



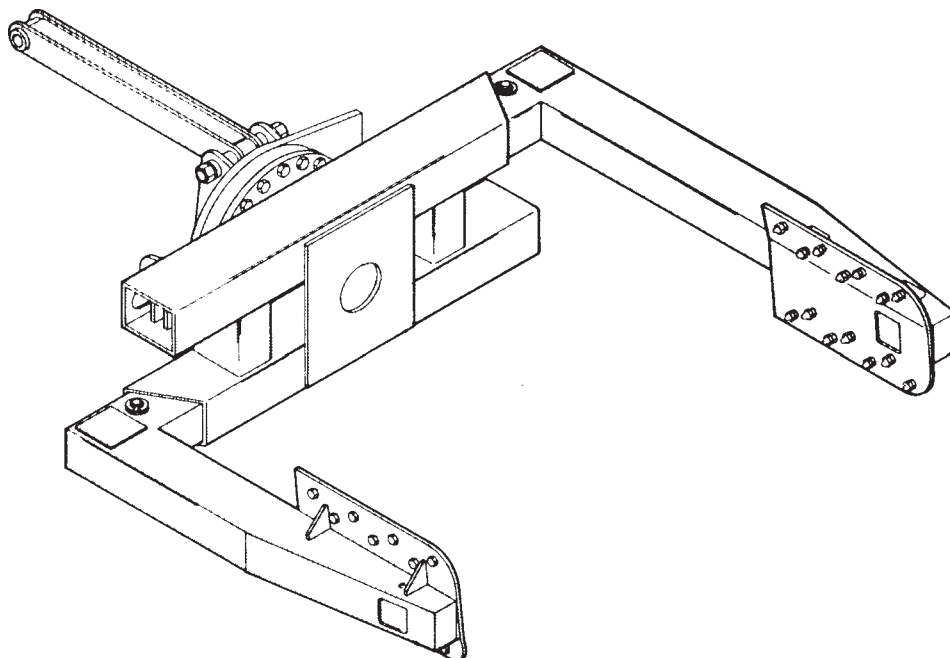
# ***Tirehand 10***

## **PARTS AND SPECIFICATIONS**

**Section 1 SPECIFICATIONS**

**Section 2 PARTS**

**Section 3 REFERENCE**



### **IOWA MOLD TOOLING CO., INC.**

BOX 189, GARNER, IA 50438-0189

TEL: 641-923-3711

TECHNICAL SUPPORT FAX: 641-923-2424

MANUAL PART NUMBER 99900285

REVISIONS LIST

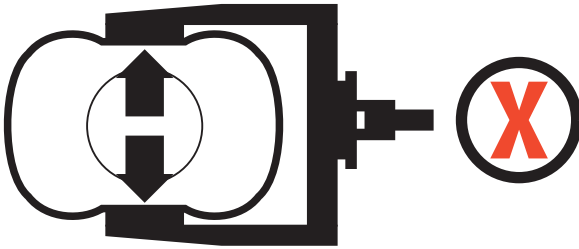
DATE	LOCATION	DESCRIPTION OF CHANGE
-	-	-
20010413	2-8	ECN 9000 ADDED 1 ELBOW, ITEMS #4 AND #6 CHANGED
20020206	2-5	ADDED MOBILTAC NOTE
	3-1,10	WARRANTY
20020520	2-5	ECN 8921 - ADDED NOTE ABOUT GEARBOX OIL
20050921	iii	Corrected spelling in operating restrictions
20070329	COVER, 2-3	UPDATED OWNERSHIP STATEMENT, NEW SERIAL NUMBER TAG.
20080212	1-5	ECN 10661 - UPDATED CAPACITY CHART
	2-5,8	ECN 10615, 10633 - UPDATED YOKE ASM, HYD KIT
20081104	2-5	ECN 10767 - 71056627 TURNTABLE BEARING TEETH REPL. 71056361
20081231	1-3	UPDATED TIREHAND SPECS

# TIREHAND OPERATING RESTRICTIONS

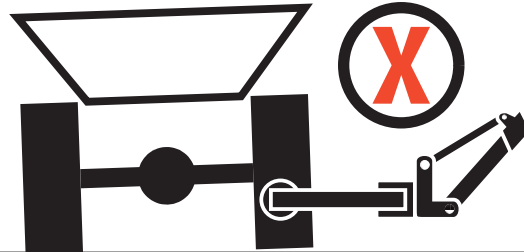
## **DANGER**

FAILURE TO OBEY THE FOLLOWING  
WILL RESULT IN  
**DEATH, SERIOUS INJURY,  
INSTABILITY OR EQUIPMENT DAMAGE**

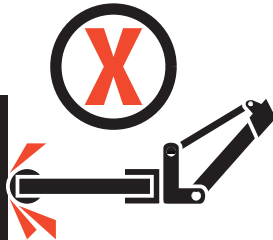
**NEVER** clamp an uninflated tire and then inflate. Damage or injury **WILL** result.



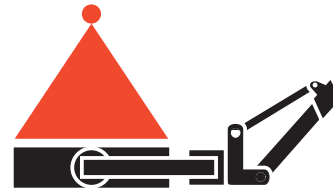
**NEVER** use the unit for any jacking, pulling or dragging operation involving an object or another vehicle.



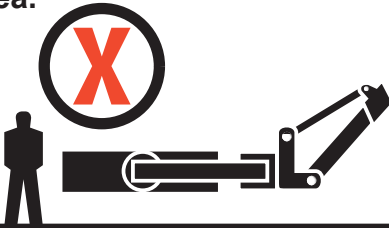
**NEVER** impact-load or hammer-push with the unit.



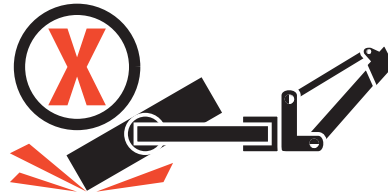
**NEVER** attempt to handle tires filled with ballast. Stability or structural failure may result if the load limit is exceeded.



**NEVER** operate the unit while persons not required for operation are in the work area.



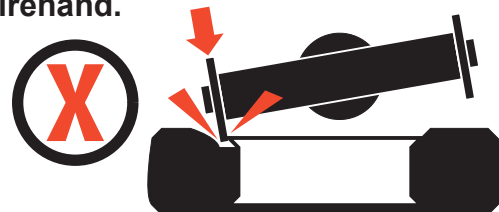
**NEVER** drag the tire-the unit is designed to lift and position.



**NEVER** sling a load using one arm of the Tirehand.



**NEVER** use crane functions to break beads using only one arm of the Tirehand.



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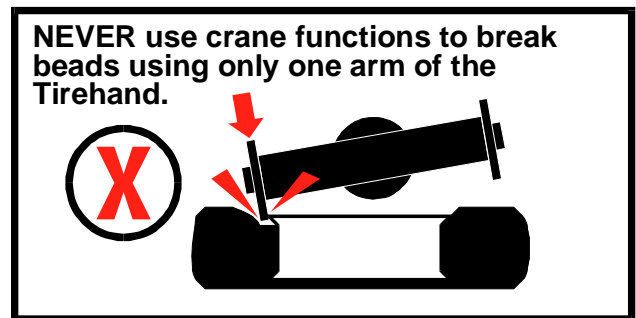
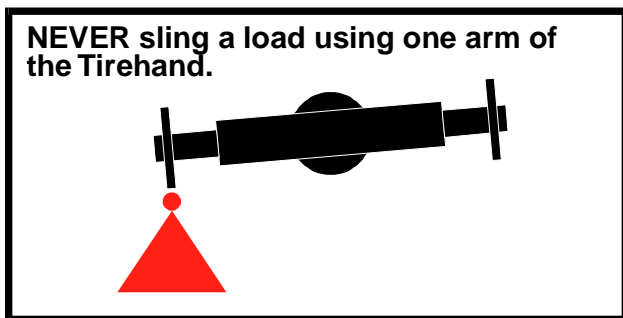
# TIREHAND OPERATING RESTRICTIONS

The Tirehand 10 mounted on a crane is intended to be a tire lifting and positioning device. There are possible misapplications of this machine that can cause serious damage to the Tirehand rotation gears. It is possible to break the teeth on the Tirehand rotation bearing by applying forces with the crane while attempting to break tire beads **with one arm** of the tire hand, or by slinging a load **under one arm** of the tire hand.

A load-carrying hook is attached to the outer boom of the crane for carrying loads other than tires. There is also an open clevis at the end of the extension boom on the crane that can be used for attaching slings.

**Use of a single Tirehand arm for lifting or carrying a load will void the tire hand warranty.**

The rotation system on the Tirehand is designed to allow the user to manipulate large tires. It is a precision function that was not designed to apply high loads. However, the load holding valves that are built into this system to help control the tire during handling will also prevent the body of the Tirehand from rotating freely when loads are applied to a single Tirehand arm. The crane is capable of producing very large forces in the downward and outward directions. When one arm is used for bead breaking, these forces can translate into torques that attempt to rotate the body of the Tirehand. The load holding valves will not allow this to occur. In this situation, the forces that are created in the Tirehand rotation turntable are well in excess of what the gear teeth can tolerate. **Using one arm of the Tirehand for bead breaking will void the warranty of the Tirehand.**



A separate bead breaker or a push bar that carries the load to both arms of the Tirehand must be used to separate the tire from the rim. It is acceptable to use the Tirehand for holding the sidewall and flange away from the bead while O-rings and locking rings are being installed.

