

OPERATION MANUAL & PARTS LIST

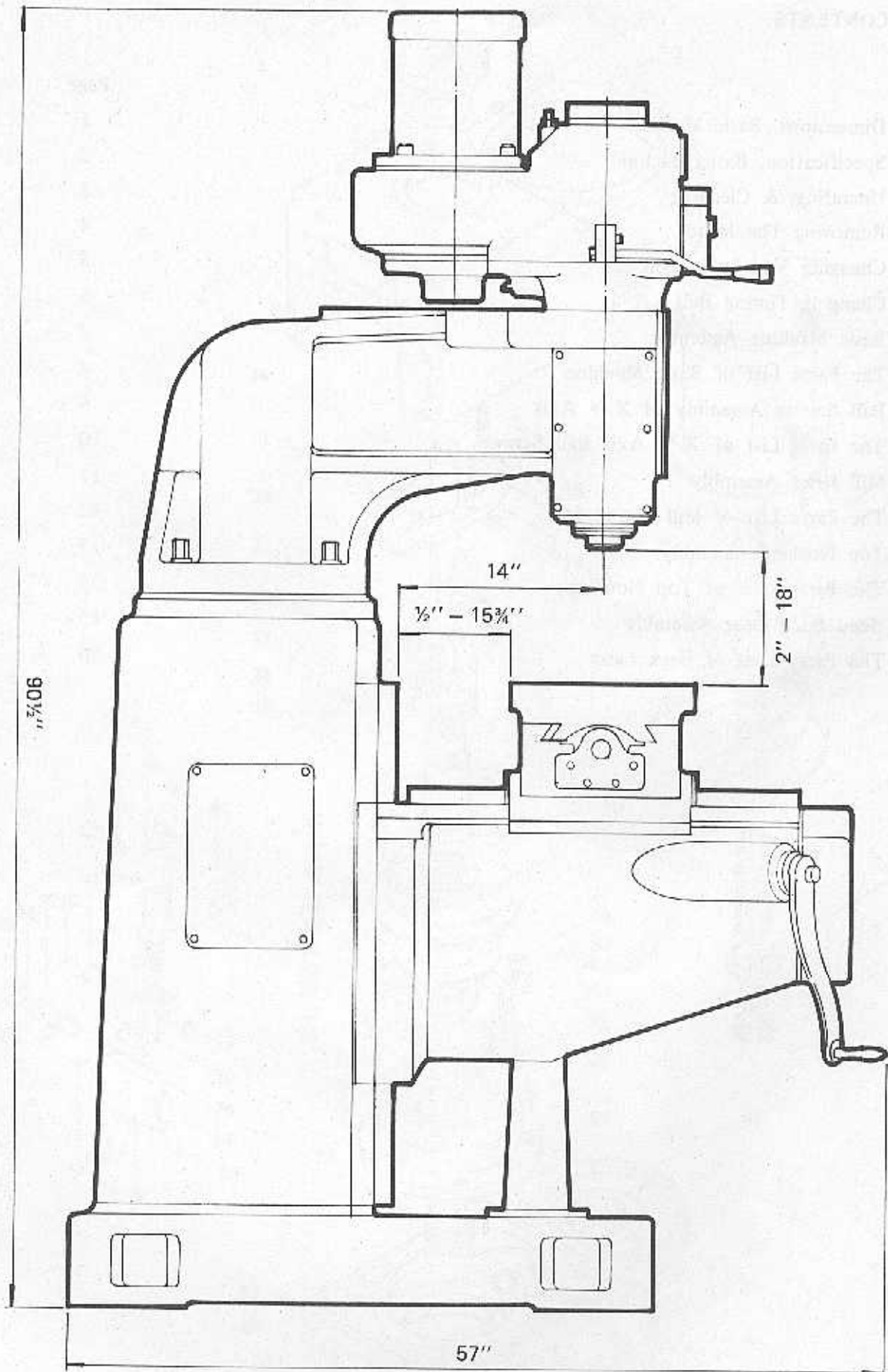
5BVK

CNC MILL FRAME



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BASIC DIMENSIONS
 Fig. 1

BASIC MACHINE SPECIFICATIONS

Spindle I.S.O. #40

Main Driving Motor 5 HP

Table

Overall Size 13" x 42" (330mm x 1067mm)

T-Slots 3" x 5/8" (16mm)

T-Slots Distance 3 1/4" (82.5mm)

Height Above Floor Max. 48" (1220mm)

Travels (Without CNC Control)

Table (X) 31 1/4" (794mm)

Saddle (Y) 15 1/4" (387mm)

Quill (Z) 6 1/4" (158mm)

Knee Manual 16" (406mm)

Spindle to Column 14" (356mm)

Spindle to Table 2" - 18" (50mm - 457mm)

Max. Weight of Workpiece 800 lbs. (362kg)

Space and Weight

Floor Area 57" x 105" (1448mm x 2667mm)

Height (From Floor to Motor) 90 1/2" (2298mm)

Height (From Floor to Power Draw Bar) 92 1/2" (2350mm)

Net Weight 4000 lbs. (1800kg)

Shipping Weight 4500 lbs. (2050kg)

Power

Electrical Supply - 50Hz/60Hz 3 Phase 220 - 575V (as specified on order)

Color

Standard Machine Tools Gray

UNCRATING:

Carefully remove protective crating so machine and parts are not marred or damaged. In the event of damage in transit, **IMMEDIATELY** notify the distributor from whom the machine was purchased, as well as the transportation company making delivery.

CLEANING:

Thoroughly clean protective coating from machine with suitable cleaning solution.

WARNING

IT IS NOT RECOMMENDED THAT GASOLINE OR ANY OTHER HIGHLY INFLAMMABLE CLEANING AGENT BE USED.

Do not move the table, knee, saddle or ram until all ways have been well cleaned and lubricated. Then, by hand, move table, saddle, and knee to limit stop in one direction. Clean and lubricate exposed ways and then move each unit to the opposite limit stop and similarly clean and lubricate the exposed ways.

CONNECTING POWER SUPPLY:

Have a qualified electrician connect the power as follows:

1. Check motor wiring to ensure it is compatible with power supply.
2. Connect wiring to power supply making sure connection complies to all local electrical code.
3. Check spindle rotation. In the HIGH SPEED range, the spindle should rotate clockwise when viewed from the top of the machine.

REMOVING THE MOTOR (See Fig. 2):

Run the head to the lowest speed of either range and shut off the motor. This puts the Vari-Drive belt in the best position for disassembly.

