket
6 Screw
7 Straight pin
8 Gear segment
9 Control rod
10 Shifter link
11 Link
12 Link pin
13 Shifter bar
14 Cotter pin
63 Screw
64 Snap ring
65 Collar
66 Apron control handle
67 Control rod apron bracket

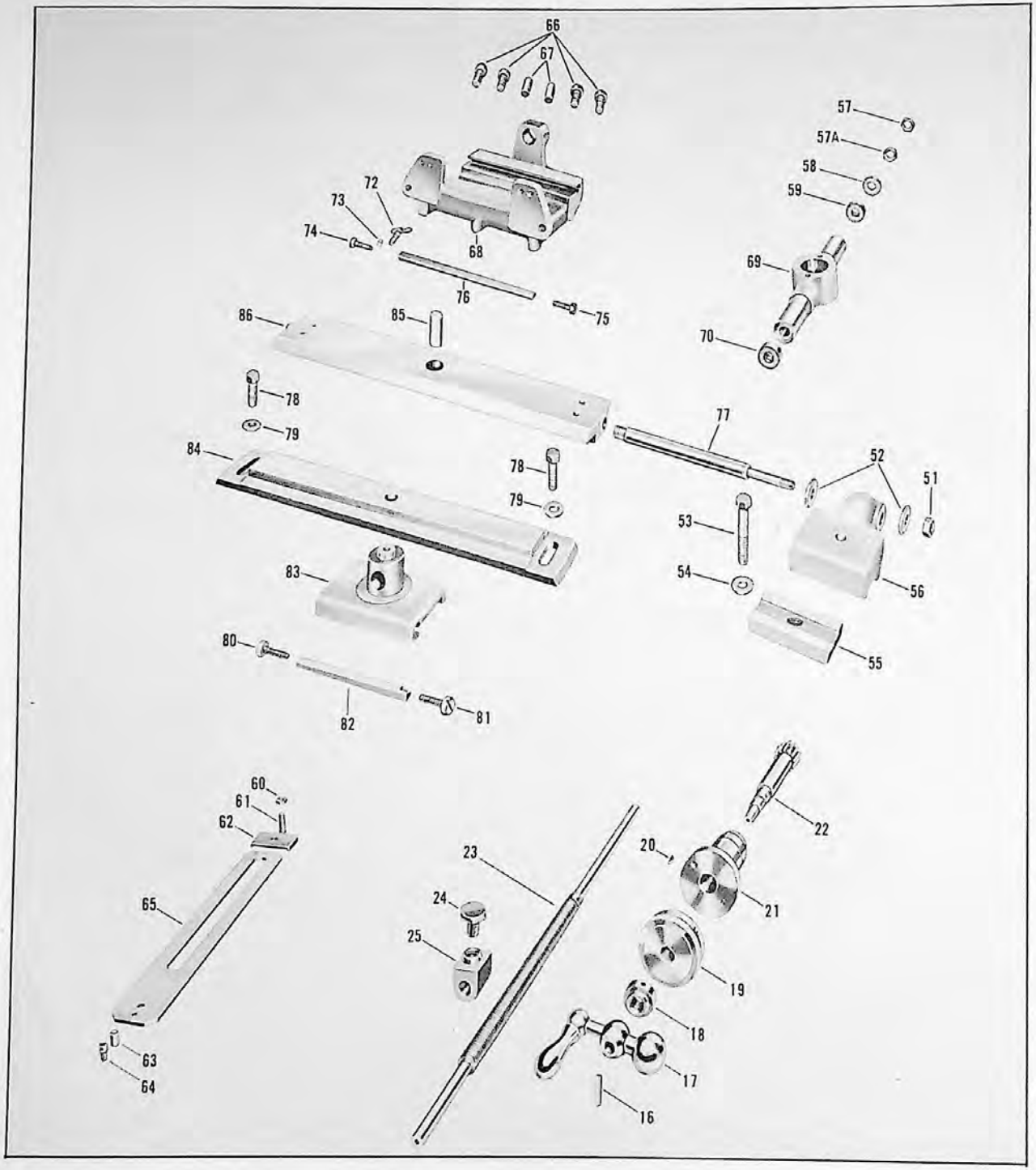
ELECTRIC BRAKE CONTROL

15 Shifter link
16 Switch control rack
17 Switch control pinion
18 Rack guide
19 Clevis pin
20 Cotter pins
21 Screws
22 Nuts
23 Taper pin
24 Set screw
25 Drum switch
26 Power pack for brake control

