



MILLTRONICS
C N C M A C H I N E S

VM30IL B Mechanical

11-13-2012
Rev 6

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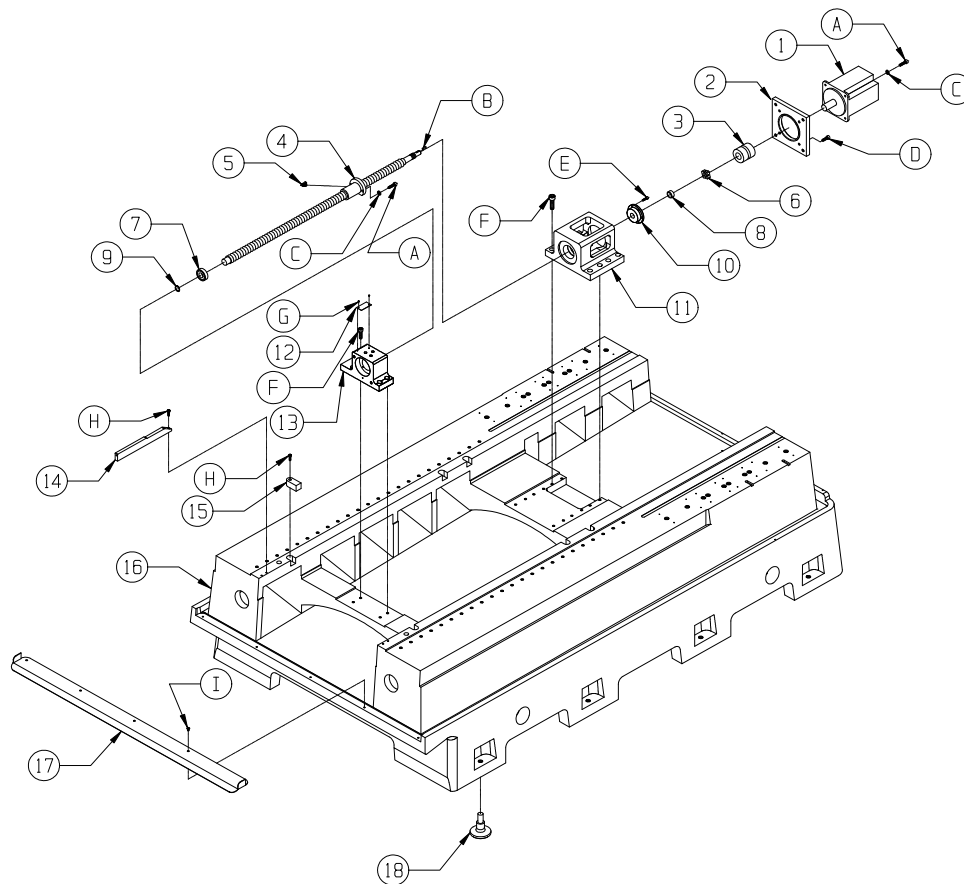
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Manual Discrepancy Sheet

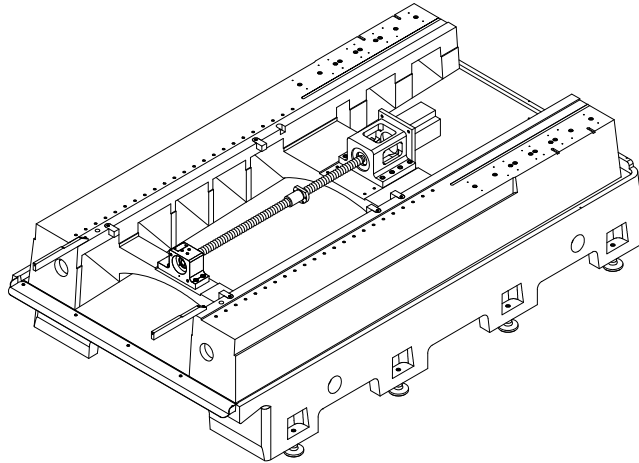
1. On page 27 #9 is qty 2 as shown
2. On page 32 meter numbers are as shown.

Machine Base Assembly



B	UPDATE TO 25TAC62 BEARINGS	7462		03/12
A	ADD MITSUBISHI TO LIST	6304	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.				
TOLERANCE UNLESS SPECIFIED		TITLE VM30 45mm PEDESTAL SUB-ASSEMBLY		
X.XXX +/-		APPLICATION PARTNER VI		
X.XX +/-		SCALE 16:1	DWG No. 6-10-020-028	SIZE B
X.X +/-		DATE 19 DEC 05	DRAWN BY DAHLKE	SHEET No. 1 OF 2
ANGLE +/-				

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PARTS LIST

No.	QTY	STOCK No.	DESCRIPTION
1	1	SEE TABLE	AXIS MOTOR
2	1	SEE TABLE	MOTOR PLATE
3	1	SEE TABLE	MOTOR COUPLER
4	1	SEE TABLE	Y AXIS BALL SCREW
5	1	SEE TABLE	1/8 NPT 4mm SWIVEL ELBOW
6	1	MP00439	BALL SCREW LOCK NUT
7	1	BG00002	BEARING 6204 ZZ
8	1	01018827	BEARING LOCK NUT SPACER
9	1	MP10108	BALL SCREW SNAP RING
10	1	10018117	BALL SCREW SUPPORT BEARING
11	1	01018820	Y AXIS REAR MOTOR MOUNT
12	1	LB00027	PULLEY MOTOR WARNING LABEL
13	1	MX00064	FRONT BALL SCREW RADIAL MOUNT
14	2	SEE TABLE	Y AXIS FRONT WAY COVER BRACKET
15	5	MP00707	HARD STOP BLOCK
16	1	MX70011	PEDESTAL - MACHINED
17	1	MP60252	PEDESTAL DRIP LIP
18	8	MP10029	LEVELING PAD

FRONT WAY COVER BRACKET

No.	DESCRIPTION	PART No.
14	BALL RAIL	MP70086
	ROLLER RAIL	MP70093

MOTOR & MOTOR PLATE & COUPLER LIST

No.	YASKAWA	FANUC	SIEMENS	MITSUBISHI
1	MD00127 (1.5kW)	8Nm A06B-0227-B200	11Nm 1FK7063-SAF71-1EA0	MD00185 (3.5kW)
	MD00144 (2.0kW)	12Nm A06B-0243-B200	18Nm 1FK7100-SAF71-1EA0	MD00187 (5.0kW)
	MD00146 (3.0kW)			
* 2	MP60231	- 8Nm MP60231 12Nm	- (11Nm) SMN0009 (18Nm)	MP60231
3	MA00240 (1.5kW)	MA00240 8Nm	MA00262 (11Nm)	MA00249
	MA00249 (2.0&3.0kW)	MA00249 12Nm	MA00288 (18Nm)	

HARDWARE LIST

No.	QTY	DESCRIPTION
* A	6	M8-1.25 x 30mm SHCS
B	1	5mm x 5mm x 12mm KEY
* C	6	M8 LOCK WASHER
D	4	M8-1.25 x 20mm
E	4	M6-1 x 30mm SHCS
F	12	M10-1.5 x 30mm SHCS
G	2	1/4 DRIVE PIN
H	9	M6-1 x 20mm SHCS
I	5	M6-1 x 10mm BHCS

* 2.0kW, 3.0kW, 5.0kW, 11Nm, 12Nm & 18Nm MOTOR OPTION ONLY USES: M12-1.75 x 35mm SHCS WITH M12 LW.

18Nm USE: M8-1.25 x 30 SHCS

BALL SCREW, SWIVEL ELBOW TABLE

No.	DESCRIPTION	STANDARD	HIGH SPEED RAPID
4	BALL SCREW	MP00572	MP00804
5	SWIVEL ELBOW	NJ00161	NJ00315

B	UPDATE TO 25TAC62 BEARINGS	7462		03/12
A	ADD MITSUBISHI TO LIST	6304	N.M.	02/07
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 +/-



TITLE VM30 45mm PEDESTAL SUB-ASSEMBLY

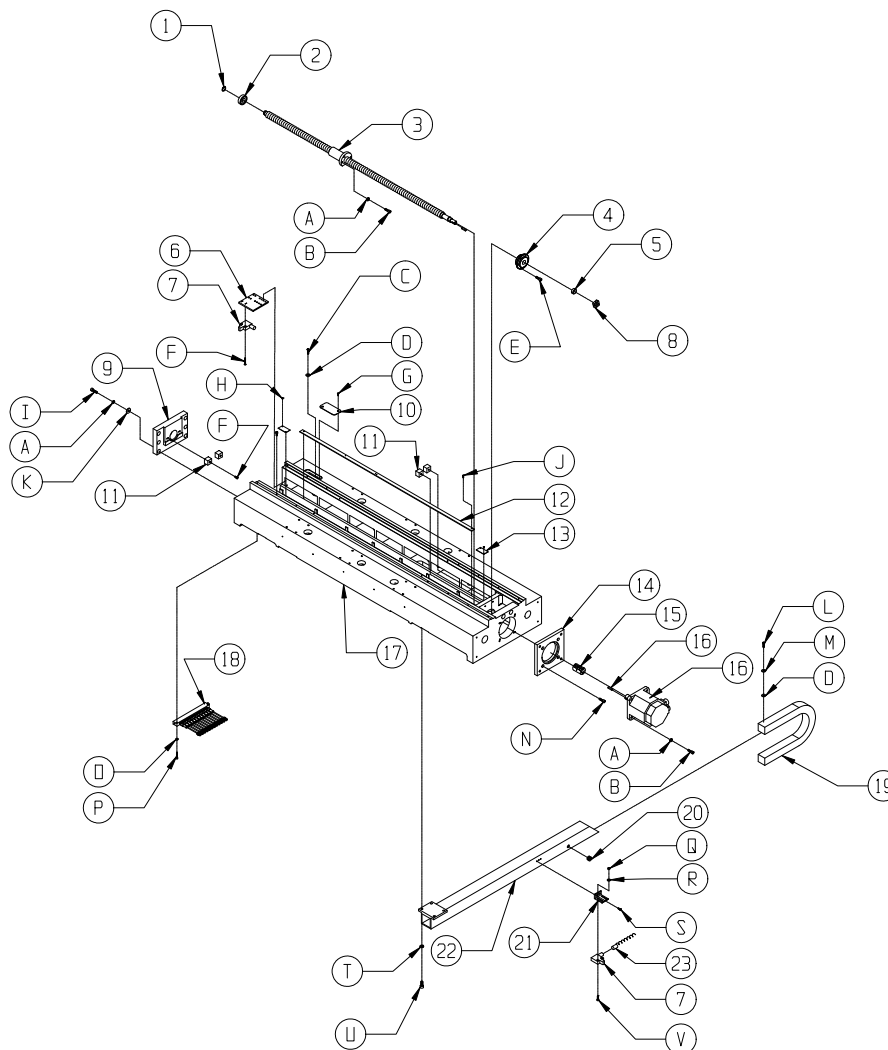
APPLICATION PARTNER VI

SCALE 16:1 DWG No. 6-10-020-028 SIZE B

DATE 19 DEC 05 DRAWN BY DAHLKE SHEET No. 2 OF 2

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Machine Saddle Assembly - 50"



C	UPDATE TO 25TAC62 BEARINGS	7461	N.M.	03/12
B	CHANGE MOTOR PLATE	6945	N.M.	12/10
A	ADD MITSUBISHI TO LIST	6305	N.M.	02/07
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 +/-

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

TITLE VM30 45mm x 50" SADDLE SUB-ASSEMBLY

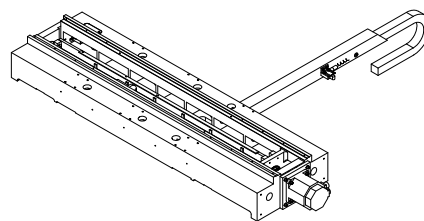
APPLICATION PARTNER VII

SCALE 20:1 DWG No. 6-10-020-029 SIZE B

DATE 20 DEC 05 DRAWN BY DAHLKE SHEET No. 1 OF 2

HARDWARE LIST

No.	QTY	DESCRIPTION
* A	12	M8 LOCK WASHER
* B	6	M8-1.25 x 30mm SHCS
C	2	M6-1 x 25mm BHCS
D	6	M6 FLAT WASHER
E	4	M6-1 x 30mm SHCS
F	6	M5-.8 x 16mm SHCS
G	2	M4-.7 x 10mm FHCS
H	4	1/4 DRIVE PIN
I	6	M8-1.25 x 45mm SHCS
J	2	M3-.5 x 10mm SHCS
K	6	M8 FLAT WASHER
L	4	M6-1 x 16mm BHCS
M	4	M6 LOCK WASHER
** N	4	M8-1.25 x 30mm SHCS
O	2	M5 LOCK WASHER
P	2	M5-.8 x 30mm SHCS
Q	2	M5-.8 HEX NUT
R	2	M5 FLAT WASHER
S	2	M5-.8 x 10mm BHCS
T	4	M10 LOCK WASHER
U	4	M10-1.5 x 30mm SHCS
V	2	M5-.8 x 20mm SHCS


MANIFOLD ASSEMBLY

No.	DRAWING No.	DESCRIPTION
18	10008058	X & Y AIR/OIL MANIFOLD ASSEMBLY
	10018049	VM X & Y AXIS OIL MANIFOLD ASSEMBLY

PARTS LIST

No.	QTY	STOCK No.	DESCRIPTION
1	1	MP10108	SNAP RING
2	1	B600002	6204 BEARING
3	1	SEE TABLE	X BALL SCREW
4	1	10018117	BALL SCREW SUPPORT BEARING
5	1	01018827	BEARING LOCKNUT SPACER
6	1	MP00309	X AXIS SWITCH PLATE
7	2	SW00193	LIMIT SWITCH
8	1	MP00439	BALL SCREW LOCKNUT
9	1	MP60266	VM RADIAL SUPPORT PLATE
10	1	MP00236	Y AXIS SWITCH SLOT COVER
11	4	MP00718	PDM HARD STOP BLOCK
12	1	MP60257	X AXIS OIL TRACK PLATE
13	2	LB00027	PULLEY MOTOR WARNING LABEL
** 14	1	SEE TABLE	VM 2Kw/3Kw MOTOR PLATE
15	1	SEE TABLE	MOTOR COUPLER
16	1	SEE TABLE	AXIS MOTOR
17	1	01018828	VM SERIES SADDLE - MACHINED
18	1	SEE TABLE	X & Y MANIFOLD ASSEMBLIES
19	1	MP60220	Y AXIS CABLE TRACK
20	1	WX00287	RUBBER GROMMET
21	1	MP10387	Y AXIS LIMIT SWITCH MOUNTING BRACKET
22	1	MP60223	Y AXIS CABLE CARRIER
23	2	SW00191	Y AXIS SWITCH CORD

** NOT USED WITH 1.5kW OR 11Nn MOTOR.

 * WITH 2.0kW OR 3.0kW MOTOR USE M12-1.75 x 35mm SHCS & M12 LOCK WASHERS,
 11Nn MOTOR USES M10-1.5 x 40mm SHCS & M10 LOCK WASHER.

MOTOR & COUPLER TABLE

No.	YASKAWA	FANUC	SIEMENS	MITSUBISHI
14	- (1.5kW)	- (8Nn)	- (11Nn)	MP10453
	MP10453 (2.0kW & 3.0kW)	MP10453 (12Nn)	SMN0081 (18Nn)	
15	MA00240 (1.5kW)	MA00239 (8Nn)	MA00262 (11Nn)	MA00249
	MA00249 (2.0kW & 3.0kW)	MA00249 (12Nn)	MA00263 (16Nn)	
16	MD00127 (1.5kW)	8Nn A06B-0227-B200	11Nn 1FK7063-5AF71-1FA0	MD00185 (3.5kW)
	MD00144 (2.0kW)			
	MD00146 (3.0kW)	12Nn A06B-0243-B200	16Nn 1FK7083-5AF71-1FA0	MD00187 (5.0kW)

BALL SCREW TABLE

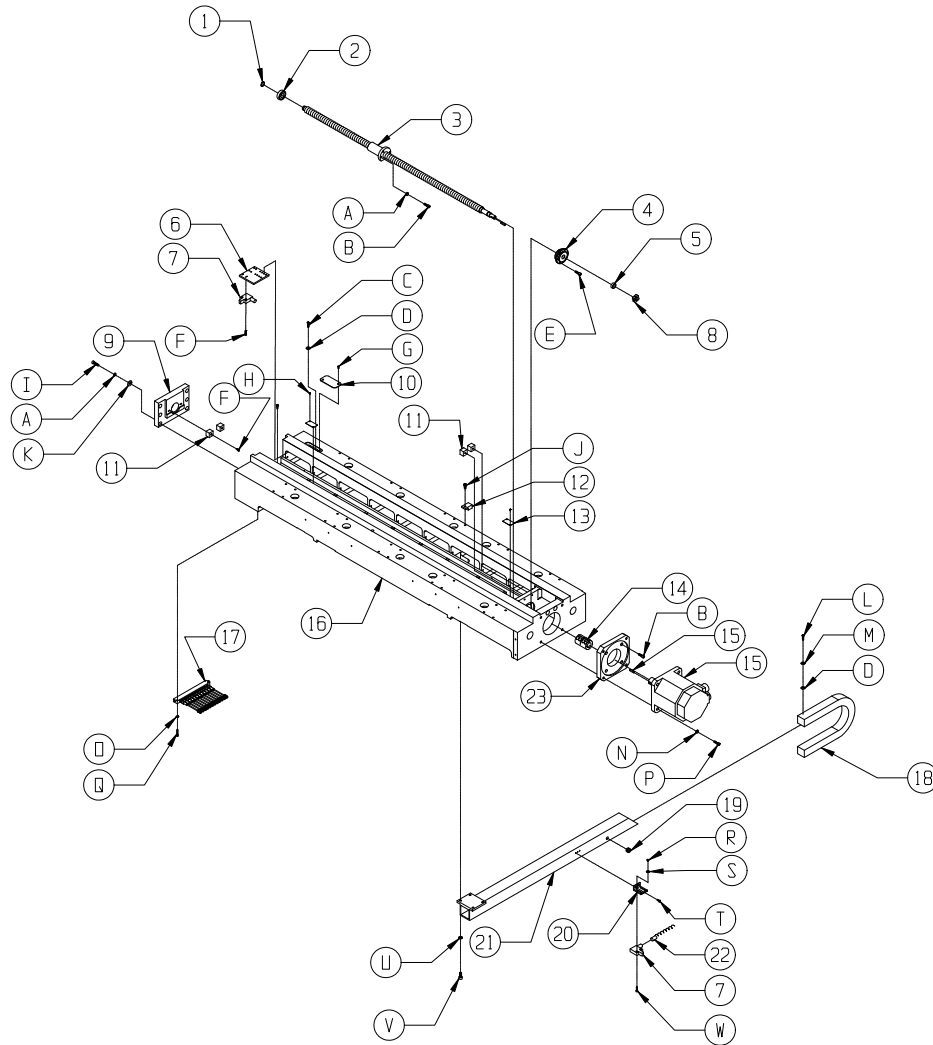
No.	DESCRIPTION	PART No.
3	STANDARD RAPID	MP00573
	HIGH SPEED RAPID	MP00805

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C	UPDATE TO 25TAC62 BEARINGS	7461	N.M.	03/12
B	CHANGE MOTOR PLATE	6945	N.M.	12/10
A	ADD MITSUBISHI TO LIST	6305	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.				
TOLERANCE UNLESS SPECIFIED		TITLE VM30 45mm x 50" SADDLE SUB-ASSEMBLY		
X.XXX +/-		APPLICATION PARTNER VII		
X.XX +/-		SCALE 20:1 DWG No. 6-10-020-029 SIZE B		
X.X +/-		DATE 20 DEC 05 DRAWN BY DAHLKE SHEET No. 2 OF 2		
ANGLE +/-				



Machine Saddle Assembly - 60"



B	UPDATE TO 25TAC62 BEARINGS	7459	N.M.	03/12
A	ADD MITSUBISHI TO LIST	6306	N.M.	02/07
REV.	DESCRIPTION OF CHANGE	E.C.O. No.	APP'D BY	DATE

MATERIAL/FINISH

STOCK/ASSY No.

