Volume 2
Parts and Specifications
Model 9616 Crane

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MANUAL PART NUMBER 99900276

Introduction - Read Carefully!

This volume deals with information applicable to your particular crane. For operating, maintenance and repair instructions, refer to Volume 1, OPERATION, MAINTENANCE AND REPAIR. Volume 1 contains the following information:

SECTION 1. OPERATION
SECTION 2. MAINTENANCE
SECTION 3. REPAIR
SECTION 4. INSPECTION & TEST REPORT
SECTION 5. INSTALLATION - CHASSIS PREPARATION
SECTION 6. APPENDIX

We recommend that Volume 2, PARTS AND SPECIFICATIONS be kept in a safe place in the office.

This manual is provided to assist you with ordering parts for you IMT truck-mounted articulating crane. It also contains additional instructions regarding you particular installation.

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

Warranty of this unit will be void on any part of the unit subjected to misuse due 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 with 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 unit. Listed below is a publication that the user should thoroughly read and understand.

ANSI/ASME B30.22
ARTICULATING BOOM CRANES
The American Society of Mechanical Engineers
United Engineering Center
345 East 47th Street
New York, NY 10017

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 working environment.

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Section 1. SPECIFICATIONS

1-1. GENERAL

Crane Rating	96,000 ft-lbs (13.28 ton-meters)
Reach (from centerline of rotation)	16'-0" (4.88m)
Hydraulic Extension	40" (1.02m)
* Lifting Height	26'-11" (8.20m)
Crane Weight	5100 lbs (2313 kg)
Outrigger Span	11'-7" (3.53m)
*Crane Storage Height	11'-6" (3.51m)
** Mounting Space Required	32" (81.3cm)
Vertical Center of Gravity (from bottom of crane - stored position)	27-1/2" (69.9cm)
Horizontal Center of Gravity (from centerline of rotation - stored position)	13-1/2" (34.3cm)
Optimum Pump Capacity	12 U.S. GPM (45.4 liters/min)
Oil Reservoir Capacity	21 U.S. gallons (79.5 liters)
Design Factor (Pins and Hydraulics)	4/1

* Based on 41" (104.1 cm.) truck frame height.
** Allow 2" (5.1cm.) between the truck cab and crane base for swing clearance.

1-2. LIFTING CAPACITY (from centerline of rotation)

8'-0" (2.44m)	12,000 lbs (5443 kg)
10'-0" (3.05m)	9600 lbs (4355 kg)
12'-8" (3.86m)	7600 lbs (3447 kg)
16'-0" (4.88m)	6000 lbs (2722 kg)

1-3. PERFORMANCE CHARACTERISTICS

Rotation: 370° (6.46 rad.)	40 seconds
Inner Boom Elevation: -20° to +72° (-0.35 rad. to +1.26 rad.)	22 seconds
Outer Boom Articulation: 113° (1.97 rad.)	16 seconds
Extension Boom: 40" (101.6cm)	8 seconds
Outrigger Extension:40" (101.6cm)	16 seconds

1-4. CYLINDERS

	Bore	**Stroke**
Inner Boom Cylinder	6-1/2" (16.5cm)	30-1/2" (77.5cm)
Outer Boom Cylinder	6" (15.2cm)	26-1/4" (66.7cm)
Extension Boom Cylinder	3" (7.6cm)	40" (101.6 cm)
Outrigger Cylinders	3" (7.6cm)	40" (101.6 cm)

1-5. POWER SOURCE

Integral-mounted hydraulic pump and PTO application. Other standard power sources may be utilized - minimum power required is 19 horsepower.

1-6. CYLINDER HOLDING VALVES

The holding sides of all cylinders are equipped with integral-mounted counter-balance valves to prevent sudden cylinder collapse in case of hose or other hydraulic failure. The extension and outrigger cylinders have positive, pilot operated valves that open only upon command. The inner and outer cylinders have pilot-operated counter-balance valves.

The counter-balance valve serves several functions. First, it is a holding valve. Secondly, it is so constructed that it will control the lowering function and allow that motion to be feathered while under load. Finally, if a hose breaks, the only oil loss will be that in the hose.

1-7. ROTATION SYSTEM

Rotation of the crane is accomplished through a turntable bearing, powered by a high torque hydraulic motor through a ring and pinion type spur gear train. Total gear reduction is 56.7 to 1.

1-8. HYDRAULIC SYSTEM

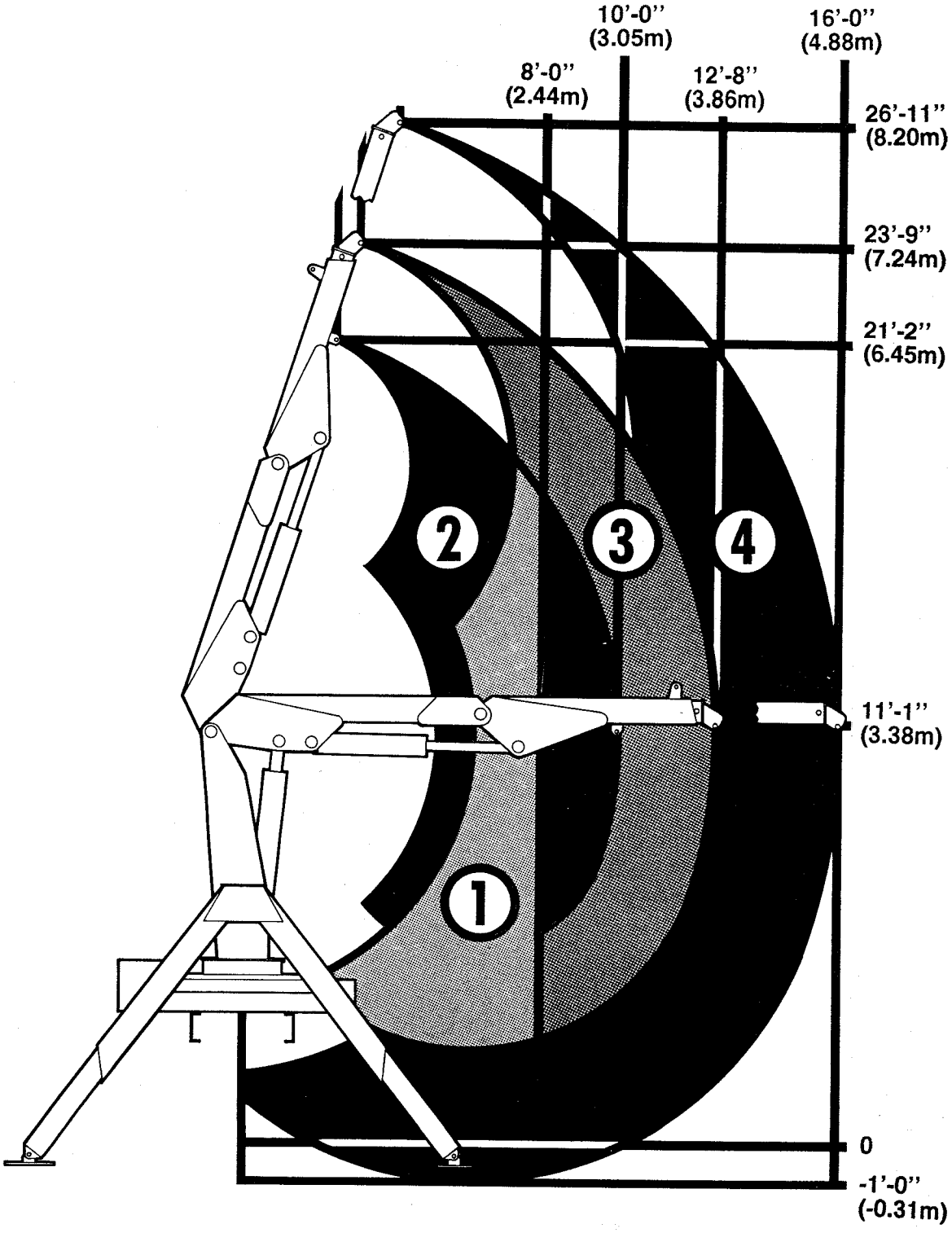
The hydraulic system is an open centered, full pressure system, requiring 12 gpm (45.4 liters/min) optimum oil flow, at 2300 psi (158.6 bar). Eight-spool, stack-type control valve, (two functions for Tirehand operation - standard crane without Tirehand will have these two functions plugged) with dual, operational control handles located at both sides for convenient operation. System includes hydraulic oil reservoir, suction-filter, return filter, control valvebank, hoses and fittings.

1-9. MINIMUM CHASSIS SPECIFICATIONS

Body Style	Conventional Cab	Conventional Cab
Wheelbase	207"	(525.8cm)
Cab-to-axle	138"	(350.5cm)
Frame Section Modulus	21 in^3	(344cc)
RBM	1,440,000 in-lbs	(16,591 kg-m)
Front Axle Rating	10,000 lbs	(4536 kg)
Rear Axle Rating	19,500 lbs	(8845 kg)
Transmission	5 speed	5 speed

In addition to these specifications, heavy-duty electrical and cooling systems and dual rear wheels are required. It is recommended that the vehicle be equipped with an electric engine tachometer, auxiliary brake lock and power steering.

IMT reserves the right to change specifications and design without notice.



RANGE	REACH	CAPACITY	RANGE	REACH	CAPACITY
1	8'-0" (2.44m)	12,000 lbs (5443 kg)	3	12'-8" (3.66m)	7800 lbs (3447 kg)
2	10'-0" (3.05m)	9600 lbs (4355 kg)	4	16'-0" (4.88m)	6000 lbs 2722 kg)

WORKING LOADS WILL BE LIMITED TO THOSE SHOWN.
DEDUCT THE WEIGHT OF LOAD-HNDLING DEVICES.

Figure A-1. CAPACITY CHART

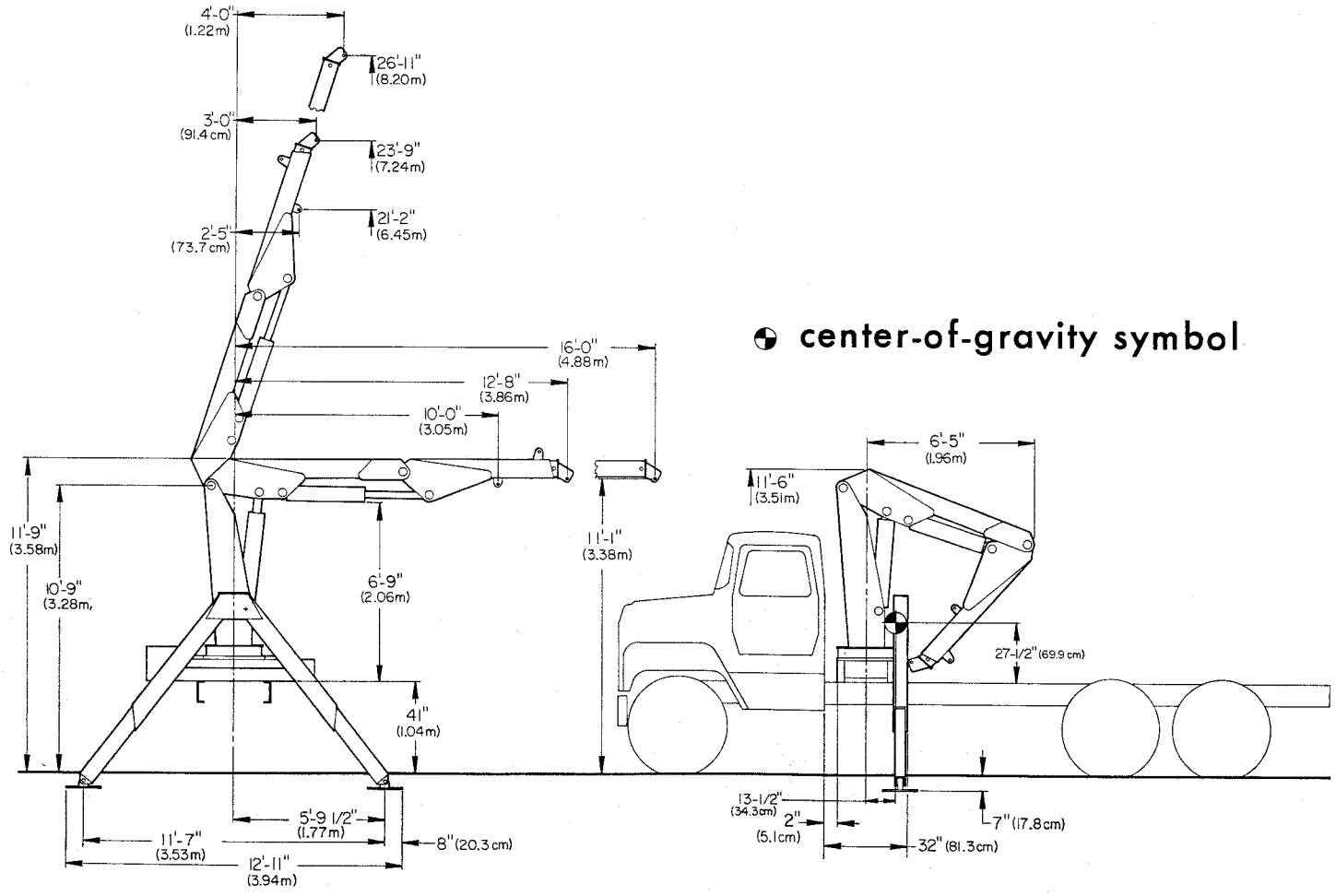


Figure A-2. GEOMETRIC CONFIGURATION

Section 2. CRANE DESCRIPTION

2-1. GENERAL

The 9616 Crane is designed primarily for use as a tire-handling crane and used with the optional Tirehand 10. This secttion describes the major assemblies used on the crane and Figure B-1 illustrates their location.

2-2. BASE

The base provides a platform for mounting the crane to a truck. It incorporates the 370° (6.46 Rad.) rotation mechanism and outriggers. The "A"-frame outriggers are powered through double acting hydraulic cylinders, and provide stabilization during crane operation.

2-3. MAST

The mast provides the necessary elevation for crane operation as well as a hinge point for the inner boom.

2-4. INNER BOOM

The inner boom will swing through a full 92° (1.61 Rad.) from -20° to +72° (-0.35 to +1.26 Rad.). It is raised and lowered through the use of a double-acting hydraulic cylinder.

2-5. OUTER BOOM

The outer boom will swing through a full 113° (1.97 Rad.). The boom is raised and lowered with a single double-acting hydraulic cylinder mounted below the inner boom. It also provides storage for the extension boom in the retracted position.

2-6. EXTENSION BOOM

The single-stage extension boom increases the operating range of the crane from 12'-8" (3.86m) to 16'-0" (4.88m). It is powered by a double-acting hydraulic cylinder. When equipped with a Tirehand 10, the extension boom controls the pitch on the Tirehand.

2-7. CONTROLS

The crane may be operated from either side of the base. The standard crane uses an eight-section valvebank with two sections plugged (for use with optional Tirehand 10).

2-8. HYDRAULICS

The crane hydraulics consist of double-braided pressure and return hoses, hydraulic filters, control valvebank and all necessary hydraulic fittings.

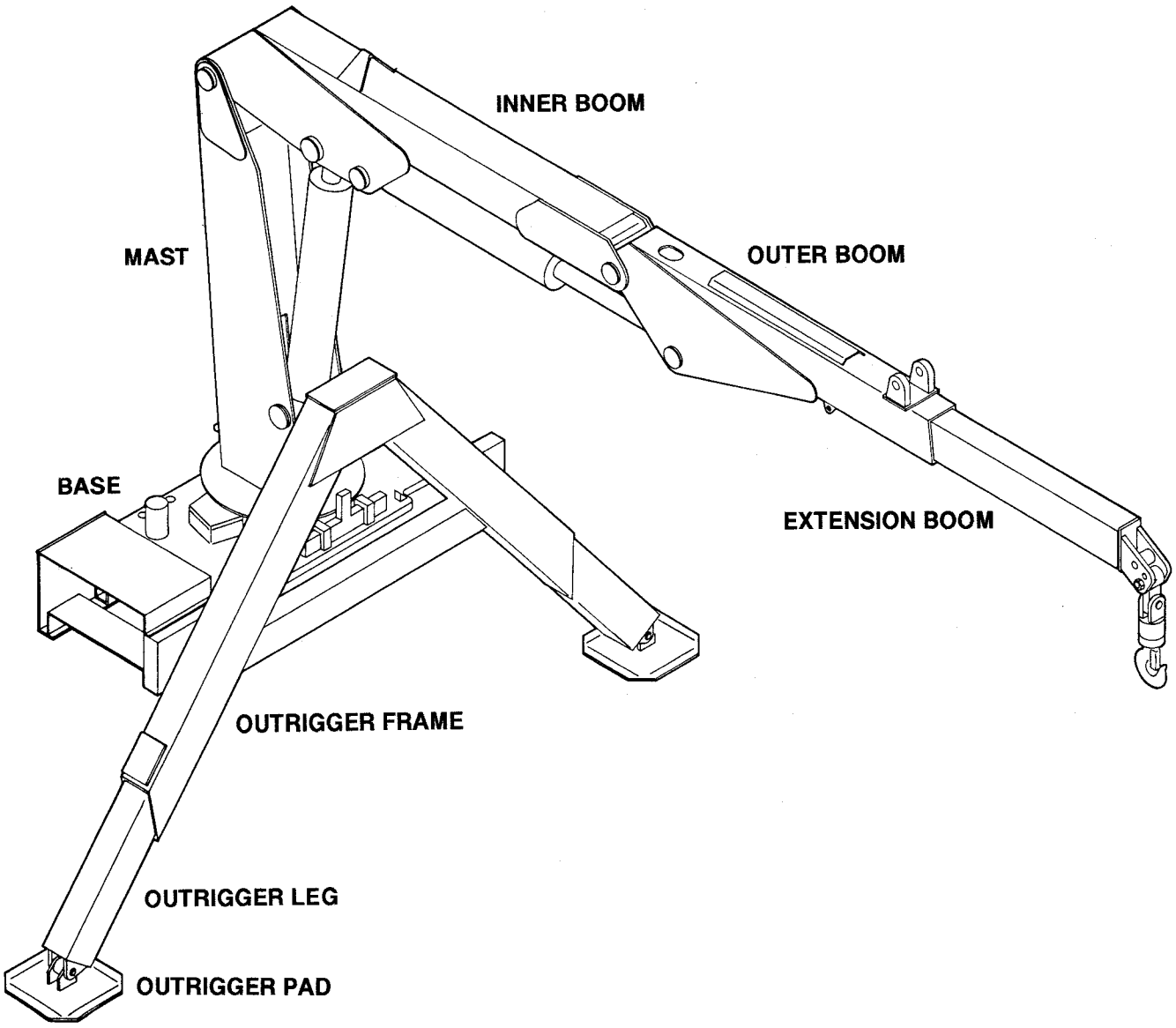


Figure B-1. 9616 CRANE GROUP

Section 3. INSTALLATION

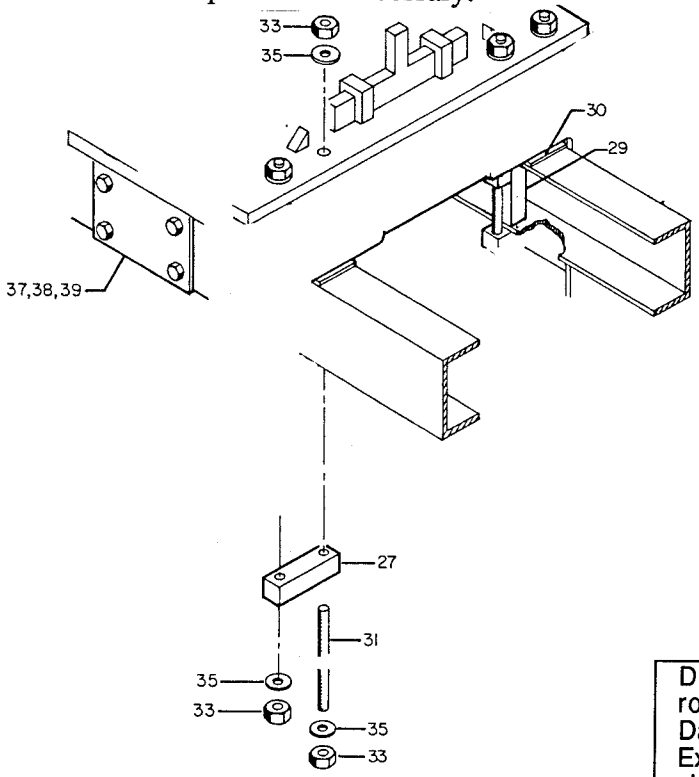
3-1. GENERAL

This section contains specific instructions for the installation of your crane. Prior to installing the crane and hydraulic components, make sure the chassis is ready to receive the crane (refer to VOLUME 1, Installation).

