

Partner 3-A

Operations Manual

Milltronics Manufacturing Company
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DRIVE BUSS TRANSFORMERS SETTINGS

CUSTOMER INPUT VOLTAGE	TRANSFORMER	PRIMARY INPUT BUSS VOLTAGE	SECONDARY OUTPUT BUSS VOLTAGE
110 VAC	3356 1KVA	H1-H2 110	X1-X2 68 X1-X3 72 X1-X4 79
220 VAC (NOTE NEED TO JUMP H1 TO H3 & H2 TO H4)	3357 1KVA	H1-H2 220	X1-X2 68 X1-X3 72 X1-X4 79
440 VAC (NOTE NEED TO JUMP H2 TO H3 & H1 TO H4)	3357 1KVA	H2-H4 220	X1-X2 68 X1-X3 72 X1-X4 79
208 VAC	3358 1.5KVA	H1-H2 208	X1-X2 110
240 VAC	3358 1.5KVA	H1-H3 240	X1-X2 110
480 VAC	3358 1.5KVA	H1-H4 480	X1-X2 110

SYSTEM 110 TRANSFORMER SETTING

CUSTOMER INPUT VOLTAGE	TRANSFORMER	PRIMARY INPUT BUSS VOLTAGE	SECONDARY OUTPUT BUSS VOLTAGE
208 VAC	3263 .5KVA	H1-H2 208	X1-X2 110
240 VAC	3263 .5KVA	H1-H3 240	X1-X2 110
480 VAC	3263 .5KVA	H1-H4 480	X1-X2 110

MEASURING POWER SUPPLY AND BUSS VOLTAGE USING A DC VOLT METER

- 1) CONNECT COMMON LEAD OF THE DC VOLT METER TO TERMINAL BLOCK BLOCK 22 (DC GROUND) AND THE OTHER LEAD TO TERMINAL BLOCK BEING CHECKED SEE TABLE (1.1)

TABLE 1.1 POWER SUPPLY TERMINAL BLOCK

TERMINAL BLOCK	VOLTAGE
12	24 VDC
23	5.1 VDC
26	14.9 VDC
27	-14.9 VDC

- 2) TO CHECK BUSS VOLTAGE SET DC VOLT METER TO ABOUT THE 200 VOLT RANGE. CONNECT THE COMMON LEAD TO THE NEGATIVE TERMINAL OF THE CAPACITOR ON DRIVE PLATE THE OTHER LEAD TO THE POSITIVE TERMINAL. USE TABLE (1.2) FOR CORRECT BUSS VOLTAGE READINGS.

TABLE 1.2 BUSS VOLTAGE FOR MILLS

MILL	BUSS VOLTAGE
2, 3, 4	95 - 105
5	150 - 160

- 3) TO CORRECT BUSS VOLTAGE MOVE THE SECONDARY TAP TO ADJUST VOLTAGE HIGHER OR LOWER ACCORDING TO DRIVE BUSS TRANSFORMER SETTINGS ON PAGE 1.

UNCRATING:

Carefully remove protective crating so that 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.

SHORTAGES:

Check shipment carefully against the itemized packing list. In case of shortages, report them IMMEDIATELY to the distributor from whom the machine was purchased.

CLEANING:

Thoroughly clean protective coating from the machine with a 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 move table, saddle, and knee to limit stop in one direction. Clean and lubricate the exposed ways and then move each unit to the opposite limit stop and similarly clean and lubricate the exposed ways.

BASIC MACHINE SPECIFICATIONS

Range

Table travel (X axis)	30 in. (762 mm) (42" table)
Saddle travel (Y axis)	13 in. (380 mm)
Quill travel	5 in.
Knee travel (Z axis manual)	14 in.
RAM travel	Rigid
Max. weight of workpiece	600 lbs.

Table

Overall sizes	13 x 42 in. (229 x 1067 mm)
T-Slots	3 on 2-1/2 in. (64 mm) centers
T-Slot size	5/8 in. (16 mm)
Height above floor (max.)	47-1/4 in. (1200 mm)

Milling

Feed rate	0.1 to 200 IPM
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Space and Weight

Floor area	7 x 10 ft. (2.1 x 3.1 m)
Height	82-3/16 in. (2088 mm)
Net weight	3000 lbs.
Shipping weight	3300 lbs.

Power

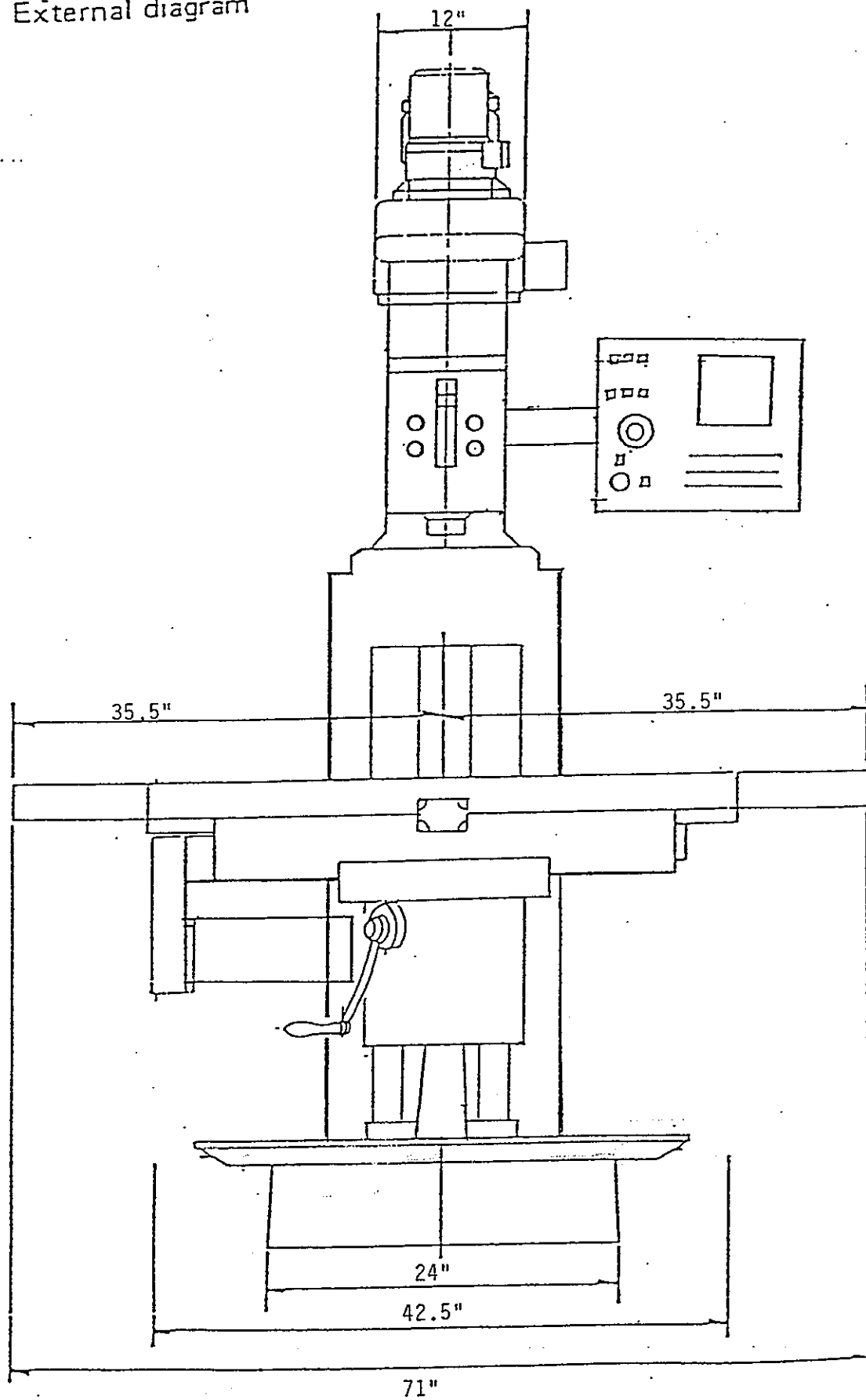
Electrical supply	60 Hz. 3 phase 220/230/440/460 V
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Color

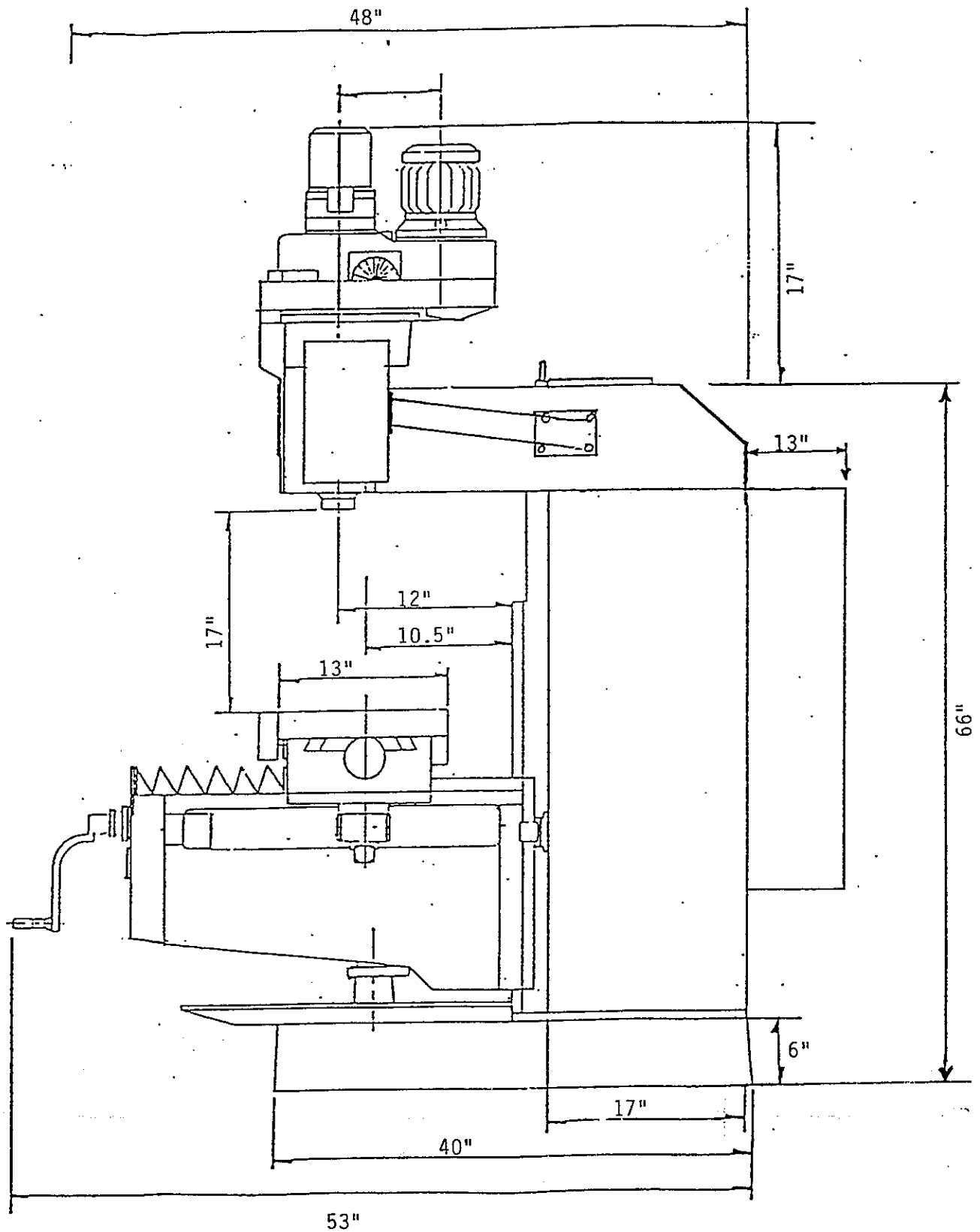
Standard	Light brown
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PARTNER III

External diagram

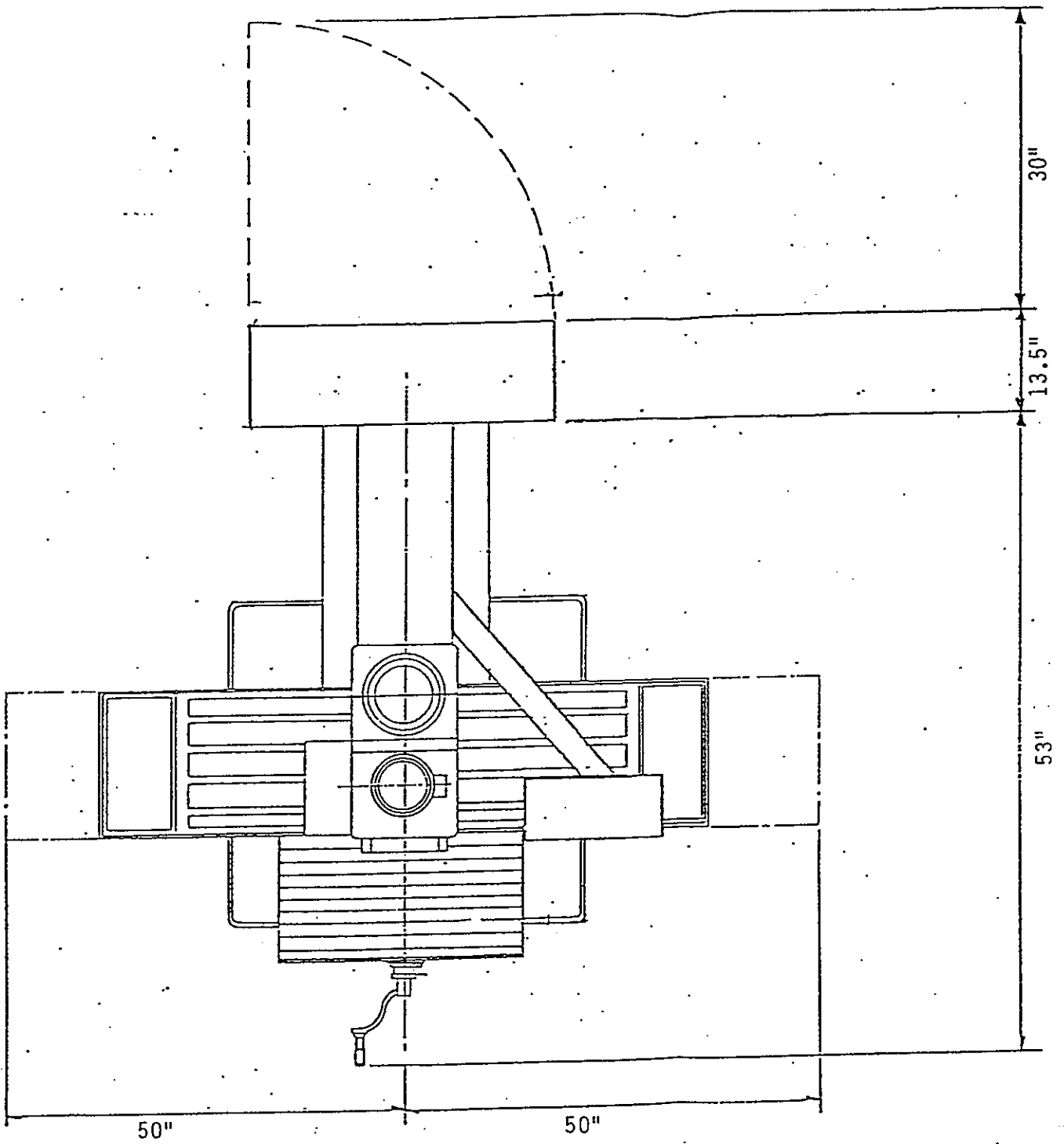


PARTNER III



EXTERNAL DIAGRAM

PARTNER III



LIFTING AND PLACING ON SOLID FOUNDATION

The machine should be lifted by using the I-bolt on top of the machine.

The column and base are a one-piece casting. When setting the machine on a concrete foundation, it is advisable to use a little grout (thin mortar) to take care of any unevenness in the concrete as well as to provide a solid foundation at all points.

