



Replacement Parts Manual

Pub. No. 92

Nos. 2 and 3 MODEL KM
7½hp No. 3—10hp No. 4

MODEL H

**Plain — Universal — Vertical
Milling Machines**

with standard
directional
table control

with mono-lever and
automatic cycle
table control

KEARNEY & TRECKER CORPORATION

MILWAUKEE, WISCONSIN, U.S.A. 53214

Pub. No. 92

REPLACEMENT PARTS MANUAL

7½ hp No. 3 and 10 hp No. 4

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Plain—Universal—Vertical



Milling Machines

with mono-lever and
automatic cycle
table control

with standard
directional
table control

One copy of this manual is furnished with each new machine. Additional copies may be obtained by writing direct to Kearney & Trecker Corporation.

Price: \$3.00

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**Kearney & Trecker
Corporation**

**Milwaukee 14, Wisconsin
U. S. A.**

FOREWORD

This is a replacement parts manual for the 7-1/2hp No. 3 and the 10hp No. 4 Model H Plain, Universal and Vertical Kearney & Trecker milling machines. In the purchase of these machine tools you possess an absolute guarantee of precision built equipment - designed and manufactured so as to assure the greatest measure of long life performance. There remains, however, still another responsibility - that of providing prompt service for replacement parts and general maintenance resulting from natural wear or accidental damage to the machine - to keep them in sound operating condition. This manual will help you do that quickly.

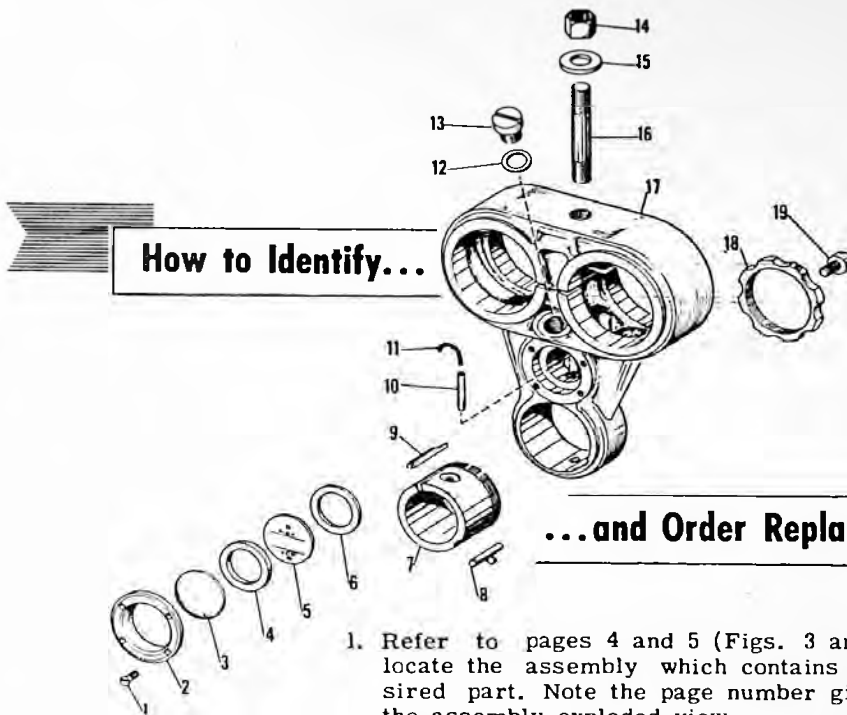
About the manual itself; every effort has been made to make this book as clear and concise as is practical to avoid delay and misunderstanding in ordering parts. The various assemblies are arranged in a natural sequence and are indexed visually on pages 4 and 5. (Figs. 3 and 4)

Instructions noted in the following pages must be followed carefully. In several instances it will be observed that certain parts are mated at the home factory. Such parts cannot be replaced individually and must be sent out in pairs or sets.

Kearney & Trecker maintains, insofar as possible, a complete record, based on machine serial number, of every machine built. To insure prompt and efficient service it is imperative, therefore, to include the machine size, model and serial number with every inquiry or order. This information will be found stamped in the lower border of the trademark located on the left side of the column.

It is our intention to continually improve the service you receive from Kearney & Trecker milling machines and make the parts replacement problem a simple procedure. By following the instructions for identifying and ordering parts, given on the next page, you will be assured of prompt service.

KEARNEY & TRECKER
Corporation
Milwaukee 14, Wisconsin
U. S. A.



How to Identify...

...and Order Replacement Parts

1. Refer to pages 4 and 5 (Figs. 3 and 4) to locate the assembly which contains the desired part. Note the page number given for the assembly exploded view.
2. Locate the desired part and its item number in the assembly exploded view. For convenience and clearness in showing parts on some large units, it was necessary to remove them from the proper location in relation to the main casting. Such assemblies are indicated by a letter in a circle A, B, C, etc. A brief study of the exploded view will show where such sub-assemblies properly belong.
3. In the parts list on the facing page, find the corresponding item number to determine the part name description and code number.
4. Send the part name description, the code number and the SIZE, MODEL and SERIAL NUMBER OF THE MACHINE (stamped in the lower border of the trademark located on the left side of the column) to the Service Department, Kearney & Trecker Corporation, Milwaukee 14, Wisconsin, U.S.A.
5. For service by telephone, call Greenfield 6-8300, and give the information in paragraph 4 above.

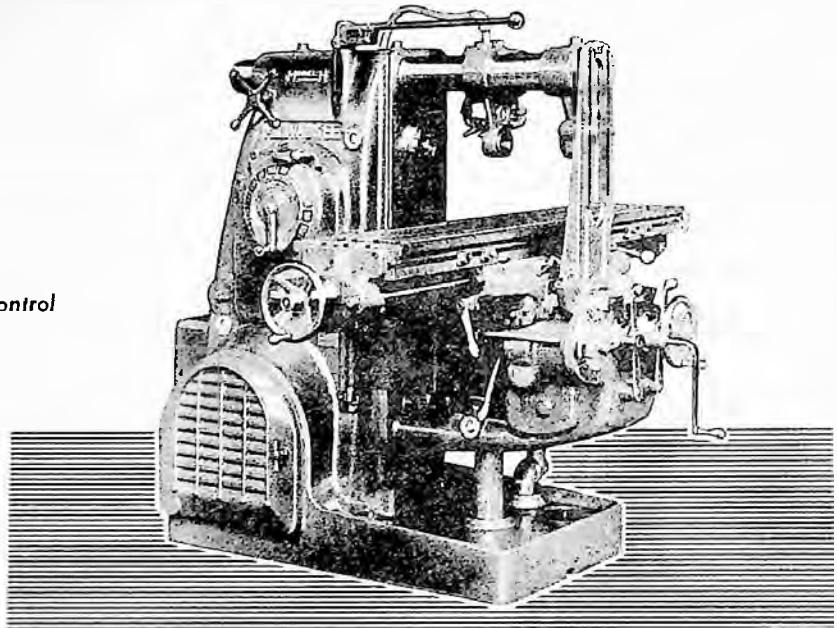
Important
→

MODEL H

7½hp No. 3 — 10hp No. 4

PLAIN STYLE

with standard directional table control



MODEL H

7½hp No. 3 — 10hp No. 4

UNIVERSAL STYLE

with standard directional table control

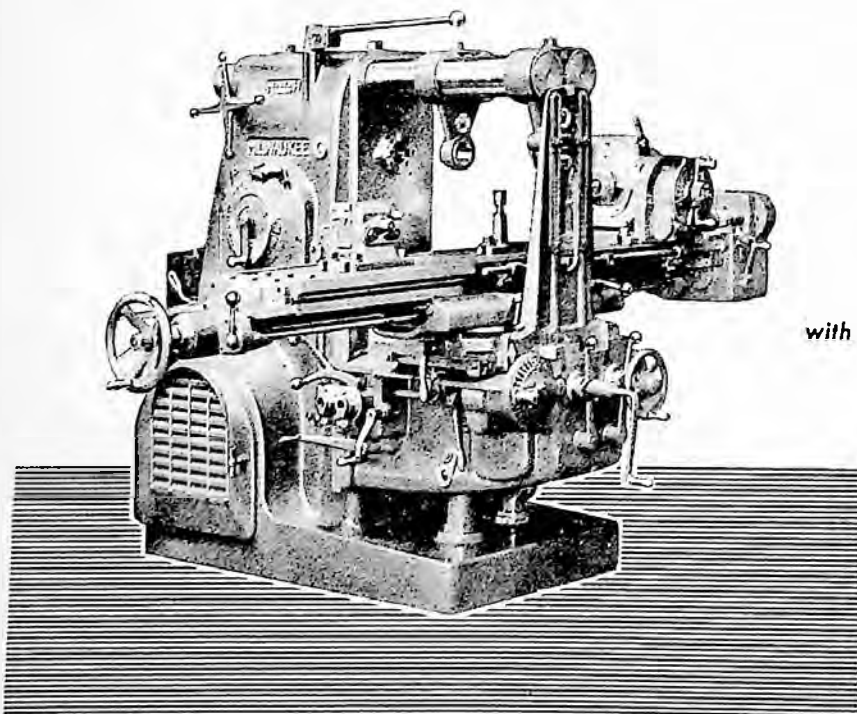
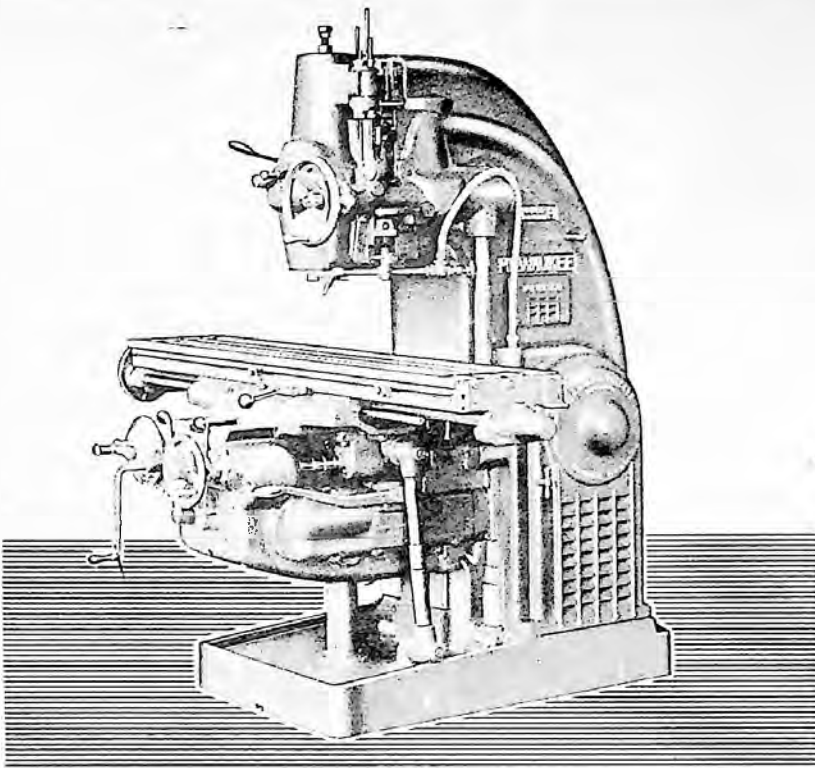


Figure 1



MODEL H

7½hp No. 3 — 10hp No. 4

VERTICAL STYLE

with standard directional table control

MODEL H

7½hp No. 3 — 10hp No. 4

VERTICAL STYLE

*with mono-lever and automatic cycle
table control*

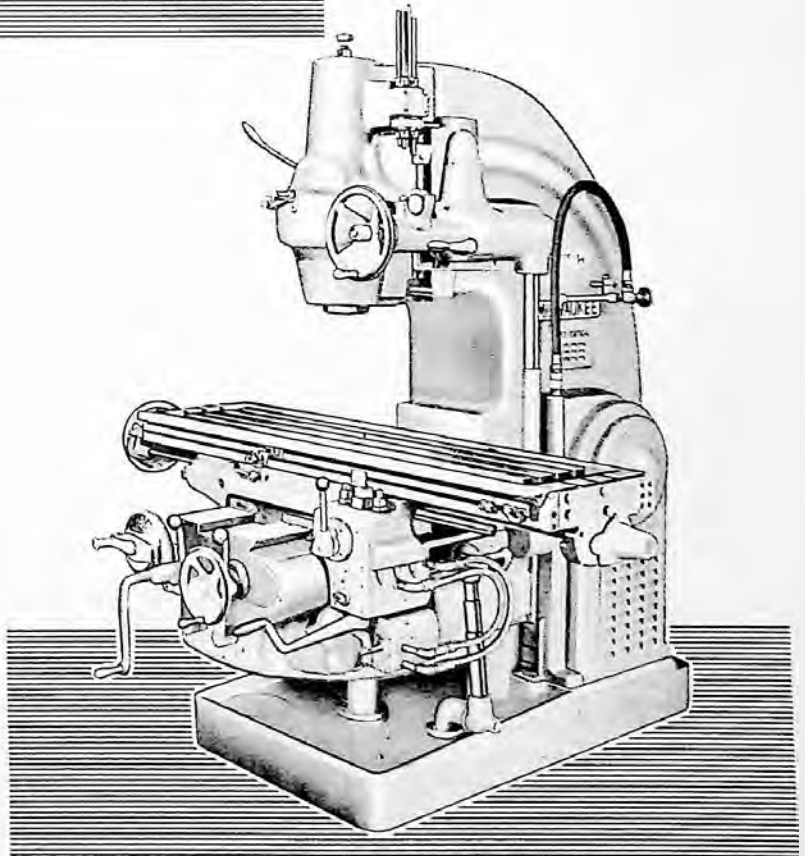


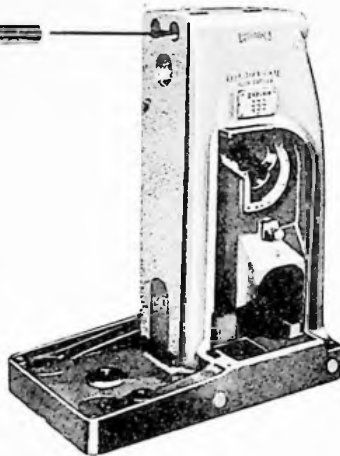
Figure 2

COOLANT SUPPLY SYSTEM,
STYLE B ARBOR SUPPORT
AND ARM BRACE
(SEE PAGES 40-41)

INTERMEDIATE ARBOR SUPPORT
AND STYLE A ARBOR SUPPORT
(SEE PAGES 42-43)



HORIZONTAL
COLUMN ASSEMBLY
(SEE PAGES 6-7)



LOW LEAD ATTACHMENT
(SEE PAGES 46-47)

TAIL STOCK, STEADY REST
AND CONVENTIONAL
LEAD ATTACHMENT
(SEE PAGES 44-45)

DIVIDING HEAD
(SEE PAGES 48-49)

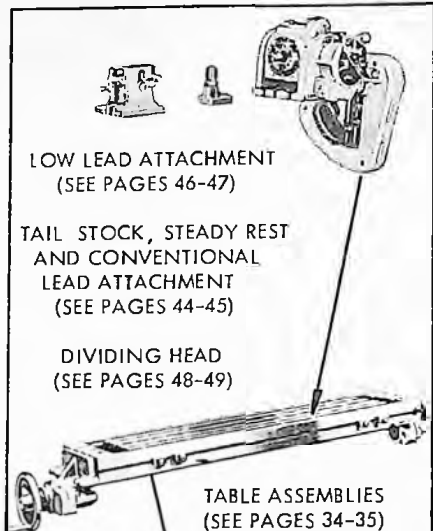


TABLE ASSEMBLIES
(SEE PAGES 34-35)

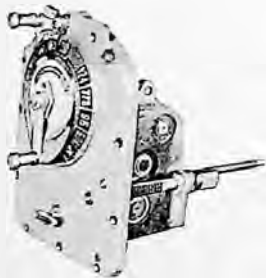
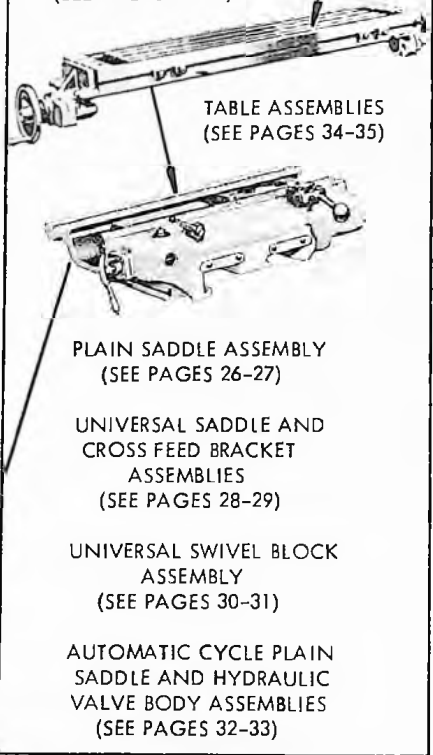


PLAIN SADDLE ASSEMBLY
(SEE PAGES 26-27)

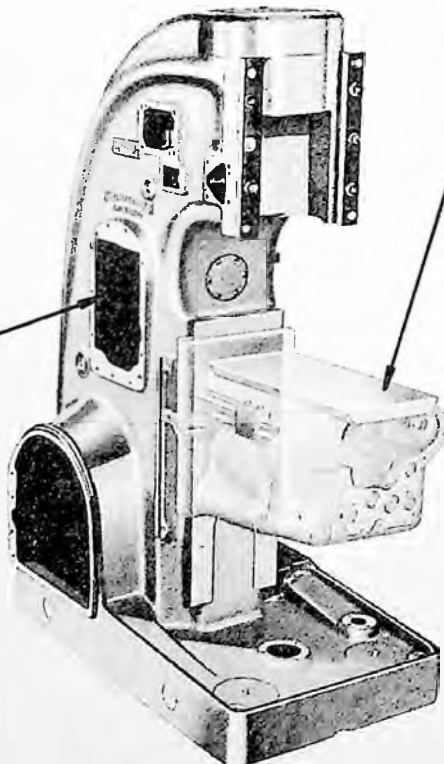
UNIVERSAL SADDLE AND
CROSS FEED BRACKET
ASSEMBLIES
(SEE PAGES 28-29)

UNIVERSAL SWIVEL BLOCK
ASSEMBLY
(SEE PAGES 30-31)

AUTOMATIC CYCLE PLAIN
SADDLE AND HYDRAULIC
VALVE BODY ASSEMBLIES
(SEE PAGES 32-33)



SPEED GEAR
BOX ASSEMBLY
(SEE PAGES 12-13)



VERTICAL COLUMN
LEFT SIDE
(SEE PAGES 8-9)

Figure 3. Horizontal Column, Left Front of Vertical Column and Assemblies

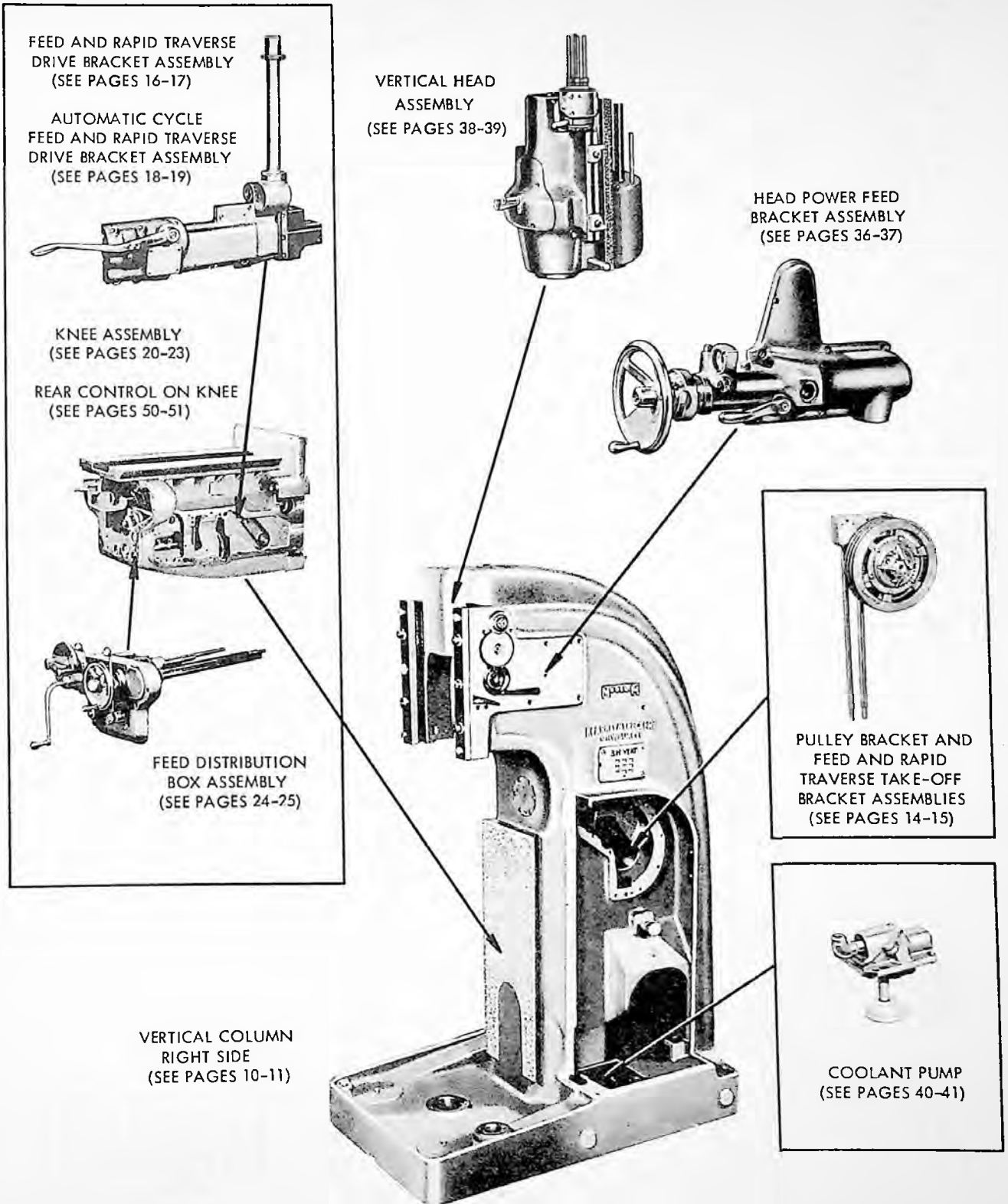


Figure 4. Right Front of Vertical Column and Assemblies

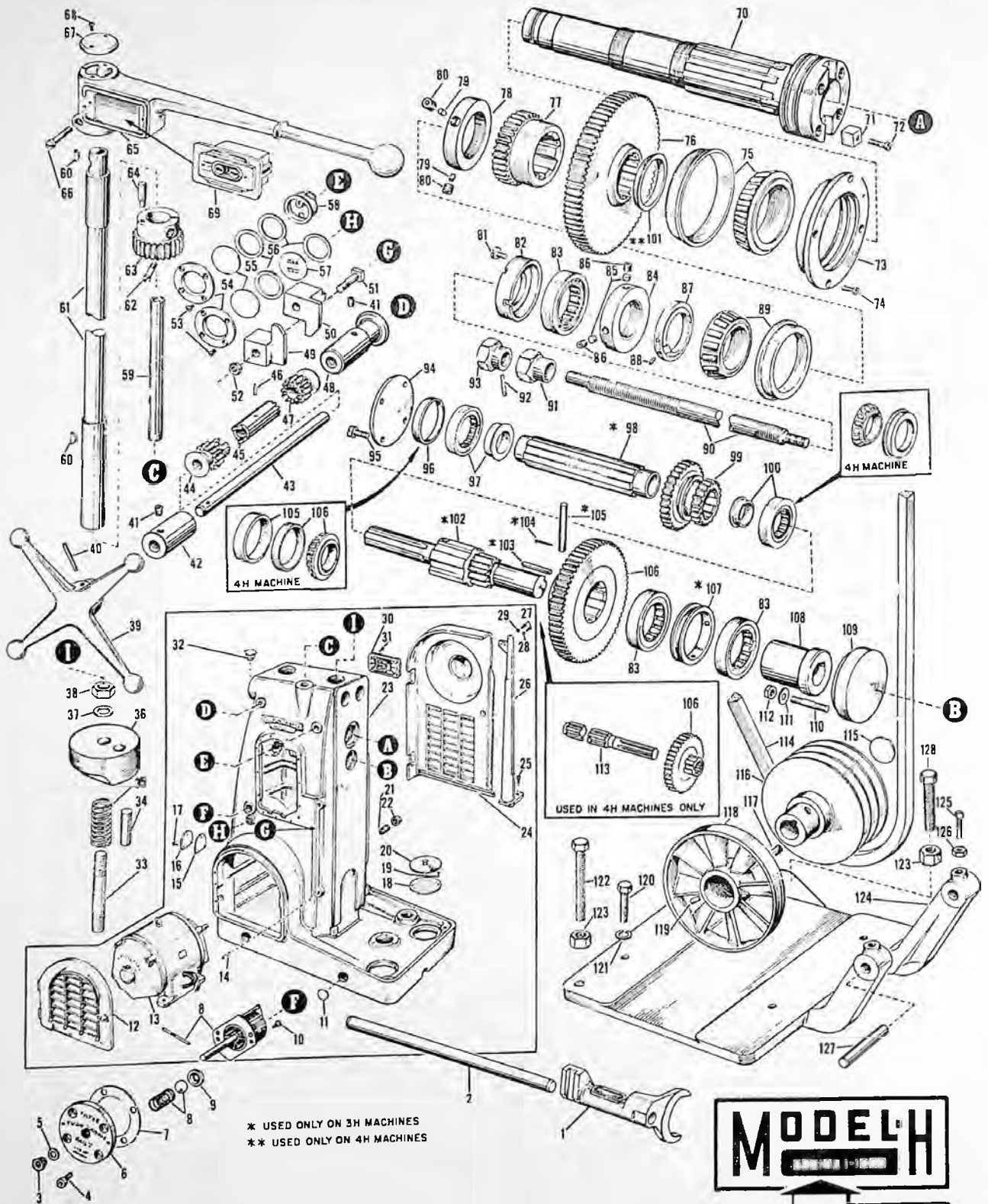


Figure 5. Horizontal Column

WHEN ORDERING PARTS
REPORT SERIAL NUMBER
SHOWN ON THIS PLATE



WHEN ORDERING PARTS
REPORT SERIAL NUMBER
SHOWN ON THIS PLATE

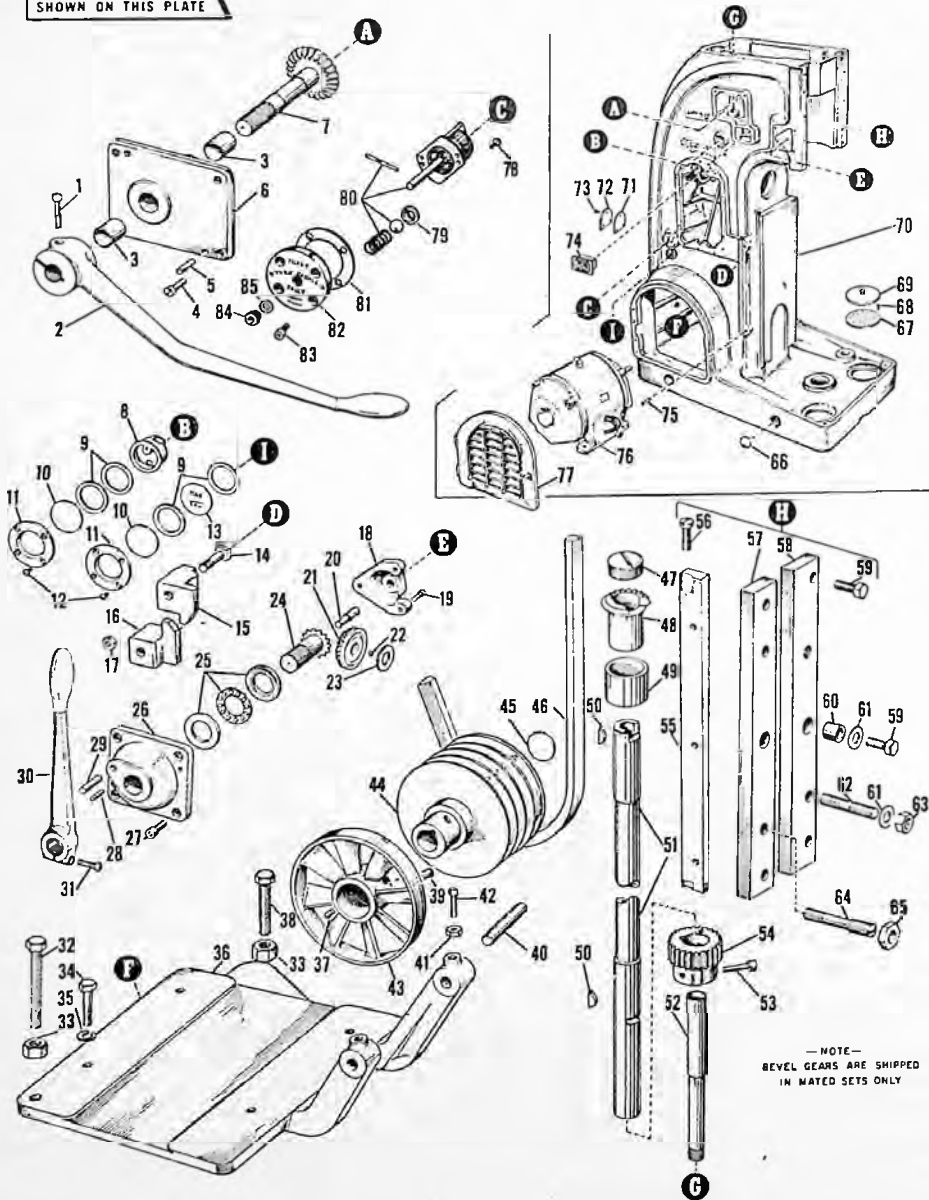


Figure 6. Vertical Column, Left Side

Replacement Parts Manual

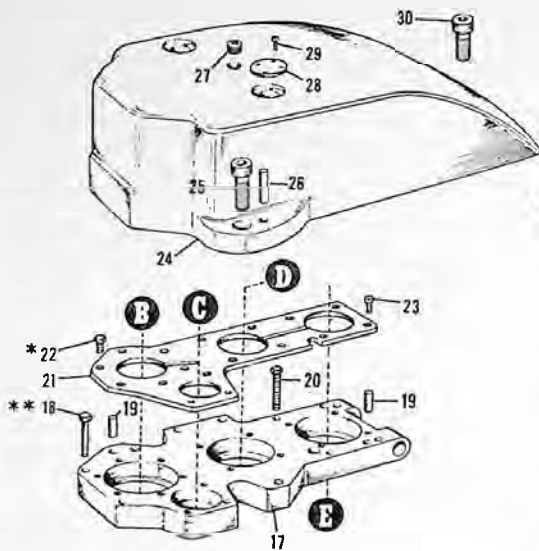
Milling Machines — Plain, Universal and Vertical