1. DISCONNECT THE POWER and then remove the switch from the side of the belt housing.
2. Remove the cover (#54, page 15) (B. Figure 2) at the lower end of the motor shaft. Use two cover screws (#55, page 15) (A) to fasten the spring (#44, page 15) (C) on the lower end of the motor shaft, to the lower motor vari-drive pulley (#43, page 15). This will reduce the hazard of personal injury that is always present when a heavy spring is under compression. When the pulley, spring retainer (#45, page 15) and spring are securely fastened as a single unit crank the speed change handwheel (#21, Figure 8.) to top speed position.
3. Now remove the screws (#9, page 15) (D) that fasten the motor to the belt housing. The motor should be lifted slightly and pulled firmly away from the spindle and toward the rear of the belt housing. This will pull the vari-drive belt (#27, page 15) deeply into the spindle pulley (#25, page 15) providing the slack needed to slip the belt over the motor pulley (#43, page 15).
4. Now lift the motor high enough to rest the motor base GENTLY on the adjusting screw (#16, page 15) (E) seen directly in front of the motor flange. The belt can now be slipped over the lower pulley and the motor removed from the housing.

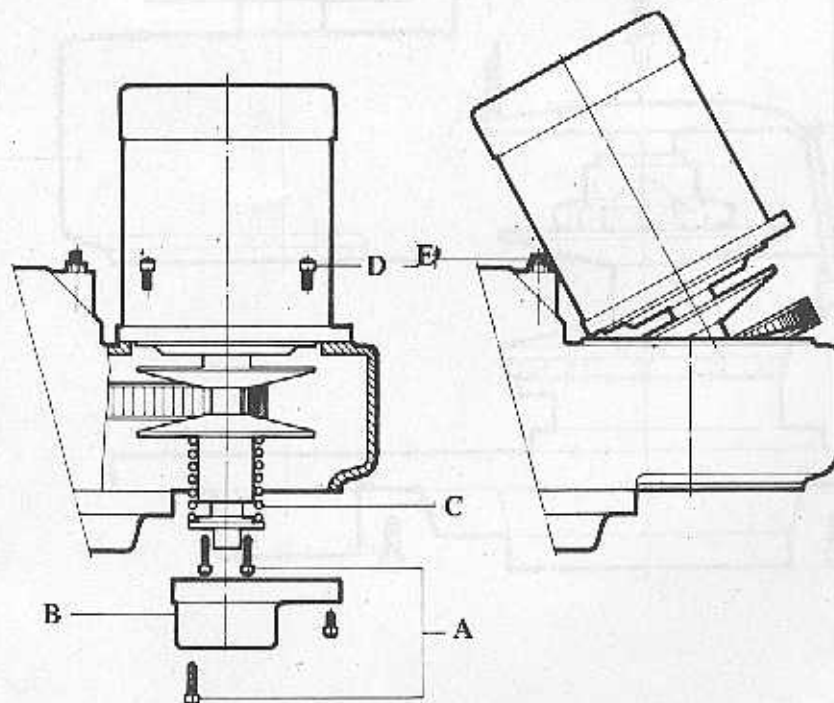


Fig. 2

CHANGING VARI-DRIVE BELT (Figure 3)

Complete the previous procedures for removing the motor, then remove the three screws (#1, page 15) (A, Fig. 3) and lift out the top bearing cap (#13, page 13) (B). Looking down inside of the housing, locate and remove two socket head cap screws (#17, page 15) and sleeves (#19, page 15) (C). Next, remove the six screws (#64, page 15) (D), then holding the belt housing (E) to the base (#63, page 15).

Remove the old belt (#27, page 15) and replace it with a new belt. Do not use a substitute belt purchased from other than Bando Variable Belt 975 vs. Vibration and heat could result from the use of the wrong belt.

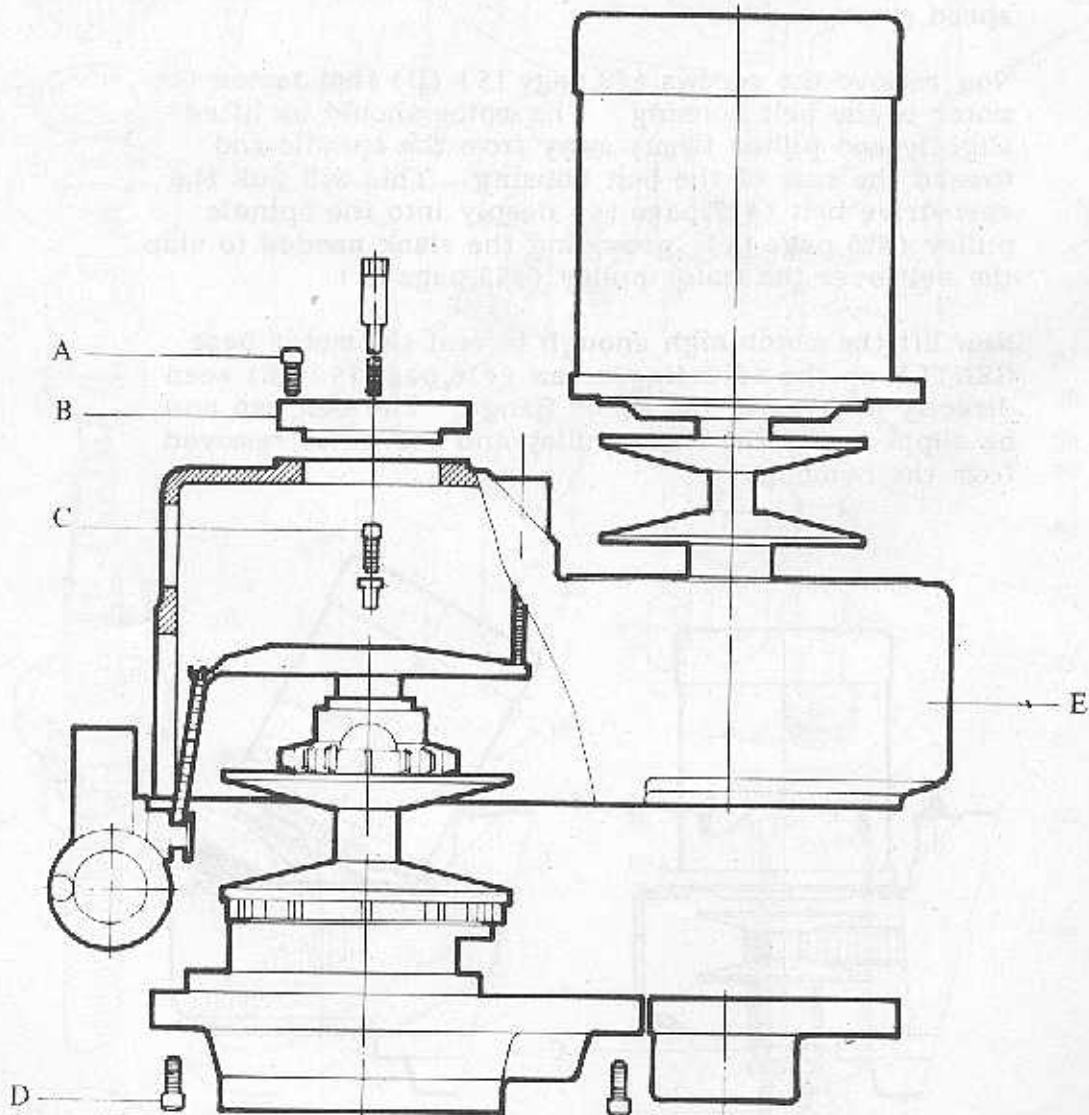


Fig. 3

CHANGING TIMING BELT (Figure 4)

Complete the operation for removing the motor. Then put the Hi-Neutral-Lo level (#70, Figure 8) in the Lo position, remove the drawbar (#14, page 15) (A, Figure 4) and lower the spindle.

