

#  
73

KEARNEY & TRECKER  
MILWAUKEE

**Replacement  
Parts Manual**  
*Pub. No. 54*

- |       |          |
|-------|----------|
| 2CK   | 3CK      |
| 3CH   | 4CH      |
| 210CH | 210CH-14 |
| 310CH | 310CH-14 |
| 315CH | 315CH-16 |
| 415CH | 415CH-16 |

PLAIN-UNIVERSAL-VERTICAL  
MILLING MACHINES

**KEARNEY & TRECKER CORPORATION**

MILWAUKEE, WISCONSIN, U.S.A. 53214

BOB JAMES

3CH

~~328~~ 328 2634

SN-10-8821

## IMPORTANT

For these models



**2CK**

**3CH**

**210CH**

**310CH**

**210CH-14**

**310CH-14**



**USE CODES**

**3CH**

**or**

**14CH**

For these models



**3CK**

**4CH**

**315CH**

**415CH**

**315CH-16**

**415CH-16**



**USE CODES**

**4CH**

**or**

**16CH**

# Replacement Parts Manual

*Pub. No. 54*



TRADEMARK REG. U. S. PAT. OFF.

## 3CH-4CH

**210CH**

**310CH**

**315CH**

**415CH**

**210CH-14**

**310CH-14**

**315CH-16**

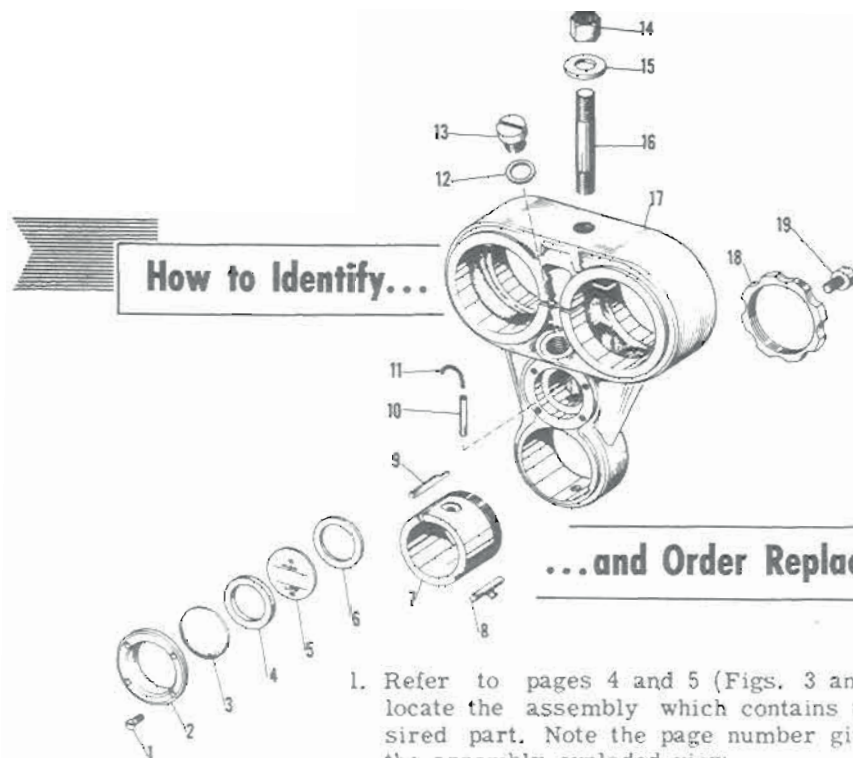
**415CH-16**

*Plain    Universal    Vertical*

*Milling Machines*

**KEARNEY & TRECKER CORPORATION**

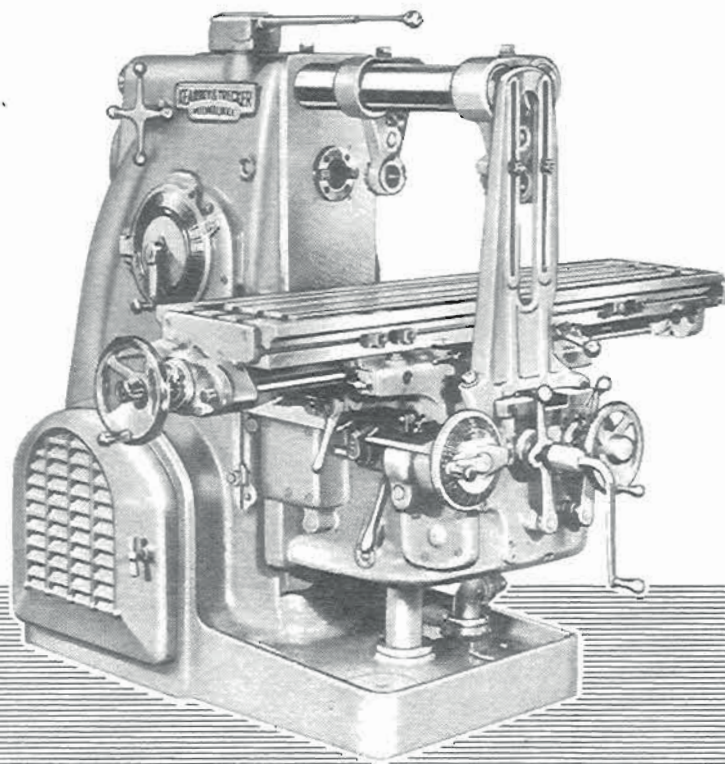
Milwaukee, Wisconsin, U. S. A. 53214 • Phone: Area 414—476-8300



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.

3CH

**PLAIN STYLE**  
with standard  
directional  
table control



See No 10-5821

15-500

McLennan 777-4-2

**UNIVERSAL STYLE**  
with standard  
directional  
table control

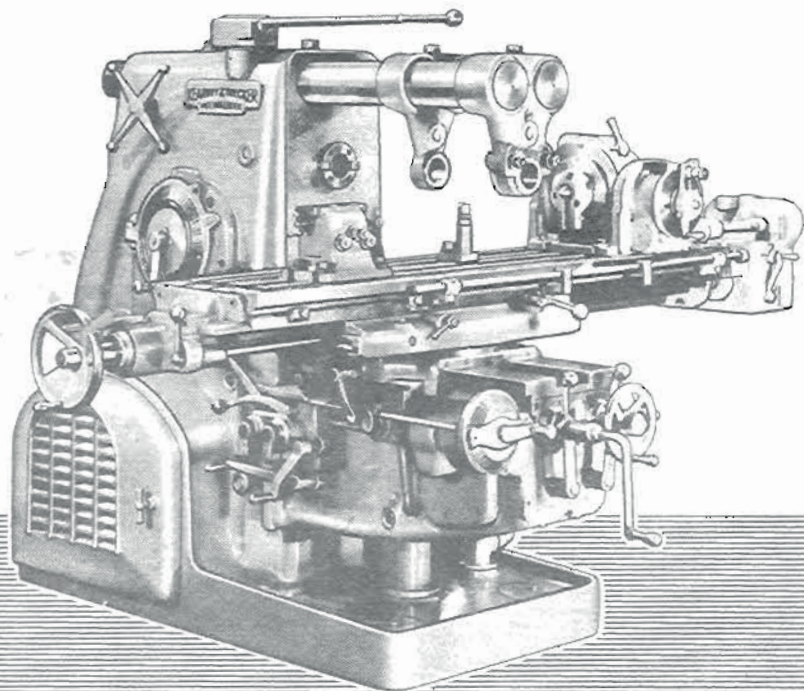
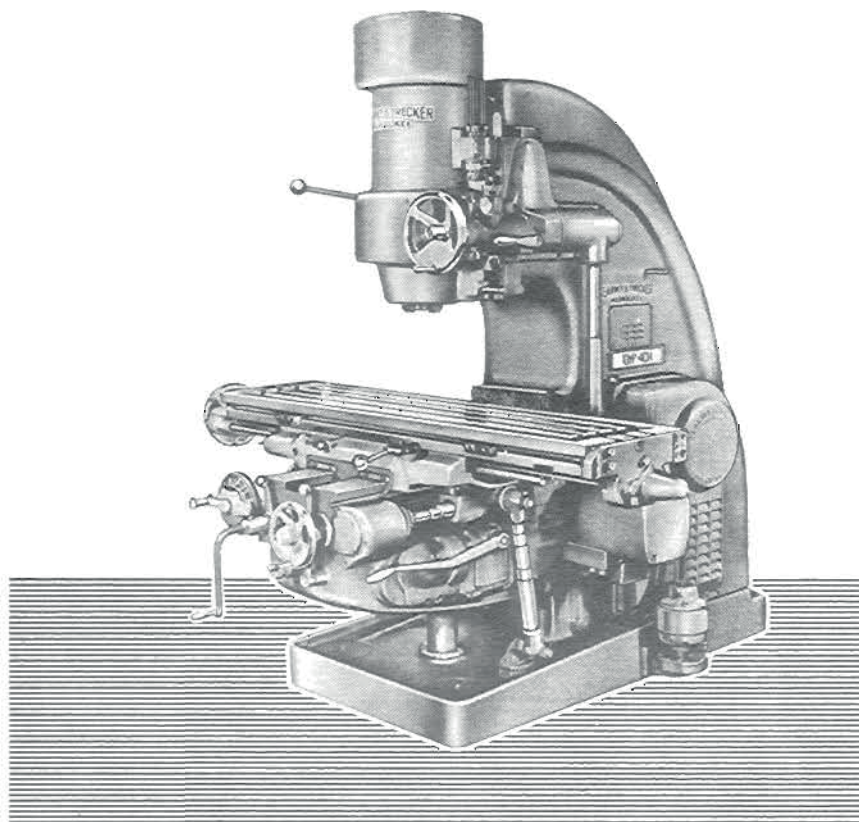


