

BR 50,60,80 G Mechanical

November 9, 2005
Rev 3

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Manual Discrepancy Sheet

1.

Exploded view diagram of the Base Sub-Assembly for a Bridge Mill. The diagram shows various components labeled with letters and numbers. Key parts include: 1. RAILS (A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, AA, AB, AC, AD, AE, AF, AG, AH, AI, AJ, AK, AL, AM, AN, AO, AP, AQ, AR, AS, AT, AU, AV, AW, AX, AY, AZ, BA, BB, BC, BD, BE, BF, BG, BH, BI, BJ, BK, BL, BM, BN, BO, BP, BQ, BR, BS, BT, BU, BV, BW, BX, BY, BZ, CA, CB, CC, CD, CE, CF, CG, CH, CI, CJ, CK, CL, CM, CN, CO, CP, CQ, CR, CS, CT, CU, CV, CW, CX, CY, CZ, DA, DB, DC, DD, DE, DF, DG, DH, DI, DJ, DK, DL, DM, DN, DO, DP, DQ, DR, DS, DT, DU, DV, DW, DX, DY, DZ, EA, EB, EC, ED, EE, EF, EG, EH, EI, EJ, EK, EL, EM, EN, EO, EP, EQ, ER, ES, ET, EU, EV, EW, EX, EY, EZ, FA, FB, FC, FD, FE, FF, FG, FH, FI, FJ, FK, FL, FM, FN, FO, FP, FQ, FR, FS, FT, FU, FV, FW, FX, FY, FZ, GA, GB, GC, GD, GE, GF, GG, GH, GI, GJ, GK, GL, GM, GN, GO, GP, GQ, GR, GS, GT, GU, GV, GW, GX, GY, GZ, HA, HB, HC, HD, HE, HF, HG, HH, HI, HJ, HK, HL, HM, HN, HO, HP, HQ, HR, HS, HT, HU, HV, HW, HX, HY, HZ, IA, IB, IC, ID, IE, IF, IG, IH, II, IJ, IK, IL, IM, IN, IO, IP, IQ, IR, IS, IT, IU, IV, IW, IX, IY, IZ, JA, JB, JC, JD, JE, JF, JG, JH, JI, JJ, JK, JL, JM, JN, JO, JP, JQ, JR, JS, JT, JU, JV, JW, JX, JY, JZ, KA, KB, KC, KD, KE, KF, KG, KH, KI, KJ, KK, KL, KM, KN, KO, KP, KQ, KR, KS, KT, KU, KV, KW, KX, KY, KZ, LA, LB, LC, LD, LE, LF, LG, LH, LI, LJ, LK, LL, LM, LN, LO, LP, LQ, LR, LS, LT, LU, LV, LW, LX, LY, LZ, MA, MB, MC, MD, ME, MF, MG, MH, MI, MJ, MK, ML, MM, MN, MO, MP, MQ, MR, MS, MT, MU, MV, MW, MX, MY, MZ, NA, NB, NC, ND, NE, NF, NG, NH, NI, NJ, NK, NL, NM, NN, NO, NP, NQ, NR, NS, NT, NU, NV, NW, NX, NY, NZ, OA, OB, OC, OD, OE, OF, OG, OH, OI, OJ, OK, OL, OM, ON, OO, OP, OQ, OR, OS, OT, OU, OV, OW, OX, OY, OZ, PA, PB, PC, PD, PE, PF, PG, PH, PI, PJ, PK, PL, PM, PN, PO, PP, PQ, PR, PS, PT, PU, PV, PW, PX, PY, PZ, QA, QB, QC, QD, QE, QF, QG, QH, QI, QJ, QK, QL, QM, QN, QO, QP, QQ, QR, QS, QT, QU, QV, QW, QX, QY, QZ, RA, RB, RC, RD, RE, RF, RG, RH, RI, RJ, RK, RL, RM, RN, RO, RP, RQ, RR, RS, RT, RU, RV, RW, RX, RY, RZ, SA, SB, SC, SD, SE, SF, SG, SH, SI, SJ, SK, SL, SM, SN, SO, SP, SQ, SR, SS, ST, SU, SV, SW, SX, SY, SZ, TA, TB, TC, TD, TE, TF, TG, TH, TI, TJ, TK, TL, TM, TN, TO, TP, TQ, TR, TS, TT, TU, TV, TW, TX, TY, TZ, UA, UB, UC, UD, UE, UF, UG, UH, UI, UJ, UK, UL, UM, UN, UO, UP, UQ, UR, US, UT, UY, UZ, VA, VB, VC, VD, VE, VF, VG, VH, VI, VJ, VK, VL, VM, VN, VO, VP, VQ, VR, VS, VT, VU, VV, VW, VX, VY, VZ, WA, WB, WC, WD, WE, WF, WG, WH, WI, WJ, WK, WL, WM, WN, WO, WP, WQ, WR, WS, WT, WU, WV, WW, WX, WY, WZ, XA, XB, XC, XD, XE, XF, XG, XH, XI, XJ, XK, XL, XM, XN, XO, XP, XQ, XR, XS, XT, XU, XV, XW, XX, XY, XZ, YA, YB, YC, YD, YE, YF, YG, YH, YI, YJ, YK, YL, YM, YN, YO, YP, YQ, YR, YS, YT, YU, YV, YW, YX, YY, YZ, ZA, ZB, ZC, ZD, ZE, ZF, ZG, ZH, ZI, ZJ, ZK, ZL, ZM, ZN, ZO, ZP, ZQ, ZR, ZS, ZT, ZU, ZV, ZW, ZX, ZY, ZZ).

1400 MILL LANE 952-442-1410
WACONIA, MN 55387 USA

REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
D	REDESIGN FRAME	5895		01/05
C	CHANGE RAILS AND BLOCKS	5324	N.M.	06/02
B	SIGMA II MOTORS	5204	N.M.	12/00
A	CHANGE RAILS	4137	N.M.	08/95

STOCK/ASSY No.	TITLE	APPLICATION	SCALE	DATE	DRAWN BY	SHEET NO.	OF
	BASE SUB-ASSEMBLY	BRIDGE MILL	25:1	19 MAY 98	THOMPSON	1	1

UNLESS SPECIFIED

X.XXX ±

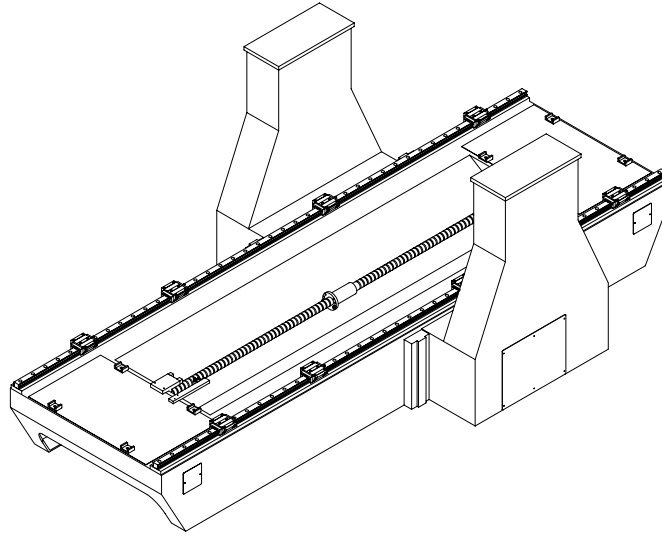
X.XX ±

X.X ±

ANGLE ±

19 MAY 98

THOMPSON



BR60/80 x axis
waycover MPB-26

BR50 100/150"
waycover MPB-29

PARTS LIST

No.	QTY	STOCK No.	DESCRIPTION
1	2	SEE TABLE	X-AXIS RAILS
2	8	SEE TABLE	45 mm RAIL BLOCK
3	1	SEE TABLE	X-AXIS BALL SCREW
4	1	SEE TABLE	X-AXIS HARD STOP BLOCK
5	4	MP-718	POM HARD STOP BUMPER
6	2	SEE TABLE	BEARING LOCK NUT
7	4		SMALL SIDE COVER
8	2	SEE TABLE	BEARING CUP ASSEMBLY
9	1		X-AXIS RADIAL SUPPORT PLATE
10	1	BR-154	X-AXIS SWITCH MOUNTING BAR
11	1	MP1-387	X-AXIS SWITCH BRACKET
12	1	SW-193	SWITCH
13	1		MACHINE BASE
14	1	SEE TABLE	X-AXIS HARD STOP BLOCK
15	8		X-AXIS COVER BAR SUPPORT
16	2		MOTOR ASSEMBLY COVER
17	1		COLUMN ACCESS COVER
18	1	PY-231	X-AXIS PULLEY
19	2		X-AXIS MOTOR SPACER PLATE
20	1	PY-232	X-AXIS BUSHING
21	1	SEE TABLE	MOTOR PULLEY
22	1	BT-102	720-8M-30 BELT
23	1	SEE TABLE	AXIS MOTOR
24	1		X-AXIS MOTOR PLATE

HARDWARE LIST

No.	QTY	DESCRIPTION
A	32	3/8-16 x 1 1/2 SHCS
B	82	RAIL PLUG
C	86	1/2-13 x 1 1/2 SHCS
D	16	1/2 LOCK WASHER
E	8	1/2-13 x 1 3/4 SHCS
F	1	10mm x 10mm x 30mm KEY
G	4	5/16-18 x 1 1/2 SHCS
H	6	3/8-16 x 1 1/4 SHCS
I	6	3/8 LOCK WASHER
J	6	M5-.8 x 20mm SHCS
K	6	3/8 FLAT WASHER
L	12	5/16-18 x 2 SHCS
M	30	1/4-20 x 1/2 BHCS
N	2	M5-.8 HEX NUT
O	2	M5-.8 x 12mm BHCS
P	2	M5 FLAT WASHER
Q	8	1/4-20 x 3/4 FHCS
R	4	1/2-13 x 3 3/4 SHCS
S	4	1/2 FLAT WASHER
T	2	1/4-20 x 1/4 SHSS
U	4	1/2-13 x 1 1/4 SHCS

