



NOTES CONT.

BILL OF MATERIAL				
ITEM NO.	PART NUMBER	QTY. REQ.	PART NAME	WT. EACH kg
20				

1 USE 3mm (0.12") OF SHIMS FOR INITIAL ASSEMBLY. FINAL THICKNESS OF SHIMS IS DETERMINED BY GEAR AND PINION ALIGNMENT. (SEE ECCENTRIC ASSEMBLY)

2 SHIMS ARE TO BE FLAT. REMOVE ALL BURRS AND UPSETS WHICH COULD AFFECT FLATNESS OF THRUST BEARINGS.

3 MAIN SHAFT ITEM 2 IS TO BE PULLED INTO FRAME 3.25mm(0.128") TO 3.76mm(0.148").

4 THOROUGHLY CLEAN ALL PASSAGES IN SHAFT.

5 REMOVE MOLD RELEASE AGENT, OIL, GREASE, DIRT, ETC FROM FLAT SURFACE OF SEAL RING USING COARSE SAND PAPER TO REMOVE SURFACE "SHINE" BEFORE CEMENTING SEAL IN PLACE.

**6 SEAL CEMENTING INSTRUCTIONS:**

A. CLEAN GROOVES WITH OIL FREE SOLVENT AND DRY.

8. APPLY ACTIVATOR IN A VERY THIN FILM TO BOTTOM OF SEAL RING. IF ACTIVATOR IS APPLIED TO PORTION OF SEAL RING, IT MAY RESULT IN A WEAK SEAL.

C. APPLY ADHESIVE TO BOTTOM OF GROOVE. APPLY ENOUGH ADHESIVE TO ENSURE MINIMAL SQUEEZE OUT.

D. POSITION SEAL RING INTO GROOVE AS SOON AS POSSIBLE AFTER ADHESIVE APPLICATION. SUFFICIENT PRESSURE TO KEEP THE TWO SURFACES IN CONTACT WITH EACH OTHER SHOULD BE MAINTAINED UNTIL A HANDLING BOND IS ATTAINED IN APPROXIMATELY THREE MINUTES.

9 FRAME RING ASSEMBLY INSTRUCTIONS:

7 FOR FIELD REPLACEMENT OF A SEAL, ORDER ADHESIVE KIT 45030348 (LOCITE DEPEND No. 00207). ONE KIT IS A SUFFICIENT AMOUNT TO GUEE BOTH SIDES.

## 8 SEAT LINER INSTALLATION PROCEDURE

A. MAIN FRAME SEAT LINER (1T.#20) IS TO BE WELDED TO FRAME IN INDIVIDUAL SEGMENTS.

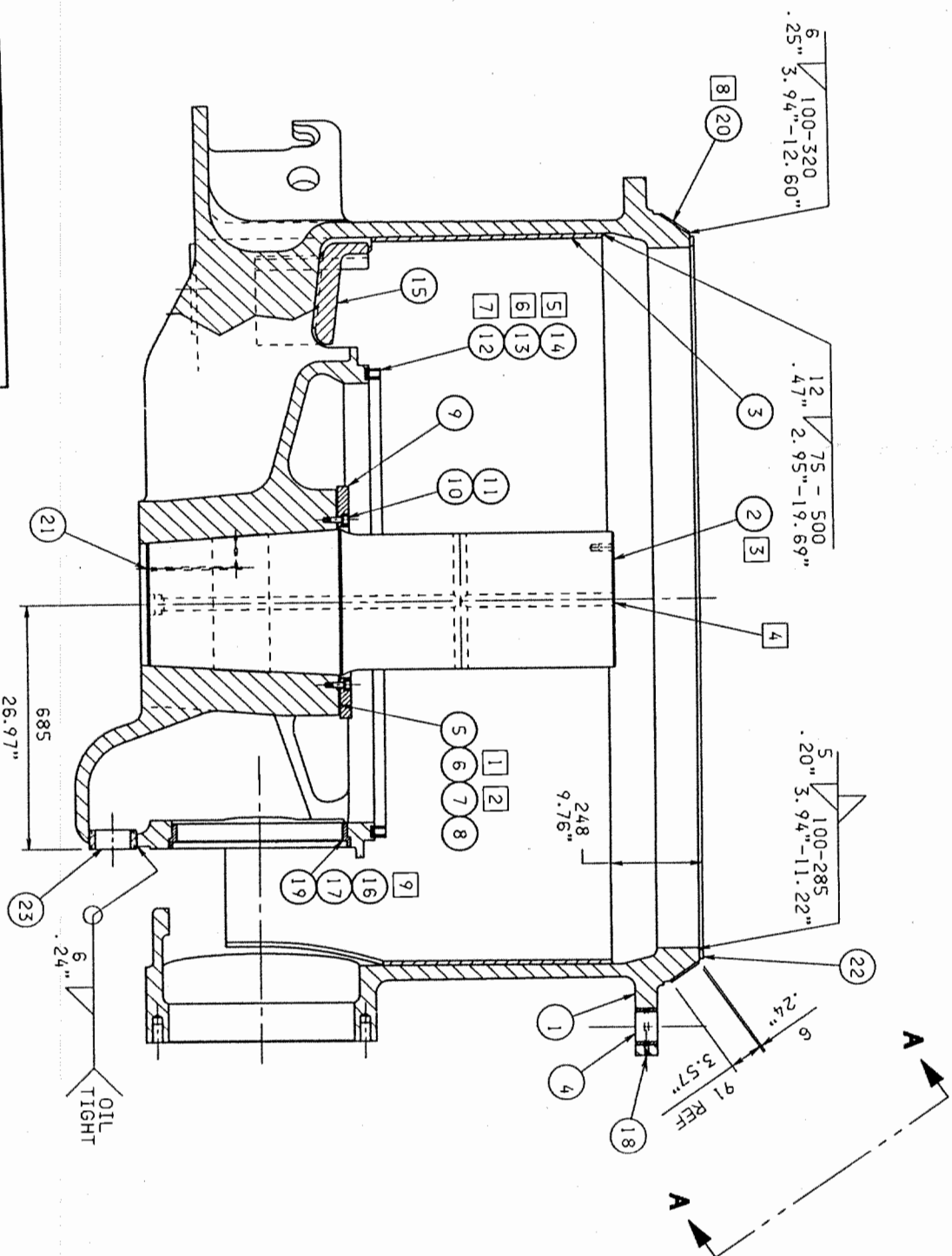
B. SET SEAT LINER (IT. H20) IN PLACE. DO NOT BUTT VERTICAL JOINTS.

C. WELD ROD = 4mm(5/32"), AMPCO ROD H10, PART CODE 410 1991 OR THE  
ANS IS HE CU AL-A2 OR HR CU AL-A2.

D. WHEN USING THESE 1/4" (6.35mm) (5/32") WELD RODS, REVERSE POLARITY AND USE BETWEEN 130 AND 190 AMPS. THE MAIN FRAME WHERE THE MELTING IS TO TAKE PLACE AND THE SEAL LINERS MUST BE PREHEATED BETWEEN 20°C (70°F) AND 40°C (100°F). THIS IS TO MAKE SURE ALL TRACES OF MOISTURE ARE REMOVED FOR PROPER WELD PENETRATION.

**9 FRAME RING ASSEMBLY INSTRUCTIONS:**

- A. LEAN FRGME. BORE AND RING O.D. WITH OIL FREE SOLVENT AND DRY.
- B. APPLY PRIMER ITEM (23) ON O.D. OF RING AND ALLOW TO DRY 3-5 MIN.
- C. COOL RING TO GIVE AT LEAST 10°C(8°F) TEMP. DIFFERENCE BETWEEN RING AND FRGME.
- D. BRUSH ON LOCITITE ITEM (22) TO ENTIRE AREA OF FRGME BORE.
- E. INSTALL RING INTO FRGME. ALLOW LOCITITE TO CURE FOR 6 HOURS BEFORE INSTALLING COUNTERSHAFT BOX INTO FRGME.



ITEM NO.	PART NUMBER	QTY REQ.	PART NAME	DWG. SIZE	WT. LB
/	1093050088	/	MAIN FRAME ASSY	/	9815
①	1033785555	1	MAIN FRAME	A0775C	
(2)	1068867278	1	MAIN SHAFT	A11113	
(3)	1048516283	1	MAIN FRAME LINER		550C
(4)	1022134661	6	BUSHING	A3	1.3
(5)	1070589817	1	SHIM 3.0 mm THICK	A3	3.5
(6)	1070589815	1	SHIM 1.6 mm THICK	A3	1.7
(7)	1070589813	1	SHIM 0.8 mm THICK	A3	0.9
(8)	1070589811	1	SHIM 0.4 mm THICK	A3	0.4
(9)	1057605167	1	THRUST BEARING	A2	43
10	1003086077	6	SPRING WASHER M14		
11	1003766801	6	SCHS M14 X 35		
12	1063518950	1	SEAL RING	A3	
13	1004590351	AS REQD	ACTIVATOR	A4	
14	1004590350	AS REQD	ADHESIVE	A4	
15	1038069595	3	ARM GUARD	A2	100C
16	1004826366	AR	LOCITITE 680		
17	1004816295	AR	PRIMER (LOCITITE)		
18	1002992006	6	SHSC M12 X 30		
19	1063915542	1	FRAME RING	A2	12
20	1048516296	1	SEAT LINER	A2	28
21	1002098744	1	PLUG #4		
22	1064668566	4	FULCRUM BAR	A3	3.0
23	1001523132	1	HALF PIPE CPLG 4" BSP THD		

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CAD STORED. DO NOT CHANGE MANUALLY

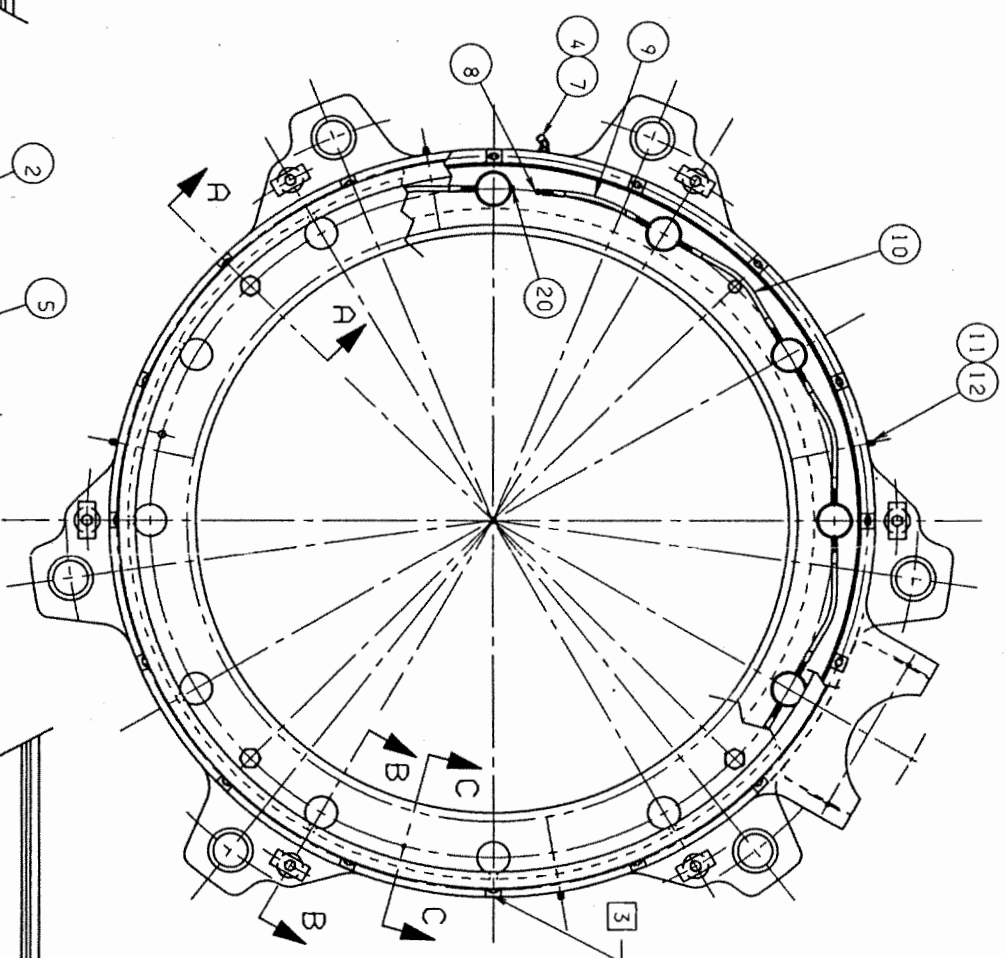
**Nordberg**

Nordberg Inc.  
P.O. Box 383  
Milwaukee, WI 53201

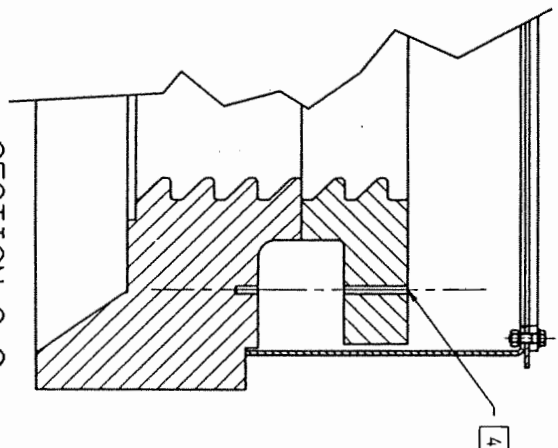
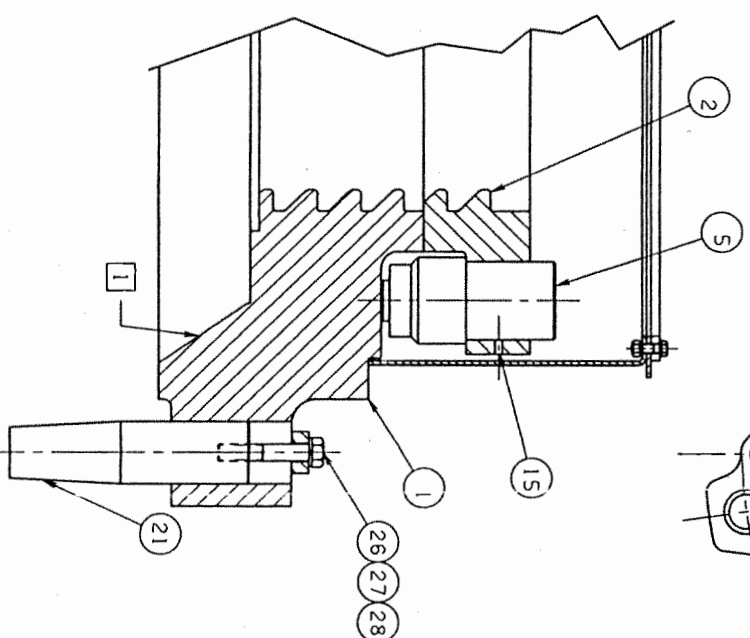
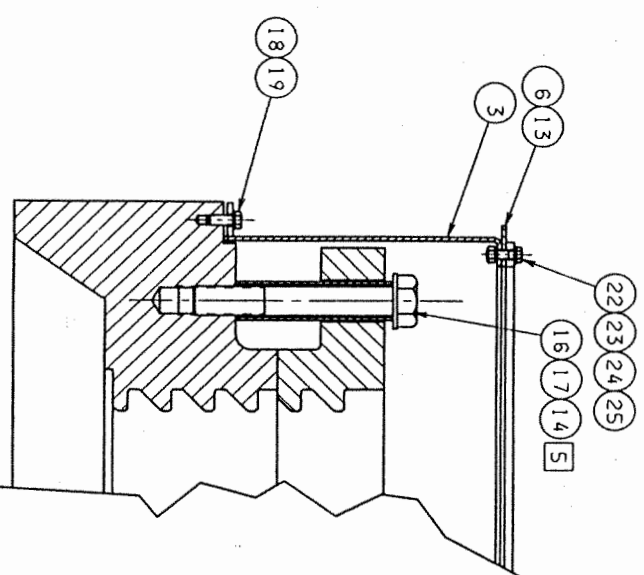
## CAST FRAME

## MAIN FRAME ASSY

- NOTES :
- 1 THE ADJUSTMENT RING SEAT IS TO BE COATED WITH GREASE: LITHIUM BASE NLGI NO. 1 WITH 5-10% MOLYBDENUM DISULFIDE POWDER.
  2. ALL HYDRAULIC PASSAGES, ESPECIALLY DRILLED HOLES, SHOULD BE CLEANED THOROUGHLY BEFORE ASSEMBLY.
  - 3 WHEN INSTALLING ADJUSTMENT RING ON FRAME PLACE THIS POINT OVER COUNTERSHAFT BOX.
  - 4 WHEN INSTALLING CLAMP RING BE SURE THAT POSITIONING HOLE IN CLAMP RING AND ADJUSTMENT RING MATCH.
  - 5 HHCS. ITEM 16 IS USED TO PREVENT ACCIDENTAL LIFTING OF CLAMP RING WHEN REMOVING BOWL.
  6. AFTER ASSEMBLY OF CLAMPING CYLINDERS AND CONNECTIONS AND BEFORE INSTALLATION OF DUST SHELL PRESSURIZE SYSTEM TO MAX OF 17.2 MPa (2500PSI) AND HOLD FOR 10 MINUTES TO CHECK CYLINDERS AND FITTINGS FOR LEAKS. HHCS. ITEM 19 MUST BE INSTALLED BEFORE PRESSURE TEST.



BILL OF MATERIAL					
ITEM NO.	PART NUMBER	QTY. REQ.	PART NAME	DWG. SIZE	WT. EACH K.G.
1	1093050128	1	ADJ RING ASSEMBLY	3946	
2	1061876294	1	ADJUSTMENT RING	A02840	
3	1061875592	1	CLAMPING RING	A1 760	
4	1061940190	1	DUST SHELL	A1 105	
5	1002080652	1	ELBOW 45°		
6	1094280065	12	CLAMPING CYL ASSY	A211.3	
7	1064667330	4	CLAMP RING SEGMENT	A3 4.0	
8	1008397408	1	CAP		
9	1002080430	1	ELBOW 90°		
10	1044250910	1	HOSE ASSY	A3	
11	1044251346	11	HOSE ASSY	1	
12	1003801023	4	GREASE FITTING		
13	1003801990	4	GREASE FITTING CAP		
14	1063519847	1	DUST SHELL SEAL	A2	
15	1003056061	4	WASHER M36		
16	1002991642	12	SET SCREW M10 X 16		
17	1003726225	4	HCS M36 X 240		
18	1073044085	4	SPACER		
19	1003723050	16	HCS M12 X 30		
20	1003060034	16	WASHER 7/16		
21	1001998504	1	CAP		
22	1054351501	6	PIN	A3	
23	1003722557	24	HCS M10 X 35		
24	1003056028	24	WASHER M10		
25	1003069046	24	LOCKWASHER M10		
26	1003010046	24	HEX NUT M10		
27	1013301443	6	PIN RETAINER	A4 .9	
28	1003724648	6	HCS M20 X 110		
29	1003069066	6	LOCKWASHER M20		



## SECTION A-A

SCALE 1:4

## SECTION B-B

SCALE 1:4

SECTION C-C  
SCALE 1:4

SCALE 1:4

			RIDE	61742
			2007114	
			BPM	
			310C177	
REV.	ISSUED	DESCRIPTION OF CHANGE	LOC DATE	ENG. ORDER NUMBER
HF				

DUAL	mm
DIMEN	inches
IML'D TOLERANCES	
FINISHED DIMENSIONS	
MILL METRICS	
XXX (15000)	15
XXX (15000)	15.5
XX	10.5
XX	10.15
INCHES	
XX (19.68)	1.12
XX (19.68)	1.06
XXXX	1.005
XXXX	1.005
NO PARTIAL FINISHES	
250	UNLESS OTHERWISE
✓	STATED
ANGLE TOLERANCE	
COMPANY STD 02-02-13	

# Northberg

Northberg Inc.  
P.O. Box 385  
Milwaukee, WI 53201

DRAWN	BDR	SUPERSEDES	ASSEMBLY
DATE 31 OCT 17			GR 02
CMD BDR		SUPERSEDED BY	
DATE 31 OCT 17			CRUSHER
APPD JCL		PRODUCT	HP 500
DATE 22 OCT 98			
DESCRIPTION			

# Northberg

Northberg Inc.  
P.O. Box 385  
Milwaukee, WI 53201

## ADD RING ASSEMBLY

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**Nordberg**

Nordberg Inc.  
P.O. Box 383  
Milwaukee, WI 53201

# ADJ RING ASSEMBLY

11093050128

7

SURFACE PREPARATION, CLEANING  
AND PAINTING SYMBOLS ACCORDING  
TO COMPANY STANDARD 03-01-01.