FIGURE 1



**VERTICAL STYLE**  
with standard  
directional  
table control

**VERTICAL STYLE**  
with mono-lever and  
automatic cycle  
table control

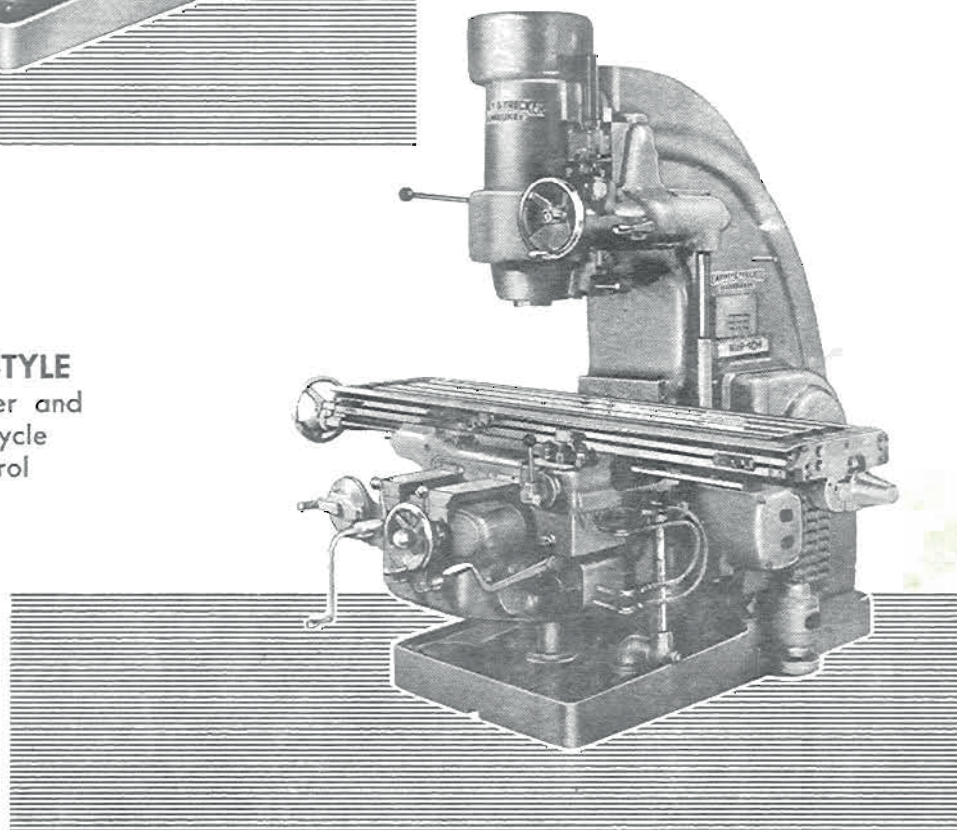


FIGURE 2

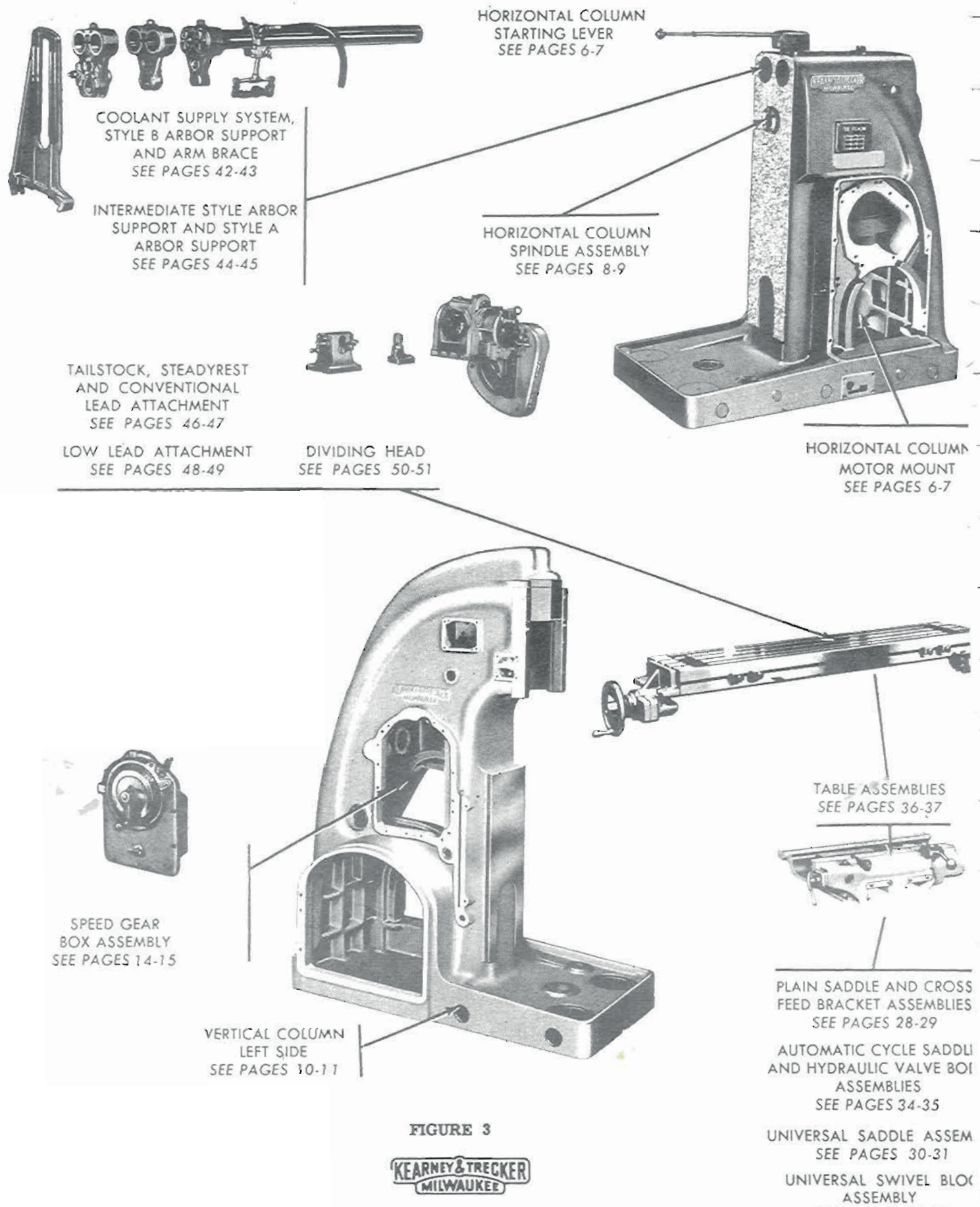


FIGURE 3



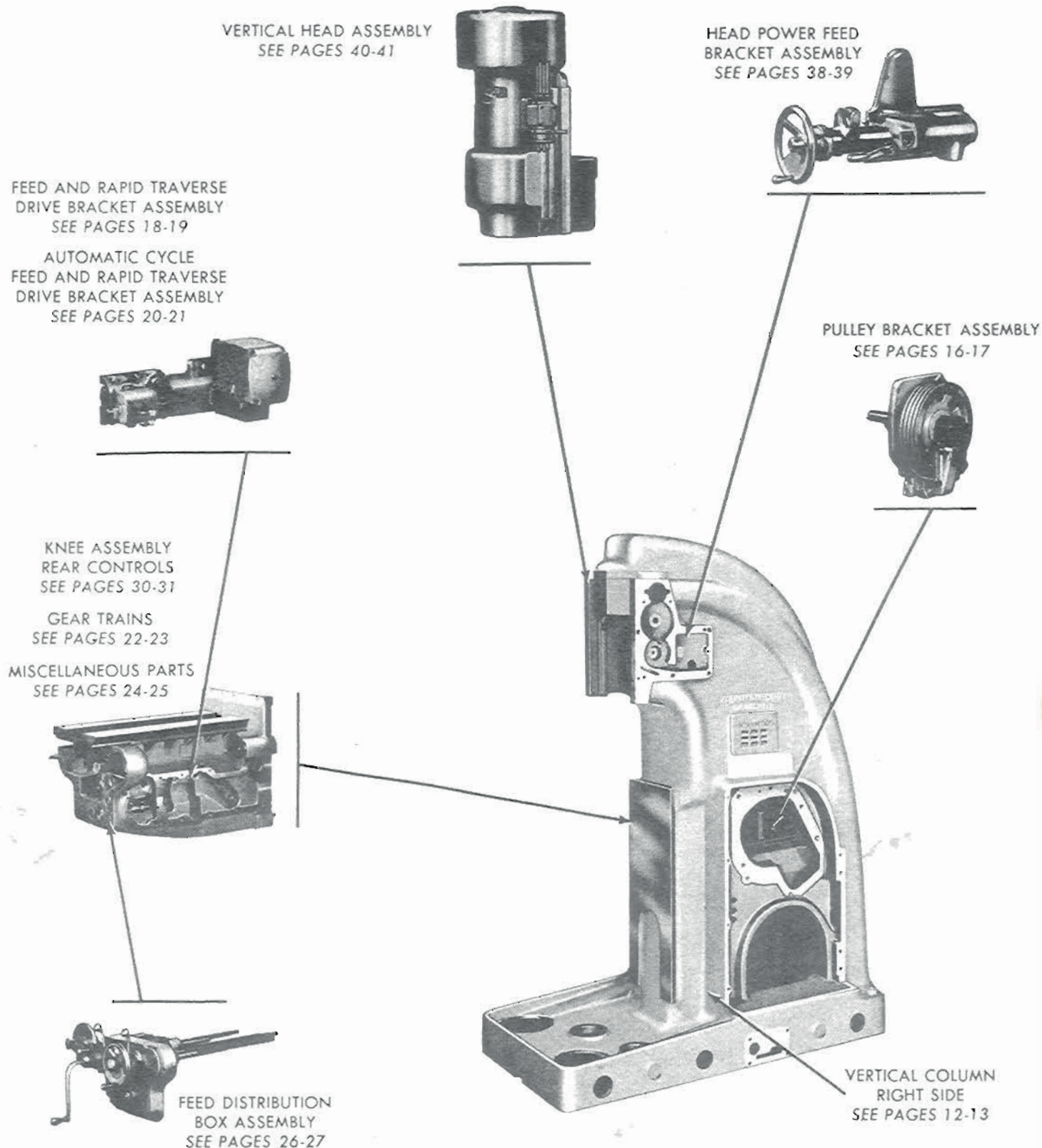


FIGURE 4



**KEARNEY & TRECKER**  
**MILWAUKEE**  
 SERIAL 1-1000

WHEN ORDERING PARTS  
 REPORT SERIAL NUMBER  
 SHOWN ON THIS PLATE

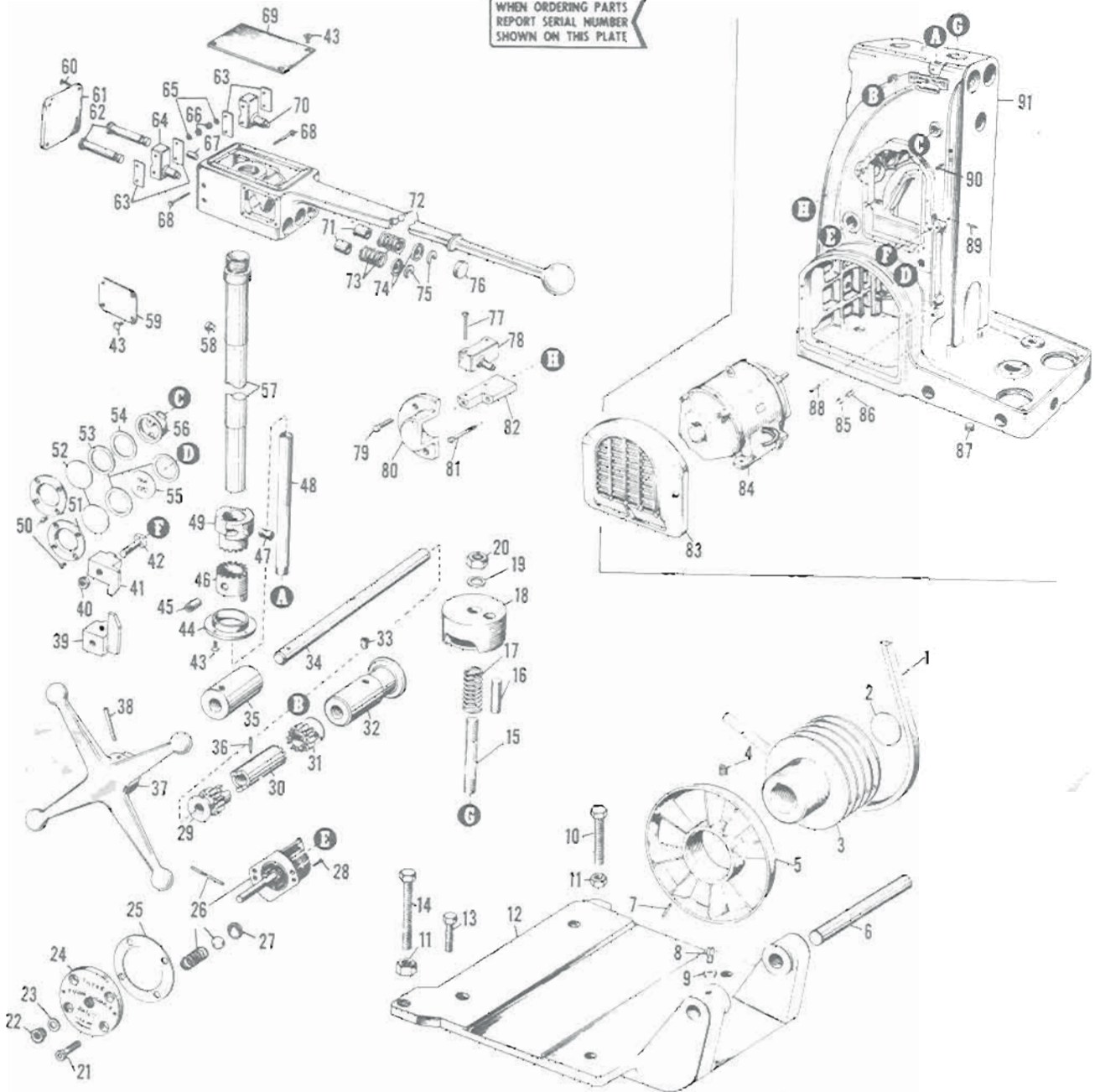


FIG. 5 - HORIZONTAL COLUMN, STARTING LEVER AND MOTOR MOUNT

BUILDERS OF PRECISION AND PRODUCTION

**KEARNEY & TRECKER**  
**MILWAUKEE**

MACHINE TOOLS FOR MILLING AND BORING

**FIG. 5A - HORIZONTAL COLUMN, STARTING LEVER, AND MOTOR MOUNT**

Item No.	Part Name and Description	Code No.		Qty.	Item No.	Part Name and Description	Code No.		Qty.
		14CH	16CH				14CH	16CH	
1	Oil Filler Cap	14CH-A1	16CH-A1	1	49	Oil Level Gage	14CH-A49	16CH-A49	1
2	Set Screw	14CH-A2	16CH-A2	2	50	Motor Door Assembly	14CH-A50		1
3	Column	14CH-A3		1			16CH-A50		1
			16CH-A3	1	51	Motor	14CH-A51		1
4	Vent Plate	14CH-A4	16CH-A4	1			16CH-A51		1
5	Screw	14CH-A5	16CH-A5	5	52	Drive Belt	14CH-A52		1
6	Door Assembly	14CH-A6		1			16CH-A52		1
			16CH-A6	1	53	Set Screw	14CH-A53		1
7	Gasket	14CH-A7	16CH-A7	1			16CH-A53		1
8	Connector Plate	14CH-A8	16CH-A8	1	54	Motor Sheave	14CH-A54		1
9	Screw	14CH-A9	16CH-A9	2			16CH-A54		1
10	Corner Bracket	14CH-A10		1	55	Motor Fan	14CH-A55	16CH-A55	1
			16CH-A10	1	56	Dowel	14CH-A56	16CH-A56	1
11	Plug	14CH-A11	16CH-A11	1	57	Set Screw	14CH-A57	16CH-A57	1
12	Screw	14CH-A12		4	58	Motor Base Support Pin	14CH-A58	16CH-A58	1
			16CH-A12	4	59	Motor Base	14CH-A59		1
13	Door Latch Strip	14CH-A13	16CH-A13	1			16CH-A59		1
14	Junction Box Cover	14CH-A14		1	60	Set Screw	14CH-A60		1
			16CH-A14	1			16CH-A60		1
15	Gasket	14CH-A15		1	61	Nut	14CH-A61		1
			16CH-A15	1			16CH-A61		1
16	Screw	14CH-A16	16CH-A16	10	62	Cap Screw	14CH-A62		1
17	Coolant Pump Wiring Chamber Cover	14CH-A17		1			16CH-A62		1
			16CH-A17	1	63	Nut	14CH-A63		2
18	Gasket	14CH-A18		1			16CH-A63		1
			16CH-A18	1	64	Cap Screw	14CH-A64		1
19	Screw	14CH-A19	16CH-A19	2	65	Trip Dog, Lower	14CH-A65	16CH-A65	1
20	Screw	14CH-A20		1	66	Trip Dog, Upper	14CH-A66	16CH-A66	1
			16CH-A20	1	67	Nut	14CH-A67	16CH-A67	2
21	Drain Screen Cover Knob	14CH-A21	16CH-A21	2	68	T Bolt	14CH-A68	16CH-A68	2
22	Drain Screen Cover	14CH-A22	16CH-A22	2	69	Overarm Handwheel	14CH-A69		1
23	Drain Screen	14CH-A23	16CH-A23	2			16CH-A69		1
24	Screw	14CH-A24	16CH-A24	6	70	Pin	14CH-A70		1
25	Stop Pin	14CH-A25	16CH-A25	2			16CH-A70		1
26	Trip Stud	14CH-A26	16CH-A26	1	71	Pinion Shaft	14CH-A71		1
27	Nipple	14CH-A27	16CH-A27	1			16CH-A71		1
28	Pipe Cap	14CH-A28	16CH-A28	1	72	Pin, Outer	14CH-A72	16CH-A72	2
29	Switch Housing	14CH-A29	16CH-A29	1	73	Pin, Inner	14CH-A73	16CH-A73	2
30	Screw	14CH-A30	16CH-A30	4	74	Set Screw	14CH-A74	16CH-A74	2
31	Screw	14CH-A31	16CH-A31	2	75	Overarm Pinion	14CH-A75	16CH-A75	2
32	Switch Bracket	14CH-A32	16CH-A32	1	76	Expansion Plug	14CH-A76	16CH-A76	1
33	Screw	14CH-A33	16CH-A33	3	77	Screw	14CH-A77	16CH-A77	4
34	Coolant Cleanout Cover	14CH-A34	16CH-A34	1	78	Plug	14CH-A78	16CH-A78	1
35	Paper Gasket	14CH-A35	16CH-A35	1	79	Washer	14CH-A79	16CH-A79	1
36	Expansion Plug	14CH-A36	16CH-A36	1	80	Filter Head	14CH-A80	16CH-A80	1
37	Pendant Swivel	14CH-A37	16CH-A37	1	81	Gasket	14CH-A81	16CH-A81	1
38	Set Screw	14CH-A38	16CH-A38	1	82	Filter	14CH-A82	16CH-A82	1
39	"O" Ring	14CH-A39	16CH-A39	1	83	Ball Retainer	14CH-A83	16CH-A83	1
40	Stop Pin	14CH-A40	16CH-A40	3	84	Screw	14CH-A84	16CH-A84	2
41	Pendant Arm	14CH-A41	16CH-A41	1			14CH-A85		2
42	Pendant Rear Cover	14CH-A42	16CH-A42	1			16CH-A85		2
43	Gasket	14CH-A43	16CH-A43	2	86	Washer	14CH-A86		2
44	Pendant Body	14CH-A44	16CH-A44	1			16CH-A86		2
45	Pendant Front Cover	14CH-A45	16CH-A45	1	87	Overarm Clamp	14CH-A87		2
46	Cover Screw	14CH-A46	16CH-A46	8			16CH-A87		2
47	Stud	14CH-A47		2	88	Spring	14CH-A88		2
			16CH-A47	2			16CH-A88		2
48	Oil Flow Gage	14CH-A48	16CH-A48	1	89	Pin	14CH-A89	16CH-A89	2

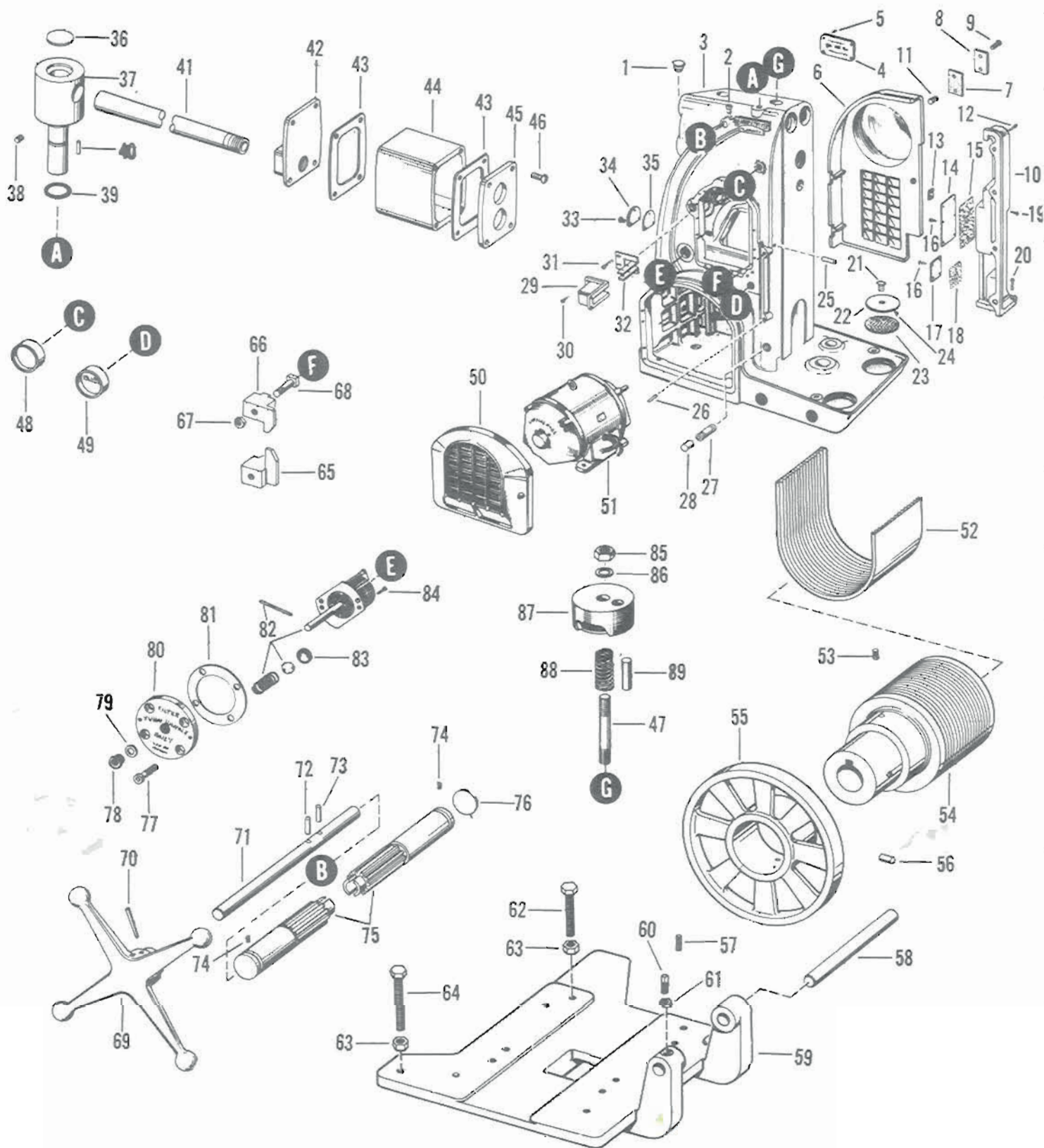


FIG. 5A - HORIZONTAL COLUMN, STARTING LEVER, AND MOTOR MOUNT

Fig. 5 - Horizontal Column, Starting Lever and Motor Mount

Item No.	Part Name and Description	Code Nos.		Qty.
		3CH	4CH	
1	V-Belt (Give motor nameplate data)	**3CH-A1	4CH-A1	***3
2	Expansion plug, 2" diam	3CH-A2		1
2	Expansion plug, 2-1/8" diam		4CH-A2	1
3	Motor sheave (Give motor nameplate data)	**3CH-A3	4CH-A3	1
4	Socket set screw, flat pt, 1/2 x 1"	3CH-A4		2
4	Socket set screw, flat pt, 1/2 x 1-1/4"		4CH-A4	2
5	Motor fan	3CH-A5	4CH-A5	1
6	Motor base support pin	3CH-A6	4CH-A6	1
7	Acme Blue Label dowel, 3/8 x 7/8"	3CH-A7	4CH-A7	1
8	Sq hd cup pt screw, 3/8 x 1-1/4"	3CH-A8	4CH-A8	1
9	Hex nut, 3/8-16	3CH-A9	4CH-A9	1
10	Hex hd cap screw, 3/4-10 x 4"	3CH-A10		1
10	Hex hd cap screw, 3/4-10 x 5-5/8"		4CH-A10	1
11	Hex nut, 3/4-10	3CH-A11	4CH-A11	2
12	Motor base	3CH-A12	4CH-A12	1
13	Hex hd cap screw, 5/8-11 x 2-5/16"	3CH-A13	4CH-A13	4
14	Hex hd cap screw, 3/4-10 x 5-5/8"	3CH-A14	4CH-A14	1
15	Stud	3CH-A15	4CH-A15	2
16	Clamp block pin	3CH-A16	4CH-A16	2
17	Spring	3CH-A17	4CH-A17	2
18	Overarm clamp	3CH-A18	4CH-A18	2
19	Washer, 3/4"	3CH-A19		2
19	Washer, 7/8"		4CH-A19	2
20	Hex nut, 3/4-10	3CH-A20		2
20	Hex nut, 7/8-9		4CH-A20	2
21	Socket hd cap screw, 3/8 x 3/4"	3CH-A21	4CH-A21	4
22	Filter hd plug	3CH-A22	4CH-A22	1
23	Filter hd washer	3CH-A23	4CH-A23	1
24	Filter hd	3CH-A24	4CH-A24	1
25	Filter hd gasket	3CH-A25	4CH-A25	1
26	100 Disc unit cartridge (Cuno B/P#B-1296)	3CH-A26	4CH-A26	1
27	Ball retainer	3CH-A27	4CH-A27	1
28	Fil hd screw, 10-32 x 5/16"	3CH-A28	4CH-A28	2
29	Overarm pinion (LH)	3CH-A29	4CH-A29	1
30	Overarm clutch sleeve	3CH-A30	4CH-A30	1
31	Overarm pinion (RH)	3CH-A31	4CH-A31	1
32	Overarm shaft bushing (RH)	3CH-A32	4CH-A32	1
33	Dog pt sock set screw, 1/2 x 3/4"	3CH-A33	4CH-A33	2
34	Overarm pinion shaft	3CH-A34	4CH-A34	1
35	Overarm shaft bushing (LH)	3CH-A35	4CH-A35	1
36	Pin	3CH-A36	4CH-A36	1
37	Overarm handwheel	3CH-A37	4CH-A37	1
38	Taper pin, #4 x 1-5/8"	3CH-A38		1
38	Taper pin, #5 x 2-3/8"		4CH-A38	1
39	Elevating trip dog (LH)	3CH-A39	4CH-A39	1
40	Hex nut, 7/16-14	3CH-A40	4CH-A40	1
41	Elevating trip dog (RH)	3CH-A41	4CH-A41	1
42	T-Bolt	3CH-A42	4CH-A42	2
43	Flat hd screw, 8-32 x 1/2"	3CH-A43	4CH-A43	12
44	Starting lever flange	3CH-A44	4CH-A44	1
45	Dowel pin	3CH-A45	4CH-A45	1
46	Starting lever positioning clutch	3CH-A46	4CH-A46	1
47	Switch cam stop pin	3CH-A47	4CH-A47	1
48	Starting lever stand pipe	3CH-A48	4CH-A48	1
49	Switch push rod cam	3CH-A49	4CH-A49	1
50	Oval hd screw, 10-32 x 15/32"	3CH-A50	4CH-A50	8

Item No.	Part Name and Description	Code Nos.		Qty.
		3CH	4CH	
51	Oil sight gage	3CH-A51	4CH-A51	1
52	Oil gage glass	3CH-A52	4CH-A52	2
53	Oil gage washer	3CH-A53	4CH-A53	3
54	Oil gage washer	3CH-A54	4CH-A54	1
55	Oil gage plate	3CH-A55	4CH-A55	1
56	Sight oil flow gage	3CH-A56	4CH-A56	1
57	Starting lever shaft	3CH-A57	4CH-A57	1
58	Starting lever stop pin	3CH-A58	4CH-A58	1
59	Starting lever cover	3CH-A59	4CH-A59	1
60	Flat hd screw, 8-32 x 5/8"	3CH-A60	4CH-A60	4
61	Starting lever end cover	3CH-A61	4CH-A61	1
62	Micro switch push rod	3CH-A62	4CH-A62	2
63	Switch insulator plate	3CH-A63	4CH-A63	4
64	Allen-Bradley precision limit switch, Bulletin #802 type PBSJ20-15 (Normally open) K-103757	3CH-A64	4CH-A64	1
65	Lockwasher, Shakeproof, #1106	3CH-A65	4CH-A65	4
66	Hex nut, 6-32	3CH-A66	4CH-A66	4
67	Acme Blue Label dowel, 5/16 x 5/8"	3CH-A67	4CH-A67	1
68	Switch support screw	3CH-A68	4CH-A68	4
69	Starting lever top cover	3CH-A69	4CH-A69	1
70	Allen-Bradley precision limit switch, Bulletin #802 type PBSJ20-15 (Double throw)	3CH-A70	4CH-A70	1
71	Starting lever stop sleeve	3CH-A71	4CH-A71	2
72	Starting lever	3CH-A72	4CH-A72	1
73	Spring	3CH-A73	4CH-A73	2
74	Push rod stop washer	3CH-A74	4CH-A74	2
75	Washer	3CH-A75	4CH-A75	2
76	Plug	3CH-A76	4CH-A76	3
77	Rd hd mach screw, 6-32 x 1-1/4"	3CH-A77	4CH-A77	2
78	Allen-Bradley precision limit switch, Bulletin #802 type PBSJ20-9	3CH-A78	4CH-A78	1
79	Fil hd screw, 5/16-18 x 5/8"	3CH-A79	4CH-A79	3
80	Switch cover	3CH-A80	4CH-A80	1
81	Fil hd screw, 1/4-20 x 1-3/4"	3CH-A81	4CH-A81	2
82	Switch bracket	3CH-A82	4CH-A82	1
83	Motor door	3CH-A83	4CH-A83	1
	Door handle	3CH-A84	4CH-A84	1
	Door latch	3CH-A85	4CH-A85	1
	Sq hd cup pt screw, 1/4-20 x 5/8"	3CH-A86	4CH-A86	1
	Spacing washer	3CH-A87	4CH-A87	*
	Door hinge	3CH-A88	4CH-A88	2
	Hex hd cap screw, 3/8-16 x 13/16"	3CH-A89	4CH-A89	8
	Lockwasher, Shakeproof #1220	3CH-A90	4CH-A90	8
84	Motor (See motor nameplate data)	3CH-A91	4CH-A91	1
85	Pipe cap, 1"	3CH-A92	4CH-A92	1
86	Nipple, 1 x 2"	3CH-A93	4CH-A93	1
87	Pipe plug, 1-1/2" (Altered)	3CH-A94	4CH-A94	1
88	Acme Blue Label dowel, 1/2 x 1-1/8"	3CH-A95	4CH-A95	2
89	Acme Blue Label dowel, 5/8 x 1-1/4"	3CH-A96		1
89	Acme Blue Label dowel, 5/8 x 1-1/2"		4CH-A96	1
90	Socket dog pt set screw, 3/8 x 1/2"	3CH-A97		1
90	Socket dog pt set screw, 3/8 x 1"		4CH-A97	1
91	Horizontal column	3CH-A98	4CH-A98	1

\*\*36012 (3CH, 50 cycle) (Dayton V-Belt #B63)

\*\*36043 (3CH, 60 cycle) (Dayton V-Belt #B62)

\*\*36009 (4CH, 50 cycle) (Dayton V-Belt #B67)

\*\*36011 (4CH, 60 cycle) (Dayton V-Belt #B66)

