



VM20IL B Mechanical

10-11-2012
Rev 7

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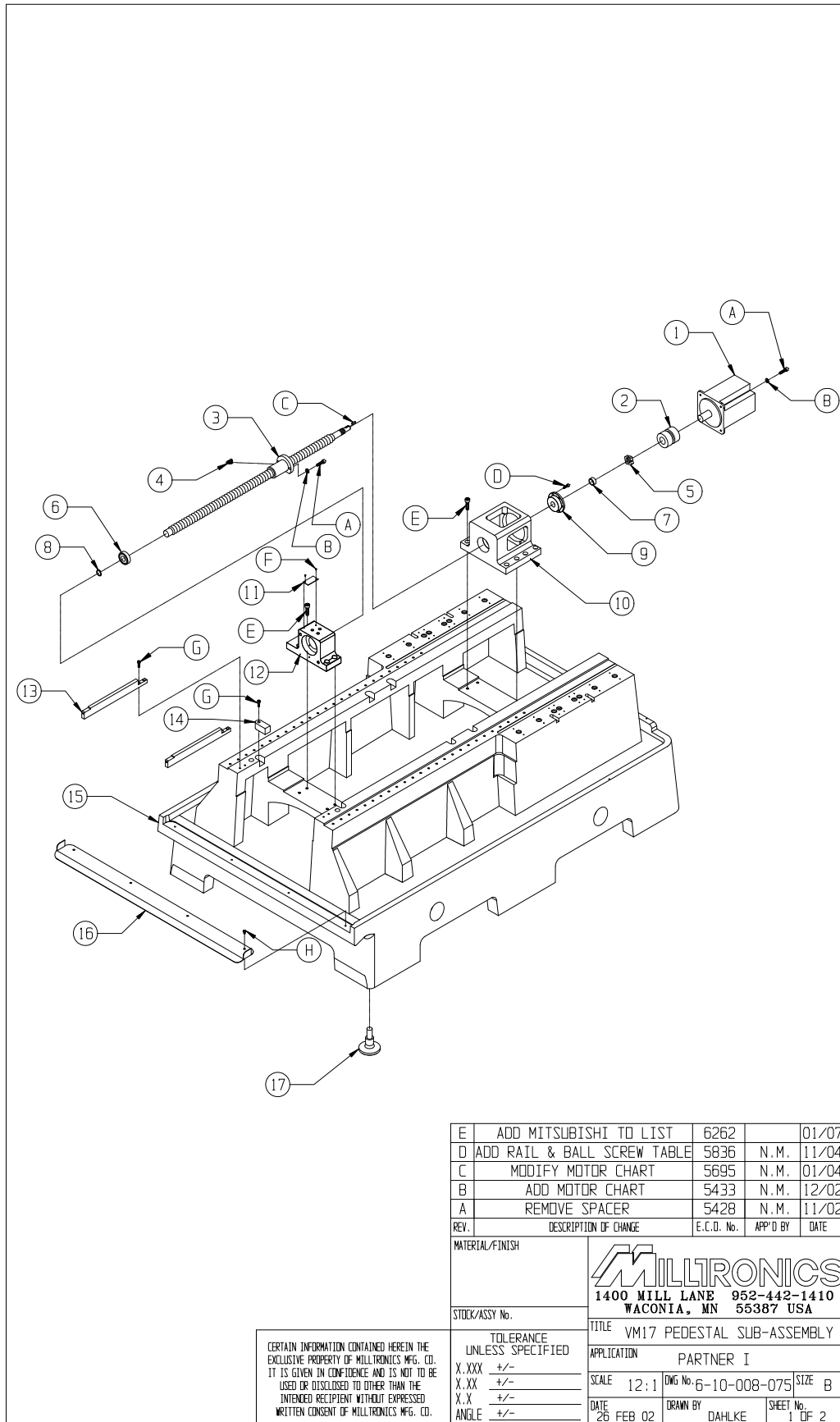


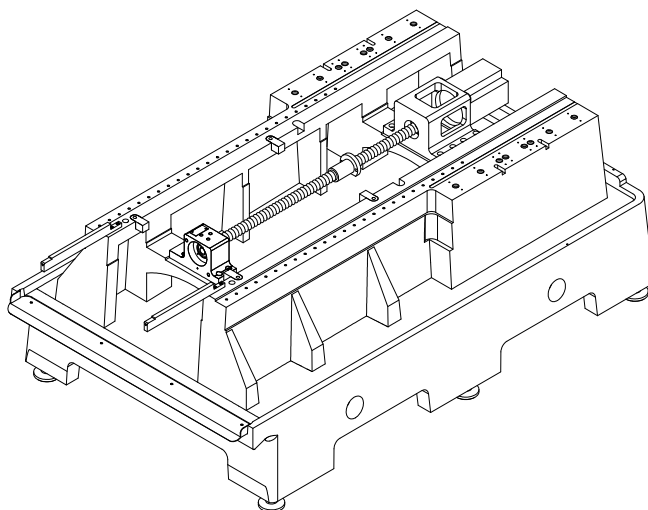
Manual Discrepancy Sheet

1. On page 6-7 item #19 is part number 01018834 as shown.
2. On page 15 item #K is M5.8x12mm as shown.
3. On page 19 items #9 and 16 are correctly shown as 2 & 1.



Machine Base Assembly





BALL SCREWS		
3	STANDARD RAPIDS	MPB-02
	HIGH SPEED OPTION	MP-801

PARTS LIST			
No.	QTY	STOCK No.	DESCRIPTION
1	1	SEE TABLE	AXIS MOTOR
2	1	SEE TABLE	MOTOR COUPLER
3	1	SEE TABLE	Y - AXIS BALL SCREW
4	1	NU-161	1/8 NPT 4mm SWIVEL ELBOW
5	1	MP1-94	BALL SCREW LOCK NUT
6	1	BG-02	BEARING 6204
7	1	MP1-107	BEARING LOCK NUT SPACER
8	1	MP1-108	BALL SCREW SNAP RING
9	1	BG-94	BALL SCREW SUPPORT BEARING
10	1	MX-51	Y - AXIS REAR MOTOR MOUNT
11	1	LB-27	PULLEY MOTOR WARNING LABEL
12	1	MX-64	FRONT BALL SCREW RADIAL MOUNT
13	2	SEE TABLE	Y - AXIS FRONT WAY COVER BRACKET
14	4	MP-707	HARD STOP BLOCK
15	1	MX1-61	PEDESTAL - MACHINED
16	1	MP1-473	PEDESTAL DRIP LIP
17	6	MP1-29	LEVELING PAD

FRONT WAY COVER BRACKET		
13	BALL RAIL STANDARD	MP1-391
	ROLLER RAIL OPTION	MP1-472

MOTOR & COUPLER LIST				
No.	YASKAWA	FANUC	SIEMENS	mitsubishi
1	MD-123 (.5kw)	4Nm A06B-0223-B200	6Nm 1FK7060-5AF71-1EA0	MD-184
	MD-125 (1.0kw)	8Nm A06B-0227-B200	11Nm 1FK7063-5AF71-1EA0	
	MD-127 (1.5kw)			
2	MA-242 (.5kw/1.0kw)	MA-242	MA-260	MA-260
	MA-241 (1.5kw)			

HARDWARE LIST		
No.	QTY	DESCRIPTION
A	6	M8-1.25 x 30mm SHCS
B	6	M8 LOCK WASHER
C	1	3/16 x 3/16 x 1/2 KEY
D	6	M6-1 x 25mm SHCS
E	8	M10-1.5 x 30mm SHCS
F	2	1/4 DRIVE PIN
G	8	M6-1 x 20mm SHCS
H	4	M6-1 x 10mm BHCS

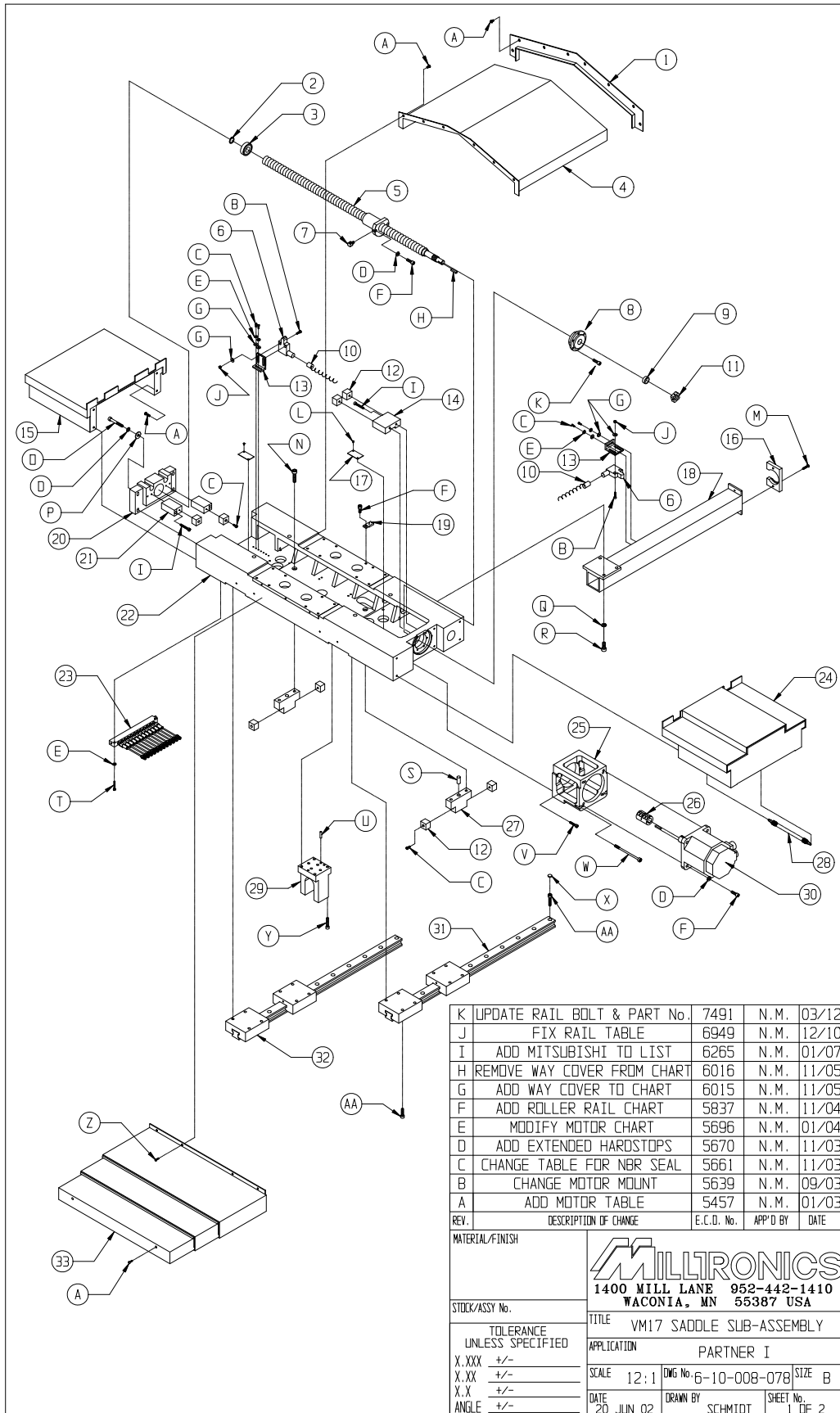
E	ADD MITSUBISHI TO LIST	6262		01/07
D	ADD RAIL & BALL SCREW TABLE	5836	N.M.	11/04
C	MODIFY MOTOR CHART	5695	N.M.	01/04
B	ADD MOTOR CHART	5433	N.M.	12/02
A	REMOVE SPACER	5428	N.M.	11/02
REV.	DESCRIPTION OF CHANGE	E.C.D. No.	APP'D BY	DATE

MATERIAL/FINISH		 1400 MILL LANE 952-442-1410 WACONIA, MN 55387 USA		
STOCK/ASSY No.		TITLE VM17 PEDESTAL SUB-ASSEMBLY		
TOLERANCE UNLESS SPECIFIED		APPLICATION PARTNER I		
X.XXX +/-		SCALE 12:1 DWG No. 6-10-008-075 SIZE B		
X.XX +/-		DATE 26 FEB 02 DRAWN BY DAHLKE SHEET No. 2 OF 2		
X.X +/-				
ANGLE +/-				

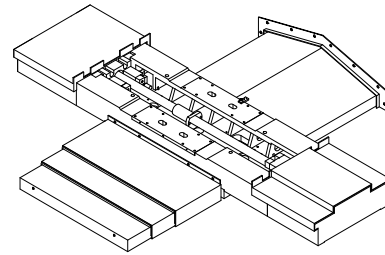
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Machine Saddle Assembly



PARTS LIST			
No.	QTY	STOCK No.	DESCRIPTION
1	1	MP10383	REAR WAY COVER WIPER
2	1	MP10108	SNAP RING
3	1	BG00002	6204 BEARING
4	1	SEE TABLE	REAR WAY COVER
5	1	SEE TABLE	X AXIS BALL SCREW
6	2	SW00193	HOME SWITCH
7	1	NU00161	1/8 NPT SWIVEL ELBOW 4nn TUBE
8	1	BG00094	BALL SCREW SUPPORT BEARING
9	1	MP10107	BEARING LOCKNUT SPACER
10	2	SW00191	X AXIS SWITCH CORD
11	1	MP10094	BALL SCREW LOCKNUT
12	8	MP00718	PDM HARD STOP BUMPER
13	2	MP10387	HOME SWITCH BRACKET
14	1	MP10446	HARD STOP BLOCK RIGHT
15	1	SEE TABLE	X AXIS WAY COVER - LEFT
16	1	BR00111	CONDUIT BRACKET
17	2	LB00027	PULLEY MOTOR WARNING LABEL
18	1	MP10388	Y AXIS CABLE BRACKET
19	1	01018834	OIL LINE BRACKET
20	1	MP10389	X AXIS RADIAL SUPPORT BRACKET
21	2	MP10447	HARD STOP BLOCK LEFT
22	1	SEE TABLE	SADDLE
23	1	SEE TABLE	X & Y AXIS MANIFOLD ASSEMBLY
24	1	SEE TABLE	X AXIS WAY COVER - RIGHT
25	1	MX10059	MOTOR MOUNT
26	1	SEE TABLE	MOTOR COUPLER
27	2	MP10410	SADDLE HARD STOP BLOCK
28	4	SEE TABLE	X AXIS WAY COVER SPRING
29	1	MX10011	Y/Z AXIS BALL SCREW CARRIER - MACHINED
30	1	SEE TABLE	AXIS MOTOR
31	2	SEE TABLE	35nn Y AXIS RAIL
32	4	SEE TABLE	35nn RAIL BLOCKS
33	1	MP10500	FRONT WAY COVER



MANIFOLD ASSEMBLY		
No.	DRAWING No.	DESCRIPTION
23	10008058	X & Y AIR/OIL MANIFOLD ASSEMBLY
	10018049	VM X & Y AXIS OIL MANIFOLD ASSEMBLY

* THESE PARTS REMOVED FOR 30" & 40" X - AXIS TRAVEL

MOTOR & COUPLER LIST			
No.	YASKAWA	FANUC	SIEMENS
26	MA00242 (.5/1.0kW)	MA00242	MA00260
	MA00241 (1.5kW)		MA00260
30	MD00123 (.5kW)	4Nn A06B-0223-B200	6Nn 1FK7060-SAF71-1EA0
	MD00125 (1.0kW)	8Nn A06B-0227-B200	11Nn 1FK7063-SAF71-1EA0
	MD00127 (1.5kW)		MD00184 (1.5kW)

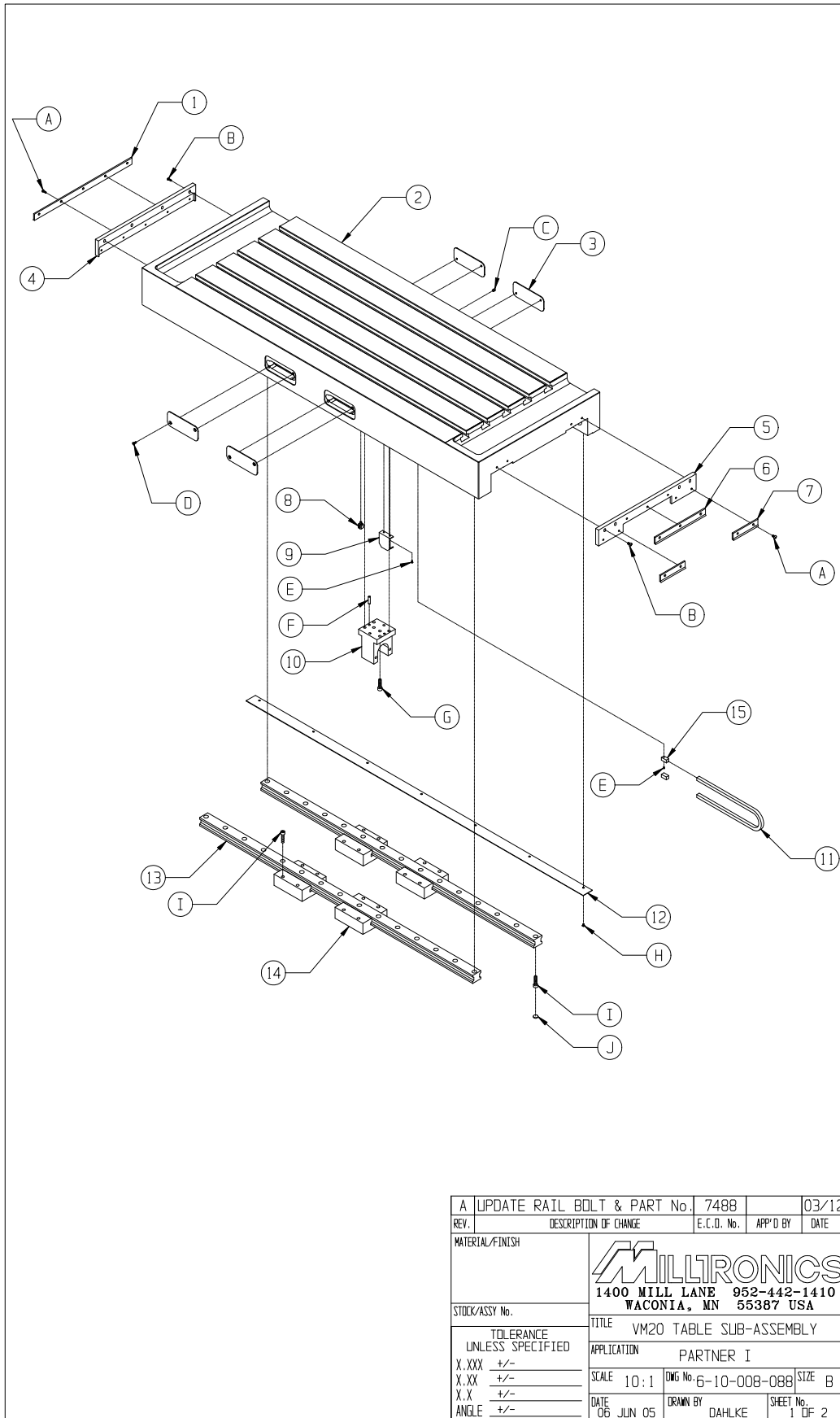
MACHINE VARIATION TABLE					
No.	DESCRIPTION	VM15/16/17 PART No.		VM20 PART No.	
		25" TRAVEL	30" TRAVEL	30" TRAVEL	40" TRAVEL
4	REAR WAY COVER	MP10382	MP10382	MP10462	MP10462
5	X AXIS BALL SCREW STANDARD	MP00569	MP00569	MP00569	MP00570
	X AXIS BALL SCREW RAPID	-	MP00802	MP00802	MP00821
15	X AXIS WAY COVER - LEFT	MP10385	MP10385	MP10385	MP10455
22	SADDLE - MACHINED	MX10055	MX10055	MX10055	MX10063
24	X AXIS WAY COVER - RIGHT	MP10442	MP10442	MP10442	MP10454
28	X AXIS WAY COVER SPRING	HD00062	HD00062	HD00062	HD00033
31	BALL RAIL	MP00640 (820)	MP00640 (820)	MP00047 (1000)	MP00047 (1000)
	ROLLER RAIL	-	MP00831 (844)	MP00811 (1024)	MP00811 (1024)
32	BALL RAIL BLOCK	MP00641	MP00641	MP00641	MP00641
	ROLLER RAIL BLOCK	-	MP00815	MP00815	MP00815