DETENT PARTS

1 Detent
2 Arm
3 Roller
4 Clevis pin
5 Cotter pins
6 Stud
7 Spacer
8 Washer
9 Nut
10 Pin
11 Spring
12 Pin
13 Pin





TELESCOPIC TAPER ATTACHMENT

The telescopic taper attachment is ruggedly constructed and simple to operate. When the carriage and taper attachment are brought into position for the taper operation, the bed bracket (part 56, at left) is tightened on the rear bed way. The swivel guide bar 84 is adjusted to the selected taper, which is marked in inches (or millimeters, on customer's option) on end and in degrees on the other end of the bar. Adjustment for the selected taper is made by loosening screws 78 and moving bar to the desired taper. The swivel guide bar is held by the screws 78 in the desired setting. With the draw bar clamp nut 60 loosened, the tool is positioned relative to the work by means of the cross feed handle 17 and the nut 60 is tightened.

Thrust from the guide bar will be transmitted through the shoe 83 and clamp 62 to the draw bar 65 which is rigidly secured to the bottom slide. Thus, the cross feed screw does not have to absorb the thrust of the taper cut and its accuracy is preserved. When the carriage feed is engaged, the bed bracket and its connecting rod 77 hold lower slide bar and adjustable swivel bar in a fixed position with relation to the bed and work. Movement of the carriage slides the gibbed shoe 83 along taper bar.

Adjustment of the cut is made by loosening clamping nut and resetting the tool and, of course, tightening nut 60 again after adjustment is made. Or adjustments of the tool may be made by the compound rest knob (part 2, page 16). When the compound rest knob is used to adjust for the successive cuts when using the taper attachment, it is not necessary to loosen nut 60 before making the adjustment.

Backlash would be present should nuts 57 and 57A or gibs 76 or 82 become loose.

Nut 57A should be tightened to put the cross feed screw in tension between thrust bearings 59 and 70. Nut 57 is used to lock nut 57A in place.

When adjusting the gibs, loosen gib 82 and set gib 76 so that the slide has a snug drag when pushed through the bracket 68. Gib 82 is then adjusted so that there will be a slight increase in the effort required to push the slide through the bracket.

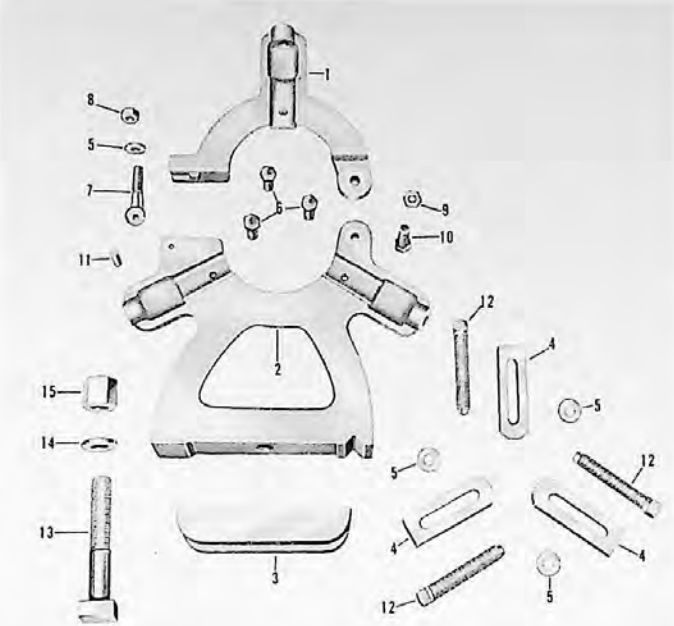
Wing nut 72 is a safety to be used when it is desired to turn a straight section when the taper attachment is set at an angle, and the bed bracket 56 is loosened from the bed but is still connected to rod 77. By tightening the wing nut a frictional load is imposed on the slide 86 so that it will not be drawn through the bracket 68, should the bed bracket 56 become wedged on the bed ways. A safer way to eliminate the danger of work spoilage under this condition would be to remove nut 51 and take bracket 56 off the bed ways.