When setting the machine on a floor that is uneven, shims should be used to correct this condition. See Figure 1 for installation layout.

NOTE

IT IS RECOMMENDED THAT THE MACHINE BE SECURED TO THE FLOOR TO PREVENT MOVEMENT OR TIPPING DUE TO OFF-CENTER LOADING.

Before securing machine to floor (i.e. tightening hold down bolts), make certain all four corners are making contact with the floor or shims, after machine is leveled. If this is not done, it is possible to twist the column and put a bind in the ways.

LEVELING MACHINE:

Set the machine by levelling the work table lengthwise and crosswise with a precision level.

CONNECTING POWER SUPPLY:

To connect the power have a qualified electrician proceed as follows:

1. Check motor wiring to ensure it is compatible with power supply.
2. Connect machine wiring to power supply making sure connection complies to all local electrical codes.
3. Check for correct spindle rotation.

ADJUSTMENT OF KNEE GIB

Remove chip wiper and adjust screw until smooth movement is attained. Replace chip wiper.

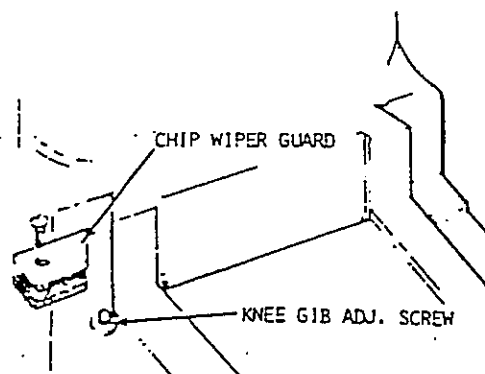


Figure 2. Knee-Column Gib

LUBRICATION

The machine has an automatic lubrication system that oils all necessary parts. The recommended way oil is Mobil VAC-2.

SPINDLE BRAKE

The brake lever can be moved in either direction to stop the spindle. It also will activate automatically when the spindle is turned off. There are no adjustments on the brake, so it must be replaced when worn out.

CAUTION

BE CERTAIN THAT THE SPINDLE BRAKE IS RELEASED BEFORE STARTING THE MOTOR. THIS IS IMPORTANT AS THE MOTOR CAN BE DAMAGED IF THE SWITCH IS TURNED ON WITH THE BRAKE IN THE LOCKED POSITION.

HI-NEUTRAL-LO LEVER

The lever is used to put the head into either direct drive or backgear. Rotate the spindle by hand to facilitate meshing of the clutch or gears.

Neutral can be obtained at mid-way position, and is provided to permit free spindle rotation for indicating and set-up.

In high speed (Direct Drive) the spindle is driven by tapered clutch teeth. If the clutch is not meshed tightly, clutch rattle will be heard. This can be corrected by moving the detent plate upward as the clutch wears. This is also the reason for possible loss of neutral, requiring the reversal of the detent plate.

CAUTION

DO NOT shift Hi-Lo Lever while the motor is running.

RECOMMENDATIONS

Use 2, 3, or 4 flute end mills. Eight flute end mills are usually not as satisfactory for general milling. When using shell mills, face mills, or any other tooling, proper machining practice should be observed.

CAUTION

DO NOT TRY TO CHANGE SPINDLE SPEED ON VARI-DRIVE HEAD UNTIL MOTOR IS RUNNING. THIS COULD CAUSE PARTS BREAKAGE.

Spindle Feeds are adjusted by turning speed change handwheel on the front of the belt housing. There are two ranges shown: 60 to 500, and 500 to 4200.

60 - 500 RPM is obtained through the back-gear drive and is referred to as low range. To engage the back-gears, use the lever marked Hi-Neutral-Lo on the right side of the head. Move this lever to the "LO" position and use low range on the variable speed dial.

When shifting to "LO," DO NOT FORCE THE LEVER if the back gears do not mesh. Hold the lever so that the gears are clear of one another, rotate the spindle nose by hand until the gears line up, and then put the unit in "LO" (back gear).

500 - 4200 RPM is direct drive and is the high range. The same procedure as previously described is used to select this range except the Hi-Neutral lever is set in the Hi position.

Wear on the vari-drive belt will cause a slight change in the speeds to that shown in windows on the dial. This can be corrected as follows. Crank the speed change handwheel snugly against the high speed stop. (This will be near the 4200 reading on the dial.) Use a tachometer to determine the spindle speed, then turn the pivot stud, after loosening the jam nut, until the spindle speed registers 4200 on the tachometer; tighten the jam nut.

Now reposition the speed dial plate to match the tachometer reading. This is done by loosening the Hex nut until the spindle speed registers 4200 on the tachometer; tighten the jam nut.

DO NOT LOOSEN THE 3 HEX NUTS on the upper part of the Quill Housing. These are set at the factory and are used only for alignment.

REMOVING THE MOTOR

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.
2. Remove the cover (B, Figure 3) at the lower end of the motor shaft. Use two cover screws (A) to fasten the spring (C) on the lower end of the motor shaft to the lower motor vari-drive pulley. This will reduce the hazard of personal injury that is always present when a heavy spring is under compression. When the pulley, spring retainer, and spring are securely fastened as a single unit, crank the speed change handwheel to the top speed position.
3. Now remove the screws (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 deeply into the spindle pulley providing the slack needed to slip the belt over the motor pulley.
4. Now lift the motor high enough to rest the motor base GENTLY on the adjusting screw (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.

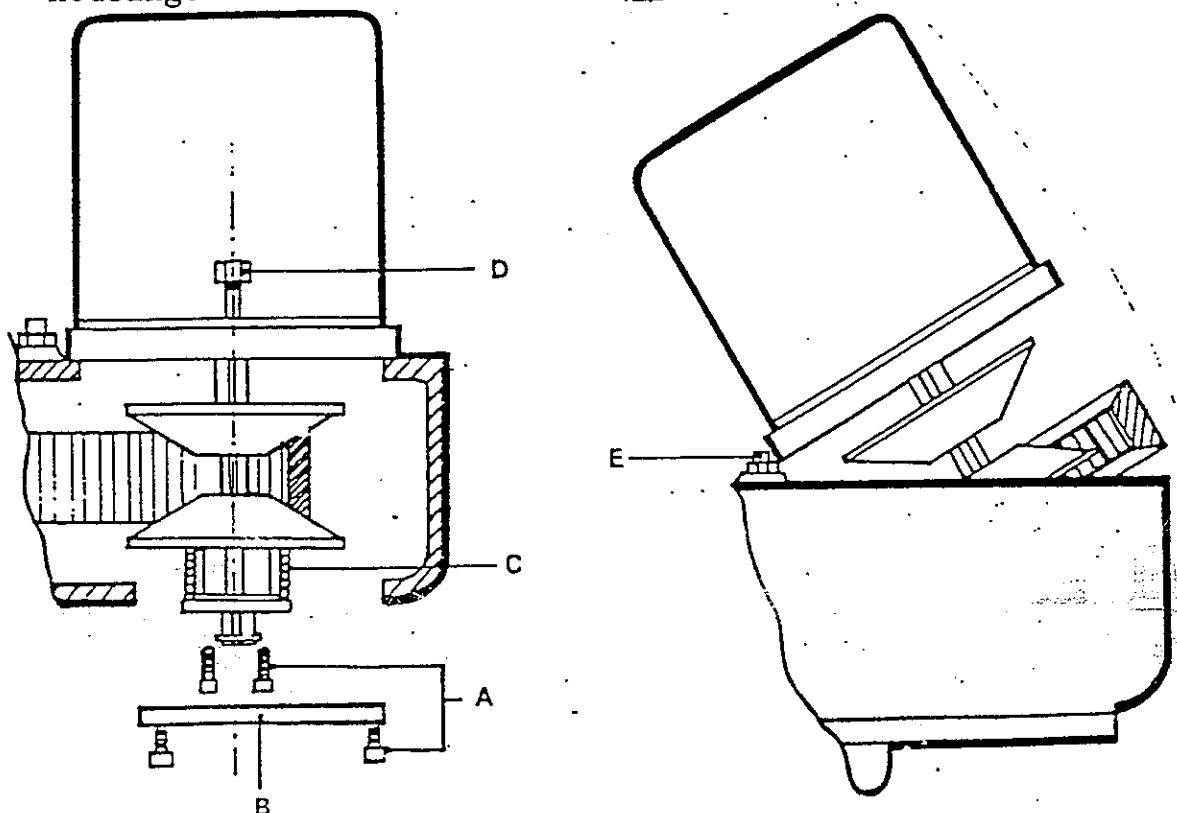


Figure 3. Removing the Motor (Side View)

CHANGING VARI-DRIVE BELT

Complete the previous procedures for removing the motor, then remove the three screws (A, Fig 4) and lift out the top bearing cap (B). Looking down inside of the housing, locate and remove two socket head cap screws and sleeves (C). Next, remove the six screws (D) then holding the belt housing (E) to the base.

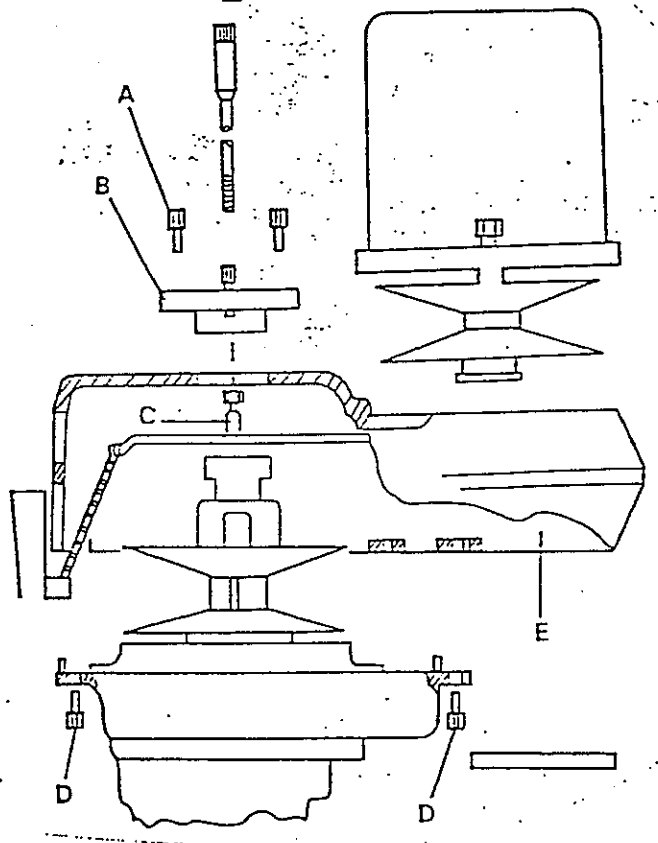


Figure 4. Removing the Vari-Drive Belt

Remove the old belt and replace it with a new belt. Do not use a substitute belt purchased from other than a # 383032B-13 of Bando V/S Belt. Vibration and heat could result from the use of the wrong belt.

CHANGING THE TIMING BELT (Figure 5)

Complete the operation for removing the motor. Then put the Hi-Neutral-Lo lever in the Lo position, remove the drawbar (A, Figure 5), and lower the spindle.

Remove screws (B) holding the upper and lower housing together, including the two lower screws (C) in speed changer bracket just below the speed dial.

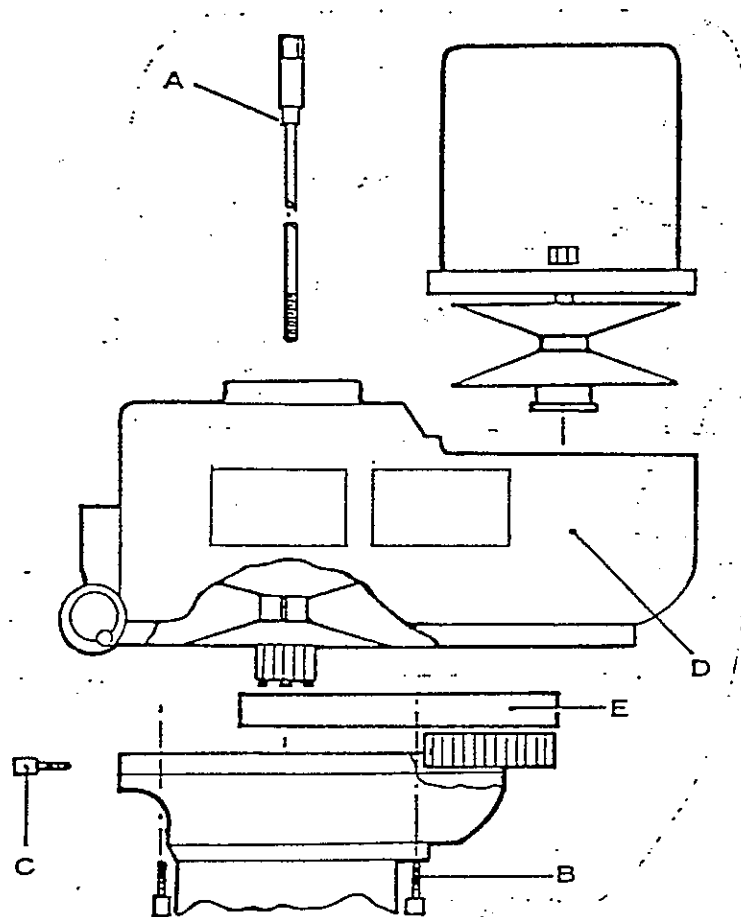


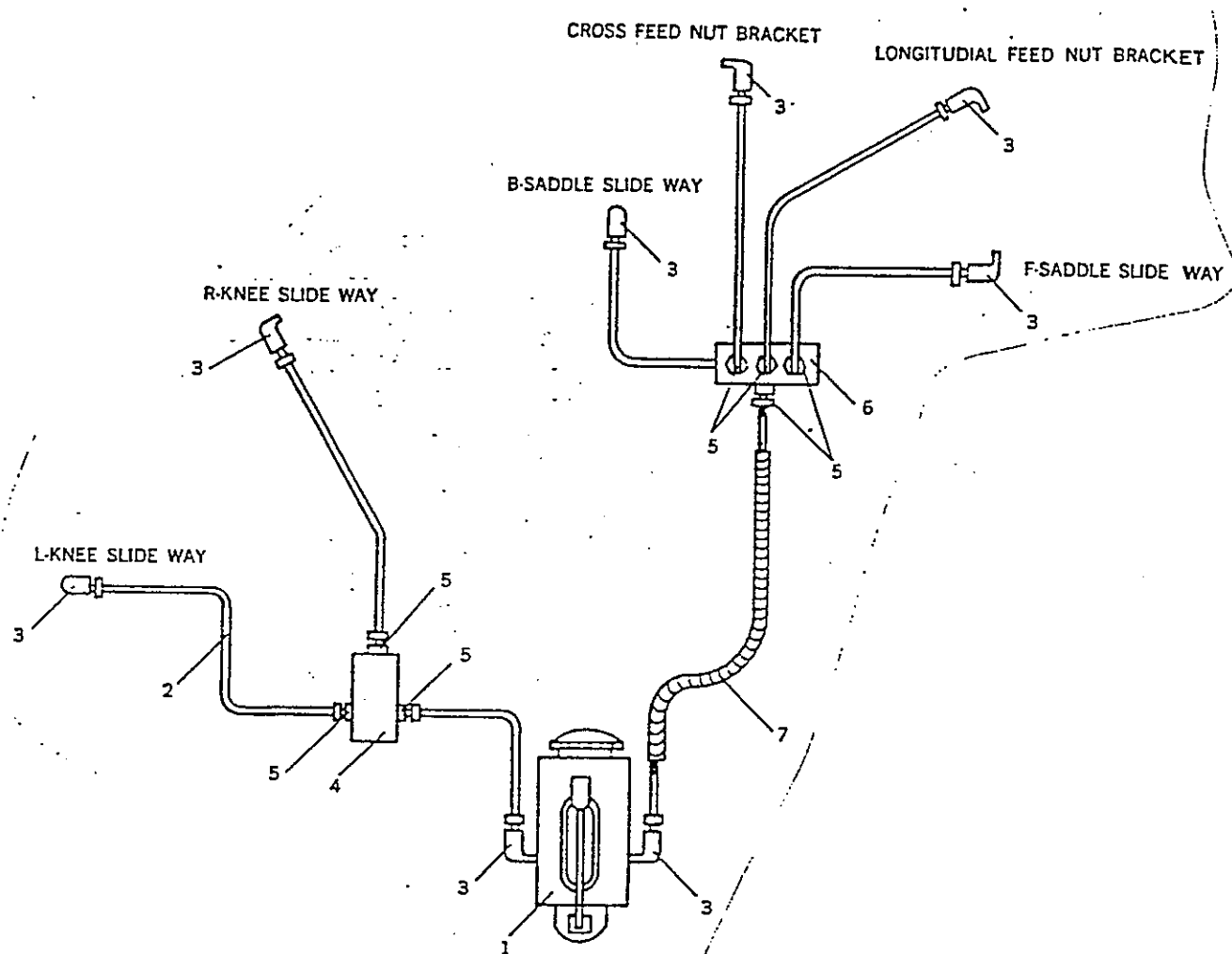
Figure 5. Removing Timing Belt

A slight blow under the speed changer bracket may be needed to separate the upper housing (D) from its base.