CAD 10/11 P

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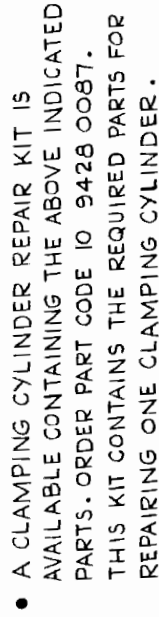
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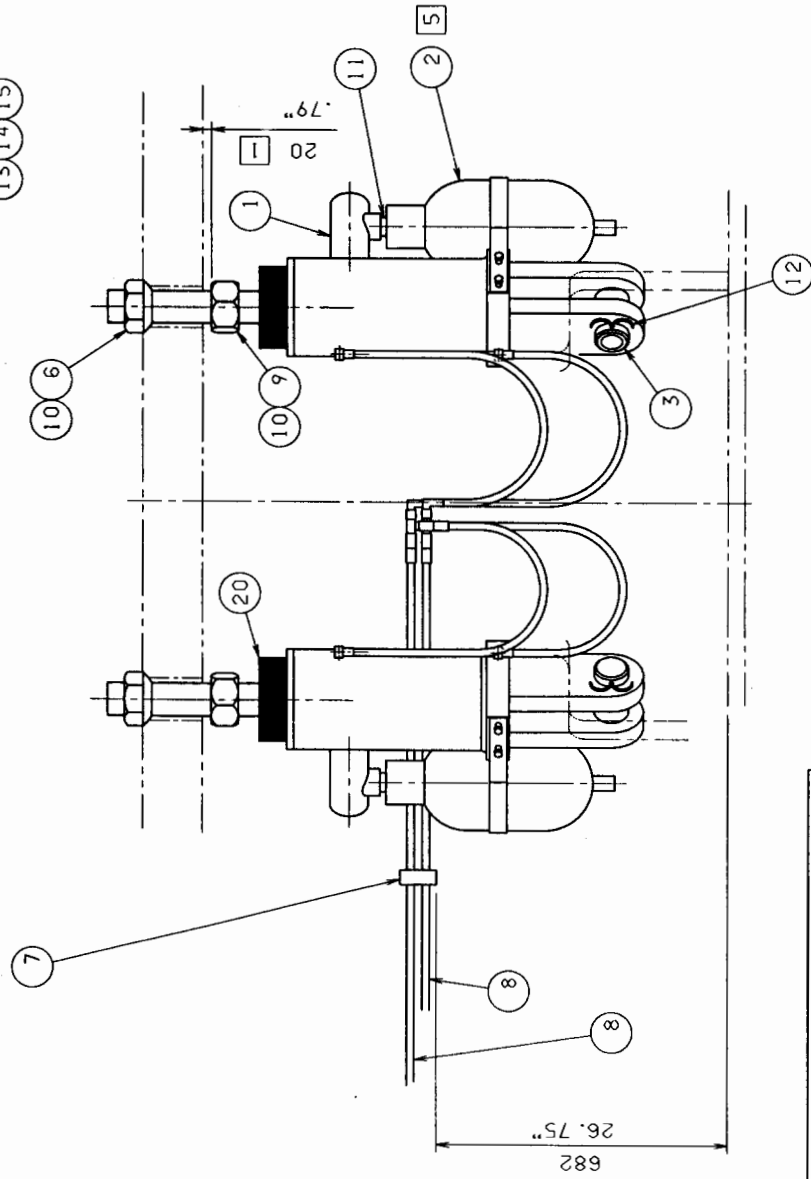
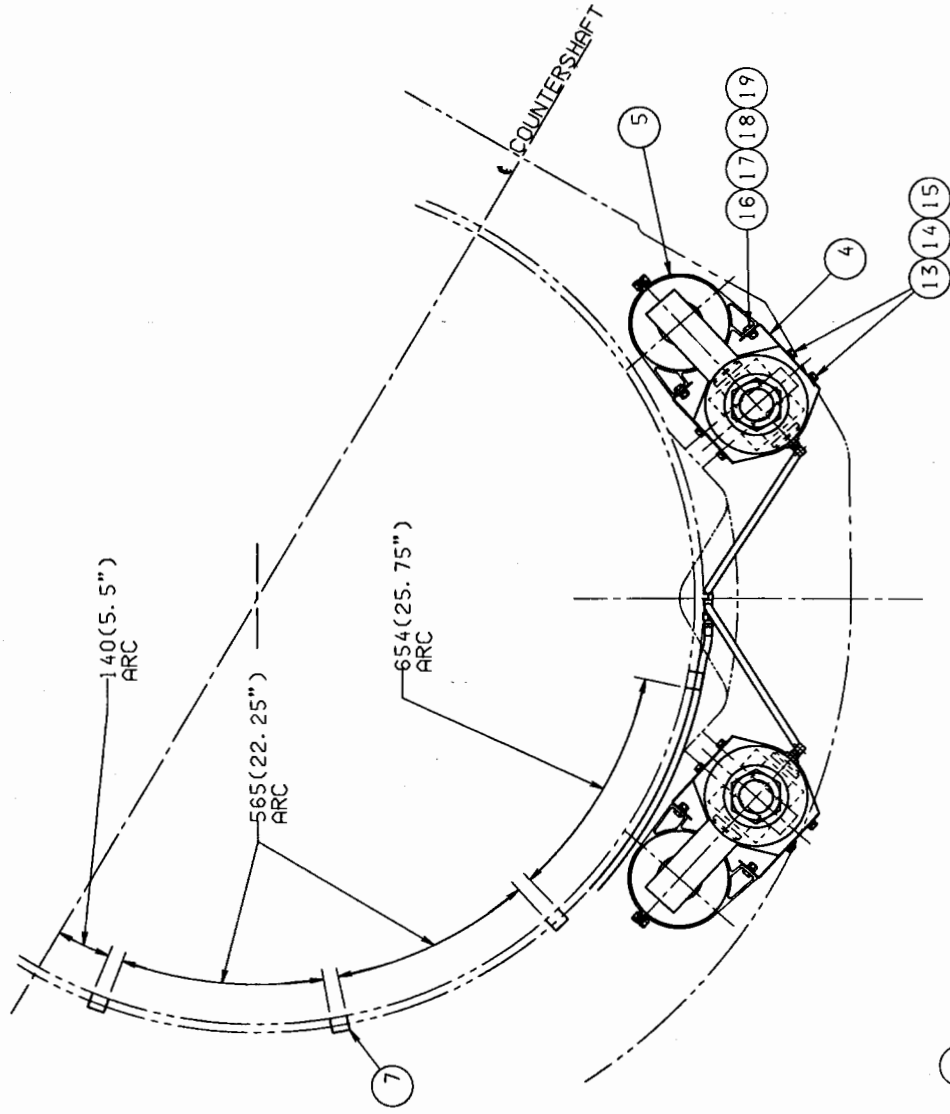


METRIC ALL DIMENSIONS IN MILLIMETERS		UNP'LED TOLERANCES FINISHED DIMENSIONS		MILLIMETERS		MAX. CHAMF. MAX. C. R. MAX. MAX. R.		0.4 1.6 0.8 0.8		0.4 1.6 0.8 0.8		0.4 1.6 0.8 0.8	
MACHINING FINISH UNLESS OTHERWISE STATED		100095		53178		42140		40837		100095		53178	
2-16-99 20 DEC 90		14 OCT 83		5-5		7 DEC 82		1 DEC 82		1-1		1-1	
BY 2-16-99		14 OCT 83		5-5		7 DEC 82		1 DEC 82		1-1		1-1	

Process Machinery Division		ASSEMBLY GR 02		CRUSHER		1352 OMNICON		DATE 2-16-99		DESCRIPTION		PART NAME CLAMPING CYLINDER		DRAWING NUMBER		REV.		C	
DRAWN ES		SUPERSEDES		SUPERSEDED BY		PRODUCT		APPROVED JLL		DATE 2-16-99		PART NAME		DRAWING NUMBER		REV.		C	
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MP	REV.	DESCRIPTION OF CHANGE	LOC.	BY	DATE	ENG. ORDER NUMBER
②	①	ISSUED		1 DEC 82	3.5	40837
③	②	ADDED-REPAIR KIT NOTE	C-6	14 OCT 83	DF	42740
④	③	ADDED ITEM (V) LOC TITLE PART N° 04326 349			10/10	53178
⑤	④	UPDATED TO 1509000 STD			2-1699	100035

SURFACE PREPARATION, CLEANING  
AND PAINTING SYMBOLS ACCORDING  
TO COMPANY STANDARD 03-01-01.




SURFACE PREPARATION. CLEANING AND PAINTING SYMBOLS ACCORDING TO COMPANY STANDARD 03-01-01.

BILL OF MATERIAL					
ITEM NO.	PART NUMBER	QTY. REQD.	PART NAME	DWG. SIZE	WT. EACH kg
1	10 93050127	1	TRAMP RELEASE ASSY	1660	
2	10 93050058	6	TRAMP RELEASE CYL	A2 220	
3	10 79142722	6	ACCUMULATOR	A3 43	
4	10 54268776	6	CLEVIS PIN	A3 8.3	
5	10 21440875	12	BRACKET	A3 0.3	
6	10 24545536	6	ACCUMULATOR CLAMP	- 0.3	
7	10 51495302	6	SPHERICAL NUT	A4 3	
8	10 24709137	8	TUBE CLAMP	-	
9	N 90158014	2	CLEAR & REL CIRCUIT	A2 3.2	
10	10 03010111	6	HEX NUT M80	-	
11	10 04826359	A/R	LOCTITE	-	
12	10 02077195	6	UNION	-	
13	10 03075458	12	COTTER PIN Ø 6X125	-	
14	10 03723043	24	HCMS M12 X 25	-	
15	10 03056031	24	WASHER M12	-	
16	10 03069051	24	LOCKWASHER M12	-	
17	10 03010041	12	HEX NUT M8	-	
18	10 03722036	12	HCMS M8 X 20	-	
19	10 03056025	24	WASHER M8	-	
20	10 03069041	12	LOCKWASHER M8	-	
21	10 19891330	6	PROTECTOR	A2	

## NOTES:

1. WHEN INSTALLING CYLINDERS, ITEM 1, PROCEED AS FOLLOWS:
  - A. BEFORE INSTALLING CYLINDERS PUSH CYLINDER RODS DOWN TO BOTTOM THE PISTONS AGAINST THE LOWER HEADS.
  - B. TURN NUTS, ITEM 9, ONTO CYLINDER RODS, DOWN TO THE END OF THREADS.
  - C. TO INSTALL CYLINDERS, SLIDE CYLINDER RODS UP THRU ADJUSTMENT RING HOLES, THEN INSTALL CLEVIS PINS, ITEM 3, AND COTTER PINS, ITEM 12.
  - D. JACK UP CYLINDER SO THAT CLEVIS PIN CONTACTS TOP OF MAINFRAME RIB HOLE.
  - E. PULL RODS OUT OF THE CYLINDERS 25( .98"). NEXT COAT TOP OF RODS WITH LOCITE, ITEM 10. THEN TURN SPHERICAL NUTS, ITEM 6, ONTO RODS UNTIL THEY BOTTOM ON ADJUSTMENT RING.
  - F. APPLY LOCITE, ITEM 10, TO FOUR ROD THREADS STARTING 20(.79") FROM THE BOTTOM OF THE ADJUSTMENT RING. THEN TURN NUTS, ITEM 9, UP THE RODS UNTIL THERE IS A 20(.79") SPACE BETWEEN THE NUT & THE UNDERSIDE OF RING.
2. ALL COMPONENTS IN TRAMP RELEASE ASS'Y ARE RATED FOR 20.7 MPA (3000 PSI).
3. AFTER COMPLETE ASSEMBLY AND BLEEDING, PRESSURE TEST RELEASE & CLEARING CIRCUITS AT 20.7 MPA (3000 PSI).
4. BEFORE PLACING SYSTEM INTO OPERATION, OR AFTER MAINTENANCE ON SYSTEM, BLEED AIR FROM CLEARING & RELEASE CIRCUITS, ITEM 8, BY LOOSENING THE FITTINGS ON THE CYLINDERS AND REMOVING BLEEDER PLUG ON THE ACCUMULATOR.
5. ACCUMULATOR TO BE RECHARGED TO 10.3 MPA (1500 PSI). THE RELEASE SYSTEM IS TO BE DEPRESSURIZED WHEN PRE-CHARGING OR CHECKING PRECHARGE PRESSURE IN THE ACCUMULATORS.

DUAL DIMEN		mm	INCHES	
IMPLIED TOLERANCES FINISHED DIMENSIONS				
MILLIMETERS				
XXX. (4500)	±.3			
XXX. (4500)	±1.5			
..X	±0.5			
..XX	±0.13			
INCHES				
..XX (±19.68)	±.12			
..XX (±19.68)	±.06			
..XX (±19.68)	±.03			
..XXX	±.005			
1/8" MAXIMUM ALLOWABLE UNFINISHED DIMENSIONS STATED				
PLANE ANGLES		± ONE DEGREE		
		3RD ANGLE PROJECTION		
SCALE		1 : 5		

B	ITEM 8 CONT. 21/DEL. ITEM 20 ITEM 21 REPLACED BY ITEM 26	E-C 11/07/0002	ENL. NO. 12 ENL. NO. 12345		
A	UPDATED TO ISO9000 STD	23CCT98	61742		
A	ISSUED	Rbk 300C177	60808		
MF	REV.	DESCRIPTION OF CHANGE	LOC.	BY DATE	ENG. ORDER NUMBER



**1093050058**

**TRAMP RELEASE CYLINDER  
SCHUTZVORRICHTUNG  
METALLINPÄÄSTÖSYLINTERI**

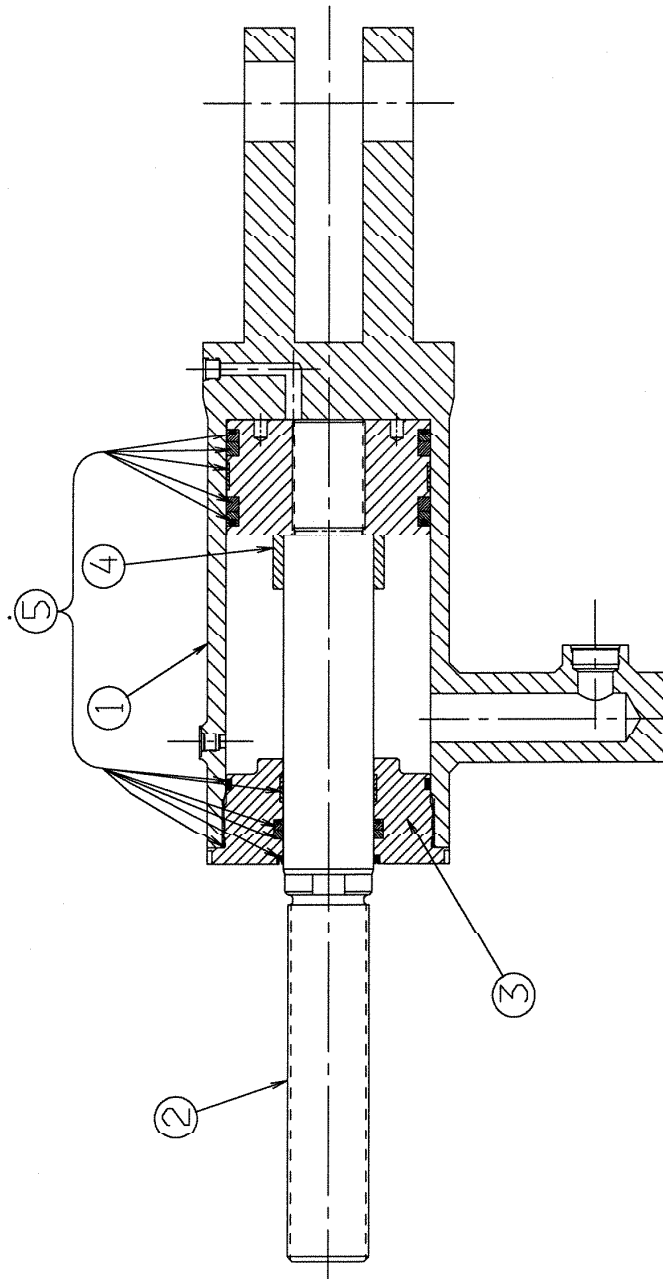
**VERIN DE MAINTIEN  
GATO DE SUJECCIÓN  
CILINDRO DE ALÍVIO**

ITEM REF. VIITE	PCS NBRE KPL	PART NO/NO ART. TEIL/PARTE N° OSA/CÓDIGO DA PEÇA	DESCRIPTION BENENNUNG NIMITYS	DESIGNATION DESCRIPCIÓN DESCRIÇÃO	NOTES BEMERK/NOTA HUOM.
1	1	1028563422	CYLINDER TUBE ZYLINDERGEHÄUSE SYLINTERI PUTKI	CORPS DE VERIN CUERPO DE GATO TUBO CILNDRICO	
2	1	1093050057	PISTON ROD KOLBENSTANGE MÄNNÄNVARSI	TIGE DE VERIN VASTAGO DEL EMBOLO HASTE DO PISTO	
3	1	1037711921	PISTON HEAD ZYLINDERKOPF MÄNNÄN PÄÄ	NEZ DE VERIN PUNTA DE GATO CABEA DO PISTO	
4	1	1063902196	STOP TUBE ARRETIERBUECHSE PYSÄYTYSPUTKI	BAGUE D'ARRET CASQUILLO DE PARADA TUBO DE PARADA	
5	1	1093070046	GASKET KIT DICHTUNGSSATZ TIIVISTE KITI	LOT JOINTS LOTE JUNTAS KIT DE VEDAES	

**1093050058**

**TRAMP RELEASE CYLINDER  
SCHUTZVORRICHTUNG  
METALLINPÄÄSTÖSYLINTERI**

**VERIN DE MAINTIEN  
GATO DE SUJECIÓN  
CILINDRO DE ALÍVIO**



110 9305 0058 DWG

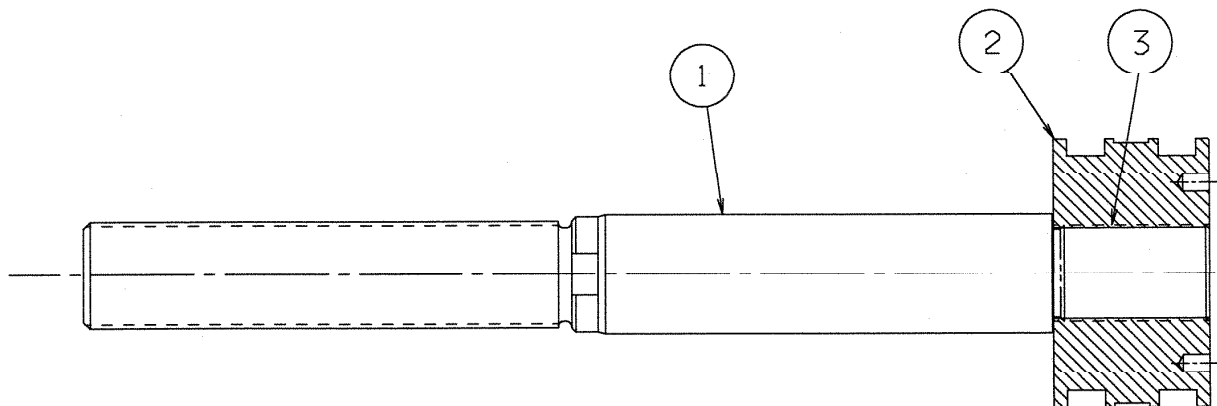
<div> <div>1093050057</div> <div>           PISTON ROD KOLBENSTANGE MÄNNÄNVARSI         </div> <div>           TIGE DE VERIN VASTAGO DEL EMBOLO HASTE DO PISTÃO         </div> </div>					
ITEM REF. VIITE	PCS NBRE KPL	PART NO/NO ART. TEIL/PARTE N° OSA/CÓDIGO DA PEÇA	DESCRIPTION BENENNUNG NIMITYS	DESIGNATION DESCRIPCIÓN DESCRIÇÃO	NOTES BEMERK/NOTA HUOM.
1	1	1065634356	PISTON ROD KOLBENSTANGE MÄNNÄNVARSI	TIGE DE VERIN VASTAGO DEL EMBOLO HASTE DO PISTO	
2	1	1054915521	PISTON KOLBEN MÄNTÄ	PISTON EMBOLO PISTO	



**1093050057**

**PISTON ROD  
KOLBENSTANGE  
MÄNNÄNVARSI**

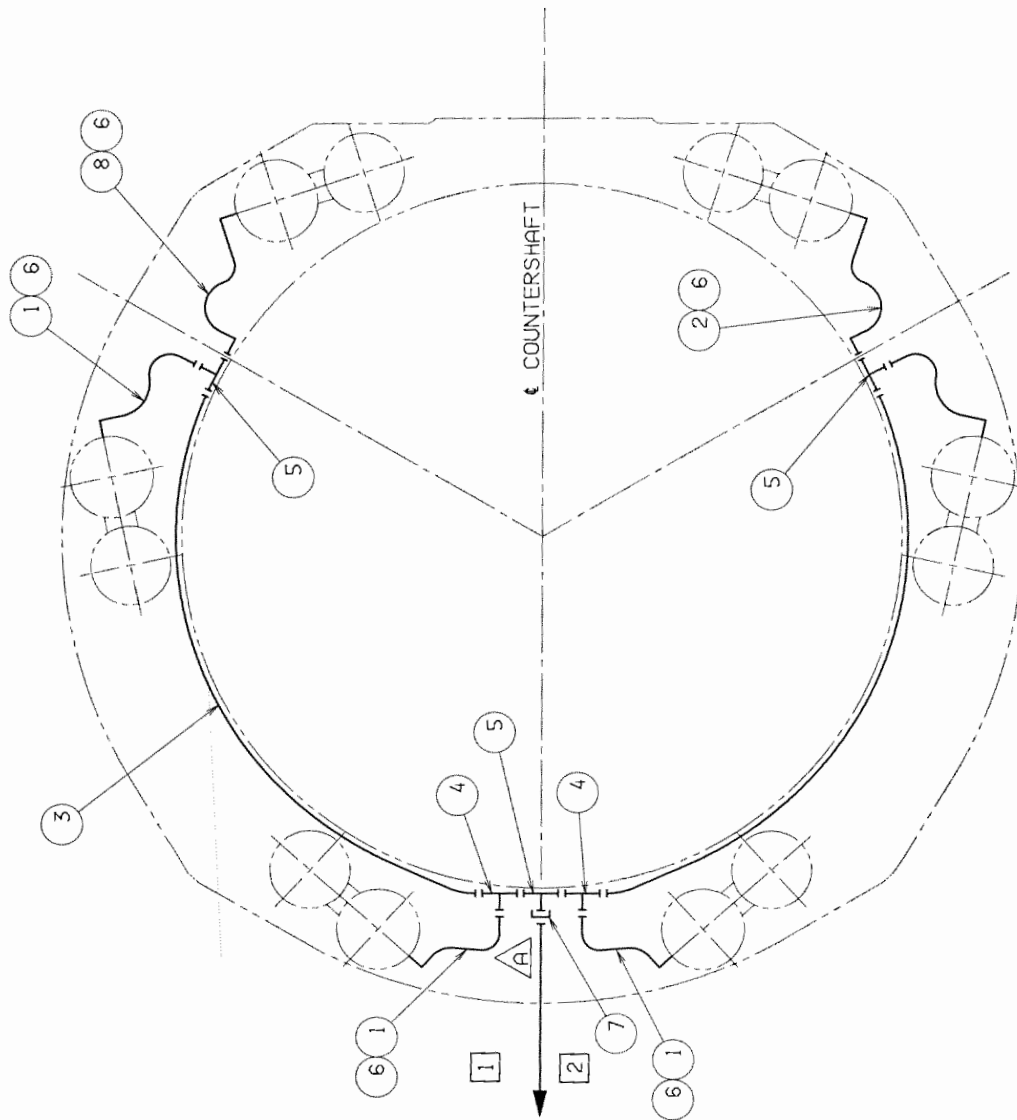
**TIGE DE VERIN  
VASTAGO DEL EMBOLO  
HASTE DO PISTÃO**



110 9305 0057 DWG

ALL INFORMATION CONTAINED ON THIS DRAWING IS CONSIDERED TO BE BOTH CONFIDENTIAL AND PROPRIETARY BY METSO MINERALS (MILWAUKEE) INC. NO USE OR REPRODUCTION THEREOF MAY BE MADE WITHOUT THE EXPRESS WRITTEN CONSENT OF METSO MINERALS (MILWAUKEE) INC.