## 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.

[illegible]

SECTION 1. TIREHAND 10 SPECIFICATIONS

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GEOMETRIC CONFIGURATION - Tirehand 10 on a 9616 CRANE..... 4

CAPACITY CHART ..... 5

## NOTES

[illegible]





## TIREHAND 10 SPECIFICATIONS

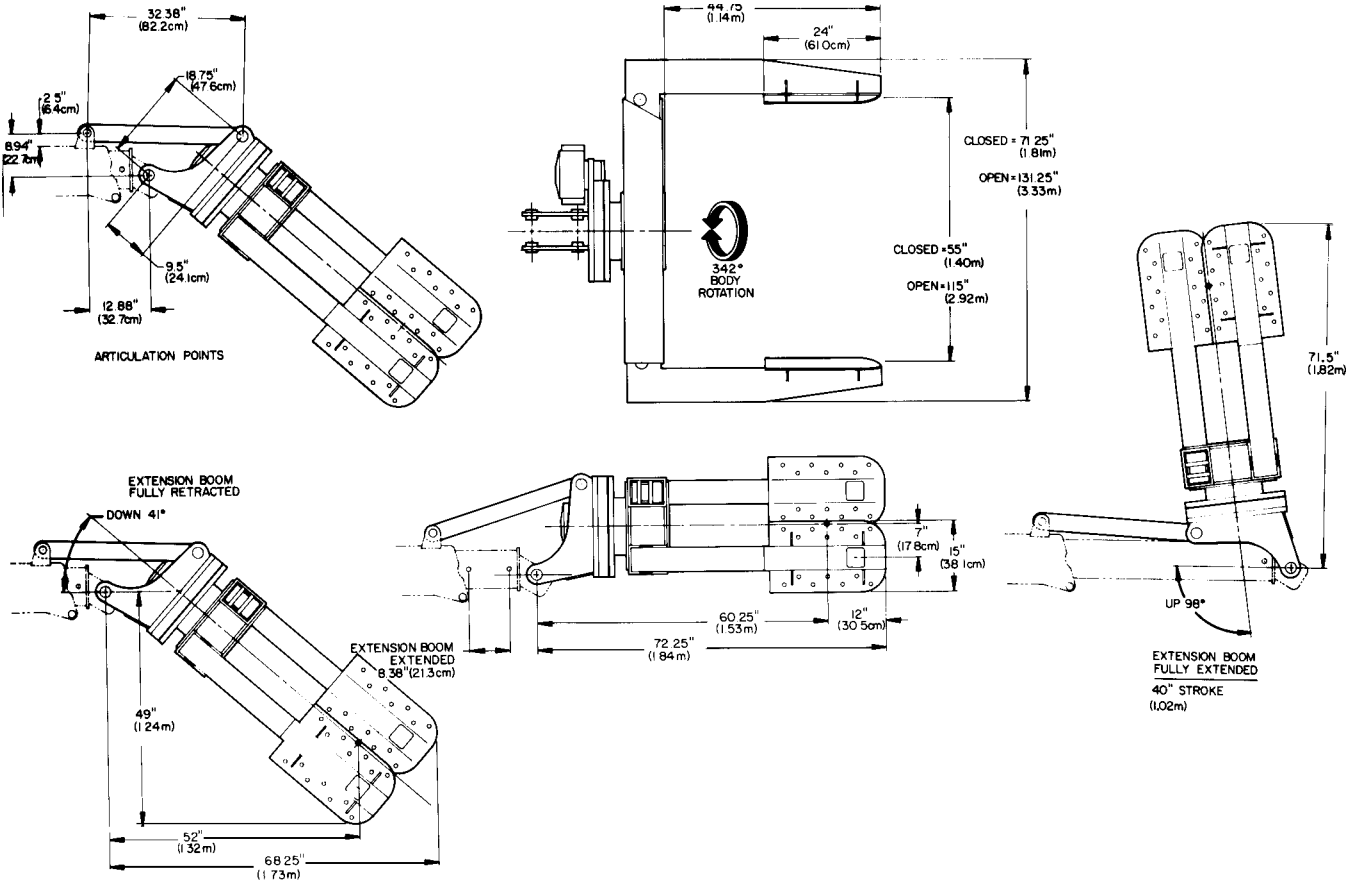
### GENERAL SPECIFICATIONS

IMT CRANE WHICH TIREHAND IS DESIGNED	Model 12916 & 9616 (truck chassis mounted)
TIREHAND MAXIMUM CAPACITY	5000 lb (2268 kg)
BODY ROTATION	342° (5.96 Rad)
CLAMPING SPAN	55" to 115" (139.7cm - 292.1cm)
METHOD OF CLAMPING	Horizontally telescoping
CLAMPING PAD ROTATION	None - Stationary Pads
TIREHAND TILT - 12916 CRANE (provided by crane extension boom)	+98° to -41° (+1.71 to -.72 Rad.)
TIREHAND TILT - 9616 CRANE (provided by crane extension boom)	+100° to -44° (+1.75 to -.77 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	1750 lbs (794 kg)
ALLOWABLE BEAD BREAKING METHOD	Push Bar, ONLY

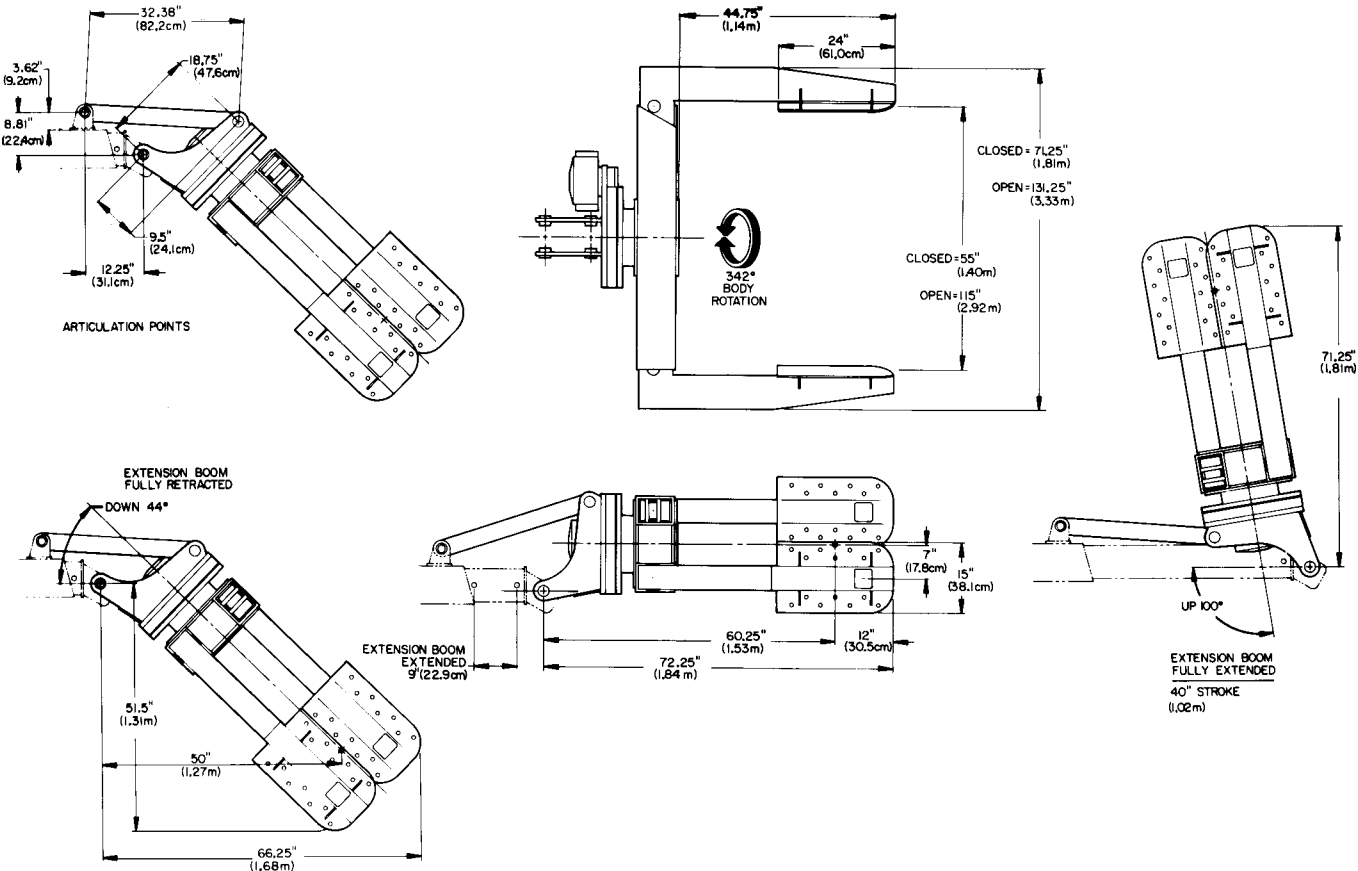
### CYLINDERS

	<b>BORE</b>	<b>STROKE</b>
CLAMPING	2-1/2" (6.35cm)	30" (76.2cm)
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.**



GEOMETRIC CONFIGURATION - TIREHAND 10 ON A 12916 CRANE



GEOMETRIC CONFIGURATION - TIREHAND 10 ON A 9616 CRANE



Tirehand 10

CAPACITY CHART

MAXIMUM CAPACITY

5,000 LB

(2,268 KG)

CLAMPING SPAN

MIN: 55" (139.7 cm)

MAX: 115" (292.1 cm)

70397315

## NOTES

[illegible]

SECTION 2. TIREHAND 10 PARTS

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WELDMENT INDENTIFICATION ..... 4

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BODY ASM (40704610) ..... 6

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0000TH10: 99900285:19950828

2-2  
**NOTES**

## PARTS INFORMATION

### GENERAL

This section contains the exploded parts drawings with the accompanying parts list for the assemblies used on the Tirehand-10. These drawings are intended to be used in conjunction with those in the 12916 and 9616 Crane manuals 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.

### TIREHAND IDENTIFICATION

Every Tirehand has an identification placard, as shown below, 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:

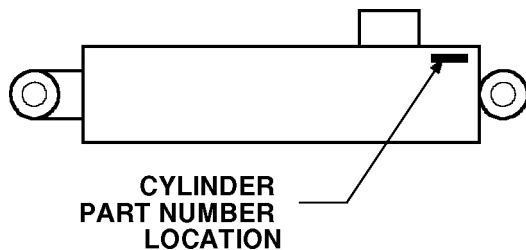
Iowa Mold Tooling Company, Inc.  
Box 189, Garner, Iowa 50438-0189  
Telephone: 641-923-3711  
Product Support Fax: 641-923-2424

 <b>IOWA MOLD TOOLING CO., INC.</b> BOX 189, GARNER, IA 50438-0189	
MODEL NUMBER	
SERIAL NUMBER	
MFG DATE	
70029119	

**SERIAL NUMBER PLACARD**

### 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, as shown below, against the information contained in this manual. You must use the part number stamped on the cylinder case when ordering parts.