As the housings are being separated, the HTD belt (E) still connects them, resisting the separating movement. The separation can be assisted by gently pushing the belt off the large pulley as the upper housing is being raised.

Remove the old belt and replace with a new belt.

CENTRAL LUBRICATING OIL-FEEDING EQUIPMENT



ITEM NO.	PARTS NO.	DESCRIPTION
1	9001	Autolube Pump
2	9002	Aluminum Pipe
3	9003	Elbow Joint (8 Req.)
4	9004	T-Joint
5	9005	Straight Joint (7 Req.)
6	9006	Oil Regulating Distributor
7	9007	Outside Steel Flexible Tube

GENERAL SPEED RECOMMENDATIONS

Material to be Cut	Feet Per Minute		
	Rough Cut	Rough and Finish	Light and Finish Cut
Cast Iron-Soft-(Under 200 Brinnell)	70	80-90	120
Cast Iron-Med.-(200-300 Brinnell)	55	60-70	90
Cast Iron-Hard-(Over 200 Brinnell)	40	50-60	70
Steel (Chrome Nickel 40-45 Shore)	30	40	50
Steel (Stainless)	60	80	90
Steel (Low Carbon)	80	90	140
Steel (High Carbon)	40	50	70
Bronze (Medium)	90	120	150
Bronze (Hard)	65	90	130
Brass (Hard)	100	150	200
Copper	150	200	300
Duraluminum	400	---	600
Aluminum	600	---	1000

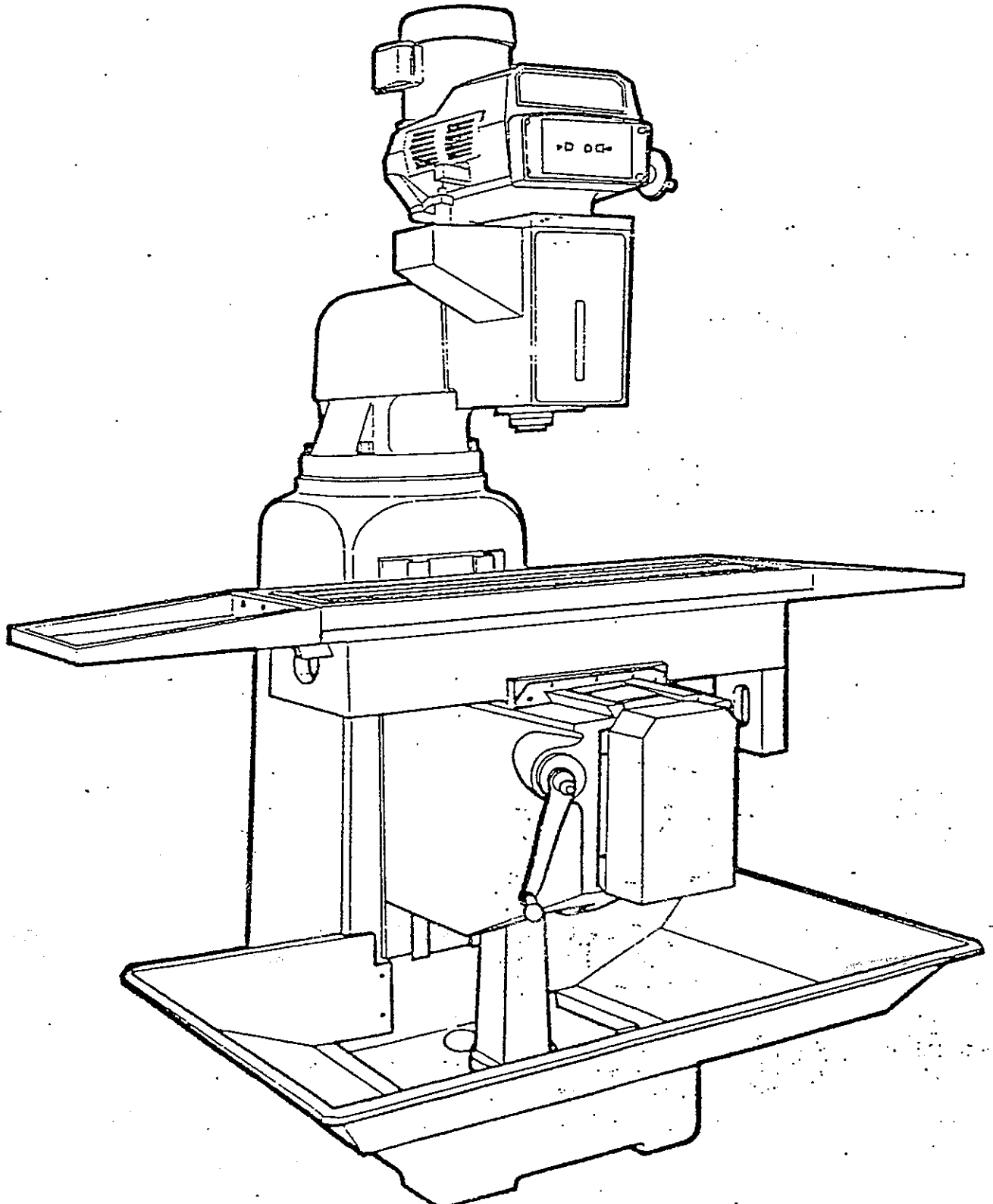
TABLE OF CUTTING SPEEDS AND FEEDS

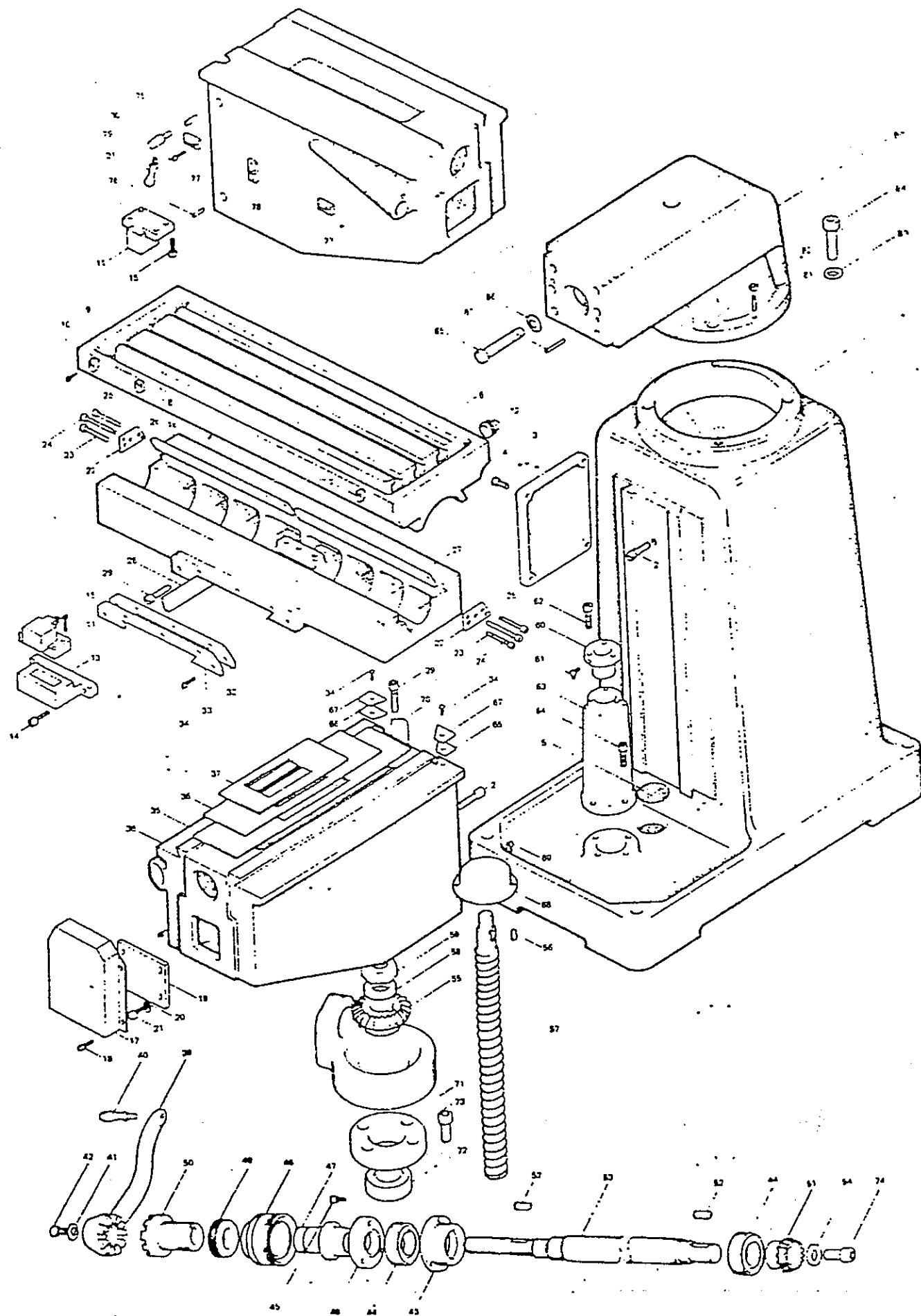
Feet Per Minute	15	20	25	30	40	50	60	70	80	90	100
Diameter, Inches	Revolutions Per Minute										
1/16"	917	1222	1528	1833	2445	3056	3667	4278	4889	5500	6112
1/8"	458	611	764	917	1222	1528	1833	2139	2445	2750	3056
3/16"	306	407	509	611	815	1019	1222	1426	1630	1833	2037
1/4"	229	306	382	458	611	764	917	1070	1375	1375	1528
5/16"	183	244	306	367	489	611	733	856	978	1100	1222
3/8"	153	204	255	306	407	509	611	713	815	917	1019
7/16"	131	175	218	262	349	437	524	611	698	786	873
1/2"	115	153	191	229	306	382	458	535	611	688	764
5/8"	91	122	153	183	244	306	367	428	489	550	611
3/4"	76	102	127	153	204	255	306	357	407	458	509
7/8"	65	87	109	131	175	218	262	306	349	393	437
1"	57	76	95	115	153	191	229	267	306	344	382
1 1/8"	50	67	84	102	136	170	204	238	272	306	340
1 1/4"	45	61	76	91	122	153	183	214	244	275	306
1 3/8"	41	55	69	83	111	139	167	194	222	250	278
1 1/2"	38	50	63	76	102	127	153	178	204	229	255
1 5/8"	35	47	58	70	94	118	141	165	188	212	235
1 3/4"	32	43	54	65	87	109	131	153	175	196	218
1 7/8"	30	40	50	61	81	102	122	143	163	183	204
2"	28	38	47	57	76	95	115	134	153	172	191