HARDWARE LIST		
No.	QTY	DESCRIPTION
A	24	M6-1 x 12nn BHCS
B	4	M5-.8 x 20nn SHCS
C	12	M5-.8 x 16nn SHCS
D	10	M8 LOCK WASHER
E	6	M5 LOCK WASHER
F	7	M8-1.25 x 30nn SHCS
G	8	M5 FLAT WASHER
H	1	3/16 x 3/16 x 1/2 KEY
I	4	M6-1 x 40nn SHCS
J	4	M5-.8 HEX NUT
K	6	M6-1 x 25nn SHCS
L	4	1/4 DRIVE RIVIT
M	2	M6-1 x 25nn BHCS
N	4	M10-1.5 x 40nn SHCS
O	4	M8-1.25 x 45nn SHCS
P	4	M8 FLAT WASHER
Q	4	M10 LOCK WASHER
R	4	M10-1.5 x 30nn SHCS
S	2	12nn x 25nn DOWEL PIN
T	2	M5-.8 x 25nn SHCS
U	2	1/4 x 1 DOWEL PIN
V	4	M6-1 x 30nn SHCS
W	2	M6-1 x 130nn SHCS
X	22	RAIL PLUGS MP00640 (820) BALL RAIL
	42	RAIL PLUGS MP00831 (844) ROLLER RAIL
	26	RAIL PLUGS MP00047 (1000) BALL RAIL
	50	RAIL PLUGS MP00811 (1024) ROLLER RAIL
Y	6	M8-1.25 x 40nn SHCS
Z	4	M5-.8 x 10nn BHCS
AA	44	M8-1.25 x 30nn SHCS MP00640 (820) BALL RAIL
	66	M8-1.25 x 35nn SHCS MP00831 (844) ROLLER RAIL
	48	M8-1.25 x 30nn SHCS MP00047 (1000) BALL RAIL
	72	M8-1.25 x 35nn SHCS MP00811 (1024) ROLLER RAIL

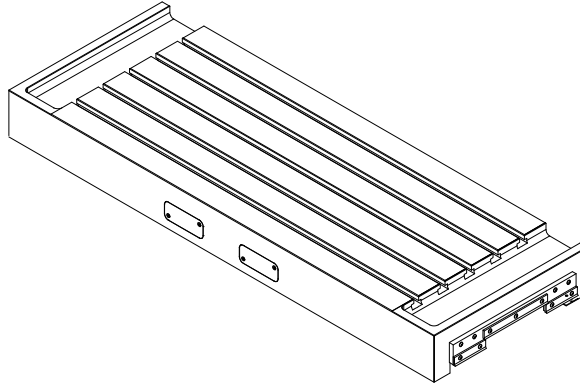
K	UPDATE RAIL BOLT & PART No.	7491	N.M.	03/12
J	FIX RAIL TABLE	6949	N.M.	12/10
I	ADD MITSUBISHI TO LIST	6265	N.M.	01/07
H	REMOVE WAY COVER FROM CHART	6016	N.M.	11/05
G	ADD WAY COVER TO CHART	6015	N.M.	11/05
F	ADD ROLLER RAIL CHART	5837	N.M.	11/04
E	MODIFY MOTOR CHART	5696	N.M.	01/04
D	ADD EXTENDED HARDSTOPS	5670	N.M.	11/03
C	CHANGE TABLE FOR NBR SEAL	5661	N.M.	11/03
B	CHANGE MOTOR MOUNT	5639	N.M.	09/03
A	ADD MOTOR TABLE	5457	N.M.	01/03
REV.	DESCRIPTION OF CHANGE	E.C.D. No.	APP'D BY	DATE
MATERIAL/FINISH				
STOCK/ASSY No.		1400 MILL LANE 952-442-1410 WACONIA, MN 55387 USA		
TOLERANCE UNLESS SPECIFIED		TITLE VM17 SADDLE SUB-ASSEMBLY		
X.XXX +/-		APPLICATION PARTNER I		
X.XX +/-		SCALE 15:1	DWG No. 6-10-008-078	SIZE B
X.X +/-		DATE 20 JUN 02	DRAWN BY SCHMIOT	SHEET No. 2 OF 2
ANGLE +/-				



Milling Table Assembly



A	UPDATE RAIL BOLT & PART No.		7488	03/12	
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 VM20 TABLE SUB-ASSEMBLY		
X.XXX	+/-		APPLICATION PARTNER I		
X.XX	+/-		SCALE 10:1		
X.X	+/-		DATE 06 JUN 05		
ANGLE	+/-		DRAWN BY DAHLKE		
			SHEET No. 1 OF 2		



PARTS LIST

No.	QTY	STOCK No.	DESCRIPTION
1	1	MP10423	VM17 WIPER - LEFT
2	1	SEE TABLE	TABLE - MACHINED
3	4	MP00315	TABLE SLOT COVER
4	1	MP10419	X-AXIS WIPER PLATE - LEFT
5	1	MP10420	X-AXIS WIPER PLATE - RIGHT
6	1	MP10422	VM17 WIPER - UPPER
7	2	MP10421	VM17 WIPER - LOWER
8	2	NU00161	SWIVEL ELBOW 1/8NPT - 4mm TUBE
9	1	MP60045	EXTENDED TRAVEL X-AXIS DOG
10	1	MX60016	X-AXIS BALL SCREW CARRIER
11	1	MP00844	X-AXIS CABLE TRACK - 33 LINKS
12	1	SEE TABLE	TABLE PLATE
13	2	SEE TABLE	35mm RAILS
14	4	SEE TABLE	35mm RAIL BLOCK
15	1	MP00845	X-AXIS CABLE TRACK - ENDS

HARDWARE LIST

No.	QTY	DESCRIPTION
A	12	M6-1 x 12mm BHCS
B	8	M6-1 x 25mm BHCS
C	1	1/8-27 NPT SHPP
D	8	M4-.7 x 8mm FHCS
E	6	M3-.5 x 6mm BHCS
F	2	1/4 x 1 DOWEL PIN
G	6	M8-1.25 x 35mm SHCS
H	7	M5-.8 x 12mm BHCS
I	46	M8-1.25 x 30mm SHCS - BALL RAIL 30"
	74	M8-1.25 x 35mm SHCS - ROLLER RAIL 30"
	52	M8-1.25 x 30mm SHCS - BALL RAIL 40"
	86	M8-1.25 x 35mm SHCS - ROLLER RAIL 40"
J	30	RAIL PLUG - BALL RAIL 30"
	58	RAIL PLUG - ROLLER RAIL 30"
	36	RAIL PLUG - BALL RAIL 40"
	70	RAIL PLUG - ROLLER RAIL 40"

TABLE TRAVEL

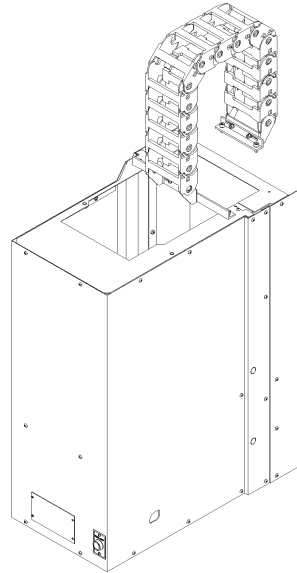
No.	DESCRIPTION	30" TRAVEL	40" TRAVEL
2	TABLE - MACHINED	MX10064	MX10065
12	TABLE PLATE	MP10463	MP10464
13	BALL RAIL	MP00732	MP00823
	ROLLER RAIL	MP00812	MP00824
14	BALL RAIL BLOCK	MP00641	MP00641
	ROLLER RAIL BLOCK	MP00815	MP00815

A	UPDATE RAIL BOLT & PART No.	7488		03/12
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.		TITLE VM20 TABLE SUB-ASSEMBLY		
TOLERANCE UNLESS SPECIFIED		APPLICATION PARTNER I		
X.XXX	+/-	SCALE 10:1	DWG No. 6-10-008-088	SIZE B
X.XX	+/-	DATE 06 JUN 05	DRAWN BY DAHLKE	SHEET No. 2 of 2
X.X	+/-			
ANGLE	+/-			



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ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	SEE TABLE	SPINDLE CABLE TRACK
2	1	MP00316	SPINDLE CABLE SUPPORT BRACKET
3	1	SEE TABLE	VM HEAD COVER - TOP
4	1	MP00664	VM SPINDLE CABLE SUPPORT BRACKET
5	1	MP00639	UNIVERSAL HEADCOVER - TOP
6	1	SEE TABLE	VM HEAD COVER - LEFT
7	1	SEE TABLE	VM HEAD COVER - RIGHT
8	1	MP00635	UNIVERSAL HEAD COVER
9	1	LB00001	SAFETY STICKER
10	1	LB00181	TOOL OUT LABEL
11	1	SW00067	TOOL OUT SWITCH
12	4	BHCS M6-1.0 x 20	M6 - 1.0 x 20 BHCS
13	8	WASHER FLAT M6	M6 WASHER FLAT
14	4	SHCS M6-1.0 x 20	M6-1.0 x 20 SHCS
15	4	WASHER LOCK M6	M6 WASHER LOCK
16	4	NUT M6-1	M6-1 NYLOCK NUT
17	41	BHCS M6-1.0 x 10	M6-1.0 x 10 BHCS
18	4	BHCS M3-0.5 x 5	M3-0.5 x 5 BHCS
19	2	BHCS M4-0.7 x 8	M4-0.7 x 8 BHCS

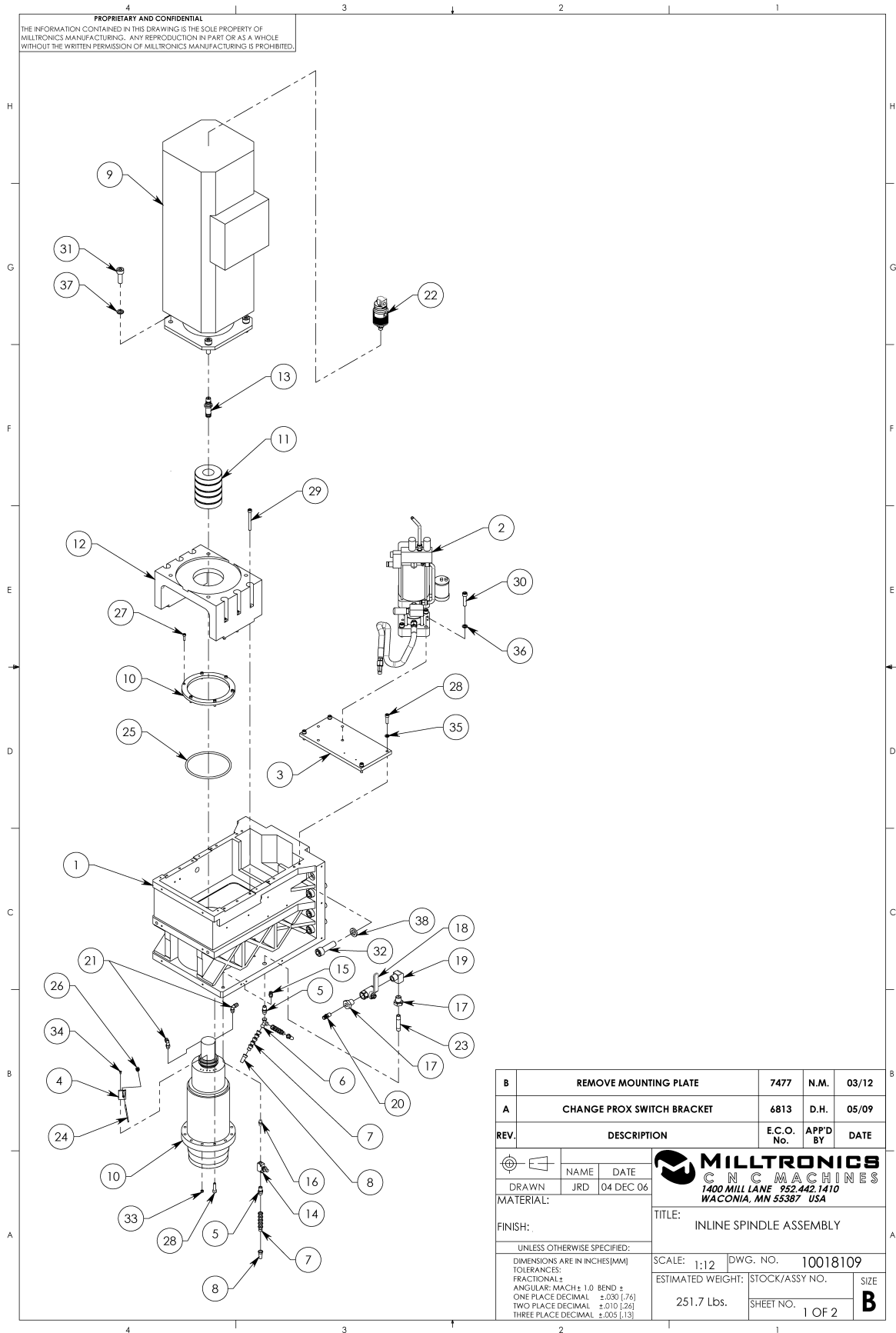
VM TABLE				
ITEM No.	VM20	VM22	VM25	VM30
1	MP00443	MP00760 *	MP00760 *	MP00760 *
3	MP10461	MP60218	MP00633	MP00638
6	MP10459	MP60219	MP00634	MP00637
7	MP10460	MP60217	MP00632	MP00636

* XP MACHINES USE MP-850 CABLE TRACK.