MOTOR & PULLEY TABLE

No.	YASKAWA	FANUC	SIEMENS
21	PY-233	PY-233	PY-240
23	MO-144 (2kw)	8Nm A06B-0227-B200	15Nm 1FK7100-5AF71

TRAVEL TABLE

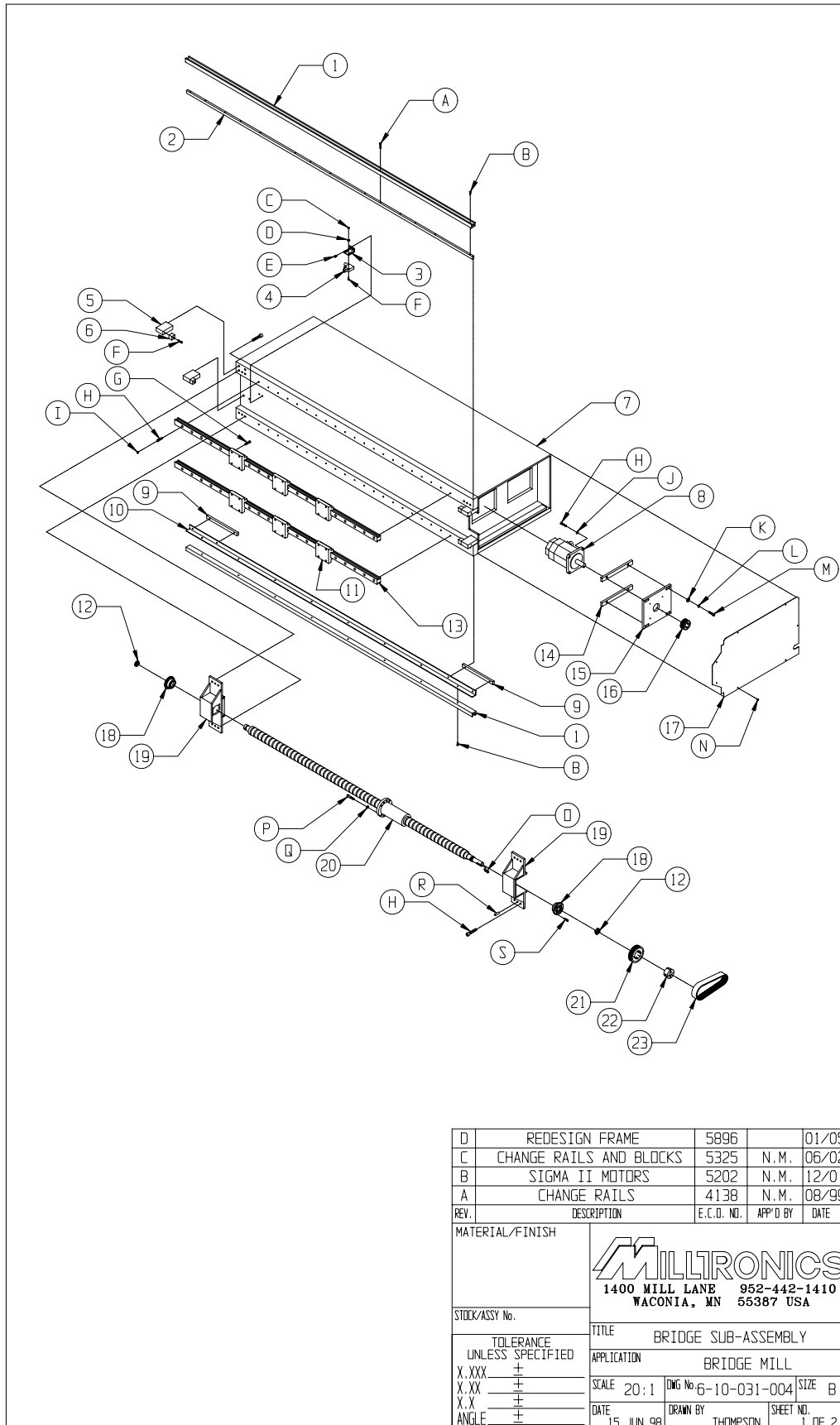
No.	DESCRIPTION	100"	150"
1	BALL RAIL	MPB-62	MPB-63
	ROLLER RAIL	N/A	N/A
2	BALL RAIL BLOCK	MP-728	MP-728
	ROLLER RAIL BLOCK	N/A	N/A
3	BALL SCREW	MPB-65	MPB-66
4	HARD STOP BLOCK	BR-155	BR-157
6	BEARING LOCKNUT	BG-119	MPB-56
8	BEARING CUP ASSEMBLY	BG-118	BG-95
14	HARD STOP BLOCK	BR-155	BR-156

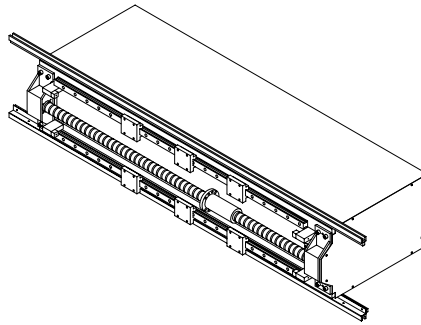
* 100" REQUIRES 8 FOR X-AXIS
150" REQUIRES 14 FOR X-AXIS

D	REDESIGN FRAME	5895		01/05
C	CHANGE RAILS AND BLOCKS	5324	N.M.	06/02
B	SIGMA II MOTORS	5204	N.M.	12/01
A	CHANGE RAILS	4137	N.M.	08/99
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	±			
TITLE		BASE SUB-ASSEMBLY		
APPLICATION		BRIDGE MILL		
SCALE		25:1	DWG No. 6-10-031-006	SIZE B
DATE		19 MAY 98	DRAWN BY THOMPSON	SHEET NO. 2 OF 2

MILLIRONICS
1400 MILL LANE 952-442-1410
WACONIA, MN 55387 USA

Bridge Assembly





PARTS LIST			
No.	QTY	STOCK No.	DESCRIPTION
1	2		Y WAY COVER RIDER
2	1		Y WAY COVER RIDER SPACER BAR
3	1	MP1-387	Y SWITCH BRACKET
4	1	SW-193	LIMIT SWITCH
5	4		HARDSTOP BLOCK
6	4	MP-718	PDM HARD STOP BUMPER
7	1		BRIDGE ASSEMBLY
8	1	SEE TABLE	AXIS MOTOR
9	2		Y WAY COVER RIDER SPACER - LOWER
10	1		Y WAY COVER RIDER BRACKET - LOWER
11	6	SEE TABLE	45mm RAIL BLOCK
12	2	MP-439	BEARING LOCKNUT
13	2	SEE TABLE	Y-AXIS RAIL
14	2		Y MOTOR PLATE SPACER
15	1		Y MOTOR PLATE
16	1	SEE TABLE	MOTOR PULLEY
17	1		Y BELT & PULLEY COVER
18	2	BG-96	BALL SCREW SUPPORT
19	2		Y BEARING HOUSING
20	1	SEE TABLE	Y BALL SCREW
21	1	PY-234	TL48-8n-30 PULLEY 2012
22	1	PY-235	19mm I.D. 2012 BUSHING
23	1	BT-102	720-8M-30

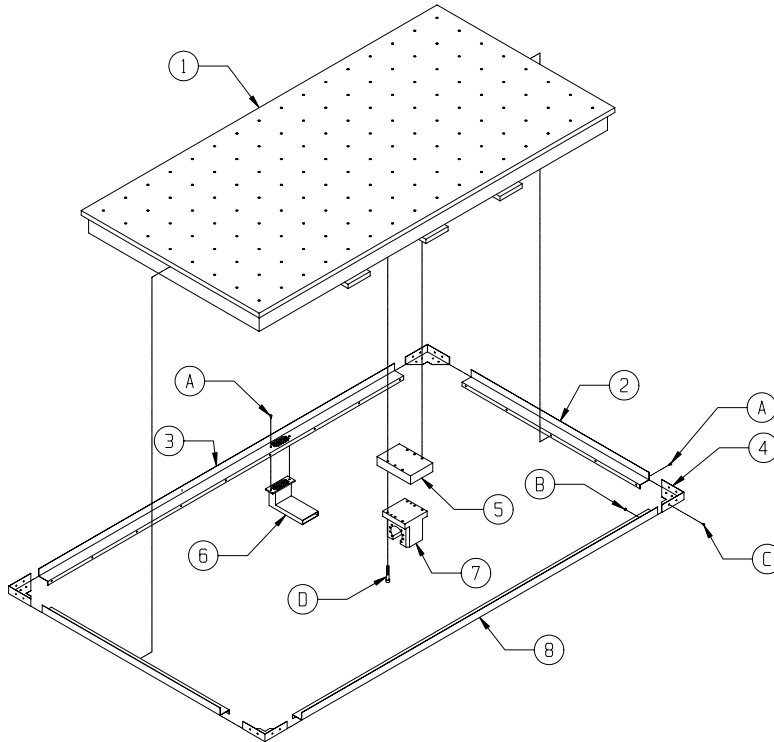
MOTOR & PULLEY TABLE			
No.	YASKAWA	FANUC	SIEMENS
8	MD-144 (2kw)	8Nm A06B-0227-B200	15Nm 1FK7100-5AF71
16	PY-233	PY-233	PY-240

RAIL, BLOCK AND BALL SCREW TABLE				
ITEM	DESCRIPTION	50"	60"	80"
11	BALL RAIL BLOCK	MP-728	MP-728	MP-728
	ROLLER RAIL BLOCK	MP-819	MP-819	MP-819
13	BALL RAIL	MPB-59	MPB-60	MPB-61
	ROLLER RAIL	MPB-72	MPB-73	MPB-74
20	BALL SCREW	MPB-67	MPB-68	MPB-69

