

Partner 6H Mechanical

12-09-99
Rev 2

All axis thrust bearings BG-01 x 2
All axis radial bearings BG-02
Spindle:
Old short 5HP
Lower thrust BG-22
Upper radial BG-05
Newer 5HP
Lower thrust BG-22
Upper radial BG-05
Top bearing cup BG-12
Newer 7.5 HP
Lower thrust BG-22 and BG-44
Upper thrust BG-45 x 2
Top bearing cup BG-12

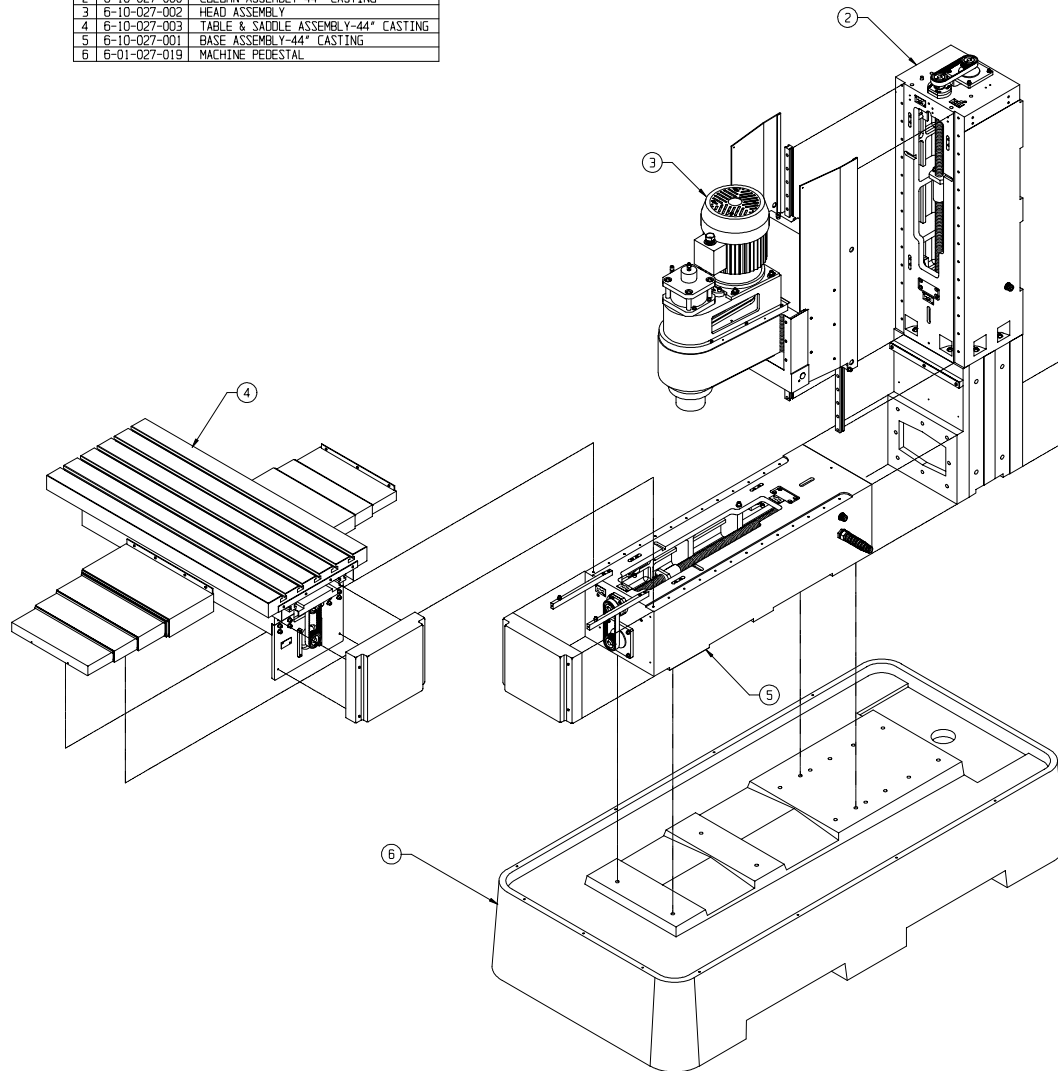
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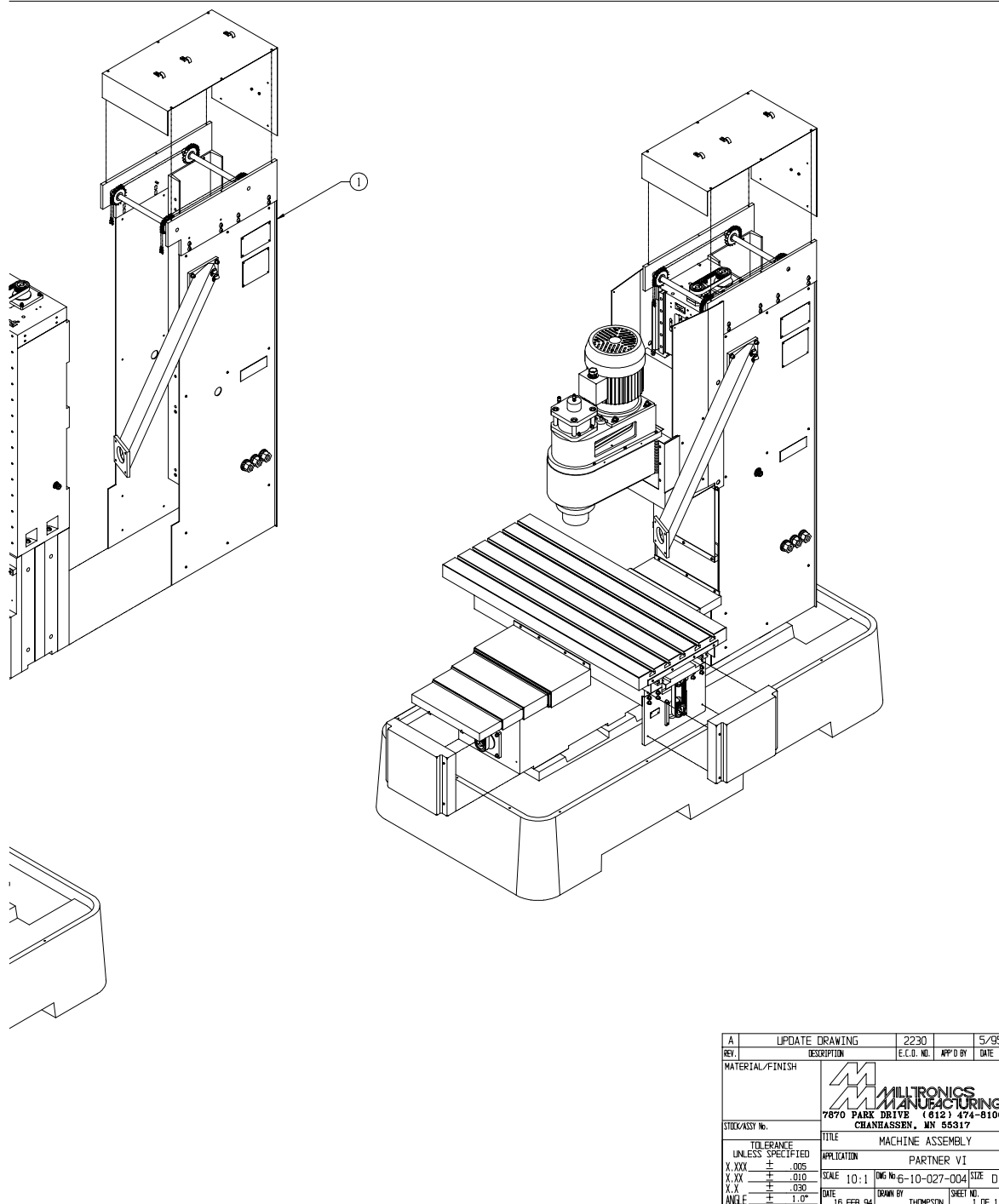
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Manual Discrepancy Sheet

Basic Machine Assembly

PARTS LIST		
No.	DRAWING No.	DESCRIPTION
1	6-10-027-007	COUNTERWEIGHT ASSEMBLY
2	6-10-027-000	COLUMN ASSEMBLY-44" CASTING
3	6-10-027-002	HEAD ASSEMBLY
4	6-10-027-003	TABLE & SADDLE ASSEMBLY-44" CASTING
5	6-10-027-001	BASE ASSEMBLY-44" CASTING
6	6-01-027-019	MACHINE PEDESTAL

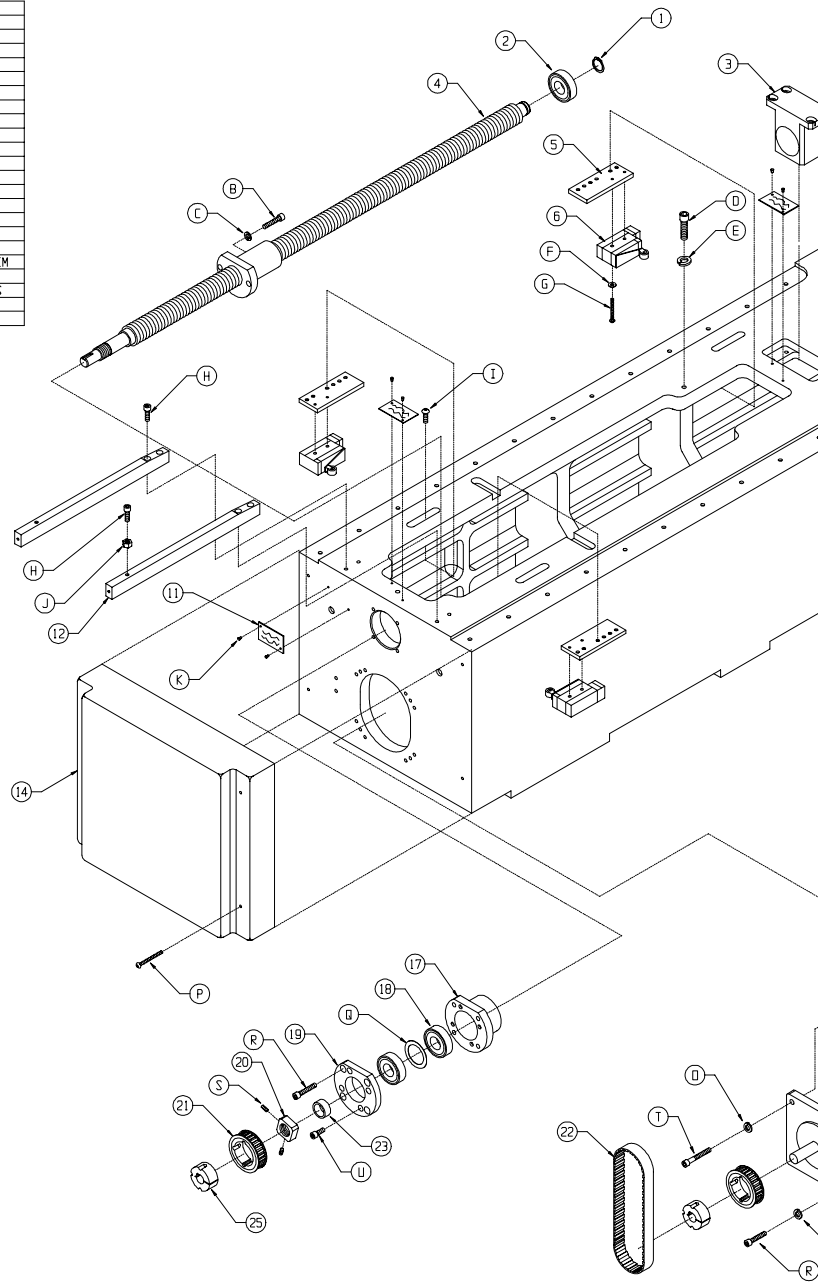


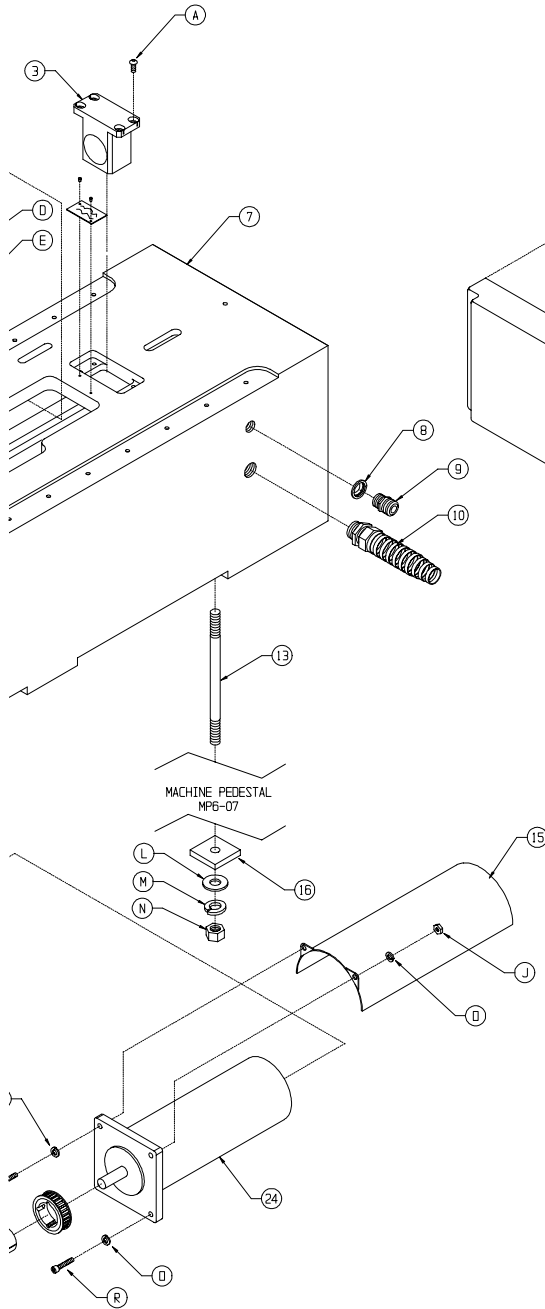


A	UPDATE DRAWING	2230	5/95
REV.	DESCRIPTION	E.C.O. NO.	APP'D BY DATE
MATERIAL/FINISH		 7870 PARK DRIVE (812) 474-8100 CHANDLASSON, MN 55317	
STOCK/ASSY No.		TITLE MACHINE ASSEMBLY	
TOLERANCE UNLESS SPECIFIED		APPLICATION PARTNER VI	
X.XX	± .005	SCALE 10:1	DWG No 6-10-027-004
X.XX	± .010		
X.X	± .030		
ANGLE	± 1.0°	DATE 16 FEB 94	DRAWN BY THOMPSON SHEET NO. 1 OF 1

Machine Base Assembly

HARDWARE LIST		
No.	QTY	DESCRIPTION
A	4	1/4-20 x 5/8 BHCS
B	2	5/16-18 x 1 1/4 SHCS
C	2	5/16 LOCK WASHER
D	1	3/8-16 x 1 SHCS
E	1	3/8 LOCK WASHER
F	6	# 8 LOCK WASHER
G	6	8-32 x 1 BHCS
H	6	1/4-20 x 3/4 SHCS
I	6	1/4-20 x 3/4 BHCS
J	4	1/4-20 NUT
K	6	1/4 DRIVE RIVET
L	6	1/2 FLAT WASHER
M	6	1/2 LOCK WASHER
N	6	1/2-13 NUT
O	6	1/4 LOCK WASHER
P	4	10-32 x 2 1/4 BHCS
Q	1	1 3/4 x 1 1/4 x .002 ROUND SHIM
R	6	1/4-20 x 1 SHCS
S	2	10-32 x 3/16 BRASS TIPPED SHCS
T	2	1/4-20 x 1 3/4 SHCS
U	4	1/4-20 x 5/8 SHCS