TOLERANCE UNLESS SPECIFIED	
X.XXX	+/-
X.XX	+/-
X.X	+/-
ANGLE	+/-



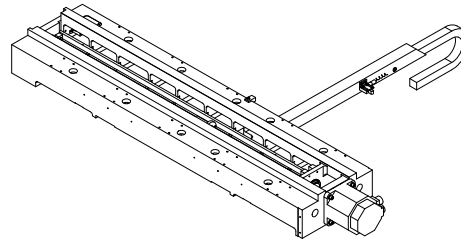
TITLE VM30 45mm x 60" SADDLE SUB-ASSEMBLY

APPLICATION PARTNER VII

SCALE 20:1 DWG No. 6-10-020-030 SIZE B

DATE 22 DEC 05 DRAWN BY DAHLKE SHEET No. 1 OF 2

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PARTS LIST

No.	QTY	STOCK No.	DESCRIPTION
1	1	MP10108	SNAP RING
2	1	BG00002	6204 BEARING
3	1	MP00806	X BALL SCREW
4	1	10018117	BALL SCREW SUPPORT BEARING
5	1	01018827	BEARING LOCKNUT SPACER
6	1	MP00309	X AXIS SWITCH PLATE
7	2	SW00193	LIMIT SWITCH
8	1	MP00439	BALL SCREW LOCKNUT
9	1	MP60266	VM RADIAL SUPPORT PLATE
10	1	MP00236	Y AXIS SWITCH SLOT COVER
11	4	MP00718	PDM HARD STOP BLOCK
12	1	MP70100	X AXIS OIL BRACKET
13	2	LB00027	PULLEY MOTOR WARNING LABEL
14	1	SEE TABLE	MOTOR COUPLER
15	1	SEE TABLE	AXIS MOTOR
16	1	01018829	VM SERIES SADDLE - MACHINED
17	1	SEE TABLE	X & Y MANIFOLD ASSEMBLIES
18	1	MP60220	Y AXIS CABLE TRACK
19	1	WX00287	RUBBER GROMMET
20	1	MP10387	Y AXIS LIMIT SWITCH MOUNTING BRACKET
21	1	MP60223	Y AXIS CABLE CARRIER
22	2	SW00191	Y AXIS SWITCH CORD
23	1	SEE TABLE	MOTOR PLATE

HARDWARE LIST

No.	QTY	DESCRIPTION
A	10	M8 LOCK WASHER
B	8	M8-1.25 x 30mm SHCS
C	2	M6-1 x 25mm BHCS
D	6	M6 FLAT WASHER
E	4	M6-1 x 30mm SHCS
F	6	M5-.8 x 16mm SHCS
G	2	M4-.7 x 10mm FHCS
H	4	1/4 DRIVE PIN
I	6	M8-1.25 x 45mm SHCS
J	1	M8-1.25 x 20mm SHCS
K	6	M8 FLAT WASHER
L	4	M6-1 x 16mm BHCS
M	4	M6 LOCK WASHER
** N	4	M12 LOCK WASHER
O	2	M5 LOCK WASHER
** P	4	M12-1.75 x 35mm SHCS
Q	2	M5-.8 x 30mm SHCS
R	2	M5-.8 HEX NUT
S	2	M5 FLAT WASHER
T	2	M5-.8 x 10mm BHCS
U	4	M10 LOCK WASHER
V	4	M10-1.5 x 30mm SHCS
W	2	M5-.8 x 20mm SHCS

MANIFOLD ASSEMBLY

No.	DRAWING No.	DESCRIPTION
17	10020027	X & Y AIR/OIL MANIFOLD ASSEMBLY
	10018106	VM X & Y AXIS OIL MANIFOLD ASSEMBLY

MOTOR & COUPLER TABLE

No.	YASKAWA	FANUC	SIEMENS	MITSUBISHI
14	MA00249 (2.0kW & 3.0kW)	MA00368 (8Nm) MA00249 (12Nm)	MA00367 (16Nm) MA00366 (18Nm)	MA00249
15	MD00144 (2.0kW) MD00146 (3.0kW)	8Nm A06B-0227-B200 12Nm A06B-0243-B200	16Nm 1FK7083-5AF71-1FA0 18Nm 1FK7100-5AF71-1FA0	MD00185 (3.5kW) MD00187 (5.0kW)
23	-	MP70113 (8Nm) - (12Nm)	SMN0082 (16Nm) SMN0083 (18Nm)	-

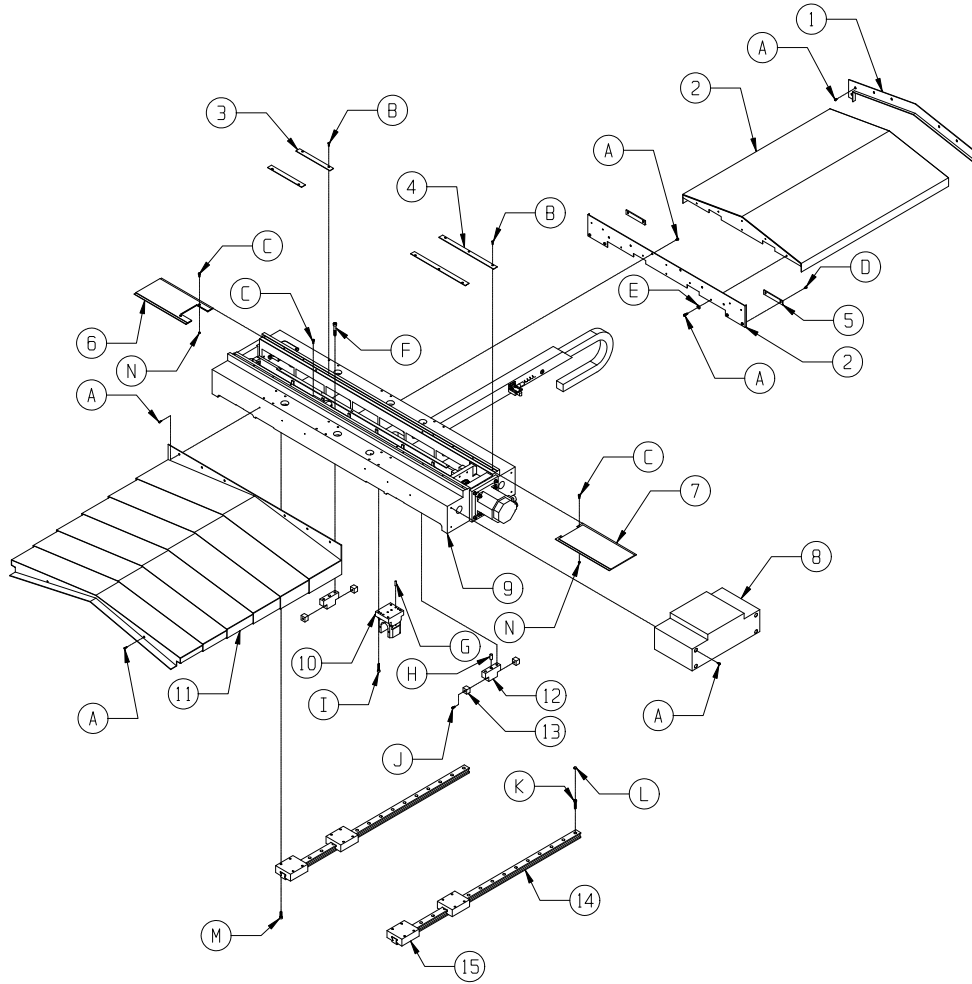
* NOT USED ON SIEMENS 16Nm MOTOR. 8Nm MOTOR USES M8-1.25 x 40 SHCS & M8 LOCK WASHER.

** SIEMENS 16Nm MOTOR USES (4) M10-1.5 x 50mm SHCS & (4) M10 LOCK WASHERS.

B	UPDATE TO 25TAC62 BEARINGS	7459	N.M.	03/12
A	ADD MITSUBISHI TO LIST	6306	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.				
TOLERANCE UNLESS SPECIFIED X.XXX +/- X.XX +/- X.X +/- ANGLE +/-		TITLE VM30 45mm x 60" SADDLE SUB-ASSEMBLY		
		APPLICATION PARTNER VII		
		SCALE 20:1	DWG No. 6-10-020-030	SIZE B
		DATE 22 DEC 05	DRAWN BY DAHLKE	SHEET No. 2 OF 2



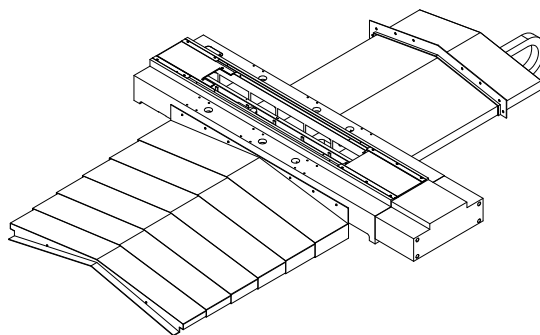
Saddle & Way Cover Assembly - 50"



B	UPDATE BALL SCREW RAIL		7464		03/12
A	ADD MITSUBISHI TO LIST		6307	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.					
TOLERANCE UNLESS SPECIFIED			TITLE VM30 45nn x 50" SADDLE ASSEMBLY		
X .XXX +/-			APPLICATION PARTNER VII		
X .XX +/-			SCALE 20:1		
X .X +/-			DWG No. 6-10-020-031		
X .X +/-			SIZE B		
ANGLE +/-			DATE 29 DEC 05		
			DRAWN BY DAHLKE		
			SHEET No. 1 OF 2		

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TOLERANCE UNLESS SPECIFIED	
X.XXX	+/-
X.XX	+/-
X.X	+/-
ANGLE	+/-


PARTS LIST

No.	QTY	STOCK No.	DESCRIPTION
1	1	MP60216	REAR WAY COVER WIPER
2	1	MP60215	Y AXIS REAR COVER
3	2	MP00454	X AXIS WAY COVER BRACKET - LEFT
4	2	MP00453	X AXIS WAY COVER BRACKET - RIGHT
5	2	MP10247	SADDLE WIPER
6	1	MP00456	X AXIS BALL SCREW COVER - LEFT
7	1	01018814	X AXIS BALL SCREW COVER - RIGHT
8	1	MP60253	X AXIS MOTOR COVER
9	1	10020029	VM30 45mm x 50" SADDLE SUB-ASSEMBLY
10	1	SEE TABLE	VM SERIES CARRIER - MACHINED
11	1	MP70084	Y AXIS FRONT WAY COVER
12	2	MP60206	SADDLE HARD STOP BLOCK
13	4	MP00718	PDM HARD STOP BLOCK
14	2	SEE TABLE	45mm 1240 RAIL
15	4	SEE TABLE	45mm RAIL BLOCK

HARDWARE LIST

No.	QTY	DESCRIPTION
A	36	M6-1 x 10mm BHCS
B	14	M4-.7 x 10mm FHCS
C	8	M5-.8 x 10mm SHCS
D	4	M5-.8 x 16mm BHCS
E	6	M6 LOCK WASHER
F	4	M10-1.5 x 45mm SHCS
G	2	1/4 x 1 DOWEL PIN
H	2	12mm x 25mm DOWEL PIN
I	6	M8-1.25 x 40mm SHCS
J	4	M5-.8 x 16mm SHCS
* K	24	M12-1.75 x 40mm SHCS
* L	24	RAIL PLUG
M	16	M10-1.5 x 35mm SHCS
N	4	M5-.8 x HEX NUT

* ROLLER RAIL USES: AN ADDITIONAL (22) RAIL PLUGS & (22) M12-1.75 x 40mm SHCS

MACHINED CARRIER TABLE

No.	DESCRIPTION	PART No.
10	STANDARD RAPID	MX00039
	HIGH SPEED RAPID	MX60044

RAIL & BLOCK TABLE

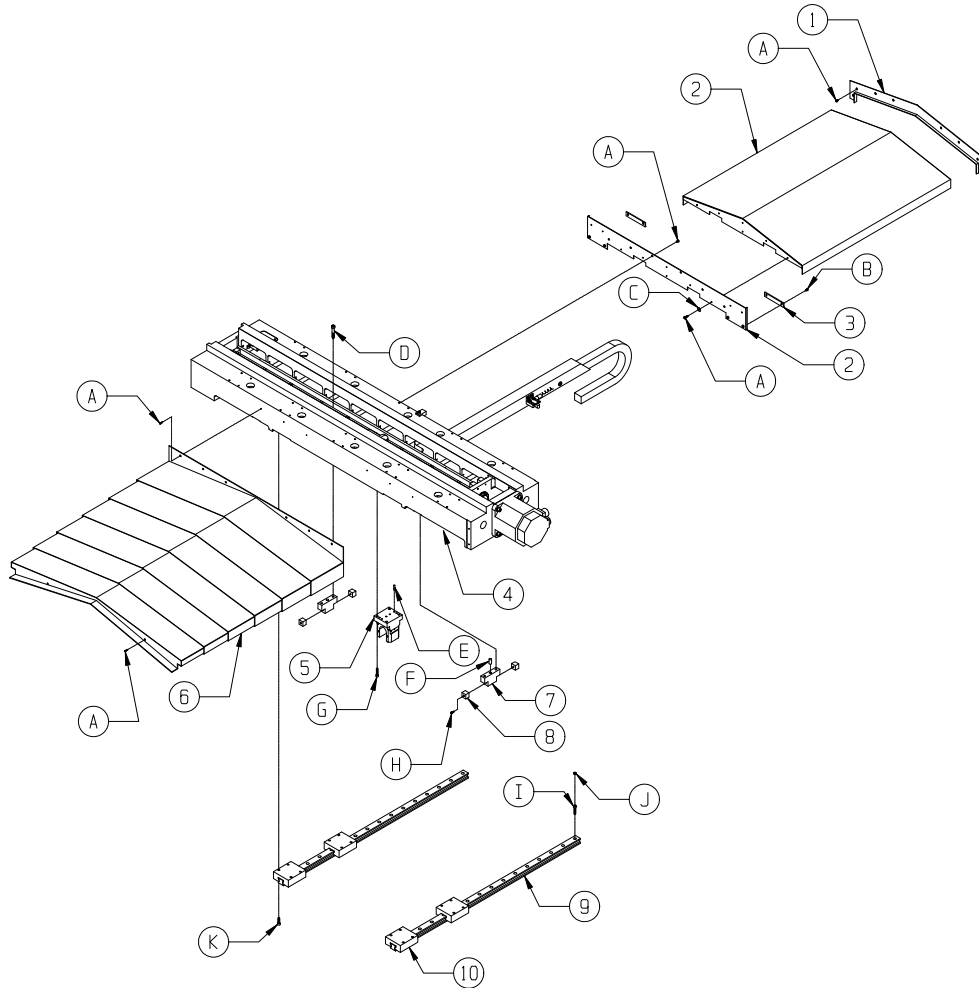
No.	DESCRIPTION	PART No.
14	BALL RAIL	MP00727
	ROLLER RAIL	MP00817
15	BALL RAIL BLOCK	MP00728
	ROLLER RAIL BLOCK	MP00819

B	UPDATE BALL SCREW RAIL	7464		03/12
A	ADD MITSUBISHI TO LIST	6307	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.				
TOLERANCE UNLESS SPECIFIED		TITLE VM30 45mm x 50" SADDLE ASSEMBLY		
X .XXX +/-		APPLICATION PARTNER VII		
X .XX +/-		SCALE 20:1 DWG No. 6-10-020-031 SIZE B		
X .X +/-		DATE 29 DEC 05 DRAWN BY DAHLKE SHEET No. 2 OF 2		
ANGLE +/-				

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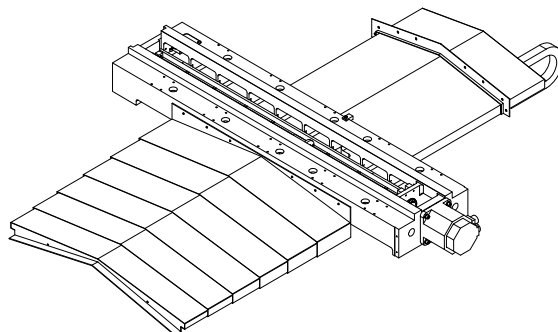


Saddle & Way Cover Assembly - 60"



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A	UPDATE RAIL	7467		03/12
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 VM30 45mm x 60" SADDLE ASSEMBLY		
TOLERANCE UNLESS SPECIFIED		APPLICATION PARTNER VII		
X.XXX +/-		SCALE 20:1		
X.XX +/-		DATE 29 DEC 05		
X.X +/-		DRAWN BY DAHLKE		
ANGLE +/-		SHEET No. 1 OF 2		
		DWG No. 6-10-020-032		
		SIZE B		


PARTS LIST

No.	QTY	STOCK No.	DESCRIPTION
1	1	MP60216	REAR WAY COVER WIPER
2	1	MP60215	Y AXIS REAR COVER
3	2	MP10247	SADDLE WIPER
4	1	10020030	VM30 SADDLE SUB-ASSEMBLY
5	1	SEE TABLE	VM SERIES CARRIER - MACHINED
6	1	MP70084	Y AXIS FRONT WAY COVER
7	2	MP60206	SADDLE HARD STOP BLOCK
8	4	MP00718	PDM HARD STOP BLOCK
9	2	SEE TABLE	45mm 1240 RAIL
10	4	SEE TABLE	45mm RAIL BLOCK

HARDWARE LIST

No.	QTY	DESCRIPTION
A	32	M6-1 x 10mm BHCS
B	4	M5-.8 x 16mm BHCS
C	6	M6 LOCK WASHER
D	4	M10-1.5 x 45mm SHCS
E	2	1/4 x 1 DOWEL PIN
F	2	12mm x 25mm DOWEL PIN
G	6	M8-1.25 x 40mm SHCS
H	4	M5-.8 x 16mm SHCS
I	24	M12-1.75 x 40mm SHCS
J	24	RAIL PLUG
K	16	M10-1.5 x 35mm SHCS

* ROLLER RAIL USES: AN ADDITIONAL (22)

M8-1.25 x 40mm SHCS

** ROLLER RAIL USES: (22) ADDITIONAL PLUGS

MACHINED CARRIER TABLE

No.	DESCRIPTION	PART No.
5	STANDARD RAPID	MX00039
	HIGH SPEED RAPID	MX60044

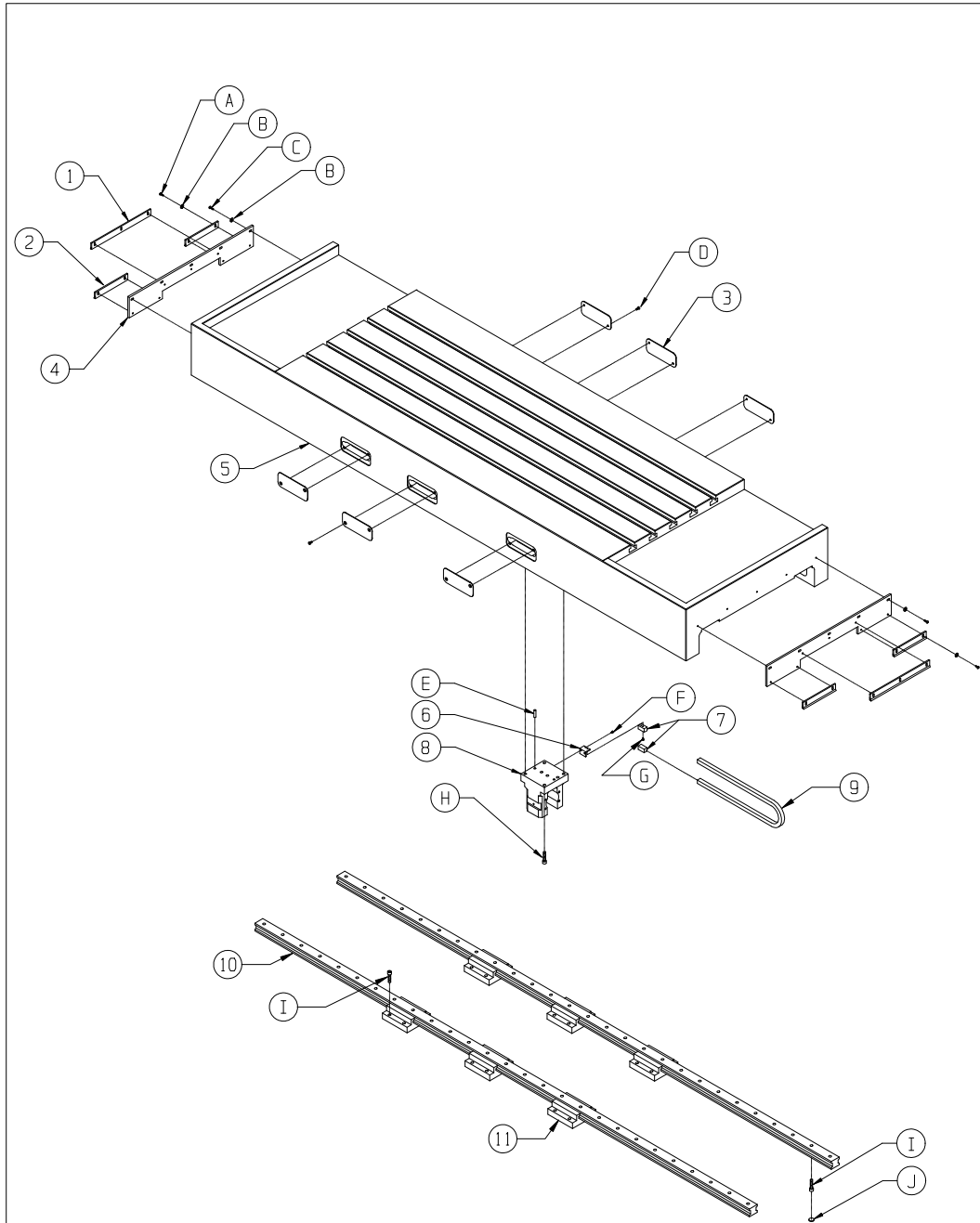
RAIL & BLOCK TABLE

No.	DESCRIPTION	PART No.
9	BALL RAIL	MP00727
	ROLLER RAIL	MP00817
10	BALL RAIL BLOCK	MP00728
	ROLLER RAIL BLOCK	MP00819

A	UPDATE RAIL	7467		03/12
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 VM30 45mm x 60" SADDLE ASSEMBLY			
X.XXX +/-	APPLICATION PARTNER VII			
X.XX +/-	SCALE 20:1 DWG No. 6-10-020-032 SIZE B			
X.X +/-	DATE 29 DEC 05 DRAWN BY DAHLKE SHEET No. 2 OF 2			
ANGLE +/-				

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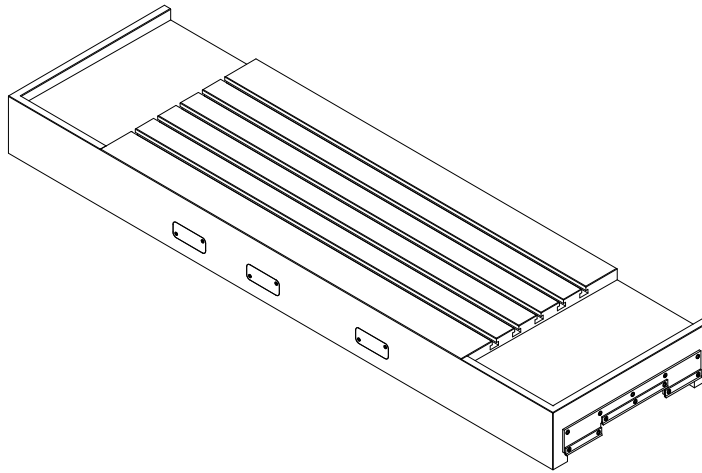
Milling Table Assembly - 50"



A		UPDATE RAIL BOLT & PART No.		7482	N.M.	03/12
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 ±		TITLE VM30 (2Kw) 50" TABLE SUB-ASSEMBLY				
X .X ±		APPLICATION PARTNER VII				
ANGLE ±		SCALE 12:1		DWG No 6-10-020-034	SIZE B	
		DATE 10 JAN 06		DRAWN BY DAHLKE	SHEET NO. 1 OF 2	