NO. 110-93050050



NOTES:

- [1] TRAMP RELEASE CYLINDER HOSE CONNECTION  
# 1 AT POWER UNIT FOR CLEARING CIRCUIT.
- [2] TRAMP RELEASE CYLINDER HOSE CONNECTION  
# 2 AT POWER UNIT FOR RELEASE CIRCUIT.
- 3. REFER TO GENERAL ARRANGEMENT DRAWING  
FOR HOSE LOCATIONS.

BILL OF MATERIAL			
ITEM NO.	PART NUMBER	QTY REQ	PART NAME
1	1093050050	1	CLEARING CIRCUIT
2	1044252548	4	HOSE ASSY 525 LG A4 0.3
3	1044252549	1	HOSE ASSY 535 LG A4 0.3
4	1044252612	2	HOSE ASSY 2110 LG A4 0.7
5	1001985750	2	TEE
6	1001978140	3	TEE
7	1035702383	6	O-RING
8	1008397408	2	CAP
9	1044252547	1	HOSE ASSY 535 LG A4

CAD STORED, DO NOT CHANGE MANUALLY

<b>metso</b> minerals		Metso Minerals Inc. 3075 S. Chase Ave. Milwaukee, WI 53207	
DRAWN	TGB	DATE	06MAR92
CHECKED	TGB	DATE	06MAR92
APPROVED	JJL	DATE	16OCT98
SUPERSEDED BY		ASSEMBLY GR 03	
PRODUCT		HP 500	
DESCRIPTION			

ITEM NO.	100022	TGB	20JAN99
ITEM NO.	61742	MMH	16OCT98
ITEM NO.	58007	TGB	22AUG95
ITEM NO.	54609	TGB	06MAR92
ITEM NO.	53416	MMH	21MAR91
ITEM NO.	52912	TGB	25SEP90
REV.	DESCRIPTION OF CHANGE	LOC.	DATE
A	BALLOON (8) WAS (2)		
B	BALLOON (2) WAS (8)		
C	UPDATED TO ISO9000 STD		
D	QTY ITEM 2 WAS 2		
E	ADDED ITEM 8		
F	ITEM 2 WAS 44252547		
G	ADDED ITEM 7		
H	ISSUED		

SURFACE PREPARATION, CLEANING AND PAINTING SYMBOLS ACCORDING TO COMPANY STANDARD 03-01-01.

PART NAME		CLEARING CIRCUIT	
SCALE	1:10	DRAWING NUMBER	93050050
PREFIX	A2110	SUFFIX	E

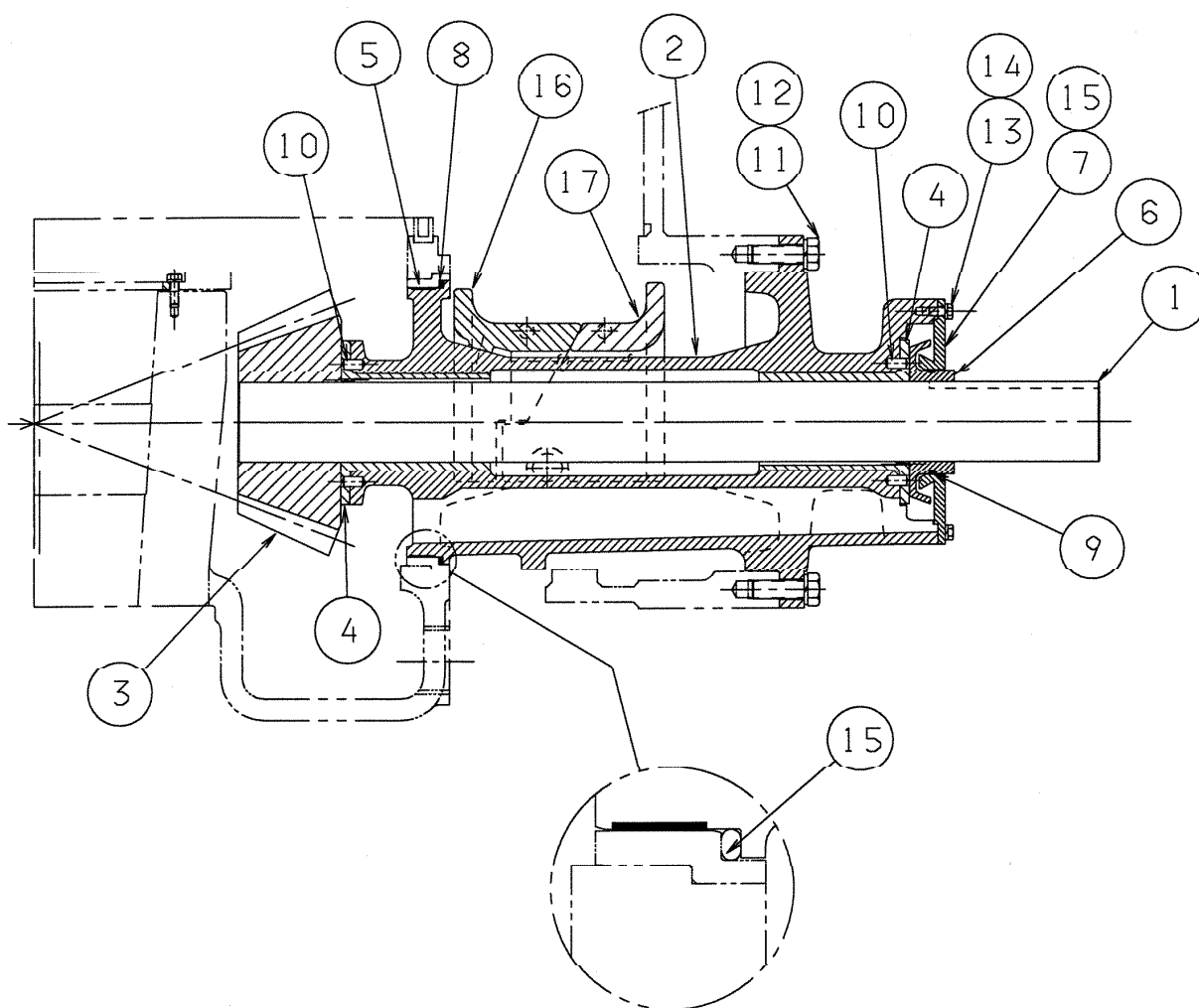
**1093050095**
**COUNTERSHAFT ASSEMBLY  
VORGELEGEWELLE  
KÄYTTÖAKSELI, KOKOONPANO**
**ENSEMBLE CONTRE-ARBRE  
CONJUNTO CONTRAEJE  
CONJUNTO DO CONTRAEIXO**

ITEM REF. VIITE	PCS NBRE KPL	PART NO/NO ART. TEIL/PARTE N° OSA/CÓDIGO DA PEÇA	DESCRIPTION BENENNUNG NIMITYS	DESIGNATION DESCRIPCIÓN DESCRIÇÃO	NOTES BEMERK/NOTA HUOM.
1	1	1068634890	COUNTERSHAFT ANTRIEBSWELLE KÄYTTÖAKSELI	ARBRE ENTRAINEMENT ARBOL DE TRANSMISION CONTRAEIXO	
2	1	1045376019	COUNTERSHAFT BOX VORGELEGEGEHAEUSE KÄYTTÖAKSELI KOTELO	BOITIER CONTRE-ARBRE CAJA CONTRAEJE CARCAA DO CONTRAEIXO	
3	1	1036831527	PINION TREIBRAD VETOPYÖRÄ	PIGNON PION PINHO	
4	2	1022065500	BUSHING BÜCHSE HOLKKI	BAGUE BOQUILLA BUCHA	
5	1	1063192846	WEAR RING RING KULUTUSRENGAS	BAGUE D'USURE CASQUILLO DE DESGASTE ANEL DE DESGASTE	
6	1	1062807442	OIL FLINGER SCHELLE ÖLJYNHEITTÄJÄ	COLLIER D'HUILE DISTRIBUIDOR IMPULSOR DE LEO	
7	1	1027471761	COVER DECKEL KANSI	COUVERCLE CUBIERTA COBERTURA	
8	1	1035715063	O-RING O-RING O-RENGAS	JOINT TORIQUE O-ANILLO ANEL-O	
9	1	1063084705	PISTON SEAL DICHTUNG MÄNNÄNTIIVISTE	JOINT DE PISTON JUNTA DE PISTN VEDAO DO PISTO	
10	10	7001619270	PIN NADEL TAPPI	GOUPILLE CLAVIJA PINO	
11	6	7001530622 ISO4017-M30X90-8.8-A3A	HEXAGONAL SCREW SCHRAUBE KUUSIORUUVI	VIS HEXAGONALE TORNIL. PARAFUSO SEXTAVADO	
12	6	7001632030 W30-NFE25.515	WASHER UNTERLEGSCHIEBE ALUSLAATTA	RONDELLE ARANDELA ARRUELA	
13	6	7001530252 ISO4017-M14X30-8.8-A3A	HEXAGONAL SCREW SCHRAUBE KUUSIORUUVI	VIS HEXAGONALE TORNIL. PARAFUSO SEXTAVADO	
14	6	N01632014 W14-NFE25.515	WASHER UNTERLEGSCHIEBE ALUSLAATTA	RONDELLE ARANDELA ARRUELA	
15	1	7008010040 RTV9101 / AE310	SILICONE SEAL ABDICHPASTE SILIKONITIIVISTE	PATE A JOINT TUBE PASTA DE JUNTA EN TUBO VEDAO DE SILICONE	
16	1	1038067481	COUNTERSH.BOX GUARD SCHLEISSAUSK. GEGENWE. KÄYTTÖAKS.KOTELON SUOJ.	BLIND. DE CONTRE-ARBRE PROTECCIN DE CONTRAEJE PROT. DA CARCAA DO CONTR.	
17	1	1038067482	COUNTERS. BOX GUARD SCHLEISSAUSKL. GEGENWE. KÄYTTÖAKS. KOTELON SUOJ.	BLIND. DE CONTRE-ARBRE PROTECCIN DE CONTRAEJE PROT. DA CARCAA DO CONTR.	

**1093050095**

**COUNTERSHAFT ASSEMBLY  
VORGELEGEWELLE  
KÄYTTÖAKSELI, KOKOONPANO**

**ENSEMBLE CONTRE-ARBRE  
CONJUNTO CONTRAEJE  
CONJUNTO DO CONTRAEIXO**



110 93050095 DWG 00

ITEM NO.	PART NUMBER	QTY REQ.	PART NAME	SIZE	WT. EACH LG.
16	1001504360	1	HEX BUSH 2" X 3/4"	—	—
17	1001540078	1	STRT EL 45° X 3/4"	—	—
18	1003722536	2	HCS M10 X 20	—	—
19	1003069046	2	LOCKWASHER M10	—	—
20	1001551462	1	NIPPLE, 2" PIPE X 7.00" LG	—	1.0
21	1018850385	1	BLOCK	A3	1.1
22	1044254097	1	HOSE ASSEMBLY 825 LONG	A3	0.5
23	1001540576	1	ELBOW 90° X 3/4"	A4	0.9
24	1001502105	1	ADAPTER R 3/4" - 3/4" NPT	—	—
25	1001674131	1	RELIEF VALVE 2"	1	4.5

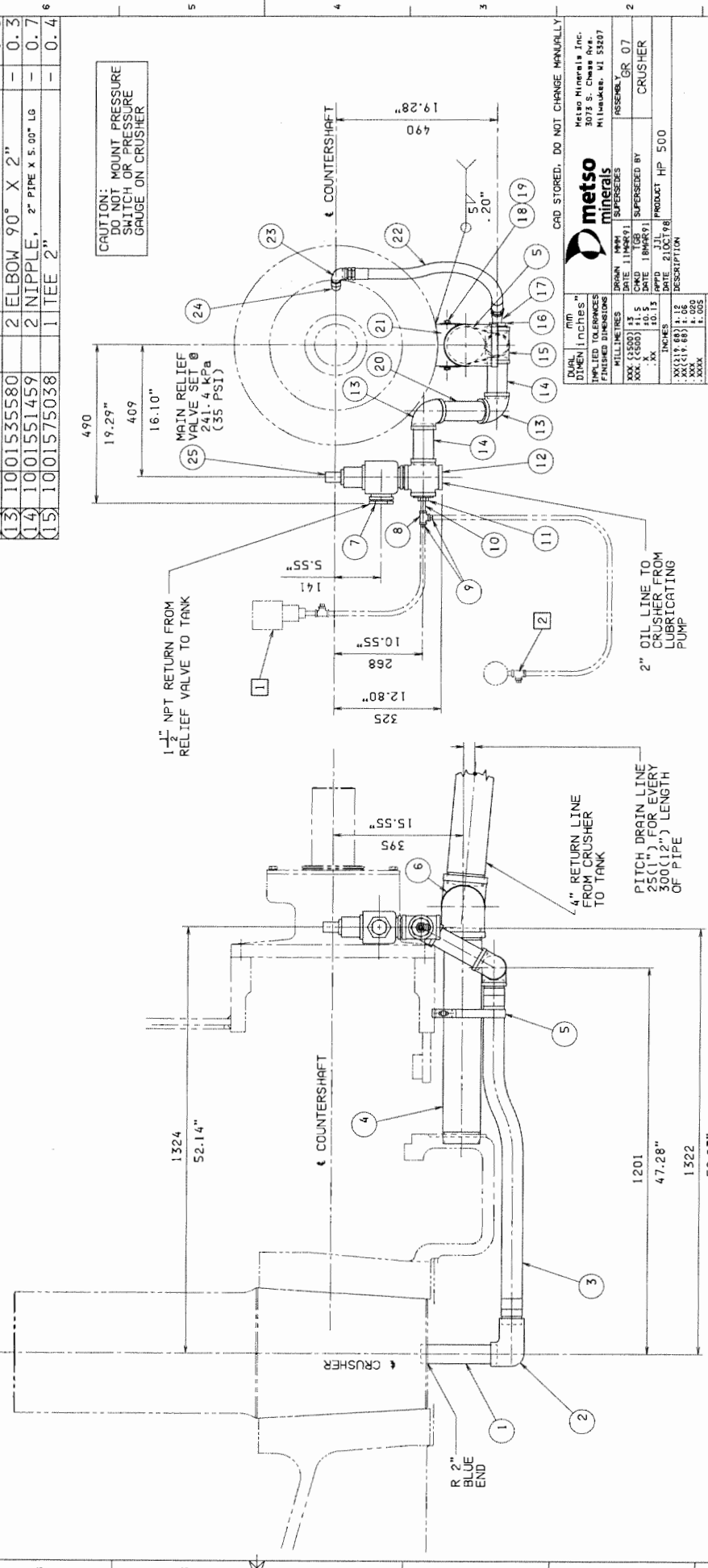
  

ITEM NO.	PART NUMBER	QTY REQ.	PART NAME	SIZE	WT. EACH LG.
1	1093050042	1	CRUSHER OIL PIPING	—	26
1	1050759592	1	PIPE 2" PIPE X 230 LG	A3	1.3
2	1001589313	1	UNION EL 90° X 2"	—	—
3	1044259220	1	HOSE ASSEMBLY 1080 LONG	A3	2.4
4	1054602417	1	NIPPLE, 4" PIPE X 665mm LG	A3	1.1
5	1001535584	1	BRACKET	—	—
6	1001535584	1	ELBOW 90° X 4"	—	—
7	1001504357	1	HEX BUSH 2" X 1 1/2"	—	—
8	1001575031	1	TEE 1 1/4"	—	—
9	1001558641	2	PIPE PLUG 1/4"	—	—
10	1001551330	1	NIPPLE 1/4" PIPE X 2" LG	—	—
11	1001504363	1	HEX BUSH 2" X 1/4"	—	0.1
12	1001527038	1	CROSS 2"	—	0.5
13	1001535580	2	ELBOW 90° X 2"	—	0.3
14	1001551459	2	NIPPLE, 2" PIPE X 5.00" LG	—	0.7
15	1001575038	1	TEE 2"	—	0.4

NOTES:

SUGGESTED INSTALLATION OF PRESSURE SWITCH & GAUGE

- 1 PRESSURE SWITCH - 0519 4260  
NIPPLE 1/4" X 2" - 0155 1330  
TEE 1/4" - 0157 5031  
PIPE PLUG 1/4" - 0155 8641  
1/4" RUBBER HOSE RECOMMENDED
- 2 PRESSURE GAUGE - 0700 7305  
PIPE PLUG 1/4" - 0157 5031  
1/4" RUBBER HOSE RECOMMENDED



**metso**  
minerals

Metso Minerals Inc.  
3075 S. Chase Ave.  
Milwaukee, WI 53207

ASSEMBLY: 1093050042  
SUPERSEDES: 07 07  
DATE: 18MAR91  
BY: JLL  
PRODUCT: HP 500  
DESCRIPTION: CRUSHER

DUAL DIMEN INCHES IMPLD TOLERANCES FINISHED DIMENSIONS MILLIMETERS XXX (1/200) 1/2 .XX (1/100) 1/4 .XXX (1/50) 3/8 .XXXX (1/25) 1/2 .XXXXX (1/12) 5/8 .XXXXXX (1/6) 3/4 .XXXXXX (1/3) 1 .XXXXXX (1/2) 1 1/2 .XXXXXX (3/4) 2 .XXXXXX (1) 3 .XXXXXX (1 1/2) 4 .XXXXXX (2) 6 .XXXXXX (3) 9 .XXXXXX (4) 12 .XXXXXX (6) 18 .XXXXXX (8) 24 .XXXXXX (12) 36 .XXXXXX (18) 54 .XXXXXX (24) 72 .XXXXXX (36) 108 .XXXXXX (48) 144 .XXXXXX (72) 216 .XXXXXX (96) 288 .XXXXXX (144) 432 .XXXXXX (180) 540 .XXXXXX (216) 648 .XXXXXX (270) 810 .XXXXXX (324) 972 .XXXXXX (360) 1080 .XXXXXX (432) 1296 .XXXXXX (486) 1458 .XXXXXX (540) 1620 .XXXXXX (648) 1944 .XXXXXX (720) 2160 .XXXXXX (810) 2430 .XXXXXX (900) 2700 .XXXXXX (1080) 3240 .XXXXXX (1296) 3888 .XXXXXX (1458) 4374 .XXXXXX (1620) 4896 .XXXXXX (1944) 5832 .XXXXXX (2160) 6480 .XXXXXX (2430) 7290 .XXXXXX (2700) 8100 .XXXXXX (2880) 3240 .XXXXXX (3240) 3672 .XXXXXX (3600) 4032 .XXXXXX (4032) 4494 .XXXXXX (4494) 5056 .XXXXXX (5056) 5618 .XXXXXX (5618) 6180 .XXXXXX (6180) 6840 .XXXXXX (6840) 7500 .XXXXXX (7500) 8160 .XXXXXX (8160) 8820 .XXXXXX (8820) 9480 .XXXXXX (9480) 10140 .XXXXXX (10140) 10800 .XXXXXX (10800) 11460 .XXXXXX (11460) 12120 .XXXXXX (12120) 12780 .XXXXXX (12780) 13440 .XXXXXX (13440) 14100 .XXXXXX (14100) 14760 .XXXXXX (14760) 15420 .XXXXXX (15420) 16080 .XXXXXX (16080) 16740 .XXXXXX (16740) 17400 .XXXXXX (17400) 18060 .XXXXXX (18060) 18720 .XXXXXX (18720) 19380 .XXXXXX (19380) 20040 .XXXXXX (20040) 20700 .XXXXXX (20700) 21360 .XXXXXX (21360) 22020 .XXXXXX (22020) 22680 .XXXXXX (22680) 23340 .XXXXXX (23340) 24000 .XXXXXX (24000) 24660 .XXXXXX (24660) 25320 .XXXXXX (25320) 25980 .XXXXXX (25980) 26640 .XXXXXX (26640) 27300 .XXXXXX (27300) 27960 .XXXXXX (27960) 28620 .XXXXXX (28620) 29280 .XXXXXX (29280) 29940 .XXXXXX (29940) 30600 .XXXXXX (30600) 31260 .XXXXXX (31260) 31920 .XXXXXX (31920) 32580 .XXXXXX (32580) 33240 .XXXXXX (33240) 33900 .XXXXXX (33900) 34560 .XXXXXX (34560) 35220 .XXXXXX (35220) 35880 .XXXXXX (35880) 36540 .XXXXXX (36540) 37200 .XXXXXX (37200) 37860 .XXXXXX (37860) 38520 .XXXXXX (38520) 39180 .XXXXXX (39180) 39840 .XXXXXX (39840) 40500 .XXXXXX (40500) 41160 .XXXXXX (41160) 41820 .XXXXXX (41820) 42480 .XXXXXX (42480) 43140 .XXXXXX (43140) 43800 .XXXXXX (43800) 44460 .XXXXXX (44460) 45120 .XXXXXX (45120) 45780 .XXXXXX (45780) 46440 .XXXXXX (46440) 47100 .XXXXXX (47100) 47760 .XXXXXX (47760) 48420 .XXXXXX (48420) 49080 .XXXXXX (49080) 49740 .XXXXXX (49740) 50400 .XXXXXX (50400) 51060 .XXXXXX (51060) 51720 .XXXXXX (51720) 52380 .XXXXXX (52380) 53040 .XXXXXX (53040) 53700 .XXXXXX (53700) 54360 .XXXXXX (54360) 55020 .XXXXXX (55020) 55680 .XXXXXX (55680) 56340 .XXXXXX (56340) 57000 .XXXXXX (57000) 57660 .XXXXXX (57660) 58320 .XXXXXX (58320) 58980 .XXXXXX (58980) 59640 .XXXXXX (59640) 60300 .XXXXXX (60300) 60960 .XXXXXX (60960) 61620 .XXXXXX (61620) 62280 .XXXXXX (62280) 62940 .XXXXXX (62940) 63600 .XXXXXX (63600) 64260 .XXXXXX (64260) 64920 .XXXXXX (64920) 65580 .XXXXXX (65580) 66240 .XXXXXX (66240) 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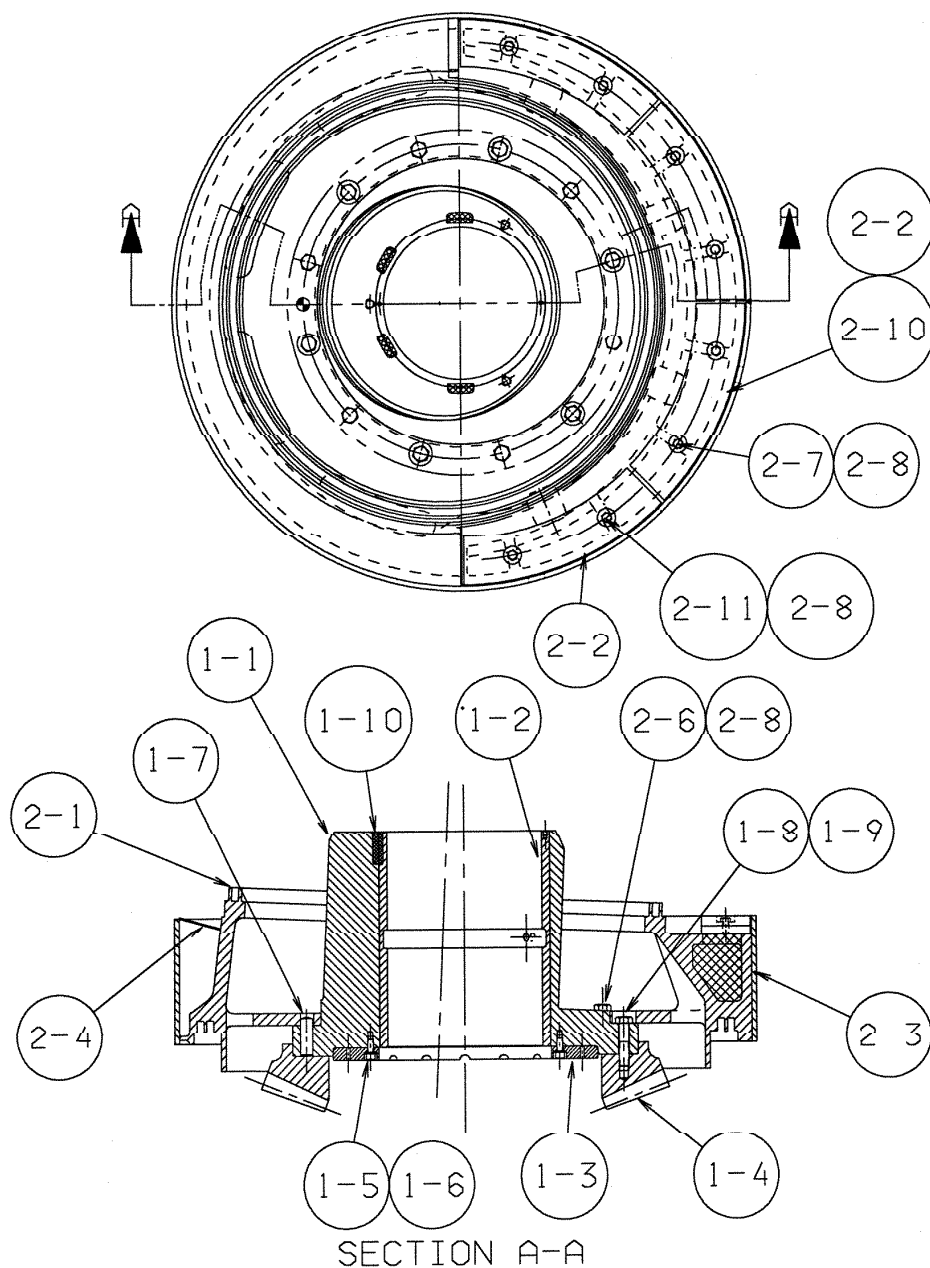
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**ECCENTRIC ASSEMBLY  
 EXZENTER  
 EPÄKESKO, KOKOONPANO**
**ENSEMBLE EXCENTRIQUE  
 CONJUNTO EXCENTRICO  
 CONJUNTO DO EXCÊNTRICO**