\*\*\*Four used on 3CH machines

\*Indicates as required

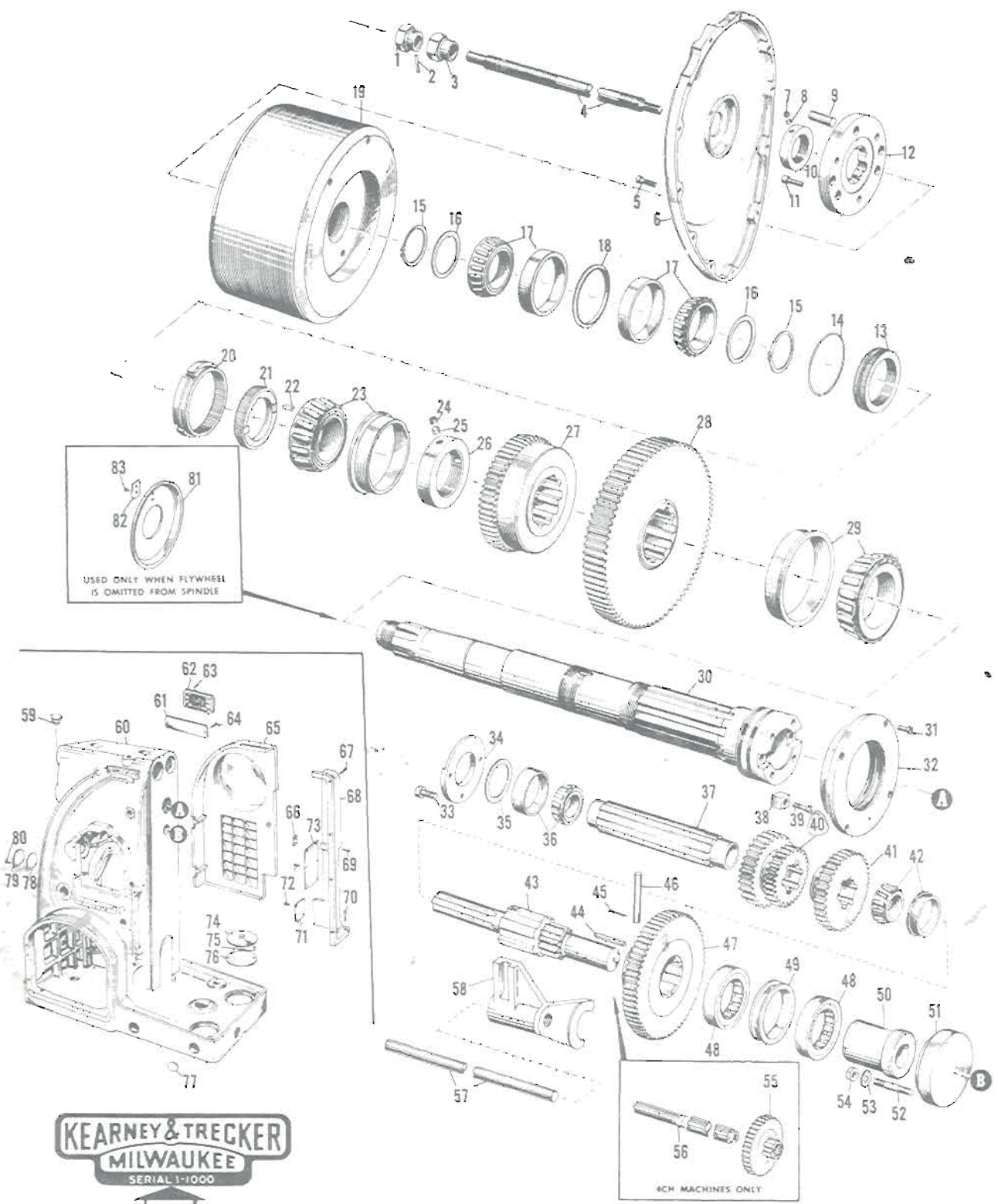


FIG. 6 - HORIZONTAL COLUMN SPINDLE ASSEMBLY

Fig. 6 - Horizontal Column Spindle Assembly

Item No.	Part Name and Description	Code Nos.		
		3CH	4CH	Qty.
1	Draw bolt hd	3CH-B1	4CH-B1	1
2	Taper pin, #4 x 1-1/4"	3CH-B2	4CH-B2	1
3	Draw bolt nut	3CH-B3	4CH-B3	1
4	Arbor draw-in bolt	3CH-B4	4CH-B4	1
5	Fil hd screw, 5/16-18 x 2"	3CH-B5		7
5	Fil hd screw, 5/16-18 x 7/8"	3CH-B6	4CH-B6	**3
6	Flywheel cover	3CH-B7	4CH-B7	1
7	Sock set screw, 3/8-24 x 3/8"	3CH-B8	4CH-B8	2
8	Collar nut shoe	3CH-B9	4CH-B9	2
9	Acme Blue Label dowel, 5/8 x 2-1/4"	3CH-B10	4CH-B10	3
10	Collar nut	3CH-B11	4CH-B11	1
11	Sock cap screw, 7/16 x 1-1/4"	3CH-B12	4CH-B12	3
12	Flywheel drive ring	3CH-B13	4CH-B13	1
13	Spindle brg drive collar nut	3CH-B14	4CH-B14	1
14	Snap ring	3CH-B15	4CH-B15**	2
15	Snap ring	3CH-B16	4CH-B16**	2
16	Spindle brg fitting washer	3CH-B17	4CH-B17	2
17	Timken brg, 33462-33275 (Spindle quality)	3CH-B18	4CH-B18	2
18	Spindle brg spacer	3CH-B19	4CH-B19	1
19	Flywheel	3CH-B20	4CH-B20	1
20	Spindle nut sleeve	3CH-B21	4CH-B21	1
21	Spindle brg drive collar	3CH-B22	4CH-B22	1
22	Key	3CH-B23	4CH-B23	1
23	Timken brg, 563B-567W (Spindle quality)	3CH-B24		1
23	Timken brg, 742B-742W (Spindle quality)		4CH-B24	1
24	Set screw, 5/8-18 x 5/8"	3CH-B25	4CH-B25	2
25	Collar nut shoe	3CH-B26	4CH-B26	2
26	Collar nut	3CH-B27	4CH-B27	1
27	Small spindle gear	3CH-B28	4CH-B28	1
28	Large spindle gear	3CH-B29	4CH-B29	1
29	Timken brg, 742B-749 (Spindle quality)	3CH-B30		1
29	Timken brg, 77675B-77375		4CH-B30	1
30	Spindle	3CH-B31	4CH-B31	1
31	Fil hd screw, 5/16-18 x 7/8"	3CH-B32		4
31	Fil hd screw, 5/16 x 7/8"		4CH-B32	4
32	Spindle oil shield	3CH-B33	4CH-B33	1
33	Fil hd screw, 7/16-14 x 1-1/8"	3CH-B34	4CH-B34	3
34	Spindle drive shaft brg retainer	3CH-B35	4CH-B35	1
35	Brg spacer	3CH-B36	4CH-B36	1
36	Timken brg, 3320-3384	3CH-B37	4CH-B37	1
37	Primary speed change shaft	3CH-B38		1
38	Spindle drive key	3CH-B39	4CH-B39	2
39	Fil hd screw, 7/16-14 x 1-5/16"	3CH-B40	4CH-B40	2
40	Primary high speed sliding gear	3CH-B41	4CH-B41	1
41	Primary low speed sliding gear	3CH-B42	4CH-B42	1
42	Timken brg, 3320B-3384	3CH-B43	4CH-B43	1
43	Spindle drive pinion	3CH-B44		1

Item No.	Part Name and Description	Code Nos.				
		3CH	4CH	Qty.		
44	Key		3CH-B45	1		
45	Cotter pin, 1/8 x 7/8"		3CH-B46	2		
46	Spindle drive gear retainer pin		3CH-B47	1		
47	Spindle drive gear (Driver)		3CH-B48	1		
48	Hyatt brg, 1310TS		3CH-B49	4CH-B49	2	
49	Primary change shaft brg spacer		3CH-B50	1		
50	Spindle drive pinion brg sleeve		3CH-B51	4CH-B51	1	
51	Spindle drive pinion brg cover		3CH-B52	4CH-B52	1	
52	Stud		3CH-B53	4CH-B53	2	
53	Washer, 3/8"		3CH-B54	4CH-B54	2	
54	Hex nut, 3/8-16		3CH-B55	4CH-B55	2	
55	Sliding spindle drive gear			4CH-B56	1	
56	Spindle drive shaft			4CH-B57	1	
57	Range shifter rod		3CH-B58	4CH-B58	1	
58	Range change shifter fork		3CH-B59	4CH-B59	1	
59	Gits oiler, #409		3CH-B60	4CH-B60	1	
60	Horizontal column		3CH-B61	4CH-B61	1	
61	Name plate		3CH-B62	4CH-B62	1	
62	Column vent plate		3CH-B63	4CH-B63	1	
63	Fil hd screw, 3/8-16 x 7/8"		3CH-B64	4CH-B64	5	
64	Oval hd screw, 10-32 x 3/4"		3CH-B65	4CH-B65	2	
65	Pulley door		3CH-B66	4CH-B66	1	
	Door handle		3CH-B67	4CH-B67	1	
	Door latch		3CH-B68	4CH-B68	1	
	Sq hd cup pt screw, 1/4-20 x 5/8"		3CH-B69	4CH-B69	1	
	Spacing washer		3CH-B70	4CH-B70	*	
	Door hinge		3CH-B71	4CH-B71	2	
	Hex hd cap screw, 3/8-16 x 13/16"		3CH-B72	4CH-B72	8	
	Lockwasher, Shakeproof #1220		3CH-B73	4CH-B73	3	
66	Door latch strip		3CH-B74	4CH-B74	1	
67	Sock hd cap screw, 3/8 x 1"		3CH-B75		4	
67	Sock hd cap screw, 1/2 x 1"			4CH-B75	4	
68	Pulley door corner bracket		3CH-B76	4CH-B76	1	
69	Sock hd cap screw, 5/16 x 5/8"		3CH-B77	4CH-B77	2	
70	Sock hd cap screw, 1/2 x 1"		3CH-B78		1	
70	Sock hd cap screw, 1/2 x 1-1/4"			4CH-B78	1	
71	Junction box cover		3CH-B79	4CH-B79	1	
72	Rd hd mach screw, 10-32 x 1/2"		3CH-B80	4CH-B80	8	
73	Pump wiring chamber cover		3CH-B81	4CH-B81	1	
74	Column drain screen cover		3CH-B82	4CH-B82	2	
75	Flat hd mach screw, 10-32 x 3/8"			3CH-B83	4CH-B83	4
76	Column drain screen		3CH-B84	4CH-B84	2	
77	Expansion plug, 2-3/4" diam		3CH-B85	4CH-B85	12	
78	Paper gasket		3CH-B86	4CH-B86	1	
79	Coolant cleanout cover		3CH-B87	4CH-B87	1	
80	Fil hd screw, 3/8-16 x 13/16"		3CH-B88	4CH-B88	3	
81	Oil slinger plate		3CH-B89	4CH-B89	1	
82	Oil slinger key		3CH-B90	4CH-B90	1	
83	Rivet, 3/16 x 3/8"		3CH-B91	4CH-B91	2	

\*\*\*Only one used on 4CH machines  
\*\*Twelve used on 4CH machines  
\*Indicates as required

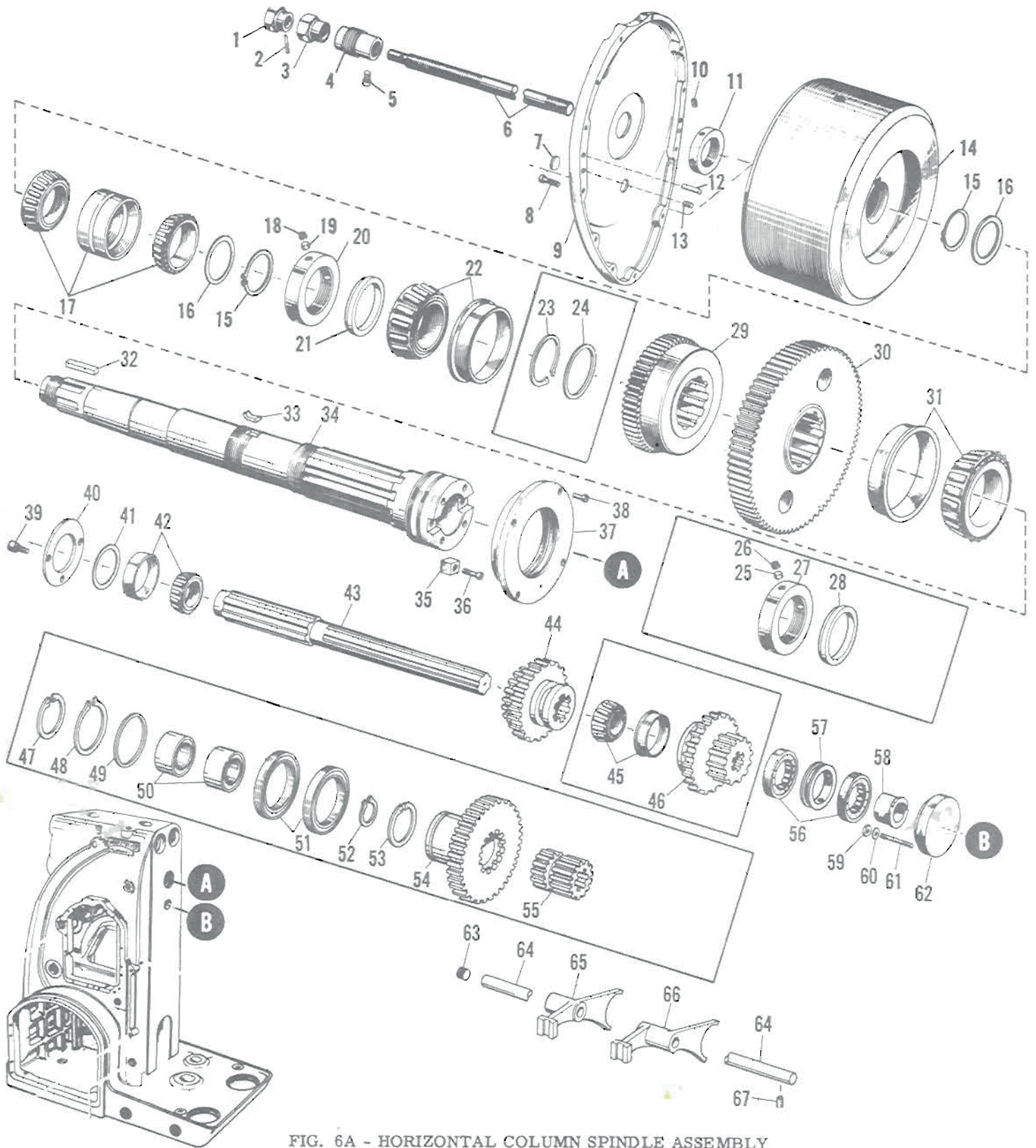


FIG. 6A - HORIZONTAL COLUMN SPINDLE ASSEMBLY

FIG. 6A - HORIZONTAL COLUMN SPINDLE ASSEMBLY

Item No.	Part Name and Description	Code No.		Qty.
		14CH	16CH	
1	Draw Bolt Head	14CH-B1	16CH-B1	1
2	Pin	14CH-B2	16CH-B2	1
3	Nut	14CH-B3	16CH-B3	1
4	Sleeve	14CH-B4	16CH-B4	1
5	Screw	14CH-B5	16CH-B5	1
6	Draw Bolt	14CH-B6	16CH-B6	1
7	Expansion Plug	14CH-B7	16CH-B7	1
8	Screw	14CH-B8	16CH-B8	9
9	Flywheel Cover	14CH-B9	16CH-B9	1
10	Set Screw	14CH-B10	16CH-B10	1
11	Bearing Nut	14CH-B11	16CH-B11	1
12	Dowel	14CH-B12	16CH-B12	2
13	Set Screw	14CH-B13	16CH-B13	2
14	Flywheel	14CH-B14	16CH-B14	1
15	Snap Ring	14CH-B15	16CH-B15	2
16	Washer	14CH-B16	16CH-B16	2
17	Bearing	14CH-B17	16CH-B17	1
18	Set Screw	14CH-B18	16CH-B18	2
19	Shoe	14CH-B19	16CH-B19	2
20	Bearing Nut	14CH-B20	16CH-B20	1
21	Washer	14CH-B21	16CH-B21	1
22	Bearing	14CH-B22	16CH-B22	1
23	Snap Ring	14CH-B23	16CH-B25	1
24	Washer	14CH-B24	16CH-B26	1
25	Shoe		16CH-B27	2
26	Set Screw		16CH-B28	1
27	Collar Nut		16CH-B29	1
28	Washer		16CH-B30	1
29	High Speed Gear	14CH-B29	16CH-B31	1
30	Bull Gear	14CH-B30	16CH-B32	1
31	Bearing	14CH-B31	16CH-B33	1
32	Key	14CH-B32	16CH-B34	1
33	Key	14CH-B33	16CH-B35	1
34	Spindle	14CH-B34		1
35	Drive Key	14CH-B35		2

Item No.	Part Name and Description	Code No.		Qty.
		14CH	16CH	
36	Screw	14CH-B36	16CH-B36	2
37	Oil Shield	14CH-B37	16CH-B37	1
38	Screw	14CH-B38	16CH-B38	4
39	Screw	14CH-B39	16CH-B39	3
40	Bearing Retainer	14CH-B40	16CH-B40	1
41	Washer	14CH-B41	16CH-B41	1
42	Bearing	14CH-B42	16CH-B42	1
43	Countershaft	14CH-B43	16CH-B43	1
44	Gear Assembly	14CH-B44	16CH-B44	1
45	Bearing	14CH-B45	16CH-B45	1
46	Gear Assembly	14CH-B46	16CH-B47	1
47	Snap Ring		16CH-B48	1
48	Snap Ring		16CH-B49	1
49	Washer		16CH-B50	2
50	Bearing		16CH-B51	2
51	Bearing		16CH-B52	1
52	Snap Ring		16CH-B53	1
53	Snap Ring		16CH-B54	1
54	Drive Gear		16CH-B55	2
55	Gear		16CH-B56	2
56	Bearing	14CH-B56	16CH-B57	2
57	Bearing Spacer	14CH-B57	16CH-B58	1
58	Bearing Race	14CH-B58	16CH-B59	1
59	Nut	14CH-B59	16CH-B60	2
60	Washer	14CH-B60	16CH-B61	2
61	Stud	14CH-B61	16CH-B62	2
62	Cover	14CH-B62	16CH-B63	1
63	Pipe Plug	14CH-B63	16CH-B64	1
64	Shifter Bar	14CH-B64	16CH-B65	1
65	Front Shifter Fork	14CH-B65	16CH-B66	1
66	Rear Shifter Fork	14CH-B66	16CH-B67	1
67	Set Screw		16CH-B67	1



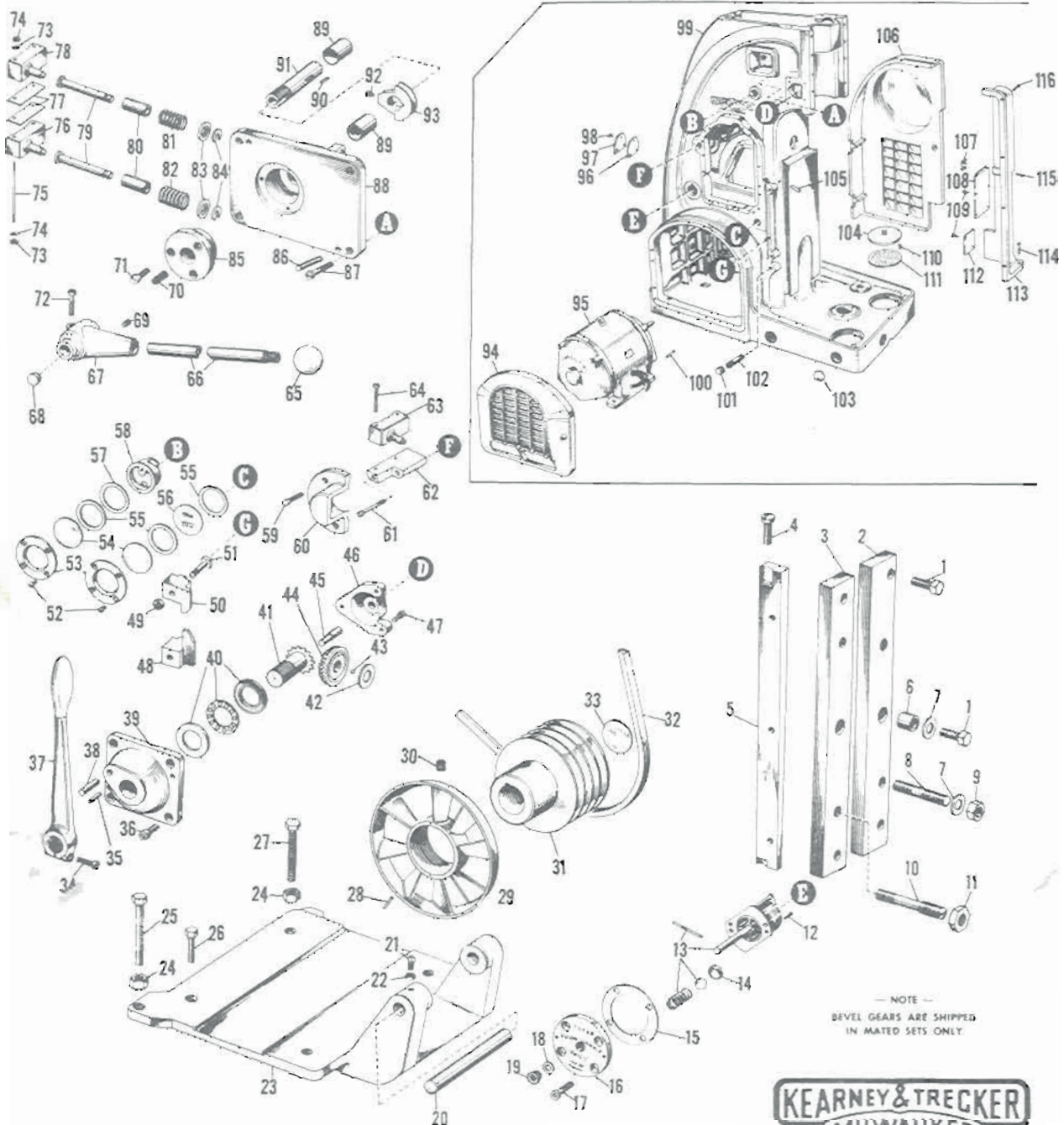


FIG. 7 - VERTICAL COLUMN LEFT SIDE

Fig. 7 - Vertical Column Left Side

Item No.	Part Name and Description	Code Nos.		
		3CH	4CH	Qty.
1	Hex hd cap screw, 5/8-11 x 1-1/4"	3CH-C1	4CH-C1	6
2	Hd gib (RH)	3CH-C2	4CH-C2	1
3	Hd gib (LH)	3CH-C3	4CH-C3	1
4	Gib screw	3CH-C4	4CH-C4	2
5	Hd taper gib	3CH-C5	4CH-C5	1
6	Hd gib spacer	3CH-C6	4CH-C6	2
7	Washer, 5/8"	3CH-C7	4CH-C7	5
8	Stud	3CH-C8	4CH-C8	3
9	Hex nut, 5/8-11	3CH-C9	4CH-C9	3
10	Hd clamp stud	3CH-C10	4CH-C10	1
11	Hex nut, 3/4-10	3CH-C11	4CH-C11	1
12	Fil hd screw, 10-32 x 5/16"	3CH-C12	4CH-C12	2
13	100Disc unit cartridge (Cuno B/P #B-1296)	3CH-C13	4CH-C13	1
14	Ball retainer	3CH-C14	4CH-C14	1
15	Filter hd gasket	3CH-C15	4CH-C15	1
16	Filter hd	3CH-C16	4CH-C16	1
17	Sock hd cap screw, 3/8 x 3/4"	3CH-C17	4CH-C17	4
18	Filter hd washer	3CH-C18	4CH-C18	1
19	Filter hd plug	3CH-C19	4CH-C19	1
20	Motor base support pin	3CH-C20	4CH-C20	1
21	Sq hd cup pt screw, 3/8 x 1-1/4"	3CH-C21	4CH-C21	1
22	Hex nut, 3/8-16	3CH-C22	4CH-C22	1
23	Motor base	3CH-C23	4CH-C23	1
24	Hex nut, 3/4-10	3CH-C24	4CH-C24	2
25	Hex hd cap screw, 3/4-10 x 5-5/8"	3CH-C25	4CH-C25	1
26	Hex hd cap screw, 5/8-11 x 2-5/16"	3CH-C26	4CH-C26	4
27	Hex hd cap screw, 3/4-10 x 4"	3CH-C27		1
27	Hex hd cap screw, 3/4-10 x 5-5/8"		4CH-C27	1
28	Acme Blue Label dowel, 3/8 x 7/8"	3CH-C28	4CH-C28	1
29	Motor fan	3CH-C29	4CH-C29	1
30	Sock set screw, flat pt, 1/2 x 1"	3CH-C30		2
30	Sock set screw, flat pt, 1/2 x 1-1/4"		4CH-C30	2
31	Motor sheave (Give motor nameplate data)	3CH-C31	4CH-C31	1
32	V-Belt (Give motor nameplate data)	3CH-C32	4CH-C32**	3
33	Expansion plug, 2" diam	3CH-C33		1
33	Expansion plug, 2-1/8" diam		4CH-C33	1
34	Sock hd cap screw, 5/16 x 1-1/8"	3CH-C34	4CH-C34	1
35	Acme Blue Label dowel, 1/4 x 3/4"	3CH-C35		2
35	Acme Blue Label dowel, 1/4 x 1"		4CH-C35	2
36	Sock hd cap screw, 3/8 x 3/4"	3CH-C36	4CH-C36	4
37	Hd clamp handle	3CH-C37	4CH-C37	1
38	Acme Blue Label dowel, 3/8 x 1"	3CH-C38		1
38	Acme Blue Label dowel, 3/8 x 1-1/2"		4CH-C38	1
39	Clamp pinion brg plate	3CH-C39	4CH-C39	1
40	Ball thrust brg	3CH-C40	4CH-C40	1
41	Hd clamp bevel pinion	3CH-C41	4CH-C41	1
42	Hd clamp bevel gear collar	3CH-C42	4CH-C42	1
43	Steel ball, 3/16" diam	3CH-C43	4CH-C43	19
44	Hd clamp bevel gear	3CH-C44	4CH-C44	1
45	Hd clamp pinion stud	3CH-C45	4CH-C45	1
46	Pinion stud support	3CH-C46	4CH-C46	1
47	Fil hd screw, 5/16-18 x 7/8"	3CH-C47		3
47	Fil hd screw, 5/16-18 x 3/4"		4CH-C47	3
48	Elevating trip dog (LH)	3CH-C48	4CH-C48	1
49	Hex nut, 7/16-14	3CH-C49	4CH-C49	2
50	Elevating trip dog (RH)	3CH-C50	4CH-C50	1
51	T-Bolt	3CH-C51	4CH-C51	2
52	Oval hd screw, 10-32 x 15/32"	3CH-C52	4CH-C52	8
53	Oil sight gage	3CH-C53	4CH-C53	2
54	Oil gage glass	3CH-C54	4CH-C54	2
55	Oil gage washer	3CH-C55	4CH-C55	3
56	Oil gage plate	3CH-C56	4CH-C56	1
57	Oil gage washer	3CH-C57	4CH-C57	1
58	Oil flow gage	3CH-C58	4CH-C58	1
59	Fil hd screw, 5/16-18 x 5/8"	3CH-C59	4CH-C59	3
60	Switch cover	3CH-C60	4CH-C60	1
61	Fil hd screw, 1/4-20 x 1-3/4"	3CH-C61	4CH-C61	2
61	Switch bracket	3CH-C62	4CH-C62	1
63	Precision limit switch, Allen-Bradley Bulletin #802, Type PBSJ20-9	3CH-C63	4CH-C63	1
64	Rd hd mach screw, 6-32 x 1-1/4"	3CH-C64	4CH-C64	2