Figure 6. Vertical Column, Left Side

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
1	Allen cap screw, 3/8 x 1-3/4	3H-B1	4H-B1	1
2	Starting lever	3H-B2	4H-B2	1
3	Oilite bearing, A1110-1	3H-B3	4H-B3	2
4	Fillister head screw	3H-B4	4H-B4	4
5	Acme blue label dowel, 5/16 x 1"	3H-B5	4H-B5	2
6	Starting lever cover	3H-B6	4H-B6	1
7	Starting lever cross shaft	3H-B7	4H-B7	1
8	Oil flow gauge	3H-B8	4H-B8	1
9	Oil gauge washer	3H-B9	4H-B9	4
10	Oil gauge glass	3H-B10	4H-B10	2
11	Oil gauge plate	3H-B11	4H-B11	2
12	Oval hd screw, 10-32 x 3/8"	3H-B12	4H-B12	8
13	Oil gauge plate	3H-B13	4H-B13	1
14	Trip dog screw	3H-B14	4H-B14	2
15	Cross and elevating trip dog (RH)	3H-B15	4H-B15	1
16	Cross and elevating trip dog (LH)	3H-B16	4H-B16	1
17	Hex nut, 7/16-14	3H-B17	4H-B17	2
18	Pinion stud support	3H-B18	4H-B18	1
19	Fil hd screw, 5/16-18 x 3/4"	3H-B19	4H-B19	3
20	Head clamp pinion stud	3H-B20	4H-B20	1
21	Head clamp bevel gear	3H-B21	4H-B21	1
22	Steel ball, 3/16" dia	3H-B22	4H-B22	19
23	Head clamp bevel collar	3H-B23	4H-B23	1
24	Head clamp bevel pinion	3H-B24	4H-B24	1
25	Ball thrust bearing	3H-B25	4H-B25	1
26	Clamp pinion bearing plate	3H-B26	4H-B26	1
27	Allen cap screw, 3/8-16 x 3/4"	3H-B27	4H-B27	4
28	Acme blue label dowel, 1/4 x 1"	3H-B28	4H-B28	2
29	Acme blue label dowel, 3/8 x 1-1/2"	3H-B29	4H-B29	1
30	Head clamp handle	3H-B30	4H-B30	1
31	Allen cap screw, 5/16 x 1-1/8"	3H-B31	4H-B31	1
32	Hex hd screw, 3/4-10 x 4"	3H-B32	--	1
	Hex hd screw, 3/4-10 x 5-5/8"	--	4H-B32	1
33	Hex nut, 3/4-10	3H-B33	4H-B33	2
34	Hex hd screw, 1/2 x 1-3/4"	3H-B34	--	4
	Hex hd screw, 5/8 x 1-3/4"	--	4H-B34	4
35	Lockwasher, 1/2"	3H-B35	--	4
	Lockwasher, 5/8"	--	4H-B35	4
36	Motor base	3H-B36	4H-B36	1
37	Acme blue label dowel, 3/8 x 7/8"	3H-B37	4H-B37	1
38	Hex hd screw, 3/4-10 x 4-5/8"	3H-B38	--	1
	Hex hd screw, 3/4-10 x 5-5/8"	--	4H-B38	1
39	Flat pt soc screw, 1/2-13 x 1"	3H-B39	4H-B39	2
40	Motor base support pin	3H-B40	4H-B40	2
41	Hex nut, 3/8-16	3H-B41	4H-B41	2
42	Sq hd cup pt set screw, 3/8-16 x 1-1/4"	3H-B42	4H-B42	2
43	Motor fan	3H-B43	4H-B43	1
44	Motor sheave	3H-B44	4H-B44	1
45	Expansion plug, 2" dia	3H-B45	4H-B45	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
46	Texrope belt, B-68	3H-B46	4H-B46	*3
47	Pipe plug, 1-1/4"	3H-B47	4H-B47	1
48	Starting lever bevel pinion	3H-B48	4H-B48	1
49	Oilite Bearing, A-2102	3H-B49	4H-B49	1
50	Hi-Pro key, HP-780	3H-B50	4H-B50	2
51	Starting lever shaft	3H-B51	4H-B51	1
52	Starting lever stand pipe	3H-B52	4H-B52	1
53	Fil hd screw, 3/8-16 x 1-3/8"	3H-B53	4H-B53	1
54	Starting lever gear	3H-B54	4H-B54	1
55	Head taper gib	3H-B55	4H-B55	1
56	Fil hd screw, 3/8-16 x 1-1/2"	3H-B56	4H-B56	2
57	Head gib (LH)	3H-B57	4H-B57	1
58	Head gib (RH)	3H-B58	4H-B58	1
59	Hex hd screw, 5/8-11 x 1-1/2"	3H-B59	4H-B59	6
60	Head gib spacer	3H-B60	4H-B60	1
61	Washer	3H-B61	4H-B61	5
62	Stud, 5/8-11	3H-B62	4H-B62	3
63	Hex nut, 5/8-11	3H-B63	4H-B63	3
64	Head clamp stud	3H-B64	4H-B64	1
65	Hex nut, 3/4-10	3H-B65	4H-B65	1
66	Expansion plug, 2-3/4" dia	3H-B66	4H-B66	6
67	Column drain screen	3H-B67	4H-B67	2
68	Flat hd mach screw, 10-32 x 3/8"	3H-B68	4H-B68	4
69	Column drain cover	3H-B69	4H-B69	2
70	Column	3H-B70	4H-B70	1
71	Gasket	3H-B71	4H-B71	1
72	Coolant cleanout cover	3H-B72	4H-B72	1
73	Fil hd screw, 3/8-16 x 13/16"	3H-B73	4H-B73	3
74	Cutler-Hammer starting switch	3H-B74	4H-B74	1
75	Acme blue label dowel, 1/2 x 1-1/8"	3H-B75	4H-B75	2
76	Electric Motor, 7-1/2 HP	3H-B76	--	1
	Electric Motor, 10 HP	--	4H-B76	1
77	Motor door	3H-B77	4H-B77	1
	Motor door hinge	3H-B78	4H-B78	2
	Hex cap screw, 3/8-16 x 13/16"	3H-B79	--	8
	Hex cap screw, 3/8-16 x 1/2"	--	4H-B79	8
	Lockwasher, #1220 shakeproof	3H-B80	4H-B80	1
	Door latch	3H-B81	4H-B81	1
	Set screw, 1/4-20 x 5/8"	3H-B82	4H-B82	1
	Door handle	3H-B83	4H-B83	1
	Spacing washer	3H-B84	4H-B84	AR
78	Fil ha screw, 10-32 x 5/16	3H-B85	4H-B85	2
	Ball retainer	3H-B86	4H-B86	1
80	Cuno 100 disc unit cartridge (cuno BP-B1296)	3H-B87	4H-B87	1
81	Filter head gasket	3H-B88	4H-B88	1
82	Filter head	3H-B89	4H-B89	1
83	Soc cap screw, 3/8 x 3/4"	3H-B90	4H-B90	4
84	Filter plug	3H-B91	4H-B91	1
85	Washer	3H-B92	4H-B92	1

* Used on 3H machine only
AR As required

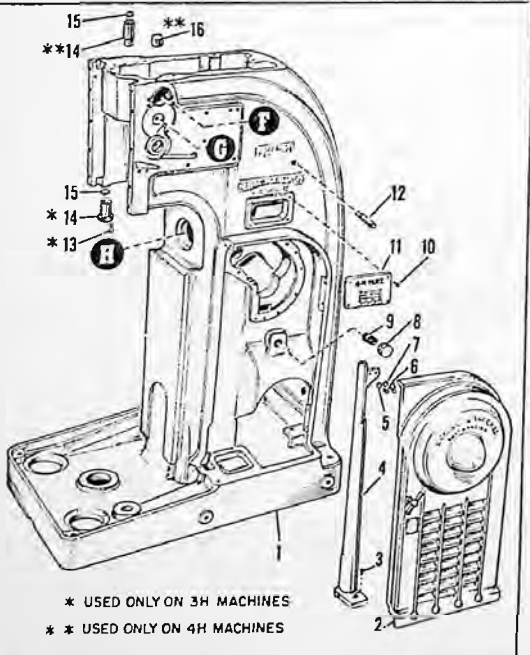


— NOTE —
LEAD SCREWS AND NUTS
ARE SHIPPED IN MATED
SETS ONLY.

— NOTE —
BEVEL GEARS ARE SHIPPED
IN MATED SETS ONLY



WHEN ORDERING PARTS
REPORT SERIAL NUMBER
SHOWN ON THIS PLATE



* USED ONLY ON 3H MACHINES

** USED ONLY ON 4H MACHINES

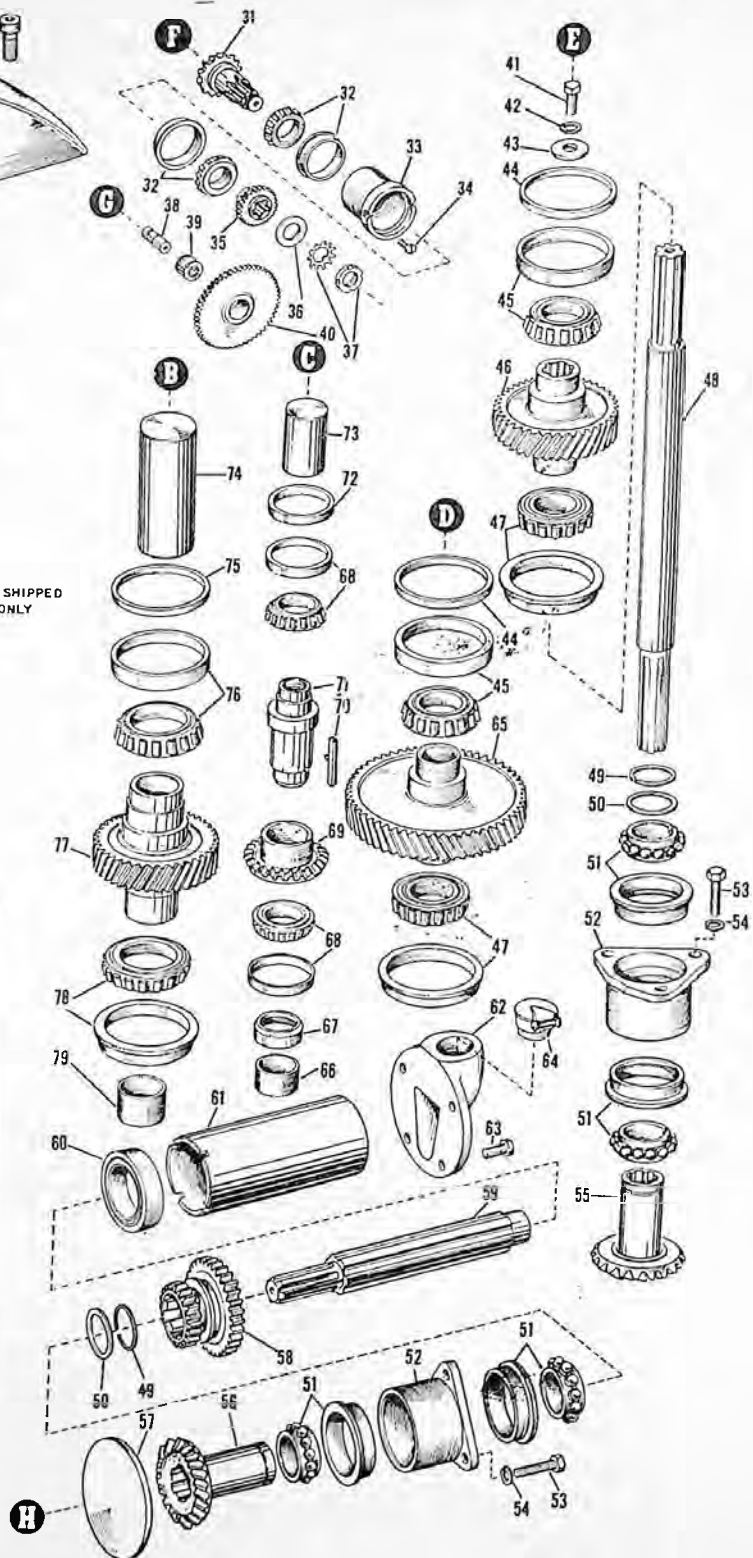


Figure 7. Vertical Column, Right Side

Figure 7. Vertical Column, Right Side

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
1	Column	3H-C1	4H-C1	1
2	Pulley door	3H-C2	4H-C2	1
	Pulley door hinge	3H-C3	4H-C3	2
	Hex hd screw, 3/8-16 x 1"	3H-C4	4H-C4	8
	Lockwasher, 3/8"	3H-C5	4H-C5	8
	Door latch	3H-C6	4H-C6	1
	Set screw, 1/4-20 x 5/8"	3H-C7	4H-C7	1
	Door handle	3H-C8	4H-C8	1
	Spring washer	3H-C9	4H-C9	AR
3	Fil hd screw, 1/2-13 x 1-3/4"	3H-C10	4H-C10	1
4	Coolant pipe guard	3H-C11	4H-C11	1
5	Washer, 1/2" (reworked)	3H-C12	4H-C12	1
6	Hex hd screw, 1/2-13 x 1-1/8"	3H-C13	4H-C13	2
7	Washer, 1/2"	3H-C14	4H-C14	1
8	Pipe cap, 1"	3H-C15	4H-C15	1
9	WI nipple, 1 x 2"	3H-C16	4H-C16	1
10	Fil hd screw, 3/8-16 x 7/8"	3H-C17	4H-C17	5
11	Coolant vent plate	3H-C18	4H-C18	1
12	Clamp rod	3H-C19	4H-C19	1
13	Flat hd mach screw, 10-32 x 1/2"	*3H-C20	--	3
14	Shifter rod sleeve	3H-C21	4H-C21	1
15	Expansion plug, 1-1/8 x 3/32"	3H-C22	4H-C22	1
16	Compensator hole plug	** --	4H-C23	1
17	Drive bearing plate	3H-C24	4H-C24	1
18	Hex hd screw, 1/2-13 x 4-3/4"	--	**4H-C25	2
19	Acme blue label dowel, 1/2 x 1-3/4"	3H-C26	4H-C26	2
20	Fil hd screw, 5/8-11 x 1-3/4"	3H-C27	--	9
	Hex hd screw, 1/2-13 x 2-3/16"	--	4H-C27	10
21	Drive plate cover	3H-C28	4H-C28	1
22	Hex hd screw, 3/8-16 x 1"	3H-C29	--	2
23	Soc cap screw, 7/16-14 x 3/4"	3H-C30	--	7
	Fil hd screw, 7/16-14 x 7/8"	--	4H-C30	15
24	Drive housing	3H-C31	4H-C31	1
25	Allen cap screw, 3/4 x 1-3/4"	3H-C32	4H-C32	2
26	Acme blue label dowel, 1/2 x 2"	3H-C33	4H-C33	2
27	Pipe plug, 1/2"	3H-C34	4H-C34	1
28	Sleeve adjusting cover	3H-C35	4H-C35	2
29	Fil hd screw, 10-32 x 1/2"	3H-C36	4H-C36	#6
30	Allen cap screw, 3/4 x 1-3/4"	3H-C37	--	1
	Allen cap screw, 3/4 x 1"	--	4H-C37	1
31	Feed cross shaft	3H-C38	4H-C38	1
32	Timken bearing, 08231-08125	3H-C39	4H-C39	1
33	Feed cross shaft bearing sleeve	3H-C40	4H-C40	1
34	Fil hd screw, 3/8-16 x 9/16"	3H-C41	4H-C41	2

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
35	Feed cross shaft gear	3H-C42	4H-C42	1
36	Feed cross shaft washer	3H-C43	4H-C43	1
37	Gurney locknut and washer, #3	3H-C44	4H-C44	1
38	Feed gear drive idler gear shaft	3H-C45	4H-C45	1
39	Hyatt bearing, 93416	3H-C46	4H-C46	1
40	Feed drive idler gear	3H-C47	4H-C47	1
41	Hex hd screw, 5/8-11 x 1-1/2"	3H-C48	4H-C48	1
42	Lockwasher, 5/8"	3H-C49	4H-C49	1
43	Washer	3H-C50	4H-C50	1
44	Drive gear adjusting washer	3H-C51	4H-C51	2
45	Timken bearing, 453A-462	3H-C52	4H-C52	2
46	Drive gear	3H-C53	4H-C53	1
47	Timken bearing, 453B-462	3H-C54	4H-C54	2
48	Drive shaft	3H-C55	4H-C55	1
49	Snap ring	3H-C56	4H-C56	2
50	Drive shaft bearing adjusting washer	3H-C57	4H-C57	2
51	New Departure bearing, NM-0210B	3H-C58	4H-C58	4
52	Drive shaft bearing sleeve	3H-C59	4H-C59	2
53	Hex hd screw, 5/8-11 x 1-5/8"	3H-C60	4H-C60	6
54	Lockwasher, 5/8"	3H-C61	4H-C61	6
55	Vertical drive spiral bevel gear (driven)	3H-C62	4H-C62	1
56	Vertical drive spiral gear (driver)	3H-C63	4H-C63	1
57	Plug	3H-C64	4H-C64	1
58	Primary speed sliding gear	3H-C65	4H-C65	1
59	Primary speed change shaft	3H-C66	4H-C66	1
60	Hyatt bearing, R-1209 TS	3H-C67	4H-C67	1
61	Bearing spacer	3H-C68	4H-C68	1
62	Primary shaft bearing retainer	3H-C69	4H-C69	1
63	Fil hd screw, 1/2-13 x 15/16"	3H-C70	4H-C70	4
64	Gits Oiler, TS-409	3H-C71	4H-C71	1
65	Drive idler gear	3H-C72	4H-C72	1
66	Feed screw oil sleeve	3H-C73	4H-C73	1
67	Head feed screw oil slinger	3H-C74	4H-C74	1
68	Timken bearing, 12303-12175	3H-C75	4H-C75	2
69	Feed screw nut drive gear	3H-C76	4H-C76	1
70	Key	3H-C77	4H-C77	1
71	Head feed nut	3H-C78	4H-C78	1
72	Feed screw bearing adjusting washer	3H-C79	4H-C79	1
73	Feed screw cover	3H-C80	4H-C80	1
74	Counter shaft cover	3H-C81	4H-C81	1
75	Counter drive gear adjusting washer	3H-C82	4H-C82	1
76	Timken bearing, 3920-3982	3H-C83	4H-C83	1
77	Counter shaft drive gear	3H-C84	4H-C84	1
78	Timken bearing, 3920B-3984	3H-C85	4H-C85	1
79	Counter shaft oil sleeve	3H-C86	4H-C86	1

* Used on 3H Machine Only

** Used on 4H Machine Only

8 Used on 4H Machine

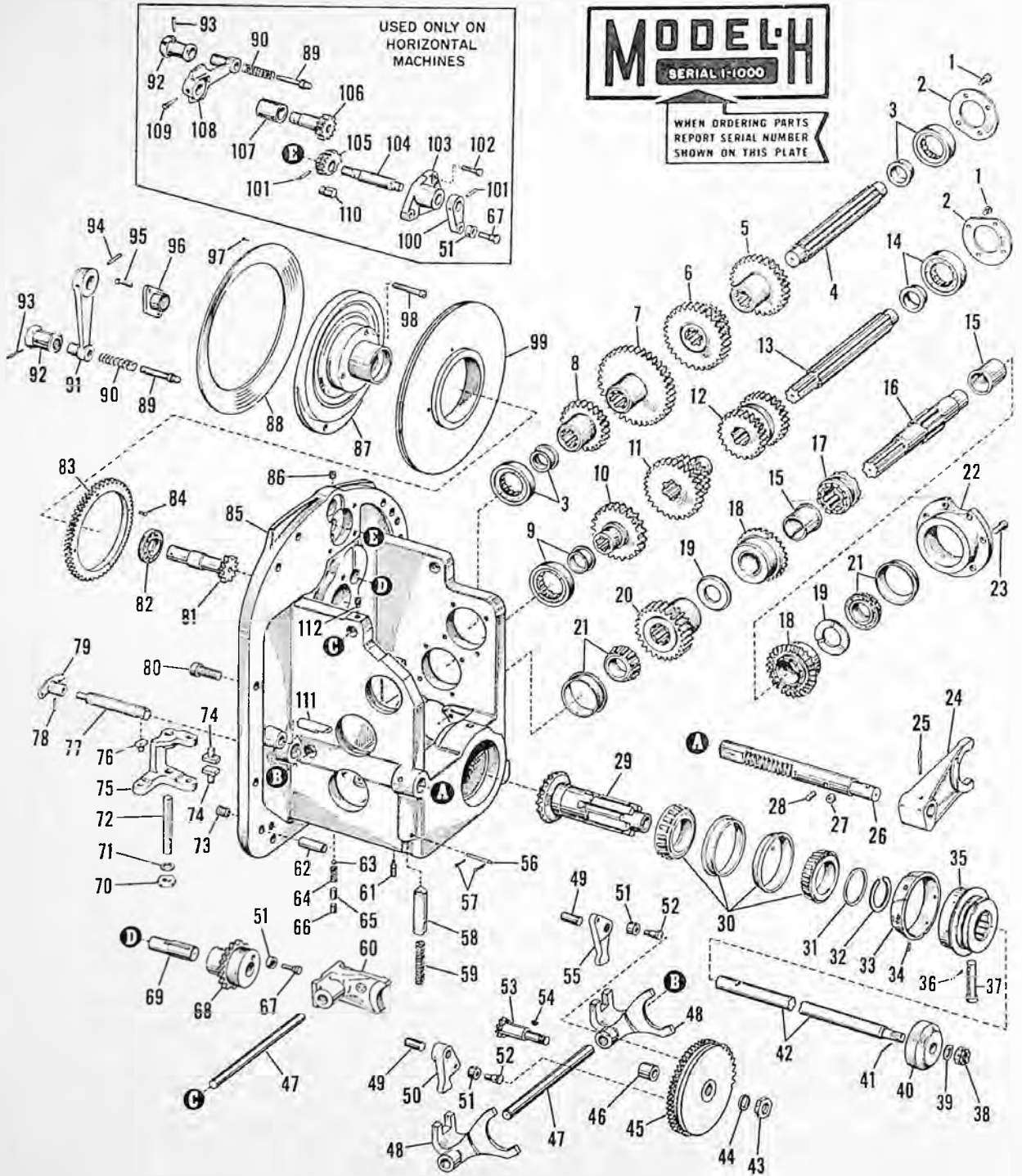
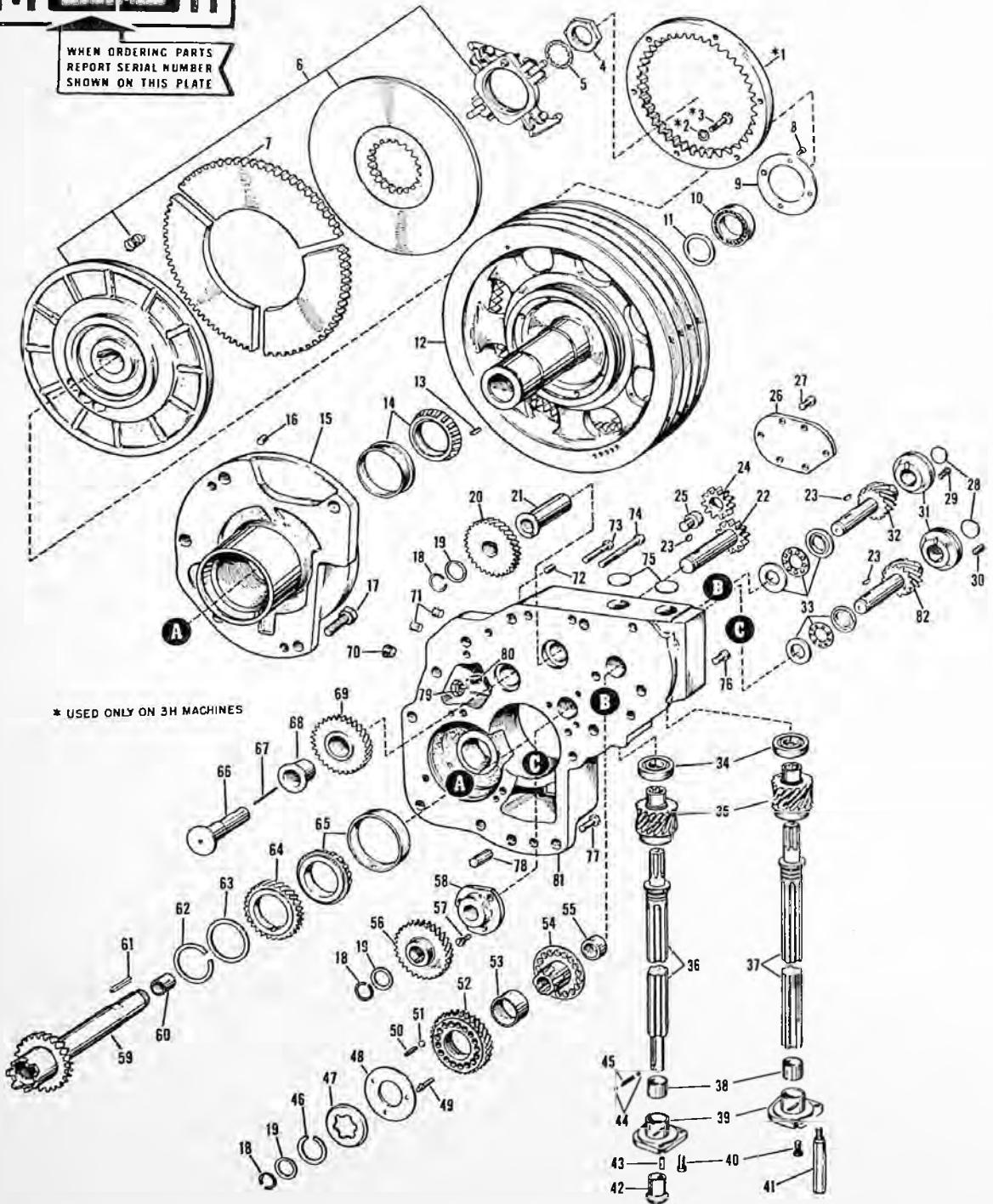


Figure 8. Speed Gear Box



WHEN ORDERING PARTS
REPORT SERIAL NUMBER
SHOWN ON THIS PLATE



* USED ONLY ON 3H MACHINES

• Figure 9. Pulley Bracket and Feed and Rapid Traverse Take-Off Bracket

Figure 9. Pulley Bracket and Feed and Rapid Traverse Take-Off Bracket

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
1	Clutch gear ring, Twin Disc, #6187	3H-E1	--	1
2	Lockwasher, 3/8"	3H-E2	--	8
3	Hex hd screw, 3/8-16 x 1-1/2"	3H-E3	--	8
4	Hex nut, 1-1/2-12 x 2"	3H-E4	4H-E4	1
5	Shakeproof lockwasher, 1244	3H-E5	4H-E5	1
6	Special C10 Twin Disc clutch	3H-E6	--	1
	Special C-11-1/2 Twin Disc clutch	--	4H-E6	1
7	Driving plate	3H-E7	4H-E7	1
8	Oval hd screw, 10-32 x 3/8"	3H-E8	4H-E8	4
9	Ball bearing retaining plate	3H-E9	4H-E9	1
10	New Departure bearing, 1208	3H-E10	4H-E10	1
11	Sleeve gear bearing collar	3H-E11	4H-E11	1
12	Pulley	3H-E12	4H-E12	1
13	Key	3H-E13	4H-E13	1
14	Timken bearing, 394A-399A	3H-E14	4H-E14	1
15	Pulley bracket	3H-E15	4H-E15	1
16	Soc flat pt set screw, 1/2 x 7/8"	3H-E16	4H-E16	2
17	Hex cap screw, 5/8-11 x 1-3/4"	3H-E17	4H-E17	5
18	Snap ring	3H-E18	4H-E18	3
19	Fitting collar	3H-E19	4H-E19	3
20	Rapid traverse and pump drive gear	3H-E20	4H-E20	1
21	Rapid traverse idler gear bushing	3H-E21	4H-E21	1
22	Oil pump gear (driver)	3H-E22	4H-E22	1
23	Hi-Pro key, HP-708	3H-E23	4H-E23	3
24	Oil pump gear (driven)	3H-E24	4H-E24	1
25	Oil pump gear stud	3H-E25	4H-E25	1
26	Oil pump cover	3H-E26	4H-E26	1
27	Fil hd screw, 5/16-18 x 11/16"	3H-E27	4H-E27	6
28	Expansion plug, 1-3/16" dia	3H-E28	4H-E28	2
29	Fil hd screw 5/16-18 x 5/8"	3H-E29	4H-E29	3
30	Soc set screw, 1/4 x 5/16"	3H-E30	4H-E30	1
31	Drive worm bearing (outer)	3H-E31	4H-E31	2
32	Feed drive worm	3H-E32	4H-E32	1
33	Thrust bearing	3H-E33	4H-E33	1
34	New Departure bearing 1206	3H-E34	4H-E34	2
35	Feed and drive worm wheel	3H-E35	4H-E35	2
36	Feed drive shaft	3H-E36	4H-E36	1
37	Rapid traverse drive shaft	3H-E37	4H-E37	2
38	Oilite bushing	3H-E38	4H-E38	2
39	Feed and rapid traverse drive shaft retainer	3H-E39	4H-E39	2
40	Fil hd screw, 3/8-16 x 3/4"	3H-E40	4H-E40	5
41	Positive stop screw	3H-E41	--	1
	Positive stop screw	--	4H-E41	1
	Positive stop	3H-E42	4H-E42	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
42	Coolant shaft drive clutch	3H-E43	4H-E43	1
43	Key	3H-E44	4H-E44	1
44	Steel ball, 3/16" dia	3H-E45	4H-E45	2
45	Spring	3H-E46	4H-E46	1
46	Snap ring	3H-E47	4H-E47	1
47	Rapid traverse slip clutch plate	3H-E48	4H-E48	1
48	Rapid traverse slip clutch friction plate	3H-E49	4H-E49	1
49	Friction plate drive pin	3H-E50	4H-E50	3
50	Spring	3H-E51	4H-E51	21
51	Steel ball, 5/16"	3H-E52	4H-E52	21
52	Rapid traverse worm drive gear	3H-E53	4H-E53	1
53	Rapid traverse slip clutch bushing	3H-E54	4H-E54	1
54	Rapid traverse slip clutch sleeve	3H-E55	4H-E55	1
55	Rapid traverse worm drive (inner)	3H-E56	4H-E56	1
56	Feed worm drive gear	3H-E57	4H-E57	1
57	Fil hd screw, 5/16-18 x 7/8"	3H-E58	4H-E58	3
58	Feed drive worm bearing (inner)	3H-E59	4H-E59	1
59	Feed drive sleeve gear	3H-E60	4H-E60	1
60	Feed drive sleeve gear bushing	3H-E61	4H-E61	2
61	Key	3H-E62	4H-E62	1
62	Snap ring	3H-E63	4H-E63	1
63	Pulley bearing fitting collar	3H-E64	4H-E64	1
64	Rapid traverse drive gear	3H-E65	4H-E65	1
65	Timken bearing, #39412-39250	3H-E66	4H-E66	1
66	Rapid traverse idler gear stud	3H-E67	4H-E67	2
67	Oilwicking	3H-E68	4H-E68	AR
68	Rapid traverse drive idler gear bushing	3H-E69	4H-E69	1
69	Rapid traverse drive idler gear	3H-E70	4H-E70	1
70	Allen pipe plug, 1/2"	3H-E71	4H-E71	1
71	Pipe plug, 1/4"	3H-E72	4H-E72	2
72	Allen flat pt set screw	3H-E73	4H-E73	2
73	Hex hd screw, 5/8-11 x 2-13/16"	3H-E74	4H-E74	1
74	Fil hd screw, 1/2-13 x 4-3/4"	3H-E75	4H-E75	2
75	Expansion plug, 1-3/8"	3H-E76	4H-E76	2
76	Fil hd screw, 1/2-13 x 3/4"	3H-E77	4H-E77	1
77	Hex hd screw, 5/8-11 x 1-3/4"	3H-E78	4H-E78	5
78	Acme blue label dowel, 5/8 x 2"	3H-E79	4H-E79	2
79	Hex nut, 3/8-16	3H-E80	4H-E80	1
80	Soc cup pt set screw, 3/8 x 1"	3H-E81	4H-E81	1
81	Feed and rapid traverse take-off bracket	3H-E82	4H-E82	1
82	Rapid traverse drive worm	3H-E83	4H-E83	1

AR as required

MODEL H
SERIAL 1-1000

WHEN ORDERING PARTS
REPORT SERIAL NUMBER
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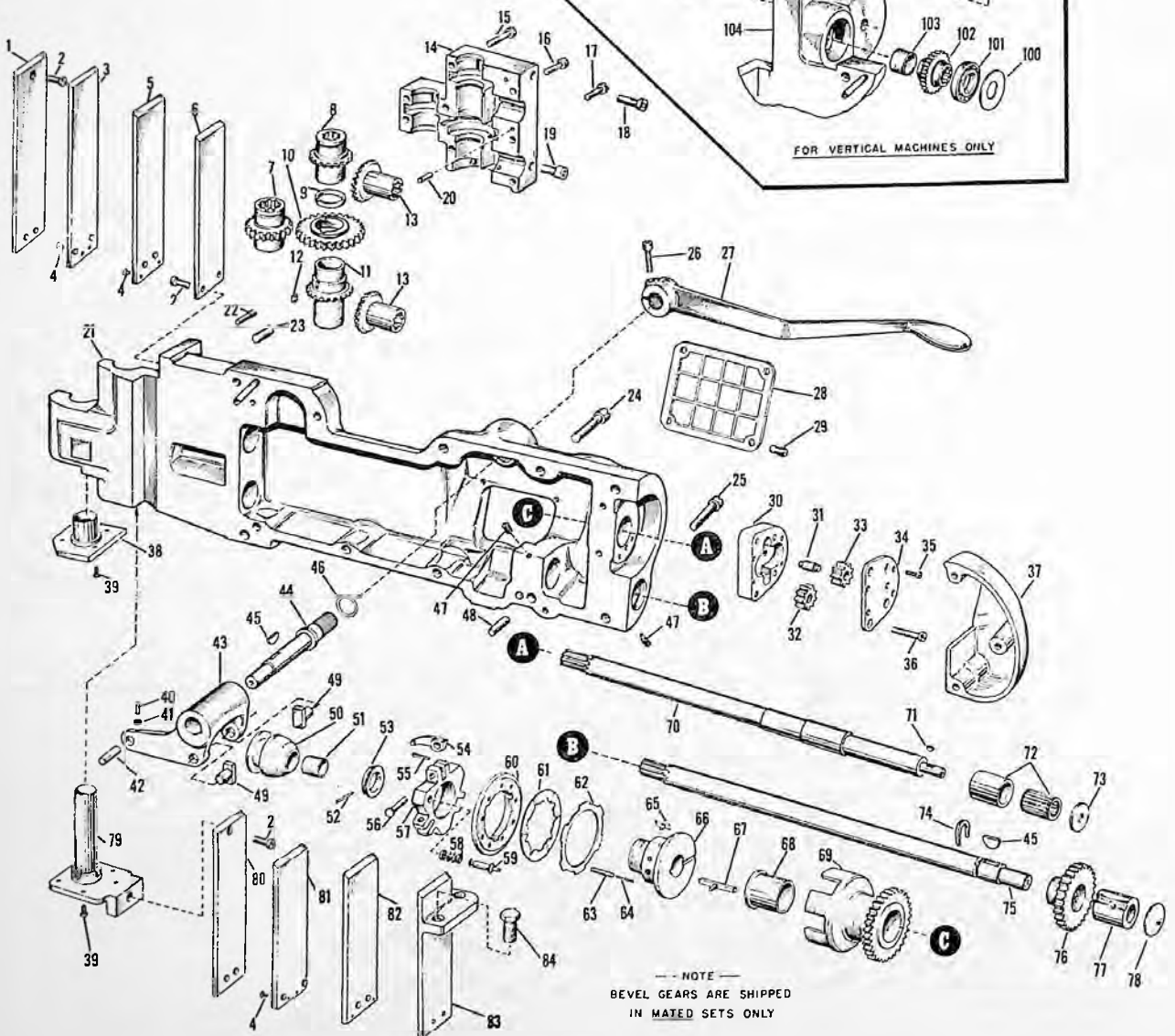
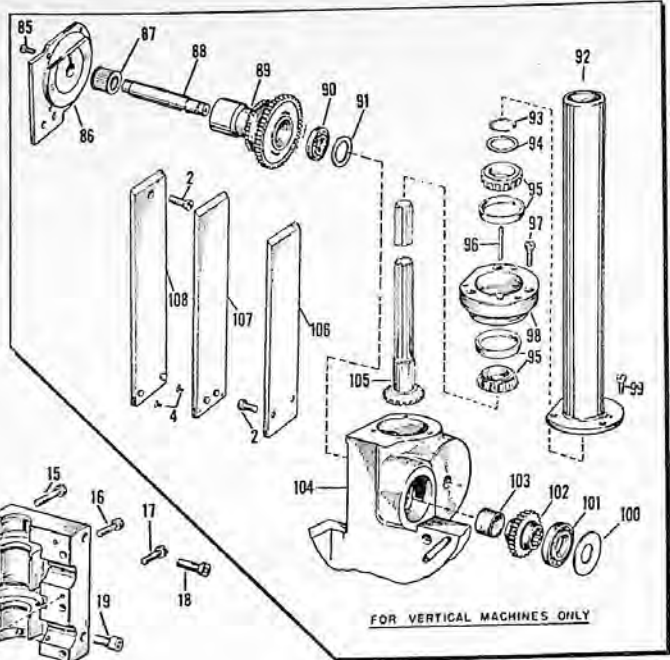


