

Parts and Specifications
Tirehand 12

IOWA MOLD TOOLING CO., INC.

BOX 189, GARNER, IA 50438-0189

515-923-3711

PRODUCT SUPPORT FAX: 515-923-3674

MANUAL PART NUMBER 99900291

REVISED

08-16-91
08-23-91
09-25-91
11-06-91
09-18-92
10-09-92
04-20-93
05-19-93
05-25-93
09-22-93
10-18-93
01-27-94
05-25-94

Introduction - Read Carefully!

This manual is provided to assist you in the identification and ordering of parts, for your IMT equipment. It contains information such as specifications, parts lists, capacities, and parts identification.

It is the user's responsibility to maintain and operate this equipment in a manner that will result in the safest working conditions possible.

Warranty of this equipment will be void on any part of the unit subjected to overloading, abuse, lack of maintenance and unauthorized modifications. No warranty - verbal, written, or implied - other than the official, published IMT new machinery and equipment warranty will be valid on this unit.

In addition, it is also the user's responsibility to be aware of existing Federal, State, and Local codes and regulations governing the safe use and maintenance of this equipment. Three means are used throughout

this manual to gain the attention of personnel. They are NOTE's, CAUTION's, and WARNING,s and are defined as follows:

NOTE

A NOTE is used to either convey additional information or to provide further emphasis for a previous point.

CAUTION

A CAUTION is used when there is the very strong possibility of damage to the equipment or premature equipment failure.

WARNING

A WARNING is used when there is the potential for personal injury or death.

Treat this equipment with respect and service it regularly. These two things can add up to a safer work environment.

TABLE OF CONTENTS

PARAGRAPH	TITLE	PAGE
Section 1. SPECIFICATIONS		
1-1.	General	1-1
1-2.	Cylinders	1-2
Section 2. PARTS		
2-1.	General	2-1
2-2.	Tirehand Identification	2-1
2-3.	Cylinder Identification	2-1
2-4.	Weldment Identification	2-2
2-5.	Ordering Repair Parts	2-2
Section 3. REFERENCE		

LIST OF ILLUSTRATIONS

FIGURE	TITLE	(PART NUMBER)	PAGE
A-1.	Geometric Configuration TH-12 on a 20017 Crane		1-2
A-2.	Capacity Chart		1-3
B-1.	Serial Number Placard		2-1
B-2.	Cylinder Identification		2-1
B-3.	Weldment Part Number Locations		2-2
B-4.	Yoke Assembly	(40704467)	2-3
B-5.	Body Assembly	(40702435)	2-4
B-6.	Arm Assembly	(40702438)	2-5
B-7.	Hydraulic Kit	(91704782)	2-6
B-8.	Installation Kit - 20017 Crane	(93706771)	2-7
B-9.	Decal Kit	(41703228)	2-8
B-10.	Saddle Assembly	(31704684)	2-9
B-11.	Pad Extension Kit	(95707720)	2-9
B-12.	Clamp Cylinder	(3B234313)	2-10
C-1.	Grease Zerk Locations and Lubrication Requirements		3-1
C-2.	Torque Data Chart		3-2
C-3.	Turntable Bearing Fastener Tightening Sequence		3-3
C-4.	Turntable Bearing Inspection for Replacement		3-4
	Spare Parts List		3-5

NOTES

A series of horizontal dotted lines for writing notes.

Section 1. SPECIFICATIONS

1-1. GENERAL

IMT CRANE WHICH TIREHAND IS DESIGNED	IMT Model 20017 (truck chassis mounted)	
TIRE SIZE CAPACITY - NARROW BASE	18.00-25 thru 36.00-51	
MAXIMUM TIRE DIAMETER	60" thru 129" (152.4cm thru 327.7cm)	
MAXIMUM TIRE WEIGHT	1100 lbs thru 7700 lbs (499 kg thru 3493 kg)	
TIRE SIZE CAPACITY - WIDE BASE	23.5-25 thru 45/65-45	
MAXIMUM TIRE DIAMETER	66" thru 108" (167.6cm thru 274.3cm)	
MAXIMUM TIRE/RIM WEIGHT	1200 lbs thru 5800 lbs (544 kg thru 2631 kg)	
TIREHAND MAXIMUM CAPACITY	7700 lbs (3493 kg)	
BODY ROTATION	342° (5.96 Rad)	
CLAMPING SPAN	60" to 129" (152.4cm - 327.7cm)	
METHOD OF CLAMPING	Horizontally telescoping	
CLAMPING PAD ROTATION	None - Stationary Pads	
TIREHAND TILT (provided by crane extension boom)	+79° to -21° (+1.38 to -.37 Rad.)	
CLAMPING LOAD HOLDING VALVES	Pilot operated check valves on clamping side	
HYDRAULIC CONTROLS	Incorporated with crane controls	
ROTATION SYSTEM	Spur gear drive	
TIREHAND WEIGHT	2560 lbs (1161 kg)	
1-2. CYLINDERS	BORE	STROKE
CLAMPING	4" (10.16cm)	34-1/2" (87.6cm)
TILT	Provided by crane extension boom	

IMT reserves the right to change specifications and design without notice. Where applicable, specifications are in accordance with SAE standards.

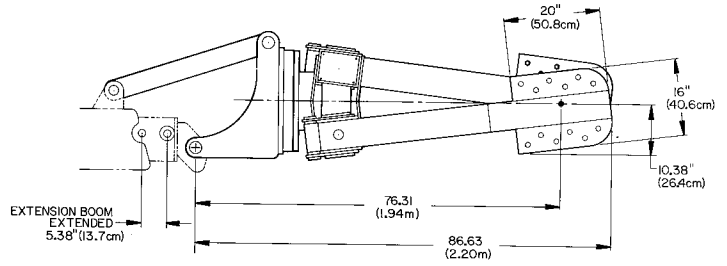
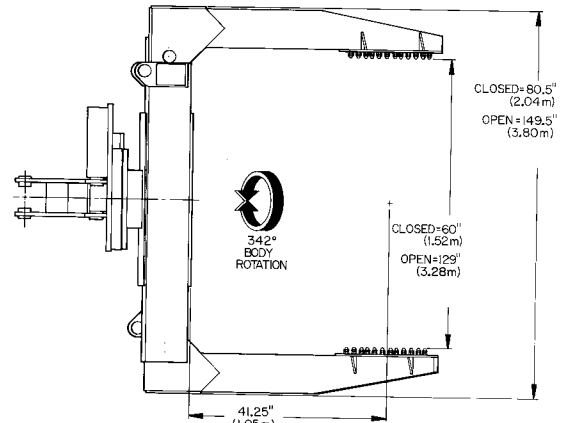
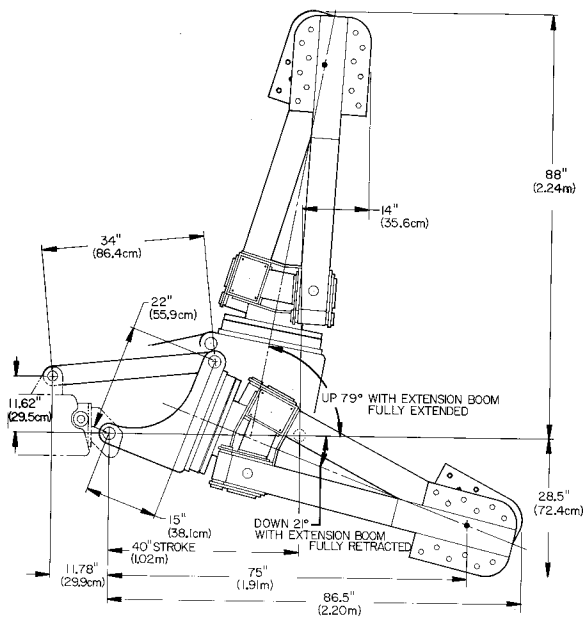



Figure A-1. GEOMETRIC CONFIGURATION - Tirehand 12 on a 20017 CRANE



Tirehand 12 CAPACITY CHART

MAXIMUM CAPACITY

7700 LBS (3493 KG)

TIRE APPLICATION CHART

NARROW BASE TIRE SIZE			WIDE BASE TIRE SIZE		
TIRE SIZE	MAX TIRE DIA (in)	TIRE & RIM WEIGHT (lbs)	TIRE SIZE	MAX TIRE DIA (in)	TIRE WEIGHT ONLY (lbs)
18.00x25	66	1100	23.5x25	66	1200
18.00x33	74	1300	26.5x25	71	1600
21.00x35	82	1800	29.5x29	75	2500
24.00x35	87	2500	33.25x29	83	1500
24.00x49	101	3000	33.25x35	91	3400
27.00x49	107	4000	35/65x33	81	2900
30.00x51	115	5400	37.25x35	95	4000
33.00x51	122	6800	37.5x39	100	4200
36.00x51	129	7700	37.5x51	113	3200
37.00Rx57	136	10000	40/65x39	94	3800
40.00x57	143	11000	45/65x45	108	5800
			49.5x57	143	9000
			50/65x51	121	8000
			50/80/57	142	9500
			53.5/85x57	154	12000
			54.5/80x57	143	13000
			57.5/85x57	154	13000
			67.5/65x51	138	13000

Wide base tire weights DO NOT include rim.

Any tires which are shaded are NOT within Tirehand capacity.

71393701

IOWA MOLD TOOLING CO., INC.

BOX 189, GARNER, IA 50438-0189
515-923-3711

Figure A-2. CAPACITY CHART

Section 2. PARTS

2-1. GENERAL

This section contains the exploded parts drawings with the accompanying parts list for the assemblies used on the Tirehand-12. These drawings are intended to be used in conjunction with those in the 20017 Crane manual and the instructions found in the REPAIR section in Volume 1.