Item No.	Part Name and Description	Code Nos.		
		3CH	4CH	Qty.
65	Knob	3CH-C65	4CH-C65	1
66	Starting lever	3CH-C66	4CH-C66	1
67	Starting lever hub	3CH-C67	4CH-C67	1
68	Plug	3CH-C68	4CH-C68	1
69	Sock dog pt screw, (Altered)	3CH-C69	4CH-C69	1
70	Spring	3CH-C70	4CH-C70	2
71	Fil hd screw, 5/16-18 x 11/16"	3CH-C71	4CH-C71	3
72	Sock hd cap screw, 3/8 x 1-1/2"	3CH-C72	4CH-C72	1
73	Hex nut, 6-32	3CH-C73	4CH-C73	4
74	Lockwasher, Shakeproof #1106	3CH-C74	4CH-C74	4
75	Switch support screw	3CH-C75	4CH-C75	2
76	Precision limit switch, double throw, Allen-Bradley Bulletin #802 Type PBSJ20-15	3CH-C76	4CH-C76	1
77	Switch insulating spacer	3CH-C77	4CH-C77	2
78	Precision limit switch (normally open) Allen-Bradley PBSJ20-15	3CH-C78	4CH-C78	2
79	Switch push rod	3CH-C79	4CH-C79	2
80	Starting lever stop sleeve	3CH-C80	4CH-C80	2
81	Spring	3CH-C81	4CH-C81	1
82	Spring	3CH-C82	4CH-C82	1
83	Spring washer	3CH-C83	4CH-C83	2
84	"U" Washer	3CH-C84	4CH-C84	2
85	Rocker retainer	3CH-C85	4CH-C85	1
86	Acme Blue Label dowel, 5/16 x 1"	3CH-C86	4CH-C86	2
87	Fil hd screw, 3/16 x 7/8"	3CH-C87	4CH-C87	4
88	Starting lever bracket	3CH-C88	4CH-C88	1
89	Oilite brg, A-1110-1	3CH-C89	4CH-C89	2
90	Key	3CH-C90	4CH-C90	1
91	Starting lever shaft	3CH-C91	4CH-C91	1
92	Sock dog pt screw, 3/8-16 x 11/16"	3CH-C92	4CH-C92	1
93	Starting lever rocker	3CH-C93	4CH-C93	1
94	Motor door	3CH-C94	4CH-C94	1
	Door handle	3CH-C95	4CH-C95	1
	Door latch	3CH-C96	4CH-C96	1
	Sq hd cup pt screw, 1/4-20 x 5/8"	3CH-C97	4CH-C97	1
	Spacing washer	3CH-C98	4CH-C98	*
	Door hinge	3CH-C99	4CH-C99	2
	Hex hd cap screw, 3/8-16 x 13/16"	3CH-C100	4CH-C100	8
	Lockwasher, Shakeproof #1220	3CH-C101	4CH-C101	8
95	Motor. (See motor nameplate data)	3CH-C102		1
95	Motor. (See motor nameplate data)		4CH-C102	1
96	Paper gasket	3CH-C103	4CH-C103	1
97	Coolant cleanout cover	3CH-C104	4CH-C104	1
98	Fil hd screw, 3/8-16 x 13/16"	3CH-C105	4CH-C105	3
99	Vert column	3CH-C106	4CH-C106	1
100	Acme Blue Label dowel, 1/2 x 1-1/8"	3CH-C107	4CH-C107	2
101	Pipe cap	3CH-C108	4CH-C108	1
102	Nipple, 1 x 2"	3CH-C109	4CH-C109	1
103	Expansion plug, 2-3/4" diam	3CH-C110	4CH-C110	12
104	Column drain screen cover	3CH-C111	4CH-C111	2
105	Acme Blue Label dowel, 5/8 x 1-1/4"	3CH-C112	4CH-C112	1
106	Pulley door	3CH-C113	4CH-C113	1
	Door handle	3CH-C114	4CH-C114	1
	Door latch	3CH-C115	4CH-C115	1
	Sq hd cup pt screw, 1/4-20 x 5/8"	3CH-C116	4CH-C116	1
	Spacing washer	3CH-C117	4CH-C117	*
	Door hinge	3CH-C118	4CH-C118	2
	Hex hd cap screw, 3/8-16 x 13/16"	3CH-C119	4CH-C119	8
	Lockwasher, Shakeproof #1220	3CH-C120	4CH-C120	8
107	Door latch strip	3CH-C121	4CH-C121	1
108	Junction box cover	3CH-C122	4CH-C122	1
109	Rd hd mach screw, 10-32 x 1/2"	3CH-C123	4CH-C123	8
110	Flat hd mach screw, 10-32 x 3/8"	3CH-C124	4CH-C124	4
111	Column drain screen	3CH-C125	4CH-C125	2
112	Pump wiring chamber cover	3CH-C126	4CH-C126	1
113	Pulley door corner bracket	3CH-C127	4CH-C127	1
114	Sock hd cap screw, 1/2 x 1"	3CH-C128		1
114	Sock hd cap screw, 1/2 x 1-1/4"		4CH-C128	1
115	Sock hd cap screw, 5/16 x 5/8"	3CH-C129	4CH-C129	2
116	Sock hd cap screw, 3/8 x 1"	3CH-C130		4
116	Sock hd cap screw, 1/2 x 1"		4CH-C130	4

\*Indicates as required  
\*\*Four used on 4CH machines

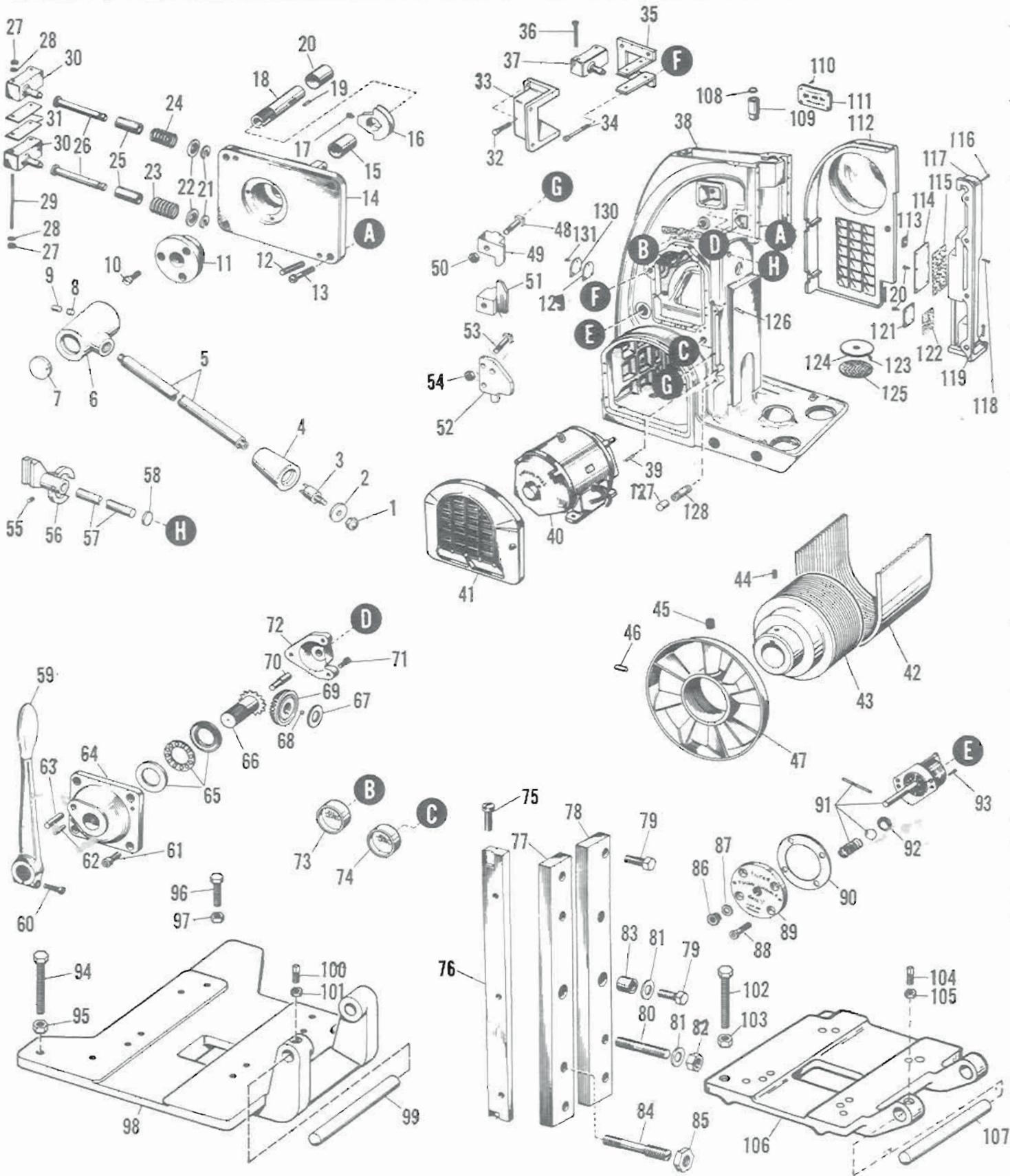


FIG. 7A - VERTICAL COLUMN, LEFT SIDE

BUILDERS OF PRECISION AND PRODUCTION



MACHINE TOOLS FOR MILLING AND BORING

FIG. 7A - VERTICAL COLUMN, LEFT SIDE

Item No.	Part Name and Description	Code No.			Item No.	Part Name and Description	Code No.		
		14CH	16CH	Qty.			14CH	16CH	Qty.
1	Seal Nut	14CH-C1	16CH-C1	1	69	Head Clamp Bevel Gear	14CH-C69	16CH-C69	1
2	Plug	14CH-C2	16CH-C2	1	70	Head Clamp Pinion Stud	14CH-C70	16CH-C70	1
3	Switch	14CH-C3	16CH-C3	1	71	Screw	14CH-C71		3
4	Knob	14CH-C4	16CH-C4	1			16CH-C71		3
5	Starting Lever	14CH-C5			72	Pinion Stud Support	14CH-C72		1
6	Starting Lever Hub	14CH-C6	16CH-C6	1			16CH-C72		1
7	Plub	14CH-C7	16CH-C7	1	73	Oil Window	14CH-C73	16CH-C73	1
8	Nylon Plug	14CH-C8	16CH-C8	1	74	Oil Window	14CH-C74	16CH-C74	1
9	Set Screw	14CH-C9	16CH-C9	1	75	Taper Gib Screw	14CH-C75	16CH-C75	2
10	Screw	14CH-C10	16CH-C10	3	76	Taper Head Gib	14CH-C76		1
11	Rocker Retainer	14CH-C11	16CH-C11	1			16CH-C76		1
12	Dowel	14CH-C12	16CH-C12	2	77	Head Gib (L. H.)	14CH-C77		1
13	Screw	14CH-C13	16CH-C13	4			16CH-C77		1
14	Starting Lever Bracket	14CH-C14	16CH-C14	1	78	Head Gib (R. H.)	14CH-C78		1
15	Bearing	14CH-C15	16CH-C15	1			16CH-C78		1
16	Starting Lever Rocker	14CH-C16	16CH-C16	1	79	Screw	14CH-C79	16CH-C79	6
17	Set Screw	14CH-C17	16CH-C17	1	80	Stud	14CH-C80	16CH-C80	3
18	Starting Lever Shaft	14CH-C18	16CH-C18	1	81	Washer	14CH-C81	16CH-C81	5
19	Key	14CH-C19	16CH-C19	1	82	Nut	14CH-C82	16CH-C82	3
20	Bearing	14CH-C20	16CH-C20	1	83	Spacer	14CH-C83	16CH-C83	2
21	"C" Washer	14CH-C21	16CH-C21	2	84	Stud	14CH-C84	16CH-C84	1
22	Spring Washer	14CH-C22	16CH-C22	2	85	Nut	14CH-C85	16CH-C85	1
23	Spring (Bottom)	14CH-C23	16CH-C23	1	86	Filter Plug	14CH-C86	16CH-C86	1
24	Spring (Top)	14CH-C24	16CH-C24	1	87	Washer	14CH-C87	16CH-C87	1
25	Stop Sleeve	14CH-C25	16CH-C25	2	88	Screw	14CH-C88	16CH-C88	4
26	Push Rod	14CH-C26	16CH-C26	2	89	Filter Head	14CH-C89	16CH-C89	1
27	Hex Nut	14CH-C27	16CH-C27	4	90	Gasket	14CH-C90	16CH-C90	1
28	Lockwasher	14CH-C28	16CH-C28	4	91	Filter Cartridge	14CH-C91	16CH-C91	1
29	Support Screw	14CH-C29	16CH-C29	2	92	Ball Retainer	14CH-C92	16CH-C92	1
30	Micro Switch	14CH-C30	16CH-C30	2	93	Cartridge Screw	14CH-C93	16CH-C93	2
31	Insulating Spacer	14CH-C31	16CH-C31	2	94	Motor Base Screw	14CH-C94		1
32	Screw	14CH-C32	16CH-C32	2	95	Nut	14CH-C95		1
33	Switch Housing	14CH-C33	16CH-C33	1	96	Motor Base Screw	14CH-C96		1
34	Screw	14CH-C34	16CH-C34	4	97	Nut	14CH-C97		1
35	Switch Bracket	14CH-C35	16CH-C35	1	98	Motor Base	14CH-C98		1
36	Screw	14CH-C36	16CH-C36	2	99	Support Pin	14CH-C99		1
37	Micro Switch	14CH-C37	16CH-C37	1	100	Screw	14CH-C100		1
38	Column	14CH-C38			101	Nut	14CH-C101		1
			16CH-C38	1	102	Motor Base Screw		16CH-C102	1
39	Dowel	14CH-C39	16CH-C39	2	103	Nut		16CH-C103	1
40	Motor	14CH-C40			104	Motor Base Screw		16CH-C104	1
			16CH-C40	1	105	Nut		16CH-C105	1
41	Motor Door	14CH-C41			106	Motor Base		16CH-C106	1
			16CH-C41	1	107	Support Pin		16CH-C107	1
42	Drive Belt	14CH-C42			108	Expansion Plug	14CH-C108	16CH-C108	1
			16CH-C42	1	109	Shifter Sleeve	14CH-C109	16CH-C109	1
43	Motor Sheave	14CH-C43			110	Screw	14CH-C110	16CH-C110	5
			16CH-C43	1	111	Vent Plate	14CH-C111	16CH-C111	1
44	Set Screw	14CH-C44			112	Pulley Door	14CH-C112		1
			16CH-C44	1			16CH-C112		1
45	Set Screw	14CH-C45	16CH-C45	1	113	Door Latch Strip	14CH-C113	16CH-C113	1
46	Dowel	14CH-C46	16CH-C46	1	114	Cover	14CH-C114		1
47	Motor Fan	14CH-C47	16CH-C47	1			16CH-C114		1
48	Trip Dog Screw	14CH-C48	16CH-C48	2	115	Gasket	14CH-C115		1
49	Trip Dog (R. H.)	14CH-C49	16CH-C49	1			16CH-C115		1
50	Trip Dog Nut	14CH-C50	16CH-C50	2	116	Screw	14CH-C116		4
51	Trip Dog (L. H.)	14CH-C51	16CH-C51	1			16CH-C116		4
52	Vertical Limit Stop	14CH-C52			117	Pulley Door Bracket	14CH-C117		1
			16CH-C52	1			16CH-C117		1
53	Limit Stop Screw	14CH-C53	16CH-C53	2	118	Screw	14CH-C118	16CH-C118	2
54	Limit Stop Nut	14CH-C54	16CH-C54	2	119	Screw	14CH-C119		1
55	Set Screw	14CH-C55	16CH-C55	1			16CH-C119		1
56	Shifter Fork	14CH-C56			120	Screw	14CH-C120	16CH-C120	10
			16CH-C56	1	121	Coolant Wiring Cover	14CH-C121		1
57	Shifter Shaft	14CH-C57					16CH-C121		1
			16CH-C57	1	122	Gasket	14CH-C122		1
58	Column Plug	14CH-C58	16CH-C58	1			16CH-C122		1
59	Head Clamp Handle	14CH-C59	16CH-C59	1	123	Screw	14CH-C123	16CH-C123	6
60	Screw	14CH-C60	16CH-C60	1	124	Drain Cover	14CH-C124	16CH-C124	2
61	Screw	14CH-C61	16CH-C61	4	125	Drain Screen	14CH-C125	16CH-C125	2
62	Dowel	14CH-C62	16CH-C62	2	126	Dowel	14CH-C126	16CH-C126	1
63	Dowel	14CH-C63	16CH-C63	1	127	Nipple	14CH-C127	16CH-C127	1
64	Pinion Bearing Plate	14CH-C64			128	Pipe Cap	14CH-C128	16CH-C128	1
			16CH-C64	1	129	Gasket	14CH-C129	16CH-C129	1
65	Thrust Bearing	14CH-C65	16CH-C65	1	130	Cleanout Cover	14CH-C130	16CH-C130	1
66	Head Clamp Pinion	14CH-C66			131	Screw	14CH-C131	16CH-C131	3
			16CH-C66	1	132	Column	14CH-C132	16CH-C132	1
67	Gear Collar	14CH-C67	16CH-C67	1			16CH-C132		1
68	3/16" Steel Balls	14CH-C68	16CH-C68	19					