ITEM REF. VIITE	PCS NBRE KPL	PART NO/NO ART. TEIL/PARTE N° OSA/CÓDIGO DA PEÇA	DESCRIPTION BENENNUNG NIMITYS	DESIGNATION DESCRIPCIÓN DESCRIÇÃO	NOTES BEMERK/NOTA HUOM.
1	1	1093055002	ECCENTRIC EXZENTER EPÄKESKO	EXCENTRIQUE EXCENTRICO EXCÊNTRICO	
2	1	1093055003	COUNTERWEIGHT ASSY GEGENGEWICHT VASTAPAINO, KOKOONPANO	ENSEMBLE BALOURD CONJUNTO DESEQUILIBRIO CONJUNTO DO CONTRAPESO	

**1093050023**

**ECCENTRIC ASSEMBLY  
EXZENTER  
EPÄKESKO, KOKOONPANO**

**ENSEMBLE EXCENTRIQUE  
CONJUNTO EXCENTRICO  
CONJUNTO DO EXCÊNTRICO**



110 9305 0023 DWG



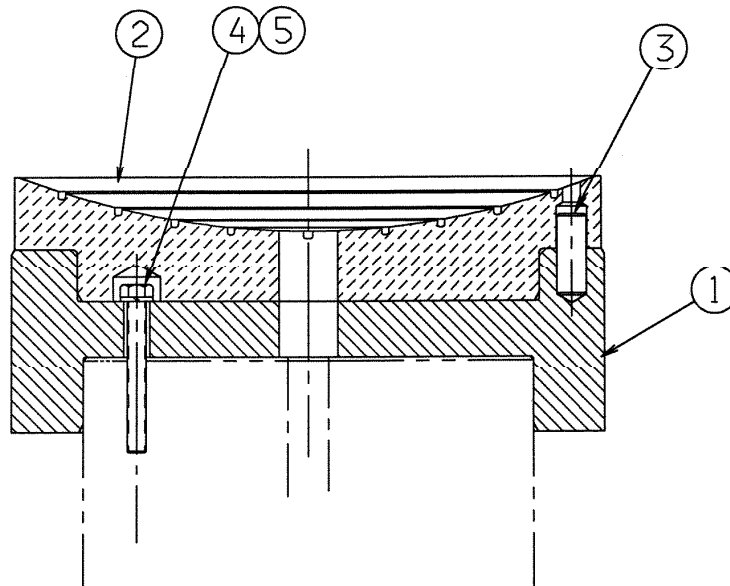
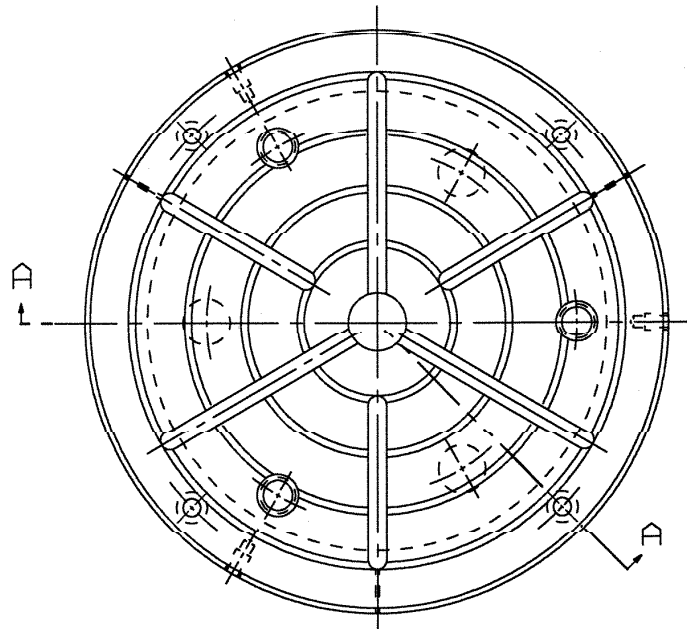
**1093050067**
**SOCKET ASSEMBLY  
BUCHSE  
HYLSYN KOKOONPANO**
**ENSEMBLE DOUILLE  
CONJUNTO CASQUILLO  
CONJUNTO DO SOQUETE**

ITEM REF. VIITE	PCS NBRE KPL	PART NO/NO ART. TEIL/PARTE N° OSA/CÓDIGO DA PEÇA	DESCRIPTION BENENNUNG NIMITYS	DESIGNATION DESCRIPCIÓN DESCRIÇÃO	NOTES BEMERK/NOTA HUOM.
1	1	1073817084	SOCKET STECKDOSE JATKOPISTORASIA	DOUILLE CASQUILLO SOQUETE	
2	1	1048723201	SOCKET LINER LAGER SCHALE MALJALAAKERI	COUSSINET SPHERIQ. COJINETE ESFRICO REVESTIMENTO DO SOQUETE	
3	3	N01619334	PIN NADEL TAPPI	GOUPILLE CLAVIJA PINO	
4	3	7001530422 <small>ISO4017-M20X80-8.8-A2A</small>	HEXAGONAL SCREW SCHRAUBE KUUSIORUUVI	VIS HEXAGONALE TORNIL. PARAFUSO SEXTAVADO	
5	3	N01631120 <small>M20-NFE25.511</small>	WASHER UNTERLEGSCHIEBE ALUSLAATTA	RONDELLE ARANDELA ARRUELA	

**1093050067**

**SOCKET ASSEMBLY  
BUCHSE  
HYLSYN KOKOONPANO**

**ENSEMBLE DOUILLE  
CONJUNTO CASQUILLO  
CONJUNTO DO SOQUETE**



SECTION A-A

110 93050067 DWG 00



**1093050097**

**FEED PLATE ASSEMBLY  
AUFGABEVERTEILKONUS  
SYÖTTÖTASO**

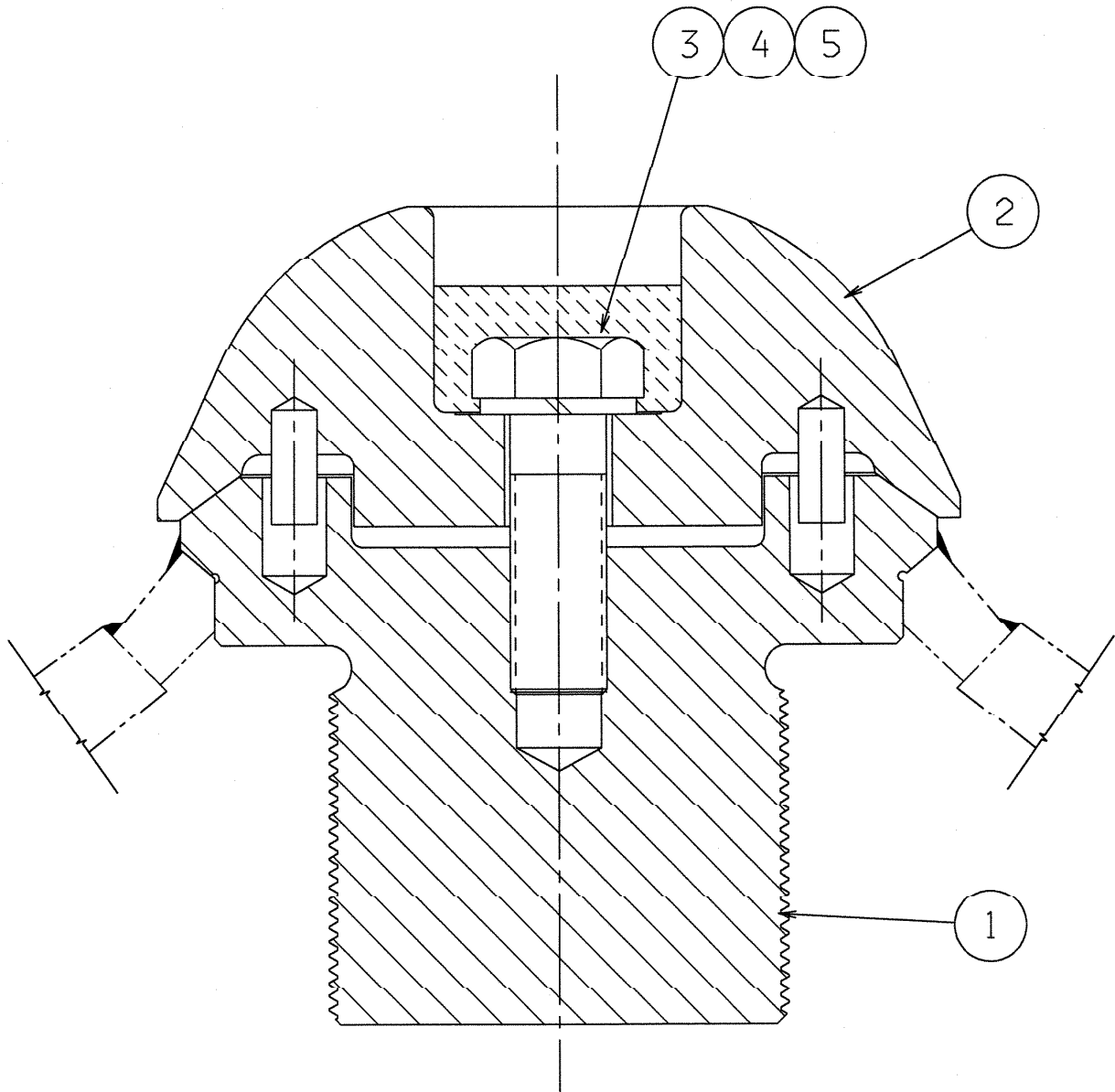
**ENSEMBLE CONE DISTRIBUTEUR  
CONJUNTO CONO DISTRIBUIDOR  
CONJ. DA PLACA DE ALIMENTAÇÃO**

ITEM REF. VIITE	PCS NBRE KPL	PART NO/NO ART. TEIL/PARTE N° OSA/CÓDIGO DA PEÇA	DESCRIPTION BENENNUNG NIMITYS	DESIGNATION DESCRIPCIÓN DESCRIÇÃO	NOTES BEMERK/NOTA HUOM.
1	1	1019559607	LOCKING BOLT SCHRAUBE LUKINTAPULTTI	VIS DE BLOCAGE TORNILLO DE FIJACIÓN PARAFUSO DE TRAVAMENTO	
2	1	1055981159	FEED PLATE AUFGABEPLATTE SYÖTTÖLEVY	PLATEAU DISTRIBUTEUR PLACA DE ALIMENTACIÓN PLACA DE ALIMENTAÇÃO	
3	1	7001530881 ISO4014-M42X120-8.8-A3A	HEXAGONAL SCREW SCHRAUBE KUUSIORUUVI	VIS HEXAGONALE TORNIL. PARAFUSO SEXTAVADO	
4	1	7001632042 W42 NITE25.515	WASHER UNTERLEGSscheIBE ALUSLAATTA	RONDELLE ARANDELA ARRUELA	
5	1	7008010040 RTV9101 / AS310	SILICONE SEAL ABDICHTPASTE SILIKONITIIVISTE	PASTE A JOINT TUBE PASTA DE JUNTA EN TUBO VEDAÇÃO DE SILICONE	

**1093050097**

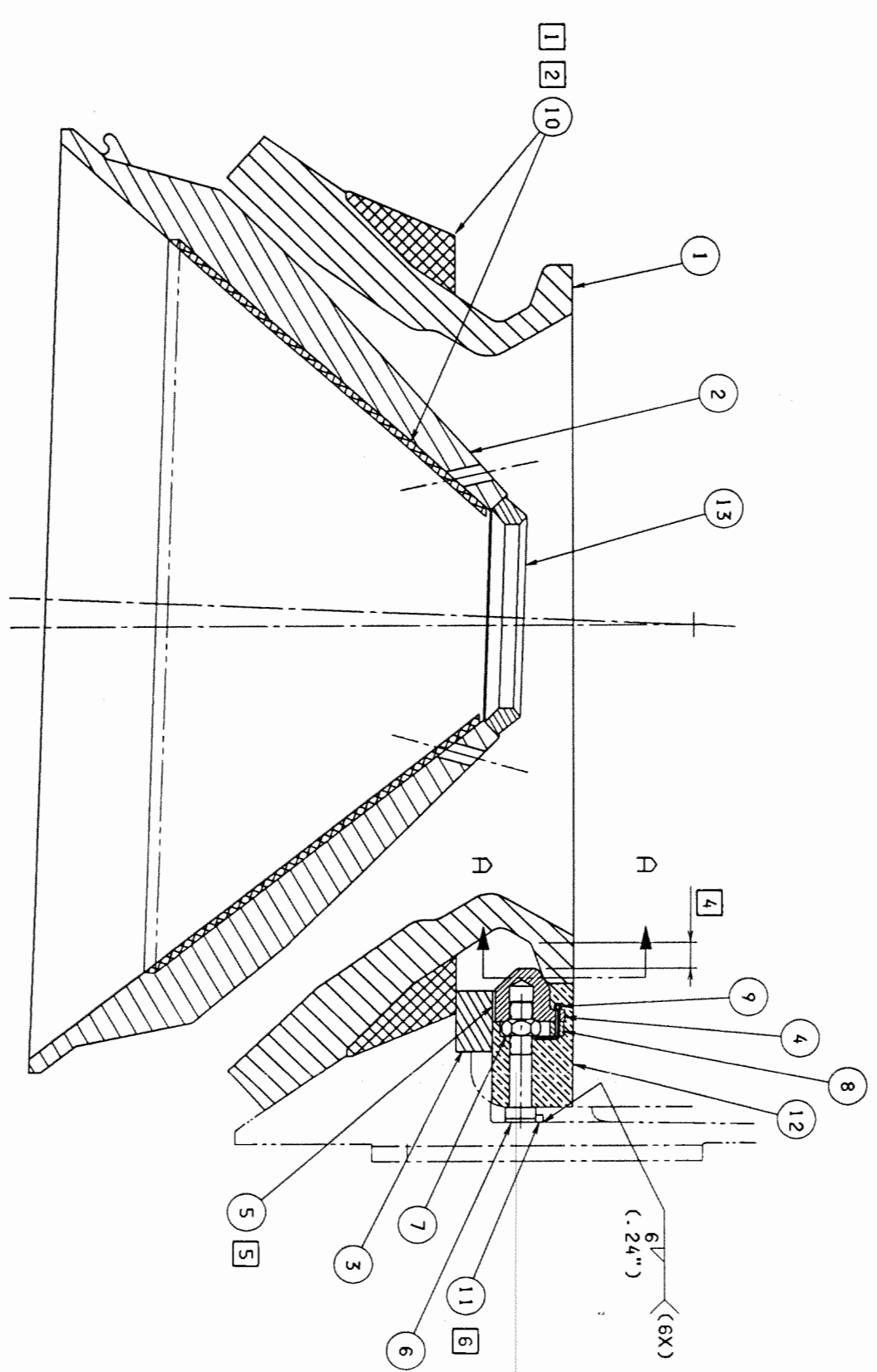
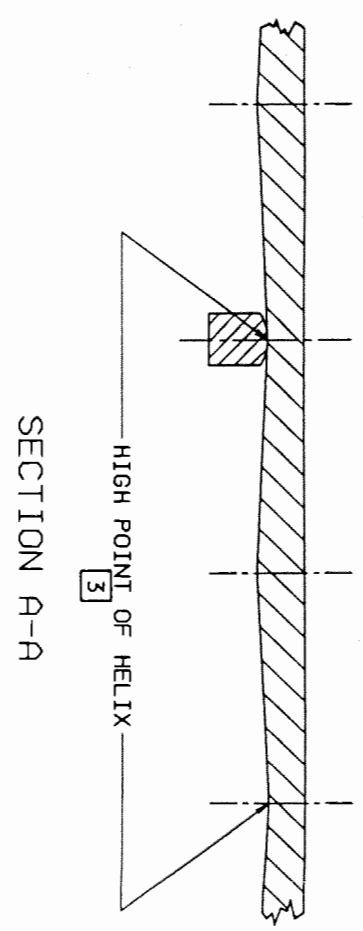
**FEED PLATE ASSEMBLY  
AUFGABEVERTEILKONUS  
SYÖTTÖTÄSO**

**ENSEMBLE CONE DISTRIBUTEUR  
CONJUNTO CONO DISTRIBUIDOR  
CONJ. DA PLACA DE ALIMENTAÇÃO**



110 9305 0097 DWG 00

NO. 110-93050134  
ALL INFORMATION CONTAINED ON THIS DRAWING IS CONSIDERED TO BE CONFIDENTIAL AND NOT TO BE DISCLOSED OR REPRODUCED IN ANY MANNER WITHOUT THE EXPRESS WRITTEN CONSENT OF METSO MINERALS (OVERLAND), INC.



BILL OF MATERIAL				
ITEM NO.	PART NUMBER	QTY.	PART NAME	DWG. SIZE
1	1093050134	1	LINER ASSEMBLY	3811
2	1048314219	1	BOWL LINER	A1 1710
3	1050143710	1	MANTLE	A1 1600
4	1063437875	1	ADAPTER RING	A2
5	1086342866	6	WEDGE	A2 2.8
6	1070516700	6	WEDGE SHIM	A4
7	1019578985	6	SQ HD BOLT	A3 2.0
8	1051486801	6	SPHERICAL NUT	A4
9	1056839400	6	LOCK PLATE	A3 1.0
10	1003075440	6	COTTER PIN 6 X 80	
11	1095059901	12	BACKING 22H KIT	10
12	1018780302	6	BOLT STOP	A4 0.1
13	1004590540	A/R	INSUL. 3.5" X 15"	
13	1063915668	1	TORCH RING	A2 12

- NOTES:
- FOR BACKING INSTRUCTIONS REFER TO HP CRUSHER INSTRUCTION MANUAL.
  - APPROXIMATE QUANTITY TO BACK BOTH LINER AND MANTLE.
  - TO INSURE SELF TIGHTENING LOCATE BOWL LINER IN BOWL SO THAT WEDGE (ITEM 4) WILL CONTACT HIGHEST POINT OF HELIX ON BOWL LINER. AFTER WEDGES AND SQUARE HEAD BOLTS ARE LOCATED, TURN SPHERICAL NUTS UNTIL HAND TIGHT, THEN TIGHTEN ALTERNATE NUTS WITH WRENCH TO PULL UP BOWL LINER EVENLY. DROP LOCKPLATES (ITEM 8) OVER SPHERICAL NUTS AND INSERT COTTER PINS (ITEM 9).
  - CLEARANCE MUST BE MAINTAINED BETWEEN WEDGE AND LINER AT THIS POINT. WEDGE SHOULD BE SHIMMED UP IF REQUIRED TO OBTAIN CLEARANCE.
  - TACK WELD WEDGE SHIM, (ITEM 5), TO BOWL IF REQUIRED.
  - AFTER SQ HD BOLTS HAVE BEEN TIGHTENED, WELD BOLT STOP (ITEM 11) ABOVE EACH BOLT HEAD AS SHOWN.