3-2. CRANE MOUNTING

1. See SPECIFICATIONS in Section 1 for crane weight. Using an overhead hoist and fabric slings of adequate capacity, lift the crane about a foot to see if the crane is adequately balanced. If not, lower hoist and adjust slings. Re-check balance and re-position crane until mounting surface is level.

2. Install the truck frame support so that the tie-down studs pass through the supports (Figure C-1). Cut the support to the inside dimensions of the truck frame. Allow about 1/16" extra. Grind the end of the support to fit inside the frame channel. Use a hammer to drive it into position if necessary.



ITEM	DESCRIPTION	QTY
27.	CLAMP PLATE	4
29.	FRAME SUPPORT	4
30.	SPACER	2
31.	TIE DOWN STUD	8
33.	LOCK NUT	16
35.	WASHER	8
37.	TIE-PLATE	2
38.	HEX-HEAD CAP SCREW	8
39.	LOCK NUT	8

Figure C-1. CRANE INSTALLATION

3. Position one bar on top of each frame rail where crane will be located, allowing sufficient clearance between the cab and crane base, at least 2" (5.1cm). Position the crane on the chassis per the applicable installation drawing, centering the mounting slots over the truck frame rails. While holding crane with hoist, start mounting hardware per Figure C-1. Note position of support weldments on truck frame. Hand tighten nuts. Observe underside of crane base. No clearance between base and frame bars is allowed. Grind bar on frame rails to eliminate clearance.

4. Torque the 1 1/4"-7 UNC Grade 5 mounting hardware to 840 ft-lbs (116 kg-m). When torquing the mounting hardware the following precautions must be followed:

   A. Never use lock washers.

   B. Hardened washers must be used, and under the turning element, whether the turning element is the nut or the head of the bolt.

   C. Torque values specified are with residual oils or without special lubricants applied to the threads. If special lubricants are used, such as Never-Seize compound graphite and oil, molybdenum disulphite collodial copper or white lead, reduce torque values 10%. Torque values for threaded fasteners are not affected with the use of Loctite.

   D. Do not use rusty fasteners, the rust will alter torque values significantly.

   E. Touch-up paint around mounting anchor plates.

CAUTION

Do not attempt to apply the same torque to the tie rod and self-locking nuts as shown in the Torque Data Chart. Do not exceed 840 ft. lbs. (116 kg-m). Exceeding this torque value could damage either the chassis or crane base.

Power wrenching is not recommended until the lead thread of the nut insert is engaged by hand turning.

3-3. HYDRAULIC INSTALLATION

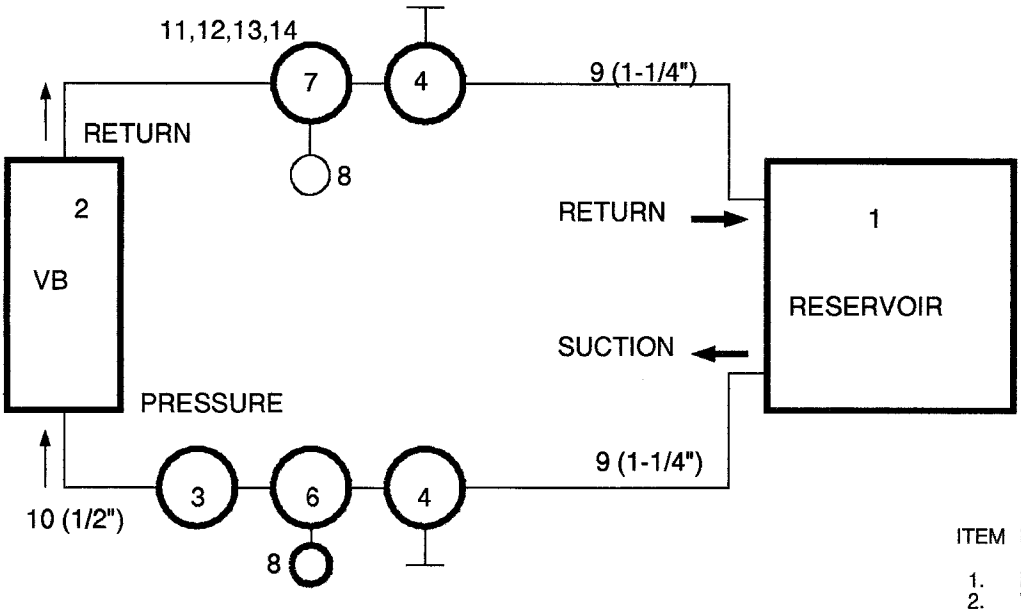
To install the hydraulic hoses, fittings, etc.:

1. Plumb the suction line filter as shown in Figure C-2.
2. Install the suction hose between the suction line filter and the pump inlet. Tighten the hose clamps.
3. Install the pressure hose between the pump outlet and the inlet port on the valvebank.
4. Install the return line between the reservoir return line filter and valvebank (if applicable).
5. Fill the hydraulic oil reservoir.
6. Open the gate valve at the suction-line filter.

CAUTION

Failure to open the gate valve will result in a dry running pump which may damage the pump.

7. Open the return gate valve.
8. Start the vehicle's engine and engage the PTO. Allow the system to run for about five minutes and then check the vacuum gauge on the suction-line filter (it should read 8" mercury or less). If the vacuum reading is too high, check to make certain that the gate valve is opened completely. If the valve is fully opened, check for a collapsed or restricted suction line.
9. Cycle all hydraulic functions. Check for leaks, and refill the reservoir if necessary.



ITEM	DESCRIPTION
1.	RESERVOIR
2.	VALVEBANK
3.	PUMP
4.	GATE VALVE 1-1/4"
6.	SUCTION FILTER
7.	RETRUN FILTER
8.	VACUUM GAUGE
9.	HOSE 1-1/4" ID
10.	HOSE 3/4" ID
11.	OIL FILTER BRACKET
12.	MOUNTING SCREW
13.	MOUNTING NUT
14.	LOCK WASHER

Figure C-2. Hydraulic Installation

Section 4. PARTS LIST

4-1. GENERAL

This section contains the exploded parts drawings with the accompanying parts list for the assemblies used on this crane. These drawings are intended to be used in conjunction with the instructions found in the REPAIR section in Volume 1. For optional equipment such as winches and remote controls, refer to the appropriate service manual.

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.

4-2. CRANE IDENTIFICATION

Every crane has an identification placard (Figure D-1) attached to the mast. 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

4-3. 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 D-2) against the information contained in this manual. You must use the part number stamped on the cylinder case when ordering parts.

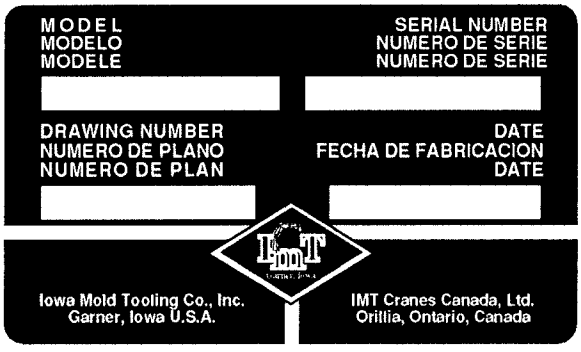


Figure D-1. SERIAL NUMBER PLACARD

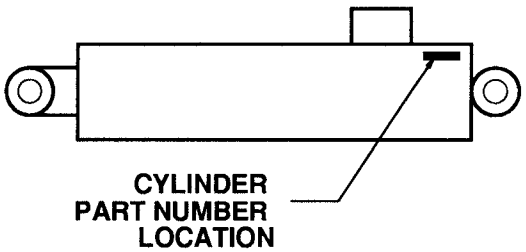


Figure D-2. CYLINDER PART NUMBER LOCATION

4-4. WELDMENT INDENTIFICATION

Each of the major weldments - base, mast, inner boom, outer boom, extension boom and outrigger leg weldments bear 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 D-3.

4-5. 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.

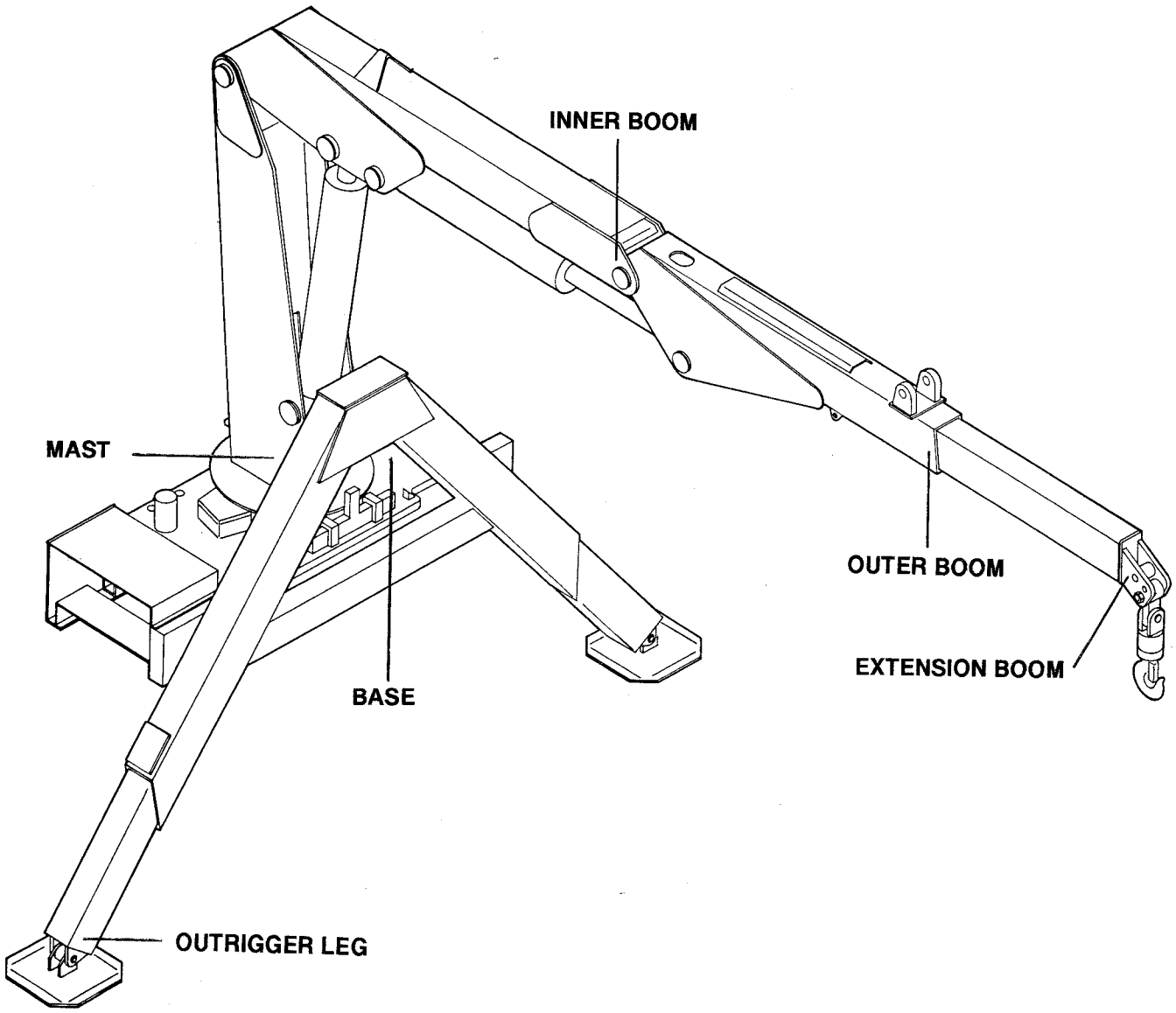


Figure D-3. Weldment Part Number Location

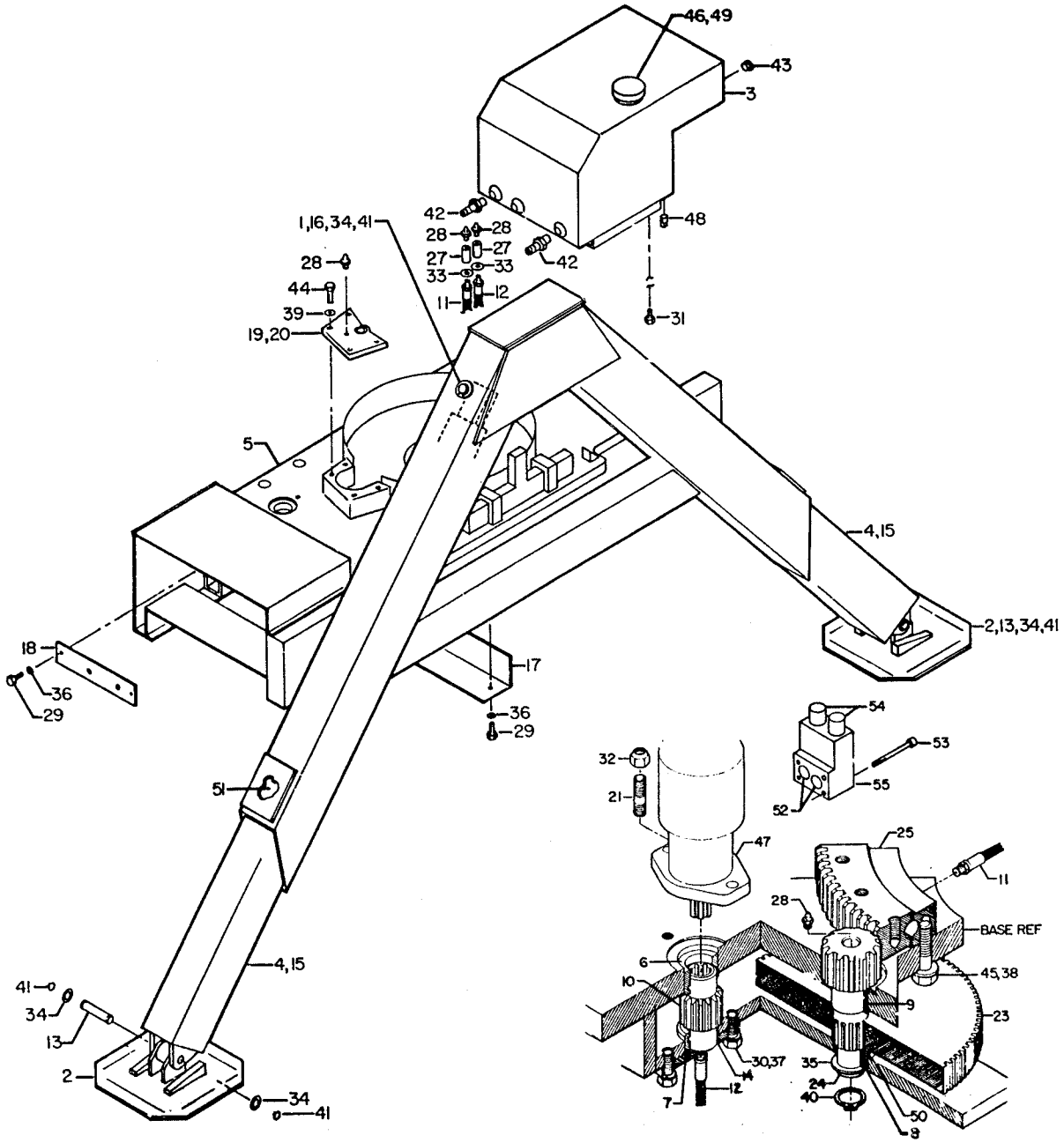
WARNING

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.

SEE PAGE 4-4 FOR DRAWING

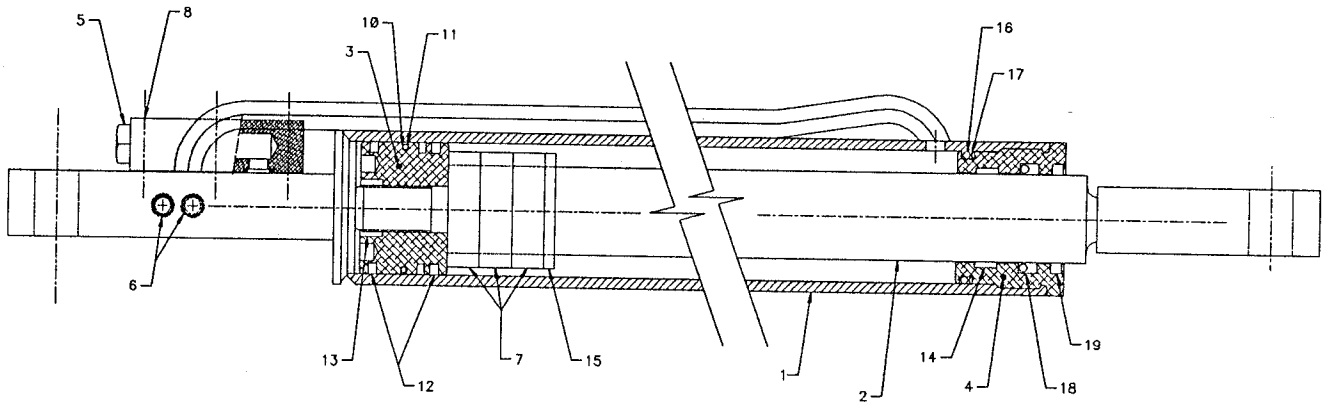
ITEM	PART	DESCRIPTION	QTY
1.	3B116513	OUTRIGGER CYLINDER	2
2.	52070005	OUTRIGGER PAD	2
3.	52703565	RESERVOIR	1
4.	52705428	OUTRIGGER LEG	2
5.	52705433	BASE (INCL: 6-10)	1
6.	60020120	BUSHING (PART OF 5)	1REF
7.	60020121	BUSHING (PART OF 5)	1REF
8.	60020122	BUSHING (PART OF 5)	1REF
9.	60020124	BUSHING (PART OF 5)	1REF
10.	71056074	DRIVE GEAR (PART OF 5)	1REF
11.	53000710	GREASE E XTENSION 29"	1
12.	53000713	GREASE EXTENSION 38"	1
13.	60010470	PIN	2
14.	60010844	GREASE PLATE	1
15.	60030117	WEAR PAD	2
16.	60101874	PIN	2
17.	60103349	GEAR GUARD	1
18.	60103367	INSPECTION PLATE	1
19.	60105964	PINION SUPPORT (INCL: 20)	1
20.	70034295	BEARING (PART OF 19)	1REF
21.	60106032	STUD 1/2-13X2	2
23.	71056072	INTERMEDIATE GEAR	1
24.	71056073	PINION GEAR	1
25.	71056273	TURNTABLE BEARING	1
27.	72053301	COUPLING 1/8NPT	2
28.	72053508	ZERK 1/8NPT	4
29.	72060004	CAP SCR 1/4-20X1 HH GR5	4
30.	72060092	CAP SCR 1/2-13X1-1/4 HH GR5	2
31.	72060833	SCR 5/16-18X3/4 HH SLFTPG	6
32.	72062080	NUT 1/2-13 LOCK	2
33.	72063004	WASHER 7/16 WRT	2
34.	72063034	MACH BUSHING 1 X 10GA NR	8
35.	72063039	MACH BUSHING 2 X 10GA NR	1
36.	72063049	WASHER 1/4 LOCK	4
37.	72063053	WASHER 1/2 LOCK	2
38.	72063115	WASHER 7/8 FLAT GR8	23
39.	72063117	WASHER 9/16 FLAT GR8	4
40.	72066095	RETAINING RING 2" STD	1
41.	72066125	RETAINING RING 1" HD EXT	8
42.	72531550	BARB NIPPLE 1-1/4MPT 1-1/4	2
43.	72532261	SIGHT GAUGE 3/4NPT	1
44.	72601144	CAP SCR 9/16-12X2 HH GR8	4
45.	72601148	CAP SCR 7/8-9X3 HH GR8	23
46.	73014671	FILL CAP	1
47.	73051004	MOTOR	1
48.	73052001	PIPE PLUG 3/4 SQHD MAGNETIC	1
49.	73141276	FILL NECK SCREEN	1
50.	60020123	THRUST WASHER	1
51.	60030119	WEAR PAD	2
52.	7Q072112	O-RING	2
53.	72060738	CAP SCR 5/16-18X2-1/2 SH	4
54.	73054470	C'BAL VALVE	2
55.	5V151830	MOTOR BLOCK	1

Figure D-4. BASE AND OUTRIGGER ASSEMBLY (41705441)



SEE PAGE 4-3 FOR PARTS LIST

Figure D-4A. BASE AND OUTRIGGER ASSEMBLY (41705441)



NOTE

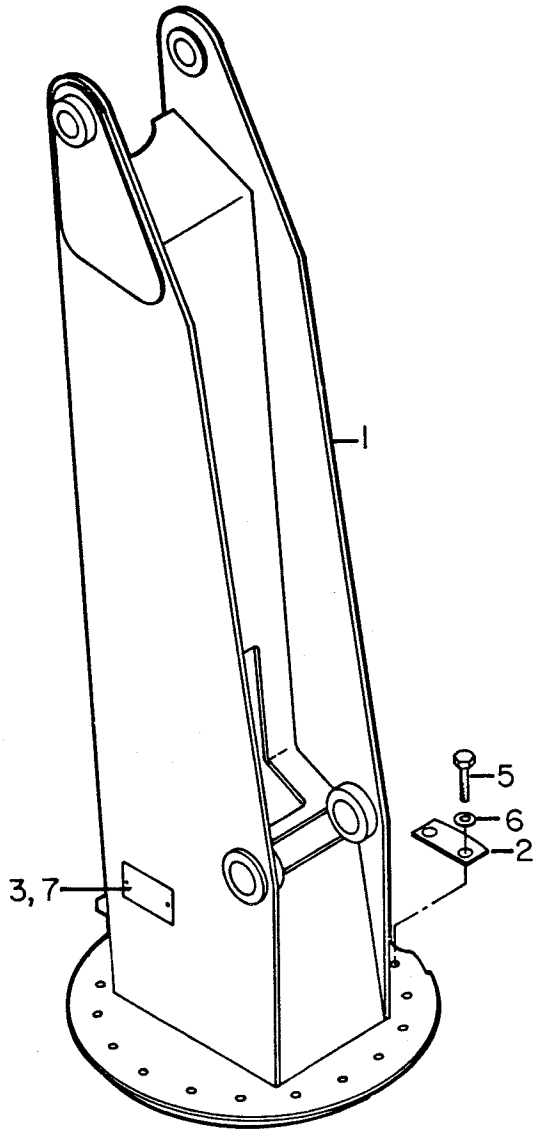
IT IS RECOMMENDED THAT ALL COMPONENTS OF THE SEAL KIT BE REPLACED WHENEVER THE CYLINDER IS DISASSEMBLED. THIS WILL REDUCE FUTURE DOWNTIME.

