

PARTS LIST
and **SERVICE**
REPAIR BOOK

CINCINNATI

MM

Plain - Universal - Vertical

MILLERS

with 3-Way Power Rapid Traverse

IMPORTANT!

Place this booklet in
the hands of the man
who is responsible for
ordering parts for
these machines . . .

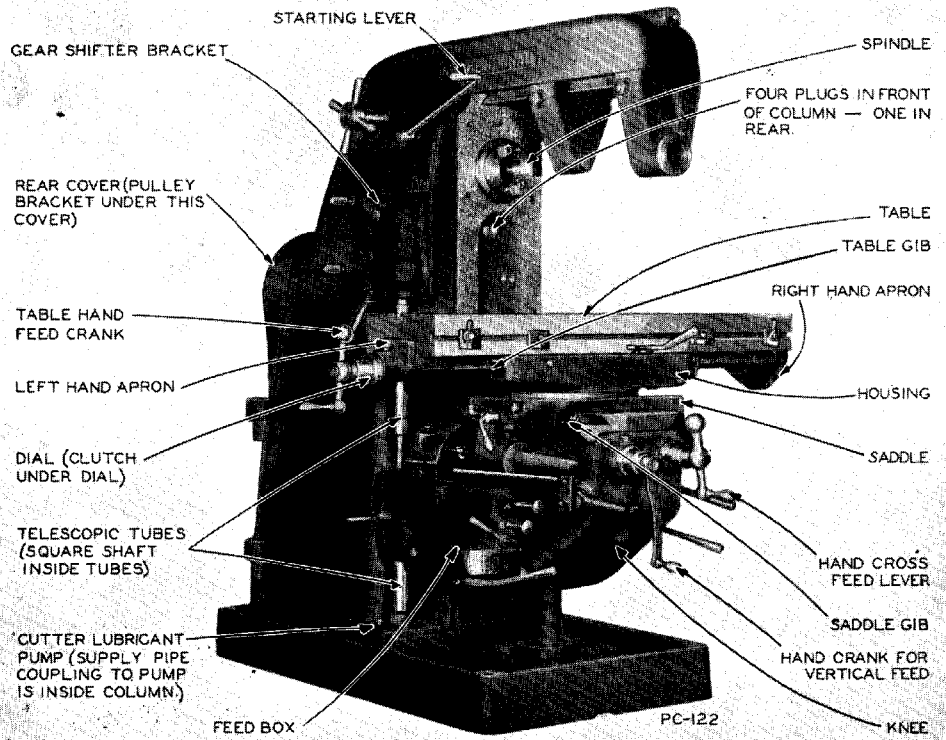
THE CINCINNATI MILLING MACHINE CO.
CINCINNATI, OHIO

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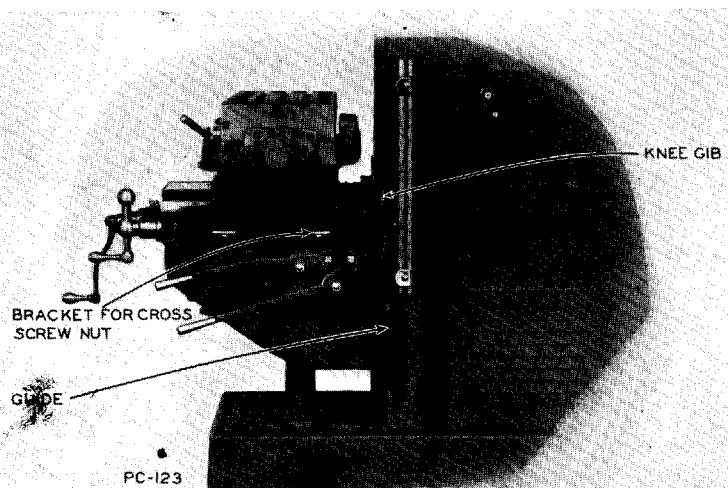
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DISMANTLING INSTRUCTIONS

Study the following nomenclature chart before removing any unit of the machine. Familiarize yourself with the names and locations of the various units and parts which are mentioned in the dismantling instructions.



Patented



Patented

Fig. 1
M-Type Miller with 3-Way Power Rapid Traverse.

Removing the Table and Lead Screw

It is not absolutely necessary to remove the table when replacing the lead screw, but it is always advisable to do so, in order that the lead screw nut and other parts may be examined.

1. Remove the table hand feed crank and dial at the left-hand end of the table.
2. Knock out the taper pin in the clutch, remove the clutch and apron on the left-hand end of the table.
3. Remove the four fillister head screws from the apron on the right-hand end of the table.
4. Remove the table gib.
5. Push the overarm back to the face of the column, support the table in some manner from above or below, and slide it off the housing from right to left.
6. Run the lead screw through the lead screw nut from left to right, being careful to support the overhanging end to avoid springing.

Removing the Housing (Universal Only)

1. Remove the table and lead screw.
2. Remove the three 5/8 hex head screws from the saddle; two on the left-hand side and one on the right-hand side.
3. Lift the housing straight up.

Removing the Saddle and Cross Screw

1. Remove the table and lead screw.
2. If the machine is universal, remove the housing.
3. Unscrew the lock nut from the cross screw. (This nut is located directly behind the front wall of the knee, as shown in Fig. 2.)
4. Remove the cross screw by turning the hand cross feed lever in a clockwise direction.
5. Remove the bracket for the cross screw nut. (The two 1/2" Allen head screws which hold this bracket in position are located in the slot for the cross feed dog.)
6. Remove the saddle gib.
7. The saddle may then be slid off the knee.

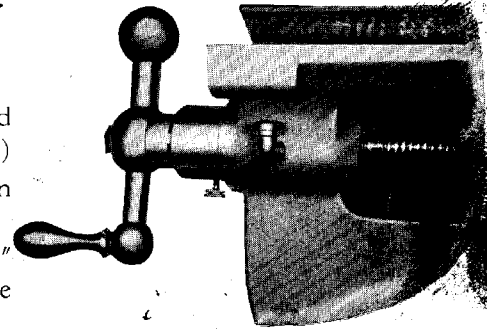


Fig. 2
View Showing Cross Screw Lock Nut Behind Front Wall of Knee.

Removing the Feed Box

1. Remove screw "A" in the boss on top of the gear shifter bracket. (Fig. 3.)
2. Remove lock spring "B" under the screw.
3. Unscrew the telescopic tube above and below the feed box. The upper part unscrews from the feed box, while the lower part unscrews from the pump.
4. Remove the square shaft by pulling it up through the feed box and gear shifter bracket.
5. Remove the three hex head screws from the feed box, and pull the unit straight out.

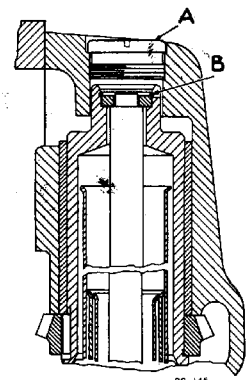


Fig. 3
Section Through Gear Shifter Bracket and Vertical Feed Shaft

Removing the Gear Shifter Bracket

1. } Same as 1, 2, 3 and 4 for "Removing the Feed Box".
2. }
3. }
4. }
5. Remove the eight fillister head set screws in the gear shifter bracket and pull the unit straight out.

Removing the Table and Lead Screw

It is not absolutely necessary to remove the table when replacing the lead screw, but it is always advisable to do so, in order that the lead screw nut and other parts may be examined.

1. Remove the table hand feed crank and dial at the left-hand end of the table.
2. Knock out the taper pin in the clutch, remove the clutch and apron on the left-hand end of the table.
3. Remove the four fillister head screws from the apron on the right-hand end of the table.
4. Remove the table gib.
5. Push the overarm back to the face of the column, support the table in some manner from above or below, and slide it off the housing from right to left.
6. Run the lead screw through the lead screw nut from left to right, being careful to support the overhanging end to avoid springing.

Removing the Housing (Universal Only)

1. Remove the table and lead screw.
2. Remove the three 5/8 hex head screws from the saddle; two on the left-hand side and one on the right-hand side.
3. Lift the housing straight up.

Removing the Saddle and Cross Screw

1. Remove the table and lead screw.
2. If the machine is universal, remove the housing.
3. Unscrew the lock nut from the cross screw. (This nut is located directly behind the front wall of the knee, as shown in Fig. 2.)
4. Remove the cross screw by turning the hand cross feed lever in a clockwise direction.
5. Remove the bracket for the cross screw nut. (The two 1/2" Allen head screws which hold this bracket in position are located in the slot for the cross feed dog.)
6. Remove the saddle gib.
7. The saddle may then be slid off the knee.

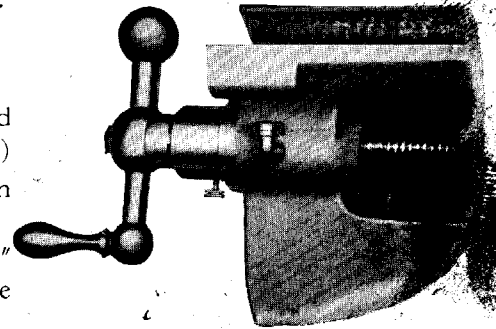


Fig. 2
View Showing Cross Screw Lock Nut Behind Front Wall of Knee.

Removing the Feed Box

1. Remove screw "A" in the boss on top of the gear shifter bracket. (Fig. 3.)
2. Remove lock spring "B" under the screw.
3. Unscrew the telescopic tube above and below the feed box. The upper part unscrews from the feed box, while the lower part unscrews from the pump.
4. Remove the square shaft by pulling it up through the feed box and gear shifter bracket.
5. Remove the three hex head screws from the feed box, and pull the unit straight out.

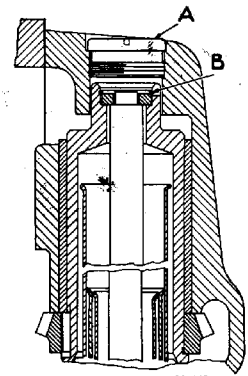


Fig. 3
Section Through Gear Shifter Bracket and Vertical Feed Shaft

Removing the Gear Shifter Bracket

1. } Same as 1, 2, 3 and 4 for "Removing the Feed Box".
2. }
3. }
4. }
5. Remove the eight fillister head set screws in the gear shifter bracket and pull the unit straight out.

Removing the Cutter Lubricant Pump

1. }
2. } Same as 1, 2, 3 and 4 for "Removing the Feed Box"
3. }
4. }
5. Unfasten the pipe coupling directly behind the pump inside the column.
6. Remove the two hex head screws in the pump flange and lift the unit straight up.

Removing the Knee

1. Remove the table, saddle, housing, and feed box as explained on page 3.
2. Remove circular plate "A" on top of the knee. (Fig. 4.)
(Tap the plate lightly to break the shellac seal and then pry it loose.)
3. Remove dog point set screw "B" from the lock nut "C" under the plate.
4. Remove the lock nut by holding it in position with a face spanner wrench and turning the hand crank for vertical feed.
5. Take two "L" clamps with 45 degrees clamping surfaces and bolt them together across the dovetails of the knee. Place the bolt central with the outside edge of the circular plate bearing. Hook up to a crane.
6. Remove the gib screw and gib on the right-hand side between the knee and column.
7. Remove the four hex head screws and the guide forming the right-hand knee bearing to the column.
8. Lift the knee straight up until the back of the knee clears the top of the elevating screw.

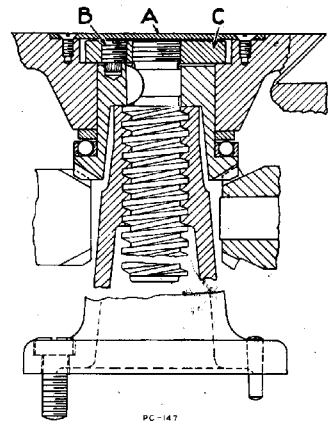


Fig. 4
Section through Vertical Screw.

Removing the Pulley or Chain Gear Bracket

1. Drain the oil from the column of the machine.
2. **Important**—Push up the starting lever as when starting the machine and leave it in that position until the pulley bracket is replaced.
3. Remove the rear cover, or open it up wide if it is on hinges.
4. **For Vertical Only**—Remove plunger pump "A". This pump is in a vertical position, directly below the pulley bracket.
5. Remove the five hex head screws in the pulley bracket flange and pull the unit straight out.

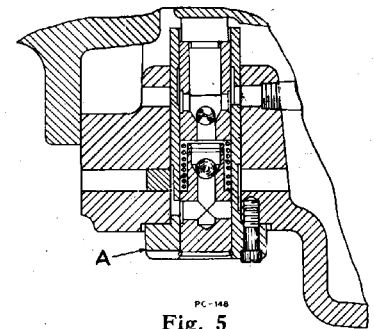


Fig. 5
Section through Plunger Pump on Vertical.

Removing the Pulley Shaft and Driving Clutch

1. Drain the oil from the machine and remove the pulley bracket as explained above.
2. Remove the gear shifter bracket as explained on page 3.
3. Reach through the opening made by removing the gear shifter bracket and remove the two cotter pins in the straight pin through the gear hub and shaft. (Fig. 7.)

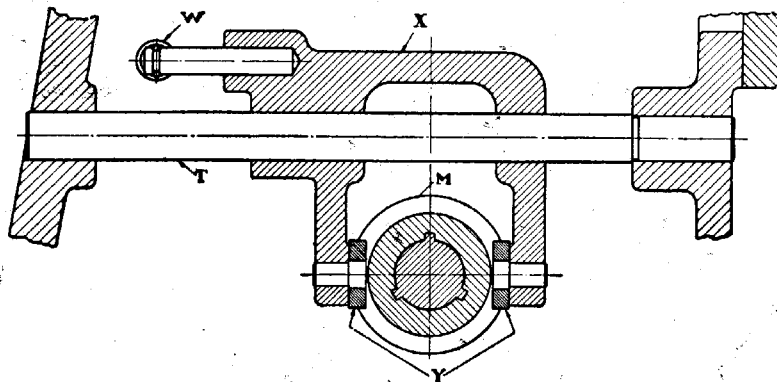


Fig. 6—Section Through Column Showing Clutch Shifter.

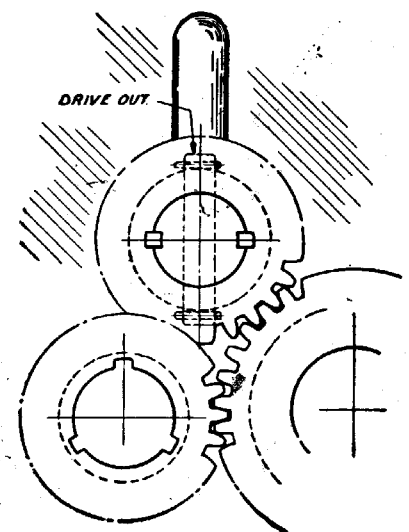


Fig. 7
Section Through Column Showing Gearing Between Pulley Shaft and Drive Shafts.

4. Drive out the straight pin as shown, allowing it to fall to the bottom of the oil reservoir. (Note that there is only one position for driving this pin between the lower gears.)
5. Remove the wrench pan on the right-hand side of the column.
6. Drive the shifter shaft "T" (Fig. 6) through the column from left to right.
7. Remove spring "W" from the spring pin and wire or prop shifter "X" in a position so that shoes "Y-Y" are out of the slot in the spool "M". (Fig. 6.)
8. Pull the pulley shaft straight out.

If the clutch plates are to be renewed, they must be reassembled with a total of $\frac{1}{64}$ " clearance between them. This clearance can be controlled by means of the adjusting nut located at the end of the integral key section of the pulley shaft. Before replacing the pulley shaft and driving clutch in the machine, the ears on the clutch plates must be lined up and spool "M" moved forward, thereby engaging the clutch fingers and holding the clutch plates in position while the pulley bracket is being replaced.

Removing the Drive Shafts

1. Remove the tapped plugs in front of the column.
2. Remove the pulley bracket as explained on page 4.
3. Remove the gear shifter bracket.
4. Remove the pulley shaft and driving clutch if the **lower** driving shaft is to be removed. (Page 4.) Otherwise it is not necessary.
5. Remove the lock washers and adjusting nuts from the rear end of the drive shafts.
6. Tap the shafts through their bearings from the front to the rear of the column. Collect the parts with the free hand as the shaft passes through its bearings.

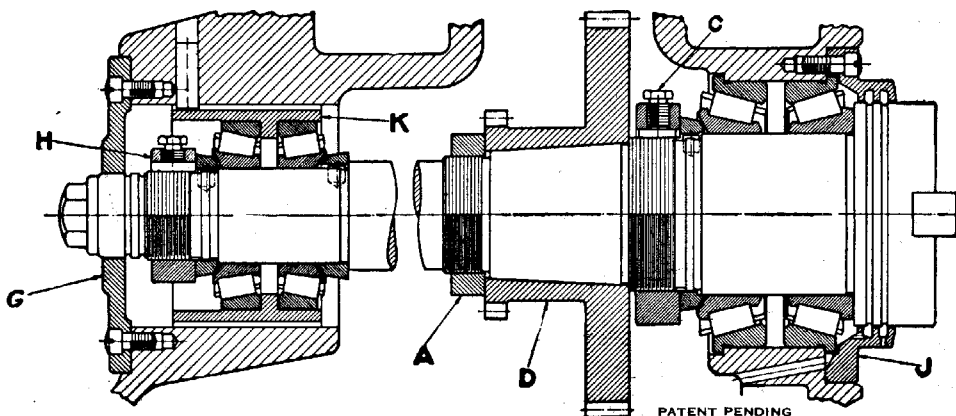


Fig. 8
Section Through Spindle of Horizontal Millers.

Removing the Spindle—Horizontal Machines (Fig. 8)

1. Remove the gear shifter bracket as explained on page 3.
2. Remove the tapped plug below the spindle in front of the column.
3. Remove the tapped plug below the spindle in the rear of the column.
4. Drive the back gear shaft through the column from the front to the rear.
5. Remove the cover on the right-hand side of the column.
6. Unscrew nut "A".
7. Remove the 1" pipe plug in the left-hand side of the column.