	NAME	DATE	
	DRAWN DAHLKE	02 JAN 07	
MATERIAL:		TITLE:	
FINISH:		VM INLINE HEAD ASSEMBLY	
UNLESS OTHERWISE SPECIFIED:		SCALE: 1:12 DWG. NO. 10018110	
DIMENSIONS ARE IN INCHES (MM) TOLERANCES: FRACTIONAL ANGULAR: MACH 1.0 BEND ONE PLACE DECIMAL .030 [.76] TWO PLACE DECIMAL .010 [.26] THREE PLACE DECIMAL .005 [.13]		ESTIMATED WEIGHT: 60.5 LBS.	STOCK/ASSY No. SHEET No. 2 OF 2 SIZE B



Inline Spindle Assembly





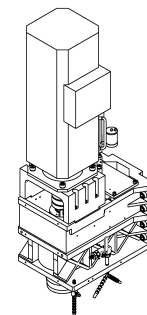
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SPINDLE MOTOR TABLE		
ITEM NO.	STOCK NO.	DESCRIPTION
10	MP001023	10K RPM
	MP001129	15K RPM

MOTOR COUPLER TABLE		
ITEM NO.	MOTOR-END HUB 1 DIA. (MM)	SPINDLE-END HUB 2 DIA. (MM)
11	24	50
	28	50
	32	50
	38	50
	40	50
	42	50
	48	50
	50	50
	55	50

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	MX00043	70mm HEAD - CASTING
2	1	10018108	AIR/OIL AMPLIFIER SYSTEM
3	1	MP00951	AIR OIL AMPLIFIER (NU00388) MOUNTING PLATE
4	1	BR00166	SPINDLE PROX SWITCH BRACKET
5	2	MA00019	CONNECTOR LOC LINE .25"
6	1	MA00020	SNAP LOC 1/4" Y
7	15	MA00022	LOC-LINE LINKS 1/4
8	3	MA00216	LOC-LINE NOZZLE 1/4
9	1	SEE TABLE	SPINDLE MOTOR
10	1	SEE TABLE	SPINDLE ASSEMBLY
11	1	SEE TABLE	MOTOR COUPLER
12	1	SEE TABLE	MOTOR CASTING MITSUBISHI AND FANUC
13	1	MP00958	CTS SPINDLE MOTOR CONNECTING TUBE (CTS OPTION)
14	1	NU00007	AIR RESTRICTOR
15	1	NU00017	1/8"NPT X 1/4 TUBE M/S
16	1	NU00024	1/8 NPT BRASS NIPPLE UNION
17	2	NU00028	1/2" NPT (MALE) - 1/4" NPT(FEMALE)
18	1	NU00064	1/2" NPT BALL VALVE
19	1	NU00125	1/2" STREET ELBOW
20	1	NU00139	FITTING 1/4NPT-1/2 BARB
21	2	NU00171	ELBOW - M/S 1/4 TUBE x 1/8NPT
22	1	NU00226	DEUBLIN COOLANT UNION
23	1	NU00263	NIPPLE .25NPT x 2.50
24	1	PR00050	PROX SWITCH
25	1	WX00270	70mm REAR CARTRIDGE SEAL O-RING
26	1	WX00358	PROX SWITCH RESTRAINT
27	6	SHCS M6-1.0 x 20	M6-1.0 x 20mm SHCS
28	10	SHCS M8-1.25 x 30	M8-1.25 x 30mm SHCS
29	6	SHCS M8-1.25 x 80	M8-1.25 x 80mm SHCS
30	4	SHCS M10-1.5 x 45	M10-1.5 x 45mm SHCS
31	4	SHCS M14-2.0 x 45	M14-2.0 x 45mm SHCS
32	8	SHCS 3_4-10 x 2.5	3/4-10 x 2.5 SHCS
33	6	SHPP 1/8-28 BSPP	1/8-28 BSPP SHPP
34	2	BHCS M4-0.7 x 8	M4-0.7 x 8mm BHCS
35	4	WASHER LOCK M8	M8 LOCK WASHER
36	4	WASHER LOCK M10	M10 LOCK WASHER
37	4	WASHER LOCK M14	M14 LOCK WASHER
38	8	WASHER LOCK .75	3/4 LOCK WASHER



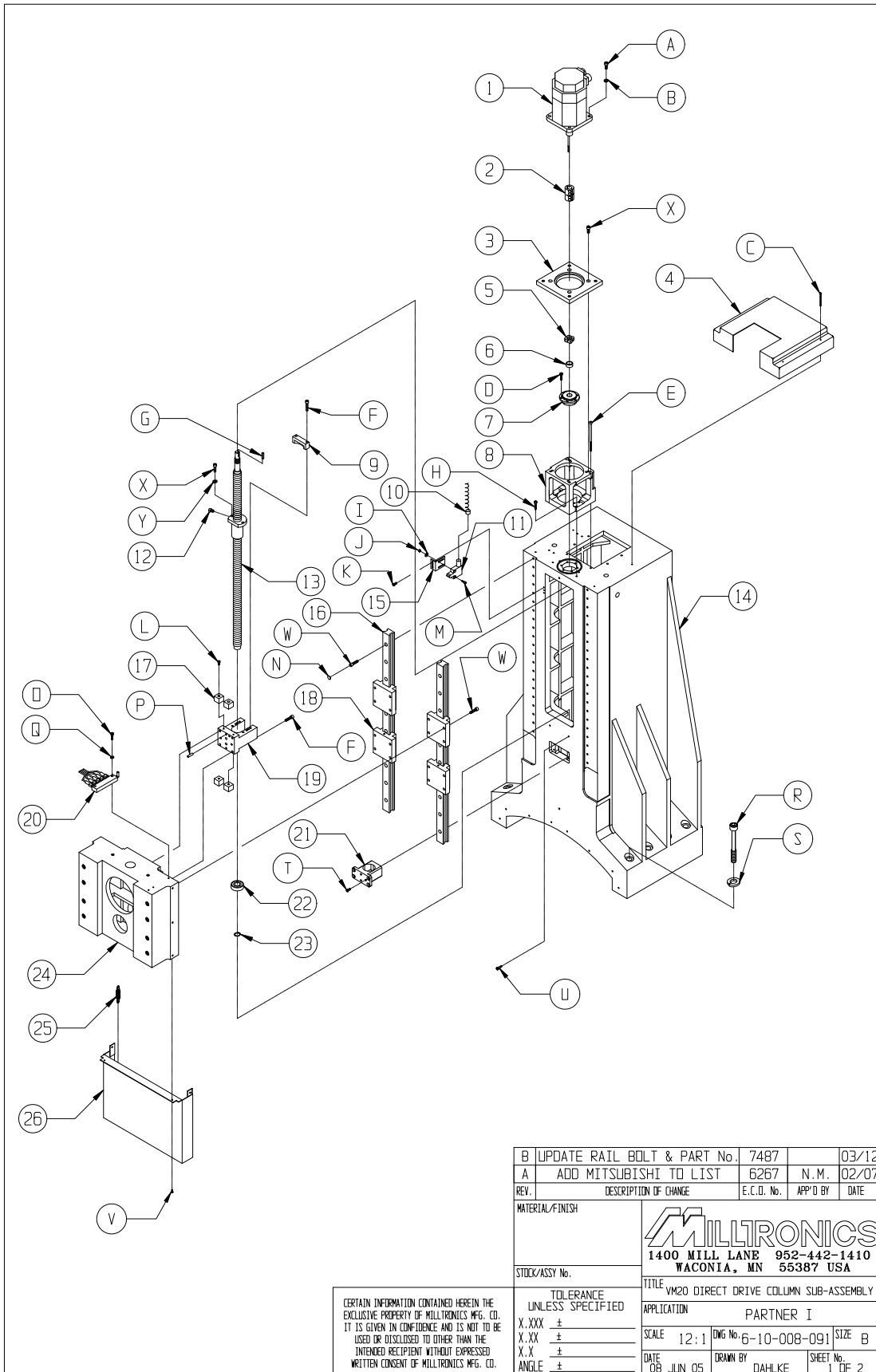
SPINDLE MOTOR TABLE		
ITEM NO.	STOCK NO.	DESCRIPTION
9	A06B-1477-B133#0121	FANUC
	A06B-1479-B133#0221	FANUC
	MO00166	MITSUBISHI
	MO00167	MITSUBISHI
	1PM 6137	SIEMENS
	1PM 6105	SIEMENS
	1PM 6133	SIEMENS

SPINDLE MOTOR MOUNTING PLATE TABLE		
ITEM NO.	STOCK NO.	DESCRIPTION
12	MX00081	7.5kW MITSUBISHI/FANUC/SIEMENS
	MX00082	11.0kW MITSUBISHI/FANUC
	MXS0005	11.0kW SIEMENS

B	REMOVE MOUNTING PLATE	7477	N.M.	03/12
A	CHANGE PROX SWITCH BRACKET	6813	D.H.	05/09
REV.	DESCRIPTION	E.C.O. No.	APP'D BY	DATE
	NAME	DATE	MILLTRONICS CNC MACHINES 1400 MILL LANE 952.442.1410 WACONIA, MN 55387 USA	
DRAWN	JRD	04 DEC 06	TITLE: INLINE SPINDLE ASSEMBLY	
MATERIAL:		FINISH:		
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES(MM) TOLERANCES: FRACTIONAL: ± ANGULAR: MACH ± 1.0 BEND ± ONE PLACE DECIMAL ±.030 [.76] TWO PLACE DECIMAL ±.010 [.26] THREE PLACE DECIMAL ±.005 [.13]				
SCALE: 1:17		DWG. NO. 10018109		SIZE
ESTIMATED WEIGHT: 251.7 Lbs.		STOCK/ASSY NO.		B
SHEET NO. 2 OF 2				



Machine Column Assembly

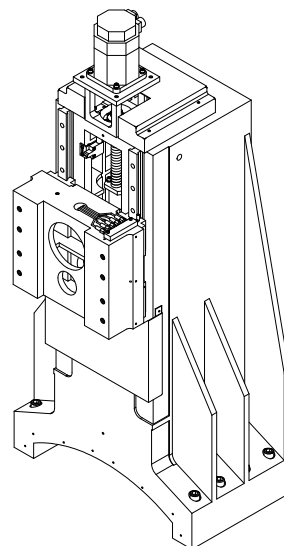




PARTS LIST			
No.	QTY	STOCK No.	DESCRIPTION
1	1	SEE TABLE	AXIS MOTOR W/BRAKE
2	1	SEE TABLE	MOTOR COUPLER
3	1	SEE TABLE	Z AXIS MOTOR PLATE
4	1	VM10008	Z AXIS MOTOR COVER
5	1	MP10094	BALL SCREW LOCK NUT
6	1	MP10107	BEARING LOCK NUT SPACER
7	1	BG00094	BALL SCREW SUPPORT BEARING
8	1	SEE TABLE	Z MOTOR MOUNT
9	1	MP00109	Z AXIS BALL SCREW SAFETY CATCH
10	1	SW00191	X AXIS SWITCH CORD
11	1	SW00193	Z AXIS SWITCH
12	1	NU00154	1/8 NPT MS 5/32 TUBE
13	1	SEE TABLE	Z AXIS BALL SCREW
14	1	SEE TABLE	COLUMN - MACHINED
15	1	MP10387	X & Y LIMIT SWITCH MOUNTING BRACKET
16	2	SEE TABLE	LINEAR RAILS
17	4	MP00718	PDM HARD STOP BUMPER
18	4	SEE TABLE	35mm RAIL BLOCK
19	1	MX10011	Z AXIS BALL SCREW CARRIER - MACH.
20	1	SEE TABLE	Z AXIS MANIFOLD ASSEMBLY
21	1	MX10028	Y-Z RADIAL SUPPORT BRACKET
22	1	BG00002	6204 BEARING
23	1	MP10108	SNAP RING
24	1	MX10062	VM20 HEAD EXTENSION-MACHINED
25	2	HD00062	WAY COVER SPRING
26	1	SEE TABLE	Z AXIS WAY COVER

*

* THIS IS ONLY USED WITH THE MP10425 2 BOX WAYCOVER



AXIS MOTOR, COUPLER & MOTOR PLATE TABLE				
No.	YASKAWA	FANUC	SIEMENS	MITSUBISHI
1	MD00138 (3.0kW)	12 Nm A06B-0243-B500	11 Nm 1FK7063-5AF71-1E0 18 Nm 1FK7100-5AF71-1E0	MD00186 (3.5kW) MD00188 (5.0kW)
2	MA00248	MA00248	MA00260 (11Nm) MA00340 (18Nm)	MA00248
3	MP10453	MP10453	- (11Nm) SMN0009 (18Nm)	MP10453
8	MX10059	MX10059	MXS0002 (11Nm) MX10059 (18Nm)	MX10059

HARDWARE LIST		
No.	QTY	DESCRIPTION
A	4	M12-1.75 x 35mm SHCS
B	4	M12 LOCK WASHER
C	4	M5-.8 x 60mm BHCS
D	6	M6-1 x 25mm SHCS
E	2	M6-1 x 130mm SHCS
F	6	M8-1.25 x 40mm SHCS
G	1	3/16 x 3/16 x 1/2 BALL SCREW KEY
H	4	M6-1 x 30mm SHCS
I	2	M5 FLAT WASHER
J	2	M5-.8 HEX NUT
K	2	M5-.8x12mm BHCS
L	4	M5-.8 x 16mm SHCS
M	2	M5-.8 x 20mm SHCS
N	22	RAIL PLUGS MP00640 (820) BALL RAIL
	42	RAIL PLUGS MP00831 (844) ROLLER RAIL
	26	RAIL PLUGS MPB0047 (1000) BALL RAIL
	50	RAIL PLUGS MP00811 (1024) ROLLER RAIL
O	2	M5-.8 x 40mm SHCS
P	2	1/4 x 1 DOWEL PIN
Q	2	5mm LOCK WASHER
R	8	3/4-10 x 7" SHCS
S	8	3/4 LOCK WASHER
T	4	M6-1 x 16mm BHCS
U	2	M8 x 10mm SHOULDER BOLT
V	2	M4-.7 x 10mm BHCS
W	38	M8-1.25 x 30mm SHCS MP00640 (820) BALL RAIL
	58	M8-1.25 x 35mm SHCS MP00831 (844) ROLLER RAIL
	42	M8-1.25 x 30mm SHCS MPB0047 (1000) BALL RAIL
	66	M8-1.25 x 35mm SHCS MP00811 (1024) ROLLER RAIL
X	6	M8-1.25 x 30mm SHCS
Y	2	M8 LOCK WASHER

*

Z-AXIS MANIFOLD ASSEMBLY		
No.	DRAWING No.	DESCRIPTION
20	10018050	VM Z-AXIS OIL MANIFOLD ASSEMBLY
	10008059	Z-AXIS AIR/OIL MANIFOLD ASSEMBLY

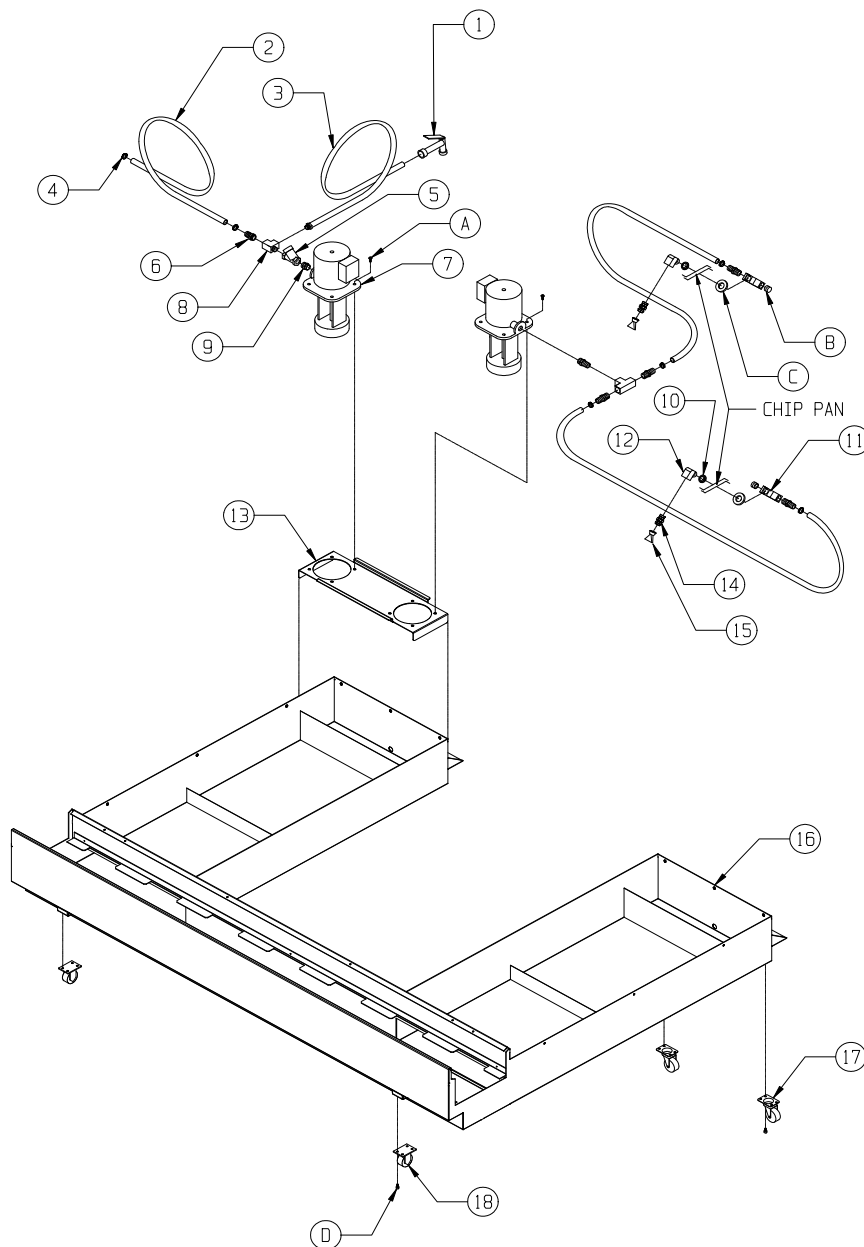
BALL SCREW TABLE		
No.	DESCRIPTION	PART No.
13	STANDARD RAPID	MPB0002
	HIGH SPEED RAPID	MP00801

TRAVEL/LINEAR RAIL TABLE			
No.	DESCRIPTION	20" TRAVEL	26" TRAVEL
14	COLUMN - MACHINED	MX10057	MX10058
16	BALL RAIL	MP00640	MPB0047
	ROLLER RAIL	MP00831	MP00811
18	BALL RAIL BLOCK	MP00641	MP00641
	ROLLER RAIL BLOCK	MP00815	MP00815
26	Z AXIS WAY COVER	MP10424	MP10425

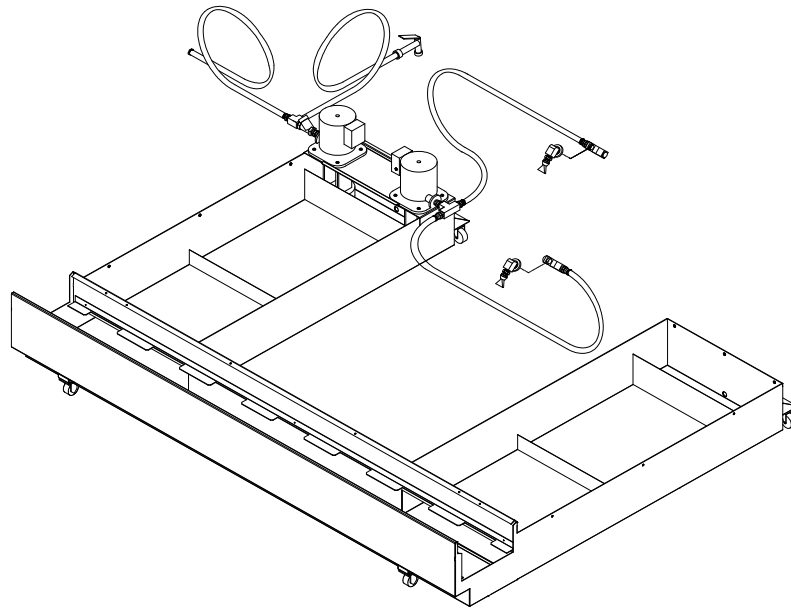
B	UPDATE RAIL BOLT & PART No.	7487		03/12
A	ADD MITSUBISHI TO LIST	6267	N.M.	02/07
REV.	DESCRIPTION OF CHANGE	E.C.D. No.	APP'D BY	DATE
MATERIAL/FINISH		 1400 MILL LANE 952-442-1410 WACONIA, MN 55387 USA		
STOCK/ASSY No.		TITLE VM20 DIRECT DRIVE COLUMN SUB-ASSEMBLY		
TOLERANCE UNLESS SPECIFIED		APPLICATION PARTNER I		
X.XXX ±		SCALE 12:1		
X.XX ±		DWG No. 6-10-008-091		
X.X ±		SIZE B		
ANGLE ±		DATE 08 JUN 05	DRAWN BY DAHLKE	SHEET No. 2 OF 2