WHEN ORDERING PARTS  
REPORT SERIAL NUMBER  
SHOWN ON THIS PLATE

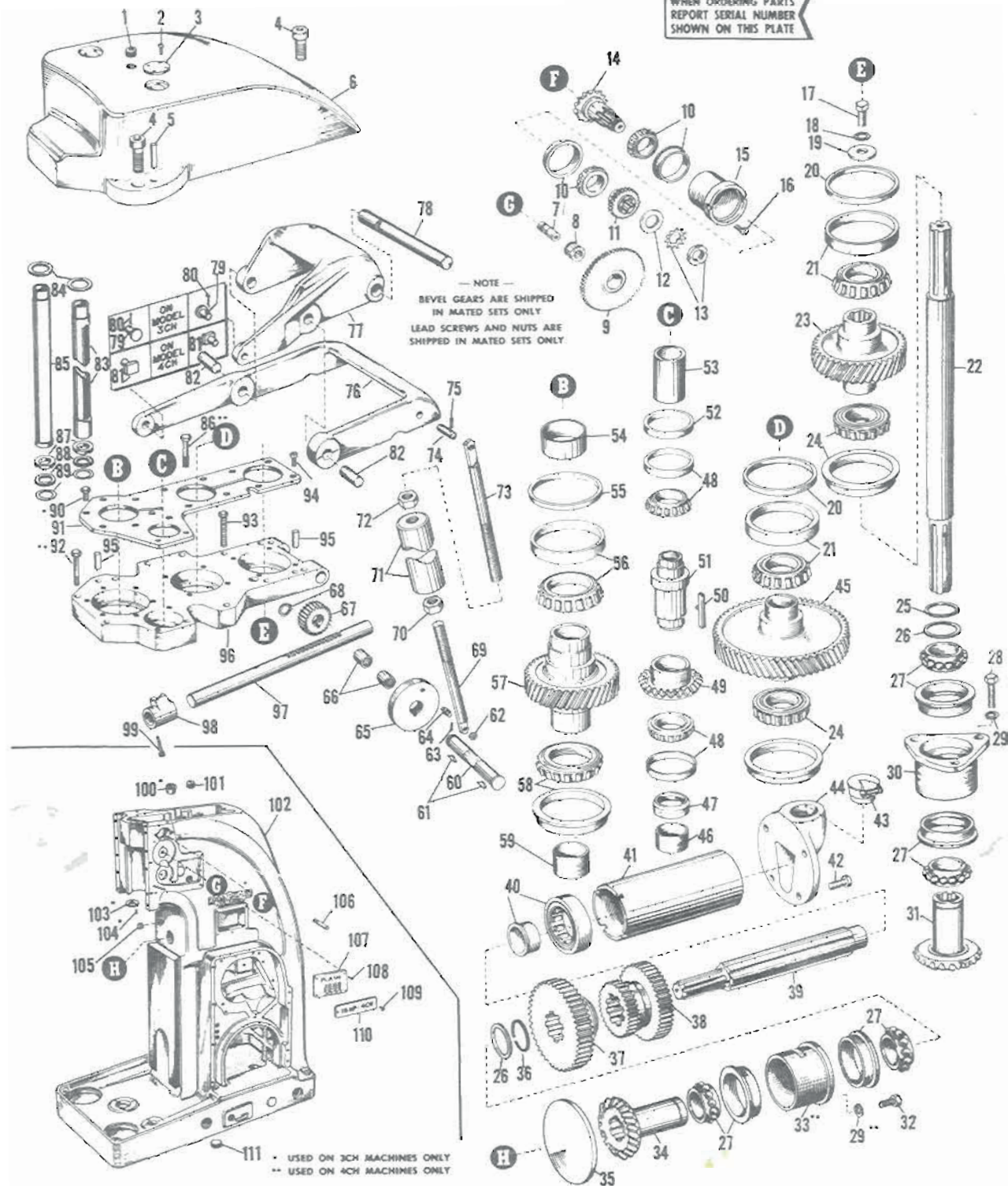


FIG. 8 - VERTICAL COLUMN RIGHT SIDE

**Fig. 8 - Vertical Column Right Side**

Item No.	Part Name and Description	Code Nos.		
		3CH	4CH	Qty.
1	Sock hd pipe plug, 1/2"	3CH-D1		1
1	Pipe plug, 1/2"		4CH-D1	1
2	Flat hd mach screw, 10-32 x 1/2"	3CH-D2		6
2	Fil hd screw, 10-32 x 1/2"		4CH-D2	8
3	Sleeve adj cover	3CH-D3	4CH-D3	2
4	Sock hd cap screw, 3/4 x 1-1/2"	3CH-D4		3
4	Sock hd cap screw, 3/4 x 1-3/4"		4CH-D4	2
4	Sock hd cap screw, 3/4 x 2"		4CH-D5	1
5	Acme Blue Label dowel, 1/2 x 2"	3CH-D6	4CH-D6	2
6	Drive housing	3CH-D7	4CH-D7	1
7	Feed drive idler gear shaft	3CH-D8	4CH-D8	1
8	Hyatt brg, 93416	3CH-D9	4CH-D9	1
9	Feed drive idler gear	3CH-D10	4CH-D10	1
10	Timken brg, 08231-08125	3CH-D11	4CH-D11	2
11	Feed cross shaft gear	3CH-D12	4CH-D12	1
12	Feed cross shaft washer	3CH-D13	4CH-D13	1
13	Gurney locknut and washer #3	3CH-D14	4CH-D14	1
14	Feed cross shaft	3CH-D15	4CH-D15	1
15	Feed cross shaft brg sleeve	3CH-D16	4CH-D16	1
16	Fil hd screw, 3/8-16 x 9/16"	3CH-D17	4CH-D17	2
17	Hex hd cap screw, 5/8-11 x 1-1/2"	3CH-D18	4CH-D18	1
18	Lockwasher, 5/8"	3CH-D19	4CH-D19	1
19	Washer	3CH-D20	4CH-D20	1
20	Drive gear adj washer	3CH-D21	4CH-D21	2
21	Timken brg, 453A-462	3CH-D22	4CH-D22	2
22	Drive shaft	3CH-D23	4CH-D23	1
23	Drive gear	3CH-D24	4CH-D24	1
24	Timken brg, 453B-462	3CH-D25	4CH-D25	2
25	Snap ring	3CH-D26	4CH-D26	1
26	Drive shaft brg, adj washer	3CH-D27	4CH-D27	2
27	New Departure brg, NM-0210B	3CH-D28	4CH-D28	4
28	Hex hd cap screw, 5/8-11 x 1-5/8"	3CH-D29	4CH-D29	3
29	Lockwasher, 5/8"	3CH-D30	4CH-D30	**3
30	Drive shaft brg sleeve	3CH-D31	4CH-D31	1
31	Vert drive spiral bevel gear	3CH-D32	4CH-D32	1
32	Hex hd screw, 5/8-11 x 1-1/8"		4CH-D33	3
33	Drive shaft brg sleeve		4CH-D34	1
34	Vert drive spiral bevel gear	3CH-D35	4CH-D35	1
35	Plug	3CH-D36	4CH-D36	1
36	Snap ring, Tru-arc 5100-200	3CH-D37	4CH-D37	1
37	Primary low speed sliding gear	3CH-D38	4CH-D38	1
38	Primary high speed sliding gear	3CH-D39	4CH-D39	1
39	Primary speed change shaft	3CH-D40	4CH-D40	1
40	Hyatt brg, R-1209 TS	3CH-D41	4CH-D41	1
41	Brg spacer	3CH-D42	4CH-D42	1
42	Fil hd screw, 1/2-13 x 15/16"	3CH-D43	4CH-D43	4
43	Gits oiler, #409	3CH-D44	4CH-D44	1
44	Primary shaft brg retainer	3CH-D45	4CH-D45	1
45	Drive idler gear	3CH-D46	4CH-D46	1
46	Feed screw oil sleeve	3CH-D47	4CH-D47	1
47	Feed screw oil slinger	3CH-D48	4CH-D48	1
48	Timken brg, 12303-12175	3CH-D49	4CH-D49	2
49	Feed screw nut drive gear	3CH-D50	4CH-D50	1
50	Key	3CH-D51	4CH-D51	1
51	Hd feed nut	3CH-D52	4CH-D52	1
52	Feed screw brg adj washer	3CH-D53	4CH-D53	1
53	Feed screw cover	3CH-D54	4CH-D54	1
54	Countershaft cover	3CH-D55	4CH-D55	1
55	Countershaft drive gear adj washer	3CH-D56	4CH-D56	1
56	Timken brg, 3920-3982	3CH-D57	4CH-D57	1
57	Spindle countershaft drive gear	3CH-D58	4CH-D58	1
58	Timken brg, 3920B-3984	3CH-D59	4CH-D59	1
59	Countershaft oil sleeve	3CH-D60	4CH-D60	1
60	Range change cam shaft	3CH-D61	4CH-D61	1
61	Hi-pro key, HP-605	3CH-D62	4CH-D62	2
62	Washer	3CH-D63	4CH-D63	1
63	Cotter pin, 1-3/32 x 3/4"	3CH-D64	4CH-D64	1
64	Range change shifter pin	3CH-D65	4CH-D65	1
65	Range change cam	3CH-D66	4CH-D66	1
66	Torrington brg, B-1616	3CH-D67	4CH-D67	2
67	Range change pinion	3CH-D68	4CH-D68	1
68	Tru-arc snap ring, 5100-100	3CH-D69	4CH-D69	1
69	Range change link stud	3CH-D70	4CH-D70	1
70	Hex nut, 1"-14 (LH)	3CH-D71	4CH-D71	1
71	Range change counterweight	3CH-D72	4CH-D72	1
72	Hex nut, 1"-14 (RH)	3CH-D73	4CH-D73	1
73	Range change link stud	3CH-D74	4CH-D74	1
74	Range change link pin	3CH-D75	4CH-D75	1
75	Cotter pin 1/16 x 3/4"	3CH-D76	4CH-D76	2
76	Speed gear shifter lever	3CH-D77	4CH-D77	1
77	Gear shifter compensating lever	3CH-D78	4CH-D78	1
78	Compensating lever pin	3CH-D79	4CH-D79	1
79	Shifter link pin	3CH-D80		2
80	Cotter pin, 1/16 x 3/4"	3CH-D81		2
81	Clutch shifter shoe		4CH-D82	2
82	Acme Blue Label dowel, 3/4 x 1-5/8"	3CH-D83		2
82	Acme Blue Label dowel, 3/4 x 2"		4CH-D83	2
83	Compensating rod sleeve	3CH-D84	4CH-D84	1
84	Sleeve adj washer	3CH-D85	4CH-D85	2
85	Shifter rod sleeve	3CH-D86	4CH-D86	1
86	Hex hd cap screw, 1/2-13 x 5"		4CH-D87	2
87	Garlock chevron packing top adapter ring, 1-31/64 OD x 63/64" ID	3CH-D88	4CH-D88	2
88	Garlock chevron packing ring, 1-31/64 OD x 63/64" ID	3CH-D89	4CH-D89	2
89	Garlock chevron packing bottom adapter ring, 1-31/64 OD x 63/64" ID	3CH-D90	4CH-D90	2
90	Hex hd cap screw, 3/8-16 x 1"	3CH-D91		2
91	Drive brg plate cover	3CH-D92	4CH-D92	1
92	Hex hd cap screw, 1/2-13 x 2-1/2"		4CH-D93	2
93	Fil hd screw, 5/8-11 x 1-3/4"	3CH-D94		9
93	Hex hd cap screw, 1/2-13 x 2-3/16"		4CH-D94	6
94	Fil hd screw, 7/16-14 x 7/8"	3CH-D95	4CH-D95	*9
95	Acme Blue Label dowel, 1/2 x 1-3/4"	3CH-D96		2
95	Acme Blue Label dowel, 1/2 x 2-1/2"		4CH-D96	2
96	Drive brg plate	3CH-D97	4CH-D97	1
97	Range change rack	3CH-D98	4CH-D98	1
98	Range change yoke	3CH-D99	4CH-D99	1
99	Taper pin screw	3CH-D100	4CH-D100	1
100	Garlock packing carrier	3CH-D101		1
101	Pipe plug, 1"	3CH-D102	4CH-D102	1
102	Vert column	3CH-D103	4CH-D103	1
103	Rod packing retainer	3CH-D104		1
104	Flat hd mach screw, 10-32 x 1/2"		3CH-D105	3
105	Column hole plug	3CH-D106	4CH-D106	1
106	Clamp rod	3CH-D107	4CH-D107	1
107	Column vent plate	3CH-D108	4CH-D108	1
108	Fil hd screw, 3/8-16 x 7/8"	3CH-D109	4CH-D109	5
109	Oval hd screw, 10-32 x 3/4"	3CH-D110	4CH-D110	2
110	Name plate	3CH-D111	4CH-D111	1
111	Pipe plug, 1-1/2"	3CH-D112	4CH-D112	1

\*Fifteen used on 4CH machines  
 \*\*Six used on 4CH machines

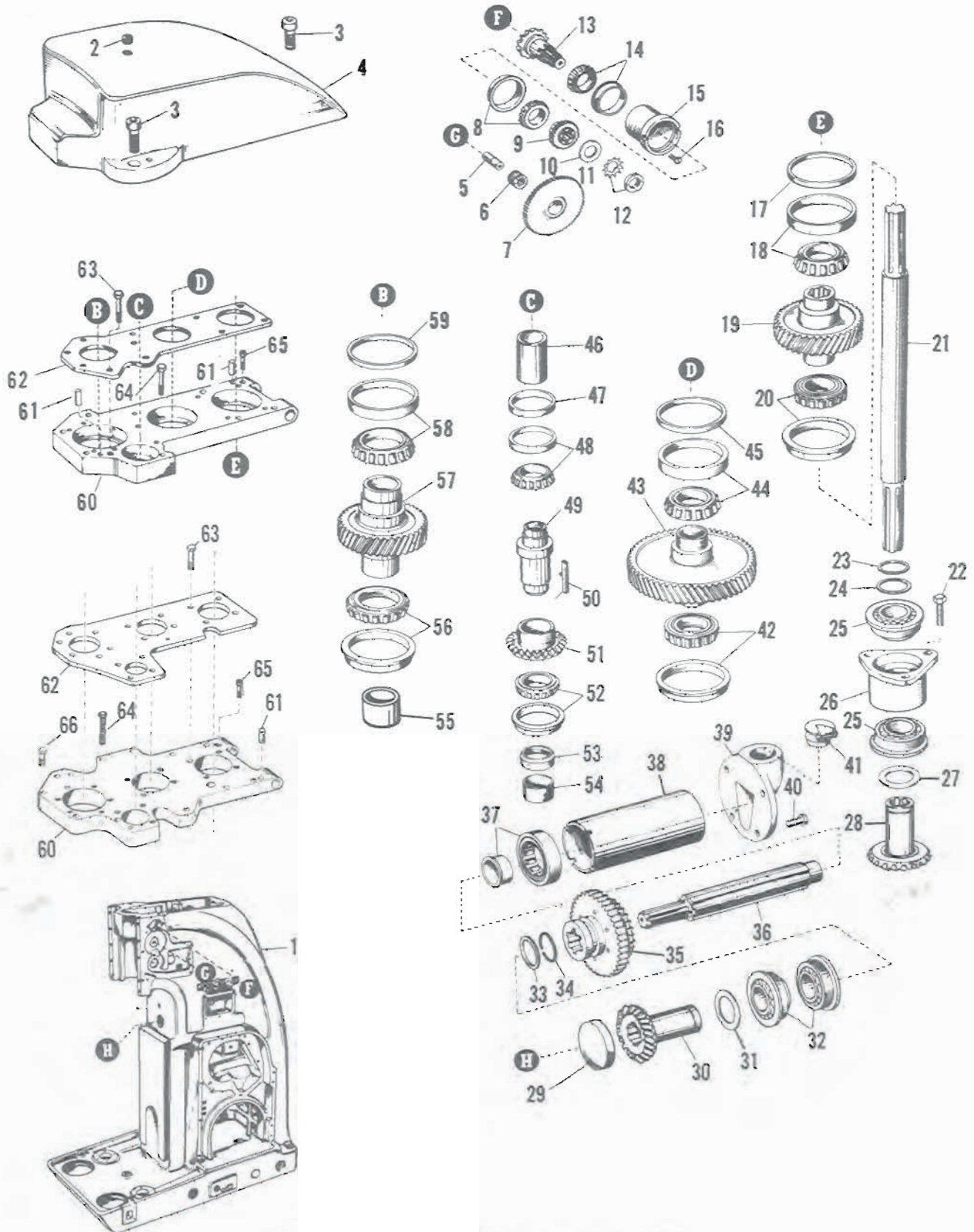


FIG. 8A - VERTICAL COLUMN, RIGHT SIDE

FIG. 8A - VERTICAL COLUMN, RIGHT SIDE

Item No.	Part Name and Description	Code No.		Qty.	Item No.	Part Name and Description	Code No.		Qty.
		14CH	16CH				14CH	16CH	
1	Column	14CH-D1	16CH-D1	1	37	Bearing	14CH-D37	16CH-D37	1
2	Plug	14CH-D2	16CH-D2	1	38	Spacer	14CH-D38		1
3	Screw	14CH-D3		3			16CH-D38	1	
4	Drive Housing	14CH-D4	16CH-D3	3	39	Retainer	14CH-D39	16CH-D39	1
5	Idler Gear Shaft		16CH-D4	1	40	Screw	14CH-D40	16CH-D40	4
6	Bearing	14CH-D5	16CH-D5	1	41	Gits Oiler	14CH-D41	16CH-D41	1
7	Idler Gear	14CH-D6	16CH-D6	1	42	Bearing	14CH-D42	16CH-D42	1
8	Bearing	14CH-D7		1	43	Drive Gear	14CH-D43		1
9	Cross Shaft Feed Gear	14CH-D8	16CH-D7	1	44	Bearing	14CH-D44	16CH-D43	1
		14CH-D9	16CH-D8	1	45	Adjusting Washer	14CH-D45	16CH-D44	1
10	Washer		16CH-D9	1	46	Screw Cover	14CH-D46		1
11	Lockwasher	14CH-D10	16CH-D9	1			16CH-D46	1	
12	Lock Nut	14CH-D11	16CH-D10	1	47	Adjusting Washer	14CH-D47		1
13	Cross Shaft	14CH-D12	16CH-D11	1			16CH-D47	1	
14	Bearing	14CH-D13	16CH-D12	1	48	Bearing	14CH-D48	16CH-D48	1
15	Bearing Sleeve		16CH-D13	1	49	Feed Nut	14CH-D49	16CH-D49	1
16	Screw	14CH-D14	16CH-D14	1	50	Key	14CH-D50	16CH-D50	1
17	Washer	14CH-D15		1	51	Drive Gear	14CH-D51	16CH-D51	1
18	Bearing		16CH-D15	1	52	Bearing	14CH-D52		1
19	Drive Gear	14CH-D16	16CH-D16	1	53	Oil Slinger	14CH-D53	16CH-D52	1
20	Bearing	14CH-D17	16CH-D17	1	54	Oil Sleeve	14CH-D54	16CH-D53	1
21	Drive Shaft	14CH-D18	16CH-D18	1			16CH-D54	1	
22	Cap Screw	14CH-D19		1	55	Oil Seal	14CH-D55		1
23	Snap Ring		16CH-D19	1	56	Bearing	14CH-D56	16CH-D55	1
24	Washer	14CH-D20	16CH-D20	1	57	Countershaft Gear	14CH-D57	16CH-D56	1
25	Bearing	14CH-D21		1			16CH-D57	1	
26	Bearing Carrier		16CH-D21	1	58	Bearing	14CH-D58		1
27	Washer	14CH-D22	16CH-D22	3			16CH-D58	1	
28	Drive Gear	14CH-D23	16CH-D23	1	59	Adjusting Washer	14CH-D59	16CH-D59	1
29	Column Plug	14CH-D24	16CH-D24	1	60	Bearing Plate	14CH-D60		1
30	Drive Gear	14CH-D25	16CH-D25	2			16CH-D60	1	
31	Washer	14CH-D26	16CH-D26	1	61	Dowel	14CH-D61		2
32	Bearing	14CH-D27	16CH-D27	1			16CH-D61	2	
33	Washer	14CH-D28	16CH-D28	1	62	Bearing Plate Cover	14CH-D62		1
34	Snap Ring	14CH-D29	16CH-D29	1			16CH-D62	1	
35	Countershaft Gear Sub Assembly	14CH-D30	16CH-D30	1	63	Cap Screw	14CH-D63	16CH-D63	11
		14CH-D31	16CH-D31	1	64	Screw	14CH-D64		1
36	Speedchange Shaft	14CH-D32	16CH-D32	2			16CH-D64	1	
		14CH-D33	16CH-D33	1	65	Screw	14CH-D65		8
		14CH-D34	16CH-D34	1			16CH-D65	8	
			16CH-D35	1	66	Screw		16CH-D66	2
			16CH-D36	1					



