INTRODUCTION

The DYNA MYTE 2400 is a three axis computer controlled precision miniature machine. It features precision ground and hardened slides, adjustable gibs, preloaded lead screws and a maintenance free precision high speed spindle. It has been designed and factory adjusted to provide long trouble-free service when it is properly maintained. User maintenance is minimal and consists only of oiling and periodic gib adjustment (as required). Mechanical parts that are subject to wear are easily replaceable. Electrical circuits are all modularized for easy replacement.

This Manual provides all the information necessary for maintenance and service of the machine. An accompanying Operating and Programming Manual describes the operation of the machine.

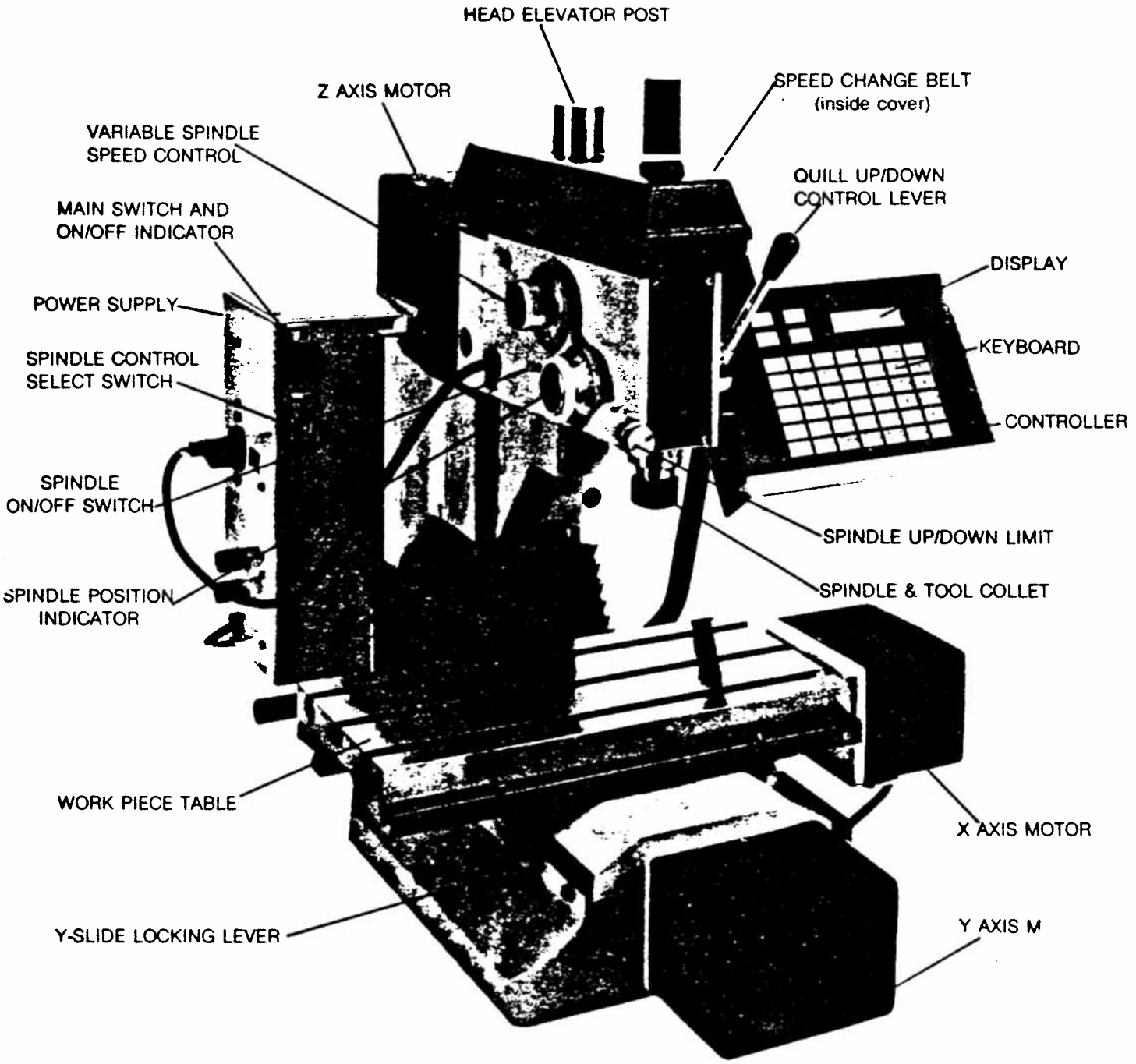
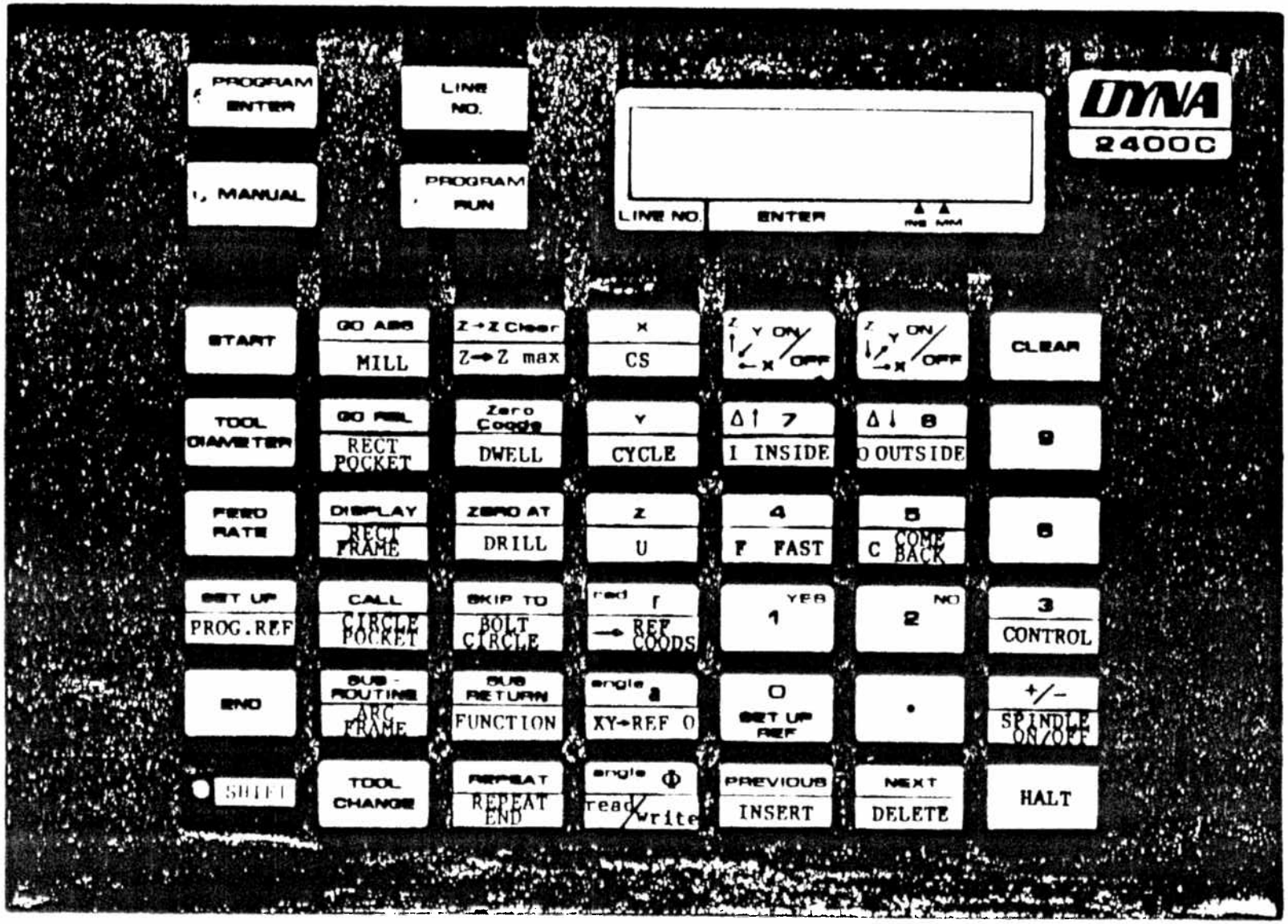


FIGURE 1 DYNA MYTE 2400 OPERATING CONTROLS


PROGRAM ENTER
LINE NO.
MANUAL
PROGRAM RUN
LINE NO.
ENTER
mm
DYNA
2400C
START
GO ABS
MILL
Z→Z Clear
Z→Z max
X
CS
Y ON
OFF
Y ON
OFF
CLEAR
TOOL DIAMETER
GO REL
RECT POCKET
Zero Coods
DWELL
Y
CYCLE
Δ 7
I INSIDE
Δ 8
O OUTSIDE
9
FEED RATE
DISPLAY
RECT FRAME
ZERO AT
DRILL
Z
U
4
F FAST
5
C COME BACK
6
SET UP
PROG.REF
CALL
CIRCLE POCKET
SKIP TO
BOLT CIRCLE
rad r
REF COODS
YES
1
NO
2
3
CONTROL
END
SUB-ROUTINE
ARC FRAME
SUB RETURN
FUNCTION
angle α
XY→REF 0
0
SET UP REF
•
+/−
SPINDLE ON/OFF
SHIFT
TOOL CHANGE
REPEAT
REPEAT END
angle Φ
read/write
PREVIOUS
INSERT
NEXT
DELETE
HALT

The DYNA MYTE 2400 is a precision machine. It will provide long, trouble-free service if it is properly maintained and adjusted. The required maintenance procedures are simple and are described in the following sections.

BREAK-IN OPERATION

The break-in period is approximately 24 hours. Prior to start of operation the machine should be lubricated for proper operation. During the break-in period the machine should not be excessively loaded. Do not use a heavy workpiece or maximum cutting speed or feed rates. The User Exercise described in the Operating Manual is a good first machining routine, since it familiarizes the user with the machine operation and provides an easy break-in of the machine.

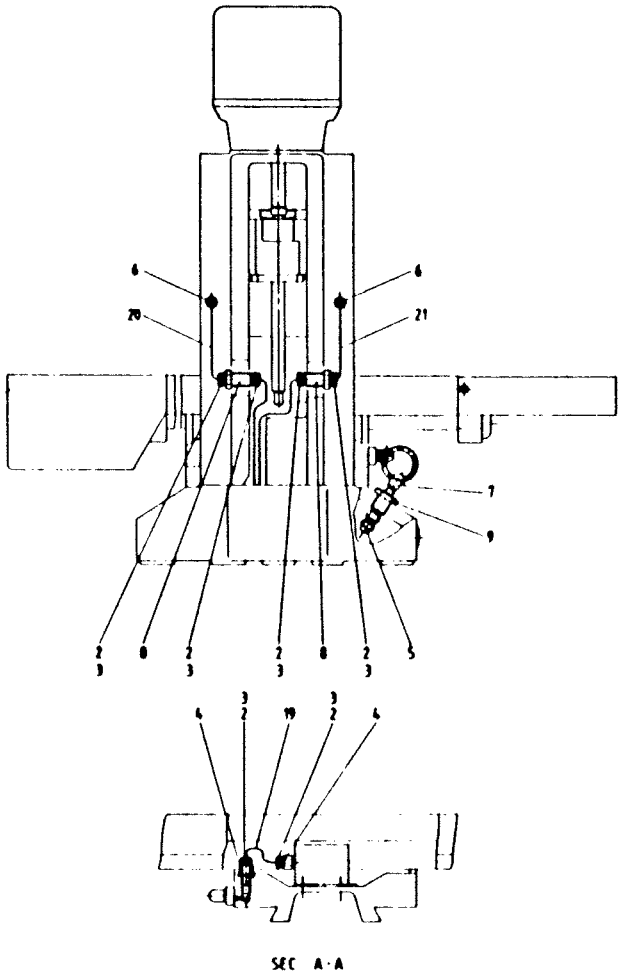
During this period, the X, Y, and Z slides will bed in to each other and the oil may become excessively contaminated due to this initial wear-in. The slides and the spindle surface should be inspected frequently dring this period for evidence of dirty oil. If evident, the surfaces should be cleaned with a soft cloth moistened with the same oil and the slides should be re-lubricated. The spindle bearings have been permanently lubricated with a high quality lubricant. No further lubrication of the spindle is necessary until it needs replacement

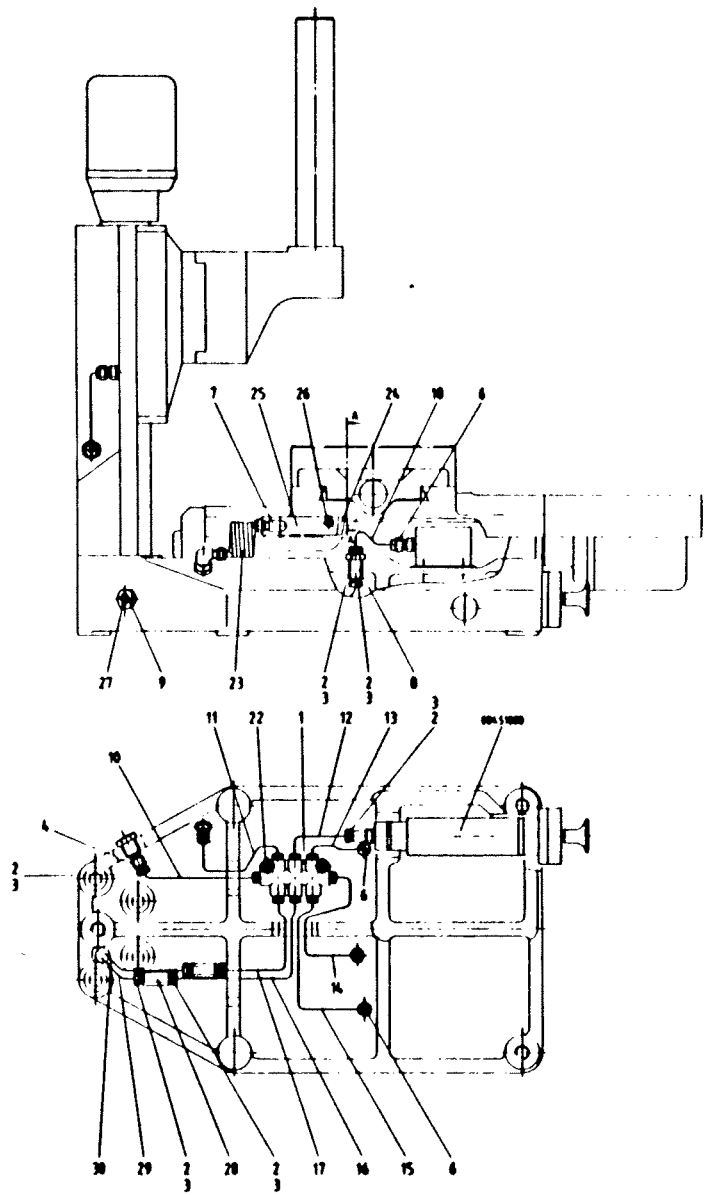
OILING

The most important maintenance routine is proper and daily oiling. This protects the machine from corrosion, excessive wear. The interval of lubrication, the lubrication points and the type of oil to be used are shown in the CENTRALIZED LUBRICATION SYSTEM diagram. A list of suitable oils is given in Table 1. Use only the recommended oil and do not mix oils of different types or use heavy oil for lubrication.