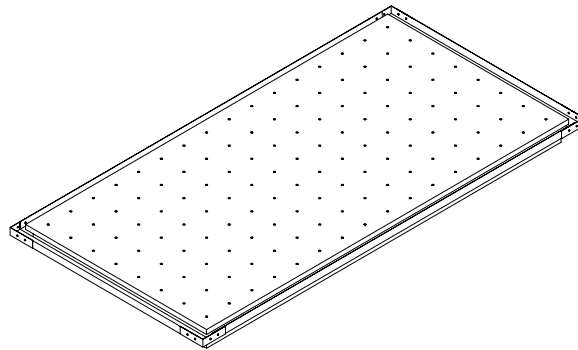
HARDWARE LIST		
No.	QTY	DESCRIPTION
A	4	1/4-20 x 3/4 SHCS
B	18	1/4-20 x 1 1/2 FHCS
C	2	M5-.8 HEX NUT
D	2	M5 FLAT WASHER
E	2	10-32 x 1/2 BHCS
F	6	M5-.8 x 20mm SHCS
G	28	3/8-16 x 1 1/4 SHCS
H	44	1/2-13 x 1 1/2 SHCS
I	44	RAIL PLUG
J	4	1/2 LOCK WASHER
K	4	3/8 FLAT WASHER
L	4	3/8 LOCK WASHER
M	4	3/8-16 x 1 1/2 SHCS
N	7	10-32 x 3/8 BHCS
O	1	5mm x 5mm x 20mm KEY
P	8	5/16-18 x 1 1/4 SHCS
Q	8	5/16 LOCK WASHER
R	4	3/8 x 1 1/2 DOWEL PIN
S	8	1/4-20 x 1 SHCS

D	REDESIGN FRAME	5896		01/05
C	CHANGE RAILS AND BLOCKS	5325	N.M.	06/02
B	SIGMA II MOTORS	5202	N.M.	12/01
A	CHANGE RAILS	4138	N.M.	08/99
REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
MATERIAL/FINISH		 MILLIRONICS 1400 MILL LANE 952-442-1410 WACONIA, MN 55387 USA		
STOCK/ASSY No.				
TOLERANCE UNLESS SPECIFIED		TITLE BRIDGE SUB-ASSEMBLY		
X .XXX ±		APPLICATION BRIDGE MILL		
X .XX ±		SCALE 20:1	DWG No 6-10-031-004	SIZE B
X .X ±		DATE 15 JUN 98	DRAWN BY THOMPSON	SHEET NO. 2 OF 2
ANGLE ±				

Table Assembly



A	REDESIGN FRAME	5897		02/05
REV.	DESCRIPTION	E.C.D. NO.	APP'D BY	DATE
MATERIAL/FINISH		 1400 MILL LANE 952-442-1410 WACONIA, MN 55387 USA		
STOCK/ASSY No.		TITLE TABLE SUB-ASSEMBLY		
TOLERANCE UNLESS SPECIFIED		APPLICATION BRIDGE MILL		
X .XXX ±		SCALE 20:1 DWG No 6-10-031-005 SIZE B		
X .XX ±		DATE 05 JUN 98		
X .X ±		DRAWN BY THOMPSON		
ANGLE ±		SHEET NO. 1 OF 2		

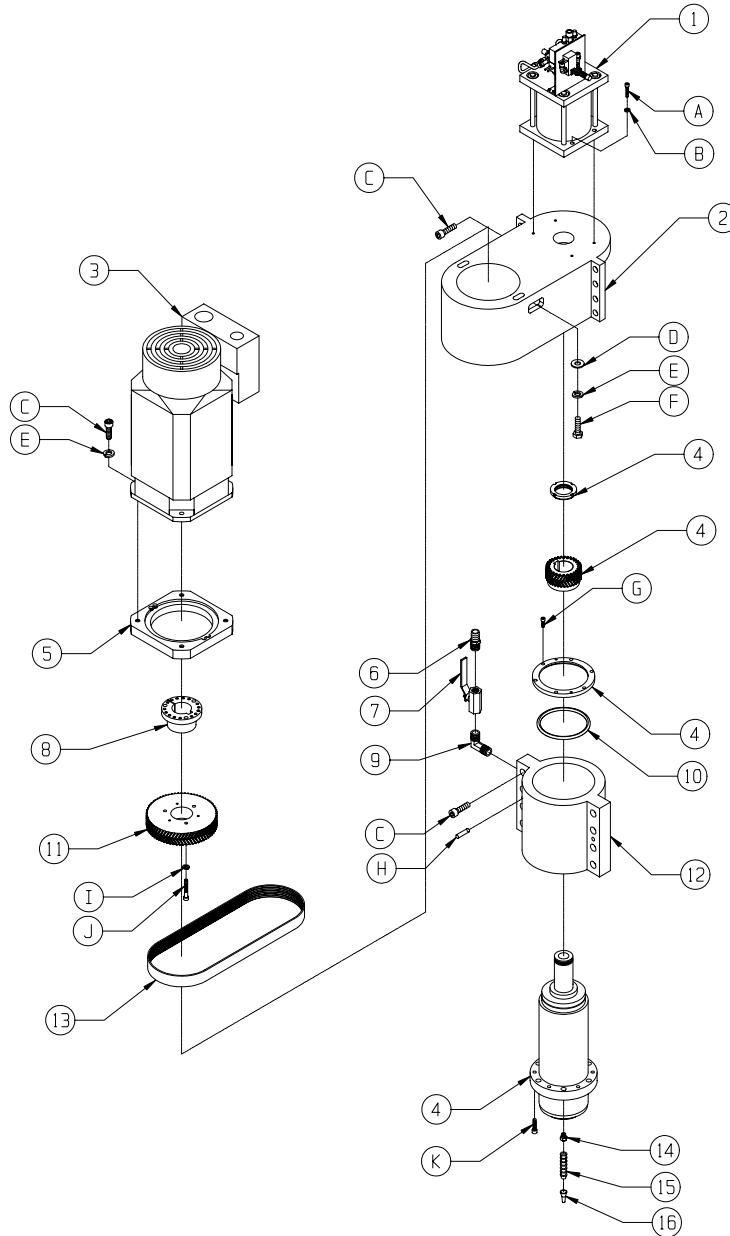


PARTS LIST			
No.	QTY	STOCK No.	DESCRIPTION
1	1		MACHINE TABLE
2	2		TABLE TROUGH - END
3	1		TABLE TROUGH - WITH DRAIN
4	4		TABLE TROUGH - CORNER
5	1		X-AXIS CARRIER SPACER
6	1		TABLE DRAIN CHUTE
7	1		X-AXIS CARRIER - MACHINED
8	1		TABLE TROUGH - WITHOUT DRAIN

HARDWARE LIST			
No.	QTY	DESCRIPTION	
A	47	1/4-20 x 3/8 BHCS	
B	32	10-32 NUT	
C	32	10-32 3/8 BHCS	
D	6	3/8-16 x 4 SHCS	

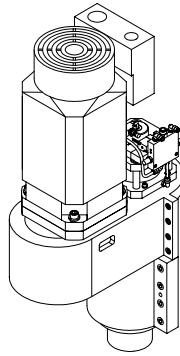
A	REDESIGN FRAME	5897		02/05
REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
MATERIAL/FINISH		 1400 MILL LANE 952-442-1410 WACONIA, MN 55387 USA		
STOCK/ASSY No.				
TOLERANCE UNLESS SPECIFIED		TITLE TABLE SUB-ASSEMBLY		
X .XXX ±		APPLICATION BRIDGE MILL		
X .XX ±		SCALE 20:1	DWG No 6-10-031-005	SIZE B
X .X ±		DATE 05 JUN 98	DRAWN BY THOMPSON	SHEET NO. 2 OF 2
ANGLE ±				

Head Assembly



G	ADD O-RING	5894		01/05
F	NEW DRAW BAR AIR CYLINDER	5438	N.M.	01/03
E	ADD MD-132 MOTOR	5412	N.M.	10/02
D	CHANGE SPINDLE ASSEMBLY	5245	N.M.	02/02
C	CHANGE SPINDLE	5186	N.M.	11/01
B	CHANGE SPINDLE & MOTOR	5089	N.M.	05/01
A	CHANGE DRAWBAR CYLINDER	3869	N.M.	3/99
REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
MATERIAL/FINISH		 1400 MILL LANE 952-442-1410 WACONIA, MN 55387 USA		
STOCK/ASSY No.				
TOLERANCE UNLESS SPECIFIED		TITLE HEAD SUB-ASSEMBLY		
X.XXX ±		APPLICATION BRIDGE MILL		
X.XX ±		SCALE 10:1 DWG No 6-10-031-013 SIZE B		
X.X ±		DATE 04 JUN 98 DRAWN BY THOMPSON SHEET NO. 1 OF 2		
ANGLE ±				

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HARDWARE LIST

No.	QTY	DESCRIPTION
A	4	1/4-20 x 1 1/4 SHCS
B	4	1/4 LOCK WASHER
C	16	1/2-13 x 1 1/2 SHCS
D	2	1/2 FLAT WASHER
E	6	1/2 LOCK WASHER
F	2	1/2-13 x 1 1/2 HHCS
G	6	1/4-20 x 3/4 SHCS
H	2	3/8 DOWEL PIN
I	3	5/16 LOCK WASHER
J	3	5/16-18 x 2 SHCS
K	6	5/16-18 x 1 1/4 SHCS