WARNING

DO NOT ATTEMPT TO REPAIR ANY COMPONENT WITHOUT READING THE INFORMATION CONTAINED IN THE REPAIR SECTION IN VOLUME 1. PAY PARTICULAR ATTENTION TO THE WARNING'S, CAUTION'S AND NOTE'S CONTAINED IN THAT SECTION. FAILURE TO COMPLY WITH THESE INSTRUCTIONS MAY RESULT IN DAMAGE TO THE EQUIPMENT, INJURY OR DEATH.

2-2. TIREHAND IDENTIFICATION

Every Tirehand has an identification placard (Figure B-1) attached to the body assembly. When ordering parts, communicating warranty information or referring to the unit in correspondence, always include the assigned serial and model numbers. All inquiries should be addressed to:

Iowa Mold Tooling Company, Inc.
Box 189, Garner, Iowa 50438-0189
Telephone: 515-923-3711
Product Support Fax: 515-923-3674

or

IMT Cranes Canada, Ltd.
385 West Street South,
Orillia, Ontario, L3V 5H2, Canada
Telephone: 705-325-7458
Fax: 705-325-7625

2-3. CYLINDER IDENTIFICATION

To ensure proper replacement parts are received, it is necessary to specify a complete number/letter sequence for any part request. Part numbers may be cross checked by comparing the stamped identification of the cylinder case (Figure B-2) against the information contained in this manual. You must use the part number stamped on the cylinder case when ordering parts.

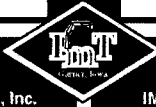
MODEL MODELO MODELE	SERIAL NUMBER NUMERO DE SERIE NUMERO DE SERIE
DRAWING NUMBER NUMERO DE PLANO NUMERO DE PLAN	DATE FECHA DE FABRICACION DATE
	
Iowa Mold Tooling Co., Inc. Garner, Iowa U.S.A.	IMT Cranes Canada, Ltd. Orillia, Ontario, Canada

Figure B-1. SERIAL NUMBER PLACARD

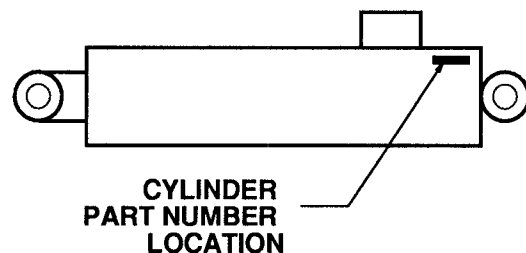


Figure B-2. CYLINDER IDENTIFICATION

2-4. WELDMENT IDENTIFICATION

Each of the major weldments of the Tirehand bears a stamped part number. Any time a major weldment is replaced, you must specify the complete part number as stamped on the weldment. The locations of the part numbers are shown in Figure B-3.

2-5. ORDERING REPAIR PARTS

When ordering replacement parts:

1. Give the model number of the unit.
2. Give the serial number of the unit.
3. Specify the complete part number. When ordering cylinder parts or one of the main weldments, always give the stamped part number.
4. Give a complete description of the part.
5. Specify the quantity required.

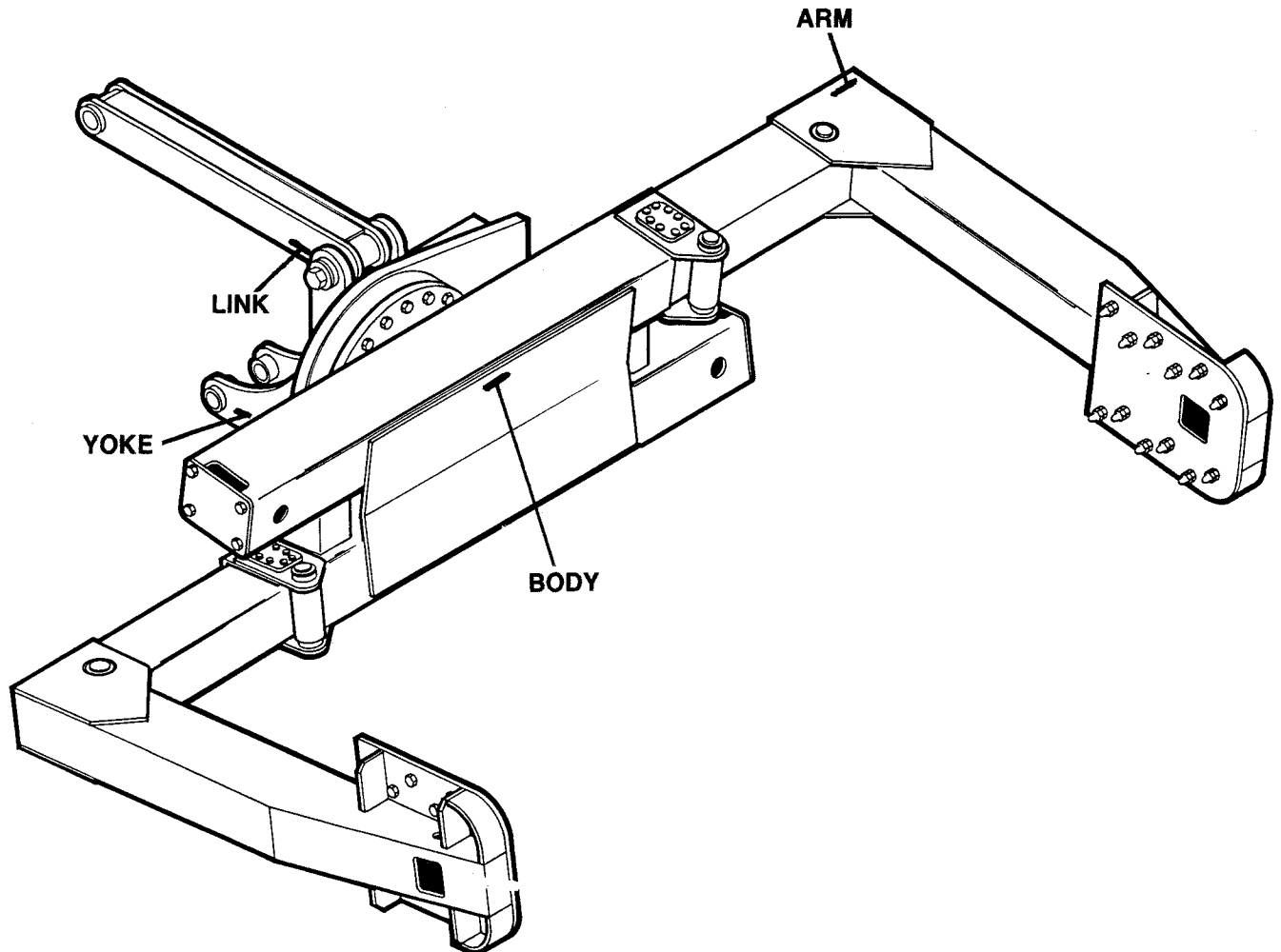
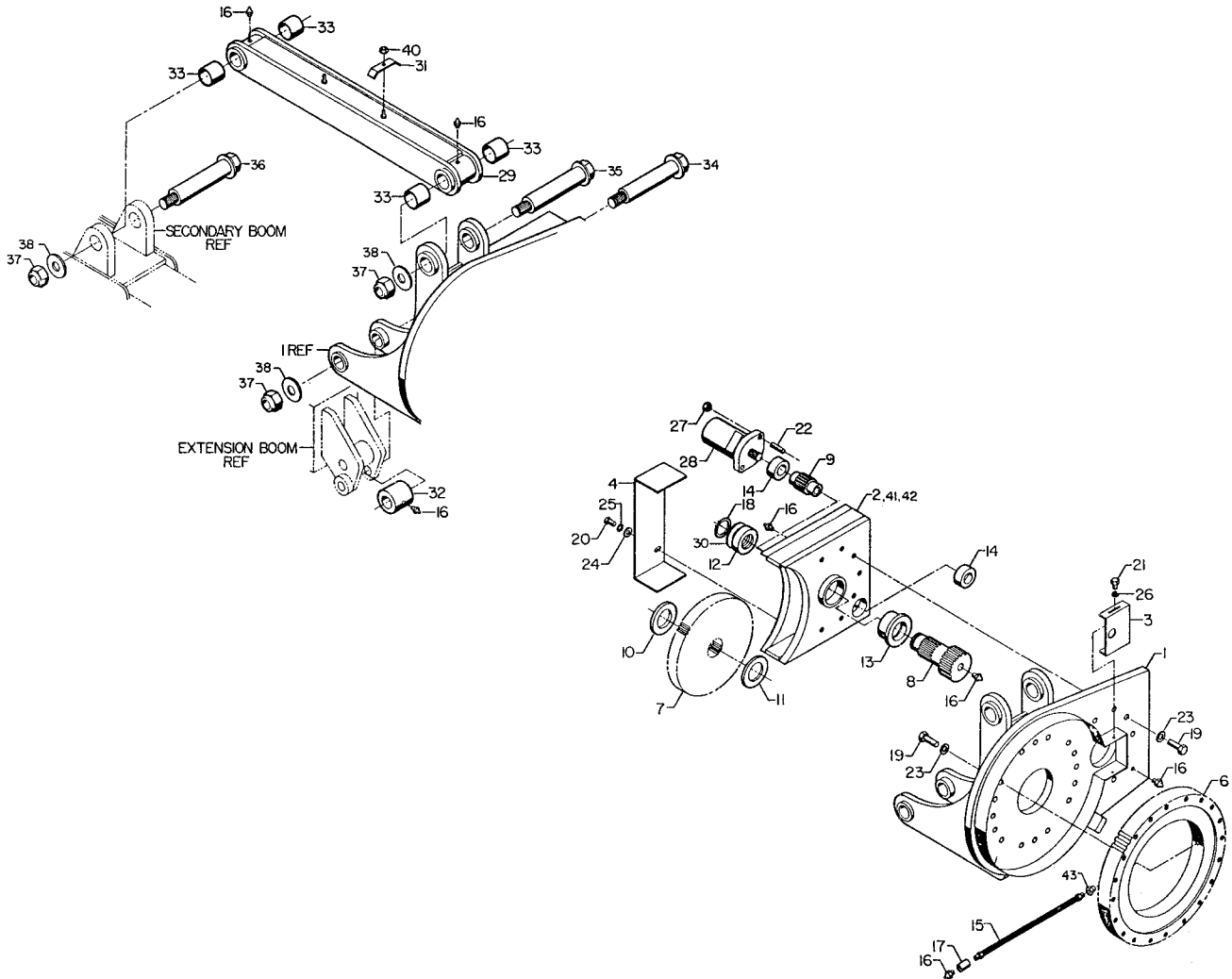