**CYLINDER IDENTIFICATION**

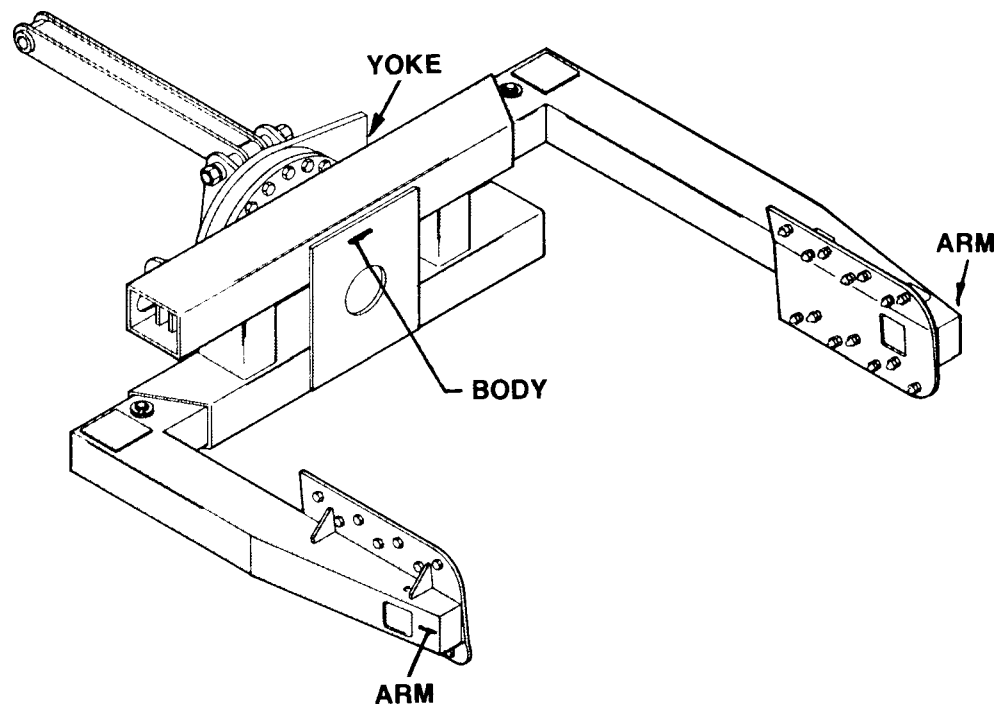
## WELDMENT IDENTIFICATION

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 below.

## 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.



## WELDMENT PART NUMBER LOCATIONS



**YOKE ASM (40070041)**

1.	52714632	YOKE-WLDMT TH10	1
2.	52070927	LINK-WLDMT TH 7 & 10	1
	70055174	BUSHING (PART OF 2)	4REF
3.	52704927	PIN-TYPE DD 1.50X 7.00 ( 8.75)	1
4.	52704928	PIN-TYPE DD 1.25X 8.62 (10.38)	1
5.	52704929	PIN-TYPE DD 1.50X 8.88 (10.62)	1
6.	60107648	CLAMP-HOSE SMALL	4
7.	60010235	COVER-PINION GEAR	1
8.	72063002	WASHER .31 FLAT	2
9.	72060833	SCR-THRD.CUT .31-18X.75	2
10.	71056627	GEAR-TRNTBL BRG	1
	(WAS 71056001	THRU 5-31-94 S/N #10THF1794040)	
11.	72063119	WASHER .62 FLAT ASTM F436	4
12.	72060151	CAP SCR .62-11X 2.00 HH GR8 Z	4
13.	72063116	WASHER .75 N FLAT	14

**NOTE**

1. APPLY MOBILTAC 375NC LUBRICANT (OR EQUIVALENT) TO THE EXTERNAL TEETH OF THE TURNTABLE BEARING AND PINION GEAR.

2. FILL GEAR BOX (#20) WITH 2-1/2 QUARTS OF 140 WT OIL (EXXON TK460 CYL OIL OR EQUIV.)

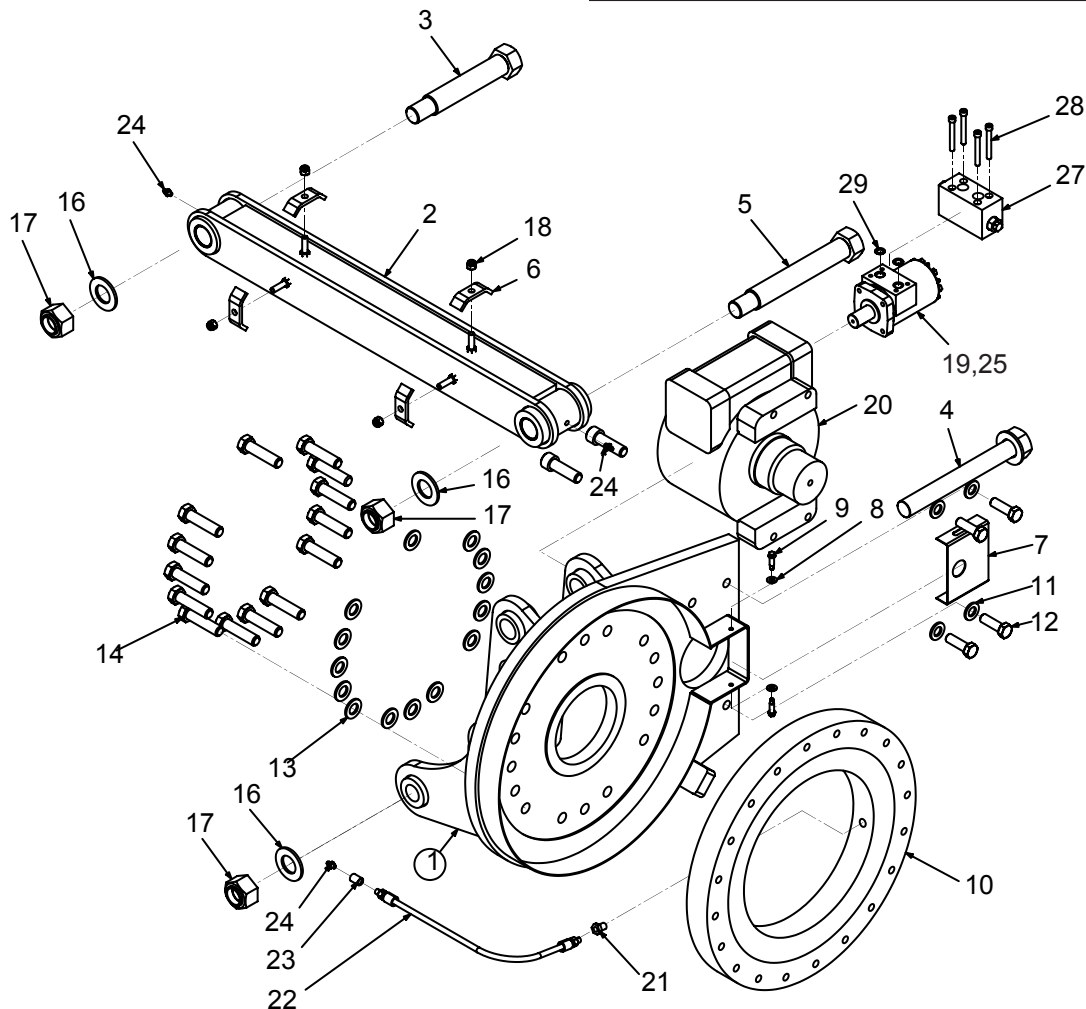
14.	72060207	CAP SCR .75-10X 3.00 HH GR8 Z	14
15.	72601488	CAP SCR .75-10X 2.50 SH Z	2
16.	72063012	WASHER 1.25 FLAT	3
17.	72062142	NUT 1.25- 7 HEX LOCK STIN GR5	3
18.	72062103	NUT .38-16 HEX NYLOCK	4
19.	73051001	MOTOR-HYD	1
20.	71057000	GEAR REDUCER-	1
21.	72053371	REDUCER BUSH-BLK .25- .12	1
22.	53000703	GREASE EXT-20 OAL 18HOSE	1
23.	72053301	COUPLING-GLV .12 SCH 40	1
24.	72053508	ZERK-NPT .12	3
25.	72060753	CAP SCREW- .38-16 X 1.00 SH	4
26.	72060738	CAP SCREW- .31-18 X 2.50 SH	4
27.	73054015	VALVE-CUSHION 10-02	1
28.	72060738	CAP SCR .31-18 2.50 SH PLAIN	4

**NOTE**

TURNTABLE BEARING BACKLASH = .006"-.010"(.152-.254mm)