Figure 10. Feed and Rapid Traverse Drive Bracket

Figure 10. Feed and Rapid Traverse Drive Bracket

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
1	Drive shaft guard	3H-F1	4H-F1	1
2	Fil hd screw, 3/8-16 x 3/4"	3H-F2	4H-F2	4
3	Drive shaft guard	3H-F3	4H-F3	1
4	Oval hd screw, 8-32 x 11/32"	3H-F4	4H-F4	**8
5	Drive shaft guard	3H-F5	4H-F5	1
6	Drive shaft guard	3H-F6	4H-F6	1
7	Feed drive gear	3H-F7	4H-F7	1
8	Rapid traverse drive bevel gear	3H-F8	4H-F8	1
9	Rapid traverse drive bevel gear collar	3H-F9	4H-F9	1
10	Feed drive spiral gear	3H-F10	4H-F10	1
11	Feed drive bevel gear	3H-F11	4H-F11	1
12	Key	3H-F12	4H-F12	1
13	Feed and rapid traverse bevel gear	3H-F13	4H-F13	2
14	Feed and rapid traverse drive bracket cap	3H-F14	4H-F14	1
15	Fil hd screw, 7/16-14 x 2"	3H-F15	4H-F15	4
16	Fil hd screw, 7/16-14 x 1-1/2"	3H-F16	4H-F16	1
17	Fil hd screw, 7/16-14 x 1-3/4"	3H-F17	4H-F17	3
18	Soc cap screw 7/16 x 1"	3H-F18	4H-F18	1
19	Soc cap screw, 7/16 x 3/4"	3H-F19	4H-F19	1
20	Acme blue label dowel, 5/16 x 1-1/4"	3H-F20	4H-F20	1
21	Feed and rapid traverse drive bracket	3H-F21	4H-F21	1
22	Oil metering pin	3H-F22	4H-F22	1
23	Allen set screw, 3/8-16 x 1-1/2"	3H-F23	4H-F23	2
24	Fil hd screw, 1/2-13 x 1-3/4"	3H-F24	4H-F24	†4
25	Fil hd screw, 1/2-13 x 2-1/2"	3H-F25	4H-F25	†4
26	Soc cap screw, 3/8 x 1-1/4"	3H-F26	4H-F26	1
27	Rapid traverse lever	3H-F27	4H-F27	1
28	Rapid traverse clutch cover	3H-F28	4H-F28	1
29	Fil hd screw, 5/16-18 x 5/8"	3H-F29	4H-F29	4
30	Oil pump body	3H-F30	4H-F30	1
31	Oil pump gear stud	3H-F31	4H-F31	1
32	Oil pump gear (driven)	3H-F32	4H-F32	1
33	Oil pump gear (driver)	3H-F33	4H-F33	1
34	Oil pump cover	3H-F34	4H-F34	1
35	Fil hd screw, 1/4-20 x 5/8"	3H-F35	4H-F35	4
36	Fil hd screw, 5/16-18 x 1-5/16"	3H-F36	4H-F36	4

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
37	Feed selection cover housing	3H-F37	4H-F37	1
38	Feed drive oil retainer plate and tube	3H-F38	4H-F38	1
39	Fil hd screw, 5/16-18 x 9/16"	3H-F39	4H-F39	8
40	Headless set screw, 1/4-20 x 25/32"	3H-F40	4H-F40	1
41	Hex nut, 1/4-20	3H-F41	4H-F41	1
†42	Rapid traverse clutch fork pin	3H-F42	4H-F42	1
43	Rapid traverse clutch fork	3H-F43	4H-F43	1
44	Rapid traverse lever shaft	3H-F44	4H-F44	1
45	Hi-Pro key, HP-806	3H-F45	4H-F45	2
46	"O" ring packing, AN 6227-19	3H-F46	4H-F46	1
47	Dog pt set screw, 3/8-16 x 1-1/16"	3H-F47	--	2
47	Dog pt set screw, 3/8-16 x 11/16"	--	4H-F47	2
48	Acme blue label dowel, 3/8 x 2-3/4"	3H-F48	4H-F48	1
49	Rapid traverse clutch fork shoe	3H-F49	4H-F49	2
50	Rapid traverse clutch sliding cone	3H-F50	4H-F50	1
51	Rapid traverse clutch cone bushing	3H-F51	4H-F51	1
52	Taper pin, #3 x 1-5/8"	3H-F52	4H-F52	1
53	Collar	3H-F53	4H-F53	1
54	Clutch finger	3H-F54	4H-F54	4
55	Cotter pin, 3/32 x 5/8"	3H-F55	4H-F55	4
56	Clutch finger pin	3H-F56	4H-F56	4
57	Adjusting yoke	3H-F57	4H-F57	1
58	Spring	3H-F58	4H-F58	1
59	Clutch adjusting plunger	3H-F59	4H-F59	1
60	Rapid traverse clutch floating plate	3H-F60	4H-F60	1
61	Clutch plate (driver)	3H-F61	4H-F61	4
62	Clutch plate (driven)	3H-F62	4H-F62	5
63	Spring	3H-F63	4H-F63	6
64	Rapid traverse clutch plate pin	3H-F64	4H-F64	6
65	Key	3H-F65	4H-F65	3
66	Rapid traverse clutch hub	3H-F66	4H-F66	1
67	Key	3H-F67	4H-F67	1
68	Rapid traverse clutch gear bushing	3H-F68	4H-F68	1
69	Rapid traverse clutch gear	3H-F69	4H-F69	1
70	Rapid traverse clutch shaft	3H-F70	4H-F70	1
71	Hi-Pro key, HP-404	3H-F71	4H-F71	1
72	Hyatt bearing, S-93524	3H-F72	4H-F72	1
73	Rapid traverse clutch shaft collar	3H-F73	4H-F73	1
74	Feed back gear retaining washer	3H-F74	4H-F74	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
75	Feed drive shaft	3H-F75	4H-F75	1
76	Main feed drive pinion	3H-F76	4H-F76	1
77	Feed drive shaft bearing (outer)	3H-F77	4H-F77	1
78	Expansion plug, 1-3/4" dia	3H-F78	--	1
	Expansion plug, 1-11/16" dia	--	4H-F78	1
79	Rapid traverse drive oil retaining plate and tube	3H-F79	4H-F79	1
80	Drive shaft guard	3H-F80	4H-F80	1
81	Drive shaft guard	3H-F81	4H-F81	1
82	Drive shaft guard	3H-F82	4H-F82	1
83	Drive shaft guard	3H-F83	4H-F83	1
84	Hex hd screw, 3/8-16 x 1"	3H-F84	4H-F84	2
*85	Fil hd screw, 1/4-20 x 1/2"	3H-F85	4H-F85	4
*86	Vertical head feed bevel gear cover	3H-F86	4H-F86	1
*87	Hyatt bearing, 93316	3H-F87	4H-F87	1
*88	Feed drive bevel gear shaft	3H-F88	4H-F88	1
*89	Vertical head feed gear assembly	3H-F89	4H-F89	1
*90	New Departure bearing, 20203	3H-F90	4H-F90	1
*91	Head feed drive bevel gear washer	3H-F91	4H-F91	1
*92	Outer telescopic tube and flange	3H-F92	4H-F92	1
*93	Snap ring	3H-F93	4H-F93	1
*94	Vertical feed shaft bearing washer	3H-F94	4H-F94	1
*95	Timken bearing, 1932-1985	3H-F95	4H-F95	2
*96	Oil wicking	3H-F96	4H-F96	1
*97	Fil hd screw, 5/16-18 x 1"	3H-F97	4H-F97	1
*98	Vertical feed shaft bearing carrier	3H-F98	4H-F98	1
*99	Fil hd screw, 1/4-20 x 11/16"	3H-F99	--	3
	Fil hd screw, 1/4-20 x 5/8"	--	4H-F99	3
*100	Drive shaft pinion bearing washer	3H-F100	4H-F100	1
*101	Gurney ball bearing, 106-N	3H-F101	4H-F101	1
*102	Drive shaft pinion	3H-F102	4H-F102	1
*103	Drive shaft pinion bearing	3H-F103	4H-F103	1
*104	Feed and rapid traverse drive bracket	3H-F104	4H-F104	1
*105	Vertical head feed bevel gear shaft	3H-F105	4H-F105	1
*106	Drive shaft guard	3H-F106	4H-F106	1
*107	Drive shaft guard	3H-F107	4H-F107	1
*108	Drive shaft guard	3H-F108	4H-F108	1

* Used on vertical machines only

** 6 used on vertical machine

† 5 used on 4H machine

‡ Used only on machine with rear control



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NOTE
BEVEL GEARS ARE SHIPPED
IN MATED SETS ONLY

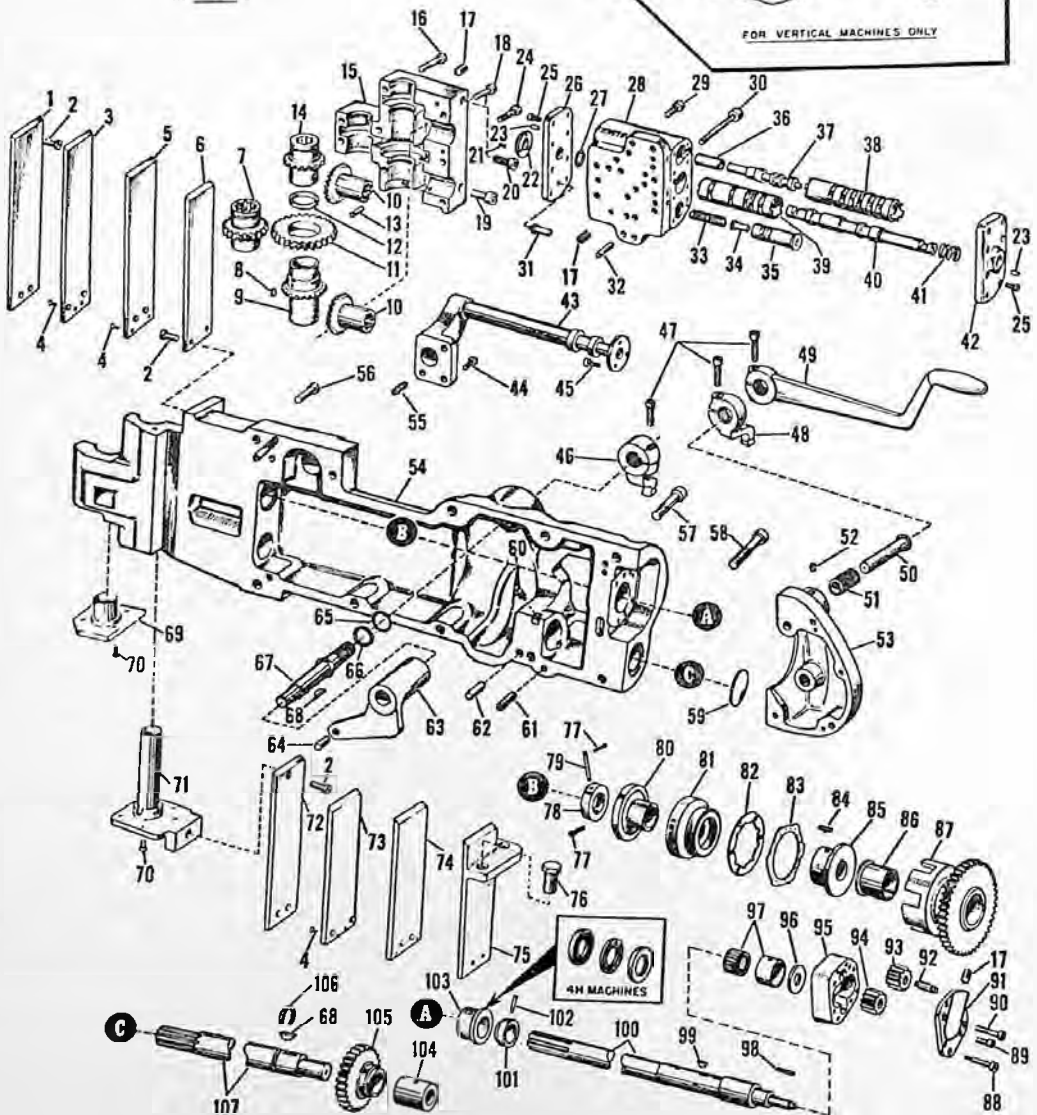
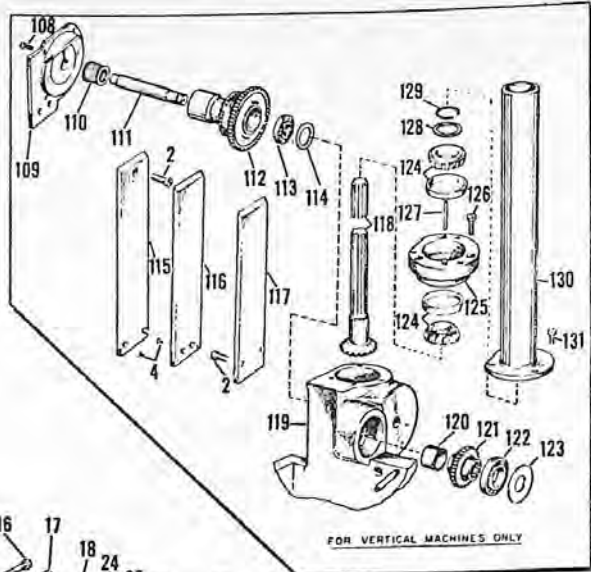


Figure 11. Automatic Cycle Feed and Rapid Traverse Drive Bracket

Figure 11. Automatic Cycle Feed and Rapid Traverse Drive Bracket

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
1	Drive shaft guard	3H-G1	4H-G1	1
2	Fil hd screw, 3/8-16 x 3/4"	3H-G2	4H-G2	4
3	Drive shaft guard	3H-G3	4H-G3	1
4	Oval hd screw, 8-32 x 11/32"	3H-G4	4H-G4	*8
5	Drive shaft guard	3H-G5	4H-G5	1
6	Drive shaft guard	3H-G6	4H-G6	1
7	Feed drive gear	3H-G7	4H-G7	1
8	Key	3H-G8	4H-G8	1
9	Feed drive bevel gear	3H-G9	4H-G9	1
10	Feed and rapid traverse bevel gear	3H-G10	4H-G10	2
11	Feed drive spur gear	3H-G11	4H-G11	1
12	Rapid traverse drive bevel gear collar	3H-G12	4H-G12	1
13	Acme blue label dowel, 5/16 x 1-1/4"	3H-G13	4H-G13	1
14	Rapid traverse drive bevel gear	3H-G14	4H-G14	1
15	Feed and rapid traverse drive bracket cap	3H-G15	4H-G15	1
16	Fil hd screw, 7/16-14 x 2"	3H-G16	4H-G16	4
17	Soc pipe plug, 1/8"	3H-G17	4H-G17	14
18	Fil hd screw, 7/16-14 x 1-3/4"	3H-G18	4H-G18	3
19	Soc cap screw, 7/16 x 1"	3H-G19	4H-G19	1
20	Soc cap screw, 7/16 x 1"	3H-G20	4H-G20	1
21	Oval hd screw, 10-32 x 3/8"	3H-G21	4H-G21	3
22	Rapid traverse control valve piston wiper	3H-G22	4H-G22	1
23	Acme blue label dowel, 3/16 x 3/4"	3H-G23	4H-G23	4
24	Fil hd screw, 7/16-14 x 2"	3H-G24	4H-G24	1
25	Soc cap screw, 5/16 x 5/8"	3H-G25	4H-G25	16
26	Rapid traverse valve body cover (rear)	3H-G26	4H-G26	1
27	"O" ring packing, AN6227-15	3H-G27	4H-G27	2
28	Rapid traverse valve body	3H-G28	4H-G28	1
29	Soc cap screw, 3/8 x 1"	3H-G29	4H-G29	3
30	Soc cap screw, 3/8 x 4"	3H-G30	4H-G30	4
31	Pressure relief valve plunger stop	3H-G31	4H-G31	1
32	Acme blue label dowel, 3/8 x 1-1/4"	3H-G32	4H-G32	2
33	Spring	3H-G33	4H-G33	1
34	Relief valve plunger	3H-G34	4H-G34	1
35	Pressure relief valve sleeve	3H-G35	4H-G35	1
36	Pilot valve sleeve (short)	3H-G36	4H-G36	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
37	Pilot valve	3H-G37	4H-G37	1
38	Rapid traverse pilot valve sleeve	3H-G38	4H-G38	1
39	Rapid traverse control valve sleeve	3H-G39	4H-G39	1
40	Rapid traverse control valve piston	3H-G40	4H-G40	1
41	Rapid traverse control valve return spring	3H-G41	4H-G41	1
42	Rapid traverse valve body cover (front)	3H-G42	4H-G42	1
43	Oil return bracket and tube assembly	3H-G43	4H-G43	1
44	Soc cap screw, 3/8 x 3/4"	3H-G44	4H-G44	3
45	Fil hd screw, 10-32 x 5/16"	3H-G45	4H-G45	3
46	Rapid traverse valve shifter (rear)	3H-G46	4H-G46	1
47	Soc cap screw, 3/8 x 1-1/4"	3H-G47	4H-G47	4
48	Rapid traverse valve shifter (front)	3H-G48	4H-G48	1
49	Rapid traverse lever	3H-G49	4H-G49	1
50	Rapid traverse lever pin	3H-G50	4H-G50	1
51	Rapid traverse lever sleeve	3H-G51	4H-G51	1
52	Dog pt set screw, 3/8-16 x 13/16"	3H-G52	4H-G52	1
53	Feed selection cam housing	3H-G53	4H-G53	1
54	Feed and rapid traverse drive bracket	3H-G54	4H-G54	1
55	Allen set screw, 3/8-16 x 1-1/2"	3H-G55	4H-G55	1
56	Oil metering pin	3H-G56	4H-G56	1
57	Soc cap screw, 1/2 x 1-3/4"	3H-G57	4H-G57	15
58	Soc cap screw, 1/2 x 2-1/2"	3H-G58	4H-G58	15
59	Expansion plug, 1-3/4"	3H-G59	4H-G59	1
60	Headless dowel screw, 3/8-16 x 1-1/16"	3H-G60	--	1
	Headless dowel screw, 3/8-16 x 11/16"	--	4H-G60	1
61	Soc set screw, 3/8 x 1-1/2"	3H-G61	4H-G61	2
62	Acme blue label dowel, 3/8 x 2-3/4"	3H-G62	4H-G62	1
63	Rapid traverse rear control link	3H-G63	4H-G63	1
64	Rapid traverse fork pin	3H-G64	4H-G64	1
65	"O" ring packing, AN6227-19	3H-G65	4H-G65	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
66	Washer	3H-G66	4H-G66	1
67	Rapid traverse lever shaft	3H-G67	4H-G67	1
68	Hi-Pro key	3H-G68	4H-G68	2
69	Feed drive oil retaining plate and tube	3H-G69	4H-G69	1
70	Fil hd screw, 5/16-18 x 9/16"	3H-G70	4H-G70	8
71	Rapid traverse drive oil retaining plate and tube	3H-G71	4H-G71	1
72	Drive shaft guard	3H-G72	4H-G72	1
73	Drive shaft guard	3H-G73	4H-G73	1
74	Drive shaft guard	3H-G74	4H-G74	1
75	Drive shaft guard	3H-G75	4H-G75	1
76	Hex hd screw, 3/8-16 x 1"	3H-G76	4H-G76	2
77	Cotter pin, 3/32 x 1/2"	3H-G77	4H-G77	2
78	Rapid traverse clutch shaft collar	3H-G78	4H-G78	1
79	Rapid traverse shaft collar pin	3H-G79	4H-G79	1
80	Rapid traverse operating sleeve	3H-G80	4H-G80	1
81	Clutch cylinder	3H-G81	4H-G81	1
82	Rapid traverse clutch plate (Twin Disc #1939-A)	3H-G82	4H-G82	8
83	Rapid traverse clutch plate (Twin Disc #1933)	3H-G83	4H-G83	8
84	Key	3H-G84	4H-G84	3
85	Rapid traverse clutch hub	3H-G85	4H-G85	1
86	Clutch gear bushing	3H-G86	4H-G86	1
87	Rapid traverse clutch gear	3H-G87	4H-G87	1
88	Allen shoulder screw, 5/16 x 1-3/4"	3H-G88	4H-G88	2
89	Soc cap screw, 1/4 x 5/8"	3H-G89	4H-G89	4
90	Soc cap screw, 5/16 x 1-3/4"	3H-G90	4H-G90	2
91	Oil pump body cover	3H-G91	4H-G91	1
92	Oil pump gear stud	3H-G92	4H-G92	1
93	Oil pump gear (driven)	3H-G93	4H-G93	1
94	Oil pump gear (driver)	3H-G94	4H-G94	1
95	Oil pump body	3H-G95	4H-G95	1
96	Rapid traverse clutch shaft collar	3H-G96	4H-G96	1
97	Hyatt bearing, 93516	3H-G97	4H-G97	1
98	Key	3H-G98	4H-G98	1
99	Hi-Pro key, HP -708	3H-G99	4H-G99	2
100	Rapid traverse clutch shaft	3H-G100	4H-G100	1
101	Rapid traverse thrust sleeve	3H-G101	4H-G101	1
102	Taper pin, #2 x 1-1/2"	3H-G102	4H-G102	1
103	Bearing	3H-G103	4H-G103	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
104	Feed drive shaft bearing (outer)	3H-G104	4H-G104	1
105	Main feed drive pinion	3H-G105	4H-G105	1
106	Feed back gear retaining washer	3H-G106	4H-G106	1
107	Feed drive shaft	3H-G107	4H-G107	1
108	Fil hd screw, 1/4-20 x 1/2"	3H-G108	4H-G108	4
109	Vertical feed bevel gear cover	3H-G109	4H-G109	1
110	Hyatt bearing, 93316	3H-G110	4H-G110	1
111	Feed drive bevel gear shaft	3H-G111	4H-G111	1
112	Vertical feed gear assembly	3H-G112	4H-G112	1
113	New Departure bearing 20203	3H-G113	4H-G113	1
114	Head feed drive bevel gear washer	3H-G114		1
115	Drive shaft guard	3H-G115	4H-G115	1
116	Drive shaft guard	3H-G116	4H-G116	1
117	Drive shaft guard	3H-G117	4H-G117	1
118	Vertical head feed bevel gear shaft	3H-G118	4H-G118	1
119	Feed and rapid traverse drive bracket (vertical)	3H-G119	4H-G119	1
120	Drive shaft pinion bearing	3H-G120	4H-G120	1
121	Drive shaft pinion	3H-G121	4H-G121	1
122	Gurney ball bearing, 106 N	3H-G122	4H-G122	1
123	Drive shaft pinion bearing washer	3H-G123	4H-G123	1
124	Timken bearing, 1932-1985	3H-G124	4H-G124	2
125	Vertical feed shaft bearing carrier	3H-G125	4H-G125	1
126	Fil hd screw, 5/16-18 x 1"	3H-G126	4H-G126	3
127	Oil wicking	3H-G127	4H-G127	AR
128	Vertical feed shaft bearing washer	3H-G128	4H-G128	1
129	Snap ring	3H-G129	4H-G129	1
130	Outer telescopic tube and flange	3H-G130	4H-G130	1
131	Fil hd screw, 1/4-20 x 11/16"	3H-G131	--	3
	Fil hd screw, 1/4-20 x 5/8"	--	4H-G131	3

* 6 used on vertical machines
 † 3H and 4H horizontal machine only
 ‡ 4 used on 3H machine
 § Used with rear control only
 ¶ Vertical machine only
 AR As required

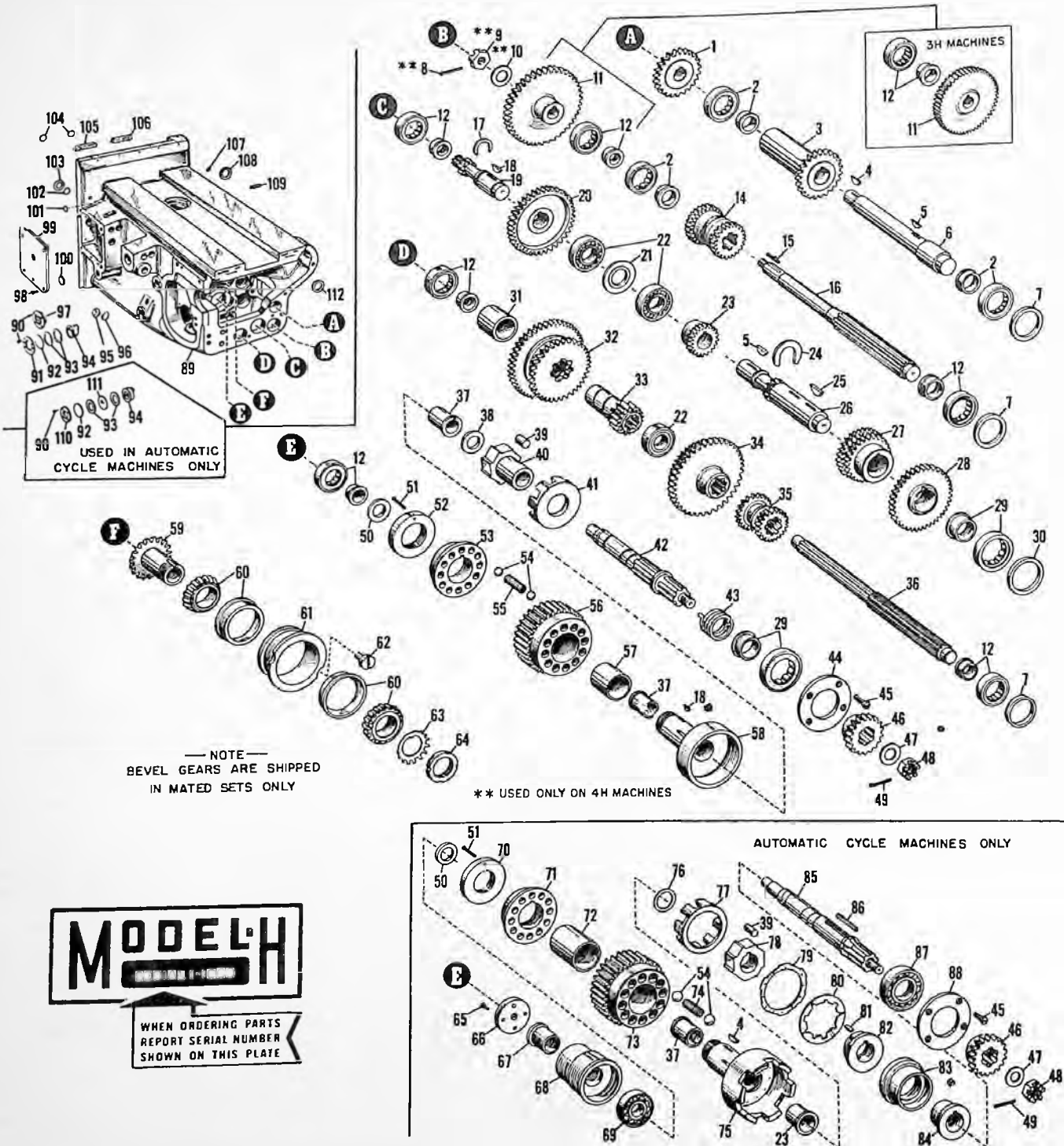


Figure 12. Knee (Gear Trains)



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Figure 12. Knee (Gear Trains)

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
1	Rapid traverse idler gear (short)	3H-H1	4H-H1	1
2	Hyatt bearing, R-1205 TS	3H-H2	4H-H2	3
3	Rapid traverse idler gear (long)	3H-H3	4H-H3	1
4	Hi-Pro key, HP-606	3H-H4	4H-H4	*1
5	Hi-Pro key, HP-806	3H-H5	4H-H5	2
6	Rapid traverse idler gear shaft	3H-H6	4H-H6	1
7	Primary feed shaft bearing washer	3H-H7	4H-H7	3
8	Cotter pin, 5/32 x 1-1/2"	--	4H-H8	1
9	Castellated nut, 5/8-11	--	4H-H9	1
10	Washer, 5/8"	--	4H-H10	1
11	Primary feed shaft drive gear	3H-H11	4H-H11	1
12	Hyatt bearing, R-1304 TS	3H-H12	4H-H12	†6
14	Primary feed sliding gear	3H-H14	4H-H14	1
15	Hi-Pro key, HP-806	3H-H15	--	1
16	Key	--	4H-H15	1
17	Primary feed shaft	3H-H16	4H-H16	1
18	Feed back gear retaining washer	3H-H17	4H-H17	1
19	Hi-Pro key, HP-706	3H-H18	4H-H18	1
20	Feed back gear pinion shaft	3H-H19	4H-H19	1
21	Feed back gear	3H-H20	4H-H20	1
22	Pinion shaft bearing spacer	3H-H21	4H-H21	1
23	Hyatt bearing, U-1205 TS	3H-H22	4H-H22	3
24	Gear on secondary feed shaft (rear)	3H-H23	4H-H23	1
25	Secondary feed gear retaining washer	3H-H24	4H-H24	1
26	Hi-Pro key, HP-1008	3H-H25	4H-H25	2
27	Secondary feed shaft	3H-H26	4H-H26	1
28	Double gear on secondary feed shaft	3H-H27	4H-H27	1
29	Double gear on secondary feed shaft (front)	3H-H28	4H-H28	1
30	Hyatt bearing, R-1206 TS	3H-H29	4H-H29	†2
31	Secondary feed shaft bearing washer	3H-H30	4H-H30	1
32	Feed sliding double back gear bushing	3H-H31	4H-H31	1
33	Feed sliding double back gear	3H-H32	4H-H32	1
34	Feed back gear pinion	3H-H33	4H-H33	1
35	Tertiary feed sliding gear (large)	3H-H34	4H-H34	1
36	Tertiary feed sliding gear (small)	3H-H35	4H-H35	1
37	Tertiary feed shaft	3H-H36	4H-H36	1
38	Feed roller clutch sleeve bushing	3H-H37	4H-H37	2
39	Feed safety clutch thrust washer	3H-H38	4H-H38	1
40	Feed clutch roller	3H-H39	4H-H39	8