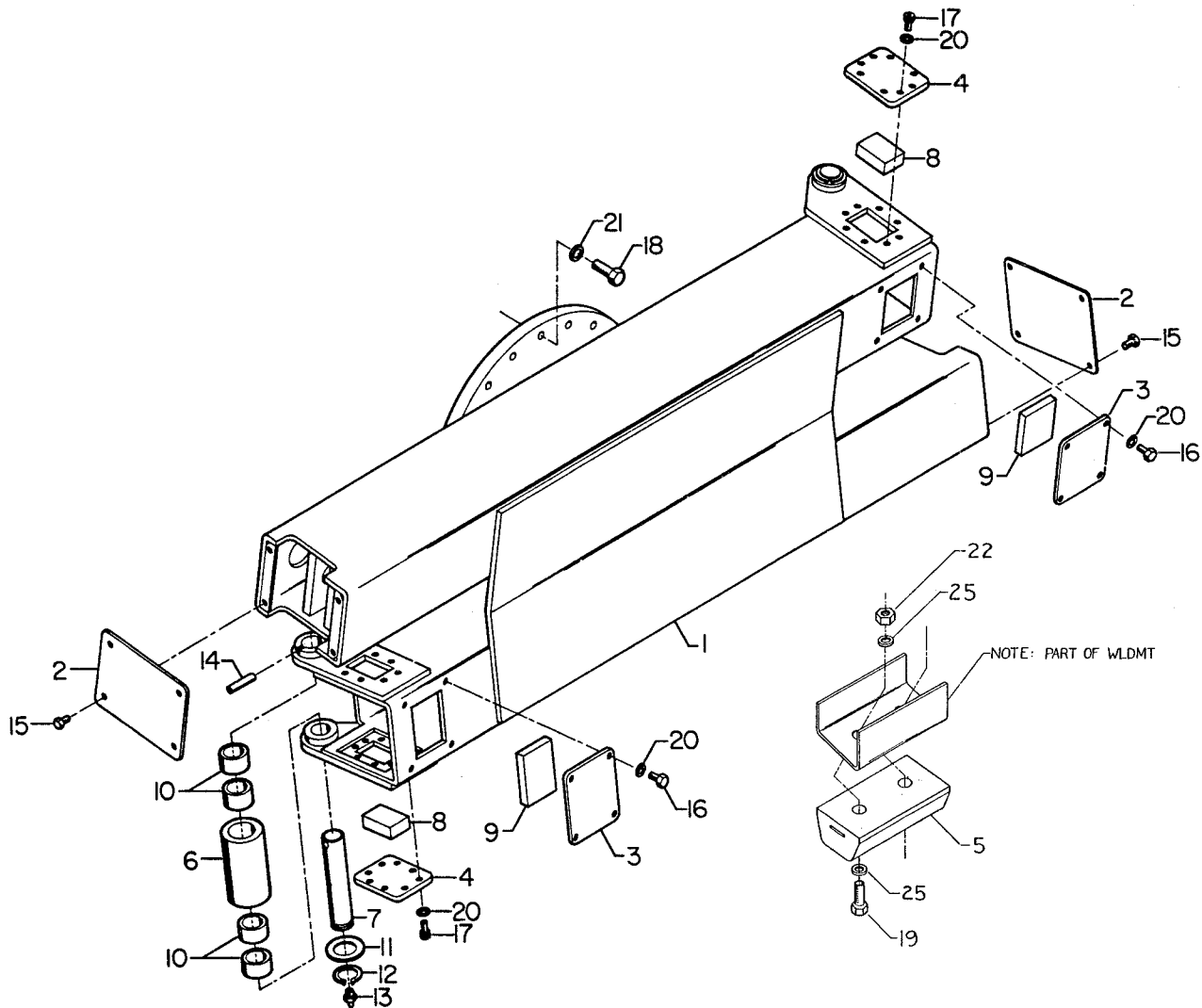
Figure B-3. WELDMENT PART NUMBER LOCATIONS

**WARNING**

Anytime a gear-bearing bolt is removed, it must be replaced with a new bolt of the identical grade and size. Failure to replace gear-bearing bolts may result in bolt failure due to metal fatigue, causing serious injury or death.

ITEM	PART NO.	DESCRIPTION	QTY
1.	52703652	YOKE	1
2.	51703654	SPUR GEAR BOX (INCL:9,12-14)	1
3.	60010235	PINION COVER	1
4.	60106306	GUARD	1
5.	60107144	SPACER (USED W/KAYDON BRG) REF	1
6.	71056001	GEAR BEARING	1
7.	71056264	INTERMEDIATE GEAR	1
8.	71056265	PINION GEAR	1
9.	60106309	DRIVE GEAR (PART OF 2)	1
10.	60020123	THRUST WASHER	1
11.	60020033	THRUST WASHER	1
12.	60020181	BUSHING (PART OF 2)	1REF
13.	60020182	BUSHING (PART OF 2)	1REF
14.	60020180	BUSHING (PART OF 2)	1REF
15.	53000703	GREASE EXTENSION 18"	1
16.	72053508	ZERK 1/8NPT	7
17.	72053301	COUPLING 1/8NPT	1
18.	72066095	RETAINING RING 2"	1
19.	72060151	CAP SCR 5/8-11X2 HH GR8	23
20.	72060091	CAP SCR 1/2-13X1 HH GR5	2
21.	72060833	SCR 5/16-18X3/4 HH SLFTPG	2
22.	60106032	STUD 1/2-13X1	2
23.	72063119	WASHER 5/8 FLAT HARD GR8	23
24.	72063005	WASHER 1/2 WRT	2
25.	72063053	WASHER 1/2 LOCK	2
26.	72063002	WASHER 5/16 WRT	2
27.	72062080	NUT 1/2-13 LOCK	2
28.	60106042	MOTOR	1REF
29.	52704466	LINK (INCL:33)	1
30.	72063039	MACH BUSHING 2X10GA NR	1
31.	60010118	HOSE CLAMP	2
32.	60105322	REINFORCEMENT TUBE	1
33.	7BF82020	BUSHING (PART OF 29)	4REF
34.	52704930	PIN	1
35.	52704931	PIN	1
36.	52704934	PIN	1
37.	72062142	NUT 1 1/4-7 LOCK	3
38.	72063012	WASHER 1-1/4 WRT	3
40.	72062103	NUT 3/8-16 LOCK	2
41.	72060147	CAP SCR 5/8-11X1 HH GR5 (USED AS PLUGS IN ITEM 2)	7
42.	72063055	WASHER 5/8 LOCK (USED AS PLUGS IN ITEM 2)	7
43.	72531826	REDUCER BUSHING 1/4-1/8NPT	1