**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.

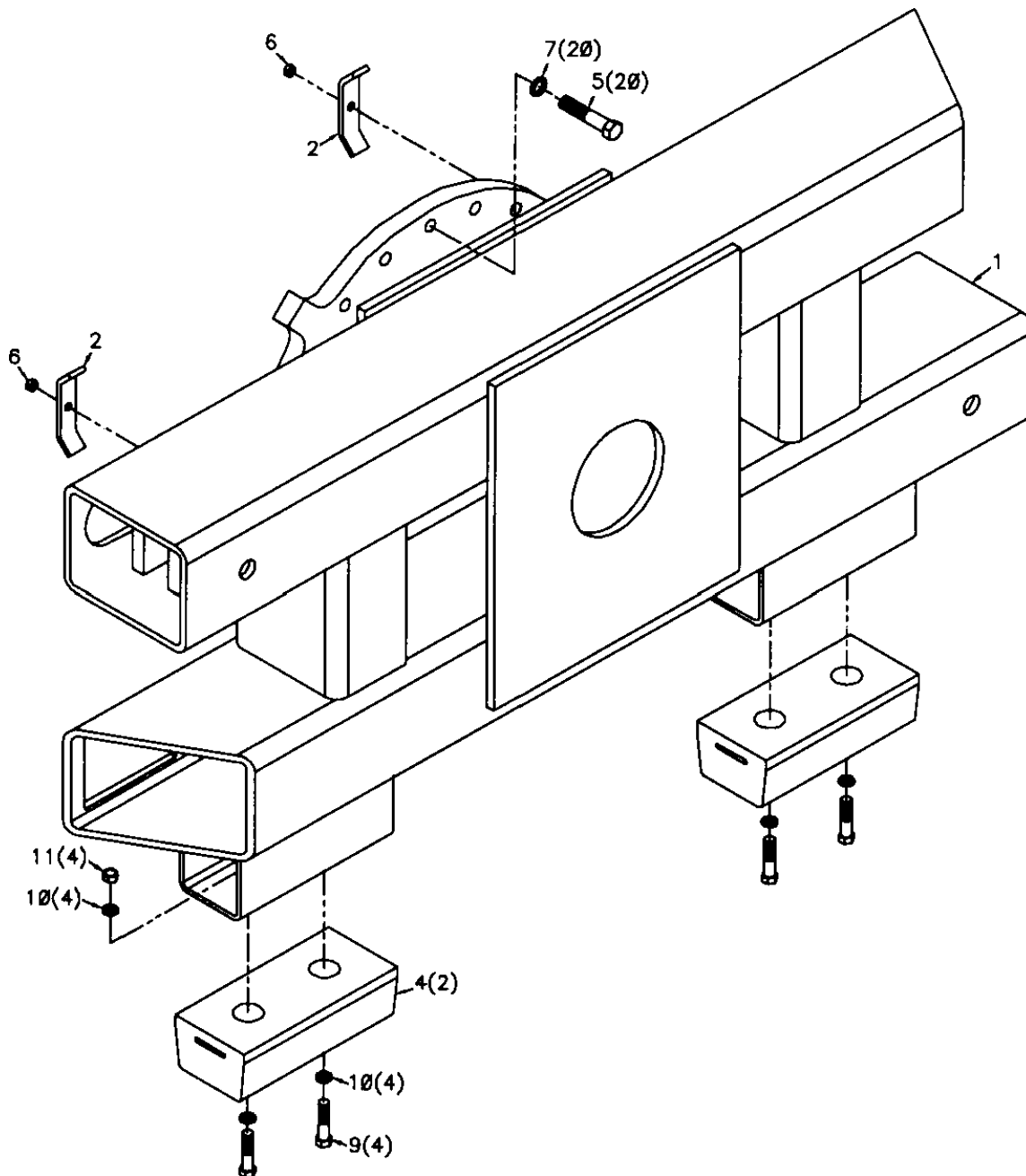


**BODY ASM (40704610)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	52704613	BODY	1
2.	60010118	HOSE CLAMP	2
3.	70029119	SER. NO. PLACARD (NOT SHWN)	1
4.	76393209	BUMPER	2
5.	72060151	CAP SCR 5/8-11X2 HHGR8	20
	TO 5-31-94/SERIAL #10THF1794040		
	72060177	CAP SCR 5/8-11X3 HHGR8	20
	FROM 6-1-94		
6.	72062103	NUT 3/8-16 LOCK	2
7.	72063119	WASHER 5/8 FLAT HARD GR8	20
8.	72066340	POP RIVET 1/8X3/8 (NOT SHWN)	2
9.	72060095	CAP SCR 1/2-13X2 HHGR5	4
10.	72063005	WASHER 1/2 WRT	8
11.	72062080	NUT 1/2-13 LOCK	4

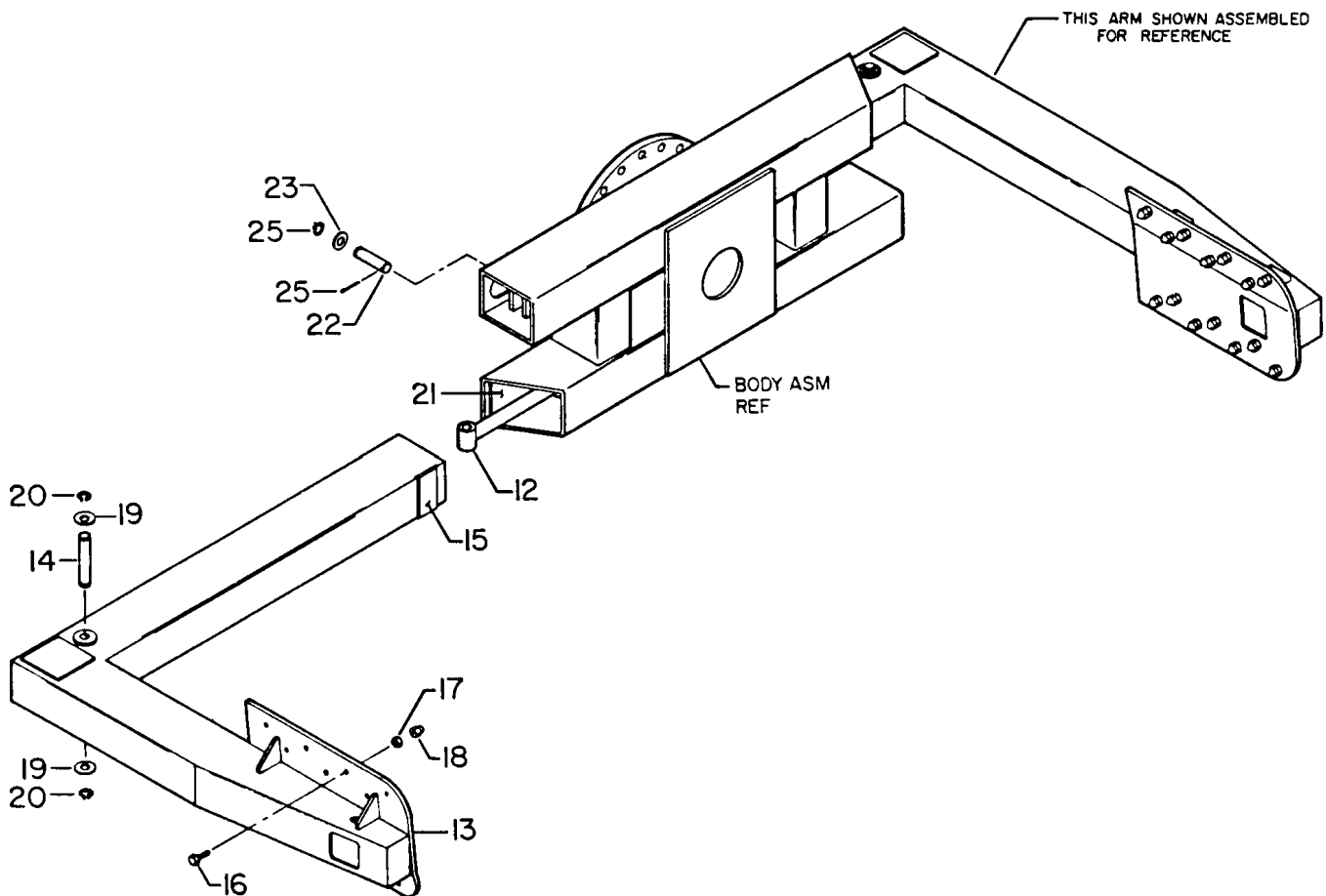
**WARNING**

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.



**ARM ASM (40704612)**

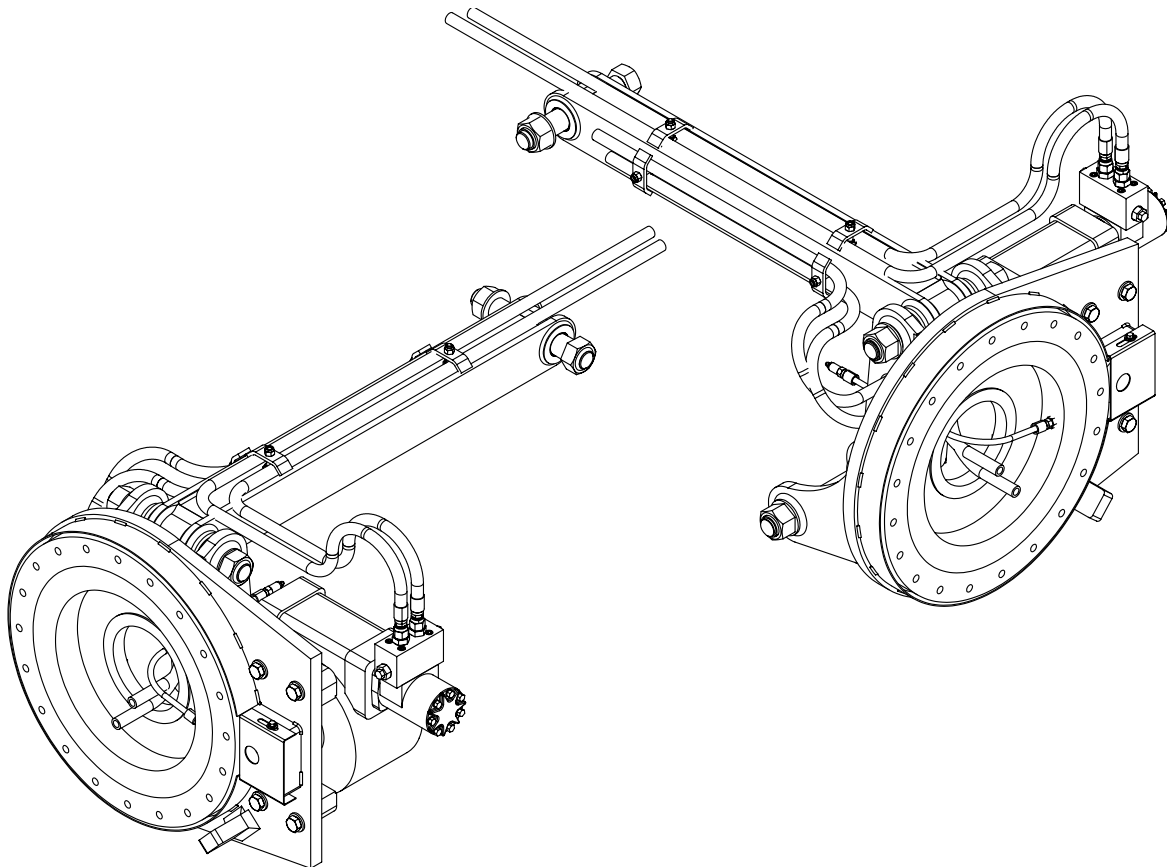
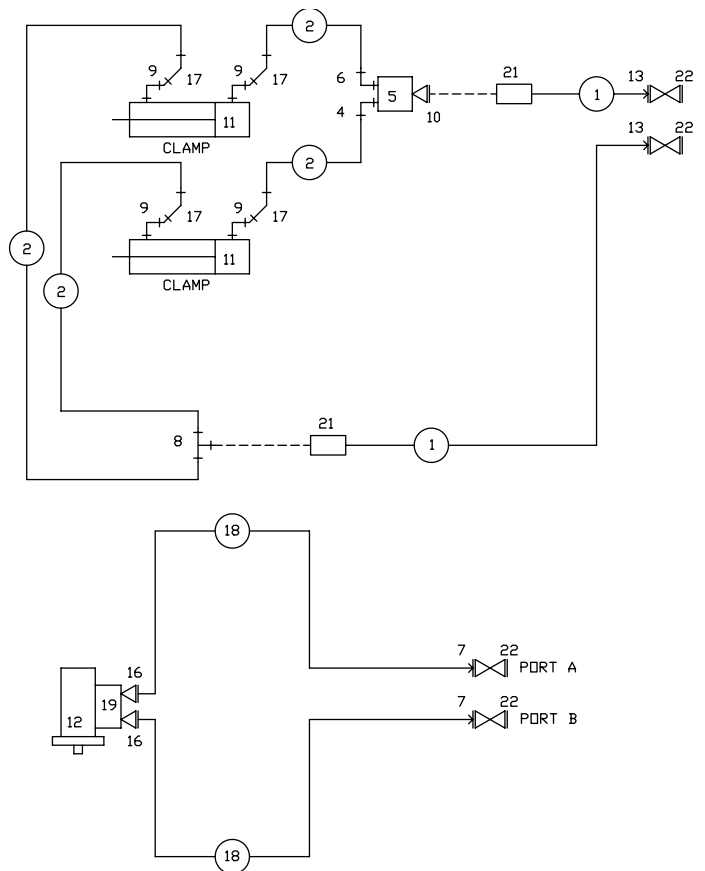
ITEM	PART NO.	DESCRIPTION	QTY
12.	3B309511	CLAMP CYLINDER	1
13.	52704614	ARM	1
14.	60010469	PIN	1
15.	60030085	WEAR PAD	1
16.	72060093	CAP SCR 1/2-13X1-1/2 HH GR5	14
17.	72062004	NUT 1/2-13 HEX	14
18.	72062134	NUT 1/2-13 HIGH ACORN	14
19.	72063034	MACH BUSHING 1X10GA NR	2
20.	72066125	RETAINING RING 1" HD EXT	2
21.	60030084	WEAR PAD	1
22.	60101905	PIN	1
23.	72063034	MACH BUSHING 1X10GA NR	1
24.	72066125	RETAINING RING 1" HD EXT	1
25.	72066187	COTTER PIN .16X1-1/2	1