Partner III

PARTS LIST

CNC FRAME

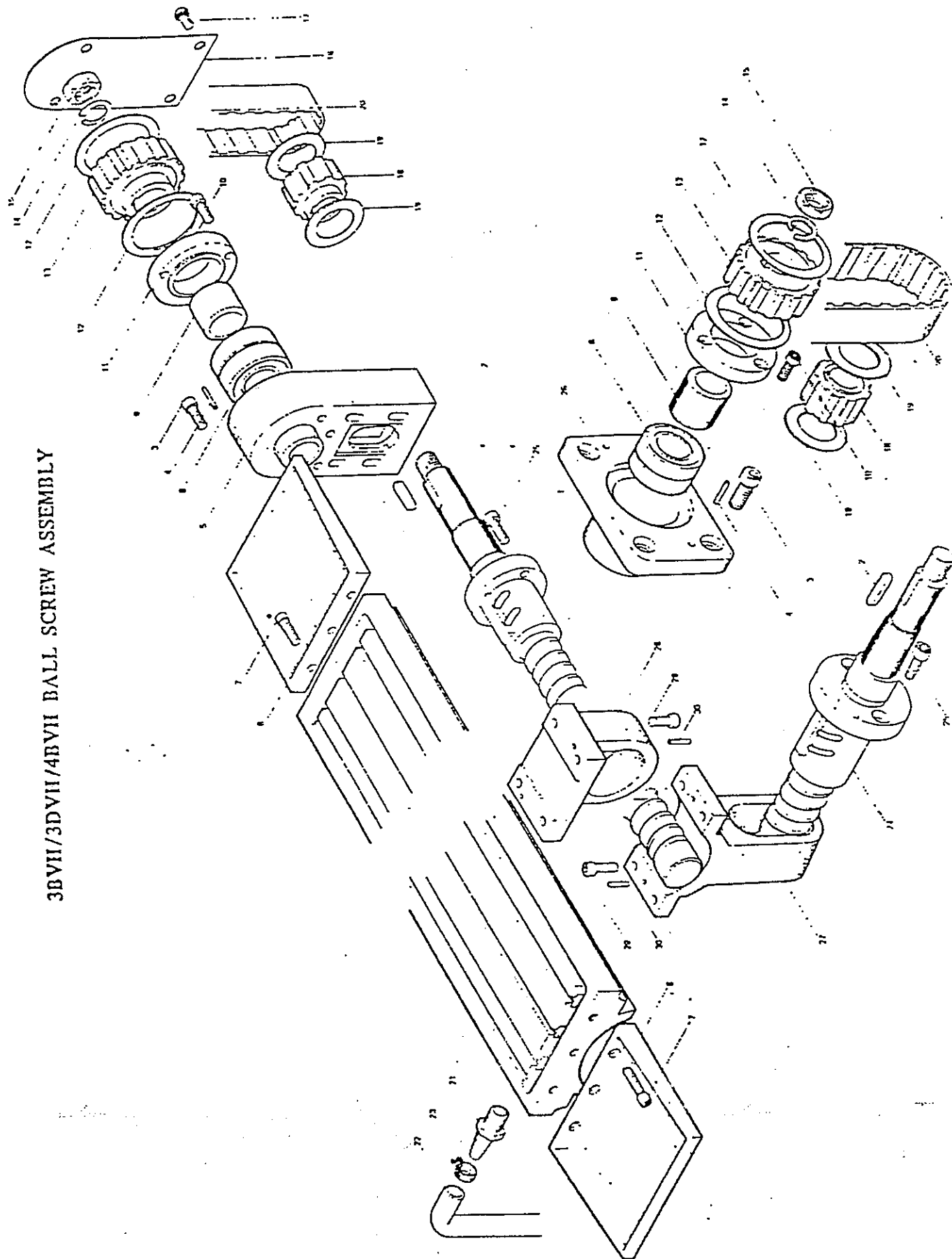




3DVH BASIC MACHINE

ITEM NO.	PARTS NO.	DESCRIPTION	ITEM NO.	PARTS NO.	DESCRIPTION
1	H1001	Column	45	4009	Socket Head Cap Screw (3 Req.)
2	1001-1	Stop Screw (2 Req.)	46	4010	Dial with 100 Graduation
3	H1002	Column Cover	47	4011	Dial Holder
4	H1003	Socket Head Cap Screw (4 Req.)	48	2011	Bearing Retaining Ring
5	H1004	Filter	49	2016	Dial Lock Nut
6	3B-2001	Table 13" x 42"	50	4013	Gearshaft Clutch Insert
7	3B-2029	X Axis Right Limit Dog	51	4014	Bevel Pinion
8	3B-2030	X Axis Home Dog	52	4015	Key (2 Req.)
9	3B-2031	X Axis Left Limit Dog	53	3H-4017	Elevating Shaft
10	3B-2033	Socket Head Cap Screw (6 Req.)	54	4017-1	Washer
11	3A-2034	Limit Switches (2 Req.)	55	4019	Bevel Gear
12	2035	Plug	56	4020	Key
13	3B-2036	Limit Switches Bracket	57	4021	Elevating Screw Assembly
14	3B-2037	Socket Head Cap Screw (4 Req.)	58	4022	Washer
15	3A-2038	Socket Head Cap Screw (8 Req.)	59	4023	Jam Nut
16	3D-3001	Saddle	60	4024	Elevating Screw Nut
17	3B-3004	Cross Feed Pulley Cover	61	4024-1	Grease Nipple
18	3B-3004-1	Oval Head Screw (4 Req.)	62	4025	Socket Head Cap Screw (3 Req.)
19	3B-3006	Motor Bracket	63	H-4026	Pedestal
20	3B-3007	Washer	64	4027	Socket Head Cap Screw (4 Req.)
21	3B-3008	Socket Head Cap Screw (4 Req.)	65	4028	Knee Wiper Felt
22	3B-3009	(2 Req.)	66	4028-1	Knee Wiper Felt
23	3B-3010	Socket Head Cap Screw (4 Req.)	67	4028-2	Wiper Holder (2 Req.)
24	3B-3011	Socket Head Cap Screw (2 Req.)	68	4034	Bevel Gear Cover
25	3B-3012	Socket Head Cap Screw (4 Req.)	69	4036	Socket Head Cap Screw
26	3B-3026	Saddle/Table Gib	70	4038	Knee/Column Gib
27	3B-3026	Saddle/Table Gib	71	4039	Bearing Retainer Ring
28	3B-3027	Saddle/Knee Gib	72	4040	Bearing
29	3028	Gib Adj. Screw (4 Req.)	73	4041	Socket Head Cap Screw (4 Req.)
30	3030	Knee Lock Bolt (2 Req.)	74	4042	Socket Head Cap Screw
31	3031	Knee Lock Bolt Handle (2 Req.)	75	4043	Knee Lock Plunger
32	3H-3037	Felt Wipers (2 Req.)	76	4044	Knee Lock Plunger
33	3H-3037-1	Saddle Knee Wipers Plate (2 Req.)	77	3A-4045	Y Axis Limit Dog (2 Req.)
34	3038	Oval Head Screw (12 Req.)	78	3A-4046	Y Axis Home Dog
35	H3039	Chip Guards	79	3A-4047	Socket Head Cap Screw (6 Req.)
36	H3039-1	Chip Guards	80	3A-5001	Fixed Ram
37	H3040	Chip Guards	81	3A-5002	Taper Pin (2 Req.)
38	3H-4001	Knee 12"	82	3A-5002-1	Jam Nut (2 Req.)
39	4002	Elevating	83	3A-5003	Washer (4 Req.)
40	4003	Handle	84	3A-5004	Lock Bolt (4 Req.)
41	4004	Washer	85	3A-5036	Socket Head Cap Screw (4 Req.)
42	4005	Socket Head Cap Screw	86	3A-5037	Washer
43	4006	Bearing Cap	87	3A-5038	Taper Pin (2 Req.)
44	4007	Bearing (2 Req.)			

3BVII/3DVII/4BVII BALL SCREW ASSEMBLY

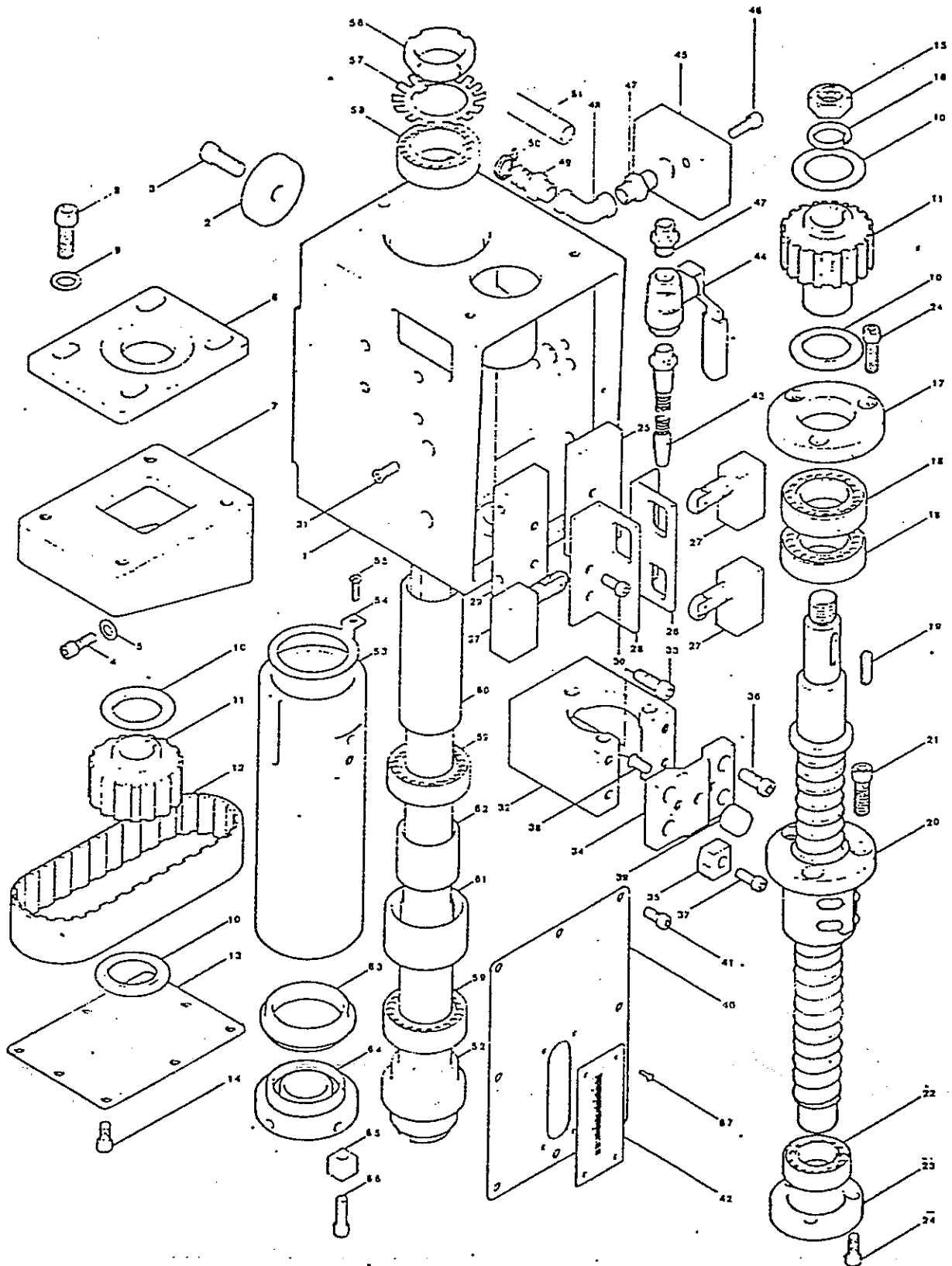


3BVH 3DVH 4BVH BALL SCREW ASSEMBLY

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

Upper Radial bearing(6007)BG-03
Front sliding pulley/ Front main pulley bearing(6010) BG-11
Back gear bearing (6203) BG-13 x 2
Spindle thrust (Fafnir JM207K) BG-15
Spindle Radial (6206) BG-14
Thrust (all axis) (7204) BG-01 x 2

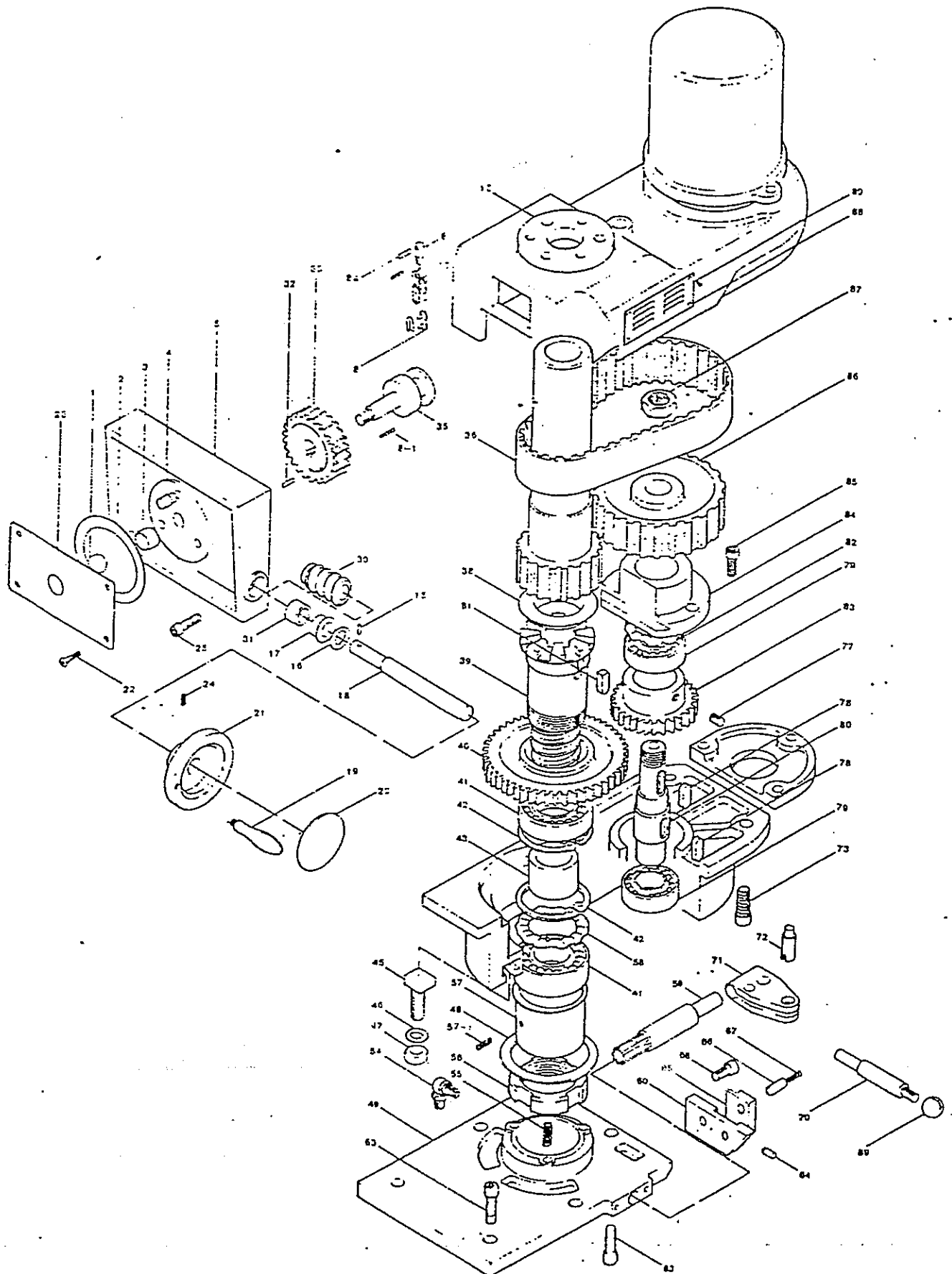
CNC HEAD



CNC HEAD

ITEM NO.	PARTS NO.	DESCRIPTION	ITEM NO.	PARTS NO.	DESCRIPTION
1	3A-6001	Quill Housing	35	3A-6035	Limit Dog (2 Req.)
2	3A-6002	Housing Washer	36	3A-6036	Socket Cap Screw (4 Req.)
3	3A-6003	Socket Cap Screw	37	3A-6037	Socket Cap Screw (2 Req.)
4	3A-6004	Socket Cap Screw (4 Req.)	38	3A-6038	RD. HD. Screw
5	3A-6005	Washer (4 Req.)	39	3A-6039	Micro. Meter Scale Rod
6	3A-6006	Z Axis Motor Adjustable Bracket	40	3A-6040	Face Plate
7	3A-6007	Z Axis Motor Bracket	41	3A-6041	Socket Cap Screw (8 Req.)
8	3A-6008	Socket Cap Screw (4 Req.)	42	3A-6042	Micrometer Scale
9	3A-6009	Washer (4 Req.)	43	3A-6043	Spraying Pipe
10	3A-6010	Pulley Flange (4 Req.)	44	3A-6044	Water Switch
11	3A-6011	Timing Belt Pulley (2 Req.)	45	3A-6045	Water Switch Bracket
12	3A-6012	Timing Belt	46	3A-6046	Socket Head Cap Screw (2 Req.)
13	3A-6013	Bracket Cover	47	3A-6047	Inserting Pipe Joint (2 Req.)
14	3A-6014	Socket Cap Screw (6 Req.)	48	3A-6048	Elbow
15	3A-6015	Jam Nut	49	3A-6049	Pipe Joint
16	3A-6016	Washer	50	3A-6050	Tube Bundle
17	3A-6017	Bearing Retainer Ring	51	3A-6051	Net Plastic Pipe
18	3A-6018	Bearing	52	3A-6084	Spindle
19	3A-6019	Key	53	3A-6085	Quill
20	3A-6020	Z Axis Feed Ball Screw	54	6088	Felt Washer
21	3A-6021	Socket Cap Screw (3 Req.)	55	6089	Socket Head Cap Screw
22	3A-6022	Bearing	56	6090	Locknut
23	3A-6023	Bearing Retainer Ring	57	6091	Lock Washer
24	3A-6024	Socket Cap Screw (3 Req.)	58	6092	Bearing
25	3A-6025	Right Limit Switches Bracket	59	6093	Bearing (2 Req.)
26	3A-6026	Right Limit Switches Adj. Bracket	60	6094	Sleeve
27	3A-6027	Micro Switch (3 Req.)	61	6095	Bearing Spacer-Large
28	3A-6028	Left Limit Switches Adj. Bracket	62	6096	Bearing Spacer-Small
29	3A-6029	Left Limit Switches Bracket	63	6097	Spindle Dirt Shield
30	3A-6030	Socket Cap Screw (4 Req.)	64	3A-6098	Nose-Piece
31	3A-6031	Socket Cap Screw (4 Req.)	65	3A-6099	Keeper Key
32	3A-6032	Z Axis Nut Bracket	66	3A-6100	Socket Head Cap Screw (2 Req.)
33	3A-6033	Socket Cap Screw (2 Req.)	67	3A-6042-1	RD. HD. Screws (4 Req.)
34	3A-6034	Limit Dog Bracket			