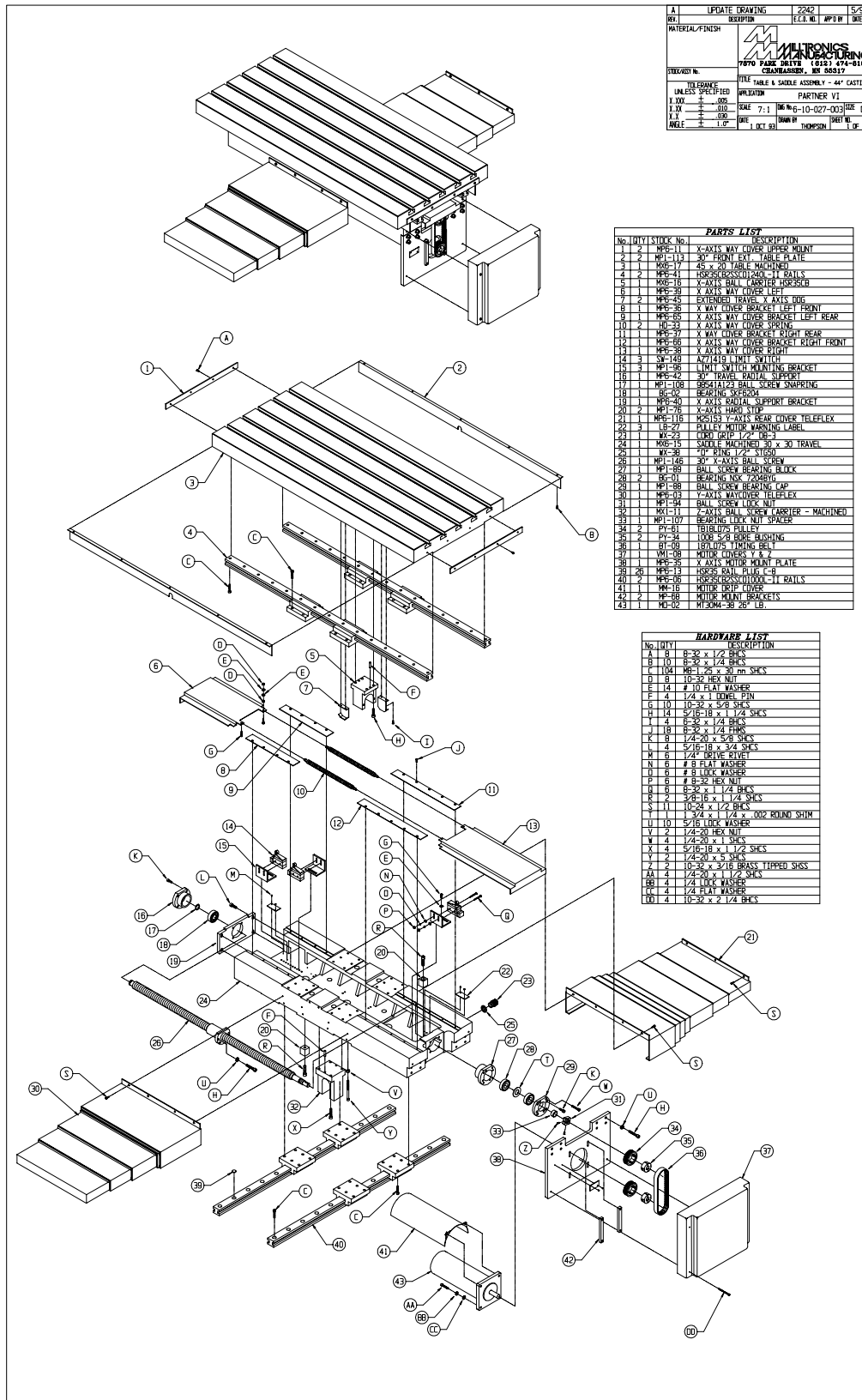




PARTS LIST		
No.	QTY	STOCK No
1	1	MP1-108
2	1	BG-02
3	1	MX1-28
4	1	MP1-145
5	3	MP1-77
6	3	SW-149
7	1	MX6-23
8	1	WX-38
9	1	WX-23
10	1	WX-180
11	3	LB-27
12	2	MP6-91
13	6	HD-28
14	1	VM1-08
15	1	MM-16
16	6	MP-138
17	1	MP1-89
18	2	BG-01
19	1	MP1-88
20	1	MP1-94
21	2	PY-61
22	1	BT-09
23	1	MP1-107
24	1	MD-02
25	2	PY-34

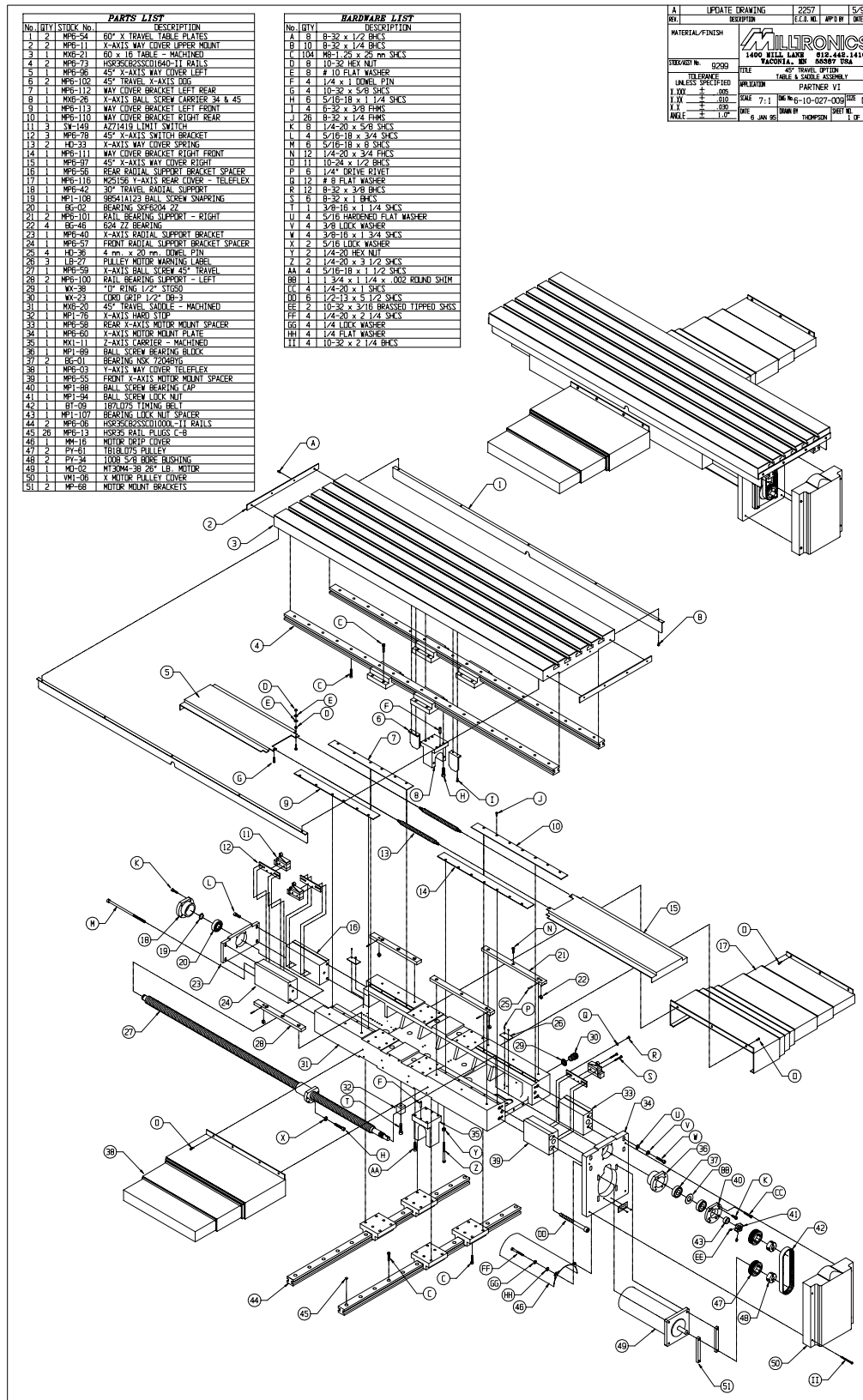
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TOLERANCE UNLESS SPECIFIED			
X.XXX	± .005		
X.XX	± .010		
X.X	± .030		
ANGLE	± 1.0°		
TITLE		BASE ASSEMBLY - 44" CASTING	
APPLICATION		PARTNER VI	
SCALE		4:1	
DATE		18 AUG 93	
DRAWN BY		THOMPSON	
SHEET NO.		1 OF 1	

Machine Table & Saddle Assembly – 30” Travel

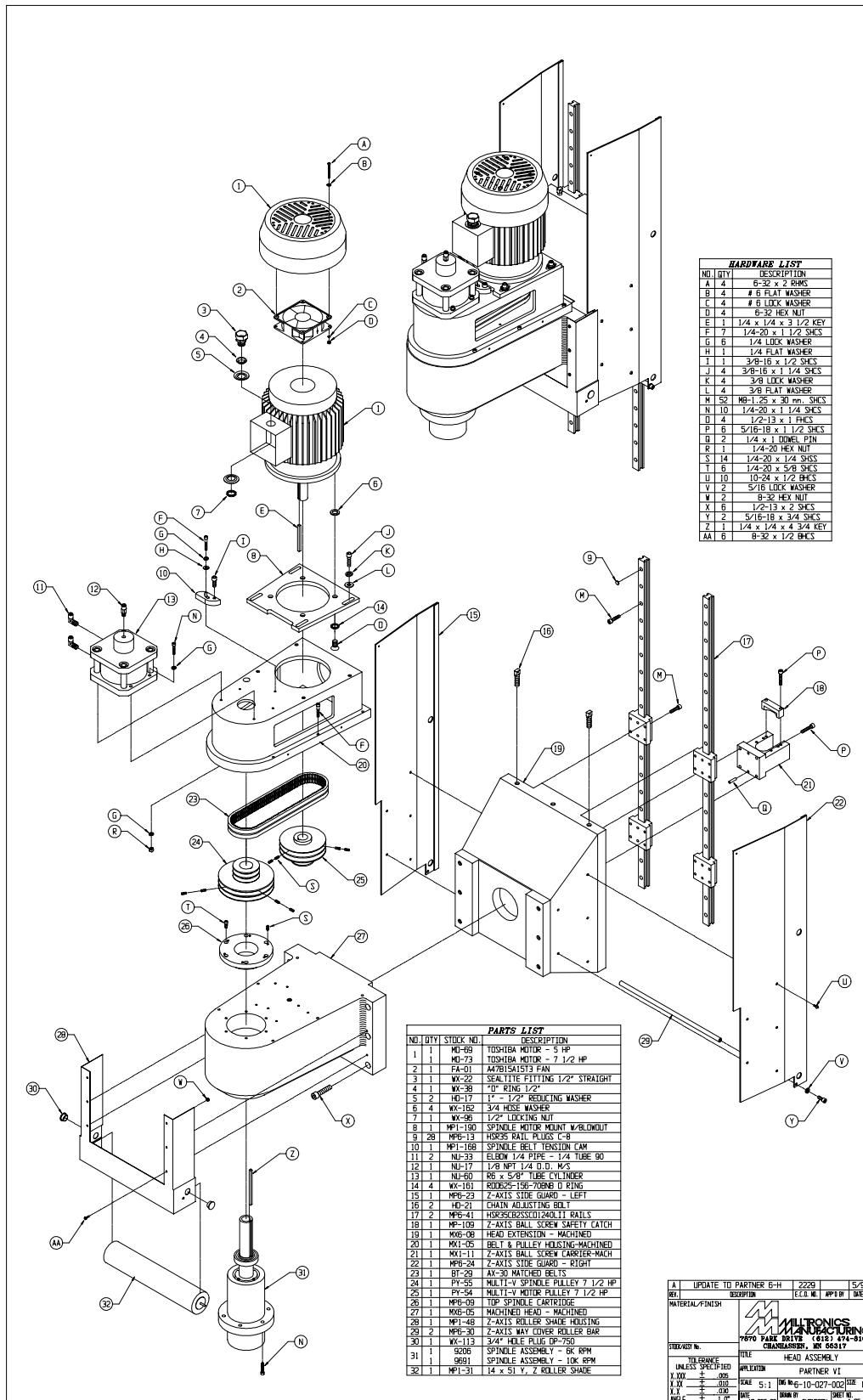


A		UPDATE DRAWING		2243	5/4
REV	DESCRIPTION			E.C.B. NO.	APP'D BY DATE
MATERIAL/FINISH					
 MILLITRONICS MANUFACTURING 7670 PAKKE DRIVE (612) 474-5111 CHANTASSE, MN 55317					
STOCK/KEY No. 9286		TITLE 34" TRAILER ASSEMBLY TABLE & SADDLE OPTION			
TOLERANCE UNLESS SPECIFIED		PARTNER VII			
X.XXX	± .005	APPLICATION		SCALE 8:1	ING No. 10-027-008
X.XX	± .010	DATE 6 JAN 85		DRAWN BY THOMPSON	SHEET NO. 1 OF 1
X.X	± .030				
ANGLE	± 1.0°				

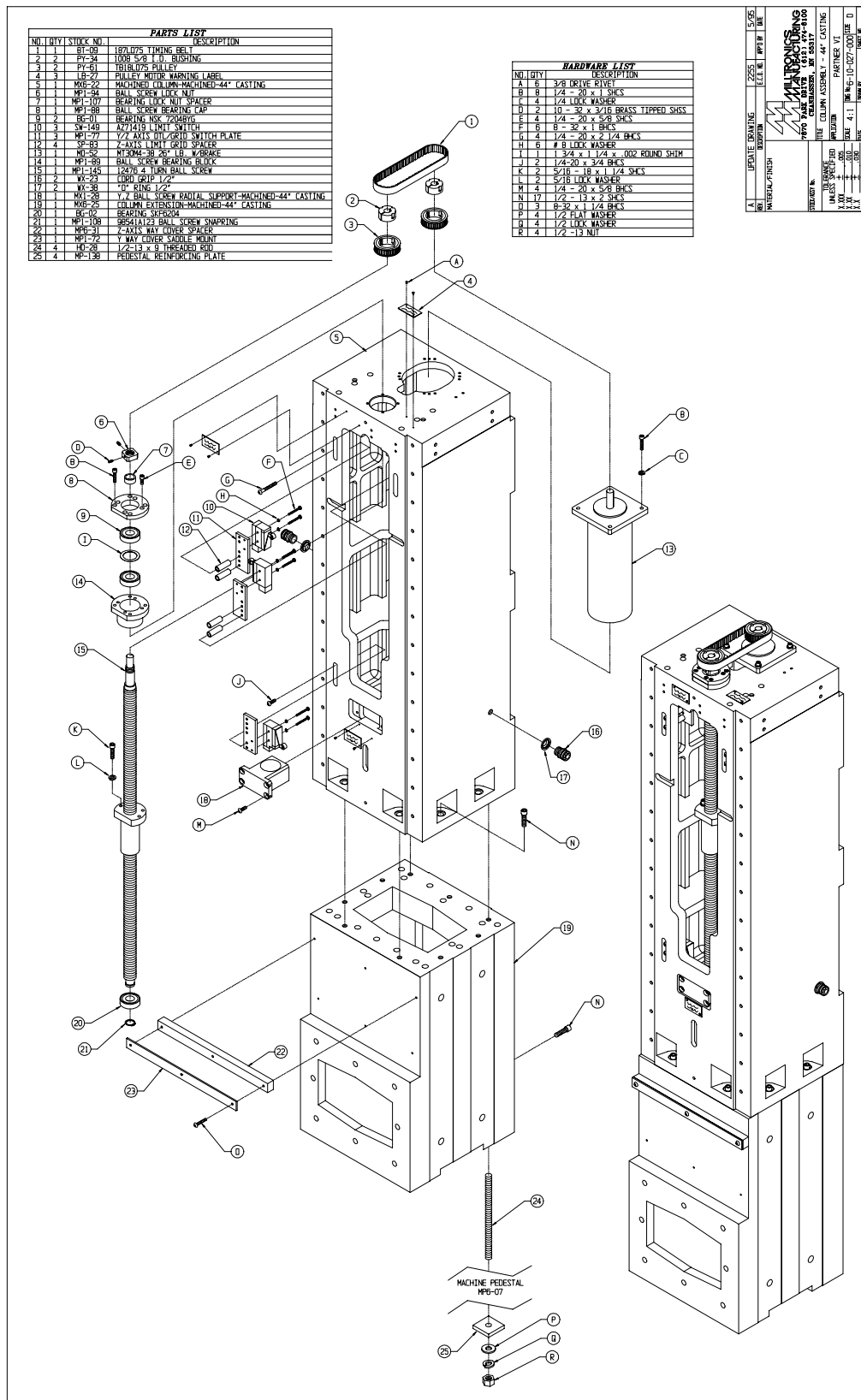
Machine Table & Saddle Assembly – 45" Travel