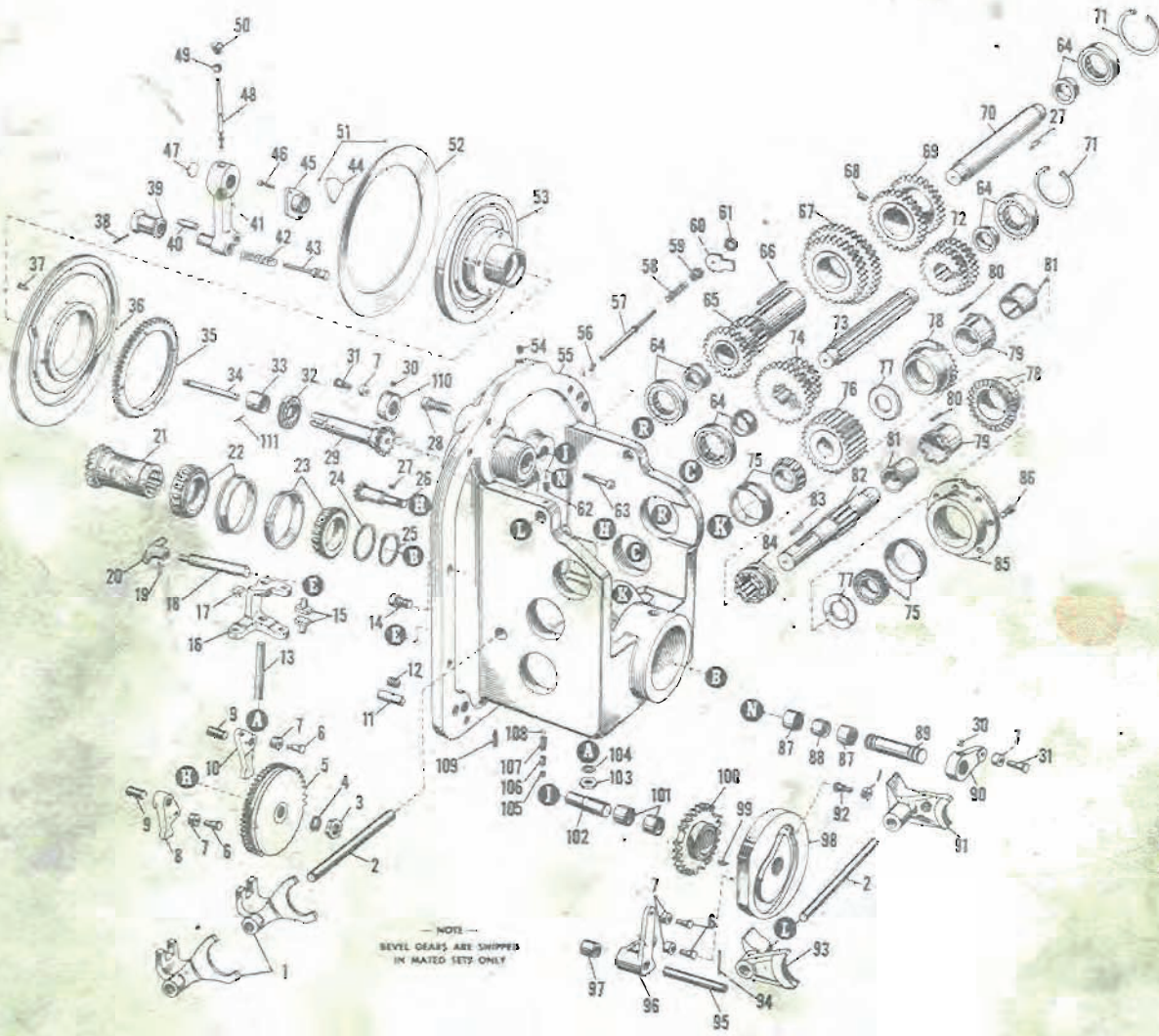


FIG. 9 - SPEED GEAR BOX

Fig. 9 - Speed Gear Box

Item No.	Part Name and Description	Code Nos.		Qty.
		3CH	4CH	
1	Secondary speed shifter fork	3CH-E1	4CH-E1	2
2	Speed shifter fork shaft	3CH-E2	4CH-E2	2
3	Hex nut, 3/4-10	3CH-E3	4CH-E3	1
4	Lockwasher, 3/4"	3CH-E4	4CH-E4	1
5	Secondary speed change cam	3CH-E5	4CH-E5	1
6	Speed selection roller pin	3CH-E6	4CH-E6	4
7	Speed selection roller	3CH-E7	4CH-E7	7
8	Secondary speed shifter crank (Front)	3CH-E8	4CH-E8	1
9	Acme Blue Label dowel, 5/8 x 1-1/2"	3CH-E9	4CH-E9	2
10	Secondary speed shifter crank (Rear)	3CH-E10	4CH-E10	1
11	Acme Blue Label dowel, 5/8 x 1-3/4"	3CH-E11	4CH-E11	2
12	Socket set screw, 5/8 x 1"	3CH-E12	4CH-E12	2
13	Spindle reverse shifter yoke stud	3CH-E13	4CH-E13	1
14	Socket hd cap screw, 1/2 x 1-1/4"	3CH-E14	4CH-E14	10
15	Shoe	3CH-E15	4CH-E15	2
16	Spindle reverse shifter yoke	3CH-E16	4CH-E16	1
17	Shoe	3CH-E17	4CH-E17	1
18	Spindle reverse rod	3CH-E18	4CH-E18	1
19	Taper pin, #3 x 3/4"	3CH-E19	4CH-E19	1
20	Spindle reverse rod	3CH-E20	4CH-E20	1
21	Spindle drive bevel gear	3CH-E21	4CH-E21	1
22	Timken brg, 382B-387	3CH-E22	4CH-E22	1
23	Timken brg, 382B-389	3CH-E23	4CH-E23	1
24	Fitting washer	3CH-E24	4CH-E24	1
25	Snap ring, Tra-arc 5100-215	3CH-E25	4CH-E25	1
26	Speed dial plate pinion	3CH-E26	4CH-E26	1
27	Key	3CH-E27	4CH-E27	2
28	Socket hd cap screw, 1/2 x 2"	3CH-E28	4CH-E28	1
29	Speed change pinion	3CH-E29	4CH-E29	1
30	Socket set screw, 5/16-18 x 5/16"	3CH-E30	4CH-E30	2
31	Range change roller pin	3CH-E31	4CH-E31	2
32	New Departure brg, 3LC6	3CH-E32	4CH-E32	1
33	Switch trip cam	3CH-E33	4CH-E33	1
34	Valve stem	3CH-E34	4CH-E34	1
35	Speed dial plate gear	3CH-E35	4CH-E35	1
36	Speed dial plate and cam	3CH-E36	4CH-E36	1
37	Csunk rivet, 1/4 x 1"	3CH-E37	4CH-E37	4
38	Taper pin, #2 x 1"	3CH-E38	4CH-E38	1
39	Speed selection knob	3CH-E39	4CH-E39	1
40	Speed selection lever pin	3CH-E40	4CH-E40	1
41	Speed selection lever	3CH-E41	4CH-E41	1
42	Spring	3CH-E42	4CH-E42	1
43	Speed selection lever plunger	3CH-E43	4CH-E43	1
44	Speed indicator plate	3CH-E44	4CH-E44	1
45	Speed change pinion brg	3CH-E45	4CH-E45	1
46	Flt hd screw, 5/16-18 x 11/16"	3CH-E46	4CH-E46	2
47	Expansion plug, 1" diam	3CH-E47	4CH-E47	1
48	Valve operating arm	3CH-E48	4CH-E48	1
49	Fulcrum ball	3CH-E49	4CH-E49	1
50	Speed selection lever screw	3CH-E50	4CH-E50	1
51	Escutcheon pin, #15	3CH-E51	4CH-E51	19
52	Speed selection dial	3CH-E52	4CH-E52	1
53	Speed dial brg	3CH-E53	4CH-E53	1
54	Set screw, 1/2-13 x 1/2"	3CH-E54	4CH-E54	1
55	Speed box	3CH-E55	4CH-E55	1
56	Steel ball, 3/8" diam	3CH-E56	4CH-E56	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3CH	4CH	
57	Switch rod	3CH-E57	4CH-E57	1
58	Spring	3CH-E58	4CH-E58	1
59	Switch rod spring retainer	3CH-E59	4CH-E59	1
60	Switch contact arm	3CH-E60	4CH-E60	1
61	Hex nut, 1/4-20	3CH-E61	4CH-E61	1
62	Dog pt set screw, 3/8-16 x 9/16"	3CH-E62	4CH-E62	1
63	Flt hd screw, 3/8-16 x 1-15/16"	3CH-E63	4CH-E63	1
64	Hyatt brg, R-1306TS	3CH-E64	4CH-E64	4
65	Front idler cluster gear	3CH-E65	4CH-E65	1
66	Key	3CH-E66	4CH-E66	1
67	Center idler cluster gear	3CH-E67	4CH-E67	1
68	Pin	3CH-E68	4CH-E68	1
69	Rear idler cluster gear	3CH-E69	4CH-E69	1
70	Speed change idler shaft	3CH-E70	4CH-E70	1
71	Snap ring, Tra-arc 5100-215	3CH-E71	4CH-E71	2
72	Rear secondary sliding gear	3CH-E72	4CH-E72	1
73	Secondary speed change shaft	3CH-E73	4CH-E73	1
74	Front secondary sliding gear	3CH-E74	4CH-E74	1
75	Timken brg, 2523B-2580	3CH-E75	4CH-E75	2
76	Range drive pinion	3CH-E76	4CH-E76	1
77	Reverse bevel gear thrust collar	3CH-E77	4CH-E77	2
78	Spindle reverse bevel gear	3CH-E78	4CH-E78	2
79	Spindle reverse bevel gear clutch	3CH-E79	4CH-E79	2
80	Clutch key	3CH-E80	4CH-E80	2
81	Spindle reverse bevel gear clutch bashing	3CH-E81	4CH-E81	2
82	Reverse bevel gear shaft	3CH-E82	4CH-E82	1
83	Pinion key	3CH-E83	4CH-E83	1
84	Spindle reverse clutch	3CH-E84	4CH-E84	1
85	Reverse bevel gear shaft brg carrier	3CH-E85	4CH-E85	1
86	Socket hd cap screw, 3/8 x 7/8"	3CH-E86	4CH-E86	6
87	Torrington brg, BH-1616X	3CH-E87	4CH-E87	2
88	Brg spacer	3CH-E88	4CH-E88	1
89	Primary range change shaft	3CH-E89	4CH-E89	1
90	Range change shifter arm	3CH-E90	4CH-E90	1
91	Primary high speed & intermediate shifter fork	3CH-E91	4CH-E91	1
92	Speed selection roller pin	3CH-E92	4CH-E92	1
93	Primary low speed shifter fork	3CH-E93	4CH-E93	1
94	Cotter pin, 1/8 x 1-3/4"	3CH-E94	4CH-E94	1
95	Primary shifter crank shaft	3CH-E95	4CH-E95	1
96	Primary low speed shifter crank	3CH-E96	4CH-E96	1
97	Speed crank spacer	3CH-E97	4CH-E97	1
98	Primary speed change cam	3CH-E98	4CH-E98	1
99	Hi-pro key, HP-908	3CH-E99	4CH-E99	1
100	Primary speed cam gear	3CH-E100	4CH-E100	1
101	Primary speed cam bushing	3CH-E101	4CH-E101	2
102	Primary speed cam shaft	3CH-E102	4CH-E102	1
103	Hex nut, 5/8-18	3CH-E103	4CH-E103	1
104	Lockwasher, 5/8"	3CH-E104	4CH-E104	1
105	Set screw, 3/8-18 x 3/16"	3CH-E105	4CH-E105	1
106	Pin	3CH-E106	4CH-E106	1
107	Spring	3CH-E107	4CH-E107	1
108	Steel ball, 5/16" diam	3CH-E108	4CH-E108	1
109	Dog pt set screw, 3/8-16 x 1-3/16"	3CH-E109	4CH-E109	1
110	Range change cam arm	3CH-E110	4CH-E110	1
111	Valve pin	3CH-E111	4CH-E111	1

210CH, 310CH, 210CH-14, 310CH-14; 315CH, 415CH, 315CH-16, 415CH-16

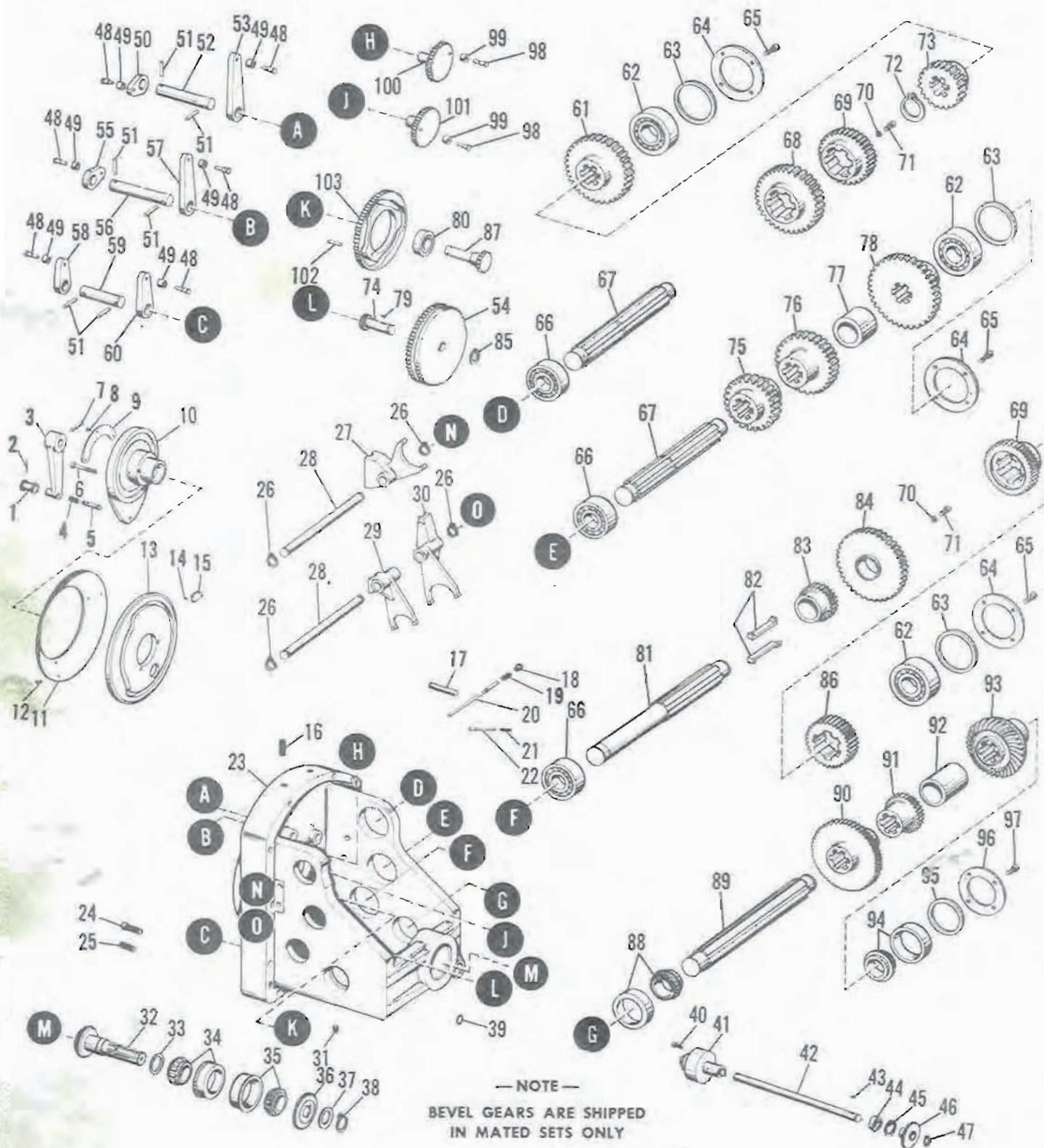


FIG. 9A - SPEED GEAR BOX

FIG. 9A - SPEED GEAR BOX

Item No.	Part Name and Description	Code No.		Qty.
		14CH	16CH	
1	Knob	14CH-E1	16CH-E1	1
2	Roll Pin	14CH-E2	16CH-E2	1
3	Speed Selector Lever	14CH-E3	16CH-E3	1
4	Spring	14CH-E4	16CH-E4	1
5	Plunger	14CH-E5	16CH-E5	1
6	Screw	14CH-E6	16CH-E6	3
7	Roll Pin	14CH-E7	16CH-E7	1
8	Escutcheon Pin	14CH-E8	16CH-E8	3
9	Spindle Stop Dial	14CH-E9	16CH-E9	1
10	Speed Dial Bearing	14CH-E10	16CH-E10	1
11	Speed Dial (15-1500 RPM)	14CH-E11	16CH-E11	1
12	Escutcheon Pin	14CH-E12	16CH-E12	12
13	Dial Carrier	14CH-E13	16CH-E13	1
14	Escutcheon Pin	14CH-E14	16CH-E14	4
15	Speed Indicator Plate	14CH-E15	16CH-E15	1
16	Set Screw	14CH-E16	16CH-E16	2
17	Dowel	14CH-E17	16CH-E17	2
18	Spring Retainer	14CH-E18	16CH-E18	1
19	Spring	14CH-E19	16CH-E19	1
20	Micro-Switch Rod	14CH-E20	16CH-E20	1
21	Spring	14CH-E21	16CH-E21	1
22	Cam Switch Rod	14CH-E22	16CH-E22	1
23	Speed Box	14CH-E23	16CH-E23	1
24	Screw	14CH-E24	16CH-E24	10
25	Set Screw	14CH-E25	16CH-E25	2
26	Snap Ring	14CH-E26	16CH-E26	4
27	Primary Shifter Fork	14CH-E27	16CH-E27	1
28	Shifter Shaft	14CH-E28	16CH-E28	2
29	Front Tertiary Fork	14CH-E29	16CH-E29	1
30	Rear Tertiary Fork	14CH-E30	16CH-E30	1
31	Pipe Plug	14CH-E31	16CH-E31	2
32	Input Gear	14CH-E32	16CH-E32	1
33	Fitting Spacer	14CH-E33	16CH-E33	1
34	Bearing	14CH-E34	16CH-E34	1
35	Bearing	14CH-E35	16CH-E35	1
36	Pump Drive Gear	14CH-E36	16CH-E36	1
37	Fitting Spacer	14CH-E37	16CH-E37	1
38	Snap Ring	14CH-E38	16CH-E38	1
39	"O" Ring	14CH-E39	16CH-E39	2
40	Screw	14CH-E40	16CH-E40	4
41	Tubhill Pump	14CH-E41	16CH-E41	1
42	Pump Drive Shaft	14CH-E42	16CH-E42	1
43	Key	14CH-E43	16CH-E43	1
44	Bearing	14CH-E44	16CH-E44	1
45	Snap Ring	14CH-E45	16CH-E45	1
46	Pump Drive Gear	14CH-E46	16CH-E46	1
47	Snap Ring	14CH-E47	16CH-E47	1
48	Roller Pin	14CH-E48	16CH-E48	6
49	Roller	14CH-E49	16CH-E49	6
50	Upper Shifter Arm	14CH-E50	16CH-E50	1
51	Roll Pin	14CH-E51	16CH-E51	6
52	Upper Shifter Rod (L. H.)	14CH-E52	16CH-E52	1

Item No.	Part Name and Description	Code No.		Qty.
		14CH	16CH	
53	Upper Shifter Arm	14CH-E53	16CH-E53	1
54	Double Gear	14CH-E54	16CH-E54	1
55	Upper Shifter Arm	14CH-E55	16CH-E55	1
56	Upper Shifter Rod (R. H.)	14CH-E56	16CH-E56	1
57	Upper Shifter Arm	14CH-E57	16CH-E57	1
58	Lower Shifter Arm	14CH-E58	16CH-E58	1
59	Lower Shifter Rod	14CH-E59	16CH-E59	1
60	Lower Shifter Arm	14CH-E60	16CH-E60	1
61	H. S. Gear	14CH-E61	16CH-E61	1
62	Bearing	14CH-E62	16CH-E62	3
63	Spacer	14CH-E63	16CH-E63	3
64	Cover	14CH-E64	16CH-E64	3
65	Screw	14CH-E65	16CH-E65	12
66	Bearing	14CH-E66	16CH-E66	3
67	Shaft	14CH-E67	16CH-E67	2
68	Change Gear	14CH-E68	16CH-E68	1
69	Sliding Gear	14CH-E69	16CH-E69	2
70	Lock Washer	14CH-E70	16CH-E70	6
71	Screw	14CH-E71	16CH-E71	1
72	Snap Ring	14CH-E72	16CH-E72	2
73	Lower Shifter Gear	14CH-E73	16CH-E73	1
74	Dial Pinion	14CH-E74	16CH-E74	1
75	Front Idler Gear	14CH-E75	16CH-E75	1
76	Intermediate Idler Gear	14CH-E76	16CH-E76	1
77	Spacer	14CH-E77	16CH-E77	1
78	Rear Idler Gear	14CH-E78	16CH-E78	1
79	Key	14CH-E79	16CH-E79	1
80	Bearing	14CH-E80	16CH-E80	1
81	Tertiary Shaft	14CH-E81	16CH-E81	1
82	Retainer Keys	14CH-E82	16CH-E82	2
83	Range Change Gear	14CH-E83	16CH-E83	1
84	Range Gear	14CH-E84	16CH-E84	1
85	Snap Ring	14CH-E85	16CH-E85	1
86	Tertiary Sliding Gear	14CH-E86	16CH-E86	1
87	Shifter Pinion	14CH-E87	16CH-E87	1
88	Bearing	14CH-E88	16CH-E88	1
89	Input Shaft	14CH-E89	16CH-E89	1
90	Input Gear	14CH-E90	16CH-E90	1
91	Lower Shifter Pinion	14CH-E91	16CH-E91	1
92	Spacer	14CH-E92	16CH-E92	1
93	Input Gear	14CH-E93	16CH-E93	1
94	Bearing	14CH-E94	16CH-E94	1
95	Spacer	14CH-E95	16CH-E95	1
96	Cover	14CH-E96	16CH-E96	1
97	Screw	14CH-E97	16CH-E97	4
98	Roller Pin	14CH-E98	16CH-E98	2
99	Shifter Block	14CH-E99	16CH-E99	2
100	Eccentric Gear	14CH-E100	16CH-E100	1
101	Eccentric Gear	14CH-E101	16CH-E101	1
102	Dowel	14CH-E102	16CH-E102	1
103	Shifter Cam	14CH-E103	16CH-E103	1

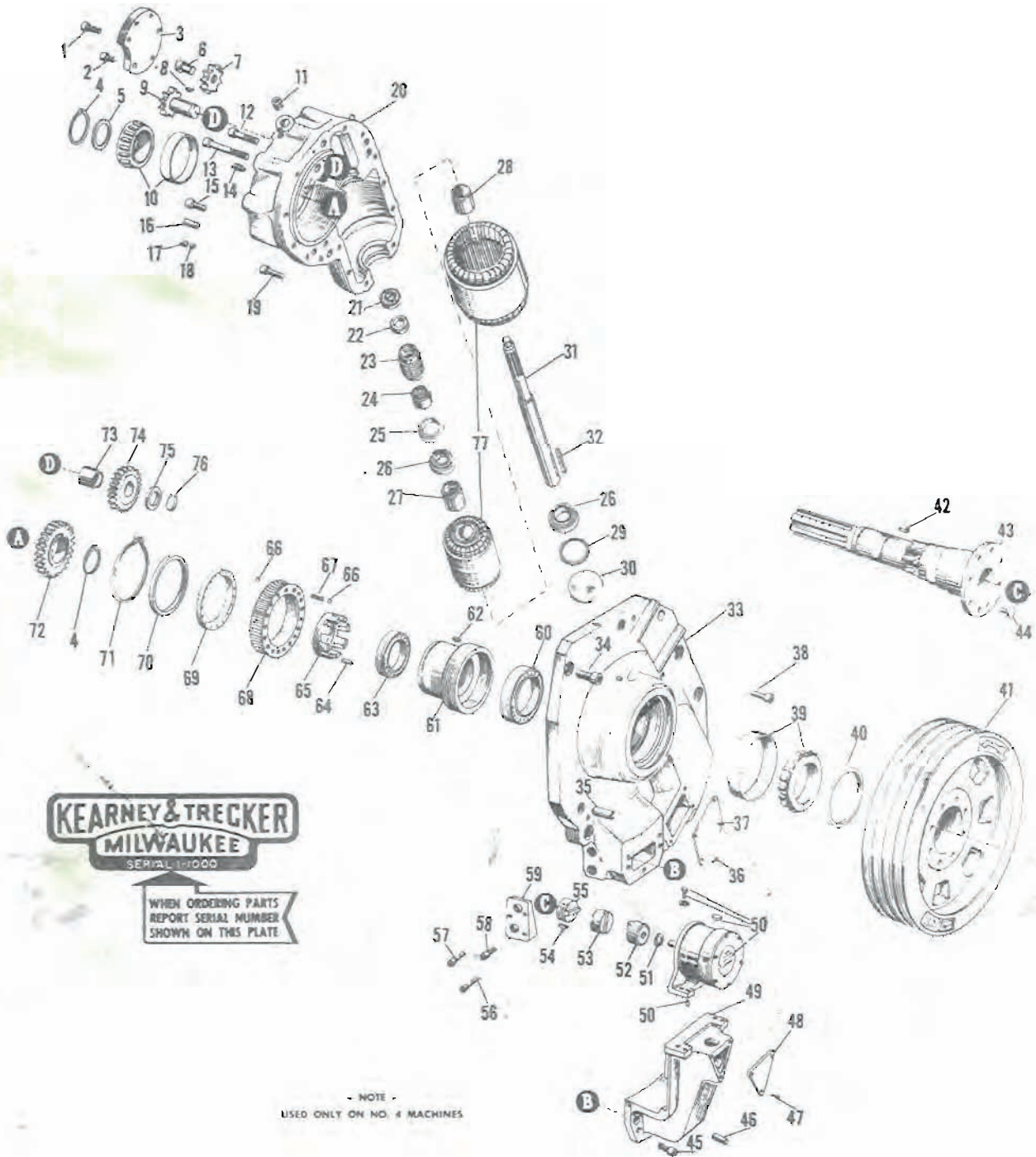


FIG. 10 - PULLEY BRACKET

Fig. 10 - Pulley Bracket

Item No.	Part Name and Description	Code Nos.		Qty.
		3CH	4CH	
1	Sock hd cap screw, 3/8 x 7/8"	3CH-F1	4CH-F1	5
2	Sock hd cap screw, 3/8 x 1/2"	3CH-F2	4CH-F2	1
3	Oil pump cover	3CH-F3	4CH-F3	1
4	Snap ring	3CH-F4	4CH-F4	2
5	Pulley shaft fitting washer	3CH-F5	4CH-F5	1
6	Oil pump gear stud	3CH-F6	4CH-F6	1
7	Oil pump gear (Driven)	3CH-F7	4CH-F7	1
8	Hi-pro key, HP-505	3CH-F8	4CH-F8	1
9	Oil pump gear (Driver)	3CH-F9	4CH-F9	1
10	Timken brg, 25521-25581	3CH-F10	4CH-F10	1
11	Pipe plug, 3/8"	3CH-F11	4CH-F11	2
12	Sock hd cap screw, 3/8 x 2-1/4"	3CH-F12	4CH-F12	1
13	Sock hd cap screw, 3/8 x 3-1/4"	3CH-F13	4CH-F13	4
14	Dog pf set screw, 3/8-16 x 15/16"	3CH-F14	4CH-F14	1
15	Sock hd cap screw, 3/8 x 1"	3CH-F15	4CH-F15	2
16	Acme Blue Label dowel, 1/2 x 1-3/4"	3CH-F16	4CH-F16	2
17	Set screw, 3/8-24 x 3/8"	3CH-F17	4CH-F17	2
18	Bronze shoe	3CH-F18	4CH-F18	2
19	Sock hd cap screw, 3/8 x 2"	3CH-F19	4CH-F19	7
20	Synchro-mesh motor bracket	3CH-F20	4CH-F20	1
21	New Departure brg, 3202	3CH-F21	4CH-F21	1
22	Worm spacer	3CH-F22	4CH-F22	1
23	Synchro-mesh worm	3CH-F23	4CH-F23	1
24	Oil seal bushing	3CH-F24	4CH-F24	1
25	Oil seal, National #50344	3CH-F25	4CH-F25	1
26	New Departure brg, 88505	3CH-F26	4CH-F26	2
27	Motor shaft spacer (Long)	3CH-F27	4CH-F27	1
28	Motor shaft spacer (Short)	3CH-F28	4CH-F28	1
29	Fitting washer	3CH-F29	4CH-F29	1
30	Synchro-mesh motor shaft brg cover	3CH-F30	4CH-F30	1
31	Synchro-mesh motor shaft	3CH-F31	4CH-F31	1
32	Key	3CH-F32	4CH-F32	1
33	Pulley bracket	3CH-F33	4CH-F33	1
34	Sock hd cap screw, 5/8 x 1-1/2"	3CH-F34	4CH-F34	5
35	Acme Blue Label dowel, 5/8 x 2"	3CH-F35	4CH-F35	2
36	Flat hd screw, 10-32 x 3/8"	3CH-F36	4CH-F36	4
37	Synchro motor junction cover	3CH-F37	4CH-F37	1
38	Sock hd cap screw, 3/8 x 1-1/4"	3CH-F38	4CH-F38	1
39	Timken brg, 394A-395A	3CH-F39	4CH-F39	1
40	Adjusting washer	3CH-F40	4CH-F40	1
41	Pulley	3CH-F41	4CH-F41	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3CH	4CH	
42	Key	3CH-F42	4CH-F42	1
43	Pulley shaft	3CH-F43	4CH-F43	1
44	Twist off screw	3CH-F44	4CH-F44	8
45	Sock hd cap screw, 3/8 x 1"	3CH-F45	4CH-F45	3
46	Acme Blue Label dowel, 5/16 x 1-1/4"	3CH-F46	4CH-F46	2
47	Button hd screw, 10-32 x 1/2"	3CH-F47	4CH-F47	3
48	Switch support bracket cover	3CH-F48	4CH-F48	1
49	Plugging switch support bracket	3CH-F49	4CH-F49	1
50	Zero speed switch, Allen-Bradley #Y - 5789D	3CH-F50		1
50	Zero speed switch, Allen-Bradley #Y - 5789		4CH-F50	1
51	Fitting washer for plugging switch	3CH-F51	4CH-F51	1
52	Plugging switch coupling (Driven)	3CH-F52	4CH-F52	1
53	Plugging switch connector coupling	3CH-F53	4CH-F53	1
54	Key	3CH-F54	4CH-F54	1
55	Plugging switch driver coupling	3CH-F55	4CH-F55	1
56	Sock hd cap screw, 10-24 x 1"		4CH-F56	1
57	Sock hd cap screw, 10-24 x 3/4"		4CH-F57	1
58	Sock hd cap screw, 10-24 x 5/8"		4CH-F58	1
59	Conduit adapter		4CH-F59	1
60	New Departure brg, OL12	3CH-F60	4CH-F60	1
61	Synchro-mesh clutch body	3CH-F61	4CH-F61	1
62	Key	3CH-F62	4CH-F62	1
63	New Departure brg, OL08	3CH-F63	4CH-F63	1
64	Synchro-mesh clutch roller	3CH-F64	4CH-F64	8
65	Synchro-mesh roller cage	3CH-F65	4CH-F65	1
66	Steel ball, 5/16" diam	3CH-F66	4CH-F66	36
67	Spring	3CH-F67	4CH-F67	18
68	Synchro-mesh wormwheel	3CH-F68	4CH-F68	1
69	Synchro-mesh clutch back plate	3CH-F69	4CH-F69	1
70	Fitting washer	3CH-F70	4CH-F70	1
71	Snap ring, Tru-arc 5100-334	3CH-F71	4CH-F71	1
72	Pump drive gear (Driver)	3CH-F72	4CH-F72	1
73	Oilite brg, A-1212-2	3CH-F73	4CH-F73	1
74	Pump drive gear (Driven)	3CH-F74	4CH-F74	1
75	Fitting washer	3CH-F75	4CH-F75	1
76	Snap ring	3CH-F76	4CH-F76	1
77	Motor, Louis Allis, shaftless, shell type, 1/2 hp, frame #413 (See motor nameplate)	3CH-F77	4CH-F77	1