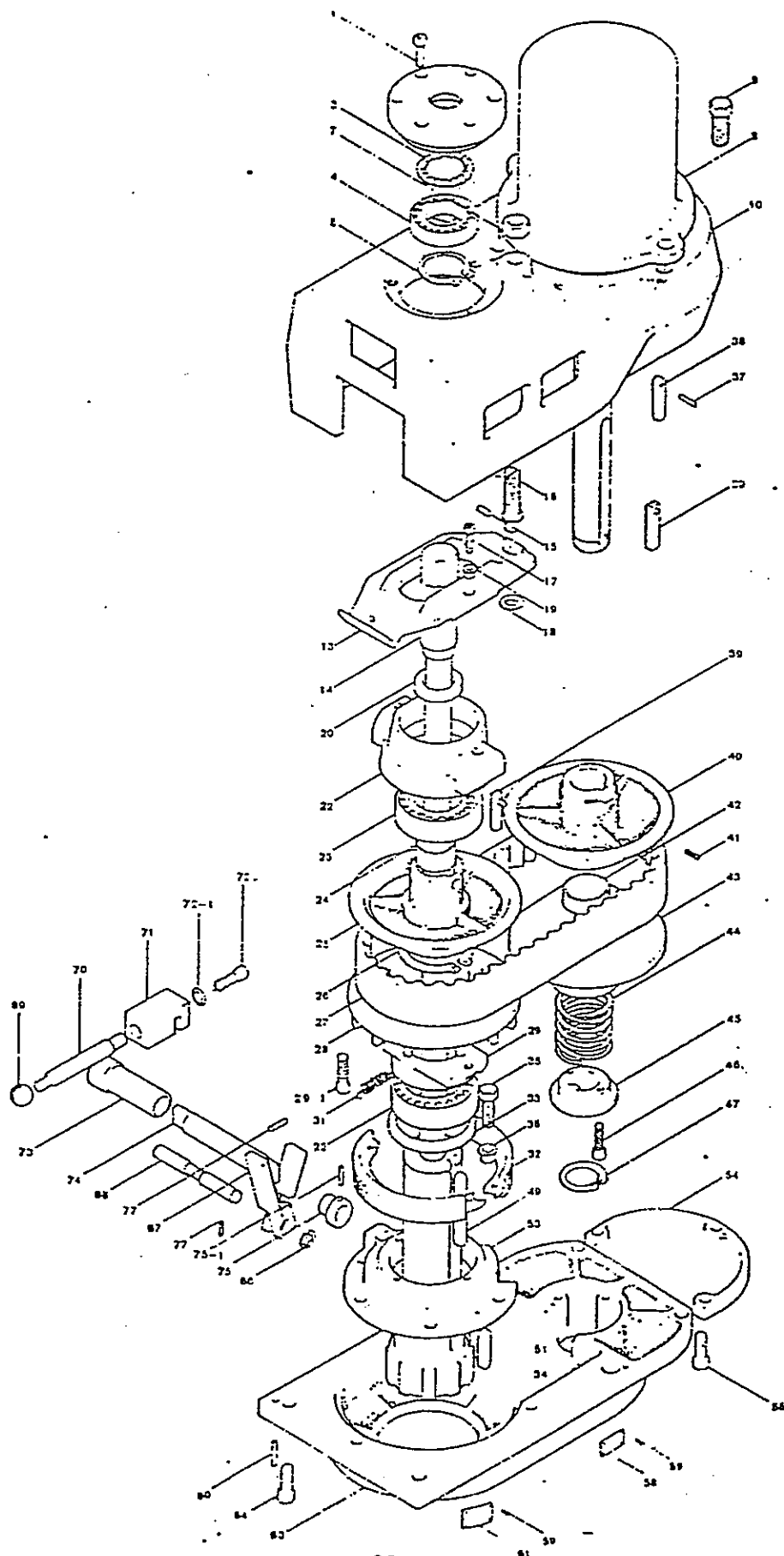
VARI-SPEED HLAD TOP HOUSING



VARI-SPEED HEAD TOP HOUSING

ITEM NO.	PARTS NO.	DESCRIPTION	ITEM NO.	PARTS NO.	DESCRIPTION
1	H7001	Hex Cap Nut	47	7047	Jam Nut (3 Req.)
2	7002	Vari-Speed Dial	48	7048	Ball Bearing Gear Sleeve Washer
3	7003	Bronze Bearing	49	3A7049	Fixed Clutch Bracket
4	7004	Full Dog Socket Set Screw	54	7054	Oil Cup
5	H7005	Speed Changer Housing	55	7055	Compression Spring (3 Req.)
8	7008	Chain Joint	56	7056	Bearing Locknut
8-1	7008-1	Roll Pin	57	7057	Bearing Sleeve
8a	7008a	Roll Pin	57-1	7057-1	Socket Set Screw
8b	7008b	Speed Change Stud	58	7058	Wave Spring Washer
10	7010	Speed Change Chain	59	7059	Bull Gear Shift Pinion
13	7013	Top Bearing Cap	60	7060	Hi-Low Detent Plate
15	7015	Roll Pin	63	3A7063	Socket Cap Screw (3 Req.)
16	7016	Spring	64	7064	Socket Set Screw
17	7017	Bronze Bearing	65	7065	Adjustable Plate
18	H7018	Speed Change Shaft	66	7066	Hi-Low Detent Plunger
19	H7019	Handle	67	7067	Spring
20	7020	Caution Plate	68	7068	Socket Cap Screw (2 Req.)
21	H7021	Speed Change Handwheel	69	7069	Bakelite Ball Handle
22	7022	Flat HD. Cap Screw (4 Req.)	70	7070	Hi-Low Shift Crank
23	7023	Face Plate	71	7071	Hi-Low Pinion Block
24	7024	Set Screw	72	7072	Roll Pin
25	H7025	Socket HD Cap Screw (4 Req.)	73	7073	Socket Cap Screw (6 Req.)
30	7030	Worm Gear	77	7077	Socket Set Screw
31	7031	Bronze Bearing	78	7078	Key (2 Req.)
32	7032	Roll Pin	79	7079	Ball Bearing (2 Req.)
33	7033	Speed Changer Spur Gear	80	7080	Gear Shaft
35	H7035	Speed Change Chain Drum	81	7081	Key
36	7036	Belt	82	7082	Wave Spring Washer
38	7038	Timing Pulley Clutch Sleeve	83	7083	Bull Gear Pinion
39	7039	Spline Gear Hub	84	7084	Bull Gear Pinion Bearing
40	7040	Spindle Bull Gear Assembly	85	7085	Socket HD Cap Screw (2 Req.)
41	7041	Ball Bearing (1 Req.)	86	7086	Timing Belt Pulley
42	7042	Snap Ring (2 Req.)	87	7087	Jam Nut
43	7043	Bull Gear Bearing Spacer	88	7088	Ventilator (2 Req.)
45	7045	Vert. Tee Bolts (3 Req.)	89	7089	Round HD. Machine Screw (12 Req.)
46	7046	Steel Washer (3 Req.)			

VARI-SPEED HEAD BACK GEAR



WIRES FOR PARTNER 2

- | | | | |
|----|------------|--------------------------|---------|
| 1. | 3 WIRE SJO | 48 INCHES | FLOOD |
| 2. | 3 WIRE SJO | 160 INCHES | 110 VAC |
| 3. | 4 WIRE SJO | 180 INCHES | X LIMIT |
| 4. | 4 WIRE SJO | 180 INCHES | Y LIMIT |
| 5. | 4 WIRE SJO | USE WIRE FROM PARTNER .4 | Z LIMIT |

6. STRIPE BACK 30 INCHES ON WIRES 2,3,4

7. WIRE IN 110 VAC
GREEN = GROUND
WHITE = 2
BLACK = 1

X LIMIT

```
BLACK = 6      RED = 7
GREEN = 22     WHITE = 34
```

Y LIMIT

BLACK = 7 RED = 8
GREEN = 22 WHITE = 43

```

[ limits ]
AC      X      Y
      0      0
[ moter ]
      AUX
X      Y      Z      0

```

(FOR PARTNER 3 SWAP X&Y MOTER)

AUX BOX

CUT SEAL TIGHT FOR 114 INCHES

WIRE FLOOD

GREEN = GROUND
WHITE = TB 57
BLACK = TB 60

WIRE Z LIMIT

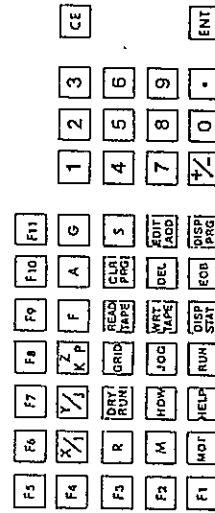
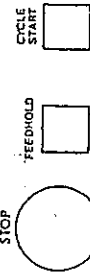
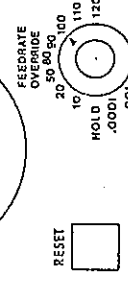
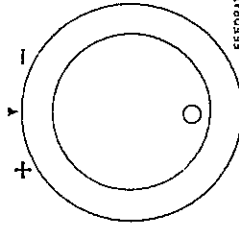
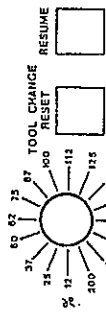
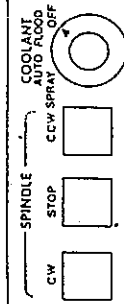
BLACK = 8 RED = 9
GREEN = 22 WHITE = 52

VARI-SPEED HEAD BACK GEAR

ITEM NO.	PARTS NO.	DESCRIPTION
1	8001	Socket Cap Screw
3	8003	Spring Washer
4	8004	Ball Bearing
5	8005	Snap Ring
7	8007	Hex Jam Nut
8	8008	Motor 3HP
9	8009	Hex HD Screw (2 Req.)
10	H8010	Belt Housing
13	8013	Speed Change Plate
14	8014	Drawbar
15	8015	Cotter Pin
16	8016	Speed Change Plate Pivot Stud
17	8017	Socket HD Screw (2 Req.)
18	8018	Washer
19	8019	Pivot Sleeve (2 Req.)
20	8020	Draw Bar Washer
22	8022	Spindle Pulley Bearing Sliding Housing
23	8023	Ball Bearing (2 Req.)
24	8024	Plastic Insert (2 Req.)
25	8025	Adjustable-Driven Varidisc
26	8026	Snap Ring No.
27	8027	Belt
28	8028	Stationary Driven Varidisc
29	8029	Brake Bearing Cap
29-1	8029-1	Socket HD Cap Screw (4 Req.)
31	8031	Brake Spring 2(2 Req.)
32	8032	Brake Shoe Assembly
33	8033	Spindle Pulley Spacer
34	8034	Spindle Pulley Hub
35	8035	Hex HD. Screw
36	8036	Brake Shoe Pivot Sleeve
37	8037	Roll dowel Pin
38	8038	Drive Key

ITEM NO.	PARTS NO.	DESCRIPTION
39	8039	Key for Adj Varidisc Motor Shaft (2 Req.)
40	8040	Stationary Motor Varidisc
41	8041	Socket Set Screw
42	8042	Plastic Insert (2 Req.)
43	8043	Adjustable Motor Varidisc Assembly
44	8044	Spring for Varidisc Motor Shaft
45	8045	Adjustable Varidisc Spring Collar
46	8046	Socket HD Cap Screw (2 Req.)
47	8047	RET. Ring
49	8049	Plastic Key
51	8051	Key
53	H8053	Belt Housing Base
54	8054	Motor Pulley Cover
55	8055	Socket Cap Screw (3 Req.)
58	8058	Hi-Low Range Nameplate
59	8059	Drive Screw (8 Req.)
60	8060	Taper Pin (2 Req.)
61	8061	Quill Feed Nameplate
63	H8063	Gear Housing
64	H8064	Socket Cap Screw (3 Req.)
66	8066	Snap Ring
67	8067	Brake Finger Pivot Stud (2 Rea.)
68	8068	Brake Operating Finger
69	8069	Bakelite Ball Handle
70	8070	Brake Lock Handle
71	3A8071	Brake Lock Stud
72	8072	Socket Set Screw
72-1	8072-1	Washer
73	H8073	Sleeve for Brake Lock Shaft
74	3A8074	Brake Lock Shaft
75	8075	Bushing (2 Req.)
75-1	8075-1	Pin
77	8077	Socket Set Screw

CENTURION IV



CENTURION IV

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USED PARTNER #1/A
ON

MATERIAL	
MACH	
OPN	JLG
CHRG	
BY	
APPD	
DATE	10-2-87
REV	
DATE	
APPD	
REP	
BY	
SHEET	
OP	

INDUSTRIAL INFORMATION
CENTURION IV
14627 MARTIN DRIVE
EDEN PRAIRIE, MINNESOTA 55344

TITLE
FRONT PANEL

PART NO.

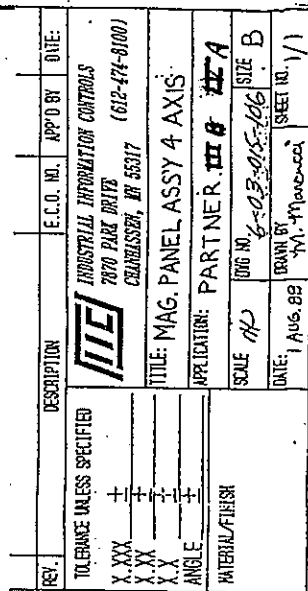
TERMINAL BLOCK DESIGNATORS

1.	115 VAC HOT.	129.	A-MOTOR TACH +	CR1.	RESET
2.	115 VAC COMMON	130.	A-MOTOR TACH -	CR1A.	EXCESS ERROR
6.	X OTL SW. OUT	134.	A-GRID SWITCH	CR1B.	DRIVE DISABLE
7.	Y OTL SW. OUT/X OTL SW. IN	135.	A-MOTOR +	CR1C.	DRIVE RESET
8.	Z OTL SW. OUT/Y OTL SW. IN	328.	POWER DRAWBAR	CR2.	TOOL CHANGE RESET
9.	Z OTL SW. IN	FI.	SW. 115 VAC TO FLOOD COOLANT	CR3.	SPINDLE CLOCKWISE
12.	+24 VDC FROM PWR. SUPPLY	G.	CHASSIS GROUND	CR4.	SPINDLE COUNTERCLOCKWISE
22.	GROUND FROM PWR. SUPPLY	22L.	MACHINE SW. GROUND	CR5.	SPINDLE STOP
23.	+5 VDC FROM PWR. SUPPLY	22X.	X-AMP GROUND	CR5A.	SPINDLE SAFETY
26.	+15 VDC FROM PWR. SUPPLY	22Y.	Y-AMP GROUND	CR7.	SPRAY MIST
27.	-15 VDC FROM PWR. SUPPLY	22Z.	Z-AMP GROUND	CR8.	FLOOD COOLANT
28.	X-AMP ANALOG SIGNAL	22A.	A-AMP GROUND	CR9.	SPINDLE HI/LO
29.	X-MOTOR TACH +			CR10A.	SPINDLE SAFETY
30.	X-MOTOR TACH -			CR11.	DISABLE S-WORD
34.	X-GRID SWITCH			CR12.	AUXILIARY RELAY
35.	X-MOTOR +			MC1F.	SPINDLE CW (AC)
36.	X-MOTOR -			MC1R.	SPINDLE CCW (AC)
37.	Y-AMP ANALOG SIGNAL			MC2.	FLOOD COOLANT (AC)
38.	Y-MOTOR TACH +			UR1.	UP SPINDLE SPEED (S-WORD)
39.	Y-MOTOR TACH -			DR1.	DOWN SPINDLE SPEED (S-WORD)
43.	Y-GRID SWITCH			UR2.	UP SPINDLE SPEED (AC)
44.	Y-MOTOR +			DR2.	DOWN SPINDLE SPEED (AC)
45.	Y-MOTOR -				
46.	Z-AMP ANALOG SIGNAL				
47.	Z-MOTOR TACH +				
48.	Z-MOTOR TACH -				
52.	Z-GRID SWITCH				
53.	Z-MOTOR +				
54.	Z-MOTOR -				
56.	115 VAC FOR FLOOD/SPRAY				
57.	SW. 115 VAC HOT				
60.	SW. 115 VAC COMMON				
61.	115 VAC FOR SPRAY				
65.	SW. 220 VAC FOR AUTOLUBE				
66.	220 VAC FOR AUTOLUBE				
74.	SW. 115 VAC FOR A-AXIS BRAKE				
76.	+15 VDC FOR AMPS				
77.	-15 VDC FOR AMPS				
78.	LUBE FAULT SWITCH				
79.	WAIT CHANNEL SWITCH				
81.	220 VAC FOR DRIVE TRANSFORMER				
82.	220 VAC FOR DRIVE TRANSFORMER				
84.	SW. 72 VAC TO RECTIFIER				
85.	SW. 72 VAC TO DRIVE TRANSFORMER				
86.	SPINDLE HI/LO PROX. SWITCH				
87.	72 VAC TO RECTIFIER				
101.	DRIVE AMPS DISABLE				
119.	S-WORD PROX. SWITCH				
120.	CR-11 COIL S-WORD DISABLE				
121.	CR-12 COIL				
128.	A-AMP ANALOG SIGNAL				