Machine Head Assembly

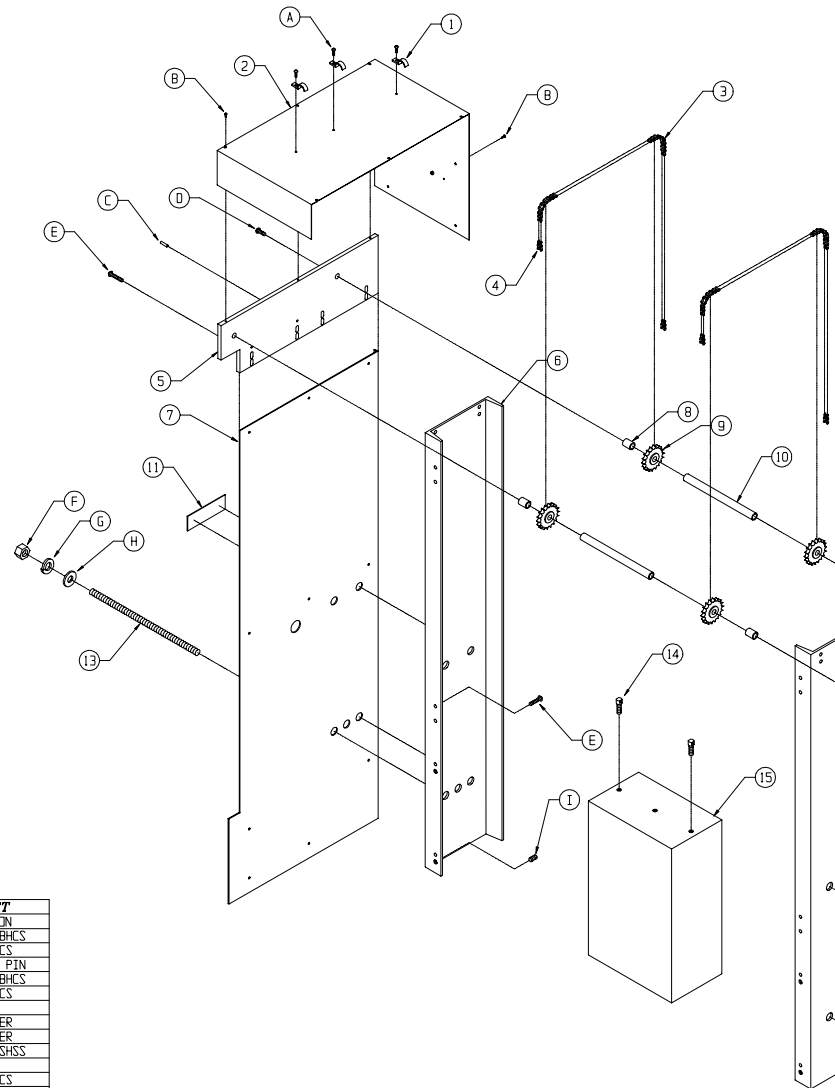


Machine Column Assembly

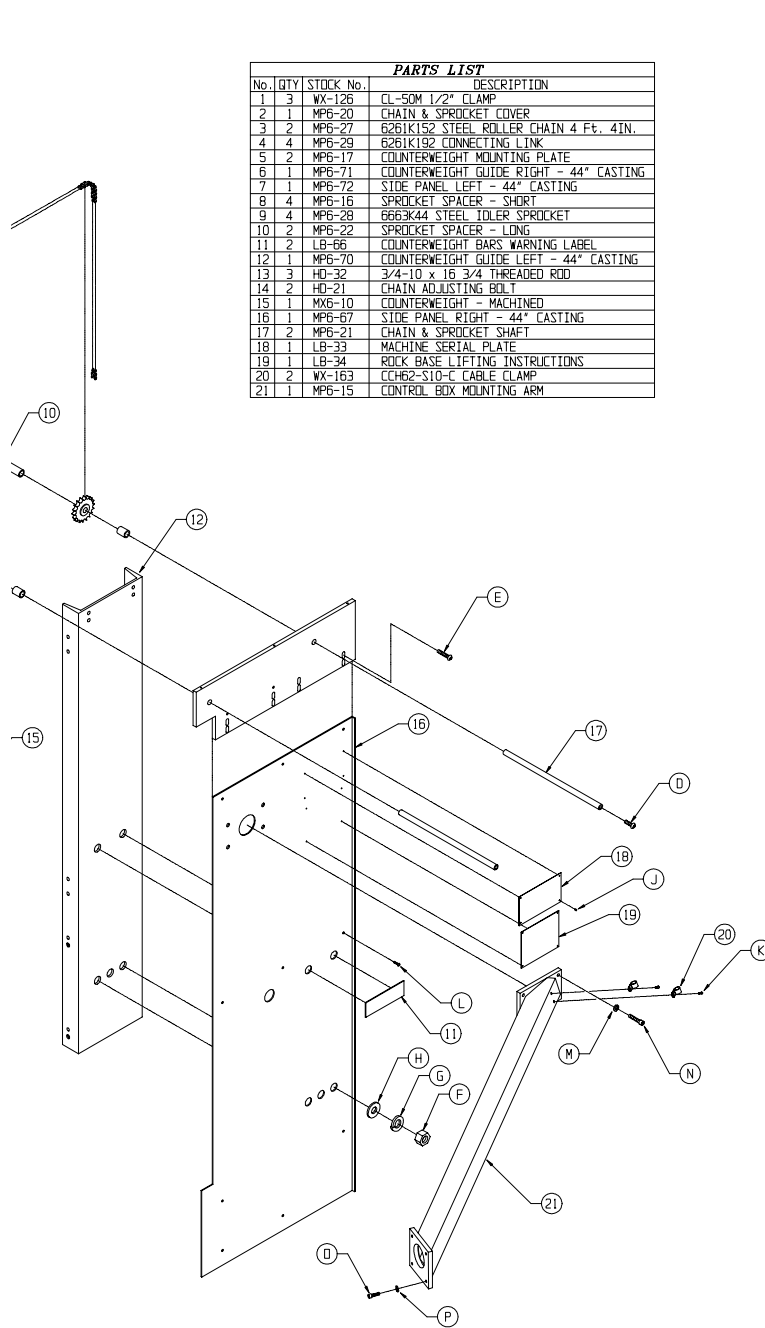


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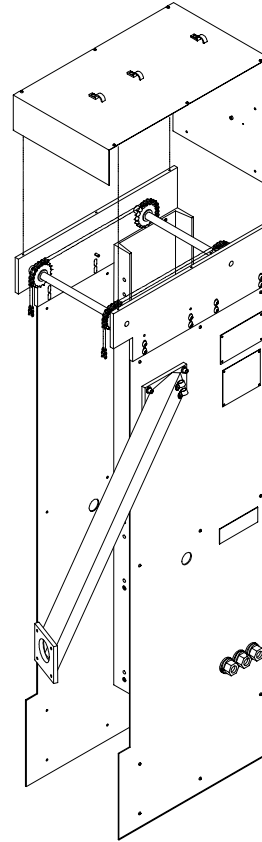
Counterweight Assembly



HARDWARE LIST		
No.	QTY	DESCRIPTION
A	3	1/4-20 x 1/2 BHCS
B	12	8-32 x 3/8 BHCS
C	4	1/4 x 1 DOWEL PIN
D	4	3/8-16 x 1/2 BHCS
E	28	3/8-16 x 1 BHCS
F	6	3/4-10 NUT
G	6	3/4 LOCK WASHER
H	6	3/4 FLAT WASHER
I	4	1/2-13 x 1/2 SHSS
J	8	DRIVE RIVETS
K	2	8-32 x 1/2 BHCS
L	20	10-24 x 1/2 BHCS
M	4	3/8 LOCK WASHER
N	4	3/8-16 x 1 1/4 SHCS
O	4	5/16-18 x 3/4 SHCS
P	4	5/16 LOCK WASHER

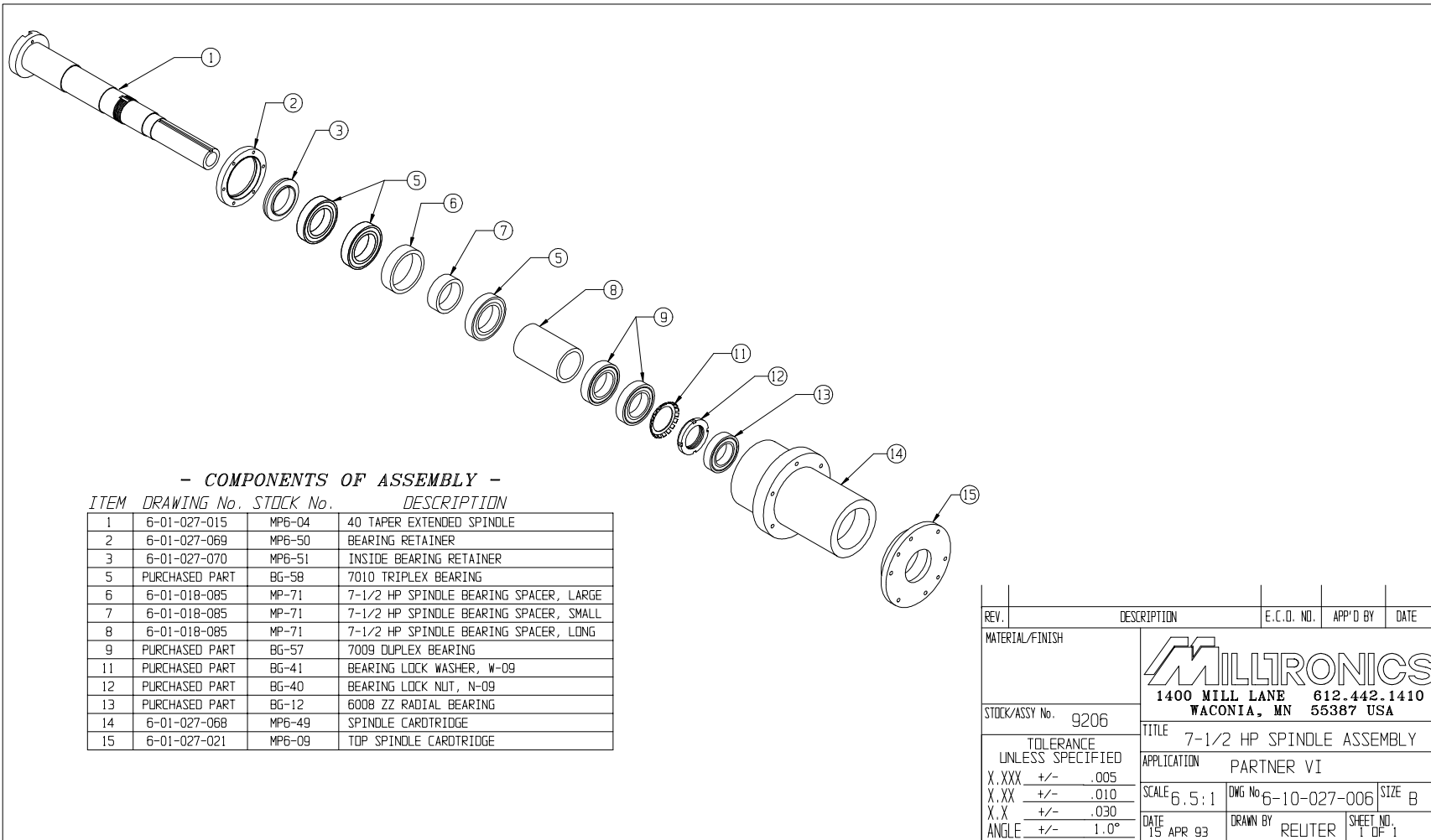


PARTS LIST			
No.	QTY	STOCK No.	DESCRIPTION
1	3	WX-126	CL-50M 1/2" CLAMP
2	1	MP6-20	CHAIN & SPROCKET COVER
3	2	MP6-27	6261K152 STEEL ROLLER CHAIN 4 Ft. 4IN.
4	4	MP6-29	6261K192 CONNECTING LINK
5	2	MP6-17	COUNTERWEIGHT MOUNTING PLATE
6	1	MP6-71	COUNTERWEIGHT GUIDE RIGHT - 44" CASTING
7	1	MP6-72	SIDE PANEL LEFT - 44" CASTING
8	4	MP6-16	SPROCKET SPACER - SHORT
9	4	MP6-28	6663K44 STEEL IDLER SPROCKET
10	2	MP6-22	SPROCKET SPACER - LONG
11	2	LB-66	COUNTERWEIGHT BARS WARNING LABEL
12	1	MP6-70	COUNTERWEIGHT GUIDE LEFT - 44" CASTING
13	3	HD-32	3/4-10 x 16 3/4 THREADED ROD
14	2	HD-21	CHAIN ADJUSTING BOLT
15	1	MX6-10	COUNTERWEIGHT - MACHINED
16	1	MP6-67	SIDE PANEL RIGHT - 44" CASTING
17	2	MP6-21	CHAIN & SPROCKET SHAFT
18	1	LB-33	MACHINE SERIAL PLATE
19	1	LB-34	ROCK BASE LIFTING INSTRUCTIONS
20	2	WX-163	CCH62-S10-C CABLE CLAMP
21	1	MP6-15	CONTROL BOX MOUNTING ARM

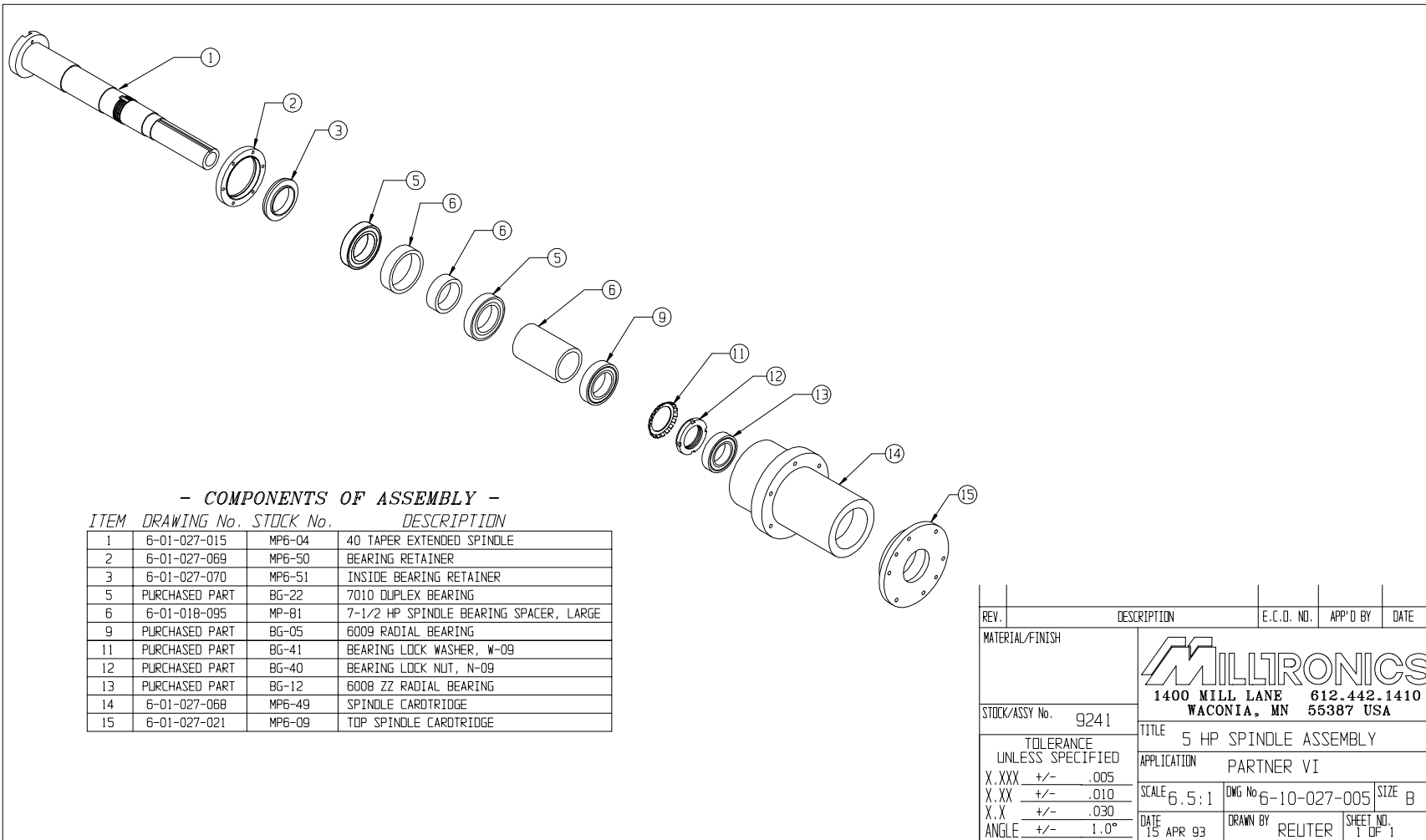


A	ADD LABEL	2228	4/95
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MATERIAL/FINISH			
STOCK/ASSY No.			
TOLERANCE			
UNLESS SPECIFIED			
X .XXX ± .005			
X .XX ± .010			
X .X ± .030			
ANGLE ± 1.0°			
TITLE			
COUNTER WEIGHT ASSEMBLY			
APPLICATION			
PARTNER VI			
SCALE			
B:1			
DATE			
11 OCT 93			
DRAWN BY			
THOMPSON			
SHEET NO.			
1 OF 1			