8. Loosen screw "C" in the locknut, tap the socket wrench to loosen the lock shoe, and with the wrench in position turn the spindle counter clockwise until the locknut backs up against the face gear.
9. Remove front spindle cap "J".
10. Remove rear cover "G".
11. Place a block between face gear "D" and the front of the column, and pound on the rear end of the spindle to loosen the face gear.
12. Unscrew locknut "H".
13. Reach through the opening made by removing the gear shifter bracket and drive out retainer "K" with a small rod.
14. Tap the spindle through its bearings from the rear end.

When replacing the spindle, first adjust the front bearings and then adjust the rear bearings for free running. Any further adjustment should be made on the front bearings only. (See "Operator's Instruction Book")

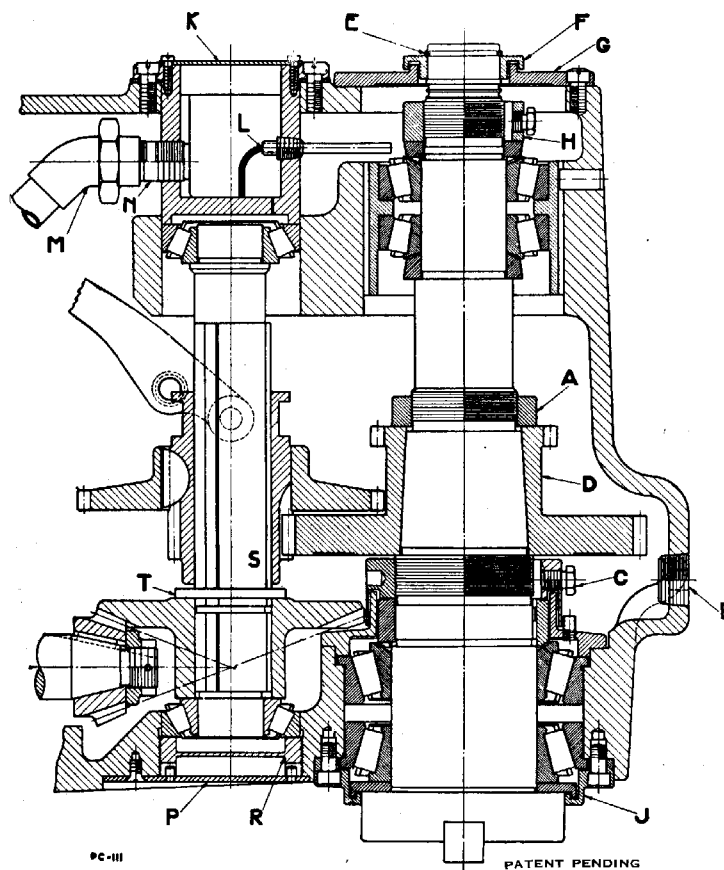


Fig. 9
Section Through Spindle of Vertical Miller.

Removing the Spindle—Vertical Machines (Fig. 9)

1. Remove the cover on the right-hand side of the column.
2. Remove the screw and the fork shaft which hold the back gear shifter fork in position. The back gear fork shaft may be driven out from the inside of the column through the opening on the right-hand side of the machine. Lift the fork out of the column.
3. Remove cover "K" on top of the oil reservoir.
Remove pipe plug "L" and the oil tube from the inside of the oil reservoir.

5. Reach through the opening in the right-hand side of the machine and disconnect union "M".
6. Remove nipple "N".
7. Disconnect the brass union in the $\frac{1}{4}$ " pipe to the oil reservoir, and also remove the short pipe.
8. Lift the oil reservoir out from the top of the column after removing the screws which hold it in place.
9. Remove rear cover "P" and retainer "R".
10. Set a rod against the lower end of back gear shaft "S" and pound it up about one-eighth of an inch.
11. Turn washer "T" until the slots register with the three keys on back gear shaft "S".
12. Continue pounding on the lower end of the shaft "S" until it is raised out of its bearings. Remove all loose parts.
13. Unscrew nut "A".
14. Remove plug "B".
15. Loosen screw "C", tap the socket wrench to loosen the lock shoe, and with the wrench in position turn the spindle counter clockwise until the locknut backs up against the face gear.
16. Remove spindle cap "J".
17. Remove lock spring "E".
18. Remove dust cap "F" and cover "G".
19. Place a block between face gear "D" and the column, and pound on the end of the spindle to loosen the gear.
20. Unscrew nut "H".
21. Tap the spindle through its bearings from the top. Block up under the flange to prevent injury to the spindle as it falls out of its bearings.

When replacing the spindle, first adjust the lower bearings and then adjust the upper bearings for free running. Any further adjustment should be made on the lower bearings only. (See "Operator's Instruction Book")

HOW TO ORDER REPAIR PARTS

You will receive quicker and better service when ordering your repair parts if you follow the instructions listed below.

Do not use this booklet when ordering parts for machines not included herein

If the order is by letter, the following information must be given:

1. Specify the amount required.
2. Give the part name of the part required.
3. Give the part number of the part.
4. Give the size and type of the machine for which the part is required.
5. Give the serial number and letters of the machine.

Example:

Please ship to us one Cap on Saddle 38146, for No. 1M Vertical, Serial E-472-C.

Signed.....

If the order is by telegram, the following information must be given:

1. Specify the amount wanted.
2. Give the part number of the part required.
Give the code word for the size and type of the machine for which the part is required.
3. Give the serial number and letters of the machine.

Example:

Ship one 34029 for EDKER, serial E-472-C.

Signed.....

You may find a factory identification number on the part which you are ordering. If you have a "Parts List and Service Repair Catalog" for the particular machine from which the broken part was taken, ignore this number completely. If you **do not** have a "Parts List and Service Repair Catalog" for the machine, the number stamped on the part, along with the amount required, the serial number and letters of the machine, and the size and type of the machine will be necessary in filling your order.

Number of parts are designated **right** or **left**. **Right** refers to the right-hand side of the machine from the normal operating position.

Unless the method of shipment is specifically stated in your order, we will ship by the quickest method and the shortest route.

CODE WORDS

For the Machines Included in this Booklet

	Belt Drive	Chain Motor Drive
1M Plain.....	EDONE	EDCHA
1M Universal.....	EDBUN	EDUMD
1M Vertical.....	EDEVE	EDKER

LOCATION OF MACHINE SERIAL NUMBER

The serial number and letters of the **Horizontal** machine are stamped on the column face directly under the spindle.

The serial number and letters of the **Vertical** machine are stamped on the column face at the top of the knee bearing.

*When telegraphing, give each digit separately of the part number and serial number.
i.e. 20507..... Two-Naught-Five-Naught-Seven, rather than Twenty-Fifty-Seven, which may be written as 2057, causing us to ship the wrong part.

TABLE AND LEAD SCREW PARTS

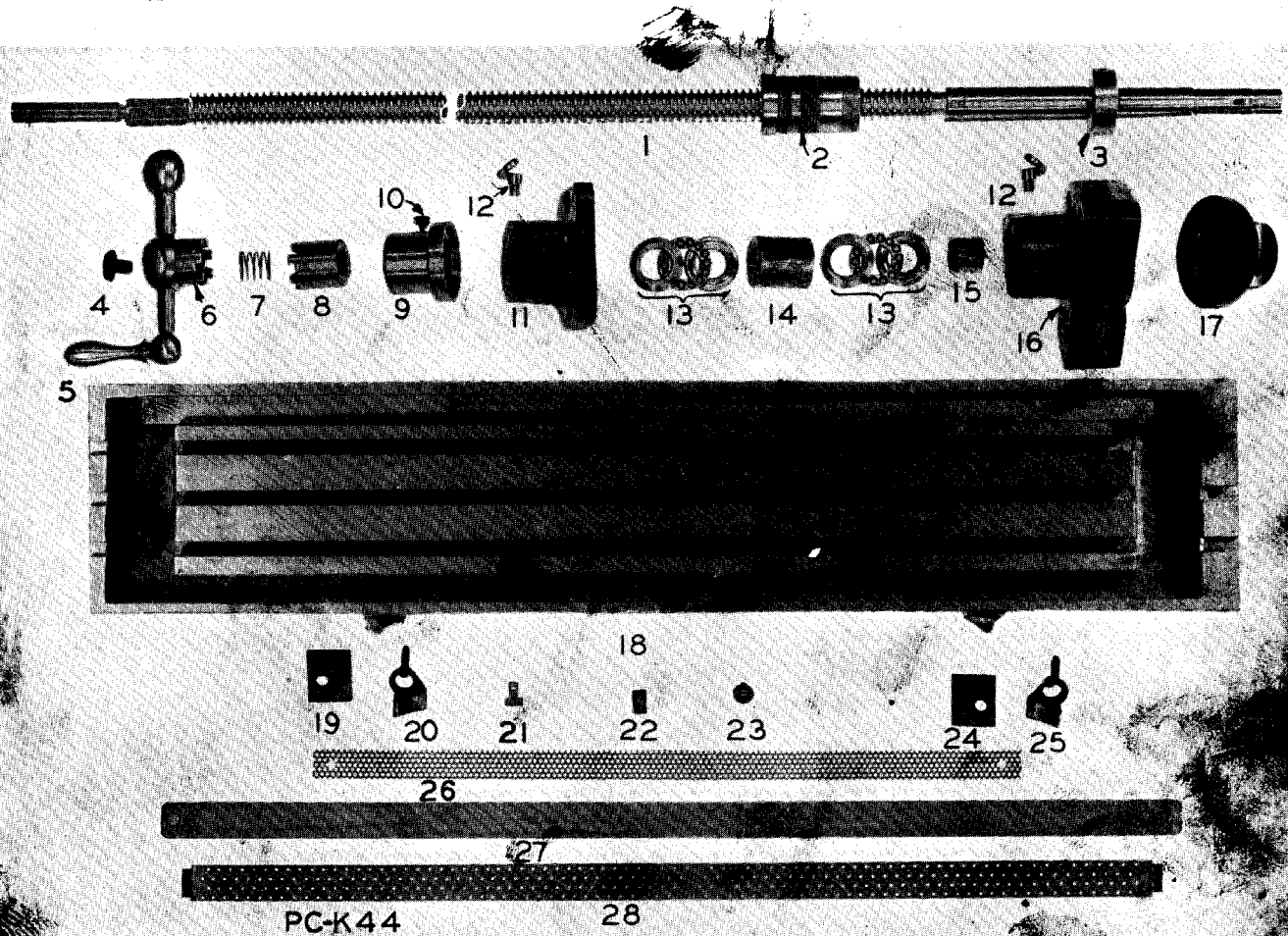
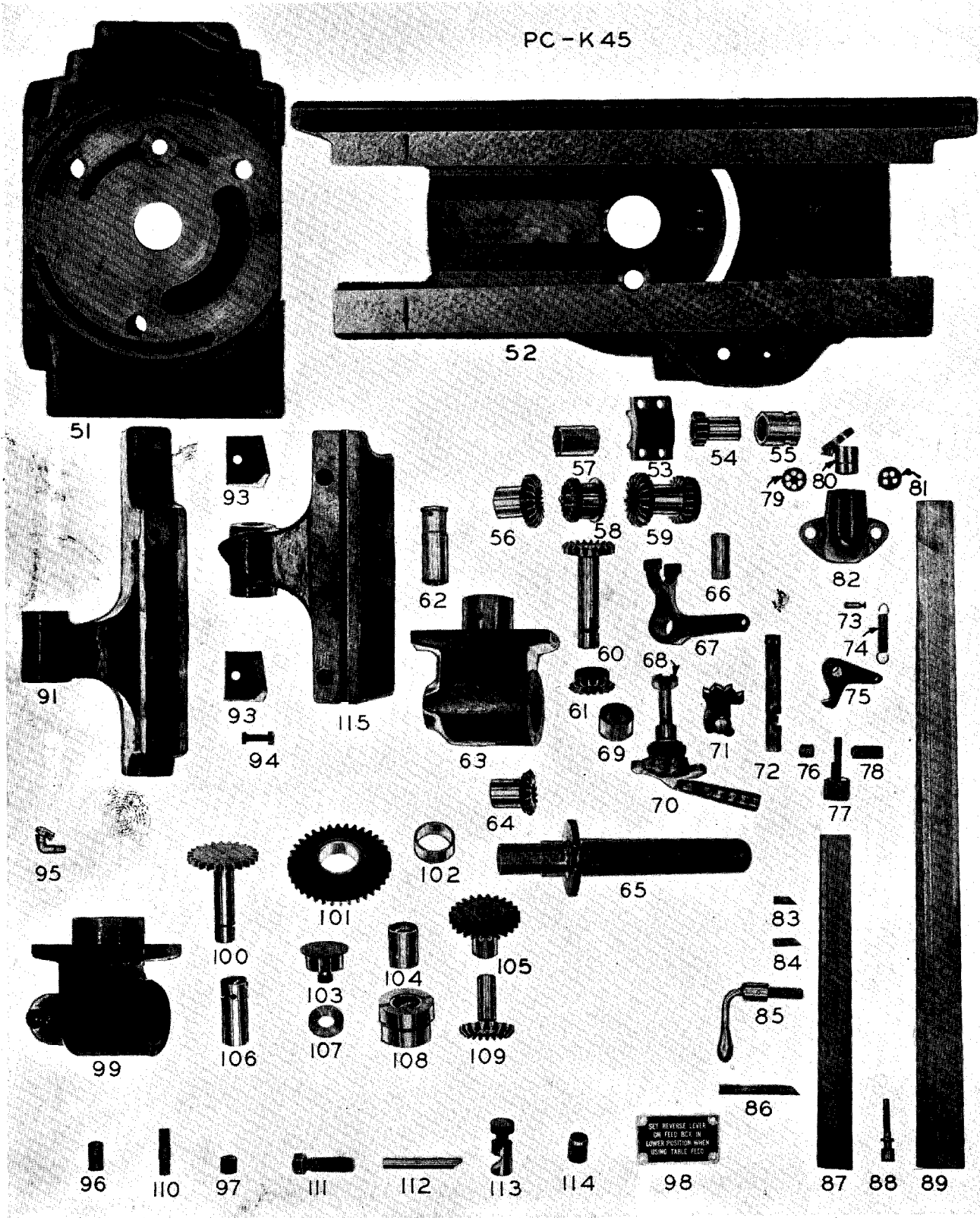


TABLE AND LEAD SCREW PARTS LIST

Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering	Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering
1	1	Lead Screw (English Pitch—Fitted with Nuts)	61984	12	2	Oil Cup ($\frac{3}{16}$ " Diameter)	51737
1	1	Lead Screw (Metric Pitch—Fitted with Nuts)	61985	13	2	Ball Thrust Bearing (S. K. F. No. 705)	31374
2	1	Nut on Lead Screw (English Pitch)	62018	14	1	Collar on Lead Screw	59645
2	1	Nut on Lead Screw (Metric Pitch)	62019	15	1	Bush in Apron	41876
4	1	Lock Nut on Lead Screw	42778	16	1	Back Apron	59631
4	1	Hex Head Collar Screw	2054	17	1	Cover for Back Apron	12369
5	1	Handle	3502	18	1	Table (Gib Included)	61986
6	1	Clutch for Table Feed Crank (Assembled as Shown)	36548-F	19	1	Trip Dog (Right Hand)	64772
7	1	Clutch Release Spring	33744	20	1	Dog Trip (Right Hand)	64771
8	1	Clutch on Lead Screw	38125	21	2	Tee Bolt ($\frac{3}{8}$ " x 1" long)	1025
9	1	Dial on Lead Screw (English)	38132	22	2	Supporting Sleeve for Strainer	56156
9	1	Dial on Lead Screw (Metric)	38131	23	2	Bushing for Dog	64775
10	1	Thumb Screw	100	24	1	Trip Dog (Left Hand)	64774
11	1	Front Apron	56694	25	1	Dog Trip (Left Hand)	64773
				26	1	Strainer for Table	56157
				27	1	Long Strainer Cover	65785
				28	1	Long Strainer for Table	65786

Specify Part Name, Part Number, and Serial Number and Letters of the machine when ordering parts. Also see Page 8 for Instructions "How to Order Repair Parts"