Remove screws (#55, page 15) (B) holding the upper and lower housings (#63, page 15) together. As the housings (C) are being separated, the ITD belt (D) (#36, page 13) still connects them, resisting the separating movement. The separation can be assisted by gently pushing the belt off the large pulley (#86, page 13) as the upper housing is being raised.

Remove the old belt and replace with a new belt.

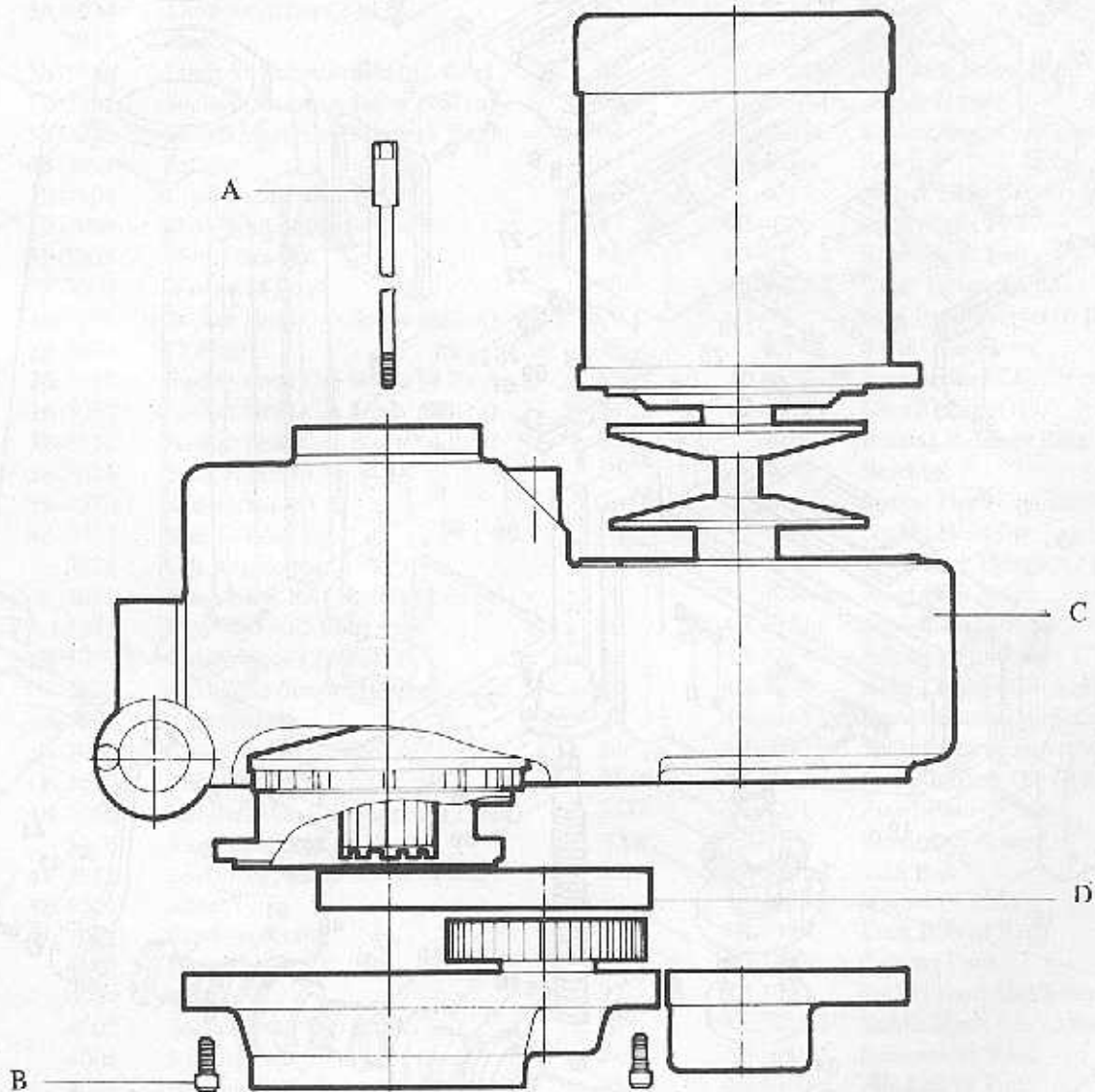


Fig. 4

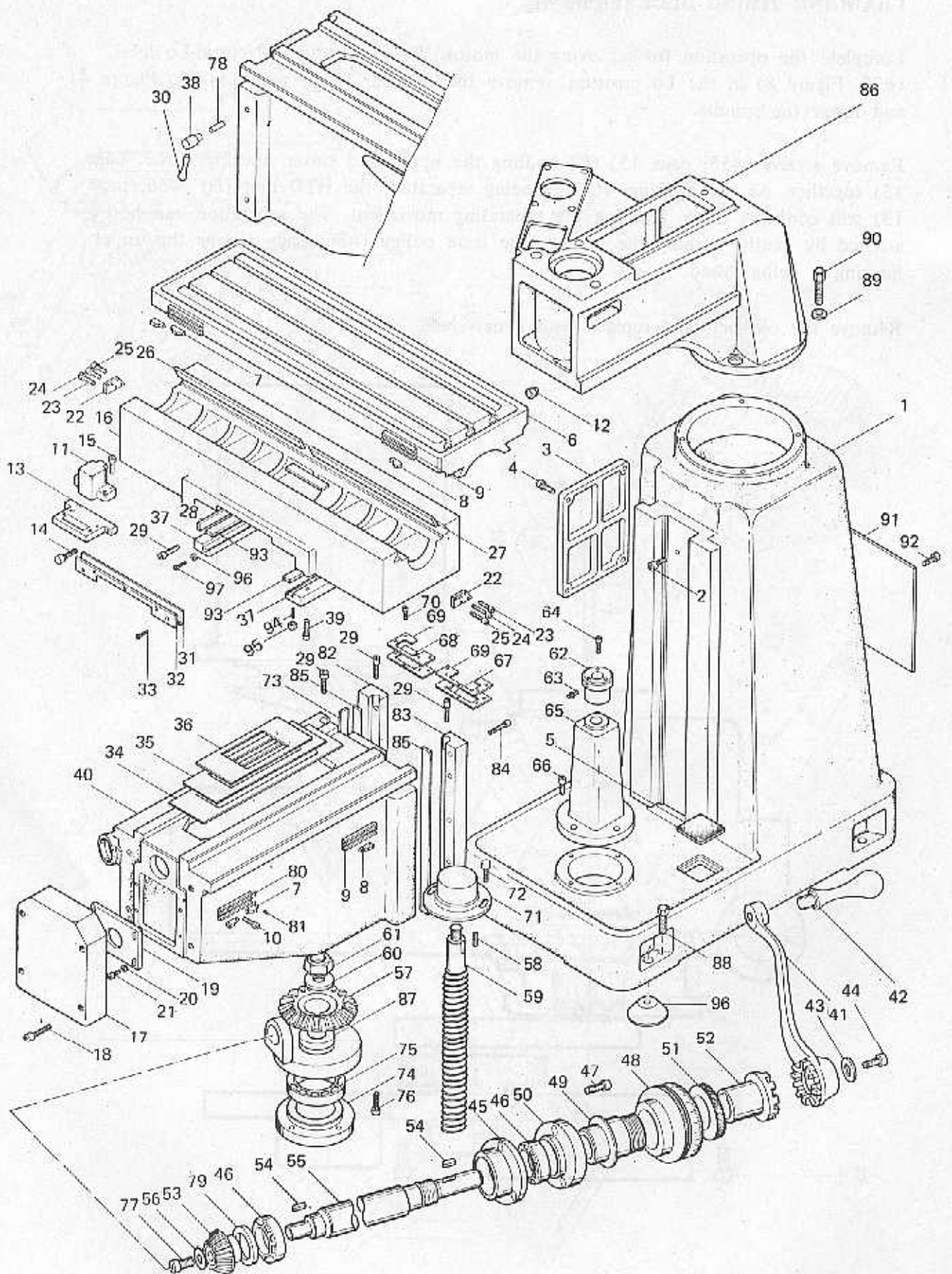


Fig. 5

5 BVK BASIC MACHINE

ITEM NO.	PARTS NO.	DESCRIPTION	ITEM NO.	PARTS NO.	DESCRIPTION
1	4H-1001	Column	50	2011	Bearing Retaining Ring
2	4H-1001-1	Stop Screw	51	2016	Dial Lock Nut
3	H-1002	Column Cover	52	4013	Gearshaft Clutch Insert
4	H-1003	Socket Head Cap Screw (4 Req)	53	4014	Bevel Pinion
5	4H-1004	Filter (2 Req)	54	4015	Key (2 Req)
6	3B-2001	Table 13" x 42"	55	4H-4017	Elevating Shaft
7	4B-2029	Home Dog (2 Req)	56	4017-1	Washer
8	4B-2030	Limit Dog (4 Req)	57	4019	Bevel Gear
9	4B-2031	Limit Dog Bracket (4 Req)	58	4020	Key
10	4B-2033	Socket Head Cap Screw (8 Req)	59	4H-4021	Elevating Screw Assembly
11	3A-2034	Limit Switches (2 Req)	60	4019-1	Washer
12	2035	Plug	61	4023	Jam Nut
13	3B-2036	Limit Switches Bracket (2 Req)	62	4024	Elevating Screw Nut
14	3B-2037	Socket Head Cap Screw (4 Req)	63	4024-1	Grease Nipple
15	3A-2038	Socket Head Cap Screw (8 Req)	64	4025	Socket Head Cap Screw (3 Req)
16	4B-3001	Saddle	65	4H-4026	Pedestal
17	3B-3004	Cross Feed Pulley Cover	66	4027	Socket Head Cap Screw (4 Req)
18	3B-3004-1	Oval Head Screw (4 Req)	67	4H-4028	Knee Wiper Felt
19	3B-3006	Motor Bracket	68	4H-4028-1	Knee Wiper Felt
20	3B-3007	Washer (4 Req)	69	4H-4028-2	Wiper Holder (2 Req)