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Flood Tank W/Washdown Assembly



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.		TITLE VM20 FLOOD TANK W/WASHDOWN ASSEMBLY		
TOLERANCE UNLESS SPECIFIED		APPLICATION PARTNER I		
X .XXX +/-		SCALE 15:1	DWG No 6-10-008-085	SIZE B
X .XX +/-		DATE 27 MAY 05	DRAWN BY DAHLKE	SHEET No 1 OF 2
X .X +/-				
ANGLE +/-				



PARTS LIST

No.	QTY	STOCK No.	DESCRIPTION
1	1	NU-124	WATER HOSE NOZZLE
2	30'	NU-69	3/4" NYLOBRAID HOSE
3	1	NU-130	WASHDOWN HOSE ASSEMBLY
4	6	NU-141	1" HOSE CLAMP
5	1	NU-128	1/2" SWING CHECK VALVE
6	5	NU-66	1/2 NPT - 3/4 BARB FITTING
7	2	MA-162	FLOOD PUMP 1/4 HP MOTOR
8	1	NU-127	1/2" STREET T
9	2	NU-65	1/2" NIPPLE
10	2	WX-38	O' RING
11	3	NU-61	1/2" FEMALE T
12	2	NU-125	1/2" STREET ELBOW
13	1	MP1-489	COOLANT PUMP MOUNTING PLATE
14	2	NU-176	1/2" CONNECTOR
15	2	NU-175	1 1/4" FLARE NOZZLE
16	1	MP1-486	ONE PIECE COOLANT TANK
17	4	EL-88	CASTER - SWIVEL
18	2	EL-98	CASTER - RIGID

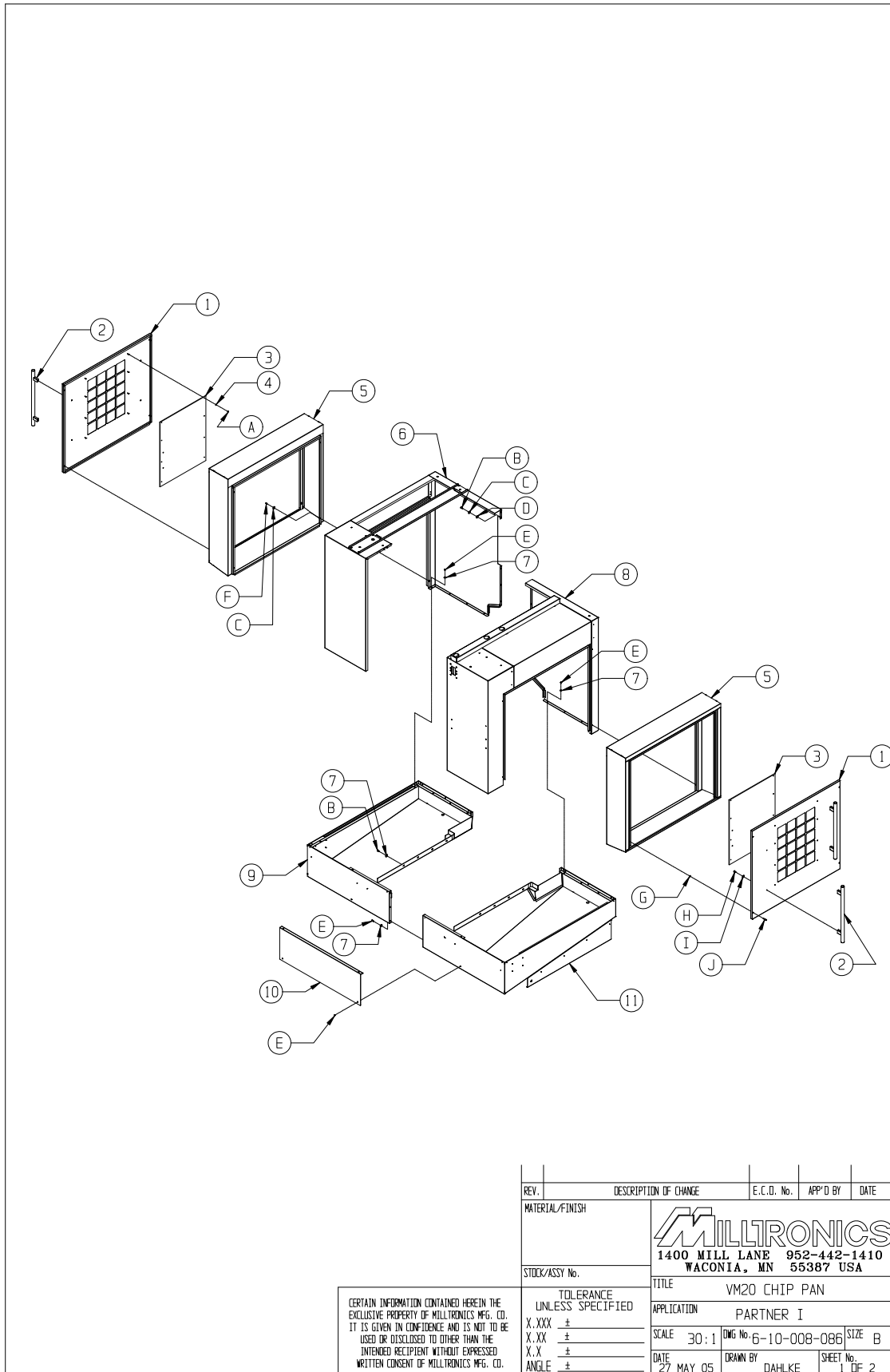
HARDWARE LIST

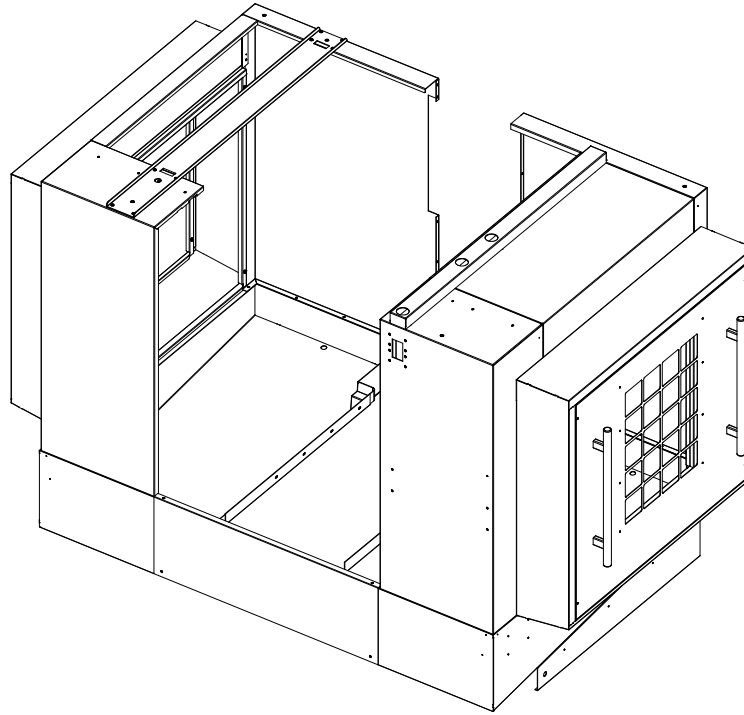
No.	QTY	DESCRIPTION
A	8	M6-1 x 12mm BHCS
B	2	1/2-14 NPT SHPP
C	2	7/8 FLAT WASHER 3/8 THICK
D	12	M6-1 x 12mm SHCS

REV.	DESCRIPTION OF CHANGE	E.C.D. No.	APP'D BY	DATE
MATERIAL/FINISH				
STOCK/ASSY No.				
TOLERANCE UNLESS SPECIFIED				
X.XXX	+/-			
X.XX	+/-			
X.X	+/-			
ANGLE	+/-			
 1400 MILL LANE 952-442-1410 WACONIA, MN 55387 USA				
TITLE VM20 FLOOD TANK W/WASHDOWN ASSEMBLY				
APPLICATION PARTNER I				
SCALE 15:1	DWG No. 6-10-008-085	SIZE B		
DATE 27 MAY 05	DRAWN BY DAHLKE	SHEET No. 2	OF 2	



Enclosure Assembly





HARDWARE LIST

No.	QTY	STOCK NO.	DESCRIPTION
1	2	MP1-483	SIDE DOOR
2	4	WX-297	25" HANDLE
3	2	MP6-163	SIDE DOOR LEXAN
4	16	HD-58	M5 RUBBERIZED WASHER
5	2	MP1-490	ENCLOSURE BUMP-OUT
6	1	MP1-479	ENCLOSURE-LEFT
7	27	HD-12	M6 RUBBERIZED WASHER
8	1	MP1-480	ENCLOSURE-RIGHT
9	1	MP1-477	CHIP PAN BOTTOM-LEFT
10	1	MP1-485	CENTER STAINLESS STEEL
11	1	MP1-478	CHIP PAN BOTTOM-RIGHT

* USE ONLY ON 40" TRAVEL

HARDWARE LIST

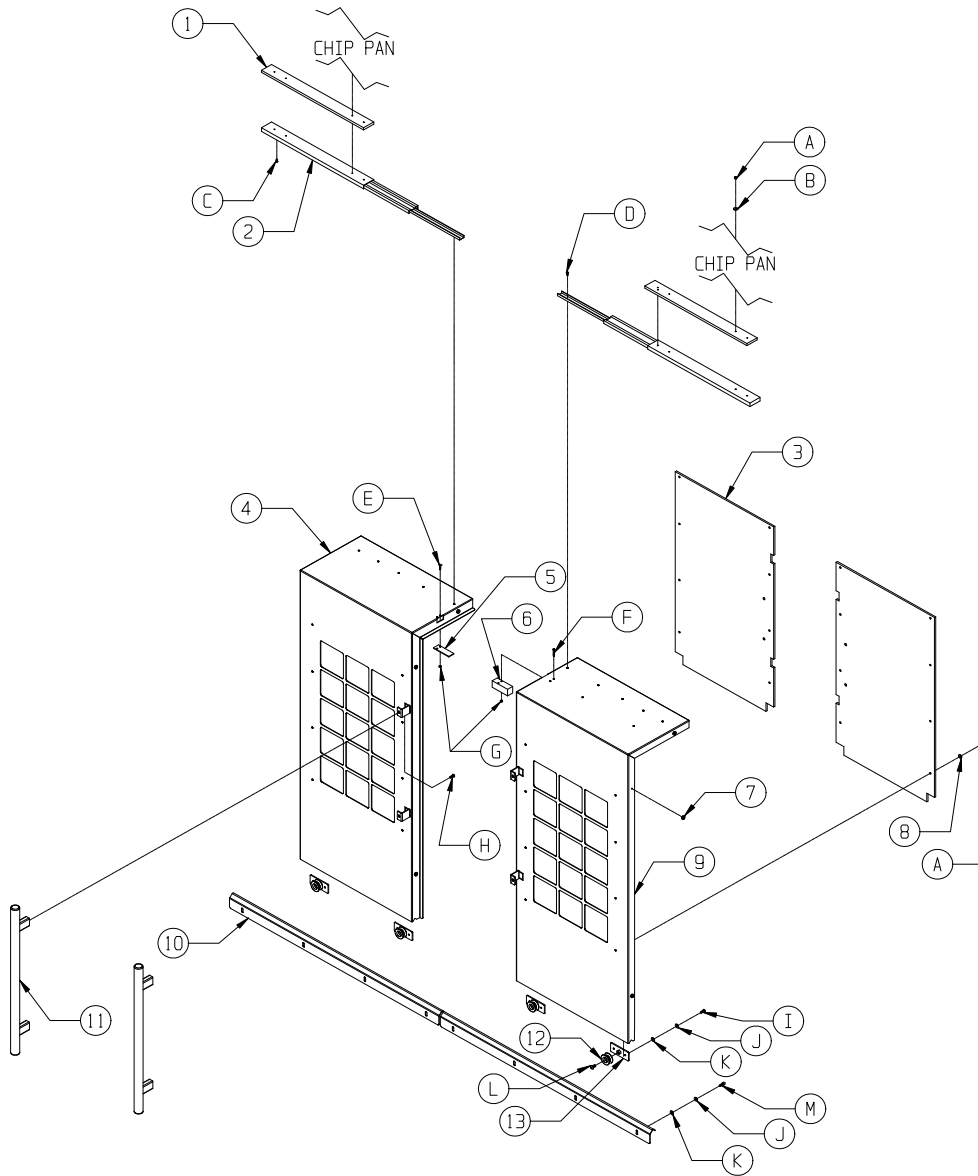
No.	QTY	DESCRIPTION
A	16	M5-.8 NYLOCK NUT
B	9	M6-1 x 20mm SHCS
C	17	M6 LOCK WASHER
D	9	M6 FLAT WASHER
E	23	M6-1 x 12mm BHCS
F	8	M6-1 x 12mm SHCS
G	8	M6-1 NYLOCK NUT
H	8	M8-1.25 x 20mm BHCS
I	8	M8 FLAT WASHER
J	8	M6-1 x 30mm SHCS

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REV.	DESCRIPTION OF CHANGE	E.C.O. No.	APP'D BY	DATE
MATERIAL/FINISH		 1400 MILL LANE 952-442-1410 WACONIA, MN 55387 USA		
STOCK/ASSY No.		TITLE VM20 CHIP PAN		
TOLERANCE UNLESS SPECIFIED		APPLICATION PARTNER I		
X .XXX ±		SCALE 16:1		
X .XX ±		DATE 27 MAY 05		
X .X ±		DRAWN BY DAHLKE		
ANGLE ±		SHEET No. 2 OF 2		

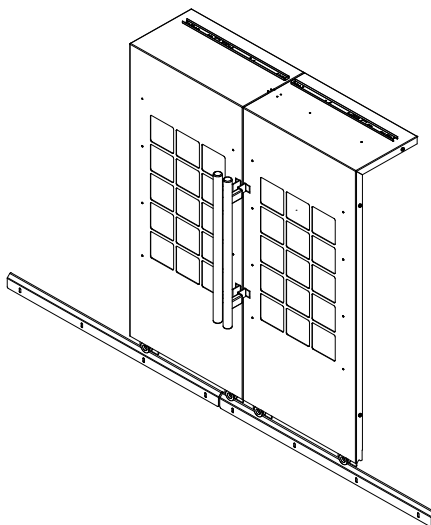
Enclosure Door Assembly

01018817 -
Center door stop
WX-381 -
bumper for



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REV.	DESCRIPTION OF CHANGE	E.C.O. No.	APP'D BY	DATE
MATERIAL/FINISH STOCK/ASSY No.  1400 MILL LANE 952-442-1410 WACONIA, MN 55387 USA				
TOLERANCE UNLESS SPECIFIED X.XXX ± X.XX ± X.X ± ANGLE ± TITLE VM20 DOOR ASSEMBLY APPLICATION PARTNER I SCALE 15:1 DATE 09 JUN 05 DWG No. 6-10-008-092 DRAWN BY DAHLKE SIZE B SHEET No. 1 OF 2				



PARTS LIST

No.	QTY	STOCK No.	DESCRIPTION
1	2	MP1-501	SLIDE SPACER
2	2	MP-838	SLIDE
3	2	MP-239	LEXAN
4	1	MP1-482	FRONT DOOR - LEFT
5	1	SW-244	SWITCH KEY
6	1	SW-243	DOOR SWITCH
7	9	WX-310	BUMPER
8	16	HD-58	M5 RUBBERIZED WASHER
9	1	MP1-481	FRONT DOOR - RIGHT
10	2	MP1-484	VM20 LOWER DOOR TRACK
11	2	WX-297	HANDLE
12	4	MP1-495	ROLLER
13	4	MP1-496	FRONT DOOR ROLLER PLATE

HARDWARE LIST

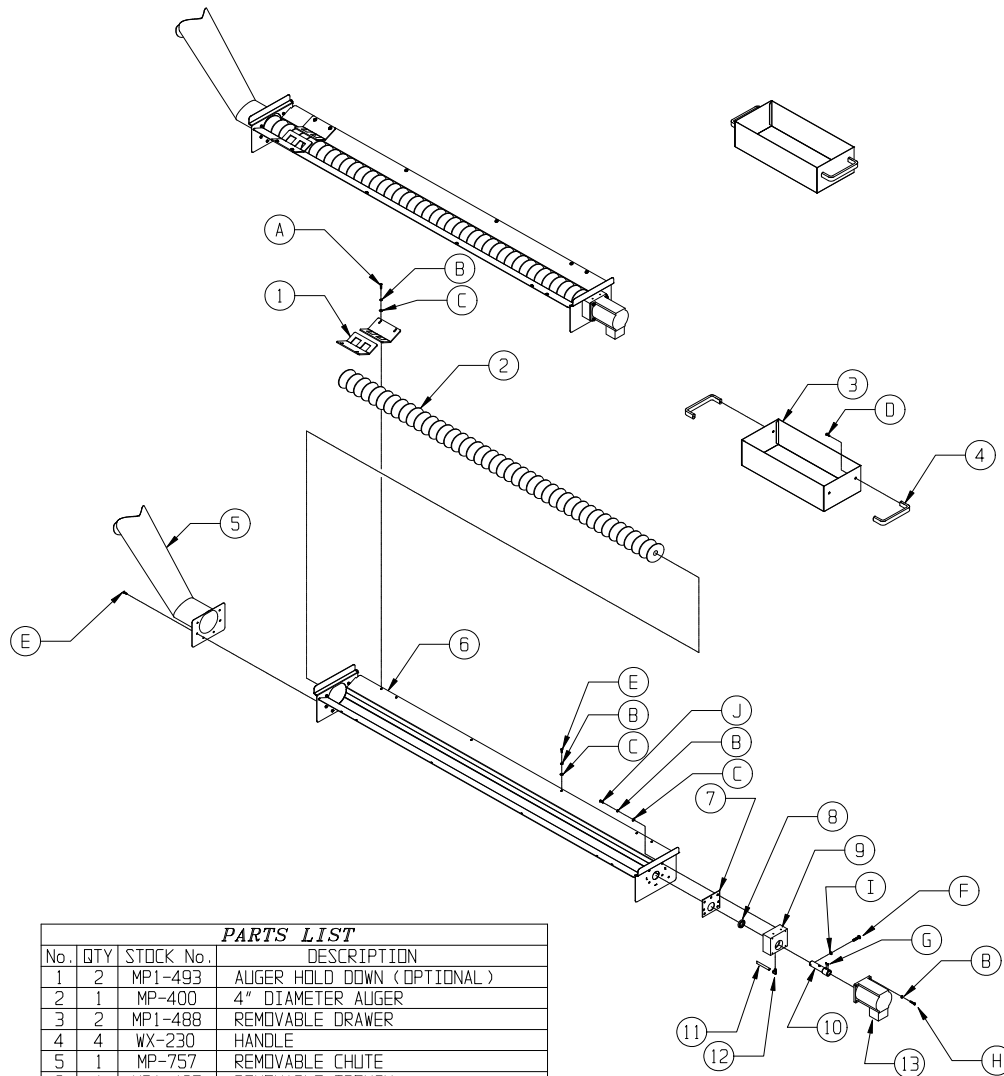
No.	QTY	DESCRIPTION
A	24	M5 NYLOCK NUT
B	8	M5 FLAT WASHER
C	8	M5-.8 x 20mm BHCS
D	10	M4-.7 x 10mm BHCS
E	2	M4-.7 x 20mm BHCS
F	2	M4-.7 x 35mm BHCS
G	4	M4-.7 NYLOCK NUT
H	4	M8-1.25 x 20mm BHCS
I	8	M6-1 x 12mm BHCS
J	16	M6 LOCK WASHER
K	16	M6 FLAT WASHER
L	4	M8-1.25 x 16mm BHCS
M	8	M6-1 x 12mm SHCS