**HYDRAULIC KIT (91704915)**

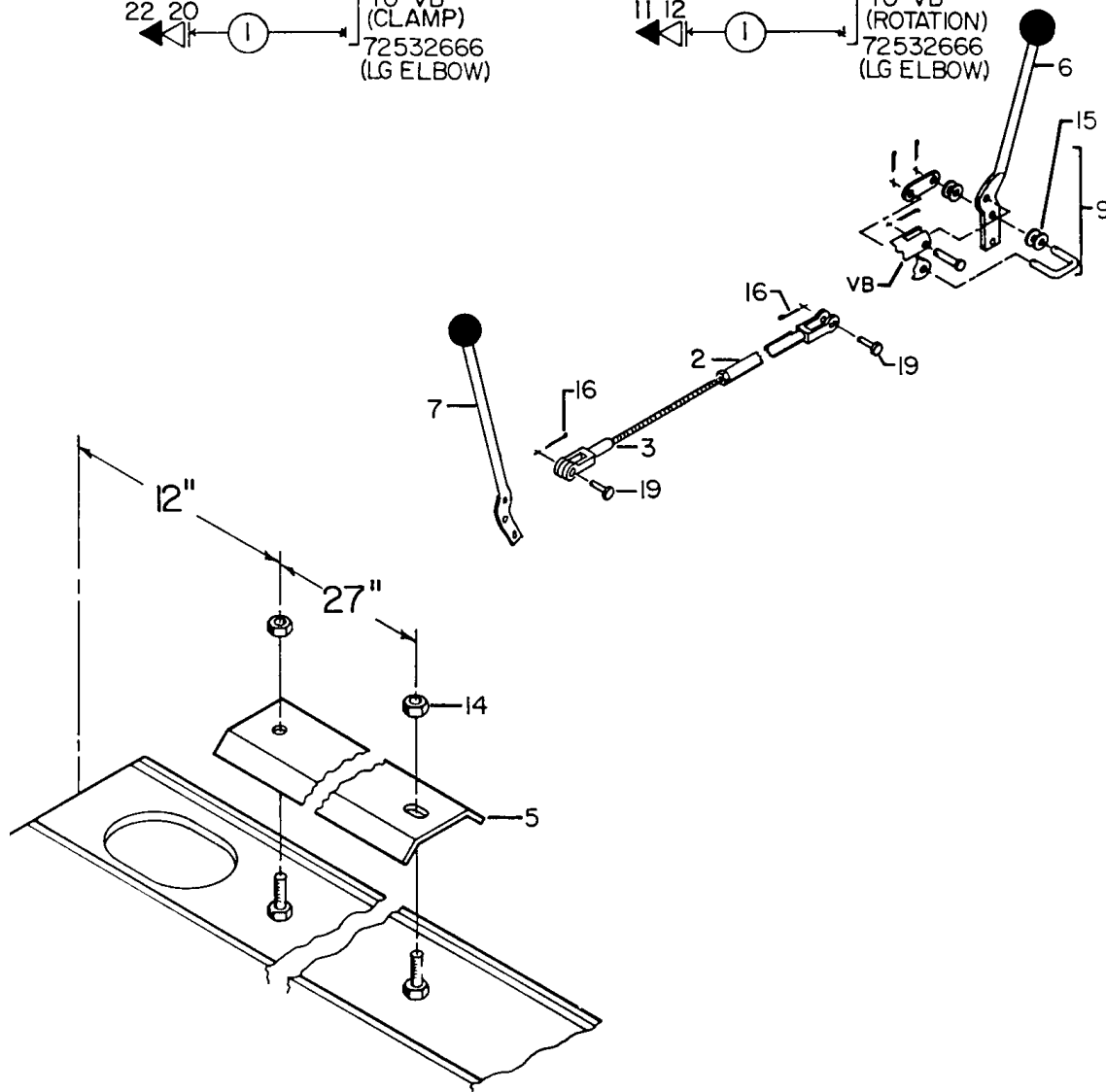
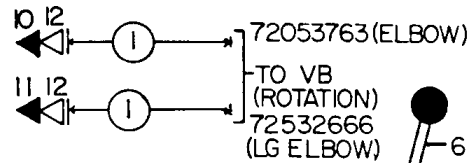
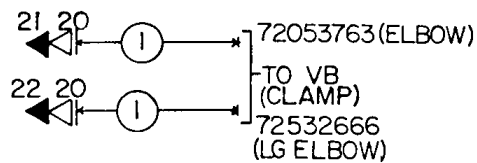
ITEM	PART NO.	DESCRIPTION	QTY
1.	51395235	HOSE ASM 3/8X73 #8F#8F	*2REF
2.	51395236	HOSE ASM 3/8X31 #8F#8F	*4REF
4.	72532779	ELBOW MSTR/MJIC .56 .75	1
5.	73054614	VALVE-FLOW DIV/COMBINER	1
6.	72053762	ELBOW MSTR/90°/MJIC .56 .75	1
7.	72053670	ADAPTER 3/8MPT 3/4MJIC	2
8.	72531205	TEE 3/4MJIC 1/2TUBE	1
9.	72532666	ELBOW #8MSTR#8MJIC90° XLG	4
10.	72532358	ADAPTER #8MSTR #8MJIC	1
11.	3B309511	CLAMP CYLINDER	REF
12.	73051001	ROTATION MOTOR	REF
13.	72053497	ADAPTER 1/2MPT 3/4MJIC	2
16.	72532359	ADAPTER 7/8MSTR 3/4MJIC	2
17.	72532670	ELBOW 3/4MJIC 3/4FJIC 45°	4
18.	51395198	HOSE ASM 3/8X69 #8F#8F	*2REF
19.	73054015	CUSHION VALVE	REF
20.	51714701	HOSE KIT (INCL:*)	1
21.	72532980	SWIVEL-#8FJIC #8MJIC INLINE	2
22.	72532679	PLUG-JIC HEXHD STL 3/4THD	4