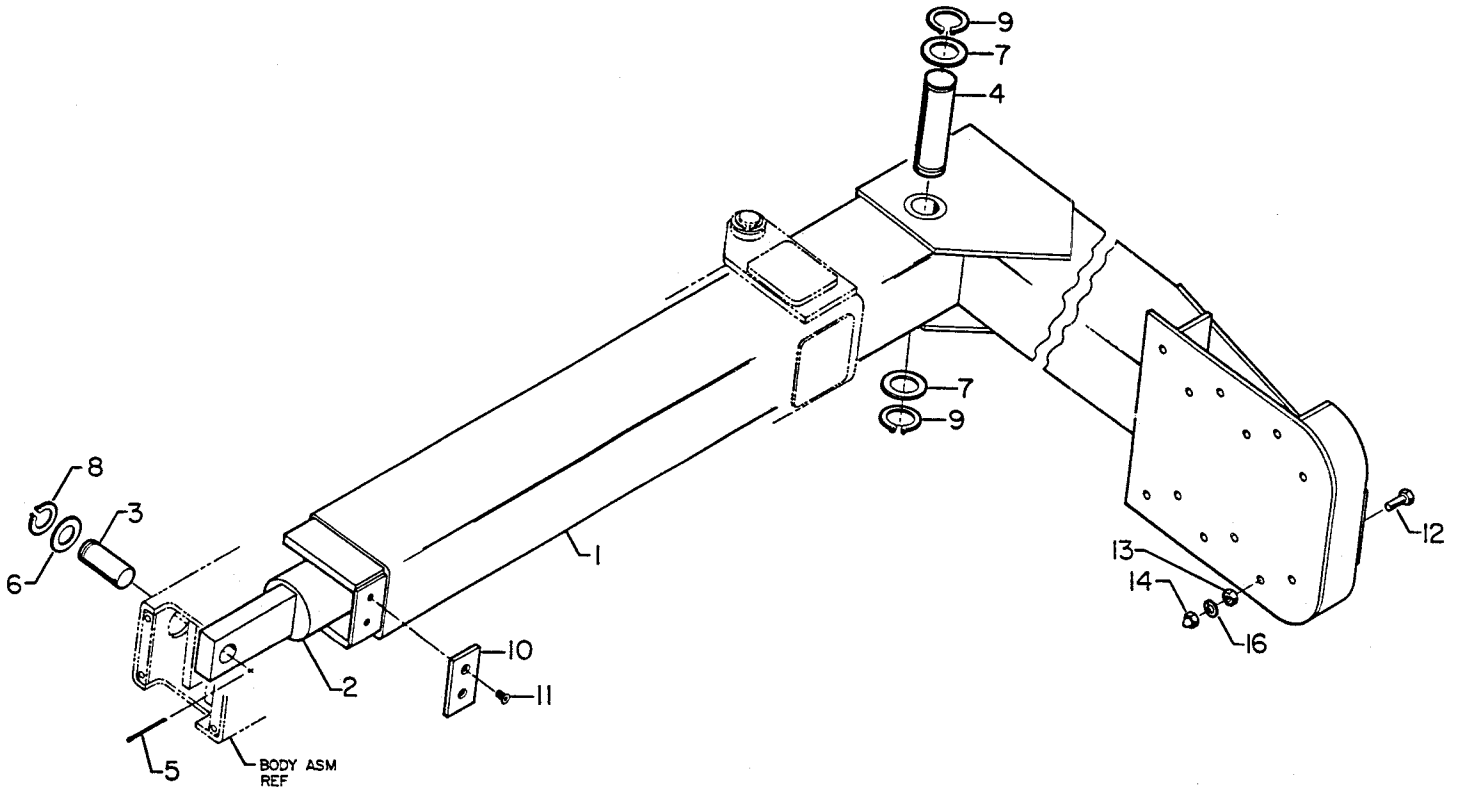
Figure B-4. YOKE ASSEMBLY (40704467)

**WARNING**

Anytime a gear-bearing bolt is removed, it must be replaced with a new bolt of the identical grade and size. Failure to replace gear-bearing bolts may result in bolt failure due to metal fatigue, causing serious injury or death.

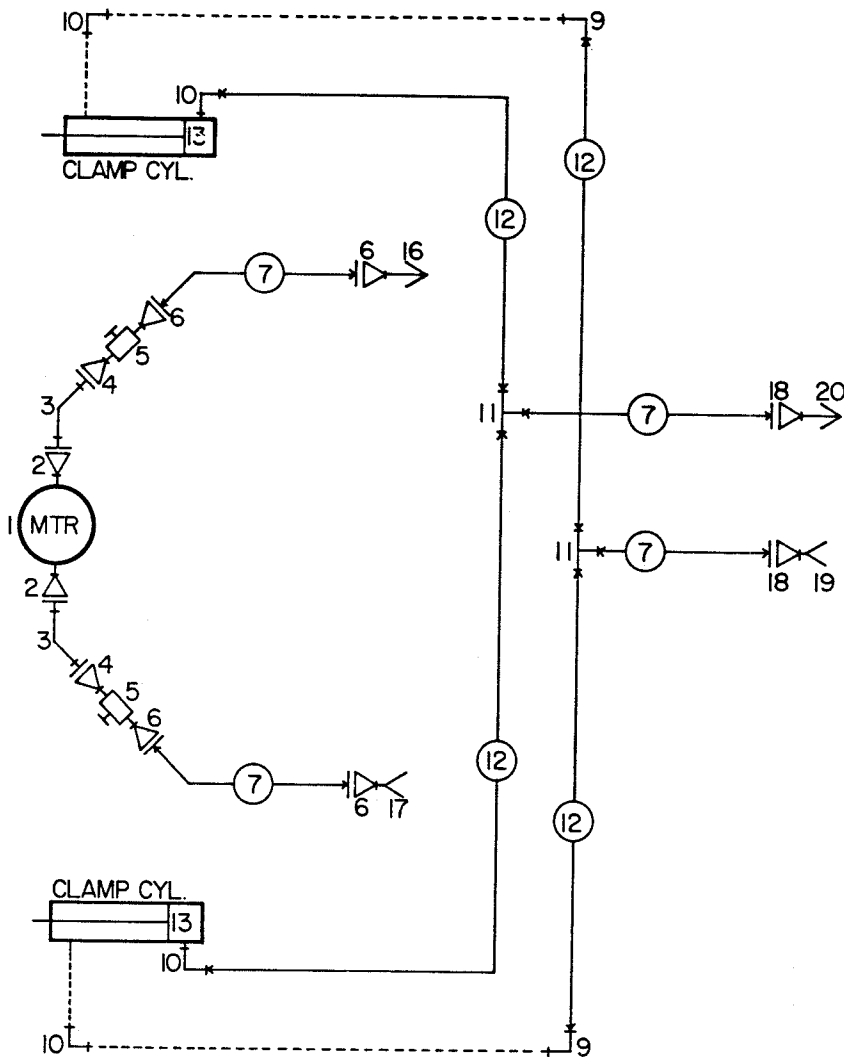
ITEM	PART NO.	DESCRIPTION	QTY
1.	52702443	BASE	1
2.	60105669	END CAP	2
3.	60105231	RETAINER PLATE	2
4.	60105622	RETAINER PLATE	4
5.	76393209	PAD	2
6.	60105293	ROLLER (INCL:10)	2
7.	60105261	PIN	2
8.	60030047	WEAR PAD	4
9.	60030041	WEAR PAD	2
10.	7BF81215	BUSHING (PART OF 6)	8REF
11.	72063037	MACH BUSHING 1-1/2X10GA NR	2
12.	72066132	RETAINING RING 1-1/2 EXT HD	2
13.	72053508	ZERK 1/8NPT	2
14.	72661159	GROOVE PIN 1/2X3	2
15.	72060833	SCR 5/16-18X3/4 HH SLFTPG	8
16.	72060044	CAP SCR 3/8-16X3/4 HH GR5	8
17.	72060753	CAP SCR 3/8-16X1 SH	32
18.	72060151	CAP SCR 5/8-11X2 HH GR8	20
19.	72060095	CAP SCR 1/2-13X2 HH GR5	4
20.	72063051	WASHER 3/8 LOCK	40
21.	72063119	WASHER 5/8 FLAT HARD GR8	20
22.	72063005	WASHER 1/2 WRT	8
23.	72661216	GRIPNAIL	2
24.	70029119	SERIAL NUMBER PLACARD	1
25.	72062080	NUT 1/2-13 LOCK	4

Figure B-5. BODY ASSEMBLY (40702435)



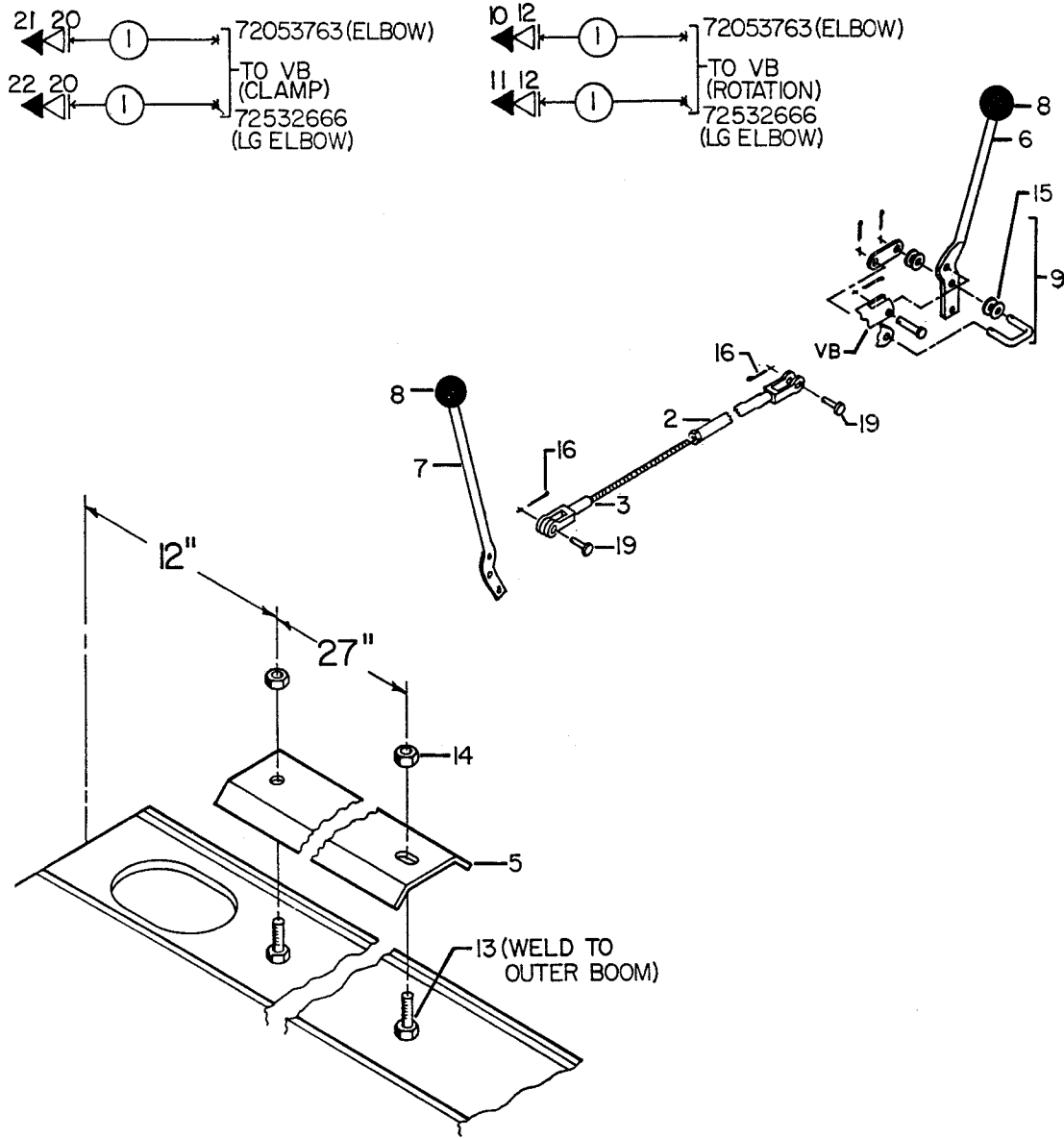
ITEM	PART NO.	DESCRIPTION	QTY
1.	52702454	ARM	1
2.	3B234313	CLAMP CYLINDER	1
3.	60102096	PIN	1
4.	60105292	PIN	1
5.	72066198	COTTER PIN .19X3	1
6.	72063037	MACH BUSHING 1-1/2X10GA NR	1
7.	72063039	MACH BUSHING 2X10GA NR	2
8.	72066132	RETAINING RING 1-1/2 EXT HD	1
9.	72066136	RETAINING RING 2" EXT HD	2
10.	60030013	WEAR PAD	1
11.	72060916	CAP SCR 5/16-18X3/4 FLTHD SOC	2
12.	72060093	CAP SCR 1/2-13X1-1/2 HH GR5	12
13.	72062004	NUT 1/2-13 HEX	12
14.	72062134	NUT 1/2-13 HUGH ACORN	12
16.	72063053	WASHER 1/2 LOCK	12