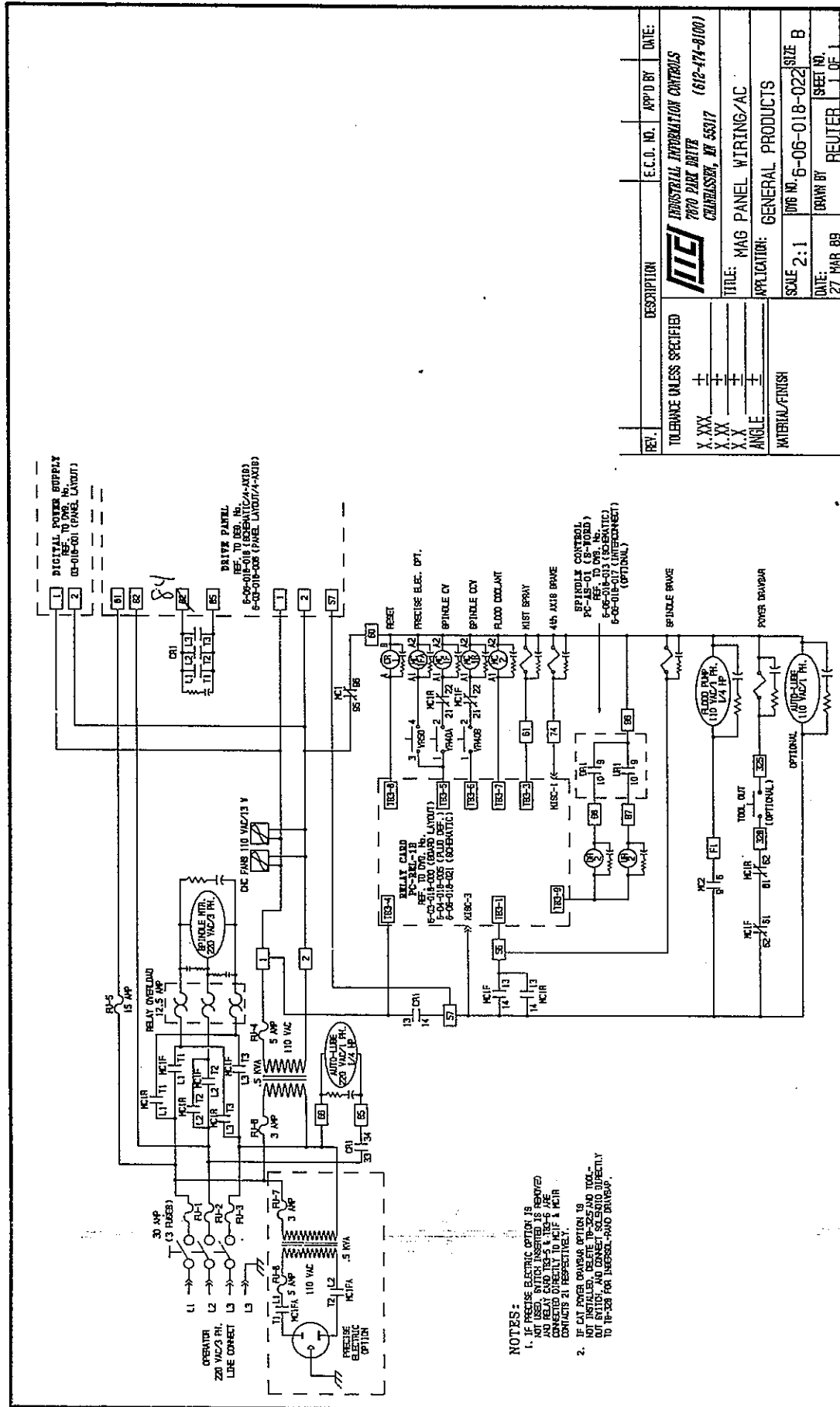
RELAYS

CR1.	RESET
CR1A.	EXCESS ERROR
CR1B.	DRIVE DISABLE
CR1C.	DRIVE RESET
CR2.	TOOL CHANGE RESET
CR3.	SPINDLE CLOCKWISE
CR4.	SPINDLE COUNTERCLOCKWISE
CR5.	SPINDLE STOP
CR5A.	SPINDLE SAFETY
CR7.	SPRAY MIST
CR8.	FLOOD COOLANT
CR9.	SPINDLE HI/LO
CR10.	SPINDLE ENABLE
CR10A.	SPINDLE SAFETY
CR11.	DISABLE S-WORD
CR12.	AUXILIARY RELAY
MC1F.	SPINDLE CW (AC)
MC1R.	SPINDLE CCW (AC)
MC2.	FLOOD COOLANT (AC)
UR1.	UP SPINDLE SPEED (S-WORD)
DR1.	DOWN SPINDLE SPEED (S-WORD)
UR2.	UP SPINDLE SPEED (AC)
DR2.	DOWN SPINDLE SPEED (AC)

REF.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
TOLERANCE UNLESS SPECIFIED				
X.XXX	±			
X.XX	±			
X.X	±			
ANGLE	±			
MATERIAL/FINISH				
 INDUSTRIAL INFORMATION CONTROLS 7070 PARK DRIVE COLUMBIANA, OH 43017 (612-474-8000)				
TITLE: TERMINAL BLOCK N12 APPLICATION: PARTNER III				
SIZE	N-A	DWG NO.	6-04-019-000	SIZE B
DATE		DRAWN BY		SHEET 10

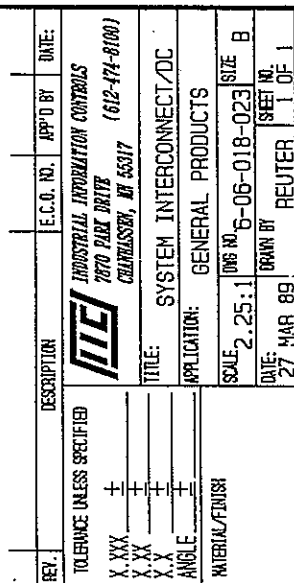


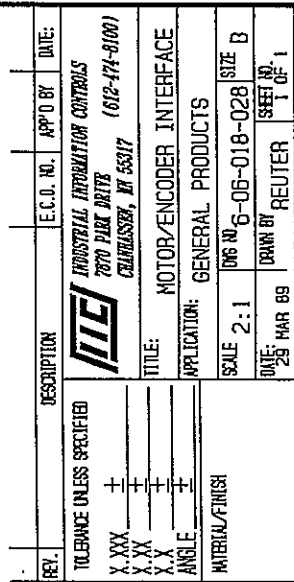
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	TOLRANCE W/LESS SPECIFIED			
	X .XXX	INDUSTRIALL INFORMATION CONTROLS		
	X .XX	7070 PARK BLVD		
	X .X	CHAMBERS, IN 45317		
	X .X			
	ANGLE			
		TITLE: MAG. PANEL ASSY 4 AXIS		
		APPROVED: PARTNER. III 8 17A		
	MATERIAL/FINISH			
		SCALE	DWG NO.	SIZE
		1/2"	6-03-015-06	B
		DATE:	DRWN BY	SHEET NO.
		1 AUG. 88	W. H. H. H. H.	1/1

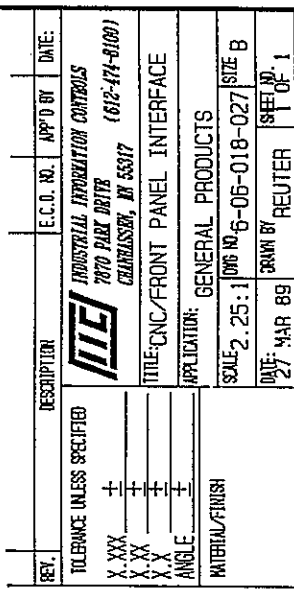


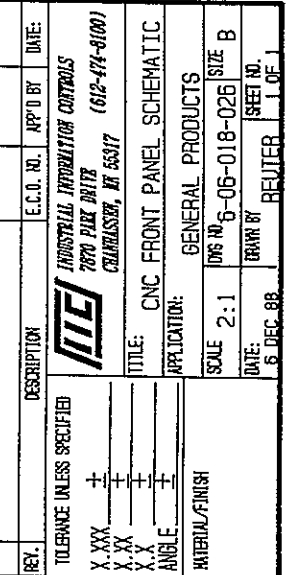
REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE:
	TOLERANCE UNLESS SPECIFIED			
	X.XXX			
	X.XX			
	X.X			
	ANGLE			
	MATERIAL/FINISH			

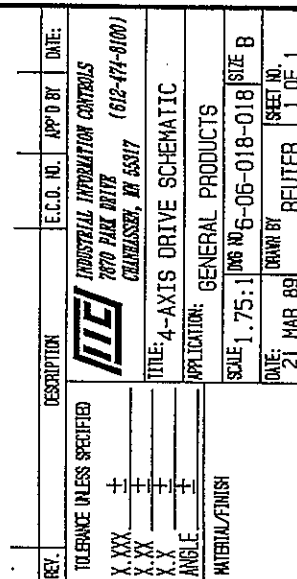
ITE	INDUSTRIAL INFORMATION CONTROLS	7870 PANEL DRIVE	(612-474-8100)
		CHAMBERS, NY 55317	
	TITLE:	MAG PANEL WIRING/AC	
	APPLICATION:	GENERAL PRODUCTS	
	SCALE:	2:1	SIZE B
	DATE:	27 MAR 89	SECT NO.
	DRAWN BY:	REUTER	1 OF 1