2-8



# **INSTALLATION KIT-12916/9616 CRANE (93706770)**

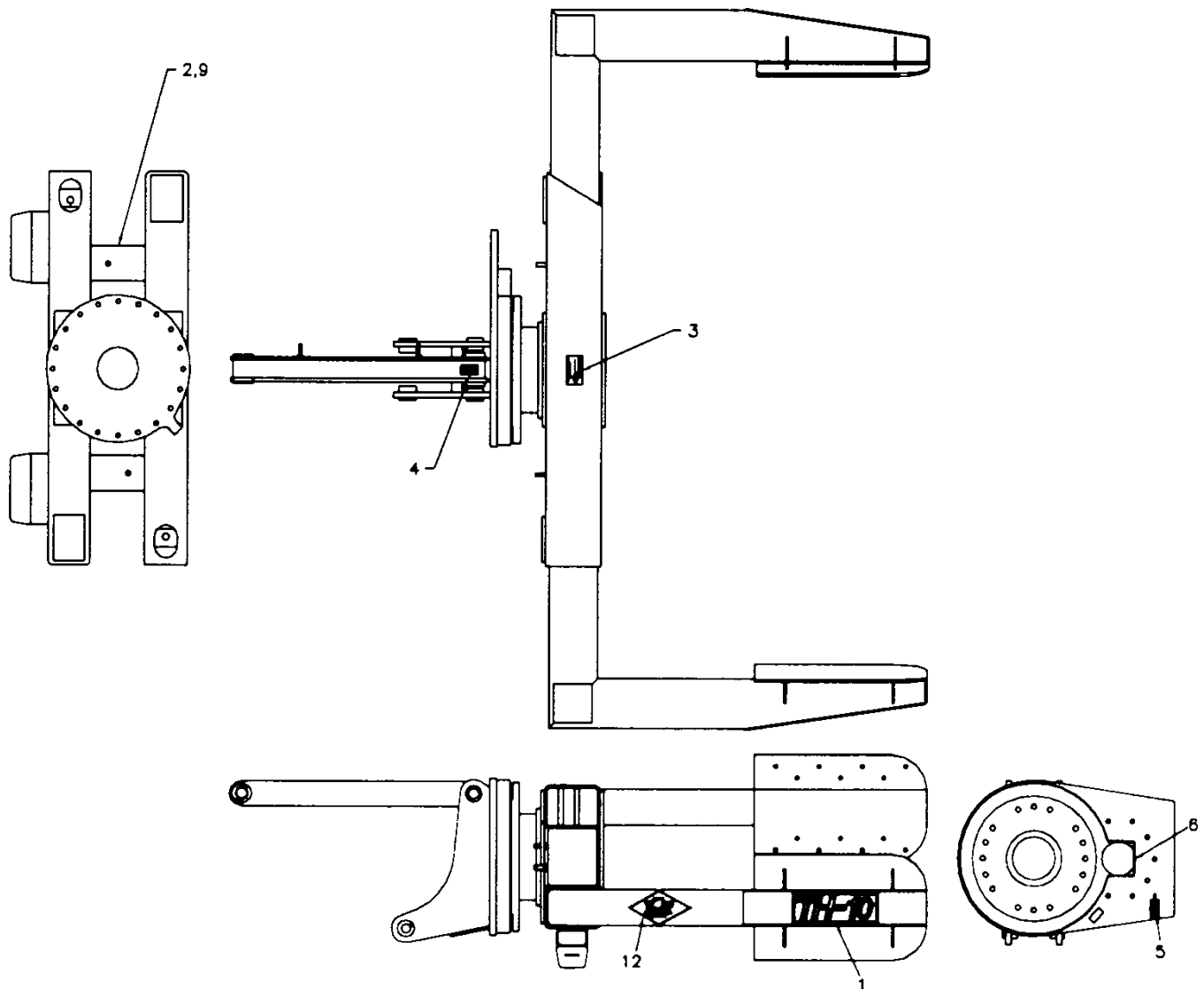
ITEM	PART NO.	DESCRIPTION	QTY
1.	51703948	HOSE ASM 3/8X288	4
2.	52702016	CONTROL ROD-F	2
3.	52702018	CONTROL ROD-M	2
5.	60101823	HOSE SHROUD	1
6.	70141982	CONTROL HANDLE	2
7.	70141984	CONTROL HANDLE	2
9.	94731839	LINK & PIN KIT	2
10.	72533101	DISCONNECT COUPLER 3/8FPT	1
11.	72533102	DISCONNECT NIPPLE 3/8FPT	1
12.	72053670	ADAPTER 3/8MPT 3/4MJIC	2
14.	72062103	NUT 3/8-16 LOCK	2
15.	72063001	WASHER 1/4 WRT	8
16.	72066168	COTTER PIN .09X3/4	4
19.	72066338	CLEVIS PIN 5/16X1	4
20.	72053497	ADAPTER 1/2MPT 3/4MJIC	2
21.	72533118	DISCONNECT COUPLER 1/2FPT	1
22.	72532996	DISCONNECT COUPLER 1/2FPT	1



**DECAL KIT (41703227)****DECAL PLACEMENT**

ITEM	PART NO.	DESCRIPTION	QTY
1.	70029082	DECAL-TH10 IDENTIFICATION	2
2.	70029119	SERIAL NUMBER PLACARD	1REF
3.	70039261	PLACARD-PATENT	1
4.	70391612	DECAL - GREASE WKLY LH	1
5.	70391613	DECAL - GREASE WKLY RH	1
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.	71393700	CAPACITY PLACARD	2
11.	70394272	DECAL-OP RESTRICTIONS	2
12.	70029251	IMT DIAMOND	2

ITEM	LOCATION
7	AT CRANE CURBSIDE CONTROLS
8	AT CRANE STREETSIDE CONTROLS
10,11	NEAR EACH CRANE OPERATOR STATION IN CLEAR VIEW OF OPERATOR

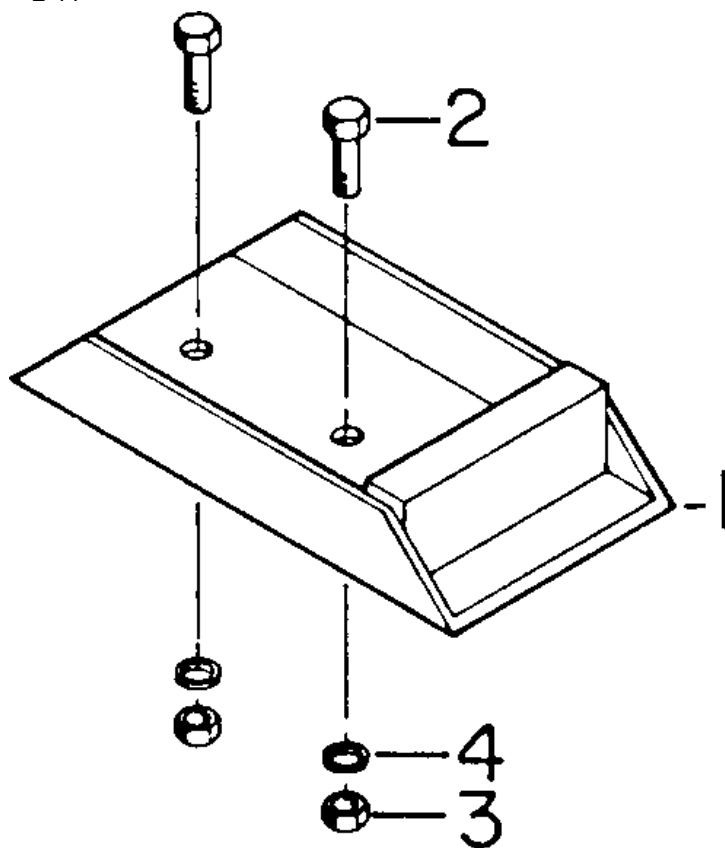


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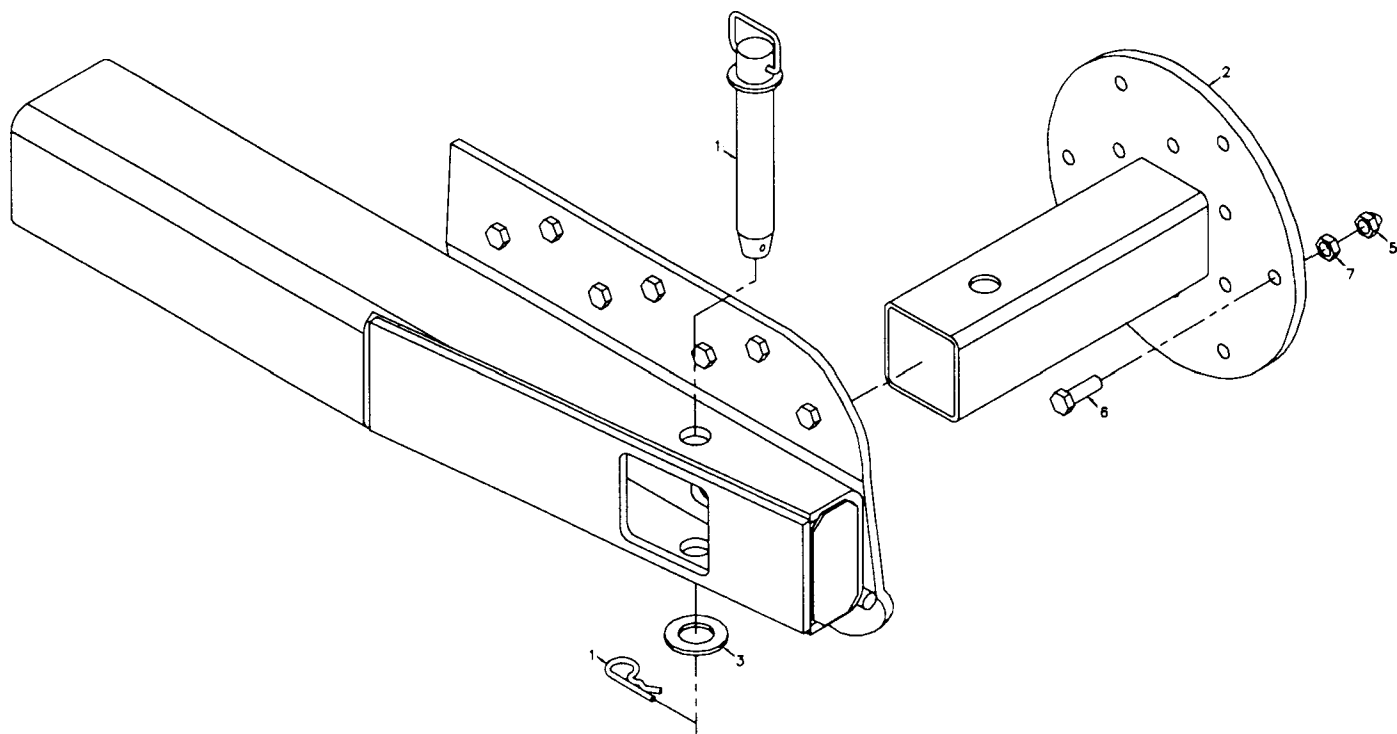
**SADDLE ASM (31704683)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	52702524	SADDLE	1
2.	72060064	CAP SCR 7/16-14X1-1/2 HH GR5	2
3.	72062003	NUT 7/16-14 HEX	2
4.	72063052	WASHER 7/16 LOCK	2



**PAD EXTENSION KIT (95704291)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	73733171	PIN 1X6 LOCK W/HAIR PIN	2
2.	52704290	EXTENSION PAD	2
3.	72063034	MACH BUSHING 1X10GA NR	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