Figure B-6. ARM ASSEMBLY (40702438)



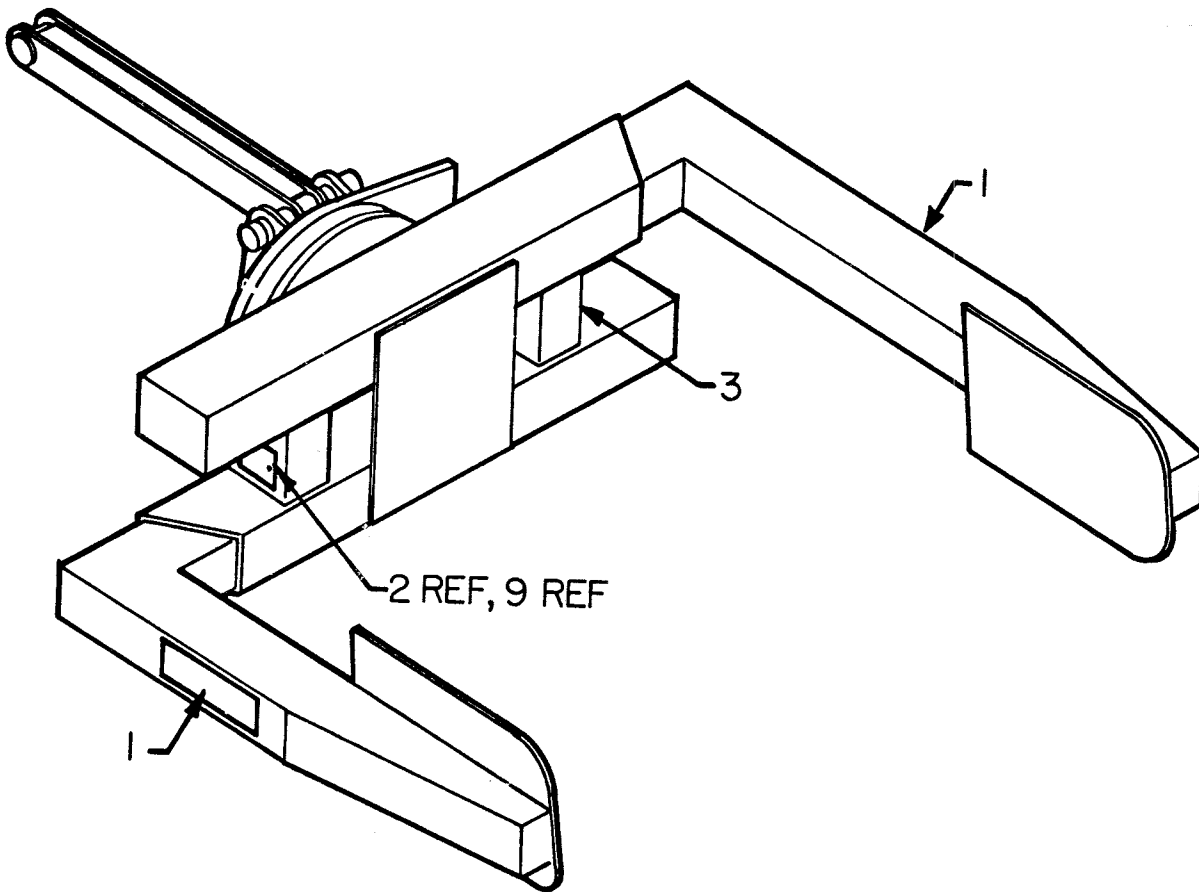
ITEM	PART NO.	DESCRIPTION	QTY
1.	73051384	MOTOR	1
2.	72053743	ADAPTER 7/8MSTR 3/8FPT	2
3.	72053563	STREET ELBOW 3/8NPT 45°	2
4.	72053723	ADAPTER 3/8MPT 3/8MPT	2
5.	73054139	COLORFLOW VALVE 3/8FPT	2
6.	72053670	ADAPTER 3/8MPT 3/4MJIC	4
7.	51703033	HOSE ASM 3/8X72	4
9.	72532658	ELBOW 3/4MJIC 3/4FJIC SWVL	2
10.	72532666	ELBOW 3/4MSTR 3/4MJIC XLG	4
11.	72531205	TEE 3/4MJIC	2
12.	51703661	HOSE ASM 3/8X36	4
13.		CLAMP CYLINDER	2REF
16.	72053540	DISCONNECT COUPLER 3/8NPT	1
17.	72053542	DISCONNECT NIPPLE 3/8NPT	1
18.	72053497	ADAPTER 1/2MPT 3/4MJIC	2
19.	72531780	DISCONNECT COUPLER 1/2FPT	1
20.	72531791	DISCONNECT NIPPLE 1/2FPT	1

Figure B-7. HYDRAULIC KIT (91704782)



ITEM	PART NO.	DESCRIPTION	QTY	ITEM	PART NO.	DESCRIPTION	QTY
1.	51706162	HOSE ASM 3/8X300	4	12.	72053670	ADAPTER 3/8MPT 3/4MJIC	2
2.	52702016	CONTROL ROD-F	2	13.	72060048	CAP SCR 3/8-16X1-1/2 HH GR5	2
3.	52702018	CONTROL ROD-M	2	14.	72062103	NUT 3/8-16 LOCK	2
5.	60101823	HOSE SHROUD	1	15.	72063001	WASHER 1/4 WRT	8
6.	70141982	CONTROL HANDLE	2	16.	72066168	COTTER PIN .09X3/4	4
7.	70141984	CONTROL HANDLE	2	19.	72066338	CLEVIS PIN 5/16X1	4
9.	94731839	LINK & PIN KIT	2	20.	72053497	ADAPTER 1/2MPT 3/4MJIC	2
10.	72053540	DISCONNECT COUPLER 3/8FPT	1	21.	72531780	DISCONNECT COUPLER 1/2FPT	1
11.	72053542	DISCONNECT NIPPLE 3/8FPT	1	22.	72531791	DISCONNECT COUPLER 1/2FPT	1

Figure B-8. INSTALLATION KIT-20017 CRANE (93706771)

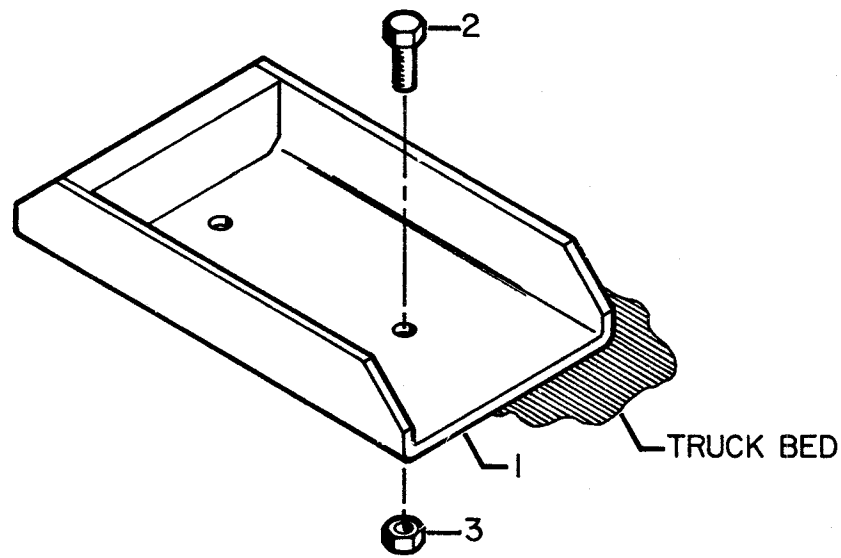


ITEM	PART NO.	DESCRIPTION	QTY
1.	70392560	DECAL-TH12 IDENTIFICATION	2
2.	70029119	SERIAL NUMBER PLACARD	1REF
3.	70039261	PLACARD-PATENT	1
4.	70391612	DECAL - GREASE WKLY LH	3
5.	70391613	DECAL - GREASE WKLY RH	3
6.	70392524	DECAL - ROTATE/GREASE	1
7.	71392632	DECAL-CONTROL CS	1
8.	71392633	DECAL-CONTROL SS	1
9.	72066340	POP RIVET 1/8	2REF
10.	71393701	CAPACITY PLACARD	2