Inspect the slides often for evidence of discolored or dirty oil. If this is observed, lubricate the slides even if it is not the routine oiling time. Keep the slides clean of all debris and metal particles by wiping them off with a soft cloth moistened in oil. DO NOT CLEAN SLIDES OR TABLE WITH AN AIR GUN as this will force particles between the slides.

CENTRALIZED LUBRICATION SYSTEM





COMPARATIVE OIL TABLE

NAME SYMBOLS	MOBIL OIL	SHELL OIL	ESSO OIL	CALTEX OIL	BP OIL	SUN OIL
A OIL	MOBIL VELOCITE OIL NO. 6	SHELL TELLUS OIL 13	SPINESSO 34	SPINTEX OIL 60	BP ENER–GOL HP 3	SOLNUS 55
B_1 OIL	MOBIL DTE OIL LIGHT	SHELL TELLUS OIL 127	TERESSO 43	REGAL OIL AR & O	– – – – –	SUNVIS 916
B_2 OIL	MOBIL DTE 24	SHELL TELLUS OIL 27	NUTO H 44	RANDO OIL A	BP ENERGOL HLP 65	SUNVIS 816WR
C OIL	MOBIL VACUOLINE OIL 1405	SHELL TONNA T OIL 25	FEBIS 42	WAY LUBRI–CANT 160	BP ENERGOL HP 10–C	SUN LUBE–WAY 150
D OIL	MOBIL VACTRA OIL HEAVY MEDIUM	SHELL VITREA OIL 33	ESSTIC 50	REGAL OIL PCR & O	BP ENERGOL EM 100	SUNVIS 831WR
E OIL	MOBIL DTE OIL HEAVY MEDIUM	SHELL TELLUS OIL 33	TERESSO 52	REGAL OIL PCR & O	BP ENERGOL HLP 100	SUNVIS 931
F OIL	MOBIL VACUOLINE OIL 1409	SHELL TONNA T OIL 33	FEBIS 50	WAY LUBRI–CANT D	BP ENERGOL HP 20–C	SUN LUBEWAY 300
G OIL	MOBIL VACTRA OIL NO. 2	SHELL TONNA T OIL 33	FEBIS K–53	WAY LUBRI–CANT D	BP ENERGOL HP 20–C	SUNOCO WAY LUB. 80

TABLE 1

H OIL	MOBIL VACTRA OIL HEAVY	SHELL VITREA OIL 37	ESSTIC 55	REGAL OIL PER & 0	BP ENERGOL EM 150	SUNVIS 841WR
I OIL	MOBIL DTE OIL EXTRA HEAVY	SHELL TELLUS OIL 41	TERESSO 65	REGAL OIL FR & 0	BP ENERGOL HLP 175	SUNVIS 975
J OIL	MOBILVACTRA OIL EXTRA HEAVY	SHELL TELLUS OIL 41	ESSTIC 65	REGAL OIL FR & 0	BP ENERGOL EM 175	SUNVIS 851WR
K OIL	MOBIL VACTRA OIL NO. 4	SHELL TONNA T OIL 71	FEBIS K–73	WAY LUBRI– CANT G	BP ENERGOL HP 60–C	SUNOCO WAY LUB. 90
L OIL	MOBIL COMPOUND DD	SHELL MACOMA R OIL 76	PEN–O–LED EP3	MEROPA LUB– RICANT 3	BP ENERGOL GR 425 EP	SUNEP 1090
M OIL	MOBILTAC D	SHELL CARDIUM COMPOUND D	SURRETT FLUID 30	CRATER 2X FLUID	BP ENERGOL GR 3000–2	SUN DRAWING COMPOUND
N OIL	MOBIL NC SYSTEM OIL	SHELL NC OIL 923	UNIVIS N47	-----	-----	-----
Y OIL	MOBILUX 2	SHELL ALVANIA GREASE 2	BEACON 2	REGAL STARFAK PREMIUM 2	BP ENER– GREASE LS–2	SUN PRESTIGE GREASE 42
Z OIL	MOBILPLE X 46	SHELL EP GREASE	LADEX 0	MULTFAC EP 0	BP ENER– GREASE LS–0	SUN PRESTIGE GREASE 740

TAPER GIBS ADJUSTMENT

The DYNA MYTE 2400 has an adjustable taper gib on each of the three axes. These provide for maintaining the accuracy of the machine table movement as the taper gibs wear-in. When the taper gibs wear-in, the clearance between the slides increases. This results in loss of table accuracy, squareness, and parallelism. It also results in chatter, poor surface finish, and excessive loads on the lead screws and drive motors. All slides should be inspected for looseness periodically. If looseness is detected the taper gibs should be adjusted.

Each taper gib is held in place by an adjusting screw and a locking screw, as shown in figure 4. To adjust the taper gib, loosen the locking screw and tighten the adjusting screw clockwise slightly until a slight drag is felt. When the correct setting is reached, tighten the locking screw.

In the event of overtightening the adjusting screw, the slide would not move smoothly when the machine has been started. In this case, loosen the adjusting screw and tighten the locking screw a little bit for loosening the taper gib. Then the readjusting can be done according to the same procedures described above.

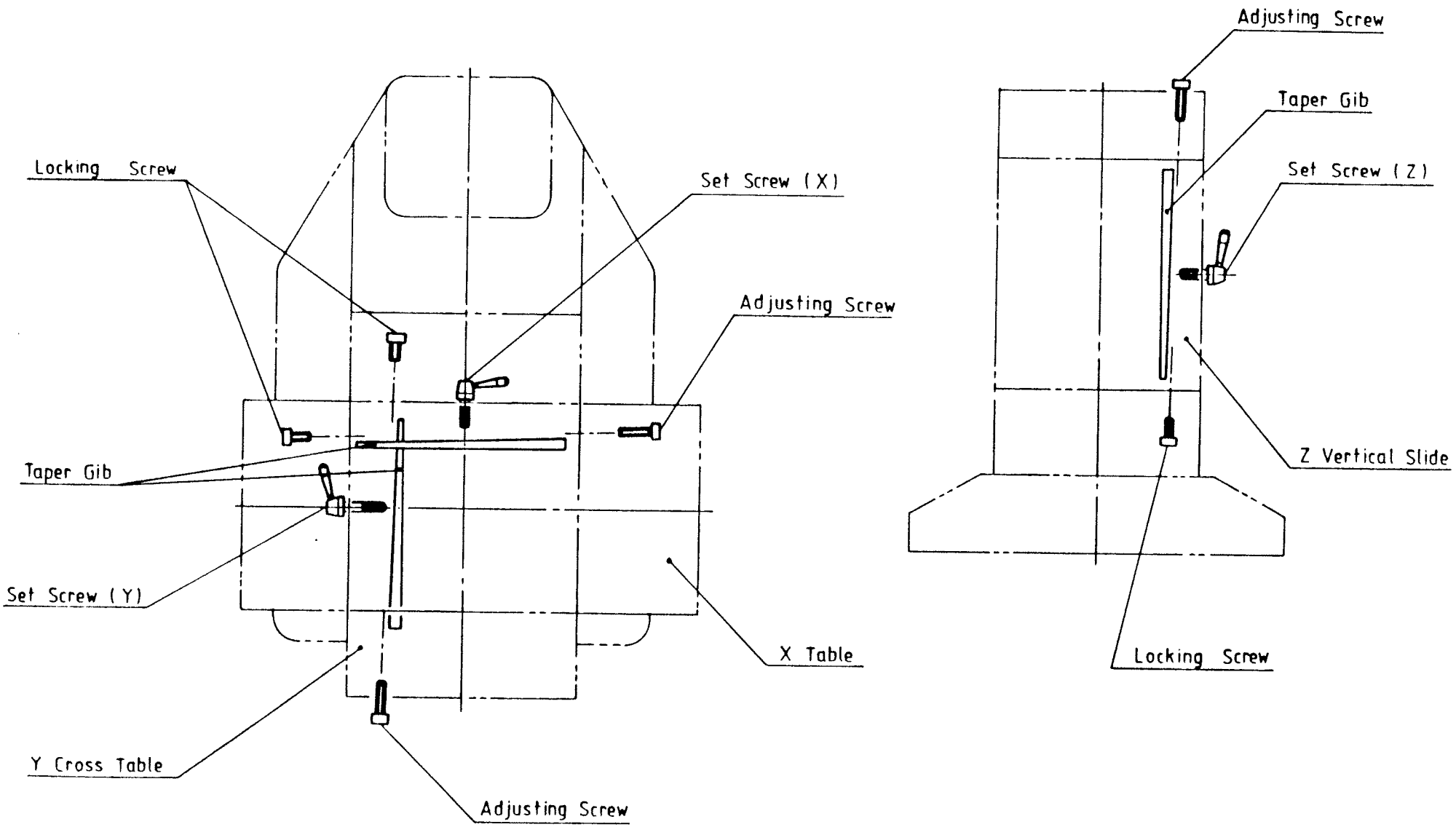


FIGURE 4 TAPER GIBS ADJUSTMENT

SPINDLE ADJUSTMENT

The DYNA MYTE 2400 spindle is supported by three preloaded angular contact ball bearings. These bearings have been carefully adjusted at the factory and should not be tampered with. If the spindle exhibits signs of wear or excessive heat the entire spindle assembly should be replaced.

MECHANICAL REPAIRS

The spindle drive belt, the spindle assembly and the X, Y, and Z table lead screws and supernuts are subject to wear, and may need replacement after long periods of operation. The replacement procedures are described below.

BELT REPLACEMENT

Replace the belt if it shows signs of wear. The belt can be easily removed by raising it slightly above the pulley at the point where it contacts the pulley, and simultaneously rotating the pulley clockwise. Replace the belt and adjust the belt tension. To adjust the tension on the belt and to compensate for tolerance in the length of the belt the spindle drive can be moved in 2 mm increments. To move the spindle motor loosen the four hexagonal head bolts (Item #72 of SPINDLE HOUSING ASSEMBLY) and move the motor until belt tension is satisfactory. Do not put too much tension on the belt as this will put a load on the spindle and will result in excessive heating of the spindle.

MACHINE SPECIFICATIONS

Drilling capacity	
Mild Steel	5 mm, 0.2"
Aluminum	10 mm, 0.37"
Endmill capacity	
Mild Steel, Aluminum	10 mm, 0.37"
Max distance from spindle nose to table	232 mm, 9.1"
Spindle stroke	38 mm, 1.5"
Quill diameter	36 mm, 1.4"
Spindle speed	0 - 10,000 rpm Continuously adjustable
X-axis travel (longitudinal)	157 mm, 6.2"
Y-axis travel (cross)	126 mm, 5"
Z-axis travel (vertical)	105 mm, 4"
work table area	330 x 150 mm, 13" x 6"
Spindle motor	1/2 HP Universal AC type
Size	Width 602, Depth 546, Height 546 mm, W 23.7", D 21.5", H 21.5"
Net Weight	130 kg, 290 Lbs.
Resolution	All axes 0.0025 mm. 0.0001"
Repeatability	0.01 mm, 0.0005"
Power Requirements	120 V 60 Hz AC Single Phase, 7 Amps
Rapid Traverse	30 in./min. for all axes
Position Accuracy	0.012 in./total 0.03 mm/total
Spindle Collet Capacity	1/16" - 3/8" (1 mm - 10 mm)

STANDARD ACCESSORIES

1.	Tool box		1 pc
2.	Spanner for collet nut		1 pc
3.	Spanner for spindle		1 pc
4.	Collet	10mm (3/8")	1 pc
5.	Hex wrench keys	1.5 - 6mm	7 pcs
6.	Double ended spanners	6 x 7, 8 x 10, 11 x 13mm	3 pcs
7.	Screw driver (+)	No. 2	1 pc
8.	Screw driver (-)	6 x 100mm	1 pc
9.	Colant recovery hose		1 pc
10.	Cable RS232		1 pc
11.	Dust cover		1 pc