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



PARTS LIST

No.	QTY	STOCK No.	DESCRIPTION
1	2	MP00323	TABLE/SADDLE WIPER - UPPER
2	4	MP00324	TABLE/SADDLE WIPER - LOWER
3	6	MP00315	TABLE SLOT COVER
4	2	MP00310	TABLE/SADDLE WIPER PLATE
5	1	MX60047	VM SERIES 84 x 24 TABLE - MACHINED
6	1	BR00105	X OIL TRACK BRACKET
7	1	MP00845	CABLE TRACK ENDS (SET)
8	1	SEE TABLE	VM SERIES CARRIER - MACHINED
9	3'	MP00844	X AXIS OIL/ CABLE TRACK (41 LINKS)
10	2	SEE TABLE	35mm 2125 RAILS
11	6	SEE TABLE	35mm RAIL BLOCK

HARDWARE LIST

No.	QTY	DESCRIPTION
A	14	M5-.8 x 10mm BHCS
B	24	M5 FLAT WASHER
C	10	M5-.8 x 15mm BHCS
D	12	M4-.7 x 8mm FHCS
E	2	1/4 x 1 DOWEL PIN
F	2	M3-.5 x 10mm SHCS
G	4	M3-.5 x 5mm SHCS
H	6	M8-1.25 x 40mm SHCS
I	78	M8-1.25 x 30mm SHCS - MP60203 BALL RAIL
	130	M8-1.25 x 35mm SHCS - MP00813 ROLLER RAIL
J	54	RAIL PLUG - MP60203 BALL RAIL
	106	RAIL PLUG - MP00813 ROLLER RAIL

MACHINED CARRIER TABLE

No.	DESCRIPTION	PART No.
8	STANDARD RAPID	MX00039
	HIGH SPEED RAPID	MX60044

RAIL & BLOCK TABLE

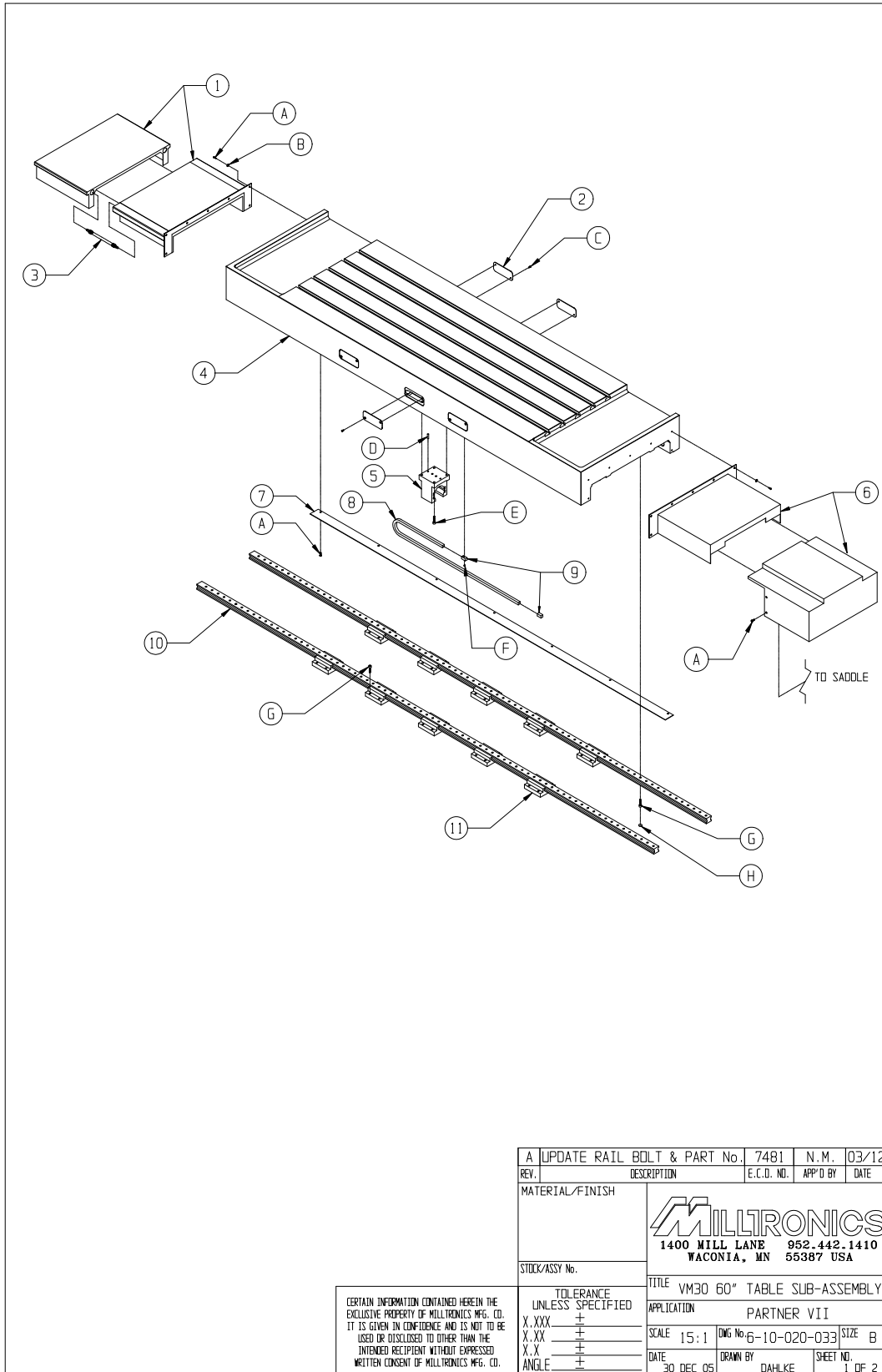
No.	DESCRIPTION	PART No.
10	BALL RAIL	MP60203
	ROLLER RAIL	MP00813
11	BALL RAIL BLOCK	MP00641
	ROLLER RAIL BLOCK	MP00815

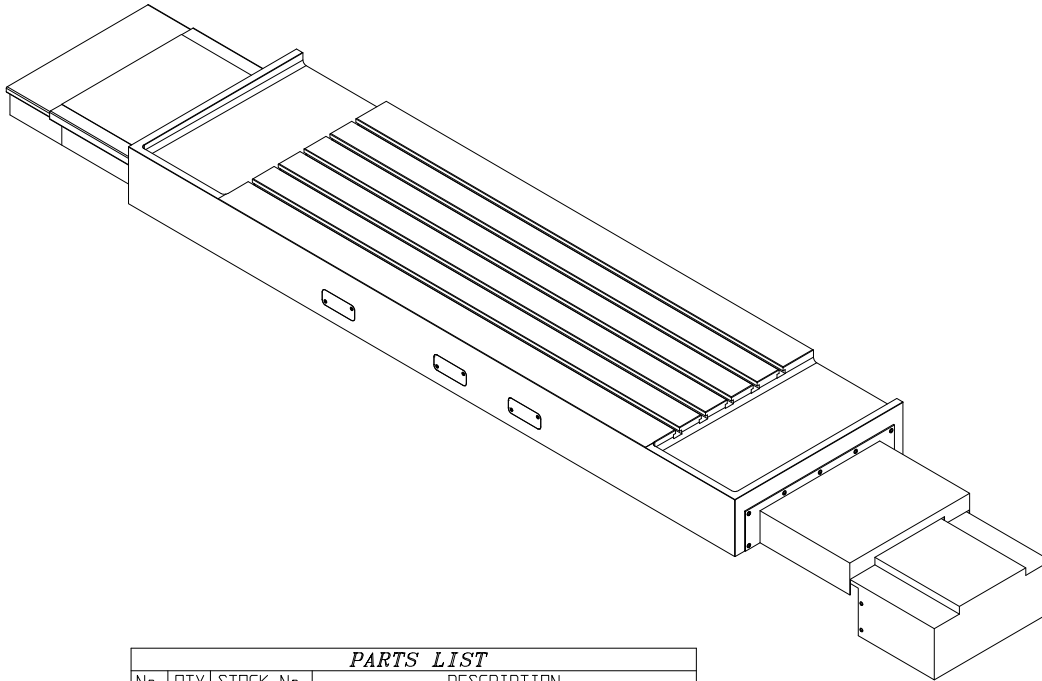
A	UPDATE RAIL BOLT & PART No.	7482	N.M.	03/12
REV.	DESCRIPTION	E.C.D. NO.	APP'D BY	DATE
MATERIAL/FINISH		 1400 MILL LANE 952.442.1410 WACONIA, MN 55387 USA		
STOCK/ASSY No.				
TOLERANCE UNLESS SPECIFIED		TITLE VM30 (2Kw) 50" TABLE SUB-ASSEMBLY		
X .XXX ±		APPLICATION PARTNER VII		
X .XX ±		SCALE 12:1 DWG No 6-10-020-034 SIZE B		
X .X ±		DATE 10 JAN 06 DRAWN BY DAHLKE SHEET NO. 2 OF 2		
ANGLE ±				

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Milling Table Assembly - 60"




PARTS LIST

No.	QTY	STOCK No.	DESCRIPTION
1	1	MP70096	VM30 60" X AXIS WAYCOVER LEFT
2	6	MP00315	TABLE SLOT COVER
3	2	HD00062	WAYCOVER SPRING
4	1	MX70010	VM SERIES 94 x 26 TABLE - MACHINED
5	1	MX60044	VM SERIES CARRIER - MACHINED
6	1	MP70083	VM30 60" X AXIS WAYCOVER RIGHT
7	1	MP70097	X-AXIS TABLE PLATE
8	6'	MP00844	X AXIS DIL/ CABLE TRACK (89 LINKS)
9	1	MP00845	CABLE TRACK ENDS (SET)
10	2	SEE TABLE	35mm 3060 RAILS
11	10	SEE TABLE	35mm RAIL BLOCK

HARDWARE LIST

No.	QTY	DESCRIPTION
A	25	M6-1 x 12mm BHCS
B	14	M6 LOCK WASHER
C	12	M4-.7 x 8mm FHCS
D	2	1/4 x 1 DOWEL PIN
E	6	M8-1.25 x 40mm SHCS
F	4	M3-.5 x 5mm SHCS
G	100	M8-1.25 x 30mm SHCS - MP60245 BALL RAIL
	158	M8-1.25 x 35mm SHCS - MP00814 ROLLER RAIL
H	60	RAIL PLUG - MP60245 BALL RAIL
	118	RAIL PLUG - MP00814 ROLLER RAIL

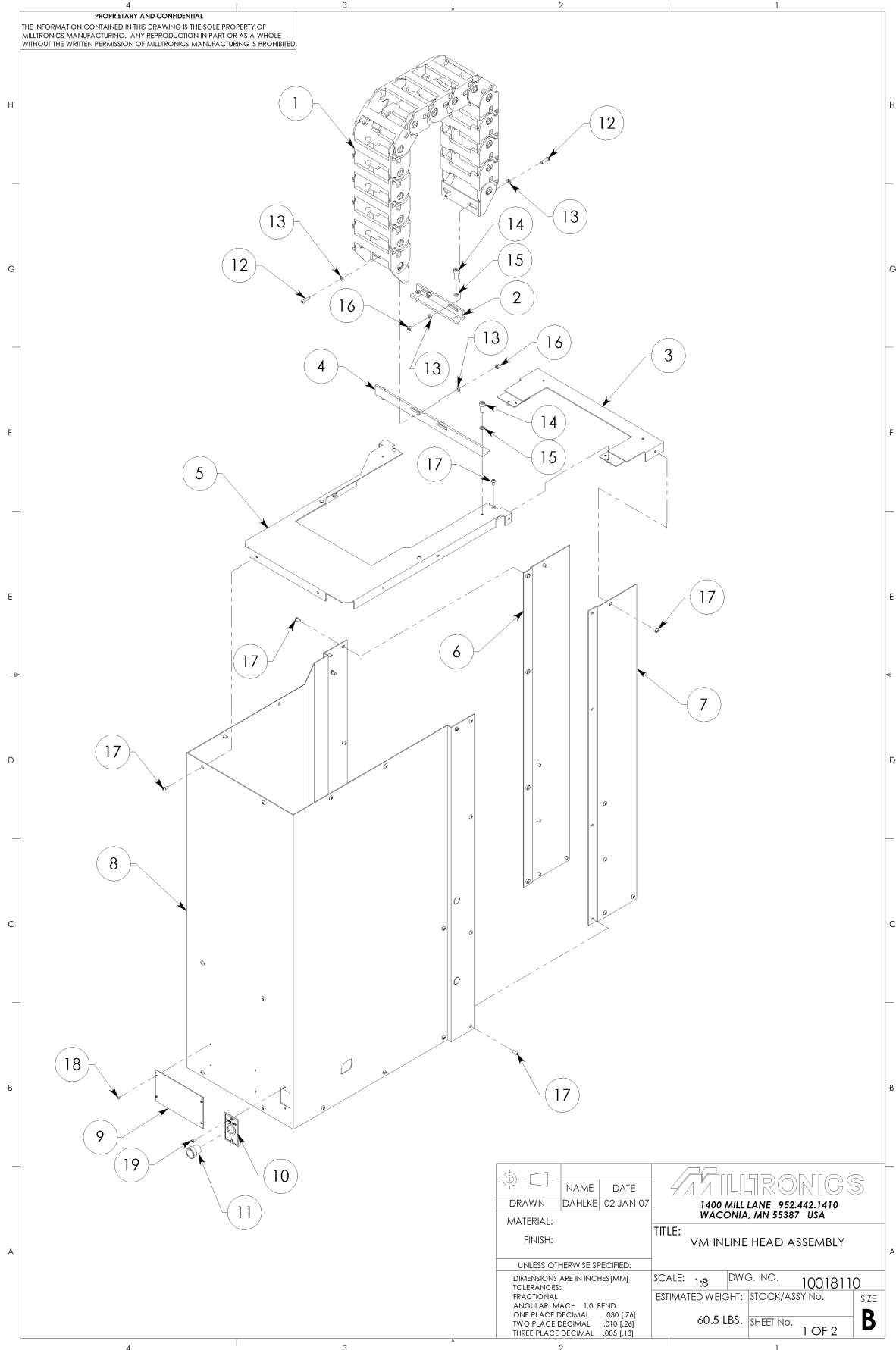
RAIL & BLOCK TABLE

No.	DESCRIPTION	PART No.
10	BALL RAIL	MP60245
	ROLLER RAIL	MP00814
11	BALL RAIL BLOCK	MP00641
	ROLLER RAIL BLOCK	MP00815

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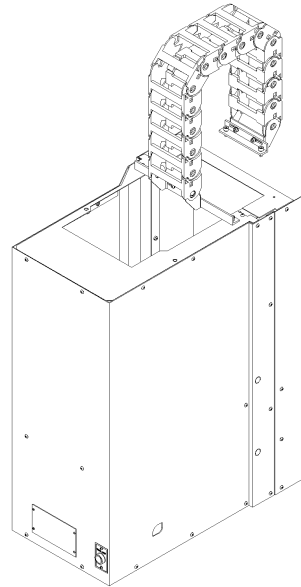
A	UPDATE RAIL BOLT & PART No.	7481	N.M.	03/12
REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
MATERIAL/FINISH		 1400 MILL LANE 952.442.1410 WACONIA, MN 55387 USA		
STOCK/ASSY No.		TITLE VM30 60" TABLE SUB-ASSEMBLY		
TOLERANCE UNLESS SPECIFIED		APPLICATION PARTNER VII		
X .XXX ±		SCALE 12:1		
X .XX ±		DWG No. 6-10-020-033		
X .X ±		SIZE B		
ANGLE ±		DATE 30 DEC 05		
		DRAWN BY DAHLKE		
		SHEET NO. 2 OF 2		

Machine Head Assembly



4 3 2 1

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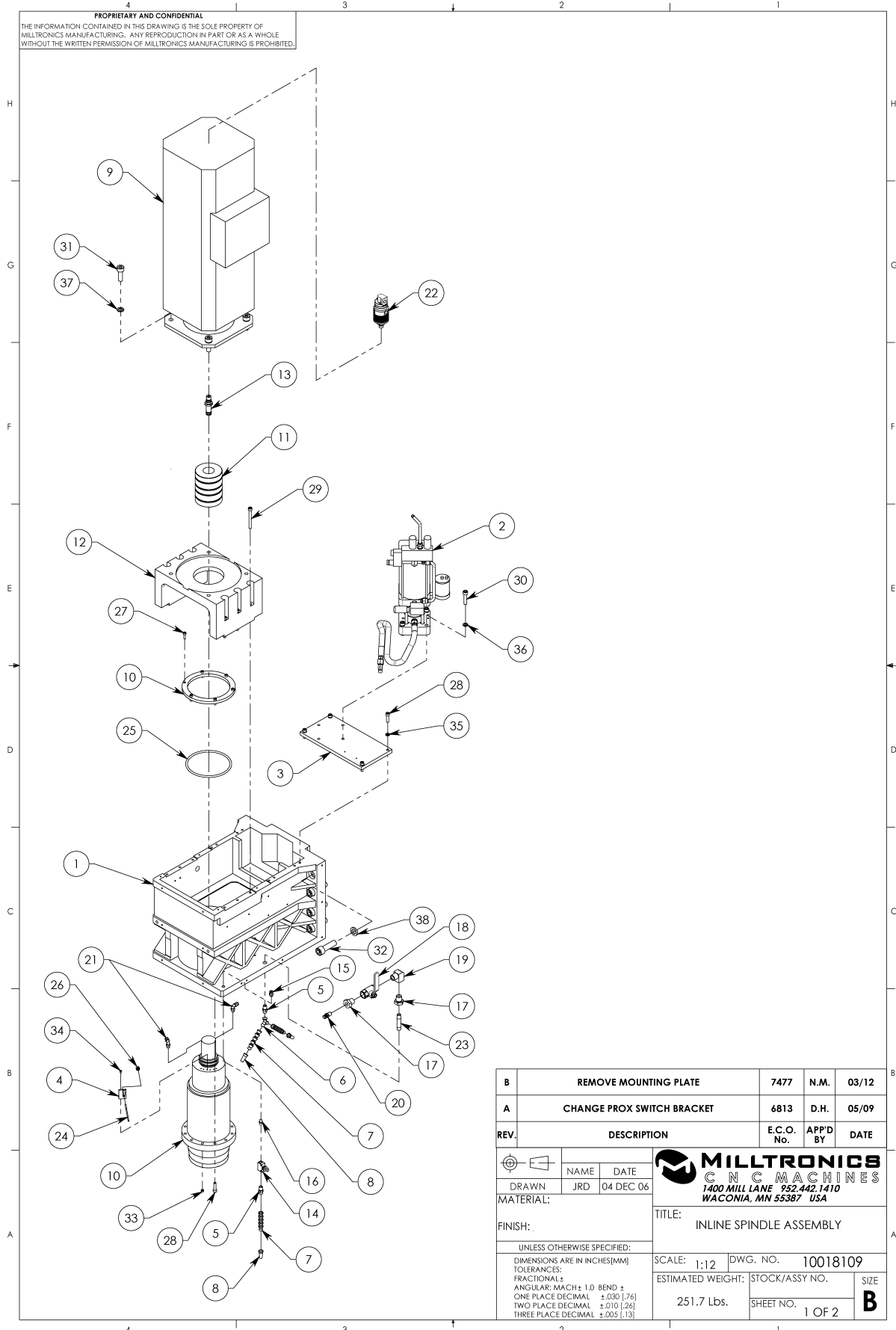
ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	SEE TABLE	SPINDLE CABLE TRACK
2	1	MP00316	SPINDLE CABLE SUPPORT BRACKET
3	1	SEE TABLE	VM HEAD COVER - TOP
4	1	MP00664	VM SPINDLE CABLE SUPPORT BRACKET
5	1	MP00639	UNIVERSAL HEADCOVER - TOP
6	1	SEE TABLE	VM HEAD COVER - LEFT
7	1	SEE TABLE	VM HEAD COVER - RIGHT
8	1	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	 1400 MILL LANE 952.442.1410 WACONIA, MN 55387 USA
	DRAWN	DAHLKE	
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 [.25] THREE PLACE DECIMAL .005 [.13]		ESTIMATED WEIGHT: 60.5 LBS.	STOCK/ASSY No. SHEET No. 2 OF 2 B

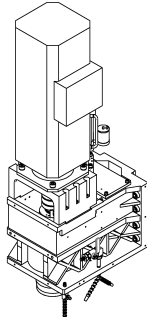
Inline Spindle Assembly



PROPRIETARY AND CONFIDENTIAL																									
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SPINDLE MOTOR TABLE		MOTOR COUPLER TABLE																							
ITEM NO.	STOCK NO.	DESCRIPTION	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">ITEM NO.</th> <th style="width: 40%;">MOTOR-END HUB 1 DIA. (MM)</th> <th style="width: 50%;">SPINDLE-END HUB 2 DIA. (MM)</th> </tr> </thead> <tbody> <tr><td rowspan="8">11</td><td>24</td><td>50</td></tr> <tr><td>28</td><td>50</td></tr> <tr><td>32</td><td>50</td></tr> <tr><td>38</td><td>50</td></tr> <tr><td>40</td><td>50</td></tr> <tr><td>42</td><td>50</td></tr> <tr><td>48</td><td>50</td></tr> <tr><td>50</td><td>50</td></tr> <tr><td>55</td><td>50</td></tr> </tbody> </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.	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																								
10	MP001023	10K RPM																							
	MP001129	15K RPM																							