21	3B-3008	Socket Head Cap Screw (4 Req)	70	4H-4029	Oval Head Screw (10 Req)
22	3B-3009	(2 Req)	71	4034	Bevel Gear Cover
23	3B-3010	Socket Head Cap Screw (4 Req)	72	4036	Socket Head Cap Screw (2 Req)
24	3B-3011	Socket Head Cap Screw (2 Req)	73	4H-4038	Knee/Column Gib
25	3B-3012	Socket Head Cap Screw (4 Req)	74	4039	Bearing Retainer Ring
26	3B-3026	Saddle/Table Gib	75	4040	Bearing
27	3B-3026-1	Saddle/Table Gib	76	4041	Socket Head Cap Screw (3 Req)
28	4B-3027	Saddle/Knee Gib	77	4042	Socket Head Cap Screw
29	3028	Gib Adj. Screw (8 Req)	78	4H-4043	Knee Lock Plunger (2 Req)
30	3031	Knee Lock Bolt Handle (2 Req)	79	4014-1	Bevel Gear Spacer
31	4,1-3037	Felt Wipers (2 Req)	80	4B-2029-1	Steel Ball (24 Req)
32	4H-3037-1	Saddle Knee (2 Req)	81	4B-2029-2	Setscrew (12 Req)
33	3038	Oval Head Screw (10 Req)	82	4H-4050	Knee/Column Gib Support
34	4H-3039	Chip Guards	83	4H-4051	Knee/Column Gib Support
35	H-3039-1	Chip Guards	84	4H-4052	Socket Head Cap Screw (8 Req)
36	H-3040	Chip Guards	85	4H-4053	Knee/Column Gib (2 Req)
37	4B-3050	Saddle/Table Gib Support (2 Req)	86	5B-6001	Fixed Ram
38	3030	Knee Lock Bolt (2 Req)	87	4022	Bevel Gear Spacer
39	4B-3052	Socket Head Cap Screw (8 Req)	88	4H-1001-2	Jack Bolt
40	4H-4001	Knee	89	5B-5003	Washer (4 Req)
41	4002	Elevating Crank	90	5B-5004	Lock Bolt (4 Req)
42	4003	Handle	91	4H-1002	Column Cover
43	4004	Washer	92	4H-1003	Socket Head Cap Screw (4 Req)
44	4005	Socket Head Cap Screw	93	4B-3027-1	Saddle/Knee Gib (2 Req)
45	4006	Bearing Cap	94	4H-3050-1	Setscrew (8 Req)
46	4007	Bearing (2 Req)	95	4H-3050-2	Jam Nut (8 Req)
47	4009	Socket Head Cap Screw (3 Req)	96	4H-3050-3	Washer (4 Req)
48	4010	Dial with 100 Graduation	97	4H-3050-4	Socket Cap Screw (4 Req)
49	4011	Dial Holder			