TAPER ATTACHMENT PARTS

No.	Name	No.	Name
1-15	See compound rest and carriage details, pages 16-17	62	Guide bar clamp plate
16	Taper pin	63	Straight pin
17	Balcrank handle	64	Socket head screw
18	Nut	65	Taper attachment draw bar
19	Graduated hub collar	66	Cap screws
20	Key	67	Straight pins
21	Cross feed bush	68	Taper attachment slide bracket
22	Cross feed pinion sleeve	69	Carriage shoe
23	Cross feed screw (taper attachment)	70	Ball thrust bearing
24	Cross feed nut screw	72	Thumb screw
25	Cross feed nut	73	Slide gib plug
26-50	See compound rest and carriage details	74-75	Gib screws
51	Hex nut	76	Taper attachment slide gib
52	Washers	77	Bed bracket clamp rod
53	Bed bracket clamping bolt	78	Hex cap screws
54	Washer	79	Washers
55	Bed bracket clamp	80	Gib screw
56	Bed bracket	81	Gib screw
57-57A	Hex nuts	82	Guide bar shoe gib
58	Cross feed screw collar	83	Guide bar shoe
59	Ball thrust bearing	84	Guide bar (English) metric grad. available
60	Carriage shoe stud nut	85	Guide bar swivel plug
61	Carriage shoe stud	86	Taper attachment slide

FOLLOW REST

The follow rest is bolted to the right side of the carriage bridge and, therefore, moves with the carriage to provide support against the force of the cut. The jaws 2 of the follow rest should be kept oiled while in use to prevent scoring or picking up.



FOLLOW REST PARTS

1 Follow rest
2 Follow rest jaw
3 Washer
4 Hex cap screw
5 Square head set screw

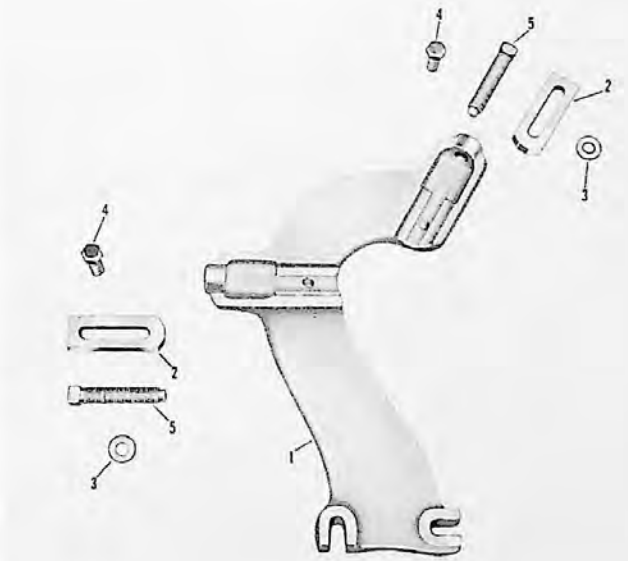
STEADY REST

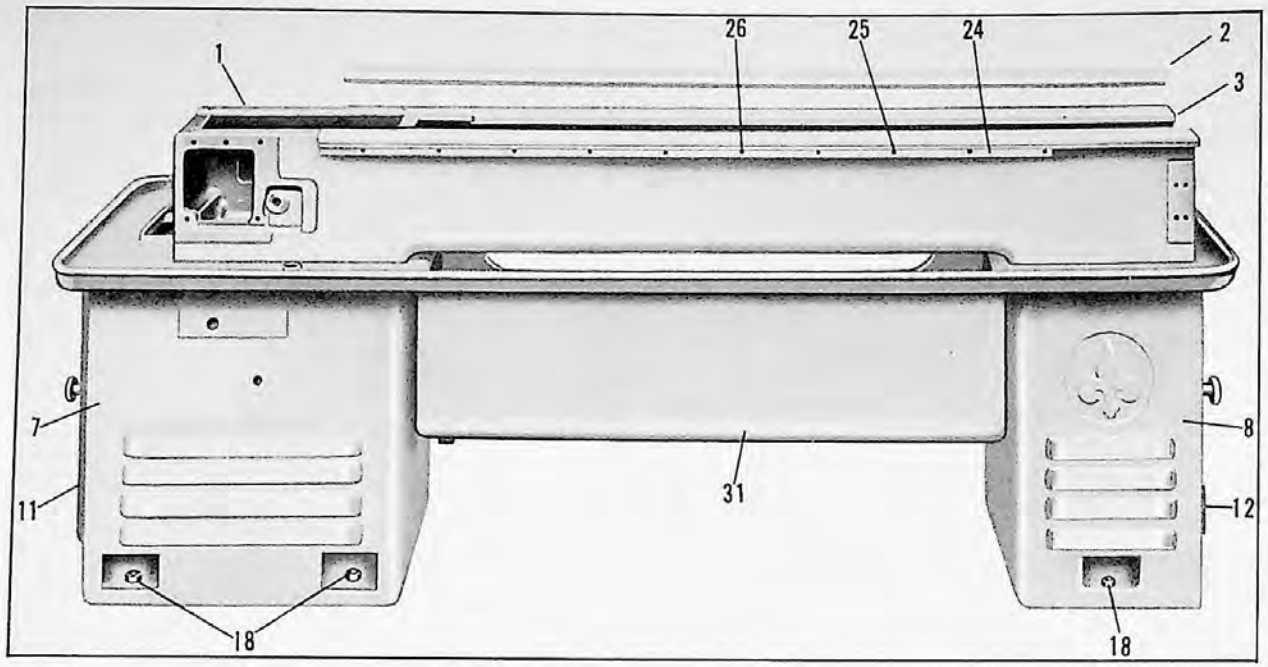
The steady rest is mounted and clamped on the lathe bed to support the stock being turned. The design of the piece usually determines the best position for the steady rest, but in general the rest is placed at about the middle of the piece.