OPTIONAL ACCESSORIES

1.	Long arbor for saws	(1/4" x 53)	1 set
2.	Arbor for saws	(1/4")	1 set
3.	Grinding arbor	(1/4")	1 set
4.	Fly cutter	(3/16")	1 set
5.	Base plate (both of steel and aluminum are available)		1 set
6.	Nut for tool holder		1 pc
7.	Long arbor for saws	(1/2" x 56)	1 set
8.	Arbor for saws	(1/2")	1 set
9.	Coolant collection hood		1 set
10.	Boring head	(3/8" x 5/16" st)	1 set
11.	Collets	1 - 9mm	11 pcs
12.	Quick-change nut for tool holder		1 pc
13.	Endmill tool holder	(3/16")	1 set
14.	Endmill tool holder	(1/4")	1 set
15.	Endmill tool holder	(3/8")	1 set
16.	Face mill arbor	(3/4")	1 set
17.	Chuck arbor	(JT 0)	1 pc
18.	Chuck arbor	(JT 1)	1 pc
19.	Chuck arbor	(JT 33)	1 pc
20.	Clamping kit		1 set
21.	Arbor for saws	(3/8")	1 set
22.	Blank tool holder	(OD. 0.63")	1 set
23.	Blank tool holder	(OD. 1.02")	1 set
24.	Cassette tapes		1 pc
25.	Probe		1 set

DYNA MYTE 2400
RECOMMENDED SPARE PARTS

PART NUMBER	DESCRIPTION
SP2001	BELTS
SP24021	DRIVER BOARD X AXIS
SP24022	DRIVER BOARD Y AXIS
SP24023	DRIVER BOARD Z AXIS
SP2403	DISTRIBUTION BOARD
SP2404	MOTOR SPEED CONTROLLER
SP2405	SUPER NUT
SP24061	LEAD SCREW X AXIS
SP24062	LEAD SCREW Y AXIS
SP24063	LEAD SCREW Z AXIS
SP2407	PINION GEAR
SP2408	SPUR GEAR
SP2409	STEPPER MOTOR
SP20101	LIMIT SWITCH X AXIS
SP20102	LIMIT SWITCH Y AXIS
SP20103	LIMIT SWITCH Z AXIS
SP2411	POWER SWITCH ON/OFF (ROCKER)
SP2412	COVER STEPPER MOTOR
SP2413	COVER BOTTOM BELT
SP2414	BELT COVER TOP
SP2415	WAY SHIELD X, Y, Z
SP2416	SPINDLE MOTOR
SP2419	BRUSHES FOR MOTOR

DYNA MYTE 2400

TROUBLESHOOTING GUIDE

TABLE OF CONTENTS

C INITIALIZATION INCOMPLETE

POSSIBLE CAUSE:	SOLUTION:
1. DIRTY LIMIT SWITCH:	REMOVE X AND Y AXIS LIMIT SWITCH COVERS. X LIMIT SWITCH COVER IS LOCATED ON THE FRONT SIDE OF THE X AXIS TABLE. Y LIMIT SWICH COVER IS LOCATED ON THE Y TABLE. USING THE EMERGENCY MOVE (BY ANSWERING "NO" TO THE "READY?" QUESTION), JOG THE X,Y AND Z AXIS, SO THAT THE LIMIT SWITCH POGO CONTACTS WILL BE OPEN; THEN CLEAN ALL OF THE SWITCHES WITH A DRY SOFT CLOTH.
2. BROKEN LIMIT SWITCH OR WIRE:	REPAIR OR REPLACE AS NEEDED
3. DISTRIBUTION BOARD:	IF BY UNPLUGGING ALL AXIS, TURNING POWER ON, ANSWERING YES TO THE "READY?" QUESTION, THE CONTROLLER SHOULD DISPLAY INITIALIZING FOR ABOUT 10 SECONDS. THEN IT SHOULD GO TO "MODE?". IF CONTROLLER STAYS IN "INITIALIZING", WITHOUT TIMING OUT; DISTRIBUTION BOARD MUST BE REPLACED.

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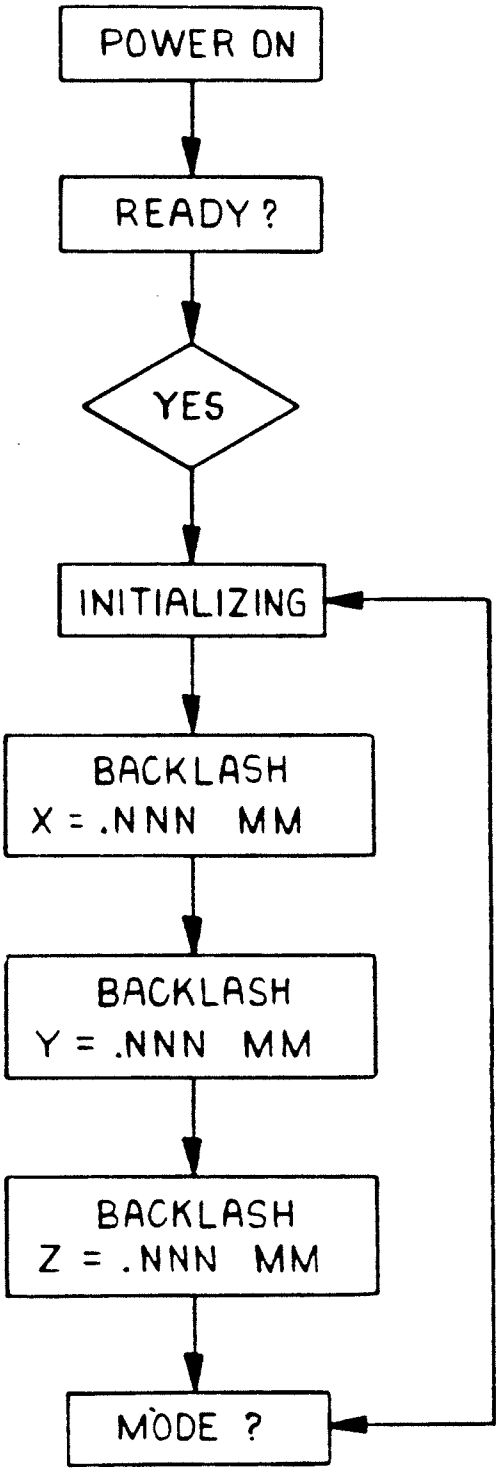
A - INITIALIZING FLOW CHART



CONTROLLER DISPLAY

E "STUCK AXIS"

POSSIBLE CAUSE:	CORRECTIVE ACTION:
1. LOCKED GIB LEVER	LOOSEN GIB LEVER
2. NEGATIVE BACKLASH (LIMIT SWITCH IS STILL CLOSED OR MAKING CONTACT)	CLEAN OR REPLACE AFFECTED POGO CONTACT

D "BACKLASH TOO BIG"

POSSIBLE CAUSES:	CORRECTIVE ACTION:
1. LIMIT SWITCH CONTAMINATION	CLEAN AFFECTED LIMIT SWITCH AND LOCAL AREA.
2. LIMIT SWITCH BROKEN	REPLACE AFFECTED SWITCH
3. POGO CONTACT MARGINAL	REPLACE AFFECTED POGO

F-STEPPER MOTOR HUMMING

POSSIBLE CAUSE:	CORRECTIVE ACTION:
1. LOCKED GIB LEVER	UNLOCKED ALL GIB LEVER BEFORE TRYING TO INITIALIZE THE MACHINE.
2. LIMIT SWITCH IS NOT BEING DETECTED	CLEAN OR REPLACED FAULTY SWITCH
3. DEFECTIVE MOTOR	REFER TO SERVICE INSTRUCTIONS SECTION "D"
4. DEFECTIVE STEPPER DRIVER BOARD	REFER TO SECTION G2

6 POWER ON, CONTROLLER DISPLAYS "INITIALIZING" BUT NO AXIS MOVEMENT

POSSIBLE CAUSE:	CORRECTIVE ACTION:
1. LOCKED GIB LEVERS	UNLOCKED ALL GIB LEVERS BEFORE ATTEMPTING TO TO INITIALIZE THE MACHINE
2. DEFECTIVE STEPPER DRIVER BOARD	TURN POWER ON, AND ANSWER "NO" TO THE "READY?" QUESTION ON THE CONTROLLER YOU ARE NOW IN THE EMERGENCY MOVE MODE. SELECT ONE AXIS AT THE TIME TO DETERMINE WHICH AXIS IS FAULT. REPLACE DEFECTIVE BOARD.
3. DEFECTIVE MOTOR	REFER TO SECTION D

COMMON PROBLEMS AND THEIR SOLUTIONS

SOFTWARE

1. Program missing or parts of program data incorrect. You are disconnecting controller from machine or desktop unit without first switching off power. This will scramble the memory.

2. Program runs occasionally off at random. This is due to electrial noise coming down the line from other machines. Try another outlet. Always avoid outlets wired to large machines.

3. Drift in set-up reference zero position. Occurs when you omit END NEWPART in program or use SKIP TO before END NEWPART.

4. Inch values changed to metric. May occur when line number 002 is ignored and program start is on a different line number of the memory stack.

HARDWARE

1. Sticking axis - Inadequate lubrication is usually at fault. Run axis test (diagnostics in manual mode) to check axis while lubricating. Only after exhausting other service procedures, should you adjust gibs.

2. Large variations in backlash measurments - Contamination of limit switches. They should be free and clear of dirt, oil, grime and other debris. Large inaccurate backlash will produce circles skewed at 0 and 180 or 90 and 270 degrees.

3. Lack of keystroke response - Contamination of keyboard with oil, dirt, or protective covering, oily hands, missing or faulty ground at outlet, or limit switches filled with metal shavings.

4. Inoperative axis - Loose axis plug at socket. A loose axis plug can cause intermitten operation or total axis failure.

5. No spindle operation.-Check circuit breaker under spindle belt cover. Check spindle on-off control for proper position. Check 3 amp and 10 amp fuse.

6. Noisy spindle.-Caused by a loose spindle belt. Tighten belt by agjusting position of motor to minimize belt noise.

SERVICE

INSTRUCTIONS

A REPLACEMENT OF STEPPER MOTOR

1. DO ALL MAINTENANCE IN AXIS DRIVE AREA WITH ALL POWER OFF. DISCONNECT AC CORD FROM OUTLET.

2. REMOVE APPROPRIATE AXIS COVER (2 SCREWS).

3. REMOVE STEPPER MOTOR HEAT SINK (2 OR 4 HEX NUTS, DEPENDING ON CONFIGURATION).

4. DISCONNECT DRIVER BOARD CONNECTORS (4).

5. REMOVE DRIVER BOARD (2 SHORT SCREWS, 2 LONG SCREWS).

6. REMOVE SCREW (1) SECURING AXIS CABLE TO MOTOR PLATE (BELOW STEPPER MOTOR).

7. REMOVE SOCKET HEX SCREWS (4) SECURING MOTOR PLATE TO BEARING HOUSING.

8. REMOVE SCREWS (2 OR 4 SCREWS DEPENDING ON CONFIGURATION) SECURING STEPPER MOTOR TO MOTOR PLATE. NOTE POSITION OF STEPPER MOTOR WIRES.

9. REVERSE PROCEDURE TO INSTALL NEW STEPPER MOTOR, APPLY HEAT SINK COMPOUND (IF AVAILABLE) TO MATING SURFACES OF STEPPER MOTOR.

10. RETURN REPLACED ITEMS FOR CREDIT . SEE RMA NUMBER.

NOTES:

1. POSITION OF MOTOR PLATE IS IMPORTANT FOR PROPER GEAR MESH, REDUCED NOISE, AND DECREASED BACKLASH.

   A). RUN HEX SOCKET SCREWS IN UNTIL MOTOR PLATE

   B). VISUALLY CENTER MOTOR PLATE AND BIAS TOWARDS THE RIGHT, UNTIL GEAR MESH IS FELT AND THEN TIGHTEN SOCKET HEX SCREWS. DO NOT USE TOO MUCH FORCE OR THE NOISE LEVEL WILL INCREASE, GEARS WILL WEAR OUT SOONER, OR JAMS MAY OCCUR.

B REPLACEMENT OF DISTRIBUTION BOARD

1. DO ALL MAINTENANCE IN POWER PACK WITH ALL POWER OFF. DISCONNECT AC CORD FROM OUTLET.

2. REMOVE POWER PACK COVER.

3. REMOVE CONNECTORS FROM DISTRIBUTION BOARD, NOTING REPLACEMENT AND DIRECTION OF CONNECTORS, INSIDE AND OUTSIDE OF PACK.

4. REMOVE 6 SCREWS SECURING DISTRIBUTION BOARD TO THE SIDE PANAL OF POWER PACK.

5. REPLACE NEW BOARD.

6. REINSTALL ALL CONNECTORS.

C REPLACEMENT OF MOTOR SPEED CONTROL BOARD

1. DO ALL MAINTENANCE WITH POWER OFF. DISCONNECT AC POWER CORD FROM OUTLET.

2. REMOVE POWER PACK COVER.

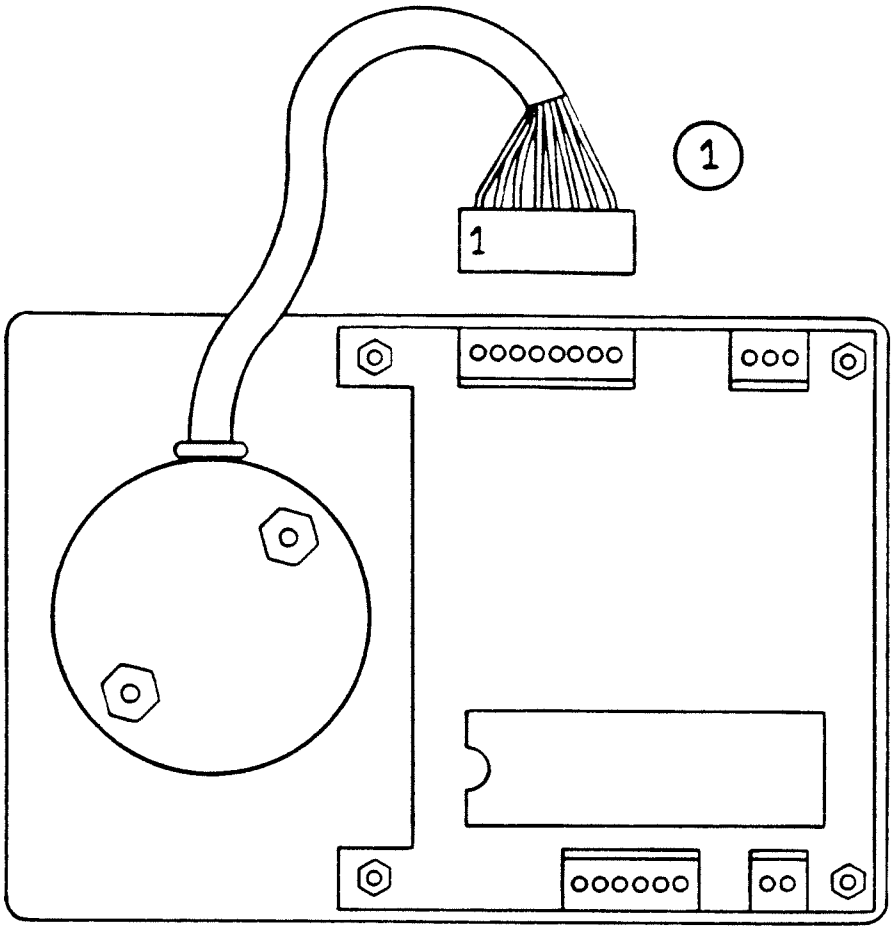
3. DISCONNECT WHITE MOLEX CONNECTOR ONLY.