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.	4B218412	CASE (INCL:17)	1
2.	4G116510	ROD	1
3.	6I030106	PISTON	1
4.	6H030020	HEAD	1
5.	73054004	VALVE	1
6.	7PNPXT02	PLUG 1/8NPT (PART OF 1)	2REF
7.	6C075020	STOP TUBE	3
8.	72060708	CAP SCR 1/4-20 X 1-1/4 SH	6
9.	9C121617	SEAL KIT (INCL:10-19)	1
10.	7Q072145	O-RING (PART OF 9)	1REF
11.	7T66P030	PISTON SEAL (PART OF 9)	1REF
12.	7T65I030	PISTON RING (PART OF 9)	2REF
13.	7T61N106	LOCK RING SEAL (PART OF 9)	1REF
14.	7T2N4022	WEAR PAD-ROD(PART OF 9)	1REF
15.	6A025020	WAFER LOCK (PART OF 9)	1REF
16.	7Q072334	O-RING (PART OF 9)	1REF
17.	7Q10P334	BACK-UP RING (PART OF 9)	1REF
18.	7R546020	ROD SEAL (PART OF 9)	1REF
19.	7R14P020	ROD WIPER (PART OF 9)	1REF

Figure D-5. OUTRIGGER CYLINDER (3B116513)

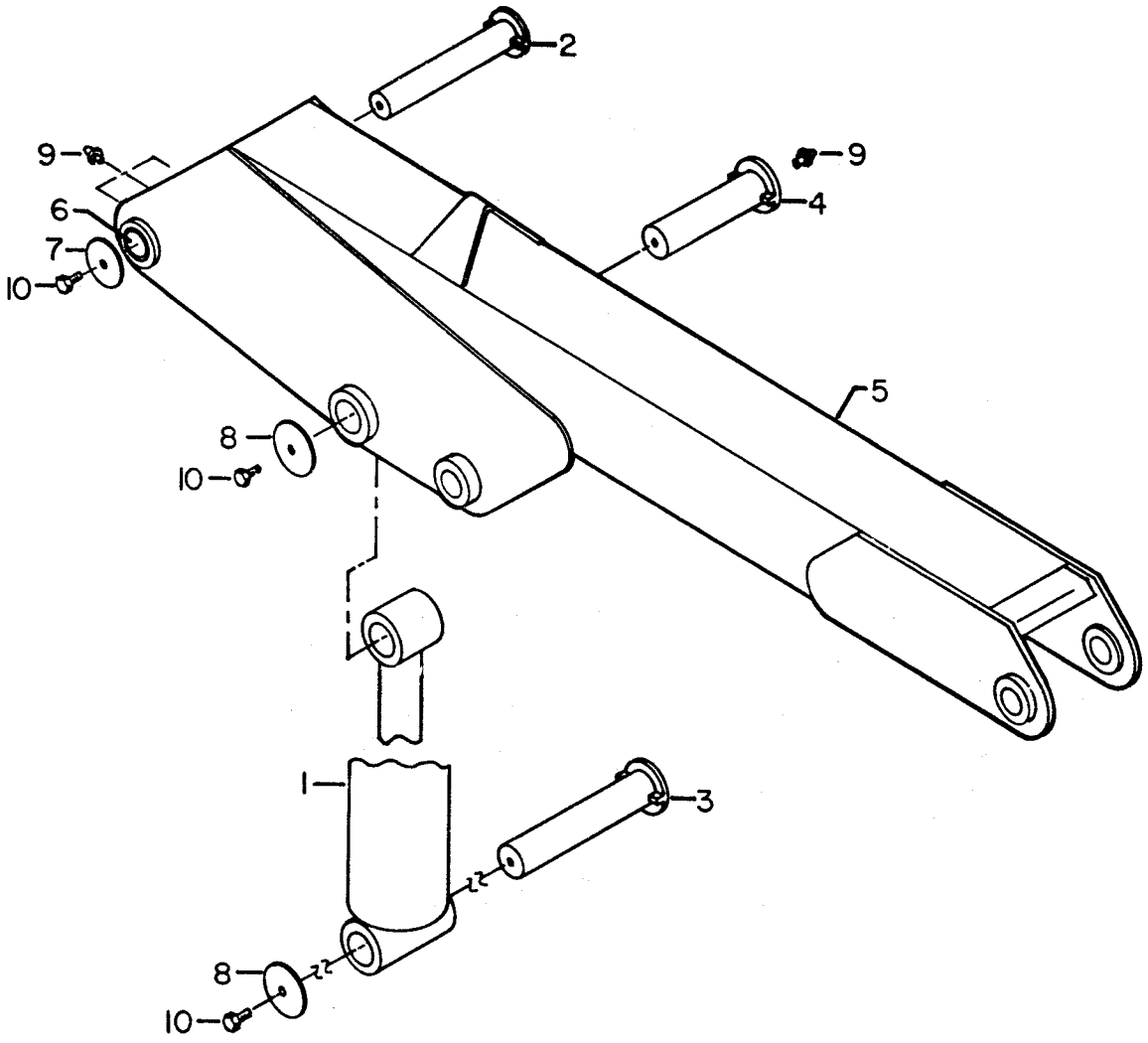


WARNING

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.	52705434	MAST	1
2.	60104247	PINION COVER	1
3.	70029119	SERIAL NO. PLACARD	1
5.	72060209	CAP SCR 3/4-10 X 2-3/4 HH GR8	18
6.	72063116	WASHER 3/4 HARDENED GR8	18
7.	72661216	GRIP NAIL 1/8	2

Figure D-6. MAST ASSEMBLY (41705442)

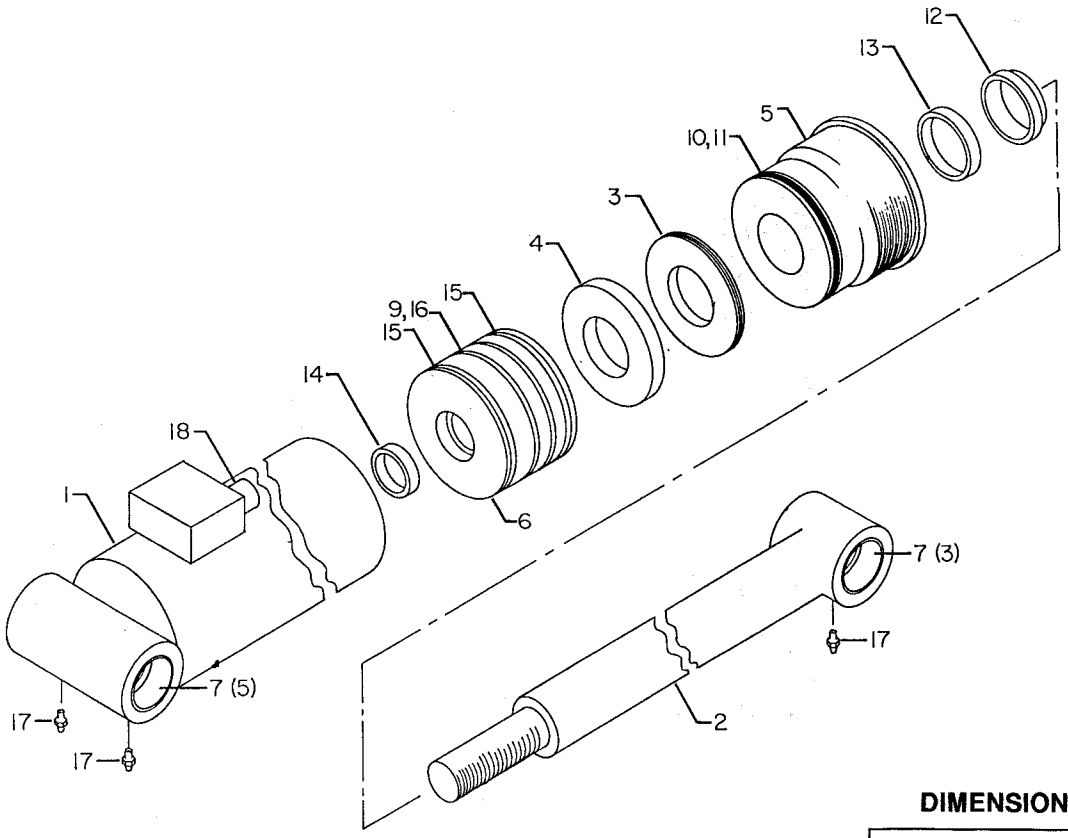


NOTE

Anytime the pin retainer plate bolts have been removed, apply Loctite 262 to the threads before reassembly.

ITEM	PART NO.	DESCRIPTION	QTY
1.	3C009911	INNER CYLINDER	1
2.	52703715	PIN	1
3.	52703746	PIN	1
4.	52703757	PIN	1
5.	52705435	INNER BOOM (INCL: 6)	1
6.	7BF82020	BUSHING (PART OF 5)	4REF
7.	60106331	PIN RETAINER PLATE 3-5/8"	1
8.	60106332	PIN RETAINER PLATE 4-1/8"	2
9.	72053508	ZERK 1/8NPT	4
10.	72060147	CAP SCR 5/8-11X1 HH GR5	3

Figure D-7. INNER BOOM ASSEMBLY (41705443)



DIMENSIONS

Bore	6-1/2"
Stroke	30-1/2"
C - C Closed	45-1/4"
Rod Diameter	3"
Pin Diameter	2-1/2"

NOTE

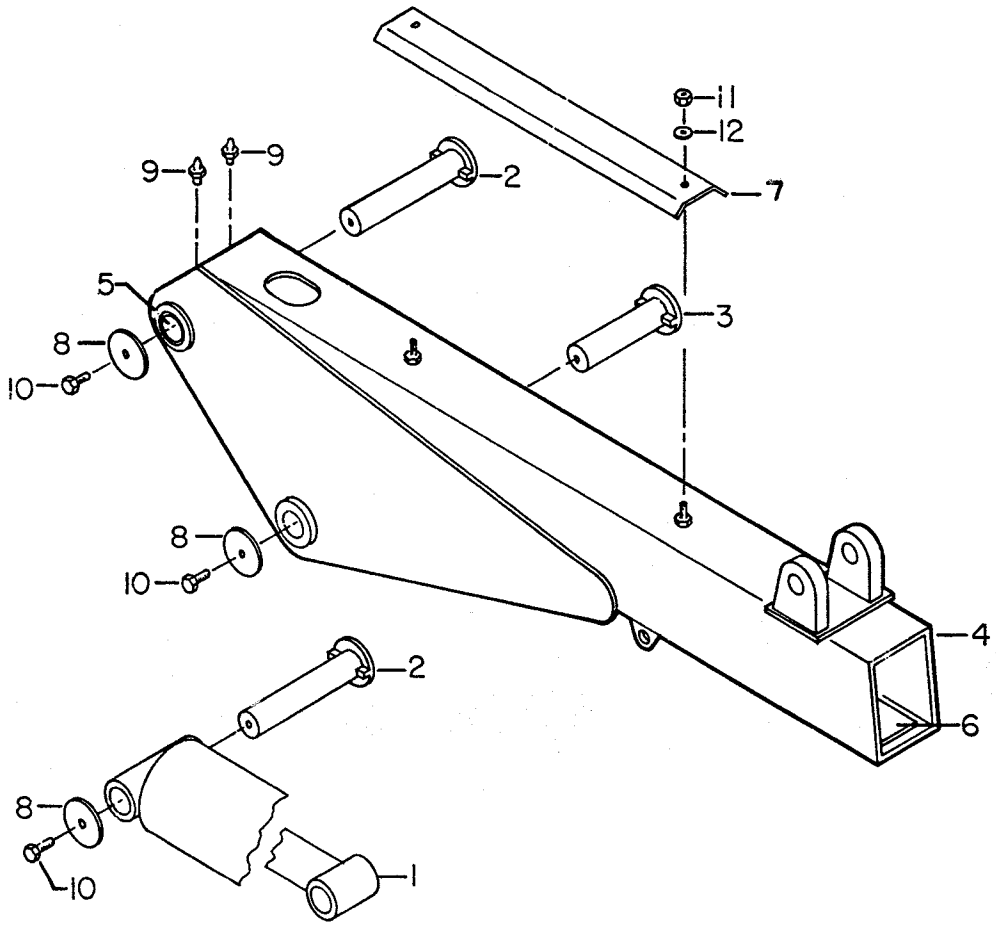
IT IS RECOMMENDED THAT ALL COMPONENTS OF THE SEAL KIT BE REPLACED WHENEVER THE CYLINDER IS DISASSEMBLED. THIS WILL REDUCE FUTURE DOWNTIME.

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.	4C009911	CASE ASM (INCL: 7,8,17)	1
2.	4G009910	ROD ASM (INCL: 7,17)	1
3.	6A025030	WAFER LOCK (PART OF 19)	1REF
4.	6C075030	STOP TUBE	1
5.	6H065030	HEAD	1
6.	6I065200	PISTON	1
7.	7BF81225	BUSHING (PART OF 1 & 2)	8REF
8.	7PNPXT02	PLUG 1/8NPT (PART OF 1)	3REF
9.	7Q072257	O-RING (PART OF 19)	1REF
10.	7Q072361	O-RING (PART OF 19)	1REF
11.	7Q10P361	BACK-UP RING (PART OF 19)	1REF
12.	7R14P030	ROD WIPER (PART OF 19)	1REF
13.	7R546030	ROD SEAL (PART OF 19)	1REF
14.	7T61N200	LOCK RING SEAL (PART OF 19)	1REF
15.	7T65I065	PISTON RING (PART OF 19)	2REF
16.	7T66P065	PISTON SEAL (PART OF 19)	1REF
17.	72053507	ZERK 1/4-28 (PART OF 1 &2)	4REF
18.	73054242	VALVE 25GPM	1
19.	9C262432	SEAL KIT (INCL: 3,7,9-16)	1

Figure D-8. INNER CYLINDER (3C009911)

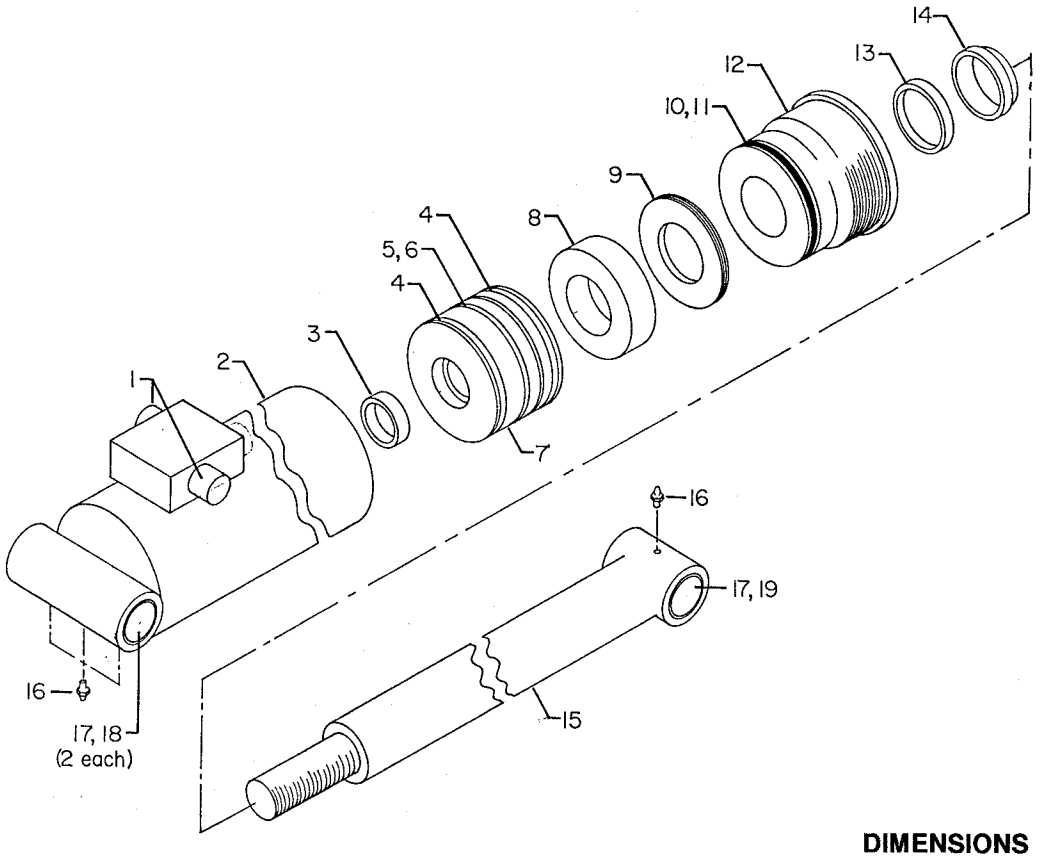


NOTE

Anytime the pin retainer plate bolts have been removed, apply Loctite 262 to the threads before re-assembly.