SPINDLE KEYS:
 MP1012 SMALL
 MP1013 BIG

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



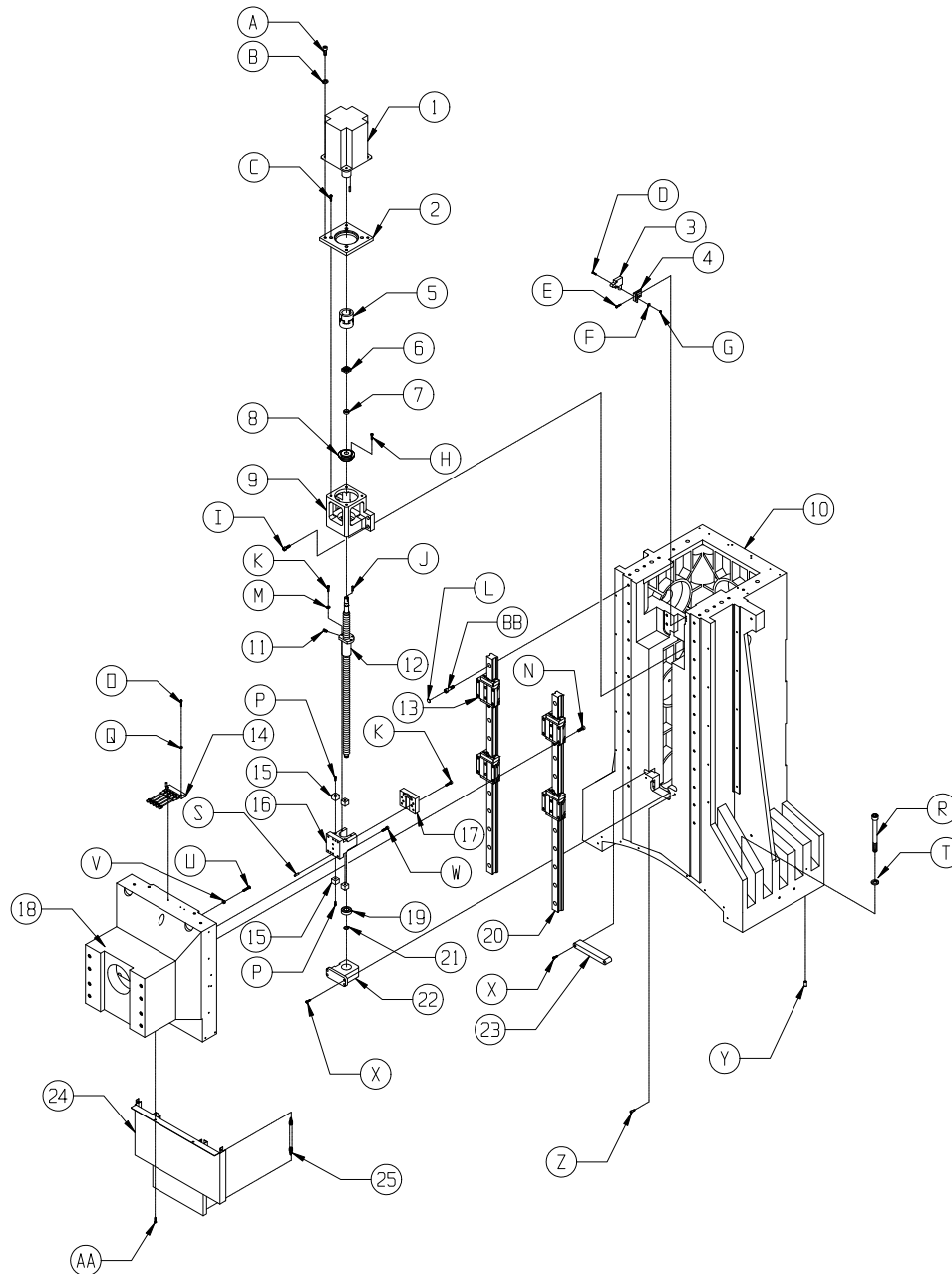
SPINDLE MOTOR TABLE		
ITEM NO.	STOCK NO.	DESCRIPTION
9	A06B-1477-B133#0121	FANUC
	A06B-1479-B133#0221	FANUC
	MO00166	MITSUBISHI
	MO00167	MITSUBISHI
	1PM 6137	SIEMENS
	1PM 6105	SIEMENS
	1PM 6133	SIEMENS

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
				
DRAWN: JRD DATE: 04 DEC 06 MATERIAL:		TITLE: INLINE SPINDLE ASSEMBLY		
FINISH:		UNLESS OTHERWISE SPECIFIED:		
DIMENSIONS ARE IN INCHES[MM] TOLERANCES: FRACTIONALS: ±.005 DECIMALS: ±.003 ANGULAR: MACH ± 1.0 BEND ±.030 ONE PLACE DECIMAL ±.010 TWO PLACE DECIMAL ±.005 THREE PLACE DECIMAL ±.001		SCALE: 1:17 DWG. NO. 10018109 ESTIMATED WEIGHT: 251.7 Lbs. STOCK/ASSY NO.		
		SHEET NO. 2 OF 2		



Machine Column Assembly



D	UPDATE TO 25TAC62 BEARINGS	7468		03/12
C	ADD MITSUBISHI TO LIST	6308	N.M.	02/07
B	ADD ROLLER TABLE	5921	N.M.	02/05
A	ADD MOTOR, COUPLER TABLE	5731	N.M.	03/04
REV.	DESCRIPTION OF CHANGE	E.C.O. No.	APP'D BY	DATE

MATERIAL/FINISH

STOCK/ASSY No.

TOLERANCE	
UNLESS SPECIFIED	
X.XXX	+/-
X.XX	+/-
X.X	+/-
ANGLE	+/-

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

TITLE VM30 COLUMN SUB-ASSEMBLY

APPLICATION PARTNER VII

SCALE 20:1 DWG No. 6-10-020-026 SIZE B

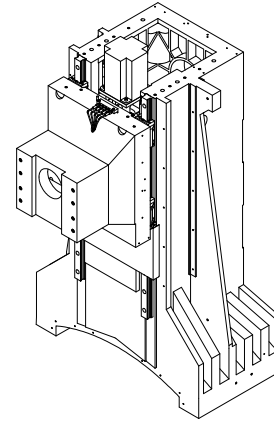
DATE 07 JUL 03 DRAWN BY DAHLKE SHEET No. 1 OF 2

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PARTS LIST

No.	QTY	STOCK No.	DESCRIPTION
1	1	SEE TABLE	AXIS MOTOR
2	1	SEE TABLE	Z - AXIS MOTOR PLATE
3	1	SW00193	LIMIT SWITCH
4	1	MP10387	X & Z LIMIT SWITCH MOUNTING BRACKET
5	1	SEE TABLE	MOTOR COUPLER
6	1	MP00439	BALL SCREW LOCK NUT
7	1	01018827	BEARING LOCK NUT SPACER
8	1	10018117	VM BEARING CUP ASSEMBLY
9	1	01018820	REAR MOTOR MOUNT Y/Z-AXIS
10	1	MX60039	VM SERIES COLUMN - MACHINED
11	1	SEE TABLE	1/8 NPT 4mm TUBE M/S
12	1	SEE TABLE	Z BALL SCREW
13	4	SEE TABLE	45mm RAIL BLOCKS
14	1	SEE TABLE	Z - AXIS MANIFOLD ASSEMBLY
15	4	MP00718	PDM HARD STOP BUMPER
16	1	SEE TABLE	VM SERIES CARRIER - MACHINED
17	1	SEE TABLE	Z - AXIS BALL SCREW SAFETY CATCH
18	1	MX70008	VM30 45mm HEAD EXTENSION - MACHINED
19	1	BG00002	6204 BEARING
20	2	SEE TABLE	45mm RAILS
21	1	MP10108	SNAP RING
22	1	MP00248	VM BALL SCREW SUPPORT
23	1	MP60225	Z - AXIS HARDSTOP BAR
24	1	MP60214	Z - AXIS WAYCOVER
25	2	HD00062	WAYCOVER SPRING



MOTOR, COUPLER & MOTOR PLATE TABLE

No.	YASKAWA	FANUC	SIEMENS	MITSUBISHI
1	MD00138 (3.0kW)	22Nm A06B-0247-B500	18Nm 1FK7100-5AF71-1FB0	MD00186 (3.5kW)
2	MD00130 (4.4kW)	30Nm A06B-0253-B500	27Nm 1FK7101-5AF71-1FB0	MD00188 (5.0kW)
3	MP60231	MP60231	SMN0009	MP60231
5	MA00249	MA00249	MA00288	MA00249

HARDWARE LIST

No.	QTY	DESCRIPTION
A	4	M12-1.75 x 35mm SHCS
B	4	M12 LOCK WASHER
C	4	M8-1.25 x 20mm SHCS
D	2	M5-.8 x 20mm SHCS
E	2	M5-.8 x 16mm BHCS
F	2	M5 FLAT WASHER
G	2	M5-.8 HEX NUT
H	4	M6-1 x 30mm SHCS
I	8	M10-1.5 x 30mm SHCS
J	1	5mm x 5mm x 15mm BALL SCREW KEY
K	8	M8-1.25 x 30mm SHCS
L	24	RAIL PLUGS
M	2	M8 LOCK WASHER
N	24	M10-1.5 x 35mm SHCS
O	2	M5-.8 x 30mm SHCS
P	4	M5-.8 x 16mm SHCS
Q	2	M5 LOCK WASHER
R	10	3/4-10 x 7 1/2 SHCS
S	2	1/4 x 1 DOWEL PIN
T	10	3/4 LOCK WASHER
U	1	M8-1.25 x 40mm BHCS
V	1	M8-1.25 HEX NUT
W	6	M8-1.25 x 40mm SHCS
X	6	M6-1 x 20mm SHCS
Y	2	M12 x 26mm DOWEL PIN
Z	2	M6 SHOULDER BOLT
AA	4	M6-1 x 10mm BHCS
BB	24	M12-1.75 x 40mm SHCS

* SIEMENS MOTOR PLATE USES:
M8-1.25 x 30mm SHCS

** ROLLER RAIL USES: AN ADDITIONAL (24)
RAIL PLUGS & (24) M12-1.75 x 40mm SHCS

Z-AXIS MANIFOLD ASSEMBLIES

No.	DRAWING No.	DESCRIPTION
14	10018050	VM Z-AXIS OIL MANIFOLD ASSEMBLY
	10008059	Z-AXIS AIR/OIL MANIFOLD ASSEMBLY

BALL SCREW, SAFETY CATCH TABLE

No.	DESCRIPTION	STANDARD	HIGH SPEED RAPID
11	OIL FITTING	NJ00154	NJ00315
12	BALL SCREW	MP00571	MP00803
16	VM SERIES CARRIER	MX00039	MX60044
17	SAFETY CATCH	MP60229	MP60243

RAIL & BLOCK TABLE

No.	DESCRIPTION	PART No.
13	BALL RAIL BLOCK	MP00728
	ROLLER RAIL BLOCK	MP00819
20	BALL RAIL	MP00727
	ROLLER RAIL	MP00818

D	UPDATE TO 25TAC62 BEARINGS	7468		03/12
C	ADD MITSUBISHI TO LIST	6308	N.M.	02/07
B	ADD ROLLER TABLE	5921	N.M.	02/05
A	ADD MOTOR, COUPLER TABLE	5731	N.M.	03/04
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 +/-

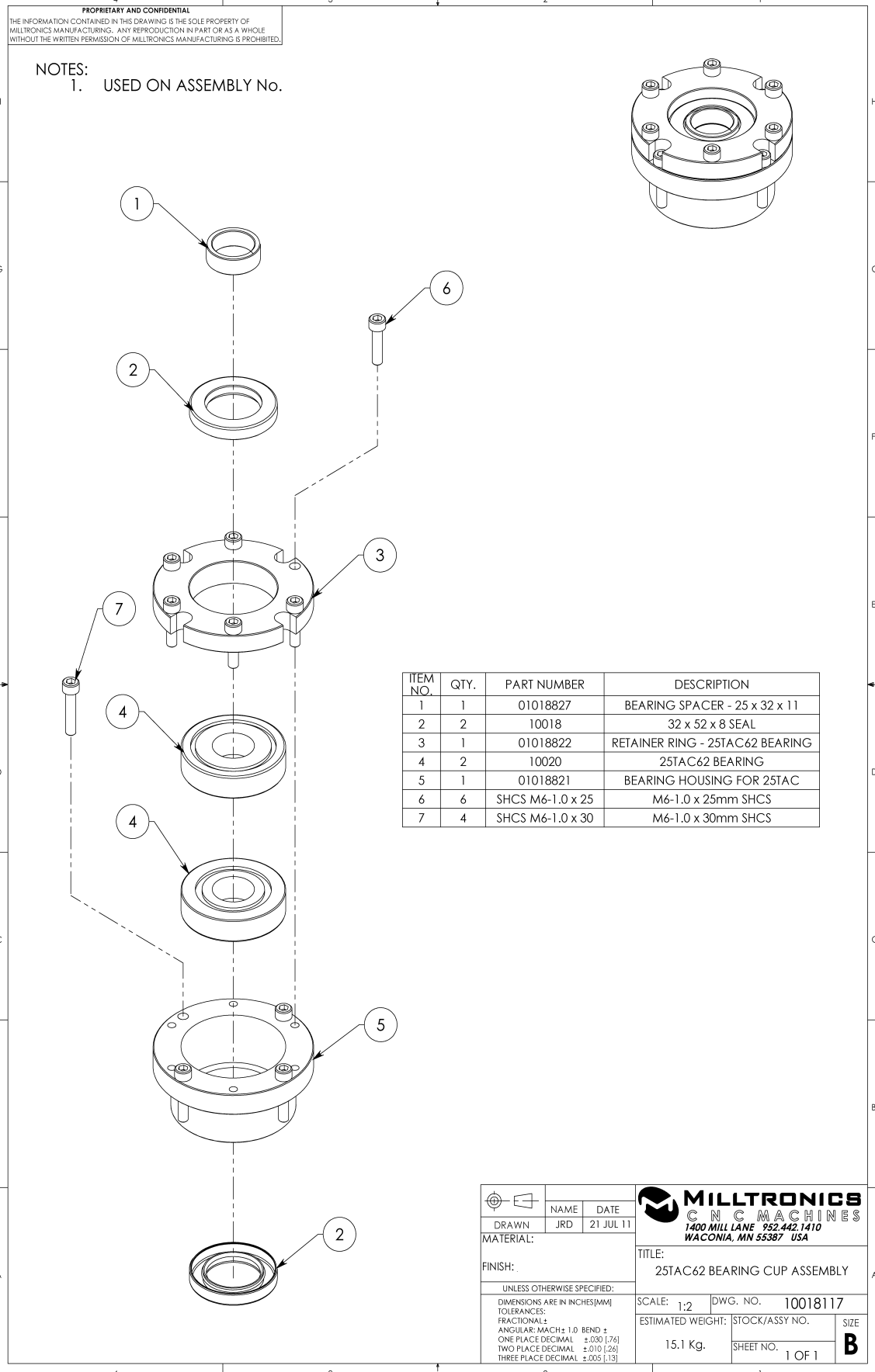


TITLE	VM30 COLUMN SUB-ASSEMBLY
APPLICATION	PARTNER VII
SCALE	20:1
DATE	07 JUL 03
DRAWN BY	DAHLKE
SHEET No.	2 OF 2

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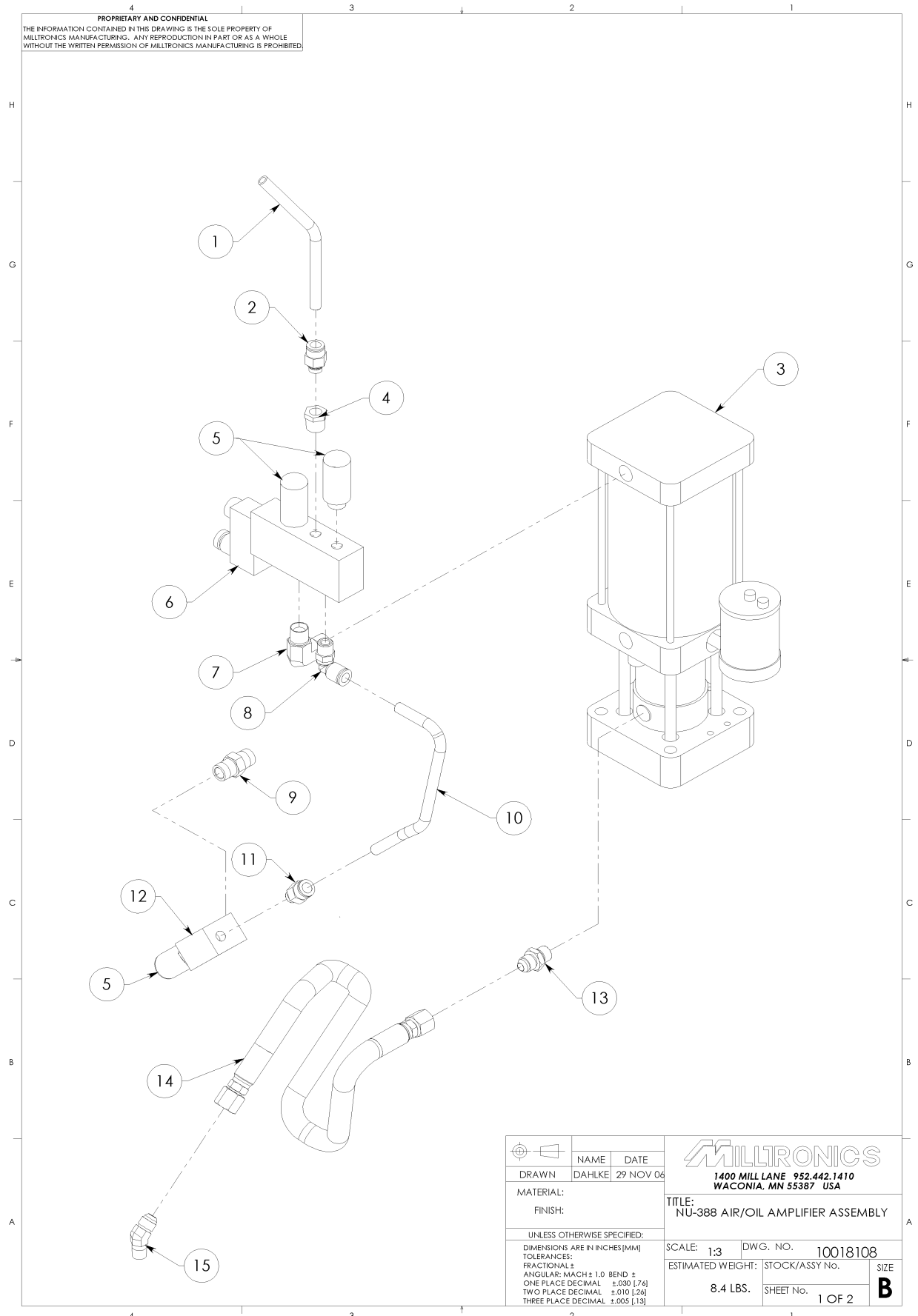
Thrust Bearing Cup Assembly (25TAC62)





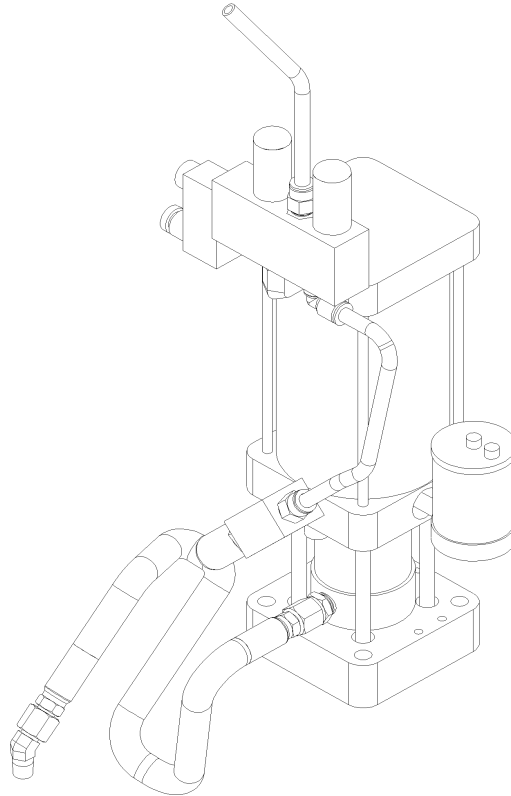
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Power Drawbar Cylinder Assembly



4 3 2 1

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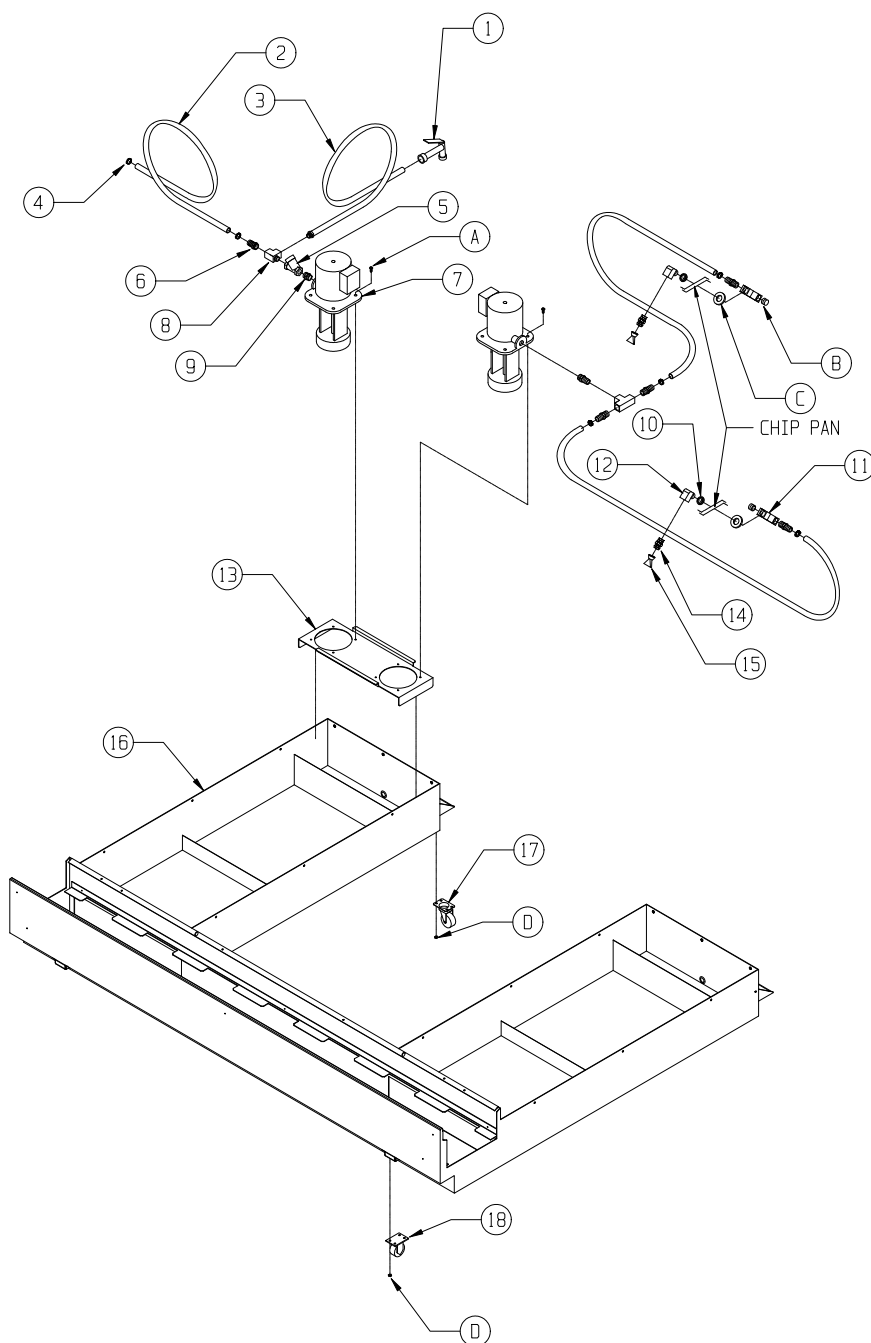