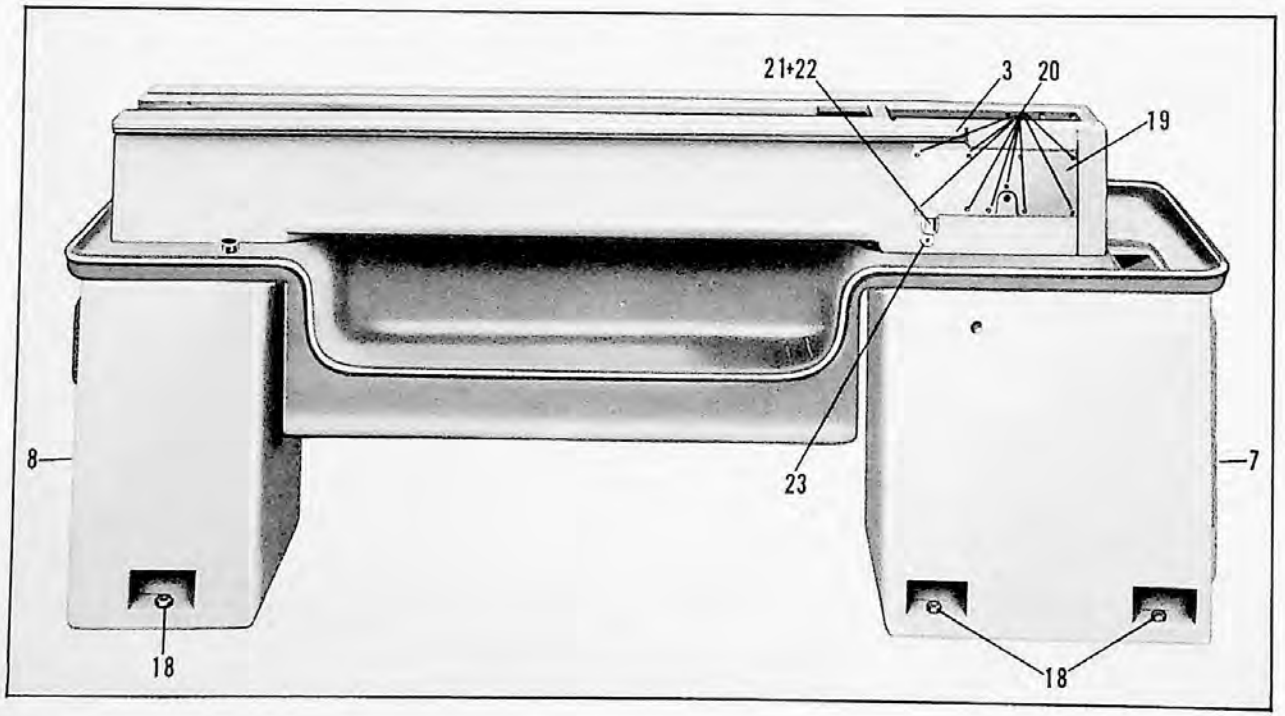
To prevent scoring, oil jaws 4 each time a piece is clamped in the rest.

STEADY REST PARTS

1	Steady rest top	9	Nut
2	Bottom	10	Hex cap screw
3	Clamp	11	Straight pin
4	Jaws	12	Square head set screw
5	Washer	13	Rough bolt
6	Hex cap screw	14	Washer
7	Eye-bolt	15	Nut
8	Nut		







DUAL DRIVE BEDS

The first Dual Drive beds were the inverted vee-type. Later models were furnished with the compensating vee on the front bed way as shown at left and on page 5.