HOUSING AND SADDLE PARTS



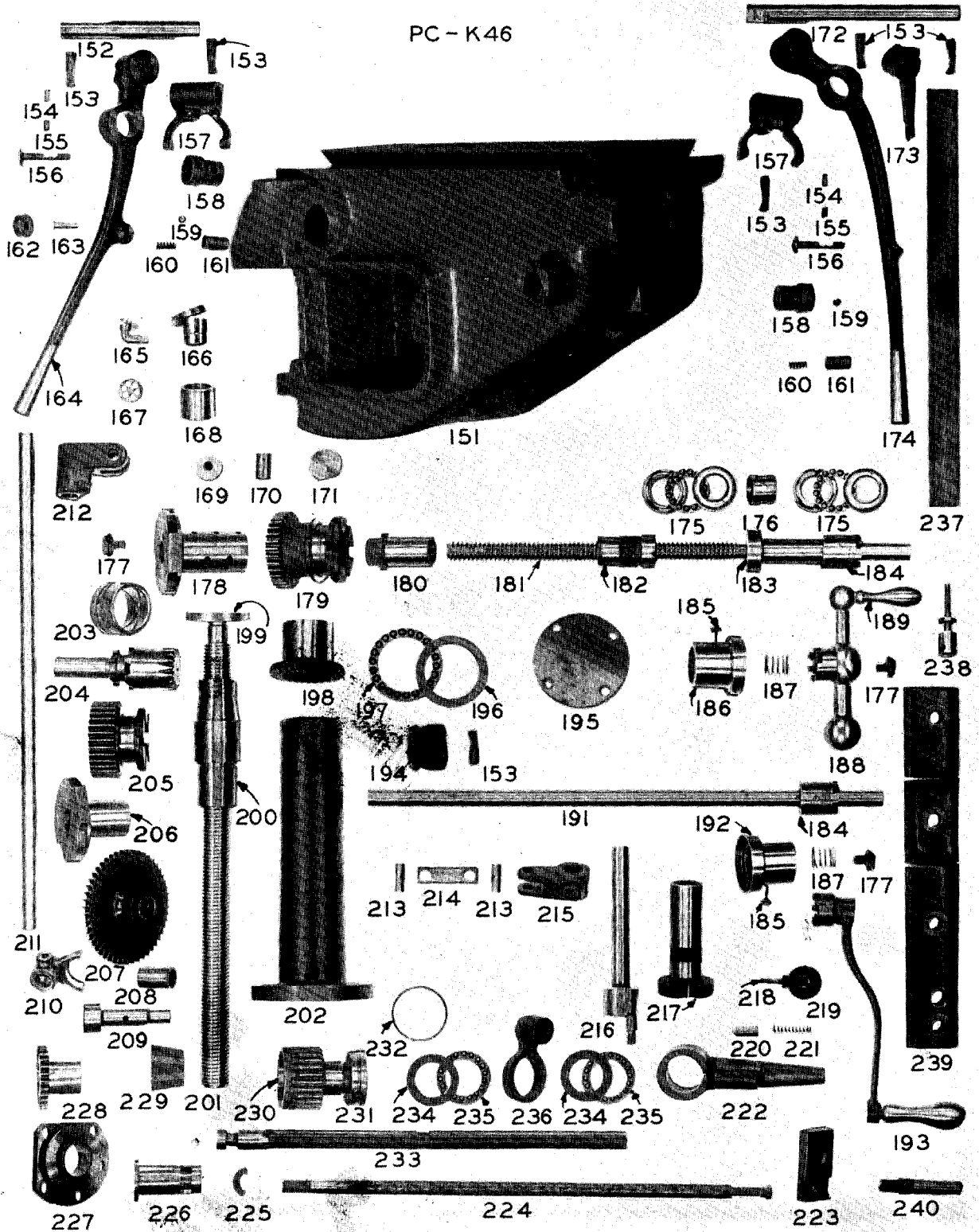
HOUSING AND SADDLE PARTS LIST

Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering	Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering
51	1	Saddle (Universal only)	61937	82	1	Oil Pocket Bracket	38283
51	1	Saddle (Assembled Complete-Univ. only)	61937-RF	83	1	Gib Clamping Shoe (1 1/8" long)	39610
52	1	Housing (Universal only)	61910	84	1	Gib Clamping Shoe (1 3/8" long)	39611
52	1	Housing (Assembled Complete-Univ. only)	61910-RF	85	1	Lever for Clamping Saddle (Fitted with Screw)	6092-FA
52	1	Saddle (Plain only)	61912	86	1	Gib Clamping Shoe (Univ.—4 1/4" long)	39617
52	1	Saddle (Assembled Complete-Plain only)	61912-RF	86	2	Gib Clamping Shoe (Plain—3 7/8" long)	38282
53	1	Cap on Saddle	59638	87	1	Gib for Saddle	38165
54	1	Gear for Driving Attachment	38145	88	2	Gib Adjusting Screw (2 7/8" long)	35942
55	1	Bush on Attachment Driving Gear (Univ. only)	38246	89	1	Gib for Table	38166
56	1	Bevel Gear on Lead Screw	61478	91	1	Bracket for Cross Feed Nut (Vert. Only)	41974
57	1	Sleeve on Lead Screw	59532	93	2	Cross Feed Dog	38427
58	1	Clutch on Sleeve on Lead Screw	61475	94	2	Tee Bolt (3/8" x 1" long)	1025
59	1	Bevel Gear on Lead Screw	61477	95	2	Ell Oil Cup (7/16" Diam.)	51738
60	1	Stem Bevel Gear (Plain only)	61474	96	3	Stop Pin	38042
61	1	Mitre Gear on Stem Bevel Gear	61476	97	1	Cap (Used when Pump is Omitted)	41971
62	1	Bush in Spline Shaft Bracket (Plain only)	38126	98	1	Instruction Plate (English)	65772
63	1	Spline Shaft Bracket (Plain only)	61503	98	1	Instruction Plate (French)	65994
64	1	Mitre Gear	61473	98	1	Instruction Plate (German)	65859
65	1	Cover for Spline Shaft Bracket (Vert.)	61490			Universal Only	
65	1	Cover for Spline Shaft Bracket (Horiz.)	62034	99	1	Spline Shaft Bracket (Fitted with Bush)	62080
66	1	Stud for Table Feed Trip Lever	51695	100	1	Stem Gear in Bracket under Saddle	38239
67	1	Clutch Shifter Fork	59607	101	1	Intermediate Gear (Fitted with Bush)	62559
68	1	Nut on Plunger Feed Trip	61890	102	1	Bush in Intermediate Gear	38244
69	1	Bush for Table Feed Lever	59625	103	1	Stud for Intermediate Gear	38243
70	1	Table Feed Trip Lever (Fitted with Nut)	61894	104	1	Bush	3534
71	1	Detent on Feed Trip Lever	61895	105	1	Sleeve Gear on Stem Bevel Gear	61892
72	1	Clutch Shifter Rod	61889	106	1	Bush in Spline Shaft Bracket	38249
73	1	Pin in Long Intermediate Clutch Lever	34258	107	1	Nut on Intermediate Gear Stud	38270
74	1	Detent Lever Spring	34333	108	1	Bush in Housing	61896
75	1	Detent Lever	59626	109	1	Stem Bevel Gear	61893
76	1	Eccentric Clamp Nut	51573	110	2	Stud	38288
77	1	Eccentric Stud	59630	111	3	Screw for Clamping Wedge Bolt	38241
78	1	Eccentric Clamp	61887	112	2	Wedge (3 5/8" long)	41803
79	1	Oil Tube Holder (6 Holes-Univ. only)	51560	112	1	Wedge (2 1/2" long)	41804
80	2	Oil Cup (1 1/4" Diameter)	51735	113	3	Wedge Bolt	38269
81	2	Oil Tube Holder (4 Holes)	51559	114	1	Tube for Return Lubricant	38247
				115	1	Bracket for Cross Feed Nut (Plain and Univ.)	41973

Specify Part Name, Part Number, and Serial Number and Letters of the machine when ordering parts

Also see Page 8 for Instructions "How to Order Repair Parts"

CROSS SCREW, VERTICAL SCREW, AND KNEE PARTS

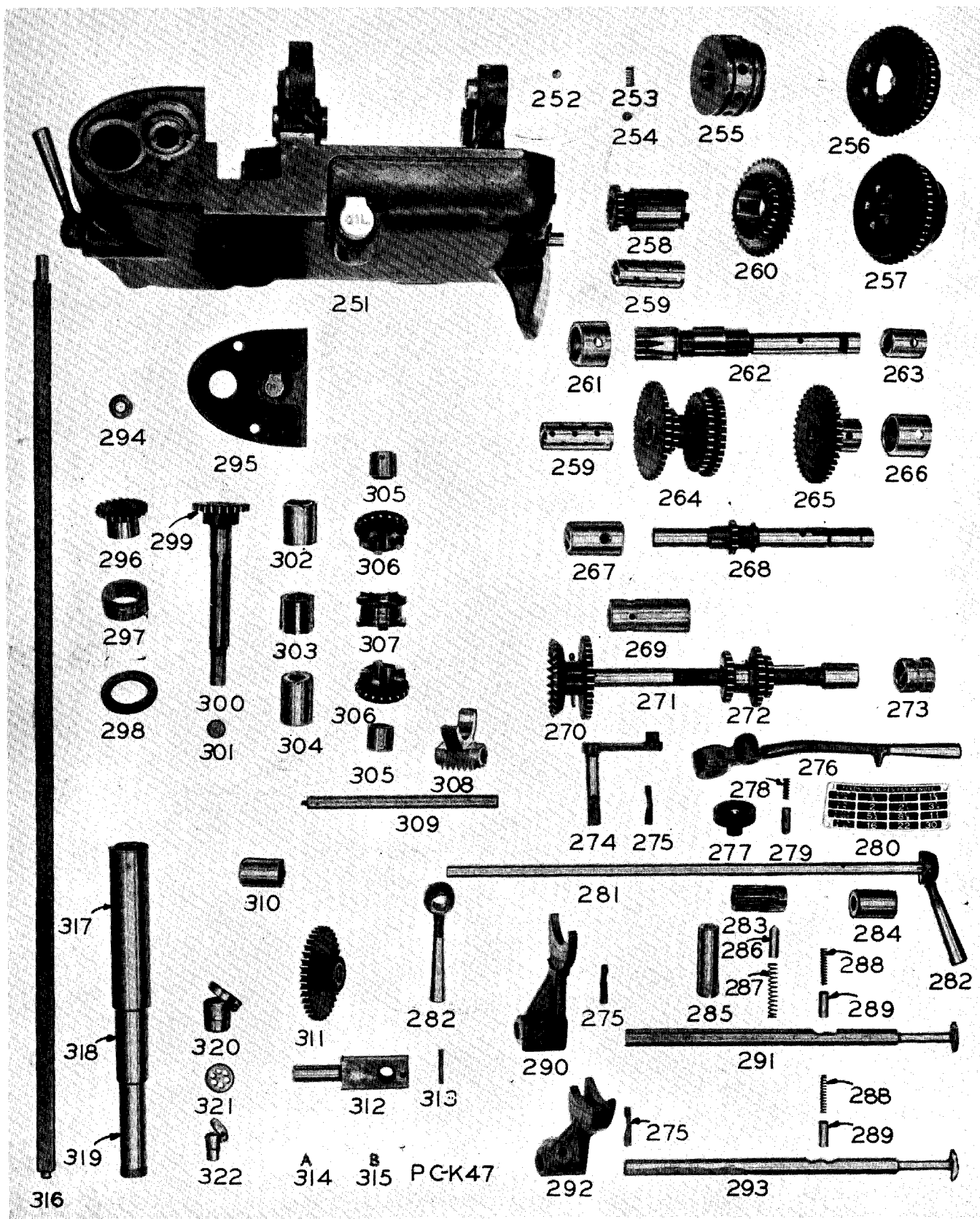


CROSS SCREW, VERTICAL SCREW, AND KNEE PARTS LIST

Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering	Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering
151	1	Knee (Vert.)	61425	192	1	Dial on Elevating Shaft (English Pitch Screw)	44357
151	1	Knee Assembly (Vert.)	61425-RF				
151	1	Knee (Horiz.)	61911	192	1	Dial on Elevating Shaft (Metric Pitch Screw)	44358
151	1	Knee Assembly (Horiz.)	61911-RF				
152	1	Shaft for Cross Feed Lever	39368	193	1	Crank (Assembled as Shown)	56426
153	6	Lock Pin (1/2" x 1 9/16" long)	38368	194	1	Bevel Gear on Elevating Shaft	38359
154	2	Spring (3/16" long)	262	195	1	Cover Plate on Knee	41853
155	2	Plunger for Locking Lever	39013	196	1	Ball Thrust Washer	38364
156	2	Pin for Locking Lever	54262	197	1	Ball Thrust Bearing	38388
157	2	Clutch Shifter Fork	38360	198	1	Bevel Gear on Vertical Screw	59373
158	2	Detent in Cross and Vertical Feed Levers	42118	199	1	Lock Nut on Vertical Screw	38611
159	2	Ball (7/16" Diam.)	29019	200	1	Nut on Vertical Screw (English Pitch)	59089
160	2	Spring (3/8" long)	2183	200	1	Nut on Vertical Screw (Metric Pitch)	60159
161	2	Plunger Holder	39012	201	1	Vertical Screw (English Pitch)	44355
162	1	Roller for Detent Lever	34676	201	1	Vertical Screw (Metric Pitch)	44356
163	1	Pin in Cross Feed Lever	38442	202	1	Vertical Screw Pedestal	59341
164	1	Cross Feed Lever	46805	203	1	Bush on Stem Bevel Gear	38384
165	1	Oil Cup (7/16" Diam.)	51738	204	1	Stem Bevel Gear	38383
166	1	Oil Cup (1 1/4" Diam.)	51735	205	1	Clutch Gear on Bevel Gear Bush	61455
166	1	Oil Cup (7/16" Diam.)	51737	206	1	Bush on Stem Bevel Gear	61452
167	1	Oil Tube Holder (8 Holes)	62988	207	1	Intermediate Gear (Fitted with Bush)	61458
168	1	Holder for Oil Pocket	62987	208	1	Bush in Intermediate Gear	3913
169	1	Plug (1" Diameter)	30715	209	1	Stud for Intermediate Gear	61457
169	1	Plug (5/8" Diameter)	54881	210	1	Shifter Fork	61451
170	1	Stop Pin	38042	211	1	Shifter Rod for Intermediate Gear (Vert.)	61491
171	1	Plug in Knee	61459	211	1	Shifter Rod for Intermediate Gear (Horiz.)	61908
172	1	Shaft for Vertical Feed Lever	39369	212	1	Shifter Lever for Intermediate Gear	61464
173	1	Plunger Lever for Vertical Feed	38410	213	2	Pin in Shifter Lever	61462
174	1	Vertical Feed Lever	46804	214	1	Shifter Link	61463
175	2	Ball Bearing for Cross Screw (No. 706 Single Thrust S.K.F. Medium Type)	39413	215	1	Lever on Eccentric Shaft for Rapid Traverse	61465
176	1	Bush in Knee for Cross Screw	42098	216	1	Eccentric Shaft for Rapid Traverse	61493
177	7	Hex Head Collar Screw	2054	217	1	Detent Sleeve for Rapid Traverse	61494
178	1	Bush on Clutch Sleeve	64380	218	1	Stud for Ball	3860
179	1	Clutch Gear on Clutch Sleeve Bush	38415	219	1	Ball	3859
180	1	Clutch Sleeve on Cross Screw	38416	220	1	Plunger	53144
181	1	Cross Screw (English Pitch--Fitted with Nuts and Clutch--Vert.)	39557	221	1	Spring (1 5/8" long)	65650
181	1	Cross Screw (Metric Pitch--Fitted with Nuts and Clutch--Vert.)	39558	222	1	Rapid Traverse Lever	61492
181	1	Cross Screw (English Pitch--Fitted with Nuts and Clutch--Horiz.)	39421	223	1	Shifter Block for Friction Gear	61461
181	1	Cross Screw (Metric Pitch--Fitted with Nuts and Clutch--Horiz.)	39422	224	1	Shifter Rod for Friction Gear (Vert.)	61460
182	1	Nut on Cross Screw (English Pitch)	41968	224	1	Shifter Rod for Friction Gear (Horiz.)	61906
182	1	Nut on Cross Screw (Metric Pitch)	41969	225	1	Split Collar	59659
183	1	Lock Nut on Cross Screw	40946	226	1	Bush for Friction Spool Gear	64553
184	2	Clutch on Cross Screw and Elevating Shaft	38125	227	1	Support for Friction Gear Bush	64553
185	2	Thumb Screw	100	228	1	Friction Spool Gear	61471
186	1	Dial on Cross Screw (English Pitch Screw)	38362	229	1	Friction Spool	61448
186	1	Dial on Cross Screw (Metric Pitch Screw)	38132	230	1	Friction Cup Gear	61470
187	2	Clutch Release Spring	33744	231	1	Nut on Friction Cup Gear	61469
188	1	Ball Crank (Assembled as Shown)	36548-F	232	1	Spring	44085
189	1	Handle	3502	233	1	Splined Shaft (Vert.)	61498
191	1	Elevating Shaft (Fitted with Clutch--Vert.)	61456-F	233	1	Splined Shaft (Horiz.)	61907
191	1	Elevating Shaft (Fitted with Clutch--Horiz.)	61905-F	234	2	Thrust Bearing Washer	61467
				235	2	Ball Thrust Bearing	59665
				236	1	Friction Gear Shifter	61468
				237	1	Gib for Knee	38395
				238	1	Gib Adjusting Screw (3 3/8" long)	38370
				239	1	Guide for Knee	38396
				240	1	Plunger for Vertical Feed	38413

Specify Part Name, Part Number, and Serial Number and Letters of the machine when ordering parts.
Also see Page 8 for Instructions "How to Order Repair Parts"