ITEM NO.	QTY	PART NO.	DESCRIPTION
1	1	NU00078	3/8 AIR LINE
2	1	NU00095	TUBE CONNECTOR - M/S 3/8 TUBE 1/4NPT
3	1	NU00408	AIR/OIL AMPLIFIER SYSTEM
4	1	NU00027	REDUCER - 3/8 x 1/4NPT
5	3	NU00375	MUFFLER
6	1	NU00293	SOLENOID VALVE
7	1	NU00292	MALE ELBOW - 3/8NPT
8	1	NU00412	SWIVEL ELBOW - M/S 10mm TUBE 3/8NPT
9	1	NU00235	NIPPLE - 3/8NPT
10	1	NU00306	10mm AIR LINE
11	1	NU00297	TUBE CONNECTOR - M/S 10mm TUBE 3/8NPT
12	1	NU00402	EXHAUST VALVE
13	1	NU00409	FLARE FITTING - 3/8NPT
14	1	NU00403	19" INLINE AMPLIFIER HOSE
15	1	NU00410	ELBOW FLARE FITTING - 1/8NPT x 45°

 DRAWN: DAHLKE DATE: 29 NOV 06	NAME: _____ DATE: _____	 1400 MILL LANE 952.442.1410 WACONIA, MN 55387 USA
	TITLE: NU-388 AIR/OIL AMPLIFIER ASSEMBLY	
MATERIAL: _____ FINISH: _____		SCALE: 1:3 DWG. NO. 10018108
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [MM] TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± 1.0 BEND ± ONE PLACE DECIMAL ±.030 [.76] TWO PLACE DECIMAL ±.010 [.25] THREE PLACE DECIMAL ±.005 [.13]		ESTIMATED WEIGHT: 8.4 LBS. STOCK/ASSY No. _____ SHEET No. 2 OF 2

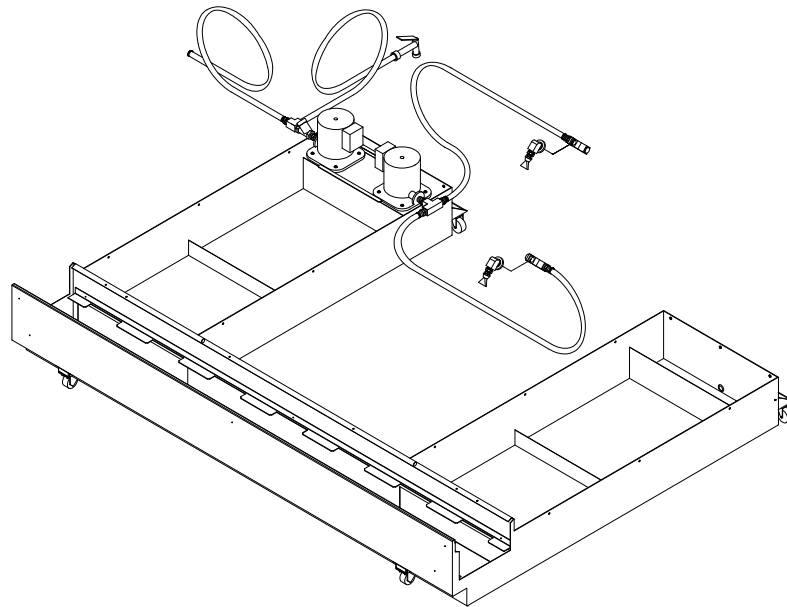
B

Coolant Tank Assembly



A	ONE PIECE COOLANT TANK	6017		11/05
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 VM22,25,30 FLOOD TANK W/WASHDOWN ASSEMBLY		
X,XXX ±		APPLICATION GENERAL PRODUCTS		
X,XX ±		SCALE 15:1		
X,X ±		DATE 18 DEC 03		
ANGLE ±		DRAWN BY DAHLKE		
		SHEET No. 1 OF 2		

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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	MP-755	COOLANT PUMP MOUNTING PLATE
14	2	NU-176	1/2" CONNECTOR
15	2	NU-175	1 1/4" FLARE NOZZLE
16	1	MP-808	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 NYLOCK HEX NUT

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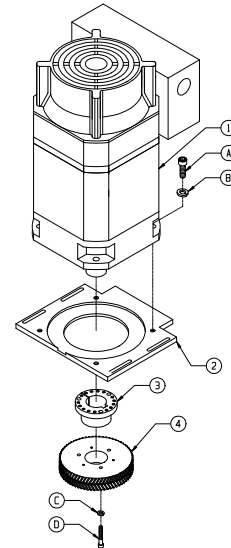
A	ONE PIECE COOLANT TANK		6017	11/05	
REV.	DESCRIPTION OF CHANGE		E.C.O. No.	APP'D BY	DATE
MATERIAL/FINISH			 1400 MILL LANE 952-442-1410 WACONIA, MN 55387 USA		
STOCK/ASSY No.					
TOLERANCE UNLESS SPECIFIED			TITLE VM22,25,30 FLOOD TANK W/WASHDOWN ASSEMBLY		
X.XXX ±			APPLICATION GENERAL PRODUCTS		
X.XX ±			SCALE 15:1		
X.X ±			DATE 18 DEC 03		
ANGLE ±			DRAWN BY DAHLKE		
			SHEET No. 2 OF 2		



Spindle Motor and Pulley Assembly

SPINDLE MOTORS		
No.	STOCK No.	DESCRIPTION
1	MD00121	18 kW UAASKD-19LYA41 - YASKAWA
	MD00132	11 kW UAASKD-11LYA41 - YASKAWA
	MD00131	7.5 kW UAASKD-08LYA21 - YASKAWA
	MD00114	7.5 kW UAASKA-08FZ1 - YASKAWA
	MD00150	11 kW UAASKA-11LYA31 - YASKAWA
	FANUC	8 kW A06B-1407-B103
	FANUC	12 kW A06B-1428-B103
	FANUC	22 kW A06B-1451-B113
	FANUC	8 kW A06B-1477-B133
	FANUC	15 kW A06B-1479-B133
	SIEMENS	11 kW 1PH7131-2QF02-OLKO
	SIEMENS	12 kW 1PH7163-2QB03-OLKO
	SIEMENS	16 kW 1PH7167-2QB03-OLKO
	SIEMENS	7.5 kW 1PM6105-2LF81-1AR1-Z
	SIEMENS	11 kW 1PM6133-2LF81-1AR1-Z
	SIEMENS	18.5 kW 1PM6137-2LF81-1AR1-Z

MOTOR PLATES		
No.	STOCK No.	DESCRIPTION
2	MP00548	MD00121 & MD00131 & MD00132 - YASKAWA 12 kW & 22 kW - FANUC
	MP00587	MD00114 & MD00150 - YASKAWA (8 kW - FANUC)
	MPB0045	MD00114 & MD00150 - YASKAWA (BRIDGE MILL ONLY)
	MPB0040	MD00131 & MD00132 - YASKAWA (BRIDGE MILL ONLY)
	SMN0008	11 kW - SIEMENS
	SMN0061	7.5 kW - SIEMENS & 8 kW - FANUC
	SMN0062	11 kW & 18.5 kW - SIEMENS
	MPTT045	15 kW - FANUC



BUSHINGS		
No.	STOCK No.	DESCRIPTION
3	PY00097	48mm ID SK BUSHING(USED WITH MD00121, MD00131, MD00132, MD00150 - YASKAWA) (8 kW & 12 kW - FANUC)
	PY00184	32mm ID SK BUSHING(USED WITH MD00114 - YASKAWA)
	PY00215	55mm ID SK BUSHING(USED WITH 16 kW - SIEMENS & 22 kW - FANUC)
	PY00216	38mm ID SK BUSHING(USED WITH 7.5 kW - SIEMENS & 8 kW - FANUC)
	PY00217	42mm ID SK BUSHING(USED WITH 11 kW & 18.5 kW - SIEMENS)
	PY00280	TLK 110-48-62 BUSHING (USED ON 50 TAPER MACHINES)

SPINDLE MOTOR PULLEYS									
No.	RPM	7.5 kW MD00114	11 kW MD00150	7.5 kW MD00131	11 kW MD00132	18 kW MD00121	FANUC	SIEMENS	50 TAPER
4	6K/8K	PY00201	PY00201	PY00192	PY00192	PY00192	PY00192	PY00192	PY00281
	12K/15K	PY00188	PY00188	PY00188	PY00188	PY00188	PY00188	PY00188	-

PARTS LIST			
No.	QTY	STOCK No.	DESCRIPTION
1	1	SEE TABLE	SPINDLE MOTORS
2	1	SEE TABLE	MOTOR PLATES
3	1	SEE TABLE	BUSHINGS
4	1	SEE TABLE	SPINDLE MOTOR PULLEYS

HARDWARE LIST		
No.	QTY	DESCRIPTION
A	4	1/2-13 x 1 1/4 SHCS
B	4	1/2 LOCK WASHER
C	3	5/16 LOCK WASHER
D	3	5/16-18 x 2 SHCS

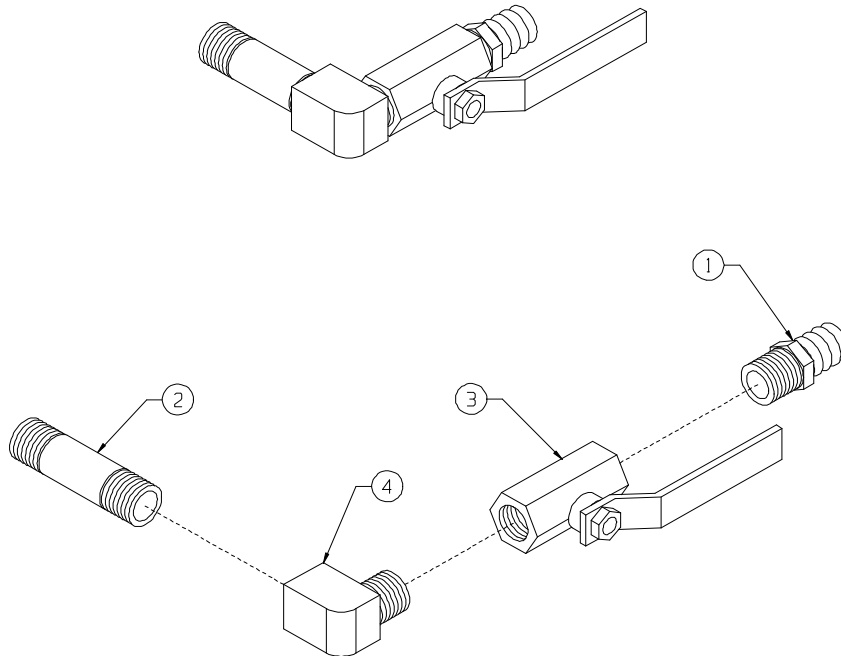
J	ADD 50 TAPER TO CHART	7078		05/11
I	ADD FANUC/SIEMENS TO CHART	6314	N.M.	03/07
H	EDIT CHART	5953	N.M.	05/05
G	ADD MD00150	5826	N.M.	11/04
F	MODIFY CHART	5697	N.M.	01/04
E	ADD MD00121 MOTOR	5509	N.M.	03/03
D	CHANGE 15 HP SPINDLE MOTOR	5257	N.M.	02/02
C	CHANGE MOTOR/PULLEY CHARTS	5251	N.M.	02/02
B	CHANGE 6K & 8K MOTOR PULLEY	5197	N.M.	12/01
A	ADD MOTOR PLATE TO CHART	5058	N.M.	04/01
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 GOODYEAR MOTOR AND PULLEY ASSEMBLY	
TOLERANCE UNLESS SPECIFIED		APPLICATION GENERAL PRODUCTS	
X .XXX ±		SCALE 10:1 DWG No 6-10-018-089 SIZE B	
X .XX ±		DATE 04 AUG 00 DRAWN BY DAHLKE SHEET NO. 1 OF 1	
X .X ±			
ANGLE ±			

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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	NU-66	3/4" BARB FITTING
2	1	NU-257	3 IN. PIPE NIPPLE
3	1	NU-64	1/2" BRASS BALL VALVE
4	1	NU-125	STREET ELBOW

B	CHANGE PIPE NIPPLE	4778		11/00
A	CHANGE PIPE NIPPLE	3851	N.M.	2/99
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 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 ±				

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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

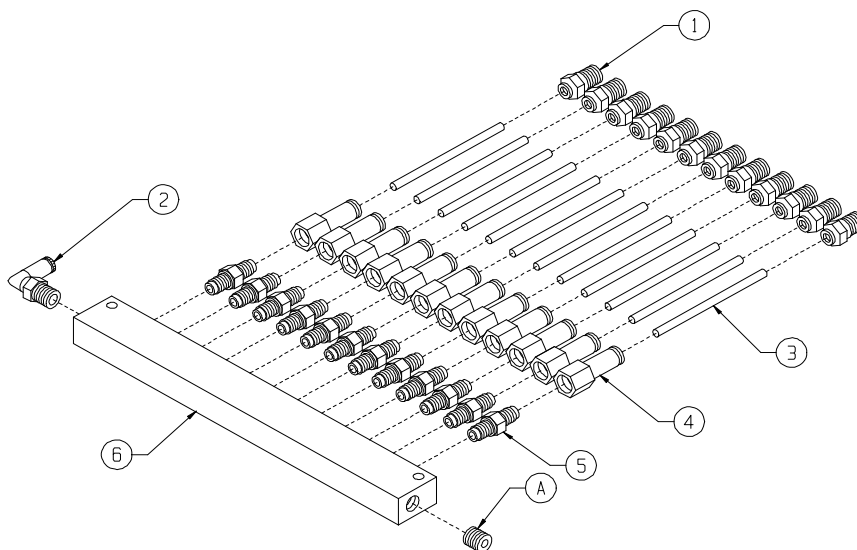
All 8200 versions have the functionality. 7200 version 77401 or higher is required to have the functionality.

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

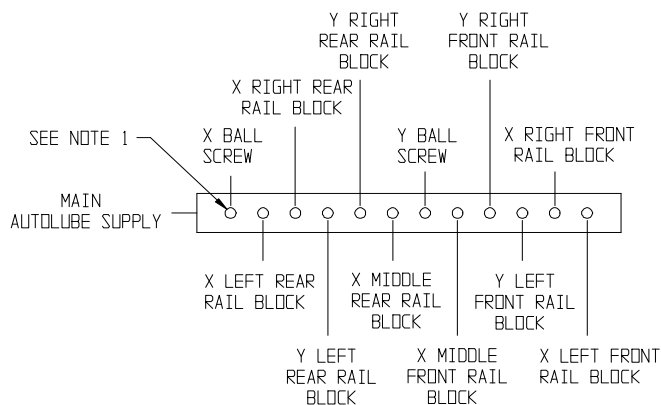


X & Y Axis Autolube Manifold Assembly – 50"



NOTES:

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

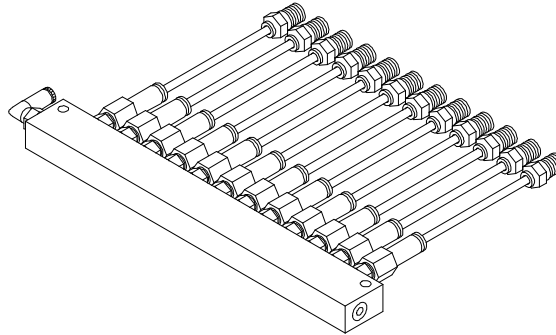


AUTOLUBE LINE DESTINATIONS

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		TITLE X & Y AXIS AUTOLUBE MANIFOLD ASSEMBLY		
X .XXX ±		APPLICATION GENERAL PRODUCTS		
X .XX ±		SCALE 2:1 DWG No 6-10-018-049 SIZE B		
X .X ±		DATE 25 JUL 97 DRAWN BY THOMPSON SHEET NO. 1 OF 2		
ANGLE ±				

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*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

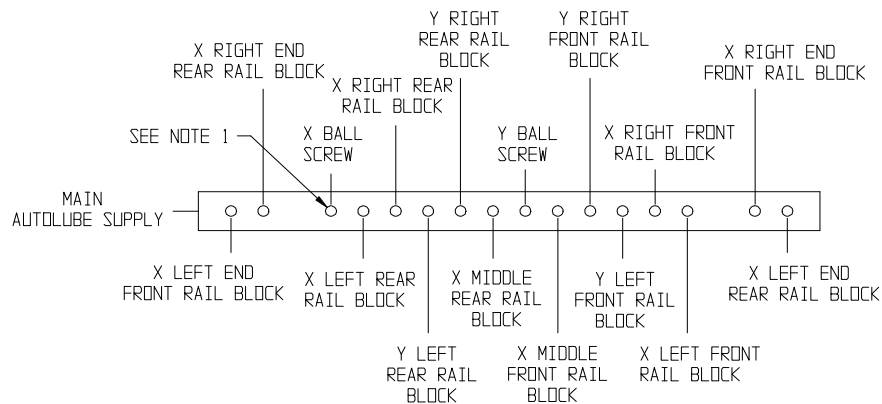
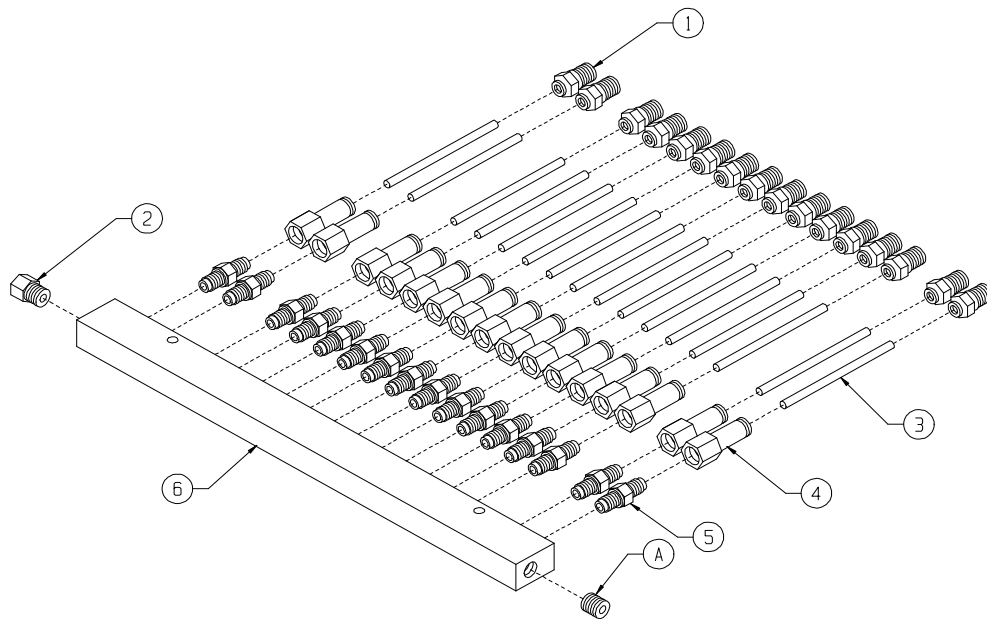
HARDWARE LIST

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.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. 2 OF 2

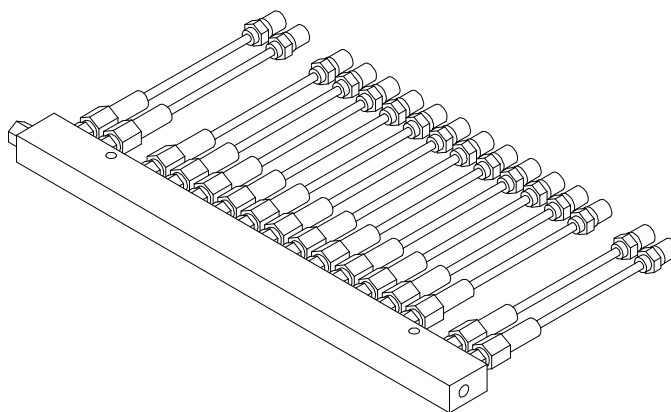
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X & Y Axis Autolube Manifold Assembly – 60”



AUTOLUBE LINE DESTINATIONS

A	CHANGE TABLE	6059	01/06	
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 X & Y AXIS 16 PORT AUTOLUBE MANIFOLD ASSEMBLY		
X.XXX ±		APPLICATION GENERAL PRODUCTS		
X.XX ±		SCALE 2:1 DWG No 6-10-018-106 SIZE B		
X.X ±		DATE 17 JUN 05 DRAWN BY DAHLKE SHEET NO. 1 OF 2		
ANGLE ±				