Both types of beds provide the firm foundation on which are mounted the various components previously described. The length of time a lathe bed remains in a condition for accurate work depends entirely on the operator. Do not use the bed as an anvil for driving arbors in and out, or as a bench for hammers, wrenches or chucks. The tail end cabinet leg provides space for tool storage, and if additional space is required, arrange a neat board on the bed.

Do not lay chuck wrenches across the bed or wings of the carriage or leave toolpost wrenches laying on the bed. Many lathes have been wrecked by allowing the carriage to feed against some such obstruction on the bed. Also see that the tops of the cross girths in the bed are free from accumulations of chips, as there is only a small clearance between the carriage bridge and the bed girths.

Keep the shears clean. Wipe them off occasionally with a cloth, following up with a little oil applied with a cloth. Once a year check to see that the screws securing the rack to the bed are still tight.

BED, LEG AND CHIP PAN PARTS

1	Bed	16	Screw
2	Front shear	18	Leveling screws
3	Rear shear	19	Cover
4	Front shear screws	20	Cover screws
5	Rear shear screws	21	Oil height gauge
6	Head-to-bed screws	22	Oil cup
7	Front leg	23	Drain plug
8	Rear leg	24	Rack
9	Leg-to-bed screws	25	Rack screws
10	Leg-to-pan-to-bed cover washers	26	Rack pins
		27	Head-to-bed oil seal gaskets
11	Front leg door	28	Screen
12	Rear leg door	29	Screen screws
13	Door latch	30	Door and catch screws
14	Knob		
15	Door catch	31	Chip pan