ITEM	PART NO.	DESCRIPTION	QTY
1.	3C335840	OUTER CYLINDER	1
2.	52703747	PIN	2
3.	52704341	PIN	1
4.	52705436	OUTER BOOM (INCL: 5)	1
5.	7BF81520	BUSHING (PART OF 4)	4REF
6.	60030119	WEAR PAD	1
7.	60101823	HOSE SHROUD (PART OF INSTALLATION KIT)	1REF
8.	60106331	PIN RETAINER PLATE 3-5/8"	3
9.	72053508	ZER 1/8NPT	2
10.	72060147	CAP SCR 5/8-11X1 HH GR5	3
11.	72062109	NUT 5/16-18 LOCK	2
12.	72063002	WASHER 5/16 WRT	2

Figure D-9. OUTER BOOM ASSEMBLY (41705444)



DIMENSIONS

Bore	6"
Stroke	26-1/4"
C-C Closed	40-3/4"
Rod Diameter	3"
Pin Diameter	2"

NOTE

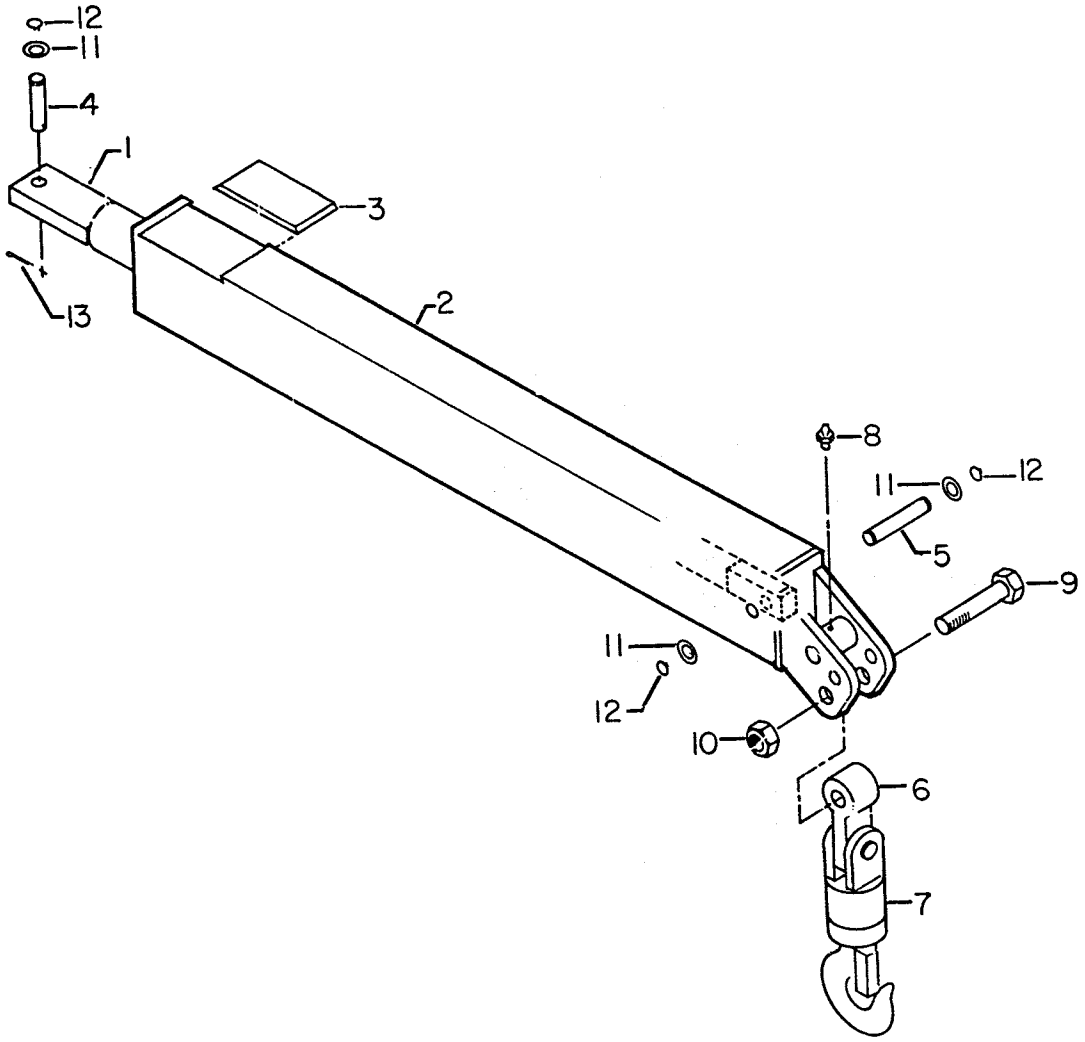
IT IS RECOMMENDED THAT ALL COMPONENTS OF THE SEAL KIT BE REPLACED WHENEVER THE CYLINDER IS DISASSEMBLED. THIS WILL REDUCE FUTURE DOWNTIME.

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.

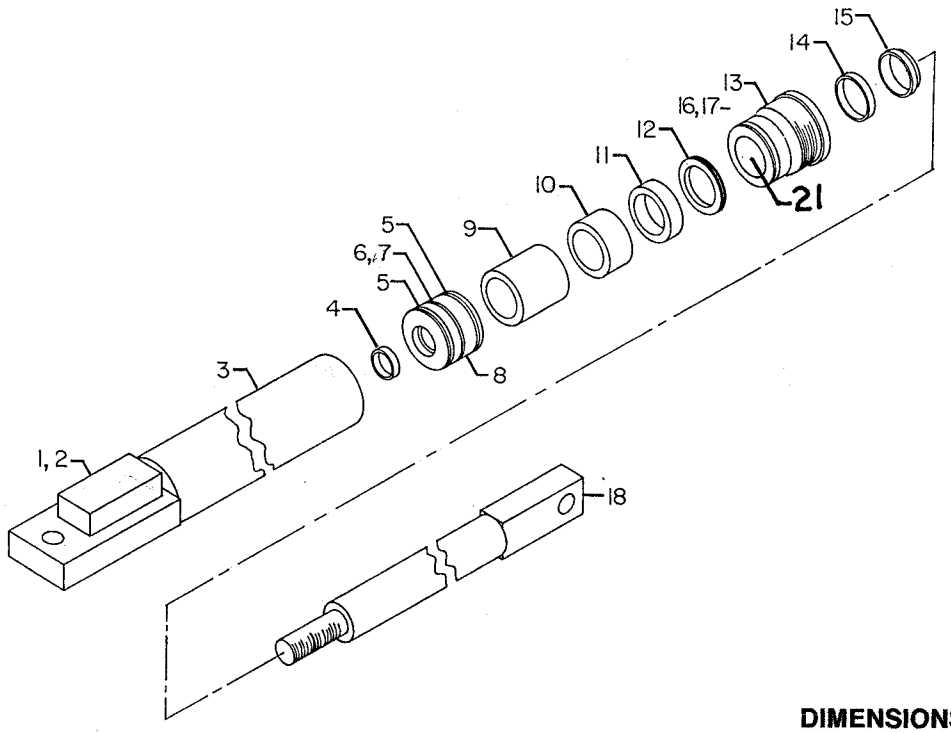
ITEM	PART NO.	DESCRIPTION	QTY
1.	73054242	VALVE 25GPM	2
2.	4C335840	CASE ASM (INCL: 16,17,18,20)	1
3.	7T61N200	LOCK RING SEAL (PART OF 21)	1REF
4.	7T65I060	PISTON RING (PART OF 21)	2REF
5.	7Q072253	O-RING (PART OF 21)	1REF
6.	7T66P060	PISTON SEAL (PART OF 21)	1REF
7.	6I060200	PISTON	1
8.	6C150030	STOP TUBE	1
9.	6A025030	WAFER LOCK (PART OF 21)	1REF
10.	7Q072358	O-RING (PART OF 21)	1REF
11.	7Q10P358	BACK-UP RING (PART OF 21)	1REF
12.	6H060030	HEAD	1
13.	7R546030	ROD SEAL (PART OF 21)	1REF
14.	7R14P030	ROD WIPER (PART OF 21)	1REF
15.	4G335840	ROD ASM (INCL: 16,17,19)	1
16.	72053507	ZERK 1/4-28 (PART OF 2 &15)	4REF
17.	7BF82020	BUSHING (PART OF 2 & 15)	3REF
18.	7BF81220	BUSHING)PART OF PART OF 2)	2REF
19.	7BF81520	BUSHING (PART OF 15)	1REF
20.	7PNPXT02	PLUG 1/8NPT (PART OF 2)	2REF
21.	9C242432	SEAL KIT (INCL:3-6,9-11,13,14)	1

Figure D-10. OUTER CYLINDER (3C335840)



ITEM	PART NO.	DESCRIPTION	QTY
1.	3B336840	EXTENSION CYLINDER	1
2.	52705437	EXTENSION BOOM	1
3.	60030118	WEAR PAD	1
4.	60101905	PIN	1
5.	60101906	PIN	1
6.	60107453	SWIVEL LINK	1
7.	70073725	CRANE HOOK	1
8.	72053508	ZERK 1/8NPT	1
9.	72060238	CAP SCR 1-1/4 - 7 X 6 HH GR5	1
10.	72062073	NUT 1-1/4 - 7 LOCK	1
11.	72063034	MACH BUSHING 1 X 10GA NR	3
12.	72066125	RETAINING RING 1" HD EXT	3
13.	72066194	COTTER PIN	1

Figure D-11. EXTENSION BOOM ASSEMBLY (41705445)



DIMENSIONS

BORE	3"
STROKE	40"
C-C CLOSED	62"
ROD DIAMETER	2"
PIN DIAMETER	1"

NOTE

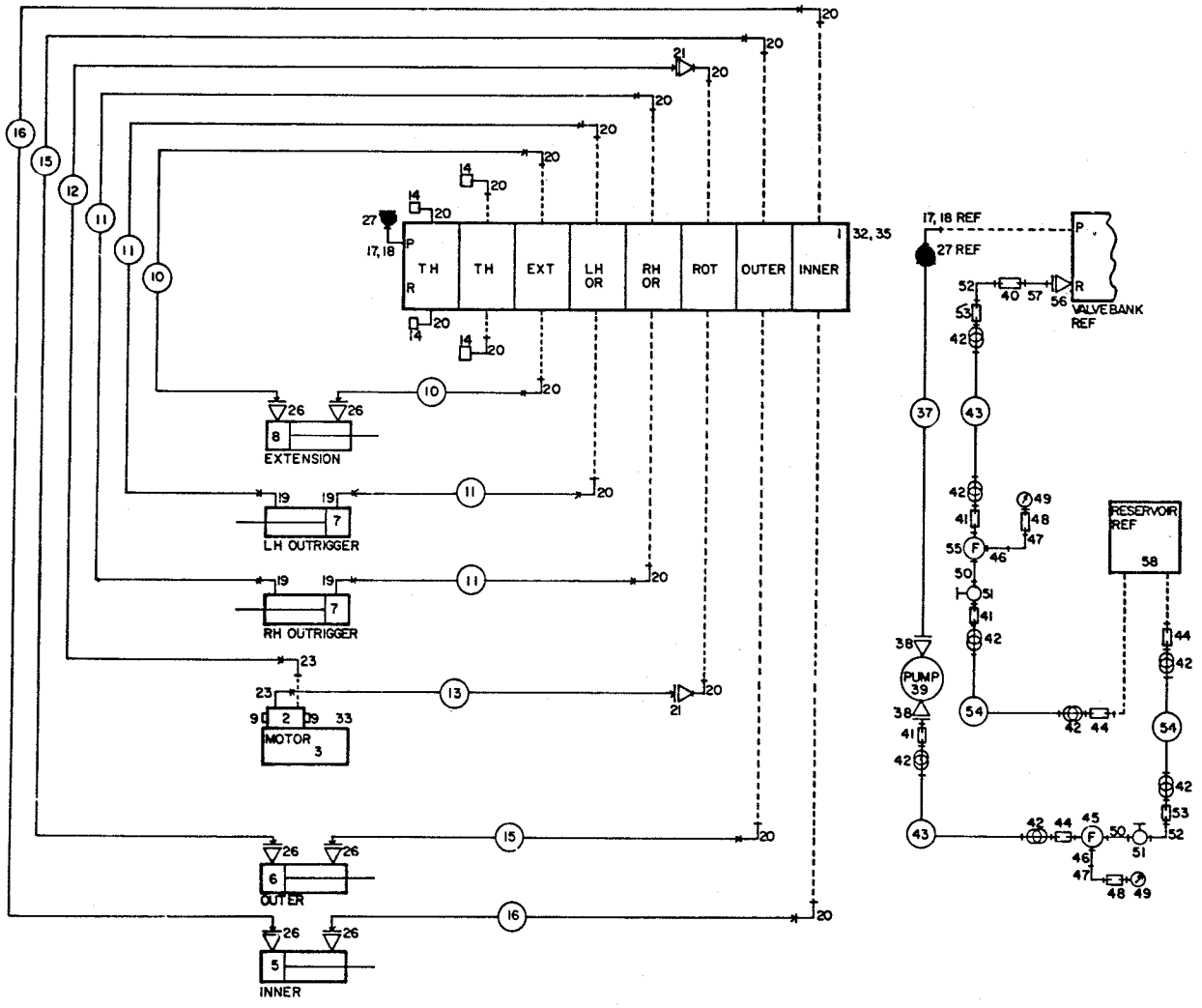
IT IS RECOMMENDED THAT ALL COMPONENTS OF THE SEAL KIT BE REPLACED WHENEVER THE CYLINDER IS DISASSEMBLED. THIS WILL REDUCE FUTURE DOWNTIME.

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.

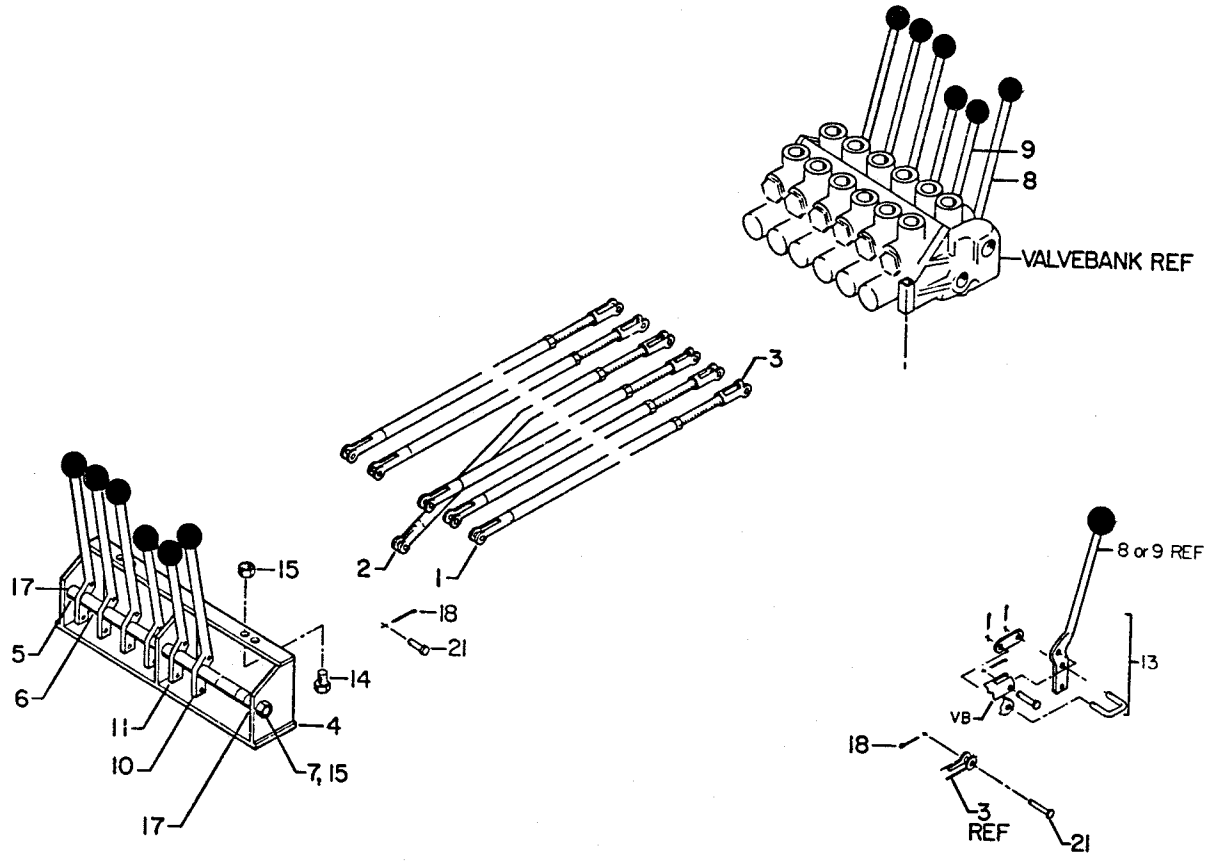
ITEM	PART NO.	DESCRIPTION	QTY
1.	73054004	VALVE	1
2.	72060708	CAP SCR 1/4-20X1-1/4 SH	6
3.	4B336840	CASE ASM (INCL: 19)	1
4.	7T61N106	LOCK RING SEAL (PART OF 20)	1REF
5.	7T65I030	PISTON RING (PART OF 20)	2REF
6.	7Q072145	O-RING (PART OF 20)	1REF
7.	7T66P030	PISTON SEAL (PART OF 20)	1REF
8.	6I030106	PISTON	1
9.	6C300020	STOP TUBE	1
10.	6C150020	STOP TUBE	1
11.	6C075020	STOP TUBE	1
12.	6A025020	WAFER LOCK (PART OF 20)	1REF
13.	6H030020	HEAD	1
14.	7R546020	ROD SEAL (PART OF 20)	1REF
15.	7R14P020	ROD WIPER (PART OF 20)	1REF
16.	7Q072334	O-RING (PART OF 20)	1REF
17.	7Q10P334	BACK-UP RING (PART OF 20)	1REF
18.	4G336840	ROD ASM	1
19.	7PNPXT02	PLUG 1/8NPT (PART OF 3)	4REF
20.	9C121617	SEAL KIT (INCL:4,6,7,12,14-17,21)	1
21.	7T2N4022	WEAR RING-ROD (PART OF 20)	1REF

Figure D-12. EXTENSION CYLINDER (3B336840)



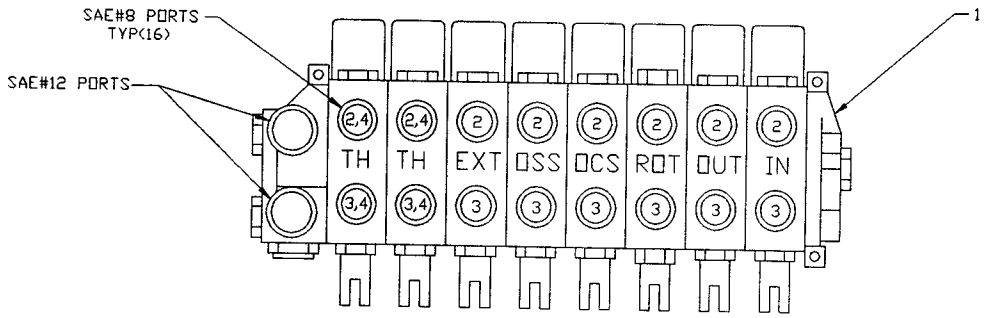
ITEM	PART NO.	DESCRIPTION	QTY
1.		VALVEBANK - 8 SECTION	REF
2.	5V151830	MOTOR BLOCK	1
3.		MOTOR	REF
5.		INNER CYLINDER	REF
6.		OUTER CYLINDER	REF
7.		OUTRIGGER CYLINDER	REF
8.		EXTENSION CYLINDER	REF
9.	73054470	C'BAL VALVE	2
10.	51705002	HOSE ASM 3/8 X 232	2
11.	51705406	HOSE ASM 3/8 X 63	4
12.	51703787	HOSE ASM 1/4 X 15	1
13.	51703595	HOSE ASM 1/4 X 17	1
14.	72532675	CAP 3/4JIC	4
15.	51705001	HOSE ASM 3/8 X 162	2
16.	51705000	HOSE ASM 3/8 X 70	2
17.	60106322	ELBOW - MODIFIED	1
18.	72053245	PIPE PLUG 1/4NPT SQHD	1
19.	72053763	ELBOW 3/4MSTR 3/4MJIC	4
20.	72053777	ELBOW 3/4MSTR 3/4MJIC 45°	16REF
21.	72532665	ADAPTER 7/16MJIC 3/4FJIC	2
23.	72053758	ELBOW 7/16MSTR 7/16MJIC 90°	2
26.	72532358	ADAPTER 3/4MSTR 3/4MJIC	6
27.	73054435	PR GAUGE 5000PSI LIQ FILLED	1
32.	72060033	CAP SCR 5/16-18X3 HH GR5	3
33.	72060739	CAP SCR 5/16-18X3 SH	4
35.	72062109	NUT 5/16-18 LOCK	3
37.	51703703	HOSE ASM 1/2 X 72	1REF
38.	7205XXXX	PUMP ADAPTER	2REF
39.	7205XXXX	PUMP	1REF
40.	72053489	REDUCER COUPLING 1-1/4 3/4	1REF
41.	72532346	BARB NIPPLE 1-1/4NPT 1-1/4 90°	3REF
42.	72066516	HOSE CLAMP 1-1/4 2-BOLT	8REF
43.	60035829	HOSE 1-1/4 100R4 X 48	2REF
44.	72531550	BARB NIPPLE 1-1/4MPT 1-1/4	3REF
45.	73052012	SUCTION FILTER	1REF
46.	72053002	NIPPLE 1/8NPT X 2	2REF
47.	72053281	STREET ELBOW 1/8NPT X 90°	2REF
48.	72053468	COUPLING 1/8NPT	2REF
49.	70048031	VACUUM GAUGE	2REF
50.	72053211	PIPE NIPPLE 1-1/4 X CLOSE	2REF
51.	73054130	GATE VALVE 1-1/4NPT	2REF
52.	72053287	STREET ELBOW 1-1/4NPT 90°	2REF
53.	72531196	BARB NIPPLE 1-1/4NPT 1-1/4 45°	2REF
54.	60035832	HOSE 1-1/4 100R4 X 38	2REF
55.	73052040	RETURN FILTER	1REF
56.	72053747	ADAPTER 1-1/16MSTR 3/4FPT	1REF
57.	72053141	PIPE NIPPLE 3/4NPT X CLOSE	1REF
58.		RESERVOIR	1REF