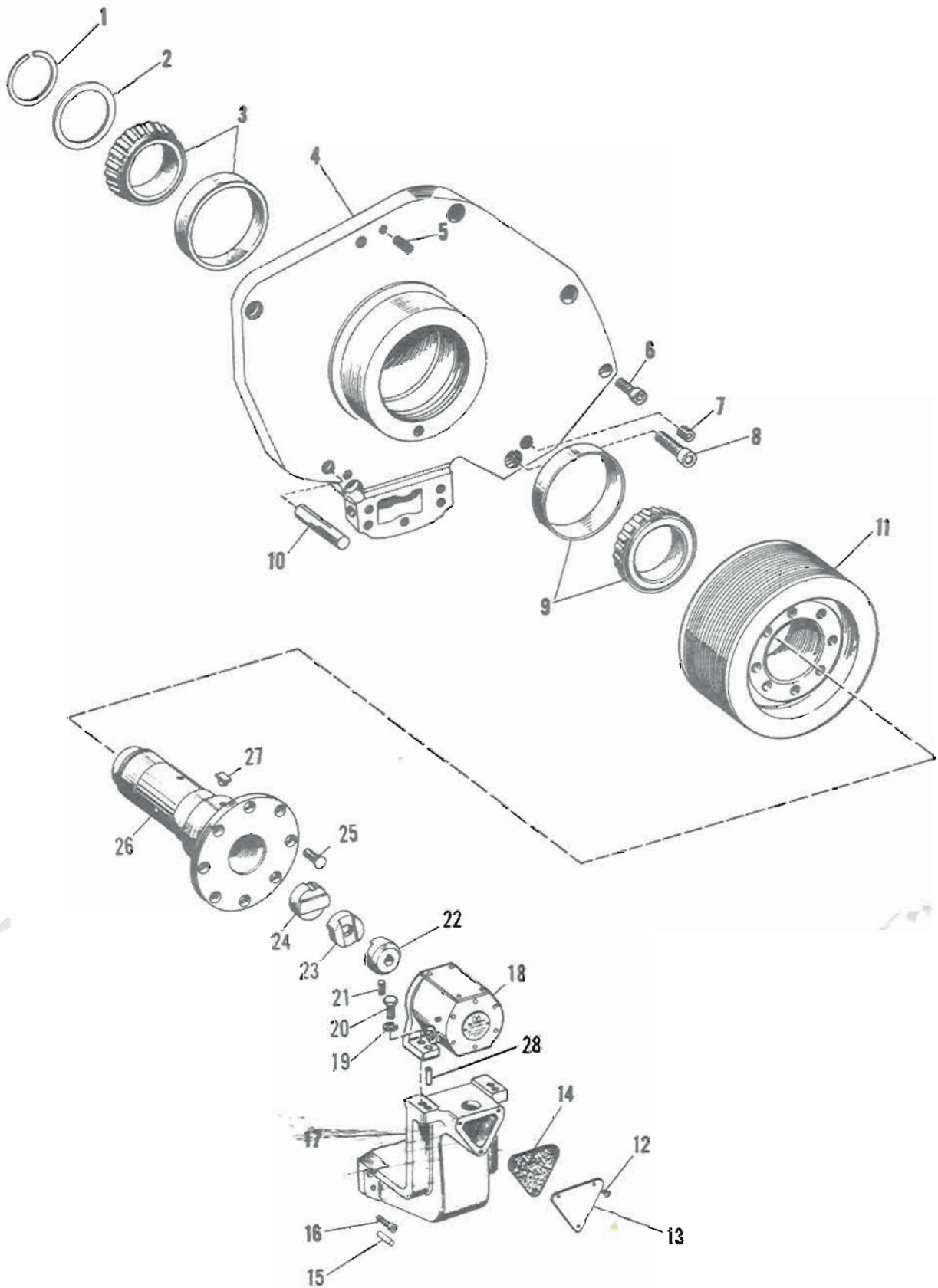


FIG. 10A - PULLEY BRACKET

FIG. 10A - PULLEY BRACKET

Item No.	Part Name and Description	Code No.		Qty.
		14CH	16CH	
1	Snap Ring	14CH-F1	16CH-F1	1
2	Washer	14CH-F2	16CH-F2	1
3	Bearing	14CH-F3	16CH-F3	1
4	Pulley Bracket	14CH-F4		1
			16CH-F4	1
5	Screw	14CH-F5		2
			16CH-F5	2
6	Screw	14CH-F6	16CH-F6	1
7	Pipe Plug	14CH-F7	16CH-F7	1
8	Screw	14CH-F8		5
			16CH-F8	5
9	Bearing	14CH-F9	16CH-F9	1
10	Dowel	14CH-F10	16CH-F10	2
11	Pulley	14CH-F11	16CH-	1
			16CH-F11	1
12	Screw	14CH-F12	16CH-F12	3
13	Support Bracket Cover	14CH-F13	16CH-F13	1
14	Cover Gasket	14CH-F14	16CH-F14	1
15	Dowel	14CH-F15		2
			16CH-F15	2
16	Screw	14CH-F16		3
			16CH-F16	3
17	Switch Support Bracket	14CH-F17		1
			16CH-F17	1
18	Zero Speed Switch	14CH-F18	16CH-F18	1
19	Lockwasher	14CH-F19	16CH-F19	2
20	Screw	14CH-F20	16CH-F20	2
21	Screw	14CH-F21	16CH-F21	2
22	Coupling (Driver)	14CH-F22	16CH-F22	1
23	Connector Coupling	14CH-F23	16CH-F23	1
24	Coupling (Driver)	14CH-F24	16CH-F24	1
25	Screw	14CH-F25	16CH-F25	8
26	Pulley Sleeve	14CH-F26		1
			16CH-F26	1
27	Key	14CH-F27	16CH-F27	1
28	Dowel	14CH-F28	16CH-F28	2



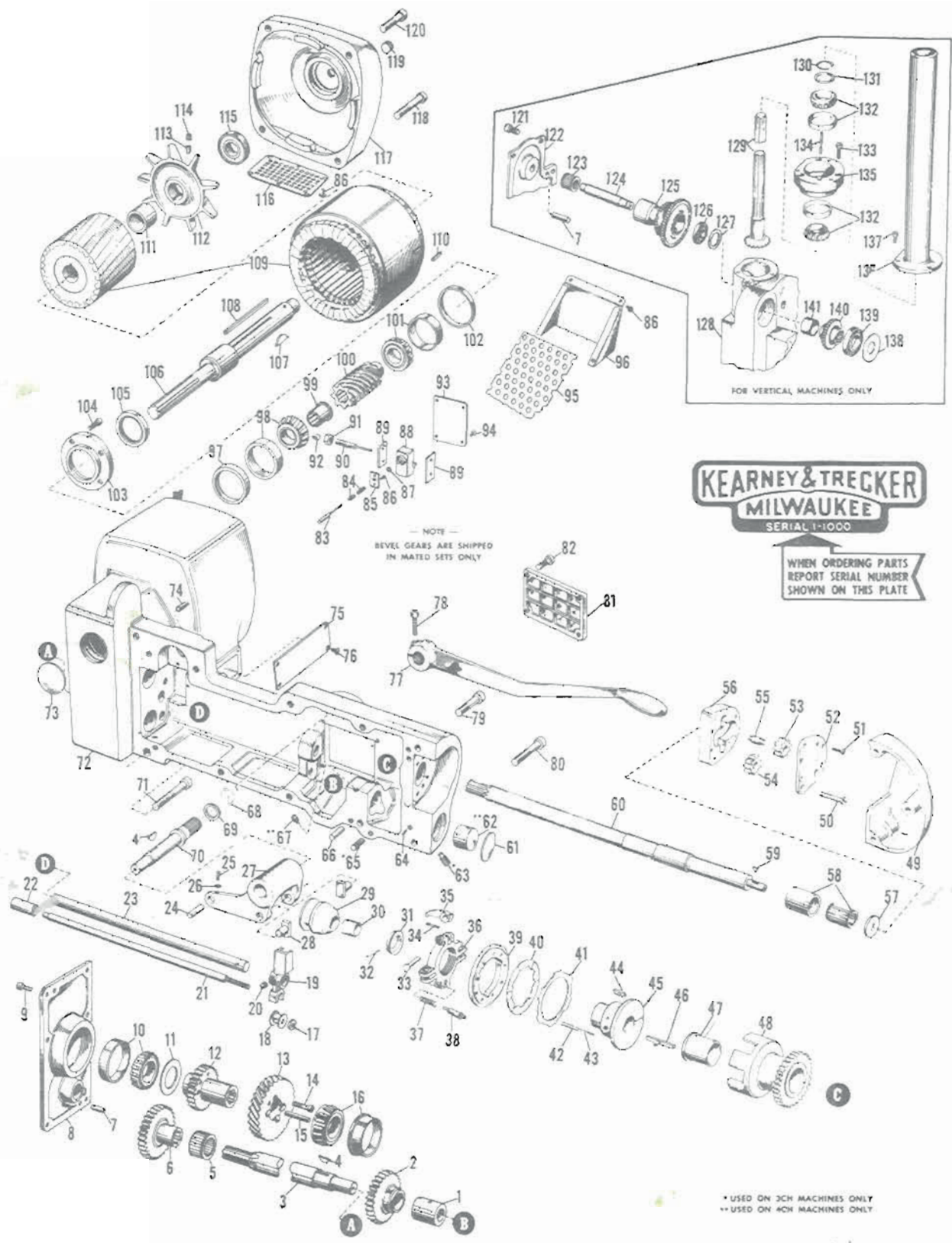


FIG. 11 - FEED AND RAPID TRAVERSE DRIVE BRACKET

Fig. 11 - Feed and Rapid Traverse Drive Bracket

Item No.	Part Name and Description	Code Nos.		Qty.	Item No.	Part Name and Description	Code Nos.		Qty.
		3CH	4CH				3CH	4CH	
1	Feed drive shaft brg (Outer)	3CH-G1	4CH-G1	1	72	Feed and rapid traverse drive bracket (Plain mach)	3CH-G72	4CH-G72	1
2	Main feed drive pinion	3CH-G2	4CH-G2	1	73	Expansion plug. 2-1/4"	3CH-G73		1
3	Feed drive shaft	3CH-G3	4CH-G3	1	74	Expansion plug. 2-1/2"		4CH-G73	1
4	Hi-pro key, HP-808	3CH-G4	4CH-G4	2	75	Socket set screw, 3/8 x 1-1/2"	3CH-G74	4CH-G74	1
5	Bantam brg. 223020	3CH-G5	4CH-G5	1	76	Wiring chamber cover	3CH-G75	4CH-G75	1
6	Feed drive gear	3CH-G6	4CH-G6	1	77	Flat hd mach screw, 10-32 x 1/2"	3CH-G76	4CH-G76	4
7	Acme Blue Label dowel, 3/8 x 1"	3CH-G7	4CH-G7	2	78	Rapid traverse lever	3CH-G77	4CH-G77	1
8	Drive bracket cover	3CH-G8	4CH-G8	1	79	Socket hd cap screw, 3/8 x 1-1/4"	3CH-G78	4CH-G78	1
9	Fl hd screw, 3/8-16 x 7/8"	3CH-G9	4CH-G9	8	80	Socket hd cap screw, 1/2 x 1-3/4"	3CH-G79	4CH-G79	14
10	Timken brg. 26882-26882	3CH-G10	4CH-G10	1	81	Socket hd cap screw, 1/2 x 2-1/2"	3CH-G80	4CH-G80	1
11	Gear fitting washer	3CH-G11	4CH-G11	1	82	Rapid traverse clutch cover	3CH-G81	4CH-G81	1
12	Feed drive pinion	3CH-G12	4CH-G12	1	83	Fl hd screw, 5/16-18 x 5/8"	3CH-G82	4CH-G82	4
13	Feed worm wheel	3CH-G13	4CH-G13	1	84	Switch push rod	3CH-G83	4CH-G83	1
14	Socket hd cap screw, 3/8 x 1-1/4"	3CH-G14	4CH-G14	4	85	Spring	3CH-G84	4CH-G84	2
15	Acme Blue Label dowel, 3/8 x 1-5/8"	3CH-G15	4CH-G15	1	86	Push rod spring retainer	3CH-G85	4CH-G85	1
16	Timken brg. 26822B-26882	3CH-G16	4CH-G16	1	87	Rd hd mach screw, 10-32 x 3/8"	3CH-G86	4CH-G86	12
17	Hex nut, 3/8-16	3CH-G17	4CH-G17	1	88	Snap ring, 3/16" National series #2	3CH-G87	4CH-G87	1
18	Rapid traverse switch yoke spool	3CH-G18	4CH-G18	1	89	Precision limit switch, Allen-Bradley catalog #802, type P8SJ20-11 (Normally closed)	3CH-G88	4CH-G88	1
19	Rapid traverse switch yoke	3CH-G19	4CH-G19	1	90	Switch insulating spacer	3CH-G89	4CH-G89	2
20	Dowel screw, 3/8-16 x 9/16"	3CH-G20	4CH-G20	1	91	Switch support rod	3CH-G90	4CH-G90	2
21	Rapid traverse switch rod	3CH-G21	4CH-G21	1	92	Hex nut, 3/8-16	3CH-G91	4CH-G91	2
22	Oilite bushing, A-804	3CH-G22	4CH-G22	1	93	Pipe plug, 1/4"	3CH-G92	4CH-G92	2
23	Yoke support rod	3CH-G23	4CH-G23	1	94	Switch cover	3CH-G93	4CH-G93	1
24	Rapid traverse clutch fork pin	3CH-G24	4CH-G24	1	95	Rd hd mach screw, 10-32 x 1/2"	3CH-G94	4CH-G94	4
25	Set screw, 1/4-20 x 25/32"	3CH-G25	4CH-G25	1	96	Exhaust screen	3CH-G95	4CH-G95	1
26	Hex nut, 1/4"	3CH-G26	4CH-G26	1	97	Exhaust baffle	3CH-G96	4CH-G96	1
27	Rapid traverse clutch fork	3CH-G27	4CH-G27	1	98	Worm brg fitting washer	3CH-G98	4CH-G98	1
28	Rapid traverse clutch fork shoe	3CH-G28	4CH-G28	2	99	Timken brg. 02420-02475	3CH-G99	4CH-G99	1
29	Rapid traverse clutch sliding cone	3CH-G29	4CH-G29	1	100	Brg thimble	3CH-G100	4CH-G100	1
30	Rapid traverse clutch cone bushing	3CH-G30	4CH-G30	1	101	Feed worm	3CH-G101	4CH-G101	1
31	Collar	3CH-G31	4CH-G31	1	102	Timken brg. 16284-16150	3CH-G102	4CH-G102	1
32	Taper pin, #3 x 1-5/8"	3CH-G32	4CH-G32	1	103	Worm brg fitting washer	3CH-G103	4CH-G103	1
33	Rapid traverse clutch finger pin	3CH-G33	4CH-G33	4	104	Oil seal carrier	3CH-G104	4CH-G104	4
34	Cotter pin, 3/32 x 5/8"	3CH-G34	4CH-G34	4	105	Socket hd cap screw, 3/8 x 3/4"	3CH-G105	4CH-G105	1
35	Rapid traverse clutch finger (Twin Disc)	3CH-G35	4CH-G35	4	106	Oil seal, Victoprene #60620	3CH-G106	4CH-G106	1
36	Rapid traverse clutch yoke (Twin Disc)	3CH-G36	4CH-G36	1	107	Motor shaft	3CH-G107	4CH-G107	1
37	Spring	3CH-G37	4CH-G37	1	108	Hi-pro key, HP-806	3CH-G108	4CH-G108	1
38	Rapid traverse clutch adj plunger	3CH-G38	4CH-G38	1	109	Key			
39	Rapid traverse clutch floating plate	3CH-G39	4CH-G39	1	110	Ohio shaftless shell type motor, 3 hp, 1500 rpm, Ohio drawing B-90223	3CH-G109	4CH-G109	1
40	Rapid traverse clutch plate (Twin Disc 1939A)	3CH-G40	4CH-G40	5	111	Key	3CH-G110	4CH-G110	2
41	Rapid traverse clutch plate (Twin Disc 1933)	3CH-G41	4CH-G41	14	112	Rotor spacer	3CH-G111	4CH-G111	1
42	Spring	3CH-G42	4CH-G42	6	113	Motor fan	3CH-G112	4CH-G112	1
43	Rapid traverse clutch plate pin	3CH-G43	4CH-G43	6	114	Socket dog pt set screw, 5/16 x 5/16"	3CH-G113	4CH-G113	1
44	Rapid traverse clutch plate key	3CH-G44	4CH-G44	3	115	Socket set screw, 5/16 x 1/4"	3CH-G114	4CH-G114	1
45	Rapid traverse clutch hub	3CH-G45	4CH-G45	1	116	New Departure brg. 88506	3CH-G115	4CH-G115	1
46	Key	3CH-G46	4CH-G46	1	117	Inlet screen	3CH-G116	4CH-G116	1
47	Rapid traverse clutch gear bushing	3CH-G47	4CH-G47	1	118	Motor end bell	3CH-G117	4CH-G117	1
48	Rapid traverse clutch gear	3CH-G48	4CH-G48	1	119	Socket hd cap screw, 1/2 x 3-1/2"	3CH-G118	4CH-G118	2
49	Feed selection cam housing	3CH-G49	4CH-G49	1	120	Pipe plug, 3/8"	3CH-G119	4CH-G119	1
50	Fl hd screw, 1/4-20 x 5/8"	3CH-G50	4CH-G50	4	121	Socket hd cap screw, 1/2 x 2-1/4"	3CH-G120	4CH-G120	2
51	Fl hd screw, 5/16-18 x 1-5/16"	3CH-G51	4CH-G51	4	122	Fl hd screw, 3/8-16 x 7/8"	3CH-G121	4CH-G121	9
52	Oil pump body cover	3CH-G52	4CH-G52	1	123	Drive bracket cover	3CH-G122	4CH-G122	1
53	Oil pump gear (Driven)	3CH-G53	4CH-G53	1	124	Hyatt brg. 93316	3CH-G123	4CH-G123	1
54	Oil pump gear (Driver)	3CH-G54	4CH-G54	1	125	Feed drive bevel gear shaft	3CH-G124	4CH-G124	1
55	Oil pump stud	3CH-G55	4CH-G55	1	126	Vert hd feed gear assy	3CH-G125	4CH-G125	1
56	Oil pump body	3CH-G56	4CH-G56	1	127	New Departure brg. 20203	3CH-G126	4CH-G126	1
57	Rapid traverse clutch shaft collar	3CH-G57	4CH-G57	1	128	Fitting washer	3CH-G127	4CH-G127	1
58	Hyatt brg. S-93524	3CH-G58	4CH-G58	1	129	Feed and rapid traverse drive bracket (Vert mach)	3CH-G128	4CH-G128	1
59	Hi-pro key, HP-404	3CH-G59	4CH-G59	1	130	Vert hd feed bevel gear shaft	3CH-G129	4CH-G129	1
60	Rapid traverse clutch shaft	3CH-G60	4CH-G60	1	131	Snap ring	3CH-G130	4CH-G130	1
61	Expansion plug, 1-3/4"	3CH-G61	4CH-G61	1	132	Feed shaft brg washer	3CH-G131	4CH-G131	1
62	Oiling plug	3CH-G62	4CH-G62	1	133	Timken brg. 1932-1985	3CH-G132	4CH-G132	2
63	Dog pt set screw, 3/8-16 x 1-1/16"	3CH-G63		1	134	Socket hd cap screw, 5/16 x 1"	3CH-G133	4CH-G133	4
64	Half dog pt set screw, 10-32 x 1/4"		4CH-G64	1	135	Fl hd screw, 5/16-18 x 1"		4CH-G133	3
65	Socket set screw, 3/8 x 1"	3CH-G65		1	136	Oil wicking	3CH-G134	4CH-G134	1
66	Acme Blue Label dowel, 3/8 x 2-3/4"	3CH-G66		1	137	Brg carrier	3CH-G135	4CH-G135	1
67	Acme Blue Label dowel, 3/8 x 3-3/4"		4CH-G66	1	138	Outer telescopic tube and flange	3CH-G136	4CH-G136	1
68	Dog pt set screw, 3/8-16 x 11/16"		4CH-G67	1	139	Fl hd screw, 1/4-20 x 11/16"	3CH-G137		3
69	"O" Ring packing, AN6227-19	3CH-G68	4CH-G68	1	140	Fl hd screw, 1/4-20 x 5/8"		4CH-G137	3
70	Washer	3CH-G69	4CH-G69	1	141	Drive shaft pinion brg washer	3CH-G138	4CH-G138	1
71	Rapid traverse lever shaft	3CH-G70	4CH-G70	1	142	Gurney brg. 106-N	3CH-G139	4CH-G139	1
72	Socket hd cap screw, 1/2 x 3-3/4"	3CH-G71		3	143	Drive shaft pinion	3CH-G140	4CH-G140	1
73	Socket hd cap screw, 1/2 x 3-1/2"		4CH-G71	4	144	Drive shaft pinion brg	3CH-G141	4CH-G141	1