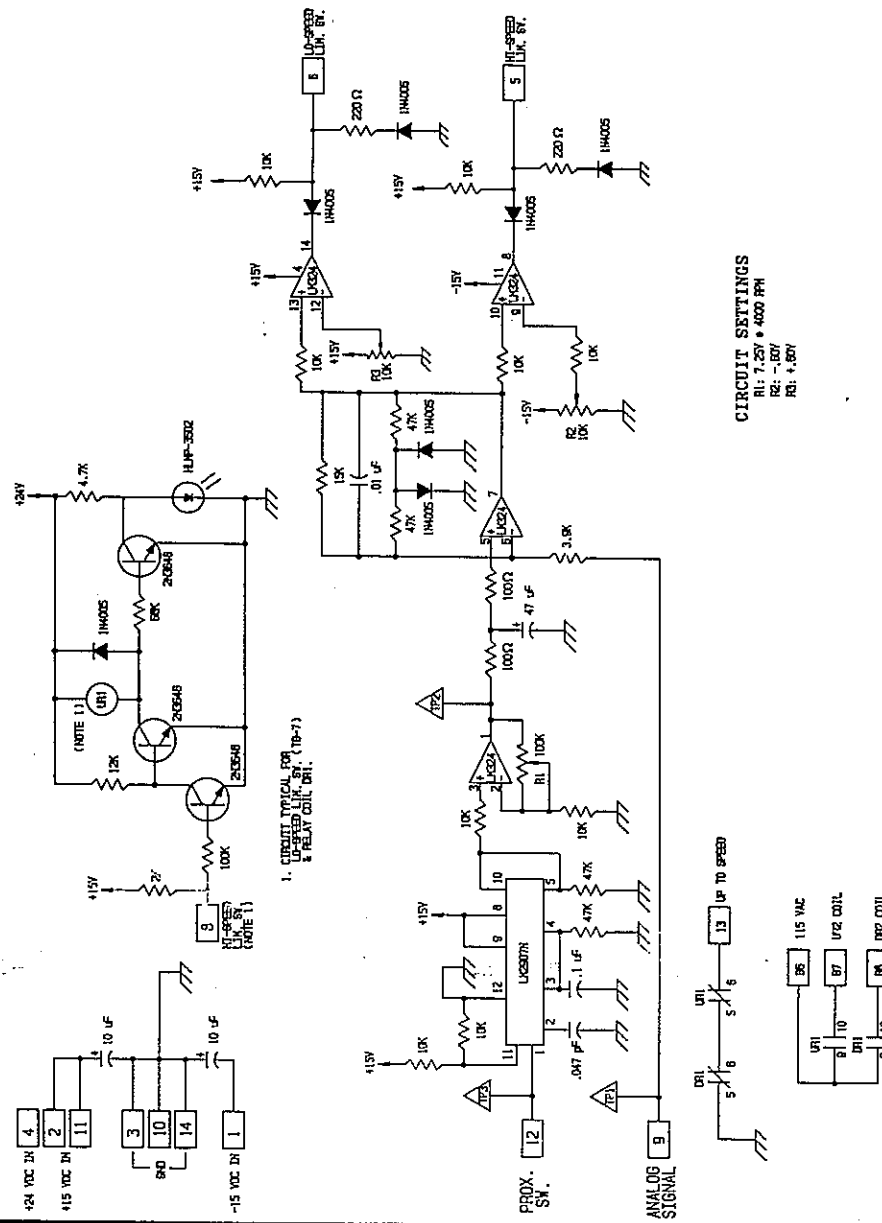






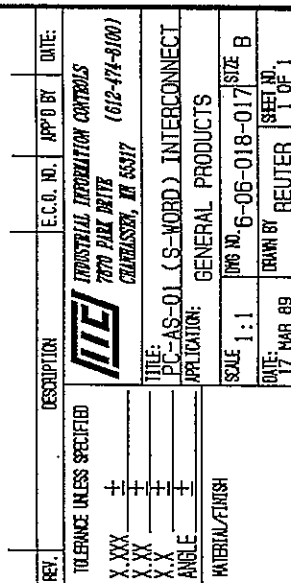




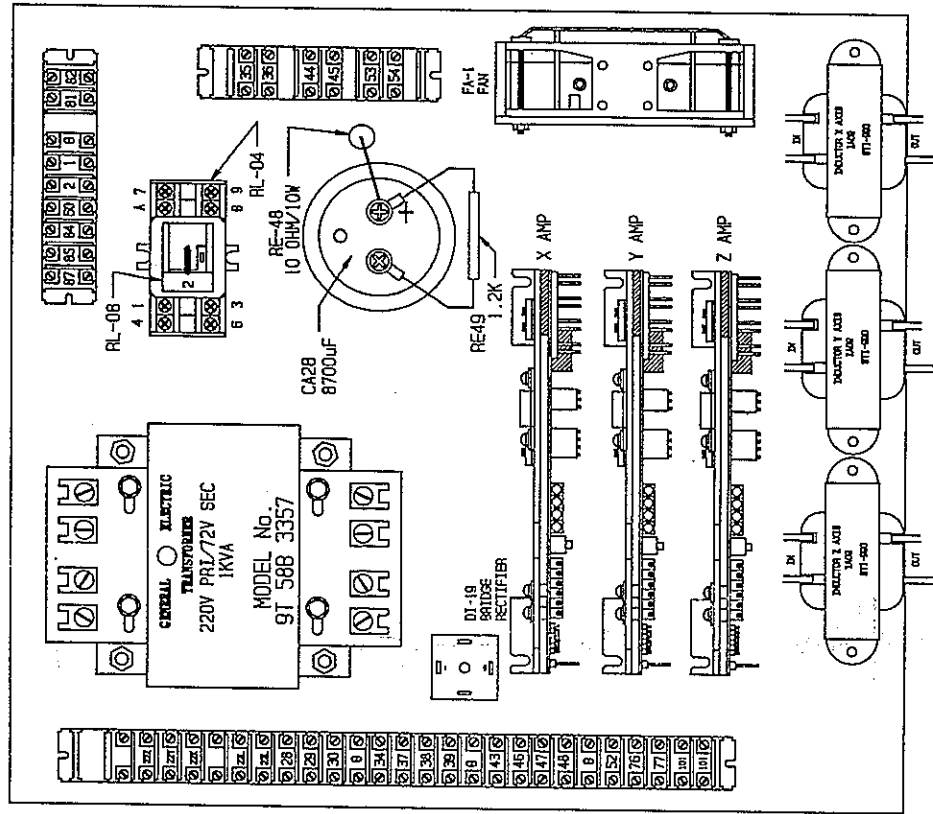


CIRCUIT SETTINGS
 R1: 1.25V ± 4000 OHM
 R2: -1.5V
 R3: 1.5V

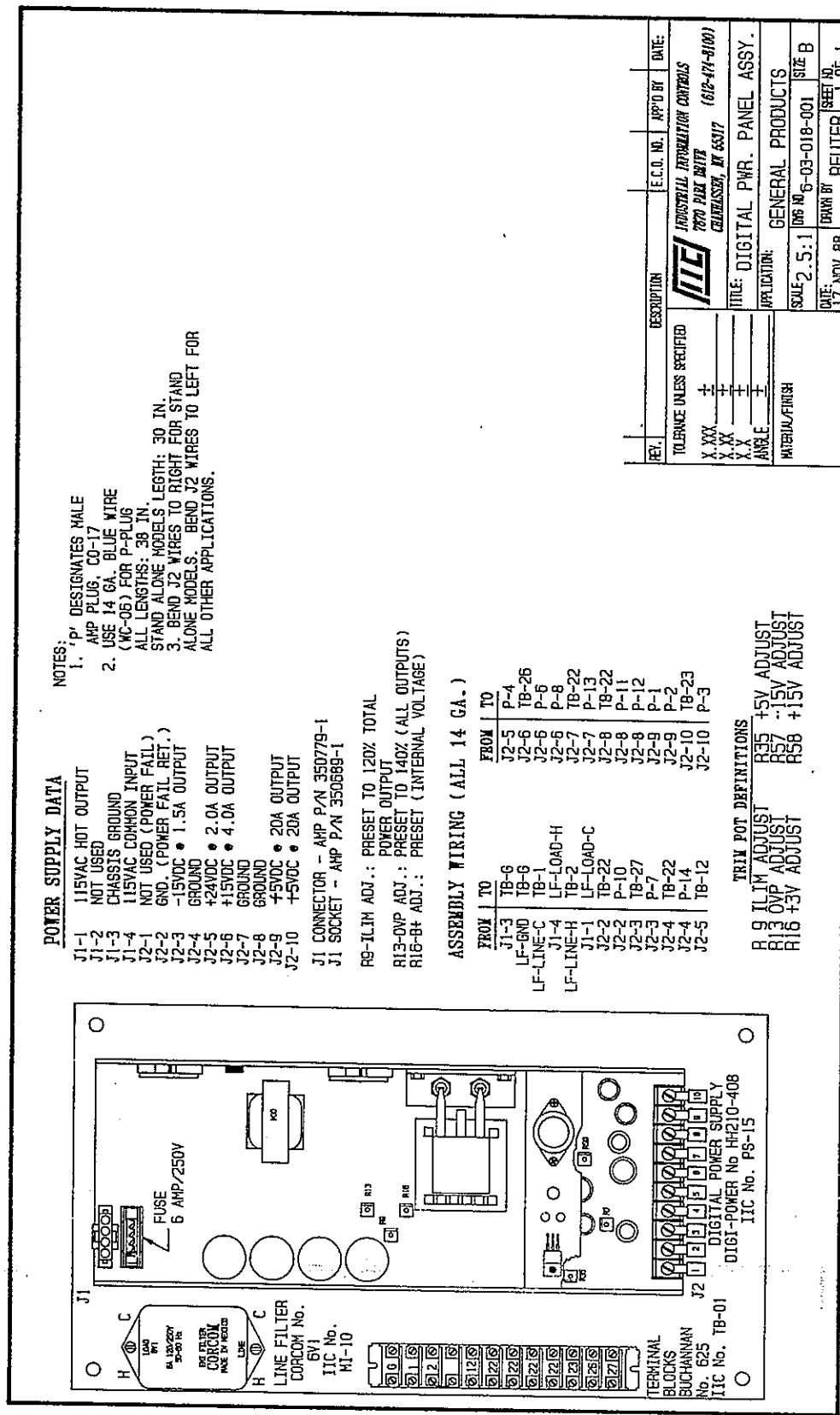
REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE:
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	CHAMBERS, W 55317			
	TITLE: PC-AS-01 (S-WORD) SCHEMATIC			
	APPLICATION: GENERAL PRODUCTS			
	SCALE 1.5:1			
	DATE: 20 MAR 89			
	DRAWN BY: REUTER			
	SIZE B			
	SHEET NO. 1 OF 1			



REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE:
	TO DANCE unless specified	 INDUSTRIAL INFORMATION CONTROLS 7070 PINE DRIVE CHILMARK, MA 05317 (612-474-8100)		
X XXX	±			
X XX	±			
X X	±			
X X	±			
ANGLE	±			
TITLE: PC-AS-01 (S-WORD) INTERCONNECT				
APPLICATION: GENERAL PRODUCTS				
MATERIAL/FINISH				
SCALE 1:1		DWS NO. 6-06-018-017		SIZE B
QUANTITY 17 MAR 89		DRAWN BY		SEEK NO. 1
		REITER		



REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE:
	TOLERANCE UNLESS SPECIFIED			
	X .XX			
	Y .XX			
	Z .XX			
	ANGLE			
	MATERIAL FINISH			
ITE INDUSTRIAL INFORMATION CONTROLS 7870 PLATE DRIVE CHAMPAIGN, IL 61817 (612-474-8100)				
TITLE: 3 AXIS DRIVER AMP BOARD				
APPLICATION: GENERAL PRODUCTS				
SCALE 2.5:1 Dwg No. 6-03-018-004 SIZE B				
DATE: 18 NOV 88 DRAWN BY: REUTER SHEET NO. 1 OF 1				



POWER SUPPLY DATA

- J1-1 115VAC HOT OUTPUT
- J1-2 NOT USED
- J1-3 CHASSIS GROUND
- J1-4 115VAC COMMON INPUT
- J2-1 NOT USED (POWER FAIL)
- J2-2 GND. (POWER FAIL RET.)
- J2-3 -15VDC • 1.5A OUTPUT
- J2-4 GROUND
- J2-5 +24VDC • 2.0A OUTPUT
- J2-6 +15VDC • 4.0A OUTPUT
- J2-7 GROUND
- J2-8 GROUND
- J2-9 +5VDC • 20A OUTPUT
- J2-10 +5VDC • 20A OUTPUT

J1 CONNECTOR - AMP P/N 350779-1
J1 SOCKET - AMP P/N 350689-1

PS-11IN ADJ.: PRESET TO 120% TOTAL
POWER OUTPUT
R13-OMP ADJ.: PRESET TO 140% (ALL OUTPUTS)
R16-B+ ADJ.: PRESET (INTERNAL VOLTAGE)

ASSEMBLY WIRING (ALL 14 GA.)

FROM	TO
J1-3	TB-6
LF-GND	TB-6
LF-LINE-C	TB-1
J1-4	LF-LOAD-H
LF-LINE-H	TB-2
J1-1	LF-LOAD-C
J2-2	TB-22
J2-3	P-10
J2-4	TB-27
J2-5	TB-22
J2-6	TB-22
J2-7	P-13
J2-8	TB-22
J2-9	P-11
J2-10	P-12
J2-11	P-1
J2-12	P-2
J2-13	TB-23
J2-14	P-3
J2-15	P-3

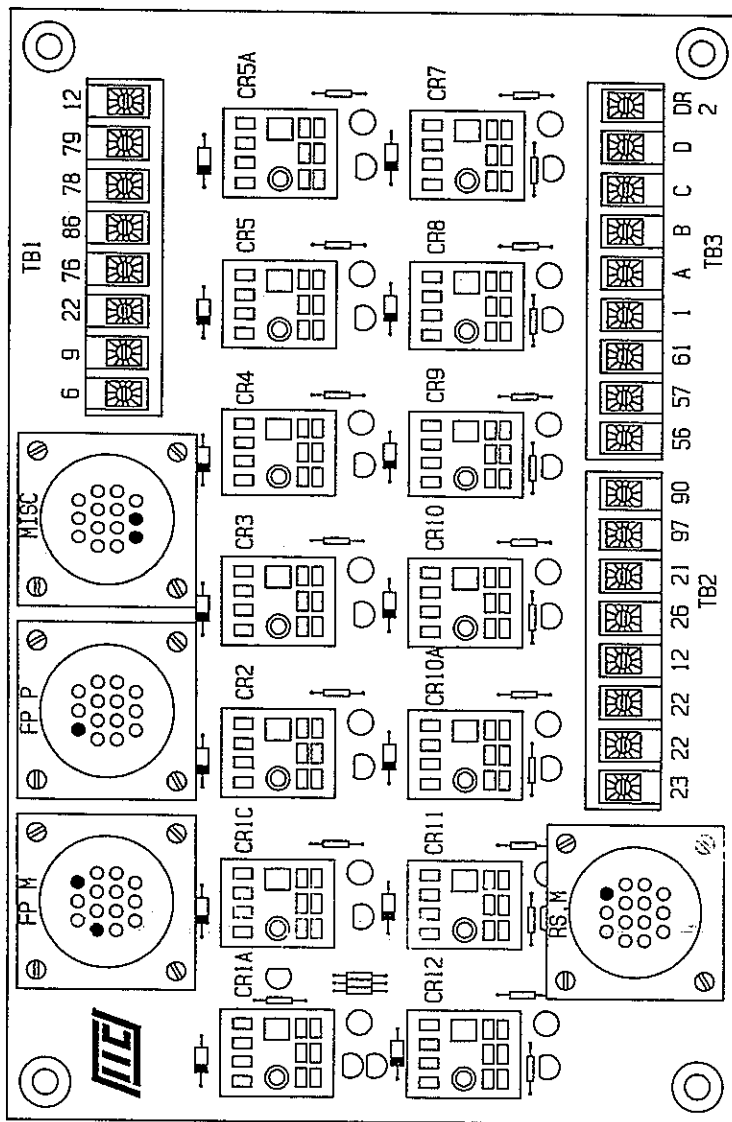
TRIM POT DEFINITIONS

R 9 11M ADJUST R35 +5V ADJUST
R12 0.1M ADJUST R37 -15V ADJUST
R16 +3V ADJUST R58 +15V ADJUST

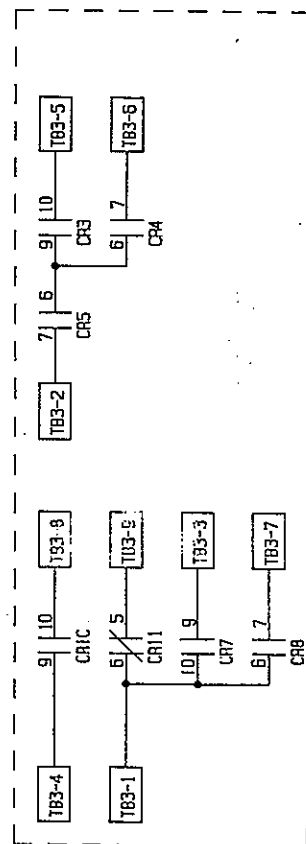
NOTES:

- 'P' DESIGNATES MALE AMP PLUG, CO-17
- USE 14 GA. BLUE WIRE (WC-06) FOR P-PLUG ALL LENGTHS: 38 IN.
- STAND ALONE MODELS LENGTH: 30 IN.
- BEND J2 WIRES TO RIGHT FOR STAND ALONE MODELS. BEND J2 WIRES TO LEFT FOR ALL OTHER APPLICATIONS.

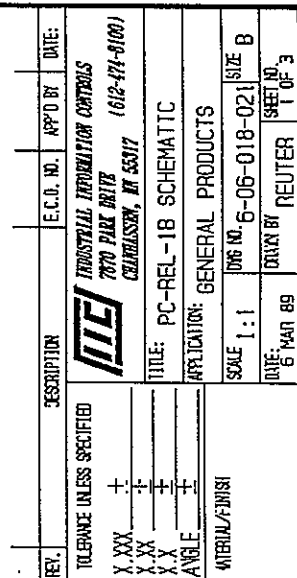
REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
	TOLERANCE UNLESS SPECIFIED			
	X.XX ±			
	X.XX ±			
	X.X ±			
	ANGLE ±			
	MATERIAL/FINISH			
INDUSTRIAL INFORMATION CONTROLS 7870 PULP DRIVE CHICAGO, IL 60617				
TITLE: DIGITAL PWR. PANEL ASSY.				
APPLICATION: GENERAL PRODUCTS				
SCALE: 2.5:1 DWG NO. 6-03-018-001 SIZE B				
DATE: 17 NOV 88 DRAWN BY: REUTER SHEET NO. 1 OF 1				



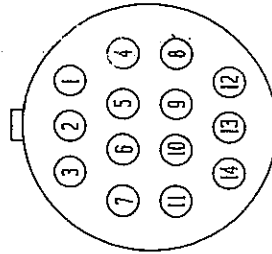
REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
	TOLERANCE UNLESS SPECIFIED			
	X.XX			
	X.XX			
	X.XX			
	ANGLE			
	MATERIAL/FINISH			
	INDUSTRIAL INFORMATION CONTROLS			
	7070 PLEX DATE (612-474-8100)			
	CHANDLER, MI 48117			
	TITLE: PC-REL-1B PANEL ASSY.			
	APPLICATION: GENERAL PRODUCTS			
	SCALE 1:1			
	DATE: 15 NOV 88			
	DRAWN BY: REUTER			
	SHEET NO. 1 OF 1			



REF.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE:
	TOLERANCE UNLESS SPECIFIED			
	X .XXX ±			
	X .XX ±			
	X .X ±			
	ANGLE .1°			
MATERIAL/FINISH				



FEMALE AMP PLUG



TERMINAL BLOCK

1	2	3	4	5	6	7	8
---	---	---	---	---	---	---	---

F.P.M.

PIN No.	FUNCTION	INT. DEST.
1	KEY	
2	RESET	CR1A-5
3	E STOP	FP4-2
4	E STOP	CR1C
5	SPINDLE STOP	CR2-6
6	TOOL CHANGE	CR2
7	KEY	
8	SPINDLE CCW	CR4-10 CR4-5
9	TOOL CHG RESET	RS4-2
10	SPINDLE STOP	RS4-3
11	COOLANT SPRAY	CR-7
12	SPINDLE CV	CR2-4 CR5-5
13	RESET	RS4-6
14	COOLANT FLOOD	CR8

F.P.P.

PIN No.	FUNCTION
1	+500C
2	+5V
3	KEY
4	GND
5	GND
6	GND
7	GND
8	+15V
9	+15V
10	SWITCHED 24V
11	24V
12	SPARE
13	SPARE
14	SPARE

MISC.

PIN No.	FUNCTION
1	CR 12-10
2	CR 12-8
3	CR 12-9
4	N/A
5	CR 12-7
6	CR 12-5
7	CR 12-5
8	SPARE
9	CR 11-8
10	CR 11-9
11	CR 11-10
12	CR 12 COIL
13	KEY
14	KEY

RSM (CNC)

PIN No.	FUNCTION	INT. DEST.
1	SPINDLE CCW	CR10A-10
2	TOOL CHG RESET	CR4-10 CR4-5
3	SPINDLE STOP	FP4-10
4	SPINDLE ANALOG	TB2-7
5	SPINDLE CV	CR10A-6
6	RESET ALLOW	FP4-13
7	COOLANT FLOOD	CR8
8	S-WORD DISABLE	CR11
9	EXCESS ERROR	TB2-6
10	UP TO SPEED	TB2-8
11	COOLANT SPRAY	CR7
12	SPINDLE ENABLE	CR5-8 CR1
13	LUBE FAULT	TB1-6
14	WAIT CHANNEL	TB1-14

NOTES:
1. TABLES REFERENCE
TO PC REL. 1B 1/0
BOARD ONLY

T.B. 1.