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
40	Feed roller clutch hub	3H-H40	4H-H40	1
41	Feed clutch roller cage	3H-H41	4H-H41	1
42	Feed safety clutch shaft	3H-H42	4H-H42	1
43	Spring	3H-H43	4H-H43	1
44	Feed safety clutch shaft washer	3H-H44	4H-H44	1
45	Fil hd screw, 5/16-18 x 11/16"	3H-H45	4H-H45	4
46	Feed safety clutch shaft pinion	3H-H46	4H-H46	1
47	Washer, 5/8"	3H-H47	4H-H47	1
48	Castellated nut, 5/8-11"	3H-H48	4H-H48	1
49	Cotter pin, 5/32 x 1-1/2"	3H-H49	4H-H49	1
50	Feed safety clutch shaft washer	3H-H50	4H-H50	1
51	Cotter pin, 1/8 x 1-1/8"	3H-H51	4H-H51	1
52	Feed safety clutch sleeve nut	3H-H52	4H-H52	1
53	Feed safety clutch end plate	3H-H53	4H-H53	1
54	Steel ball, 9/16" dia	3H-H54	4H-H54	‡24
55	Spring	3H-H55	4H-H55	‡12
56	Feed safety clutch gear	3H-H56	4H-H56	1
57	Feed safety clutch gear bushing	3H-H57	4H-H57	1
58	Feed roller clutch sleeve	3H-H58	4H-H58	1
59	Elevating bevel pinion	3H-H59	4H-H59	1
60	Timken bearing, 14276B-14137	3H-H60	4H-H60	2
61	Elevating bevel pinion bearing sleeve	3H-H61	4H-H61	1
62	Fil hd screw, 1/2-13 x 3/4"	3H-H62	--	2
63	Fil hd screw, 1/2-13 x 1"	--	4H-H62	2
64	Gurney lockwasher, #7	3H-H63	4H-H63	1
65	Gurney locknut, #7	3H-H64	4H-H64	1
66	Soc cap screw, 1/4-20 x 1"	3H-H65	--	1
67	Soc cap screw, 1/4-20 x 7/8"	3H-H66	--	2
68	Soc cap screw, 1/4-20 x 5/8"	3H-H67	--	1
69	Soc cap screw, 1/4-1/2"	--	4H-H68	4
70	Bearing carrier cover	3H-H69	4H-H69	1
71	Bearing carrier bushing	3H-H70	4H-H70	1
72	Safety clutch shaft bearing carrier	3H-H71	4H-H71	1
73	New Departure bearing, 20304	3H-H72	4H-H72	1
74	Feed safety clutch sleeve nut	3H-H73	4H-H73	1
75	Feed safety clutch end plate	3H-H74	4H-H74	1
76	Feed safety clutch gear bushing	3H-H75	4H-H75	1
77	Feed safety clutch gear	3H-H76	4H-H76	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
74	Spring	3H-H77	4H-H77	‡12
75	Feed roller clutch	3H-H78	4H-H78	1
76	Feed safety clutch thrust washer	3H-H79	4H-H79	1
77	Feed clutch roller cage	3H-H80	4H-H80	1
78	Feed roller clutch hub	3H-H81	4H-H81	1
79	Clutch plate bronce (driven)	3H-H82	4H-H82	3
80	Clutch plate steel (driver)	3H-H83	4H-H83	3
81	Brake plate key	3H-H84	4H-H84	3
82	Clutch plate retainer	3H-H85	4H-H85	1
83	Brake cylinder	3H-H86	4H-H86	1
84	Brake piston	3H-H87	4H-H87	1
85	Feed safety clutch shaft	3H-H88	4H-H88	1
86	Round end key	3H-H89	4H-H89	1
87	New Departure bearing, 20206	3H-H90	4H-H90	1
88	Feed safety clutch shaft bearing retainer	3H-H91	4H-H91	1
89	Knee (standard direction control machines)	3H-H92	4H-H92	1
90	Knee (automatic cycle machines)	3H-H92	4H-H92	1
91	Oval hd screw, 10-32 x 3/8"	3H-H93	4H-H93	8
92	Oil sight gauge	3H-H94	4H-H94	1
93	Oil gauge glass	3H-H95	4H-H95	1
94	Oil gauge washer	3H-H96	4H-H96	2
95	Sight oil flow gauge	3H-H97	4H-H97	1
96	Oil filler screw	3H-H98	4H-H98	1
97	Washer	3H-H99	4H-H99	1
98	Knee vent plate	3H-H100	4H-H100	1
99	Fil hd screw, 1/2-13 x 15/16"	3H-H101	4H-H101	5
100	Rear control opening cover	3H-H102	4H-H102	1
101	Expansion plug, 1-1/8" dia	3H-H103	4H-H103	1
102	Expansion plug, 7/8" dia	3H-H104	4H-H104	1
103	"O" Ring, 6227-19	3H-H105	4H-H105	1
104	Knee clamp shaft spacer	3H-H106	4H-H106	1
105	Expansion plug, 1-1/4" dia	3H-H107	4H-H107	2
106	Oil pad	3H-H108	4H-H108	1
107	Oil pad	3H-H109	4H-H109	1
108	Dog pt set screw, 3/8-16 x 11/16"	3H-H110	--	1
109	Dog pt set screw, 3/8-16 x 7/8"	--	4H-H110	1
110	Oil seal, Victoprene 60318	3H-H111	4H-H111	1
111	Coolant drip spout	3H-H112	4H-H112	1
112	Oil flow gauge plate	3H-H113	4H-H113	1
113	Oil gauge indicator plate	3H-H114	4H-H114	1
114	Oil seal, Victoprene 60388	3H-H115	--	1
115	Oil seal, Victoprene 60562	--	4H-H115	1

* 2 used on machines with mono-lever control
 † 5 used on machines with mono-lever control
 ‡ 1 used on machines with mono-lever control
 § 9 springs and 18 balls used on 3H machines
 ¶ Used only on machines without rear control



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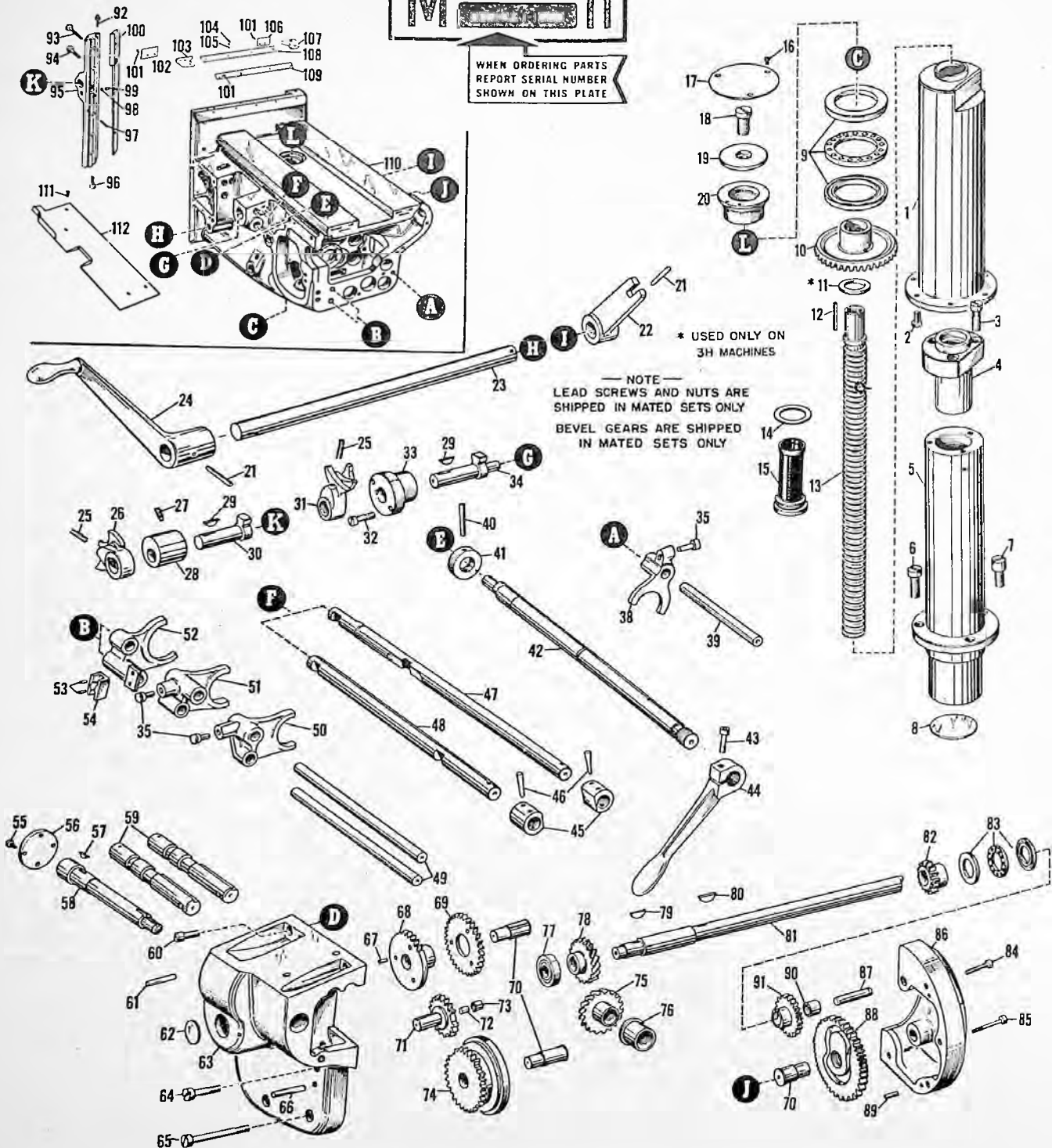


Figure 13. Knee (Miscellaneous Parts)

Figure 13. Knee (Miscellaneous Parts)

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
1	Elevating screw shield assembly	3H-J1	4H-J1	1
2	Fil hd screw, 3/8-16 x 13/16"	3H-J2	4H-J2	6
3	Fil hd screw, 3/8-16 x 1-3/8"	3H-J3	--	3
	Fil hd screw, 1/2-13 x 1"	--	4H-J3	3
4	Elevating screw nut	3H-J4	4H-J4	1
5	Elevating nut extension	3H-J5	4H-J5	1
6	Fil hd screw, 1/2-13 x 1-1/8"	3H-J6	--	2
	Fil hd screw, 5/8-11 x 1-1/4"	--	4H-J6	2
7	Knee bumper screw	3H-J7	4H-J7	1
8	Expansion plug, 2-1/2" dia	3H-J8	--	1
	Expansion plug, 2-5/8" dia	--	4H-J8	1
9	Gurney thrust bearing, 13-B	3H-J9	--	1
	Gurney thrust bearing, 15-B	--	4H-J9	1
10	Elevating bevel gear	3H-J10	4H-J10	1
11	Elevating screw collar	3H-J11	--	1
12	Key	3H-J12	4H-J12	1
13	Elevating screw	3H-J13	4H-J13	1
14	Intake screen retaining plug washer	3H-J14	4H-J14	1
15	Oil intake screen, retaining plug and ring	3H-J15	4H-J15	1
16	Flat hd screw, 8-32 x 1/2"	3H-J16	--	3
	Flat hd screw, 8-32 x 3/8"	--	4H-J16	3
17	Elevating bevel gear cover	3H-J17	4H-J17	1
18	Fil hd screw, 3/4-16 x 1-3/8"	3H-J18	4H-J18	1
19	Elevating screw retainer	3H-J19	4H-J19	1
20	Elevating bevel gear bearing	3H-J20	4H-J20	1
21	Taper pin, #4 x 1-3/4"	3H-J21	4H-J21	2
22	Rapid traverse lever shifter arm	3H-J22	4H-J22	1
23	Rapid traverse lever shaft	3H-J23	4H-J23	1
24	Rapid traverse lever (rear)	3H-J24	4H-J24	1
25	Cup pt soc set screw, 5/16-18 x 1"	3H-J25	4H-J25	2
26	Vertical feed trip lever	3H-J26	4H-J26	1
27	Dog pt screw, 3/8-16 x 13/16"	3H-J27	4H-J27	1
28	Vertical feed trip lever shaft bushing	3H-J28	4H-J28	1
29	Hi-Pro key, HP-708	3H-J29	4H-J29	2
30	Vertical feed trip lever arm shaft	3H-J30	4H-J30	1
31	Cross feed trip lever	3H-J31	4H-J31	1
32	Fil hd screw, 1/4-20 x 1-1/16"	3H-J32	4H-J32	2
33	Cross feed lever shaft bushing	3H-J33	4H-J33	1
34	Cross feed trip lever arm shaft	3H-J34	4H-J34	1
35	Feed shifting fork pin	3H-J35	4H-J35	3
38	Primary shaft high speed shifter	3H-J38	4H-J38	1
39	Primary shifter rod	3H-J39	4H-J39	1
40	Taper pin, #4 x 1-7/8"	3H-J40	4H-J40	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
41	Knee clamp shaft collar	3H-J41	4H-J41	1
42	Knee clamp shaft	3H-J42	4H-J42	1
43	Fil hd screw, 3/8-16 x 1-1/4"	3H-J43	4H-J43	1
44	Knee clamp lever	3H-J44	4H-J44	1
45	Trip rod coupling	3H-J45	4H-J45	2
46	Taper pin, #4 x 1-7/16"	3H-J46	4H-J46	2
47	Vertical feed trip rod	3H-J47	4H-J47	1
48	Cross feed trip rod	3H-J48	4H-J48	1
49	Tertiary shaft shifting rod	3H-J49	4H-J49	2
50	Tertiary shaft high speed shifter	3H-J50	4H-J50	1
51	Tertiary shaft low speed shifter	3H-J51	4H-J51	1
52	Back gear shifter	3H-J52	4H-J52	1
53	Pin, 3/16 x 1"	3H-J53	4H-J53	2
54	Back gear shifter cam	3H-J54	4H-J54	1
55	Fil hd screw, 1/4-20 x 1/2"	3H-J55	4H-J55	4
56	Feed change shaft thrust plate	3H-J56	4H-J56	1
57	Hi-Pro key, HP-606	3H-J57	4H-J57	1
58	Feed change shaft	3H-J58	4H-J58	1
59	Feed change housing trip rod	3H-J59	4H-J59	2
60	Fil hd screw, 7/16-14 x 1"	3H-J60	4H-J60	2
61	Acme blue label dowel, 3/8 x 1-1/4"	3H-J61	4H-J61	1
62	Expansion plug, 1-3/8" dia	3H-J62	4H-J62	1
63	Feed change gear housing	3H-J63	4H-J63	1
64	Fil hd screw, 1/2-13 x 1-3/4"	3H-J64	4H-J64	1
65	Fil hd screw, 1/2-13 x 2-1/2"	3H-J65	--	4
	Fil hd screw, 1/2-13 x 3-5/8"	--	4H-J65	4
66	Acme blue label dowel, 3/8 x 1-3/4"	3H-J66	4H-J66	1
67	Section hd rivet, #5 x 7/8"	3H-J67	4H-J67	3
68	Secondary change intermittent gear	3H-J68	4H-J68	1
69	Intermittent gear (driver)	3H-J69	4H-J69	1
70	Shifting cam stud	3H-J70	4H-J70	3
71	Back gear shifter cam	3H-J71	4H-J71	1
72	Acme blue label dowel, 5/16 x 7/8"	3H-J72	4H-J72	1
73	Back gear shifter roller	3H-J73	4H-J73	1
74	Secondary shifter cam	3H-J74	4H-J74	1
75	Feed change helical gear (driver)	3H-J75	4H-J75	1
76	Feed change helical gear bearing	3H-J76	4H-J76	1
77	New Departure bearing, 3203	3H-J77	4H-J77	1
78	Feed change helical gear (driven)	3H-J78	4H-J78	1
79	Hi-Pro key, HP-705	3H-J79	4H-J79	1
80	Hi-Pro key, HP-806	3H-J80	4H-J80	1
81	Feed change cross shaft	3H-J81	4H-J81	1
82	Secondary shifter cam driving gear	3H-J82	4H-J82	1
83	Ball thrust bearing	3H-J83	4H-J83	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
84	Soc cap screw, 3/8 x 1-3/4"	3H-J84	--	3
	Soc cap screw, 3/8 x 1-1/2"	--	4H-J84	1
85	Soc cap screw, 3/8 x 2-1/2"	3H-J85	4H-J85	1
86	Feed selection cam housing (With standard table directional control machines)	3H-J86	4H-J86	1
	Feed selection cam housing (Automatic cycle machines)	3H-J86	4H-J86	1
87	Primary shifter cam driving gear stud	3H-J87	4H-J87	1
88	Primary shifter cam	3H-J88	4H-J88	1
89	Acme blue label dowel, 1/4 x 2"	3H-J89	--	2
	Acme blue label dowel, 1/4 x 1-1/2"	--	4H-J89	2
90	Primary shifter cam driving gear bushing	3H-J90	4H-J90	1
91	Primary shifter cam driving gear	3H-J91	4H-J91	1
92	Gib screw	3H-J92	4H-J92	1
93	Hex hd screw, 5/8-11 x 2-1/2"	3H-J93	--	2
	Hex hd screw, 5/8-11 x 2-3/4"	--	4H-J93	2
94	Hex hd screw, 5/8-11 x 2-5/16"	3H-J94	4H-J94	4
95	Knee gib support	3H-J95	4H-J95	1
96	Fil hd screw, 1/2-13 x 1-1/2"	3H-J96	4H-J96	1
97	Acme blue label dowel, 3/8 x 1-1/2"	3H-J97	4H-J97	1
98	Knee clamp shoe	3H-J98	4H-J98	1
99	Knee clamp pin	3H-J99	4H-J99	1
100	Knee gib	3H-J100	4H-J100	1
101	Rd hd mach screw, 10-32 x 3/8"	3H-J101	4H-J101	8
102	Column dovetail wiper spring (LH)	3H-J102	4H-J102	1
103	Column dovetail wiper (RH)	3H-J103	4H-J103	1
104	Wiper screw	3H-J104	4H-J104	*7
105	Wiper screw spring	3H-J105	4H-J105	*7
106	Column dovetail wiper spring (RH)	3H-J106	4H-J106	1
107	Column dovetail wiper (RH)	3H-J107	4H-J107	1
108	Column face bearing wiper	3H-J108	4H-J108	1
109	Column face bearing wiper spring	3H-J109	4H-J109	1
110	Knee (standard table directional control machines)	3H-J110	4H-J110	1
	Knee (automatic cycle machines)	3H-J110	4H-J110	1
111	Flat hd mach screw, 1/4-20 x 1/2"	3H-J111	4H-J111	4
112	Knee chip guard (machines with rear control)	3H-J112	4H-J112	1
	Knee chip guard (machines without rear control)	3H-J112	4H-J113	1

* 9 used on 4H machines



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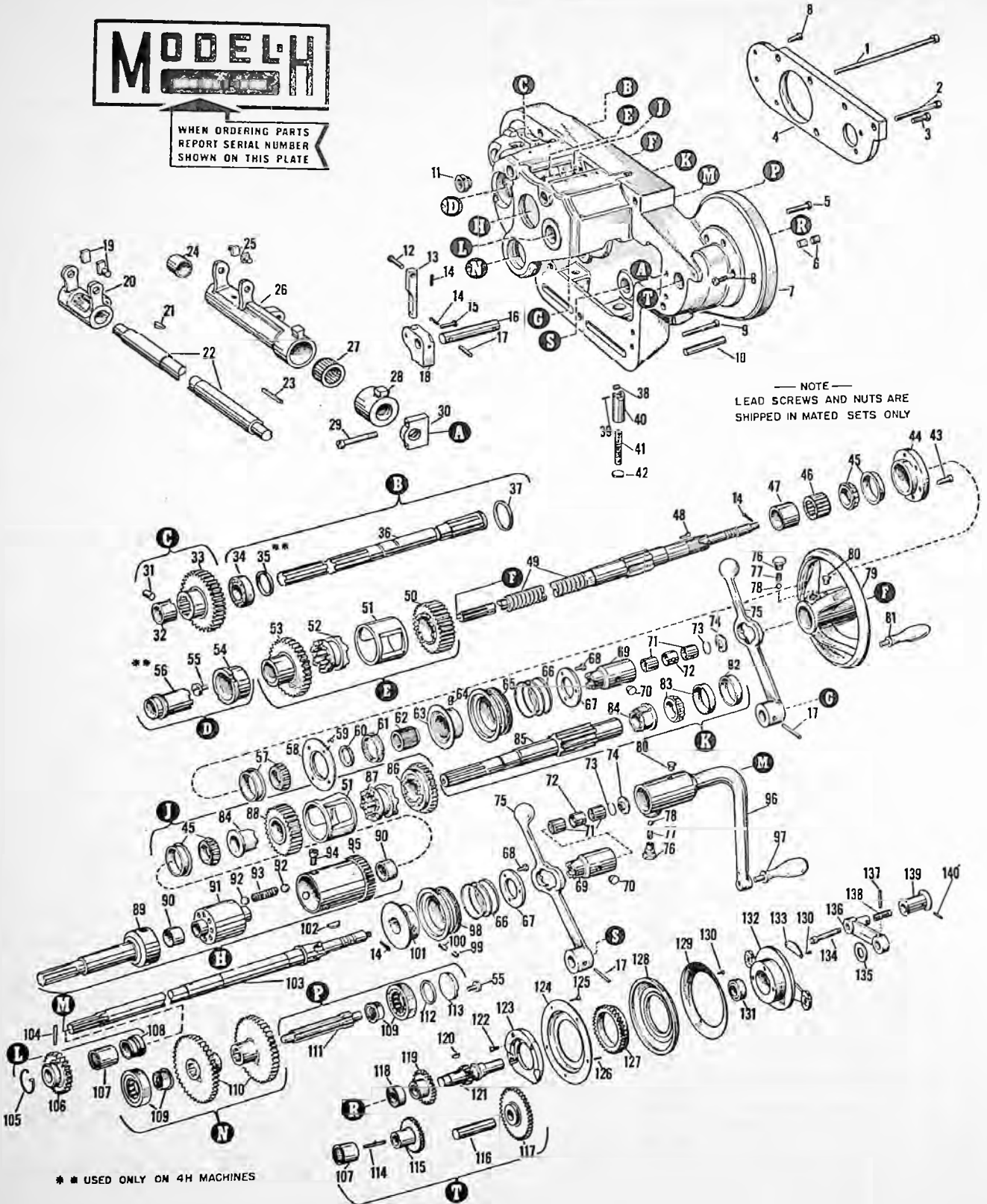


Figure 14. Feed Distribution Box

Figure 14. Feed Distribution Box

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
1	Soc cap screw, 1/2-13 x 8-1/4"	3H-K1	4H-K1	2
2	Soc cap screw, 1/2 x 3-1/4"	3H-K2	4H-K2	2
3	Fil hd screw, 3/8-16 x 21/32"	3H-K3	4H-K3	2
4	Feed distribution box dial plate	3H-K4	4H-K4	1
5	Soc cap screw, 1/2 x 1-3/4"	3H-K5	4H-K5	1
6	Special soc set screw	3H-K6	4H-K6	4
7	Feed distribution box	3H-K7	4H-K7	1
8	Fil hd screw, 3/8-16 x 7/8"	3H-K8	4H-K8	8
9	Soc cap screw, 1/2 x 2-3/4"	3H-K9	4H-K9	5
10	Acme blue label dowel, 1/2 x 3"	3H-K10	4H-K10	2
11	Spacing plug	3H-K11	4H-K11	2
12	Reverse lever link pin (upper)	3H-K12	4H-K12	2
13	Reverse lever link	3H-K13	4H-K13	2
14	Cotter pin, 3/32 x 3/4"	3H-K14	4H-K14	6
15	Reverse lever link pin, (lower)	3H-K15	4H-K15	2
16	Cross and elevating reverse lever shaft	3H-K16	4H-K16	2
17	Taper pin, #4 x 1-7/8"	3H-K17	4H-K17	2
18	Cross feed and elevating inner lever detent	3H-K18	4H-K18	2
19	Cross feed and elevating clutch fork shoe	3H-K19	4H-K19	2
20	Cross feed clutch fork	3H-K20	4H-K20	1
21	Hi-Pro key, HP-806	3H-K21	4H-K21	1
22	Cross feed clutch fork shaft	3H-K22	4H-K22	1
23	Key	3H-K23	4H-K23	1
24	Elevating clutch fork and trip segment bushing	3H-K24	4H-K24	1
25	Cross feed and elevating clutch fork shoe	3H-K25	4H-K25	2
26	Elevating clutch fork and trip segment	3H-K26	4H-K26	1
27	Hyatt bearing, 94620	3H-K27	4H-K27	1
28	Cross feed trip segment	3H-K28	4H-K28	1
29	Clutch fork shaft bearing screw	3H-K29	4H-K29	2
30	Clutch fork shaft bearing	3H-K30	4H-K30	1
31	Pin, 5/16 x 9/16"	3H-K31	4H-K31	1
32	Table feed shaft bearing	3H-K32	4H-K32	1
33	Table feed shaft drive gear	3H-K33	4H-K33	1
34	New Departure bearing, 1207	3H-K34	4H-K34	1
35	Collar	--	4H-K35	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
36	Table feed shaft (plain machines only)	3H-K36	4H-K36	1
	Table feed shaft (vertical machines only)	3H-K36	4H-K36	1
37	Table feed shaft bearing spacer	3H-K37	4H-K37	1
38	Detent plunger roller	3H-K38	4H-K38	2
39	Detent roller pin	3H-K39	4H-K39	2
40	Trip detent plunger	3H-K40	4H-K40	2
41	Spring	3H-K41	4H-K41	2
42	Detent lever plug	3H-K42	4H-K42	2
43	Soc cap screw, 5/16 x 3/4"	3H-K43	4H-K43	6
44	Cross feed screw bearing carrier	3H-K44	4H-K44	1
45	Timken bearing, 17244B-17119	3H-K45	4H-K45	2
46	Torrington bearing, B-2420	3H-K46	--	1
	Orange roller bearing, 7294	--	4H-K46	1
47	Roller bearing carrier	3H-K47	4H-K47	1
48	Key	3H-K48	4H-K48	1
49	Cross feed screw (machines without rear control)	3H-K49	4H-K49	1
	Cross feed screw (machines with rear control)	3H-K49	4H-K49	1
50	Cross feed clutch gear (front)	3H-K50	4H-K50	1
51	Clutch gear spacer	3H-K51	4H-K51	2
52	Cross feed reverse clutch	3H-K52	4H-K52	1
53	Cross feed clutch gear (rear)	3H-K53	4H-K53	1
54	Cross feed clutch gear bearing	3H-K54	4H-K54	1
55	Fil hd screw, 3/8-16 x 9/16"	3H-K55	4H-K55	4
56	Cross feed reverse clutch gear sleeve	--	4H-K56	1
57	Timken bearing, 17244B-17119W	3H-K57	4H-K57	1
58	Cross feed screw oil retainer	3H-K58	4H-K58	1
59	Flat hd screw, 8-32 x 1/2"	3H-K59	4H-K59	4
60	Cross feed screw bearing adjusting washer	3H-K60	4H-K60	1
61	Cross feed screw bearing adjusting ring	3H-K61	4H-K61	1
62	Cross feed screw bearing adjusting nut	3H-K62	4H-K62	1
63	Cross feed dial collar	3H-K63	4H-K63	1
64	Dowel pt screw, 5/16-18 x 1/2"	3H-K64	4H-K64	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
65	Serrated graduated dial (250 divisions)	3H-K65	4H-K65	1
66	Spring	3H-K66	4H-K66	2
67	Graduated dial spring retainer	3H-K67	4H-K67	2
68	Fil hd screw, 10-32 x 1/2"	3H-K68	4H-K68	6
69	Handwheel clutch	3H-K69	4H-K69	2
70	Plug	3H-K70	4H-K70	2
71	Torrington bearing, B-1210	3H-K71	4H-K71	4
72	Bearing spacer	3H-K72	4H-K72	2
73	Snap ring	3H-K73	4H-K73	2
74	Hand feed clutch stop	3H-K74	4H-K74	2
75	Cross and elevating reverse lever	3H-K75	4H-K75	2
76	Hand elevating crank set screw	3H-K76	4H-K76	2
77	Spring	3H-K77	4H-K77	2
78	Steel ball, 1/4" dia	3H-K78	4H-K78	2
79	Cross feed handwheel	3H-K79	4H-K79	1
80	Gits oiler, RS-532	3H-K80	4H-K80	2
81	Rockwood handle, #3QA	3H-K81	4H-K81	1
82	Elevating clutch shaft bearing spacer	3H-K82	4H-K82	1
83	Timken bearing, 17244-17119	3H-K83	4H-K83	1
84	Elevating clutch gear bushing	3H-K84	4H-K84	2
85	Elevating clutch shaft	3H-K85	4H-K85	1
86	Elevating clutch gear (front)	3H-K86	4H-K86	1
87	Elevating reverse clutch	3H-K87	4H-K87	1
88	Elevating clutch gear (rear)	3H-K88	4H-K88	1
89	Elevating slip clutch shaft	3H-K89	4H-K89	1
90	Elevating slip clutch hub bushing	3H-K90	4H-K90	2
91	Elevating slip clutch hub	3H-K91	4H-K91	1
92	Steel ball, 9/16" dia	3H-K92	4H-K92	**12
93	Spring	3H-K93	4H-K93	*6
94	Soc cap screw, 3/8-24 x 3/8"	3H-K94	4H-K94	3
95	Elevating slip clutch sleeve	3H-K95	4H-K95	1
96	Hand elevating crank	3H-K96	4H-K96	1
97	Rockwood handle #4QA	3H-K97	4H-K97	1
98	Serrated graduated dial (100 divisions)	3H-K98	4H-K98	1
99	Soc set screw, 1/4 x 1/4"	3H-K99	4H-K99	1
100	Soc dog pt screw, 1/4 x 5/16"	3H-K100	4H-K100	1
101	Elevating shaft dial collar	3H-K101	4H-K101	1
102	Hi-Pro key, HP-505	3H-K102	4H-K102	1
103	Hand elevating shaft (for machines without rear control)	3H-K103	4H-K103	1
	Hand elevating shaft (for machines with rear control)	3H-K103	4H-K103	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
104	Taper pin, #4 x 1-9/16"	3H-K104	4H-K104	1
105	Snap ring	3H-K105	4H-K105	1
106	Hand elevating gear	3H-K106	4H-K106	1
107	Torrington bearing, B-1616	3H-K107	4H-K107	2
108	Elevating shaft bearing (front)	3H-K108	4H-K108	1
109	Hyatt bearing, R-1305TS	3H-K109	4H-K109	2
110	Cross and elevating reverse gear	3H-K110	4H-K110	2
111	Cross and elevating reverse gear shaft	3H-K111	4H-K111	1
112	Bearing washer	3H-K112	4H-K112	1
113	Reverse gear shaft bearing cover	3H-K113	4H-K113	1
114	Key	3H-K114	4H-K114	1
115	Feed selection gear (driven)	3H-K115	4H-K115	1
116	Acme blue label dowel, 7/16 x 1-3/4"	3H-K116	4H-K116	1
117	Feed dial idler gear	3H-K117	4H-K117	1
118	New Departure bearing, 1203	3H-K118	4H-K118	1
119	Feed selection gear (driver)	3H-K119	4H-K119	1
120	Hi-Pro key, HP-404	3H-K120	4H-K120	1
121	Feed dial pinion shaft	3H-K121	4H-K121	1
122	Fil hd screw, 5/16-18 x 9/16"	3H-K122	4H-K122	3
123	Dial support ring	3H-K123	4H-K123	1
124	Grease shield	3H-K124	4H-K124	1
125	Flat hd screw, 8-32 x 3/8"	3H-K125	4H-K125	5
126	Pin	3H-K126	4H-K126	2
127	Feed dial carrier gear	3H-K127	4H-K127	1
128	Feed dial carrier	3H-K128	4H-K128	1
129	Feed dial (3/8-90 feed range)	3H-K129	4H-K129	1
130	Escutcheon pin, #15	3H-K130	4H-K130	18
131	New Departure bearing, 88503	3H-K131	4H-K131	1
132	Feed dial support bracket	3H-K132	4H-K132	1
133	Feed indicator plate	3H-K133	4H-K133	1
134	Lever plunger	3H-K134	4H-K134	1
135	Dial support washer	3H-K135	4H-K135	1
136	Feed dial lever	3H-K136	4H-K136	1
137	Taper pin, #3 x 1-5/8"	3H-K137	4H-K137	1
138	Spring	3H-K138	4H-K138	1
139	Lever knob	3H-K139	4H-K139	1
140	Taper pin, #2 x 1"	3H-K140	4H-K140	1

* 18 used on 4H machines
** 8 used on 4H machines

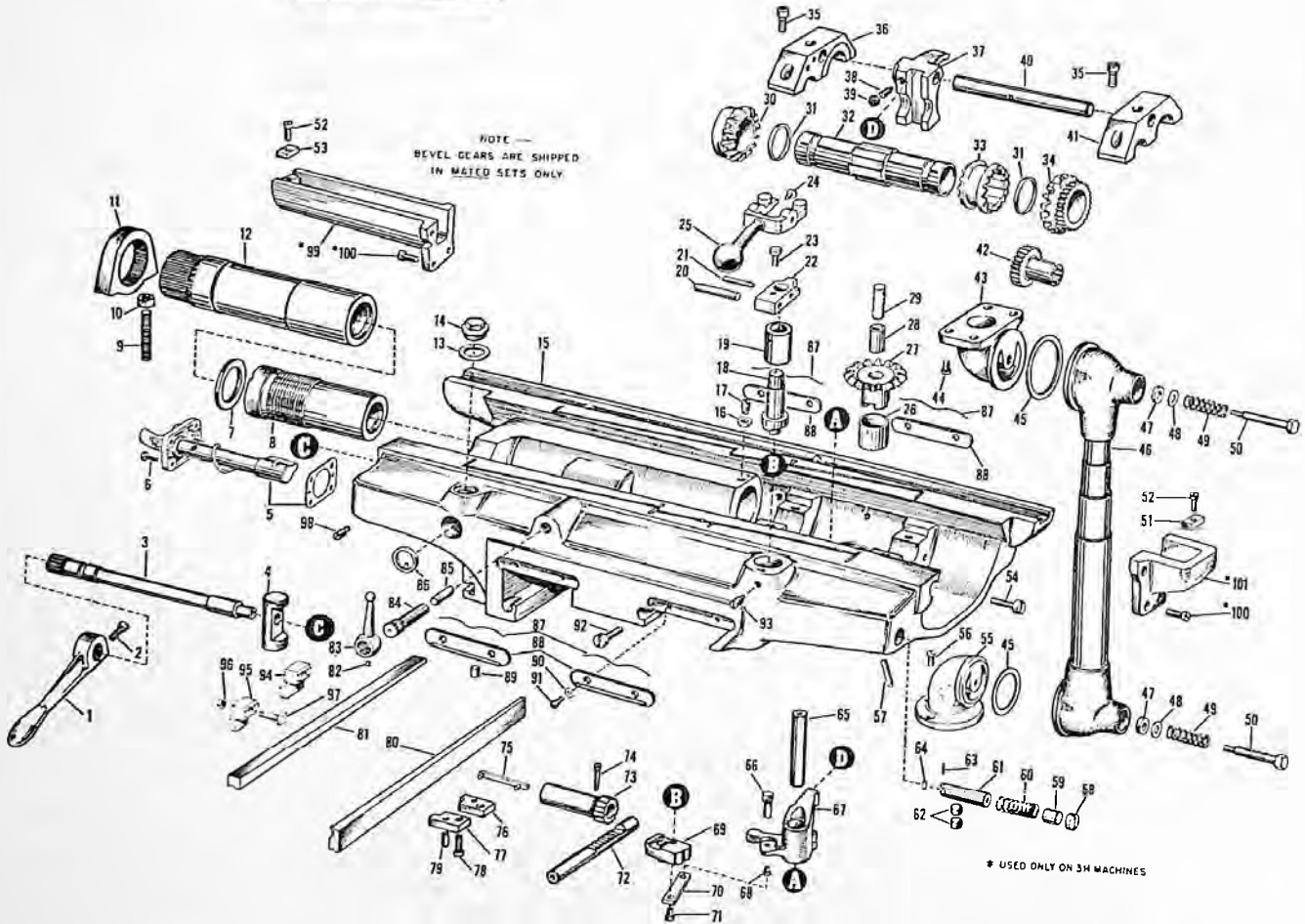
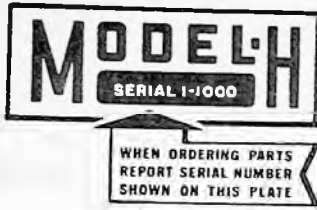