7010 Spindle Assembly



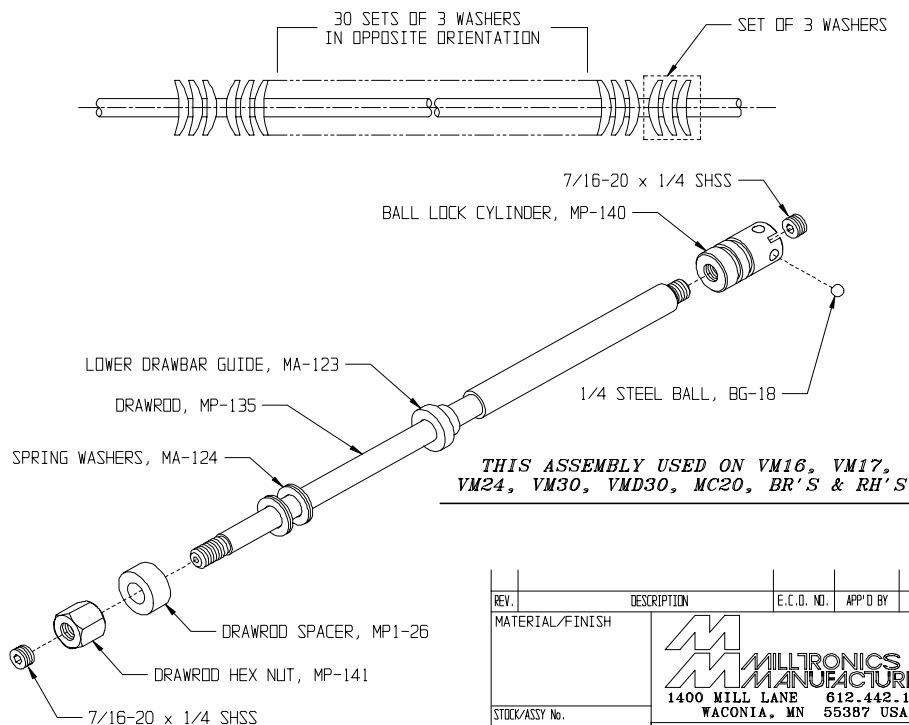
7010 10K RPM Spindle Assembly



Power Drawbar Assembly & Instructions

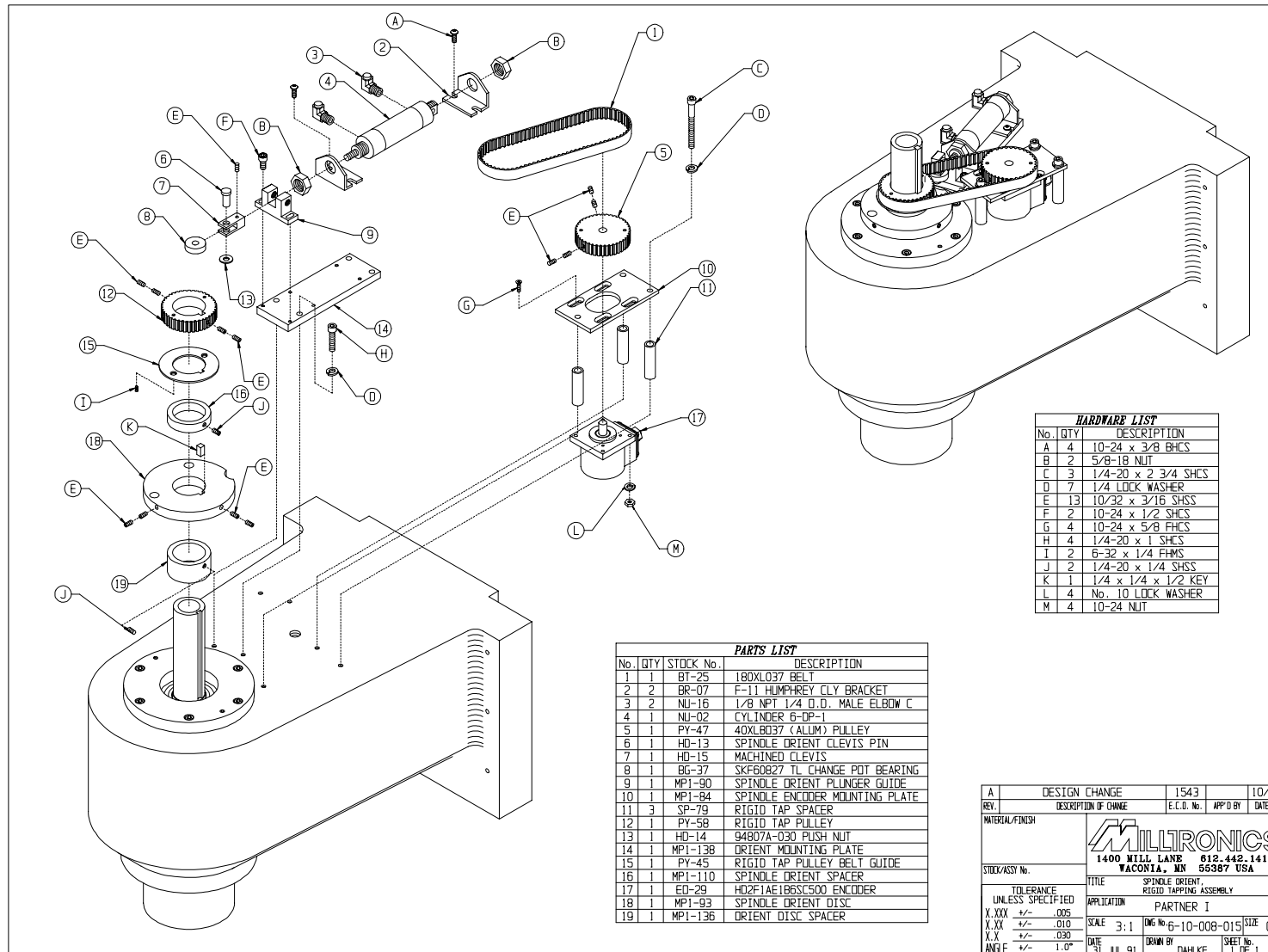
- INSTRUCTIONS FOR ASSEMBLY -

1. EACH SPINDLE VARIES SLIGHTLY IN THE SIZE OF THE DRAWBAR BORE I.D. THE LOWER GUIDE, (MA-123), AND THE DRAWROD SPACER, (MP1-26), MUST FIT IN THE SPINDLE BORE WITH A TOLERANCE OF $-.0005/-0.0010$ TO INSURE THAT OPERATION OF THE DRAWBAR IS MAINTAINED.
2. SLIDE THE LOWER DRAWBAR GUIDE, (MA-123) AND SPRING WASHERS, (MA-124), ON THE DRAWROD, (MP-135), AS SHOWN IN THE ILLUSTRATION. OBSERVE THE ORIENTATION OF THE SPRING WASHERS CLOSELY. SLIDE THE DRAWROD SPACER, (MP1-26), ONTO THE DRAWROD. THEN THREAD THE DRAWROD NUT, (MP-141), TWO FULL TURNS ONTO THE END OF THE DRAWROD AND LOCK IT IN PLACE WITH A 7/16-20 SETSCREW.
3. PREPARE THE BALL LOCK CYLINDER, (MP-140), FOR INSTALLATION. INSERT THE FOUR BALLS, (BG-18), INTO THE POCKETS ON THE BALL LOCK CYLINDER. BE SURE THAT THEY MOVE FREELY IN THE POCKETS. LUBRICATE ALL OF THE BALLS AND FILL THE GROOVES WITH HIGH PRESSURE GREASE.
4. LOWER THE ASSEMBLED PORTION OF THE DRAWBAR DOWN INTO THE SPINDLE BORE.
5. INSERT A 1/8 x 7/8 x 6 PIECE OF BAR STOCK INTO THE SLOTS ON THE END OF THE BALL LOCK CYLINDER AND PUSH IT UP INTO THE SPINDLE. THEN TIGHTEN THE BALL LOCK CYLINDER UNTIL IT LANDS ON THE SHOULDER OF THE DRAWROD. LOCK IT IN PLACE WITH A 7/16-20 SETSCREW. ALUMINUM STOCK IS RECOMMENDED FOR THIS PROCEDURE TO AVOID POSSIBLE DAMAGE TO THE SPINDLE.
6. WHILE HOLDING THE DRAWROD NUT IN PLACE, REMOVE IT'S SETSCREW. HOLD THE BALL LOCK CYLINDER WITH THE BAR STOCK OR WITH A LONG "T-HANDLE" INSERTED INTO THE SETSCREW AT THE BALL LOCK CYLINDER, AND THEN TIGHTEN THE DRAWROD NUT BY HAND UNTIL ALL FREE-PLAY HAS BEEN TAKEN OUT OF THE SPRING WASHERS. THIS CONDITION IS KNOWN AS 'FREE HEIGHT'.
7. ONCE FREE HEIGHT HAS BEEN ESTABLISHED, TIGHTEN THE DRAWROD NUT AN ADDITIONAL 4-1/2 TO 5 TURNS AND REPLACE THE SETSCREW IN THE DRAWROD NUT. THIS WILL SET THE PRELOAD TO THE DRAWBAR ASSEMBLY.
8. INSTALL THE AIR CYLINDER UNIT ON TOP OF THE SPINDLE HOUSING. THE DRAWBAR SHOULD BE FLUSH OR BELOW THE TOP OF THE SPINDLE HOUSING. ADJUST THE STRIKE ON THE CYLINDER SO THAT THE TOOL IS BEING PUSHED OUT OF THE TAPER .030 AND LOCK ADJUSTING NUT IN PLACE.
9. TO TEST THE DRAWBAR FOR PROPER FUNCTION, MEASURE THE HEIGHT OF THE DRAWBAR WITH A TOOL HOLDER IN THE SPINDLE TAPER, AND AGAIN WITHOUT A TOOL HOLDER. THE DIFFERENCE BETWEEN THE TWO MEASUREMENTS MUST BE APROXIMATELY .02 IN.

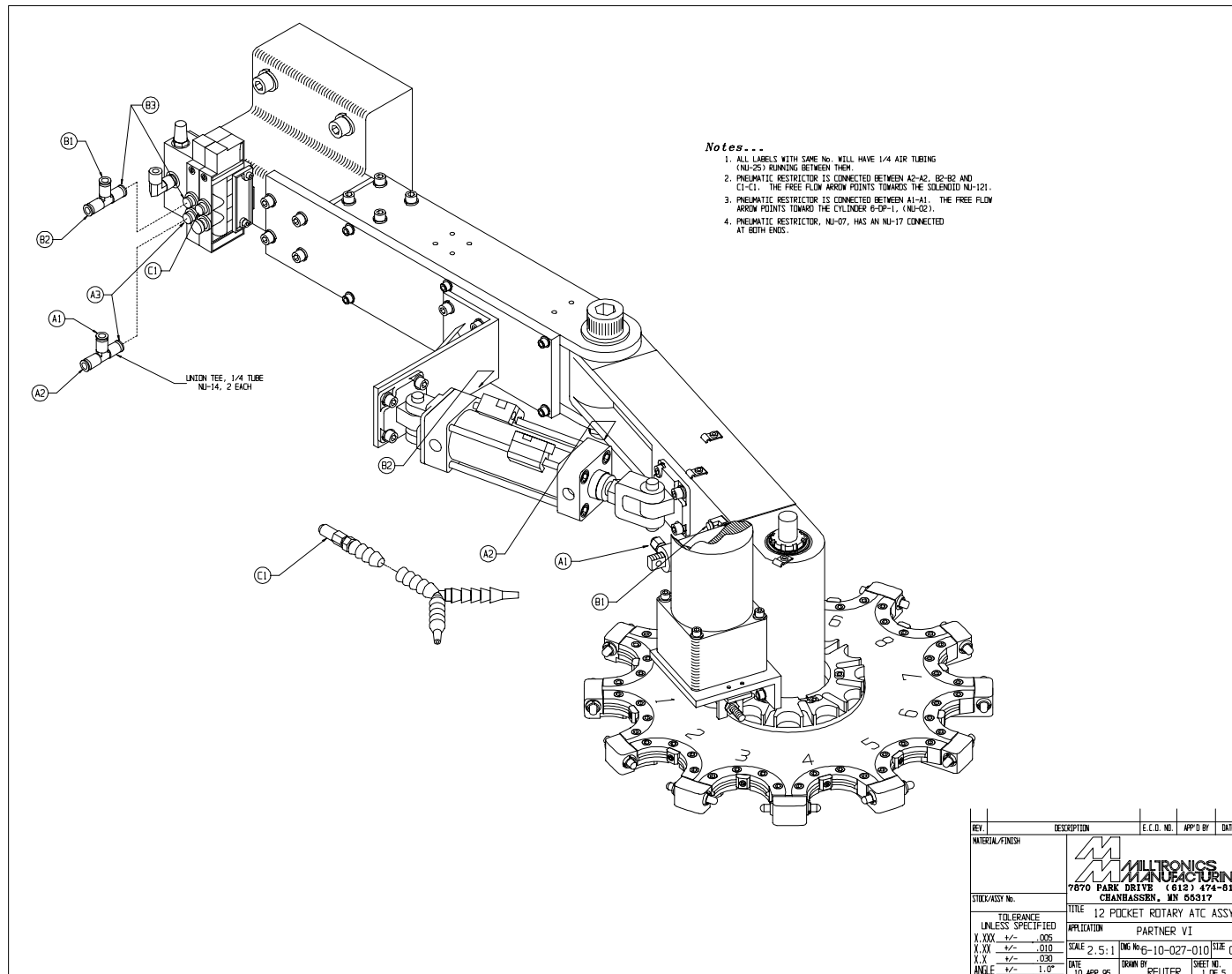


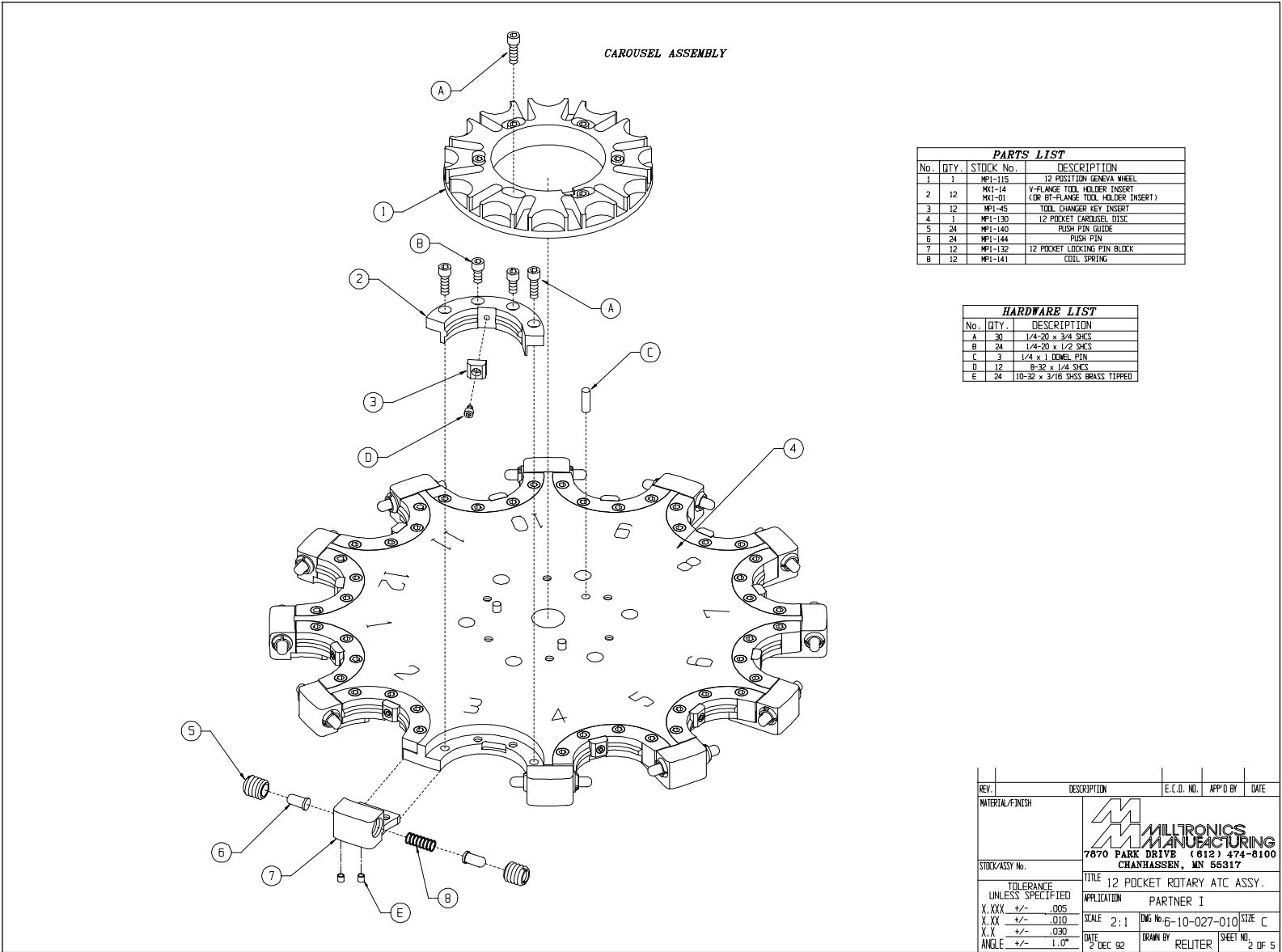
REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
MATERIAL/FINISH	 1400 MILL LANE 612.442.1410 WACONIA, MN 55387 USA			
STOCK/ASSY No.	TITLE DRAWBAR W/BLOWOUT ASSEMBLY APPLICATION PARTNER I SCALE 2:1 ENG No 6-10-008-028 SIZE B DATE 13 OCT 94 DRAWN BY THOMPSON SHEET NO. 1 OF 1			
TOLERANCE UNLESS SPECIFIED X .XXX ± X .XX ± X .X ± X . ± ANGLE ±				