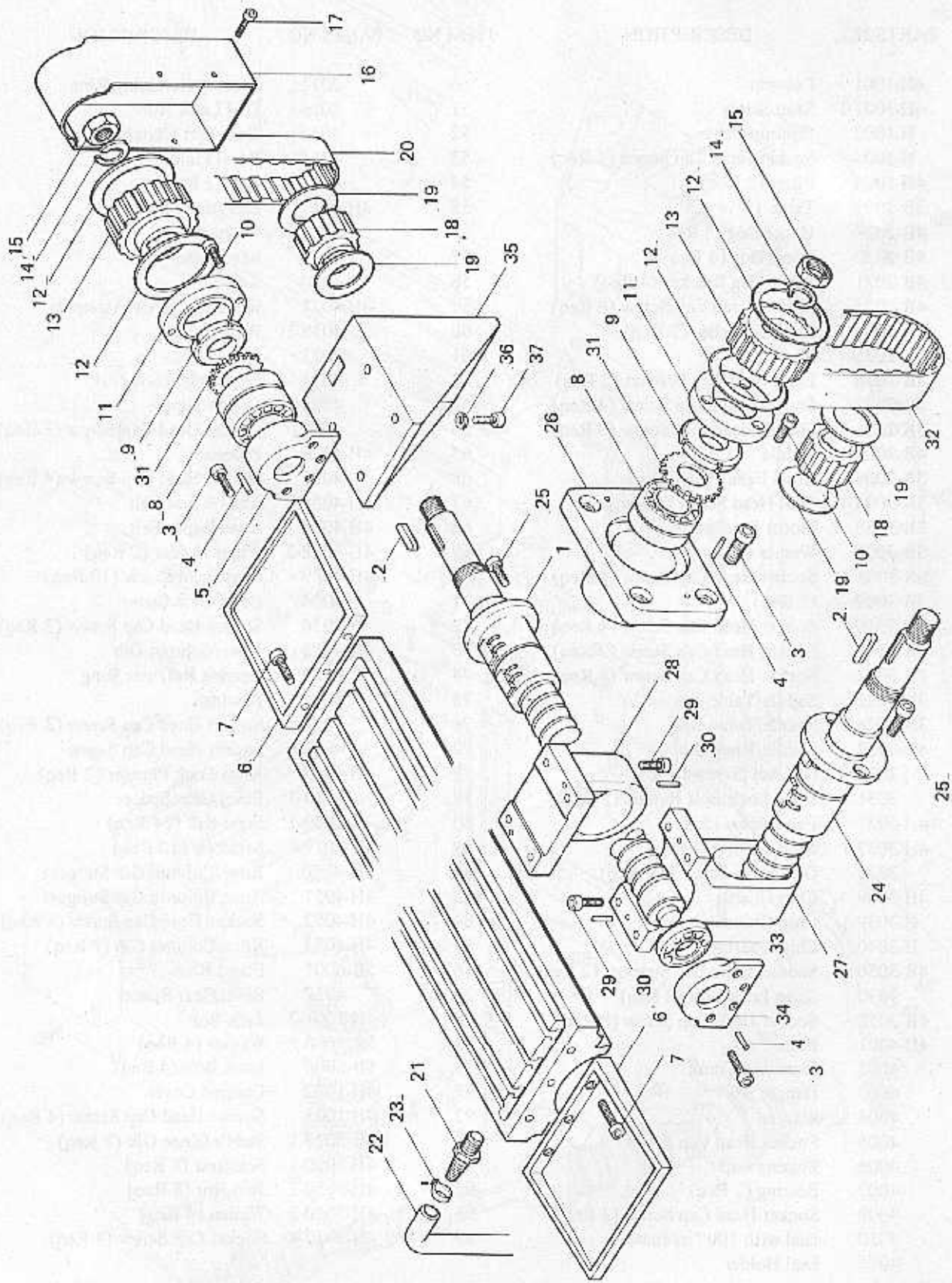


Fig. 6

5 BVK BALL SCREW ASSEMBLY

ITEM NO.	PARTS NO.	DESCRIPTION	ITEM NO.	PARTS NO.	DESCRIPTION
1	5B-2002	Longitudinal Feed Ball Screw	20	3B-2020	Timing Belt
2	3A-2003	Key (2 Req)	21	3A-2022	Inserting Pipe Joint
3	3A-2004	Socket Cap Screw (12 Req)	22	3A-2023	Net Plastic Pipe
4	3A-2005	Taper Pin (6 Req)	23	3A-2024	Tube Bundle
5	3B-2006	Right Bearing Bracket	24	5B-3002	Cross Feed Ball Screw
6	3B-2007	Table Extensions (2 Req)	25	3A-3003	Socket Cap Screw (6 Req)
7	3B-2007-1	Socket Cap Screw (6 Req)	26	3B-3005	Cross Feed Bearing Bracket
8	3A-2008	Bearing (2 Req)	27	3B-3022	Cross Feed Nut Bracket
9	3B-2009	Locknut (2 Req)	28	3B-3023	Longitudinal Feed Nut Bracket
10	3A-2010	Socket Cap Screw (6 Req)	29	3B-3024	Socket Cap Screw (8 Req)
11	3A-2011	Bearing Retainer Ring (2 Req)	30	3B-3025	Taper Pin (4 Req)
12	3A-2012	Timing Belt Pulley Flange (4 Req)	31	3B-2009-1	Lockwasher (2 Req)
13	3A-2013	Timing Belt Pulley (2 Req)	32	3B-2020-1	Timing Belt
14	3A-2014	Washer (2 Req)	33	3B-2025-1	Bearing
15	3A-2015	Jam Nut (2 Req)	34	3B-2025	Left Bearing Bracket
16	3B-2016	Longitudinal Feed Pulley Cover	35	3B-2006-1	X Axis Motor Bracket
17	3B-2017	RD. HD. Screws (4 Req)	36	3B-2006-2	Washer (4 Req)
18	3A-2018	Timing Belt Pulley (2 Req)	37	3B-2006-3	Socket Cap Screw (4 Req)
19	3A-2019	Timing Belt Pulley Flange (4 Req)			