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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 VM20 DOOR ASSEMBLY		
X .XXX ±	APPLICATION PARTNER I		SCALE 15:1	
X .XX ±	DATE 09 JUN 05		DRAWN BY DAHLKE	
X .X ±	DATE 09 JUN 05		DRAWN BY DAHLKE	
ANGLE ±	DATE 09 JUN 05		DRAWN BY DAHLKE	
DATE 09 JUN 05		DRAWN BY DAHLKE		SHEET No. 2 OF 2



Chip Pan Drawer/Auger Assembly



PARTS LIST

No.	QTY	STOCK No.	DESCRIPTION
1	2	MP1-493	AUGER HOLD DOWN (OPTIONAL)
2	1	MP-400	4" DIAMETER AUGER
3	2	MP1-488	REMOVABLE DRAWER
4	4	WX-230	HANDLE
5	1	MP-757	REMOVABLE CHUTE
6	1	MP1-487	REMOVABLE TROUGH
7	1	WX-313	AUGER MOTOR PLATE GASKET
8	1	BG-69	BEARING CUP OIL SEAL
9	1	MP-440	BROTHER AUGER MOTOR MTG BRACKET
10	1	MP-441	BROTHER AUGER DRIVE SHAFT
11	1'	NU-25	1/4" NYLON TUBING
12	1	NU-171	MALE ELBOW 1/8 NPT 1/4 TUBE
13	1	MD-120	AUGER MOTOR

HARDWARE LIST

No.	QTY	DESCRIPTION
A	4	M6-1 x 16mm BHCS
B	20	M6 LOCK WASHER
C	16	M6 FLAT WASHER
D	8	M8-1.25 x 16mm BHCS
E	14	M6-1 x 12mm BHCS
F	2	M10-1.5 x 40mm BHCS
G	2	10-32 x 1/4 SHSS
H	4	M6-1 x 25mm SHCS
I	2	M10 LOCK WASHER
J	4	M6-1 x 20 SHCS

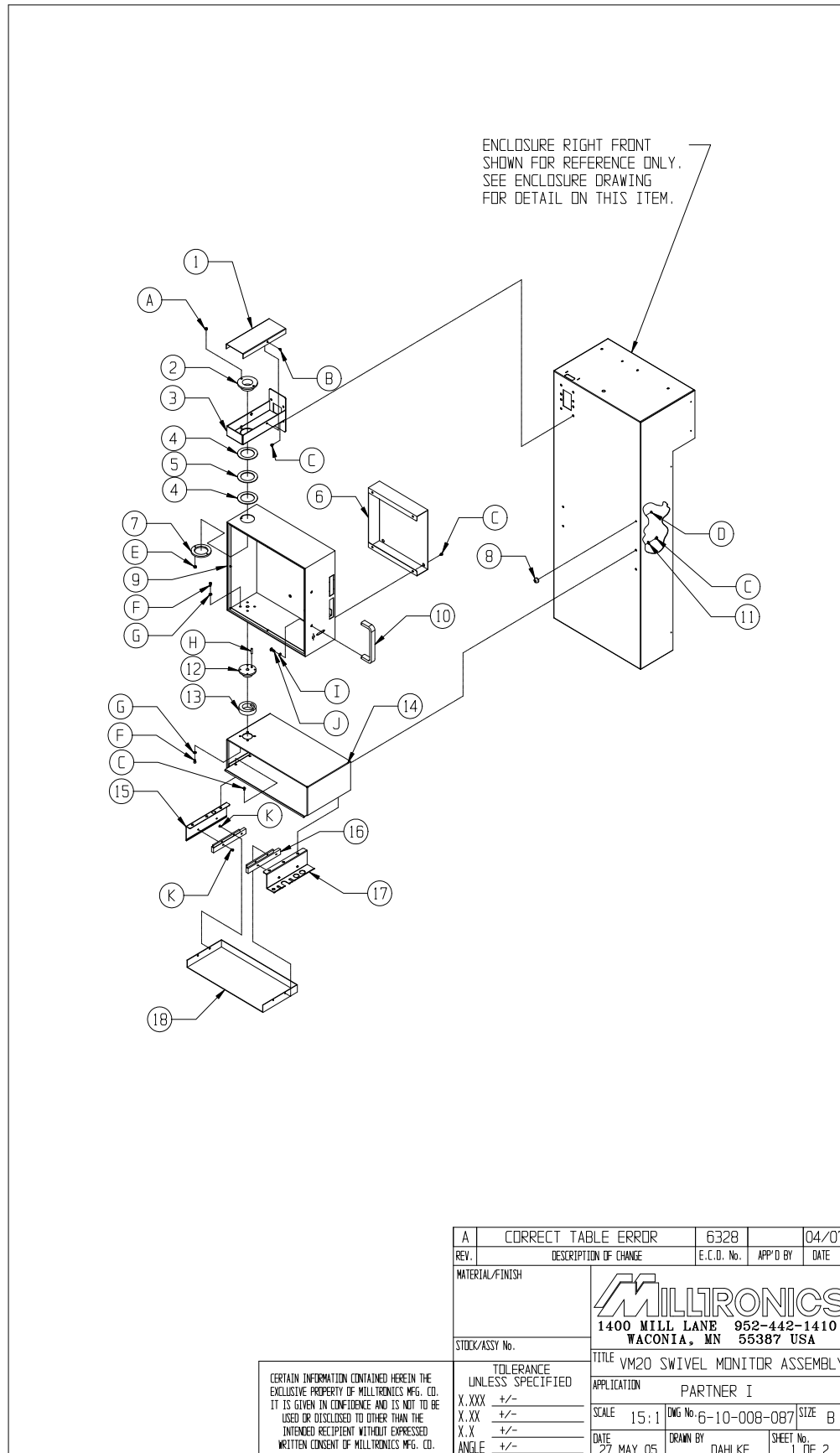
D	CHANGE AUGER BOLTS	6753		03/09
C	CHANGE AUGER BOLT SIZE	6751	N.M.	03/09
B	UPDATE HARDWARE LIST	6256	N.M.	01/07
A	ADD AUGER GASKET	6144	N.M.	07/06
REV.	DESCRIPTION OF CHANGE	E.C.D. No.	APP'D BY	DATE
MATERIAL/FINISH		 1400 MILL LANE 952-442-1410 WACONIA, MN 55387 USA		
STOCK/ASSY No.				
TOLERANCE UNLESS SPECIFIED		TITLE VM20 DRAWER/AUGER ASSEMBLY		
X .XXX +/-		APPLICATION PARTNER I		
X .XX +/-		SCALE 20:1 DWG No. 6-10-008-089 SIZE B		
X .X +/-		DATE 08 JUN 05 DRAWN BY DAHLKE SHEET No. 1 OF 1		
ANGLE +/-				

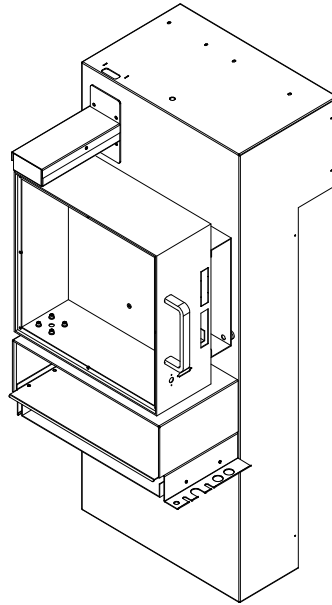


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Enclosure Swivel Monitor Assembly





PARTS LIST

No.	QTY	STOCK No.	DESCRIPTION
1	1	MP1-494	COVER SWIVEL MONITOR UPPER SUPPORT ARM
2	1	MP-663	FLANGED BUSHING - SWIVEL MONITOR
3	1	MP1-491	UPPER SUPPORT ARM - SWIVEL MONITOR
4	2	WX-295	WASHER - SWIVEL MONITOR
5	1	MP3D-12	WAVE WASHER
6	1	MP-653	3-RING BINDER POCKET - SWIVEL MONITOR
7	1	MP-647	COLLAR - SWIVEL MONITOR
8	1	WX-156	BLACK BUMPER
9	1	SEE TABLE	SWIVEL MONITOR BOX
10	1	WX-230	HANDLE
11	4	HD-12	RUBBERIZED WASHER
12	1	MP-648	SWIVEL PIVOT BUSHING
13	1	MP-649	SWIVEL PIVOT BASE
14	1	MP1-492	SWIVEL MONITOR BASE
15	1	MP1-498	BRACKET - SWIVEL MONITOR DRAWER OPTION
16	1	MP-654	8" FULL EXTENSION ACCURIDE SLIDE
17	1	MP1-497	UTILITY TRAY - SWIVEL MONITOR
18	1	MP-626	TRAY - KEYBOARD PULL-OUT

PARTS LIST

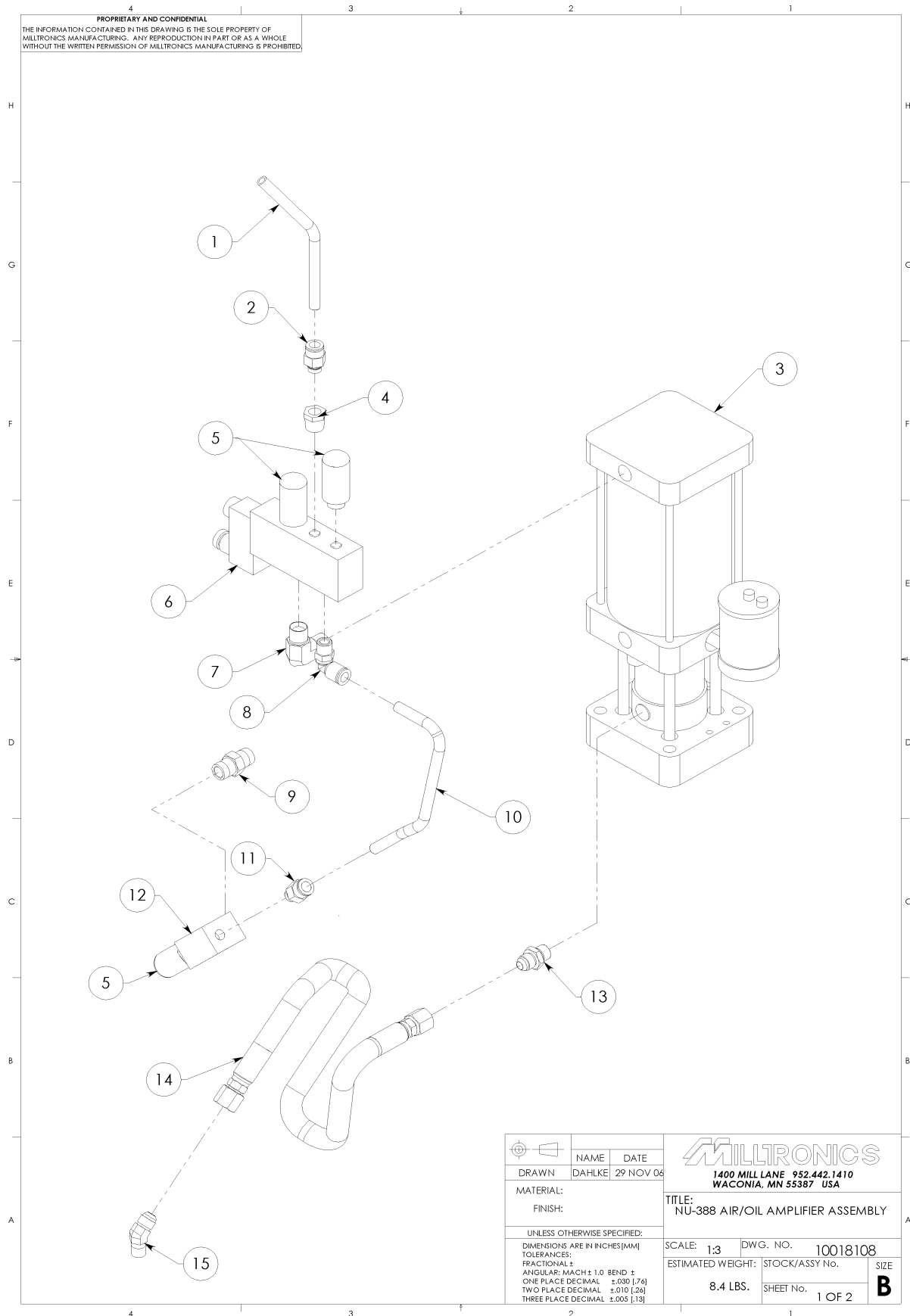
No.	QTY	DESCRIPTION
A	2	M6-1 NYLOCK NUT
B	2	M5-.8 x 10mm BHCS
C	18	M6-1 x 10mm BHCS
D	1	8-32 NYLOCK NUT
E	2	M5-.8 NYLOCK NUT
F	8	M6-1 x 10mm SHCS
G	8	M6 LOCK WASHER
H	1	1/4 x .5 DOWEL PIN
I	2	M8 FLAT WASHER
J	2	M8-1.25 x 20mm BHCS
K	8	M3-.5 x 10mm BHCS

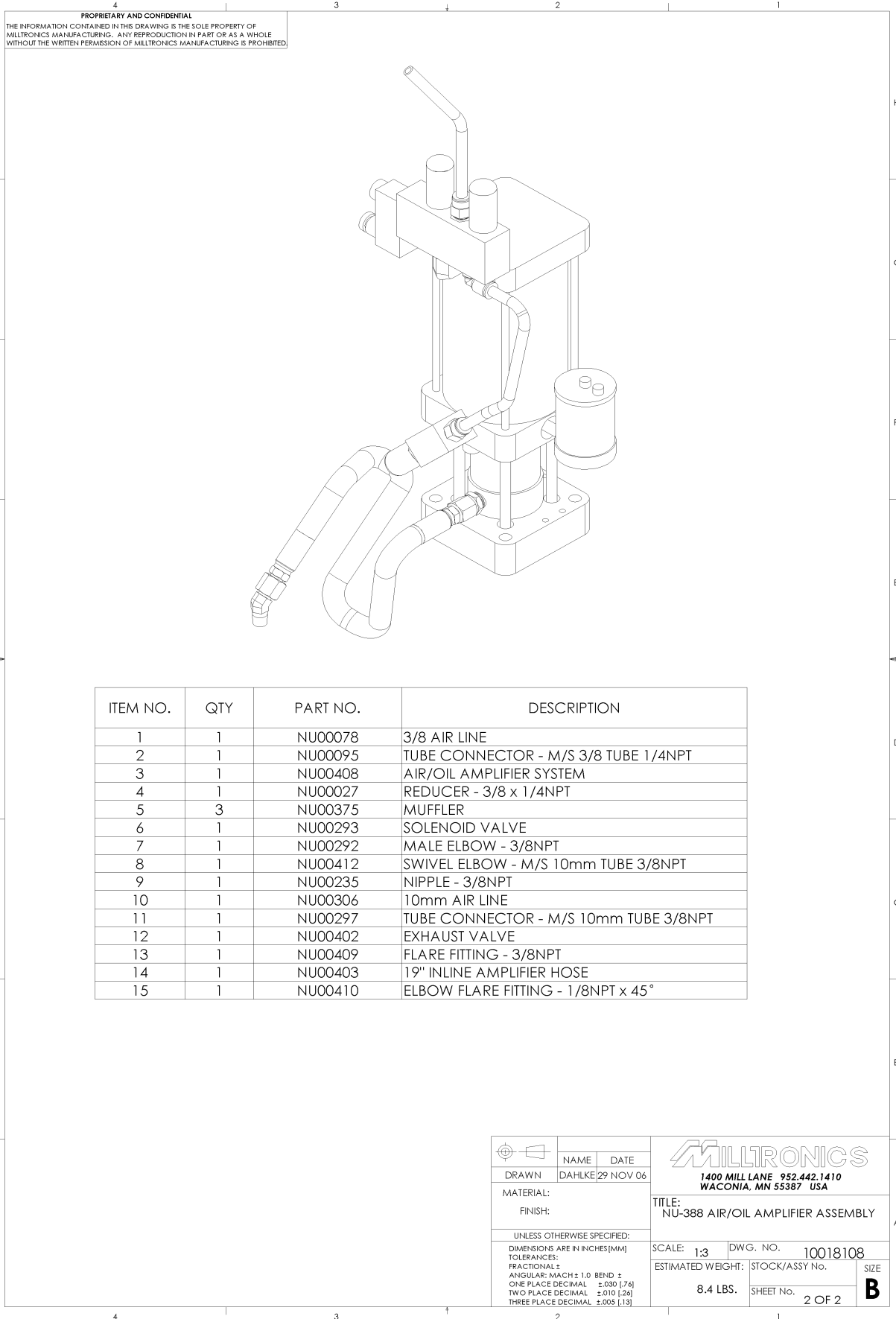
SWIVEL BOX TABLE

No.	CENT. 7	INT. CONTROL
9	MM-80	MPIC-03

A	CORRECT TABLE ERROR	6328		04/07
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.		TITLE VM20 SWIVEL MONITOR ASSEMBLY		
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		SCALE 10:1	DWG No. 6-10-008-087	SIZE B
		DATE 27 MAY 05	DRAWN BY DAHLKE	SHEET No. 2 OF 2

Power Drawbar Cylinder Assembly







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Waylube Pump MA00458

The on time and off time can be adjusted using MISC control parameters “Way Lube ON time (sec)”, and “Way Lube OFF time (min)”.