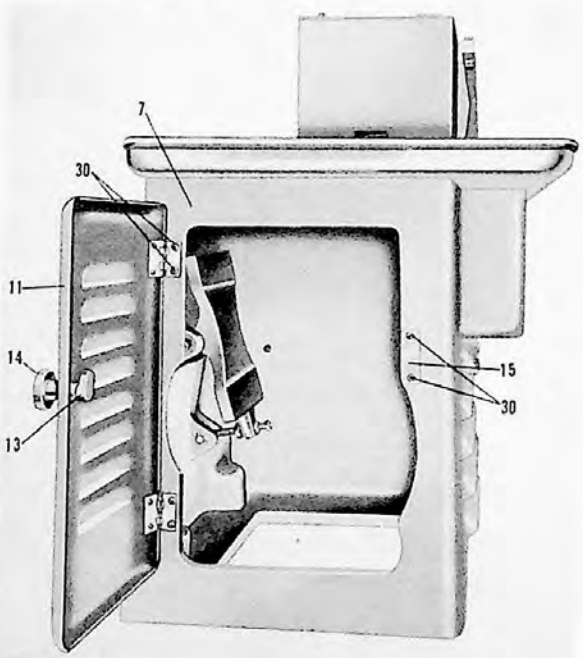
MAIN DRIVE MOTOR

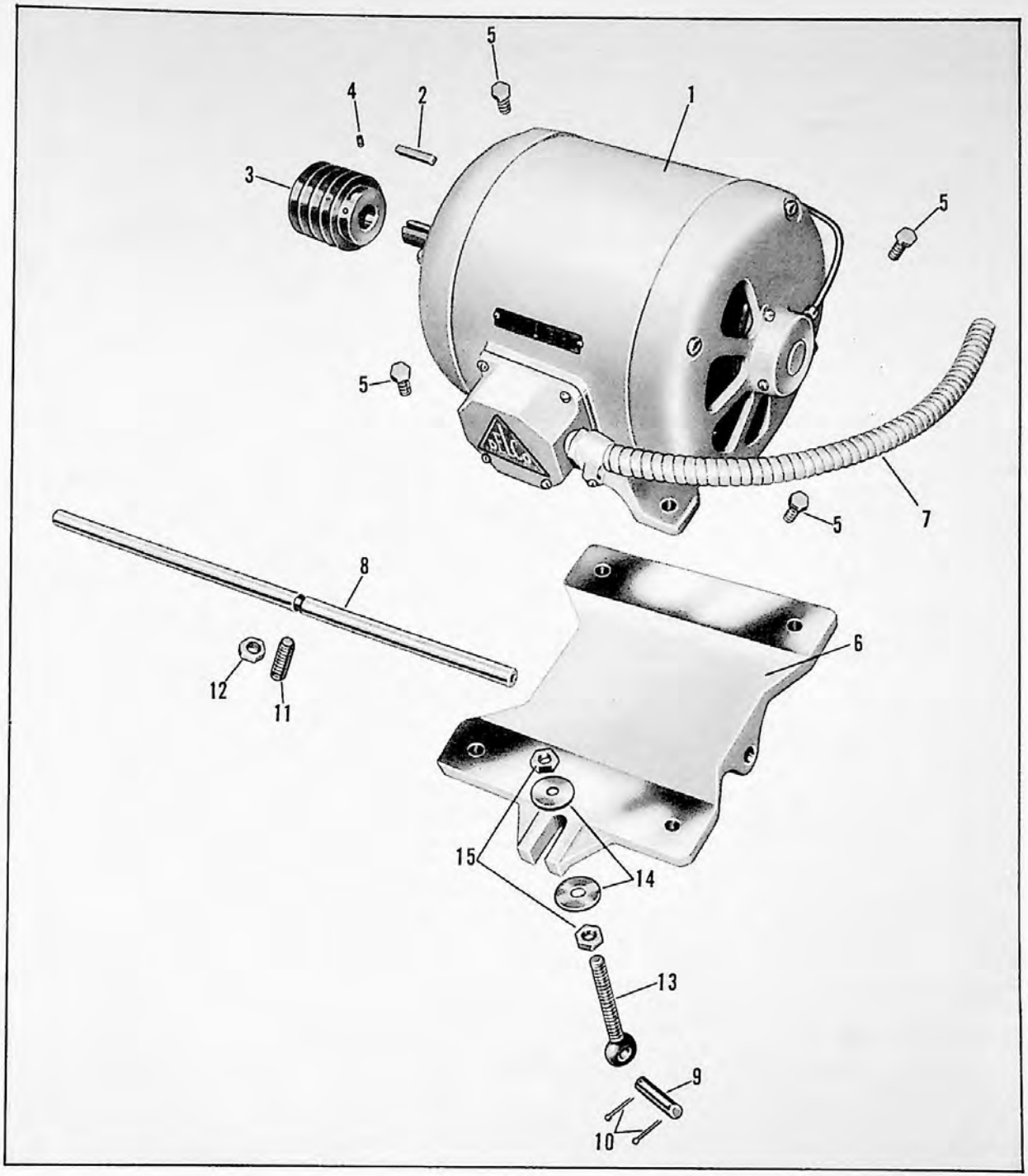
The main drive motor mounted in the head end leg transmits power to the drive pulley through four vee-belts. It is mounted on a plate which pivots on shaft 8, thus providing an easy method of adjusting the belts.

To tighten the drive belts, loosen nut 15 under the motor plate, allowing it to pivot about the shaft 8. Tighten the nut 15 on top of the plate to secure it in place and then bring jack screw 11 (in rear wall of leg) up to contact the motor plate to eliminate any vibration that may be present. Then lock the screw in place by means of locknut 12.

MOTOR PLATE PARTS

1	Motor	9	Clevis pin
2	Key	10	Cotter pins
3	Motor pulley	11	Set screw
4	Set screw	12	Locknut
5	Motor-to-plate screws	13	Eye-bolt
6	Motor plate	14	Washers
7	Motor conduit	15	Nuts
8	Motor hinge pin		