4. REMOVE 5 SCREWS SECURING BOARD TO THE SIDE PANEL OF POWER PACK.

5. REPLACE NEW BOARD.

6. RECONNECT WHITE MOLEX CONNECTOR.

D ORIENTATION AND WIRING OF STEPPER MOTOR

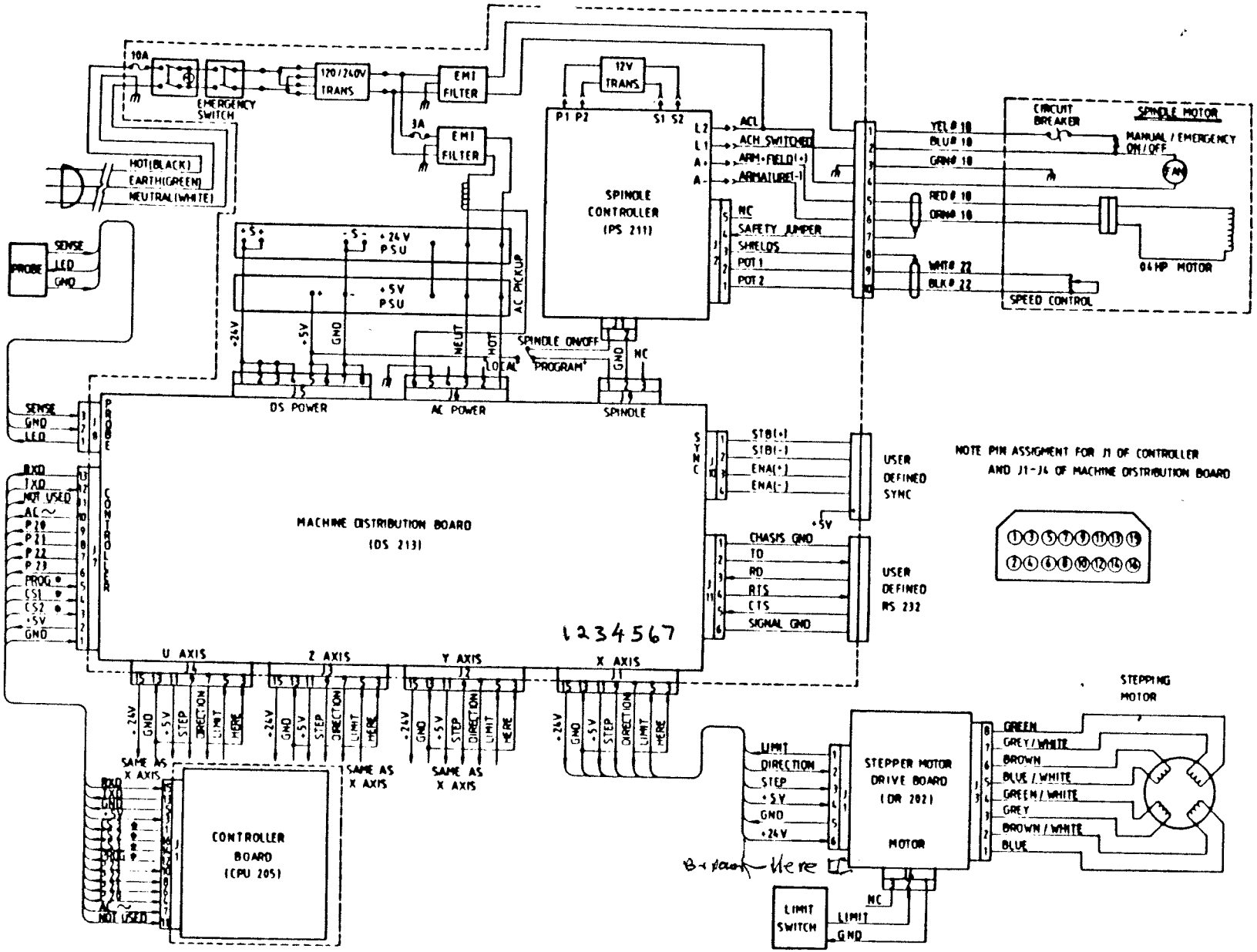


MEASURING STEPPER MOTOR WINDINGS. THEY SHOULD READ BETWEEN .7 TO 1 OHM RESISTANCE. IF THEY DON'T - REPLACE STEPPER MOTOR. UNPLUG MOTOR CONNECTOR ON APPROPRIATE DRIVE. LOOKING TOWARD LEAD SCREW, BLUE WIRE WILL BE ON YOUR LEFT. COUNTING THIS AS NUMBER 1 CHECK RESISTANCE (SEE WIRE TABLE) BETWEEN 1 & 5, 2 & 6, 3 & 7, 4 & 8. IF READINGS ARE CORRECT , REMOVE COVER FROM ANOTHER MOTOR , REMOVE HEAT SINK, REMOVE 8748 MICRO PROCESSOR AND INSTALL IN DRIVER BOARD. IF AXIS MOVES, 8748 MICRO PROCESSOR CHIP MUST BE REPLACED, IF NOT, REPLACE DRIVER BOARD.