Figure 15. Plain Saddle

Replacement Parts Manual

Milling Machines — Plain, Universal and Vertical

Figure 15. Plain Saddle

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
1	Saddle clamp handle	3H-L1	4H-L1	1
2	Fil hd screw, 3/8-16 x 7/8"	3H-L2	4H-L2	1
3	Saddle clamp eccentric	3H-L3	4H-L3	1
4	Saddle clamp	3H-L4	4H-L4	1
5	Bijur KIB lubricator pump, 1" stroke, C-1957	3H-L5	4H-L5	1
6	Soc cap screw, 1/4-20 x 3/4"	3H-L6	4H-L6	4
7	Table nut spacer	3H-L7	4H-L7	1
8	Table nut	3H-L8	4H-L8	1
9	Soc hd oval point set screw, 1/2-13 x 3"	3H-L9	4H-L9	2
10	Hex nut, 1/2-13	3H-L10	4H-L10	2
11	Adjusting nut yoke	3H-L11	4H-L11	1
12	Adjusting table screw nut	3H-L12	4H-L12	1
13	Washer	3H-L13	4H-L13	1
14	Oil hole plug screw	3H-L14	4H-L14	1
15	Plain saddle	3H-L15	4H-L15	1
16	Hex nut, 3/8-16	3H-L16	4H-L16	1
17	Dog point screw, 3/8-16 x 7/8"	3H-L17	4H-L17	1
18	Table trip lever shaft	3H-L18	4H-L18	1
19	Table trip lever shaft bearing	3H-L19	4H-L19	1
20	Acme blue label dowel, 3/8 x 2-1/2"	3H-L20	4H-L20	1
21	Taper pin, #5 x 1-3/8"	3H-L21	4H-L21	1
22	Table trip lever block	3H-L22	4H-L22	1
23	Table trip lever block screw	3H-L23	4H-L23	1
24	Table trip lever fork pin	3H-L24	4H-L24	1
25	Table trip lever	3H-L25	4H-L25	1
26	Table drive bevel gear bearing	3H-L26	4H-L26	1
27	Table drive bevel gear	3H-L27	4H-L27	1
28	Table drive gear plug	3H-L28	4H-L28	1
29	Table drive gear felt	3H-L29	4H-L29	1
30	Table screw clutch gear	3H-L30	4H-L30	1
31	Clutch gear collar	3H-L31	4H-L31	2
32	Feed reverse gear sleeve	3H-L32	4H-L32	1
33	Table feed reverse clutch	3H-L33	4H-L33	1
34	Table screw clutch gear	3H-L34	4H-L34	1
35	Soc cap screw, 7/16-14 x 7/8"	3H-L35	--	6
	Soc cap screw, 7/16-14 x 1-1/4"	--	4H-L35	6
36	Bearing cap (LH)	3H-L36	4H-L36	1
37	Clutch shifter yoke	3H-L37	4H-L37	1
38	Dog pt set screw, 3/8-16 x 15/16"	3H-L38	--	1
	Dog pt set screw, 3/8-16 x 1-3/16"	--	4H-L38	1
39	Hex nut, 3/8-16	3H-L39	4H-L39	1
40	Shifter yoke rod	3H-L40	4H-L40	1
41	Bearing cap (RH)	3H-L41	4H-L41	1
42	Auxiliary drive shaft gear	3H-L42	4H-L42	1
43	Saddle coolant return elbow	3H-L43	4H-L43	1
44	Fil hd screw, 3/8-16 x 13/16"	3H-L44	4H-L44	4
45	Coolant fitting washer	3H-L45	4H-L45	2
46	Telescopic coolant return assembly	3H-L46	4H-L46	1
47	Coolant fitting washer	3H-L47	4H-L47	2
48	Coolant fitting washer	3H-L48	4H-L48	2

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
49	Spring	3H-L49	4H-L49	2
50	Coolant fitting screw	3H-L50	4H-L50	2
51	Coolant pocket block (RH)	3H-L51	4H-L51	1
52	Fil hd screw, 5/16-18 x 9/16"	3H-L52	4H-L52	2
53	Coolant pocket block	3H-L53	4H-L53	1
54	Gib screw, 3/8-16 x 1-1/2"	3H-L54	--	2
	Gib screw, 1/2-13 x 1-1/2"	--	4H-L54	2
55	Coolant return elbow	3H-L55	4H-L55	1
56	Fil hd screw, 1/2-13 x 15/16"	3H-L56	4H-L56	3
57	Pin, 1/4 x 1-3/8"	3H-L57	4H-L57	1
58	Plug	3H-L58	4H-L58	1
59	Spring spacer	3H-L59	4H-L59	1
60	Spring	3H-L60	4H-L60	1
61	Table trip detent plunger	3H-L61	4H-L61	1
62	Special soc set screw	3H-L62	4H-L62	2
63	Detent plunger roller pin	3H-L63	4H-L63	1
64	Detent plunger roller	3H-L64	4H-L64	1
65	Clutch shifter arm stud	3H-L65	4H-L65	1
66	Reverse shifter arm stop pin	3H-L66	4H-L66	1
67	Reverse shifter yoke arm	3H-L67	4H-L67	1
68	Link pin, short	3H-L68	4H-L68	1
69	Table trip lever detent	3H-L69	4H-L69	1
70	Table trip lever link	3H-L70	4H-L70	1
71	Link pin (long)	3H-L71	4H-L71	1
72	Release shaft gear rack	3H-L72	4H-L72	1
73	Handwheel release shaft gear	3H-L73	4H-L73	1
74	Headless dowel screw	3H-L74	4H-L74	1
75	Key	3H-L75	4H-L75	1
76	Saddle limit stop (rear)	3H-L76	4H-L76	1
77	Saddle limit stop (front)	3H-L77	4H-L77	1
78	Fil hd screw, 3/8-16 x 3/4"	3H-L78	4H-L78	2
79	Acme blue label dowel, 5/16 x 3/4"	3H-L79	4H-L79	2
80	Saddle gibs	3H-L80	4H-L80	1
81	Saddle gibs	3H-L81	4H-L81	1
82	Soc set screw, 1/4 x 1/4"	3H-L82	4H-L82	1
83	Clamp lever	3H-L83	4H-L83	1
84	Clamp screw	3H-L84	4H-L84	1
85	Table clamp plug	3H-L85	4H-L85	1
86	Bijur oil window, B-4904	3H-L86	4H-L86	1
87	Spring	3H-L87	4H-L87	4
88	Knee top bearing wiper	3H-L88	4H-L88	4
89	Pipe plug, 3/4"	3H-L89	--	1
	Pipe plug, 1/2"	--	4H-L89	1
90	Spring	3H-L90	4H-L90	8
91	Wiper screw	3H-L91	4H-L91	8
92	Gib screw, 3/8-16 x 1/2"	3H-L92	4H-L92	4
93	Dog pt screw, 3/8-16 x 3/4"	3H-L93	--	1
	Dog pt screw, 3/8-16 x 15/16"	--	4H-L93	1
94	Trip dog (rear)	3H-L94	4H-L94	1
95	Trip dog (front)	3H-L95	4H-L95	1
96	Hex nut, 7/16-14	3H-L96	4H-L96	2
97	Trip dog screw, 7/16-14 x 1-3/4"	3H-L97	4H-L97	2
98	Dog pt screw	3H-L98	4H-L98	1
99	Saddle extension (LH)	3H-L99	4H-L99	1
100	Fil hd screw	3H-L100	4H-L100	*6
101	Saddle extension (RH)	3H-L101	--	1

* Only 3 used on 4H machines

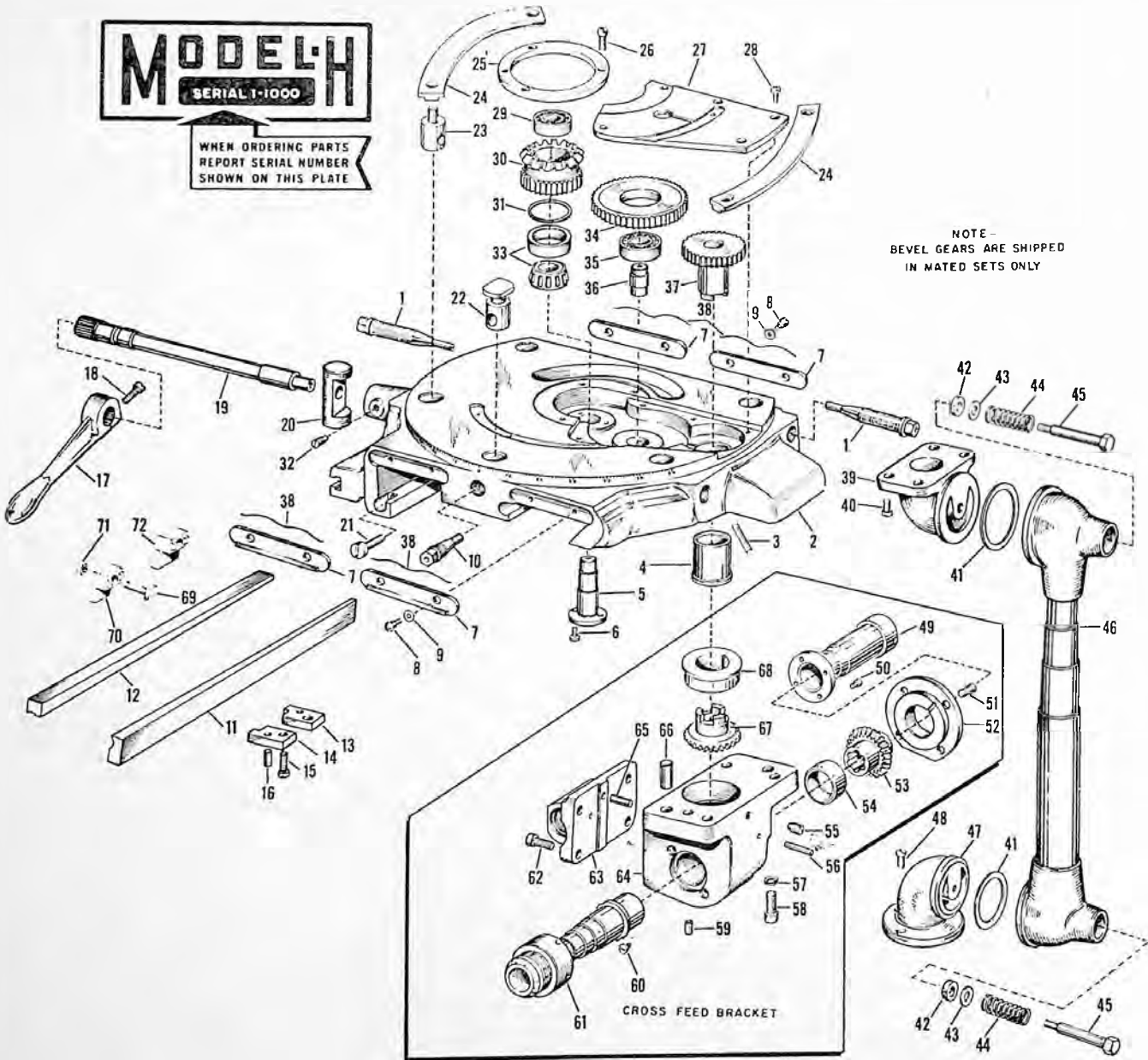


Figure 16. Universal Saddle and Cross Feed Bracket

Replacement Parts Manual

Milling Machines — Plain, Universal and Vertical

Figure 16. Universal Saddle and Cross Feed Bracket

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
1	Clamp screw (long)	3H-M1	4H-M1	4
2	Universal saddle	3H-M2	4H-M2	1
3	Pin, 1/4 x 1-3/8"	3H-M3	4H-M3	1
4	Table drive gear bearing	3H-M4	4H-M4	1
5	Table drive level gear stud	3H-M5	4H-M5	1
6	Fil hd screw, 5/16-18 x 9/16"	3H-M6	4H-M6	2
7	Knee top bearing wiper	3H-M7	4H-M7	4
8	Wiper screw	3H-M8	4H-M8	8
9	Spring	3H-M9	4H-M9	8
10	Clamp screw (short)	3H-M10	4H-M10	1
11	Saddle gib	3H-M11	4H-M11	1
12	Saddle gib	3H-M12	4H-M12	1
13	Saddle limit stop (rear)	3H-M13	4H-M13	1
14	Saddle limit stop (front)	3H-M14	4H-M14	1
15	Fil hd screw, 3/8-16 x 3/4"	3H-M15	4H-M15	2
16	Acme blue label dowel, 5/16 x 3/4"	3H-M16	4H-M16	2
17	Saddle clamp handle	3H-M17	4H-M17	1
18	Fil hd screw, 3/8-16 x 1-3/8"	3H-M18	4H-M18	1
19	Saddle clamp eccentric shaft	3H-M19	4H-M19	1
20	Saddle clamp	3H-M20	4H-M20	1
21	Gib screw, 3/8-16 x 1-1/2"	3H-M21	4H-M21	4
22	Swivel block clamp	3H-M22	4H-M22	1
23	Swivel block clamp bolt	3H-M23	4H-M23	4
24	Swivel block clamp ring	3H-M24	4H-M24	2
25	Universal saddle ring	3H-M25	4H-M25	1
26	Fil hd screw, 5/16-18 x 3/4"	3H-M26	--	1
	Fil hd screw, 3/8-16 x 7/8"	--	4H-M26	3
27	Universal saddle cover	3H-M27	4H-M27	1
28	Fil hd screw, 5/16-18 x 11/16"	3H-M28	4H-M28	4
29	New Departure bearing, 1204	3H-M29	--	1
	New Departure bearing, 1206	--	4H-M29	1
30	Table drive bevel gear	3H-M30	4H-M30	1
31	Bevel gear adjusting washer	3H-M31	4H-M31	1
32	Dog point set screw, 3/8-16 x 13/16"	3H-M32	--	1
	Dog point set screw, 3/8-16 x 7/8"	--	4H-M32	1
33	Timken bearing, 1779-1729	3H-M33	--	1
	Timken bearing, 26126-26274	--	4H-M33	1
34	Table drive idler gear	3H-M34	4H-M34	1
35	New Departure bearing 1205	3H-M35	--	1
	New Departure bearing 1207	--	4H-M35	1
36	Table drive idler gear stud	3H-M36	4H-M36	1
37	Table drive gear	3H-M37	4H-M37	1
38	Wiper spring	3H-M38	4H-M38	4
39	Coolant return elbow	3H-M39	4H-M39	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
40	Fil hd screw, 3/8-16 x 13/16"	3H-M40	4H-M40	4
41	Coolant fitting washer	3H-M41	4H-M41	2
42	Coolant fitting washer	3H-M42	4H-M42	2
43	Coolant fitting washer, 5/8"	3H-M43	4H-M43	2
44	Spring	3H-M44	4H-M44	2
45	Coolant fitting screw	3H-M45	4H-M45	2
46	Telescopic coolant return assembly	3H-M46	4H-M46	1
47	Coolant return elbow	3H-M47	4H-M47	1
48	Fil hd screw, 1/2-13 x 15/16"	3H-M48	4H-M48	3
49	Rear telescopic tube assembly	3H-M49	4H-M49	1
50	Fil hd screw, 10-32 x 15/16"	3H-M50	4H-M50	4
51	Fil hd screw, 3/8-16 x 13/16"	3H-M51	4H-M51	4
52	Table feed sliding bevel gear bearing	3H-M52	4H-M52	1
53	Table feed sliding bevel gear	3H-M53	4H-M53	1
54	Table feed sliding bevel gear bearing	3H-M54	4H-M54	1
55	Dog point screw, 3/8-16 x 7/8"	3H-M55	4H-M55	1
56	Pin, 1/4 x 1-3/8"	3H-M56	--	1
	Pin, 3/16 x 1-1/8"	--	4H-M56	1
57	Lockwasher, 1/2"	3H-M57	4H-M57	4
58	Allen cap screw, 1/2 x 1-1/4"	3H-M58	4H-M58	4
59	Coolant drip spout	3H-M59	4H-M59	1
60	Fil hd screw, 5/16-18 x 5/8"	3H-M60	4H-M60	2
61	Front telescopic tube assembly	3H-M61	4H-M61	1
62	Hex hd screw, 7/16-14 x 1-1/8"	3H-M62	--	4
	Allen cap screw, 7/16 x 1"	--	4H-M62	4
63	Cross feed nut	3H-M63	4H-M63	1
64	Cross feed bracket	3H-M64	4H-M64	1
65	Acme blue label dowel, 3/8 x 1"	3H-M65	--	1
	Acme blue label dowel, 3/8 x 1-1/2"	--	4H-M65	1
66	Acme blue label dowel, 5/8 x 1-1/2"	3H-M66	--	2
	Acme blue label dowel, 5/8 x 1-5/8"	--	4H-M66	2
67	Table feed drive bevel gear	3H-M67	4H-M67	1
68	Cross feed bracket bearing sleeve	3H-M68	4H-M68	1
69	Trip dog screw, 7/16-14 x 1-3/4"	3H-M69	4H-M69	2
70	Cross and elevating trip dog (front)	3H-M70	4H-M70	1
71	Hex nut, 7/16-14	3H-M71	4H-M71	2
72	Cross and elevating trip dog (rear)	3H-M72	4H-M72	1



WHEN ORDERING PARTS
REPORT SERIAL NUMBER
SHOWN ON THIS PLATE

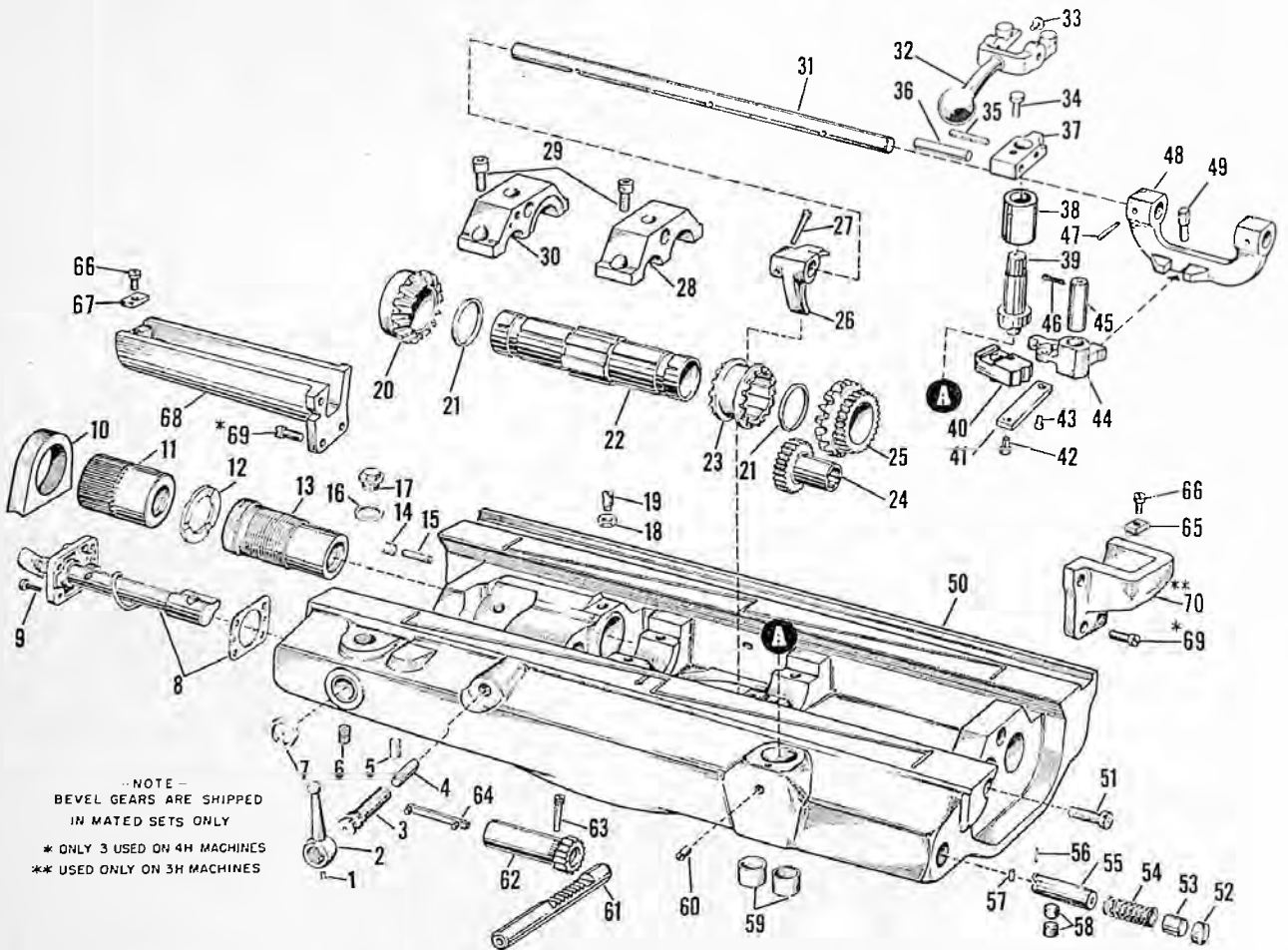


Figure 17. Universal Swivel Block

Figure 17. Universal Swivel Block

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
1	Allen set screw, 1/4 x 1/4"	3H-N1	4H-N1	1
2	Clamp lever	3H-N2	4H-N2	1
3	Clamp screw	3H-N3	4H-N3	1
4	Table clamp plug	3H-N4	4H-N4	1
5	Oval hd soc set screw, 1/2-13 x 1-3/8"	3H-N5	--	1
	Oval hd soc set screw, 1/2-13 x 1-3/4"	--	4H-N5	1
6	Pipe plug, 3/4"	3H-N6	--	1
	Soc pipe plug, 1/2"	--	4H-N6	1
7	Bijur oil window, B-4904	3H-N7	4H-N7	1
8	Bijur KIB lubricator pump (1" stroke), C-1957	3H-N8	4H-N8	1
9	Soc hd cap screw, 1/4-20 x 3/4"	3H-N9	4H-N9	4
10	Nut adjusting yoke	3H-N10	4H-N10	1
11	Table screw adjusting nut	3H-N11	4H-N11	1
12	Table nut spacer	3H-N12	4H-N12	1
13	Table screw nut	3H-N13	4H-N13	1
14	Flat pt soc set screw, 3/8-16 x 3/4"	3H-N14	4H-N14	2
15	Yoke lock screw plug	3H-N15	4H-N15	2
16	Fiber washer	3H-N16	4H-N16	1
17	Oil hole plug screw	3H-N17	4H-N17	1
18	Hex nut	3H-N18	4H-N18	1
19	Dog pt set screw	3H-N19	4H-N19	1
20	Table screw clutch gear	3H-N20	4H-N20	1
21	Clutch gear collar	3H-N21	4H-N21	2
22	Feed reverse gear sleeve	3H-N22	4H-N22	1
23	Table feed reverse clutch	3H-N23	4H-N23	1
24	Auxiliary drive shaft gear	3H-N24	4H-N24	1
25	Table screw clutch gear	3H-N25	4H-N25	1
26	Clutch shifter	3H-N26	4H-N26	1
27	Taper pin screw	3H-N27	4H-N27	1
28	Bearing cap (RH)	3H-N28	4H-N28	1
29	Soc hd cap screw, 7/16-14 x 7/8"	3H-N29	--	6
	Soc hd cap screw, 7/16-14 x 1-1/4"	--	4H-N29	6
30	Bearing cap (LH)	3H-N30	4H-N30	1
31	Reverse clutch shifter shaft	3H-N31	4H-N31	1
32	Table trip lever	3H-N32	4H-N32	1
33	Table trip lever fork pin	3H-N33	4H-N33	1
34	Table trip lever block screw	3H-N34	4H-N34	1
35	Taper pin, #5 x 1-3/4"	3H-N35	4H-N35	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
36	Acme blue label dowel, 3/8 x 2-1/2"	3H-N36	4H-N36	1
37	Table trip lever block	3H-N37	4H-N37	1
38	Table trip lever shaft bushing	3H-N38	4H-N38	1
39	Table trip lever shaft	3H-N39	4H-N39	1
40	Table trip lever detent	3H-N40	4H-N40	1
41	Table trip lever link	3H-N41	4H-N41	1
42	Link pin (long)	3H-N42	4H-N42	1
43	Link pin (short)	3H-N43	4H-N43	1
44	Reverse shifter yoke arm	3H-N44	4H-N44	1
45	Clutch shifter arm stud	3H-N45	4H-N45	1
46	Cotter pin, 1/8 x 1"	3H-N46	4H-N46	1
47	Taper pin, #4 x 1-3/8"	3H-N47	--	2
	Taper pin, #4 x 1-1/4"	--	4H-N47	2
48	Reverse clutch shifter yoke	3H-N48	4H-N48	1
49	Clutch shifter yoke stop pin	3H-N49	4H-N49	1
50	Universal swivel block	3H-N50	4H-N50	1
51	Fil hd screw, 3/8-16 x 1-1/2"	3H-N51	--	2
	Fil hd screw, 1/2-13 x 1-1/2"	--	4H-N51	2
52	Plug	3H-N52	4H-N52	1
53	Spring spacer	3H-N53	4H-N53	1
54	Spring	3H-N54	4H-N54	1
55	Table trip detent plunger	3H-N55	4H-N55	1
56	Detent roller pin	3H-N56	4H-N56	1
57	Detent plunger roller	3H-N57	4H-N57	1
58	Special soc set screw	3H-N58	4H-N58	2
59	Coolant return tube	3H-N59	4H-N59	2
60	Headless dog pt set screw, 3/8-16 x 13/16"	3H-N60	--	1
	Headless dog pt set screw, 3/8-16 x 15/16"	--	4H-N60	1
61	Release shaft gear rack	3H-N61	4H-N61	1
62	Handwheel release shaft gear	3H-N62	4H-N62	1
63	Headless dowel screw	3H-N63	4H-N63	1
64	Key	3H-N64	4H-N64	1
65	Coolant pocket block (RH)	3H-N65	4H-N65	1
66	Fil hd screw, 5/16-18 x 9/16"	3H-N66	4H-N66	2
67	Coolant pocket block (LH)	3H-N67	4H-N67	1
68	Saddle extension (LH)	3H-N68	4H-N68	1
69	Fil hd screw	3H-N69	4H-N69	*6
70	Saddle extension (RH)	3H-N70	--	1

*3 Used on 4H machines only

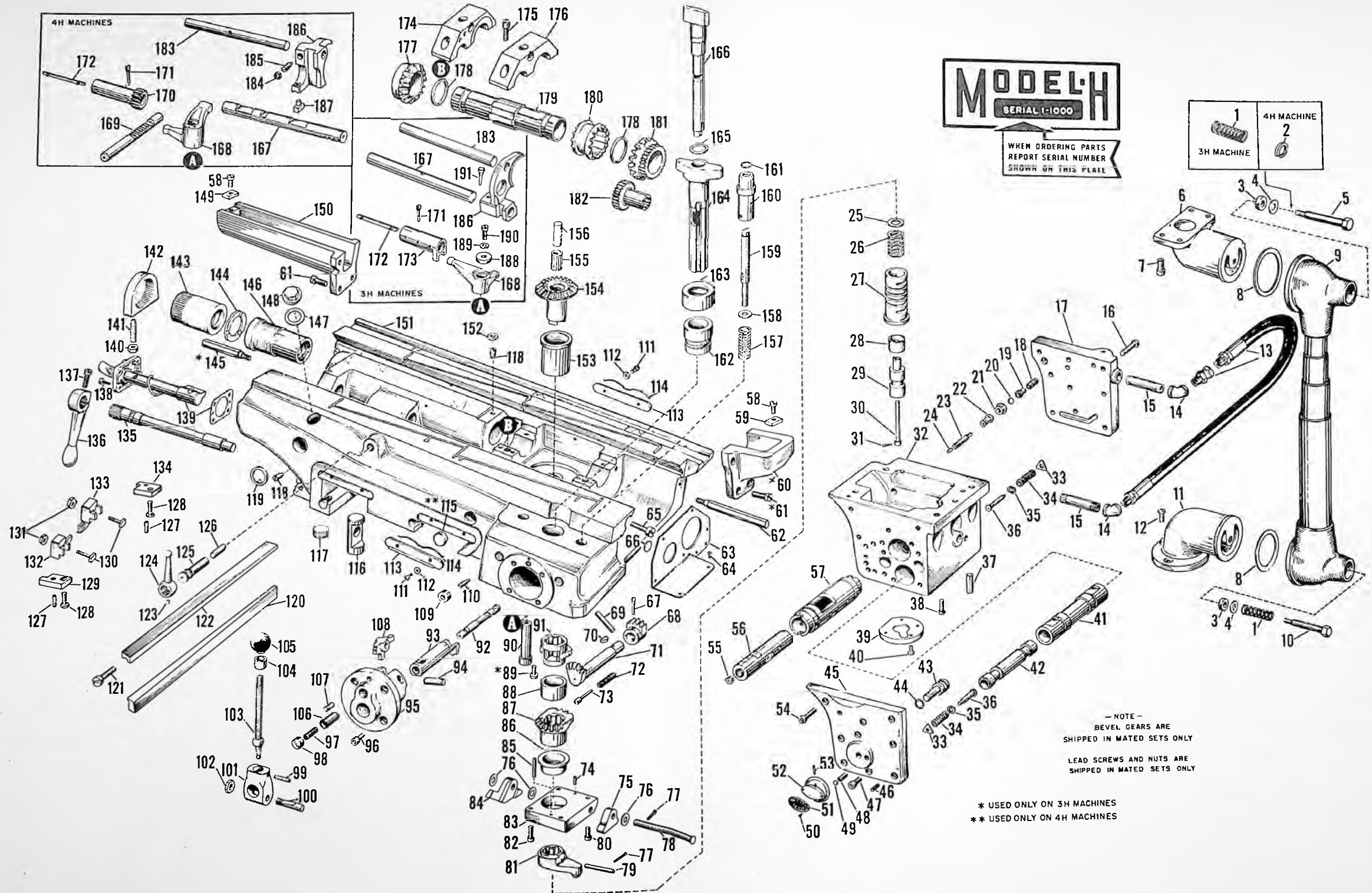
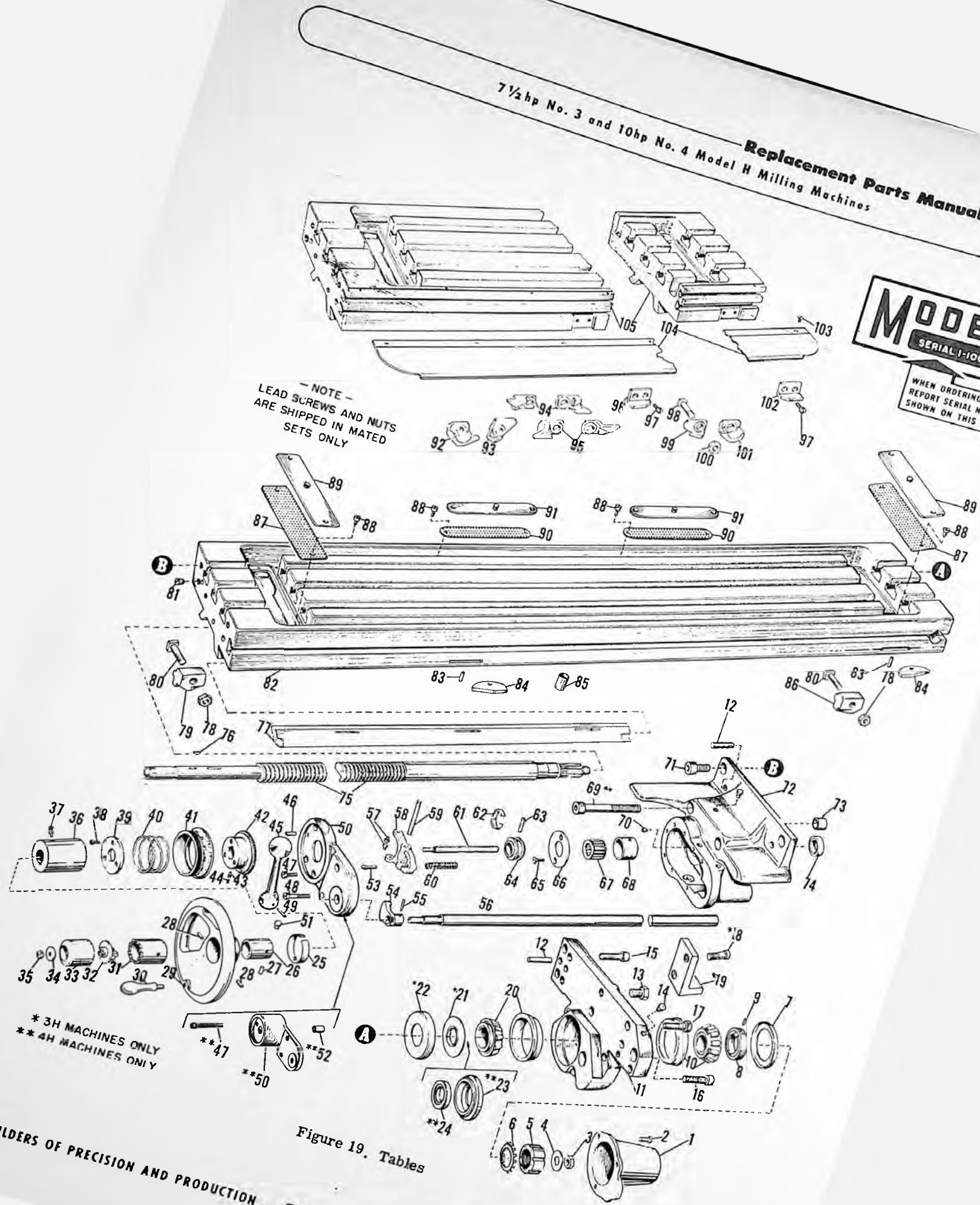