Figure D-13. HYDRAULIC KIT - 6 FUNCTION (91705449)



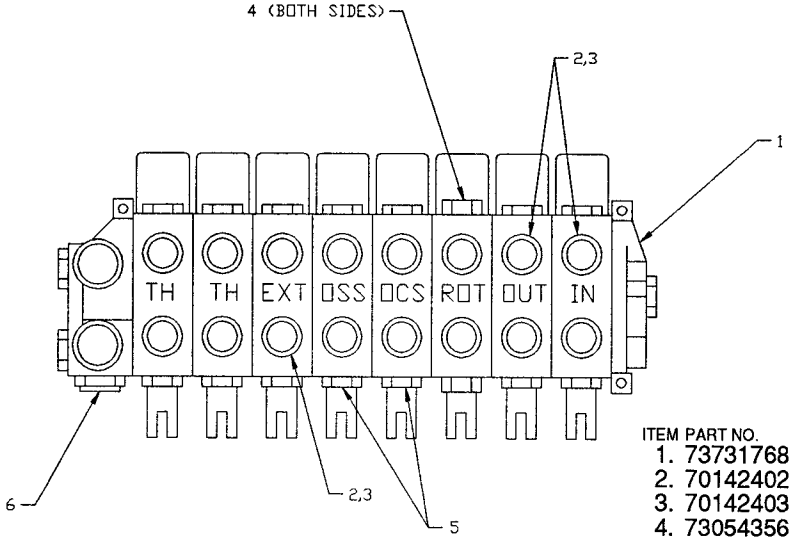
ITEM	PART NO.	DESCRIPTION	QTY
1.	52702016	CTRL ROD - FEMALE	5
2.	52702017	CTRL ROD - FEMALE BENT	1
3.	52702018	CTRL ROD - MALE	6
4.	52702777	VALVEBANK	1
5.	60030045	SPACER 5/8	5
6.	60030046	SPACER 1-1/2	6
7.	60105503	ROD	1
8.	70141982	CTRL HANDLE - VB LONG	4
9.	70141983	CTRL HANDLE - VB SHORT	2
10.	70141984	CTRL HANDLE - CS LONG	4
11.	70141985	CTRL HANDLE - CS SHORT	2
13.	94731839	LINK & PIN KIT	6
14.	72060025	CAP SCR 5/16-18 X 1 HH GR5	2
15.	72062109	NUT 5/16-18 LOCK	4
17.	72063002	WASHER 5/16 WRT	2
18.	72066168	COTTER PIN	12
21.	72066338	CLEVIS PIN	12

Figure D-14. CONTROL KIT - MANUAL 6-FUNCTION (90704441)



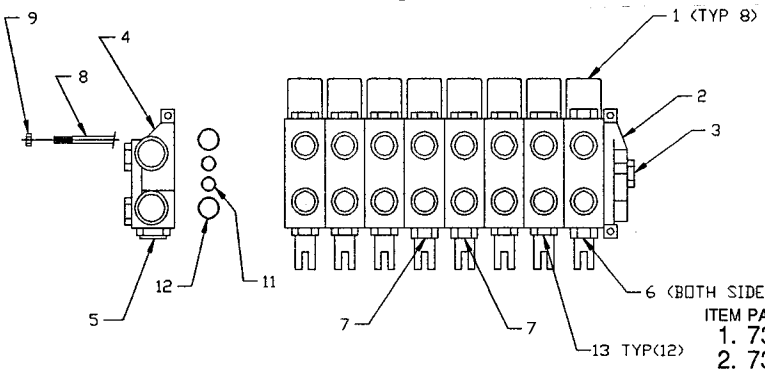
ITEM	PART NO.	DESCRIPTION	QTY
1.	51705410	VALVEBANK 8-SECT	1
2.	72053763	ELBOW #8MSTR #8MJIC 90°	8
3.	72532666	ELBOW #8MSTR #8MJIC XLG	8
4.	72532675	CAP 3/4JIC STL	4

Figure D-15. VALVEBANK ASSEMBLY-8 SECTION MANUAL (51705411)



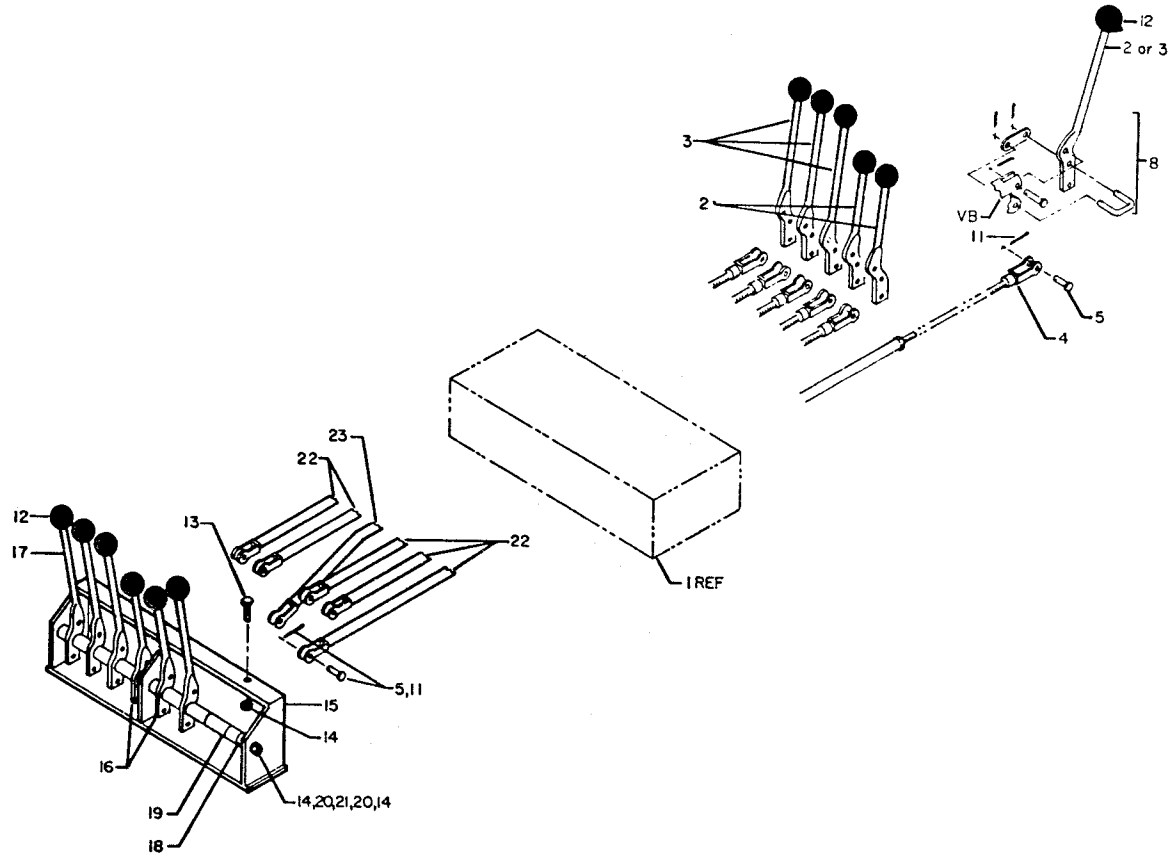
ITEM	PART NO.	DESCRIPTION	QTY
1.	73731768	VALVEBANK	1
2.	70142402	ORIFICE PLATE	3
3.	70142403	SPRING	3
4.	73054356	RELIEF 1800PSI	2
5.	73054010	LOAD CHECK PLUG	2
6.	73054673	RELIEF VALVE 2750PSI	1

Figure D-15A. VALVEBANK (51705410)



ITEM	PART NO.	DESCRIPTION	QTY
1.	73054432	VALVE SECT V20 4WAY SAE#8	8
2.	73054442	END COVER RH	1
3.	73073022	CONVERSION PLUG	1
4.	73731424	END COVER LH	1
5.	73054637	RELIEF VALVE	1
6.	73054516	RELIEF 1300PSI NON-ADJ	2
7.	73054007	RELIEF 1800PSI NON-ADJ	2
8.	73014668	STUD 3/8X17	3
9.	72062037	NUT 3/8-24 HEX	6
10.	51393494	O-RING KIT	REF
11.	7Q072117	O-RING	18
12.	7Q072119	O-RING	18
13.	73054010	LOAD CHECK PLUG	12

Figure D-15B. VALVEBANK (73731768)



ITEM	PART NO.	DESCRIPTION	QTY
1.		VALVEBANK	REF
2.	70141983	LEVER-SHORT	2
3.	70141982	LEVER-LONG	4
4.	52702018	CONTROL LINK	6
5.	72066338	CLEVIS PIN	12
8.	94731839	LINK & PIN KIT	6
11.	72066168	COTTER PIN .09 X 3/4	12
12.	71039096	KNOB	12
13.	72060025	CAP SCR 5/16-18X1 HH GR5	2
14.	72062109	NUT 5/16-18 LOCK	4
15.	52702777	DUMMY VALVEBANK	1
16.	70141985	CTRL LEVER-SHORT	2
17.	70141984	CTRL LEVER-LONG	4
18.	60030045	SPACER 5/8	5
19.	60030046	SPACER 1-1/2	6
20.	72063002	WASHER 5/16 WRT	2
21.	60105503	ROD	1
22.	52702016	CONTROL LINK	5
23.	52702017	CONTROL LINK - BENT	1

SEE PAGE 4-17 FOR THE FOLLOWING PARTS.

ITEM	PART NO.	DESCRIPTION	QTY
26.	51703243	CABLE ASM 50"	1
27.	51704714	HANDLE & CABLE ASM	1
28.	60107719	JIC BOX	1
29.	51704784	CABLE ASM #1WIRE X 6	1
30.	77041237	SOLENOID 12V 150A	1
32.	51705902	CABLE ASM 16GA 4WIRE X15'	REF
33.	77041006	TOGGLE SWITCH DT	4REF
34.	77041004	TOGGLE SWITCH ST	2REF
35.	77041023	PUSH BUTTON SWITCH	1REF
36.	72060000	CAP SCR 1/4-20X1/2 HH GR5	4
37.	72062104	NUT 1/4-20 LOCK	4
38.	77041251	RELAY 12V	2

Figure D-16. REMOTE CONTROL KIT 4R/2M (90704717)

SEE PAGE 4-16 FOR PARTS LIST

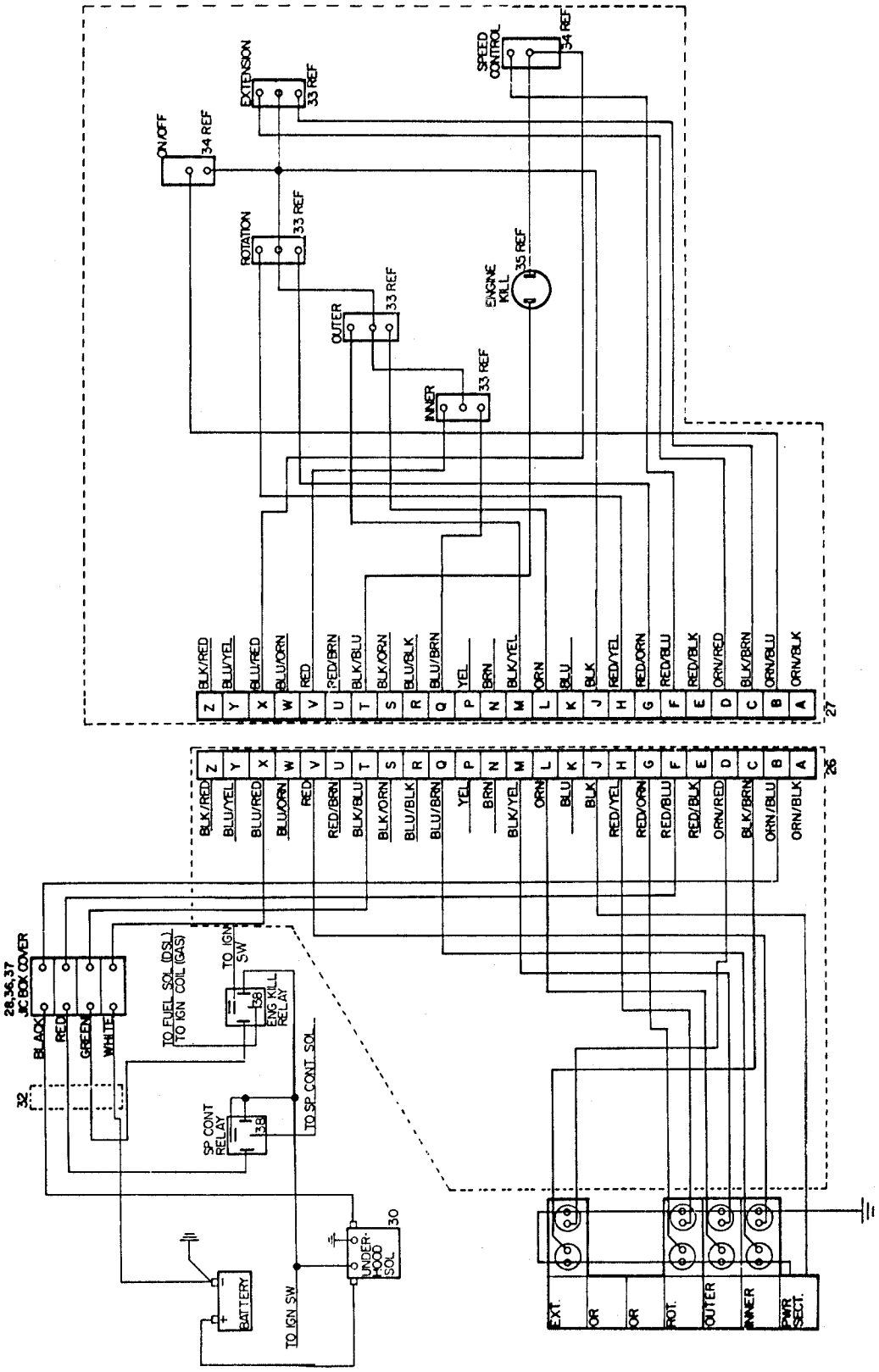
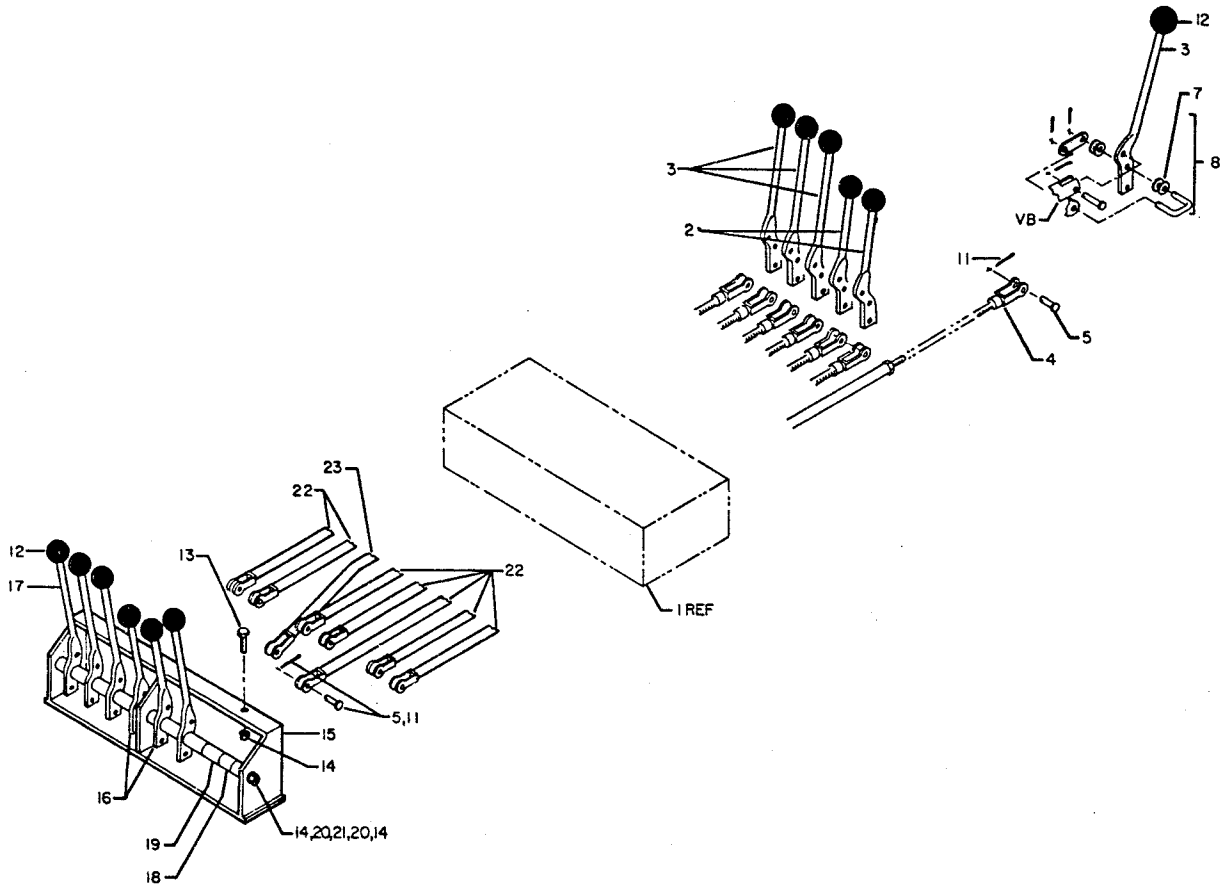


Figure D-17. REMOTE CONTROL KIT 4R/2M (90704717)



ITEM	PART NO.	DESCRIPTION	QTY
1.		VALVEBANK	REF
2.	70141983	LEVER-SHORT	2
3.	70141982	LEVER-LONG	4
4.	52702018	CONTROL LINK	6
5.	72066338	CLEVIS PIN	12
7.	72063001	WASHER 1/4 WRT	24
8.	94731839	LINK & PIN KIT	6
10.	72066335	COTTER PIN	8REF
11.	72066168	COTTER PIN .09 X 3/4	12
12.	71039096	KNOB	12
13.	72060025	CAP SCR 5/16-18X1 HH GR5	2
14.	72062109	NUT 5/16-18 LOCK	4
15.	52702777	DUMMY VALVEBANK	1
16.	70141985	CTRL LEVER-SHORT	2
17.	70141984	CTRL LEVER-LONG	4
18.	60030045	SPACER 5/8	5
19.	60030046	SPACER 1-1/2	6
20.	72063002	WASHER 5/16 WRT	2
21.	60105503	ROD	1
22.	52702016	CONTROL LINK	5
23.	52702017	CONTROL LINK - BENT	1

SEE PAGE 4-19 FOR THE FOLLOWING PARTS.