WIRE TABLE	
PIN NO.	COLOR
1	GRN
2	GRA/WHT
3	BRN
4	BLU/WHT
5	GRN/WHT
6	GRA
7	BRN
8	BLU

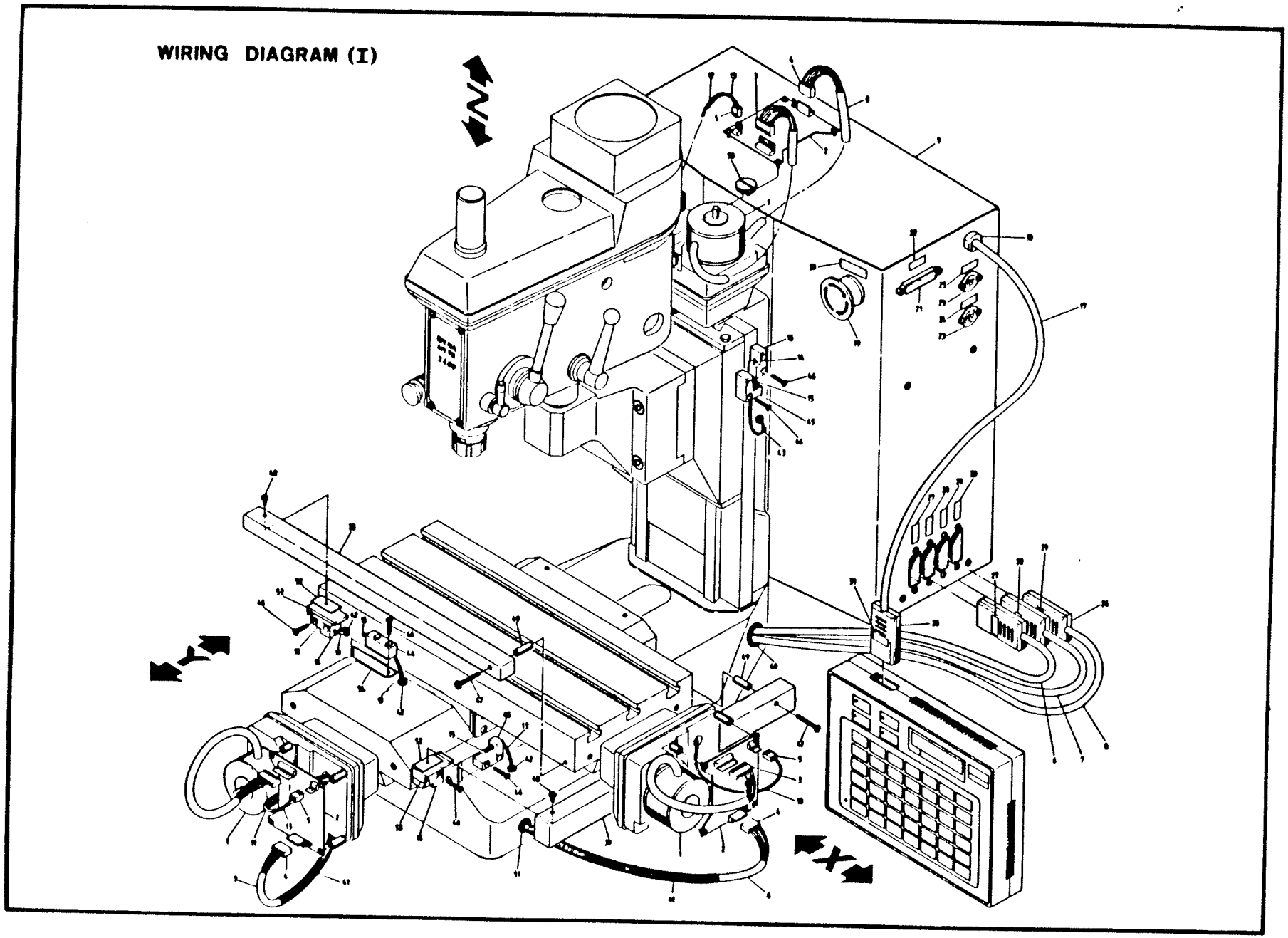
DYNA MYTE

WIRING DIAGRAM

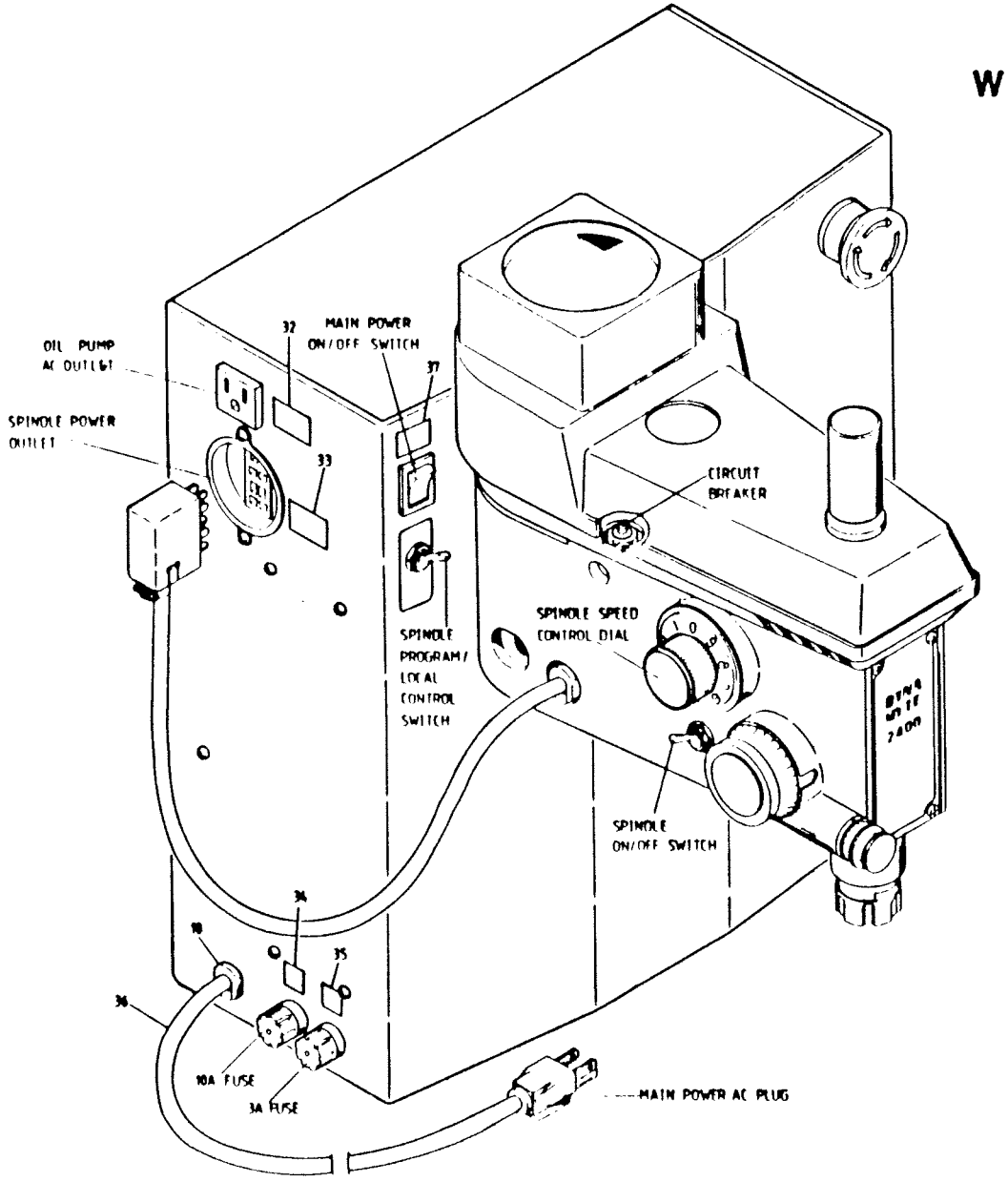

10A
EMERGENCY SWITCH
120/240V TRANS
EMI FILTER
3A
EMI FILTER
12V TRANS
P1 P2
S1 S2
SPINDLE CONTROLLER (PS 211)
L2
L1
A+
A-
ACL
ACH SWITCHED
ARM+FIELD(+)
ARMATURE(-)
NC
SAFETY JUMPER
SHIELDS
POT 1
POT 2
HOT(BLACK)
EARTH(GREEN)
NEUTRAL(WHITE)
PROBE
SENSE
LED
GND
+24V PSU
+5V PSU
AC PICKUP
+24V
+5V
GND
NEUT
HOT
LOCAL
PROGRAM
SPINDLE ON/OFF
GND
NC
DS POWER
AC POWER
SPINDLE
CIRCUIT BREAKER
SPINDLE MOTOR
MANUAL / EMERGENCY ON/OFF
FAN
YEL # 18
BLU # 18
GRN # 18
RED # 18
ORN # 18
WHT # 22
BLK # 22
.04 HP MOTOR
SPEED CONTROL
MACHINE DISTRIBUTION BOARD (DS 213)
1234567
PROBE
CONTROLLER
SYNC
STB(+)
STB(-)
ENA(+)
ENA(-)
+5V
USER DEFINED SYNC
CHASIS GND
TD
RD
RTS
CTS
SIGNAL GND
USER DEFINED RS 232
NOTE PIN ASSIGMENT FOR J1 OF CONTROLLER AND J1-J6 OF MACHINE DISTRIBUTION BOARD
BLKD
TXD
NOT USED
AC ~
P20
P21
P22
P23
PROG *
CS1 *
CS2 *
+5V
GND
U AXIS
Z AXIS
Y AXIS
X AXIS
+24V
GND
+5V
STEP
DIRECTION
LIMIT
HERE
SAME AS X AXIS
CONTROLLER BOARD (CPU 205)
LIMIT
DIRECTION
STEP
+5V
GND
+24V
STEPPER MOTOR DRIVE BOARD (DR 202)
MOTOR
Black Here
LIMIT SWITCH
NC
LIMIT
GND
STEPPING MOTOR
GREEN
GREY / WHITE
BROWN
BLUE / WHITE
GREEN / WHITE
GREY
BROWN / WHITE
BLUE

PARTS LIST

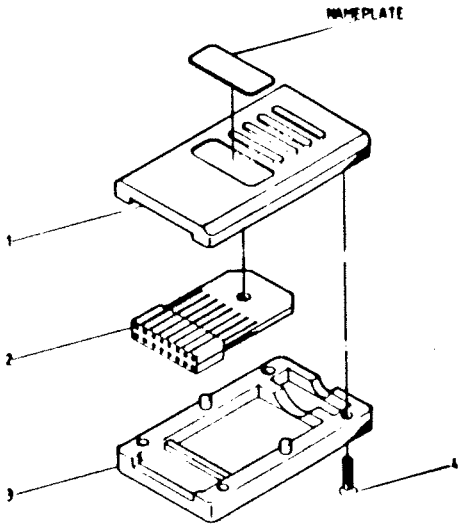
WIRING DIAGRAM (I)



WIRING DIAGRAM (II)



CONNECTOR ASSEMBLY



WIRING DIAGRAM

Ref. No.	Parts Number	Parts Name	Q'ty	Spec.
1	7403-00002	Stepping Motor	3	PMI US52
2	7102-00001	Stepping Motor Driver Brd	3	
3	7902-00008	Terminal Housing	3	8 Pin
4	7902-00006	Terminal Housing	3	6 Pin
5	7902-00003	Terminal Housing	3	3 Pin
6	7200-00002	7-Conductor Cable X	1	Belden 9537
7	7200-00003	7-Conductor Cable Y	1	Belden 9537
8	7200-00004	7-Conductor Cable Z	1	Belden 9537
9	00441000	Power Package	1	
10		Wire	1	Orange 24AWG
11		Wire	1	Blue 24AWG
12		Wire	1	Yellow 24AWG
13		Wire	1	Black 24AWG
14	7904-00001	POGO Contact	3	P2532-1
15	7904-00002	Terminal Lug	3	#2009
16	00144007	Contact Seat	3	
17	7200-00001	15 Conductor Cable	1	Belden 9541
18	7701-00001	Strain Relief	1	SB6N-4
19	7500-00004	Emergency Stop SW	1	10A/500VAC
20	00441009	Emergency Stop Name-plate	1	
21	7900-00003	D-Connector Female	1	
22	00441006	D-Connector Name Plate	1	
23	7900-00002	DIN Female Connector	1	
24	00141017	PROBE Name Plate	1	
25	00441005	SYNC I/O Name Plate	1	

WIRING DIAGRAM

Ref. No.	Parts Number	Parts Name	Q'ty	Spec.
26	00146000	Connector	4	
27	00141006	X Axis Name Plate	1	
28	00141007	Y Axis Name Plate	1	
29	00141008	Z Axis Name Plate	1	
30	00141009	U Axis Name Plate	1	
31	00146003	Controlier Name Plate	1	
32	00441010	110VAC Name Plate	1	
33	00141011	SPINDLE POWER Name Plate	1	
34	00141013	3A Fuse Name Plate	1	
35	00141014	10A Fuse Name Plate	1	
36	7203-00002	Power Cord	1	10A/125V
37	00441007	Power ON/OFF Name Plate	1	
38	00444001	X-Axis Cover	1	
39	0044003	Y-Axis Cover	1	
40	00148003	Protection Ring	1	
41	00148005	Cable Protection Spring	2	
42	00148001	Protection Ring	6	
43	00148004	Wire Protection Spring	1	
44	0014404	X-Axis Terminal Seat	1	
45	00144006	YZ-Axis Terminal Seat	2	
46	0107-03016	CRS Recd Rnd Hd Mach SCR	12	M3x16
47	0111-03025-122	CRS Recd Bdg Mach SCR	2	M3x25
48	0111-03006	CRS Recd Bdg Mach SCR	2	M3x6
49	0044002	Spacer	3	
50	00441012	Screw	1	

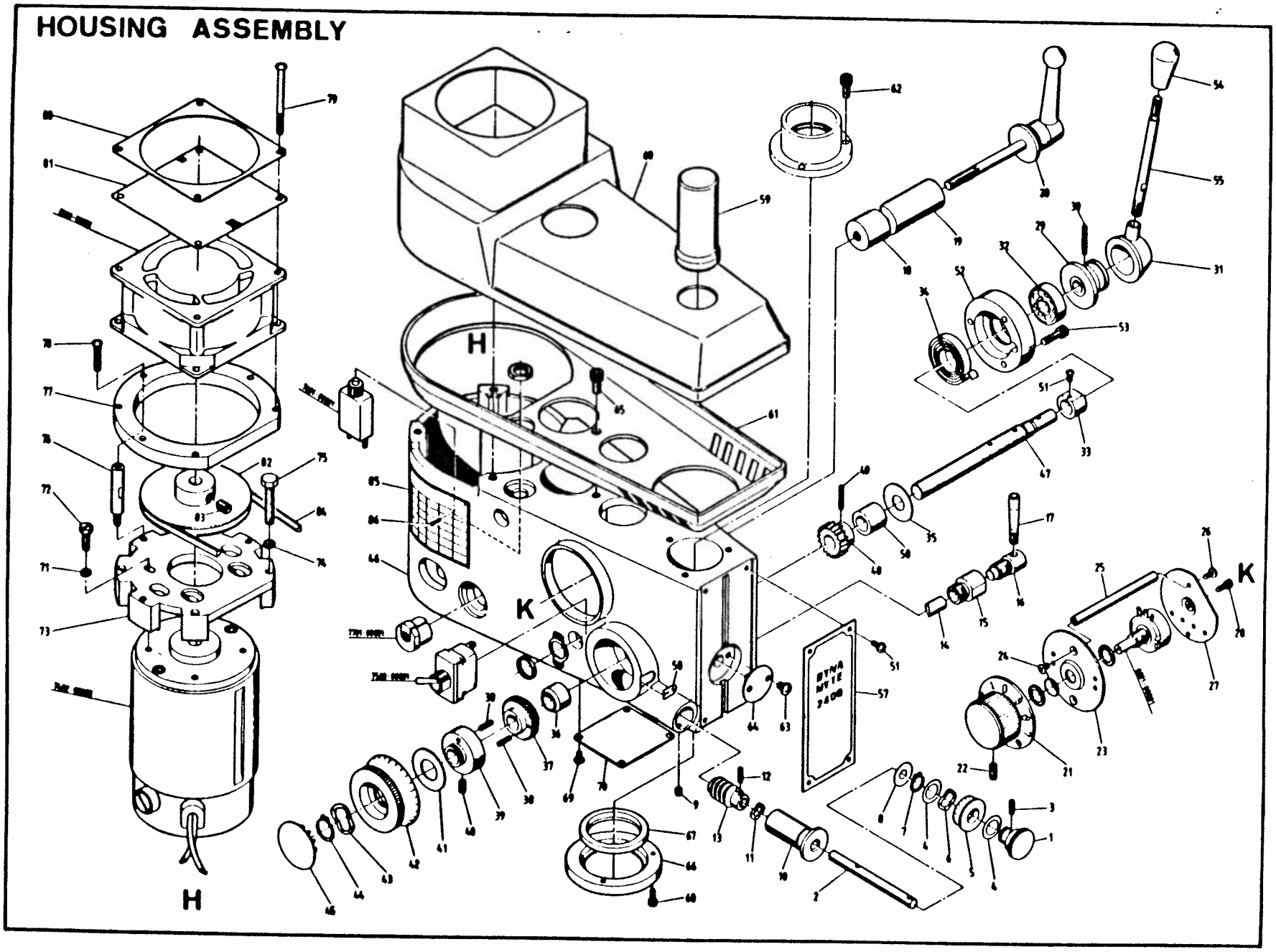
WIRING DIAGRAM

Ref. No.	Parts Number	Parts Name	Q'ty	Spec.
51	00148002	Protection Spring	3	
52	00444004	Packing	2	329MM
53	00444005	Contact Seat Cover	2	
54	00444006	Terminal Seat Cover	2	

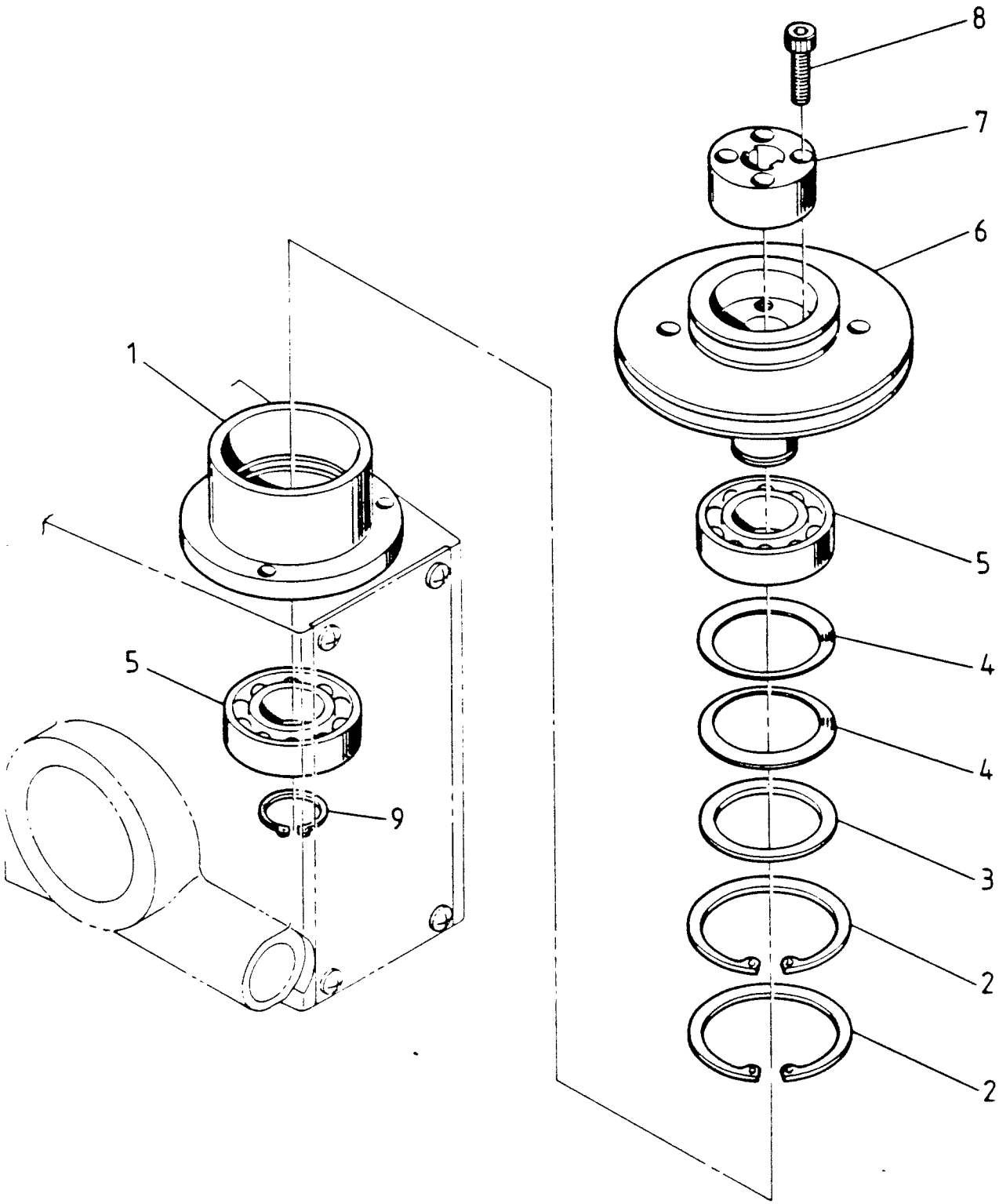
CONNECTOR ASSEMBLE

Ref. No.	Parts Number	Parts Name	Q'ty	Spec.
1	00146001	Upper Cover	4	
2	7902-00030	Female Header	4	8x2
3	00146002	Base	4	
4	0135-02309-122	Crs Recd Flat Hd Tapping Scr	16	M2.3x9