**CLAMP CYLINDER (3B309511)**

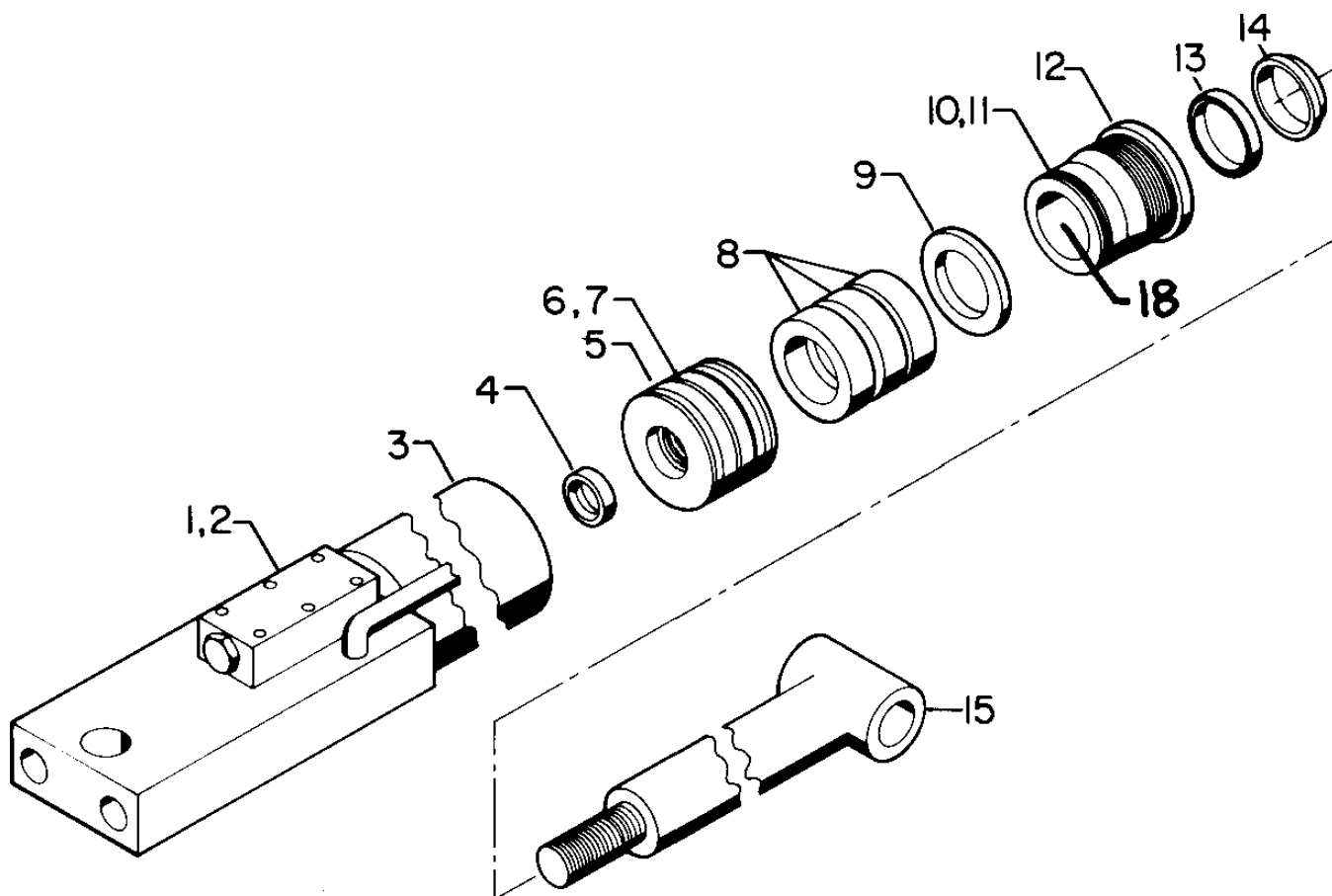
ITEM	PART NO.	DESCRIPTION	QTY
1.	73054004	VALVE	1
2.	72060708	CAP SCR 1/4-20X1-1/4 SH	6
3.	4B309511	CASE (INCL:16)	1
4.	7T61N087	LOCK RING SEAL (PART OF 17)	1REF
5.	6I025087	PISTON	1
6.	7Q072137	O-RING (PART OF 17)	1REF
7.	7T66P025	PISTON SEAL (PART OF 17)	1REF
8.	6C075015	STOP TUBE	3
9.	6A025015	WAFER LOCK (PART OF 17)	1REF
10.	7Q072228	O-RING (PART OF 17)	1REF
11.	7Q10P228	BACK-UP RING (PART OF 17)	1REF
12.	6H025015	HEAD	1
13.	7R546015	ROD SEAL (PART OF 17)	1REF
14.	7R14P015	ROD WIPER (PART OF 17)	1REF
15.	4G309510	ROD	1
16.	7PNPXT02	PLUG 1/8NPT (PART OF 3)	4REF
17.	9B101214	SEAL KIT (INCL:4,6,7,9-11,13,14,18)	1
18.	7T2N8015	WEAR RING (PART OF 17)	1REF

**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.



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**SECTION 3. REFERENCE**

**GREASE ZERK LOCATIONS & LUBRICANT REQUIREMENTS ..... 3**

**TORQUE DATA CHART-DOMESTIC ..... 4**

**TORQUE DATA CHART-METRIC ..... 5**

**TURNTABLE BEARING FASTENER TIGHTENING SEQUENCE ..... 6**

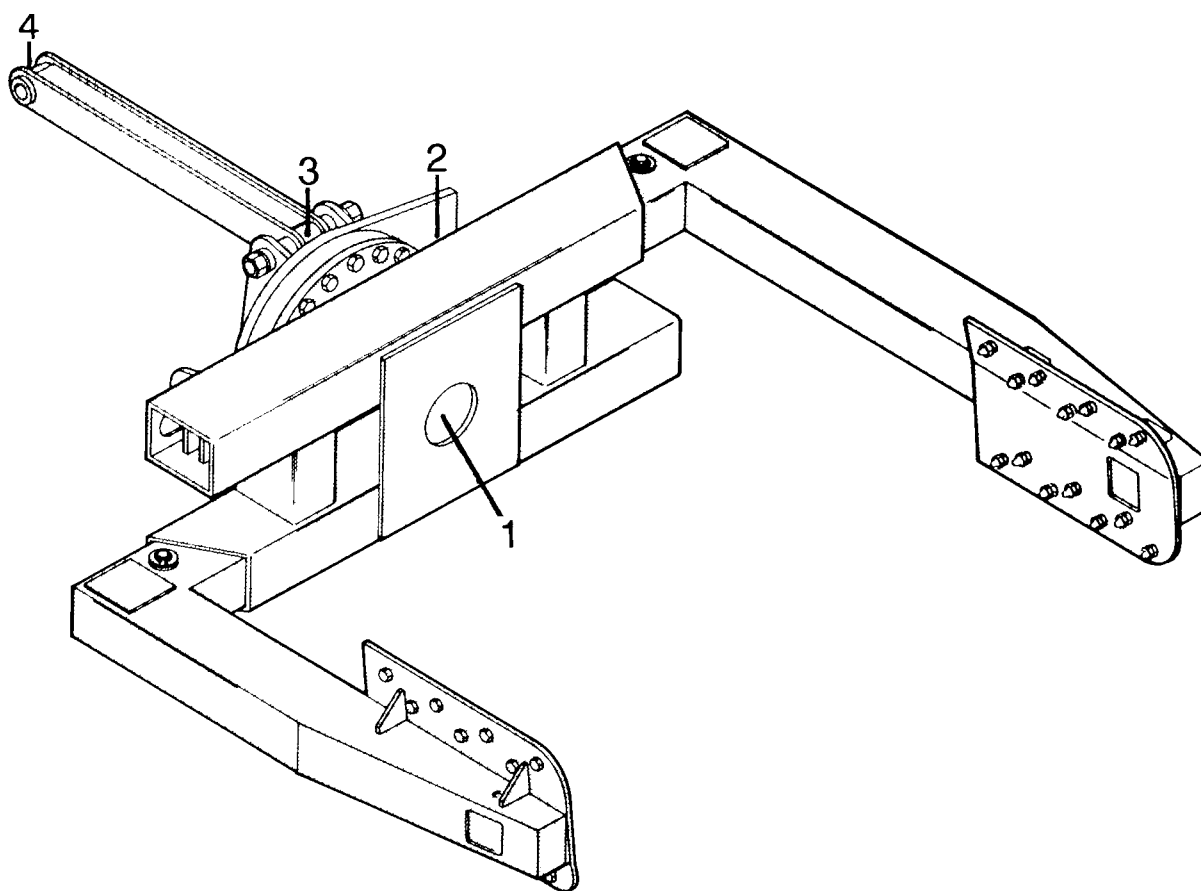
**TURNTABLE BEARING INSPECTION FOR REPLACEMENT ..... 7**

**RECOMMENDED SPARE PARTS LIST ..... 8**

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**NOTES**

## GREASE ZERK LOCATIONS & LUBRICANT REQUIREMENTS

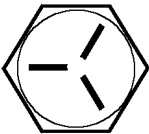



ITEM	LOCATION DESCRIPTION	LUBRICANT	FREQUENCY
1.	TURNTABLE BEARING GREASE EXTENSION *ROTATE TIREHAND WHILE GREASING	SHELL ALVANIA 2EP	WEEKLY
2.	DRIVE GEAR	OR	
3.	LINK/TIREHAND HINGE	SHELL RETINAX "A"	
4.	LINK/CRANE OUTER BOOM HINGE		

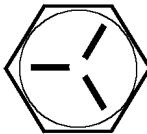

NOTE: All application points must be greased weekly under normal work loads and moderate weather conditions. Under severe operating conditions, lubrication should be performed more frequently. See Volume 1; Operation, Maintenance and Repair for additional lubrication requirements.

# TORQUE DATA CHART - DOMESTIC

## FINE THREAD BOLTS

SIZE (DIA-TPI)	BOLT DIA (INCHES)	TIGHTENING TORQUE			
					
		SAE J429 GRADE 5		SAE J429 GRADE 8	
		PLAIN (FT-LB)	PLATED (FT-LB)	PLAIN (FT-LB)	PLATED (FT-LB)
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 (FT-LB)	PLATED (FT-LB)	PLAIN (FT-LB)	PLATED (FT-LB)
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.