O-RING

STOCK No.	DESCRIPTION
WX-182	60mm OPTION
WX-270	70mm OPTION

PARTS LIST

No.	QTY	STOCK No.	DESCRIPTION
1	1	6-10-018-100	NU-313 DRAWBAR CYLINDER ASSEMBLY
2	1		MACHINE HEAD
3	1	SEE TABLE	SPINDLE MOTOR
4	1	SEE TABLE	SPINDLE ASSEMBLY
5	1	SEE TABLE	MOTOR PLATE
6	1	NU-66	3/4 BARB 1/2 NPT FITTING
7	1	NU-64	BRASS BALL VALVE
8	1	PY-97	PULLEY BUSHING
9	1	NU-140	1/2 NPT MALE ELBOW
10	1	SEE TABLE	O-RING
11	1	SEE TABLE	SPINDLE MOTOR PULLEYS
12	1		SPINDLE CARTRIDGE HOUSING
13	1	BT-62	W896 SPINDLE BELT
14	6	NU-111	1/4 LOCKLINK 1/8 NPT
15	24	MA-22	LOCKLINK HOSE
16	6	MA-216	1/4 NOZZLE

SPINDLE MOTOR PULLEYS

STOCK No.	DESCRIPTION
PY-188	12,000 RPM & 15,000 RPM
PY-192	6,000 RPM & 8,000 RPM

SPINDLE MOTORS

STOCK No.	DESCRIPTION
MD-121	18kw DUAL WINDING SPINDLE MOTOR - YASKAWA
MD-150	11kw SINGLE WINDING SPINDLE MOTOR - YASKAWA
MD-132	11kw DUAL WINDING SPINDLE MOTOR - YASKAWA

SPINDLE ASSEMBLY SELECTION

KW	RPM	60mm SPINDLE				70mm SPINDLE			
		6000	8000	12000	15000	6000	8000	12000	15000
11kw SNGL-WINDING	9900	9900-1	9899-4	9899-5	9899	9899-1	9899-2	9899-3	9899-3
11kw DUAL-WINDING	9900	9900-1	9899-4	9899-5	9899	9899-1	9899-2	9899-3	9899-3
18kw DUAL-WINDING	9900	9900-1	9899-4	9899-5	9899	9899-1	9899-2	9899-3	9899-3

MOTOR PLATES

STOCK No.	DESCRIPTION
MPB-40	11kw OR 18kw DUAL WINDING
MPB-45	11kw SINGLE WINDING

G	ADD O-RING	5894		01/05
F	NEW DRAW BAR AIR CYLINDER	5438	N.M.	01/03
E	ADD MD-132 MOTOR	5412	N.M.	10/02
D	CHANGE SPINDLE ASSEMBLY	5245	N.M.	02/02
C	CHANGE SPINDLE	5186	N.M.	11/01
B	CHANGE SPINDLE & MOTOR	5089	N.M.	05/01
A	CHANGE DRAWBAR CYLINDER	3869	N.M.	03/99
REV.	DESCRIPTION	E.C.D. NO.	APP'D BY	DATE

MATERIAL/FINISH

STOCK/ASSY No.

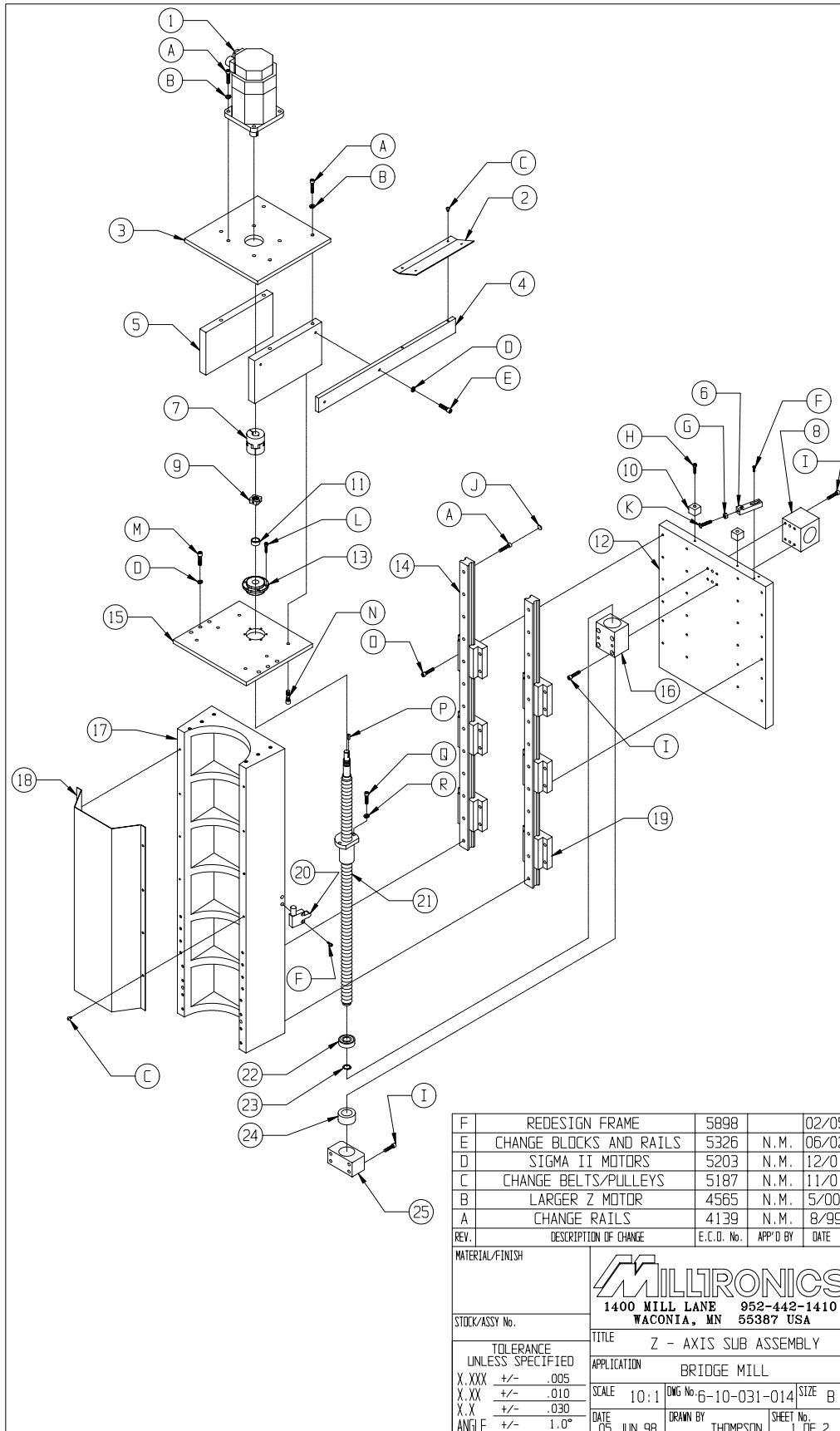
TOLERANCE UNLESS SPECIFIED	
X.XXX	±
X.XX	±
X.X	±
ANGLE	±

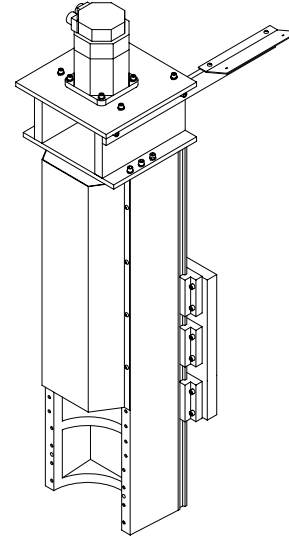


TITLE	HEAD SUB-ASSEMBLY
APPLICATION	BRIDGE MILL
SCALE	10:1
DATE	04 JUN 98
DRAWN BY	THOMPSON
SHEET NO.	2 OF 2

CERTAIN INFORMATION CONTAINED HEREIN IS THE EXCLUSIVE PROPERTY OF MILLIRONICS MFG. CO. IT IS GIVEN IN CONFIDENCE AND IS NOT TO BE USED OR DISCLOSED TO OTHER THAN THE INTENDED RECIPIENT WITHOUT EXPRESSED WRITTEN CONSENT OF MILLIRONICS MFG. CO.

Z Axis Assembly





PARTS LIST

No.	QTY	STOCK No.	DESCRIPTION
1	1	SEE TABLE	AXIS MOTOR W/BRAKE
2	1		CABLE TRACK BRACKET
3	1		Z-AXIS MOTOR PLATE
4	1		CABLE TRACK SUPPORT BAR
5	2		MOTOR PLATE SPACERS
6	1	MPL-72	SWITCH DOG
7	1	SEE TABLE	COUPLER
8	1		Y-AXIS BALL SCREW CARRIER
9	1	MP1-94	BALL SCREW LOCK NUT
10	2	MP-718	PDM HARD STOP BUMPER
11	1	MP1-107	BEARING LOCK NUT SPACER
12	1		Y/Z RAIL MOUNTING PLATE
13	1	BG-94	AXIS BEARING
14	2	SEE TABLE	45mm 1220 RAILS
15	1		Z-AXIS MOTOR HOUSING
16	1		Z-AXIS BALL SCREW CARRIER
17	1		Z-AXIS MAIN - MACHINED
18	1		Z-AXIS FRONT COVER
19	6	SEE TABLE	45mm RAIL BLOCK
20	1	SW-193	SWITCH
21	1	MP-569	Z-AXIS BALL SCREW
22	1	BG-02	BEARING SKF6204 2Z
23	1	MP1-108	BALL SCREW SNAP RING
24	1		HARD STOP BUMPER
25	1		Z-AXIS RADIAL SUPPORT