DECAL PLACEMENT

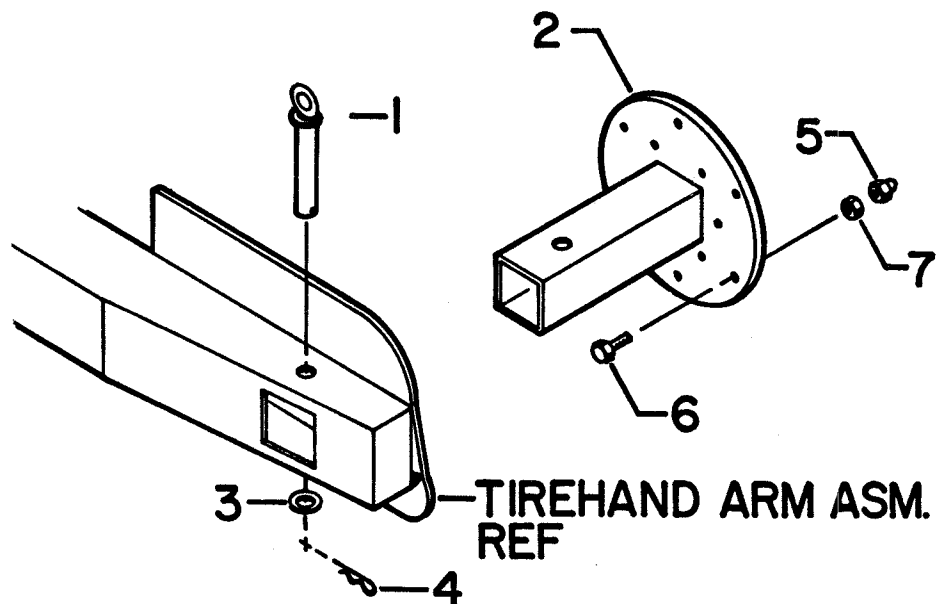
ITEM	LOCATION
4,5	NEAR ALL GREASE ZERKS
6	NEAR TURNTABLE GREASE ZERK
7	AT CURBSIDE CONTROLS
8	AT STREETSIDE CONTROLS
10	NEAR CRANE OPERATOR STATION

Figure B-9. DECAL KIT (41703228)



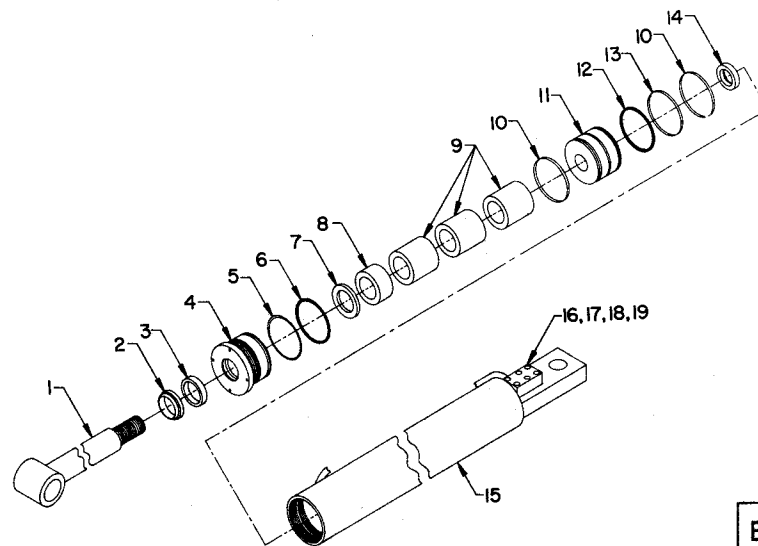
ITEM	PART NO.	DESCRIPTION	QTY
1.	52704685	SADDLE	1
2.	72060093	CAP SCR 1/2-13X1-1/2 HH GR5	2
3.	72062080	NUT 1/2-13 LOCK	2

Figure B-10. SADDLE ASSEMBLY (31704684)



ITEM	PART NO.	DESCRIPTION	QTY
1.	52702082	PIN	2
2.	52704290	EXTENSION PAD	2
3.	72063034	MACH BUSHING 1X10GA NR	2
4.	72066145	HAIR PIN .19	2
5.	72062134	NUT 1/2-13 ACORN HIGH	24
6.	72060093	CAP SCR 1/2-13X1-1/2 HH GR5	24
7.	72062004	NUT 1/2-13 HEX	24

Figure B-11. PAD EXTENSION KIT (95707720)



DIMENSIONS

Bore	4"
Stroke	34-1/2"
C-C Closed	61-3/8"
Rod diameter	2"
Pin dia - Base	1-1/2"
Pin dia - Rod	2"

NOTE

IT IS RECOMMENDED THAT ALL COMPONENTS OF THE SEAL KIT BE REPLACED WHENEVER THE CYLINDER IS DISASSEMBLED. THIS WILL REDUCE FUTURE DOWNTIME.

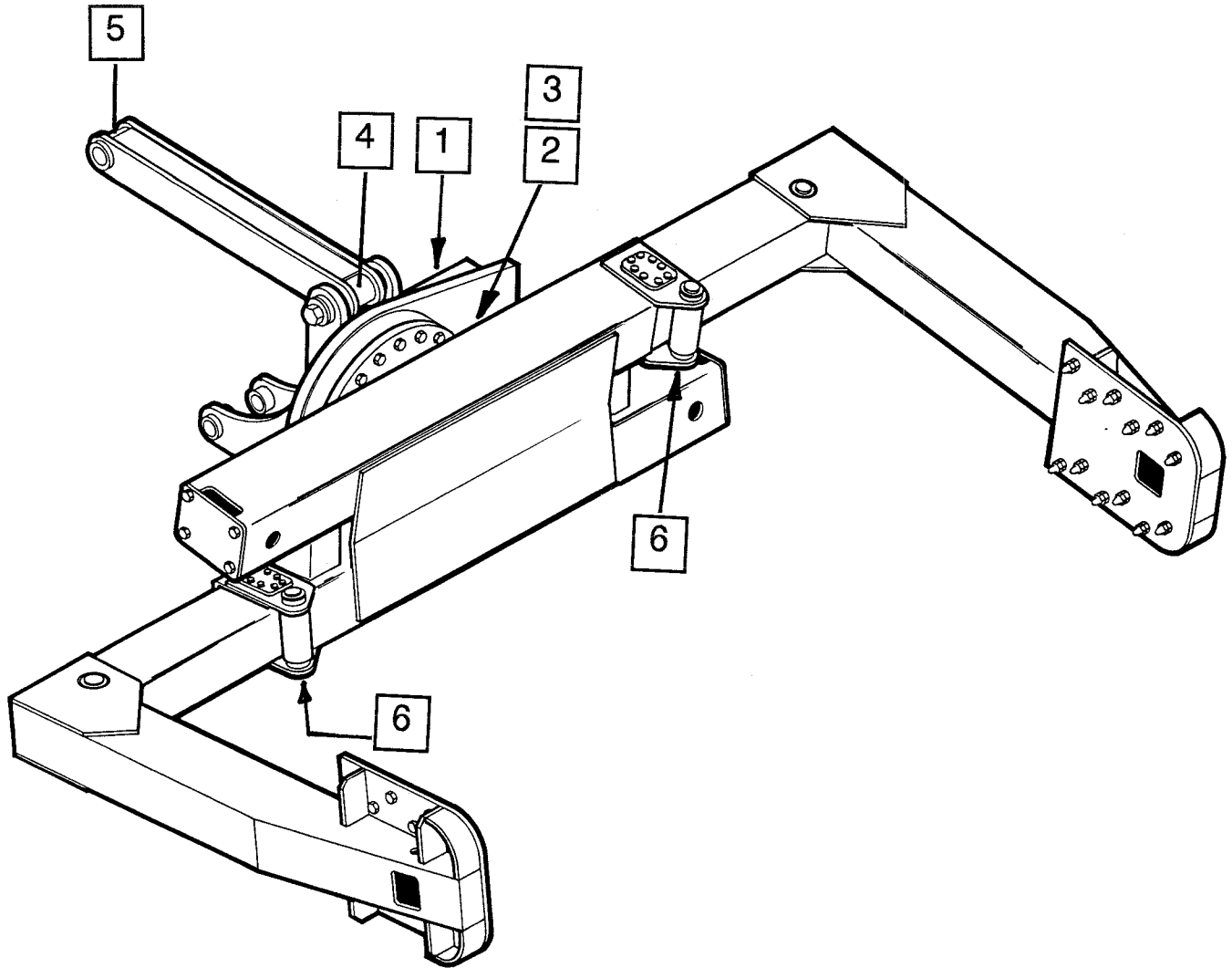
APPLY "LUBRIPLATE #630-2" MEDIUM HEAVY, MULTI-PURPOSE LUBRICANT OR EQUIVALENT TO ALL PISTON AND HEAD GLANDS, LOCK RING AND ROD THREADS BEFORE ASSEMBLY.