SUPERSEDED  
BY  
70 90258905  
13NOV01  
ECN 103636

REVISION	DATE	DESCRIPTION	BY	ENG. ORDER NUMBER
B	10/30/95	SUPERSEDED BY 70 90258905		103636
A	10/30/95	UPDATED TO ISO9000 STD		61742
ISSUED				61366

DRAWN

mm

1:12

DIMEN

inches

1:12

FINISHED TOLERANCES

MILLIMETERS

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SURFACE PREPARATION, CLEANING AND PAINTING SYMBOLS ACCORDING TO COMPANY STANDARD 03-01-01.

CAD STORED. DO NOT CHANGE MANUALLY

metso

minerals

Metso Minerals Inc.

3073 S. Chase Ave.

Hillman, WI 53007

DATE

10/30/95

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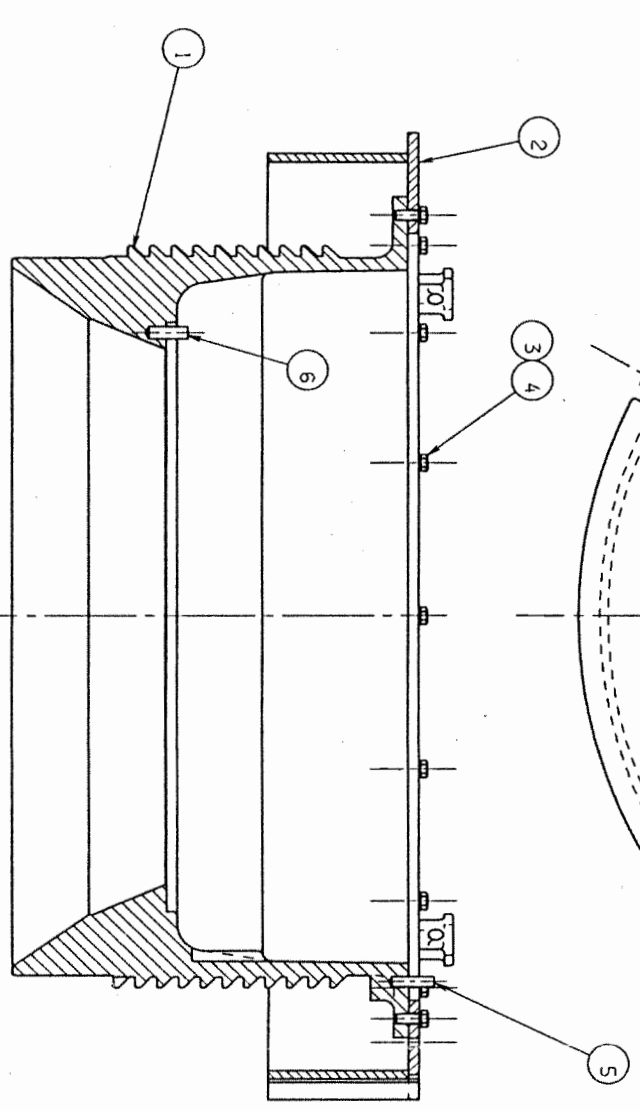
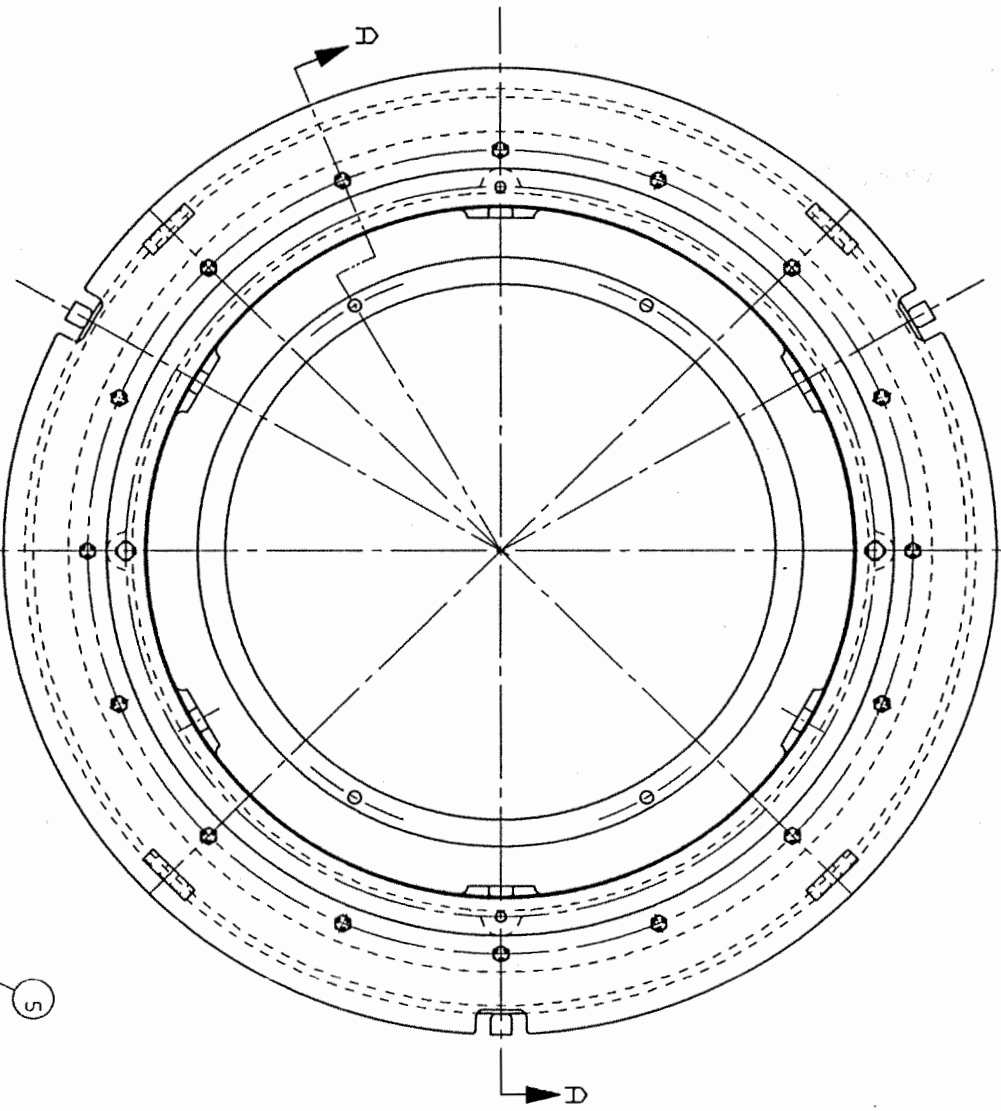
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10/30/95

LINER ASSEMBLY

REV. B

NO. 110-93050130  
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SECTION "A-A"

SURFACE PREPARATION, CLEANING AND PAINTING SYMBOLS ACCORDING TO COMPANY STANDARD 03-01-01.

REF: 93050053

BILL OF MATERIAL				
ITEM NO.	PART NUMBER	QTY.	PART NAME	ENG. DATE
1	1093050130	1	BOWL ASSEMBLY	4297
2	1020055255	1	BOWL	A03600
3	1022815052	1	ADJUSTMENT CAP	A1 697
4	1003725092	16	HCS M24X60	-
5	1003069071	16	LOCK WASHER M24	-
6	1003344519	2	PIN Ø 25 X 100	-
7	1003344787	4	PIN Ø 30 X 90	-

NOTE:  
1. RUB DOWN OR SPRAY THREADS OF BOWL AND ADJUSTMENT RING WITH MOLYBDENUM DISULFIDE BEFORE INSTALLATION.

REV.	DESCRIPTION OF CHANGE	LOC.	BY	DATE	ENG. ORDER NUMBER
1	ISSUED		60879	220C79	61742

DRAWN	DATE	BY	DATE	BY	DATE
XXX (2500)	13	XXX (2500)	13	XXX (2500)	13
XXX (5500)	11.5	XXX (5500)	11.5	XXX (5500)	11.5
XXX	10.5	XXX	10.5	XXX	10.5
XXX	10.13	XXX	10.13	XXX	10.13
DATE	220C79	DATE	220C79	DATE	220C79

SCALE 1:8

11093050130

REV. A

CAD STORED. DO NOT CHANGE MANUALLY

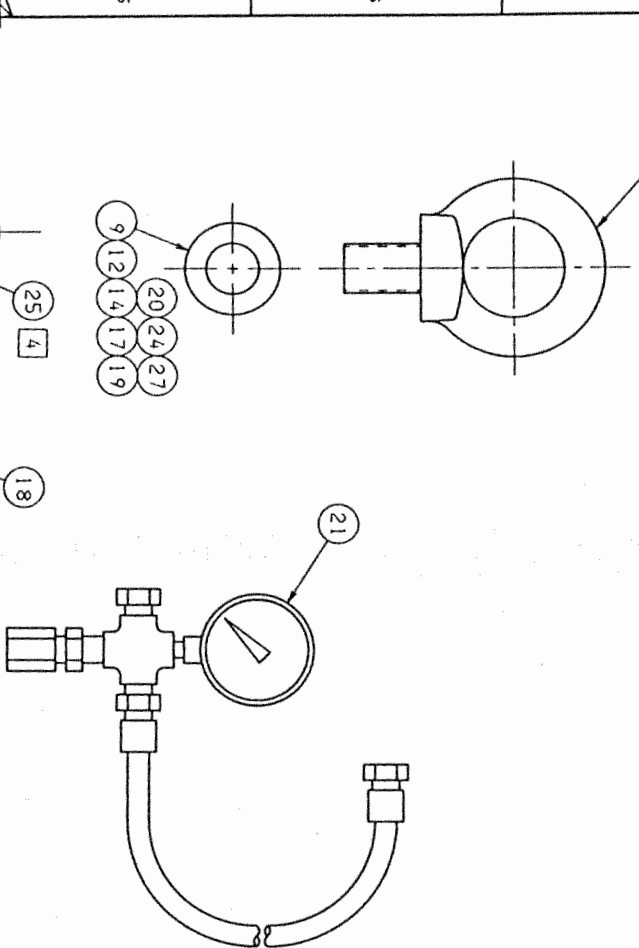


Nordberg Inc.  
P.O. Box 385  
Milwaukee, WI 53201

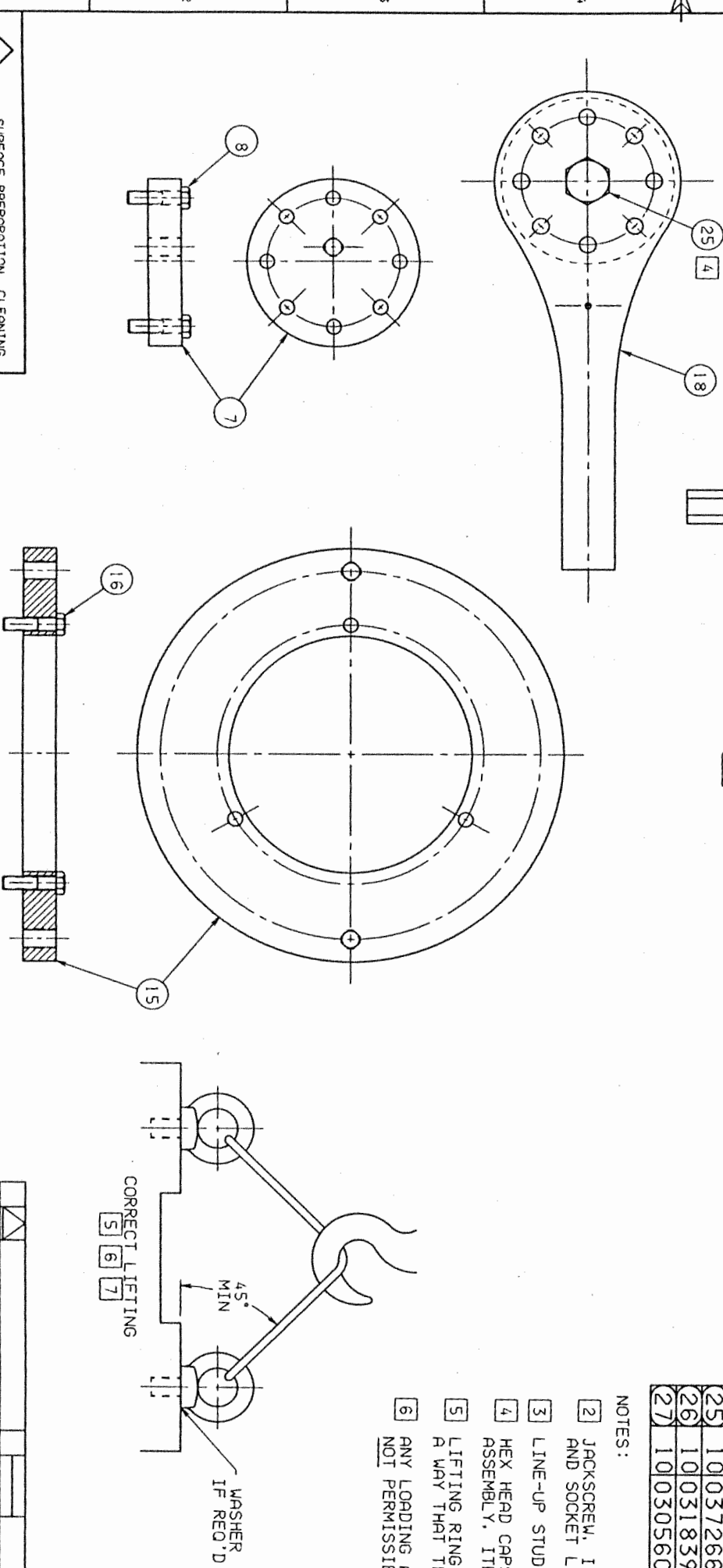
BOWL ASSEMBLY







- 7 WASHERS. ITEMS (9), (12), (14), (17), (19), (20), (24) AND (27) SHALL BE INSERTED IF NECESSARY TO EXCLUDE THE POSSIBILITY OF INCORRECT LOADING.
- 8 JACKSCREW, ITEM (22), IS TO BE USED FOR PULLING IN AND JACKING OUT COUNTERSHAFT BOX.
- 9 USED ON UPPER BUSHING.
- 10 USED ON UPPER THRUST BRG. ECC BUSHING, SOCKET, SOCKET LINER, LOWER BUSHING AND LOWER THRUST BRG.
- 11 USED ON MAIN SHAFT, COUNTERWEIGHT, ECCENTRIC, HEAD BALL, DRIVE RING AND ADAPTER RINGS.
- 12 USED ON ECC LIFT PLATE AND HEAD.
- 13 USED ON ADJUSTMENT RING AND HEAD LIFT PLATE.
- 14 USED ON UPPER THRUST BRG. ECC BUSHING, SOCKET.
- 15 USED ON CLAMP RING AND BEAR.
- 16 USED ON STD-COARSE ADAPTER RING.




- 2 JACKSCREW, ITEM (10), IS TO BE USED TO DISASSEMBLE SOCKET AND SOCKET LINER.
- 3 LINE-UP STUD, ITEM (11), IS USED TO ASSEMBLE SOCKET.
- 4 HEX HEAD CAPSCREW, ITEM (25), IS USED TO HOLD WRENCH ASSEMBLY, ITEM (18), DOWN WHILE SLEDGING MANTLE TIGHT.
- 5 LIFTING RING BOLTS MUST ALWAYS BE SCREWED TIGHT IN SUCH A WAY THAT THEY FIT FLUSH AGAINST THE BEARING SURFACE.
- 6 ANY LOADING AT RIGHT ANGLES TO THE PLANE OF THE EYE IS NOT PERMISSIBLE.

ITEM NO.	PART NUMBER	QTY. REQ.	PART NAME	DWG. SIZE	WT. EACH KG.
	1093050074		TOOLS ASSEMBLY		180
1	1003183908	2	RING BOLT M8 [9]	-	0.06
2	1003183910	3	RING BOLT M10 [10]	-	0.11
3	1003183936	4	RING BOLT M36 [13]	-	2.65
4	1003183942	2	RING BOLT M42 [14]	-	
5	1003183920	4	RING BOLT M20 [11]	-	0.45
6	1002183930	2	RING BOLT M30 [12]	-	1.66
7	1080960104	1	HEAD LIFTING PLATE	A3	31
8	1003724634	4	HHCS M20 X 90	-	
9	1003056067	2	WASHER M42	-	
10	1067262600	3	JACKSCREW	A4	1.03
11	1065875316	3	LINE UP STUD	A4	.6
12	1003056043	4	WASHER M20	-	
13					
14	1003056055	2	WASHER M30		
15	1080960057	1	ECCENT LIFT PLATE	A3	69
16	1003724620	3	HHCS M20 X 80	-	
17	1003056049	2	WASHER M24		
18	1087729037	1	WRENCH ASSY	A3	54
19	1003056028	3	WASHER M10	-	
20	1003056025	2	WASHER M8	-	
21	1094290022	1	CHARGING ASSY	A4	
22	1067262601	3	JACKSCREW	A4	1.0
23	1003183924	2	RING BOLT M24 [15]	-	
24	1003056061	4	WASHER M36	-	
25	1003726697	1	HHCS M42 X 180	-	
26	1003183912	2	RING BOLT M12 [16]	-	
27	1003056031	2	WASHER M12	-	

NOTES:

CAD STORED. DO NOT CHANGE MANUALLY

DUAL DIMEN INCHES "		MM	
IMPLIED TOLERANCES			
FINISHED DIMENSIONS			
MILL INCHES			
XXX: (3500)	1:3	DATE 21OCT98	SUPERSEDES
XXX: (3500)	1: 5	CAID 108	SUPERSEDED BY
XX	10: 3	DATE 21OCT98	CRUSHER
XX	10: 3	DATE 21OCT98	PRODUCT HP 500
INCHES			
XX(11.68)	1: 2	DESCRIPTION	
XXX (11.68)	1: 070		
XXXX	1: .015		
NO / NOCUTTING STATE			
		Northberg Inc. P.O. Box 363 Milwaukee, WI 53201	
ASSEMBLY GR 20			

[illegible]

SURFACE PREPARATION, CLEANING  
AND PAINTING SYMBOLS ACCORDING  
TO COMPANY STANDARD 03-01-01.

CAD 10/79 P

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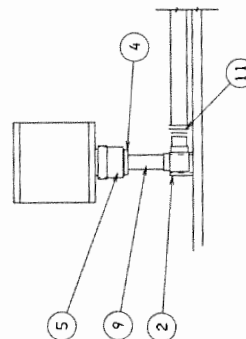
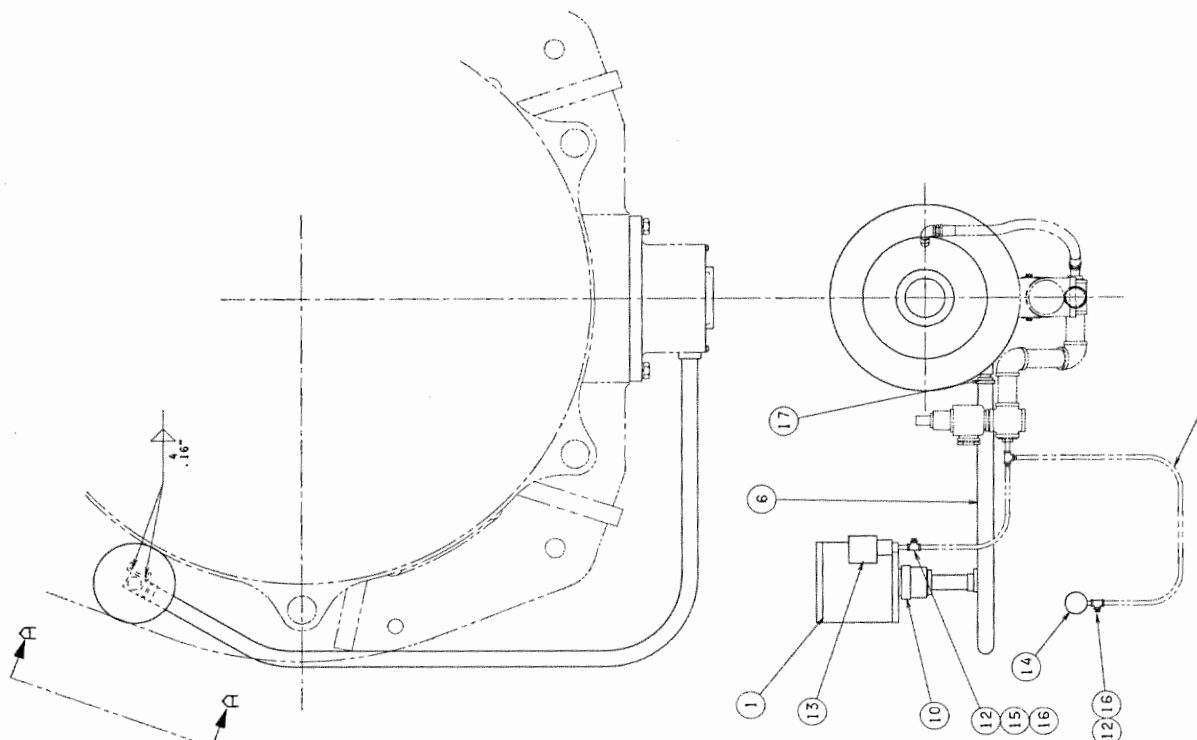
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NO. 110-93050026

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VIEW A-A

SURFACE PREPARATION: CLEANING  
BY BRUSHING AND BLASTING  
TO COMPANY STANDARD 03-01-01.