VERTICAL FEED SHAFT AND FEED BOX PARTS

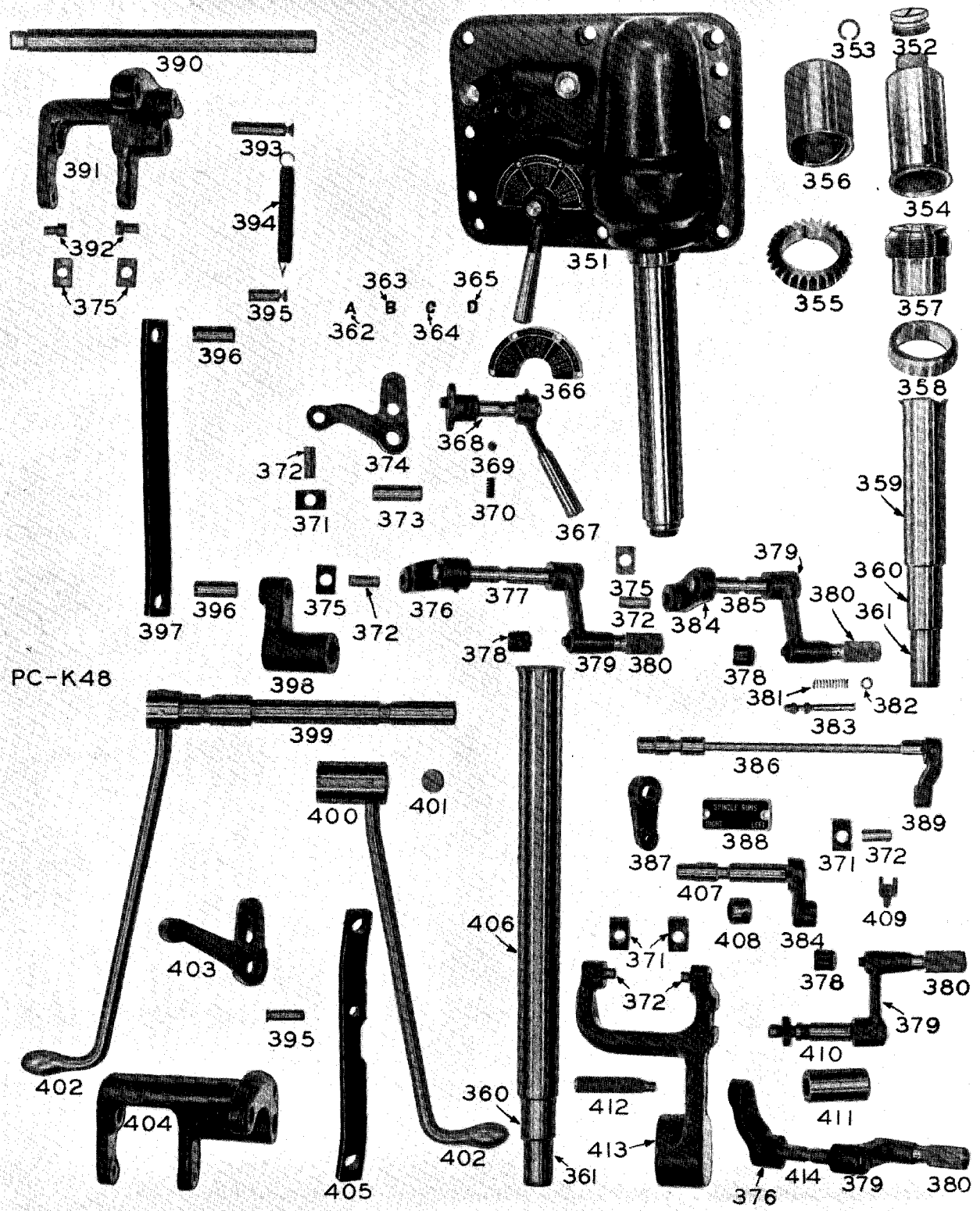


VERTICAL FEED SHAFT AND FEED BOX PARTS LIST

Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering	Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering
251	1	Feed Box	61424	282	2	Reverse Lever	3516
251	1	Feed Box (Assembled Complete)	61424-RF	283	1	Gear on Reverse Rod	61454
252	80	Ball (1/4" Diam.)	30060	284	1	Reverse Rod Bush	59676
253	9	Spring (3/32" long)	2183	285	1	Plunger Sleeve for Reverse Rod Gear	61485
254	9	Ball (1/16" Diam.)	29019	286	1	Plunger for Reverse Rod Gear	61484
255	1	Safety Gear Sleeve	43303	287	1	Spring (1 3/4" long)	61864
256	1	Safety Gear	50810	288	2	Spring in Plunger (1 1/2" long)	2176
257	1	Safety Gear (Assembled as Shown)	50810-F	289	2	Plunger for Shifter Rods "A" and "B"	38553
258	1	Back Gear Pinion on Third Feed Shaft (Fitted with Bush)	50809	290	1	Fork for Shifter Rod "B"	38552
259	2	Bush in Gear	38488	291	1	Rod "B" for Shifting Fork	65807
260	1	Sliding Gear on Third Feed Shaft	50814	292	1	Fork for Shifter Rod "A"	38551
261	1	Large Bush for Third Feed Shaft (1 1/16" Bore)	61483	293	1	Rod "A" for Shifting Fork	65808
262	1	Third Feed Shaft	61500	294	1	Washer on Vertical Feed Shaft	38649
263	1	Small Bush for Third Feed Shaft (5/16" Bore)	43972	295	1	Feed Box Cover	59628
264	1	Gear on Second Feed Shaft (Fitted with Bush)	50812	296	1	Gear on Vertical Feed Shaft (21 Teeth—for 3/4" to 30" Feeds)	50803
265	1	Back Gear on Second Feed Shaft	50811	297	1	Gear on Vertical Feed Shaft (16 Teeth—for 7/16" to 18" Feeds)	65873
266	1	Short Bush for Second Feed Shaft (1 1/2" Bore)	43971	298	1	Bush for Gear on Vertical Shaft	38744
267	1	Long Bush for Second Feed Shaft (7/8" Bore)	38494	299	1	Washer for Gear on Vertical Shaft	38747
268	1	Second Feed Shaft	50815	299	1	Gear on Reverse Shaft (23 Teeth—for 3/4" to 30" Feeds)	50804
269	1	Long Bush for First Feed Shaft	61489	300	1	Gear on Reverse Shaft (28 Teeth—for 7/16" to 18" Feeds)	65874
270	1	Bevel Gear on First Feed Shaft	61488	301	1	Reverse Shaft	61499
271	1	First Feed Shaft	61502	302	1	Plug (3/4" Diam.)	3549
272	1	Sliding Gear on First Feed Shaft	50813	302	1	Upper Bush for Reverse Shaft (1" Bore)	59583
273	1	Short Bush for First Feed Shaft	38487	303	1	Reverse Clutch Spacer	61481
274	1	Gear Shifter	38558	304	1	Lower Bush for Reverse Shaft (3/4" Bore)	61479
275	3	Lock Pin (3/8" x 1 1/16" long)	33941	305	2	Bush in Bevel Reverse Pinion	61449
276	1	Gear Shifter Lever	38563	306	2	Bevel Reverse Pinion	61480
277	1	Stop for Gear Shifter Lever	38559	307	1	Reverse Clutch	61482
278	1	Spring in Plunger (7/8" long)	2175	308	1	Reverse Fork	61450
279	1	Plunger for Gear Shifter Lever	38560	309	1	Shifter Fork Rod	59637
280	1	Feed Plate (English—3/4" to 30" Feeds)	40529	310	1	Bush in Intermediate Gear	3832
280	1	Feed Plate (English—7/16" to 18" Feeds)	65755	311	1	Intermediate Gear (Fitted with Bush)	61486
280	1	Feed Plate (German—19 to 761 mm. Feeds)	42251	312	1	Intermediate Gear Support	61487
280	1	Feed Plate (German—11 to 457 mm. Feeds)	65895	313	1	Pin Screw	486
280	1	Feed Plate (French—19 to 761 mm. Feeds)	40530	314	1	Index Letter "A"	3334
280	1	Feed Plate (French—11 to 457 mm. Feeds)	65896	315	1	Index Letter "B"	3335
280	1	Feed Plate (English-Reading in Millimeter Figures—19 to 761 mm. Feeds)	65986	316	1	Vertical Feed Shaft (Horizontal only)	50897
281	1	Reverse Rod (Fitted with Bush, Lever, and Gear)	61501-F	316	1	Vertical Feed Shaft (Vertical only)	32951
281	1	Reverse Rod	61501	317	1	Third Telescopic Tube (Fitted with 2nd Tube)	42078
				318	1	Second Telescopic Tube	42079
				319	1	Small Telescopic Guard	52779
				320	1	Oil Cup (1 1/4" Diam.)	51735
				321	1	Oil Tube Holder	51560
				322	1	Oil Cup (5/8" Diam.)	51736
				---	1	Taper Pin No. 8	39616

Specify Part Name, Part Number, and Serial Number and Letters of the machine when ordering parts.
Also see Page 8 for Instructions "How to Order Repair Parts"

GEAR SHIFTER BRACKET, STARTING, AND REVERSE MECHANISM PARTS

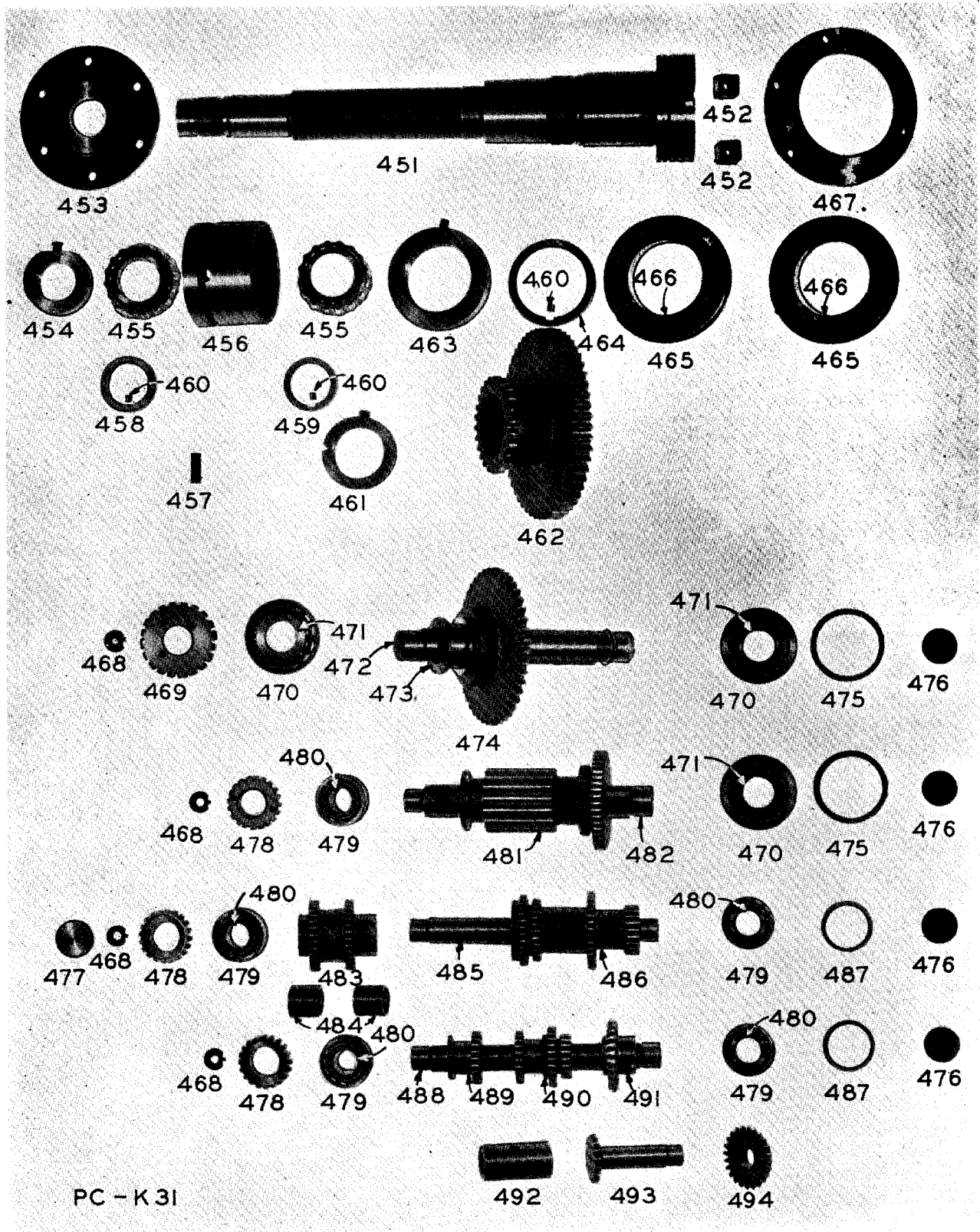


GEAR SHIFTER BRACKET, STARTING AND REVERSE MECHANISM PARTS

Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering	Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering
351	1	Gear Shifter Bracket (Horizontal)	61974	386	1	Shaft for Reverse Shifter	50856
351	1	Gear Shifter Bracket (Vertical)	61975	387	1	Reverse Lever	53280
352	1	Plug on Gear Shifter Bracket	38650	388	1	Spindle Reverse Plate (English)	3885
353	1	Lock Ring for Vertical Feed Shaft	38648	388	1	Spindle Reverse Plate (German)	52317
354	1	Sleeve in Bracket	38064	388	1	Spindle Reverse Plate (French)	35355
355	1	Bevel Gear (Horizontal)	38050	389	1	Reverse Gear Shifter	47549
355	1	Bevel Gear (Vertical)	52730	390	1	Clutch Shifter Shaft (Horiz.)	50855
356	1	Bush in Bracket	38051	390	1	Clutch Shifter Shaft (Vert.)	52721
357	1	Support for Sleeve	42097	391	1	Clutch Shifter	51185
358	1	Oil Retainer in Bracket	38048	392	2	Shifter Shoe Pin	46855
359	1	Third Telescopic Tube (Horizontal only—Fitted with Second Tube)	42078	393	1	Pin for Spring (2 $\frac{1}{16}$ " Long)	51184
360	1	Second Telescopic Tube	42079	394	1	Clutch Shifter Spring	37990
361	1	Small Telescopic Guard for Vertical Feed Shaft	52779	395	1	Pin for Spring (1 $\frac{1}{16}$ " Long)	52732
362	1	Index Letter "A"	3334	395	1	Pin for Spring (1 $\frac{3}{8}$ " Long)	52726
363	1	Index Letter "B"	3335	396	2	Pin for Starting Lever	48592
364	1	Index Letter "C"	3336	397	1	Clutch Shifter Link	51183
365	1	Index Letter "D"	3337	398	1	Starting Lever Shifter	47556
366	1	Spindle Speeds Plate	64156	399	1	Starting Lever Shaft (Fitted as shown—Horizontal)	50833-F
367	1	Lower Speed Change Lever	42827	399	1	Starting Lever Shaft (Fitted as shown—Vertical)	52724-F
368	1	Shaft for Lower Speed Change Lever (Fitted as shown)	42826-F	399	1	Starting Lever Shaft (Horizontal)	50833
368	1	Shaft for Lower Speed Change Lever	46826	399	1	Starting Lever Shaft (Vertical)	52724
369	1	Ball ($\frac{3}{16}$ " diameter)	29019	400	1	Starting Lever Hub (Fitted as shown—Horizontal)	50832-FA
370	1	Spring	2183	400	1	Starting Lever Hub (Fitted as shown—Vertical)	50832-FB
371	5 Vert. 3 Horiz.	Shoe for Speed Change Shifter	38321	400	1	Starting Lever Hub	50832
372	5 Vert. 4 Horiz.	Double Diameter Pin	48591	401	1	Plug in Starting Lever Hub	51637
373	1	Stud for Lower Shifter	37887	402	2	Starting Lever (Horiz.)	46795
374	1	Lower Speed Change Shifter	38669	402	2	Starting Lever (Vert.)	38824
375	3	Shoe for Clutch Shifter	42983	Vertical Only			
376	1	Shifter for Central Speed Change	39563	403	1	Shifter for Lower Speed Change	53713
377	1	Shaft for Central Speed Change (Fitted as shown)	51272-F	404	1	Clutch Shifter	52725
377	1	Shaft for Central Speed Change	51272	405	1	Clutch Shifter Link	52720
378	4	Stop Pin for Speed Change Lever	3521	406	1	Large Telescopic Guard	42084
378	2	Stop for Speed Change Lever (Vertical only)	38180	407	1	Reverse Shifter Shaft (Fitted with Shifter)	52722-F
379	3	Speed Change Lever	42830	407	1	Reverse Shifter Shaft	52722
380	3	Handle on Index Pin	3525	408	1	Spacer for Reverse Shifter Shaft	53707
381	3	Spring	1733	409	1	Shifter Shoe	88213
382	3	Bush in Lever	3523	410	1	Shaft for Back Gear Shifter Fork (Fitted as shown)	42831-F
383	3	Index Pin (Fitted with Handle)	33296-F	410	1	Shaft for Back Gear Shifter Fork	42831
384	1	Shifter for Upper Speed Change	52723	411	1	Bush on Shaft for Fork	39678
385	1	Shaft for Upper Speed Change Lever (Fitted as shown)	42829-F	412	1	Stud for Back Gear Shifter Fork	38820
385	1	Shaft for Upper Speed Change Lever	42829	413	1	Fork for Shifting Back Gear	38842
386	1	Shaft for Reverse Shifter (Fitted with Shifter)	50856-F	414	1	Shaft for Upper Speed Change Lever (Fitted as shown)	42828-F
				414	1	Shaft for Upper Speed Change Lever	42828

Specify Part Name, Part Number, and Serial Number and Letters of the machine when ordering parts.
Also see Page 8 for Instructions "How to Order Repair Parts"

SPINDLE AND DRIVE GEARING PARTS (HORIZONTAL ONLY)

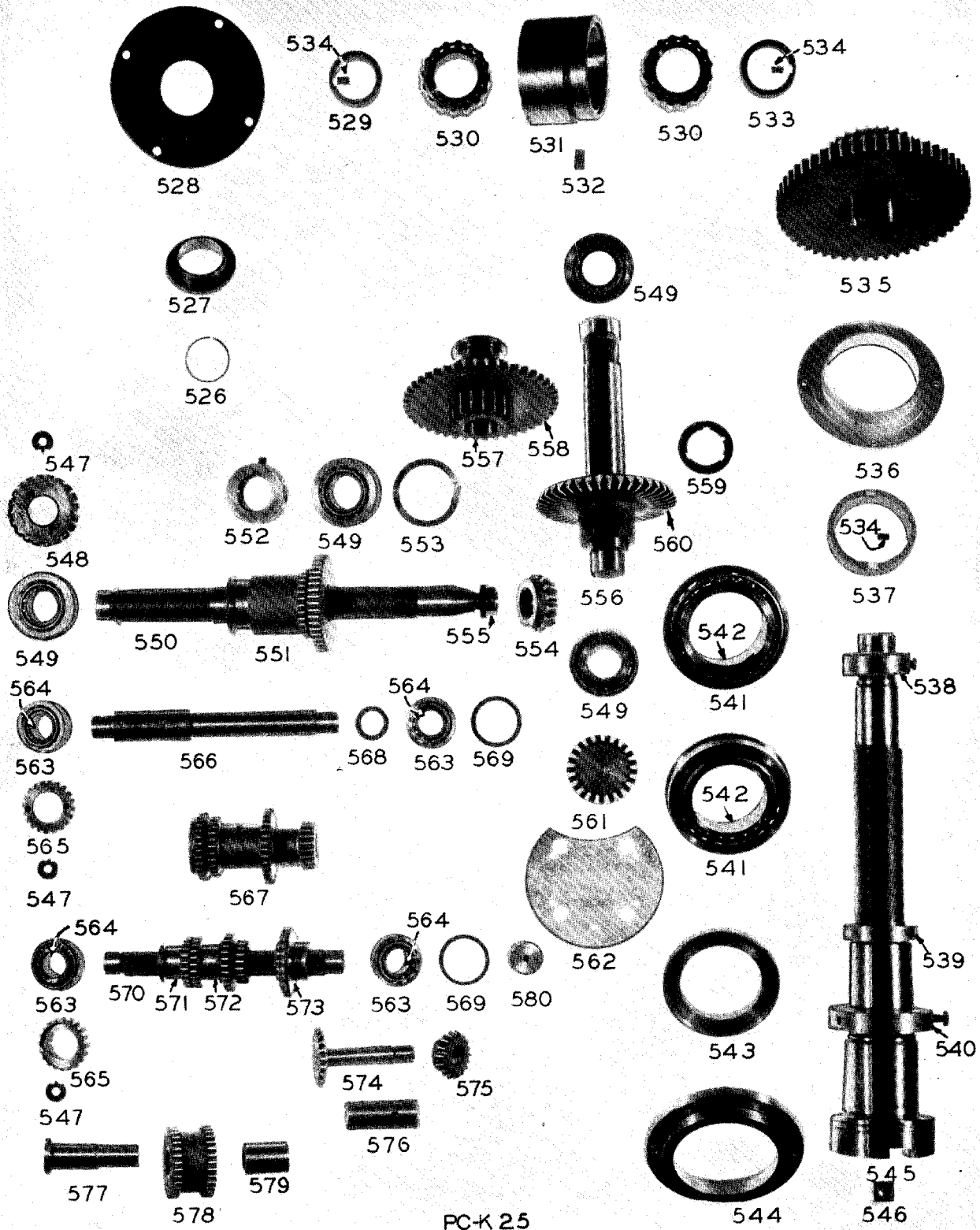


SPINDLE AND DRIVE GEARING PARTS LIST (HORIZONTAL ONLY)

Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering.	Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering
451	1	Spindle (Fitted with Nuts).....	57061	472	1	Back Gear Shaft.....	53492
452	2	Arbor Driving Key.....	3687	473	1	Face Gear Pinion.....	54910
453	1	Cover for Rear Roller Bearing on Spindle.....	57057	474	1	Large Back Gear.....	39409
454	1	Nut on Spindle.....	3856	475	2	Spacer for Roller Bearing.....	51620
455	2	Cone (Timken No. 456-W).....	57052	476	4	Steel Plug (1 3/4" diameter).....	3554
456	1	Retainer for Roller Bearing.....	57058	477	1	Steel Plug (1 7/8" diameter).....	21507
	2	(Two Cups—Timken No. 453-A; Pressed into Retainer.)		478	3	Adjusting Nut for Roller Bearing.....	3591
457	2	Plug.....	3547	479	5	Cup (Timken No. 2530).....	3568
458	1	Lock Washer for Bearing (2" Bore).....	57054	480	5	Cone (Timken No. 2558).....	64364
459	1	Lock Washer for Bearing (2 1/8" Bore).....	57055	481	1	Gear on Third Drive Shaft.....	51172
460	3	Straight Pin—(3/8" x 3/8" long).....	3385	482	1	Third Drive Shaft.....	51622
461	1	Lock Nut for Face Gear.....	43964	483	1	Reverse Gear on Second Drive Shaft.....	47550
462	1	Face Gear.....	58708	484	2	Bush in Reverse Gear.....	46788
463	1	Nut on Spindle.....	60802	485	1	Second Drive Shaft.....	51623
464	1	Lock Washer for Front Bearing.....	57056	486	1	Gear on Second Drive Shaft.....	51606
465	2	Cup (Timken No. 592-B).....	57891	487	2	Spacer for Roller Bearing.....	3594
466	2	Cone (Timken No. 598-W).....	57231	488	1	First Drive Shaft.....	52634
467	1	Front Spindle Cap.....	57059	489	1	Reverse Gear.....	47555
468	4	Lock Washer.....	3445	490	1	Sliding Gear on First Drive Shaft.....	38807
469	1	Adjusting Nut for Roller Bearing.....	51618	491	1	Bevel Gear on First Drive Shaft.....	51158
470	3	Cup (Timken No. 432).....	3572	492	1	Bush for Bevel Pinion.....	37998
471	3	Cone (Timken No. 444).....	3571	493	1	Bevel Pinion.....	38036
				494	1	Bevel Gear on Bevel Pinion.....	37981

Specify **Part Name**, **Part Number**, and **Serial Number and Letters** of the machine when ordering parts.
 Also see Page 8 for Instructions "How to Order Repair Parts"

SPINDLE AND DRIVE GEARING PARTS (VERTICAL ONLY)



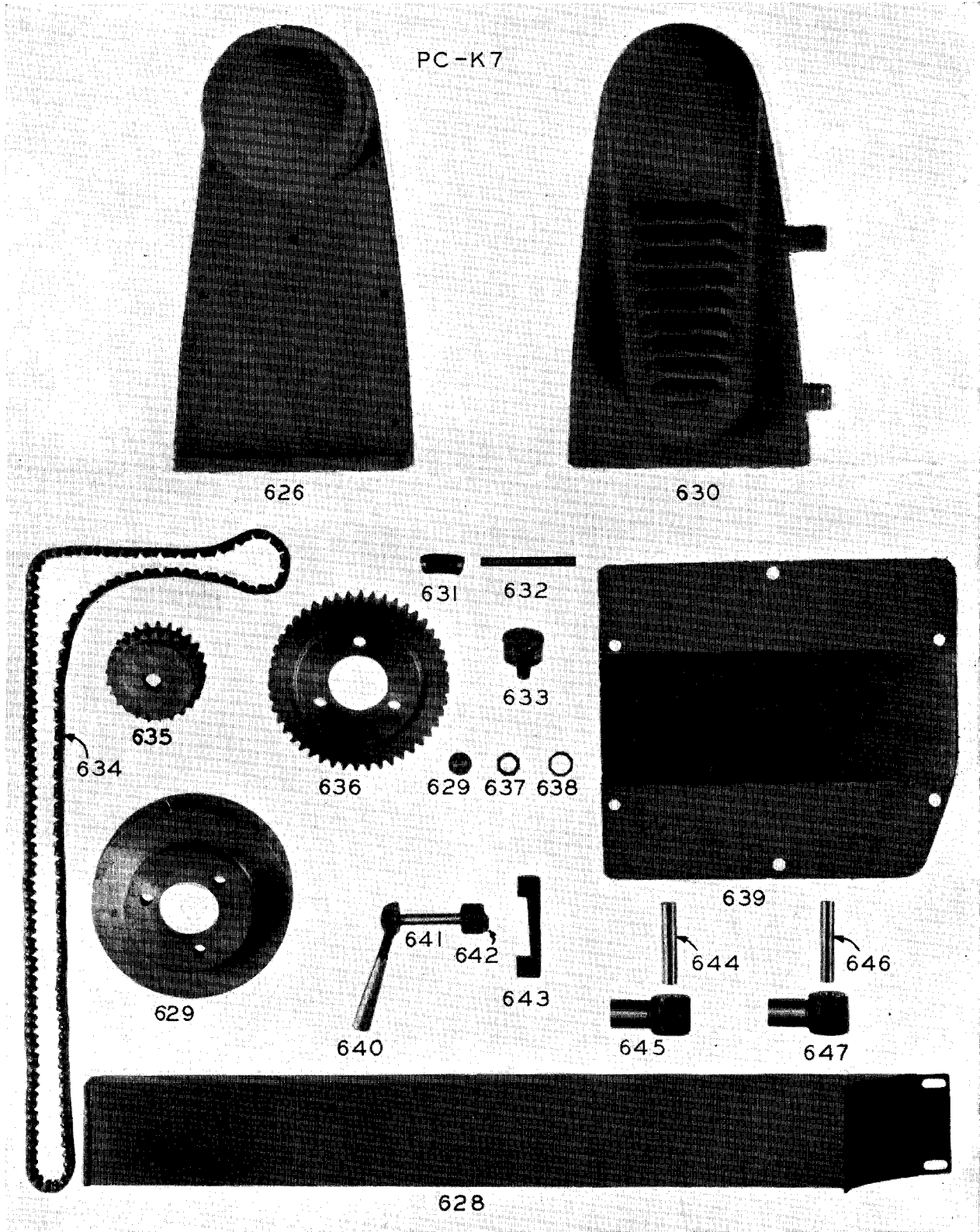
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SPINDLE AND DRIVE GEARING PARTS LIST (VERTICAL ONLY)

Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering	Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering
526	1	Locking Spring.....	57072	552	1	Collar for Third Drive Shaft.....	53757
527	1	Upper Dust Cap on Spindle.....	57070	553	1	Spacer for Roller Bearing.....	52901
528	1	Upper Spindle Cover.....	57066	554	1	Bevel Gear on Third Drive Shaft....	52664
529	1	Lock Washer for Bearing (2" Bore).....	57054	555	1	Castellated Nut on Third Drive Shaft.....	37070
530	2	Cone (Timken No. 456-W).....	57052	556	1	Back Gear Shaft.....	52667
531	1	Retainer for Roller Bearing.....	57058	557	1	Face Gear Pinion.....	39448
	2	(Two Cups—Timken No. 453-A; Pressed into Retainer).....		558	1	Large Back Gear.....	39409
532	1	Pin (1/2" diameter x 1" long).....	1899	559	1	Lower Washer on Back Gear Shaft....	38789
533	1	Lock Washer for Bearing (2 3/8" Bore).....	57055	560	1	Bevel Gear on Back Gear Shaft.....	52665
534	3	Straight Pin (3/8" diameter x 3/8" long).....	3385	561	1	Adjusting Nut for Roller Bearing....	52656
535	1	Face Gear.....	58708	562	1	Cover for Lower Back Gear Bearing....	57075
536	1	Oil Retainer.....	59349	563	4	Cup (Timken No. 2530).....	3568
537	1	Lock Washer for Lower Bearing.....	58234	564	4	Cone (Timken No. 2558).....	64364
538	1	Nut on Spindle.....	3856	565	2	Adjusting Nut for Roller Bearing....	3591
539	1	Lock Nut for Face Gear.....	43964	566	1	Second Drive Shaft.....	52662
540	1	Nut on Spindle.....	59348	567	1	Gear on Second Drive Shaft.....	51606
541	2	Cup (Timken No. 592-B).....	57891	568	1	Washer on Second Drive Shaft.....	52651
542	2	Cone (Timken No. 598-W).....	57231	569	2	Spacer for Roller Bearing.....	3594
543	1	Lower Dust Guard on Spindle.....	57076	570	1	First Drive Shaft.....	52634
544	1	Cap for Spindle.....	57067	571	1	Reversing Gear.....	47555
545	1	Spindle (Fitted with Nuts).....	57068	572	1	Sliding Gear on First Drive Shaft....	38807
546	2	Arbor Driving Key.....	3687	573	1	Bevel Gear on First Drive Shaft....	51158
547	3	Lock Washer.....	3445	574	1	Stem Bevel Gear.....	52729
548	1	Adjusting Nut for Roller Bearing....	52657	575	1	Bevel Pinion on Stem Bevel Gear....	52731
549	4	Roller Bearing (Timken No. 44162, 44348).....	52649	576	1	Bush for Bevel Pinion.....	52728
550	1	Third Drive Shaft (Fitted with Nut).....	53722	577	1	Stud for Intermediate Gear.....	52650
551	1	Sliding Gear on Third Drive Shaft..	39193	578	1	Intermediate Reverse Gear.....	52648
				579	1	Bush for Intermediate Reverse Gear..	52663
				580	1	Plug (1 3/4" diameter).....	37227

Specify **Part Name**, **Part Number**, and **Serial Number and Letters** of the machine when ordering parts
 Also see Page 8 for Instructions "How to Order Repair Parts"

BELT DRIVE AND MOTOR DRIVE PARTS



BELT DRIVE AND MOTOR DRIVE PARTS LIST

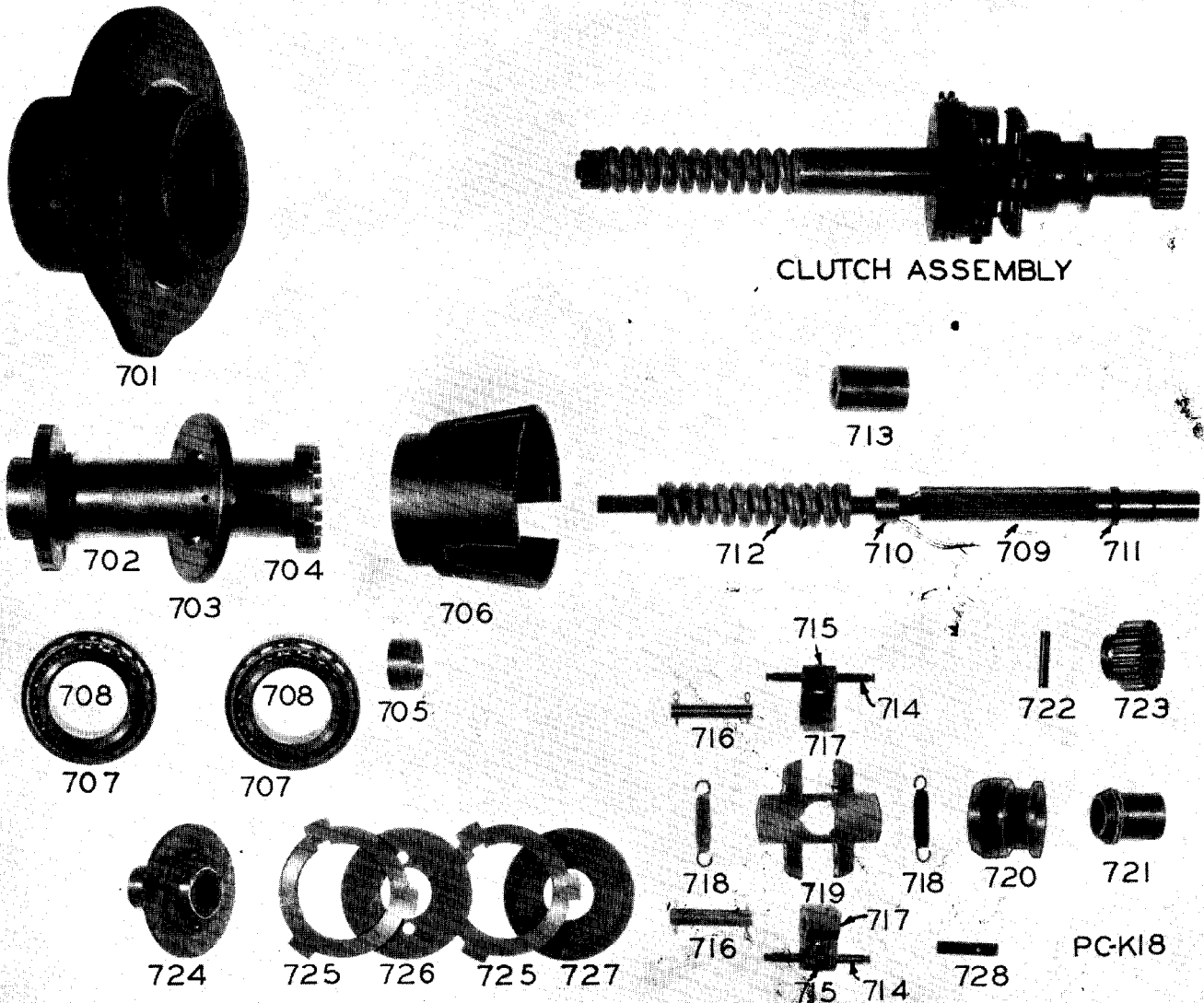
Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering	Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering
Belt Drive Machines Only							
626	1	Belt Drive Cover (Horizontal)	50887	635	1	††Chain Pinion on Motor—16 Teeth (1750 r.p.m. Motor)	53920
626	1	Belt Drive Cover (Vertical)	52770	635	1	Chain Pinion on Motor—19 Teeth (1450 r.p.m. Motor)	53921
627	1	Driving Pulley	50873	635	1	Chain Pinion on Motor—25 Teeth (1150 r.p.m. Motor)	53922
628	2	Belt Guard	50893	636	1	Chain Gear (on Machine)	50874
629	1	Plug in Column (1 1/8" diameter)	88082	637	2	Conduit Bushing (3/4"—14 Pipe Threads)	52942
631	1	Direction Plate for Pulley (English)	3888	638	2	Lock Nut (3/4"—14 Pipe Threads)	52943
631	1	Direction Plate for Pulley (German)	52157	639	1	Raising Plate for Motor	52136
631	1	Direction Plate for Pulley (French)	50668	640	1	Large Control Lever	3515
Motor Drive Machines Only							
630	1	Motor Drive Cover (Horizontal)	60264	641	1	Latch Stud	54804
630	1	Motor Drive Cover (Vertical)	60265	642	1	Door Latch	3919
631	1	Direction Plate for Gear (English)	3888	643	1	Lock for Latch	3921
631	1	Direction Plate for Gear (German)	52157	644	1	Upper Stud for Cover (7/8" diam.)	54796
631	1	Direction Plate for Gear (French)	50668	645	1	Top Cover Hinge (7/8" Bore)	54491
632	1	Plate on Small Louvre	53199	646	1	Lower Stud for Cover (3/4" diam.)	54486
633	1	Grease Cup (3/8" Pipe Thread)	52588	647	1	Bottom Cover Hinge (3/4" Bore)	54492
634	1	†Motor Chain—Links	51435	—	1	Louver	3787

†Specify number of links in chain.

††Specify diameter of bore and size of keyway in chain gear.