Oiler Comparison

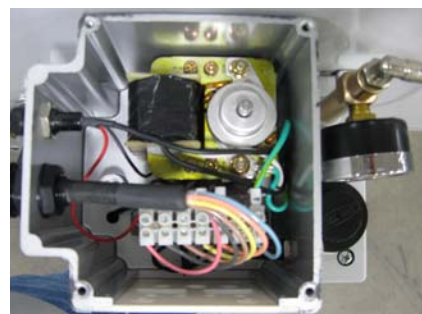
	Old style	New style
Model #	CESD	CEN01
Part #	MA00219	MA00458
Timer function ON/OFF	Built-in controls	Via CNC #66
Audible alarm	YES	NO
Oil pressure gauge	NO	YES
Manual override button	YES	YES

Software & control

All 8200 versions have the functionality. 7200 version 77401 or higher is required to have the functionality.

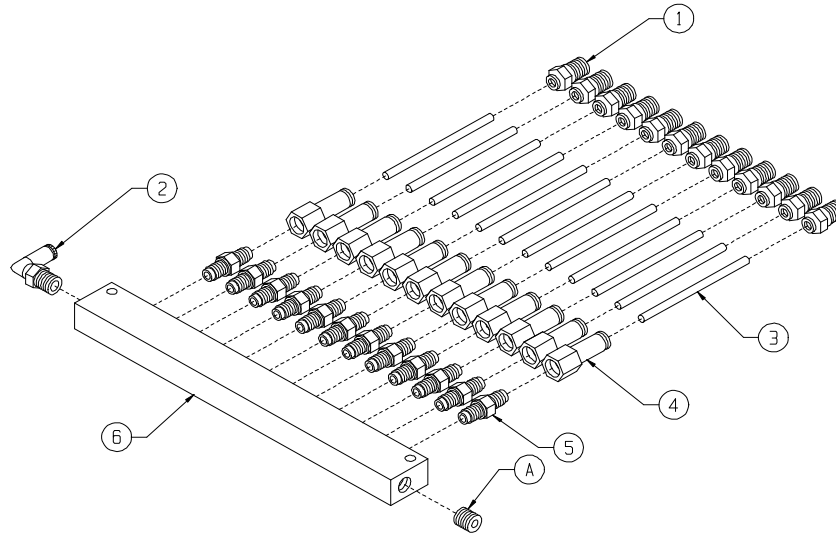
The oiler timer is functional only when the “Grease Cycle Time” parameter is set to Zero, and the Way Lube ON and OFF time parameters are non-zero.

Pictures of MA00458



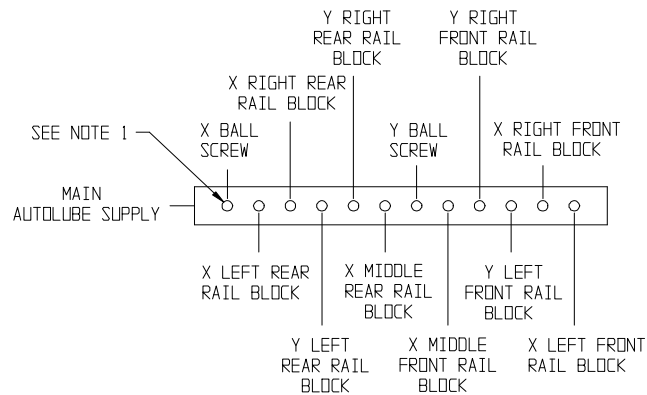


X & Y Axis Autolube Manifold Assembly



NOTES:-

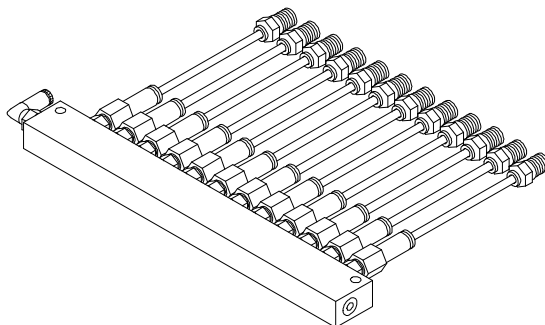
1. X MIDDLE RAILBLOCK PORTS, FRONT AND REAR ARE PLUGGED IF NOT USED.



AUTOLUBE LINE DESTINATIONS

B	UPDATE OIL METER FITTINGS	6760		03/09
A	ADD FRAMES TO CHART	5996	N.M.	08/05
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.				
TOLERANCE UNLESS SPECIFIED X. XXX + X. XX + X. X + ANGLE +		TITLE X & Y AXIS AUTOLUBE MANIFOLD ASSEMBLY		
		APPLICATION GENERAL PRODUCTS		
		SCALE 2:1	DWG No 6-10-018-049	SIZE B
		DATE 25 JUL 97	DRAWN BY THOMPSON	SHEET NO. 1 OF 2

*THIS ASSEMBLY IS USED ON
VM15, VM16, VM20, VM25 & VM30*



PARTS LIST

No.	QUANTITY	STOCK No.	DESCRIPTION
1	12	NU-154	5/32 TUBE 1/8 NPT M/S
2	1	NU-161	1/8 NPT-.156 SWIVEL FITTING
3	SEE TABLE	NU-117	5/32 NYLON TUBING
4	12	NU-157	5/32 TUBE-1/8 NPT FEM.
5	-	SEE TABLE	OIL METER
6	1	MP-356	X & Y AIR/OIL LUBE MANIFOLD

NU-117 TUBING LENGTH

CONNECTION	VM15-16	VM20	VM22	VM25/30(50)	OIL METER
X LEFT REAR RAIL BLOCK	20	20	24	24	#3 (NU-156)
X RIGHT REAR RAIL BLOCK	27	27	44	44	#3 (NU-156)
Y LEFT REAR RAIL BLOCK	12	12	24	24	#3 (NU-156)
Y RIGHT REAR RAIL BLOCK	24	30	44	44	#3 (NU-156)
X MIDDLE REAR RAIL BLOCK	-	-	38	38	#3 (NU-156)
Y BALL SCREW	26	32	39	39	#2 (NU-155)
X MIDDLE FRONT RAIL BLOCK	-	-	38	38	#3 (NU-156)
Y RIGHT FRONT RAIL BLOCK	24	30	44	44	#3 (NU-156)
Y LEFT FRONT RAIL BLOCK	12	12	24	24	#3 (NU-156)
X RIGHT FRONT RAIL BLOCK	27	27	44	44	#3 (NU-156)
X LEFT FRONT RAIL BLOCK	20	20	24	24	#3 (NU-156)
X BALL SCREW	40	40	60	60	#2 (NU-155)

ALL MEASUREMENTS ARE IN INCHES

HARDWARE LIST

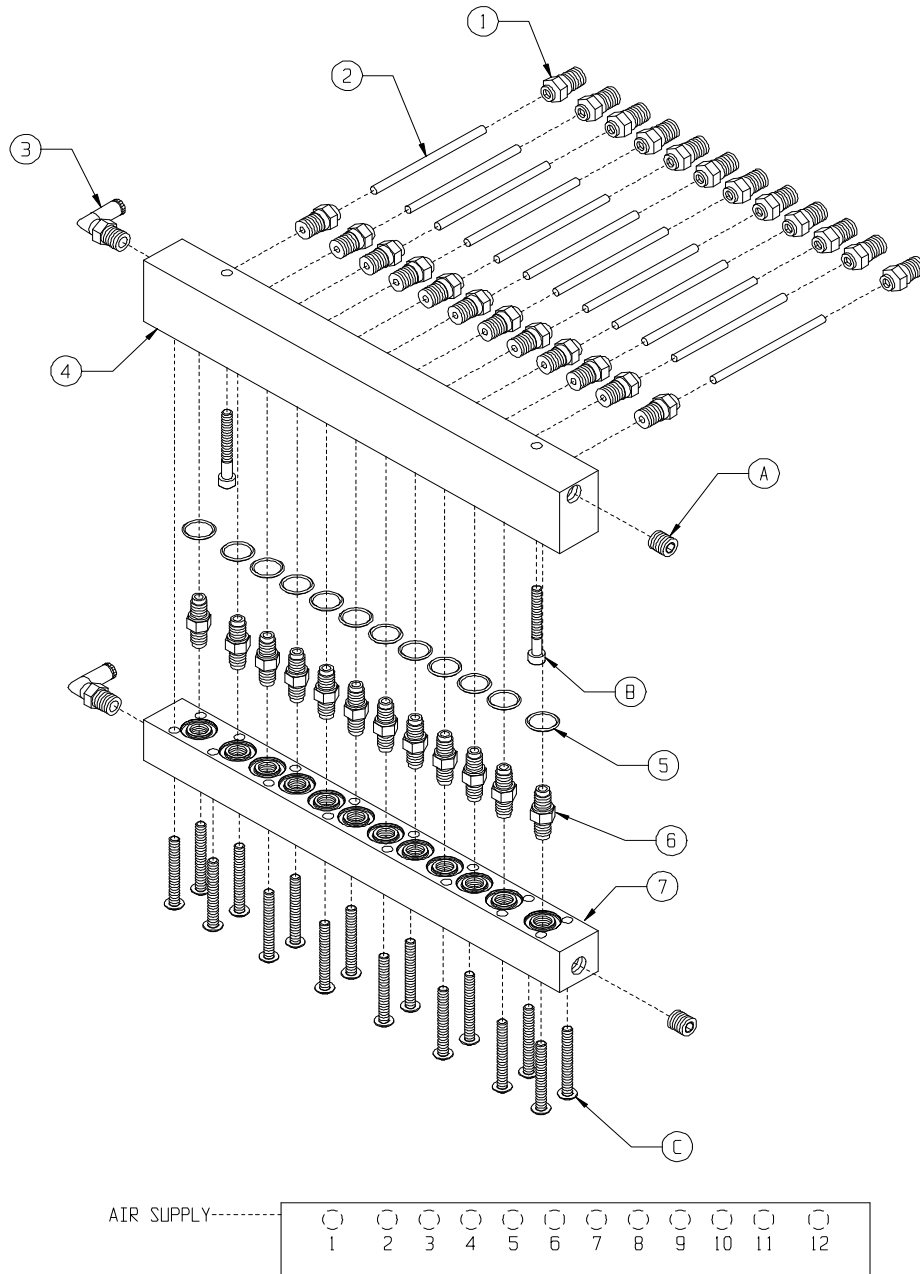
No.	QTY	DESCRIPTION
A	1	1/8-27 NPT SHPP

B	UPDATE OIL METER FITTINGS	6760		03/09
A	ADD FRAMES TO CHART	5996	N.M.	08/05
REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
MATERIAL/FINISH				
STOCK/ASSY No.				
 1400 MILL LANE 952.442.1410 WACONIA, MN 55387 USA				
TITLE X & Y AXIS				
AUTOLUBE MANIFOLD ASSEMBLY				
APPLICATION GENERAL PRODUCTS				
SCALE 2:1		DWG No 6-10-018-049		SIZE B
DATE 25 JUL 97		DRAWN BY THOMPSON		SHEET NO. 2 OF 2

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X & Y Axis Air/Oil Manifold Assembly

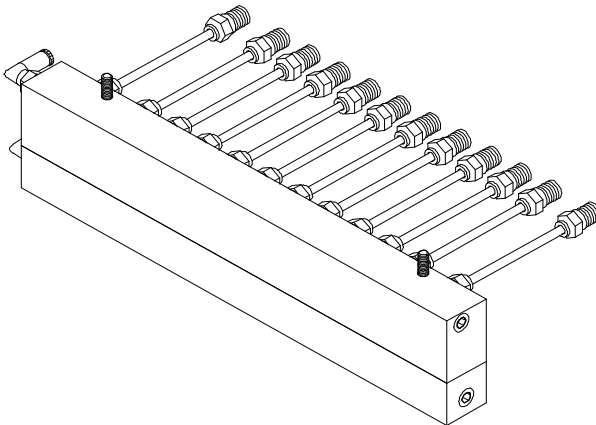


AIR/OIL LINE DESTINATIONS	
No.	RAIL BLOCK/BALL SCREW
1	X BALL SCREW
2	X LEFT REAR RAIL BLOCK
3	X RIGHT REAR RAIL BLOCK
4	Y LEFT REAR RAIL BLOCK
5	Y RIGHT REAR RAIL BLOCK
6	X MIDDLE REAR RAIL BLOCK
7	Y BALL SCREW
8	X MIDDLE FRONT RAIL BLOCK
9	Y RIGHT FRONT RAIL BLOCK
10	Y LEFT FRONT RAIL BLOCK
11	X RIGHT FRONT RAIL BLOCK
12	X LEFT FRONT RAIL BLOCK

E	CHANGE TABLE	6060		01/06
D	ADD FRAMES	5995	N. M.	08/05
C	CHANGED METERS	4988	D. H.	2/01
B	ADD VMG17 TO NOTE	4729	N. M.	10/00
A	ADD VMG24 TO NOTE	4327	N. M.	12/99
REV.	DESCRIPTION OF CHANGE	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 X & Y AXIS AIR/OIL MANIFOLD ASSEMBLY		
X .XXX +/- .005		APPLICATION PARTNER I		
X .XX +/- .010		SCALE 2:1		DWG No. 6-10-008-058
X .X +/- .030		DATE 10 JUN 99		SIZE B
ANGLE +/- 1.0°		DRAWN BY HERME		SHEET No. 1 OF 2



THIS ASSEMBLY IS USED ON VM15, VM16, VM17, VM20, VM22, VM25/30(50)



PARTS LIST

No.	QUANTITY	STOCK No.	DESCRIPTION
1	32	NU-154	5/32 TUBE 1/8 NPT M/S
2	SEE TABLE	NU-117	5/32 NYLON TUBING
3	2	NU-161	ELBOW - SWIVEL 5/32 TUBE 1/8 NPT
4	1	MP6-183	X & Y AIR/OIL MANIFOLD - AIR
5	16	WX-248	O-RING Buna 1/2 ID x 5/8 OD
6	-	SEE TABLE	OIL METER
7	1	MP-661	16 PORT 1/8 NPT MANIFOLD - OIL

NU-117 TUBING LENGTH

	VM15/16	VM20	VM22	VM25/30(50)	OIL METER
X LEFT REAR RAIL BLOCK	20	20	24	24	#3 (NU-156)
X RIGHT REAR RAIL BLOCK	27	27	44	44	#3 (NU-156)
Y LEFT REAR RAIL BLOCK	13	12	24	24	#3 (NU-156)
Y RIGHT REAR RAIL BLOCK	33	30	44	44	#3 (NU-156)
X MIDDLE REAR RAIL BLOCK	-	-	38	38	#3 (NU-156)
Y BALL SCREW	26	32	39	39	#2 (NU-155)
X MIDDLE FRONT RAIL BLOCK	-	-	38	38	#3 (NU-156)
Y RIGHT FRONT RAIL BLOCK	30	30	44	44	#3 (NU-156)
Y LEFT FRONT RAIL BLOCK	12	12	24	24	#3 (NU-156)
X RIGHT FRONT RAIL BLOCK	27	27	44	44	#3 (NU-156)
X LEFT FRONT RAIL BLOCK	20	20	24	24	#3 (NU-156)
X BALL SCREW	40	40	60	60	#2 (NU-155)

ALL MEASUREMENTS ARE IN INCHES

NOTES:

- IF REFERENCED WITH A (-) PLUG AIR/OIL LINE HOLE AND OIL METER HOLE IN MANIFOLD WITH 1/8 NPT PLUG.