Figure 18. Automatic Cycle Plain Saddle and Hydraulic Valve Body



— NOTE —
LEAD SCREWS AND NUTS
ARE SHIPPED IN MATED
SETS ONLY

WHEN ORDERING PARTS
REPORT SERIAL NUMBER
SHOWN ON THIS PLATE

BUILDERS OF PRECISION AND PRODUCTION



MACHINE TOOLS FOR MILLING AND BORING

Figure 19. Tables

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
1	Table bracket cover (RH)	3H-Q1	4H-Q1	1
2	Fil hd screw, 5/16-18 x 11/16"	3H-Q2	--	3
	Fil hd screw, 5/16-18 x 9/16"	--	4H-Q2	3
3	Hex nut, 1/2-13"	3H-Q3	4H-Q3	1
4	Washer, 1/2"	3H-Q4	--	1
	Washer, 1/2"	--	4H-Q4	1
5	Bearing adjusting nut	3H-Q5	4H-Q5	1
6	Lockwasher, Timken 3809	3H-Q6	--	1
	Lockwasher, #7	--	4H-Q6	1
7	Bearing cover	3H-Q7	4H-Q7	1
8	Bearing clutch collar	3H-Q8	4H-Q8	1
9	Pin	3H-Q9	--	1
	Pin, 1/4 x 5/8"	--	4H-Q9	1
10	Timken bearing, 41286B-41125W	3H-Q10	--	1
	Timken bearing, 44348B-44143W	--	4H-Q10	1
11	Table bracket (RH)	3H-Q11	4H-Q11	1
12	Acme Blue Label dowel, 3/8 x 1-1/2"	3H-Q12	--	4
	Acme Blue Label dowel, 1/2 x 1-3/4"	--	4H-Q12	4
13	Table bracket plug	3H-Q13	4H-Q13	1
14	Gits oiler, RS533	3H-Q14	4H-Q14	2
15	Soc hd cap screw, 1/2 x 1-1/2"	3H-Q15	--	2
	Soc hd cap screw, 5/8 x 1-1/2"	--	4H-Q15	2
16	Soc hd cap screw, 1/2-13 x 1-1/2"	3H-Q16	--	2
	Soc hd cap screw, 5/8-13 x 1-1/2"	--	4H-Q16	2
17	Hex hd cap screw, 1/2-13 x 1-7/8"	3H-Q17	--	4
	Hex hd cap screw, 5/8-11 x 1-7/8"	--	4H-Q17	3
18	Fil hd screw, 1/2-13 x 13/16"	3H-Q18	--	2
19	Saddle extension cover	3H-Q19	--	1
20	Timken bearing, 41286B-41125	3H-Q20	--	1
	Timken bearing, 44348B-44143	--	4H-Q20	1
21	Grease retainer	3H-Q21	--	1
22	Bearing cover	3H-Q22	--	1
23	Oil seal carrier	--	4H-Q23	1
24	Gits oil seal, O. S. 1750	--	4H-Q24	1
25	Snap ring	3H-Q25	4H-Q25	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
26	Handwheel bushing	3H-Q26	4H-Q26	1
27	Handwheel retaining pin	3H-Q27	4H-Q27	1
28	Pin	3H-Q28	4H-Q28	2
29	Handwheel	3H-Q29	4H-Q29	1
30	Rockwood handle, #3QA	3H-Q30	4H-Q30	1
31	Clutch in handwheel	3H-Q31	4H-Q31	1
32	Handwheel clutch	3H-Q32	4H-Q32	1
33	Handwheel clutch knob	3H-Q33	4H-Q33	1
34	Clutch washer	3H-Q34	4H-Q34	1
35	Hex nut, 5/16-24"	3H-Q35	4H-Q35	1
36	Graduated dial spacer	3H-Q36	4H-Q36	1
37	Soc dog pt set screw, 5/16 x 5/8"	3H-Q37	4H-Q37	1
38	Fil hd screw, 10-32 x 1/2"	3H-Q38	4H-Q38	3
39	Graduated dial spring retainer	3H-Q39	4H-Q39	1
40	Spring	3H-Q40	4H-Q40	1
41	Graduated dial	3H-Q41	4H-Q41	1
42	Serrated dial collar	3H-Q42	4H-Q42	1
43	Dog pt set screw, 1/4-20 x 1/2"	3H-Q43	4H-Q43	1
44	Soc set screw, 1/4-20 x 1/4"	3H-Q44	4H-Q44	1
45	Table reverse lever	3H-Q45	4H-Q45	1
46	Acme Blue Label dowel, 1/4 x 1/2"	3H-Q46	4H-Q46	1
47	Fil hd screw, 5/16-18 x 11/16"	3H-Q47	--	4
	Fil hd screw, 5/16-18 x 3-3/4"	--	4H-Q47	3
48	Fil hd screw, 5/16-18 1-1/4"	3H-Q48	4H-Q48	2
49	Taper pin, #2 x 1-3/8"	3H-Q49	4H-Q49	1
50	Table bracket cover (LH)	3H-Q50	4H-Q50	1
51	Gits oiler, RS532	3H-Q51	4H-Q51	1
52	Oilite bearing, A-1110-1	--	4H-Q52	1
53	Clutch release yoke pin	3H-Q53	4H-Q53	2
54	Clutch release cam	3H-Q54	4H-Q54	1
55	Taper pin, #2 x 7/8"	3H-Q55	4H-Q55	1
56	Handwheel release shaft	3H-Q56	4H-Q56	1
57	Shifter yoke pin	3H-Q57	4H-Q57	2
58	Clutch release yoke	3H-Q58	4H-Q58	1
59	Clutch release yoke shaft	3H-Q59	4H-Q59	1
60	Spring (Not used in Auto-cycle mach)	3H-Q60	4H-Q60	1
61	Clutch release rod	3H-Q61	4H-Q61	1
62	Snap ring	3H-Q62	4H-Q62	1
63	Clutch release rod pin	3H-Q63	4H-Q63	1
64	Clutch release plate	3H-Q64	4H-Q64	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
65	Flat hd mach screw, 1/4-20 x 5/8"	3H-Q65	--	2
	Fil hd screw, 10-32 x 1/2"	--	4H-Q65	2
66	Bearing retainer	3H-Q66	4H-Q66	1
67	Hyatt bearing, 94516	3H-Q67	4H-Q67	1
68	Bearing race	3H-Q68	4H-Q68	1
69	Soc cap screw, 5/8 x 5"	--	4H-Q69	2
70	Cone pt pin	3H-Q70	4H-Q70	1
71	Fil hd screw, 1/2-13 x 1-1/4"	3H-Q71	--	4
	Soc hd cap screw, 5/8-11 x 1-1/2"	--	4H-Q71	2
72	Table bracket (LH)	3H-Q72	4H-Q72	1
73	Oilite bearing, A-1203	3H-Q73	4H-Q73	1
74	Gits oil seal, O. S. -1000	3H-Q74	--	1
	Gits oil seal, O. S. -1250	--	4H-Q74	1
75	Table screw	3H-Q75	4H-Q75	1
76	Hi-pro key, HP-606	3H-Q76	4H-Q76	2
77	Table gib	3H-Q77	4H-Q77	1
78	Hex nut, 7/16-14"	3H-Q78	4H-Q78	4
79	Table trip dog (LH)	3H-Q79	4H-Q79	2
80	T-Bolt	3H-Q80	4H-Q80	4
81	Pipe plug, 3/4"	3H-Q81	4H-Q81	1
82	Table	3H-Q82	4H-Q82	1
83	Limit stop pin	3H-Q83	4H-Q83	2
84	Limit block	3H-Q84	4H-Q84	1
85	Coolant return tube	3H-Q85	4H-Q85	2
86	Table trip dog (RH)	3H-Q86	4H-Q86	2
87	Table screen (large)	3H-Q87	4H-Q87	2
88	Fil hd screw, 10-32 x 5/16"	3H-Q88	4H-Q88	8
89	Table screen cover (large)	3H-Q89	4H-Q89	2
90	Table screen (small)	3H-Q90	4H-Q90	2
91	Table screen cover (small)	3H-Q91	4H-Q91	2
*92	Reverse dog (LH)	3H-Q92	4H-Q92	1
*93	Stop dog (LH)	3H-Q93	4H-Q93	1
*94	Rate change dog "B"	3H-Q94	4H-Q94	2
*95	Rate change dog "A"	3H-Q95	4H-Q95	2
*96	Table limit block (LH)	3H-Q96	4H-Q96	1
*97	Fil hd screw, 5/16-18 x 11/16"	3H-Q97	4H-Q97	4
*98	T-Bolt	3H-Q98	4H-Q98	8
*99	Stop dog (RH)	3H-Q99	4H-Q99	1
*100	Hex nut, 7/16-20"	3H-Q100	4H-Q100	8
*101	Reverse dog (RH)	3H-Q101	4H-Q101	1
*102	Table limit block (RH)	3H-Q102	4H-Q102	1
*103	Flat hd mach screw, 1/4-20 x 1/2"	3H-Q103	4H-Q103	13
*104	Table coolant guard	3H-Q104	4H-Q104	1
*105	Table (Autocycle)	3H-Q105	4H-Q105	1

* For automatic cycle machines only

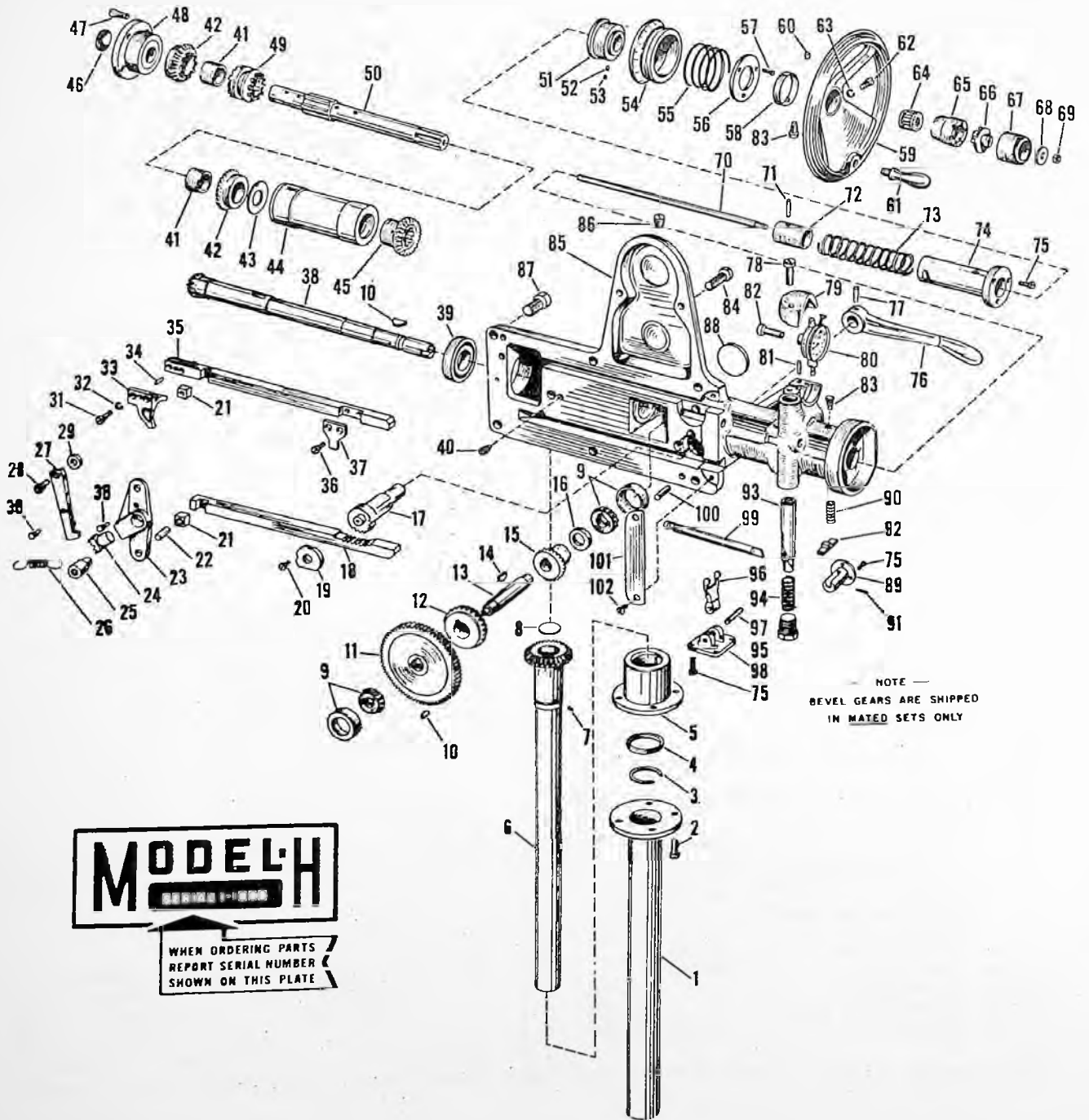


Figure 20. Vertical Head Power Feed Bracket

Figure 20. Vertical Head Power Feed Bracket

Item No.	Part Name and Description	Code Nos.		Qty.	Item No.	Part Name and Description	Code Nos.		Qty.	Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H				3H	4H				3H	4H	
1	Inner telescopic tube and flange	3H-R1	4H-R1	1	33	Head feed clutch shifter	3H-R33	4H-R33	1	68	Clutch washer	3H-R68	4H-R68	1
2	Fil hd screw, 3/8-16 x 1-1/16"	3H-R2	4H-R2	4	34	Acme blue label dowel, 1/4 x 3/4"	3H-R34	4H-R34	1	69	Hex nut, 5/16-24	3H-R69	4H-R69	1
3	Snap ring	3H-R3	4H-R3	1	35	Trip plunger	3H-R35	4H-R35	1	70	Handwheel release rod	3H-R70	4H-R70	1
4	Head feed drive gear washer	3H-R4	4H-R4	1	36	Fil hd screw, 5/16-18 x 7/16"	3H-R36	4H-R36	2	71	Handwheel release rod pin	3H-R71	4H-R71	1
5	Head feed drive miter gear bearing	3H-R5	4H-R5	1	37	Trip plunger connecting block	3H-R37	4H-R37	1	72	Vertical handwheel release shaft	3H-R72	4H-R72	1
6	Head feed drive miter gear (upper)	3H-R6	4H-R6	1	38	Handwheel shaft and bevel pinion	3H-R38	4H-R38	1	73	Spring	3H-R73	4H-R73	1
7	Pin, 3/16 x 9/32"	3H-R7	4H-R7	1	39	New Departure bearing, 20206	3H-R39	4H-R39	1	74	Handwheel shaft retainer bushing	3H-R74	4H-R74	1
8	Expansion plug, 1-3/16" dia	3H-R8	4H-R8	1	40	Dog pt set screw	3H-R40	4H-R40	1	75	Fil hd screw, 1/4-20 x 1/2"	3H-R75	4H-R75	10
9	Timken bearing, 07204B-07079	3H-R9	4H-R9	2	41	Head feed reverse bevel gear bushing	3H-R41	4H-R41	2	76	Head feed starting lever	3H-R76	4H-R76	1
10	Hi-Pro Key, HP-606	3H-R10	4H-R10	2	42	Head feed reverse clutch miter gear	3H-R42	4H-R42	2	77	Taper pin, #3 x 1-1/2"	3H-R77	4H-R77	1
11	Head feed take-off gear	3H-R11	4H-R11	1	43	Thrust washer	3H-R43	4H-R43	1	78	Fil hd screw, 5/16 - 18 x 1-1/4"	3H-R78	4H-R78	2
12	Vertical head feed miter gear	3H-R12	4H-R12	1	44	Clutch shaft bevel bearing retainer	3H-R44	4H-R44	1	79	Indicator cap	3H-R79	4H-R79	1
13	Feed take-off gear shaft	3H-R13	4H-R13	1	45	Reverse clutch shaft bevel gear	3H-R45	4H-R45	1	80	Starrett indicator (standard)	3H-R80	4H-R80	1
14	Hi-Pro key, HP-706	3H-R14	4H-R14	1	46	Expansion plug, 1-3/8" dia	3H-R46	4H-R46	1	81	Acme blue label dowel, 1/4 x 1-3/8"	3H-R81	4H-R81	2
15	Head feed take-off bevel gear	3H-R15	4H-R15	1	47	Fil hd screw, 3/8-16 x	3H-R47	4H-R47	4	82	Fil hd screw, 1/4-28 x 1"	3H-R82	4H-R82	1
16	Fitting washer	3H-R16	4H-R16	7	48	Reverse clutch shaft end bearing	3H-R48	4H-R48	1	83	Gits oiler, RS-532	3H-R83	4H-R83	2
17	Head feed starting lever eccentric and pinion	3H-R17	4H-R17	1	49	Head feed reverse clutch	3H-R49	4H-R49	1	84	Soc cap screw, 3/8 x 1"	3H-R84	4H-R84	2
18	Trip plunger (lower)	3H-R18	4H-R18	1	50	Head feed reverse clutch shaft	3H-R50	4H-R50	1	85	Vertical head power feed bracket	3H-R85	4H-R85	1
19	Starting lever bearing	3H-R19	4H-R19	1	51	Serrated dial collar	3H-R51	4H-R51	1	86	Plug, 1/2-13 x 1/2"	--	4H-R86	1
20	Fil hd screw, 1/4-20 x 1/2"	3H-R20	4H-R20	3	52	Soc pt screw, 1/4 x 5/16"	3H-R52	4H-R52	1	87	Soc cap screw, 5/8 x 1-1/4"	3H-R87	4H-R87	*5
21	Trip plunger shoe	3H-R21	4H-R21	2	53	Soc set screw, 1/4 x 1/4"	3H-R53	4H-R53	1	88	Expansion plug, 2-1/4" dia	3H-R88	4H-R88	1
22	Acme blue label dowel, 3/8 x 1"	3H-R22	4H-R22	2	54	Graduated dial	3H-R54	4H-R54	1	89	Indicator lever carrier	3H-R89	4H-R89	1
23	Vertical head feed trip equalizing lever	3H-R23	4H-R23	1	55	Spring	3H-R55	4H-R55	1	90	Spring	3H-R90	4H-R90	1
24	Vertical head trip detent	3H-R24	4H-R24	1	56	Graduated dial spring retainer	3H-R56	4H-R56	1	91	Pin	3H-R91	4H-R91	1
25	Equalizing lever plug	3H-R25	4H-R25	1	57	Fil hd screw, 10-32 x 1/2"	3H-R57	4H-R57	3	92	Indicator lever	3H-R92	4H-R92	1
26	Spring	3H-R26	4H-R26	1	58	Pin retainer spring	3H-R58	4H-R58	1	93	Precision stop plunger	3H-R93	4H-R93	1
27	Detent lever	3H-R27	4H-R27	1	59	Head adjusting handwheel	3H-R59	4H-R59	1	94	Spring	3H-R94	4H-R94	1
28	Detent lever stud	3H-R28	4H-R28	1	60	Handwheel retaining pin	3H-R60	4H-R60	1	95	Stop screw	3H-R95	4H-R95	1
29	Detent spacer	3H-R29	4H-R29	1	61	Rockwood handle, 3QA	3H-R61	4H-R61	1	96	Vertical head handwheel release yoke	3H-R96	4H-R96	1
30	Spring post	3H-R30	4H-R30	2	62	Adjusting screw	3H-R62	4H-R62	1	97	Release yoke pin	3H-R97	4H-R97	1
31	Fil hd screw, 5/16-18 x 1"	3H-R31	--	2	63	Lockwasher, 5/16"	3H-R63	4H-R63	1	98	Release yoke carrier plate	3H-R98	4H-R98	1
	Allen hd screw, 5/16-18 x 3/4"	--	4H-R31	2	64	Hyatt bearing, 93416	3H-R64	4H-R64	1	99	Precision stop trip plunger	3H-R99	4H-R99	1
32	Lockwasher, 5/16"	3H-R32	4H-R32	2	65	Vertical head handwheel clutch	3H-R65	4H-R65	1	100	Acme blue label dowel, 1/2 x 1-1/2"	3H-R100	4H-R100	2
					66	Handwheel clutch	3H-R66	4H-R66	1	101	Power feed bracket cover plate	3H-R101	4H-R101	1
					67	Handwheel clutch knob 7/8"	3H-R67	4H-R67	1	102	Flat hd screw, 10-32 x 3/8"	3H-R102	4H-R102	2

* 6 used on 4H machine

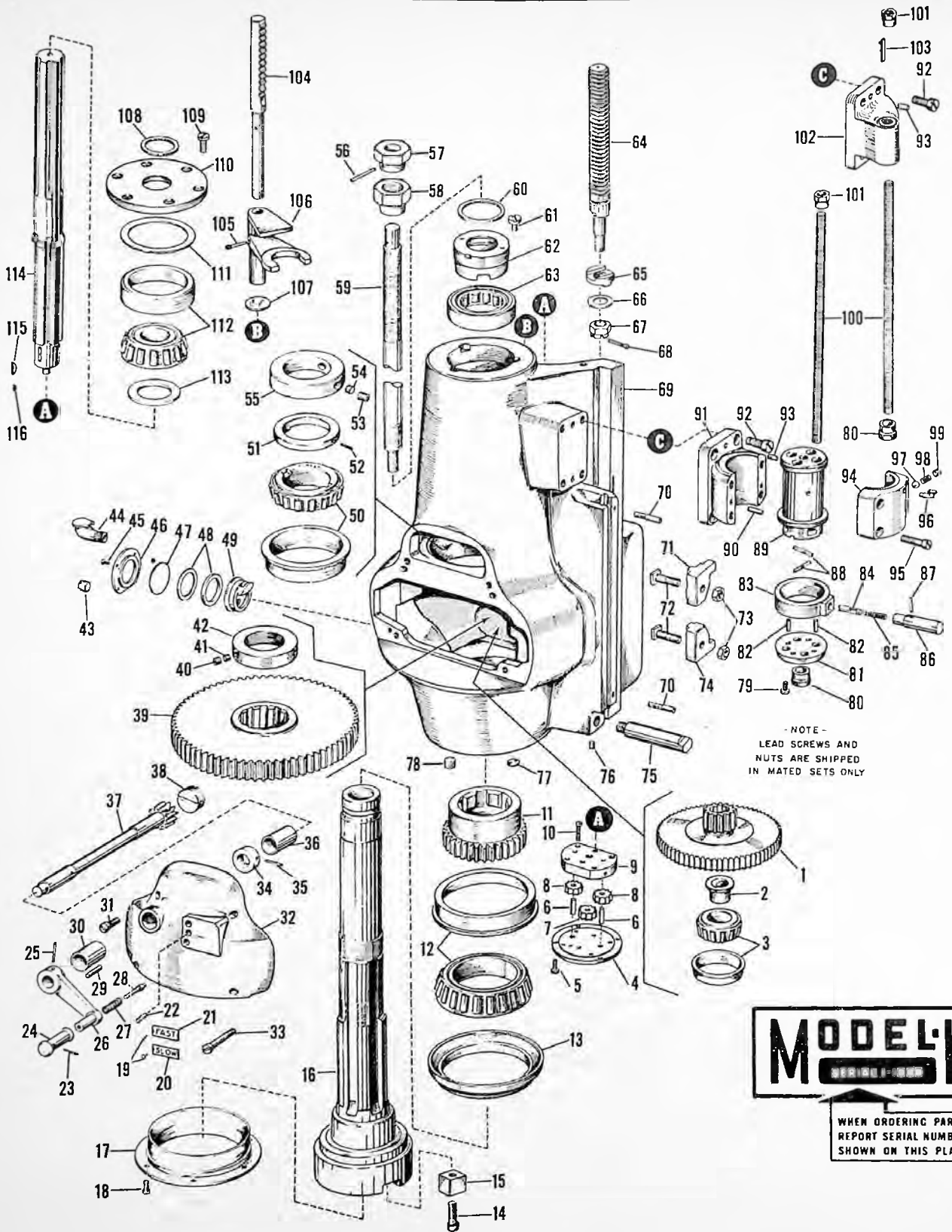


Figure 21. Vertical Head



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Figure 21. Vertical Head

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
1	Spindle drive sliding gear	3H-S1	4H-S1	1
2	Bearing sleeve	3H-S2	4H-S2	1
3	Timken bearing, 453-B-461	3H-S3	--	1
	Timken bearing, 453-B-460	--	4H-S3	1
4	Vertical head oil pump cover	3H-S4	4H-S4	1
5	Fil hd screw, 5/16-18 x 1 1/16"	3H-S5	4H-S5	4
6	Oil pump stud	3H-S6	4H-S6	2
7	Oil pump gear (driver)	3H-S7	4H-S7	1
8	Oil pump gear (driven)	3H-S8	4H-S8	2
9	Vertical head oil pump body	3H-S9	4H-S9	1
10	Fil hd screw, 5/16-18 x 7/8"	3H-S10	4H-S10	6
11	Small spindle gear	3H-S11	4H-S11	1
12	Timken bearing, 742B-749	3H-S12	--	1
	Timken bearing, 77675B-77375	--	4H-S12	1
13	Spindle oil slinger	3H-S13	4H-S13	1
14	Fil hd screw, 7/16-14 x 1-1/8"	3H-S14	4H-S14	2
15	Spindle drive key	3H-S15	4H-S15	2
16	Spindle	3H-S16	4H-S16	1
17	Spindle oil retainer	3H-S17	4H-S17	1
18	Fil hd screw, 5/16-18 x 3/4"	3H-S18	4H-S18	6
19	Escutcheon pin, #15	3H-S19	4H-S19	4
20	Speed plate (slow)	3H-S20	4H-S20	1
21	Speed plate (fast)	3H-S21	4H-S21	1
22	Acme blue label dowel, 3/8 x 3/4"	3H-S22	--	1
	Acme blue label dowel, 3/4 x 1"	--	4H-S22	1
23	Taper pin, #2 x 7/8"	3H-S23	4H-S23	1
24	Speed selection knob	3H-S24	4H-S24	1
25	Taper pin, #4 x 1-9/16"	3H-S25	4H-S25	1
26	Pinion shaft lever	3H-S26	4H-S26	1
27	Spring	3H-S27	4H-S27	1
28	Plunger	3H-S28	4H-S28	1
29	Acme blue label dowel, 5/16 x 1-1/8"	3H-S29	4H-S29	1
30	Oilite bearing, A-1108	3H-S30	4H-S30	2
31	Fil hd screw, 3/8-16 x 1-3/8"	3H-S31	--	3
	Fil hd screw, 7/16-14 x 2-1/4"	--	4H-S31	2
32	Vertical spindle head cover	3H-S32	4H-S32	1
33	Fil hd screw, 3/8-16 x 1-3/8"	3H-S33	--	1
	Fil hd screw, 7/16-14 x 1-1/4"	--	4H-S33	2
34	Pinion shaft retainer collar	3H-S34	4H-S34	1
35	Taper pin, #4 x 1/2"	3H-S35	4H-S35	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
36	Oilite bearing, #A-1108-8	3H-S36	4H-S36	1
37	Gear shifter pinion shaft	3H-S37	4H-S37	1
38	Pipe plug	3H-S38	4H-S38	1
39	Large spindle gear	3H-S39	4H-S39	1
40	Collar nut screw	3H-S40	4H-S40	1
41	Plug	3H-S41	4H-S41	1
42	Spindle lock nut	3H-S42	4H-S42	1
43	Pipe plug, 1/4"	3H-S43	4H-S43	1
44	Gits oiler, LP-1401	3H-S44	4H-S44	1
45	Oval hd screw, 10-32 x 3/8"	3H-S45	4H-S45	4
46	Oil flow gauge plate	3H-S46	4H-S46	1
47	Oil gauge glass	3H-S47	4H-S47	1
48	Oil gauge washer	3H-S48	4H-S48	2
49	Oil sight washer	3H-S49	4H-S49	1
50	Timken bearing, 742B-750W	3H-S50	--	1
	Timken bearing, 563B-567W	--	4H-S50	1
51	Spindle bearing drive collar	3H-S51	4H-S51	1
52	Spindle bearing drive collar pin	3H-S52	4H-S52	1
53	Special soc set screw	3H-S53	4H-S53	2
54	Collar nut shoe	3H-S54	4H-S54	2
55	Collar nut	3H-S55	4H-S55	1
56	Taper pin, #4 x 1/4"	3H-S56	4H-S56	1
57	Draw bolt head	3H-S57	4H-S57	1
58	Draw bolt nut	3H-S58	4H-S58	1
59	Arbor draw-in bolt	3H-S59	4H-S59	1
60	Spindle oil shield felt	3H-S60	4H-S60	1
61	Fil hd screw, 3/8-16 x 9/16"	3H-S61	4H-S61	3
62	Spindle oil shield	3H-S62	4H-S62	1
63	Hyatt bearing, 1310TS	3H-S63	4H-S63	1
64	Head feed screw	3H-S64	4H-S64	1
65	Head feed screw drive washer	3H-S65	4H-S65	1
66	Washer, 7/8"	3H-S66	4H-S66	1
67	Castle nut, 7/8-14	3H-S67	4H-S67	1
68	Cotter pin, 1/8 x 1-3/4"	3H-S68	4H-S68	1
69	Vertical spindle head	3H-S69	4H-S69	1
70	Positive stop pin	3H-S70	4H-S70	2
71	Upper trip dog	3H-S71	4H-S71	1
72	T-Bolt, 7/16-14 x 1-17/32"	3H-S72	4H-S72	2
73	Hex nut, 7/16-14	3H-S73	4H-S73	2
74	Lower trip dog	3H-S74	4H-S74	1
75	Clamp rod	3H-S75	4H-S75	1
76	Pipe plug, 1/8"	3H-S76	4H-S76	2
77	Expansion plug, 1-5/8" dia	3H-S77	4H-S77	1
78	Pipe plug, 3/4"	3H-S78	4H-S78	1
79	Fil hd screw, 5/16-18 x 1 1/16"	3H-S79	4H-S79	2
80	Precision stop graduated collar	3H-S80	4H-S80	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
81	Precision stop cover	3H-S81	4H-S81	1
82	Acme blue label dowel, 1/4 x 3/4"	3H-S82	4H-S82	2
83	Precision stop adjusting ring	3H-S83	4H-S83	1
84	Precision stop bracket pin	3H-S84	4H-S84	1
85	Spring	3H-S85	4H-S85	1
86	Precision stop bracket	3H-S86	4H-S86	1
87	Taper pin, #00 x 3/4"	3H-S87	4H-S87	1
88	Key	3H-S88	4H-S88	2
89	Precision stop barrel	3H-S89	4H-S89	1
90	Acme blue label dowel, 5/16 x 1-3/4"	3H-S90	4H-S90	2
91	Precision stop bracket	3H-S91	4H-S91	1
92	Fil hd screw, 1/2-13 x 1-1/8"	3H-S92	4H-S92	4
93	Acme blue label dowel, 1/2 x 1-1/8"	3H-S93	4H-S93	2
94	Precision stop bracket cap	3H-S94	4H-S94	1
95	Fil hd screw, 7/16-14 x 1-1/2"	3H-S95	4H-S95	4
96	Gits oiler, #1204	3H-S96	4H-S96	1
97	Steel ball, 3/8" dia	3H-S97	4H-S97	1
98	Spring	3H-S98	4H-S98	1
99	Headless set screw, 7/16-14 x 1/2"	3H-S99	4H-S99	1
100	Precision stop screw	3H-S100	4H-S100	4
101	Locknut, 1/2-20	3H-S101	4H-S101	4
102	Single precision stop bracket	3H-S102	4H-S102	1
103	Key	3H-S103	4H-S103	1
104	Spindle gear shifter rod	3H-S104	4H-S104	1
105	Headless dowel screw	3H-S105	4H-S105	1
106	Spindle gear shifter	3H-S106	4H-S106	1
107	Expansion plug, 1-5/8" dia	3H-S107	4H-S107	1
108	Counter shaft cover felt washer	3H-S108	4H-S108	1
109	Fil hd screw, 3/8-16 x 13/16"	3H-S109	--	4
	Hex hd screw, 3/8-16 x 1"	--	4H-S109	6
110	Spindle counter shaft cover	3H-S110	4H-S110	1
111	Counter shaft bearing adjusting washer	3H-S111	4H-S111	1
112	Timken bearing, 522-527	3H-S112	--	1
	Timken bearing, 612-615	--	4H-S112	1
113	Counter shaft bearing retaining washer	3H-S113	4H-S113	1
114	Spindle counter shaft	3H-S114	4H-S114	1
115	Hi-Pro key, HP-606	3H-S115	4H-S115	1
116	Hi-Pro key, HP-404	3H-S116	4H-S116	1