PARTS LIST

No.	QUANTITY	STOCK No.	DESCRIPTION
1	16	NU-154	5/32 TUBE 1/8 NPT M/S
2	1	NU-110	1/8 NPT-M8-1 OIL FITTING
3	SEE TABLE	NU-117	5/32 NYLON TUBING
4	16	NU-157	5/32 TUBE-1/8 NPT FEM.
5	-	SEE TABLE	OIL METER
6	1	MP7-95	X & Y AIR/OIL LUBE MANIFOLD

NU-117 TUBING LENGTH		OIL METER	
CONNECTION	VM25/30(60)		
X LEFT REAR END RAIL BLOCK	18	#3	Oil meter part numbers #2 = NU-155 #3 = NU-156
X RIGHT REAR END RAIL BLOCK	73	#3	
X LEFT REAR RAIL BLOCK	32	#3	
X RIGHT REAR RAIL BLOCK	60	#3	
Y LEFT REAR RAIL BLOCK	25	#3	
Y RIGHT REAR RAIL BLOCK	55	#3	
X MIDDLE REAR RAIL BLOCK	46	#3	
Y BALL SCREW	42	#2	
X MIDDLE FRONT RAIL BLOCK	46	#3	
Y RIGHT FRONT RAIL BLOCK	55	#3	
Y LEFT FRONT RAIL BLOCK	25	#3	
X RIGHT FRONT RAIL BLOCK	60	#3	
X LEFT FRONT RAIL BLOCK	32	#3	
X BALL SCREW	60	#2	
X RIGHT FRONT END RAIL BLOCK	73	#3	
X LEFT FRONT END RAIL BLOCK	18	#3	

ALL MEASUREMENTS ARE IN INCHES

HARDWARE LIST

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

A	CHANGE TABLE	6059		01/06
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 X & Y AXIS 16 PORT AUTOLUBE MANIFOLD ASSEMBLY		
TOLERANCE UNLESS SPECIFIED		APPLICATION GENERAL PRODUCTS		
X .XXX		SCALE 2:1 DWG No. 6-10-018-106 SIZE B		
X .XX		DATE 17 JUN 05		
X .X		DRAWN BY DAHLKE		
ANGLE		SHEET NO. 2 OF 2		

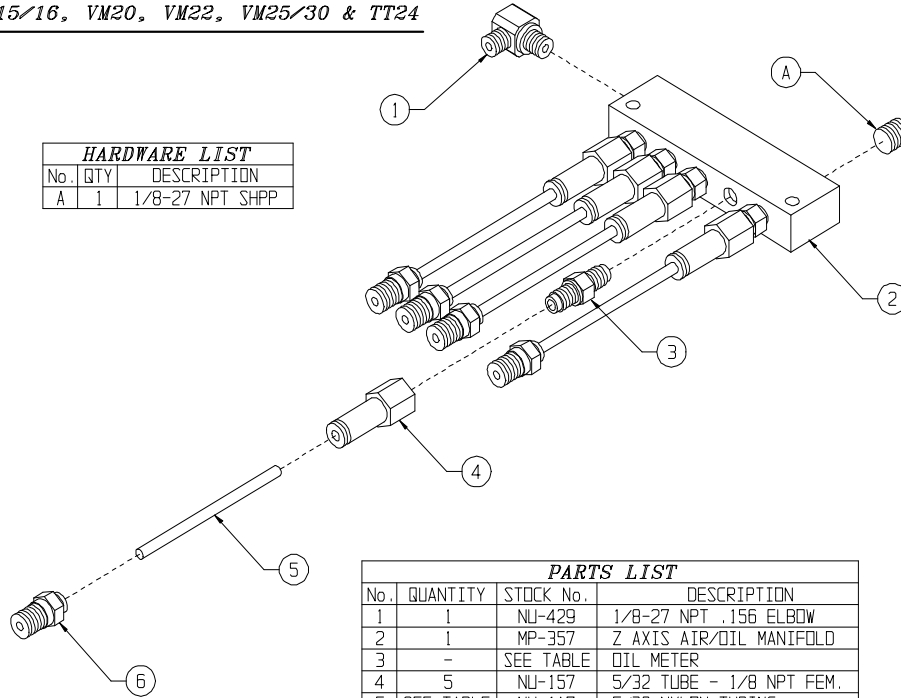
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Z-Axis Autolube Manifold Assembly

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

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



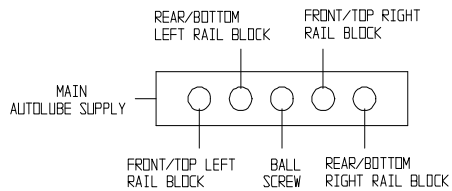
PARTS LIST			
No.	QUANTITY	STOCK No.	DESCRIPTION
1	1	NU-429	1/8-27 NPT .156 ELBOW
2	1	MP-357	Z AXIS AIR/OIL MANIFOLD
3	-	SEE TABLE	OIL METER
4	5	NU-157	5/32 TUBE - 1/8 NPT FEM.
5	SEE TABLE	NU-117	5/32 NYLON TUBING
6	5	SEE TABLE	5/32 TUBE-1/8 NPT M/S

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



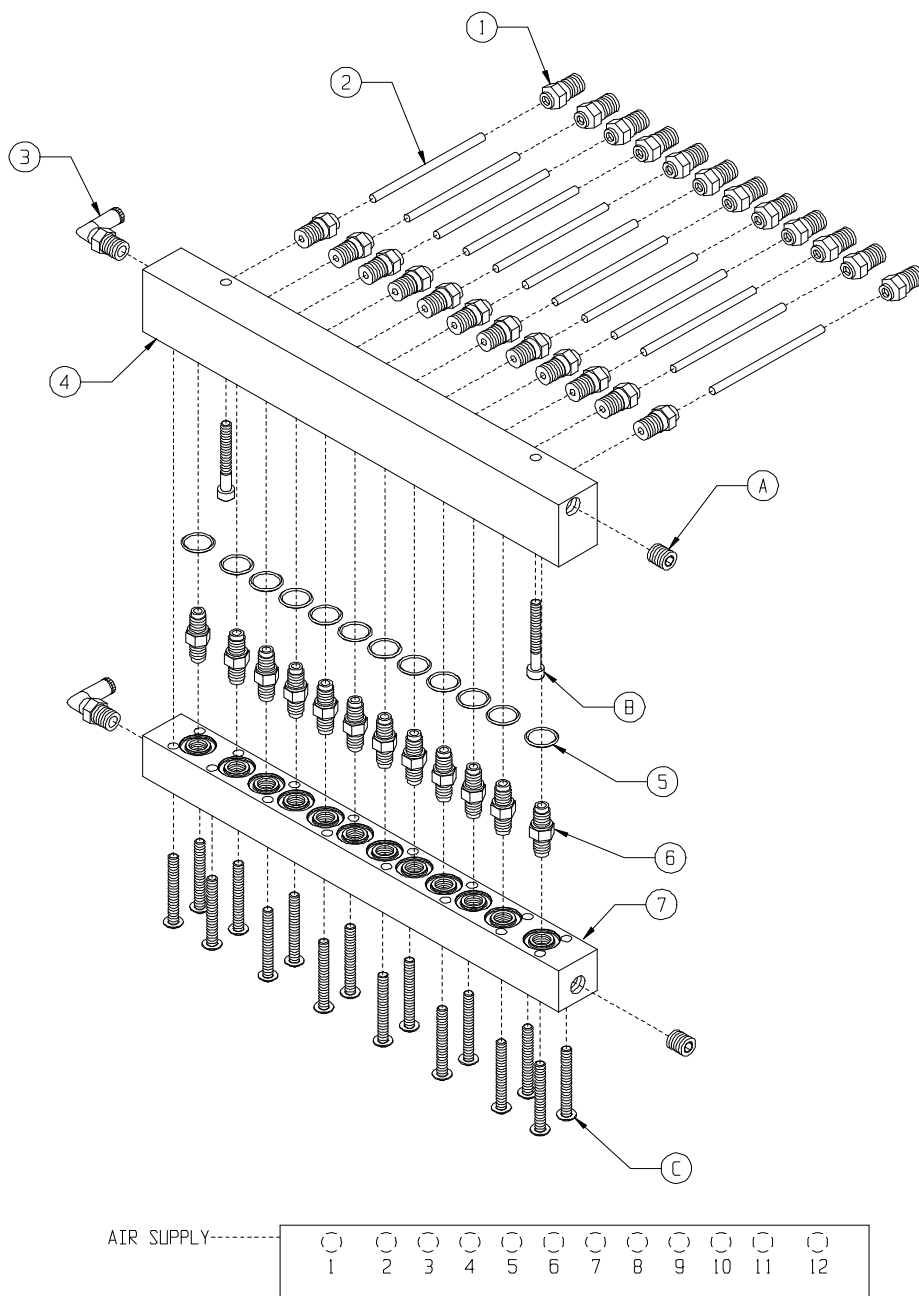
NOTES:

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.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 5 PORT AUTOLUBE MANIFOLD ASSEMBLY		
X. XXX ±		APPLICATION GENERAL PRODUCTS		
X. XX ±		SCALE 1.5:1 DWG No. 6-10-018-050 SIZE B		
X. X ±		DATE 20 AUG 97 DRAWN BY THOMPSON SHEET NO. 1 OF 1		
ANGLE ±				

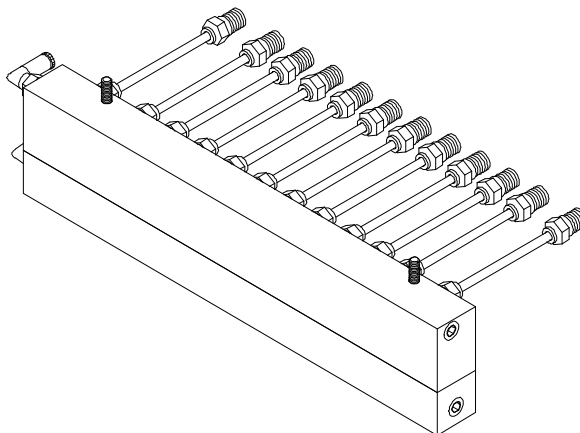
X & Y Axis Air/Oil Manifold Assembly – 50"



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	SIZE B
X .X +/- .030		DATE 10 JUN 99	DRAWN BY HERME	SHEET No. 1 OF 2
ANGLE +/- 1.0°				

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:

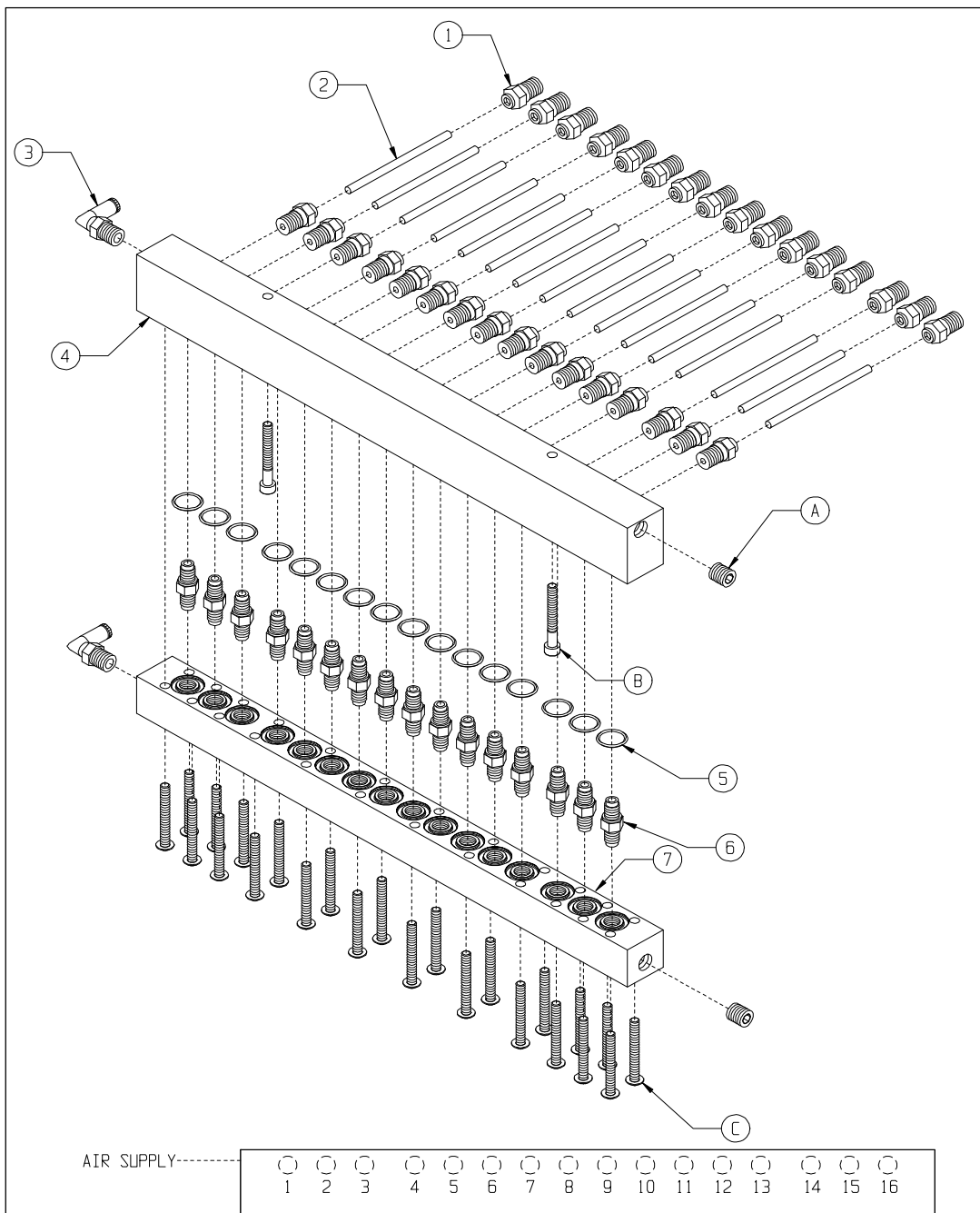
- IF REFERENCED WITH A (-) PLUG
AIR/OIL LINE HOLE AND OIL METER
HOLE IN MANIFOLD WITH 1/8 NPT PLUG.

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°				

X & Y Axis Air/Oil Manifold Assembly – 60"

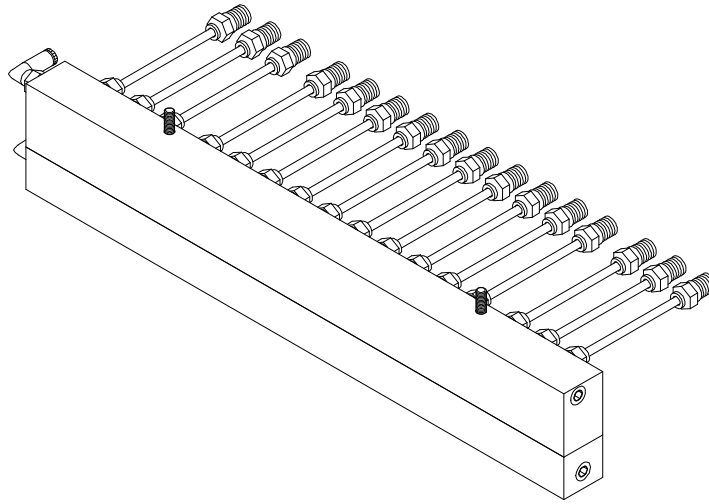


AIR/OIL LINE DESTINATIONS

No.	RAIL BLOCK/BALL SCREW
1	X LEFT END FRONT RAIL BLOCK
2	X RIGHT END FRONT RAIL BLOCK
3	X BALL SCREW
4	X LEFT REAR RAIL BLOCK
5	X RIGHT REAR RAIL BLOCK
6	Y LEFT REAR RAIL BLOCK
7	Y RIGHT REAR RAIL BLOCK
8	X MIDDLE REAR RAIL BLOCK
9	Y BALL SCREW
10	X MIDDLE FRONT RAIL BLOCK
11	Y RIGHT FRONT RAIL BLOCK
12	Y LEFT FRONT RAIL BLOCK
13	X RIGHT FRONT RAIL BLOCK
14	X LEFT FRONT RAIL BLOCK
15	X RIGHT END FRONT RAIL BLOCK
16	X LEFT END FRONT RAIL BLOCK

REV.	DESCRIPTION OF CHANGE	E.C.D. 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 X & Y AXIS AIR/OIL MANIFOLD ASSEMBLY		
X,XXX	+/- .005	APPLICATION PARTNER VII		
X,XX	+/- .010	SCALE 2:1	DWG No 6-10-020-027	SIZE B
X,X	+/- .030	DATE 07 SEP 05	DRAWN BY DAHLKE	SHEET No. 1 OF 2
ANGLE	+/- 1.0°			

THIS ASSEMBLY IS USED ON VM25/30(60) WITH 60" TRAVEL



PARTS LIST

PARTS LIST			
No.	QUANTITY	STOCK No.	DESCRIPTION
1	32	NJ-154	5/32 TUBE 1/8 NPT M/S
2	SEE TABLE	NJ-117	5/32 NYLON TUBING
3	2	NJ-161	ELBOW - SWIVEL 5/32 TUBE 1/8 NPT
4	1	MP7-098	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	MP7-099	16 PORT 1/8 NPT MANIFOLD - OIL

NU-117 TUBING LENGTH

NU-117 TUBING LENGTH		
	VM25/30(60)	OIL METER
X LEFT REAR END RAIL BLOCK	18	#3 (NU-156)
X RIGHT REAR END RAIL BLOCK	73	#3 (NU-156)
X LEFT REAR RAIL BLOCK	32	#3 (NU-156)
X RIGHT REAR RAIL BLOCK	60	#3 (NU-156)
Y LEFT REAR RAIL BLOCK	25	#3 (NU-156)
Y RIGHT REAR RAIL BLOCK	55	#3 (NU-156)
X MIDDLE REAR RAIL BLOCK	46	#3 (NU-156)
Y BALL SCREW	42	#2 (NU-155)
X MIDDLE FRONT RAIL BLOCK	46	#3 (NU-156)
Y RIGHT FRONT RAIL BLOCK	55	#3 (NU-156)
Y LEFT FRONT RAIL BLOCK	25	#3 (NU-156)
X RIGHT FRONT RAIL BLOCK	60	#3 (NU-156)
X LEFT FRONT RAIL BLOCK	32	#3 (NU-156)
X BALL SCREW	60	#2 (NU-155)
X LEFT FRONT END RAIL BLOCK	73	#3 (NU-156)
X RIGHT FRONT END RAIL BLOCK	18	#3 (NU-156)

ALL MEASUREMENTS ARE IN INCHES

NOTES:

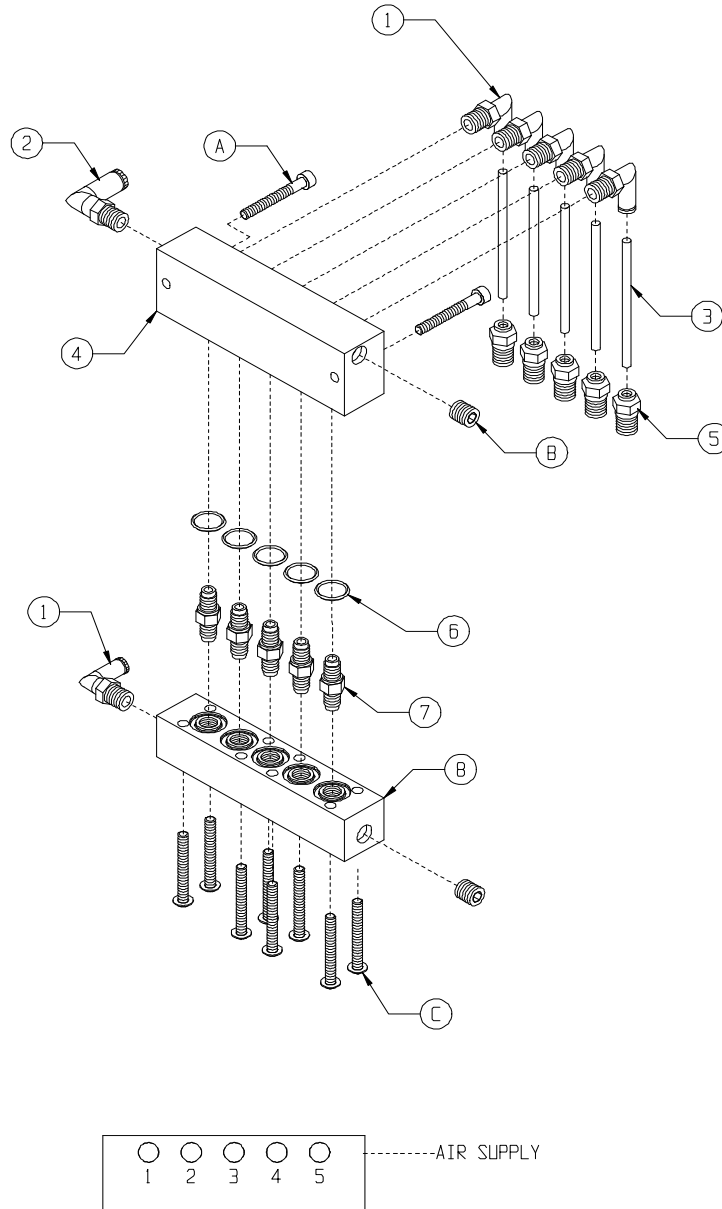
1. IF REFERENCED WITH A (-) PLUG
AIR/OIL LINE HOLE AND OIL METER
HOLE IN MANIFOLD WITH 1/8 NPT PLUG.