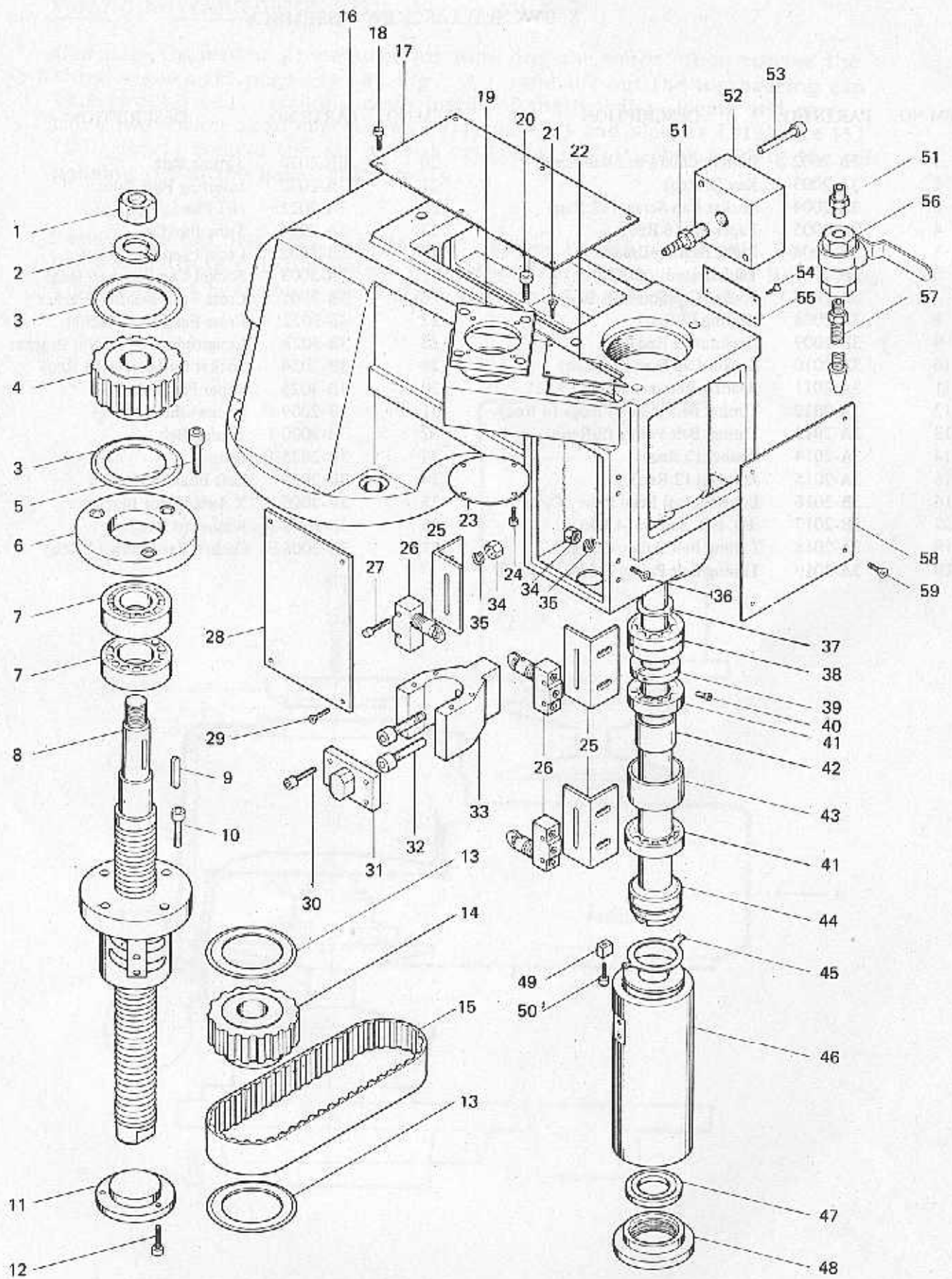


Fig. 7

5 BVK QUILL HOUSING & HEAD

ITEM NO.	PARTS NO.	DESCRIPTION	ITEM NO.	PARTS NO.	DESCRIPTION
1	3A-6015	Jam Nut	31	5B-6034	Limit Dog
2	3A-6016	Washer	32	5B-6033	Socket Cap Screw (2 Req)
3	3A-2012	Pulley Flange (2 Req)	33	5B-6032	Z Axis Not Bracket
4	3A-6011	Timing Belt Pulley	34	5B-6028	Jam Nut (12 Req)
5	3A-6024	Socket Cap Screw (3 Req)	35	5B-6029	Washer (12 Req)
6	3A-6017	Bearing Retainer Ring	36	5B-6030	Socket Cap Screw (6 Req)
7	3A-6018	Bearing	37	5K-6090	RET. Ring
8	5B-6020	Z Axis Feed Ball Screw	38	5K-6092	Bearing (2 Req)
9	3A-6019	Key	39	5K-6094	Lock Nut
10	5B-6021	Socket Cap Screw (4 Req)	40	5K-6094-1	Socket Cap Screw
11	5B-6023	Ball Screw Cover	41	5K-6093	Bearing (2 Req)
12	5B-6024	Socket Cap Screw (3 Req)	42	5K-6096	Bearing Spacer-Small
13	3A-2012	Pulley Flange (Z Req)	43	5K-6095	Bearing Spacer-Large
14	3A-2013	Timing Belt Pulley	44	5B-6084	Spindle
15	5B-6012	Timing Belt	45	5K-6088	Felt Washer
16	5B-6001	Quill Housing	46	5B-6085	Quill
17	5B-6002	Quill Housing Cover	47	5K-6097	Spindle Dirt Shield
18	5B-6003	Socket Cap Screw (6 Req)	48	5B-6098	Nose-Piece
19	5B-6006	Z Axis Motor Adjustable Bracket	49	5B-6099	Keeper Key (2 Req)
20	5B-6008	Socket Cap Screw (4 Req)	50	5B-6100	Socket Head Cap Screw (2 Req)
21	5B-6004	Timing Belt Pulley Cover	51	3A-6047	Inserting Pipe Joint (2 Req)
22	5B-6005	Socket Cap Screw (3 Req)	52	3A-6045	Water Switch Bracket
23	5B-6007	Timing Belt Pulley Cover	53	3A-6046	Socket Head Cap Screw (2 Req)
24	5B-6009	Socket Cap Screw (4 Req)	54	5B-6011	Socket Cap Screw (4 Req)
25	5B-6026	Limit Switches Adj. Bracket	55	5B-6010	Coler
26	3A-6027	Micro Switch (3 Req)	56	3A-6044	Water Switch
27	5B-6025	Socket Cap Screw (6 Req)	57	3A-6043	Spraying Pipe
28	5B-6040	Z Axis Feed Ball Screw Cover	58	5B-6012	Frontal Cover of Mill Head
29	5B-6041	Socket Cap Screw (6 Req)	59	5B-6013	Socket Cap Screw (4 Req)
30	5B-6036	Socket Cap Screw (4 Req)			