ITEM NO.	PART NUMBER	QTY. REQ.	PART NAME	DRG. SIZE	WT. LBS.
1	1093050026	1	ACCESSORIES ASSY	A4	
2	1021880064	1	AIR CLEANER	A3	1
3	1021347700	1	BRACKET ASSY	A3	3.3
4	1018780324	3	SAFETY BLOCK	A3	3.3
5	101504378	1	HEX BUSHING 3"X1.5"		
6	1001520070	1	COUPLING 3"		
7	1044258031	1	HOSE 1.5"X2400	A4	
8	101551444	1	NIPPLE 1.5"X6	A4	
9	1024544220	1	CLAMP		
10	1001992008	1	COMBINATION NIPPLE 1.5"		
11	100158641	2	PIPE PLUG .25"		
12	1005194260	1	PRESSURE SWITCH		
13	1007007305	1	PRESSURE GAGE		
14	1001551330	1	NIPPLE .25"X2"		
15	1001575031	2	TEE .25"		
16	7070005002	1	ADAPTER 1-1/2" BSP	A4	

CRD STORED. DO NOT CHANGE MANUALLY

**metso minerals**  
Metso Minerals Inc.  
3115 Industrial Blvd.  
Milwaukee, WI 53207

DATE: 10/15/03  
BY: JTL  
CHECKED: 10/15/03  
DATE: 10/15/03  
APPROVED: 10/15/03  
PRODUCT: HP500

ASSEMBLY OR 21

ACCESSORIES ASSY

110 93050026

1:8

61672

59506

59050

REVISIONS

REVISION 17

REVISION 16

REVISION 15

REVISION 14

REVISION 13

REVISION 12

REVISION 11

REVISION 10

REVISION 9

REVISION 8

REVISION 7

REVISION 6

REVISION 5

REVISION 4

REVISION 3

REVISION 2

REVISION 1

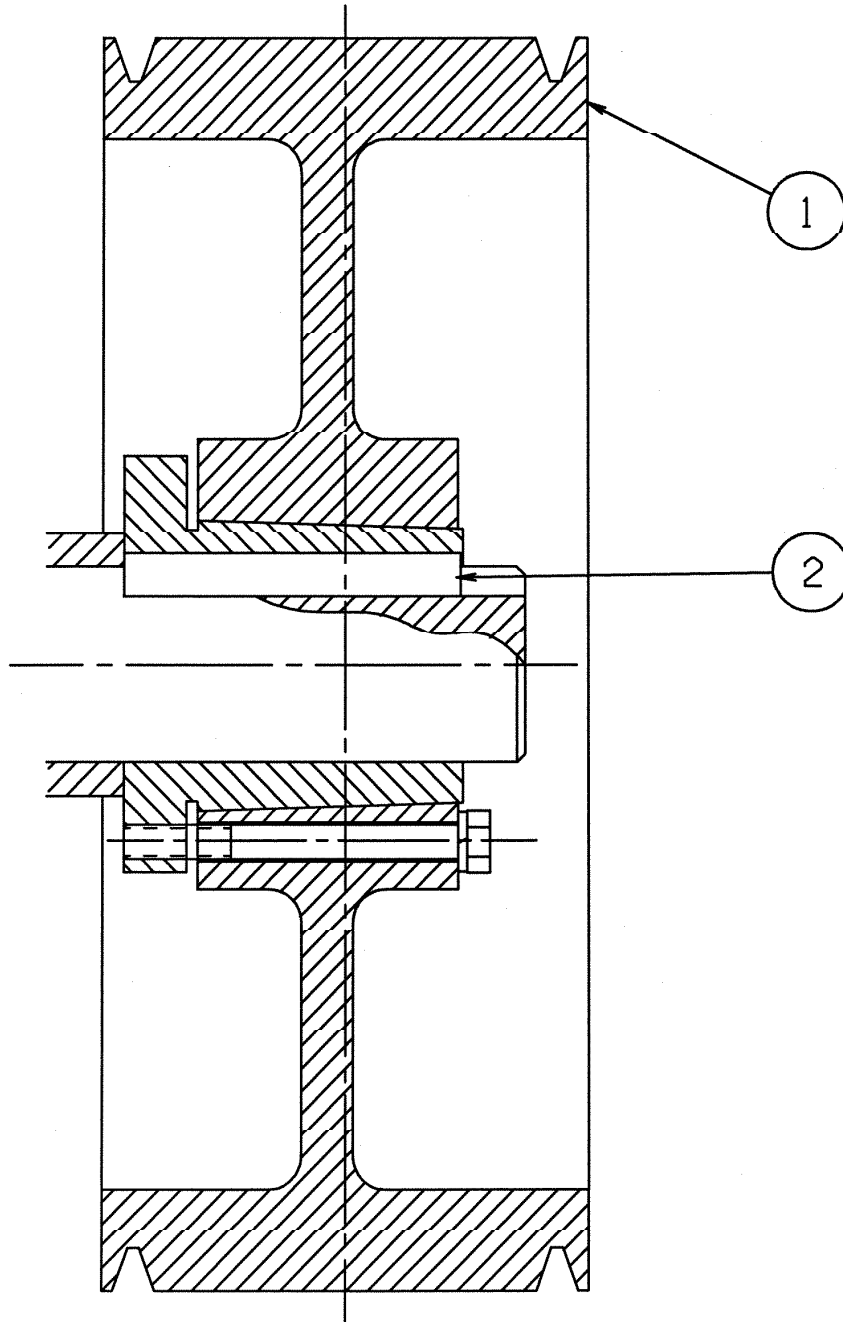
<div> <div> <b>1093050004</b>  12 grooves 8V Dp 902 </div> <div> <b>PULLEY</b>  <b>SCHEIBE</b>  <b>HIHNAPYRÄ</b> </div> <div> <b>POULIE</b>  <b>POLEA</b>  <b>POLIA</b> </div> </div>						
ITEM REF. VIITE	PCS NBRE KPL	PART NO/NO ART. TEIL/PARTE N° OSA/CÓDIGO DA PEÇA	DESCRIPTION BENENNUNG NIMITYS	DESIGNATION DESCRIPCIÓN DESCRIÇÃO	NOTES BEMERK/NOTA HUOM.	
1	1	1059239350	PULLEY SCHEIBE HIHNAPYRA	POULIE POLEA POLIA		
2	1	1047009530	PARALLEL KEY KEIL PARALLEELIKIILA	CLAVETTE PARALELLE CLAVIJA PARALELA CHAVETA PARALELA		

**1093050004**

12 grooves 8V Dp 902

PULLEY  
SCHEIBE  
HIHNAPYRÄ

POULIE  
POLEA  
POLIA



110 9304 0071 DWG

NO. 110-26740202

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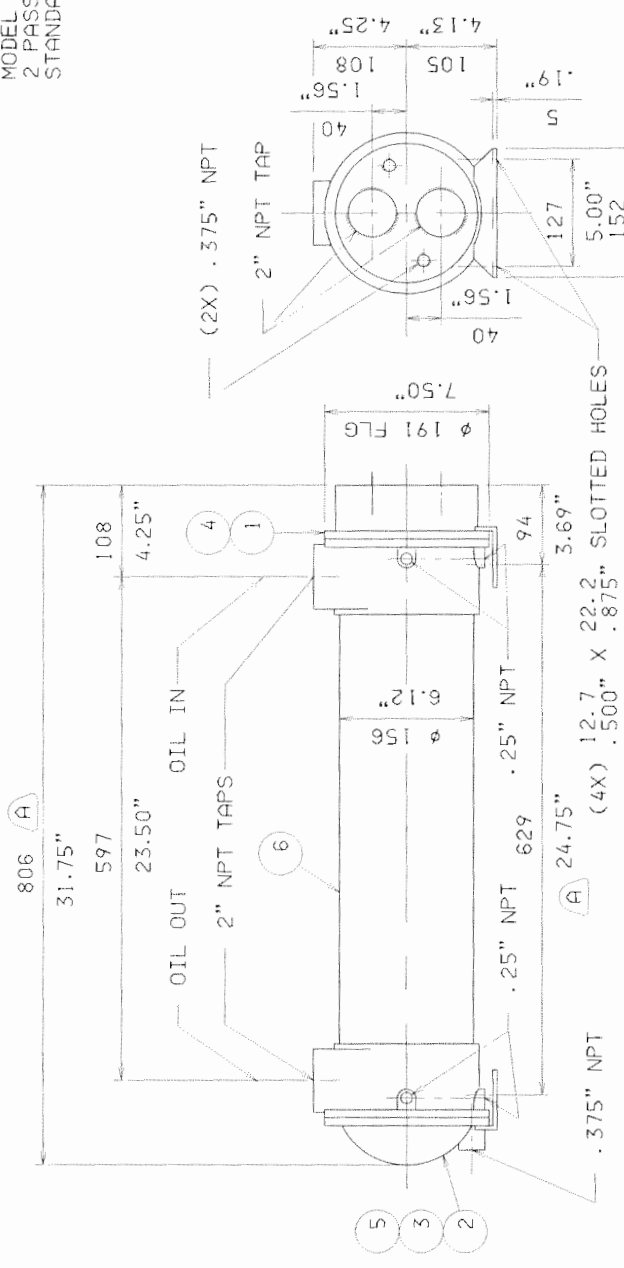
BILL OF MATERIAL

ITEM NO.	PART NUMBER	QTY REQ	PART NAME	DWG. SIZE	WT. EACH KG
1	SEE NOTE	1	HEAT EXCHANGER	28	
2	27453624	1	IN-OUT BONNET		
3	27453625	1	REVERSING BONNET		
4	10520003	2	ZINC ANODE		
5	35256502	1	IN-OUT GASKET		
6	35256503	1	REVERSING GASKET		
7	N/A	1	CORE ASSEMBLY		

REPLACEMENT PARTS

NOTE:

AMERICAN-STANDARD, HEAT TRANSFER DIVISION  
MODEL 06027TCF,  
2 PASS, AND 90-10 COPPER NICKEL CORE ASSEMBLY  
STANDARD FEET ATTACHED TO BONNETS



CAD STORED, DO NOT CHANGE MANUALLY

<b>metso minerals</b> Metso Minerals Inc. 3075 S. Chase Ave. Milwaukee, WI 53207	
DRAWN: MM	DATE: 11DEC91
CHECKED: TGB	DATE: 12DEC91
APPROVED: JJJ	DATE: 10OCT98
PRODUCT: HP 500	DESCRIPTION: COOLER
ASSEMBLY: GR 29	SUPERSEDED BY: CRUSHER
PART NAME: HEAT EXCHANGER	
DWG. SIZE: A2110	DWG. NUMBER: 26740202
SCALE: 1:4	REV.:

61742	61742	10OCT98	10OCT98	10OCT98	10OCT98
58751	58751	14MAR96	14MAR96	14MAR96	14MAR96
54439	54439	09APR92	09APR92	09APR92	09APR92
54407	54407	12DEC91	12DEC91	12DEC91	12DEC91
61742	61742	10OCT98	10OCT98	10OCT98	10OCT98
58751	58751	14MAR96	14MAR96	14MAR96	14MAR96
54439	54439	09APR92	09APR92	09APR92	09APR92
54407	54407	12DEC91	12DEC91	12DEC91	12DEC91

SURFACE PREPARATION, CLEANING  
AND PAINTING SYMBOLS ACCORDING  
TO COMPANY STANDARD 03-01-01.








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PARTS LIST Cone Crusher		PAGE 3 OF 3		110-98200437	
ITEM NO.	PART NAME	NO. REQ'D	PART CODE NO.	DWG SIZE	
70	RED ACCENT STRIPE DECAL, 6" HIGH STRIPE TO BE APPLIED TO THE SIDE OF THE OIL TANK WHICH HAS THE LARGE DRAIN COUPLING. STRIPE TO BE POSITIONED JUST BELOW THE COUPLING WELD ON EACH SIDE OF NORDBERG DECAL.	2	2930 0110	3	
71	NORDBERG DECAL, 6" HIGH DECAL TO BE CENTERED ON THE TANK BETWEEN THE RED ACCENT STRIPES WITH 3" SPACING BETWEEN THE NORDBERG DECAL AND THE RED ACCENT STRIPE DECALS.	1	2930 0107	3	
72	HOSE ASSEMBLY 2" X 15.5"	1	4425 9097	A3	
73	PIPE NIPPLE 2" X 11"	1	1551466		
74	PIPE NIPPLE 2" X 7"	1	1551462		

FOR ASSEMBLY SEE DRAWING 10 9820 0278.


CAD STORED.  
DO NOT CHANGE MANUALLY

 <sup>®</sup>

Nordberg Inc.  
Milwaukee, WI 53207

DRAWN  
DATE

TGB/05MAY98

APPROV  
DATE

JJL/19OCT98

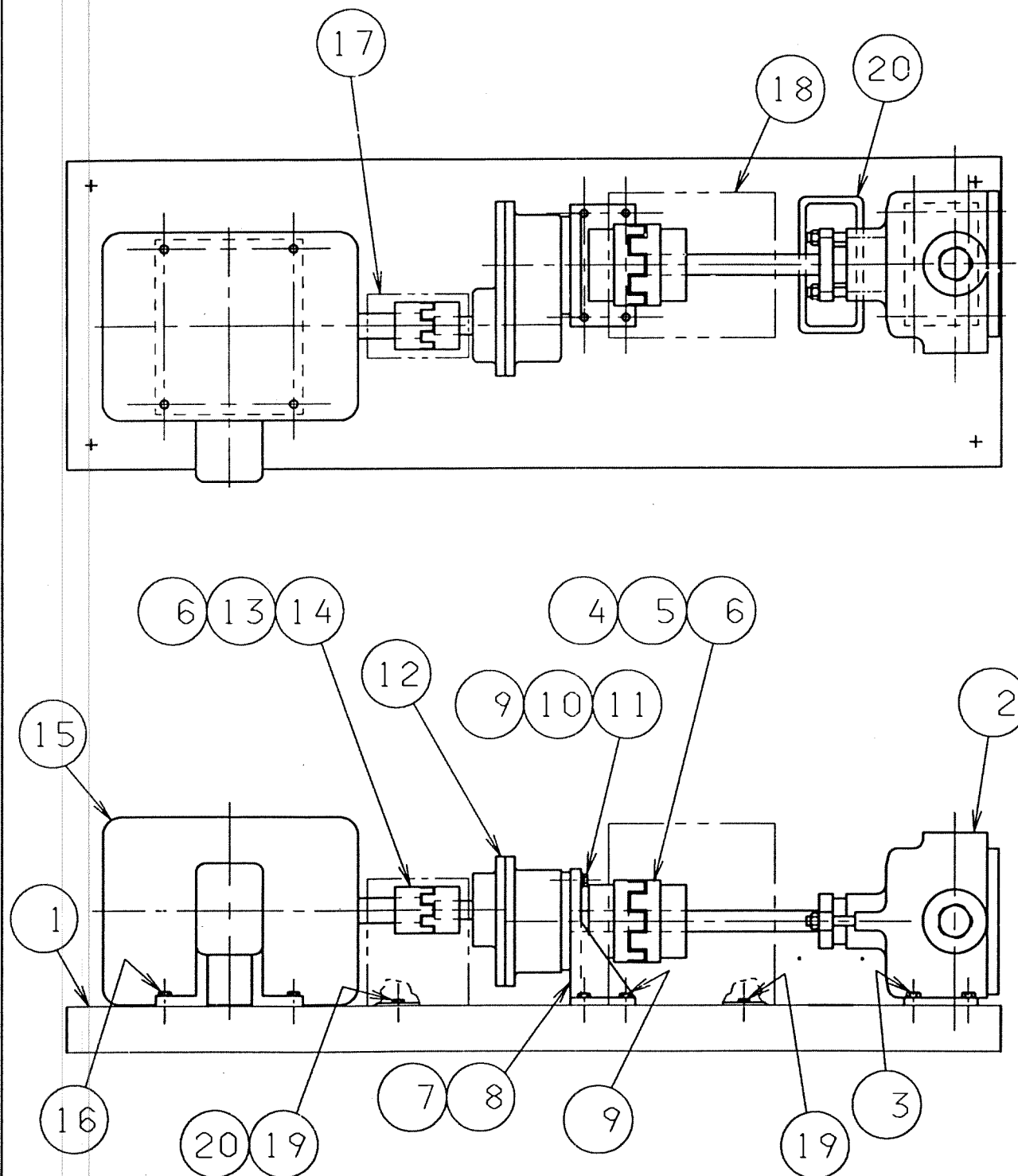
HP500 SX

7 1/2 HP, 1800 RPM  
460 VOLT, 3 PHASE  
60 CYCLE, 14750' ELEV

PACKAGE LUBE SYSTEM  
60-65 GPM 460 VOLT

110-98200437

REV  
A



PUMP AND MOTOR ASSY

**Nordberg®**

 Nordberg Inc.  
 Milwaukee, WI 53207

 REV  
 A

110-94360336

 DRAWN TGB APPD JJJ  
 DATE 05MAY98 DATE 16OCT98

A RED &amp; REV 61742 16OCT98

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PARTS LIST			PAGE 2 OF 2	110-94360336
ITEM NO.	PART NAME	QTY REQ'D	PART CODE	DWG SIZE
1	PUMP BASE *	1	5964 0273	S7-C-785
2	OIL PUMP VIKING L-32	1	5942 0079	
3	HEX HEAD CAPSCREW 7/16 X 1-1/8	4	2775 036	
4	KEY 3/8 X 3/8 X 1 3/4	1	3350 239	
5	COUPLING L-190	1	2688 7831	LU-1303 D
6	KEY 1/4 X 1/4 X 2 3/4	2	3350 131	
7	BRACKET BLOCK	2	5964 0282	
8	REDUCER BRACKET	1	5964 0277	
9	HEX HEAD CAPSCREW 3/8 X 1 1/2	8	2774 801	1
10	WASHER 3/8 (SPECIAL)	4	5964 0275	
11	LOCKWASHER 3/8	4	3065 910	
12	REDUCER "B" SIZE 6.27:1 RATIO *	1	5964 0280	
13	KEY 5/16 X 5/16 X 2	1	3350 169	
14	COUPLING L-100	1	2688 7780	
15	MOTOR-GENERAL ELECTRIC OR EQUAL 7 1/2 HP, 1800 RPM, 460 VOLT, 3 PHASE, 60 CYCLE, TOTALLY ENCLOSED FAN COOLED, 14750 FT. ELEV.	1	5021 4500	
16	HEX HEAD CAPSCREW 3/8 X 1	4	2774 781	
17	COUPLING GUARD (MOTOR)	1	5964 0300	
18	COUPLING GUARD (PUMP)	1	5964 0299	
19	HEX HEAD CAPSCREW 5/16 X 5/8	6	2774 516	
20	WASHER 5/16	6	3060 028	

\* FOR REPAIR PARTS ON MOTOR, REDUCER OR OIL PUMP, SPECIFY MODEL & SERIAL NUMBERS AS THEY APPEAR ON NAME PLATE

6.27:1 RATIO, 60-65 GPM  
7 1/2 HP, 460 VOLT,  
60 CYCLE, 3 PHASE  
14750 FT. ELEV.

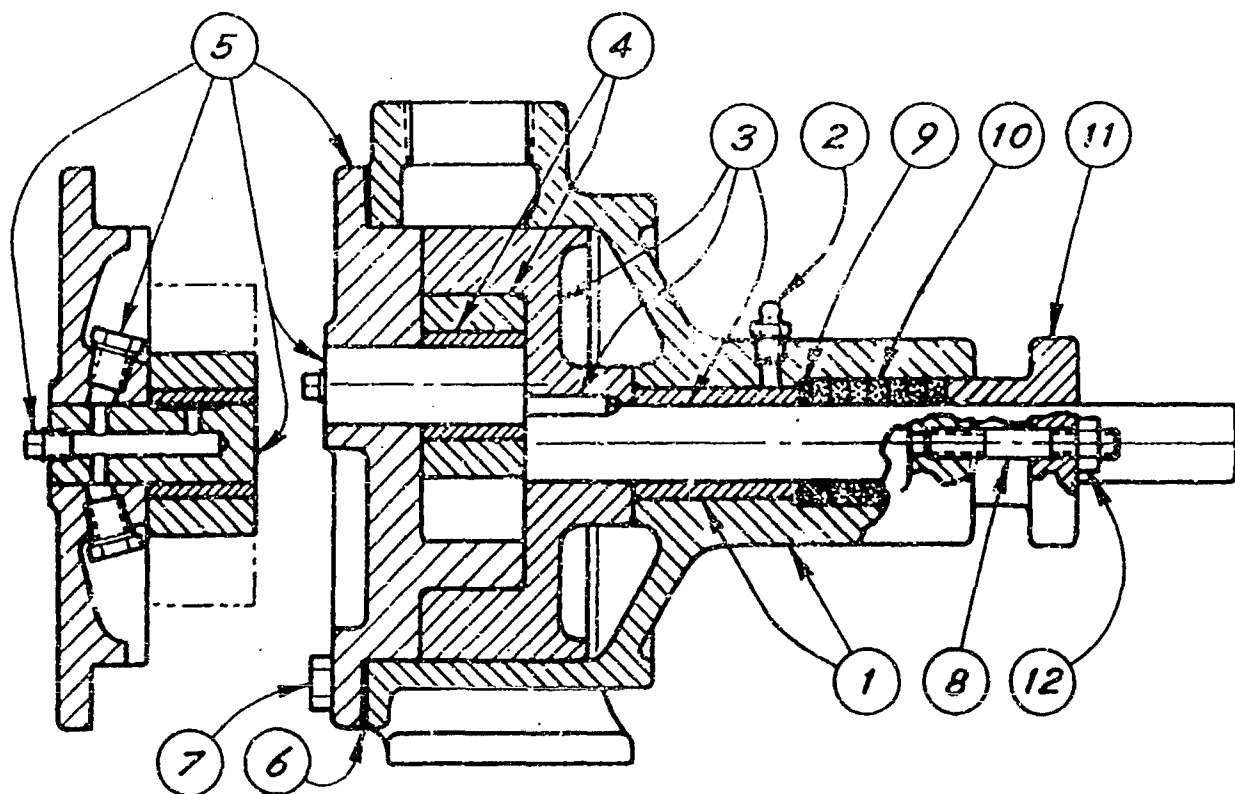



DRAWN TGB APPD JJL  
DATE 23JUN93 DATE 16OCT98

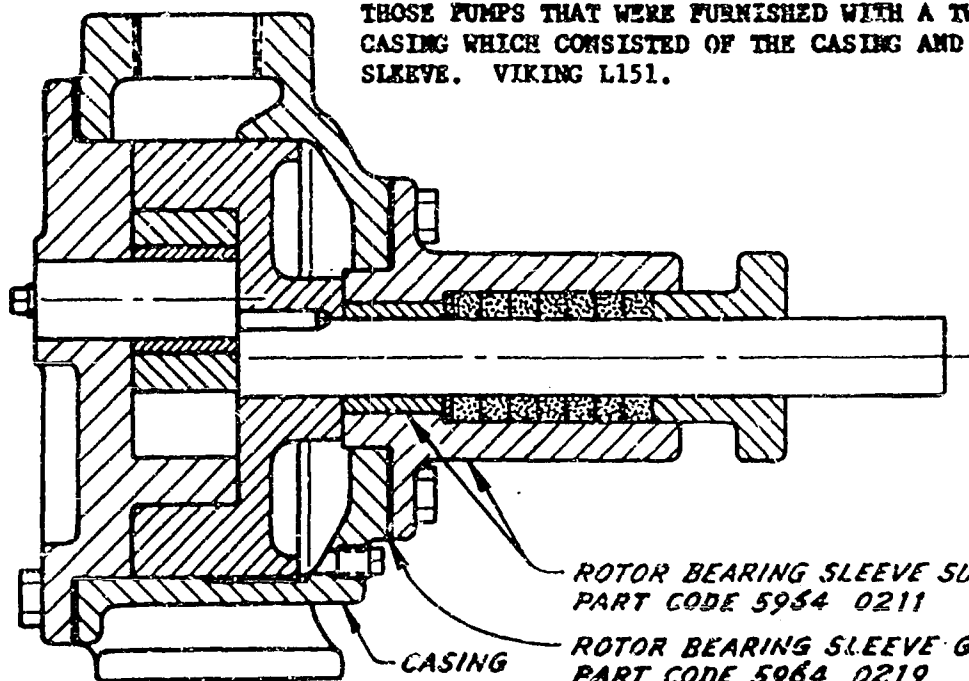
PUMP AND MOTOR ASSY

110-94360336

REV  
A



USE THIS ILLUSTRATION FOR ORDERING REPLACEMENT PARTS ON THOSE PUMPS THAT WERE FURNISHED WITH A TWO (2) PIECE CASING WHICH CONSISTED OF THE CASING AND ROTOR BEARING SLEEVE. VIKING L151.