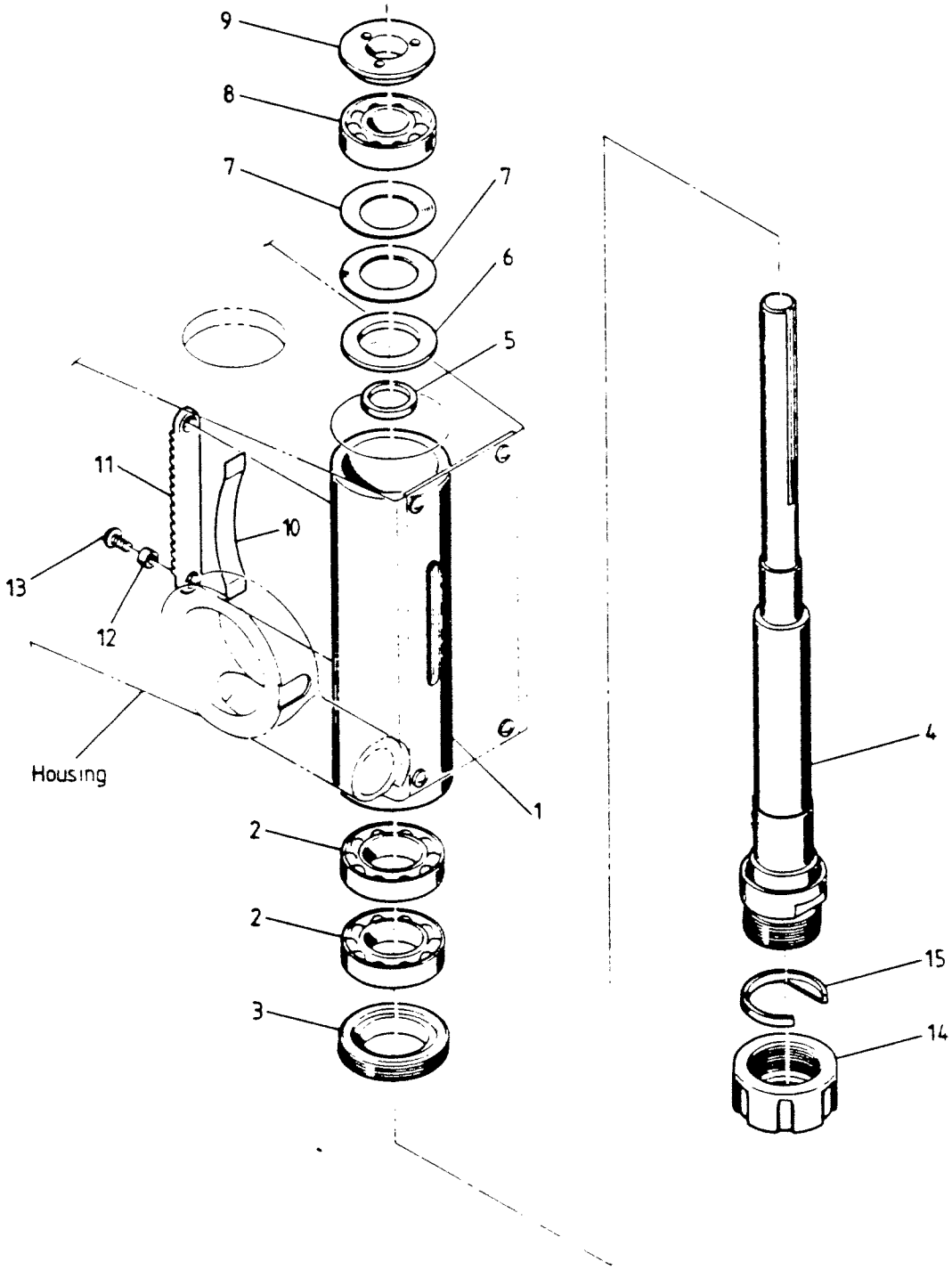
HOUSING ASSEMBLY



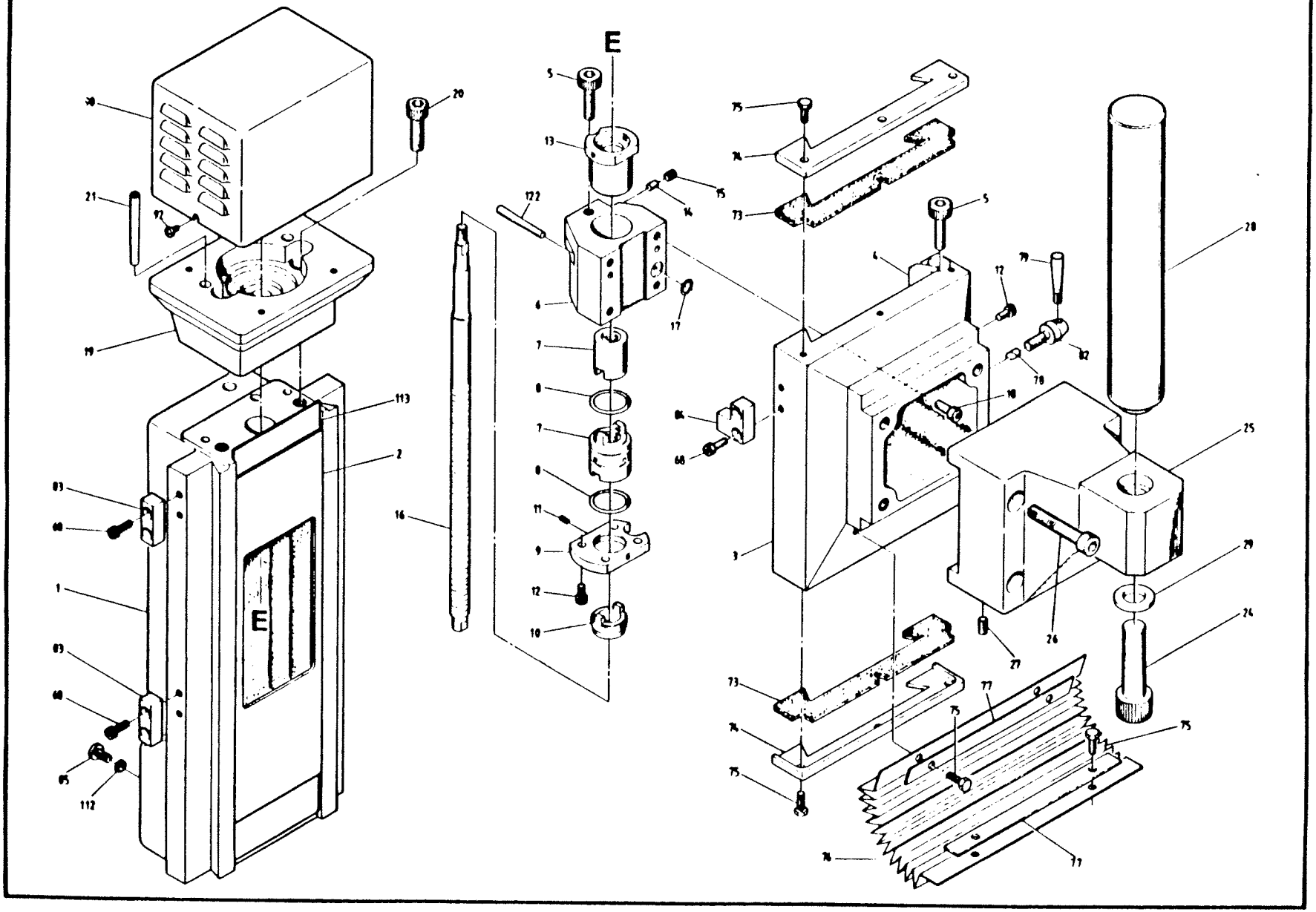
SPINDLE PULLEY ASSEMBLY



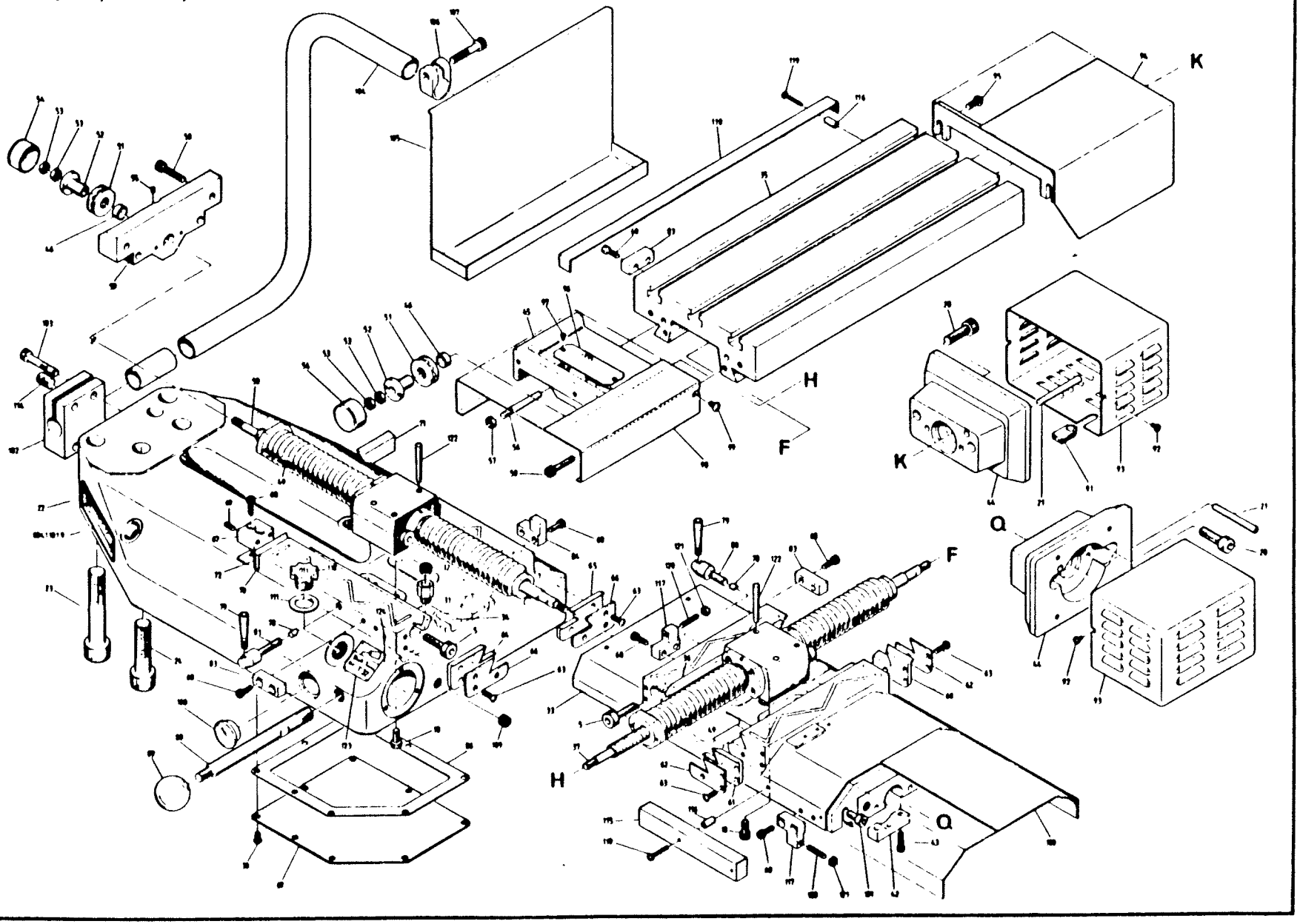
SPINDLE ASSEMBLY



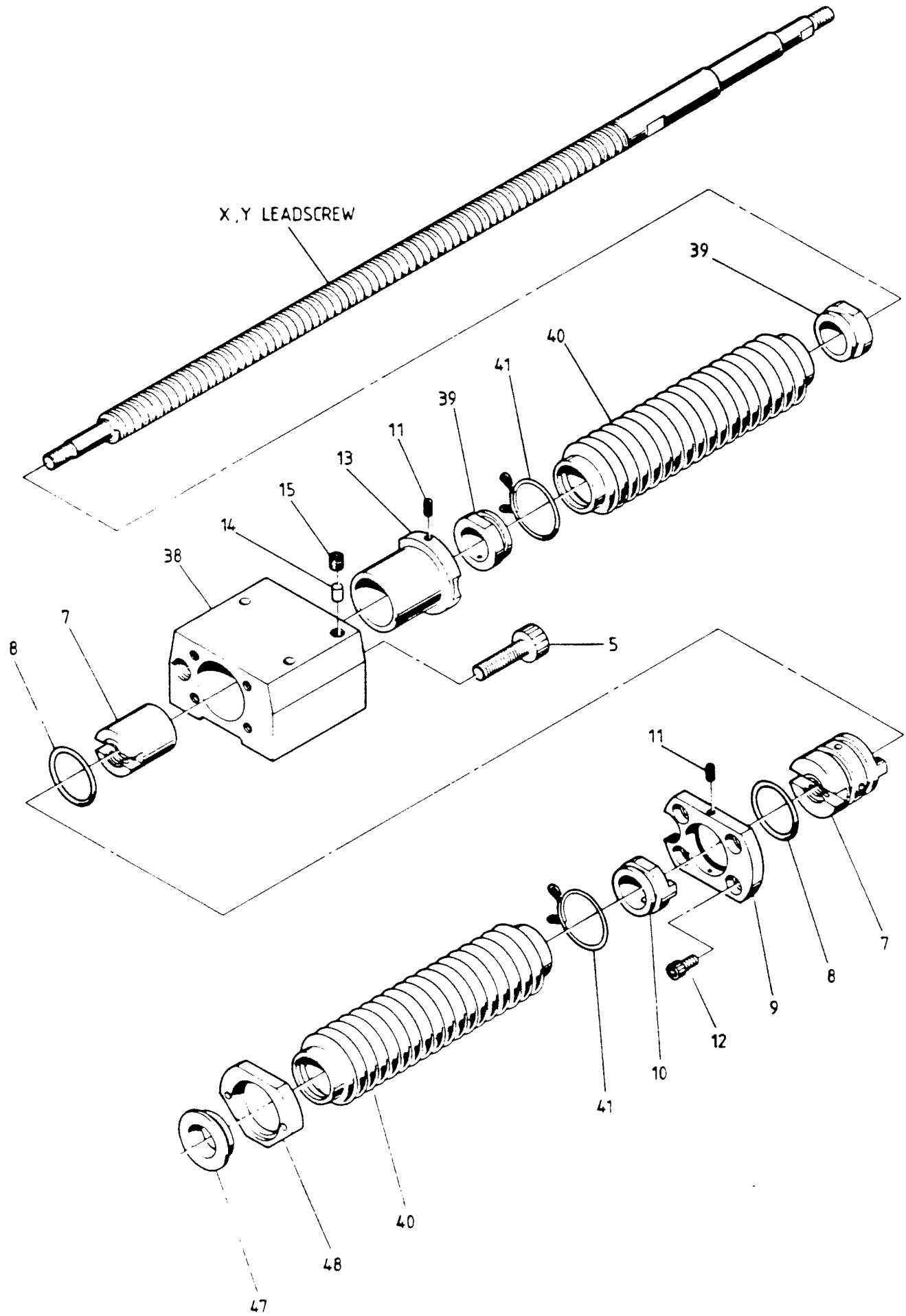
COLUMN, TABLE, SADDLE & BASE ASSEMBLY (I)



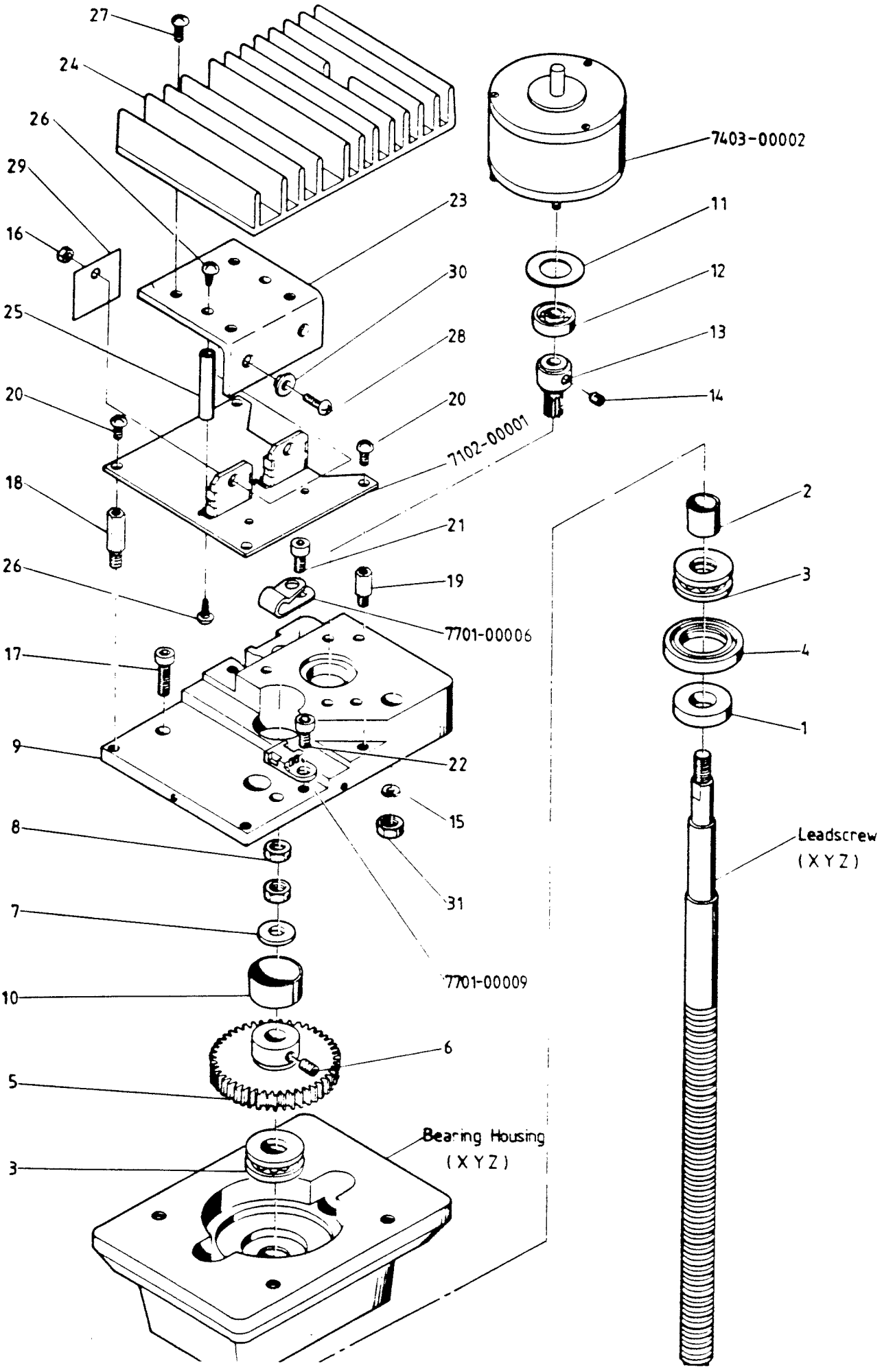
COLUMN, TABLE, SADDLE & BASE ASSEMBLY (II)



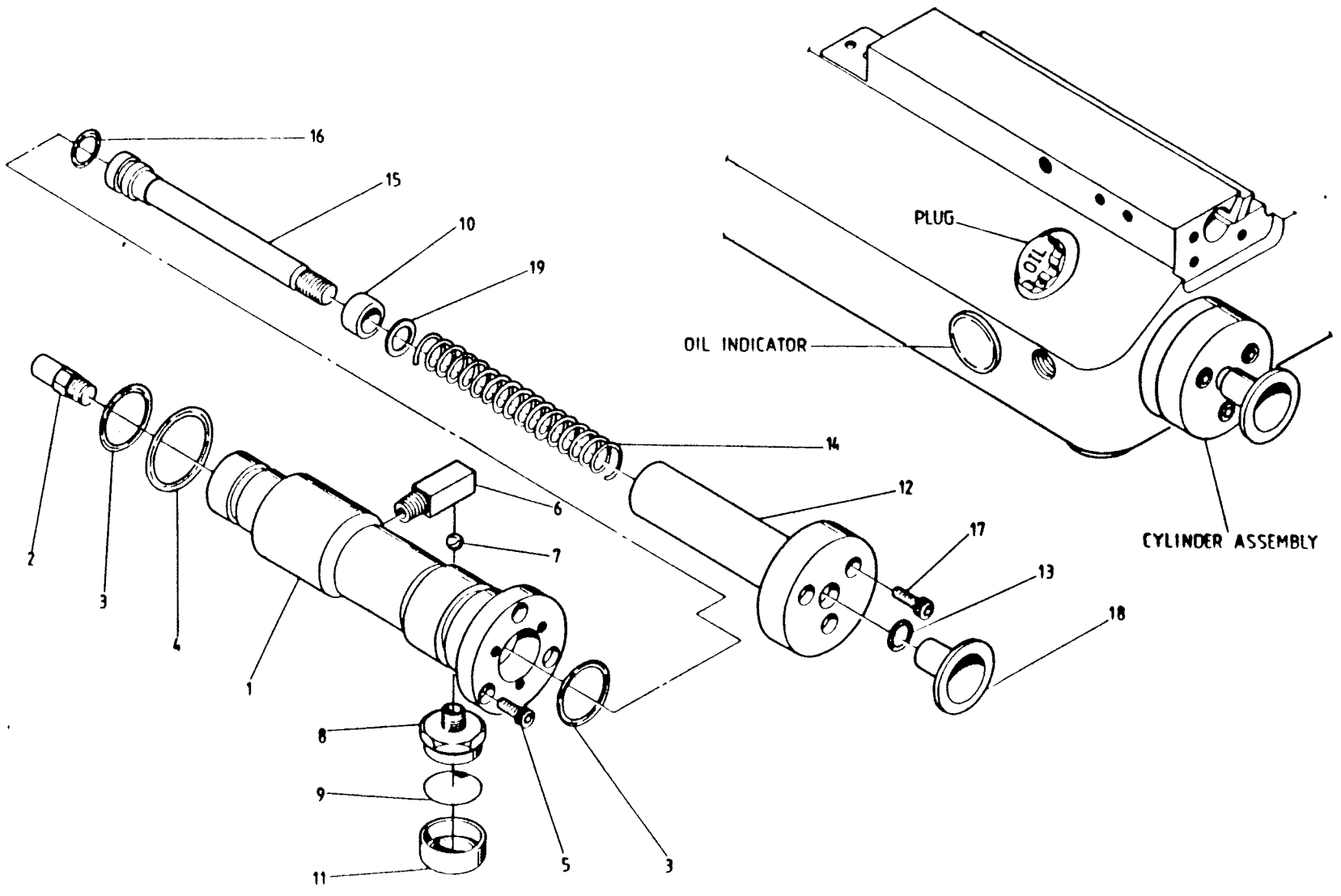
& BASE ASSEMBLY (Ⅲ)



GEAR ASSEMBLY



CYLINDER ASSEMBLY



SPINDLE HEAD ASSEMBLY

Ref. No.	Parts Number	Parts Name	Q'ty	Spec.
1	00111020	Dial Knob	1	
2	00111019	Shaft	1	
3	0412-02009	Spring Pin	1	2x9
4	00111021	Washer	2	
5	00111022	Dial	1	
6	0278-10000	Wave Washer	1	WW-10
7	0700-01000	Ext Retaining Ring C-type	1	10
8	00111023	Steel Washer	1	
9	0112-03004	Hex Skt Set Scr	1	M3x4
10	00111024	Dial-Support Housing	1	
11	0278-06000	Wave Washer	1	WW-6
12	0412-02010	Spring Pin	1	2x10
13	00111025	Worm Shaft	1	
14	00411001	Shoe-Quill Lock	1	
15	00411002	Quill Lock Bushing	1	
16	00411003	Screw-Quill Clamp	1	
17	00111033	Hand Lever	1	
18	00411006	Sleeve-Column Clamp	1	
19	00111027-3	Sleeve-Column Clamp	1	
20	00411004	Movable Knob	1	
21	00411017	Speed Dial	1	
22	0112-04010	Hex Skt Set Scr	1	M4x10
23	00111049	Cover	1	
24	0108-03006	Crs Recd Flat Hd Mach Scr	2	M3x6

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SPINDLE HEAD ASSEMBLY

Ref. No.	Parts Number	Parts Name	Q'ty	Spec.
25	00111052	Spacer	2	
26	0111-03006	Crs Recd Bdg Mach	2	M3x6