ITEM	PART NO.	DESCRIPTION	QTY
26.	51703243	CABLE ASM 50"	1
27.	51705055	HANDLE & CABLE ASM	1
28.	60107719	JIC BOX	1
29.	51704784	CABLE ASM #1WIRE X 6	1
30.	77041237	SOLENOID 12V 150A	1
32.	51705902	CABLE ASM 16GA 4WIRE X15'	1REF
33.	77041006	TOGGLE SWITCH DT	4REF
34.	77041004	TOGGLE SWITCH ST	2REF
35.	77041023	PUSH BUTTON SWITCH	1REF
36.	72060000	CAP SCR 1/4-20X1/2 HH GR5	4
37.	72062104	NUT 1/4-20 LOCK	4
38.	77041251	RELAY 12V	2

Figure D-18. REMOTE CONTROL KIT 6R/2M (90704721)

SEE PAGE 4-18 FOR PARTS LIST

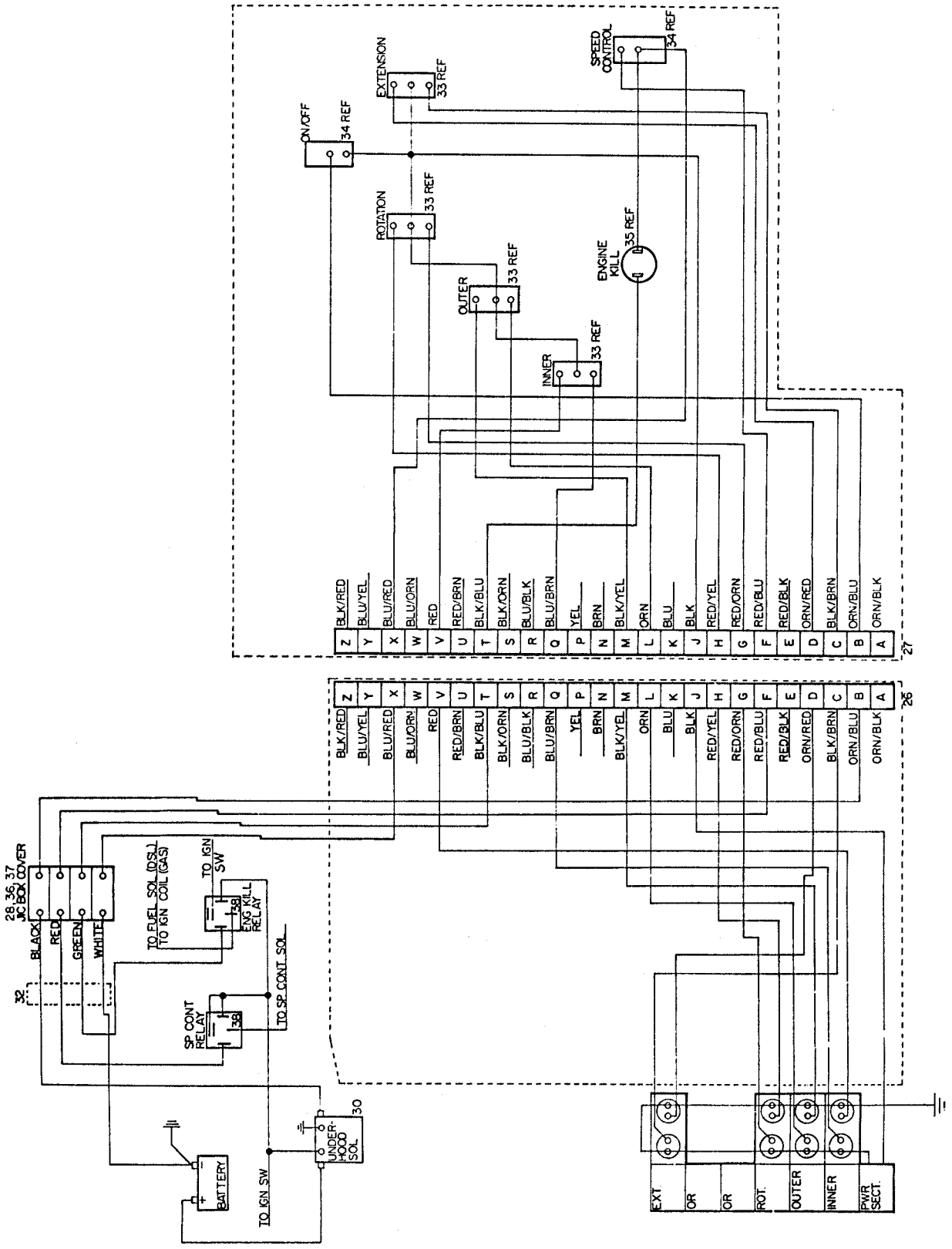
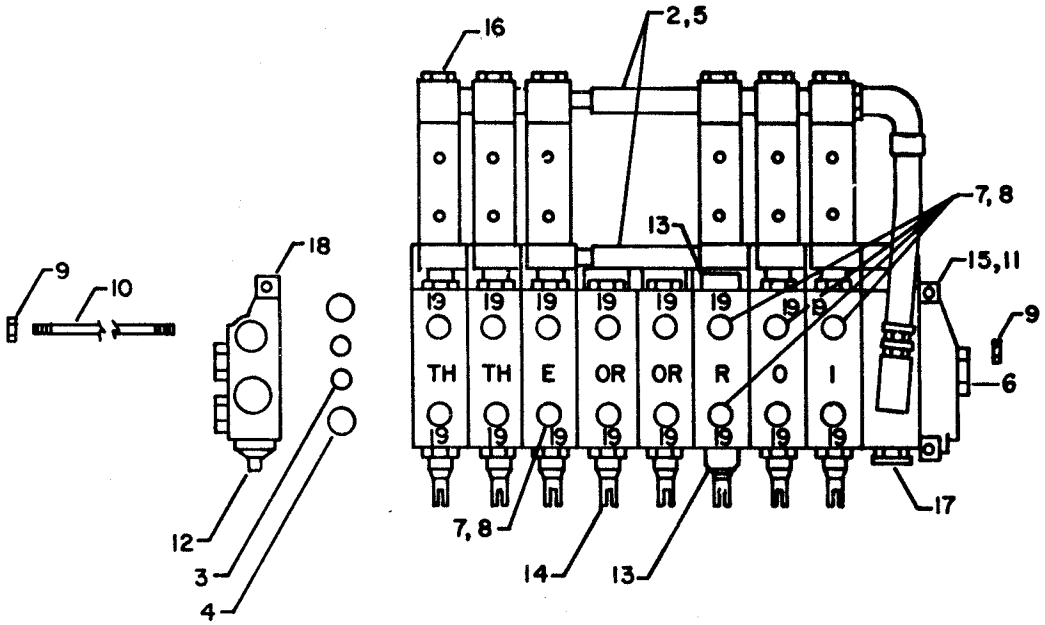
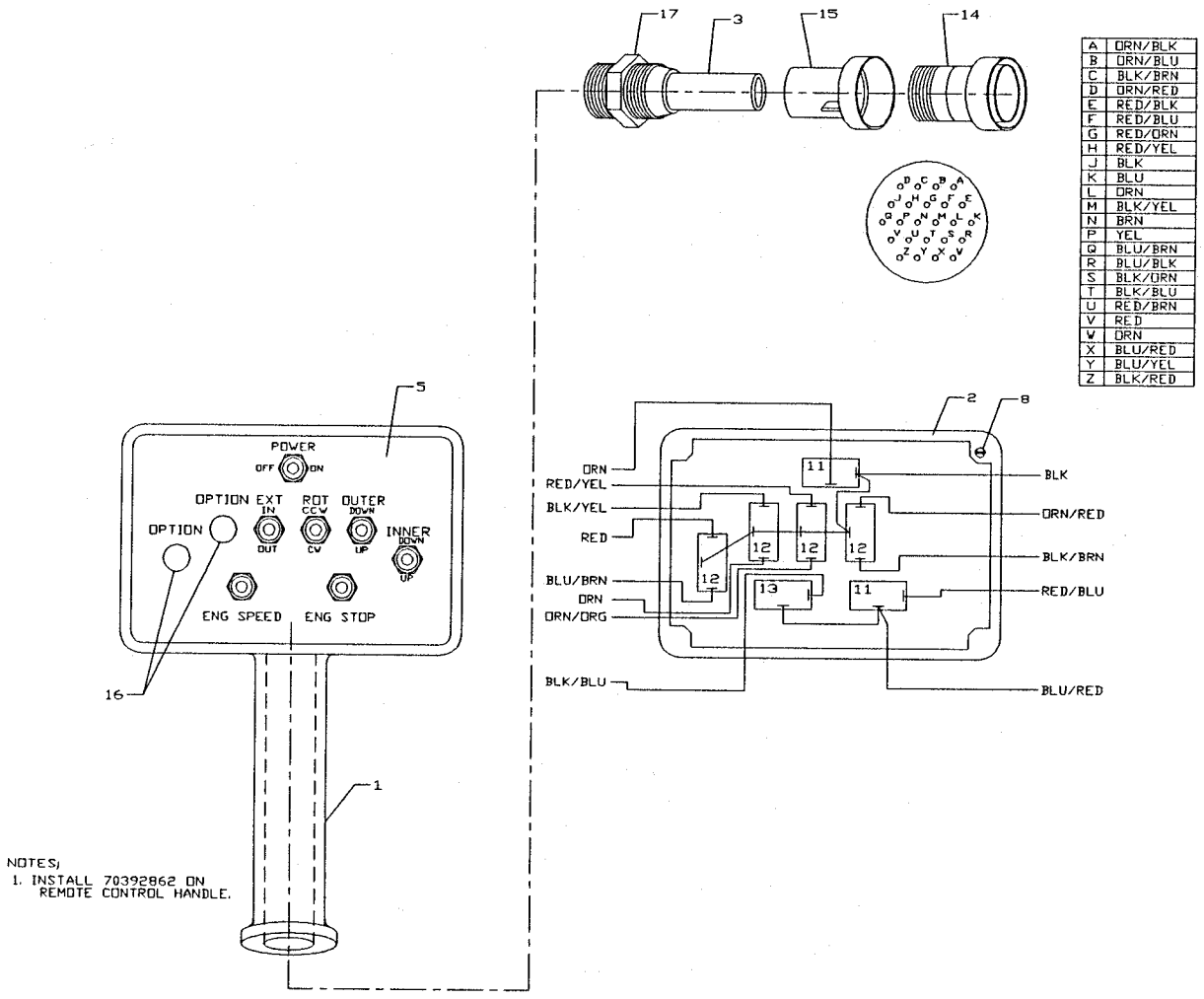


Figure D-19. REMOTE CONTROL KIT 6R/2M (90704721)



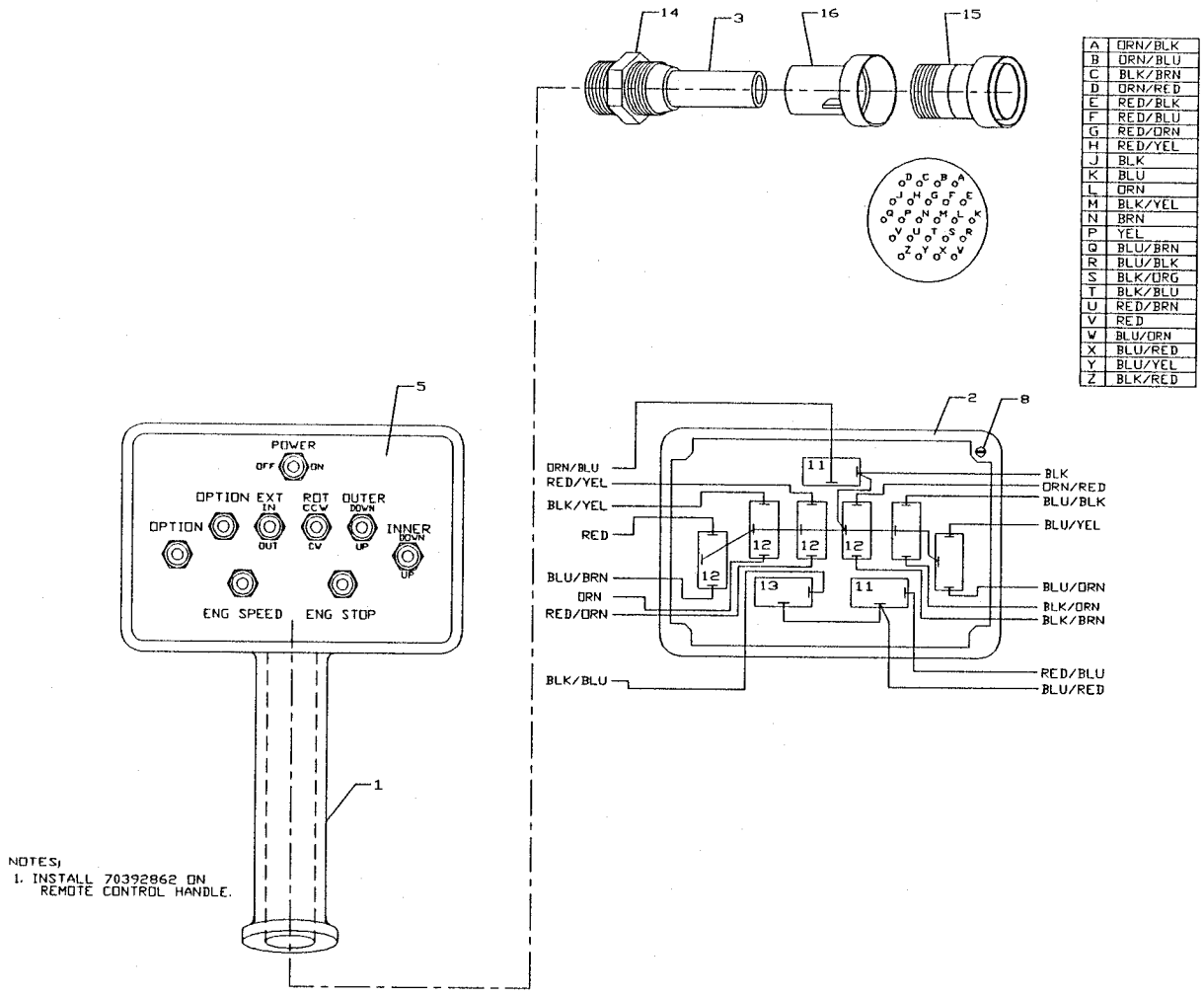
ITEM	PART NO.	DESCRIPTION	QTY
1.	51705408	VB 8-SECT (INCL:2-18)	1
2.	60025207	SPACER (PART OF 1)	2REF
3.	7Q072019	O-RING (PART OF 1)	20REF
4.	7Q072021	O-RING (PART OF 1)	20REF
5.	7Q092012	O-RING (PART OF 1)	2REF
6.	73073022	COVERSION PLUG (PART OF 15)	1REF
7.	70142402	ORIFICE (PART OF 1)	5REF
8.	70142403	SLEEVE (PART OF 1)	5REF
9.	72062037	NUT (PART OF 1)	6REF
10.	73014672	STUD (PART OF 1)	3REF
11.	73054442	END CAP (PART OF 15)	1REF
12.	73054643	RELIEF CAP (PART OF 1)	1REF
13.	73054356	PORT RELIEF 1800PSI (PART OF 1)	2REF
14.	73054432	VALVE SECTION (PART OF 1)	2REF
15.	73731241	END CAP RH (INCL:6,11) (PART OF 1)	1REF
16.	73054468	VALVE SECTION W/RC (PART OF 1)	6REF
17.	73054502	UTILITY SECTION (PART OF 1)	1REF
18.	73731424	END CAP LH(PART OF 1)	1REF
19.	72053777	ELBOW 3/4MSTR 3/4MJIC 45°	16

Figure D-20. REMOTE VALVEBANK ASSEMBLY WITH TIREHAND (51705409)



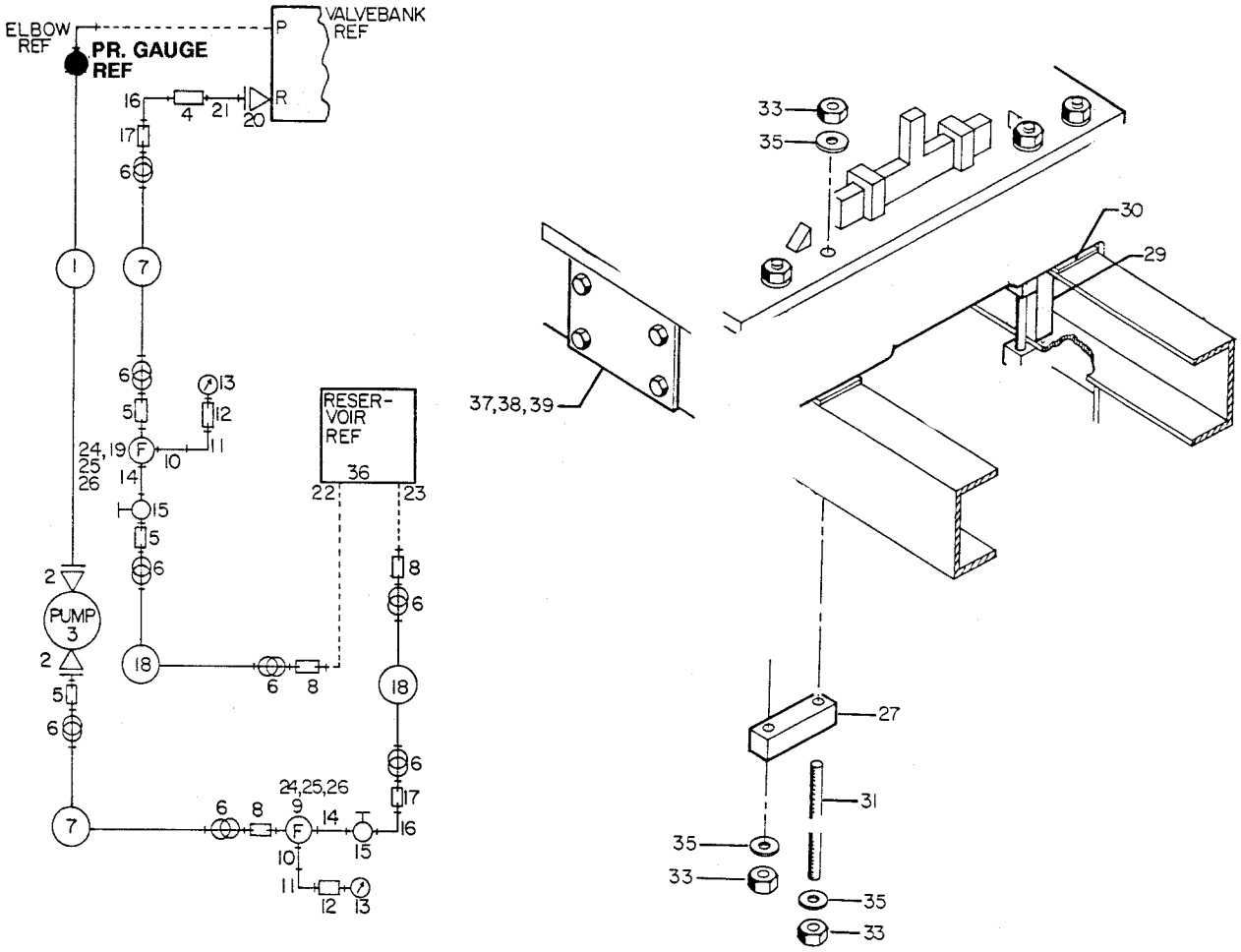
ITEM	PART NO.	DESCRIPTION	QTY
1.	60111140	HANDLE	1
2.	70034306	BACK	1
3.	89044100	CABLE 18GA 24WIRE X 420	1
4.	89044214	WIRE 18GA GRN	1.62'
5.	70393262	DECAL-REMOTE CONTROL	1
6.	70392862	DECAL-DANGER RC ELEC	1
7.	70029119	SERIAL NUMBER PLACARD	1
8.	72061009	SHT MTL SCR #6X3/4 PH	4
9.	72066340	POP RIVET 1/8	2
10.	77040186	TERMINAL 1/4 FSLPON	18
11.	77041345	TOGGLE SWITCH ST	2
12.	77041346	TOGGLE SWITCH DT	4
13.	77041347	TOGGLE SWITCH MOMENT.	1
14.	77044146	CONNECTOR 24PIN	1
15.	77044147	CABLE CLAMP	1
16.	70392785	PLUG 1/2	2
17.	77044196	STRAIN RELIEF 3/4	1

Figure D-21. REMOTE HANDLE ASSEMBLY 4F (51704714)



ITEM	PART NO.	DESCRIPTION	QTY
1.	60111140	HANDLE	1
2.	70034306	BACK	1
3.	89044100	CABLE 18GA 24WIRE X 420	1
4.	89044214	WIRE 18GA GRN	2.33'
5.	70393262	DECAL-REMOTE CONTROL	1
6.	70392862	DECAL-DANGER RC ELEC	1
7.	70029119	SERIAL NUMBER PLACARD	1
8.	72061009	SHT MTL SCR #6X3/4 PH	4
9.	72066340	POP RIVET 1/8	2
10.	77040186	TERMINAL 1/4 FSLPON	24
11.	77041345	TOGGLE SWITCH ST	2
12.	77041346	TOGGLE SWITCH DT	6
13.	77041347	TOGGLE SWITCH MOMENT.	1
14.	77044196	STRAIN RELIEF 3/4	1
15.	77044146	CONNECTOR 16PIN	1
16.	77044147	CABLE CLAMP	1