RAIL & BLOCK LIST

No.	DESCRIPTION	PART No.
14	BALL RAIL	MPB-58
	ROLLER RAIL	MPB-71
19	BALL RAIL BLOCK	MP-728
	ROLLER RAIL BLOCK	MP-819

MOTOR & COUPLER TABLE

No.	YASKAWA	FANUC	SIEMENS
1	MD-138 (3kw)	22Nm A06B-0247-B500	16Nm 1FK7083-SAF71-1E80
7	MA-248	MA-248	MA-261

HARDWARE LIST

No.	QTY	DESCRIPTION
A	32	1/2-13 x 1 1/2 SHCS
B	8	1/2 LOCK WASHER
C	10	1/4-20 x 3/8 BHCS
D	12	3/8 LOCK WASHER
E	2	3/8-16 x 1 1/4 SHCS
F	4	M5-.8 x 20mm SHCS
G	1	M8-1.25 HEX NUT
H	2	M5-.8 x 16mm SHCS
I	12	5/16-18 x 1 1/2 SHCS
J	24	RAIL PLUGS
K	1	M8-1.25 x 40mm BHCS
L	6	1/4-20 x 1 SHCS
M	10	3/8-16 x 1 3/4 SHCS
N	6	3/8-16 x 1 1/4 SHCS
O	24	3/8-16 x 1 1/2 SHCS
P	1	3/16 x 3/16 x 1/2 KEY
Q	3	5/16-18 x 1 1/4 SHCS
R	3	5/16 LOCK WASHER

F	REDESIGN FRAME	5898		02/05
E	CHANGE RAILS AND BLOCKS	5326	N.M.	06/02
D	SIGMA II MOTORS	5203	N.M.	12/01
C	CHANGE BELTS/PULLEYS	5187	N.M.	11/01
B	LARGER Z MOTOR	4565	N.M.	5/00
A	CHANGE RAILS	4139	N.M.	8/99
REV.	DESCRIPTION OF CHANGE	E.C.D. No.	APP'D BY	DATE
MATERIAL/FINISH		 1400 MILL LANE 952-442-1410 WACONIA, MN 55387 USA		
STOCK/ASSY No.				
TOLERANCE UNLESS SPECIFIED		TITLE Z - AXIS SUB ASSEMBLY		
X. XXX +/- .005		APPLICATION BRIDGE MILL		
X. XX +/- .010		SCALE 10:1	DWG No. 6-10-031-014	SIZE B
X. X +/- .030		DATE 05 JUN 98	DRAWN BY THOMPSON	SHEET No. 2 OF 2
ANGLE +/- 1.0°				

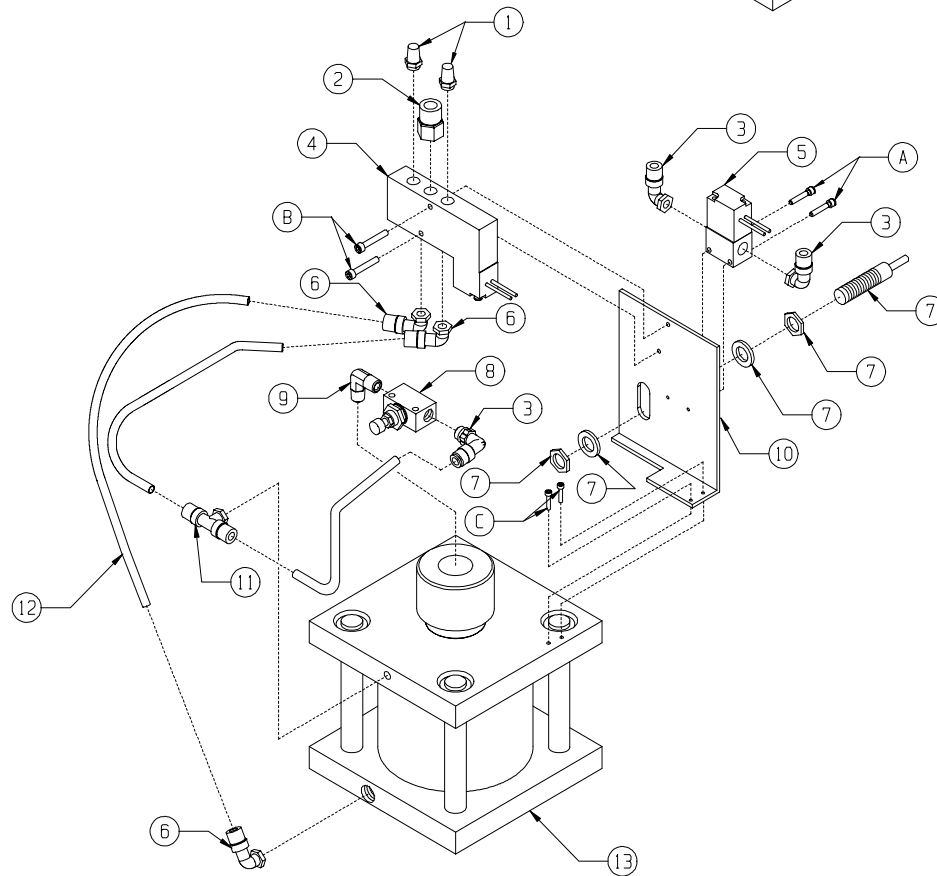
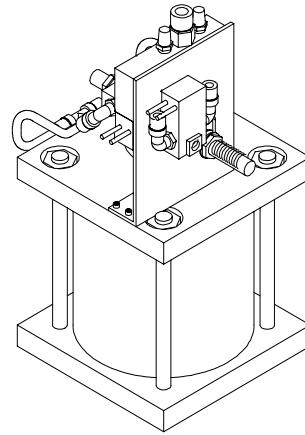
Drawbar Cylinder Assembly

PARTS LIST

ITEM	QTY	STOCK No.	DESCRIPTION
1	2	NU-177	1/8 NPT MUFFLER
2	1	NU-95	MALE STRAIGHT 1/4 NPT - 3/8 TUBE
3	3	NU-187	SWIVEL ELBOW 1/8 NPT - 1/4 TUBE
4	1	NU-179	DRAW BAR - AIR VALVE
5	1	NU-320	AIR PURGE - AIR VALVE
6	3	NU-186	SWIVEL ELBOW 1/4 NPT - 1/4 TUBE
7	1	PR-33	DRAWBAR PROX SWITCH
8	1	NU-190	FLOW CONTROL FOR BLOW OUT
9	1	NU-189	MALE ELBOW 1/8 NPT
10	1	BR-145	DRAWBAR PROX SWITCH BRACKET
11	1	NU-321	SWIVEL T CONNECTOR - 1/4 TUBE
12	26"	NU-25	1/4" TUBING
13	1	NU-319	TRIPLE STACK DRAW BAR AIR CYLINDER

HARDWARE LIST

ITEM	QTY	DESCRIPTION
A	2	6-32 x 3/4 SHCS
B	2	8-32 x 1 SHCS
C	2	8-32 x 3/8 SHCS

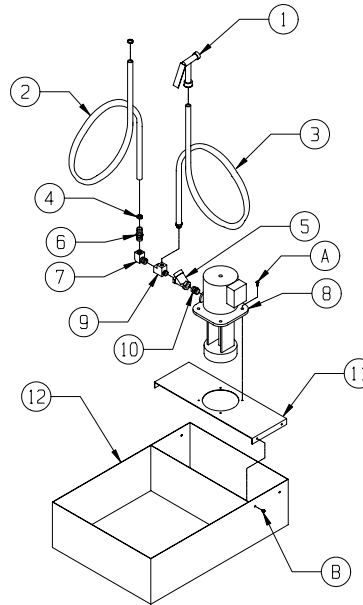
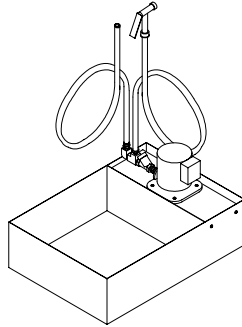


REV.	DESCRIPTION OF CHANGE	E.C.O. No.	APP'D BY	DATE
MATERIAL/FINISH				
STOCK/ASSY No.				
MILLIRONICS 1400 MILL LANE 952-442-1410 WACONIA, MN 55387 USA TITLE NU-313 DRAW BAR ASSEMBLY APPLICATION GENERAL PRODUCTS SCALE 3:1 DWG No 6-10-018-100 SIZE B DATE 13 JAN 03 DRAWN BY DAHLKE SHEET No. 1 OF 1				
TOLERANCE UNLESS SPECIFIED X.XXX +/- X.XX +/- X.X +/- ANGLE +/-				

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Coolant Trough Assembly

*THIS IS USED ON ASSEMBLY
FOR VM15, VM16, VM17.*



PARTS LIST

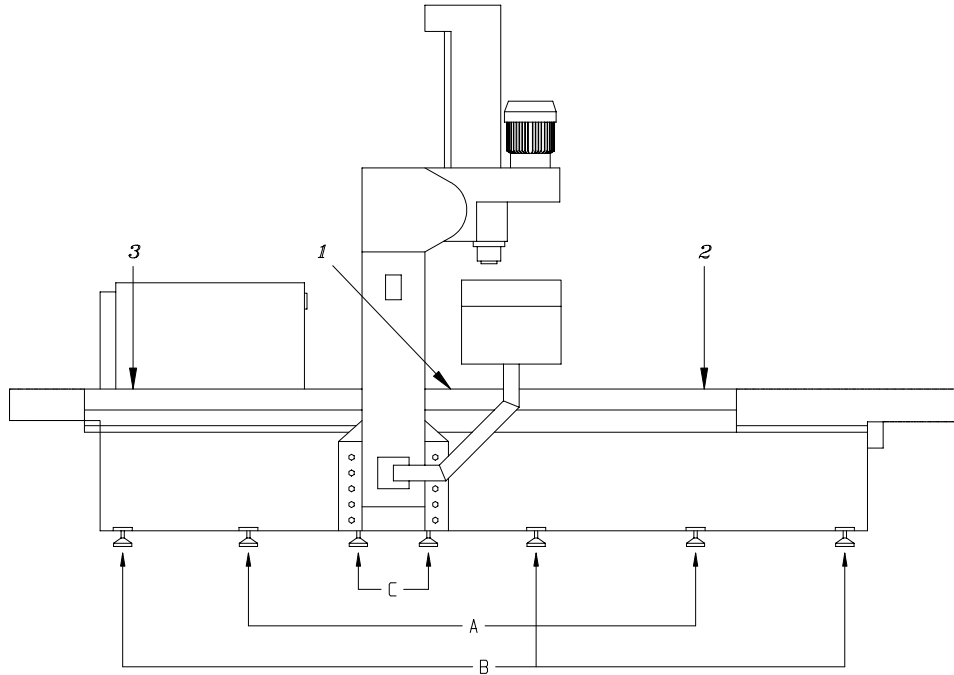
No.	QTY	STOCK No.	DESCRIPTION
1	1	NU-124	WATER HOSE NOZZLE
2	20'	NU-69	3/4" NYLOBRAID HOSE
3	1	NU-130	WASHDOWN HOSE ASSEMBLY
4	2	NU-141	1" HOSE CLAMP
5	1	NU-128	1/2" SWING CHECK VALVE
6	1	NU-66	HOSE BRASS 3/4"
7	1	NU-125	1/2" ELBOW-STREET
8	1	MA-162	FLOOD PUMP 1/4 HP MOTOR
9	1	NU-127	1/2" STREET T
10	1	NU-65	1/2" NIPPLE
11	1	MP1-24	FLOOD PUMP MOUNTING PLATE
12	1	MP1-21	FLOOD CONTAINER