HARDWARE LIST

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

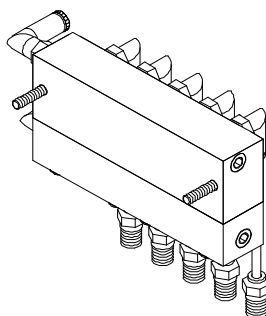
REV.	DESCRIPTION OF CHANGE	E.C.D. No.	APP'D BY	DATE
MATERIAL/FINISH		 MILLTRONICS 1400 MILL LANE 952-442-1410 WACONIA, MN 55387 USA		
STOCK/ASSY No.		TITLE X & Y AXIS AIR/OIL MANIFOLD ASSEMBLY APPLICATION PARTNER VII		
TOLERANCE UNLESS SPECIFIED X .XXX +/- .005 X .XX +/- .010 X .X +/- .030 ANGLE +/- 1.0°		SCALE 2:1 DWG No. 6-10-020-027 SIZE B DATE 07 SEP 05 DRAWN BY DAHI KE SHEET No. 2 OF 2		

Z Axis Air/Oil Manifold Assembly



AIR/OIL LINE DESTINATIONS	
No.	RAIL BLOCK/BALL SCREW
1	Z RIGHT UPPER RAIL BLOCK
2	Z RIGHT LOWER RAIL BLOCK
3	Z BALL SCREW
4	Z LEFT LOWER RAIL BLOCK
5	Z LEFT UPPER RAIL BLOCK

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.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 AIR/OIL MANIFOLD ASSEMBLY		
X.XXX +/- .005		APPLICATION PARTNER I		
X.XX +/- .010		SCALE 2:1		DWG No. 6-10-008-059
X.X +/- .030				SIZE B
ANGLE +/- 1.0°		DATE 11 JUN 99		DRAWN BY HERME
				SHEET No. 1 OF 2


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	MPI-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

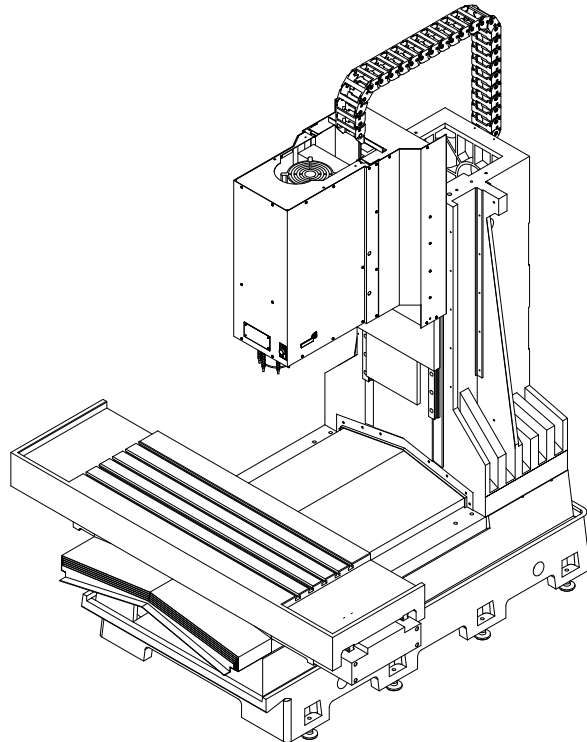
D	CHANGE TO ALL FRAMES	6002		11/05
C	REMOVED VMG24	4987	N.M.	2/01
B	ADD VMG24 NOTE	4338	N.M.	1/00
A	UPDATED TUBE LENGTHS	4077	N.M.	7/99
REV.	DESCRIPTION OF CHANGE	E.C.O. No.	APP'D BY	DATE
MATERIAL/FINISH		 1400 MILL LANE 952-442-1410 WACONIA, MN 55387 USA		
STOCK/ASSY No.				
TOLERANCE UNLESS SPECIFIED		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°				



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 / DILER 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, SUNOCO 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	5681		12/03
E	CHANGED HEAD COVERS	5030	N.M.	4/01
D	ADD DTE 24 TABLE	4704	N.M.	10/00
C	UPDATE TO VM30-D	3946	N.M.	4/99
B	CHANGE GREASE SPECS.	3413	N.M.	2/98
A	UPDATE DRAWING	3168	N.M.	7/97
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 LUBRICATION DRAWING		
X.XXX	±	APPLICATION PARTNER VII		SIZE B
X.XX	±	SCALE 20:1	DWG No. 6-11-020-007	
X.X	±	DATE 07 JUN 95	DRAWN BY THOMPSON	
ANGLE	±	SHEET NO. 1 OF 2		

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, ng D 2882 (MOD)	-
CMCO, P-SPEC, APPROVAL	P-47
BIJUR PT 37-1 APPROVAL	PASS
OKUMA APPROVAL	PASS

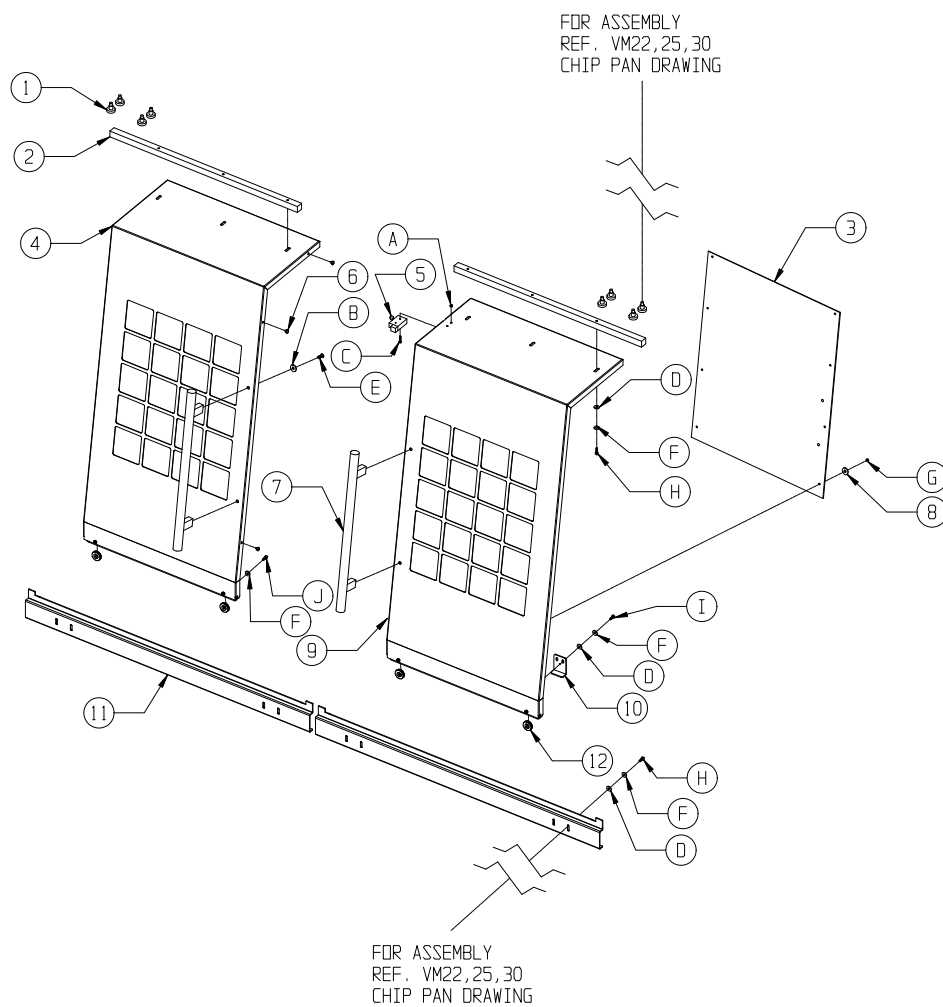
MOBIL DTE 24

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 PASSED DIN 51534	12

F	CHANGE FRAME	5681		12/03
E	CHANGED HEAD COVERS	5030	N.M.	4/01
D	ADD DTE 24 TABLE	4704	N.M.	10/00
C	UPDATE TO VM30-D	3946	N.M.	4/99
B	CHANGE GREASE SPECS.	3413	N.M.	2/98
A	UPDATE DRAWING	3168	N.M.	7/97

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 ±  1400 MILL LANE 952-442-1410 WACONIA, MN 55387 USA				
TITLE LUBRICATION DRAWING APPLICATION PARTNER VII SCALE 15:1 DATE 07 JUN 97 DRAWN BY THOMPSON SHEET NO. 2 OF 2 DWG No. 6-11-020-007 SIZE B				

Chip Pan Door Assembly



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

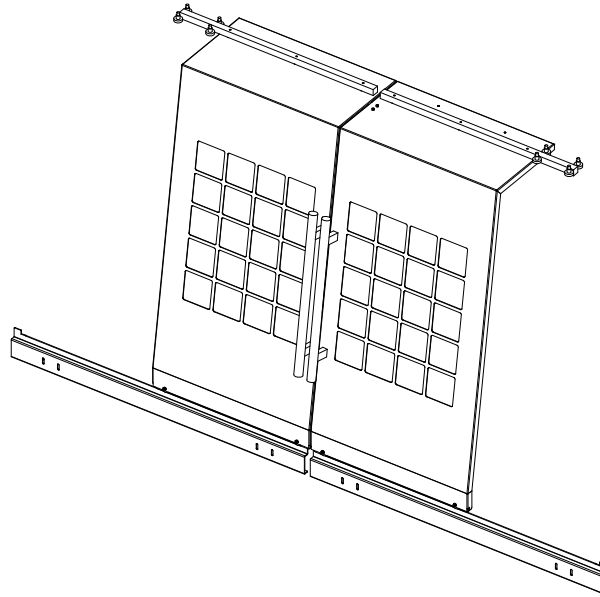
TITLE VM22,25,30 DOOR ASSEMBLY

APPLICATION GENERAL PRODUCTS

SCALE 15:1 DWG No. 6-10-018-103 SIZE B

DATE 11 DEC 03 DRAWN BY DAHLKE SHEET No. 1 OF 2

CERTAIN INFORMATION CONTAINED HEREIN THE EXCLUSIVE PROPERTY OF MILLTRONICS 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 MILLTRONICS MFG. CO.


PARTS LIST

No.	QTY	STOCK No.	DESCRIPTION
1	8	BG-100	CHIP PAN BEARING
2	2	MP6-224	UPPER DOOR RAIL
3	2	MP6-163	LEXAN
4	1	MP-746	LEFT FRONT DOOR
5	1	SW-194	NON-LOCKING AUGER SWITCH
6	3	WX-310	BUMPER
7	2	WX-297	HANDLE
8	16	HD-58	M5 RUBBERIZED WASHER
9	1	MP-745	RIGHT FRONT DOOR
10	4	MP-748	DOOR STOP
11	2	MP-747	LOWER TRACK
12	4	BG-56	ROLLER BEARING

HARDWARE LIST

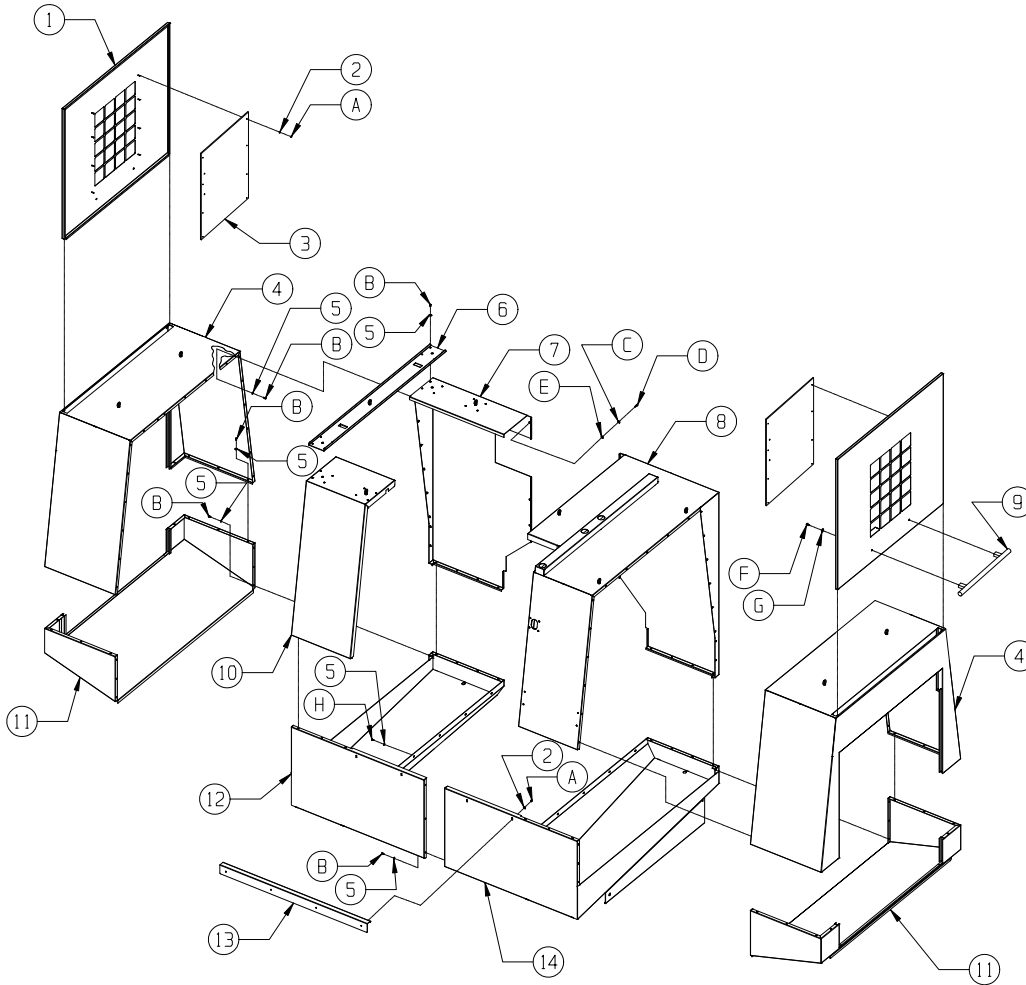
No.	QTY	DESCRIPTION
A	2	M4 NYLOCK NUT
B	4	M8 FLAT WASHER
C	2	M4-.7 x 30mm BHCS
D	26	M6 FLAT WASHER
E	4	M8-1.25 x 20mm BHCS
F	30	M6 LOCK WASHER
G	16	M5 NYLOCK NUT
H	14	M6-1 x 20mm SHCS
I	12	M6-1 x 16mm BHCS
J	4	M6-1 x 20mm BHCS

REV.	DESCRIPTION OF CHANGE	E.C.D. 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 VM22, 25, 30 DOOR ASSEMBLY		
X .XXX ±		APPLICATION GENERAL PRODUCTS		
X .XX ±		SCALE 15:1 DWG No. 6-10-018-103 SIZE B		
X .X ±		DATE 11 DEC 03 DRAWN BY DAHLKE SHEET No. 2 OF 2		
ANGLE ±				

CERTAIN INFORMATION CONTAINED HEREIN THE EXCLUSIVE PROPERTY OF MILLTRONICS 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 MILLTRONICS MFG. CO.

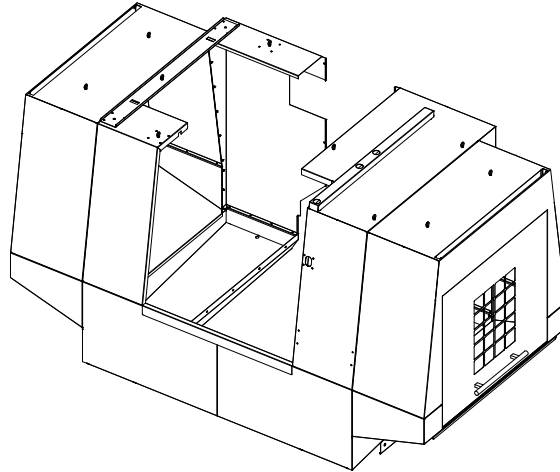


Chip Pan Assembly



A	ADD 60" ENDS TO CHART		6054	01/06	
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 VM22/25/30 CHIP PAN		
X .XXX +/-			APPLICATION GENRAL PRODUCTS		
X .XX +/-			SCALE 30:1		DWG No. 6-10-018-102 SIZE B
X .X +/-			DATE 04 DEC 03		DRAWN BY DAHLKE
ANGLE +/-					SHEET No. 1 OF 2

CERTAIN INFORMATION CONTAINED HEREIN THE EXCLUSIVE PROPERTY OF MILLTRONICS 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 MILLTRONICS MFG. CO.



PARTS LIST

No.	QTY	STOCK No.	DESCRIPTION
1	2	MP-749	SIDE DOOR
2	20	HD-58	M5 RUBBERIZED WASHER
3	2	MP6-163	LEXAN
4	2	SEE TABLE	ENCLOSURE END - TOP
5	97	HD-12	M6 RUBBERIZED WASHER
6	1	MP-742	TOP STIFFENER
7	1	MP-741	REAR PANEL - LEFT
8	1	MP-738	TOP PAN - RIGHT
9	2	WX-297	HANDLE
10	1	MP-740	FRONT PANEL - LEFT
11	2	SEE TABLE	ENCLOSURE END - BOTTOM
12	1	MP-739	BOTTOM PAN - LEFT
13	1	MP-754	FRONT DOOR LEDGE
14	1	MP-737	BOTTOM PAN - RIGHT

HARDWARE LIST

No.	QTY	DESCRIPTION
A	20	M5-.8 NYLOCK NUT
B	87	M6-1 x 12mm BHCS
C	8	M6 LOCK WASHER
D	8	M6-1 x 20mm SHCS
E	8	M6 FLAT WASHER
F	4	M8-1.25 x 20mm BHCS
G	4	M8 FLAT WASHER
H	10	M6-1 x 16mm BHCS

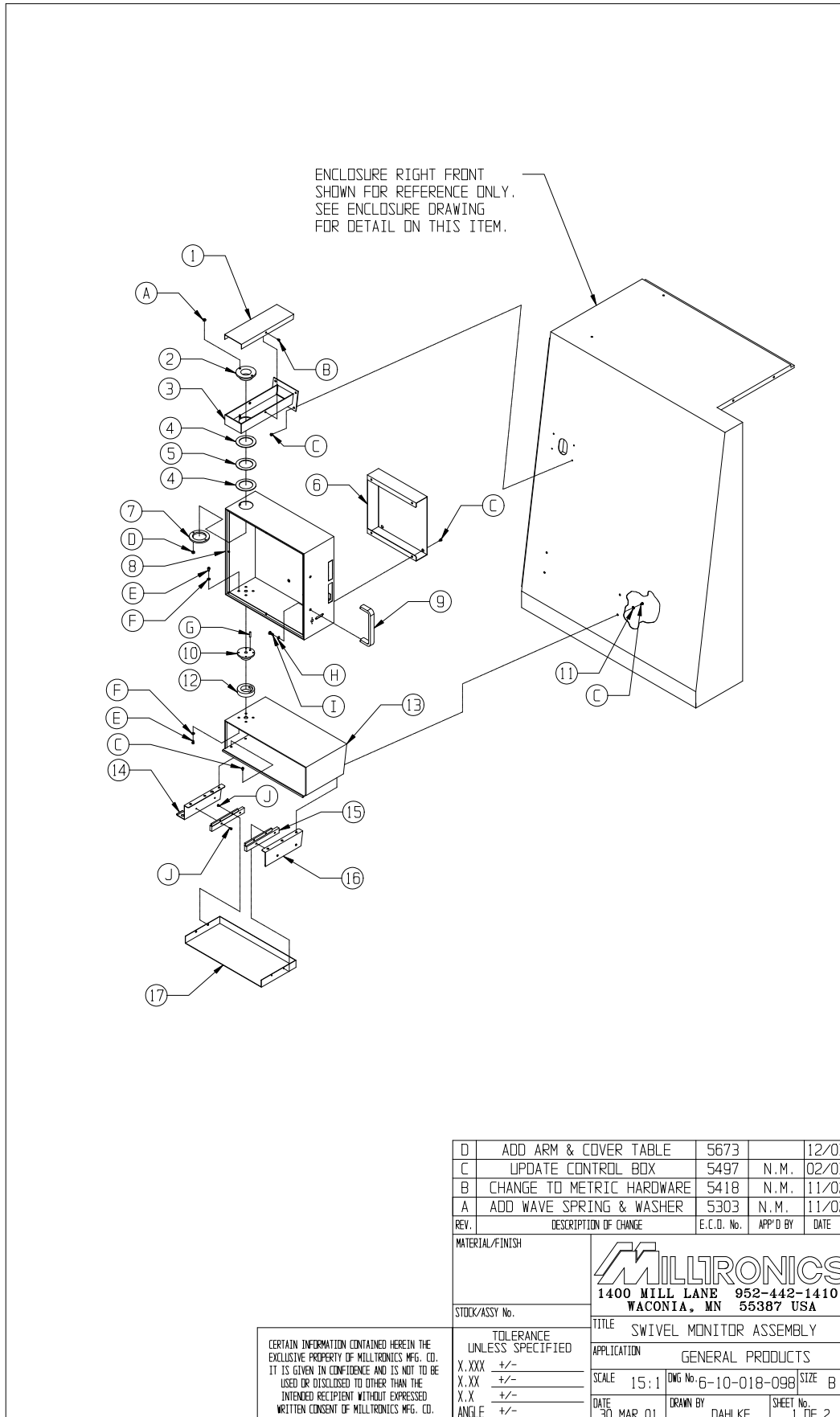
ENCLOSURE END TABLE

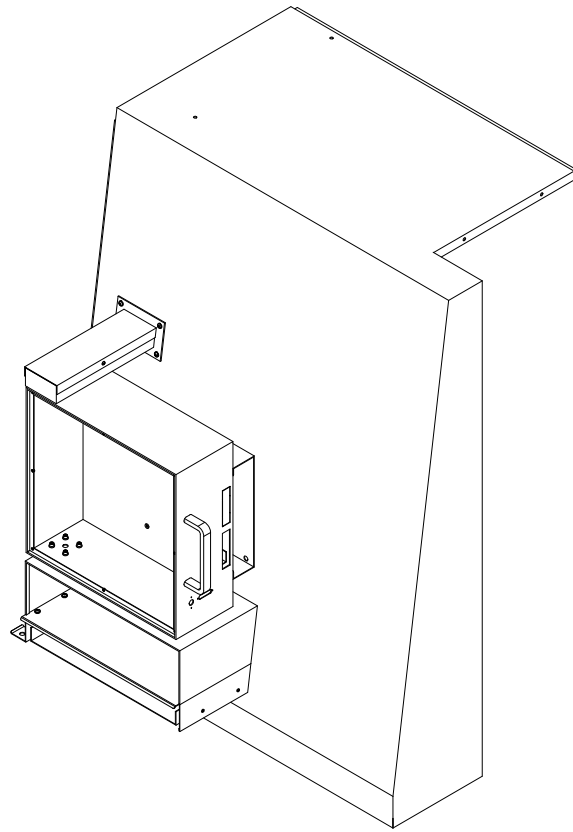
No.	VM22	VM25/30 (50"X)	VM25/30 (60"X)			
4	MP6-235	MP-744	TOP	LEFT	RIGHT	END
			MP7-88	MP7-90	MP7-91	MP7-92
11	MP6-236	MP-743	MP7-89			