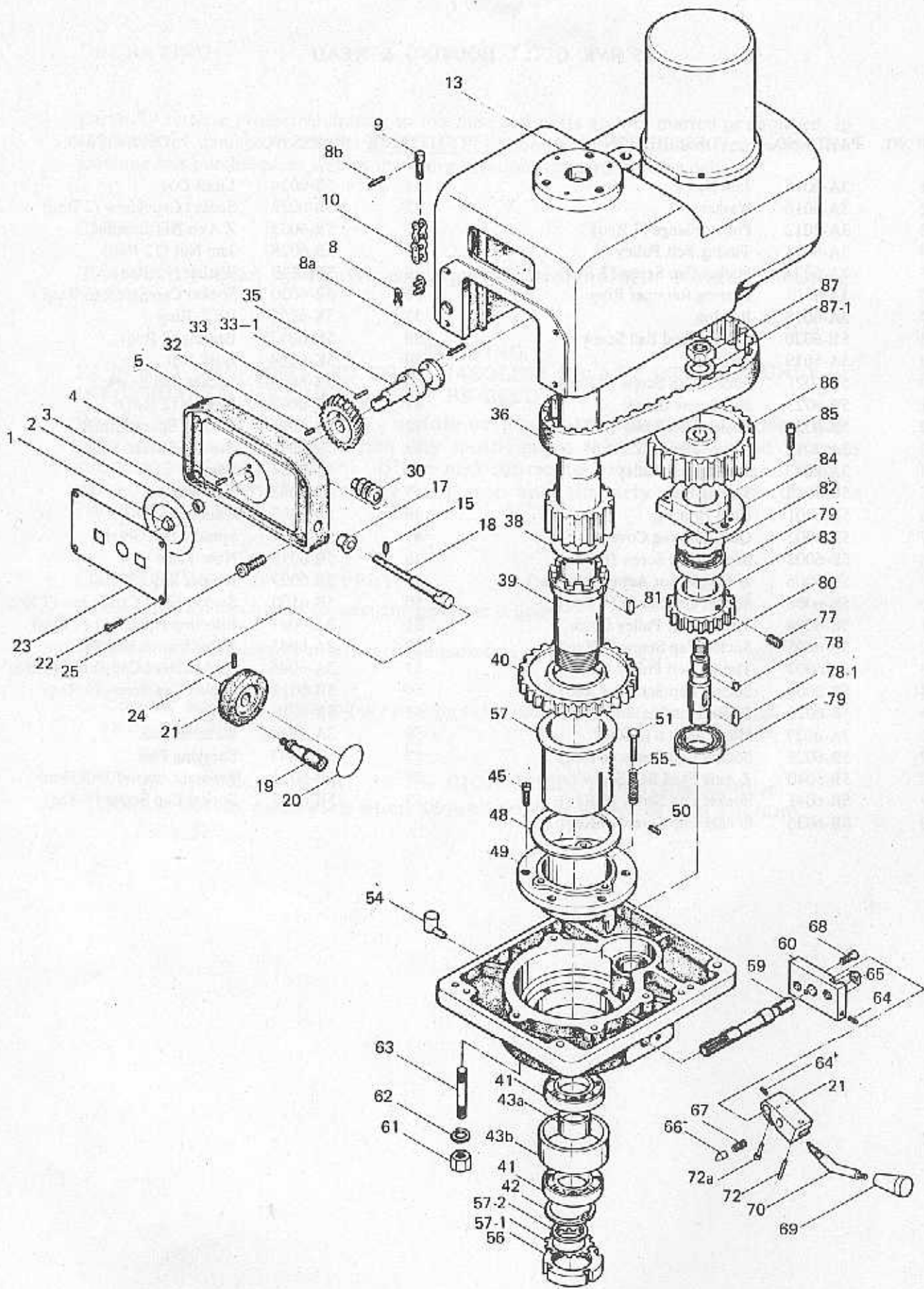


Fig. 8

5 BVK VARI-SPEED HEAD TOP HOUSING

ITEM NO.	PARTS NO.	DESCRIPTION	ITEM NO.	PARTS NO.	DESCRIPTION
1	5K-7001	Hex Cap Nut	51	7055-1	Adjust Pin (3 Req.)
2	5K-7002	Vari-Speed Dial	54	7054	Oil Cup
3	5K-7001-1	Bronze Bearing	55	5K-7055	Compression Spring (3 Req.)
4	5K-7004	Full Dog Socket Set Screw	56	5K-7056	Bearing Locknut
5	5K-7005	Speed Changer Housing	57	5B-7057	Bearing Sleeve
8	7008	Chain Joint	57-1	5K-7057-1	Lock Washer
8a	7008a	Roll Pin	57-2	5K-7057-2	Washer
8b	7008b	Roll Pin	59	5B-7059	Bull Gear Shift Pinion
9	5K-7009	Speed Change Stud	60	5B-7060	Hi-Low Detent Plate
10	7010	Speed Change Chain	61	5K-7061	Hex Nut (3 Req.)
13	5K-7013	Top Bearing Cap	62	5K-7062	Lock Washer (3 Req.)
15	5K-7015	Roll Pin	63	5B-7063	Socket Cap Screw (3 Req.)
17	5K-7017	Bronze Bearing	64	7064	Socket Set Screw (2 Req.)
18	5K-7018	Speed Change Shaft	65	5K-7065	Adjustable Plate
19	5K-7019	Handle	66	5K-7066	Hi-Low Detent Plunger
20	7020	Caution Plate	67	5K-7067	Spring
21	5K-7021	Speed Change Handwheel	68	5K-7068	Socket Cap Screw (2 Req.)
22	7022	Flat HD. Cap Screw (4 Req.)	69	5K-7069	Bakelite Ball Handle
23	5K-7023	Face Plate	70	5K-7070	Hi-Low Shift Crank
24	5K-7024	Set Screw	71	5K-7071	Hi-Low Pinion Block
25	5K-7025	Socket HD Cap Screw (4 Req.)	72	5K-7072	Roll Pin
30	5K-7030	Worm Gear	72a	5K-7072a	Socket Cap Screw (2 Req.)
32	5K-7032	Set Screw (2 Req.)	77	5K-7077	Socket Set Screw
33	5K-7033	Speed Changer Spur Gear	78	5K-7078	Key
35	5K-7035	Speed Change Chain Drum	78-1	5K-7078-1	Key
36	5K-7036	Belt	79	5K-7079	Ball Bearing (2 Req.)
38	5K-7038	Timing Pulley Clutch Sleeve	80	5K-7080	Gear Shaft
39	5B-7039	Spline Gear Hub	81	5K-7081	Key
40	5K-7040	Spindle Bull Gear Assembly	82	5K-7082	Wave Spring Washer
41	5K-7041	Ball Bearing (2 Req.)	83	5K-7083	Bull Gear Pinion
42	5K-7042	Snap Ring	84	5K-7084	Bull Gear Pinion Bearing
43	5B-7043	Ball Gear Bearing Spacer	85	5K-7085	Socket HD Cap Screw (2 Req.)
45	5K-7045	Socket Cap Screw (6 Req.)	86	5K-7086	Timing Belt Pulley
48	5K-7048	Ball Bearing Gear Sleeve Washer	87	5K-7087	Jam Nut
49	5K-7049	Fixed Clutch Bracket	87-1	5K-7087-1	Spring Washer
50	5K-7050	Set Screw			