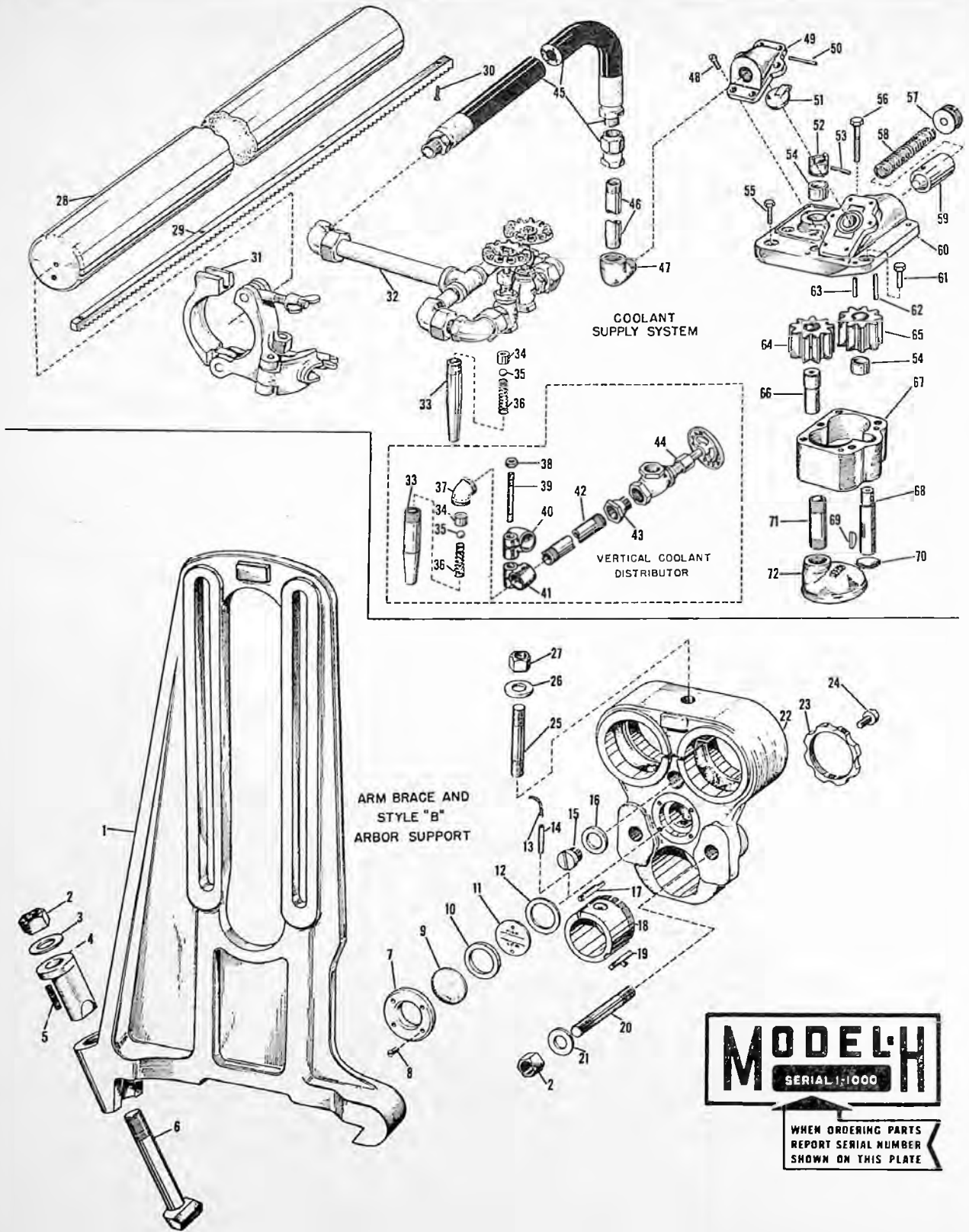


Figure 22. Coolant Supply System, Style B Arbor Support and Arm Brace

Replacement Parts Manual

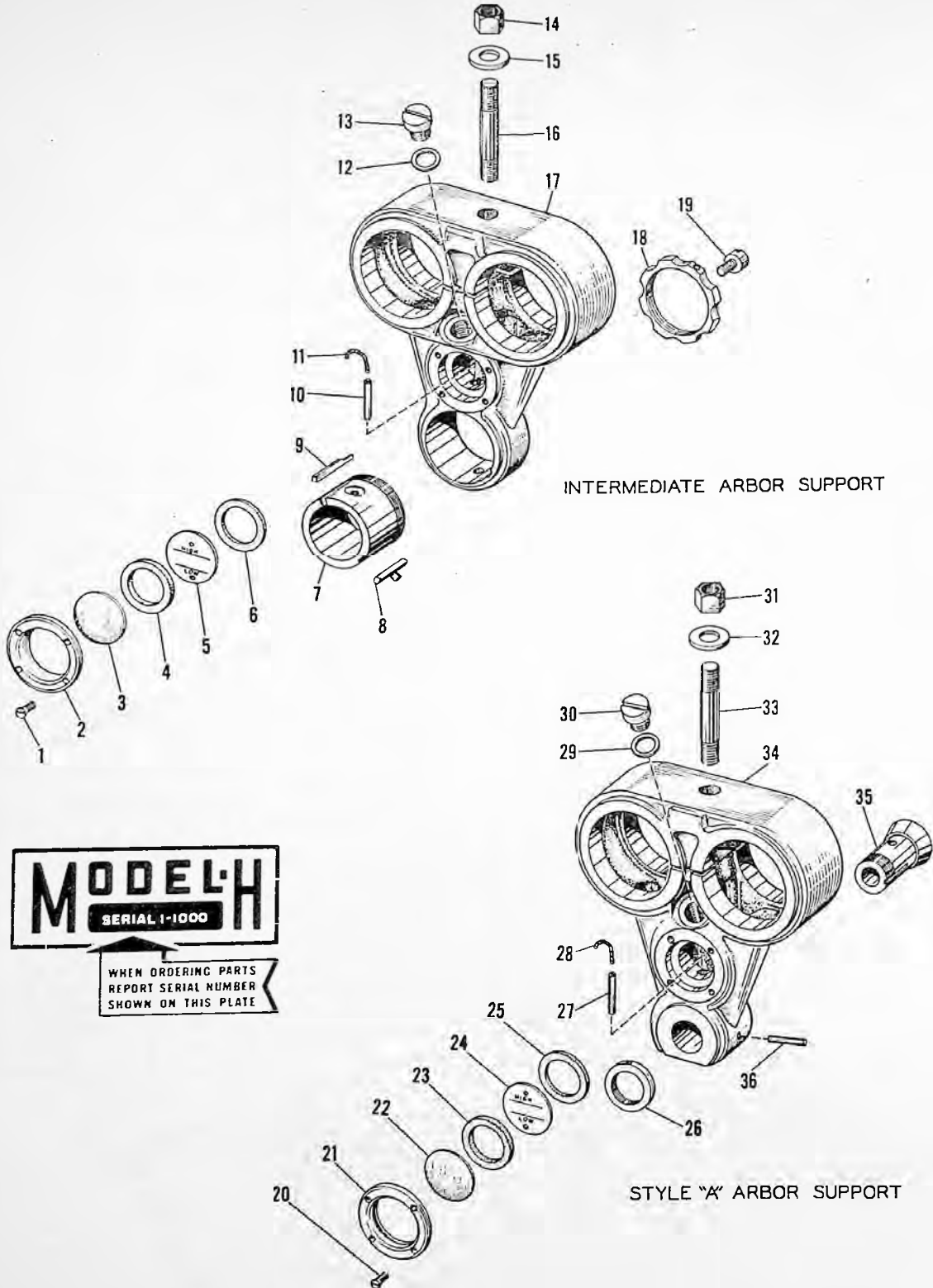
Milling Machines - Plain, Universal and Vertical

Figure 22. Coolant Supply System, Style B Arbor Support and Arm Brace

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
1	Arm brace	3H-T1	4H-T1	1
2	Hex nut, 5/8-11	3H-T2	4H-T2	3
3	Washer	3H-T3	4H-T3	1
4	Clamp sleeve	3H-T4	4H-T4	1
5	Spring	3H-T5	4H-T5	1
6	Clamp stud	3H-T6	4H-T6	1
7	Oil gauge plate	3H-T7	4H-T7	1
8	Oval hd screw, 10-32 x 3/8"	3H-T8	4H-T8	4
9	Oil gauge glass	3H-T9	4H-T9	1
10	Oil gauge washer	3H-T10	4H-T10	1
11	Oil gauge plate	3H-T11	4H-T11	1
12	Oil gauge washer	3H-T12	4H-T12	1
13	Oil wicking	3H-T13	4H-T13	AR
14	Copper tube, 1/4 x 2-7/8"	3H-T14	4H-T14	1
15	Oil filler plug	3H-T15	4H-T15	1
16	Fiber washer	3H-T16	4H-T16	1
17	Oil retainer	3H-T17	4H-T17	1
18	Arbor support bushing	3H-T18	4H-T18	1
19	Key	3H-T19	4H-T19	1
20	Stud	3H-T20	4H-T20	2
21	Washer	3H-T21	4H-T21	1
22	Style "B" arbor support	3H-T22	4H-T22	1
23	Bushing nut	3H-T23	4H-T23	1
24	Screw	3H-T24	4H-T24	1
25	Stud	3H-T25	4H-T25	1
26	Washer	3H-T26	4H-T26	1
27	Hex nut, 3/4-10	3H-T27	4H-T27	1
*OVERARMS				
*28	Overarm (horizontal machines only)	3H-T28	4H-T28	2
*29	Overarm rack	3H-T29	4H-T29	2
*30	Flt hd screw, 5/16-24 x 11/16"	3H-T30	4H-T30	†8
COOLANT SUPPLY SYSTEM				
*31	Coolant distributor clamp assembly	3H-T31	4H-T31	1
*32	Distributor complete	3H-T32	4H-T32	1
33	Coolant nozzle	3H-T33	4H-T33	‡2
34	Nozzle ball retainer	3H-T34	4H-T34	‡2
35	Steel ball, 1/2" dia	3H-T35	4H-T35	‡2
36	Spring	3H-T36	4H-T36	‡2
§37	Elbow, 1/2"	3H-T37	4H-T37	1
§38	Hex nut, 7/16-14	3H-T38	4H-T38	1
§39	Stud	3H-T39	4H-T39	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
§40	Coolant pipe clamp	3H-T40	4H-T40	1
§41	Coolant pipe clamp	3H-T41	4H-T41	1
§42	Coolant pipe	3H-T42	4H-T42	1
§43	Reducing bushing, 3/4 x 1/2"	3H-T43	4H-T43	1
§44	Angle valve, 3/4"	3H-T44	4H-T44	1
45	Coolant hose	3H-T45	4H-T45	1
46	WI pipe 3/4 x 31"	3H-T46	--	1
	WI pipe 3/4 x 32-1/2"	--	4H-T46	1
47	Street ell, 3/4"	3H-T47	4H-T47	1
48	Flt hd screw, 1/4-20 x 5/8"	3H-T48	4H-T48	6
49	Check valve cover	3H-T49	4H-T49	1
50	Pin for check valve cover	3H-T50	4H-T50	1
51	Check valve	3H-T51	4H-T51	1
52	Coolant pump drive clutch	3H-T52	4H-T52	1
53	Taper pin, #3 x 1-1/16"	3H-T53	4H-T53	1
54	Iron ollite bearing, SM-576	3H-T54	4H-T54	2
55	Hex hd screw, 3/8-16 x 1"	3H-T55	4H-T55	5
56	Hex hd screw, 1/2-13 x 2-3/16"	3H-T56	4H-T56	1
57	Pipe plug, 1"	3H-T57	4H-T57	1
58	Spring	3H-T58	4H-T58	1
59	Coolant relief plunger	3H-T59	4H-T59	1
60	Coolant pump cover	3H-T60	4H-T60	1
61	Hex hd screw 1/2-13 x 1-1/8"	3H-T61	4H-T61	1
62	Acme blue label dowel, 1/4 x 1-1/4"	3H-T62	4H-T62	1
63	Acme blue label dowel, 5/16 x 1"	3H-T63	4H-T63	4
64	Coolant pump gear (idler)	3H-T64	4H-T64	1
65	Coolant pump gear (driver)	3H-T65	4H-T65	1
66	Coolant pump gear stud	3H-T66	4H-T66	1
67	Coolant pump body	3H-T67	4H-T67	1
68	Coolant pump drive shaft	3H-T68	4H-T68	1
69	H1-Pro key, HP-706	3H-T69	4H-T69	1
70	Expansion plug 1-1/4" dia	3H-T70	4H-T70	1
71	WI nipple, 3/4 x 3"	3H-T71	4H-T71	1
72	Strainer	3H-T72	4H-T72	1

* Horizontal machines only
 † 10 used on 4H machines
 ‡ 1 used on vertical machines
 § Vertical machines only
 AR As required



MODEL H
SERIAL 1-1000

WHEN ORDERING PARTS
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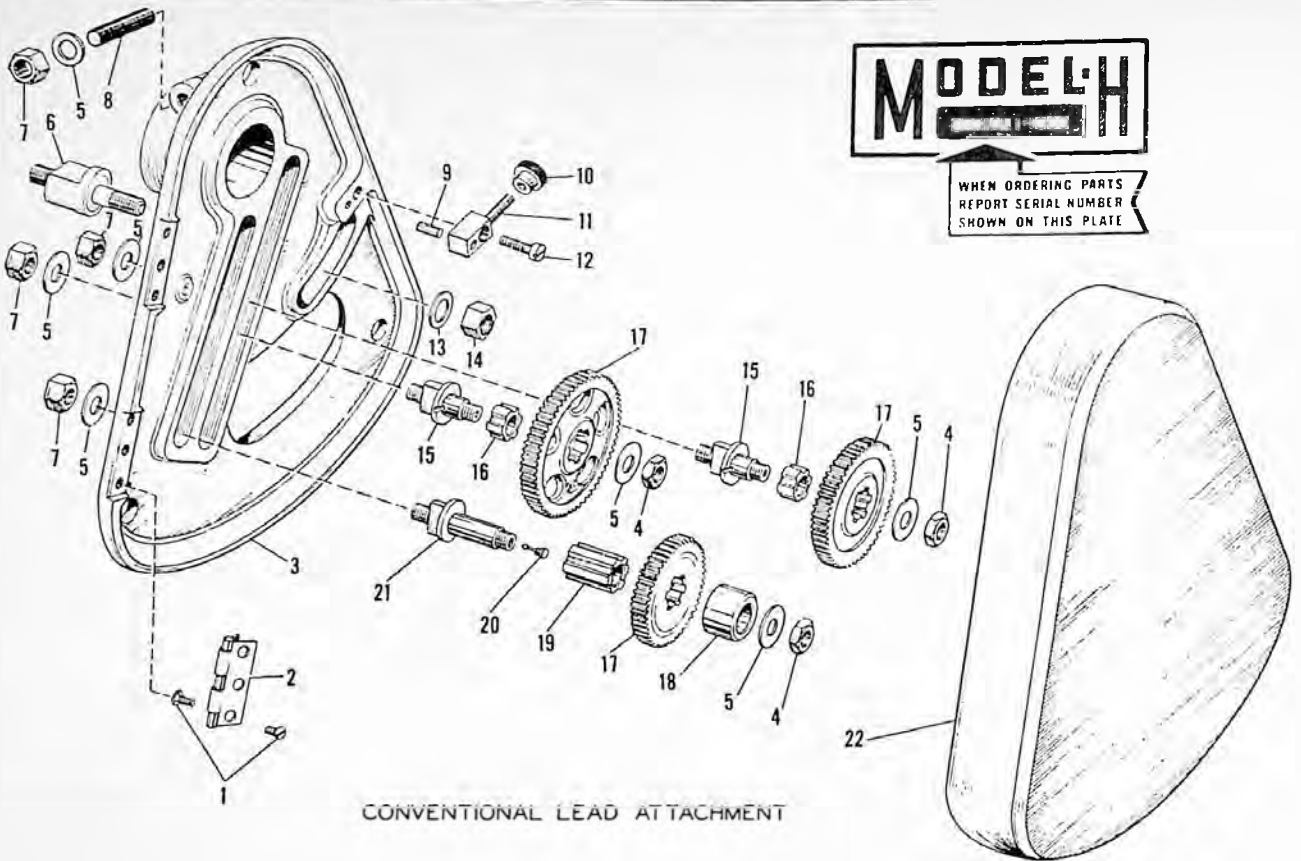
Figure 23. Intermediate Arbor Support and Style A Arbor Support

Figure 23. Intermediate Arbor Support and Style A Arbor Support

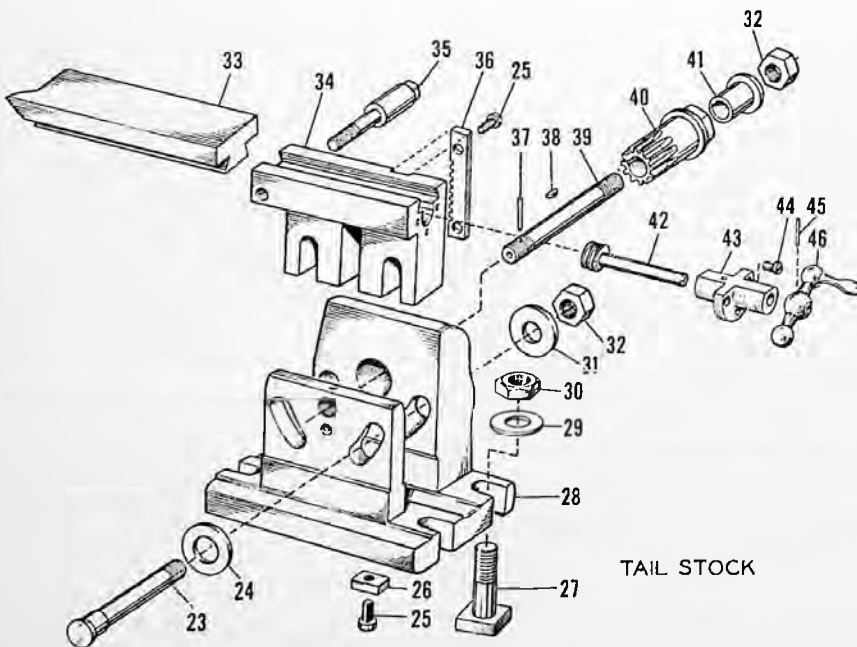
Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
1	Oval hd screw, 10-32 x 15/32"	3H-U1	4H-U1	4
2	Oil gauge plate	3H-U2	4H-U2	1
3	Oil gauge glass	3H-U3	4H-U3	1
4	Oil gauge washer	3H-U4	4H-U4	1
5	Oil gauge back plate	3H-U5	4H-U5	1
6	Oil gauge washer	3H-U6	4H-U6	1
7	Arbor support bushing	3H-U7	4H-U7	1
8	Key	3H-U8	4H-U8	1
9	Oil retainer	3H-U9	4H-U9	1
10	Copper tube, 1/4 x 2-5/16"	3H-U10	--	1
	Copper tube, 1/4 x 2-1/4"	--	4H-U10	1
11	Oil wicking	3H-U11	4H-U11	1
12	Fiber washer	3H-U12	4H-U12	1
13	Oil filler plug	3H-U13	4H-U13	1
14	Hex nut, 3/4-10	3H-U14	4H-U14	1
15	Washer, 3/4"	3H-U15	4H-U15	1
16	Stud	3H-U16	4H-U16	1
17	Intermediate arbor support	3H-U17	4H-U17	1
18	Bushing nut	3H-U18	4H-U18	1
19	Fil hd screw, 3/8-16 x 11/16"	3H-U19	4H-U19	1
STYLE "A" ARBOR SUPPORT				
20	Oval hd screw, 10-32 x 15/32"	3H-U20	4H-U20	4
21	Oil gauge plate	3H-U21	4H-U21	1
22	Oil gauge glass	3H-U22	4H-U22	1
23	Oil gauge washer	3H-U23	4H-U23	1
24	Oil gauge back plate	3H-U24	4H-U24	1
25	Oil gauge washer	3H-U25	4H-U25	1
26	Bushing nut	3H-U26	4H-U26	1
27	Copper tube, 1/4 x 3"	3H-U27	--	1
	Copper tube, 1/4 x 3-7/8"	--	4H-U27	1
28	Oil wicking	3H-U28	4H-U28	1
29	Fiber washer	3H-U29	4H-U29	1
30	Oil filler plug	3H-U30	4H-U30	1
31	Hex nut, 3/4-10	3H-U31	4H-U31	1
32	Washer, 3/4"	3H-U32	4H-U32	1
33	Stud	3H-U33	4H-U33	1
34	Style "A" arbor support	3H-U34	4H-U34	1
35	Bushing	3H-U35	4H-U35	1
36	Pin	3H-U36	4H-U36	1



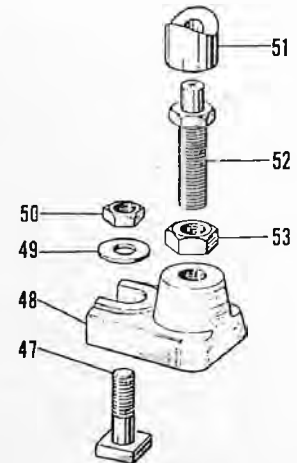
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CONVENTIONAL LEAD ATTACHMENT



TAIL STOCK



STEADY REST

Figure 24. Conventional Lead Attachment, Tail Stock and Steady Rest

Figure 24. Conventional Lead Attachment, Tail Stock and Steady Rest

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
CONVENTIONAL LEAD ATTACHMENT				
1	Flat hd screw, 10-32 x 1/2"	3H-V1	4H-V1	12
2	Butt hinge, #800 Stanley	3H-V2	4H-V2	2
3	Change gear bracket	3H-V3	4H-V3	1
4	Hex nut, 1/2-13	3H-V4	4H-V4	3
5	Washer, 1/2"	3H-V5	4H-V5	7
6	Change gear bracket stud	3H-V6	4H-V6	1
7	Hex nut, 1/2-13	3H-V7	4H-V7	4
8	Stud	3H-V8	4H-V8	1
9	Acme blue label dowel, 1/4 x 7/8"	3H-V9	4H-V9	1
10	Knurled nut	3H-V10	4H-V10	1
11	Door lock bolt	3H-V11	4H-V11	1
12	Fil hd screw, 5/16-18 x 1"	3H-V12	4H-V12	1
13	Washer	3H-V13	4H-V13	1
14	Hex nut	3H-V14	4H-V14	1
15	Idler stud	3H-V15	4H-V15	2
16	Splined bushing (short)	3H-V16	4H-V16	2
17	Change gears			
	Change gear, 24T - 12P	3H-V17	4H-V17	1
	Change gear, 28T - 12P	3H-V18	4H-V18	1
	Change gear, 32T - 12P	3H-V19	4H-V19	1
	Change gear, 40T - 12P	3H-V20	4H-V20	1
	Change gear, 44T - 12P	3H-V21	4H-V21	1
	Change gear, 48T - 12P	3H-V22	4H-V22	2
	Change gear, 56T - 12P	3H-V23	4H-V23	1
	Change gear, 64T - 12P	3H-V24	4H-V24	1
	Change gear, 72T - 12P	3H-V25	4H-V25	1
	Change gear, 86T - 12P	3H-V26	4H-V26	1
	Change gear, 100T - 12P	3H-V27	4H-V27	1
18	Spacing collars			
	Spacing collar (small)	3H-V28	4H-V28	1
	Spacing collar (large)	3H-V29	4H-V29	1
19	Splined bushing (long)	3H-V30	4H-V30	1
20	Gits oiler, RS-531	3H-V31	4H-V31	1
21	Differential index compound stud	3H-V32	4H-V32	1
22	Change gear bracket cover	3H-V33	4H-V33	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
TAILSTOCK				
23	Clamp screw	3H-V34	4H-V34	2
24	Washer, 5/8	3H-V35	4H-V35	2
25	Fil hd screw, 5/16-18 x 1 1/16"	3H-V36	4H-V36	4
26	Tongue	3H-V37	4H-V37	2
27	T-Bolt	3H-V38	4H-V38	4
28	Tailstock	3H-V39	4H-V39	1
29	Washer, 5/8"	3H-V40	4H-V40	4
30	Hex nut, 5/8-11	3H-V41	4H-V41	4
31	Washer, 5/8"	3H-V42	4H-V42	2
32	Hex nut, 3/4"	3H-V43	4H-V43	3
33	Center	3H-V44	4H-V44	1
34	Center block	3H-V45	4H-V45	1
35	Center locking screw	3H-V46	4H-V46	1
36	Elevating rack	3H-V47	4H-V47	1
37	Taper pin, #1 x 1-1/8"	3H-V48	4H-V48	1
38	Hi-Pro key, HP-504	3H-V49	4H-V49	1
39	Clamping stud	3H-V50	4H-V50	1
40	Elevating rack pinion	3H-V51	4H-V51	1
41	Sleeve	3H-V52	4H-V52	1
42	Center adjusting worm	3H-V53	4H-V53	1
43	Worm sleeve	3H-V54	4H-V54	1
44	Fil hd screw, 1/4-20 x 1/2"	3H-V55	4H-V55	3
45	Taper pin, #1 x 13/16"	3H-V56	4H-V56	1
46	Ball crank, #00	3H-V57	4H-V57	1
STEADY REST				
47	T-Bolt	3H-V58	4H-V58	1
48	Steady rest base	3H-V59	4H-V59	1
49	Washer, 5/8"	3H-V60	4H-V60	1
50	Hex nut, 5/8"	3H-V61	4H-V61	1
51	Steady rest vee block	3H-V62	4H-V62	1
52	Steady rest adjusting screw	3H-V63	4H-V63	1
53	Hex nut, 3/4-10	3H-V64	4H-V64	1



WHEN ORDERING PARTS
REPORT SERIAL NUMBER
SHOWN ON THIS PLATE

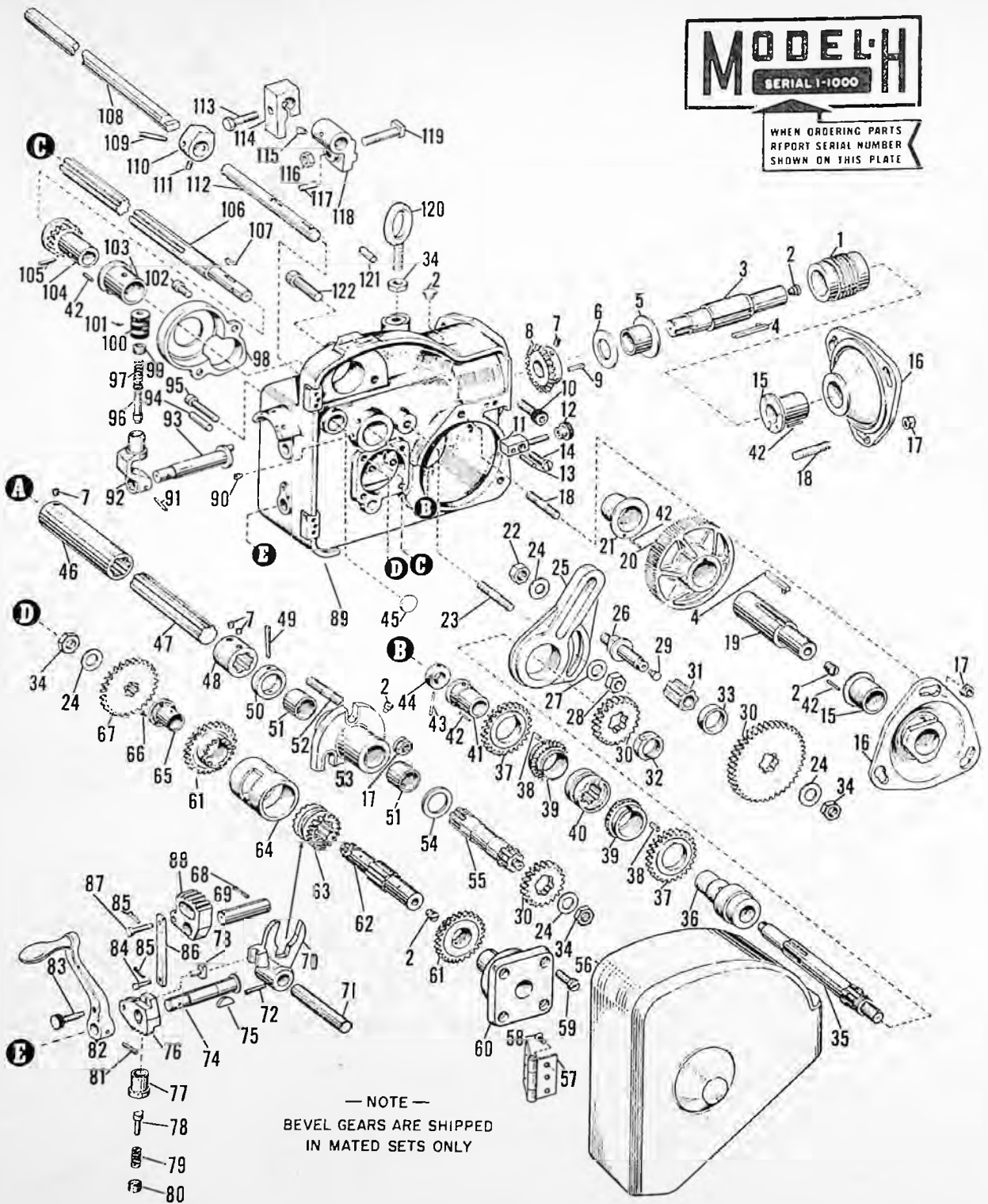
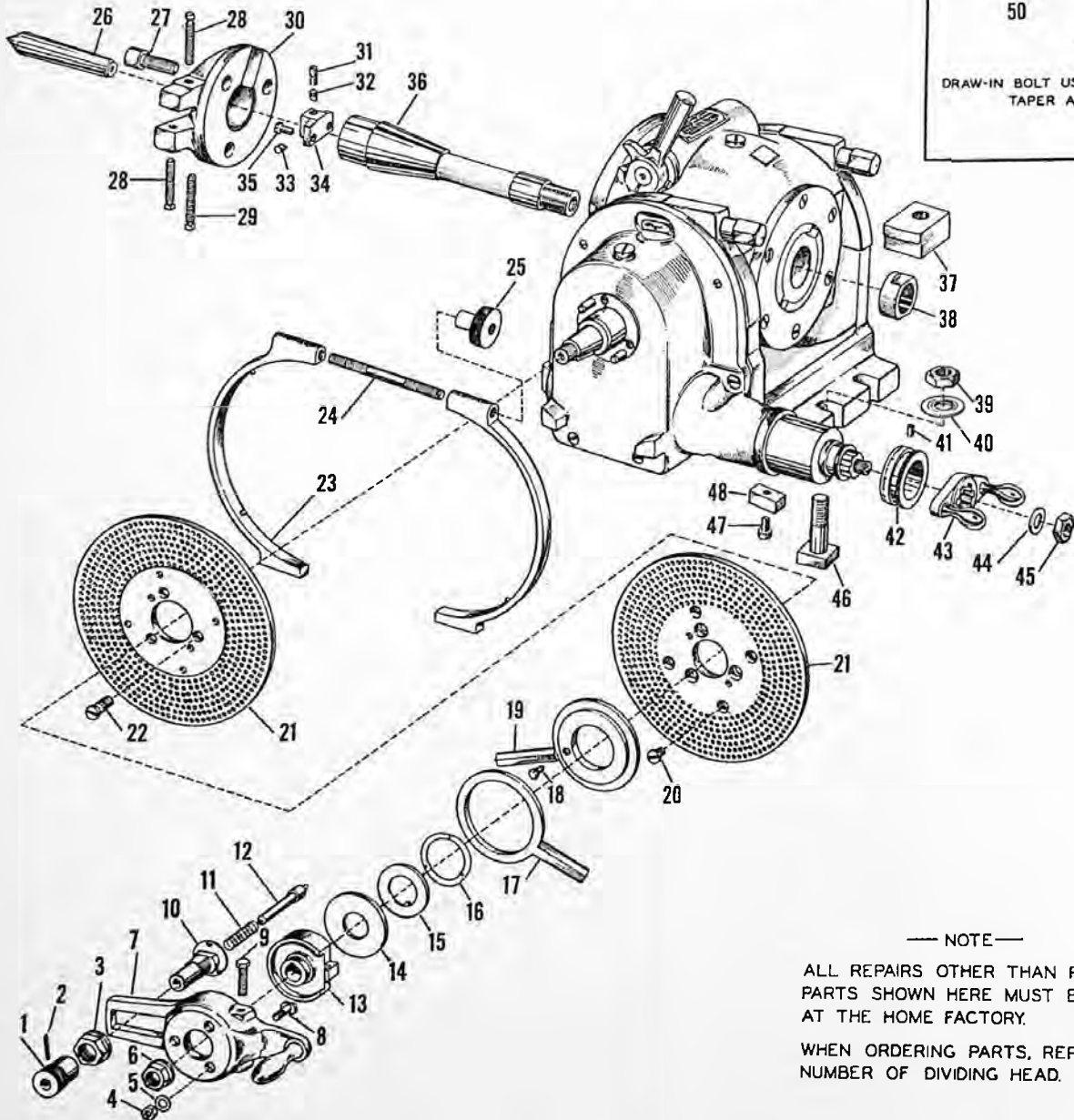
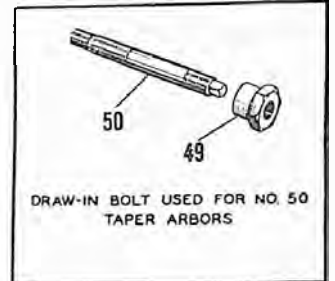


Figure 25. Low Lead Attachment



WHEN ORDERING PARTS
REPORT SERIAL NUMBER
SHOWN ON THIS PLATE



— NOTE —

ALL REPAIRS OTHER THAN REPLACING
PARTS SHOWN HERE MUST BE DONE
AT THE HOME FACTORY.