TAILSTOCK

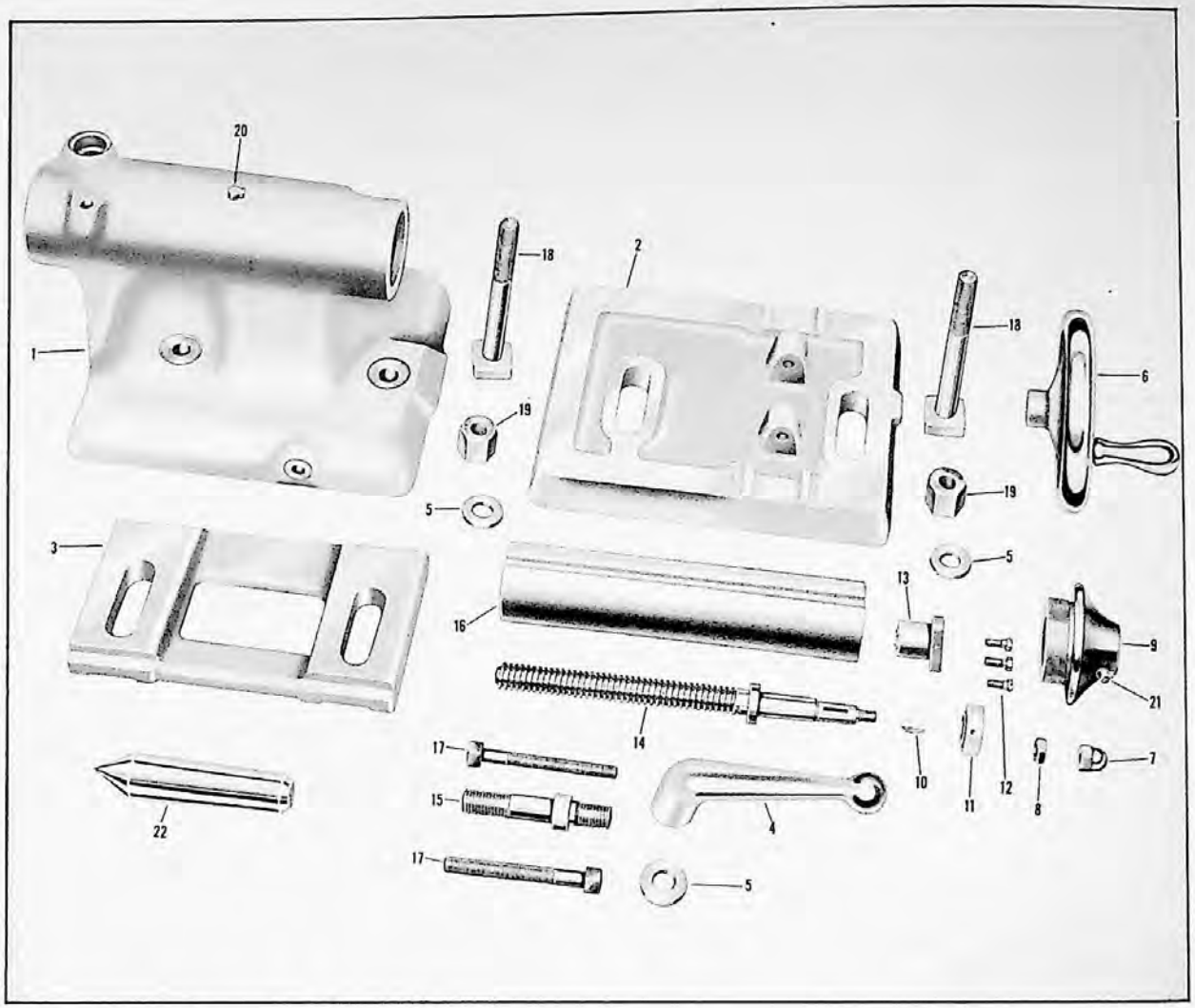
The tailstock unit comprises the tailstock top (part 1, at right) bottom 2, clamp 3, spindle 16, screw 14 and other parts as illustrated. The entire unit is movable on the ways along the length of the bed to accommodate pieces of varying lengths between centers within the capacity of the machine. The tailstock is kept in alignment with the headstock by a vee on the rear way of the bed and can be clamped in position with the tailstock clamping bolts 18.

Before moving the tailstock along the bed, clean and oil the ways. Chips on the ways will score the tailstock bottom and bed ways.

The tailstock top rests on the bottom and is held in alignment by a cross tongue. For turning tapers when the lathe is not equipped with a taper attachment, a setover is provided for the tailstock top. A setover adjusting screw 17 on each side of the tailstock top provides means for setting, and a raised boss in the rear is graduated to show the amount of setover.

The tailstock spindle is moved in and out of the tailstock barrel by means of the screw 14 which fits a bronze nut 13 attached to the spindle. The front end of the spindle is bored and reamed to a morse taper to hold live tailstock center, drills, drill chucks and reamers. To remove the center, run the spindle back as far as it will go, until the center hits the end of the screw, thus forcing it out of the tapered hole. Before replacing the center, carefully wipe out the hole, clean the center, move the spindle forward by a few furns of the handwheel, 6, and push the center in. When using drills, drill chucks and reamers, be sure they are tight in the taper hole. If they are not tight, they will revolve and score the tapered hole, destroying its accuracy. Should the hole become scored, carefully ream out the burrs or score marks in the taper with a morse taper reamer.

The design of the tailstock allows the spindle to be clamped in any position by means of a clamp handle 4. The spindle should be removed occasionally to oil the spindle nut and the outside of the spindle barrel.



TAILSTOCK PARTS

1	Top	12	Filister head screws
2	Bottom	13	Spindle screw nut
3	Calmp	14	Spindle screw
4	Binder handle	15	Binder stud
5	Washer	16	Spindle
6	Handwheel	17	Hex cap screw
7	Cap nut	18	Rough sq. hd. bolt
8	Flat nut	19	Special nut
9	Tailstock cap	20	Oiler
10	Woodruff key	21	Oiler
11	Ball thrust bearing	22	Center

When ordering repair parts, always give us the serial number of your lathe. It's stamped on the cross girth of the bed at the tailstock end.