\*Used only on machines with rear control  
:Six used on 4CH machines

⊖Eight used on 4CH machines  
:Five used on 4CH machines

⊕Used only on 4CH vertical machines  
/Two used on 4CH machines

7½ hp No. 3 and 10 hp No. 4 Model CH

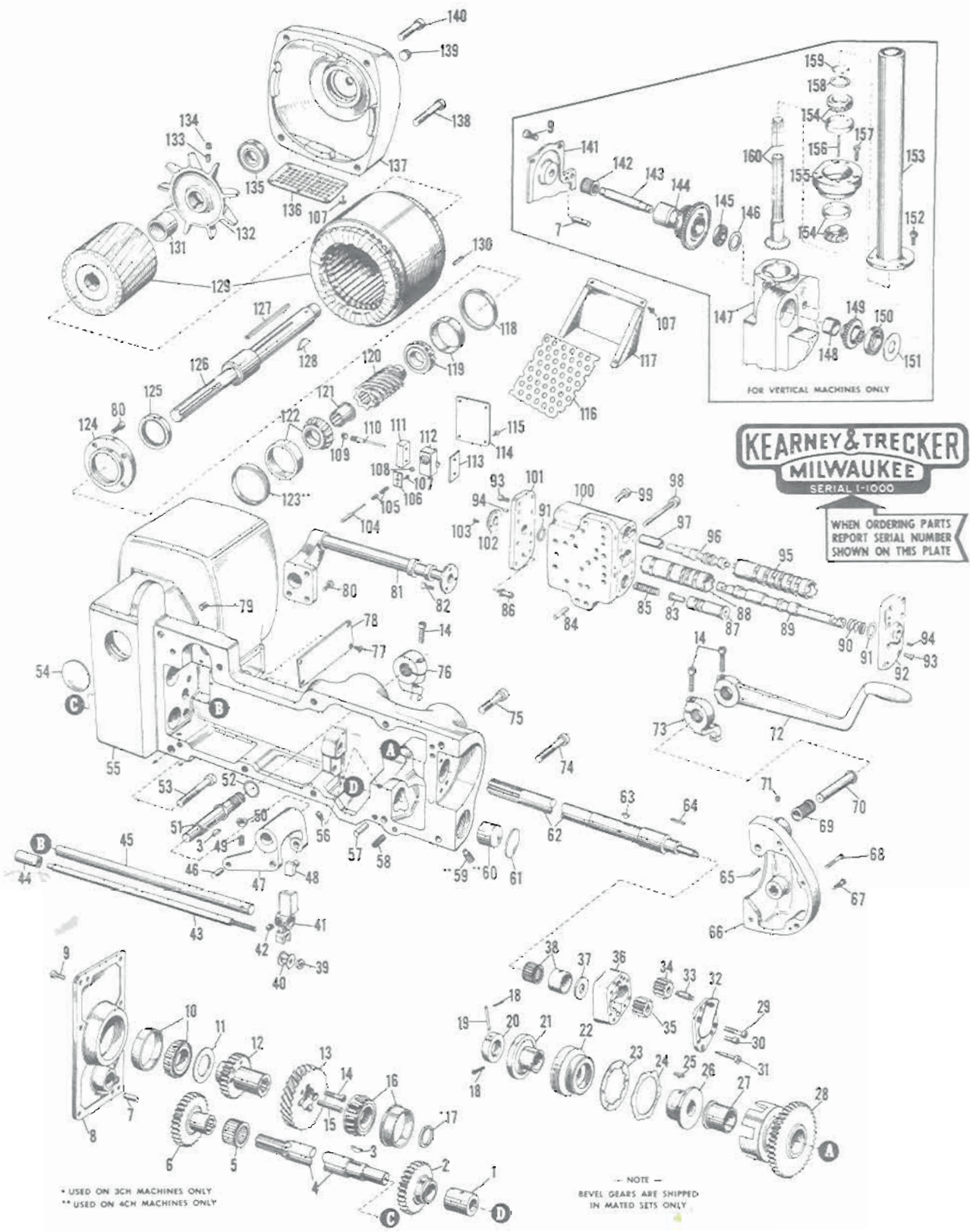


FIG. 12 - AUTOMATIC FEED AND RAPID TRAVERSE DRIVE BRACKET

BUILDERS OF PRECISION AND PRODUCTION



MACHINE TOOLS FOR MILLING AND BORING

Fig. 12 - Automatic Feed and Rapid Traverse Drive Bra

Item No.	Part Name and Description	Code Nos.		Qty.
		3CH	4CH	
1	Feed drive shaft brg (Outer)	3CH-H1	4CH-H1	1
2	Main feed drive pinion	3CH-H2	4CH-H2	1
3	Hi-pro key, HP-806	3CH-H3	4CH-H3	2
4	Feed drive shaft	3CH-H4	4CH-H4	1
5	Bantam brg. 223020	3CH-H5	4CH-H5	1
6	Feed drive gear	3CH-H6	4CH-H6	1
7	Acme Blue Label dowel, 3/8x1"	3CH-H7	4CH-H7	2
8	Drive bracket cover (Plain mach)	3CH-H8	4CH-H8	1
9	Fil hd screw, 3/8-16 x 7/8"	3CH-H9	4CH-H9	*8
10	Timken brg. 26822-26882	3CH-H10	4CH-H10	1
11	Gear fitting washer	3CH-H11	4CH-H11	1
12	Feed drive pinion	3CH-H12	4CH-H12	1
13	Feed worm wheel	3CH-H13	4CH-H13	1
14	Sock cap screw, 3/8 x 1-1/4"	3CH-H14	4CH-H14	7
15	Acme Blue Label dowel, 3/8 x 1-5/8"	3CH-H15	4CH-H15	1
16	Timken brg. 26822B-26878	3CH-H16	4CH-H16	1
17	Rapid traverse shaft thrust collar	3CH-H17		1
18	Cotter pin, 3/32 x 1/2"	3CH-H18	4CH-H18	2
19	Rapid traverse shaft collar pin	3CH-H19	4CH-H19	1
20	Rapid traverse shaft collar	3CH-H20	4CH-H20	1
21	Rapid traverse operating sleeve	3CH-H21	4CH-H21	1
22	Clutch engage sleeve	3CH-H22	4CH-H22	1
23	Rapid traverse clutch plate (Twin Disc 1939A)	3CH-H23	4CH-H23	8
24	Rapid traverse clutch plate (Twin Disc 1933)	3CH-H24	4CH-H24	8
25	Rapid traverse clutch plate key	3CH-H25	4CH-H25	3
26	Rapid traverse clutch hub	3CH-H26	4CH-H26	1
27	Rapid traverse clutch gear bushing	3CH-H27	4CH-H27	1
28	Rapid traverse clutch gear	3CH-H28	4CH-H28	1
29	Sock cap screw, 5/16 x 1-3/4"	3CH-H29	4CH-H29	2
30	Sock cap screw, 1/4 x 5/8"	3CH-H30	4CH-H30	4
31	Allen shoulder screw, 5/16 x 1-3/4"	3CH-H31	4CH-H31	2
32	Oil pump cover	3CH-H32	4CH-H32	1
33	Oil pump gear stud	3CH-H33	4CH-H33	1
34	Oil pump gear (Driven)	3CH-H34	4CH-H34	1
35	Oil pump gear (Driver)	3CH-H35	4CH-H35	1
36	Oil pump body	3CH-H36	4CH-H36	1
37	Rapid traverse clutch shaft collar	3CH-H37	4CH-H37	1
38	Hyatt brg. S-93516	3CH-H38	4CH-H38	1
39	Hex nut, 3/8-16	3CH-H39	4CH-H39	1
40	Rapid traverse switch yoke spool	3CH-H40	4CH-H40	1
41	Rapid traverse switch yoke	3CH-H41	4CH-H41	1
42	Dog pt set screw, 3/8-16 x 9/16"	3CH-H42	4CH-H42	1
43	Rapid traverse switch rod	3CH-H43	4CH-H43	1
44	Oilite brg. A-604	3CH-H44	4CH-H44	1
45	Yoke support rod	3CH-H45	4CH-H45	1
46	Rapid traverse clutch fork pin	3CH-H46	4CH-H46	1
47	Rapid traverse clutch fork	3CH-H47	4CH-H47	1
48	Rapid traverse clutch fork shoe	3CH-H48	4CH-H48	1
49	Set screw, 1/4-20 x 25/32"	3CH-H49	4CH-H49	1
50	Hex nut, 1/4-20	3CH-H50	4CH-H50	1
51	Rapid traverse lever shaft	3CH-H51	4CH-H51	1
52	"O" Ring packing, AN-6227-19	3CH-H52	4CH-H52	1
53	Sock hd cap screw, 1/2 x 3/4"	3CH-H53		3
54	Sock hd cap screw, 1/2 x 3-1/2"		4CH-H53	3
55	Expansion plug, 2-1/4"	3CH-H54		1
56	Expansion plug, 2-1/2"		4CH-H54	1
55	Feed and rapid traverse drive bracket (Plain mach)	3CH-H55	4CH-H55	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3CH	4CH	
56	Dog pt set screw, 3/8-16 x 1-1/16"	3CH-H56		1
56	Dog pt set screw, 3/8-16 x 11/16"		4CH-H56	1
57	Acme Blue Label dowel, 3/8 x 2-3/4"	3CH-H57	4CH-H57	2
58	Sock set screw, (Flat pt) 3/8 x 1"	3CH-H58		1
58	Sock set screw, (Flat pt) 3/8 x 1-1/2"		4CH-H58	1
59	Dog pt set screw, 7/16-14 x 1-1/8"		4CH-H59	1
60	Oiling plug		4CH-H60	1
61	Expansion plug, 1-3/4" diam	3CH-H61	4CH-H61	1
62	Rapid traverse clutch shaft	3CH-H62	4CH-H62	1
63	Hi-pro key, HP-708	3CH-H63	4CH-H63	2
64	Rd end key	3CH-H64	4CH-H64	1
65	Acme Blue Label dowel, 1/4x2"	3CH-H65		2
65	Acme Blue Label dowel, 1/4 x 1-1/2"		4CH-H65	2
66	Feed selection cam housing	3CH-H66	4CH-H66	1
67	Sock hd screw, 3/8 x 1-1/2"	3CH-H67		3
67	Sock hd screw, 3/8 x 1-1/4"		4CH-H67	3
68	Sock hd screw, 3/8 x 2-3/4"	3CH-H68		1
68	Sock hd screw, 3/8 x 2-1/2"		4CH-H68	1
69	Rapid traverse lever sleeve	3CH-H69	4CH-H69	1
70	Rapid traverse lever pin	3CH-H70	4CH-H70	1
71	Dog pt set screw, 3/8-16 x 13/16"	3CH-H71	4CH-H71	1
72	Rapid traverse lever	3CH-H72	4CH-H72	1
73	Rapid traverse valve shifter (Front)	3CH-H73	4CH-H73	1
74	Sock hd cap screw, 1/2 x 2-1/2"	3CH-H74	4CH-H74	1
75	Sock hd cap screw, 1/2 x 1-3/4"	3CH-H75	4CH-H75	4
76	Rapid traverse valve shifter (Rear)	3CH-H76	4CH-H76	1
77	Flat hd mach screw, 10-32x1/2"	3CH-H77	4CH-H77	4
78	Wiring chamber cover	3CH-H78	4CH-H78	1
79	Sock set screw, (Flat pt) 3/8 x 1-1/2"	3CH-H79	4CH-H79	1
80	Sock cap screw, 3/8 x 3/4"	3CH-H80	4CH-H80	7
81	Oil return tube and bracket assy	3CH-H81	4CH-H81	1
82	Fil hd screw, 3/16-32 x 3/8"	3CH-H82		3
82	Fil hd screw, 10-32 x 5/16"		4CH-H82	3
83	Relief valve plunger	3CH-H83	4CH-H83	1
84	Acme Blue Label dowel, 3/8 x 1-1/4"	3CH-H84	4CH-H84	2
85	Spring	3CH-H85	4CH-H85	1
86	Pressure relief valve plunger stop	3CH-H86	4CH-H86	1
87	Pressure relief valve sleeve	3CH-H87	4CH-H87	1
88	Rapid traverse control valve sleeve	3CH-H88	4CH-H88	1
89	Rapid traverse control valve piston	3CH-H89	4CH-H89	1
90	Spring	3CH-H90	4CH-H90	1
91	"O" Ring packing, AN-6227-15	3CH-H91	4CH-H91	2
92	Rapid traverse valve body cover (Front)	3CH-H92	4CH-H92	1
93	Sock hd cap screw, 5/16 x 5/8"	3CH-H93	4CH-H93	16
94	Acme Blue Label dowel, 3/16 x 3/4"	3CH-H94	4CH-H94	4
95	Rapid traverse pilot valve sleeve	3CH-H95	4CH-H95	1
96	Pilot valve	3CH-H96	4CH-H96	1
97	Pilot valve sleeve (Short)	3CH-H97	4CH-H97	1
98	Sock hd cap screw, 3/8 x 4"	3CH-H98	4CH-H98	4
99	Sock hd cap screw, 3/8 x 1"	3CH-H99	4CH-H99	3
100	Rapid traverse valve body	3CH-H100	4CH-H100	1
101	Rapid traverse valve body cover (Rear)	3CH-H101	4CH-H101	1

†Two used on 4CH machines

\*Three used on 4CH machines

○Five used on 4CH machines

12 - Automatic Feed and Rapid Traverse Drive Bracket

Item No.	Part Name and Description	Code Nos.		Qty.
		3CH	4CH	
56	Dog pt set screw, 3/8-16 x 1-1/16"	3CH-H56		1
56	Dog pt set screw, 3/8-16 x 11/16"		4CH-H56	1
57	Acme Blue Label dowel, 3/8 x 2-3/4"	3CH-H57	4CH-H57	2
58	Socket set screw, (Flat pt) 3/8 x 1-1/2"	3CH-H58		1
58	Socket set screw, (Flat pt) 3/8 x 1-1/2"		4CH-H58	1
59	Dog pt set screw, 7/16-14 x 1-1/8"		4CH-H59	1
60	Oiling plug		4CH-H60	1
61	Expansion plug, 1-3/4" diam	3CH-H61	4CH-H61	1
62	Rapid traverse clutch shaft	3CH-H62	4CH-H62	1
63	Hi-pro key, HP-708	3CH-H63	4CH-H63	2
64	Rd end key	3CH-H64	4CH-H64	1
65	Acme Blue Label dowe, 1/4x2" 1-1/2"	3CH-H65		2
65	Acme Blue Label dowel, 1/4 x 1-1/2"		4CH-H65	2
66	Feed selection cam housing	3CH-H66	4CH-H66	1
67	Socket hd screw, 3/8 x 1-1/2"	3CH-H67		3
67	Socket hd screw, 3/8 x 1-1/4"		4CH-H67	3
68	Socket hd screw, 3/8 x 2-3/4"	3CH-H68		1
68	Socket hd screw, 3/8 x 2-1/2"		4CH-H68	1
69	Rapid traverse lever sleeve	3CH-H69	4CH-H69	1
70	Rapid traverse lever pin	3CH-H70	4CH-H70	1
71	Dog pat set screw, 3/8-16 x 13/16"	3CH-H71	4CH-H71	1
72	Rapid traverse lever	3CH-H72	4CH-H72	1
73	Rapid traverse valve shifter (Front)	3CH-H73	4CH-H73	1
74	Socket hd cap screw, 1/2 x 2-1/2"	3CH-H74	4CH-H74	1
75	Socket hd cap screw, 1/2 x 1-3/4"	3CH-H75	4CH-H75	4
76	Rapid traverse valve shifter (Rear)	3CH-H76	4CH-H76	1
77	Flat hd mach screw, 10-32x1/2"	3CH-H77	4CH-H77	4
78	Wiring chamber cover	3CH-H78	4CH-H78	1
79	Socket set screw, (Flat pt) 3/8 x 1-1/2"	3CH-H79	4CH-H79	1
80	Socket cap screw, 3/8 x 3/4"	3CH-H80	4CH-H80	7
81	Oil return tube and bracket assy	3CH-H81	4CH-H81	1
82	Fil hd screw, 3/16-32 x 3/8"	3CH-H82		3
82	Fil hd screw, 10-32 x 5/16"		4CH-H82	3
83	Relief valve plunger	3CH-H83	4CH-H83	1
84	Acme Blue Label dowel, 3/8 x 1-1/4"	3CH-H84	4CH-H84	2
85	Spring	3CH-H85	4CH-H85	1
86	Pressure relief valve plunger stop	3CH-H86	4CH-H86	1
87	Pressure relief valve sleeve	3CH-H87	4CH-H87	1
88	Rapid traverse control valve sleeve	3CH-H88	4CH-H88	1
89	Rapid traverse control valve piston	3CH-H89	4CH-H89	1
90	Spring	3CH-H90	4CH-H90	1
91	"O" Ring packing, AN-6227-15	3CH-H91	4CH-H91	2
92	Rapid traverse valve body cover (Front)	3CH-H92	4CH-H92	1
93	Socket hd cap screw, 5/16 x 5/8"	3CH-H93	4CH-H93	16
94	Acme Blue Label dowel, 3/16 x 3/4"	3CH-H94	4CH-H94	4
95	Rapid traverse pilot valve sleeve	3CH-H95	4CH-H95	1
96	Pilot valve	3CH-H96	4CH-H96	1
97	Pilot valve sleeve (Short)	3CH-H97	4CH-H97	1
98	Socket hd cap screw, 3/8 x 4"	3CH-H98	4CH-H98	4
99	Socket hd cap screw, 3/8 x 1"	3CH-H99	4CH-H99	3
100	Rapid traverse valve body	3CH-H100	4CH-H100	1
101	Rapid traverse valve body cover (Rear)	3CH-H101	4CH-H101	1

Item No.	Part Name and Description	Code Nos.		Qty.
		3CH	4CH	
102	Rapid traverse control valve piston wiper	3CH-H102	4CH-H102	1
103	Oval hd screw, 10-32 x 15/32"	3CH-H103	4CH-H103	3
104	Micro switch push rod	3CH-H104	4CH-H104	1
105	Spring	3CH-H105	4CH-H105	2
106	Push rod spring retainer	3CH-H106	4CH-H106	1
107	Rd hd mach screw, 10-32 x 3/8"	3CH-H107	4CH-H107	12
108	Snap ring, 3/16 series #2, national	3CH-H108	4CH-H108	1
109	Set screw	3CH-H109	4CH-H109	2
110	Switch support rod	3CH-H110	4CH-H110	2
111	Switch insulating spacer	3CH-H111	4CH-H111	1
112	Precision limit switch, Allen-Bradley catalog #802 type #PBSJ-20-11 (Normally closed)	3CH-H112	4CH-H112	1
113	Switch insulating spacer	3CH-H113	4CH-H113	1
114	Switch cover	3CH-H114	4CH-H114	1
115	Rd hd screw, 10-32 x 1/2"	3CH-H115	4CH-H115	4
116	Exhaust screen	3CH-H116	4CH-H116	1
117	Exhaust baffle	3CH-H117	4CH-H117	1
118	Worm brg fitting washer	3CH-H118	4CH-H118	1
119	Timken brg, 16284-16150	3CH-H119	4CH-H119	1
120	Feed worm	3CH-H120	4CH-H120	1
121	Brg thimble	3CH-H121	4CH-H121	1
122	Timken brg, 02420-02475	3CH-H122	4CH-H122	1
123	Worm spacing washer		4CH-H123	*1
124	Oil seal carrier	3CH-H124	4CH-H124	1
125	Victoprene oil seal, 60620	3CH-H125	4CH-H125	1
126	Motor shaft	3CH-H126	4CH-H126	1
127	Rotor key	3CH-H127	4CH-H127	1
128	Hi-pro key, HP-606	3CH-H128	4CH-H128	1
129	Ohio shaftless shell type motor, 3 hp, 1500 rpm, Ohio drawing B-90223	3CH-H129	4CH-H129	1
130	Key	3CH-H130	4CH-H130	1
131	Rotor spacer	3CH-H131	4CH-H131	1
132	Motor fan	3CH-H132	4CH-H132	1
133	Socket dog pt set screw, 5/16 x 5/16"	3CH-H133	4CH-H133	1
134	Socket set screw, 5/16 x 1/4"	3CH-H134	4CH-H134	1
135	New Departure brg, 88506	3CH-H135	4CH-H135	1
136	Inlet screen	3CH-H136	4CH-H136	1
137	Motor end bell	3CH-H137	4CH-H137	1
138	Socket cap screw, 1/2 x 3-1/2"	3CH-H138	4CH-H138	2
139	Slotted pipe plug, 3/8"	3CH-H139	4CH-H139	1
140	Socket cap screw, 1/2 x 2-1/4"	3CH-H140	4CH-H140	2
141	Drive bracket cover (Vert mach)	3CH-H141	4CH-H141	1
142	Hyatt brg, 93316	3CH-H142	4CH-H142	1
143	Feed drive bevel gear shaft	3CH-H143	4CH-H143	1
144	Vert hd gear assy	3CH-H144	4CH-H144	1
145	New Departure brg, 20203	3CH-H145	4CH-H145	1
146	Fitting washer	3CH-H146	4CH-H146	1
147	Feed and rapid traverse drive bracket (Vert mach)	3CH-H147	4CH-H147	1
148	Drive shaft pinion brg	3CH-H148	4CH-H148	1
149	Drive shaft pinion	3CH-H149	4CH-H149	1
150	Gurney brg, 106N	3CH-H150	4CH-H150	1
151	Drive shaft pinion brg washer	3CH-H151	4CH-H151	1
152	Fil hd screw, 1/4-20 x 11/16"	3CH-H152		3
152	Fil hd screw, 1/4-20 x 5/8"		4CH-H152	3
153	Outer telescopic tube and flange	3CH-H153	4CH-H153	1
154	Timken brg, 1932-1985	3CH-H154	4CH-H154	2
155	Brg carrier	3CH-H155	4CH-H155	1
156	Oil wicking	3CH-H156	4CH-H156	1
157	Fil hd screw, 5/16-18 x 1"	3CH-H157	4CH-H157	*4
158	Vert feed shaft brg washer	3CH-H158	4CH-H158	1
159	Snap ring	3CH-H159	4CH-H159	1
160	Vert hd feed bevel gear shaft	3CH-H160	4CH-H160	1

†Two used on 4CH machines

\*Three used on 4CH machines

◊Five used on 4CH machines