WHEN ORDERING PARTS, REPORT SERIAL
NUMBER OF DIVIDING HEAD.

Figure 26. Model K Dividing Head

Replacement Parts Manual

Milling Machines — Plain, Universal and Vertical

Figure 26. Model K Dividing Head

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
1	Index plunger knob	3H-X1	4H-X1	1
2	Taper pin, #1 x 1-1/16"	3H-X2	4H-X2	1
3	Clamp nut	3H-X3	4H-X3	1
4	Hex nut, 3/8-16	3H-X4	4H-X4	3
5	Washer, 3/8"	3H-X5	4H-X5	3
6	Clamp nut	3H-X6	4H-X6	1
7	Index crank	3H-X7	4H-X7	1
8	Tee bolt, 3/8-16 x 13/16"	3H-X8	4H-X8	3
9	Adjusting screw, 3/8-24 x 1-1/8"	3H-X9	4H-X9	2
10	Index plunger sleeve	3H-X10	4H-X10	1
11	Spring	3H-X11	4H-X11	1
12	Index plunger	3H-X12	4H-X12	1
13	Index crank adjusting lever	3H-X13	4H-X13	1
14	Index crank back plate	3H-X14	4H-X14	1
15	Spring retainer	3H-X15	4H-X15	1
16	Spring	3H-X16	4H-X16	1
17	Index finger	3H-X17	4H-X17	1
18	Hex hd screw, 10-32 x 1/16"	3H-X18	4H-X18	1
19	Index finger	3H-X19	4H-X19	1
20	Fil hd screw, 5/16-18 x 7/16"	3H-X20	4H-X20	4
21	Index plates			
	Index plate, 100-96-92-84-72-66-60	3H-X21	4H-X21	1
	Index plate, 98-88-78-76-68-58-54	3H-X22	4H-X22	1
	Index plate, 99-91-83-77-69-62-56	3H-X23	4H-X23	1
	Index plate, 94-87-81-73-64-59-52	3H-X24	4H-X24	1
	Index plate, 97-89-82-74-67-61-53	3H-X25	4H-X25	1
	Index plate, 93-86-79-71-63-57-51	3H-X26	4H-X26	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
22	Fil hd screw, 3/8-16 x 1-3/32"	3H-X27	4H-X27	3
23	Index plate clamp ring	3H-X28	4H-X28	1
24	Stud	3H-X29	4H-X29	1
25	Knurled nut	3H-X30	4H-X30	1
26	Center	3H-X31	4H-X31	1
27	Allen hd screw, 5/8 x 1-1/2"	3H-X32	4H-X32	3
28	Sq hd set screw, 3/8-16 x 3/4"	3H-X33	4H-X33	2
29	Sq hd set screw, 3/8-16 x 1"	3H-X34	4H-X34	1
30	Driving dog	3H-X35	4H-X35	1
31	Spindle drive key screw	3H-X36	4H-X36	1
32	Expansion key plug	3H-X37	4H-X37	1
33	Expansion wedge key	3H-X38	4H-X38	1
34	Spindle drive expansion key	3H-X39	4H-X39	1
35	Fil hd screw, 1/4-20 x 11/16"	3H-X40	4H-X40	2
36	Centering plug	3H-X41	4H-X41	1
37	Clamp block	3H-X42	4H-X42	1
38	Nut	3H-X43	4H-X43	1
39	Hex nut, 5/8-11	3H-X44	4H-X44	5
40	Washer, 5/8"	3H-X45	4H-X45	5
41	Allen set screw, 5/16-18 x 3/8"	3H-X46	4H-X46	1
42	Graduated collar	3H-X47	4H-X47	1
43	Crank	3H-X48	4H-X48	1
44	Washer, 1/2"	3H-X49	4H-X49	1
45	Hex nut, 1/2-13	3H-X50	4H-X50	1
46	Tee bolt	3H-X51	4H-X51	5
47	Fil hd screw, 5/16-18 x 11/16"	3H-X52	4H-X52	2
48	Vise tongue	3H-X53	4H-X53	2
49	Draw bolt head	3H-X54	4H-X54	1
50	Draw-in bolt	3H-X55	4H-X55	1



WHEN ORDERING PARTS
REPORT SERIAL NUMBER
SHOWN ON THIS PLATE

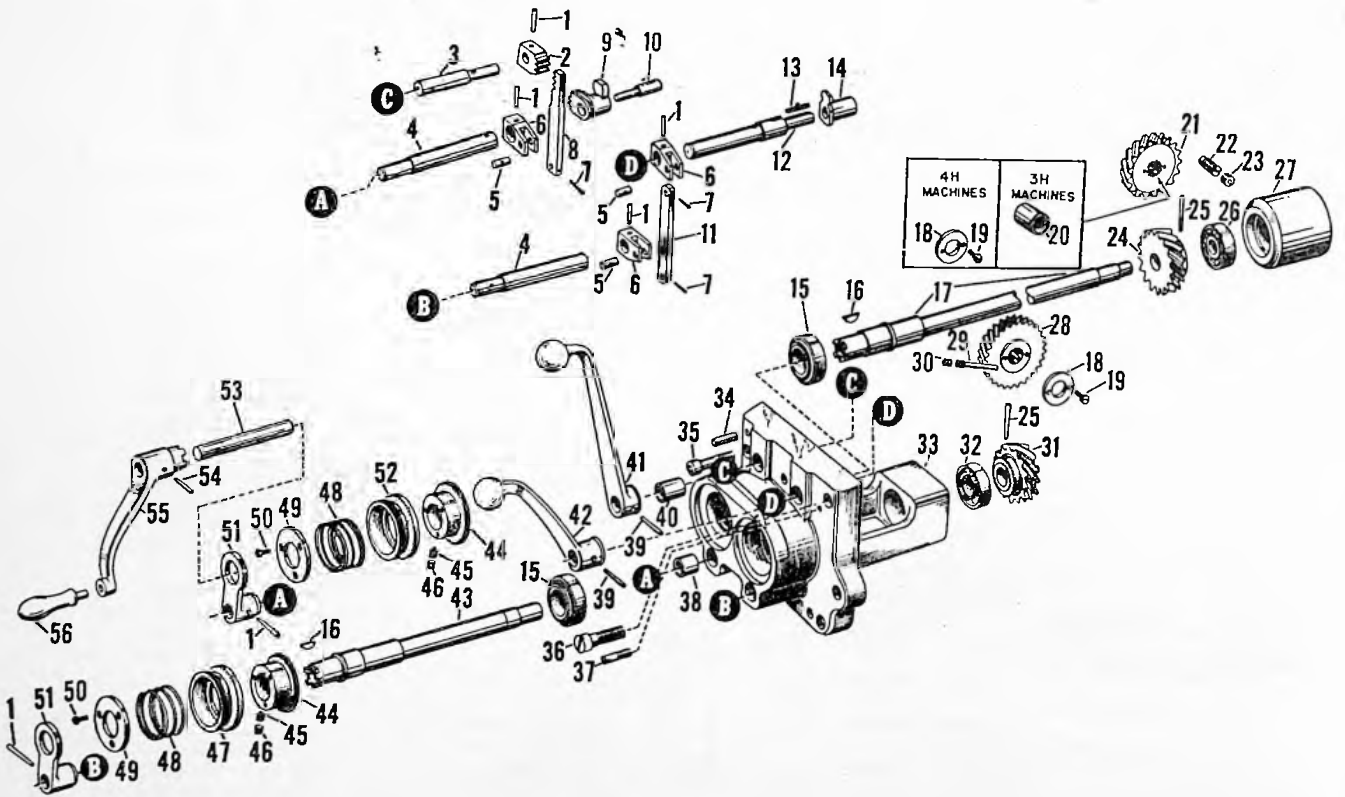


Figure 27. Rear Control On Knee

Replacement Parts Manual

Milling Machines — Plain, Universal and Vertical

Figure 27. Rear Control On Knee

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
1	Taper pin, #3 x 1-1/8"	3H-Y1	4H-Y1	6
2	Cross feed rear control lever segment	3H-Y2	4H-Y2	1
3	Cross feed rear control lever shaft	3H-Y3	4H-Y3	1
4	Crank guard shaft	3H-Y4	4H-Y4	2
5	Clevis pin	3H-Y5	4H-Y5	3
6	Clevis joint	3H-Y6	4H-Y6	3
7	Cotter pin, 3/32 x 1"	3H-Y7	4H-Y7	3
8	Clevis joint rack	3H-Y8	4H-Y8	1
9	Cross feed trip rod segment	3H-Y9	4H-Y9	1
10	Cross feed trip rod segment shaft	3H-Y10	4H-Y10	1
11	Link	3H-Y11	4H-Y11	1
12	Vertical feed rear control lever shaft	3H-Y12	4H-Y12	1
13	Key	3H-Y13	4H-Y13	1
14	Vertical feed lever shaft arm	3H-Y14	4H-Y14	1
15	New Departure bearing, 88506	3H-Y15	4H-Y15	2
16	Hi-Pro key, HP-505	3H-Y16	4H-Y16	2
17	Cross feed rear control shaft	3H-Y17	4H-Y17	1
18	Spiral gear thrust collar	3H-Y18	4H-Y18	*1
19	Fil hd screw, 3/16-32 x 3/8"	3H-Y19	4H-Y19	†2
20	Spacer and oil sealed sleeve	3H-Y20		1
21	Cross feed rear control spiral gear (driven)	3H-Y21	4H-Y21	1
22	Dog pt set screw, 3/8-16 x 1-3/16"	3H-Y22	--	1
	Dog pt set screw, 1/2-13 x 1-3/8"	--	4H-Y22	1
23	Soc set screw, 3/8 x 3/8"	3H-Y23	--	1
	Soc set screw, 1/2 x 1/4"	--	4H-Y23	1
24	Cross feed rear control spiral gear (driver)	3H-Y24	4H-Y24	1
25	Taper pin, #4 x 1-7/8"	3H-Y25	4H-Y25	2
26	New Departure bearing, 3304	3H-Y26	4H-Y26	1
27	Cross feed spiral gear bearing carriage	3H-Y27	4H-Y27	1
28	Vertical rear control spiral gear (driven)	3H-Y28	4H-Y28	1
29	Soc set screw, 3/8 x 3/8"	3H-Y29	--	1
	Set screw, 3/8 x 1/2"	--	4H-Y29	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3H	4H	
30	Dowel screw	3H-Y30	4H-Y30	1
31	Vertical rear control spiral gear (driver)	3H-Y31	4H-Y31	1
32	New Departure bearing, 3205	3H-Y32	4H-Y32	1
33	Rear control bracket	3H-Y33	4H-Y33	1
34	Acme Blue Label dowel, 1/2 x 2"	3H-Y34	4H-Y34	2
35	Fil hd screw, 1/2 x 1-11/16"	3H-Y35	4H-Y35	4
36	Fil hd screw, 1/2-13 x 1-1/2"	3H-Y36	4H-Y36	1
37	Soc set screw, 3/8 x 1-1/4"	3H-Y37	4H-Y37	2
38	Oilite bearing, A-1049-3	3H-Y38	4H-Y38	4
39	Taper pin, #4 x 1-5/16"	3H-Y39	4H-Y39	2
40	Oilite bearing, A-1049-4	3H-Y40	4H-Y40	2
41	Cross feed rear control lever	3H-Y41	4H-Y41	1
42	Vertical feed rear control lever	3H-Y42	4H-Y42	1
43	Vertical rear control shaft	3H-Y43	4H-Y43	1
44	Rear control serrated dial collar	3H-Y44	4H-Y44	2
45	Soc dog pt screw, 5/16 x 1/4"	3H-Y45	4H-Y45	2
46	Soc set screw, 5/16 x 1/4"	3H-Y46	4H-Y46	2
47	Vertical rear control serrated dial	3H-Y47	4H-Y47	1
48	Spring	3H-Y48	4H-Y48	2
49	Rear control dial spring retainer	3H-Y49	4H-Y49	2
50	Fil hd screw, 10-32 x 1/2"	3H-Y50	4H-Y50	6
51	Rear control crank guard	3H-Y51	4H-Y51	2
52	Cross feed rear control serrated dial	3H-Y52	4H-Y52	1
53	Rear control crank guide pin	3H-Y53	4H-Y53	1
54	Taper pin, #4 x 1-7/16"	3H-Y54	4H-Y54	1
55	Rear control cross and elevating crank	3H-Y55	4H-Y55	1
56	Rockwood handle, 3QA	3H-Y56	4H-Y56	1

* 2 used on 4H machines

† 4 used on 4H machines

SAFETY EVERYBODY'S BUSINESS

PUB - 578

First Edition — May, 1976

Kearney & Trecker Corporation



PREFACE

SAFETY . . . Everybody's Business

A metal cutting machine tool can be a very safe machine. Or you as a user can make it be a very dangerous one. The difference depends on you . . . and the other people who are required to perform functions relating to the machine tool operation. Yes, this also depends on management and others who may be observers of the metal cutting machine tool. Everybody must become safety conscious. If everybody thinks safety, accidents can be prevented. If an effort is made by everyone to understand and follow the basic safety procedures that follow and also the safety rules prescribed in your own company . . . you can prevent serious injury to personnel and costly damage to equipment.

We recognize that these suggested safety precautions are a beginning and not an end. They cannot include all of the eventualities that might arise in all companies . . . and in all types of operations on all types of metal cutting machine tools.

So when you are following these suggestions, add a large amount of common sense attitudes and good judgment along with them.

Always think safety! Remember, a metal cutting machine tool can be very safe or very dangerous. It depends on you. It is the intent of the Kearney & Trecker Corporation to update this safety information. We would welcome comments or suggestions from our product

users. Your input will be given our serious consideration for inclusion in the next update of this information.

Some parts of the information contained in this booklet are also included in the front of each manual. **THE CUSTOMER RECEIVES THESE MANUALS WHEN HE PURCHASES A KEARNEY & TRECKER PRODUCT.**

As you read this safety literature, you will notice that it is addressed to all occupation skill groups that are concerned with machine operation, supervision and maintenance. Since the Kearney & Trecker Corporation believes that safety is everybody's business, we are not attempting to separate these safety guide lines where separate manuals would be required for the machine operators, supervisors, maintenance technicians, etc. We believe that you will agree that this is a good approach. Please take time to read the **ENTIRE** manual.

When an accident occurs, investigation may reveal the cause and pinpoint what should have been done to have prevented the accident. This can only provide **HINDSIGHT**. The purpose of a good safety program is to prevent the accident from occurring in the first place. This can be accomplished by the use of **FORESIGHT** and knowing the results of our actions when working around machine tools.

THINK SAFETY — WORK SAFELY

GENERAL SAFETY REMINDERS

1. The employer is responsible for selecting competent and qualified employees. Kearney & Trecker conducts training classes. We strongly suggest you enroll your employees.
2. MANUALS ARE PROVIDED WITH EACH MACHINE TOOL. THE USER SHOULD HAVE THESE MANUALS AVAILABLE FOR THE PERSONNEL WORKING WITH THE MACHINE TOOL.
3. Guards and shields are to be in place at all times.
4. Operators must be forbidden from changing workpieces or performing other work close to a revolving cutter . . . Stopping the spindle is a good work habit.
5. When contaminants are released to the atmosphere as a result of machining, an exhaust system is recommended.
6. All employees should be aware of first aid facilities and be encouraged to use same, regardless of the severity of the injury.
7. Employees should be encouraged to report to their supervisors any hazardous condition on the machine tool or in the immediate area.
8. Air hoses — it is recommended that air hoses not be available for use around the machine tool. Flying chips may cause personal injury or damage equipment.
9. Levels of illumination in the immediate area of the machine tool should comply with National Standards.
10. Fire prevention must be practiced and fire protection available to prevent loss of life, personal injury and to protect property.
11. Protective footwear — safety shoes afford good protection against rolling objects, dropping heavy objects, accidentally kicking sharp edged materials. Comfortable protective footwear is a good investment.
12. Eye protection — eye protection devices must be considered as optical instruments and they should be carefully selected, fitted and used. Compulsory wearing of spectacles with impact resistant lenses is a good safety policy.
13. The employer must insist that his employees study this safety information and practice safety.
14. Users must have available adequate lifting facilities capable of lifting within the safe load limits; also appropriate slings and hitches.
15. Every floor opening resulting from the machine tool installed in pits or below floor level should be covered with a material of proper strength with non-slip features.
16. When machines are installed above floor level and a platform is built around the machine tool, the platform must be constructed of materials of proper strength with non-slip features of the walking surfaces. Railings and toe boards must be installed where applicable.
17. Management personnel have the responsibility to alert operating personnel of any unsafe practice they may observe.

MACHINE TOOL SAFETY

Metacutting machine tools play an essential role in a modern society; HIGH HORSEPOWER, SHARP CUTTING TOOLS, RAPIDLY MOVING PARTS, HIGH VOLTAGE, and AUTOMATIC OPERATION are necessary ingredients of a satisfactory machine tool, and are all POTENTIAL HAZARDS!

The METAL REMOVAL process often results in rapidly propelled metal chips and sharp edges and burrs on the finished workpiece. These are POTENTIAL HAZARDS! Due to these potential dangers inherent in a machine tool, protective guards, safety design features and warning signs are utilized. For MAXIMUM PERSONAL SAFETY it is imperative that all operators, maintenance personnel, observers, and all others that could be exposed to inherent machine hazards are made FULLY AWARE of potential dangers, and are THOROUGHLY INSTRUCTED in the SAFETY PRECAUTIONS they MUST FOLLOW to avoid those dangers. It is essential that persons required to become involved with the machine are properly trained and have the required knowledge and skill to perform their respective functions.

If assistance is required, contact your local Kearney & Trecker representative. Adherence to the following list of recommended SAFETY PRECAUTIONS, plus the application of common sense attitudes, will reduce to a minimum the possibility of personal injury resulting from the use of a Kearney & Trecker machine tool.

FOR MAXIMUM SAFETY AROUND MACHINE TOOLS:

1. BEFORE you START a machine, be sure you know what is going to happen. KNOW your MACHINE.
2. Be sure you know how to STOP the machine before you start it. KNOW your MACHINE.
3. MAINTAIN the machine in GOOD OPERATING ORDER. Report unusual conditions or machine malfunctions immediately.

4. Always STOP your CUTTER before REMOVING a finished WORKPIECE from in front of the spindle. Do not place your hands near a rotating tool.
5. Never attempt to perform any cleaning, chip removal or work piece clamping while units are in motion. This is like running a race and some day you may lose the race.
6. If you are assigned an assistant for any reason, both the assistant and the operator have the responsibility of deciding who will be in command of the machine and its controls. Only one person should control the machine. ANYONE ELSE SHOULD STAND CLEAR AND BE VISIBLE TO THE PERSON WHO IS ASSIGNED TO OPERATE THE MACHINE CONTROLS. Also, be alert for any bystanders or unauthorized person who may be in the area of the machine travel limits and chip disposal areas. An area that may not be a hazard to the machine operator at his control station may be hazardous to an assistant or bystander.
7. Remember that your work area may change during the day as material is delivered to and removed from your machine area. Be alert for pinch point and work hazard areas created by workpiece storage.
8. Keep the immediate area clean. Avoid slippery floors, remove debris, remove obstacles, remove chips, etc.

Chips that are allowed to accumulate in the area in which you must walk are a hazard that can cause you to fall or slip against the machine or its controls.

9. Remember that many accidents occur that are not related to the actual machine operation and actual metal cutting process. Accidents during material handling represent a large percentage of reported personal injuries.

MACHINE TOOL SAFETY (Cont.)

10. Report any HYDRAULIC OIL LEAKS OR COOLANT LEAKS. These should be CORRECTED IMMEDIATELY and not be allowed to accumulate causing an area to become unsafe for walking.
11. ONE COMMON CAUSE OF INJURY IS ATTEMPTING TO PERFORM MAINTENANCE OR CLEANING WHILE A MACHINE IS IN MOTION OR AUTOMATIC MODE. ANOTHER IS ACCIDENTAL START UP OF THE MACHINE BY A SECOND PERSON WHILE ONE MAN IS PERFORMING MAINTENANCE OR LUBRICATION.

Never attempt to perform maintenance or lubrication while the machine is in operation. The operator and the person(s) performing maintenance must be mutually aware of each other's presence in the machine area.

During maintenance or lubrication, the machine should be taken out of service. THE CONTROLS SHOULD BE PROPERLY MARKED WITH A WARNING SIGN AND LOCKED.

Re-read Items 5 and 6 above.

Remember that no one will normally be injured by a machine that is taken out of service. Use all precautions to avoid accidental start-up of a machine while it is being serviced.
12. DULL cutting tools are DANGEROUS. DON'T use them. Make certain that all CUTTING TOOLS are properly SHARPENED and correctly assembled to appropriate tool holders, arbors, etc.
13. NEVER use cutters, wrenches, or other tools that do not fit the machine properly.
14. Be sure the workpiece is held SECURELY in the vise or fixture.
15. Be sure that all protective GUARDS are in place BEFORE the machine is STARTED.
16. NEVER apply a wrench to MOVING work or parts.
17. DO NOT attempt to ADJUST a tool while the machine is RUNNING. Shut off machine at main disconnect.
18. Be sure of CLEARANCE between CUTTERS and WORKPIECE and FIXTURES before STARTING the machine.
19. DO NOT ADJUST COOLANT FLOW OR DELIVERY NOZZLES with the spindle running. Hands or coolant nozzles may be pulled into the revolving cutter resulting in personal injury or damage to the machine.
20. Be sure that the machine's moving parts are kept CLEAR of all LOOSE OBJECTS, TOOLS, CHUCK WRENCHES, ETC. Do not use the machine as a work bench.
21. DO NOT attempt to BRAKE or SLOW down moving machine parts with your HANDS or MAKESHIFT devices.
22. DO NOT CLEAN a machine with an AIR HOSE. Flying chips can cause personal injury or damage to machine.
23. NEVER CLIMB on or around machine on makeshift devices such as skids, tote pans, boxes, etc. Use only SAFETY APPROVED LADDERS.
24. Be AWARE of conditions that may be a FIRE HAZARD, such as volatile liquids and machining materials with a low flash point.
25. DON'T attempt to use the machine BEYOND its designated CAPABILITIES.
26. NEVER attempt to MEASURE MOVING WORKPIECES in the machine, or NEAR the revolving CUTTER, always stop cutter and machine motion when measuring.
27. The machine should NOT be left RUNNING while UNATTENDED.

MACHINE TOOL SAFETY (Cont.)

28. When making repairs, be sure to take all **NECESSARY PRECAUTIONS** to prevent **PERSONAL INJURY** from **LOOSENED** or **UNSUPPORTED** machine parts or units.
29. **DO NOT** wear **RINGS, WATCHES, JEWELRY** around moving machinery.
30. **DO NOT** wear **LOOSE** fitting **CLOTHES**. Clothing should be comfortable, but **LONG SLEEVES, NECKTIES, etc.**, should **NOT** be **WORN**.
31. **SHOP APRONS** are deliberately made with a light tie-string for a purpose; do **NOT REPLACE** the light string with a heavy cord or wire.
32. Wearing of **SAFETY SHOES** is recommended.
33. **WEARING** of **GLOVES** or other hand covering articles is not recommended around moving machinery. **GLOVES MUST BE CONSIDERED THE SAME AS LOOSE FITTING CLOTHES**.
34. **ALWAYS WEAR** approved **SAFETY GLASSES** when operating metal cutting machine tools. Clear vision helps you do good work as well as avoid accidents.
35. **NEVER LEAN** on the **MACHINE**. You may inadvertently set it in motion, or fall into a moving cutter.
36. **LONG HAIR** should be covered with a protective cover such as a **HAIR NET**.
37. **NEVER** use a **RAG** or other material to remove chips from a revolving cutter. Use a **BRUSH** provided for such application.
38. **NEVER** handle **SHARP CUTTERS BARE-HANDED**. Wrap the cutter in a rag. See also Items 47 and 48.
39. **ALWAYS** be sure the **WRENCH** fits the nut. Use a straight arm body pull — do not jerk. Be prepared for the bolt to shear or the wrench to slip. **KEEP BALANCED**.
40. In using any **WRENCH**, it is better to **PULL** than to **PUSH**. If it is necessary to **PUSH**, use the open palm. When using an adjustable wrench, exert handle pressure toward the moveable jaw. Stand to one side when you are pulling down on wrenches above your head. **DO NOT** hammer on a wrench with a hard hammer; if necessary, use a babbitt pounder.
41. Screw drivers should not be used as a **WEDGE** or **CHISEL** or **PUNCH**.
42. Pliers **SHOULD NOT** be used as a wrench.
43. **DO NOT** use a file as a pry bar.
44. When filing **DO NOT** use a file that does not have a **HANDLE** firmly attached and covering the pointed tang.
45. Hand tools especially those with **POINTS** and **SHARP EDGES** should **NEVER** be carried in pockets or under trouser belts. Use a tool box or a tool belt.
46. **NEVER** misuse compressed air as a practical joke. **KEEP** air at **PRESSURE LEVEL** recommended by industry standards. Improper use of an air hose may cause permanent disability or even death.
47. When handling cutters which are already mounted on tool holders, grasp the tool holder in the area of the flange, not the area of the cutter. On tooling for **MACHINING CENTERS**, the code ring area provides a safe place for handling the cutter/tool holder assembly.

On larger size cutters (exceeding approximately 5-inch diameter) or where the cutter/holder assembly must be changed manually, or where the tool must be inserted horizontally, it will be found practical to use a rag to protect the hands.

MACHINE TOOL SAFETY (Cont.)

48. On STANDARD KNEE TYPE MACHINES with a POWER DRAW ROD unit, heavy cutter/arbor assemblies should be supported on the machine table in suitable cradles and/or wood blocks. The use of the knee, table and saddle axis movements allows you to position the arbor for easy alignment to the spindle and drive keys. This nearly eliminates the possibility of cross threading the start of the arbor and draw-bolt threads. Let the

machine do the work for you. This is easier and safer instead of trying to insert a heavy arbor/cutter assembly with your own strength. Use the same wood cradles or blocks when removing a heavy cutter/arbor assembly. This will avoid the possibility of personal injury and also prevent possible expensive damage to the cutters in the event you should drop the heavy cutter/arbor assembly onto the machine table.

ELECTRICAL SAFETY

1. All electrical/electronic troubleshooting and repair should be undertaken only by personnel who are properly trained and have adequate knowledge and skill.
2. It must be assumed at all times that POWER is "ON" so all conditions must be treated as live. This practice develops a caution that may prevent an accident.
3. REMOVE LOAD from circuit or equipment.
4. OPEN disconnect or breaker and (a) lock in open position or (b) remove fuses or (c) install "Hold-Off" tag or (d) have someone stand by. A switch in the open position with a lock that you only have a key for is positive protection from someone accidentally turning power on while you are working.
5. MAKE CERTAIN you have opened the circuit by using the proper test equipment — NOTE: Test equipment must be checked at regular intervals.
6. Capacitors MUST be given time to discharge, otherwise it should be done manually with CARE.
7. When trouble-shooting "LIVE" equipment, the necessary precautions must be taken as follows:
 - a. MAKE CERTAIN your tools and body are clear of ground.
 - b. Use extra PRECAUTION in DAMP areas.
 - c. BE ALERT and work without any outside distraction.
8. BEFORE applying POWER to any equipment, it must be established without a DOUBT that all persons are CLEAR.
9. The CONTROL PANEL DOORS shall be open ONLY when it is necessary to check out the electrical equipment or wiring. After CLOSING the door, make certain that the disconnecting means is operating properly with the DISCONNECT HANDLE MECHANISM.
10. ALL COVERS on junction boxes must be CLOSED before leaving any job.
11. BEFORE STARTING, read and understand all WARNING markings and notices.

ELECTRICAL SAFETY (Cont.)

12. READ all marking such as nameplates and identification plates.
13. DO NOT alter circuits unless authorized to do so by the manufacturer.
14. DO NOT alter or by-pass protective interlocks.
15. DO NOT place jumper wires across fuses.
16. DO NOT alter overcurrent protective devices.
17. WHEN conductors are REPLACED, they shall conform to the manufacturer's SPECIFICATIONS, including PROPER COLOR CODING.
18. GROUND connections cause fault currents to flow directly into the ground instead of following through the body into the ground. ALL ELECTRICAL APPARATUS MUST BE PROPERLY GROUNDED.
19. Use CAUTION when connecting test equipment probes to test points. SHOCK HAZARDS could exist at the test points or in the test point area and/or TRANSIENTS induced by the probes could cause a MACHINE ACTION.
20. AVOID wearing glasses that have a METAL FRAME.
21. AVOID wearing a necklace or chain that is made of a METALLIC substance.

LIFTING EQUIPMENT

There is a variety of accessories that might be needed for a lifting or turning job.

1. Hooks — They are made in many shapes and sizes. The hook must not be loaded over its capacity and must be used properly.
2. Chains — Not recommended for heavy lifts because flaws are difficult to detect and they are too cumbersome to handle.
3. Manila Rope — Provides a good grip on the job and is light and flexible to handle. Must be protected against the weather and other destructive elements such as solvents, oil, and heat. Manila rope should be inspected frequently.
4. Nylon Rope — Gradually replacing manila rope. Basically the same strength and not affected by destructive elements.
5. Wire Rope — Most slings are made of wire rope. It is preferred because it is stronger than fabric ropes; it is flexible and can be shaped to most lifting requirements.

Remember, your first responsibility is to practice safety. Before you begin any lift, we suggest you go through a mental check list. Ask yourself questions like the following:

1. What is the weight of this load?
2. What type of accessory, hitch or connection is required?
3. Will the lift be a straight lift or whether an angle rig is required. This determination will affect the lifting capability of the accessory.
4. Are the slings free of kinks, knots, or broken strands.
5. Is proper clearance available to make the lift safely.

For further information on hoisting your Kearney & Trecker products, we refer you to the Product Installation Instructions provided with your machine.

PERSONAL PROTECTIVE EQUIPMENT

When involved in the lifting of heavy loads, we suggest you protect yourself by wearing the following protective gear.

1. Safety Shoes — Foot injuries can be eliminated or their seriousness can be reduced through the wearing of approved safety shoes.
2. Safety Glasses — Eye protective devices must be considered as optical instrument and they should be carefully selected, fitted and used.
3. Safety Helmets — Because of the possibility of falling objects, the head is exposed to hazards, therefore, head protection devices should be worn.
4. Gloves — Although it is recommended that gloves not be worn unless absolutely necessary, gloves can protect the hands from cuts or abrasions caused by slings or sharp edges.

LIFTING TIPS

Because the type of hoisting equipment in each customer's facility is unknown to the Kearney & Trecker Corporation, these instructions are written with the intent of being general rather than specific. However, whether you have in your facility a bridge, jib, gantry, semi-gantry, cantilever wall crane, or some other lifting crane, these safety rules will apply.

In some cases where adequate hoisting equipment is not available, it may be necessary to contact an outside contractor. Whatever your conditions are, you must practice good safety procedures. The operation of the hoisting equipment may not be your full time job, but if you are involved when hoisting Kearney & Trecker products, you must follow all of these good safety practices. Remember, a child could manipulate the controls. Your job is safety.

1. NEVER lift more than the rated capacity of the hoisting equipment.
2. If in doubt, have the hoisting equipment INSPECTED for safe operating conditions. INSPECT all slings. DON'T TAKE CHANCES, if in doubt, check with proper authority.
3. BALANCE LOAD in sling before LIFTING more than a few inches. Distribute load evenly.
4. Use a sling LARGE enough for the LOAD.
5. To PREVENT damage from the slings to the finished parts of the machine, be sure machine parts are properly PROTECTED by PADDING.
6. ALWAYS be sure your slings are free of knots and kinks. Also, SLACK must be taken out of the sling before lifting.
7. TO PREVENT a serious accident that may be caused by sharp corners and edges cutting the sling, use proper BLOCKING and PADDING.
8. CLARIFY HAND SIGNALS with co-workers. If signals are not understood, make no move until they are clarified.
9. DO NOT lift loads with extra slings or cables suspended from the hook.

LIFTING TIPS (Cont.)

10. ALL loads must be lifted gradually. Sudden jerks may DAMAGE cables or slings.
11. BEFORE lifting a machine or a component of a machine VERIFY that all inter-related connections are disconnected.
12. BEFORE you signal to have a load lifted, be sure that all tools, parts, chips, coolant, oil, etc. are REMOVED from the LOAD.
13. DO NOT carry loads over aisles unless absolutely necessary.
14. As the lift starts OBSERVE the slings or lifting devices to assure that they are FUNCTIONING PROPERLY.
15. BEFORE making the lift, ask all employees to STAND CLEAR. NEVER allow a person to work under the load while the load is suspended from the crane hook.
16. When setting loads down, prepare the landing area beforehand and DON'T create a condition of LEANING and UNSTABLE units.
17. When lowering the load on blocks, the blocks MUST be even in height for a LEVEL and STABLE load.
18. DON'T set your load down in aisles. It is your duty to keep AISLES CLEAR for other employees.
19. ALWAYS be suspicious of a heavy load which must be lifted by eye bolts and NEVER lift such loads at an angle unless the eye bolts are short shouldered.
20. Between lifts, DON'T leave slings or hooks or other equipment lying around on the floor.
21. ALWAYS use good horse sense and good judgment in handling all loads.