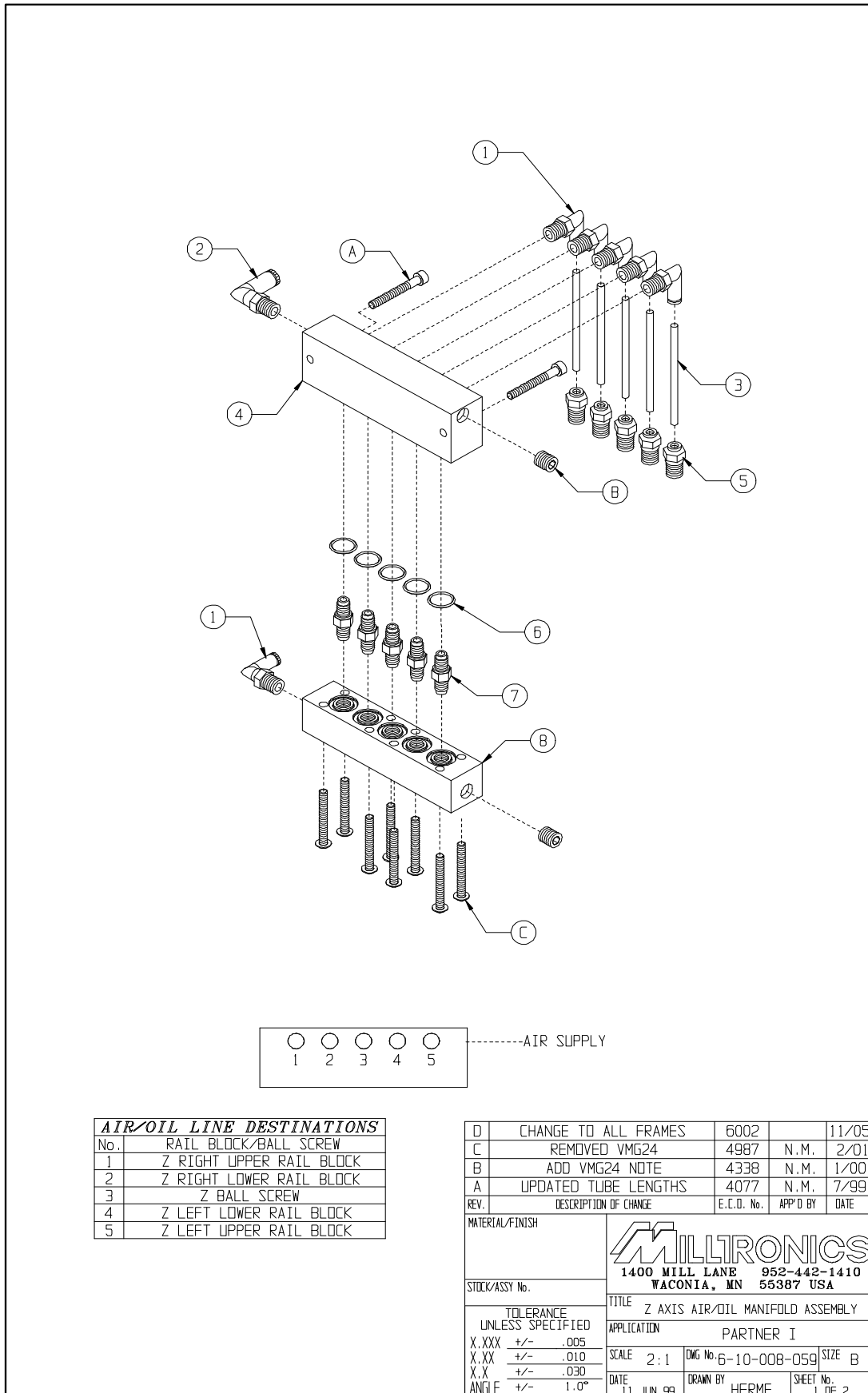
HARDWARE LIST

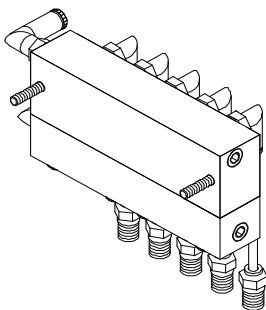
No.	QTY	DESCRIPTION
A	2	1/8-27 NPT SHPP
B	2	10-32 x 1 1/2 SHCS
C	20	10-32 x 1 1/4 BHCS

E	CHANGE TABLE	6060		01/06
D	ADD FRAMES	5995	N.M.	08/05
C	CHANGED METERS	4988	D.H.	02/01
B	ADD VMG17 TO NOTE	4729	N.M.	10/00
A	ADD VMG24 TO NOTE	4327	N.M.	12/99
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 X & Y AXIS AIR/OIL MANIFOLD ASSEMBLY		
X .XXX +/- .005		APPLICATION PARTNER I		
X .XX +/- .010		SCALE 2:1 DWG No. 6-10-008-058 SIZE B		
X .X +/- .030		DATE 10 JUN 99 DRAWN BY HERME SHEET No. 2 OF 2		
ANGLE +/- 1.0°				



Z-Axis Air/Oil Manifold Assembly





PARTS LIST

No.	QUANTITY	STOCK No.	DESCRIPTION
1	6	NU-161	ELBOW-SWIVEL 5/32 TUBE 1/8 NPT
2	1	NU-171	ELBOW - SWIVEL 1/4 TUBE 1/8 NPT
3	SEE TABLE	NU-117	5/32 NYLON TUBING
4	1	MP1-301	Z AIR/OIL MANIFOLD - AIR
5	5	NU-154	5/32 TUBE 1/8 NPT M/S
6	5	WX-248	O-RING BUNA 1/2 ID x 5/8 OD
7	-	SEE TABLE	OIL METER
8	1	MP-660	Z AIR/OIL MANIFOLD - OIL

NU-117 TUBING LENGTH

CONNECTION	ALL FRAMES	OIL METER
Z LEFT UPPER RAIL BLOCK	37	#3 (NU-156)
Z LEFT LOWER RAIL BLOCK	31	#3 (NU-156)
Z RIGHT UPPER RAIL BLOCK	29	#3 (NU-156)
Z RIGHT LOWER RAIL BLOCK	23	#3 (NU-156)
Z BALL SCREW	26	#2 (NU-155)

ALL MEASUREMENTS ARE IN INCHES

HARDWARE LIST

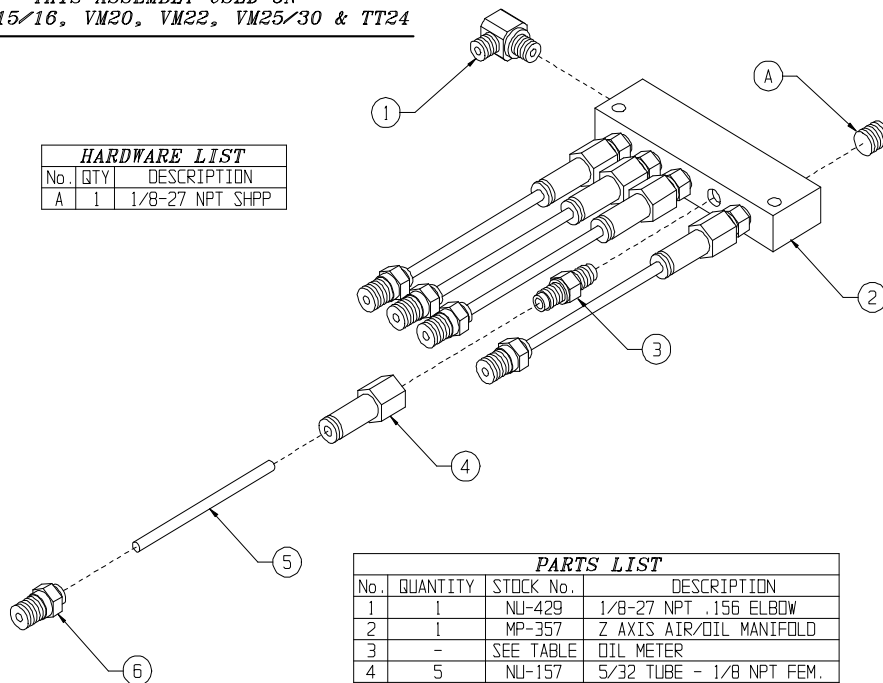
No.	QTY	DESCRIPTION
A	2	10-32 x 1 1/2 SHCS
B	2	1/8-27 NPT SHPP
C	8	10-32 x 1 1/2 BHCS

D	CHANGE TO ALL FRAMES	6002		11/05
C	REMOVED VMG24	4987	N.M.	2/01
B	ADD VMG24 NOTE	4338	N.M.	1/00
A	UPDATED TUBE LENGTHS	4077	N.M.	7/99
REV.	DESCRIPTION OF CHANGE	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 Z AXIS AIR/OIL MANIFOLD ASSEMBLY		
X.XXX +/- .005		APPLICATION PARTNER I		
X.XX +/- .010		SCALE 2:1	DWG No. 6-10-008-059	SIZE B
X.X +/- .030		DATE 11 JUN 99	DRAWN BY HERME	SHEET No. 2 OF 2
ANGLE +/- 1.0°				

Z-Axis Autolube Manifold Assembly

THIS ASSEMBLY USED ON
 VM15/16, VM20, VM22, VM25/30 & TT24

HARDWARE LIST		
No.	QTY	DESCRIPTION
A	1	1/8-27 NPT SHPP



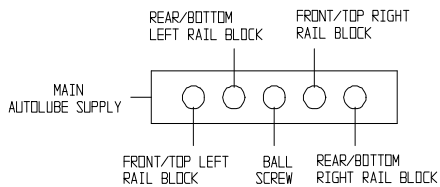
PARTS LIST			
No.	QUANTITY	STOCK No.	DESCRIPTION
1	1	NU-429	1/8-27 NPT .156 ELBOW
2	1	MP-357	Z AXIS AIR/OIL MANIFOLD
3	-	SEE TABLE	OIL METER
4	5	NU-157	5/32 TUBE - 1/8 NPT FEM.
5	SEE TABLE	NU-117	5/32 NYLON TUBING
6	5	SEE TABLE	5/32 TUBE-1/8 NPT M/S

NU-117 TUBING LENGTH						OIL METER
CONNECTION	VM15/16	VM20	VM22	VM25/30	TT24	
FRONT/TOP LEFT RAIL BLOCK	18	20	30	30	10	No. 3 (NU-156)
REAR/BOTTOM LEFT RAIL BLOCK	35	14	42	42	20	No. 3 (NU-156)
BALL SCREW	24	15	30	30	8	No. 2 (NU-155)
REAR/BOTTOM RIGHT RAIL BLOCK	35	8	42	42	20	No. 3 (NU-156)
FRONT/TOP RIGHT RAIL BLOCK	18	11	30	30	10	No. 3 (NU-156)

ALL MEASUREMENTS ARE IN INCHES

No.	DESCRIPTION	VM15/16	VM20	VM22	VM25/30	TT24
6	ROLLER RAIL	NU-315	NU-315	NU-315	NU-315	NU-315
	BALL RAIL	NU-315 NU-154	NU-315	NU-315	NU-315	NU-315

AUTOLUBE LINE DESTINATIONS

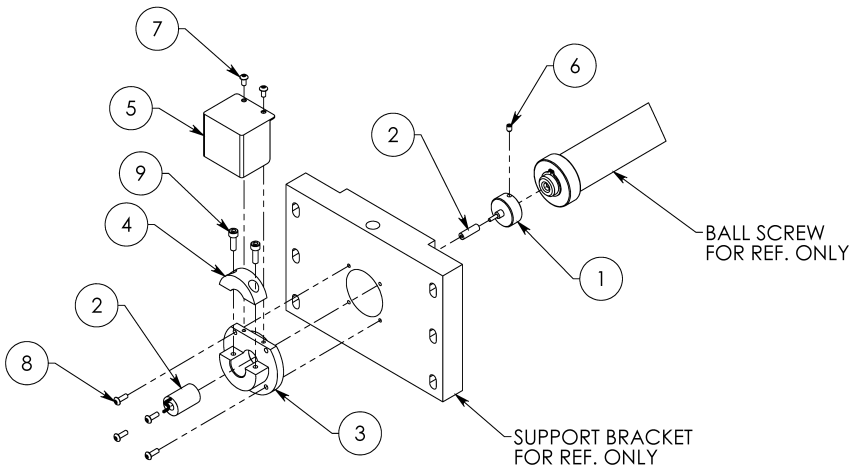


NOTES:

1. USED ON ASSEMBLY No.

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B	ADD TT24	6750		03/09		
A	ADD FRAMES TO CHART	6001	N.M.	08/05		
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.						
TOLERANCE UNLESS SPECIFIED					TITLE 5 PORT AUTOLUBE MANIFOLD ASSEMBLY	
X.XXX ± X.XX ± X.X ± ANGLE ±					APPLICATION GENERAL PRODUCTS	
		SCALE 1.5:1	DWG NO 6-10-018-050	SIZE B		
		DATE 20 AUG 97	DRAWN BY THOMPSON	SHEET NO. 1 OF 1		



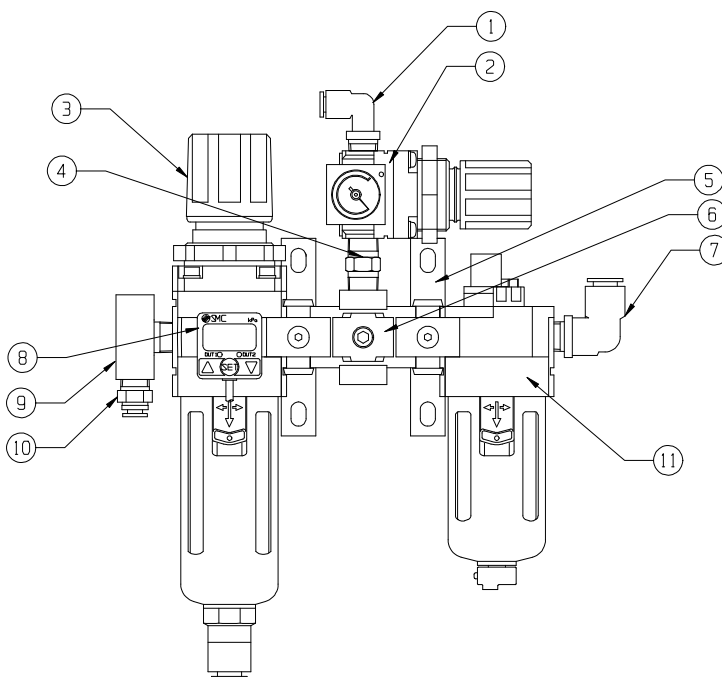
ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	MP00858	THERMAL BALL SCREW CAP
2	1	PR00043	THERMAL COMP SENSOR
3	1	MP00848	THERMAL SENSOR RING
4	1	MP00849	THERMAL SENSOR - CLAMP
5	1	MP00886	X AXIS THERMAL COVER
6	1	SHSSBT 10-32 x .188	10/32 x 3/16 BRASS TIPPED SHSS
7	2	BHCS M4-0.7 x 8	M4-0.7 x 8mm BHCS
8	4	BHCS M4-0.7 x 12	M4-0.7 x 12mm BHCS
9	2	SHCS M5-0.8 x 16	M5-0.8 x 16mm SHCS

1. ITEMS 3 & 4 ARE REVERSED ON SOME AXES
2. ITEMS 5 & 7 ARE NOT USED ON SOME AXES

			 MILLTRONICS CNC MACHINES		
DRAWN	NAME	DATE	1400 MILL LANE 752.442.1410 WACONIA, MN 55387 USA		
JRD	24 JAN 07				
MATERIAL:			TITLE: THERMAL COMP ASSEMBLY		
FINISH:					
UNLESS OTHERWISE SPECIFIED:			SCALE: 1:4 DWG. NO. 10018111		
DIMENSIONS ARE IN INCHES[MM]			ESTIMATED WEIGHT: STOCK/ASSY NO. SIZE		
TOLERANCES:			16.0 Lbs. SHEET NO. 1 OF 1		
FRACTIONAL ±					
ANGULAR: MACH 1:0 BEND ±					
ONE PLACE DECIMAL ±.030 [.76]					
TWO PLACE DECIMAL ±.010 [.26]					
THREE PLACE DECIMAL ±.005 [.13]					

Air Filter / Lubricator / Filter Assembly

PARTS LIST			
ITEM	QTY	STOCK No.	DESCRIPTION
1	1	NU-199	1/4 NPT 3/8 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-430	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



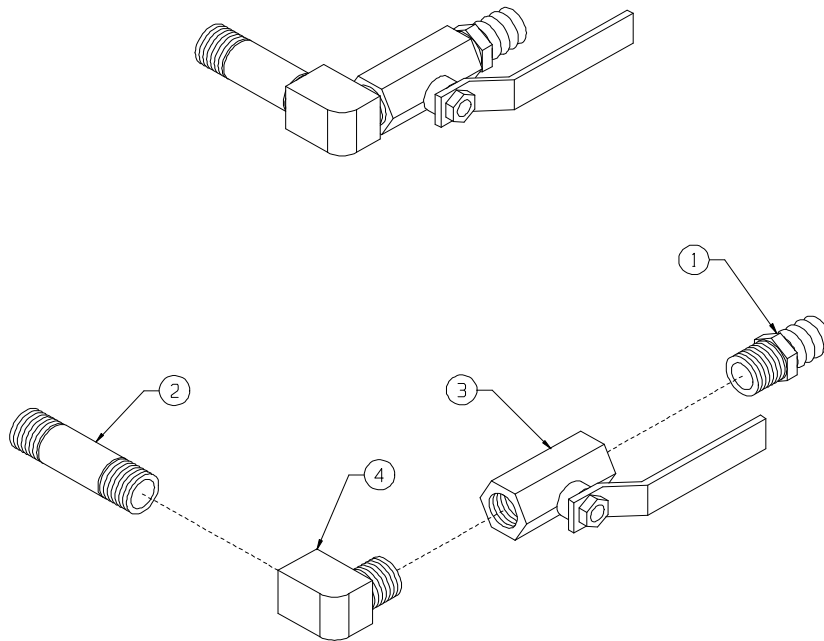
REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
MATERIAL/FINISH		 1400 MILL LANE 952-442-1410 WACONIA, MN 55387 USA		
STOCK/ASSY No.				
TOLERANCE UNLESS SPECIFIED		TITLE NU-417 FRL ASSEMBLY		
X.XXX +/-		APPLICATION GENERAL PRODUCTS		
X.XX +/-		SCALE 3:1		DWG No. 6-10-018-112
X.X +/-		DATE 14 APR 08		SIZE B
ANGLE +/-		DRAWN BY DAHLKE		SHEET NO. 1:1

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Flood Coolant Valve Handle Assembly

THIS ASSEMBLY USED ON VM16, VM17, VM24, VM30, VMD30, & MC20



PARTS LIST

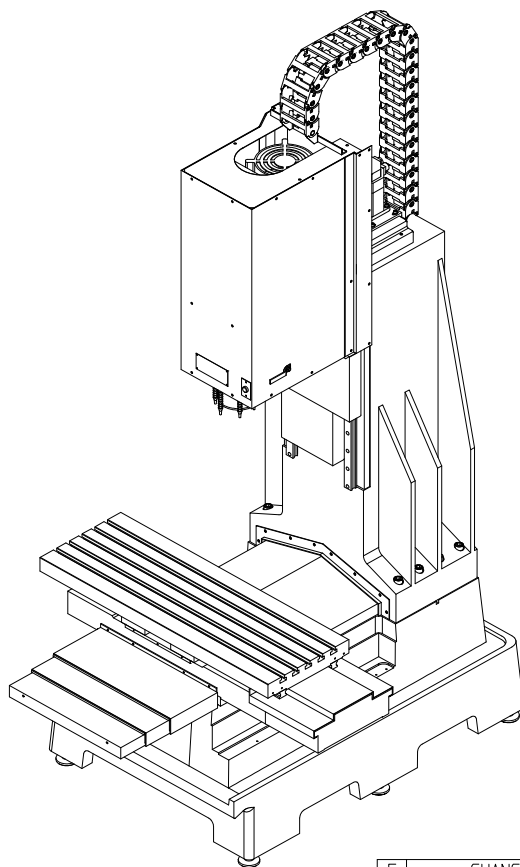
No.	QTY	STOCK No.	DESCRIPTION
1	1	NJ-66	3/4" BARB FITTING
2	1	NJ-257	3 IN. PIPE NIPPLE
3	1	NJ-64	1/2" BRASS BALL VALVE
4	1	NJ-125	STREET ELBOW

B	CHANGE PIPE NIPPLE	4778		11/00
A	CHANGE PIPE NIPPLE	3851	N.M.	2/99
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.				
TOLERANCE UNLESS SPECIFIED		TITLE VM17 FLOOD HANDLE SUB-ASSEMBLY		
X .XXX ±		APPLICATION PARTNER I		
X .XX ±		SCALE 2:1 DWG No 6-10-008-039 SIZE B		
X .X ±		DATE 29 APR 97 DRAWN BY THOMPSON SHEET NO. 1 OF 1		
ANGLE ±				

Machine Lubrication Instructions

NOTES:

1. USE MOBILITH AW SERIES MULTIPURPOSE EP GREASE OR OTHER EQUIVALENT FOR ALL LUBE POINTS. MACHINE SHOULD BE SERVICED ONCE A MONTH FOR PROPER OPERATION AND ACCURACY OF MACHINE. SEE PAGE TWO FOR SPECIFICATIONS.
2. CLEAN AND FILL AIR FILTER / REGULATOR / OILER EVERY WEEK FOR PROPER OPERATION OF ALL PNEUMATIC PARTS FILL WITH MARVEL No. 085, MOBIL VELOCITE No. 10 OR OTHER EQUIVALENT QUALITY AIR TOOL OIL. SEE PAGE TWO FOR SPECIFICATIONS.
3. MACHINES WITH AUTOLUBE OPTION USE MOBIL OIL VACTRA 2, AMOCO WAYTAC No. 68, SUNDCO SUNWAY LUBE No. 1180, OR EQUIVALENT QUALITY WAY OIL SEE PAGE TWO FOR SPECIFICATIONS.
4. MACHINES WITH 15,000 RPM AIR/OIL OPTION USE MOBIL OIL DTE 24, OR EQUIVALENT QUALITY SPINDLE OIL.