Spindle Orient, Rigid Tap Assembly

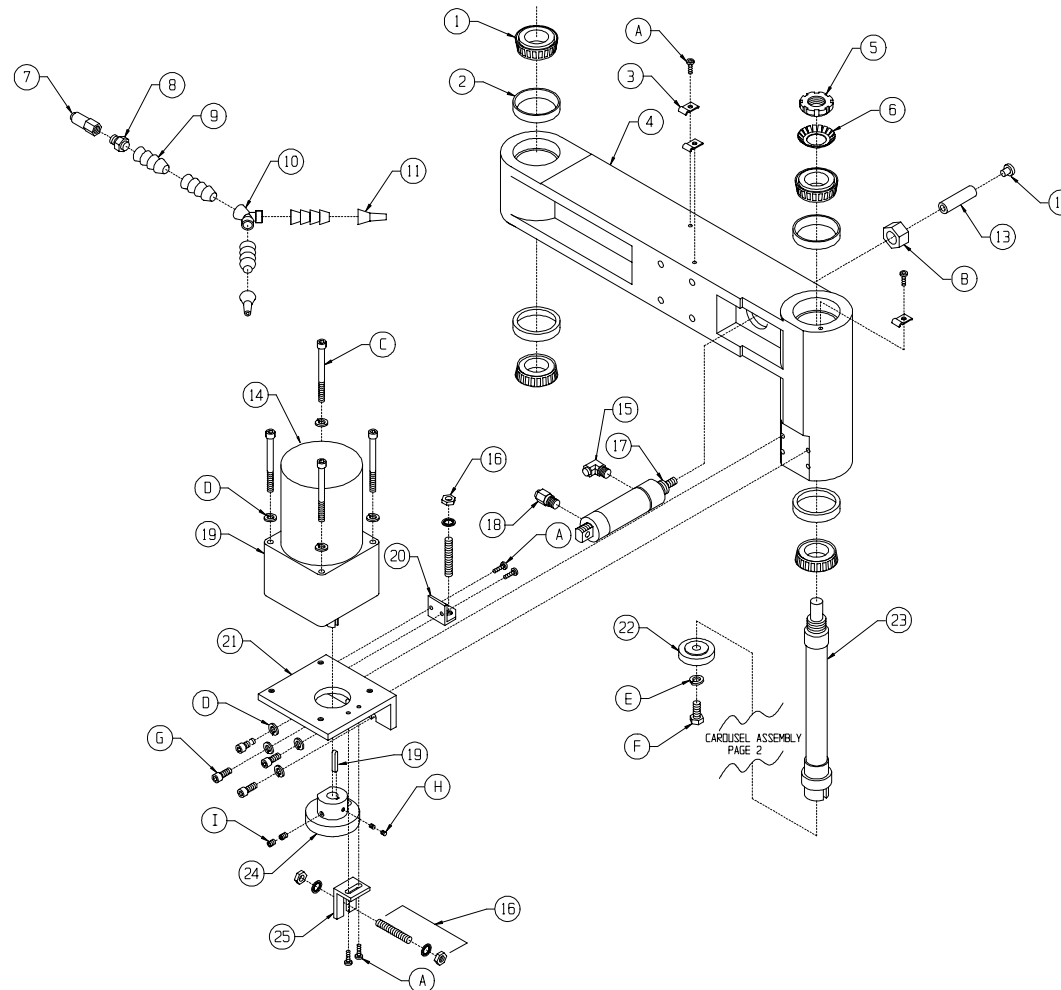


12 Pocket Rotary Tool Changer Assembly





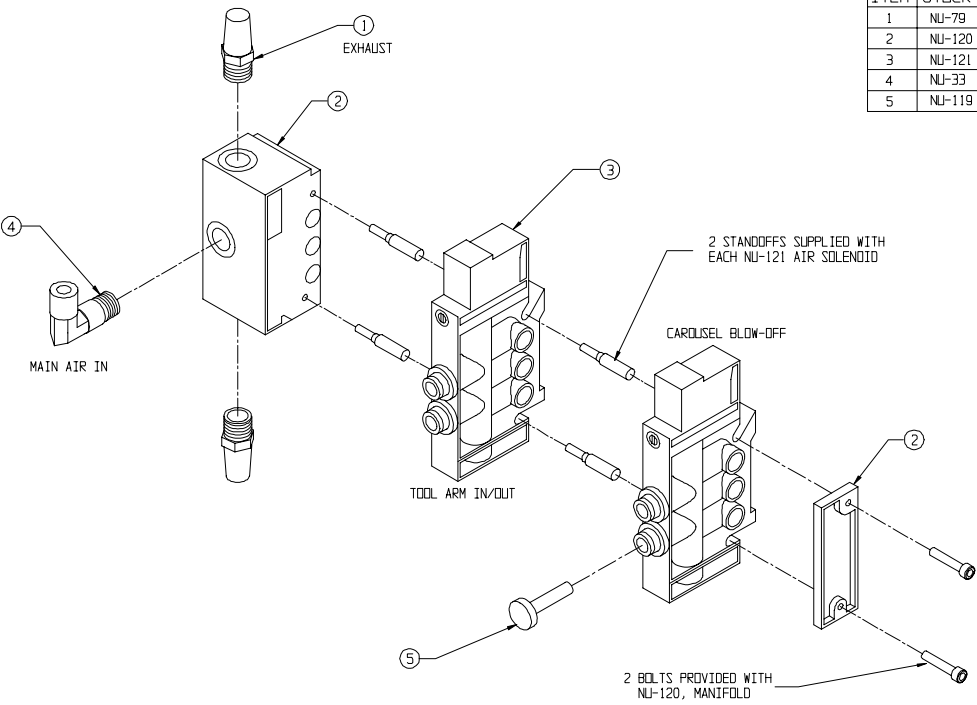
FRONT ARM ASSEMBLY



PARTS LIST		
No.	QTY.	STOCK No. DESCRIPTION
1	4	BG-33 07100 CONE TAPERED BEARING
2	4	BG-34 07196 CLIP TAPERED BEARING
3	3	NU-36 CLAMP 5/32 OILER
4	1	MX1-03 FRONT ARM SUPPORT MACHINED
5	1	BG-35 N04 BEARING LOCKNUT
6	1	BG-36 N04 BEARING LOCK WASHER
7	1	NU-116 1/8 NPT 1/4 O.D. 56642
8	1	NU-111 1-49425 1/4 LOCKLINK 1/8 NPT
9	52	MA-22 LOCKLINK HOSE 48501
10	1	MA-20 48503 1/4 Y FITTING
11	2	MA-21 1/8 NOZZLE 49423
12	1	KK-159 RUBBER BUMPER TIP ZB 4292
13	1	MP-95 ATC PUSH (PH) BAR - 12 POCKET
14	1	MD-72 SRK40GN-C MOTOR
15	1	NU-16 1/8 NPT 1/4 O.D. MALE ELBOW
16	2	PR-19 SWITCH PROX ES7MB8T110 NPN-NCB
17	1	NU-02 CYLINDER 6-DF-1
18	1	NU-17 1/8 NPT 1/4 O.D. M.S. 56642
19	1	MD-71 5GN3SK GEAR BOX
20	1	MP1-120 ATC HOME PROX BRACKET
21	1	MP1-117 GENEVA WHEEL MOTOR MOUNT
22	1	MD-11 CAROUSEL HARDENED WASHER
23	1	MP1-41 CAROUSEL ROTATION SHAFT
24	1	MX1-02 GENEVA WHEEL DRIVE CAM - MACHINED
25	1	MP1-118 GENEVA WHEEL PROX MOUNT

HARDWARE LIST	
No.	QTY. DESCRIPTION
A	7 8-32 x 3/8 BHCS
B	1 5/8-18 HEX NUT
C	4 1/4-20 x 3 SHCS
D	8 1/4 LOCK WASHER
E	1 5/16 LOCKWASHER
F	1 5/16-18 x 1-1/4 SHCS
G	4 1/4-20 x 3/4 SHCS
H	2 8-32 x 1/4 SHSS
I	2 1/4-20 x 1/4 SHSS

REV	DESCRIPTION	E.C.D. NO.	APP'D BY	DATE
1	MATERIAL/FINISH			
 MILLIRONICS MANUFACTURING 7870 PARK DRIVE (612) 474-8100 CBNABASSSEN, MN 55317				
STOCK/ASSY No.	TITLE 12 POCKET ROTARY ATC ASSY.			
TOLERANCE UNLESS SPECIFIED	APPLICATION PARTNER I			
X.XXX +/- .005	SCALE 3:1			
X.XX +/- .010	DWG No 6-10-027-010			
X.X +/- .030	DATE 8 DEC 92			
ANGLE +/- 1.0°	DRAWN BY REUTER			
	SHEET NO. 3 OF 5			

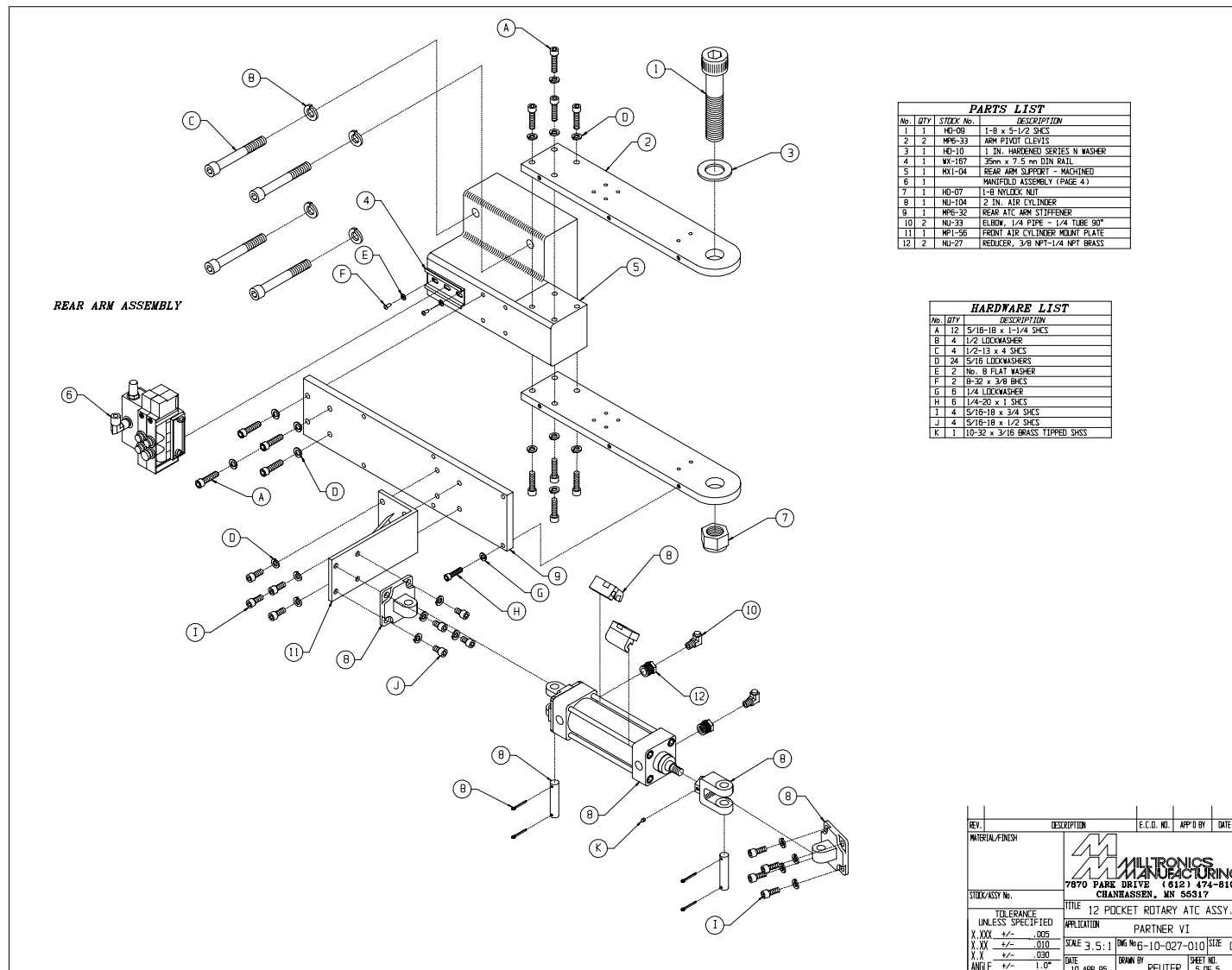


AIR MANIFOLD SUB ASSEMBLY

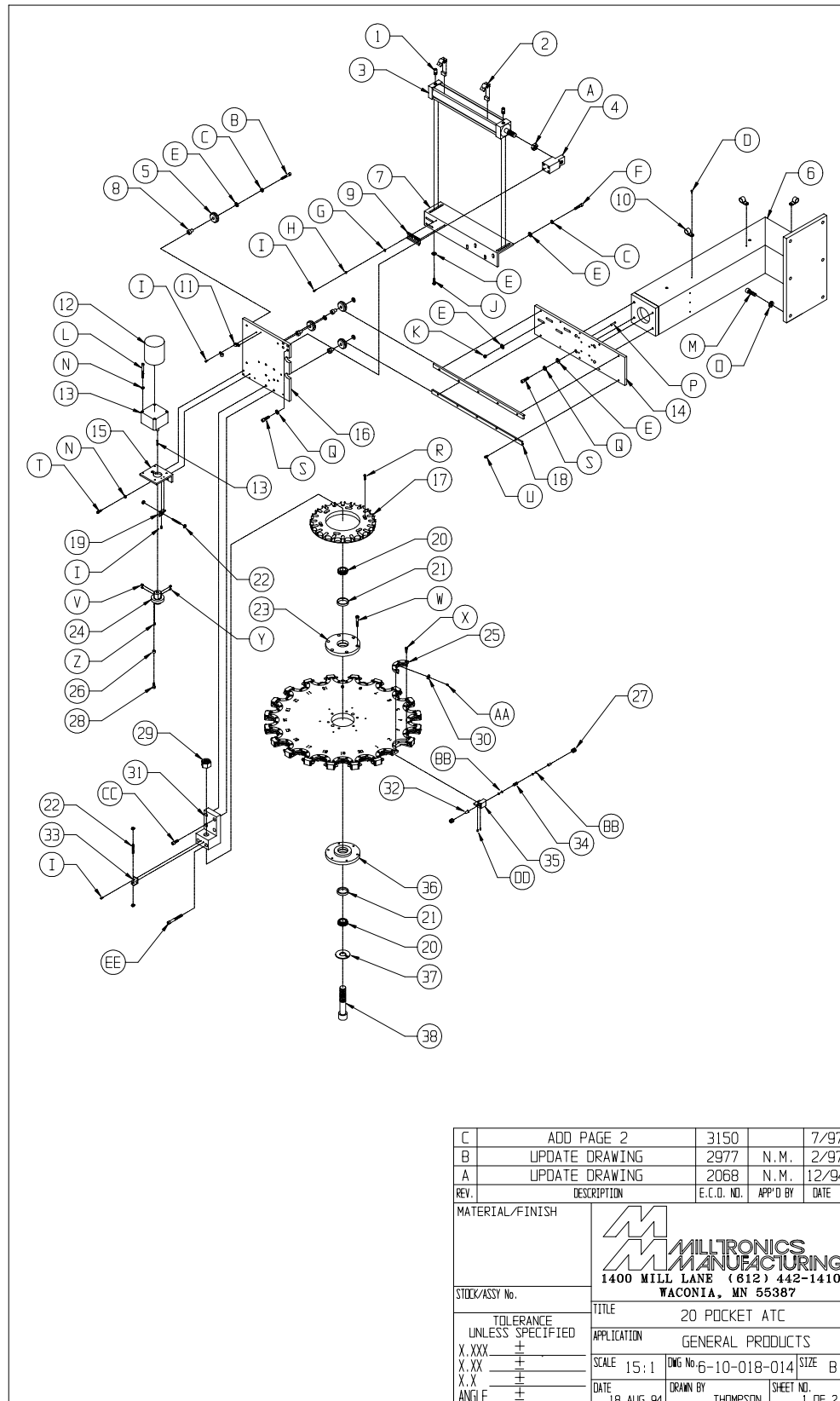
PARTS LIST

ITEM	STOCK No.	QTY.	DESCRIPTION
1	NU-79	2	FLOW MUFFLER ASP-2
2	NU-120	1	START/END PLATE MANIFOLD, PVL-B17197
3	NU-121	2	AIR SOLENOID, PVL-B1216067
4	NU-33	1	1/4 NPT-1/4 TUBE 90° ELBOW, 56944
5	NU-119	1	VALVE PLUG, 5208-4

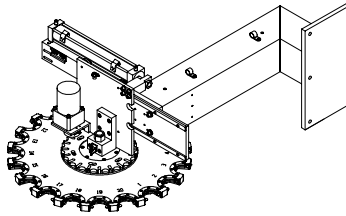
REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
MATERIAL/FINISH	 MILLIRONICS MANUFACTURING 7870 PARK DRIVE (612) 474-8100 CHANHASSEN, MN 55317			
STOCK/ASSY No.	TITLE 12 POCKET ROTARY ATC ASSY.			
TOLERANCE UNLESS SPECIFIED	APPLICATION PARTNER VI			
X.XXX +/- .005	SCALE 2:1	DWG No 6-10-027-010	SIZE B	SHEET NO. 4 OF 5
X.XX +/- .010				
X.X +/- .030				
ANGLE +/- 1.0°	DATE 6 APR 95	DRAWN BY REUTER		