LEBLOND DUAL DRIVE SPECIFICATIONS

CAPACITY

Swing over bed and carriage wings	15″
Swing over compound rest	9½″
Distance between centers	30″
Size of tool (forged)	⅝″ x 1⅛″
Size of tool (tool holder)	⅝″ x 1⅜″
Collet capacity, spindle nose type	1⅜″
Steady rest	4″
Follow rest	2¾″

HEADSTOCK

Spindle speeds, number	12
Spindle speeds, gear drive, rpm	28, 41, 60, 95, 134, 193, 282, 445
Spindle speeds, belt drive, rpm	540, 782, 1140, 1800
Driving pulley dia., No. of vee belts	10″-4
Driving pulley speed, rpm	520
Front spindle bearing diameter	2⅜″
Rear spindle bearing diameter	2″
Front spindle anti-friction bearing, o.d	4¼″
Rear spindle anti-friction bearing, o.d	3½″
Spindle size of hole	1½″
Spindle size of center	Morse No. 4
Spindle nose, std. taper size and diameter	No. L00-2¾″

BED

Length, standard	5 '9″
Increases of increments of	12″
Width	11″
Depth	9¾″

CARRIAGE

Length on ways	17¼″
Bridge, width	6¼″
Cross slide travel	9½″
Compound rest travel	4″

FEEDS-THREADS

Feeds, gear drive, number	48
Feeds, direct belt drive, number	48
Feeds, range gear drive	.0017″—.1062″
Feeds, range direct belt drive	.0004″— .026″
Threads, gear drive only, number	48
Threads per inch, range	4-224
Leadscrew, threads per inch	6

TAPER ATTACHMENT

Maximum taper per foot	3½″
Turns at one setting	10″

TAILSTOCK

Spindle diameter	2-3/16″
Spindle size of center	Morse No. 4
Spindle travel	5½″

MOTOR FURNISHED

Horsepower	3
Speed	1800 rpm

WEIGHT—FLOOR SPACE

Domestic shipping weight, lbs.	2900
Floor space required, approximate	84″ x 36″

Thread Range (Gear drive only): 4, 4.5, 5, 5.5, 5.75, 6, 6.5, 7, 8, 9, 10, 11, 11.5, 12, 13, 14, 16, 18, 20, 22, 23, 24, 26, 28, 32, 36, 40, 44, 46, 48, 52, 56, 64, 72, 80, 88, 92, 96, 104, 112, 128, 144, 160, 176, 184, 192, 208, 224

Feed Range (Gear drive): .0017, .0020, .0022, .0023, .0024, .0026, .0029, .0033, .0038, .0041, .0044, .0046, .0048, .0053, .0059, .0066, .0076, .0081, .0088, .0092, .0097, .0106, .0118, .0132, .0151, .0163, .0177, .0184, .0194, .0212, .0236, .0265, .0303, .0326, .0354, .0368, .0386, .0424, .0472, .0531, .0607, .0653, .0708, .0736, .0772, .0849, .0944, .1062

Feed Range (Direct belt drive): .0004, .0005, .0006, .0007, .0008, .0009, .001, .0011, .0012, .0013, .0014, .0016, .0018, .002, .0022, .0023, .0024, .0026, .0029, .0032, .0037, .004, .0043, .0045, .0047, .0052, .0058, .0065, .0074, .008, .0086, .009, .0094, .0104, .0115, .013, .0148, .016, .0172, .018, .0189, .0208, .023, .026

STANDARD EQUIPMENT

3-hp 1800 rpm open type ball bearing motor, electric brake and power pack, non-reversing magnetic starter and push buttons, electric reversing drum switch with apron control. Hardened and ground steel bed ways front and rear, small face plate, graduated compound rest, No. 1 tool post assembly, taper spindle sleeve, standard No. L00 taper spindle nose, chasing dial, adjustable thread cutting stop, multiple automatic length stops, cabinet legs, chip pan, centers and necessary wrenches, lag screws and washers.

EXTRA EQUIPMENT

Electric duplicating attachment, taper attachment, steady rest, follow rest, grinding attachment, coolant system, milling and keyway cutting attachment, micrometer carriage stops, drill pad, special centers, metric transposing gears, turret tool post, turret on bed, chucks, tools and many others.

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LE BLOND
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