27	00111050	Cover	1	
28	0100-03008	Hex Skt Bolt	1	
29	00111009	Knob	1	
30	0412-03020	Spring Pin	1	
31	00111010	Hand-Lever Housing	1	
32	0500-00629-AHA	Deep Groove Ball Bearing	1	629zz
33	00111006	Set Bush	1	
34	00411005	Spring	1	
35	00111005	Washer	1	
36	00111013	Bush	1	
37	00111014	Worm Gear	1	
38	0412-03010	Spring Pin	2	3x10
39	00111015	Dial Bushing	1	
40	0112-04008	Hex Skt Set Scr	1	M4x8
41	00111-16	Friction Gasket	1	
42	00111017	Dial-Cross Shaft	1	
43	0278-14000	Wave Washer	1	WW-14
44	0700-01400	Ext Retaining Ring C-type	1	14
45	00111018	Snap Plug Bottom	1	
46	00411015	Housing	1	
47	00111002	Shaft	1	
48	00111003	Quill Gear	1	

SPINDLE HEAD ASSEMBLY

Ref. No.	Parts Number	Parts Name	Q'ty	Spec.
49	0412-03016	Spring Pin	1	3x6
50	00111004	Bush	1	
51	0111-03006-122	Crs Recd Bdg Mach Scr	9	M3x6
52	00111008	Bearing Housing	1	
53	0100-04014	Hex Skt Bolt	3	M4x14
54	00111012	Knob	1	
55	00111011	Hand Lever	1	
56	00411019	Name Plate	1	
57	00411022	Face Plate	1	
58	00411006	Indicating Plate	1	
59	00111045	Cover-Spindle	1	
60	00411020	Cover-Top	1	
61	00411021	Cover-Bottom	1	
62	0100-04010	Hex Skt Bolt	3	M4x10
63	0111-04005	Crs Recd Bdg Mach Scr	2	M4x5
64	00411018	Guide Pin	1	
65	0100-05010	Hex Skt Bolt	1	M5x10
66	00411008	Seal Cover	1	
67	00411009	Dust Seal	1	
68	0100-03008	Hex Skt Bolt	3	M3x8
69	0111-03006-122	Crs Recd Bdg Mach Scr	9	M3x6
70	00111046	Cover	1	
71	0265-04000	Spring Washer	4	4
72	0102-00815-525	Hex Hd Bolt	4	No.8x1/2
73	00411007	Brackett	1	