USE "NEVER-SEEZ" OR EQUIVALENT BETWEEN THE HEAD AND THE CASE WHEN ASSEMBLING THE CYLINDER.

ITEM	PART NO.	DESCRIPTION	QTY
1.	4G308410	ROD	1
2.	7R14P020	ROD WIPER (PART OF 20)	1REF
3.	7R546020	ROD SEAL (PART OF 20)	1REF
4.	6H040020	HEAD	1
5.	7Q10P342	BACK-UP RING (PART OF 20)	1REF
6.	7Q072342	O-RING (PART OF 20)	1REF
7.	6A025020	WAFER LOCK (PART OF 20)	1REF
8.	6C150020	STOP TUBE	1
9.	6C300020	STOP TUBE	3
10.	7T65I040	PISTON RING (PART OF 20)	2REF
11.	6I040143	PISTON	1
12.	7Q072153	O-RING (PART OF 20)	1REF
13.	7T66P040	PISTON SEAL (PART OF 20)	1REF
14.	7T61N143	LOCK RING SEAL (PART OF 20)	1REF
15.	4B308411	CASE	1
16.	73054004	VALVE	1
17.	72060708	CAP SCR 1/4-20X1-1/4 SH	6
18.	7Q072012	O-RING SM (PART OF 20)	1
19.	7Q072113	O-RING LG (PART OF 20)	2
20.	9C161623	SEAL KIT (INCL:2,3,5-7,10,12-14,18,19)	1

Figure B-12. CLAMP CYLINDER (3B234313)

SECTION 3. Reference





ITEM	LOCATION DESCRIPTION	LUBRICANT	FREQUENCY
1.	TURNTABLE BEARING GREASE EXTENSION *ROTATE TIREHAND WHILE GREASING	SHELL ALVANIA 2EP OR SHELL RETINAX "A"	WEEKLY
2.	DRIVE GEAR		
3.	PINION GEAR		
4.	LINK/TIREHAND HINGE		
5.	LINK/CRANE OUTER BOOM HINGE		
6.	CLAMP ARM ROLLER PINS		

NOTE: All application points must be greased weekly under normal work loads and moderate weather conditions. Under severe operating conditions, lubrication should be performed more frequently. See Volume 1; Operation, Maintenance and Repair for additional lubrication requirements.

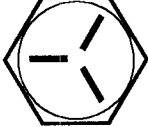

Figure C-1. GREASE ZERK LOCATIONS AND LUBRICANT REQUIREMENTS

TORQUE DATA CHART

FINE THREAD BOLTS

SIZE (DIA-TPI)	BOLT DIA (INCHES)	TIGHTENING TORQUE			
		 SAE J429 GRADE 5		 SAE J429 GRADE 8	
		PLAIN (LB FT)	PLATED (LB FT)	PLAIN (LB FT)	PLATED (LB FT)
5/16-24	0.3125	19	14	27	20
3/8-24	0.3750	35	26	49	35
7/16-20	0.4375	55	41	78	58
1/2-20	0.5000	90	64	120	90
9/16-18	0.5625	120	90	170	130
5/8-18	0.6250	170	130	240	180
3/4-16	0.7500	300	225	420	315
7/8-11	0.8750	445	325	670	500
1-12	1.0000	645	485	995	745
1 1/8-12	1.1250	890	670	1445	1085
1 1/4-12	1.2500	1240	930	2010	1510
1-3/8-12	1.3750	1675	1255	2710	2035
1 1/2-12	1.5000	2195	1645	3560	2670

COARSE THREAD BOLTS

SIZE (DIA-TPI)	BOLT DIA (INCHES)	TIGHTENING TORQUE			
		 SAE J429 GRADE 5		 SAE J429 GRADE 8	
		PLAIN (LB FT)	PLATED (LB FT)	PLAIN (LB FT)	PLATED (LB FT)
5/16-18	0.3125	17	13	25	18
3/8-16	0.3750	31	23	44	33
7/16-14	0.4375	49	37	70	52
1/2-13	0.5000	75	57	105	80
9/16-12	0.5625	110	82	155	115
5/8-11	0.6250	150	115	220	160
3/4-10	0.7500	265	200	375	280
7/8-9	0.8750	395	295	605	455
1-8	1.0000	590	445	910	680
1 1/8-7	1.1250	795	595	1290	965
1 1/4-7	1.2500	1120	840	1815	1360
1-3/8-6	1.3750	1470	1100	2380	1780
1 1/2-6	1.5000	1950	1460	3160	2370

When using the torque data in the charts above, the following rules should be observed.

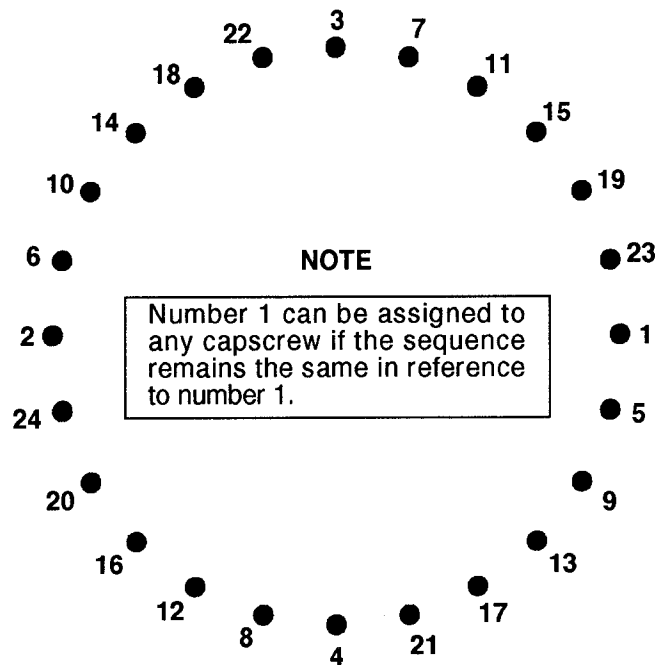
1. Bolt manufacturer's particular specifications should be consulted when provided.
2. Flat washers of equal strength must be used.
3. All torque measurements are given in foot-pounds. To convert to inch-pounds, multiply by 12.
4. Torque values specified are for bolts with residual oils or no special lubricants applied. If special lubricants of high stress ability, such as Never-Seez compound graphite and oil, molybdenum disulphite, colloidal copper or white lead are applied, multiply the torque values in the charts by the factor .90. The use of Loctite does not affect the torque values listed above.
5. Torque values for socket-head capscrews are the same as for Grade 8 capscrews.

WARNING

Anytime a gear-bearing bolt is removed, it must be replaced with a new bolt of the identical grade and size. Once a bolt has been torqued to 75% of its proof load and then removed, the torque coefficient may no longer be the same as when the bolt was new thus giving indeterminate clamp loads after torquing. Failure to replace gear-bearing bolts may result in bolt failure due to metal fatigue causing serious injury or DEATH.

Figure C-2. TORQUE DATA CHART

Refer to the diagram below for proper tightening/torquing sequence of the turntable bearing to the crane base and crane mast. The total quantity of cap screws varies dependent on crane model.



TIGHTENING PROCEDURE:

1. Refer to the Torque Data Chart to determine the proper torque value to apply to the size of capscrew used.
2. Follow the tightening sequence shown in the diagram. Note that the quantity of capscrews may differ from the diagram, but the sequence must follow the criss-cross pattern as shown in the diagram.
3. Torque all capscrews to approximately 40% of the specified torque value, by following the sequence. (EXAMPLE: $.40 \times 265 \text{ FT-LBS} = 106 \text{ FT-LBS}$)
4. Repeat Step 3, but torquing all capscrews to 75% of the specified torque value. Continue to follow the tightening sequence. (EXAMPLE: $.75 \times 265 \text{ FT-LBS} = 199 \text{ FT-LBS}$)
5. Using the proper sequence, torque all capscrews to the listed torque value as determined from the Torque Data Chart.

Figure C-3. TURNTABLE BEARING FASTENER TIGHTENING SEQUENCE

Before a bearing is removed from a crane for inspection, one of the following conditions should be evident:

1. Metal particles present in the bearing lubricant.
2. Increased drive power required to rotate the crane.
3. Noise emitting from the bearing during crane rotation.
4. Rough crane rotation.
5. Uneven or excessive wear between the pinion gear and turntable gear.

If none of the above conditions exists, the bearing is functioning properly and need not be replaced. But, if one or more of the above conditions exists, inspection may be required. Limits are measured in "TILT" which is dependent on the internal clearances of the bearing. TILT is the most practical determination of a bearings internal clearance once mounted on a crane.

Periodic readings indicating a steady increase in TILT may be an indicator of bearing wear. Note that a bearing found to have no raceway cracks or other structural irregularities should be reassembled and returned to service.

TEST PROCEDURE

STEP 1.