F	CHANGE FRAME	5671		12/03
E	CHANGED HEAD COVERS	5021	N.M.	3/01
D	ADD DTE 24 TABLE	4703	N.M.	10/00
C	REMOVE HEAT EXCHANGER	3909	N.M.	3/99
B	CHANGE GREASE SPECS.	3411	N.M.	2/98
A	ADD SPECIFICATIONS	3133	N.M.	6/97
REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
MATERIAL/FINISH				
STOCK/ASSY No.				
TOLERANCE UNLESS SPECIFIED				
X.XXX	+			
X.XX	+			
X.X	+			
X.X	+			
ANGLE	+			
 1400 MILL LANE 952-442-1410 WACONIA, MN 55387 USA				
TITLE VM17 LUBRICATION DRAWING				
APPLICATION PARTNER VM17				
SCALE 15:1		DWG No. 6-10-008-044		SIZE B
DATE 02 JUN 97		DRAWN BY THOMPSON		SHEET NO. 1 OF 2



THIS ASSEMBLY USED ON VM16, VM17

MOBILITH AW SERIES, MULTIPURPOSE EP GREASE	
PRODUCT NUMBER	64352-8
NLGI GRADE	1
COLOR	GREEN
STRUCTURE	SMOOTH/TACKY
SOAP TYPE	LITHIUM COMPLEX
MINERAL OIL VISCOSITY	
cST AT 40°C	150
cST AT 100°C	13
SUS AT 100°F	750
SUS AT 210°F	70
ISO VISCOSITY GRADE	150
PENETRATION AT 23°C (77°F), WORKED	325
DROPPING POINT, ASTM D 2265, °F	475
TIMKEN OK LOAD, ASTM D 2509, lb	40
FOUR-BALL EP TEST, ASTM D 2596, WELD LOAD, kg	250
LOAD WEAR INDEX	40
FOUR-BALL WEAR TEST, ASTM D 2266, SCAR DIAMETER, mm, MAX	0.5
CORROSION PREVENTION, ASTM D 1743	PASS
WHEEL BEARING TEST, ASTM D 4290 MODIFIED, LEAKAGE, GRAM	5

MOBIL VELOCITE OIL No. 10	
PRODUCT NUMBER	60068-4
GRAVITY, API	32.0
POUR, °C (°F), max.	-4 (25)
FLASH, °C (°F), min.	182 (360)
VISCOSITY	
cST AT 40° C	22.0
cST AT 100° C	4.0
SUS AT 100° F	115
SUS AT 210° F	40
ISO VG	22
VISCOSITY INDEX	95
COLOR, ASTM D 1500	2.0
RUST PROTECTION, ASTM D 665	PASS
CINCINNATI MILACRON SPECIFICATION	P-45

MOBIL VACTRA OIL No. 2	
PRODUCT NUMBER	60049-4
SPECIFIC GRAVITY, 60/60F	0.88
POUR POINT, °C (°F), max.	-9 (16)
FLASH POINT, °C (°F), min.	244 (472)
VISCOSITY	
cST AT 40°C	68
cST AT 100°C	8.6
SUS AT 100°F	356
SUS AT 210°F	55
VISCOSITY INDEX	97
ISO VG	68
COLOR, ASTM D 1500	4
FZG, PASS STAGES	11
4 BALL WELD, kg, ASTM D 2783	160
4 BALL WEAR, mm, ASTM D 4172	0.22
COPPER CORROSION, ASTM D 130	1B
RUST, D665A	PASS
VICKERS V-104C, mg D 2882 (MOD)	-
CMCD, P-SPEC, APPROVAL	P-47
BIJUR PT 37-1 APPROVAL	PASS
OKUMA APPROVAL	PASS

MOBIL DTE 24	
PRODUCT NUMBER	60262-3
98 CMCS CODE (DRUM)	98020E
SPECIFIC GRAVITY	0.871
POUR POINT, °C (°F), max	-18 (0)
FLASH POINT, °C (°F), min	200 (392)
VISCOSITY	
cST AT 40°C	32
cST AT 100°C	5.3
SUS AT 100°F	165
SUS AT 210°F	44
ISO VISCOSITY GRADE	32
VISCOSITY INDEX	95
RUST PROTECTION, ASTM D 665, A & B	PASS
COLOR, ASTM D1500, max	3.5
FZG GEAR TEST STAGES	12
PASSED DIN 51534	

F	CHANGE FRAME	5671		12/03
E	CHANGED HEAD COVERS	5021	N.M.	3/01
D	ADD DTE 24 TABLE	4703	N.M.	10/00
C	REMOVE HEAT EXCHANGER	3909	N.M.	3/99
B	CHANGE GREASE SPECS.	3411	N.M.	2/98
A	ADD SPECIFICATIONS	3133	N.M.	6/97
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.		TITLE VM17 LUBRICATION DRAWING		
TOLERANCE UNLESS SPECIFIED		APPLICATION PARTNER VM17		
X .XXX	±	SCALE 15:1	DWG No. 6-10-008-044	SIZE B
X .XX	±			
X .X	±	DATE 02 JUN 97	DRAWN BY THOMPSON	SHEET NO. 2 OF 2
ANGLE	±			

Retention Knob Chart

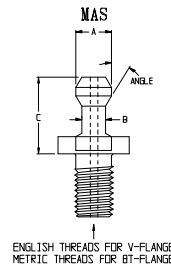
NOTE: STANDARD RETENTION KNOBS FOR 40 TAPER SPINDLES

MAS RETENTION KNOBS STYLE CT-FLANGE 40 TAPER

A B C ANGLE			MILLTRONICS MACHINE				COMMAND	KENNA METAL	VALENITE	LYNDEX
			60mm SPINDLE		70mm SPINDLE			PART No.	PART No.	PART No.
.59 .39 1.27	60°		BR50, BR60, BR80, RH18, RH20, RH30, RH35, RH35, RH15, VM15, VM16, VM20, VM22, VM25, VM30, VM2016, VM15, VM16, VM20, VM22, VM25, VM30.	BR50, BR60, BR80, RH20, RH30, RH35, RH35, RH15, VM15, VM16, VM20, VM22, VM25, VM30, VM2016, VM15, VM16, VM20, VM22, VM25, VM30.	BR50, BR60, RH20, RH30, RH35, RH35, RH15, VM15, VM16, VM20, VM22, VM25, VM30, VM2016, VM15, VM16, VM20, VM22, VM25, VM30.	BR50, BR60, RH20, RH30, RH35, RH35, RH15, VM15, VM16, VM20, VM22, VM25, VM30, VM2016, VM15, VM16, VM20, VM22, VM25, VM30.	RB4E-0002	RK31114A	PT-532-60	C40-6000

MAS RETENTION KNOBS STYLE BT-FLANGE 40 TAPER

A B C ANGLE			MILLTRONICS MACHINE				COMMAND PART No.	KENNAMETAL PART No.	VALENITE PART No.	LYNDEX PART No.
			60mm SPINDLE		70mm SPINDLE					
.59	.39	1.38	60°	BR50, BR60, BR80, RH18, RH20, RH30, RH35, RH35, RH15, VM15, VM16, VM20, VM22, VM25, VM30, VM2016, VM15, VM16, VM20, VM22, VM25, VM30.	BR50, BR60, BR80, RH20, RH30, RH35, RH35, RH15, VM15, VM16, VM20, VM22, VM25, VM30, VM2016, VM15, VM16, VM20, VM22, VM25, VM30.	BR50, BR60, BR80, RH20, RH30, RH35, RH35, RH15, VM15, VM16, VM20, VM22, VM25, VM30, VM2016, VM15, VM16, VM20, VM22, VM25, VM30.	RB4M-0002	RK31113A	PT-444-60	B40-6000



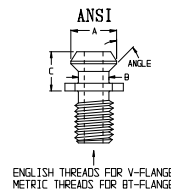
NOTE: STANDARD RETENTION KNOBS FOR 50 TAPER SPINDLES

ANSI RETENTION KNOBS STYLE CT-FLANGE 50 TAPER

DIMENSIONS				MILLTRONICS MACHINE	COMMAND PART No.	KENNAMETAL PART No.	VALENITE PART No.	LYNDEX PART No.
A	B	C	ANGLE					
1.14	.83	1.00	45°	HBM110, RH33XP, RH35XP, TT40XP, VM22XP, VM25XP, VM30XP, TT40XP, VM22XP, VM25XP, VM30XP.	RCBE-0001	DWG RK11144	N/A	C50-STD

ANSI RETENTION KNOBS STYLE BT-FLANGE 50 TAPER

DIMENSIONS				MILLTRONICS MACHINE	COMMAND PART No.	KENNAMETAL PART No.	VALENITE PART No.	LYNDEX PART No.
A	B	C	ANGLE					
1.14	.83	1.00	45°	HBM110, RH33XP, RH35XP, TT40XP, VM22XP, VM25XP, VM30XP, TT40XP, VM22XP, VM25XP, VM30XP.	RSBM-0105	DWG RK11144A	N/A	N/A



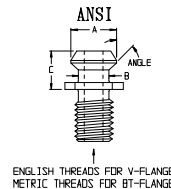
NOTE: OPTIONAL RETENTION KNOBS FOR 40 TAPER SPINDLES

ANSI RETENTION KNOBS STYLE CT-FLANGE 40 TAPER

DIMENSIONS			MILLTRONICS MACHINE		COMMAND PART No.	KENNAMETAL PART No.	VALENITE PART No.	LYNDEX PART No.
A	B	ANGLE	60mm SPINDLE	70mm SPINDLE				
.74	.49	.64 45°	SELECTION NOT AVAILABLE	BR50, BR60, BR80, HN20, HM35, RH20, RH30, RH33, RH35, TT24, TT40, TT60, TT80, VM16, VM20, VM22, VM25, VM28, VM32A, VM42A, VM60, VM65, TT24, TT40, TT60, TT80, VM16, VM20, VM22, VM25, VM30	RC4E-0001	RK11122	PT-475E	C40-STD

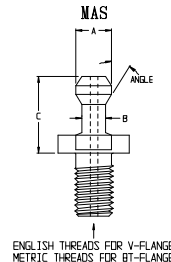
ANSI RETENTION KNOBS STYLE BT-FLANGE 40 TAPER

DIMENSIONS			MILLTRONICS MACHINE				COMMAND PART No.	KENNAMETAL PART No.	VALENITE PART No.	LYNDEX PART No.	
A	B	C	60mm SPINDLE		70mm SPINDLE						
.74	.49	.75	45°	SELECTION NOT AVAILABLE		BR50, BR60, BR80, HX20, HX35, RH20, RH30, RH133, RH35, T124, T140, T160, T180, VM16, VM20, VM25, VM29, VM324, VM422A, VM230, HX35, T124, T140, T160, T180, VM16, VM20, VM25, VM29, VM324, VM422A, VM230		RS4M-0115	RK11126A	N/A	B40-FADAL



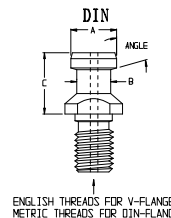
MAS RETENTION KNOBS STYLE CT-FLANGE 40 TAPER

DIMENSIONS			MILLTRONICS MACHINE			COMMAND PART No.	KENNAMETAL PART No.	VALENITE PART No.	LYNDEX PART No.	
A	B	ANGLE	60mm SPINDLE							
.59	.39	1.27	45°	SELECTION NOT AVAILABLE			RB4E-0001	RK31114	PT-532-45	C40-4500
				BR50, BR60, BR80, HK20, HK35, RH20, RH30, RH33, RH35, T124, T140, T160, T180, VM16, VM20, VM22, VM25, VM30, VM324A, VM242A, VM280, HK35, T124, T140, T160, T180, VM16, VM18, VM20, VM22, VM25, VM30, VM32, VM30.						



MAS RETENTION KNOBS STYLE BT-FLANGE 40 TAPER

DIMENSIONS			MILLTRONICS MACHINE				COMMAND PART No.	KENNAMETAL PART No.	VALENITE PART No.	LYNDEX PART No.
A	B	C ANGLE	60mm SPINDLE		70mm SPINDLE					
.59	.39	1.38	45°	SELECTION NOT AVAILABLE			RB4M-0001	RK31113	PT-444-45	B40-4500
				RB50, RB60, RB80, HK20, HK35, RH20, RH30, RH33, RH35, T124, T140, T160, T180, VM16, VM20, VM22, VM25, VM30, VM324, VM242, VM240, VM35, T124, T140, T160, T180, VM16, VM18, VM20, VM22, VM25, VM30, VM32, VM30.						



DIN 69872 RETENTION KNOBS STYLE CT-FLANGE 40 TAPER

DIMENSIONS			MILLTRONICS MACHINE		COMMAND PART No.	KENNAMETAL PART No.	VALENITE PART No.	LYNDEX PART No.
A	B	C	60mm SPINDLE	70mm SPINDLE				
.75	.55	1.02	75°	BR50, BR60, BR80, HM20, HM35, RH20, RH30, RH33, RH35, T124, T140, T160, T180, VM16, VM20, VM32, VM25, VM30, VM324, VM224, VM40, VM35, T124, T140, T160, T180, VM16, VM20, VM32, VM25, VM30, VM324, VM224	RS4E-0114-C	DWG RK71125	N/A	C40-1500

DIN 69872 RETENTION KNOBS STYLE DIN-FLANGE 40 TAPER

DIMENSIONS			MILLTRONICS MACHINE				COMMAND PART NO.	KENNAMETAL PART NO.	VALENITE PART NO.	LYNDEX PART NO.
A	B	C	60mm SPINDLE		70mm SPINDLE					
.75	.55	1.02	75°	SELECTION NOT AVAILABLE			RS4M-0114-C	DWG RK71124	N/A	B40-1500
				BR50, BR60, BR80, HNC20, HNC30, HNC40, HNC50, HNC60, HNC70, HNC80, HNC90, HNC100, HNC110, HNC120, HNC130, HNC140, HNC150, HNC160, HNC170, HNC180, HNC190, HNC200, HNC210, HNC220, HNC230, HNC240, HNC250, HNC260, HNC270, HNC280, HNC290, HNC300, HNC310, HNC320, HNC330, HNC340, HNC350, HNC360, HNC370, HNC380, HNC390, HNC400, HNC410, HNC420, HNC430, HNC440, HNC450, HNC460, HNC470, HNC480, HNC490, HNC500, HNC510, HNC520, HNC530, HNC540, HNC550, HNC560, HNC570, HNC580, HNC590, HNC600, HNC610, HNC620, HNC630, HNC640, HNC650, HNC660, HNC670, HNC680, HNC690, HNC700, HNC710, HNC720, HNC730, HNC740, HNC750, HNC760, HNC770, HNC780, HNC790, HNC800, HNC810, HNC820, HNC830, HNC840, HNC850, HNC860, HNC870, HNC880, HNC890, HNC900, HNC910, HNC920, HNC930, HNC940, HNC950, HNC960, HNC970, HNC980, HNC990, HNC1000, HNC1010, HNC1020, HNC1030, HNC1040, HNC1050, HNC1060, HNC1070, HNC1080, HNC1090, HNC1100, HNC1110, HNC1120, HNC1130, HNC1140, HNC1150, HNC1160, HNC1170, HNC1180, HNC1190, HNC1200, HNC1210, 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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. IN-LINE SPINDLES, IN THEIR RESPECTIVE FRAME SIZE, USE THE SAME RETENTION KNOB AS THE NON IN-LINE SPINDLES

I	ADD VM2016, VM3224, VM4224, TT60, TT80, TT40XP, TTC24, TTC40, TTC40XP, HBM110	7573	N.M.	07/12
H	ADD VM22XP, RH33XP FRAMES TO 50 TAPER	6715	N.M.	01/09
G	ADD MM18 AND MOVE HMC70 FRAMES TO 50 TAPER	6193	N.M.	10/06
F	ADD VMC, TT, AND HMC FRAMES	6175	N.M.	09/06
E	UPDATE CHART	5992	N.M.	08/05
D	ADD RH/RW12 & RH19	5146	N.M.	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 1.75:1	DWG No. 6-11-018-054	SIZE B
	GENERAL PRODUCTS	DATE 30 APR 99	DRAWN BY DAHLKE	SHEET NO. 1 OF 1