Specify **Part Name, Part Number, and Serial Number and Letters** of the machine when ordering parts.
 Also see Page 8 for Instructions "How to Order Repair Parts"

PULLEY BRACKET AND DRIVING CLUTCH PARTS

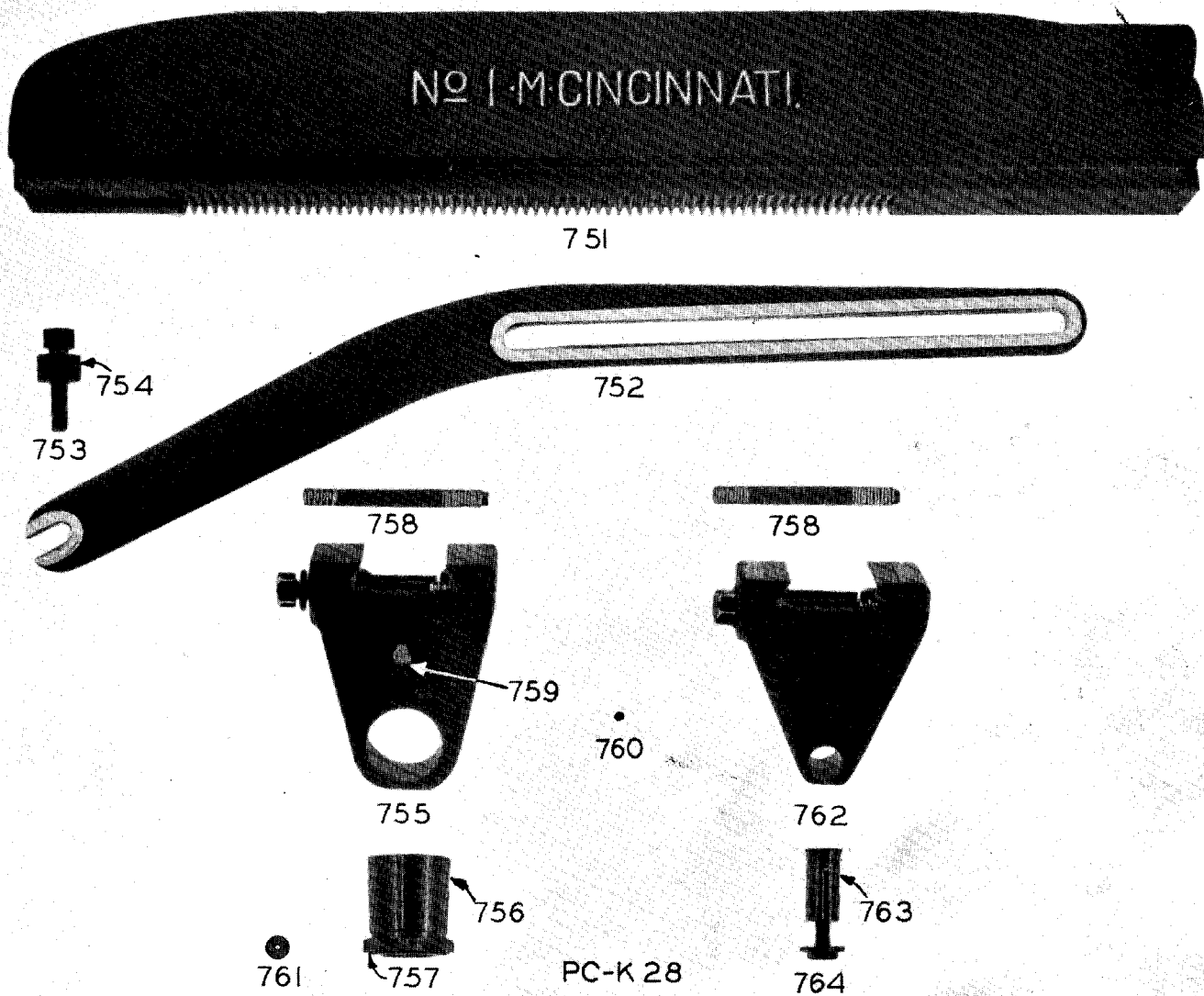


PULLEY BRACKET AND DRIVING CLUTCH PARTS LIST

Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering	Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering
701	1	Pulley Bracket	54759	714	2	Pin in Clutch Finger	48590
702	1	Pulley Sleeve (Fitted with Bush)	51164	715	2	Roller for Clutch Finger	33273
703	1	Oil Retainer	51160	716	2	Pin in Clutch Finger Carrier	36877
704	1	Nut for Pulley Sleeve	51694	717	2	Clutch Finger (Fitted with Pin and Roller)	37983
705	1	Bush in Pulley Sleeve	50276	718	2	Spring for Clutch Finger	50392
706	1	Flange for Driving Disc (Horizontal only)	51171	719	1	Carrier for Clutch Finger	50277
706	1	Flange for Driving Disc (Vertical only)	52670	720	1	Clutch Shifter Spool (Assembled)	46787-F
707	2	Cup (Timken No. 563)	3590	721	1	Bush for Brake	46780
708	2	Cone (Timken No. 567)	3589	722	1	Pin in Gear on Pulley Shaft	47552
709	1	Pulley Shaft	53483	723	1	Gear on Pulley Shaft	47553
710	1	Adjusting Nut	51636	724	1	Driven Disc (End)	50867
711	1	Washer for Pulley Shaft	46779	725	2	Driving Disc	50465
712	1	Spring on Pulley Shaft	52502	726	1	Driven Disc (Center)	50464
713	1	Sleeve for Spring	50869	727	1	Friction Ring	50463
				728	1	Lock Pin in Clutch Finger Carrier	36861

Specify Part Name, Part Number, and Serial Number and Letters of the machine when ordering parts
Also see Page 8 for Instructions "How to Order Repair Parts"

ARBOR SUPPORTING PARTS (HORIZONTAL ONLY)

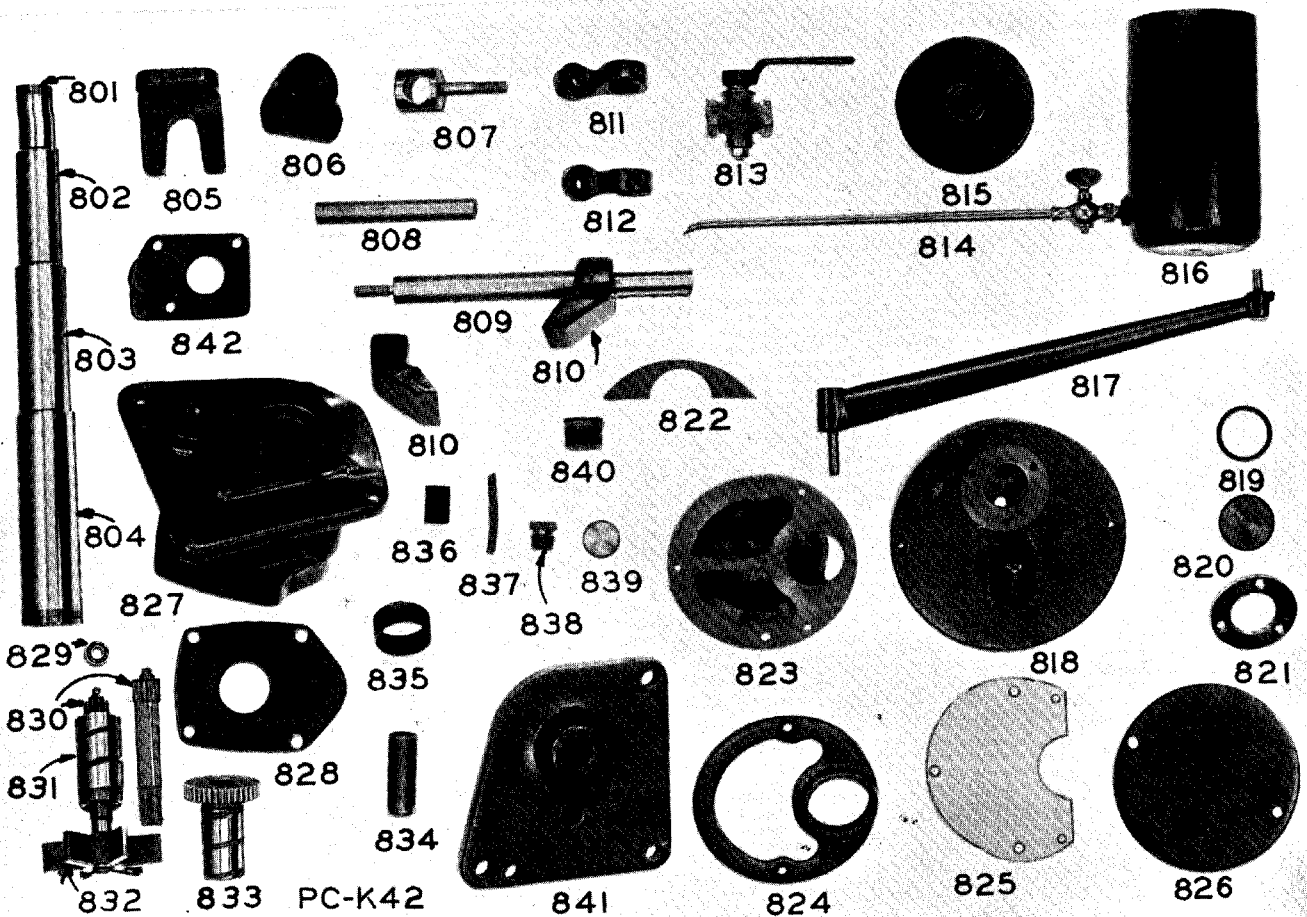


ARBOR SUPPORTING PARTS LIST (HORIZONTAL ONLY)

Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering	Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering
751	1	Over-arm.....	50857	757	1	Adjusting Nut.....	3701
752	2	Over-arm Brace.....	46749	758	2	Stud.....	50027
753	1	Screw (3/4"—10 U. S. S. x 3 1/4" long, x 1 1/4" Hexagon).....	528	759	1	Oil Cup.....	51737
753	1	Screw (3/4"—10 U. S. S. x 2 1/2" long, x 1 1/4" Hexagon).....	837	760	1	Felt Plug.....	3433
754	1	Collar for Brace.....	50461	761	1	Roller.....	934
755	1	Large Arbor Support (Fitted Complete).....	56541	762	1	Small Arbor Support (Fitted Complete).....	50023
756	1	Arbor Support Adjustable Bush (Fitted with Nut).....	3697	763	1	Arbor Support Bushing (Fitted with Screw).....	3695
				764	1	Adjusting Screw for Arbor Support Bushing.....	3692

Specify Part Name, Part Number, and Serial Number and Letters of the machine when ordering parts
Also see Page 8 for Instructions "How to Order Repair Parts"

CENTRIFUGAL PUMP PARTS AND OIL POT PARTS

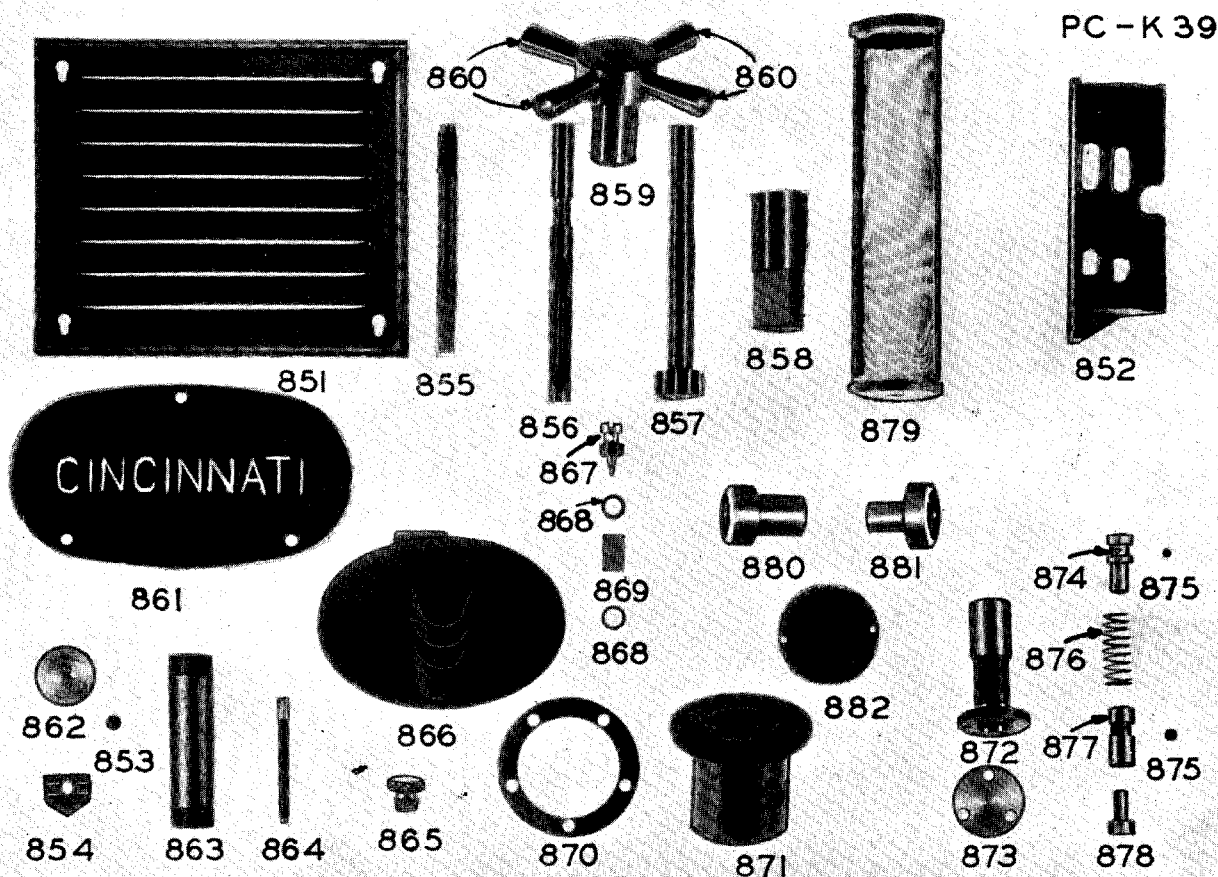


CENTRIFUGAL PUMP PARTS AND OIL POT PARTS LIST

Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering	Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering
801	1	Small Telescopic Tube.....	51546	823	1	Lower Strainer Frame (Fitted up Complete).....	39307-F
802	1	Second Telescopic Tube.....	42079	824	1	Upper Strainer Frame.....	39305
803	1	Third Telescopic Tube (Fitted with Second Tube).....	42078	825	1	Strainer.....	39308
804	1	Large Telescopic Tube.....	42081	826	1	Cover in Base.....	39404
805	1	Supply Hose Bracket.....	61306	827	1	Body for Centrifugal Pump.....	50759
806	1	Clamp for Supply Pipe Holder.....	38856	828	1	Bottom Plate on Pump.....	51543
807	1	Holder for Supply Pipe.....	38855	829	1	Ball Bearing (S.K.F. 9434).....	58167
808	1	Stud for Supply Pipe Holder (Vertical only).....	38855	830	1	Driven Impeller Gear.....	58165
809	1	Shaft for Overarm Clamp (Fitted with one Clamp—Horizontal only).....	43780	830	1	Driven Impeller Gear (Fitted with Sleeve and Impeller).....	58165-F
810	2	Clamp on Overarm (Horizontal only).....	39574	831	1	Sleeve on Impeller Gear.....	39276
811	1	Supply Pipe Bracket (Horizontal).....	41743	832	1	Pump Impeller.....	56021
812	1	Supply Pipe Bracket (Vertical).....	41907	833	1	Driving Gear.....	42099
813	1	Valve and Wrench (1/2" Pipe).....	42984	834	1	Bush in Pump.....	39274
814	1	Spout with Cock.....	51714	835	1	Ring for Large Telescopic Tube.....	41292
815	1	Lid for Round Oil Pot.....	5810	836	1	Felt Plug.....	33694
816	1	Round Oil Pot.....	5809	837	1	Felt Wick.....	58218
817	1	Oil Pot Bracket.....	51578	838	1	Plug in Pump Body.....	33693
818	1	Holder for Oil Pot Bracket.....	61331	839	1	Plug for Supply Pipe Hole (Used when Pump is Omitted).....	48166
819	2	Oil Gage Gasket.....	3850	827	1	Centrifugal Pump Assembly.....	50759-RF
820	2	Oil Gage Disc.....	3849	840	1	Large Nipple.....	41972
821	1	Oil Gage Cover.....	3848	841	1	Bracket on Base (Used when Pump is Omitted).....	52780
822	1	Gasket for Strainer Frame.....	43489	842	1	Pump Body Cover.....	58166
823	1	Lower Strainer Frame.....	39307				

Specify Part Name, Part Number, and Serial Number and Letters of the machine when ordering parts. Also see Page 8 for Instructions "How to Order Repair Parts"