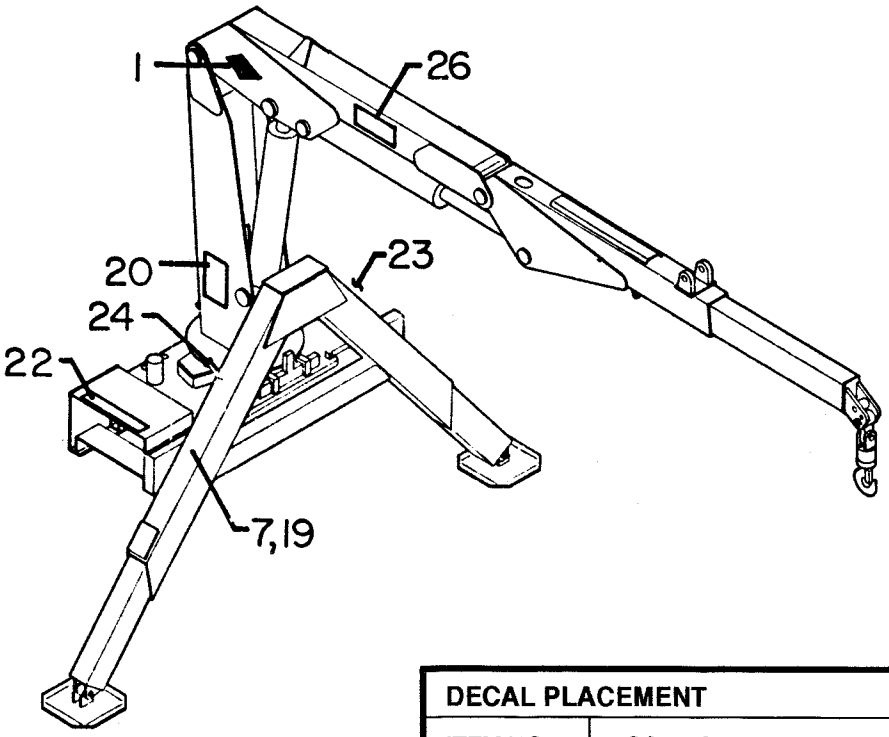
Figure D-22. REMOTE HANDLE ASSEMBLY 6F (51705055)



ITEM	PART NO.	DESCRIPTION	QTY
1.	51703703	HOSE ASM 1/2 X 72	1
2.		PUMP ADAPTER	2REF
3.		PUMP	1REF
4.	72053489	REDUCER COUPLING 1-1/4 3/4	1
5.	72532346	BARB NIPPLE 1-1/4 90°	3
6.	72066516	HOSE CLAMP 1-1/4	8
7.	60035829	HOSE 1-1/4 X 48	2
8.	72531550	BARB NIPPLE 1-1/4	3
9.	73052012	SUCTION FILTER (INCL: 13)	1
10.	72053002	PIPE NIPPLE 1/8NPT X 2	2
11.	72053281	STRT ELBOW 1/8NPT 90°	2
12.	72053468	COUPLING 1/8NPT	2
13.	70048031	VACUUM GAUGE (PART OF 9)	2REF
	70048149	ELEMENT 100MESH (PART OF 9)	1REF
	73052014	ELEMENT 25MIC (PART OF 9)	1REF
14.	72053211	PIPE NIPPLE 1-1/4 X CLOSE	2
15.	73054130	GATE VALVE 1-1/4	2
16.	72053287	STRT ELBOW 1-1/4NPT 90°	2
17.	72531196	BARB NIPPLE 1-1/4 45°	2

ITEM	PART NO.	DESCRIPTION	QTY
18.	60035832	HOSE 1-1/4 X 38	2
19.	73052040	RETURN FILTER W/ELEMENT	1
	73052014	ELEMENT 25MIC	1REF
20.	72053747	ADAPTER 1-1/16MSTR 3/4FPT	1
21.	72053141	PIPE NIPPLE 3/4 X CLOSE	1
24.	60103870	OIL FILTER BRACKET	2
25.	72060025	CAP SCR 5/16-18X1 HH GR5	4
26.	72062109	NUT 5/16-18 LOCK	4
27.	60010665	CLAMP PLATE	4
29.	52706660	FRAME SUPPORT	4
30.	60103563	SPACER	2
31.	71014847	TIE-DOWN STUD 1-1/4X28-1/2	8
33.	72062142	NUT 1-1/4 - 7 LOCK	16
35.	72063067	WASHER 1-1/4 HI STRENGTH	16
36.		RESERVOIR	REF
37.	60105107	TIE PLATE	2
38.	72060183	CAP SCR 3/4-10X1-1/2 HH GR5	8
39.	72062114	NUT 3/4-10 LOCK	8

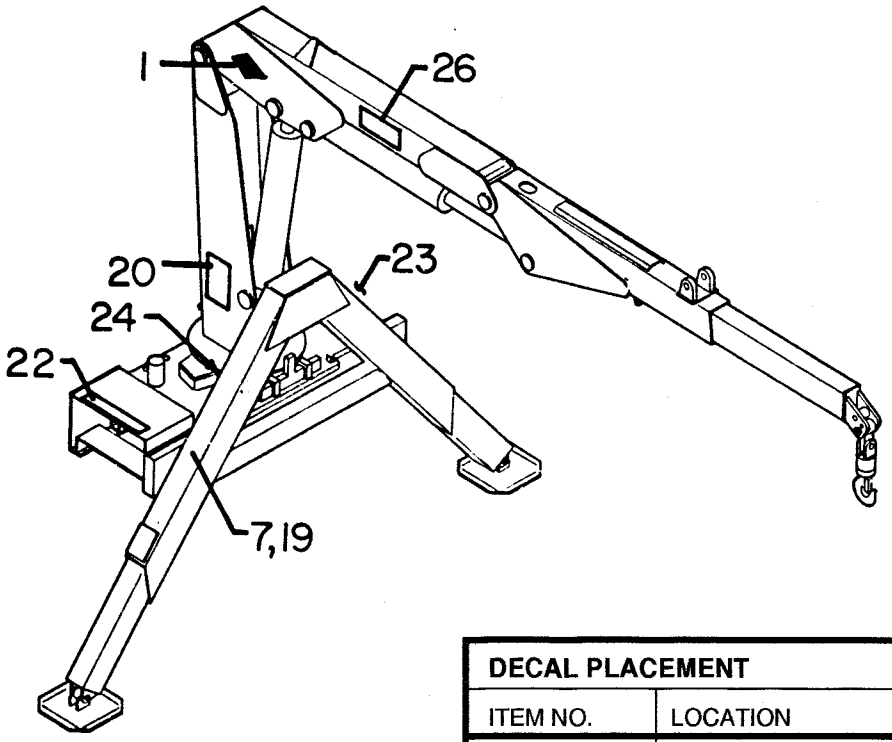
Figure D-23. INSTALLATION KIT (93705446)



DECAL PLACEMENT	
ITEM NO.	LOCATION
2,9,10,11,14, 16,17,18,21	AT OR NEAR THE NORMAL OPERATING STATIONS.
12,15	ONE ON EACH OUTRIGGER
13	ONE ON EACH SIDE OF CARRIER VEHICLE
8	AT THE TURNTABLE GREASE ZERK
3,4	AT ALL GREASE ZERKS
6	ON THE RESERVOIR, AT THE RETURN LINE
5	ON THE RESERVOIR, AT THE SUCTION LINE

ITEM	PART NO.	DESCRIPTION	QTY
1.	70029252	PLACARD - IMT DIAMOND	2
2.	70391583	DECAL-SETUP/STOW INST.	2
3.	70391612	DECAL-GREASE WEEKLY LEFT	8
4.	70391613	DECAL-GREASE WEEKLY RIGHT	8
5.	70392108	DECAL-SUCTION LINE	1
6.	70392109	DECAL-RETURN LINE	1
7.	70392213	DECAL-CAUTION WASH/WAX	1
8.	70392524	DECAL-ROTATE CRANE/GREASE	1
9.	70392813	DECAL-DANGER ELECTROC'N	2
10.	70392814	DECAL-DANGER OPERATOR	2
11.	70392815	DECAL-DANGER OPERATION	2
12.	70392864	DECAL-DANGER OUTR STD CLR	2
13.	70392865	DECAL-DANGER ELECTROC'N	4
14.	70392866	DECAL-DANGER OPER COND	2
15.	70392867	DECAL-DANGER OUTR MOVING	2
16.	70392888	DECAL-DANGER OPER RESTRICT	2
17.	70392890	DECAL-DANGER STOW/UNFOLD	2
18.	70392891	DECAL-DANGER DRIVELINE	2
19.	70392982	DECAL-CONTACT IMT	1
20.	71392427	CAPACITY PLACARD	2
21.	71039134	DECAL-CAUTION OIL LEVEL	2
22.	71039168	DECAL-CTRL W/WINCH SS	1
23.	71039169	DECAL-CTRL W/WINCH CS	1
24.	71392365	DECAL-ROTATION ALIGNMENT	1
26.	70392548	DECAL-9616 IDENT	2

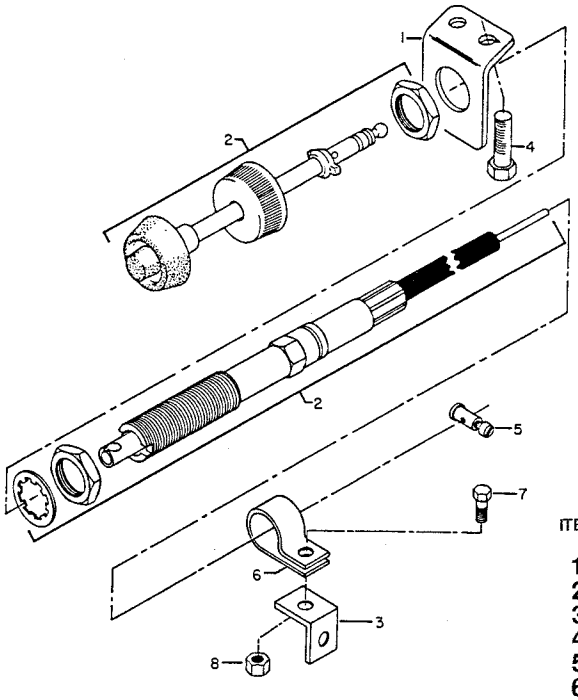
Figure D-24. DECAL KIT - MANUAL CONTROLS (95708866)



DECAL PLACEMENT	
ITEM NO.	LOCATION
2,9,10,11,14, 16,17,18,21,25	AT OR NEAR THE NORMAL OPERATING STATIONS.
12,15	ONE ON EACH OUTRIGGER
13	ONE ON EACH SIDE OF CARRIER VEHICLE
8	AT THE TURNTABLE GREASE ZERK
3,4	AT ALL GREASE ZERKS
6	ON THE RESERVOIR, AT THE RETURN LINE
5	ON THE RESERVOIR, AT THE SUCTION LINE

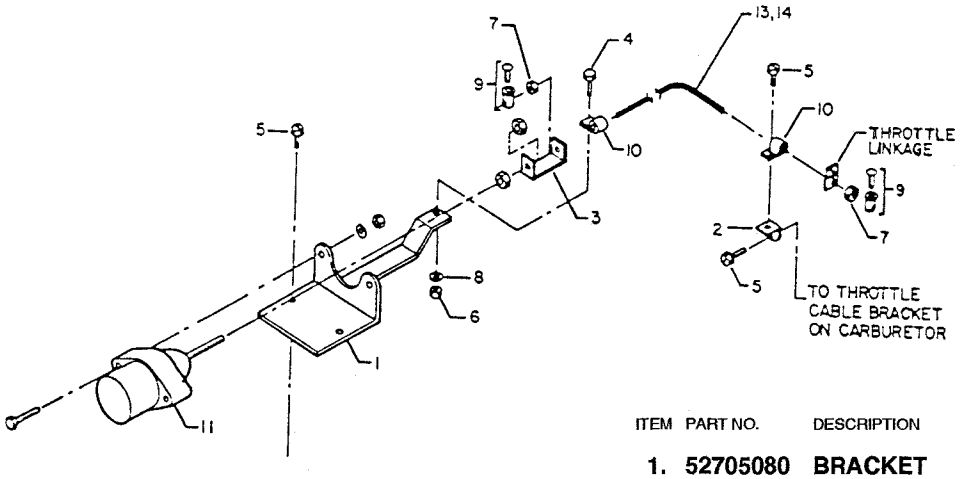
ITEM	PART	DESCRIPTION	QTY	ITEM	PART	DESCRIPTION	QTY
1.	70029252	PLACARD - IMT DIAMOND	2	14.	70392866	DECAL-DANGER OPER COND	2
2.	70391583	DECAL-SETUP/STOW INST.	2	15.	70392867	DECAL-DANGER OUTR MOVING	2
3.	70391612	DECAL-GREASE WEEKLY LEFT	8	16.	70392888	DECAL-DANGER OPER RESTRICT	2
4.	70391613	DECAL-GREASE WEEKLY RIGHT	8	17.	70392890	DECAL-DANGER STOW/UNFOLD	2
5.	70392108	DECAL-SUCTION LINE	1	18.	70392891	DECAL-DANGER DRIVELINE	2
6.	70392109	DECAL-RETURN LINE	1	19.	70392982	DECAL-CONTACT IMT	1
7.	70392213	DECAL-CAUTION WASH/WAX	1	20.	71392427	CAPACITY PLACARD	2
8.	70392524	DECAL-ROTATE CRANE/GREASE	1	21.	71039134	DECAL-CAUTION OIL LEVEL	2
9.	70392813	DECAL-DANGER ELECTROC'N	2	22.	71039168	DECAL-CTRL W/WINCH SS	1
10.	70392814	DECAL-DANGER OPERATOR	2	23.	71039169	DECAL-CTRL W/WINCH CS	1
11.	70392815	DECAL-DANGER OPERATION	2	24.	71392365	DECAL-ROTATION ALIGNMENT	1
12.	70392864	DECAL-DANGER OUTR STD CLR	2	25.	70392889	DECAL-DANGER RC ELECTRO LG	2
13.	70392865	DECAL-DANGER ELECTROC'N	4	26.	70392548	DECAL-9616 IDENT	2

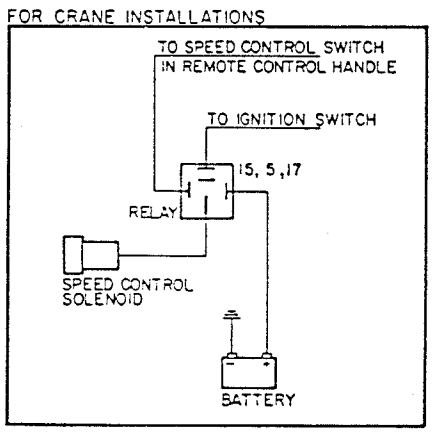
Figure D-25. DECAL KIT - REMOTE CONTROLS (95708867)



ITEM	PART NO.	DESCRIPTION	QTY
1.	60105400	MOUNTING BRACKET	1
2.	70058067	THROTTLE CONTROL 18'	1
3.	60106760	LINKAGE BRACKET	1
4.	72060962	SCR 5/16-18X 1 HH SLFTPG	2
5.	72066377	CABLE STOP	1
6.	72066523	CLAMP	1
7.	72060636	MACH SCR #10-24 LOCK	2
8.	72062106	NUT #10-24 LOCK	2

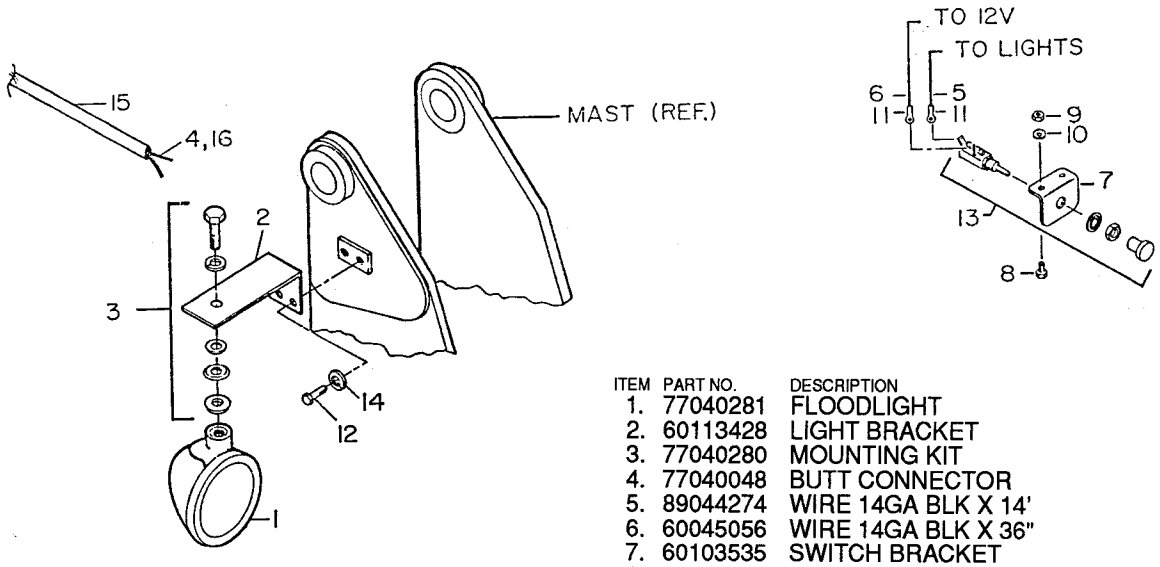
Figure D-26. OPTION - MANUAL THROTTLE CONTROL KIT (31702746)





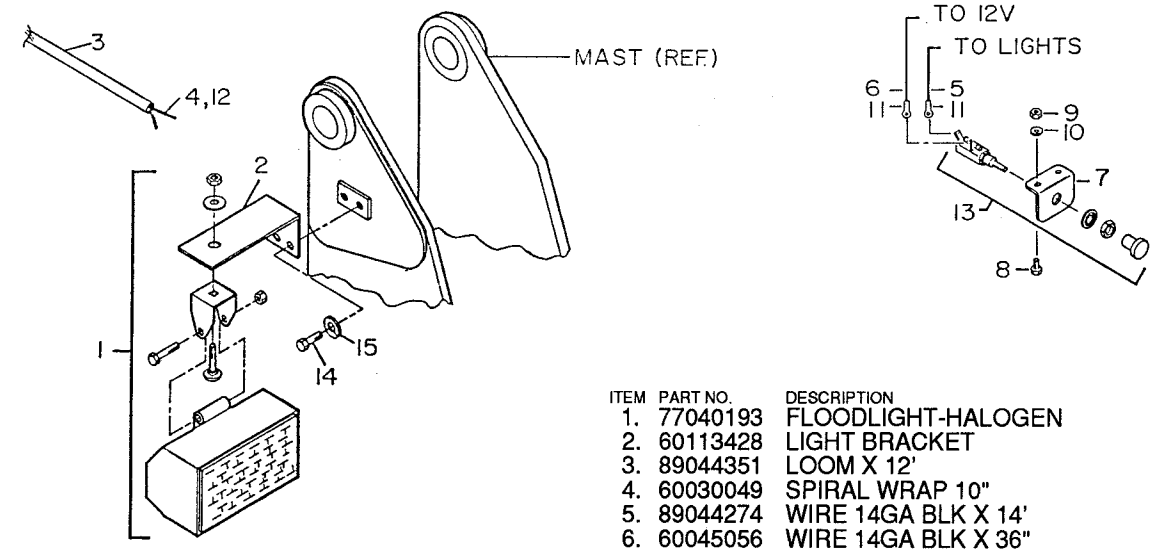
ITEM	PART NO.	DESCRIPTION	QTY
1.	52705080	BRACKET	1
2.	60106760	LINKAGE BRACKET	1
3.	60108086	PLUNGER BRACKET	1
4.	72060002	CAP SCR 1/4-20 X 3/4 HH GR5	5
5.	72061004	SCREW #14 X 3/4 SHT METAL	5
6.	72062000	NUT 1/4-20 HEX	5
7.	72062093	NUT #8-32 HEX	2
8.	72063049	WASHER 1/4 LOCK	5
9.	72066377	CABLE STOP	2
10.	72066523	CLAMP	2
11.	73054654	SOLENOID VALVE 12V	1
13.	89058892	CASING	3.5'
14.	89058934	CABLE	4'
15.	77041251	RELAY	1
16.	89044233	WIRE - 14GGA BRN	20'
17.	77040186	TERMINAL	4
18.	60103535	SWITCH BRACKET (NOT SHOWN)	2
19.	77041345	TOGGLE SWITCH (NOT SHOWN)	2

Figure D-27. OPTION - SYNCHRO START THROTTLE CONTROL (31705270)