HARDWARE LIST

No.	QTY	DESCRIPTION
A	4	1/4-20 x 5/8 BHCS
B	4	1/4-20 x 3/8 BHCS

REV.	DESCRIPTION OF CHANGE	E.C.D. No.	APP'D BY	DATE
MATERIAL/FINISH		 1400 MILL LANE 952-442-1410 WACONIA, MN 55387 USA		
STOCK/ASSY No.				
TOLERANCE UNLESS SPECIFIED		TITLE COOLANT TROUGH ASSEMBLY		
X.XXX +/- .005		APPLICATION PARTNER I		
X.XX +/- .010		SCALE 15:1	DWG No. 6-10-008-066 SIZE B	
X.X +/- .030		DATE 10 APR 00	DRAWN BY DAHLKE	SHEET No. 1 OF 1
ANGLE +/- 1.0°				

Leveling Instructions For BR 50



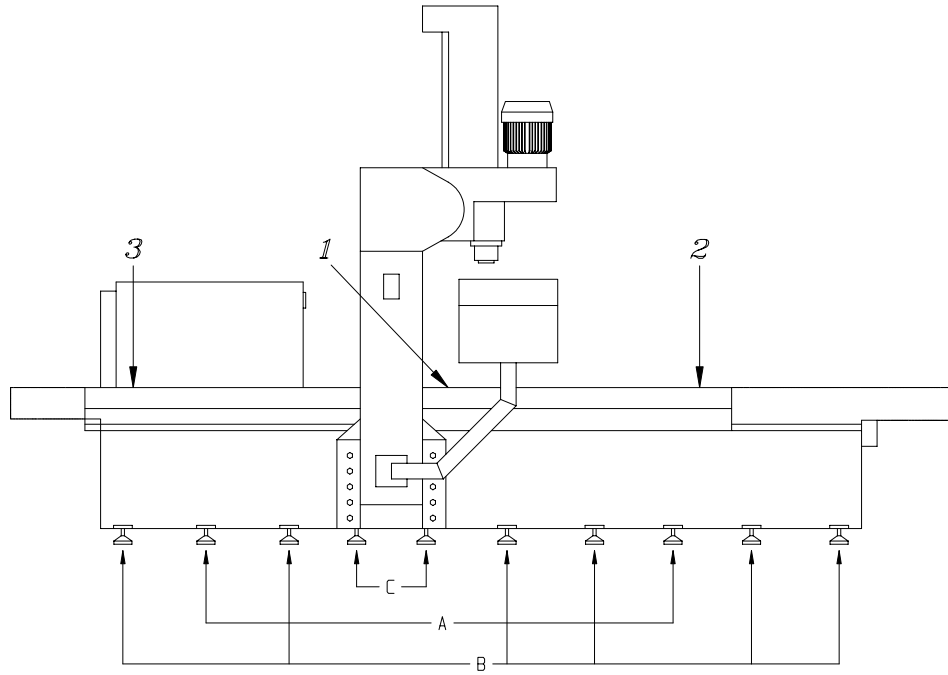
REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
	MATERIAL/FINISH			
	STOCK/ASSY No.			
	TOLERANCE UNLESS SPECIFIED	TITLE BR50 LEVELING INSTRUCTIONS		
X .XXX	±	APPLICATION BRIDGE MILL		
X .XX	±	SCALE 20:1	DWG No. 6-10-031-018	SIZE B
X .X	±	DATE 15 JUN 98	DRAWN BY THOMPSON	SHEET NO. 1 OF 2
ANGLE	±			

NOTES:

1. Center the table in the travel of the X axis.
2. Raise the 4 leveling pads directly under the columns pads "C" most of the way in so they are NOT touching the floor.
3. With the level located in the center of the table (position 1) use pads "A" to level the machine in both X and Y.
4. With the level located at the ends of the table (position 2 and 3) level each end with pads "B" in both X and Y.
5. Double-check the level at all locations.
6. The remaining pads should be threaded approximately 2/3 to 3/4 of the way in and touching the floor. Even pressure should be applied to each of these pads.
7. Lower the 4 leveling pads directly below the columns until they are resting on the floor with even pressure.
8. Spin the locknut for each pad up then secure them in place.
9. Using a magnetic base with a dial indicator sweep the table to check tram. The tram should sweep acceptably (typically .001" over a 10" diameter sweep) if the table surface has been machined at the factory. Adjust the 4 leveling pads below the column to adjust the tram if necessary. At this stage it is more important to be level to tram and NOT level to the precision level.

REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
	MATERIAL/FINISH			
	STOCK/ASSY No.			
	TOLERANCE UNLESS SPECIFIED	TITLE BR50 LEVELING INSTRUCTIONS		
	X .XXX ±	APPLICATION BRIDGE MILL		
	X .XX ±	SCALE 20:1	DWG No. 6-10-031-018	SIZE B
	X .X ±	DATE 15 JUN 98	DRAWN BY THOMPSON	SHEET NO. 2 OF 2
	ANGLE ±			

Leveling Instructions For BR 60 & 80



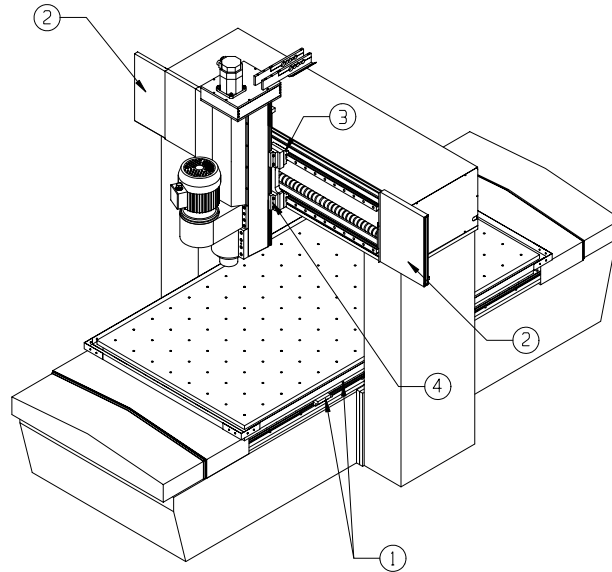
REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
MATERIAL/FINISH		 MILLIRONICS MANUFACTURING 1400 MILL LANE (612) 442-1410 WACONIA, MN 55387		
STOCK/ASSY No.				
TOLERANCE UNLESS SPECIFIED		TITLE BR60 & 80 LEVELING INSTRUCTIONS		
X.XXX X.XX X.X ANGLE		APPLICATION BRIDGE MILL		
		SCALE 20:1	DWG No 6-10-031-019	SIZE B
		DATE 15 JUN 98	DRAWN BY THOMPSON	SHEET NO. 1 OF 2

NOTES:

1. Center the table in the travel of the X axis.
2. Raise the 4 leveling pads directly under the columns pads "C" most of the way in so they are NOT touching the floor.
3. With the level located in the center of the table (position 1) use pads "A" to level the machine in both X and Y.
4. With the level located at the ends of the table (position 2 and 3) level each end with pads "B" in both X and Y.
5. Double-check the level at all locations.
6. The remaining pads should be threaded approximately 2/3 to 3/4 of the way in and touching the floor. Even pressure should be applied to each of these pads.
7. Lower the 4 leveling pads directly below the columns until they are resting on the floor with even pressure.
8. Spin the locknut for each pad up then secure them in place.
9. Using a magnetic base with a dial indicator sweep the table to check tran. The tran should sweep acceptably (typically .001" over a 10" diameter sweep) if the table surface has been machined at the factory. Adjust the 4 leveling pads below the column to adjust the tran if necessary. At this stage it is more important to be level to tran and NOT level to the precision level.

REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
MATERIAL/FINISH		 MILLIRONICS MANUFACTURING 1400 MILL LANE (612) 442-1410 WACONIA, MN 55387		
STOCK/ASSY No.				
TOLERANCE UNLESS SPECIFIED		TITLE BR60 & 80 LEVELING INSTRUCTIONS		
X .XXX ±		APPLICATION BRIDGE MILL		
X .XX ±		SCALE 20:1	DWG No. 6-10-031-019	SIZE B
X .X ±		DATE 15 JUN 98	DRAWN BY THOMPSON	SHEET NO. 2 OF 2
ANGLE ±				

Machine Lubrication Instructions



GREASE EVERY 500 HOURS OR SIX MONTHS

1. GREASE THE X-AXIS BEARING BLOCKS, 3 OR 4 ON EACH SIDE, AND THE X-AXIS BALLSCREW 2 PUMPS PER BLOCK.
2. SLIDE THE Y-AXIS WAY COVERS OUT TO ACCESS THE BEARING BLOCKS AND BALLSCREW.
3. GREASE THE 6 BEARING BLOCKS, 3 ON EACH SIDE, AND THE Y-AXIS BALLSCREW 2 PUMPS PER BLOCK AND BALLSCREW.
4. GREASE THE 6 BEARING BLOCKS, 3 ON EACH SIDE, AND THE Z-AXIS BALLSCREW 2 PUMPS PER BLOCK AND BALLSCREW.
5. INSTALL ALL WAY COVERS AND CYCLE MACHINE THE FULL TRAVELS AT 10 IPM MAX. TO FULLY LUBRICATE THE ENTIRE LENGTH OF THE RAILS AND BALLSCREWS.