ROTOR BEARING SLEEVE SUB-ASSEMBLY  
PART CODE 5964 0211

CASING  
ROTOR BEARING SLEEVE GASKET  
PART CODE 5964 0219

# OIL PUMP ASSEMBLY

**Nordberg**

Nordberg Inc.  
Milwaukee, WI 53207

DRAWN BBK APPD JJJ  
DATE 19FEB99 DATE 19FEB99

H	ECN 100095	19FEB99
G	REDRAWN & REVISED	11-9-79

REV  
H

110-59420079

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## PARTS LIST

PAGE 2 OF 2

S7-C-785

ITEM NO.	PART NAME	QTY REQ'D	PART CODE	DWG SIZE
1	CASING SUB-ASSEMBLY CONSISTING OF: CASING CASING BUSHING	1	59640423	
2	GREASE FITTING	1	3801070	
3	ROTOR SUB-ASSEMBLY CONSISTING OF: ROTOR ROTOR SHAFT ROTOR KEY	1	59640215	
4	IDLER SUB ASSEMBLY CONSISTING OF: IDLER IDLER BUSHING	1	59640260	
5	HEAD SUB-ASSEMBLY CONSISTING OF: HEAD IDLER PIN CHECK VALVE PIPE PLUG 1/8	1	59640263	
6	HEAD GASKET	1 SET	59640123	
7	CAPSCREW HEX HEAD 7/16 X 1-1/8	7	2775036	
8	PACKING GLAND STUD	2	59640424	
9	PACKING RETAINER WASHER	1	59640425	
10	PACKING	1 SET	59640218	
11	PACKING GLAND	1	59640120	
12	JAM NUT 7/16	2	3004026	

VIKING MODEL L32 2" PORTS

Nordberg Inc.  
Milwaukee, WI 53207DRAWN BBK APPD JJL  
DATE 19FEB99 DATE 19FEB9948", 5', 54", 5-1/2',  
66", 7' & 84"  
OIL PUMP ASSEMBLY

110-59420079

REV  
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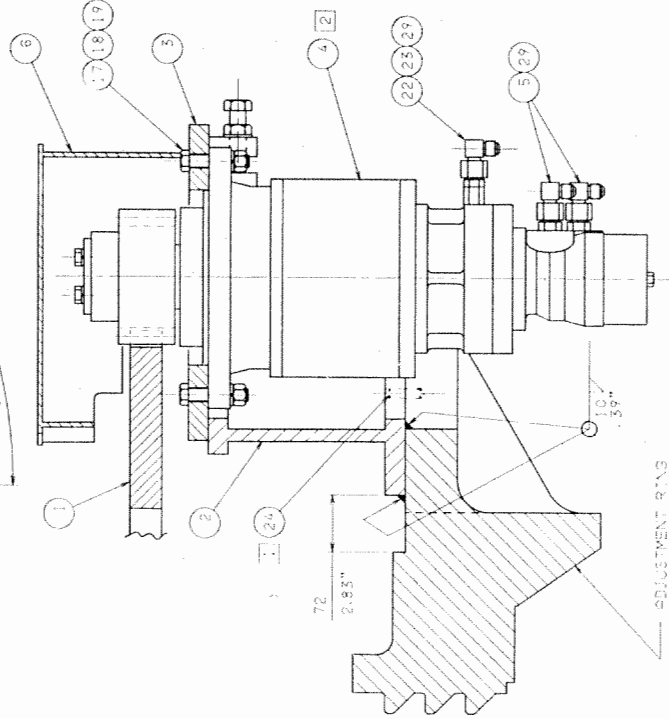
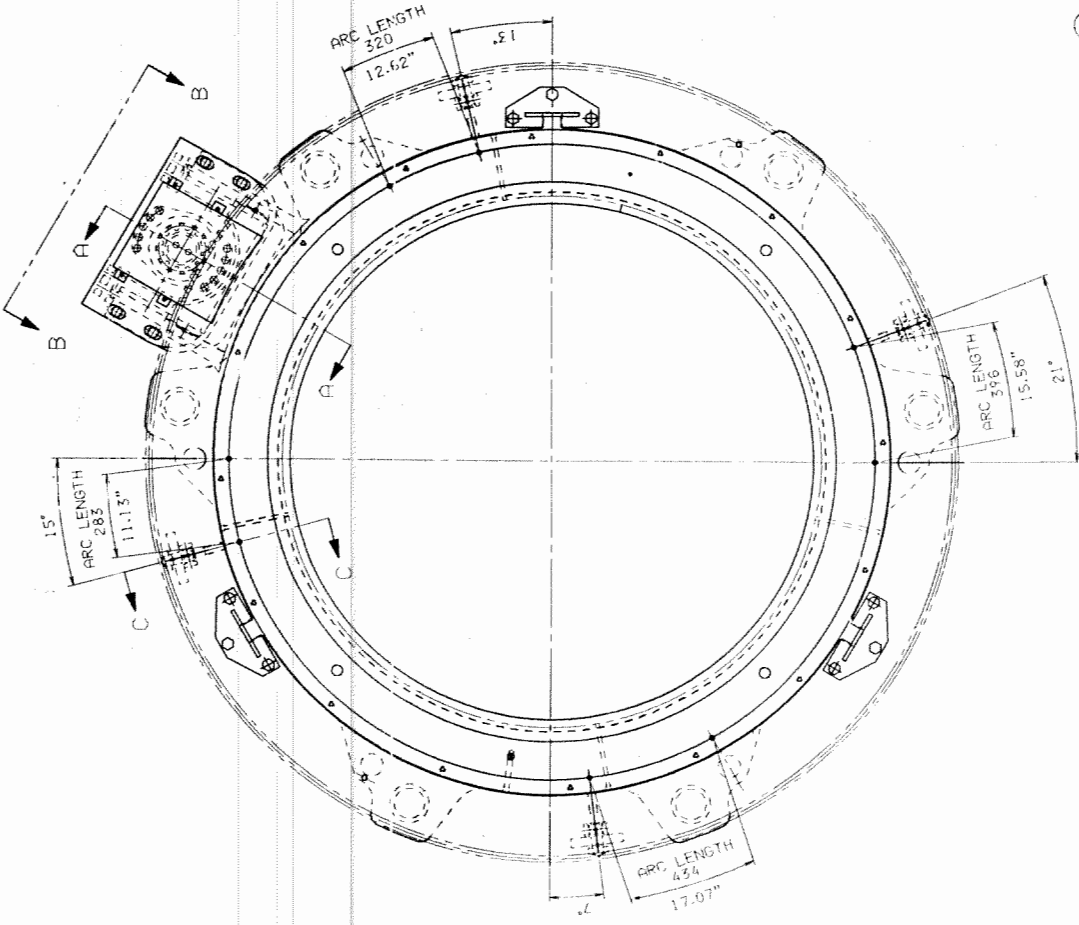
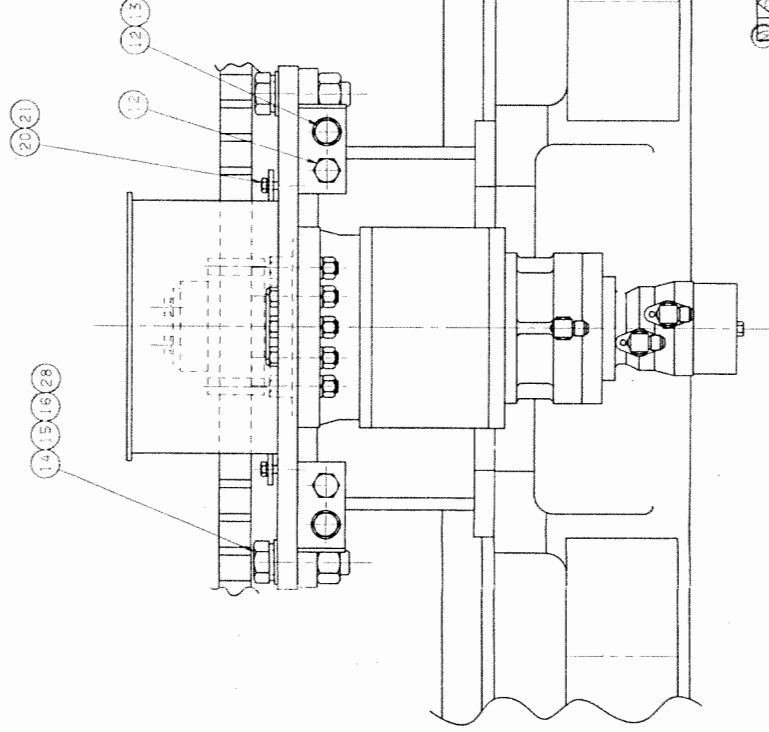
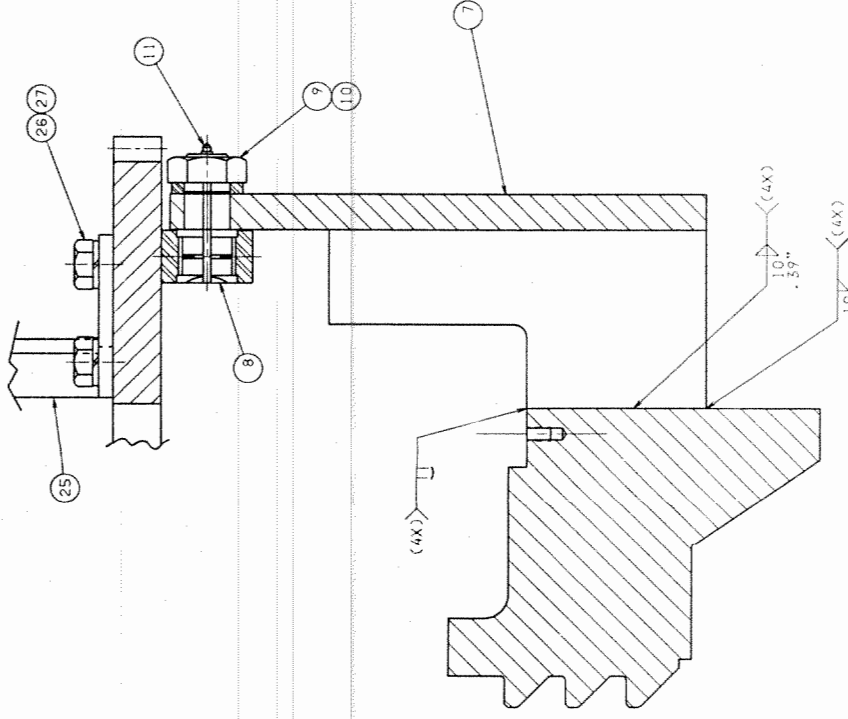
NO. 110-9305094

ALL INFORMATION CONTAINED ON THIS DRAWING IS CONSIDERED TO BE BOTH CONFIDENTIAL AND PROPRIETARY BY AMERZING, INC. NO USE OR REPRODUCTION THEREOF MAY BE MADE WITHOUT THE EXPRESS WRITTEN CONSENT OF AMERZING, INC.

ITEM NO.	PART NUMBER	BILL OF MATERIAL	QTY	UNIT	DATE	W. EIGHT
1	1093050094	ADJ MECH ASSY	1	EA	915	
2	1062440044	1 DRIVE RING	A2	520		
3	1010212959	1 MOUNTING ADAPTER	A1	74		
4	1055497955	1 MOUNTING WELDMENT	A2	45		
5	1093070178	1 HYD DRIVE ASSY	A3	131		
6	102076251	2 STRAIGHT ADAPTER				
7	1027272404	1 COVER SHIELD	A1	13		
8	1071794002	4 BEARING SUPPORT	A2	25		
9	1005397260	4 CAM FOLLOWER				
10	103027251	4 JAM NUT 1.500"				
11	103064524	4 LOCKWASHER 1.500"				
12	1003801503	4 HYDRAULIC FITTING				
13	1003724628	4 HCS M20-2.5X80				
14	1003056043	2 WASHER M20				
15	1003725641	4 HCS M30-3.5X100				
16	1003010076	4 NUT M30				
17	1003724113	4 LOCKWASHER M30				
18	1003010061	10 HCS M16-2 X 75				
19	1003069061	10 NUT M16				
20	1003722557	10 LOCKWASHER M16				
21	1003069046	4 HCS M10-1.5X35				
22	1003076431	4 LOCKWASHER M10				
23	102076250	1 STRAIGHT ADAPTER				
24	1003585142	1 STRAIGHT ADAPTER				
25	1020962080	2 SPRING PIN Ø 12X40				
26	1003725084	3 TURNING BRACKET				
27	1003069071	9 HCS M24-3X50				
28	1003056055	4 LOCKWASHER M24				
29	1001979650	4 WASHER M30				
30		3 SWIVEL ELBOW - 90°				

NOTES:

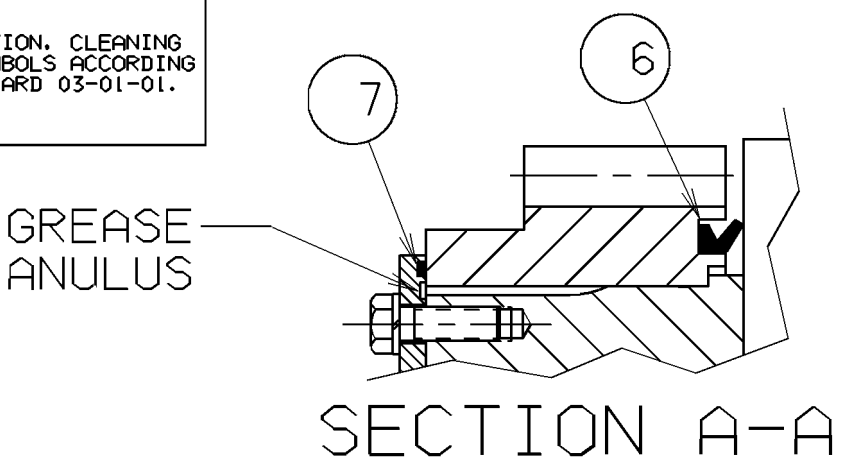
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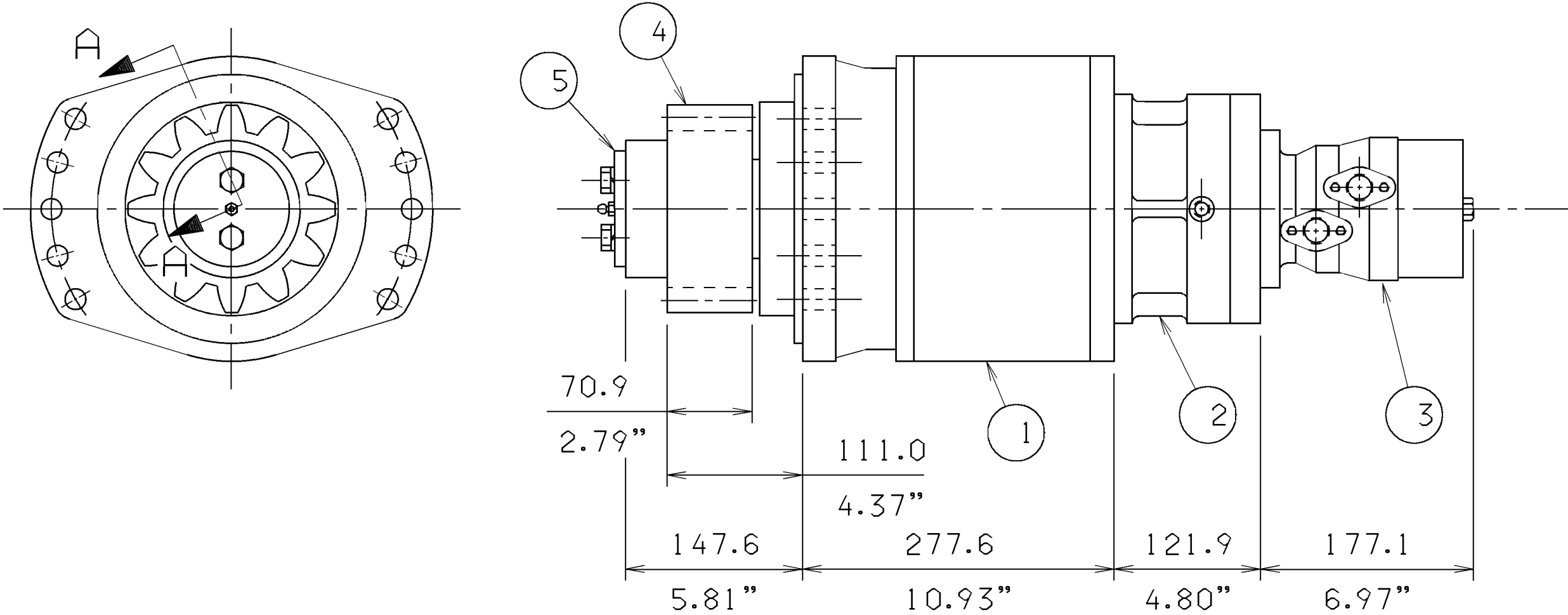
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 SURFACE PREPARATION, CLEANING AND PAINTING SYMBOLS ACCORDING TO COMPANY STANDARD 03-01-01.



BILL OF MATERIAL						
ITEM NO.	PART NUMBER		QTY REQ.	PART NAME	DWG SIZE	WT. EACH KG
	10	93070298		HYD DRIVE ASSEMBLY		120
①	10	61030423	1	PLANETARY DRIVE	A3	79
②	10	21790057	1	BRAKE	A4	19
③	10	50230067	1	HYDRAULIC MOTOR	A4	11
④	10	37071003	1	PINION	A4	10
⑤	10	57100516	1	RETAINER KIT	A4	
⑥	10	07235820	1	V-RING	-	
⑦	10	07256419	1	O-RING	-	



CAD STORED. DO NOT CHANGE MANUALLY

				DUAL DIMENSION		mm Inches"		Nº 250/ MACHINE FINISH UNLESS OTHERWISE STATED		Metso Minerals Inc. 3073 S. Chase Ave. Milwaukee, WI 53207		DESCRIPTION RATIO 19.54:1										
				IMPLIED TOLERANCES FINISHED DIMENSIONS		MILLIMETRES						ANGLE TOLERANCE COMPANY STD 02-02-13		DRAWN TGB DATE 09FEB00		SUPERSEDES		ASSEMBLY GR 34		PART NAME HYD DRIVE ASSEMBLY		
				XXX. (≥500)		± 3		 3RD ANGLE PROJECTION	CHKD TGB DATE 09FEB00		SUPERSEDED BY				DWG. SIZE		DRAWING NUMBER		REV.			
				XXX. (<500)		± 1.5			DATE 09FEB00						A3		PREFIX		CODE		SUFFIX	
				.X		± 0.5																
				.XX		± 0.13																
				INCHES																		
				.XX (≥19.68)		± .12		SCALE 1 : 4		APPD JJL DATE 09FEB00		PRODUCT HP400, HP500 & HP700										
				.XX (<19.68)		± .06																
				.XXX		± .020																
				.XXXX		± .005																



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PARTS LIST		PAGE 1 OF 2		110-9450 4602	
ITEM NO.	PART NAME	NO. REQ'D	PART CODE	DWG SIZE	
1	CONSOLE	1			
2	OIL LEVEL GAUGE/THERMOMETER	1	7030 816		
3	FILLER-BREATHER ASSEMBLY	1	2188 0057		
4	SUCTION STRAINER SKB-1	1	3880 158		
5	REPLACEABLE RESERVOIR	1			
6	PUMP D/R PF-2009-3022 (5 X 1)	1	5942 3012		
7	PRESSURE GAUGE 2-1/2" 0-5000	3	7017 102		
8	PRESSURE SWITCH	1	5194 194		
9	SNUBBER	1	7095 250		
10	VALVE MODULE	1	8339 0602	3	
11	MOTOR 10 HP-1800-230/460/60/3 CM-ODP	1	5021 8936		
12	BRACKET MOUNTING	1	1021 0669		
13	COUPLING MOTOR HALF-L110-1-5/8 X 3/8	1	2688 7752		
14	COUPLING PUMP HALF L110-7/8 X 1/4				
15	SPIDER -L110				
16	PRESSURE FILTER	1	3880 320	1	
17	ACCUMULATOR - 1 GAL.	1	7914 1214	A2	
18	ACCUMULATOR BRACKET	1	2138 0202		
19	ISOLATION MOUNTS	4	5027 0070		
20	MOUNTING RAIL	2	5101 121		
21	HOSE ASSEMBLY (SUCTION)	1	4425 6202		
22	HOSE ASSEMBLY (5 PISTON)	1	4425 3339		
23	HOSE ASSEMBLY (1 PISTON)	1	4425 5143		
24	TERMINAL BOX WITH TERMINALS	1			
25	PRESSURE SWITCH	1	5194 198		
26	VALVE MODULE	1	8339 0610	3	
27	MANIFOLD	1	5005 1547		
28	RELIEF VALVE	1	1677 205		
29	VENT VALVE	1	1699 045		
30	DIRECTIONAL VALVE	1	1699 046		
31	SHUTTLE VALVE	1	1690 011		
32	RED ACCENT STRIPE DECAL 2" HIGH STRIPE TO BE APPLIED TO FRONT COVER STRIPE TO BE POSITIONED 5-1/2" DOWN FROM THE TOP.	1	2930 0115		