SPINDLE HEAD ASSEMBLY

Ref. No.	Parts Number	Parts Name	Q'ty	Spec.
74	0265-05000	Spring Washer	4	5
75	0102-05030	Hex Hd Bolt	4	M5x30
76	00411014	Little Column	3	
77	00411013	Plate	1	
78	0107-04020	Crs Recd Rnd Mach Scr	3	M4x20
79	0107-04050	Crs Recd Rnd Mach Scr	4	M4x50
80	00411010	Plate	1	
81	00411012	Filter	1	50 Mesh
82	00411010	Motor Pulley	1	
83	0112-06008	Hex Skt Set Scr	1	M6x8
84	0311-00530	Polymax Belt	1	5M530
85	00411023	RPM Indicator	1	
86		Rivet	4	02

SPINDLE ASSEMBLY

Ref. No.	Parts Number	Parts Name	Q'ty	Spec.
1	00410001	Quill	1	
2	0501-71903-DAV	Angular Contact Ball Bearing	2	71903C/P4 DT
3	00410002	Fixed Ring	1	
4	00410003	Spindle	1	
5	00410004	Spacer	1	
6	00410005	Spacer	1	
7	0279-06001-151	Belleville Spring for Bearing	2	6001
8	0501-07001-DAS	Angular Contact Ball Bearing	1	7001C/P4
9	00410006	Sleeve	1	
10	00110002	Spring-Rack	1	
11	00410007	Rack-Quill	1	
12	00410008	Sleeve-Rack	1	
13	0111-03006-122	Crs Recd Bdg Mach Scr	2	M3X6
14	00110008	Nut	1	
15	00110009	Extraction Tangue	1	

SPINDLE PULLEY ASSEMBLY

REF. NO.	PARTS NUMBER	PARTS NAME	Q'TY	SPEC.
1	00412001	Pulley Support Housing	1	
2	0701-03200	Internal Retaining Ring C-type	2	32
3	00412002	Spacer	1	
4	0279-06002-151	Belleville Spring for Bearing	2	6002
5	0500-06002-AGM	Deep Groove Ball Bearing	2	6002ZP
6	00412003	spindle Pulley	1	
7	00412004	Driving Ring	1	
8	0100-04016	Hex Skt Bolt	4	M4x16
9	0700-01500	External Retaining Ring C-type	1	15

COLUMN, TABLE, SADDLE & BASE ASSEMBLY

Ref. No.	Parts Number	Parts Name	Q'ty	Spec.
1	00420001	Vertical Column	1	
2	00420002	Damper	1	
3	00420003	Vertical Slide	1	
4	00420004	Taper Gib	1	
5	00420005	Adjusting Screw	9	
6	00420006	Nut Bracket	1	
7	00420007	Super Nut	3	
8	0639-02000-P	O-ring	6	P20
9	00420008	Cover	3	
10	00420009	Bellow Seat	3	
11	0112-03006	Hex Skt Set Scr	5	M3x6(P=0.5)
12	0100-03006	Hex Skt Bolt	13	M4x8(P=0.7)
13	00420010	Cover	3	
14	00420069	Nylon Pad	3	04x6
15	0112-05006	Hex Skt Set Scr	3	M5x12(P=0.8)
16	00420011	Leadscrew	1	
17	0639-00700-P	O-ring	1	P7
18	0100-05012	Hex Skt Bolt	12	M5x12(P=0.8)
19	00420012	Z Bearing Housing	1	
20	0100-08025	Hex Skt Bolt	6	M8x25
21	00420013	Taper Pin	6	#4x2"
22	00420014	Base Slide	1	
23	0100-14075	Hex Skt Bolt	2	M14x75
24	0100-14050	Hex Skt Bolt	3	M14x50
25	00420015	Support	1	

COLUMN, TABLE, SADDLE & BASE ASSEMBLY

Ref. No.	Parts Number	Parts Name	Q'ty	Spec.
26	0100-08045	Hex Skt Bolt	4	M8x45
27	0112-05010	Hex Skt Set Scr	2	M5x10(P=0.8)
28	00120017	Column	1	
29	00120018	Washer	1	
30	0107-04008	Crs Rced Rnd Hd Mach Scr.	8	M4x8(P=0.7)
31	00420018	Breather	1	
32	00420017	Felt	1	
33	00420018	Cross Table	1	
34	00420019	Tapper Gib	1	
35	00420020	Table	1	
36	00420021	Tapper Gib	1	
37	00420022	Leadscrew	1	
38	00420023	Nut Bracket	2	
39	00420024	Bellow Seat	4	
40	00420025	Bellows	4	
41	00420070	Clamp	4	
42	00420027	Clamp	2	
43	0100-04014	Hex Skt Bolt	4	M4x14(P=0.7)
44	00420028	X Y Bearing Housing	2	
45	00420029	X Screw Support	1	
46	0533-01006	Dry Bearing	1	
47	00420030	Bellow Seat	2	MB1006Du
48	00420031	Stand	2	
49	0100-03008	Hex Skt Bolt	4	M3x8(P=0.5)
50	0100-05025	Hex Skt Bolt	8	M5x25(P=0.8)

COLUMN, TABLE, SADDLE & BASE ASSEMBLY

Ref. No.	Parts Number	Parts Name	Q'ty	Spec.
51	0512-51100	Thrust Ball Bearing	2	51100
52	00420032	Bush	2	
53		U-nut	2	M6
54	00420033	Cap	2	
55	0112-03004	Hex Skt Set Scr	2	M3x4(P=0.5)
56	00420034	Taper Pin	2	#3x1 3/4"
57	0201-05000	Hex Nut	2	M5
58	00420035	Leadscrew	1	
59	00420036	Y Screw Support	1	
60	00420037	X-Axis Wiper (L)2	2	
61	00420038	X-Axis Wiper (R)	2	
62	00420039	X-Axis Cover	4	
63	0107-04012	Crs Recd Rnd Hd Mach scr	18	M4x12(P=0.7)
64	00420040	Y-Axis Wiper (FL)	1	
65	00420041	Y-Axis Wiper (FR)	1	
66	00420042	Y-Axis Cover (F)	2	
67	00420043	Y-Axis Wiper Seat	2	
68	0100-04012	Hex Skt Bolt	22	M4x12(P=0.7)
69	0112-04010	Hex Skt Set Scr	4	M4x10(P=0.7)
70	00420044	Y-Axis Wiper (RL)	1	
71	00420045	Y-Axis Wiper (RR)	1	
72	00420046	Y-Axis Cover (R)	2	
73	00420047	Felt	2	
74	00420048	Z-Axis Cover	2	
75	0102-04012	Hex Skt Bolt	10	M4x12(P=0.7)

COLUMN, TABLE, SADDLE & BASE ASSEMBLY

Ref. No.	Parts Numbers	Parts Name	Q'ty	Spec.
76	00420049	Rubber Cover	1	
77	00420050	Fixing Plate	2	
78	00120037	Shoe-Gib Lock	3	
79	00111033	Hand Lever	3	
80	00420064	Set Screw	1	
81	00420065	Set Screw	1	
82	00120040	Set Screw	1	
83	00420051	Stopper	5	
84	00420066	Stopper	2	
85	0111-05010	Crs Recd Bog Hd Mach Scr.	2	M5x10(P=0.8)
86	00420052	Packing	1	
87	00420053	Cover	1	
88	00420054	Handle	2	
89		Knob	2	29(M8)
90	00120014	Z Cover	1	
91	00120015	Strain Relief	3	
92	0111-03006	Crs Recd Bog Hd Mach Scr.	6	M3x6(P=0.5)
93	00120021	X Y Cover	2	
94	00420055	X Axis Cover (R)	1	
95	0107-05012	Crs Recd Rnd Hd Mach Scr.	2	M5x12(P=0.8)
96	00190805	Strainer	1	
97	0107-03004	Crs Recd Rnd Hd Mach Scr.	2	M3x4(P=0.5)
98	00420056	X Axis cover (L)	1	

COLUMN, TABLE, SADDLE & BASE ASSEMBLY

Ref. No.	Parts Number	Parts Name	Q'ty	Spec.
99	0111-04006	Crs Recd Bdg Hd Mach Scr.	2	M4x6(P=0.7)
100	00420057	Cover	1	
101	0100-06012	Hex Skt Bolt	2	M6x12
102	00120029	Bracket Stand	1	
103	0100-06035	Hex Skt Bolt	4	M6x35
104	00420058	Controller Bracket	1	
105	00120031	Controller Seat	1	
106	00120041	Bundle	1	
107	0100-06030	Hex Skt Bolt	1	M6x30
108		Oil Indicator	1	Ø19
109		Hex Skt Plug	1	Pt1/8
110		Plug	1	OP5/8
111	00420059	Packing	1	
112	00420060	Spacer	2	
113	00420061	Cover	1	
114	0112-10014	Hex Skt Set Scr	1	M10x14
115	00420062	Cover	1	
116	00420063	Spacer	4	
117	00420067	Stopper	2	
118	00420068	Cover	1	
119	0111-03020-122	Crs Recd Bdg Mach Scr	4	M3x20
120	0112-04020	Hex Skt Set Scr	2	M4x20
121	0201-04000-122	Hex Nut	2	M4
122	0402-03040-5	Taper Pin	6	#3x1 1/2"
123	00420071	Name Plate	1	

COLUMN, TABLE, SADDLE & BASE ASSEMBLY

Ref. No.	Parts Number	Parts Name	Q'ty	Spec.
124		Rivet	4	02

STEP MOTOR & REDUCING GEAR ASSEMBLY

Ref. No.	Parts Number	Parts Name	Q'ty	Spec.
1	00430001	Sleeve	3	
2	0599-01012	DU Bush	3	MB1012DU
3	0512-51100-AAA	Thrust Ball Bearing	6	51100
4	0605-20030-05A	SC Type Oil Seal	3	SC20X30X5
5	00430002	Gear	3	
6	0112-04005	Hex Skt Set Scr	3	M4x5
7	00430003	Spacer	3	
8	0202-06000-122	Hex Nut	6	M6
9	00430004	Motor Plate	3	
10	0599-01810	DU Bush	3	1810DU
11	00430005	Spacer	3	
12	0500-00625-AnA	D Grv Brg	3	625ZZ
13	00430006	Pinion	3	
14	0112-04004	Hex Skt Set Scr	3	M4x4
15	0265-00400-552	Spring Washer	6	no.6
16	0201-03000-122	Hex Nut	6	3
17	0100-04014	Hex Skt Bolt	12	M4x14
18	00130008	Spacer	6	16.8L
19	00130009	Spacer	6	10L
20	0111-03006-122	Crs Recd Bdg Mach Scr	12	M3x6
21	0100-04008	Hex Skt Bolt	3	M4x8
22	0100-04006	Hex Skt Bolt	3	M4x6
23	00430007	Heat Sink Seat	3	
24	00430008	Heat Sink	3	
25	00430009	Spacer	6	

STEP MOTOR & REDUCING GEAR ASSEMBLY

Ref. No.	Parts Number	Parts Name	Q'ty	Spec.
26	0144-02308-142	Crs Recd Rnd Hd Mach Scr	12	M2.3x8
27	0111-03008-122	Crs Recd Bag Mach Scr	12	M3x8
28	0111-03010-122	Crs Recd Bag Mach Scr	6	M3x10
29	7603-00003	Silicon Insulator	6	
30		Insulator	6	3
31	0201-00400-522	Hex Nut	6	No.6

CYLINDER ASSEMBLY

Ref. No.	Parts Numbers	Parts Name	Q'ty	Spec.
1	00451001	Sleeve	1	
2		Check Valve	1	M8 PT 1/8
3	0639-02200-P	O Ring	2	P22
4	0639-02800-P	O Ring	1	P28
5	0100-04010	Hex Skt Bolt	3	M4x10
6	00451002	Elbow Joint	1	
7	0899-08000-5	Steel Ball	1	1/4
8	00451003	Check Filter	1	
9	0451004	Screen	1	
10	0451011	Wear Ring	1	
11	0451006	Cover	1	
12	0451007	Cylinder	1	
13	0639-01000-P	O Ring	1	P10
14	0451008	Spring	1	
15	0451009	Plunger	1	
16	0639-01200-P	O Ring	1	P12
17	0100-04014	Hex Skt Bolt	3	M4x14
18	0451010	Grip	1	
19	0451012	Washer	1	

CENTRALIZED LUBRICATION SYSTEM

Ref. No.	Parts Number	Parts Name	Q'ty	Spec.
1		Distributor	1	DA-8
2		Sleeve	14	PB-4
3		Compression Plug	14	PA-4
4		D Type Nipple	3	PD-4
5		Flow Unit	1	PST-3
6		Flow Unit	5	PST-2
7		Elbow	2	PT 1/8-04
8		M Type Connector	3	PM-104
9	00450001	Joint	2	
10	00450002	#1 Pipe	1	04
11	00450003	#2 Pipe	1	04
12	00450004	#3 Pipe	1	04
13	00450005	#4 Pipe	1	04
14	00450006	#5 Pipe	1	04
15	00450007	#6 Pipe	1	04
16	00450008	#7 Pipe	1	04
17	0450009	#8 Pipe	1	04
18	0450010	#9 Pipe	1	04
19	0450011	#10 Pipe	1	04
20	0450012	#11 Pipe	1	04
21	0450013	#12 Pipe	1	04
22	0100-05020	Hex Skt Bolt	2	M5x20
23	00450014	Formed Tube	1	04x02.5
24	00450015	Packing	1	
25	0450016	Manifold	1	

CENTRALIZED LUBRICATION SYSTEM

Ref. No.	Parts Number	Parts Name	Q'ty	Spec.
26		Hex Skt Bolt	4	M4x12
27		Hex Skt Plug	1	PT 1/8
28		Twin Joint	2	PM-4
29	00450017	#13 Pipe	1	Ø4
30	00450018	#14 Pipe	1	Ø4