REV.	DESCRIPTION OF CHANGE	E.C.D. No.	APP'D BY	DATE
MATERIAL/FINISH		 1400 MILL LANE 952-442-1410 WACONIA, MN 55387 USA		
STOCK/ASSY No.				
TOLERANCE UNLESS SPECIFIED		TITLE BRIDGE MILL GREASE INSTRUCTIONS		
X.XXX +/-		APPLICATION BRIDGE MILL		
X.XX +/-		SCALE 24:1 DWG No. 6-11-031-001 SIZE B		
X.X +/-		DATE 01 FEB 01 DRAWN BY NEW SHEET No. 1 OF 2		
ANGLE +/-				

REV.	DESCRIPTION OF CHANGE	E.C.O. No.	APP'D BY	DATE
MATERIAL/FINISH		 MILLTRONICS 1400 MILL LANE 952-442-1410 WACONIA, MN 55387 USA		
STOCK/ASSY No.				
TOLERANCE UNLESS SPECIFIED		TITLE BRIDGE MILL GREASE INSTRUCTIONS		
X .XXX +/-		APPLICATION BRIDGE MILL		
X .XX +/-		SCALE 24:1 DWG No 6-11-031-001 SIZE B		
X .X +/-		DATE 01 FEB 01 DRAIN BY NEW SHEET No 2 OF 2		
X .X ANGLE +/-				

Retention Knob Chart

ANSI RETENTION KNOBS STYLE V-FLANGE 50 TAPER									
RET. KNOB ASSEMBLY SELECTION	DIMENSIONS				MILLTRONICS MACHINE	COMMAND PART No.	KENNAMETAL PART No.	VALENITE PART No.	LYNDEX PART No.
	A	B	C	ANGLE					
N/A	1.14	.83	1.00	45°	RW30B	RC6E-0001	DWG RK11144	N/A	C50-STD

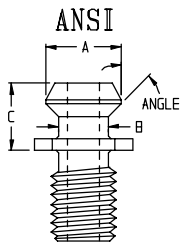
ANSI RETENTION KNOBS STYLE BT-FLANGE 50 TAPER									
RET. KNOB ASSEMBLY SELECTION	DIMENSIONS				MILLTRONICS MACHINE	COMMAND PART No.	KENNAMETAL PART No.	VALENITE PART No.	LYNDEX PART No.
	A	B	C	ANGLE					
N/A	1.14	.83	1.00	45°	RW30B	RS6M-0105	DWG RK11144A	N/A	N/A

ANSI RETENTION KNOBS STYLE V-FLANGE 40 TAPER									
RET. KNOB ASSEMBLY SELECTION	DIMENSIONS				MILLTRONICS MACHINE	COMMAND PART No.	KENNAMETAL PART No.	VALENITE PART No.	LYNDEX PART No.
	A	B	C	ANGLE					
4836	.74	.49	.64	45°	RH20F, RH25D, RH30D, BR50C, BR60C, BR80C VM16G, VM17E, VMG17D, VM24E, VMG24B, VM25C, VM30F, VMD30E	RC4E-0001	RK11122	PT-475C	C40-STD

ANSI RETENTION KNOBS STYLE BT-FLANGE 40 TAPER									
RET. KNOB ASSEMBLY SELECTION	DIMENSIONS				MILLTRONICS MACHINE	COMMAND PART No.	KENNAMETAL PART No.	VALENITE PART No.	LYNDEX PART No.
	A	B	C	ANGLE					
4837	.74	.49	.75	45°	RH20F, RH25D, RH30D, BR50C, BR60C, BR80C VM16G, VM17E, VMG17D, VM24E, VMG24B, VM25C, VM30F, VMD30E	RS4M-0115	RK11126A	N/A	B40-FADAL

DIN 69872 RETENTION KNOBS STYLE V-FLANGE 40 TAPER									
RET. KNOB ASSEMBLY SELECTION	DIMENSIONS				MILLTRONICS MACHINE	COMMAND PART No.	KENNAMETAL PART No.	VALENITE PART No.	LYNDEX PART No.
	A	B	C	ANGLE					
4838	.75	.55	1.02	75°	RH20F, RH25D, RH30D, BR50C, BR60C, BR80C VM16G, VM17E, VMG17D, VM24E, VMG24B, VM25C, VM30F, VMD30E	RS4E-0114-C	DWG RK71125	N/A	C40-1500

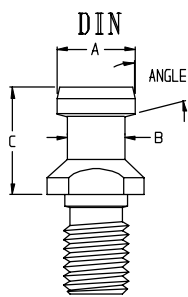
DIN 69872 RETENTION KNOBS STYLE DIN-FLANGE 40 TAPER									
RET. KNOB ASSEMBLY SELECTION	DIMENSIONS				MILLTRONICS MACHINE	COMMAND PART No.	KENNAMETAL PART No.	VALENITE PART No.	LYNDEX PART No.
	A	B	C	ANGLE					
4839	.75	.55	1.02	75°	RH20F, RH25D, RH30D, BR50C, BR60C, BR80C VM16G, VM17E, VMG17D, VM24E, VMG24B, VM25C, VM30F, VMD30E	RS4M-0114-C	DWG RK71124	N/A	B40-1500



ANSI

↑

ENGLISH THREADS FOR V-FLANGE
METRIC THREADS FOR BT-FLANGE



DIN

↑

ENGLISH THREADS FOR V-FLANGE
METRIC THREADS FOR DIN-FLANGE

D	ADD RH/RW12 & RH19	5146		09/01
C	ADD RETENTION KNOBS TO CHART	4859	N.M.	12/00
B	CHANGE 70mm BT-FLANGE CHART	4730	N.M.	10/00
A	ADD LYNDEX CORP. IN CHART	4351	N.M.	1/00
REV.	DESCRIPTION	E.C.D. NO.	APP'D BY	DATE
MILLTRONICS 4400 BETA LANE MADISON, WI 53704-1910 800-646-1410 FAX 608-271-0796		TITLE RETENTION KNOB CHART		
APPLICATION GENERAL PRODUCTS		SCALE 1:1	DWG No. 6-11-01B-054	SIZE B
DATE 30 APR 99		DRAWN BY DAHLKE		SHEET NO. 1 OF 2

MAS RETENTION KNOBS STYLE V-FLANGE 40 TAPER

RET. KNOB ASSEMBLY SELECTION	DIMENSIONS				MILLTRONICS MACHINE	COMMAND PART No.	KENAMETAL PART No.	VALENITE PART No.	LYNDEX PART No.
A	B	C	ANGLE						
4831	.59	.39	1.27	45°	RH20F, RH25D, RH30D, BR50C, BR60C, BR80C, RW20A* VM16G, VM17E, VMG17D, VM24E, VMG24B, VM25C, VM30F, VMD30E	RB4E-0001	RK31114	PT-532-45	C40-4500

MAS RETENTION KNOBS STYLE BT-FLANGE 40 TAPER

RET. KNOB ASSEMBLY SELECTION	DIMENSIONS				MILLTRONICS MACHINE	COMMAND PART No.	KENAMETAL PART No.	VALENITE PART No.	LYNDEX PART No.
A	B	C	ANGLE						
4832	.59	.39	1.38	45°	RH20F, RH25D, RH30D, BR50C, BR60C, BR80C, RW20A* VM16G, VM17E, VMG17D, VM24E, VMG24B, VM25C, VM30F, VMD30E	RB4M-0001	RK31113	PT-444-45	B40-4500

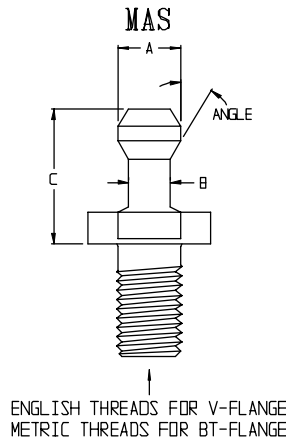
MAS RETENTION KNOBS STYLE V-FLANGE 40 TAPER

RET. KNOB ASSEMBLY SELECTION	DIMENSIONS				MILLTRONICS MACHINE	COMMAND PART No.	KENAMETAL PART No.	VALENITE PART No.	LYNDEX PART No.
A	B	C	ANGLE						
4833	.59	.39	1.27	60°	RH12, RH19, RH20F, RH25D, RH30D, RW12, BR50C, BR60C, BR80C VM16G, VM17E, VMG17D, VM24E, VMG24B, VM25C, VM30F, VMD30E	RB4E-0002	RK31114A	PT-532-60	C40-6000

MAS RETENTION KNOBS STYLE BT-FLANGE 40 TAPER

RET. KNOB ASSEMBLY SELECTION	DIMENSIONS				MILLTRONICS MACHINE	COMMAND PART No.	KENAMETAL PART No.	VALENITE PART No.	LYNDEX PART No.
A	B	C	ANGLE						
4834	.59	.39	1.38	60°	RH12, RH19, RH20F, RH25D, RH30D, RW12, BR50C, BR60C, BR80C VM16G, VM17E, VMG17D, VM24E, VMG24B, VM25C, VM30F, VMD30E	RB4M-0002	RK31113A	PT-444-60	B40-6000

NOTES:

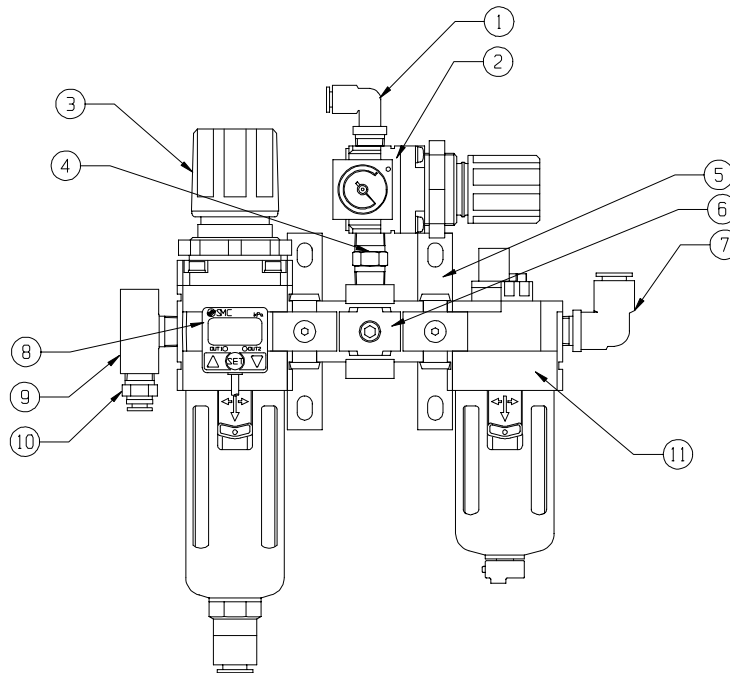


1. FOR SPINDLES OF 8000 RPM AND GREATER YOU MUST USE BALANCED TOOLING TO A G2.5 SPEC. OR IT WILL VOID THE SPINDLE WARRANTY.
 2. CHART IS GOOD FOR ALL MACHINE VERSIONS LISTED AND ALL FUTURE VERSIONS.
 3. COMMAND CORPORATION
TEL: 1-800-328-2197
FAX: 1-763-576-6911
 4. KENAMETAL
TEL: 1-800-446-7738
FAX: 1-800-962-4910
 5. VALENITE
TEL: 1-800-544-3336
FAX: 1-800-488-0695
 6. LYNDEX CORPORATION
TEL: 1-800-543-6237
FAX: 1-847-509-2909
- * RW20 ONLY COMES WITH ONE RETENTION KNOB. NO RETENTION KNOB ASSEMBLY SELECTION IS USED.

D	ADD RH/RW12 & RH19	5146		09/01
C	ADD RETENTION KNOBS TO CHART	4859	N.M.	12/00
B	CHANGE 70mm BT-FLANGE CHART	4730	N.M.	10/00
A	ADD LYNDEX CORP. IN CHART	4351	N.M.	1/00
REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
	RETENTION KNOB CHART	SCALE 1:1	DATE 6-11-01B-054	SHEET 8
	APPLICATION GENERAL PRODUCTS	DATE 30 APR 99	DRAWN BY DAHLKE	SHEET NO. 2 OF 2

Air Filter / Regulator / Lubricator Assembly

PARTS LIST			
ITEM	QTY	STOCK No.	DESCRIPTION
1	1	NU-186	1/4 NPT 1/4 TUBE SWIVEL ELBOW
2	1	NU-262	LOW PRESSURE REGULATOR W/GAGE
3	1	NU-212	LARGE FILTER/HIGH PRESSURE REGULATOR
4	1	NU-30	1/4 NPT PIPE NIPPLE
5	2	NU-210	LARGE MOUNTING SPACER
6	1	NU-211	LARGE MANIFOLD SPACER
7	1	NU-199	1/4 NPT 3/8 TUBE SWIVEL ELBOW
8	1	NU-259	DIGITAL AIR GAUGE WITH PRESSURE SWITCH
9	1	NU-219	1/4 NPT BRANCH TEE
10	1	NU-32	1/4 NPT 1/4 TUBE MALE STRAIGHT
11	1	NU-209	LARGE LUBRICATOR

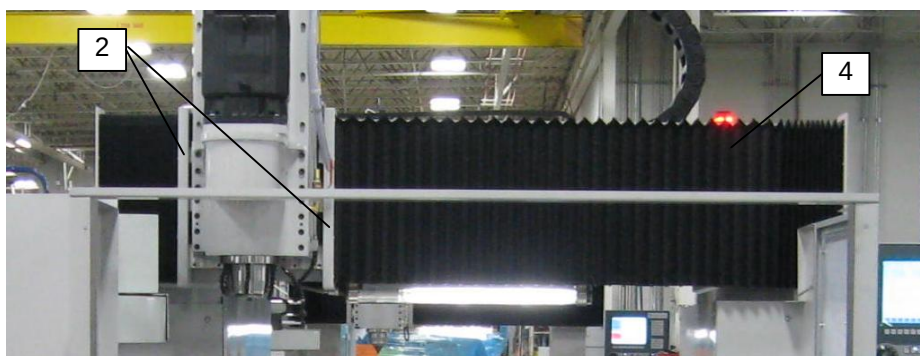
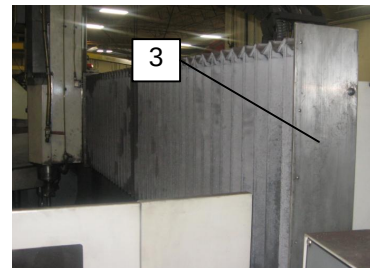


B	ADD DIGITAL GAGE	4860		12/00
A	CHANGE STOCK NUMBER	4813	N. M.	12/00
REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
MATERIAL/FINISH		 1400 MILL LANE 952-442-1410 WACONIA, MN 55387 USA		
		STOCK/ASSY No.		
TOLERANCE UNLESS SPECIFIED X.XXX +/- X.XX +/- X.X +/- ANGLE +/-		TITLE NU-232 FRL ASSEMBLY		
		APPLICATION GENERAL PRODUCTS		
		SCALE 3:1	DWG NO. 6-10-018-095	SIZE B
		DATE 14 JAN 00	DRAWN BY DAHLKE	SHEET NO. 1

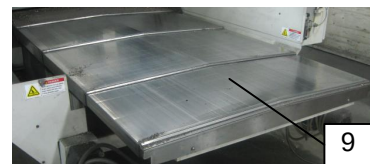
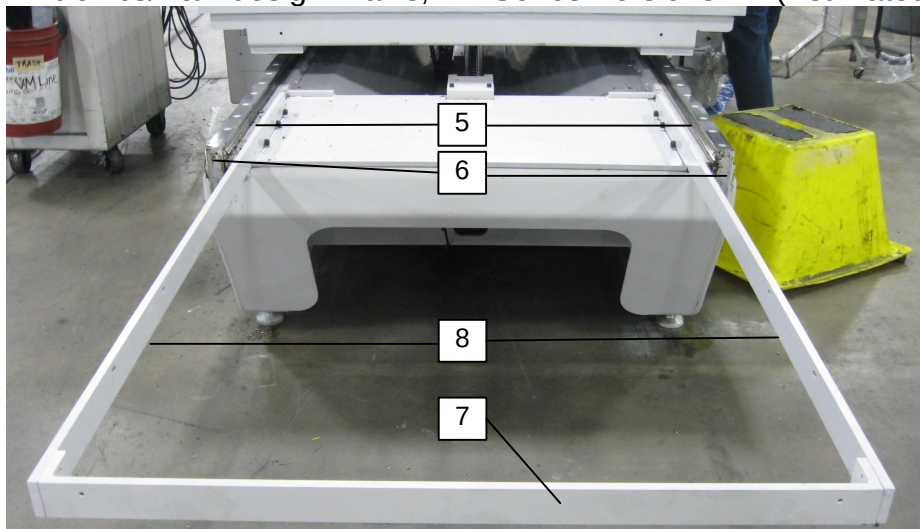
BR Series Way Cover Types

For BR Machine Versions A-K

Milltronics/A&A design Y axis, BR Series Versions I-K (Estimated)



Milltronics/A&A design X axis, BR Series Versions I-K (Estimated)



Item	Part #	Qty	Description
1	MPB-175	4	Y-axis Way cover mount extension – roller rails
	MPB-183		Y-axis Way cover mount extension – ball rails
2	MPB-177	2	Y-axis Way cover mounting bracket – Bellows – left/right
3	MPB-142	2	Y-axis Way cover mounting plate – outside – bellows – left/right
4	MPB-112	2	Y-axis Bellows way cover – Standard BR50 models
	MPB-141		Y-axis Bellows way cover – Standard BR60–80 models
	MPB-245		Y-axis Bellows way cover – BR80 MTS special
	MPB-249		Y-axis Bellows way cover – BR100
5	MPB-179	2	X-axis Spacer for mounting bar
6	MPB-180	2	X-axis Bracket, rail guide
7	MPB-181	1	X-axis Way cover mounting bracket – center
8	MPB-182	2	X-axis Way cover mounting bar – left/right
9	MPB-135	1	X-axis Way cover – 100"
	MPB-136		X-axis Way cover – 150"

Original design Y axis, BR Series Versions A-H (Estimated)



Original design X axis, BR Series Versions A-H (Estimated)



Item	Part #	Qty	Description
1	MPB-27	1	BR50 Left y-axis cover
	MPB-30		BR80 Left y-axis cover
	MPB-28	1	BR50 Right y-axis cover
	MPB-31		BR80 Right y-axis cover
2	JD	2	Y-axis rider brackets and spacers
3	JD	2	X-axis Way cover bar
4	JD	8	X-axis Way cover bar support
5	MPB-29	2	X-axis telescoping cover, BR50 standard travel
	MPB-26		X-axis telescoping cover, BR60/80
	MPB-136		X-axis telescoping cover, BR50-150 extended travel