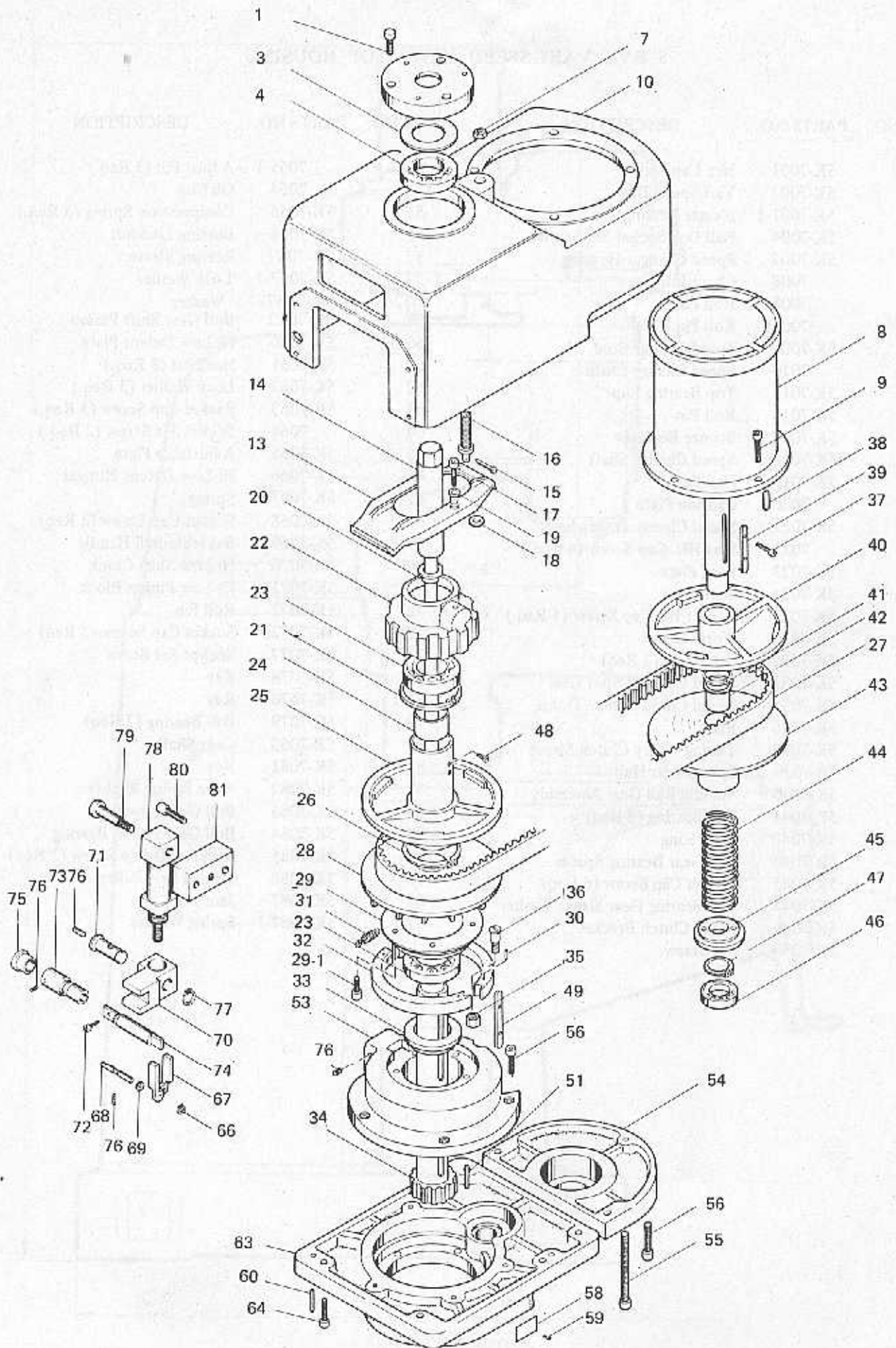


Fig. 9

5 BVK VARI-SPEED HEAD 'BACK GEAR

ITEM NO.	PARTS NO.	DESCRIPTION	ITEM NO.	PARTS NO.	DESCRIPTION
1	5K-8001	Socket Cap Screw	41	5K-8041	RET. Ring
3	5K-8003	Spring Washer	42	5K-8042	Plastic Insert (2 Req)
4	5K-8004	Ball Bearing	43	5K-8043	Adjustable Motor Varidisc Assembly
7	5K-8007	Hex Jam Nut	44	5K-8044	Spring for Varidisc Motor Shaft
8	5K-8008	Motor 5HP	45	5K-8045	Adjustable Varidisc Spring Collar
9	5K-8009	Hex HD Screw (4 Req)	46	5K-8046	Ball Bearing
10	5K-8010	Belt Housing	47	5K-8047	RET. Ring
13	5K-8013	Speed Change Plate	48	5K-8048	Socket Cap Screw (2 Req)
14	5K-8014	Drawbar	49	5K-8049	Key
15	5K-8015	Cotter Pin	51	5K-8051	Key
16	5K-8016	Speed Change Plate Pivot Stud	53	5K-8053	Belt Housing Base
17	5K-8017	Socket HD Screw (2 Req)	54	5K-8054	Motor Pulley Cover
18	5K-8018	Washer	55	5K-8055	Socket Cap Screw (2 Req)
19	5K-8019	Pivot Sleeve (2 Req)	56	5K-8056	Socket Cap Screw
20	5K-8020	Draw Bar Washer	58	5K-8058	Hi-Low Range Nameplate
21	5K-8021	Snap Ring (2 Req)	59	5K-8059	Drive Screw (2 Req)
22	5K-8022	Spindle Pulley Bearing Sliding Housing	60	5K-8060	Taper Pin (2 Req)
23	5K-8023	Ball Bearing (2 Req)	63	5K-8063	Gear Housing
24	5K-8024	Plastic Insert (2 Req)	64	5K-8064	Socket Cap Screw (6 Req)
25	5K-8025	Adjustable-Driven Varidisc	66	5K-8066	Snap Ring
26	5K-8026	Snap Ring No.	67	5K-8067	Brake Finger Pivot Stud (2 Req)
27	5K-8027	Belt	68	5K-8068	Brake Operating Finger
28	5K-8028	Stationary Driven Varidisc	69	5K-8068-1	Washer
29	5K-8029	Brake Bearing Cap	70	3A-5102	Brake Lock Stud
29-1	8029-1	Socket HD Cap Screw (5 Req)	71	3A-5104	Pin
31	5K-8031	Brake Spring (2 Req)	72	5K-8072	Socket Set Screw
32	5K-8032	Brake Shoe Assembly	73	5K-8073	Sleeve for Brake Lock Shaft
33	5K-8033	Spindle Pulley Spacer	74	5K-8074	Brake Lock Shaft
34	5K-8034	Spindle Pulley Hub	75	5K-8075	Rubber Busing
35	5K-8035	Jam Nut	76	5K-8076	Set Screw
36	5K-8036	Brake Shoe Pivot Sleeve	77	5K-8077	R.E.T. Ring
37	5K-8037	Socket Cap Screw (2 Req)	78	3A-5108	Cylinder
38	5K-8038	Drive Key	79	3A-5106	Screw
39	5K-8039	Key	80	5B-5107-1	Socket Cap Screw (2 Req)
40	5K-8040	Stationary Motor Varidisc	81	5B-5107	