MISCELLANEOUS COLUMN PARTS

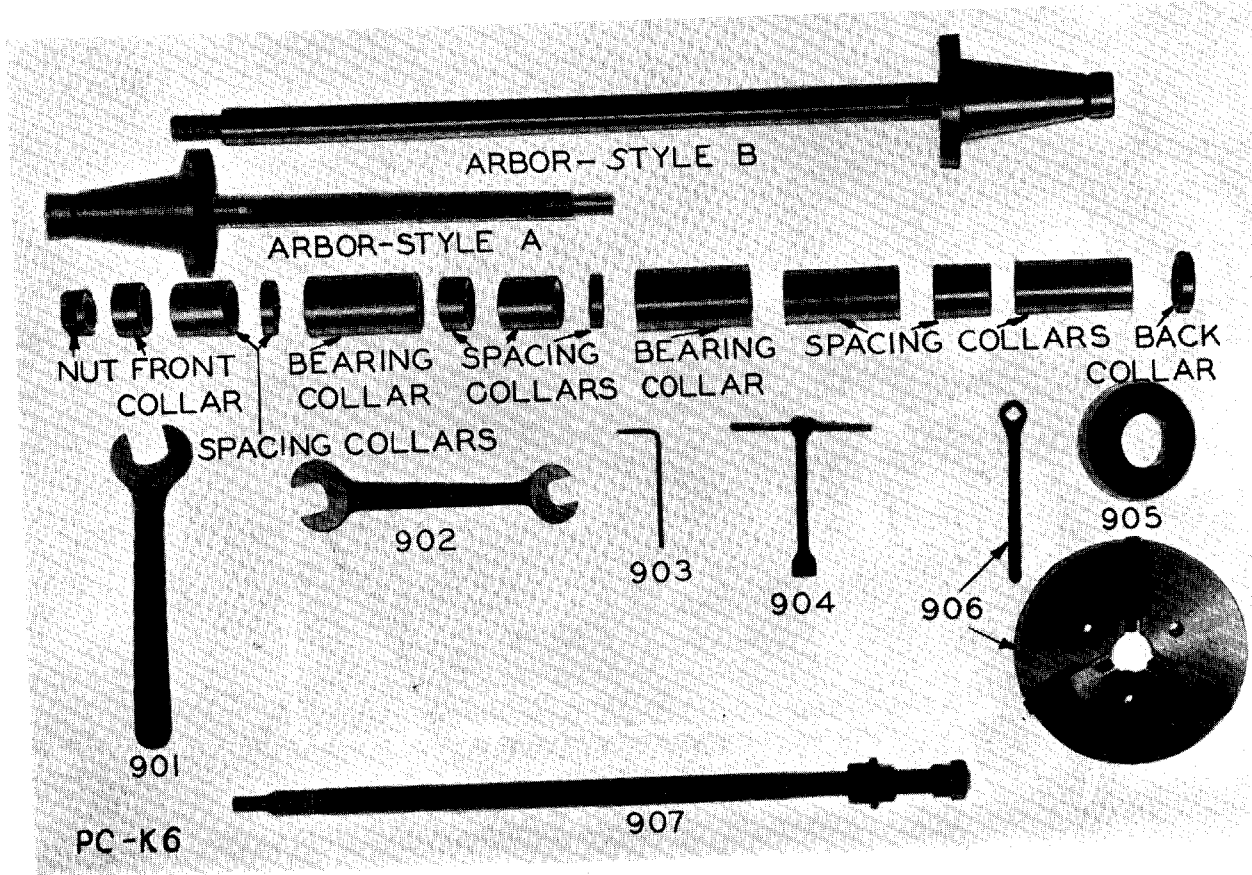


MISCELLANEOUS COLUMN PARTS LIST

Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering	Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering
Common—Vert. and Horiz.							
851	1	Louver Cover.....	3784	864	2	Set Screw.....	54073
852	1	Pan for Wrenches.....	51693	865	1	Plug in Street Ell.....	86827
853	1	Plug (1/2" Diam.).....	3529	866	1	Cover on Column for Indicating Oil.....	56056
854	1	Dog on Column for Vertical Feed.....	38428	867	1	Screw in Cover on Column.....	33783
Horizontal Only							
855	2	Stud in Column.....	43245	868	2	Leather Washer.....	44387
856	1	Plug for Oiling Front Bearing.....	57060	869	1	Glass Tube in Cover on Column.....	33782
857	1	Stem Pinion for Pilot Wheel.....	47559	870	1	Laminated Washer.....	52660
858	1	Bush in Column.....	47560	871	1	Oil Reservoir.....	53912
859	1	Hub for Pilot Wheel.....	43243	872	1	Sleeve for Oil Pump.....	53778
859	1	Hub for Pilot Wheel (assembled).....	43243 FC	873	1	Cap for Oil Pump.....	53848
860	4	Spoke for Pilot Wheel.....	12680	874	1	Valve for Oil Pump.....	53777
Vertical Only							
853	1	Plug (7/8" Diam.).....	8367	875	2	Ball (3/16" Diam.).....	29019
853	1	Plug (.452" Diam.).....	37957	876	1	Plunger Spring.....	52672
861	1	Cover on Column.....	39319	877	1	Plunger for Oil Pump (Fitted with Plug).....	52653
862	1	Plug in Column (2 1/8" Diam.).....	41198	878	1	Plug in Oil Pump Plunger.....	53753
863	1	Air Chamber.....	53874	879	1	Strainer in Column.....	54896
				880	1	Large Oil Retainer (1 5/16" Bore).....	53867
				881	1	Small Oil Retainer (1" Bore).....	53868
				882	1	Cover.....	47946

Specify Part Name, Part Number, and Serial Number and Letters of the machine when ordering parts
Also see Page 8 for Instructions "How to Order Repair Parts"

WRENCHES, DRAW-IN BOLT, AND DIVIDING HEAD CHUCK



WRENCHES, DRAW-IN BOLT, AND DIVIDING HEAD CHUCK PARTS LIST

Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering
901	1	Single Head Wrench (1 1/4" Opening)	3607
902	1	Double Head Wrench (7/8" and 1 1/8" Opening)	3605
903	1	Wrench for 3/8" Hollow Headless Set Screw	35678
904	1	Socket Wrench (31/4" Hex. Opening)	9281
905	1	Flange for 6" Chuck	22053
906	1	6" Chuck and Wrench (Fitted with Flange—for Universal Machines only)	16456-F
907	1	Arbor Draw-In Bolt (for Horizontal Machines)	56329-F
907	1	Arbor Draw-In Bolt (for Vertical Machines)	56292-F

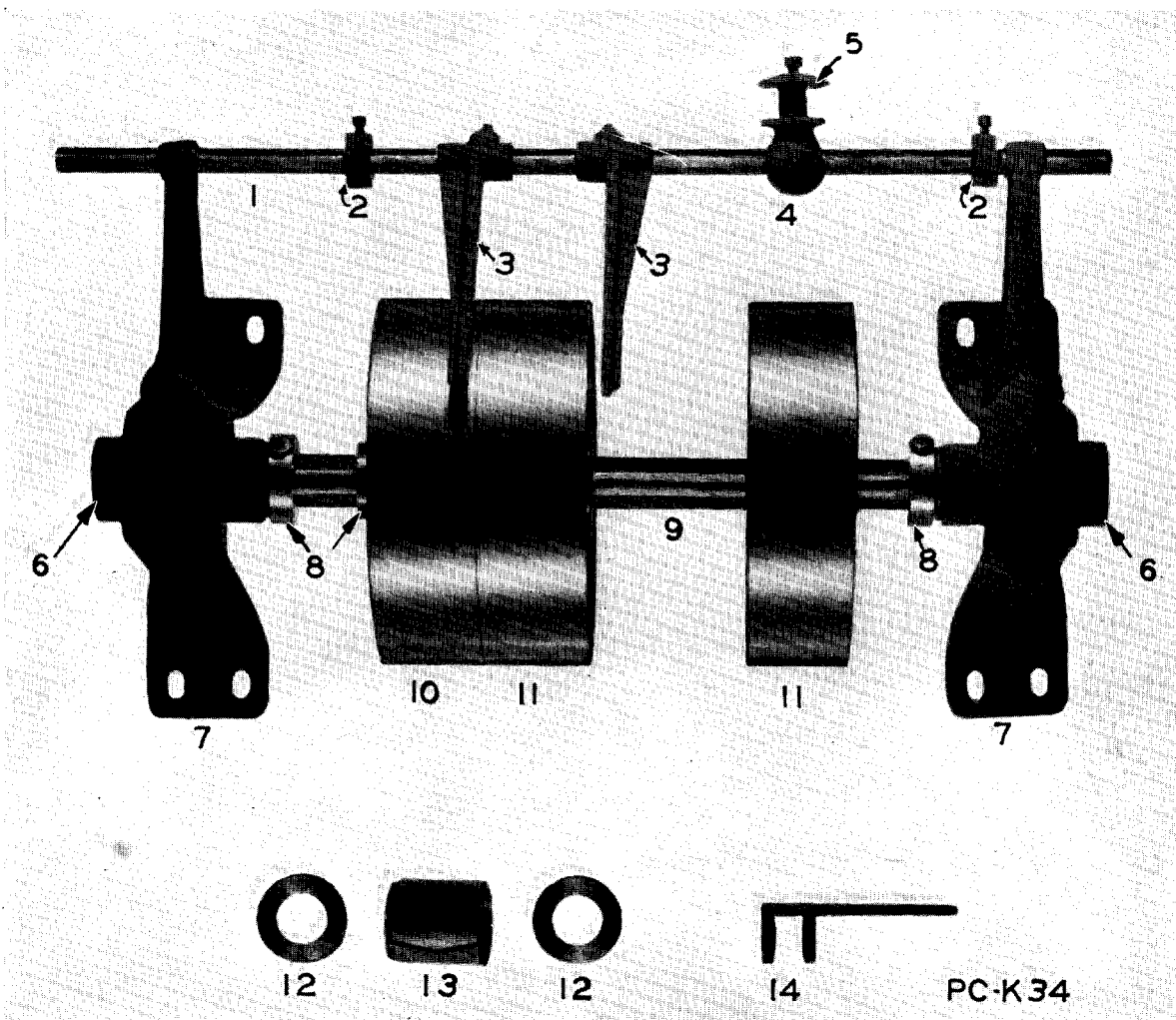
COMPLETE LIST OF PARTS FOR ARBORS

(Amount of Collars used is not listed because it depends upon the length of the Arbor)

Nominal Diameter of Arbor	3/8"	1"	1 1/4"	1 1/2"	2"	2 1/2"	22mm	27mm	32mm	38mm	50mm
Spacing Collar—1/2" long	3644	3647	3651	3655	3659	3663	3880	3763	3758	3769	3891
Spacing Collar—1" long	3645	3648	3652	3656	3660	3664	3881	3764	3759	3770	3892
Spacing Collar—2" long	3646	3649	3653	3657	3661	3665	3882	3765	3760	3771	3893
Bearing Collar—4" long		3668 (2 1/8" OD)	3670 (2 1/8" OD)	3672 (2 1/8" OD)	3674 (2 3/4" OD)	3676 (3 1/8" OD)			3778	3773	3895
Bearing Collar—4" long		3788 (2 3/4" OD)	3671 (2 3/4" OD)	3673 (2 3/4" OD)			3883	3767	3761	3774	3896
Back Collar—1/2" long	3681	3682	3683	3684	3685	3686			3779	3775	3897
Front Collar			3677	3678	3679	3680					
Nut on Arbor	1341	3693	3693	3694	3694	3694	1341	3693	3693	3694	3694

Specify Part Name, Part Number, and Serial Number and Letters of the machine when ordering parts
Also see Page 8 for Instructions "How to Order Repair Parts"

COUNTERSHAFT PARTS

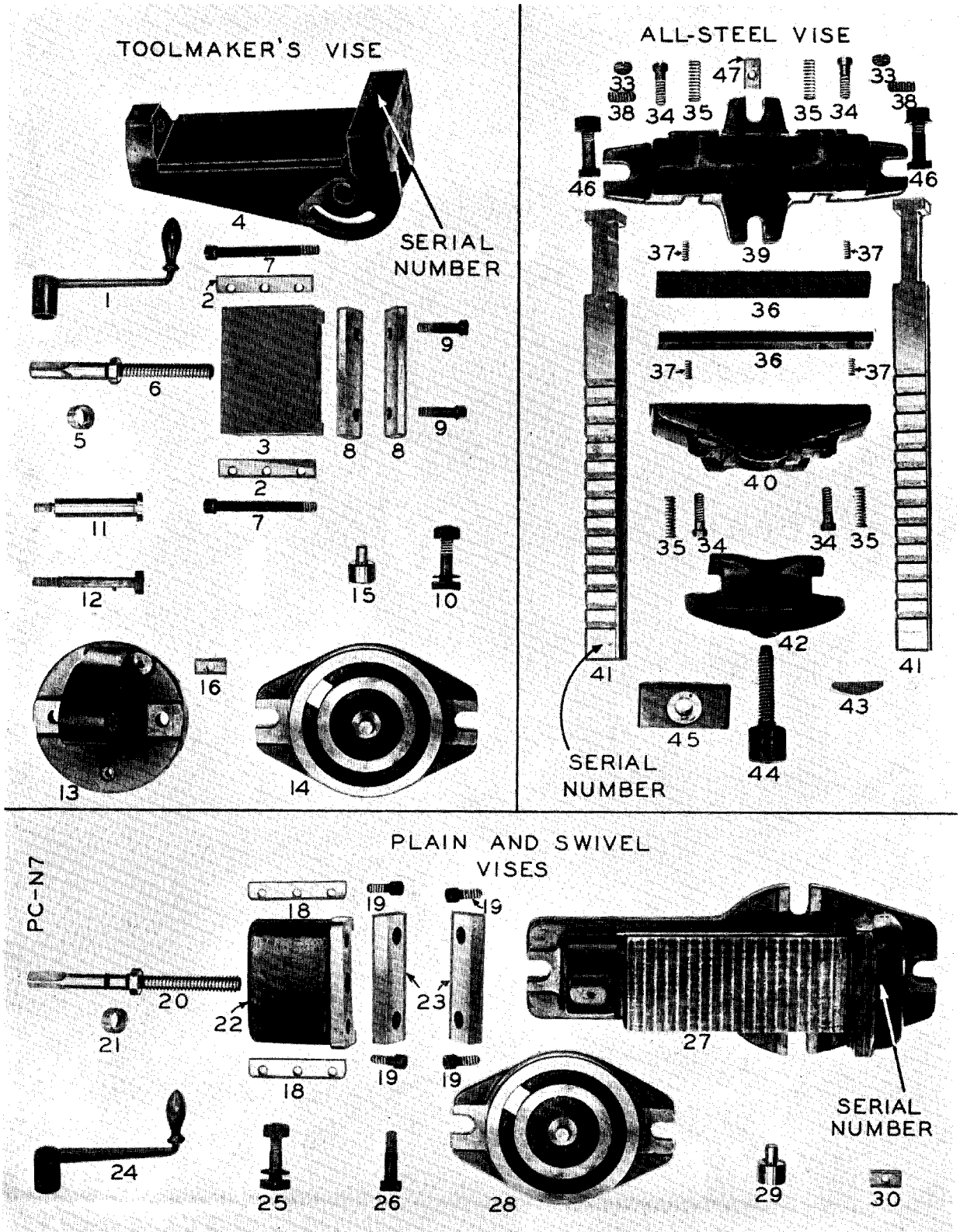


COUNTERSHAFT PARTS LIST

Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering	Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering
1	1	Rod for Shifter.....	14121	8	3	Shaft Collar—(1¼" Shaft)	3783
2	2	Shaft Collar—(⅜" Shaft)	3781	9	1	Countershaft.....	41724
3	2	Finger.....	7335	10	1	Loose Pulley.....	41726
4	1	Carrier for Shifter (Fitted with Washer).....	7332	11	2	Driving Pulley.....	41725
5	1	Washer for Carrier.....	7345	12	2	Plug in Loose Pulley.....	41728
6	2	Bearing Box.....	41878	13	1	Roller Bearing (Hyatt No. 18345, Medium Type).....	41727
7	2	Hanger (Pressed Steel).....	34093	14	1	Angle for Shifter.....	7329

Specify **Part Name**, **Part Number**, and **Serial Number** and **Letters** of the machine and attachment when ordering attachment parts. Also see Page 8 for Instructions "How to Order Repair Parts"

VICE PARTS
FOR ALL-STEEL, PLAIN, SWIVEL AND TOOLMAKERS' VISES



VISE PARTS LIST FOR ALL-STEEL, PLAIN, SWIVEL, AND TOOLMAKERS' VISES

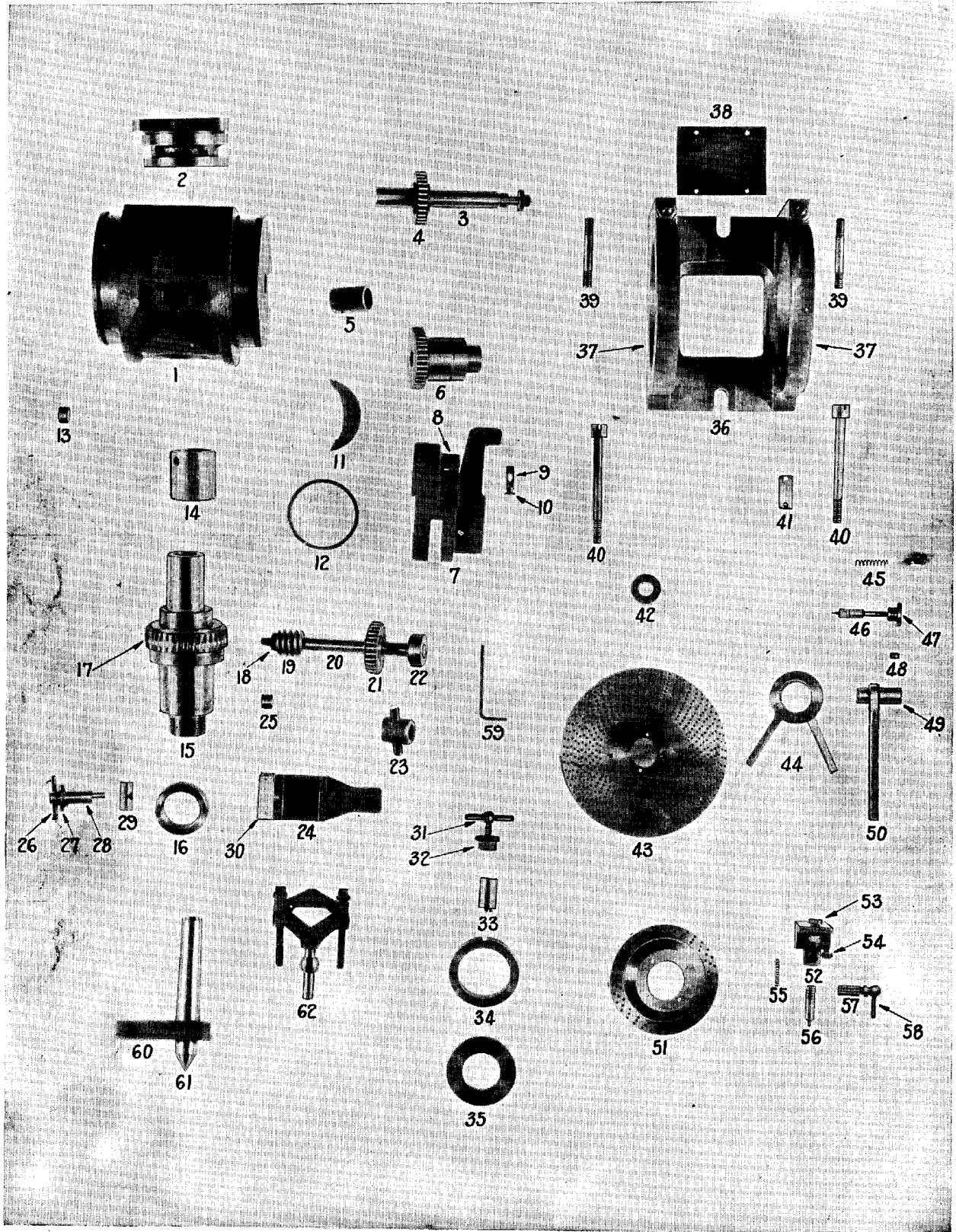
Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering
TOOLMAKERS' VISE PARTS			
1	1	Hand Crank	3565
2	2	Gib on Housing	8773
3	1	Housing	14032
4	1	Body	41926
5	1	Collar on Screw	22331
6	1	Screw	32971
7	2	Collar Screw in Housing (4-25/32" Long)	15421
8	2	Jaw	14031
9	2	Collar Screw in Body (1-31/32" Long)	41927
10	2	Tee Bolt (Specify Size and Type of Machine)	
11	1	Bolt	6050
12	1	Clamp Bolt	893
13	1	Swivel Block	43460
14	1	Plate (Fitted with Stud)	14892
15	1	Stud in Swivel Plate	10624
16	2	Tongue Strip (for 1/16" and 3/16" Slots)	3357

Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering	
PLAIN AND SWIVEL VISE PARTS				
18	2	Gib on Housing	No. 3 63023	No. 5 63019
19	4	Allen Head Screw (1/2" x 1 1/4" Long)	3343	3343
20	1	Screw	63026	63021
21	1	Collar on Screw	22331	22332
22	1	Housing	63025	63020
23	2	Vise Jaw	63024	63018
24	1	Hand Crank	3565	3566
25	2	Tee Bolt (5/8" x 2 1/4" Long—Swivel Vise only)	222	
25	2	Tee Bolt (3/4" x 2 3/4" Long—Swivel Vise only)		3355
26	2	Tee Bolt (5/8" x 2 1/2" Long)	3363	
26	2	Tee Bolt (3/4" x 3" Long)		3366
27	1	Vise Body	63027	63022
28	1	Plate (Fitted with Stud—Swivel Vise only)	60537	60539
29	1	Stud (Swivel Vise only)	10624	10539
30	2	Tongue (for 1/16" and 3/16" Slots)	3357	3357

Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering	
			8" x 10"	10" x 10"
ALL STEEL VISE PARTS				
33	4	Headless Set Screw	1744	1744
34	4	Fillister Head Screw	1278	1278
35	4	Spring	846	846
36	2	Jaw	24820	24827
37	4	Spring	727	727
38	2	Hollow Hex Head Set Screw	2145	1919
39	1	Body	27817	27815
40	1	Movable Jaw Support	27818	27816
41	2	Bar	27722	27722
42	1	Screw Holder	35263	35262
43	1	Abutment	27791	27791
44	1	Screw	49844	49844
45	1	Clamp	25641	25642
46	2	Tee Bolt for Vise Body (Specify Size and Type of Machine)		
47	2	Tongue Strip (for 1/16" and 3/16" Slots)	3357	3357

Specify **Part Name**, **Part Number**, and **Serial Number and Letters** of the machine and attachment when ordering attachment parts.
Also see Page 8 for Instructions "How to Order Repair Parts"

DIVIDING HEAD PARTS—HEADSTOCK



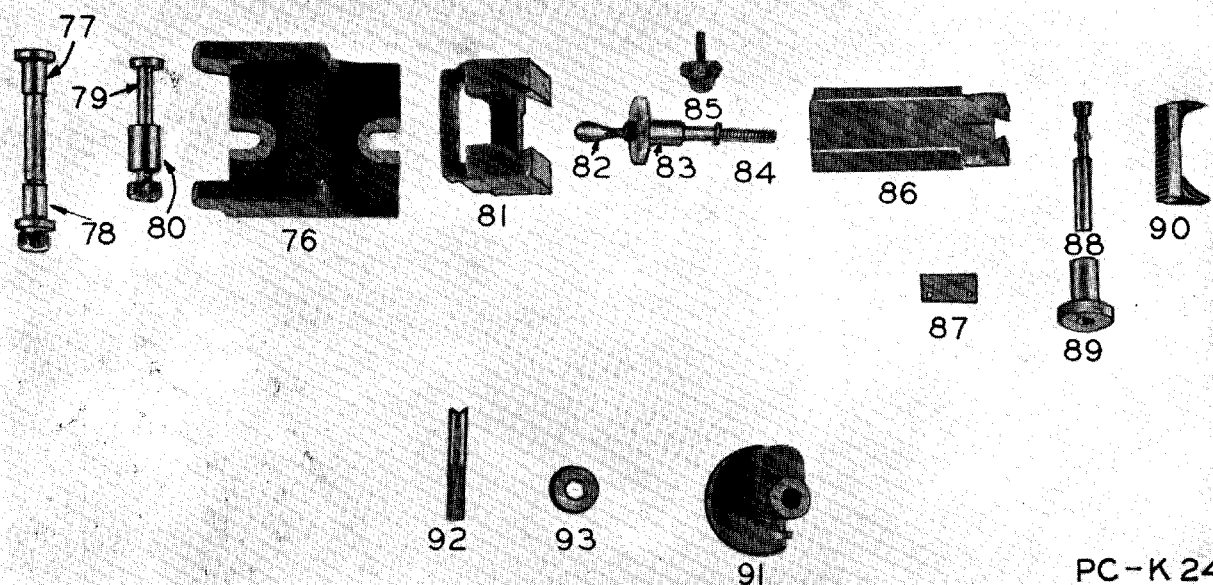
DIVIDING HEAD PARTS LIST—HEADSTOCK

Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering		
			10" Head	12" Head	14" Head
1	1	Swivel Block.....	* 5556	* 8213	* 8213
2	1	Back Cap on Spindle.....	34834	34835	34835
3	1	Index Shaft.....	8372	8427	8427
4	1	Gear on Index Shaft.....	8357	8416	8416
5	1	Bush in Swivel Block.....	23596	23596	23596
6	1	Gear in Cover on Swivel Block.....	5574	5575	5575
7	1	Cover on Swivel Block.....	8356	8414	8414
8	2	Cap on Cover on Swivel Block.....	8353	8353	8353
9	1	Stop for Side Plate.....	8106	8106	8106
10	1	Screw.....	731	731	731
11	1	Lid on Cover on Swivel Block.....	8360	8418	8418
12	1	Ring in Cover on Swivel Block.....	35998	35999	35999
13	1	Plug in Swivel Block.....	8367	8367	8367
14	1	Bush in Back Cap on Spindle.....	34767	34768	34768
15	1	Spindle.....	* 8374	* 7439	* 7439
16	1	Cover for Spindle Thread.....	33592	33593	33593
17	1	Worm Wheel.....	*35155	*35156	*35156
18	1	Nut on Worm.....	8361	8419	8419
19	1	Worm.....	*34391	*34393	*34393
20	1	Shaft for Worm.....	35130	35131	35131
21	1	Gear on Shaft for Worm.....	8358	8417	8417
22	1	Lock Nut on Worm Shaft.....	35125	35126	35126
23	1	Bearing for Worm Shaft.....	5588	5589	5589
24	1	Yoke.....	5774	5775	5775
25	1	Bush in Yoke.....	8352	8410	8410
26	1	Pin.....	1263	1263	1263
27	1	Plate for Eccentric Stop.....	8295	8294	8294
28	1	Eccentric.....	8296	8297	8297
29	1	Slide.....	8373	8428	8428
30	1	Slide Holder.....	8223	8222	8222
31	1	Hand Clamp Screw.....	617	3536	3536
32	1	Cap for Split Ring.....	8225	8225	8225
33	1	Plug for Split Ring.....	8366	8422	8422
34	1	Split Ring.....	8369	8424	8424
35	1	Collar on Spindle.....	23887	20652	20652
36	1	Housing.....	60515	60517	60519
37	2	Clamp.....	* 8354	* 8412	* 8412
38	1	Cover for Yoke.....	57150	57151	57151
39	2	Bolt.....	862	863	863
40	2	Screw in Clamp.....	45793	45794	45795
41	1	Vernier.....	8231	8233	8233
42	1	Collar in Front of Sector.....	8072	8072	8072
43	1	Standard Index Plate.....	6855	6855	6855
43	1	Index Plate No. 1-AB (Special—for high numbers).....	10525	10525	10525
43	1	Index Plate No. 2-CD (Special—for high numbers).....	10526	10526	10526
43	1	Index Plate No. 3-EF (Special—for high numbers).....	10527	10527	10527
44	1	Sector.....	8100-1	8100-1	8100-1
45	1	Spring.....	253	253	253
46	1	Index Pin.....	8083	8083	8083
47	1	Knob.....	1007	1007	1007
48	1	Bush.....	295	295	295
49	1	Index Pin Holder.....	37750	37750	37750
50	1	Carrier for Index Pin Holder.....	37751	37751	37751
51	1	Front Plate.....	8365	8421	8421
52	1	Holder for Index Pin (Front Plate).....	8234	8234	8234
53	1	Tee Bolt (3/8" diameter x 1 1/4" long).....	494	494	494
54	1	Thumb Screw.....	100	100	100
55	1	Spring.....	266	266	266
56	1	Index Pin for Front Plate.....	8363	8363	8363
57	1	Pinion for Index Pin for Front Plate.....	19084	19084	19084
58	1	Pin.....	1374	1374	1374
59	1	Wrench for 3/8" Hollow Headless Screw.....	35678	35678	35678
60	1	Holder for Dog.....	24102	24102	24102
61	1	Head Center.....	24578	24576	24576
62	1	Milling Machine Dog (sent on demand only).....	24184	24184	24184

Specify **Part Name**, **Part Number**, and **Serial Number and Letters** of the machine and attachment when ordering attachment parts.
 Also see Page 8 for Instructions "How to Order Repair Parts"

*When ordering these parts, return the Dividing Head to our plant for fitting.

DIVIDING HEAD PARTS—TAILSTOCK AND STEADYREST



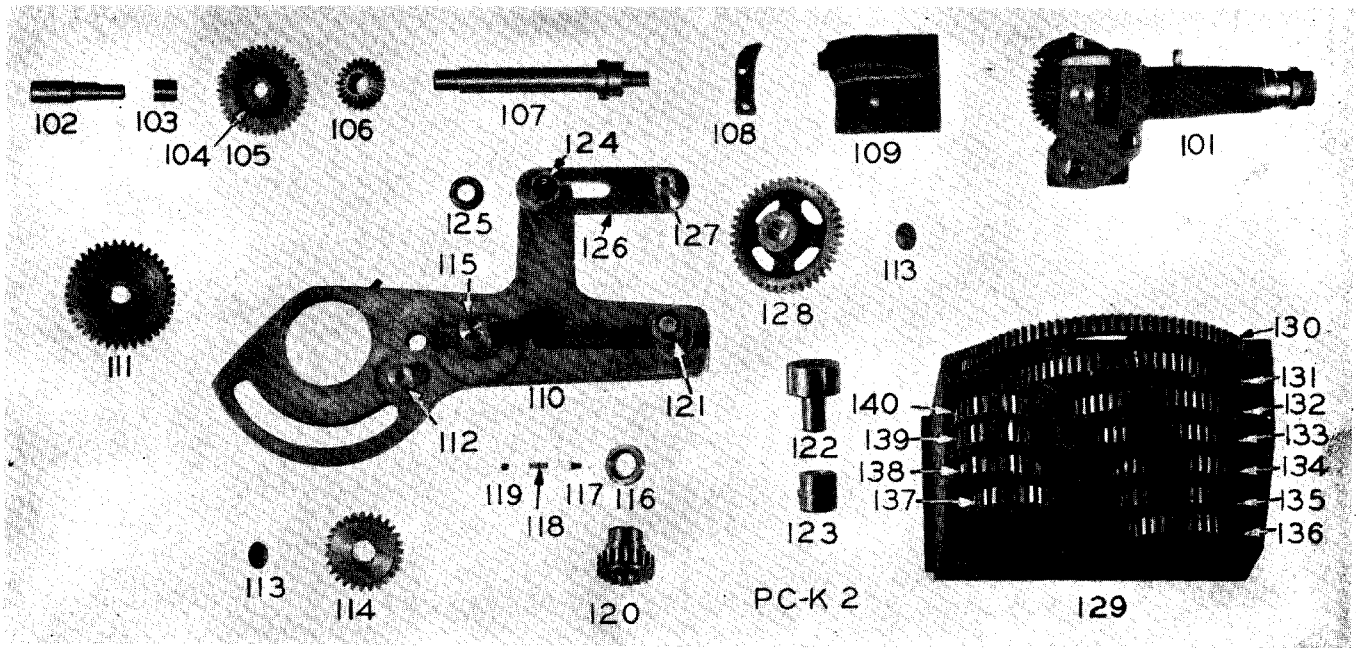
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TAILSTOCK AND STEADYREST PARTS LIST

Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering		
			10" Head	12" Head	14" Head
TAILSTOCK PARTS					
76	1	Housing.....	60516	60518	60520
77	1	Long Bolt for Tailstock.....	8375	8402	8402
78	1	Bush in Housing.....	8377	8377	8377
79	1	Short Bolt for Tailstock.....	8376	8403	8403
80	1	Collar on Short Bolt.....	8379	8406	8406
81	1	Swivel Block for Tailstock.....	44183	44181	44181
82	1	Handle.....	1014	1014	1014
83	1	Knob on Screw.....	23620	23621	23621
84	1	Screw.....	8380	8380	8380
85	1	Bearing for Screw.....	44184	44184	44184
86	1	Slide for Tailstock.....	44180	44182	44182
87	1	Plate Over Slot.....	6106	6106	6106
88	1	Pinion.....	8238	8239	8239
89	1	Knob on Pinion.....	8227	8229	8229
90	1	Elevating Center.....	8378	8405	8405
STEADY REST PARTS					
91	1	Body.....	8382	8400	8400
92	1	Stem.....	8384	8399	8398
93	1	Nut.....	18977	18977	18977

Specify Part Name, Part Number, and Serial Number and Letters of the machine and attachment when ordering attachment parts.
Also see Page 8 for Instructions "How to Order Repair Parts"

DIVIDING HEAD PARTS DRIVING MECHANISM FOR CUTTING SPIRALS ON M-TYPES AND 2 AND 3 HIGH POWER AND STANDARD MACHINES



DRIVING MECHANISM PARTS LIST

Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering		Key No.	Amt. Used	PART NAME	PART NUMBER to use when ordering	
			10' Head	12' & 14' Head				10' Head	12' & 14' Head
101	1	Bearing for Mitre Gear.....	13956	12087	119	1	Headless Set Screw.....	1213	1213
101	1	Bearing for Mitre Gear (Assembled).....	13956-F	12087-F	120	1	Small Gear on Segment—19 Teeth.....	12100	12100
102	1	Short Shaft.....	8286	8264	121	1	Tee Bolt (5/8" diameter x 3 7/8" long)	1712	1712
103	1	Bush in Bearing for Mitre Gear.....	22829	8259	122	1	Sleeve for Bush in Change Gear.....	8065	8065
104	1	Mitre Gear on Short Shaft.....	8279	8261	123	1	Bush in Change Gear.....	8059	8059
105	1	Gear on Mitre Gear on Short Shaft (Fitted with Mitre Gear)	8221	8262	124	1	Hexagon Head Screw.....	682	682
106	1	Mitre Gear on Shaft for Change Gear.....	8278	8076	125	1	Shoulder Washer.....	1496	1496
107	1	Shaft for Change Gears.....	13957	12097	126	1	Holder for Intermediate Gear.....	12084	12084
108	1	Front Cover on Mitre Gear Bearing.....	8276	8260	127	1	Stud in Holder for Intermediate Gear.....	12096	12096
109	1	Top Cover on Mitre Gear Bearing.....	57816	57815	128	1	Intermediate Gear.....	9352	9352
110	1	Segment.....	18847	18847	129	1	Box for Change Gears.....	51359	51359
111	1	Gear on Lead Screw—38 Teeth.....	12085	12085	130	1	Change Gear—100 Teeth.....	5987	5987
112	1	Stud for Large or Small Gear on Segment.....	12099	12099	131	1	Change Gear—86 Teeth.....	5988	5988
113	2	Fillister Head Cap Screw.....	286	286	132	1	Change Gear—72 Teeth.....	5364	5364
114	1	Large Gear on Segment—27 Teeth.....	12083	12083	133	1	Change Gear—64 Teeth.....	5365	5365
115	1	Stud in Segment.....	12098	12098	134	1	Change Gear—56 Teeth.....	5366	5366
116	1	Washer on Stud in Segment.....	1455	1455	135	1	Change Gear—48 Teeth.....	5989	5989
117	1	Pin.....	1350	1350	136	1	Change Gear—44 Teeth.....	5990	5990
118	1	Spring.....	1349	1349	137	1	Change Gear—40 Teeth.....	5986	5986
					138	1	Change Gear—32 Teeth.....	48045	48045
					139	1	Change Gear—28 Teeth.....	48043	48043
					140	2	Change Gear—24 Teeth.....	48044	48044

Specify Part Name, Part Number, and Serial Number and Letters of the machine and attachment when ordering attachment parts.
Also see Page 8 for Instructions "How to Order Repair Parts"

Foreign Agents

Abo-Helsingfors, Finland	Maskin-Aktiebolaget E. Gronblom
Barcelona, Bilbao, Madrid, Spain	Hijo De Miguel Mateu
Berlin, Germany	Bühling & Boker
Brussels, Antwerp, Belgium	Isbecque Todd & Company
Buenos Aires, Argentine	Negrone Hermanos
Copenhagen, Denmark	Aktieselskabet C. A. Herstad
Frederiksstad, Norway	American Specialty Company
Honolulu, Hawaii	The H. S. Gray Company
Johannesburg, Durban, Capetown, S. Africa	D. Drury & Company
London, Birmingham, Manchester, Glasgow, Newcastle-on-Tyne, Bristol	Charles Churchill & Co., Ltd.
Manila, P. I.	Edward J. Nell Company
Melbourne, Sydney, Adelaide, Brisbane, Australia	McPherson's Pty.
Milan, Italy	Ercole Vaghi
Paris, Bordeaux, Lille, Lyon, France	Aux Forges De Vulcain
Prague, Czechoslovakia	Ing. M. Kocian & G. Nedela
Rotterdam, Holland	W. Ferd. Klingelberg Söhne
Stockholm, Sweden	Gunnar Ekstrom
Tokio, Yokohama, Japan	Andrews & George Company
Zurich, Switzerland	C. Schinz & Co.