A	ADD 60" ENDS TO CHART	6054		01/06
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.		TITLE VM22/25/30 CHIP PAN		
TOLERANCE UNLESS SPECIFIED		APPLICATION GENRAL PRODUCTS		
X .XXX +/-		SCALE 30:1		DWG No. 6-10-018-102
X .XX +/-		DATE 04 DEC 03		SIZE B
X .X +/-		DRAWN BY DAHLKE		SHEET No. 2 OF 2
ANGLE +/-				

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Chip Pan Swivel Monitor Assembly





PARTS LIST

No.	QTY	STOCK No.	DESCRIPTION
1	1	SEE TABLE	COVER SWIVEL MONITOR UPPER SUPPORT ARM
2	1	MP-663	FLANGED BUSHING - SWIVEL MONITOR
3	1	SEE TABLE	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	SEE TABLE	SWIVEL MONITOR BOX
9	1	WX-230	HANDLE
10	1	MP-648	SWIVEL PIVOT BUSHING
11	4	HD-12	RUBBERIZED WASHER
12	1	MP-649	SWIVEL PIVOT BASE
13	1	MP-624	SWIVEL MONITOR BASE
14	1	MP-651	UTILITY TRAY - SWIVEL MONITOR
15	1	MP-654	8" FULL EXTENSION ACCURIDE SLIDE
16	1	MP-652	BRACKET - SWIVEL MONITOR DRAWER OPTION
17	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	2	M5-.8 NYLOCK NUT
E	8	M6-1 X 10mm SHCS
F	8	M6 LOCK WASHER
G	1	1/4 x .5 DOWEL PIN
H	2	M8 FLAT WASHER
I	2	M8-1.25 x 20mm BHCS
J	8	M3-.5 X 10mm BHCS

UPPER SUPPORT ARM & COVER TABLE

No.	VM15,16,17	VM22,25,30	INT. CONTROL
1	MP-650	MP-650	MPIC-01
3	MP-646	MP6-232	MPIC-02

SWIVEL BOX TABLE

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

D	ADD ARM & COVER TABLE	5673		12/03
C	UPDATE CONTROL BOX	5497	N.M.	02/03
B	CHANGE TO METRIC HARDWARE	5418	N.M.	11/02
A	ADD WAVE SPRING & WASHER	5303	N.M.	05/02
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	+/-



TITLE SWIVEL MONITOR ASSEMBLY

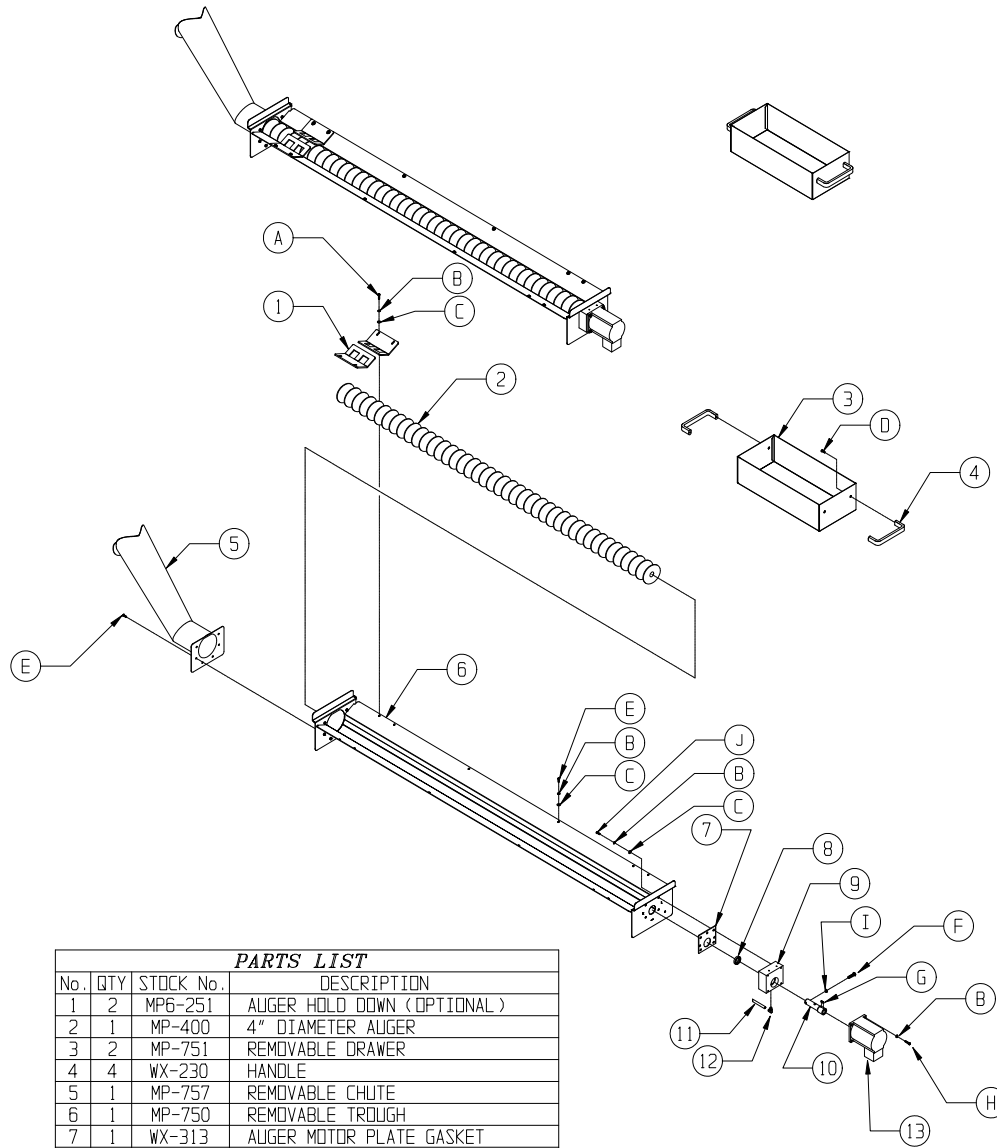
APPLICATION GENERAL PRODUCTS

SCALE 10:1 DWG No. 6-10-018-098 SIZE B

DATE 30 MAR 01 DRAWN BY DAHLKE SHEET No. 2 OF 2

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Chip Auger Assembly



PARTS LIST

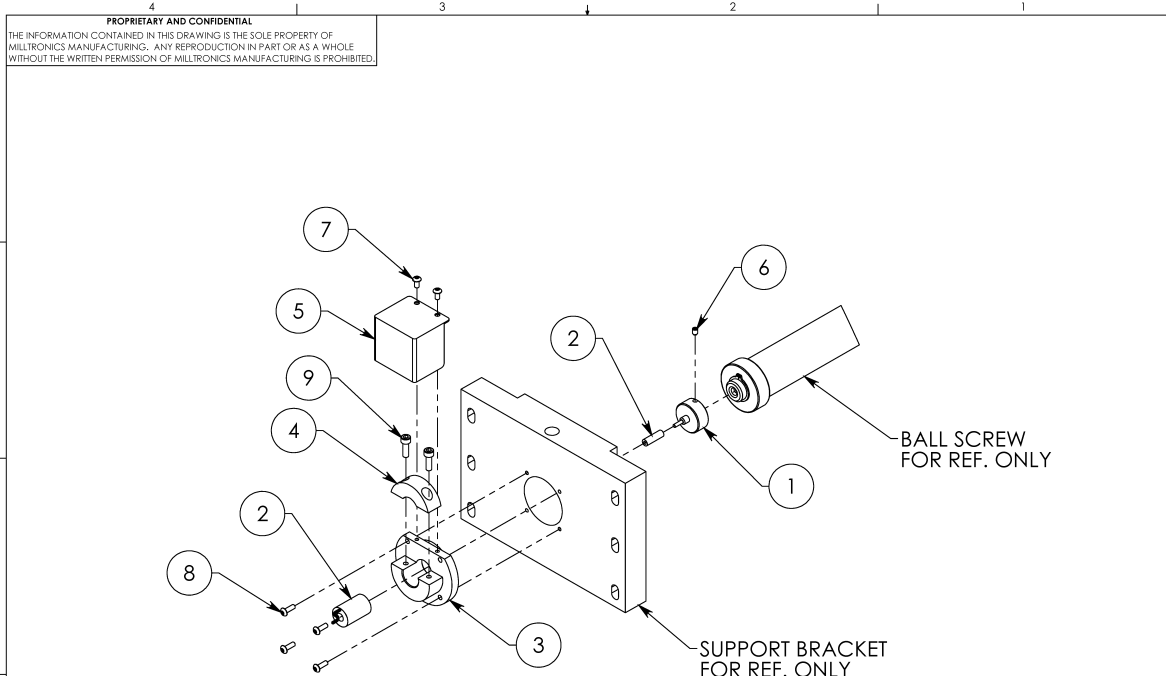
No.	QTY	STOCK No.	DESCRIPTION
1	2	MP6-251	AUGER HOLD DOWN (OPTIONAL)
2	1	MP-400	4" DIAMETER AUGER
3	2	MP-751	REMOVABLE DRAWER
4	4	WX-230	HANDLE
5	1	MP-757	REMOVABLE CHUTE
6	1	MP-750	REMOVABLE TROUGH
7	1	WX-313	AUGER MOTOR PLATE GASKET
8	1	BG-69	BEARING CUP OIL SEAL
9	1	MP-440	BROTHER AUGER MOTOR MTG 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 20mm SHCS

D	CHANGE AUGER BOLTS	6754		03/09
C	CHANGE AUGER BOLTS SIZE	6752	N.M.	03/09
B	UPDATE HARDWARE LIST	6257	N.M.	01/07
A	ADD AUGER HOLD DOWN	6141	N.M.	07/06
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 VM22,25,30 DRAWER/AUGER ASSEMBLY				
APPLICATION GENERAL PRODUCTS				
SCALE 20:1 DWG No. 6-10-018-101 SIZE B				
DATE 01 DEC 03 DRAWN BY DAHLKE SHEET No. 1 OF 1				

Thermal Compensation Assembly



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

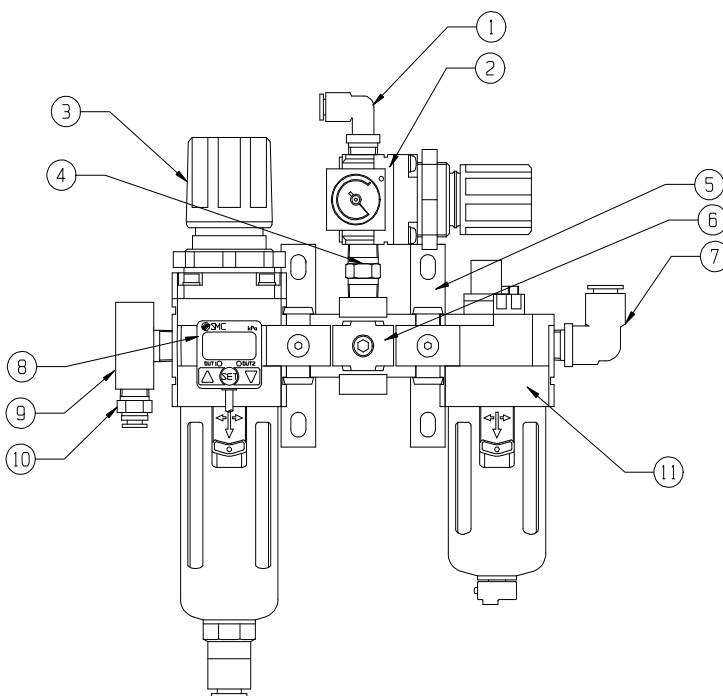
NOTES:

- ITEMS 3 & 4 ARE REVERSED ON SOME AXES
- ITEMS 5 & 7 ARE NOT USED ON SOME AXES

		NAME _____ DATE _____ DRAWN JRD 24 JAN 07		 MILLTRONICS CNC MACHINES 1400 MILL LANE 552.442.1410 WACONIA, MN 55387 USA	
MATERIAL:		FINISH:		TITLE: THERMAL COMP ASSEMBLY	
UNLESS OTHERWISE SPECIFIED:		SCALE: 1:4		DWG. NO. 10018111	
DIMENSIONS ARE IN INCHES (MM) TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± 1.0 BEND ± ONE PLACE DECIMAL ±.030 [.76] TWO PLACE DECIMAL ±.010 [.25] THREE PLACE DECIMAL ±.005 [.13]		ESTIMATED WEIGHT: 16.0 Lbs.		STOCK/ASSY NO. _____ SHEET NO. 1 OF 1	
				SIZE B	

Air Filter / Regulator / Lubricator 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			
	STOCK/ASSY No.			
	TOLERANCE UNLESS SPECIFIED			
	X .XXX	+/-		
	X .XX	+/-		
	X .X	+/-		
	ANGLE	+/-		
	 1400 MILL LANE 952-442-1410 WACONIA, MN 55387 USA			
	TITLE NU-417 FRL ASSEMBLY			
	APPLICATION GENERAL PRODUCTS			
	SCALE 3:1	DWG No. 6-10-018-112	SIZE B	
	DATE 14 APR 08	DRAWN BY DAHLKE	SHEET NO. 1:1	

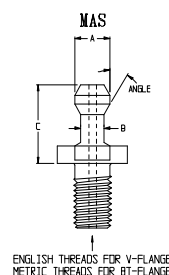
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Retention Knob Chart

NOTE: STANDARD RETENTION KNOBS FOR 40 TAPER SPINDLES

NAS RETENTION KNOBS STYLE CT-FLANGE 40 TAPER									
DIMENSIONS			MILLITRONICS MACHINE				COMMAND		
A	B	C	ANGLE	60mm SPINDLE		70mm SPINDLE		PART No.	KENAMETAL PART No.
59	39	1.27	60°	BR50, BR60, BR80, MM18, RH10, RH30, RH33, RH35, RM15, VM15, VM16, VM22, VM25, VM30, VM2016, VM25, VM16, VM18, VM22, VM25, VM30	BR50, BR60, BR80, MM20, MM35, RH20, RH30, RH33, RH35, T124, T140, T180, T180, VM16, VM22, VM25, VM30, VM3224, VM4224, VM30, VM35, VM40, T140, T180, T180, VM16, VM20, VM22, VM25, VM30	6B4E-0002	RK311144	PT-532-60	C40-6000

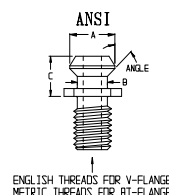
NAS RETENTION KNOBS STYLE BT-FLANGE 40 TAPER												
DIMENSIONS			MILLITRONICS MACHINE						COMMAND	KENAMETAL	VALENTE	LYNDE
A	B	C	ANGLE	60mm SPINDLE			70mm SPINDLE			PART No.	PART No.	PART No.
59	39	1.38	60°	BR50, BR60, BR80, MM18, RH20, RH30, RH33, RH35, MM15, MM16, MM22, MM25, VM30, VM316, VM15, VM16, VM20, VM22, VM25, VM30	BR50, BR60, BR80, MM18, RH20, RH30, RH33, RH35, MM15, MM16, MM22, MM25, VM30, VM316, VM15, VM16, VM20, VM22, VM25, VM30	BR50, BR60, BR80, MM18, RH20, RH30, RH33, RH35, MM15, MM16, MM22, MM25, VM30, VM316, VM15, VM16, VM20, VM22, VM25, VM30	BR50, BR60, BR80, MM18, RH20, RH30, RH33, RH35, MM15, MM16, MM22, MM25, VM30, VM316, VM15, VM16, VM20, VM22, VM25, VM30	BR50, BR60, BR80, MM18, RH20, RH30, RH33, RH35, MM15, MM16, MM22, MM25, VM30, VM316, VM15, VM16, VM20, VM22, VM25, VM30	694M-0002	RK31113A	PT-444-80	840-6000



NOTE: STANDARD RETENTION KNOBS FOR 50 TAPER SPINDLES

ANSI RETENTION KNOBS STYLE CT-FLANGE 50 TAPER					MILLTRONICS MACHINE		COMMAND PART No.	KENAMETAL PART No.	VALENTE PART No.	LYNDEX PART No
A	B	C	ANGLE							
1.14	.83	1.00	45°		HBM110, RH33XP, RH5XP, 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				MILLITRONICS MACHINE	COMMAND PART No.	KENNAMETAL PART No.	VALENTE PART No.	LYNDEX PART No
A	B	C	ANGLE					
1.14	.83	1.00	45°	HBM110, RH33XP, RH35XP, TT40XP, VM22XP, VM25XP, VM30XP, VM40XP, VM42XP, VM45XP, VM40XP, VM43XP,	R3BM-0105	DWG RK11144A	N/A	N/A



NOTE: OPTIONAL RETENTION KNOBS FOR 40 TAPER SPINDLES

ANSI RETENTION KNOBS STYLE CT-FLANGE 40 TAPER													
DIMENSIONS				MELLTRONICS MACHINE						COMMAND			
A	B	C	ANGLE	Ømm SPINDLE			70mm SPINDLE			PART No.	KENNAMETAL PART No.	VALENTE PART No.	LYNDEX PART No
.74	.49	.64	45°	SELECTION NOT AVAILABLE									
				BR50, BR60, BR80, HM20, HM35, RH20, RH30, RH33, RH35, TT24, TT40, TT60, TT80, VM16, VM20, VM22, VM30, VM324, VM424, VMK20, WM35, TT24, TT40, TT60, TT80, VM16, VM20, VM22, VM30, VM324, VM424,						RK4E-0001	RK11122	PT-475C	C40-STD

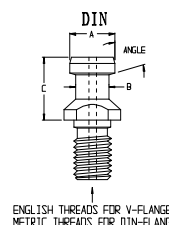
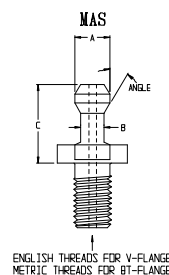
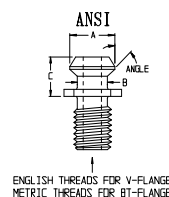
ANSI RETENTION KNOBS STYLE BT-FLANGE 40 TAPER																			
DIMENSIONS				MILLITRONICS MACHINE								COMMAND		KENNAMETAL		VALENTE		LYNDEX	
A	B	C	ANGLE	60mm SPINDLE				70mm SPINDLE				Part No.	Part No.	Part No.	Part No.	Part No.	Part No.		
.74	.49	.75	45°	SELECTION NOT AVAILABLE				BR50, BR60, BR80, HM20, HM35, R420, RH30, RH33, RH35, T124, T140, T160, T180, WM16, WM20, WM22, WM25, VM30, VM32A, VM42A, VM40, VM35, VM42, VM25, VM30, VM30, VM32, VM25, VM30, VM30				RS4M-0115	RK111126A	N/A	B40-FADAB				

NAS RETENTION KNOBS STYLE CT-FLANGE 40 TAPER											
DIMENSIONS				MILLITRONICS MACHINE				COMMAND	KENAMETAL	VALENTE	LYNDEX
A	B	C	ANGLE	60mm SPINDLE		70mm SPINDLE		Part No.	Part No.	Part No.	Part No.
.58	.39	1.27	45°	SELECTION NOT AVAILABLE				RB4E-0001	RK31114	PT-532-45	C40-4500
				BR50, BR60, BR80, HMC0, HMC2, HMC5, R420, RH30, RH33, RH35, TT24, TT40, TT60, TT80, VMC16, VMC2, VMC5, VMC6, VMC24, VMC25, VMC30, HMC20, HMC35, TT24, TT40, TT60, TT80, VMC16, VMC20, VMC22, VMC45, VMC30							

M&S RETENTION KNOBS STYLE BT-FLANGE 40 TAPER												
DIMENSIONS			MILLITRONICS MACHINE					COMMAND PART No.		KENAMETAL PART No.		
A	B	C	ANGLE	60mm SPINDLE		70mm SPINDLE			VALENTE PART No.		LYNDE PART No	
				SECTION NOT AVAILABLE		BR50, BR60, BR80, HM20, HM35, RH20, RH30, RH35, RH45, TT24, TT40, TT60, TT80, VM16, VM20, VM22, VM35, VM50, VM324, VM424, VM430, VM35, TT24, TT40, TT60, TT80, VM16, VM16, VM20, VM22, VM35, VM30.			RB4M-0001	RK31113	PT-444-45	B40-4500

[illegible]

DIN 69672 RETENTION KNOBS STYLE DIN-FLANGE 40 TAPER										
DIMENSIONS			MILLITRONICS MACHINE				COMMAND	KENNA/METAL	VALENITE PART	LYNDEX PART
A	B	C	ANGLE	60mm SPINDLE		70mm SPINDLE		PART No.		
.75	.55	1.02	75°	SECTION NOT AVAILABLE		BR50, BR60, BR80, HK20, HK35, RH20, RH30, RH35, RH45, TT24, TT40, TT60, TT80, VW16, VK20, VK22, VK25, VK30, VK32A, VK4224, VK420, HK35, TT24, TT40, TT60, TT80, VK16, VK20, VK22, VK25, VK30, VK32A, VK4224, VK420		RS4M-0114-C	DWG R71124	N/A 840-1500



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 KNUR AS THE MINI 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 MDVE 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.D. NO.	APP'D BY	DATE					
 MILLITRONICS 1400 BELL LANE 905-448-1410 RACINE, WI 53403	TITLE	RETENTION KNOB CHART		SCALE	1.75:1	DWG No.	6-11-08-054	SIZE	B
	APPLICATION	GENERAL PRODUCTS		DATE	30 APR 99	DRAWN BY	DAH KF	SHEET NO.	1 OF 1