T.B. No.	FUNCTION	INT. DEST.
1 (6)	OVER TRAVEL LIMITS	CR1A
2 (9)	OVER TRAVEL LIMITS	CR1A
3 (22)	GND	
4 (76)	+15V	
5 (86)	SPINDLE HI/LOW	CR9
6 (78)	CNC AUTO LUBE	CR9
7 (79)	CNC WAIT CHANNEL	RS4-13
8 (12)	+24V	RS4-14

T.B. 2

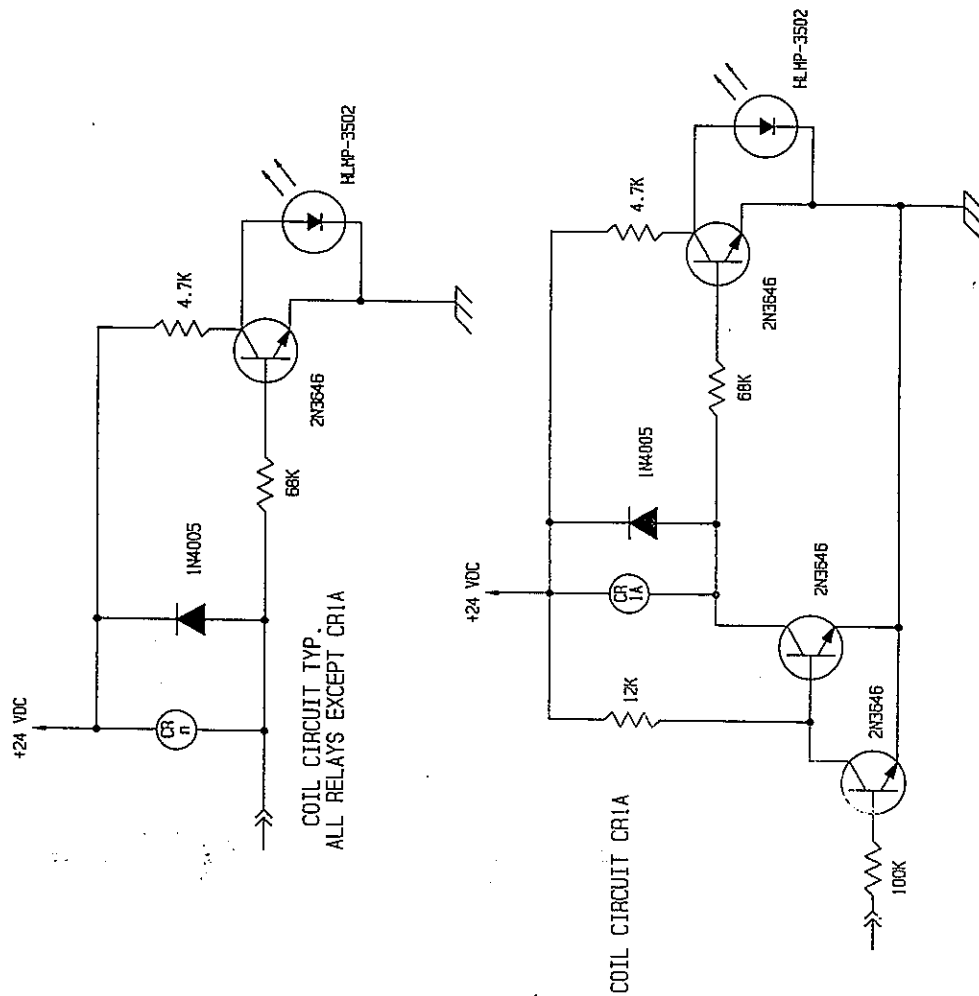
T.B. No.	FUNCTION	INT. DEST.
1 (23)	+5V	
2 (22)	GND	
3 (22)	GND	
4 (12)	+24V	
5 (26)	+15V	
6 (21)	EXCESS ERROR	CR1A
7 (97)	SPINDLE ANALOG	RS4-4
8 (90)	AUTO SPEED	RS4-10

T.B. 3

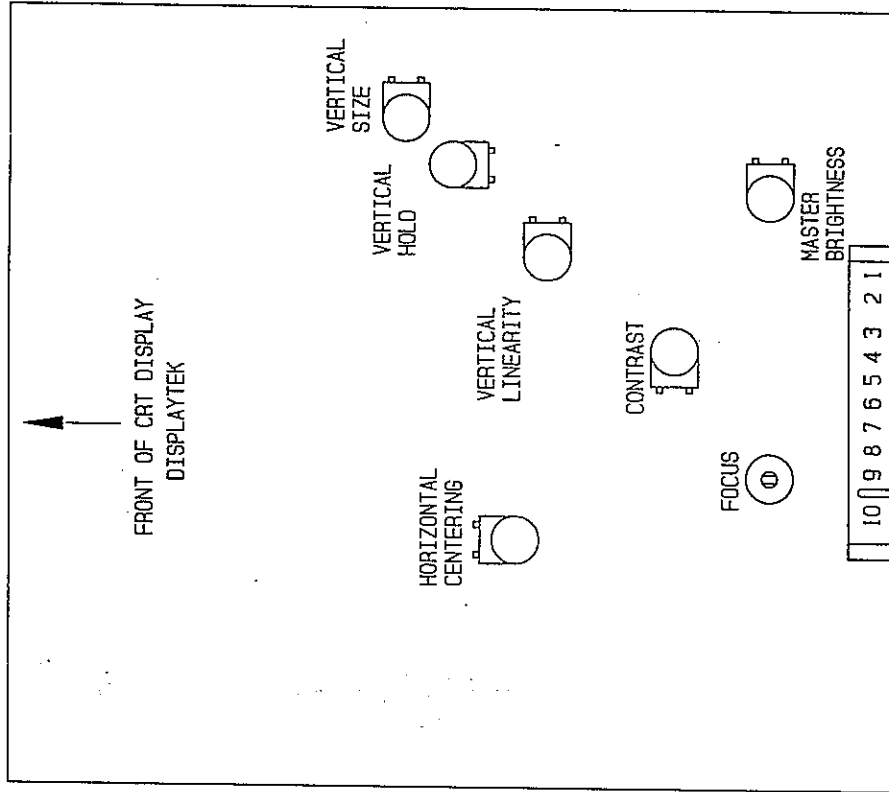
T.B. No.	FUNCTION	INT. DEST.
1 (56)	AC MAGNETICS	CR14 CR10
2 (57)	AC MAGNETICS	CR5-7
3 (61)	AC MAGNETICS	CR7-9
4 (1)	AC MAGNETICS	CR1C-9
5 (A)	AC MAGNETICS	CR3-10
6 (B)	AC MAGNETICS	CR4-7
7 (C)	AC MAGNETICS	CR8-7
8 (D)	AC MAGNETICS	CR1C-10
9 (CR2)	AC MAGNETICS	CR11-5

REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE:
TOLERANCE UNLESS SPECIFIED				
X.XXX	±			
X.XX	±			
X.X	±			
ANGLE	±			
MATERIAL/FINISH				
TITLE: PC REL. 1B 1/0 PLUG DEF.				
APPLICATION: GENERAL PRODUCTS				
SCALE 1:1				
DATE: 11 AUG 88				
DRAWN BY: REUTER				
SHEET NO. 1 OF 1				

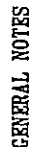




REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
	TOLERANCE UNLESS SPECIFIED			
	X.XX			
	X.X			
	X			
	ANGLE			
	W/TB/IN/FINISH			
INDUSTRIAL INFORMATION CONTROLS 7070 PARK DRIVE CHILMARK, MA 01917 TEL: (617) 810-1000				
TITLE: PC-REL-1B SCHEMATIC				
APPLICATION: GENERAL PRODUCTS				
SCALE 1:1	JWG	NO 6-06-018-021	SIZE D	
DATE: / MAR 89	BY: JWG	REV: 1	SHEET NO.	
REVISION: 3 OF 3				



REV.	DESCRIPTION	E.C.D. NO.	APP'D BY	DATE:
	TOLERANCE UNLESS SPECIFIED			
	X.XXX ±			
	X.XX ±			
	X.X ±			
	ANGLE ±			
	MATERIAL/FINISH			
 INDUSTRIAL INFORMATION CONTROLS 7870 PARK DRIVE (612-474-8100) CHANDLER, MN 55317				
TITLE: CRT PC TRIMPOT LOCATOR				
APPLICATION: GENERAL PRODUCTS				
SCALE 1:1		DWG NO. 6-02-018-101		SIZE B
DATE: 20 SEP 88		DRAWN BY: REUTER		SHEET NO. 1 OF 1



ATTACH WIRES:
CUT OFF SHIELD ON MOTOR END AND
SECURE WITH HEAT-SHRINK. PULL 4 IN. WIRE
THRU SHIELD AND SECURE WITH HEAT-SHRINK.
LARGE SHIELD AS '68'

ENCODER WIRES:

CUT OFF SHIELD ON MOTOR ENDS AND SECURE WITH HEAT-SHRINK. LABEL AS 1,2,3,4. PULL 4 IN. WIRE THRU SHIELDS. PLACE MALE AMP PINS ON WIRES. LABEL WIRES 1 THRU 8. INSTALL PINS TO PLUGS

SRID WIRE:

CUT OFF SHIELD AND RED WIRE ON MOTOR END. SECURE WITH HEAT-SHRINK. LABEL AS '10'. CUT OFF RED WIRE AND COVER SHIELD WITH HEAT SHRINK. PLACE MALE AMP PIN ON BLACK WIRE AND INSTALL INTO PLUG.

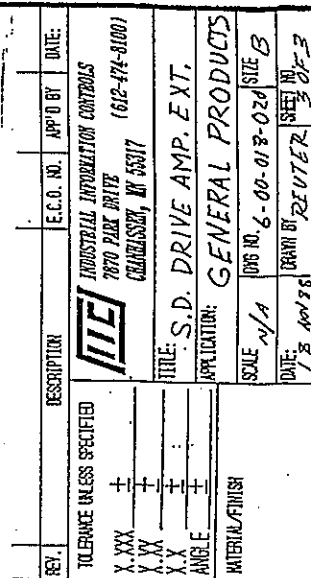
SIGNAL WIRE:

CUT OFF SHIELD AND BLACK WIRE ON MOTOR END. SECURE WITH HEAT-SHRINK. LABEL AS '11'. CUT OFF BLACK WIRE AND COVER SHIELD WITH HEAT-SHRINK. PLACE MALE AMP PIN ON RED WIRE AND INSTALL INTO PLUG.

ARMATURE WIRES (PARTNER V)

ARMATURE WIRES (PAPINEH V)
12 GA. RED/BLACK TWISTED PAIR

SOURCE	COLOR/TIRE	I	DESTINATION Y Z
MOTOR +	RED 14 GA	TB-35	TB-44 TB-53
MOTOR -	BLK 14 GA	TB-36	TB-45 TB-54
TACH +	RED 22 GA	TB-29	TB-38 TB-47
TACH -	BLK 22 GA	TB-30	TB-39 TB-48
SIGNAL	RED 22 GA	TB-28	TB-37 TB-46
GRN	BLK 22 GA	TB-34	TB-43 TB-52



PARTNER II/B

SOURCE	LENGTH		
	X	Y	Z
WC-30/ARH.	7' 6"	8'	10'
WC-15/TACH.	9'	5'	8' 6"
WC-27/ENC.	11'	7' 4"	8' 6"
WC-15/SIG.	3'	3'	3'
WC-15/GRID	3'	3'	3'
SEALTITE	5' 2"	3' 9"	4'
SHIELDS	3'	3'	3'

PARTNER III/AS

SOURCE	LENGTH		
	X	Y	Z
WC-30/ARH.	11' 9"	11' 9"	11' 9"
WC-15/TACH.	11' 9"	11' 9"	11' 9"
WC-27/ENC.	11' 6"	11' 6"	11' 6"
WC-15/SIG.	4' 2"	4' 2"	4' 2"
WC-15/GRID	3' 11"	3' 11"	3' 11"
SEALTITE	9'	9'	1' 4"
SHIELDS	4'	4'	4'

PARTNER II/BS

SOURCE	LENGTH		
	X	Y	Z
WC-30/ARH.	18' 6"	12' 6"	18' 6"
WC-15/TACH.	18' 6"	12' 6"	18' 6"
WC-27/ENC.	18' 6"	12' 6"	18' 6"
WC-15/SIG.	4' 2"	4' 2"	4' 2"
WC-15/GRID	3' 11"	3' 11"	3' 11"
SEALTITE	16'	10'	16'
SHIELDS	4'	4'	4'

PARTNER III/B, IV/A, IV/B

SOURCE	LENGTH		
	X	Y	Z
WC-30/ARH.	12' 6"	12' 6"	10' 6"
WC-15/TACH.	12' 6"	12' 6"	10' 6"
WC-27/ENC.	12' 6"	12' 6"	10' 6"
WC-15/SIG.	3'	3'	3'
WC-15/GRID	3'	3'	3'
SEALTITE	3' 4"	3' 4"	1'
SHIELDS	3'	3'	3'

PARTNER III/A

SOURCE	LENGTH		
	X	Y	Z
WC-30/ARH.	12'	12'	11'
WC-15/TACH.	11'	11'	10'
WC-27/ENC.	11'	11'	10'
WC-15/SIG.	3'	3'	3'
WC-15/GRID	3'	3'	3'
SEALTITE	2' 10"	2' 10"	1' 6"
SHIELDS	3'	3'	3'

PARTNER III/BS, IV/AS, IV/BS

SOURCE	LENGTH		
	X	Y	Z
WC-30/ARH.	14' 6"	14' 6"	18' 6"
WC-15/TACH.	14' 6"	14' 6"	18' 6"
WC-27/ENC.	14' 6"	14' 6"	18' 6"
WC-15/SIG.	4' 2"	4' 2"	4' 2"
WC-15/GRID	3' 11"	3' 11"	3' 11"
SEALTITE	12'	12'	16'
SHIELDS	4'	4'	4'

REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
	TOLERANCE UNLESS SPECIFIED			
	X.XXX			
	X.XX			
	X.X			
	ANGLE			
	MATERIAL/FINISH			
	SCALE 1:1			
	DATE: 9 DEC 88			
	DRAWN BY: REUTER			
	SHEET NO. 2 OF 3			

INDUSTRIAL INFORMATION CONTROLS
7870 PARK DRIVE (612-474-8100)
CHAMBERLAIN, MN 55317

TITLE: 3 AXIS MOTOR CABLES/LENGTHS
APPLICATION: GENERAL PRODUCTS

PARTNER IV/B W/YASKAWA DRIVE

SOURCE	LENGTH		
	X	Y	Z
WC-30/ARM.	6' 3"	6'	9' 6"
WC-15/TACH.	4' 6"	4' 6"	7'
WC-27/ENC.	6' 6"	6' 6"	10' 6"
WC-15/SIG.	3'	3'	3'
WC-15/GRID	3'	3'	3'
SEALTIE	3'	3'	3' 9"
SHIELDS	3'	3'	3'

PARTNER V

SOURCE	LENGTH		
	X	Y	Z
SEE NOTE	14' 6"	13'	12'
WC-15/TACH.	12'	11' 6"	9' 6"
WC-27/ENC.	13'	12' 6"	10' 6"
WC-15/SIG.	3' 6"	3' 6"	3' 6"
WC-15/GRID	3' 6"	3' 6"	3' 6"
SEALTIE	4' 2"	3'	2' 6"
SHIELDS	3' 6"	3' 6"	3' 6"

NOTE: TWISTED PAIR (ARMATURE)
 WC-24 12 GA. BLACK
 DEARBORN No. 20129
 WC-23 12 GA. RED
 DEARBORN No. 201219

REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE:
 INDUSTRIAL INFORMATION CONTROLS 7070 PARK DRIVE CHARLESTON, MI 48817 (612-474-8100)				
TOLERANCE UNLESS SPECIFIED				
X.XXX	±			
X.XX	±			
X.X	±			
ANGLE	±			
TITLE: 3 AXIS MOTOR CABLES/LENGTHS				
APPLICATION: GENERAL PRODUCTS				
SCALE 1:1		DWG NO. 6-04-018-006		SIZE B
DATE: 12 DEC 88		DRAWN BY: REUTER		SHEET NO. 3 OF 3