COULD  
BE  
1623 503  
CONFIRM

CAD STORED.  
DO NOT CHANGE MANUALLY



Metso Minerals Inc.  
Milwaukee, WI 53207

HP 500  
HYDRAULIC MOTOR ADJUSTMENT  
HYDRAULIC CONSOLE

A RED & REV 61742 16OCT98

DATE TGB/05MAY98 APP'D JJL/16OCT98


110-9450 4602

REV  
A

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PARTS LIST		PAGE 2 OF 2		110-9450 4602
ITEM NO.	PART NAME	NO. REQ'D	PART CODE	DWG SIZE
33	<p>NORDBERG DECAL 2" HIGH TO BE APPLIED ON THE RIGHT SIDE OF THE COVER IN LINE WITH THE RED ACCENT STRIPE.</p> <p>FOR THE LOCATION OF THESE ITEMS REFER TO HYDRAULIC CONSOLE GENERAL ARRANGEMENT DRAWING PART CODE NO. 9400 0299, SIZE 4.</p> <p>FOR THE HYDRAULIC SCHEMATIC REFER TO DRAWING PART CODE NO. 9400 0272, SIZE A1.</p> <p>FOR THE ELECTRIC SCHEMATIC AND WIRING DIAGRAM REFER TO DRAWING PART CODE NO. 9400 0273, SIZE A1.</p> <p>FOR THE PUSH BUTTON CONTROL BOX REFER TO DRAWING PART CODE NO. 9450 6001, SIZE 3</p>	1	2930 0113	3
		<p>INTERMITTENT MOTOR OPERATION 230/460/60/3 10 HP ODP-CM 14750 FT ELEVATION</p>		
		<p>HP 500 HYDRAULIC MOTOR ADJUSTMENT HYDRAULIC CONSOLE</p>		
		110-9450 4602		
		REV A		

CAD STORED.  
DO NOT CHANGE MANUALLY

  
Metso Minerals Inc.  
Milwaukee, WI 53207

DRAWN TGB/05MAY98 APP'D JLL/16OCT98







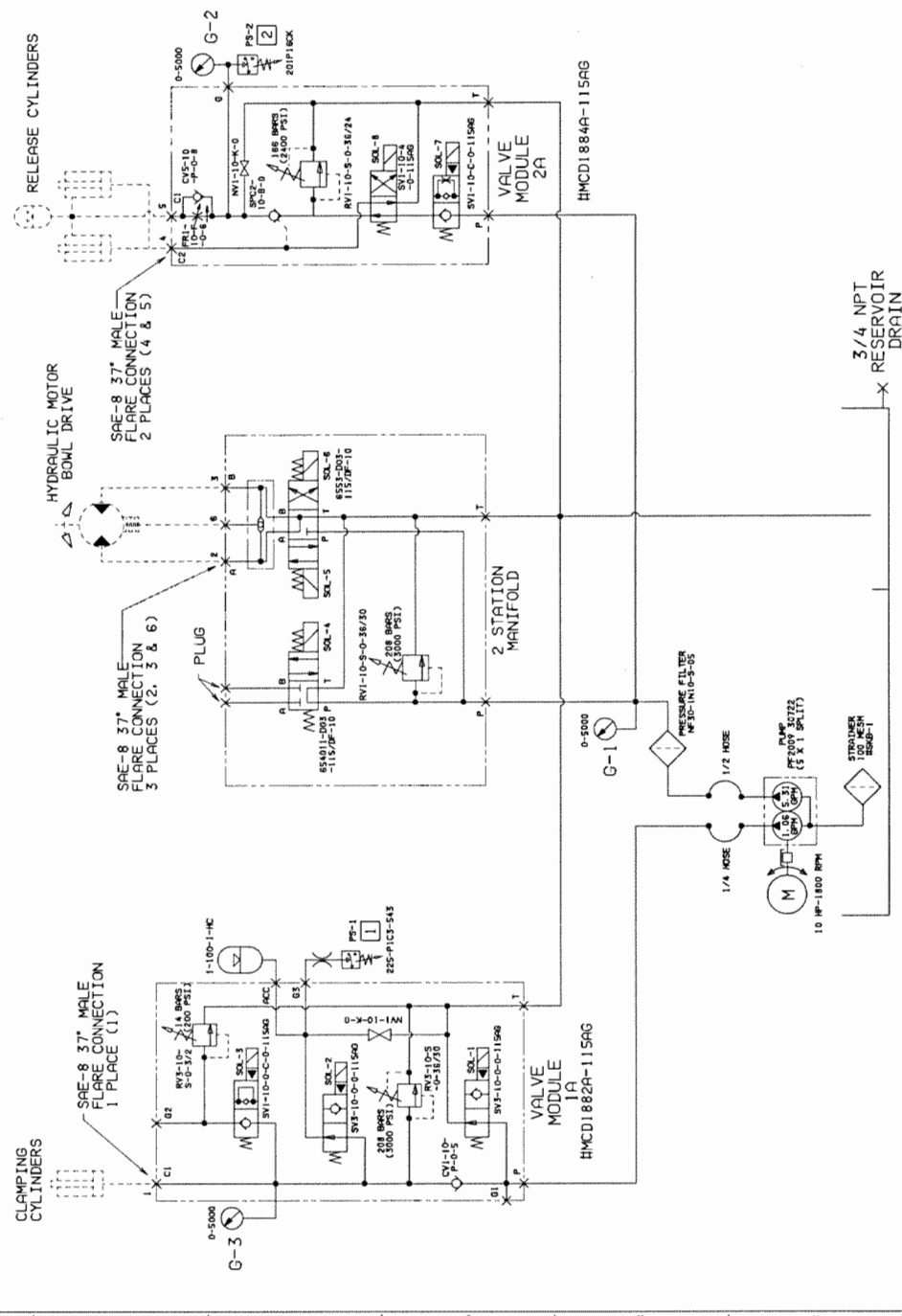




NO. 110-94000272		ITEM NO.		PART NUMBER		BILL OF MATERIAL		PART NAME		QTY REQ.		UNIT		MT. EACH	
				10 94000272				HYDRAULIC SCHEMATIC							

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- NOTES:
- PS-1 SET TO OPEN AT 194 BARS (2800 PSI) RISING PRESSURE, AND CLOSE AT 166 BARS (2400 PSI) FALLING PRESSURE.
  - PS-2 SET TO CLOSE AT 152 BARS (2200 PSI) FALLING PRESSURE



SCHEMATIC FUNCTION TABLE

FUNCTION	ACTUATED	RELIED	FOR	FUNCTION
OPEN SETTING	1	2	3	4
CLOSE SETTING	5	6	7	8
RELEASE CYLINDER PRESSURIZE				
CLEARING-UP				
CLAMPING CYLINDER PRESSURIZE				

CUSTOMARY CAD STORED. DO NOT CHANGE MANUALLY

metso minerals

Metso Minerals Inc.  
3075 S. Chase Ave.  
Milwaukee, WI 53207

DATE 1/20/94  
BY 100716  
SUPERSEDED BY 59477  
DATE 2/1/99  
PRODUCT HP 500  
CRUSHER

IMPLD TOLERANCES  
FINISHED DIMENSIONS  
DECIMAL INCH  
X .125  
XXX .005  
XXXX .005

250 INCHES FINISH  
UNITED STATES

SCALE NTS

HYDRAULIC SCHEMATIC

4110 94000272

100716  
59477  
58024

REVISED TO ISO 9000 STD  
REVISED VENDOR PART  
REVISED & REDRAWN  
REV. DESCRIPTION OF CHANGE

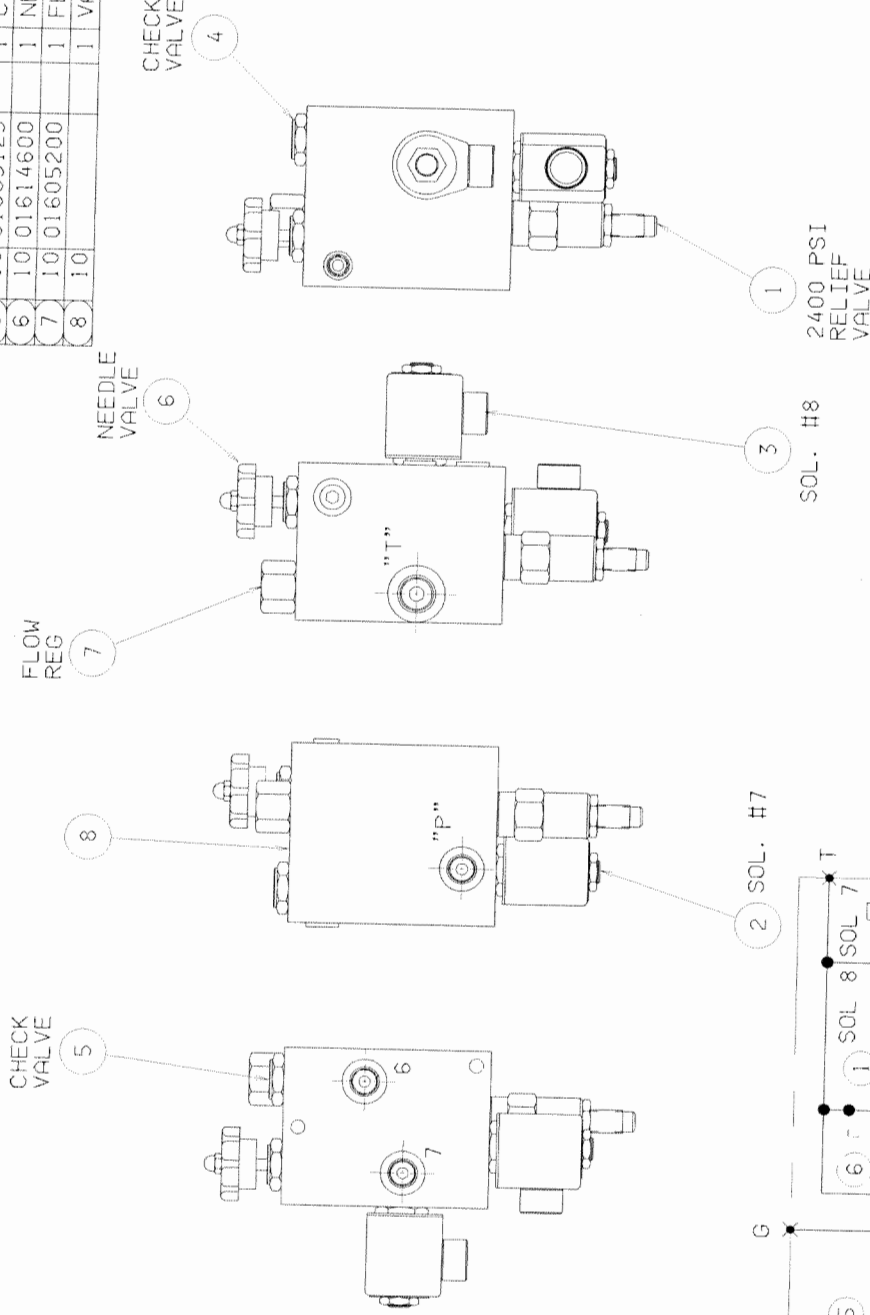
SURFACE PREPARATION, CLEANING AND PAINTING SYMBOLS ACCORDING TO COMPANY STANDARD D3-01-01.

NO. 110-833 10

ALL INFORMATION CONTAINED ON THIS DRAWING IS CONSIDERED TO BE BOTH CONFIDENTIAL AND PROPRIETARY OF METSO MINERALS (MILWAUKEE) INC. NO USE OR REPRODUCTION THEREOF MAY BE MADE WITHOUT THE EXPRESS WRITTEN CONSENT OF METSO MINERALS (MILWAUKEE) INC.

BILL OF MATERIAL

ITEM NO.	PART NUMBER	QTY REQ	PART NAME	QTY EACH SIZE LBS
1	10183390610	1	VALVE MODULE	1
2	10101623501	1	RELIEF VALVE	1
3	10101698951	1	SOLENOID VALVE	1
4	10101698957	1	SOLENOID VALVE	1
5	10101605100	1	CHECK VALVE	1
6	10101605125	1	CHECK VALVE	1
7	10101614600	1	NEEDLE VALVE	1
8	10101605200	1	FLOW REGULATOR	1
9	10101605200	1	VALVE MANIFOLD	1



CUSTOMARY ALL DIMENSIONS IN INCHES

CAD STORED, DO NOT CHANGE MANUALLY



Metso Minerals Inc.  
3075 S. Chase Ave.  
Milwaukee, WI 53207

DRAWN DATE	ELS APR93	SUPERSEDES	ASSEMBLY	GR 36
DATE	JUL 93	SUPERSEDED BY	PRODUCT	7 FT HD & HP500
DESCRIPTION				CRUSHER

REF MCD-1884A REV2

VALVE MODULE 2A

DWG SIZE	3110	PREFIX	CODE	SUFFIX
DRAWING NUMBER	83390610			
SCALE	1:2			

REV.	DESCRIPTION OF CHANGE	LOC.	DATE	BY	ENG. ORDER NUMBER
E	SOL. #7 WAS SOL. #6 SOL. #8 WAS SOL. #7		14NOV00	MMH	102862
D	UPDATED TO ISO9000 STD		08APR99	RDE	100499
C	REVISED		28OCT94	JCN	57309
B	ROTATED VIEW		16SEP94	ELS	57147
A	REDRAWN & REVISED		08APR93	SAPR93	55953

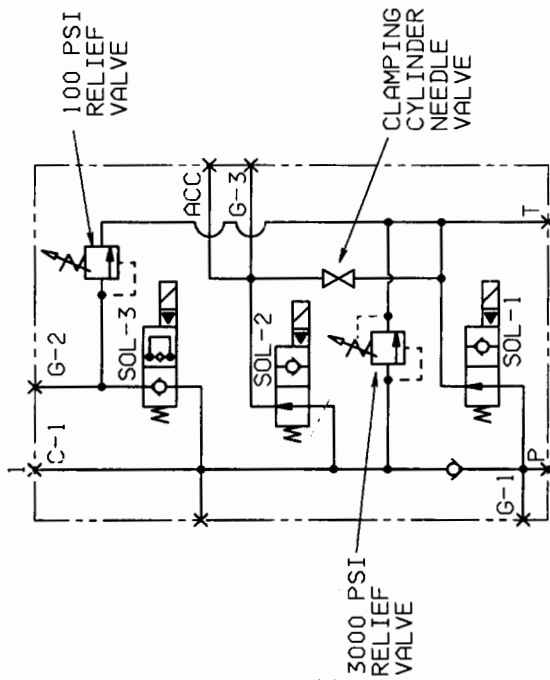
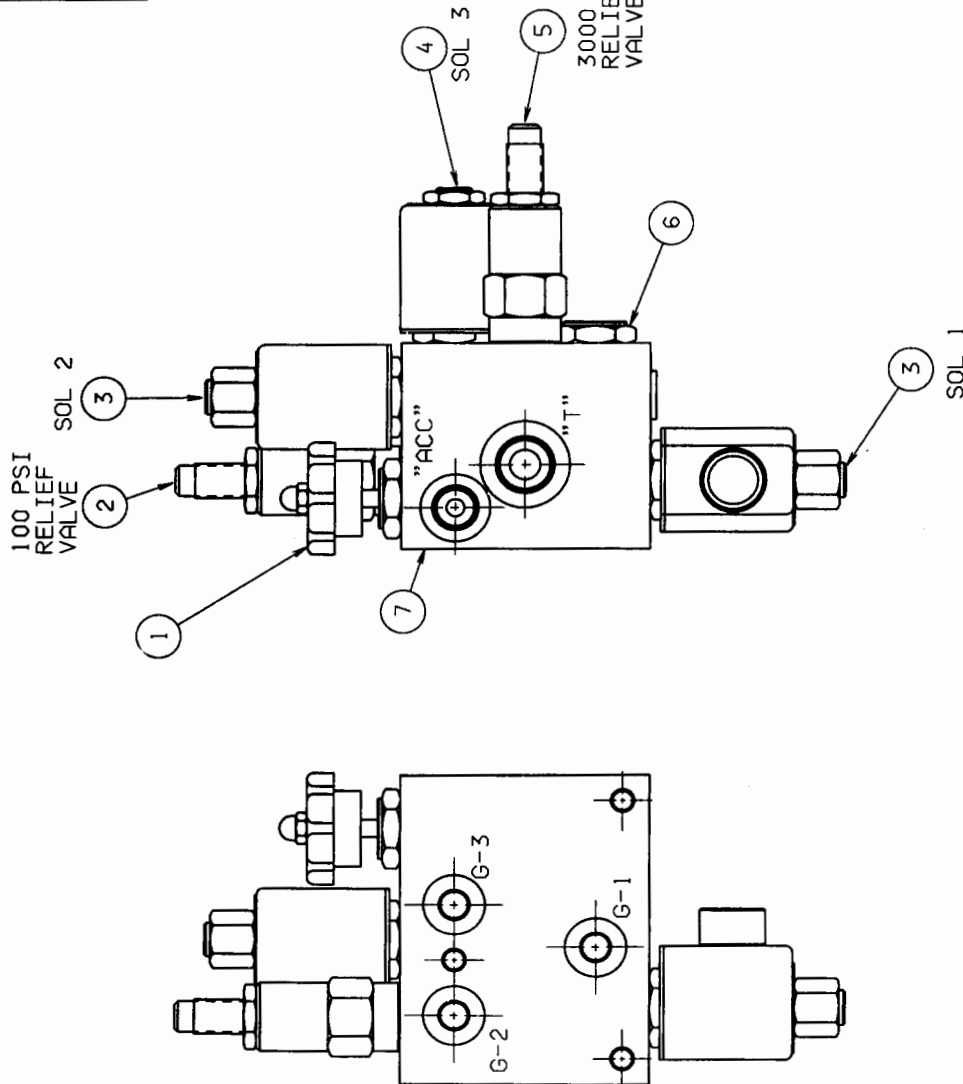
SURFACE PREPARATION, CLEANING AND PAINTING SYMBOLS ACCORDING TO COMPANY STANDARD 03-01-01.

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THEREOF MAY BE MADE WITHOUT THE EXPRESS WRITTEN CONSENT OF NORDBERG, INC.

NO. 110-833 02

BILL OF MATERIAL

ITEM NO.	QTY REQ	PART NUMBER	PART NAME	DWG. SIZE	MT. EACH
1	1	83390602	VALVE MODULE NO. 1A	1A	
2	1	1614600	NEEDLE VALVE		
3	1	1623517	RELIEF VALVE		
4	2	1698952	SOLENOID VALVE		
5	1	1698951	SOLENOID VALVE		
6	1	1623515	RELIEF VALVE		
7	1	1605110	CHECK VALVE		
8	1	1605110	VALVE MANIFOLD		



CUSTOMARY  
ALL DIMENSIONS  
IN INCHES

CAD STORED, DO NOT CHANGE MANUALLY

**Nordberg**

Nordberg Inc.  
P. O. Box 583  
Hillsdale, NJ 07620

IMPLD TOLERANCES	FINISHED DIMENSIONS	DECIMAL INCH	IMPLD TOLERANCES	FINISHED DIMENSIONS	DECIMAL INCH
DATE 31OCT94	DATE 31OCT94	DATE 31OCT94	DATE 31OCT94	DATE 31OCT94	DATE 31OCT94
CHKD ELS	CHKD ELS	CHKD ELS	CHKD ELS	CHKD ELS	CHKD ELS
APPRO JTL	APPRO JTL	APPRO JTL	APPRO JTL	APPRO JTL	APPRO JTL
DATE 05FEB99	DATE 05FEB99	DATE 05FEB99	DATE 05FEB99	DATE 05FEB99	DATE 05FEB99
DESCRIPTION	DESCRIPTION	DESCRIPTION	DESCRIPTION	DESCRIPTION	DESCRIPTION
PRODUCT ALL CONES	PRODUCT ALL CONES	PRODUCT ALL CONES	PRODUCT ALL CONES	PRODUCT ALL CONES	PRODUCT ALL CONES
CRUSHER	CRUSHER	CRUSHER	CRUSHER	CRUSHER	CRUSHER
REF M. C. DWG 1882A-115 AS	REF M. C. DWG 1882A-115 AS	REF M. C. DWG 1882A-115 AS	REF M. C. DWG 1882A-115 AS	REF M. C. DWG 1882A-115 AS	REF M. C. DWG 1882A-115 AS

DATE	BY	LOC.	DESCRIPTION OF CHANGE	DATE	BY	LOC.	DESCRIPTION OF CHANGE
05FEB99	BT		UPDATED TO ISO 9000 STD	05FEB99	BT		UPDATED TO ISO 9000 STD
31OCT94	JON		REDRAWN & REVISED	31OCT94	JON		REDRAWN & REVISED
57309	ENG. ORDER NUMBER			57309	ENG. ORDER NUMBER		
311083390602	SUFFIX			311083390602	SUFFIX		
D	REV.			D	REV.		

DATE	BY	LOC.	DESCRIPTION OF CHANGE	DATE	BY	LOC.	DESCRIPTION OF CHANGE
05FEB99	BT		UPDATED TO ISO 9000 STD	05FEB99	BT		UPDATED TO ISO 9000 STD
31OCT94	JON		REDRAWN & REVISED	31OCT94	JON		REDRAWN & REVISED
57309	ENG. ORDER NUMBER			57309	ENG. ORDER NUMBER		
311083390602	SUFFIX			311083390602	SUFFIX		
D	REV.			D	REV.		

DATE	BY	LOC.	DESCRIPTION OF CHANGE	DATE	BY	LOC.	DESCRIPTION OF CHANGE
05FEB99	BT		UPDATED TO ISO 9000 STD	05FEB99	BT		UPDATED TO ISO 9000 STD
31OCT94	JON		REDRAWN & REVISED	31OCT94	JON		REDRAWN & REVISED
57309	ENG. ORDER NUMBER			57309	ENG. ORDER NUMBER		
311083390602	SUFFIX			311083390602	SUFFIX		
D	REV.			D	REV.		

SURFACE PREPARATION, CLEANING  
AND PAINTING SYMBOLS ACCORDING  
TO COMPANY STANDARD 03-01-01.