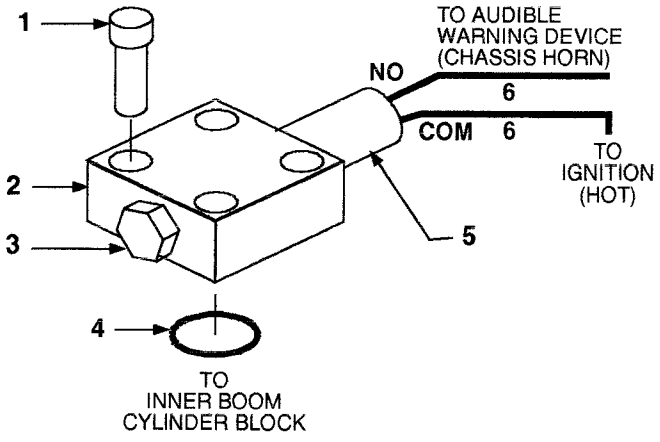
ITEM	PART NO.	DESCRIPTION	QTY
1.	77040281	FLOODLIGHT	2
2.	60113428	LIGHT BRACKET	2
3.	77040280	MOUNTING KIT	2REF
4.	77040048	BUTT CONNECTOR	2
5.	89044274	WIRE 14GA BLK X 14'	2
6.	60045056	WIRE 14GA BLK X 36"	1
7.	60103535	SWITCH BRACKET	1
8.	72060000	CAP SCR 1/4-20 X 1/2 HH GR5	2
9.	72062000	NUT 1/4-20 HEX	2
10.	72063049	WASHER 1/4 LOCK	2
11.	77040000	TERMINAL	2
12.	72060044	CAP SCR 3/8-16 X 3/4 HH GR5	4
13.	77041014	PUSH-PULL SWITCH	1
14.	72063051	WASHER 3/8 LOCK	4
15.	89044351	LOOM X 12'	1
16.	60030049	SPIRAL WRAP 10"	2

Figure D-28. OPTION - CHROME FLOOD LIGHT KIT (51709312)



ITEM	PART NO.	DESCRIPTION	QTY
1.	77040193	FLOODLIGHT-HALOGEN	2
2.	60113428	LIGHT BRACKET	2
3.	89044351	LOOM X 12'	1
4.	60030049	SPIRAL WRAP 10"	2
5.	89044274	WIRE 14GA BLK X 14'	2
6.	60045056	WIRE 14GA BLK X 36"	1
7.	60103535	SWITCH BRACKET	1
8.	72060000	CAP SCR 1/4-20 X 1/2 HH GR5	2
9.	72062000	NUT 3/8-16 HEX	2
10.	72063049	WASHER 1/4 LOCK	2
11.	77040000	TERMINAL	2
12.	77040048	BUTT CONNECTOR	2
13.	77041014	PUSH-PULL SWITCH	1
14.	72060044	CAP SCR 3/8-16 X 3/4 HH GR5	4
15.	72063051	WASHER 3/8 LOCK	4

Figure D-29. OPTION - HALOGEN FLOOD LIGHT KIT (51709313)

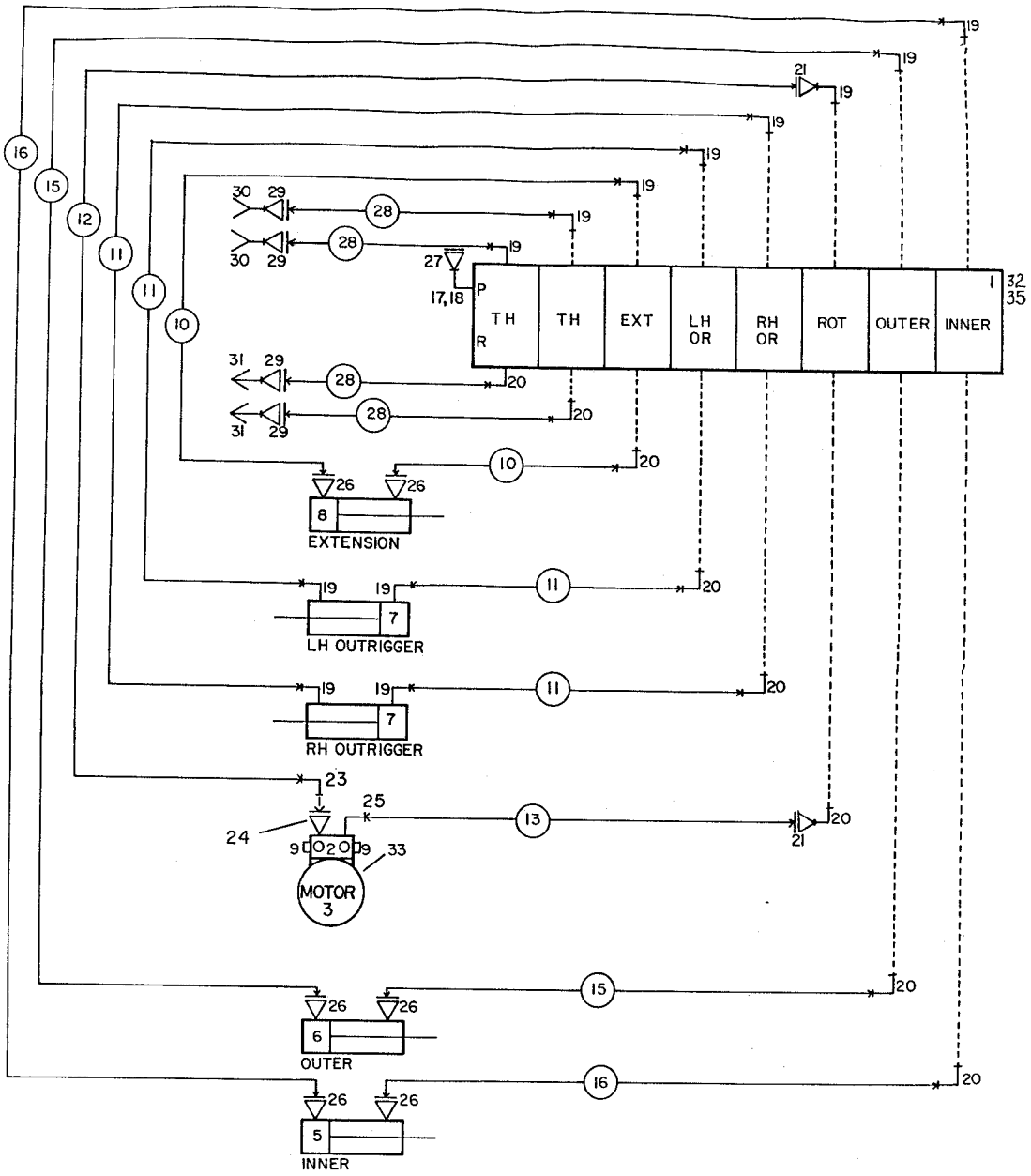


NOTE

This capacity alert system consists of a pressure switch mounted on the lift side of the inner boom lift cylinder which senses hydraulic pressure. It is to be connected electrically (by the customer) to an audible warning device such as the truck chassis horn, using 14-gauge wire.

ITEM	PART NO.	DESCRIPTION	QTY
1.	72060731	CAP SCR 5/16-18X3/4 SH	4
2.	60025221	MANIFOLD	1
3.	72532140	PLUG 9/16-18 STR THD HH	1
4.	7Q072015	O-RING	1
5.	77041283	PRESSURE SWITCH	1
6.	89044188	WIRE-14GA (Customer Supplied)	REF
7.	99900118	INSTALLATION DWG	1

Figure D-30. CAPACITY ALERT KIT - AUDIBLE (31705698)

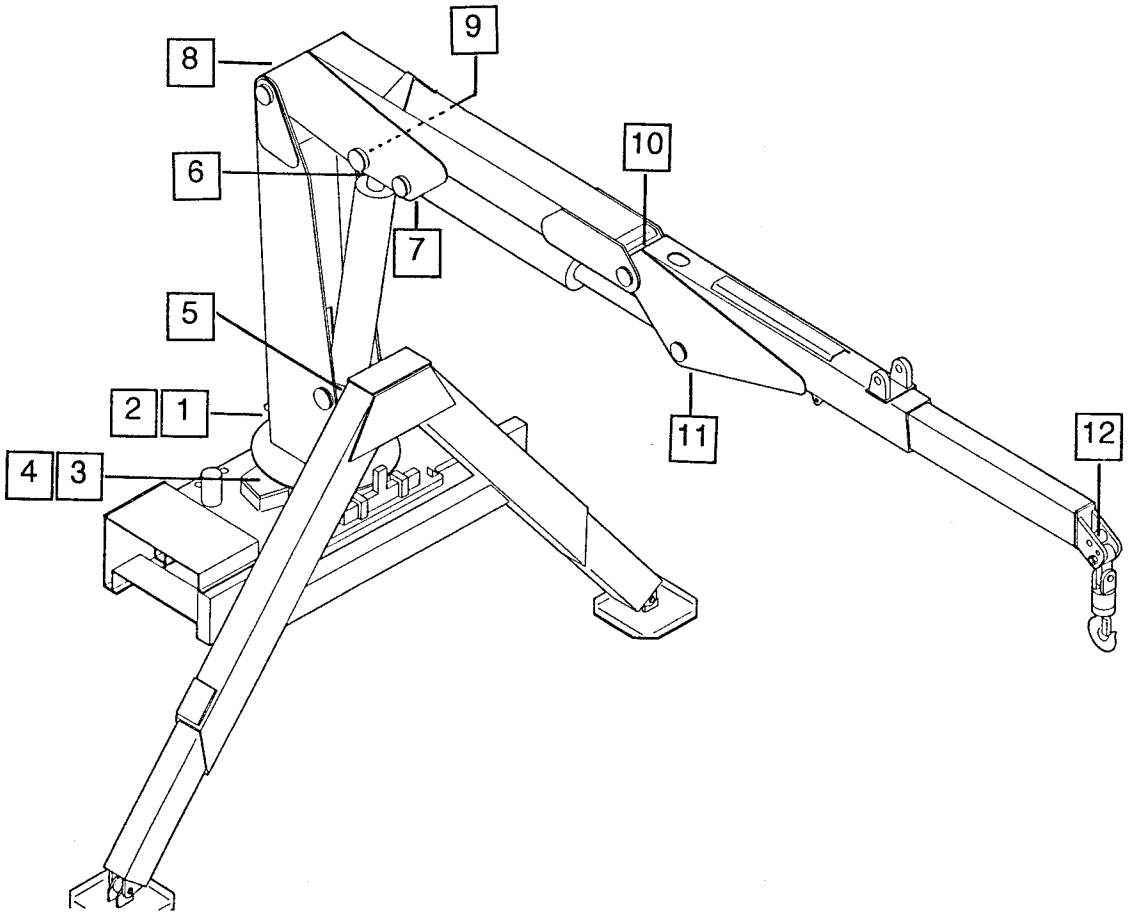


ITEM	PART NO.	DESCRIPTION	QTY
1.		VALVEBANK 8-SECT V20	REF
2.	5V151830	MOTOR BLOCK	REF
3.		MOTOR	REF
5.		INNER CYLINDER	REF
6.		OUTER CYLINDER	REF
7.		OUTERIGGER CYLINDER	REF
8.		EXTENSION CYLINDER	REF
9.	73054470	CARTRIDGE-C'BAL VALVE	2REF
10.	51705002	HOSE ASM 3/8X232 FF	2
11.	51705406	HOSE ASM 3/8X63 FF	4
12.	51703787	HOSE ASM 1/4X15 FF	1
13.	51703595	HOSE ASM 1/4X17 FF	1
15.	51705001	HOSE ASM 3/8X162 FF	2
16.	51705000	HOSE ASM 3/8X70 FF	2
17.	60106322	ELBOW-PR GAUGE MOD	1
18.	72053245	PIPE PLUG 1/4NPT SQHD	1

ITEM	PART NO.	DESCRIPTION	QTY
19.	72053763	ELBOW 3/4MSTR 3/4MJIC	12
20.	72532666	ELBOW 3/4MSTR 3/4MJIC XLG90°	8
21.	72532665	ADAPTER 7/16MJIC 3/4FJIC	2
23.	72053758	ELBOW 7/16MSTR 7/16MJIC 90°	1
24.	72532351	ADAPTER 7/16MSTR 7/16MJIC	1
25.	72532690	ELBOW 7/16FJIC 7/16MJIC	1
26.	72532358	ADAPTER 3/4MSTR 3/4MJIC	6
27.	72532669	ADAPTER 3/4MJIC 7/8FJIC	1
28.	51703948	HOSE ASM 3/8X288 FF	4
29.	72053670	ADAPTER 3/8MPT 3/4MJIC	4
30.	72053540	DISCONNECT COUPLING 3/8FPT	2
31.	72053542	DISCONNECT NIPPLE 3/8FPT	2
32.	72060033	CAP SCR 5/16-18X3 HHGR5	3
33.	72060739	CAP SCR 5/16-18X3 SH	4REF
35.	72062109	NUT 5/16-18 LOCK	3

Figure D-31. HYDRAULIC KIT 8-SECTION MANUAL (91705450)

Section 5. REFERENCE



ITEM	LOCATION DESCRIPTION	LUBRICANT	FREQUENCY
1.	TURNTABLE/BEARING GREASE EXTENSION *ROTATE CRANE WHILE GREASING	SHELL ALVANIA 2EP OR SHELL RETINAX "A"	WEEKLY
2.	DRIVE GEAR GREASE EXTENSION		
3.	PINION GEAR		
4.	PINION SUPPORT		
5.	INNER CYLINDER BASE		
6.	INNER CYLINDER ROD		
7.	OUTRIGGER CYLINDER BASE		
8.	MAST/INNER BOOM HINGE PIN		
9.	INNER BOOM/INNER CYLINDER PIN		
10.	INNER BOOM/OUTER BOOM HINGE PIN		
11.	OUTER CYLINDER ROD		
12.	EXTENSION BOMM/TIREHAND 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.

Figure E-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 PLAIN (LB FT)	SAE J429 GRADE 5 PLATED (LB FT)	SAE J429 GRADE 8 PLAIN (LB FT)	SAE J429 GRADE 8 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 PLAIN (LB FT)	SAE J429 GRADE 5 PLATED (LB FT)	SAE J429 GRADE 8 PLAIN (LB FT)	SAE J429 GRADE 8 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.

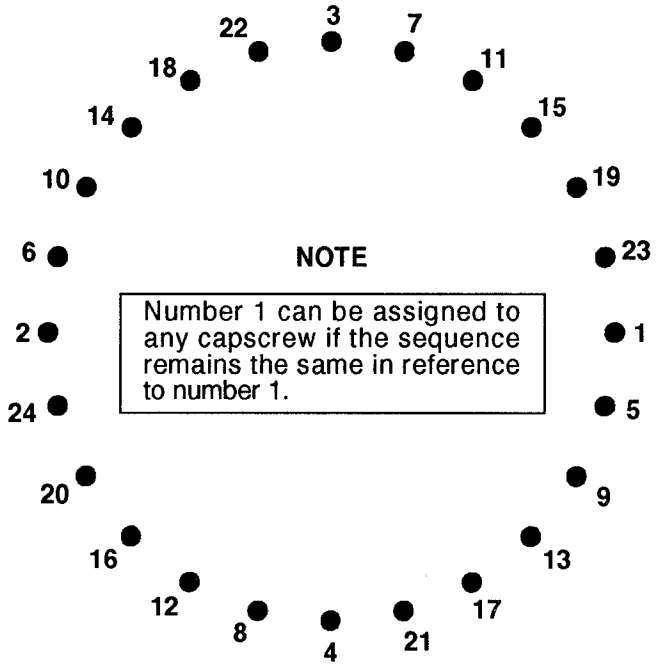
1. Bolt manufacturer's particular specifications should be consulted when provided.
2. Flat washers of equal strength must be used.
3. All torque measurements are given in foot-pounds. To convert to inch-pounds, multiply by 12.
4. Torque values specified are for bolts with residual oils or no special lubricants applied. If special lubricants of high stress ability, such as Never-Seez compound graphite and oil, molybdenum disulphite, 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 fatique causing serious injury or DEATH.

Figure E-2. TORQUE DATA CHART

Refer to the diagram below for proper tightening/torqueing 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 x 265 FT-LBS = 106 FT-LBS)

4. Repeat Step 3, but torqueing all capscrews to 75% of the specified torque value. Continue to follow the tightening sequence. (EXAMPLE: .75 x 265 FT-LBS = 199 FT-LBS)

5. Using the proper sequence, torque all capscrews to the listed torque value as determined from the Torque Data Chart.

Figure E-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.

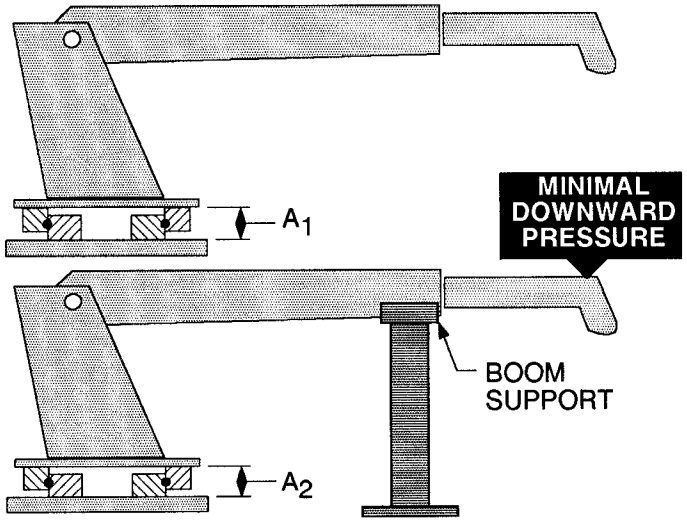
Periodic readings indicating a steady increase in TILT may be an indicator of bearing wear. Note that a bearing found to have no raceway cracks or other structural irregularities should be reassembled and returned to service.

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

NOTE	IMT CRANE OR TIREHAND MODEL				
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.		814 1007 1014 2010 215 2015 2109 2815 3016 315A 320H 3515 3617 3625 421 425 5016 TH7 BODY ROT'N TH1449A BODY ROT'N TH15A CLAMP TH1836A CLAMP TH2551 CLAMP TH2557 CLAMP TH2557A CLAMP	4817 4825 516 525 5826 6014 6425 725 7020 7025 8025 8031 TH10 BODY ROT'N TH12 BODY ROT'N	32018 32030 HAWK-H1150 HAWK-H1150TL HAWK-H4961	9616 9825 9831 10020 10025 1216 1325 1331 13031 13034 13426 14018 14048 14126 15033 1725 18026 20017 HAWK-H1200 TH1836 BODY ROT'N TH1836A BODY ROT'N TH2551 BODY ROT'N TH2557 BODY ROT'N 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 E-4. TURNTABLE BEARING INSPECTION FOR REPLACEMENT

SPARE PARTS LIST
(Major Assemblies Only)
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.

FIGURE	ITEM NO.	PART NO.	DESCRIPTION	QTY
D-4	4	73051223	MOTOR	1
D-4	5	60020124	BUSHING	1
D-4	6	60020122	BUSHING	1
D-4	7	60020123	THRUST WASHER	1
D-4	8	60020120	BUSHING	1
D-4	9	60020121	BUSHING	1
D-4	10	71056074	DRIVE GEAR	1
D-4	11	71056073	PINION GEAR	1
D-4	12	70056188	TURNTABLE-BEARING	1
D-4	13	71056072	INTERMEDIATE GEAR	1
D-4	16	72601148	CAP SCR 7/8-9 X 3 HH GR8	23
D-4	17	72063115	WASHER 7/8 HARDENED	23
D-4	25	71056374	BRAKE	1
D-4	43	70034295	BEARING	1
D-4	44	7BF81225	BUSHING	8
D-4	61	60030176	WEAR PAD	2
D-6	1	7Q072361	O-RING	2
D-6	7	7BF81225	BUSHING	6
D-6	9	73054304	VALVE 10GPM	4
D-6	19	7BF81225	BUSHING	8
D-6	20	9X262832	SEAL KIT	2
D-7	3	72060207	CAP SCR 3/4-10 X 3 HH GR8	18
D-7	4	72063116	WASHER 3/4 HARDENED GR8	18
D-8	5	60020192	BUSHING	3
D-9	14	60020190	BUSHING	3
D-9	15	60020189	BUSHING	2
D-9	16	73054242	VALVE 25GPM	1
D-9	18	9C323239	SEAL KIT	1
D-10	6	60020195	BUSHING	2
D-10	7	60030028	WEAR PAD	1
D-10	8	60030032	WEAR PAD	2
D-10	9	60030074	WEAR PAD	1
D-11	9	60020193	BUSHING	2
D-11	11	73054242	VALVE 25GPM	1
D-11	12	60020194	BUSHING	2
D-11	19	9C302835	SEAL KIT	1
D-12	21	60030071	WEAR PAD	1
D-12	22	60030072	WEAR PAD	2
D-13	16	73054304	VALVE 10GPM	2
D-13	18	9C162023	SEAL KIT	1

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 9616 Crane	MANUAL PART NO. 99900276-5/91
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 occurence.

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

IOWA MOLD TOOLING Co., Inc.
BOX 189, GARNER, IA 50438-0189
TEL: 515-923-3711
PRODUCT SUPPORT FAX: 515-923-3674