20 Pocket Rotary Tool Changer Assembly



C	ADD PAGE 2	3150		7/97
B	UPDATE DRAWING	2977	N.M.	2/97
A	UPDATE DRAWING	2068	N.M.	12/94
REV.	DESCRIPTION	E.C.D. NO.	APP'D BY	DATE
MATERIAL/FINISH		 1400 MILL LANE (612) 442-1410 WACONIA, MN 55387		
STOCK/ASSY No.				
TOLERANCE UNLESS SPECIFIED		TITLE 20 POCKET ATC		
X .XXX ±		APPLICATION GENERAL PRODUCTS		
X .XX ±		SCALE 15:1 DWG No. 6-10-018-014 SIZE B		
X .X ±		DATE 18 AUG 94 DRAWN BY THOMPSON SHEET NO. 1 OF 2		
ANGLE ±				



PARTS LIST

No.	QTY	STOCK No.	DESCRIPTION
1	2	NU-32	1/4 NPT - 1/4 TUBE M/S
2	2	SW-158	REED SWITCH/BACKET
3	1	NU-123	2" AIR CYLINDER
4	1	MP-118	20 POCKET AIR CYLINDER CLEVIS
5	4	MP-143	V-RAIL GUIDE WHEEL
6	1	SEE TABLE	20 POCKET ARM
7	1	MP-117	20 POCKET AIR CYLINDER MOUNTING BRACKET
8	2	MP-145	STATIONARY BUSHING
9	1	WX-167	3" LONG DIN RAIL
10	3	WX-195	3/4" CABLE CLAMP
11	2	WX-82	3/8" CABLE CLAMP
12	1	MD-72	GENEVA MOTOR
13	1	MD-71	GEAR BOX W/KEY
14	1	MP-142	V-RAIL PLATE
15	1	MP1-117	GENEVA WHEEL MOTOR MOUNT
16	1	MP-123	20 POCKET CAROUSEL SLIDING PLATE
17	1	MP-120	20 POSITION GENEVA WHEEL
18	2	MX-12	20 POCKET LINEAR V-RAIL MODS.
19	1	MP1-118	GENEVA WHEEL PROX MOUNT
20	2	BG-33	CONE TAPERED BEARING
21	2	BG-34	CLIP TAPERED BEARING
22	2	PR-19	SWITCH PROX
23	1	MP-116	UPPER CAROUSEL BEARING CLIP
24	1	MX-10	20 ATC DRIVE CAM - MACHINED
25	20	SEE TABLE	20 POCKET INSERT
26	1	HD-39	1/2 x 5/16 DRILL BUSHING
27	40	MP1-140	PUSH PIN GUIDE
28	1	HD-38	5/16 x 3/8 SHOULDER BOLT
29	1	HD-07	1"-8 UNC NYLOCK NUT
30	20	SEE TABLE	20 POCKET TOOL CHANGE KEY
31	1	MP-124	20 POCKET CAROUSEL MOUNTING BRACKET
32	40	MP1-144	PUSH PIN
33	1	MP1-120	ATC HOME PROX BRACKET
34	40	MP1-141	COIL SPRING
35	20	MP-121	20 ATC LOCKING PIN BLOCK
36	1	MP-115	LOWER CAROUSEL BEARING CLIP
37	1	HD-10	1" HARDENED SERIES N WASHER
38	1	HD-09	1-8 x 5 1/2 UNC SHCS BOLT

HARDWARE LIST

No.	QTY	DESCRIPTION
A	1	3/4-10 JAM NUT
B	4	5/16-18 x 1 5/8 SHCS
C	8	5/16 LOCK WASHER
D	3	10-32 x 3/8 BHCS
E	20	5/16 HARDENED FLAT WASHER
F	4	5/16-18 x 1 1/2 SHCS
G	2	# 8 FLAT WASHER
H	2	# 8 LOCK WASHER
I	8	8-32 x 1/2 BHCS
J	4	5/16-24 x 3/4 BHCS
K	4	5/16-18 HEX NUT
L	4	1/4-20 x 3 SHCS
M	6	1/2-13 x 2 SHCS
N	8	1/4 LOCK WASHER
O	6	1/2 LOCK WASHER
P	4	1/4 x 1 DOWEL PIN
Q	8	3/8 LOCK WASHER
R	6	1/4-20 x 3/4 BHCS
S	8	3/8-16 x 1 1/4 SHCS
T	4	1/4-20 x 7/8 SHCS
U	5	1/4-20 x 5/8 BHCS
V	2	5/16-18 x 1/4 SHSS
W	6	5/16-18 x 1 3/4 SHCS
X	80	1/4-20 x 3/4 SHCS
Y	2	1/4-20 x 1/4 SHSS
Z	1	8-32 x 1/4 BHCS
AA	20	8-32 x 1/4 SHCS
BB	4	#6 FLAT WASHER
CC	4	3/8-16 x 1 SHCS
DD	40	10-32 x 3/16 BRASS TIPPED SHSS
EE	2	3/8-16 x 3 SHCS

* BB IS REMOVED FOR V-FLANGE OPTION *

20 POCKET ARM CHART

MACHINE	STOCK No.
VM-17	MP1-193
VM-24	MP6-126
VM-30	MP7-61
VMD-30	MP7-61
MC-20	MPS-05

20 POCKET TOOL CHANGE KEY CHART

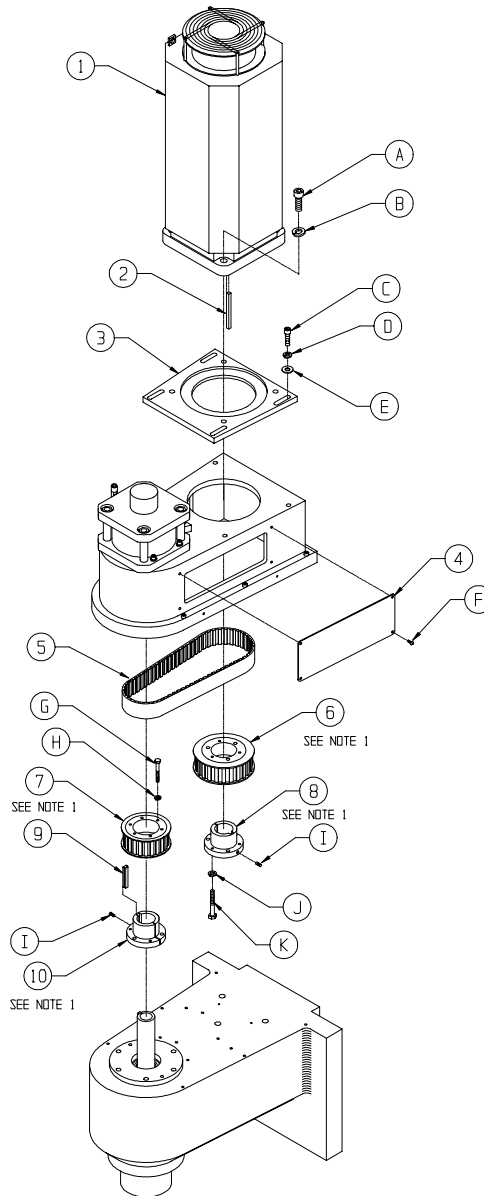
V-FLANGE	MP1-45
BT	MP1-121

20 POCKET INSERT CHART

V-FLANGE	MX-11
BT	MX-13

C	ADD PAGE 2	3150		7/97
B	UPDATE DRAWING	2977	N.M.	2/97
A	UPDATE DRAWING	2068	N.M.	12/94
REV.	DESCRIPTION	E.C.D. NO.	APP'D BY	DATE
MATERIAL/FINISH		 1400 MILL LANE (612) 442-1410 WACONIA, MN 55387		
STOCK/ASSY No.				
TOLERANCE UNLESS SPECIFIED		TITLE 20 POCKET ATC		
X.XXX X.XX X.X ANGLE		APPLICATION GENERAL PRODUCTS		
+		SCALE 15:1		
+		DWG No 6-10-018-014		
+		SIZE B		
+		DATE 18 AUG 94		
+		DRAWN BY THOMPSON		
+		SHEET NO. 2 OF 2		

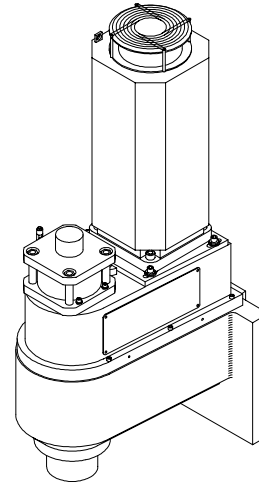
12 & 15 HP 6K Pulley Assembly



REV.	DESCRIPTION	E.C.D. NO.	APP'D BY	DATE
MATERIAL/FINISH		 1400 MILL LANE (612) 442-1410 WACONIA, MN 55387		
STOCK/ASSY No.				
TOLERANCE UNLESS SPECIFIED		TITLE 12 1/2 H.P. 6K RPM SPINDLE HEAD		
X .XXX ±		APPLICATION GENERAL PRODUCTS		
X .XX ±		SCALE 8:1	DWG No 6-10-018-057	SIZE B
X .X ±		DATE 25 FEB 98	DRAWN BY THOMPSON	SHEET NO. 1 OF 2
ANGLE ±				

NOTES:

1. THIS ARRANGEMENT IS FOR HIGH SPEED RANGE
INTERCHANGE ITEMS 6 & 7 FOR LOW SPEED
OPERATION.



PARTS LIST

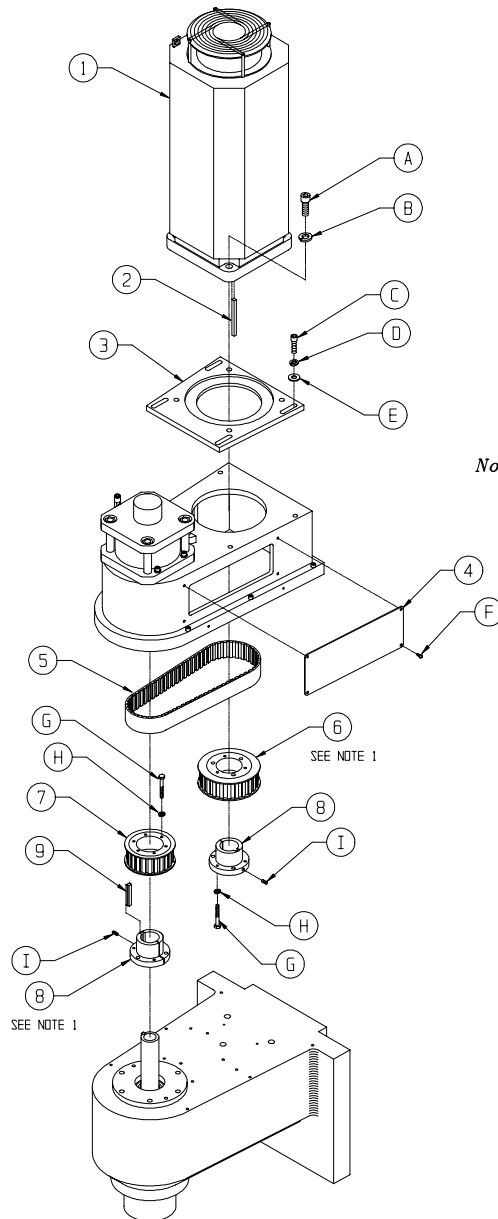
No.	QTY	STOCK No.	DESCRIPTION
1	1	MD-80	12 1/2 H.P. SPINDLE MOTOR
2	1	MP-111	12 1/2 H.P. SPINDLE MOTOR PULLEY KEY
3	1	MP-110	12 1/2 H.P. SPINDLE MOTOR MOUNT
4	2	MP-113	12 H.P. SPINDLE BELT COVER
5	1	BT-31	TIMING BELT 330H150
6	1	PY-75	TIMING PULLEY 32H150 SK
7	1	PY-76	TIMING PULLEY 22H150 SD
8	1	PY-74	1 1/2 I.D. SK BUSHING
9	1	MP-112	12 H.P. SPINDLE PULLEY KEY
10	1	PY-64	1 1/2 I.D. SD BUSHING

HARDWARE LIST

No.	QTY	DESCRIPTION
A	4	1/2-13 x 1 1/4 SHCS
B	4	1/2 LOCK WASHER
C	4	3/8-16 x 1 1/4 SHCS
D	4	3/8 LOCK WASHER
E	4	3/8 FLAT WASHER
F	8	8-32 x 3/8 BHCS
G	3	1/4-20 x 2 HHCS
H	3	1/4 LOCK WASHER
I	2	1/4-20 x 3/8 SHSS
J	3	5/16 LOCK WASHER
K	3	5/16-18 x 2 HHCS

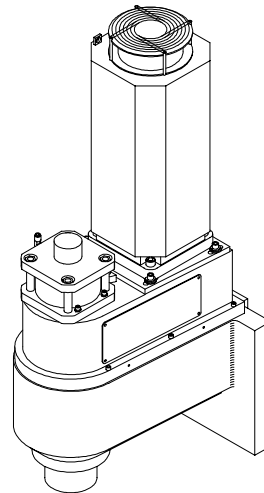
REV.	DESCRIPTION	E.C.D. NO.	APP'D BY	DATE
MATERIAL/FINISH		 1400 MILL LANE (612) 442-1410 WACONIA, MN 55387		
STOCK/ASSY No.				
TOLERANCE UNLESS SPECIFIED		TITLE 12 1/2 H.P. 6K RPM SPINDLE HEAD		
X .XXX	±	APPLICATION GENERAL PRODUCTS		
X .XX	±	SCALE 8:1	DWG No 6-10-018-057	SIZE B
X .X	±	DATE 25 FEB 98	DRAWN BY THOMPSON	SHEET NO. 2 OF 2
ANGLE	±			

12 & 15 HP 4.5K Pulley Assembly



Notes:

1. THIS ARRANGEMENT IS FOR HIGH SPEED RANGE INTERCHANGE ITEMS 6 & 7 FOR LOW SPEED OPERATION.

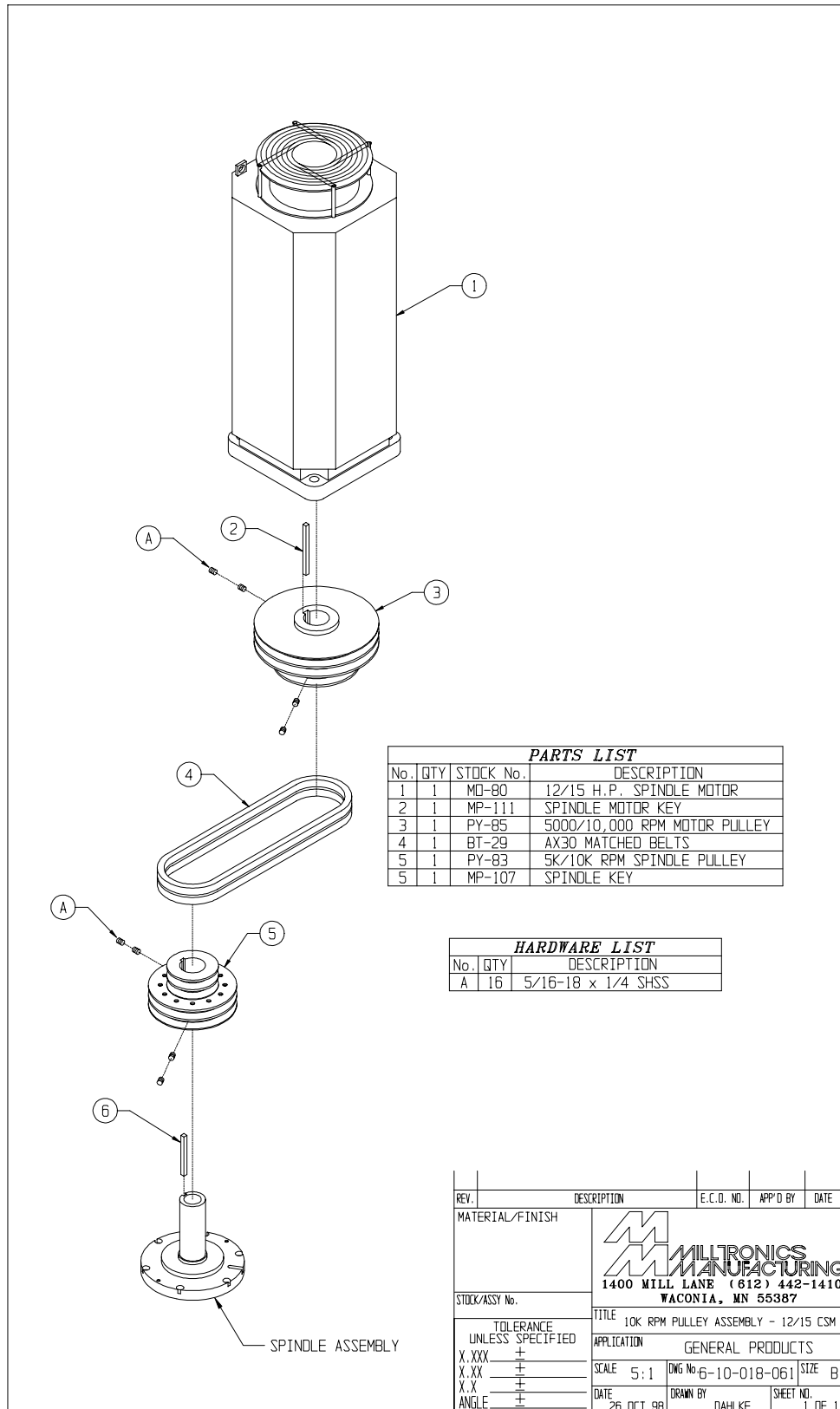


REV.	CHANGE NOTES	2411	E.C.D. NO.	APP'D BY	DATE
A					9/95
MATERIAL/FINISH					
STOCK/ASSY No.					
TOLERANCE UNLESS SPECIFIED					
X .XX ± .005					
X .XX ± .010					
X .XX ± .030					
ANGLE 1.0°					
APPLICATION					
TITLE 12-1/2 H.P. SPINDLE HEAD ASSEMBLY					
DRAWN BY THOMPSON					
DATE 19 JUN 94					
SHEET NO. 1 OF 1					