# TORQUE DATA CHART - METRIC

## FINE THREAD BOLTS

SIZE (DIA-TPI)	BOLT DIA (INCHES)	TIGHTENING TORQUE			
					
		SAE J429 GRADE 5		SAE J429 GRADE 8	
		PLAIN (KG-M)	PLATED (KG-M)	PLAIN (KG-M)	PLATED (KG-M)
5/16-24	0.3125	3	2	4	3
3/8-24	0.3750	5	4	7	5
7/16-20	0.4375	8	6	11	8
1/2-20	0.5000	12	9	17	12
9/16-18	0.5625	17	12	24	18
5/8-18	0.6250	24	18	33	25
3/4-16	0.7500	41	31	58	44
7/8-11	0.8750	62	45	93	69
1-12	1.0000	89	67	138	103
1 1/8-12	1.1250	123	93	200	150
1 1/4-12	1.2500	171	129	278	209
1-3/8-12	1.3750	232	174	375	281
1 1/2-12	1.5000	304	228	492	369

## COARSE THREAD BOLTS

SIZE (DIA-TPI)	BOLT DIA (INCHES)	TIGHTENING TORQUE			
					
		SAE J429 GRADE 5		SAE J429 GRADE 8	
		PLAIN (KG-M)	PLATED (KG-M)	PLAIN (KG-M)	PLATED (KG-M)
5/16-18	0.3125	2	2	3	2
3/8-16	0.3750	4	3	6	5
7/16-14	0.4375	7	5	10	7
1/2-13	0.5000	10	8	15	11
9/16-12	0.5625	15	11	21	16
5/8-11	0.6250	21	16	30	22
3/4-10	0.7500	37	28	52	39
7/8-9	0.8750	55	41	84	63
1-8	1.0000	82	62	126	94
1 1/8-7	1.1250	110	82	178	133
1 1/4-7	1.2500	155	116	251	188
1-3/8-6	1.3750	203	152	329	246
1 1/2-6	1.5000	270	210	438	328

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

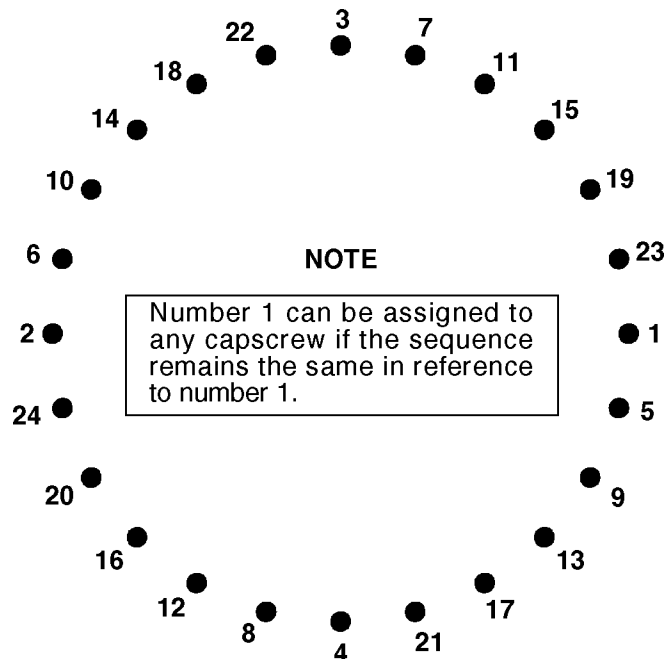
1. Bolt manufacturer's particular specifications should be consulted when provided.
2. Flat washers of equal strength must be used.
3. All torque measurements are given in kilogram-meters.
4. Torque values specified are for bolts with residual oils or no special lubricants applied. If special lubricants of high stress ability, such as Never-Seez compound graphite and oil, molybdenum disulphite, collodial 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.

## TURNTABLE BEARING FASTENER TIGHTENING SEQUENCE

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 cap screw used.
2. Follow the tightening sequence shown in the diagram. Note that the quantity of cap screws may differ from the diagram, but the sequence must follow the criss-cross pattern as shown in the diagram.
3. Torque all cap screws to approximately 40% of the specified torque value, by following the sequence.  
(EXAMPLE:  $.40 \times 265 \text{ FT-LBS} = 106 \text{ FT-LBS}$ )  
(EXAMPLE-METRIC:  $.40 \times 36 \text{ KG-M} = 14.4 \text{ KG-M}$ )
4. Repeat Step 3, but torqueing all cap screws to 75% of the specified torque value. Continue to follow the tightening sequence.  
(EXAMPLE:  $.75 \times 265 \text{ FT-LBS} = 199 \text{ FT-LBS}$ )  
(EXAMPLE-METRIC:  $.75 \times 36 \text{ KG-M} = 27 \text{ KG-M}$ )
5. Using the proper sequence, torque all cap screws to the listed torque value as determined from the Torque Data Chart.



## TURNABLE BEARING INSPECTION FOR REPLACEMENT

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 bearing's 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.

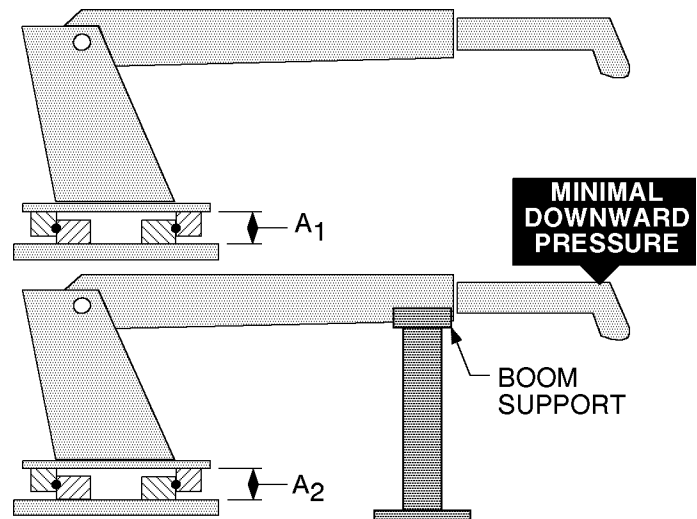
With the crane horizontal and fully extended, measure between the top and bottom mounting surfaces of the turntable bearing (A1), using a dial indicator for accuracy.

#### 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 A2.

#### STEP 3.

Subtract A1 from A2 to determine tilt and compare the result with the accompanying chart.



**COMPARISON CHART - MODEL TO MEASURED TILT DIMENSION**

<b>NOTE</b> THE FIGURES LISTED IN THIS CHART ARE SERVICE GUIDELINES AND DO NOT, IN THEMSELVES, REQUIRE THAT THE BEARING BE INSPECTED.  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.	<b>IMT CRANE, LOADER OR TIREHAND MODEL</b>	1007 1014 2015 2015GH 2109 2200 3000 3016 321GH 3816 425 4300 5016 6016 TH7 BODY ROT'N TH1449 BODY ROT'N TH15B CLAMP TH2551B CLAMP TH2557A CLAMP	5200 5200R 5217 5800 7020 7025 7200 7415 9000 TH10 BODY ROT'N TH14 BODY ROT'N	16035 16042 32018 32030 T30 T40	9800 12916 13031 13034 14000 15000 18000 20017 H1200 H1200RR T50 TH2551B BODY ROT'N TH2557B BODY ROT'N TH2557A BODY ROT'N
	<b>BALL DIA. (REF)</b>	.875" (22mm)	1.00" (25mm)	1.18"-1.25" (30-32mm)	1.75" (44mm)
	<b>TILT DIM. (A<sub>1</sub>-A<sub>2</sub>)</b>	.060" (1.524mm)	.070" (1.778mm)	.075" (1.905mm)	.090" (2.286mm)

**RECOMMENDED SPARE PARTS LIST****1 YEAR SUPPLY****TIREHAND 10****FOR MANUAL: 99900285**

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 the minimal down-time waiting for parts. There may be parts failures not covered by this list. Parts not listed are considered as not being Critical or Normal Wear items during the first year of operations and you need to contact the distributor or manufacturer for availability.

ASSEMBLY DESIGNATION	ITEM NO.	PART NO.	DESCRIPTION	QTY	CODE	SHELF LIFE (MO)	ORDER QTY
<b>40070041.01.19960423</b>	<b>YOKE ASM</b>						
	2	70055174	BUSHING	4	W		
	4	52704927	PIN	1	W		
	5	52704928	PIN	1	W		
	6	52704929	PIN	1	W		
	12	71057000	GEAR REDUCER	1	C		
	21	72062142	NUT	3	W		
	25	73051001	MOTOR	1	C		
	26	73054015	CUSHION VALVE	1	C		
	27	7Q072112	O-RING	2	C		
<b>40704610.01.19970708</b>	<b>BODY ASM</b>						
	4	76393209	BUMPER	2	W		
<b>40704612.01.19911106</b>	<b>ARM ASM</b>						
	15	60030085	WEAR PAD	2	W		
	18	72062134	ACORN NUT	14	W		
	21	60030084	WEAR PAD	2	W		
<b>3B309511.01.19920227</b>	<b>CLAMP CYLINDER</b>						
	1	73054004	CHECK VALVE	2	C		
	5	6I025087	PISTON	1	W		
	12	6H025015	HEAD	1	W		
	17	9B101214	SEAL KIT	2	W		

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	MANUAL PART NO.
SUBMITTED BY		
COMPANY		
ADDRESS		
CITY, STATE, ZIP		
TELEPHONE		

☐

ERROR FOUND

LOCATION OF ERROR (page no.): \_\_\_\_\_

DESCRIPTION OF ERROR: \_\_\_\_\_

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REQUEST FOR ADDITION TO MANUAL

DESCRIPTION OF ADDITION: \_\_\_\_\_

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REASON FOR ADDITION: \_\_\_\_\_

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MAIL TO: IOWA MOLD TOOLING Co., Inc.  
Box 189,  
Garner IA 50438-0189  
ATTN: Technical Publications

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BOX 189, GARNER, IA 50438-0189  
TEL: 641-923-3711  
TECHNICAL SUPPORT FAX: 641-923-2424  
[www.imt.com](http://www.imt.com)