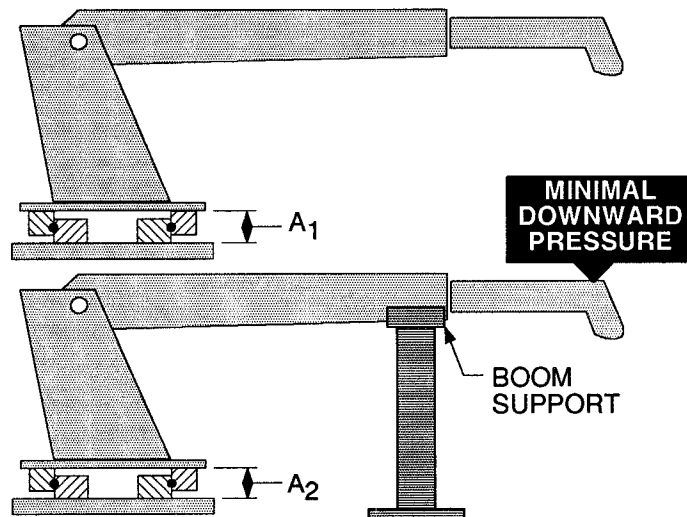
With the crane horizontal and fully extended, measure between the top and bottom mounting surfaces of the turntable bearing (A_1), using a dial indicator for accuracy.

STEP 2.

Reverse the load by applying minimal downward pressure on the boom while the boom is in the boom support or on a solid surface. Again measure A_2 .

STEP 3.

Subtract A_1 from A_2 to determine tilt and compare the result with the accompanying chart.



COMPARISON CHART - MODEL TO MEASURED TILT DIMENSION					
<p>NOTE</p> <p>THE FIGURES LISTED IN THIS CHART ARE SERVICE GUIDELINES AND DO NOT, IN THEMSELVES, REQUIRE THAT THE BEARING BE INSPECTED.</p> <p>IF THERE IS REASON TO SUSPECT AN EXCESS OF BEARING WEAR AND THE MEASURED TILT DIMENSION EXCEEDS THE DIMENSION LISTED, REMOVE THE BEARING FOR INSPECTION.</p>	<p>IMT CRANE OR TIREHAND MODEL</p>	814	4817	32018	9616
		1007	4825	32030	9825
		1014	516	HAWK-H1150	9831
		2010	525	HAWK-H1150TL	10020
215	5826	HAWK-H4961	10025		
2015	6014		1216		
2109	6425		1325		
2815	725		1331		
3016	7020		13031		
315A	7025		13034		
320H	8025		13426		
3515	8031		14018		
3617	TH10 BODY ROT'N		14048		
3625	TH12 BODY ROT'N		14126		
421			15033		
425			1725		
5016			18026		
TH7 BODY ROT'N			20017		
TH1449A BODY ROT'N			HAWK-H1200		
TH15A CLAMP			TH1836 BODY ROT'N		
TH1836A CLAMP			TH1836A BODY ROT'N		
TH2551 CLAMP			TH2551 BODY ROT'N		
TH2557 CLAMP			TH2557 BODY ROT'N		
TH2557A CLAMP			TH2557A BODY ROT'N		
BALL DIA. (REF)	.875" (22mm)	1.00" (25mm)	1.18" - 1.25" (30 - 32mm)	1.75" (44mm)	
TILT DIM. ($A_1 - A_2$)	.060" (1.524mm)	.070" (1.778mm)	.075" (1.905mm)	.090" (2.286mm)	

Figure C-4. TURNTABLE BEARING INSPECTION FOR REPLACEMENT

SPARE PARTS LIST

1-Year Supply

This spare parts list does not necessarily indicate that the items can be expected to fail in the course of a year. It is intended to provide the user with a stock of parts sufficient to keep the unit operating with minimal down-time waiting for parts. Obviously, there may be part failures not covered by this list.

The item numbers shown on this list correspond to the item numbers on the page listed.

FIG. NO.	ITEM NO.	PART NO.	DESCRIPTION	QTY
B-4.	6	71056001	GEAR BEARING	1
B-4.	7	71056264	INTERMEDIATE GEAR	1
B-4.	8	71056265	PINION GEAR	1
B-4.	9	60106309	DRIVE GEAR	1
B-4.	10	60020123	THRUST WASHER	1
B-4.	11	60020033	THRUST WASHER	1
B-4.	12	60020181	BUSHING	1
B-4.	13.	60020182	BUSHING	1
B-4.	14	60020180	BUSHING	1
B-4.	19	72060151	CAP SCR 5/8-11X2 HH GR8	23
B-4.	23	72063119	WASHER 5/8 FLAT HARD GR8	23
B-4.	28.	60106042	MOTOR	1
B-4.	33	7BF82020	BUSHING	4
B-5.	8	60030047	WEAR PAD	4
B-5.	9	60030041	WEAR PAD	2
B-5.	10	7BF81215	BUSHING	8
B-5.	18	72060151	CAP SCR 5/8-11X2 HH GR8	20
B-5.	21	72063119	WASHER 5/8 FLAT HARD GR8	20
B-6.	10	60030013	WEAR PAD	2
B-12.	16	73054004	VALVE	2
B-12.	20	9C161623	SEAL KIT	2

The information within this manual has been compiled and checked but errors do occur. To provide our customers with a method of communicating those errors we have provided the Manual Change Request form below. In addition to error reporting, you are encouraged to suggest changes or additions to the manual which would be of benefit to you. We cannot guarantee that these additions will be made but we do promise to consider them. When completing the form, please write or print clearly. Submit a copy of the completed form to the address listed below.

MANUAL CHANGE REQUEST

DATE	PRODUCT MANUAL	TH-12	MANUAL PART NO.	99900291-8/91
SUBMITTED BY				
COMPANY				
ADDRESS				
CITY, STATE, ZIP				
TELEPHONE				

ERROR FOUND

LOCATION OF ERROR (page no.): _____

DESCRIPTION OF ERROR: _____

REQUEST FOR ADDITION TO MANUAL

DESCRIPTION OF ADDITION: _____

REASON FOR ADDITION: _____

MAIL TO: IOWA MOLD TOOLING Co., Inc.
 Box 189,
 Garner IA 50438
 ATTN: Technical Publications

MANUFACTURER'S LIMITED WARRANTY

WARRANTY COVERAGE - Products manufactured by Iowa Mold Tooling Co., Inc. (IMT) are warranted to be free from defects in material and workmanship, under proper use, application and maintenance in accordance with IMT's written recommendations, instructions and specifications as follows:

1. Ninety (90) days; labor on IMT workmanship from the date of delivery to the end user.
2. One (1) year; original IMT parts from the date of delivery to the end user.

IMT's obligation under this warranty is limited to, and the sole remedy for any such defect shall be the repair or replacement (at IMT's option) of unaltered parts returned to IMT, freight prepaid, provided such defect occurs within the above stated warranty period and is reported within fourteen (14) days of its occurrence.

IMPLIED WARRANTY EXCLUDED - This is the only authorized IMT warranty and is in lieu of all other express or implied warranties or representations, including any implied warranties of merchantability or fitness for any particular purpose or of any other obligations on the part of IMT.

ITEMS EXCLUDED - The manufacturer gives no warranty on any components or parts purchased by the manufacturer, and such components as are covered only by the warranties of their respective manufacturers.

WARRANTY CLAIMS - Warranty claims must be submitted and shall be processed in accordance with IMT's established warranty claim procedure.

WARRANTY SERVICE - Warranty service will be performed by any IMT distributor authorized to sell new IMT products of the type involved or by any IMT Service Center authorized to service the type of product involved or by IMT in the event of direct sales made by IMT. At the time of requesting warranty service, the purchaser must present evidence of the date of delivery of the product. The purchaser shall pay any premium for overtime labor requested by the purchaser, any charge for making service calls and for transporting the equipment to the place where warranty work is performed.

WARRANTY VOIDED - All obligations of IMT under this warranty shall be terminated: (1) if service other than normal maintenance or normal replacement of service items is performed by someone other than an authorized IMT dealer, (2) if product is modified or altered in ways not approved by IMT.

PURCHASER'S RESPONSIBILITY - This warranty covers only defective material and workmanship. It does not cover depreciation or damage caused by normal wear, accident, improper protection in storage, or improper use. The purchaser has the obligation of performing the care and maintenance duties discussed in IMT's written recommendations, instructions and specifications. Any damage which results because of purchaser's failure to perform such duties shall not be covered by this warranty. The cost of normal maintenance and normal replacement of service items such as filters, belts, etc. shall be paid by the purchaser.

CONSEQUENTIAL DAMAGES - The only remedies the purchaser has in connection with the breach or performance of any warranty on IMT products are those set forth above. In no event will the dealer, IMT or any company affiliated with IMT, be liable for business interruptions, loss of sales and/or profits, rental or substitute equipment, costs of delay or for any other special, indirect, incidental or consequential losses, costs or damages.

REPRESENTATIONS EXCLUDED - IMT products are subject to no expressed, implied or statutory warranty other than herein set forth, and no agent, representative or distributor of the manufacturer has any authority to alter the terms of this warranty in any way whatsoever or to make any representations or promises, express or implied, as to the quality or performance of IMT products other than those set forth above.

CHANGE IN DESIGN - IMT reserves the right to make changes in design or improvements upon its products without imposing any obligation upon itself to install the same upon its products theretofore manufactured.

Effective January, 1984

This parts manual is provided to the user to assist in servicing the equipment. It is the property of Iowa Mold Tooling Co., Inc and, as such, may not be reproduced either whole or in part, whether by chemical, electrostatic, mechanical or photographic means without the expressed written permission of an officer of Iowa Mold Tooling Co., Inc. One manual is provided with each piece of new equipment and additional manuals may be obtained at a nominal price.

IOWA MOLD TOOLING Co., Inc.

BOX 189, GARNER, IA 50438-0189

TEL: 515-923-3711

PRODUCT SUPPORT FAX: 515-923-3674