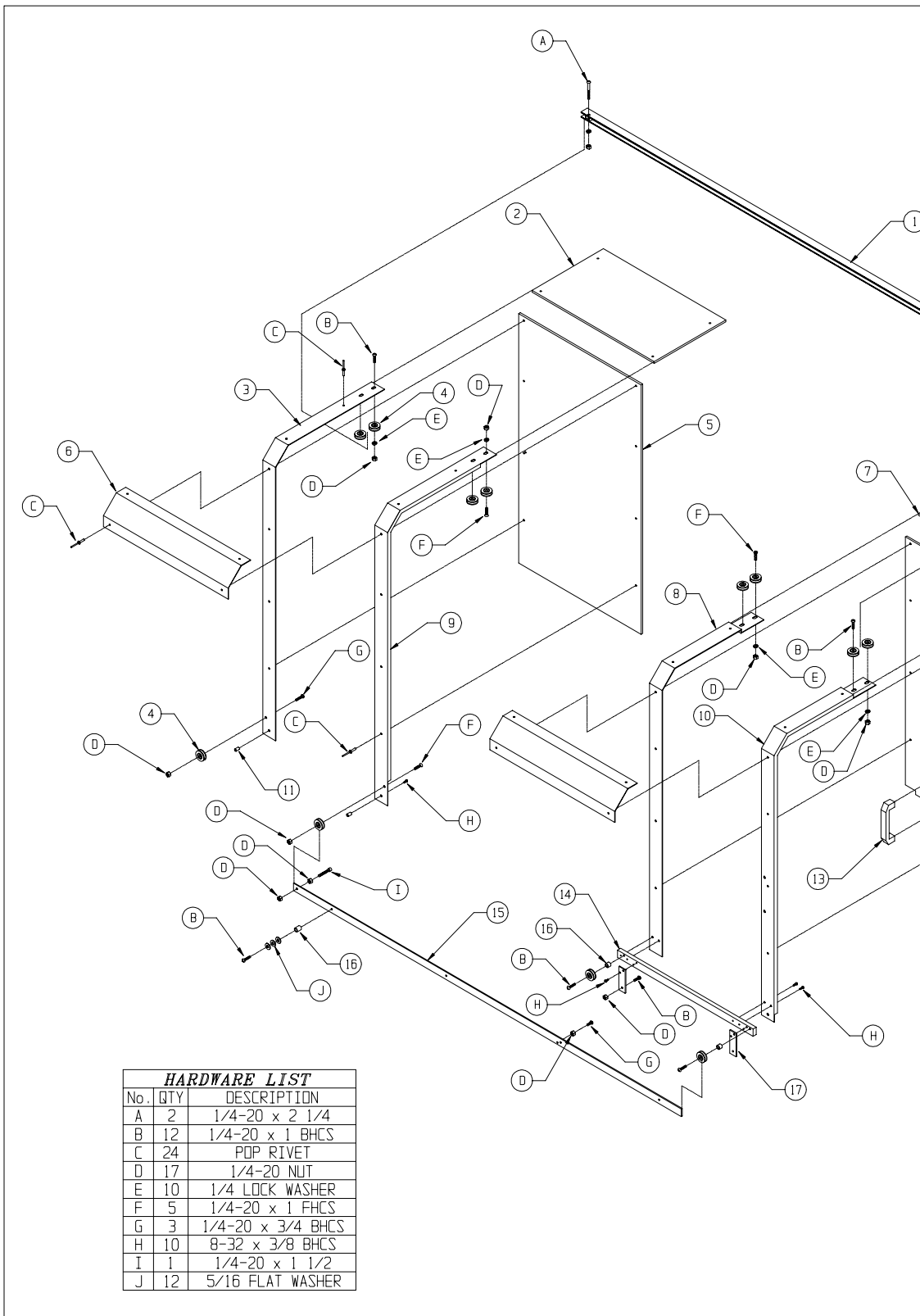
PARTS LIST		
No.	QTY	DESCRIPTION
1	1	MO-80 12 1/2 H.P. SPINDLE MOTOR NB1902FRM-445
2	1	MP-111 12 1/2 H.P. SPINDLE MOTOR PULLEY KEY
3	1	MP-110 12 1/2 H.P. SPINDLE MOTOR MOUNT
4	2	MP-113 12 H.P. SPINDLE BELT COVER
5	1	BT-31 TIMING BELT 330H150
6	1	PY-63 TIMING PULLEY 30H150 SD
7	1	PY-62 TIMING PULLEY 24H150 SD
8	2	PY-64 1 1/2 I.D. SD BUSHING
9	1	MP-112 12 H.P. SPINDLE PULLEY KEY

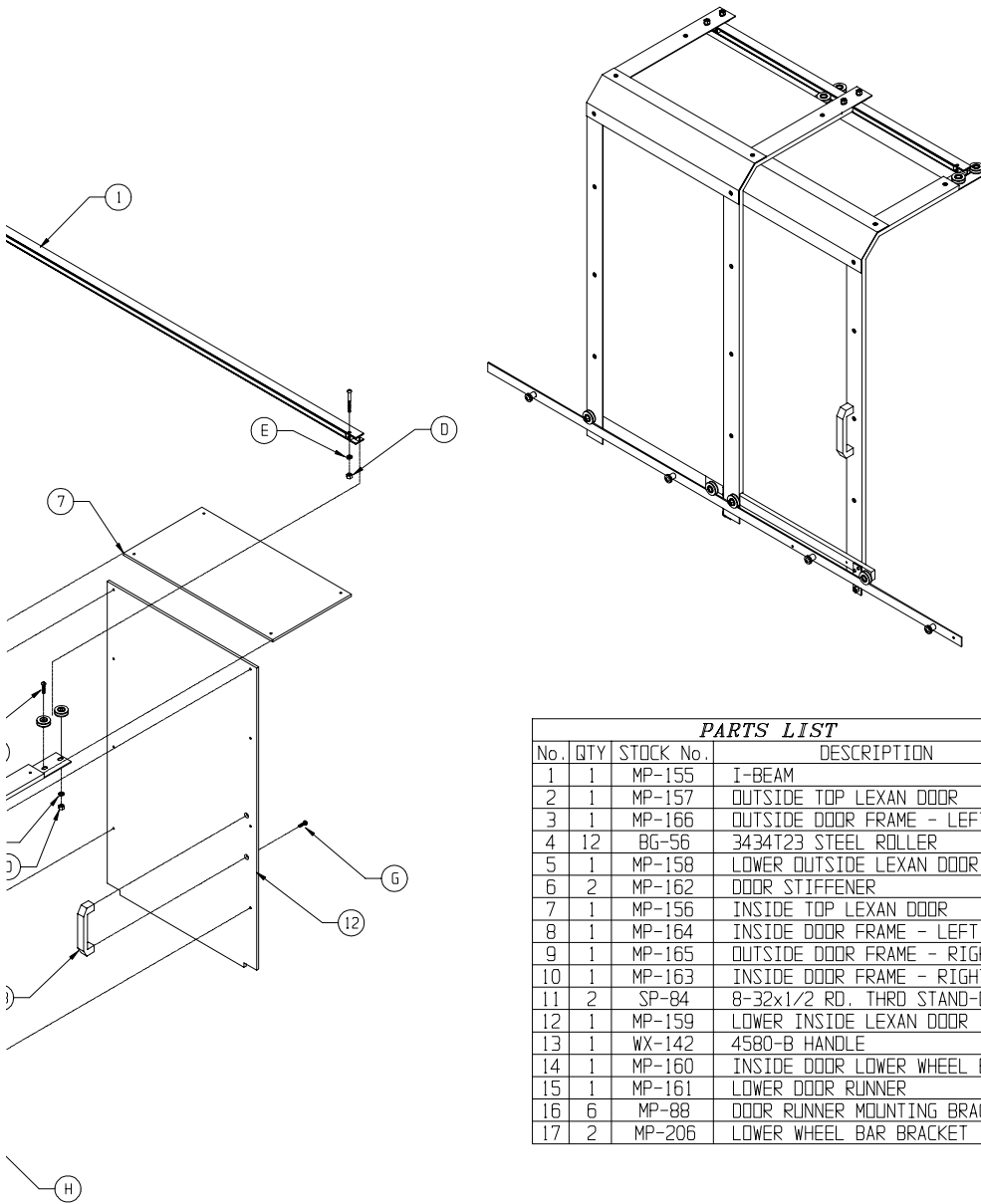
HARDWARE LIST		
No.	QTY	DESCRIPTION
A	4	1/2-13 x 1 1/4 SHCS
B	4	1/2 LOCK WASHER
C	4	3/8-16 x 1 1/4 SHCS
D	4	3/8 LOCK WASHER
E	4	3/8 FLAT WASHER
F	8	8-32 x 3/8 BHCS
G	6	1/4-20 x 2 HHCS
H	6	1/4 LOCK WASHER
I	2	1/4-20 x 3/8 SHSS

12 & 15 HP 10K Pulley Assembly



Chip Pan Door Assembly



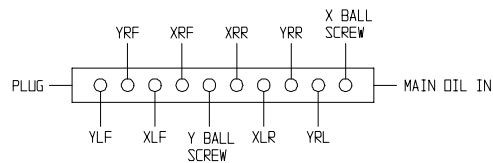


PARTS LIST

No.	QTY	STOCK No.	DESCRIPTION
1	1	MP-155	I-BEAM
2	1	MP-157	OUTSIDE TOP LEXAN DOOR
3	1	MP-166	OUTSIDE DOOR FRAME - LEFT
4	12	BG-56	3434T23 STEEL ROLLER
5	1	MP-158	LOWER OUTSIDE LEXAN DOOR
6	2	MP-162	DOOR STIFFENER
7	1	MP-156	INSIDE TOP LEXAN DOOR
8	1	MP-164	INSIDE DOOR FRAME - LEFT
9	1	MP-165	OUTSIDE DOOR FRAME - RIGHT
10	1	MP-163	INSIDE DOOR FRAME - RIGHT
11	2	SP-84	8-32x1/2 RD. THRD STAND-OFF
12	1	MP-159	LOWER INSIDE LEXAN DOOR
13	1	WX-142	4580-B HANDLE
14	1	MP-160	INSIDE DOOR LOWER WHEEL BAR
15	1	MP-161	LOWER DOOR RUNNER
16	6	MP-88	DOOR RUNNER MOUNTING BRACKET
17	2	MP-206	LOWER WHEEL BAR BRACKET

REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
MATERIAL/FINISH		 MILLTRONICS MANUFACTURING 7870 PARK DRIVE (612) 474-8100 CHANHASSEN, MN 55317		
STOCK/ASSY No.				
TOLERANCE UNLESS SPECIFIED		TITLE 52" CHIP PAN DOORS		
X .XXX ± .005		APPLICATION GENERAL PRODUCTS		
X .XX ± .010		SCALE 10:1 DWG No. 6-10-018-017 SIZE C		
X .X ± .030		DATE 11 JAN 95 DRAWN BY THOMPSON SHEET NO. 1 OF 1		
ANGLE ± 1.0°				

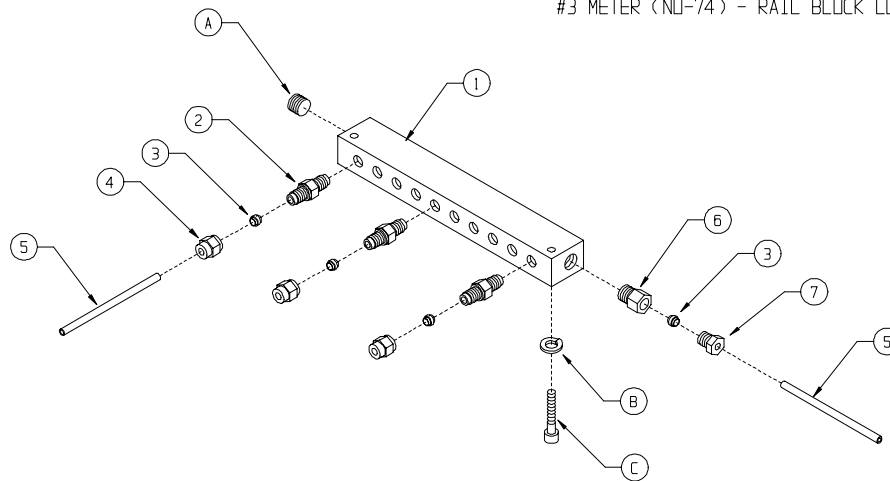
X & Y Axis Autolube Manifold Assembly



OIL LINE DESTINATIONS
SEE NOTE FOR METER SIZE

NOTES:

1. OIL METER SIZES:
#2 METER (NU-63) - BALL SCREW LOCATIONS.
#3 METER (NU-74) - RAIL BLOCK LOCATIONS.

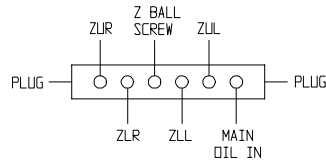


PARTS LIST			
No.	QTY	STOCK No.	DESCRIPTION
1	1	MP1-92	X & Y AXIS OIL MANIFOLD
2	10	----	OIL METER (SEE NOTE FOR SIZE)
3	11	NU-38	B-1061 FERRULE DOUBLE
4	10	NU-45	PAN-4-M COMPRESSION NUT
5	-	NU-81	TUBING 5-32 5C25
6	1	NU-110	15352 1/8 NPT-M8-1 OIL FITTING
7	1	NU-108	15328 COMPRESSION FITTING

HARDWARE LIST		
No.	QTY	DESCRIPTION
A	1	1/8-27 PIPE PLUG
B	2	# 10 LOCK WASHER
C	2	10-32 x 1 1/4 SHCS

REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
MATERIAL/FINISH		 MILLIRONICS MANUFACTURING 7870 PARK DRIVE (612) 474-8100 CHANHASSEN, MN 55317		
STOCK/ASSY No.				
TOLERANCE UNLESS SPECIFIED		TITLE X & Y AXIS OIL MANIFOLD ASSEMBLY		
X.XXX ± .005		APPLICATION PARTNER I		
X.XX ± .010		SCALE 2.5:1		DWG No. 6-10-008-023
X.X ± .030		DATE 7 JUN 94		SIZE B
ANGLE ± 1.0°		DRAWN BY THOMPSON		SHEET NO. 1 OF 1

Z-Axis Autolube Manifold Assembly



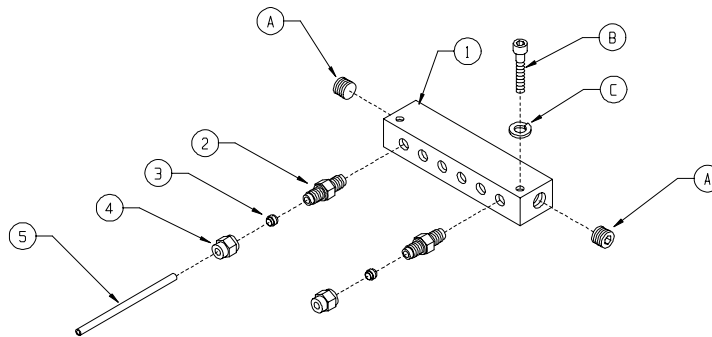
OIL LINE DESTINATIONS
SEE NOTE FOR METER SIZE

NOTES:

1. OIL METER SIZE:
#2 METER (NU-63) - BALL SCREW LOCATION.
#3 METER (NU-74) - RAIL BLOCK LOCATIONS.

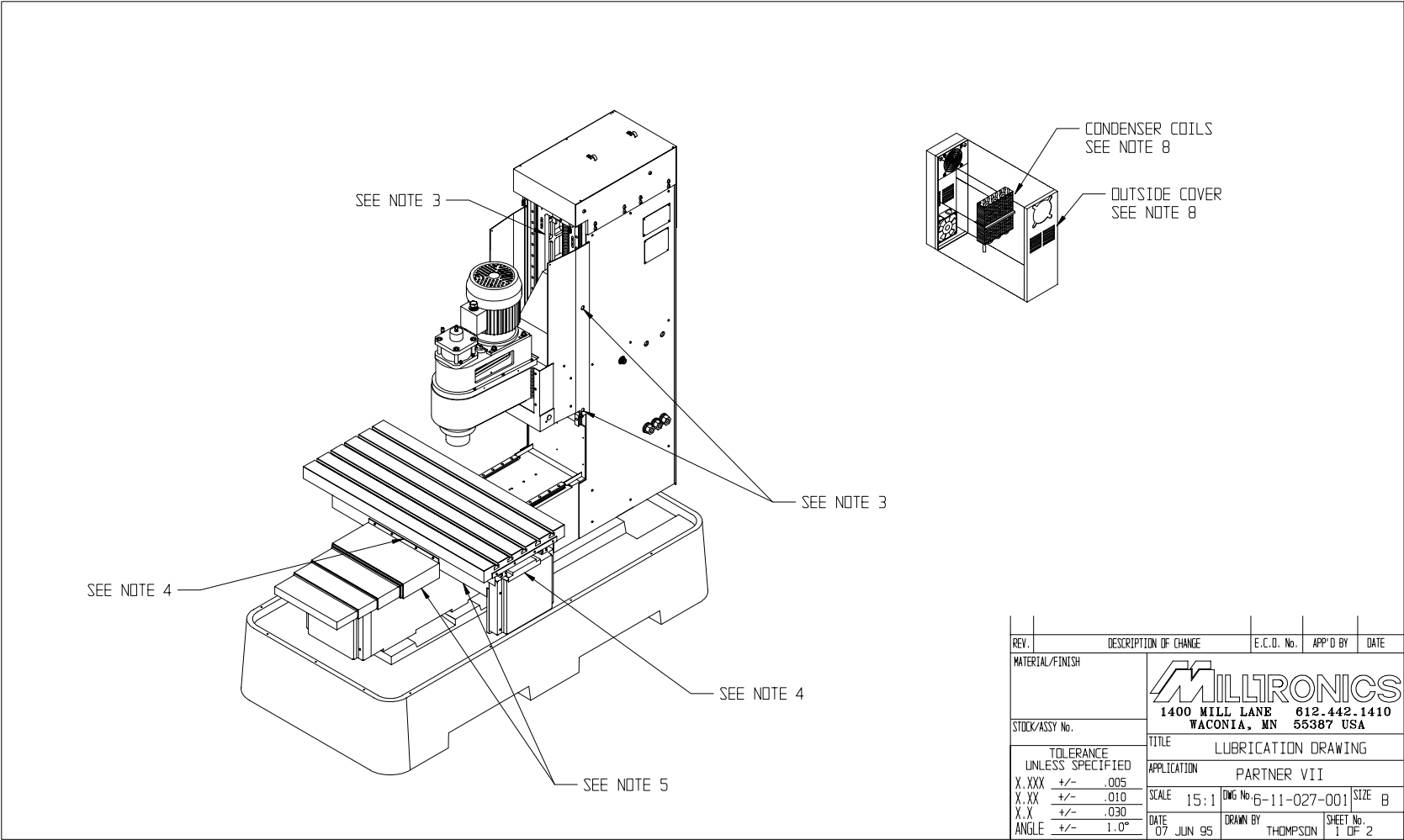
PARTS LIST			
No.	QTY	STOCK No.	DESCRIPTION
1	1	MP1-91	Z-AXIS OIL MANIFOLD
2	6	----	OIL METER (SEE NOTE FOR SIZE)
3	6	NU-38	B-1061 FERRULE DOUBLE
4	6	NU-45	PAN-4-M COMPRESSION NUT
5	-	NU-81	TUBING 5-32 5C25

HARDWARE LIST		
No.	QTY	DESCRIPTION
A	2	1/8-27 PIPE PLUG
B	2	10-32 x 1 1/4 SHCS
C	2	# 10 LOCK WASHER



REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
MATERIAL/FINISH		 MILLIRONICS MANUFACTURING 7870 PARK DRIVE (612) 474-8100 CHANHASSEN, MN 55317		
STOCK/ASSY No.				
TOLERANCE UNLESS SPECIFIED		TITLE Z-AXIS OIL MANIFOLD ASSEMBLY		
X.XXX ± .005		APPLICATION PARTNER I		
X.XX ± .010		SCALE 2.5:1		
X.X ± .030		DWG No. 6-10-008-024		
ANGLE ± 1.0°		DATE 7 JUN 94		
		DRAWN BY THOMPSON		SHEET NO. 1 OF 1

Machine Lubrication Instructions

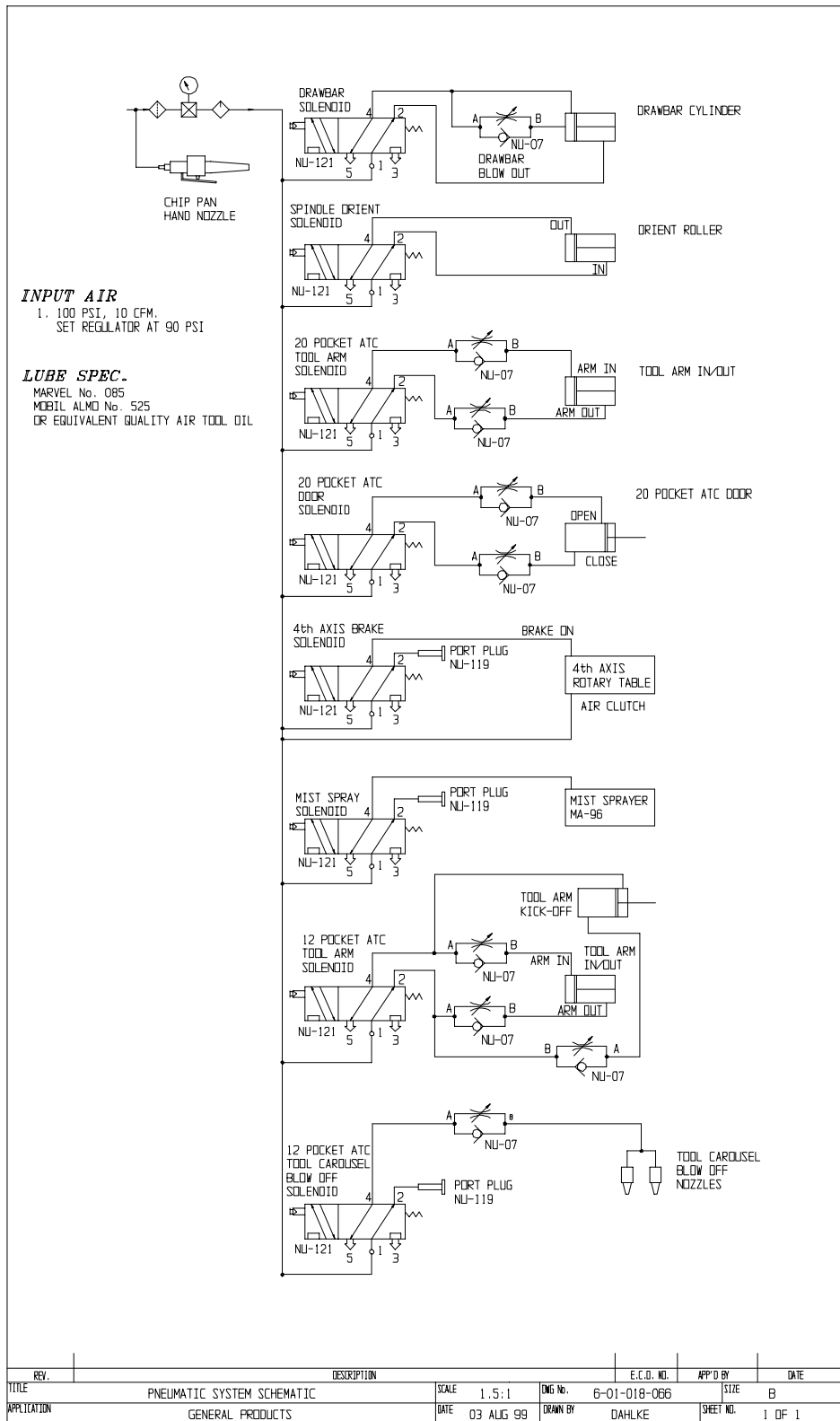


REV.	DESCRIPTION OF CHANGE	E.C.O. No.	APP'D BY	DATE
MATERIAL/FINISH		 1400 MILL LANE 612.442.1410 WACONIA, MN 55387 USA		
STOCK/ASSY No.		TITLE LUBRICATION DRAWING		
TOLERANCE UNLESS SPECIFIED		APPLICATION PARTNER VII		
X.XXX	+/- .005	SCALE 15:1	DWG No. 6-11-027-001	SIZE B
X.XX	+/- .010			
X.X	+/- .030			
ANGLE	+/- 1.0°	DATE 07 JUN 95	DRAWN BY THOMPSON	SHEET No. 1 OF 2

1. BE SURE TO CLEAN THE ENTIRE MACHINE BEFORE LUBRICATION TO ENSURE CONTAMINANTS WILL NOT GET INTO THE RAIL BLOCKS AND BALL SCREWS. USE MOBIL 1 SYNTHETIC UNIVERSAL GREASE OR OTHER EQUIVALENT FOR ALL LUBE POINTS.
2. USE THE 12" GREASE GUN EXTENSION TUBE SUPPLIED WITH THE MACHINE TO MAKE THE TASK MUCH EASIER. IT IS ALSO NECESSARY ON THE SAME GREASE GUN TO BEVEL THE EDGE OF THE NOZZLE TO GAIN MORE CLEARANCE BETWEEN THE RAIL BLOCK AND GREASE FITTING.
3. REMOVE HOLE PLUGS (WX-113) FROM THE Z-AXIS SIDE GUARDS LEFT AND RIGHT SIDE. THIS WILL ALLOW ACCESS TO THE GREASE FITTINGS ON THE Z RAIL BLOCKS. REPLACE HOLE PLUGS IN THE SIDE GUARDS AFTER COMPLETION. TO GREASE Z-AXIS BALL SCREW MOVE THE HEAD DOWN TO THE EXTREME LIMIT AND EMERGENCY STOP THE MACHINE. PUT A GENEROUS AMOUNT OF GREASE IN YOUR HAND AND REACH IN FROM THE FRONT OF THE COLUMN THROUGH THE ACCESS HOLE AND APPLY TO THE BALL SCREW. WHEN COMPLETED CYCLE Z-AXIS FULL TRAVEL FIVE TIMES TO ENSURE THE BALL SCREW IS PROPERLY GREASED TRAVELING NO FASTER THAN 50 ipm.
4. MOVE Y-AXIS TO THE HOME POSITION AND CENTER THE TABLE ON X-AXIS. USE THE NOTCHES IN THE FRONT AND REAR TABLE PLATES FOR ACCESS. ALIGN THE NOTCH TO THE GREASE FITTING ON THE LEFT FRONT X-AXIS RAIL BLOCK. INSERT GREASE GUN TIP THROUGH THE NOTCH AND GREASE RAIL BLOCK. BEFORE MOVING THE TABLE GREASE THE LEFT REAR RAIL BLOCK IN THE SAME MANNER. REPEAT PROCEDURE FOR THE RIGHT SIDE RAIL BLOCKS. TO GREASE THE X-AXIS BALL SCREW REMOVE RUBBER WIPER FLAPS MOUNTED ON THE ENDS OF THE TABLE. WITH THE TABLE STILL IN THE CENTER OF TRAVEL PULL THE RIGHT X-AXIS WAY COVER OUT ABOUT 2 INCHES AND PLACE A 2 x 2 x 2 SPACER BETWEEN THE WAYCOVER AND THE BELT & PULLEY COVER. MOVE X-AXIS TO THE HOME POSITION AND EMERGENCY STOP THE MACHINE. THROUGH THE GAP BETWEEN THE X-AXIS WAYCOVER AND THE TABLE APPLY GREASE TO THE BALL SCREW. MOVE X-AXIS BACK TO THE CENTER OF THE TRAVEL AND MOVE THE SPACER FROM THE RIGHT SIDE TO THE LEFT SIDE AND REPEAT PROCESS EXCEPT FOR MOVING THE TABLE TO THE EXTREME RIGHT. WHEN COMPLETED CENTER THE TABLE THEN REMOVE THE SPACER AND CYCLE X-AXIS FULL TRAVEL FIVE TIMES TO ENSURE THE BALL SCREW IS PROPERLY GREASED TRAVELING NO FASTER THAN 50 ipm.
5. MOVE Y-AXIS TO THE CENTER OF THE TRAVEL TO GREASE ALL Y-AXIS RAIL BLOCKS. ACCESS TO THE GREASE FITTINGS ON THE RAIL BLOCKS IS GAINED FROM UNDER THE SADDLE AND IN BETWEEN THE RAIL BLOCKS. TO GREASE THE Y-AXIS BALL SCREW MOVE Y-AXIS INTO THE EXTREME LIMIT OF THE TRAVEL AND EMERGENCY STOP THE MACHINE. REMOVE THE FOUR SCREWS HOLDING THE FRONT Y-AXIS WAY COVER TO THE SADDLE AND SLIDE THE WAY COVER BACK TOWARDS THE CHIP PAN PUT A GENEROUS AMOUNT OF GREASE IN YOUR HAND AND REACH IN FROM THE TOP OF THE BASE THROUGH THE ACCESS HOLE AND APPLY TO THE BALL SCREW. AFTER GREASING MOVE Y-AXIS TO HOME POSITION AND RE-INSTALL THE FRONT Y-AXIS WAY COVER AND CYCLE Y-AXIS FULL TRAVEL FIVE TIMES TO ENSURE THE BALL SCREW IS PROPERLY GREASED TRAVELING NO FASTER THAN 50 ipm.
6. BALL SCREWS NEED ONLY BE GREASED 2 TIMES PER YEAR, RAIL BLOCKS SHOULD BE GREASED EVERY 500 HOURS OR 3 MONTHS WHICH EVER COMES FIRST.
7. CLEAN AND FILL AIR FILTER / REGULATOR / OILER EVERY WEEK FOR PROPER OPERATION OF ALL PNEUMATIC PARTS. FILL WITH MARVEL No. 085, MOBIL ALMO 525 OR OTHER EQUIVALENT QUALITY AIR TOOL OIL.
8. CLEAN THE HEAT EXCHANGER EVERY MONTH BY REMOVING THE MOUNTING HARDWARE ON THE BOTTOM AND REMOVE THE OUTSIDE COVER. REMOVE THE CONDENSER COILS AND CLEAN IT WITH AN AIR NOZZLE AND REASSEMBLE.

REV.	DESCRIPTION OF CHANGE	E.C.D. No.	APP'D BY	DATE
MATERIAL/FINISH	 1400 MILL LANE 612.442.1410 WACONIA, MN 55387 USA			
STOCK/ASSY No.				
TOLERANCE UNLESS SPECIFIED	TITLE	LUBRICATION DRAWING		
X.XXX +/- .005	APPLICATION	PARTNER VII		
X.XX +/- .010	SCALE	20:1	DWG No. 6-11-027-001	SIZE B
X.X +/- .030	DATE	30 OCT 95	DRAWN BY THOMPSON	SHEET No. 2 OF 2
ANGLE +/- 1.0°				

Pneumatic Schematic



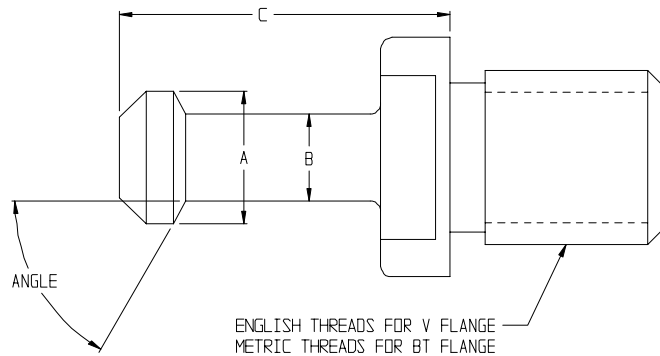
Retention Knob Chart

RETENTION KNOBS STYLE V-FLANGE

V-FLANGE TAPER	DIMENSIONS				MILLIRONICS MACHINE	COMMAND PART No.	KENAMETAL PART No.	VALENITE PART No.
	A	B	C	ANGLE				
40	.59	.39	1.27	60°	RH20, RH25, RH30, BR50, BR60, BR80 PARTNER VM15, VM16, VM17, VMG17, VM24, VM25, VM30, VMD30	RB4E-0002	RK31114A	PT-532-60

RETENTION KNOBS STYLE BT-FLANGE

BT-FLANGE TAPER	DIMENSIONS				MILLIRONICS MACHINE	COMMAND PART No.	KENAMETAL PART No.	VALENITE PART No.
	A	B	C	ANGLE				
40	.59	.39	1.38	60°	RH20, RH25, RH30, BR50, BR60, BR80 PARTNER VM15, VM16, VM17, VMG17, VM24, VM25, VM30, VMD30	RB4M-0002	RK31113A	PT-444-60



Notes:

1. COMMAND CORPORATION
TEL - 1.800.328.2197
FAX - 1.612.576.6911
2. KENAMETAL
TEL - 1.800.446.7738
FAX - 1.800.962.4910
3. VALENITE
TEL - 1.800.544.3336
FAX - 1.800.488.0695

REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
	MATERIAL/FINISH			
	STOCK/ASSY No.			
	TOLERANCE UNLESS SPECIFIED			
	X.XXX +/-			
	X.XX +/-			
	X.X +/-			
	ANGLE +/-			
	 1400 MILL LANE 612.442.1410 WACONIA, MN 55387 USA			
	TITLE	RETENTION KNOB CHART		
	APPLICATION	GENERAL PRODUCTS		
	SCALE	1:1	DWG No. 6-11-018-054	SIZE B
	DATE	30 APR 99	DRAWN BY DAHLKE	SHEET NO. 1 OF 1