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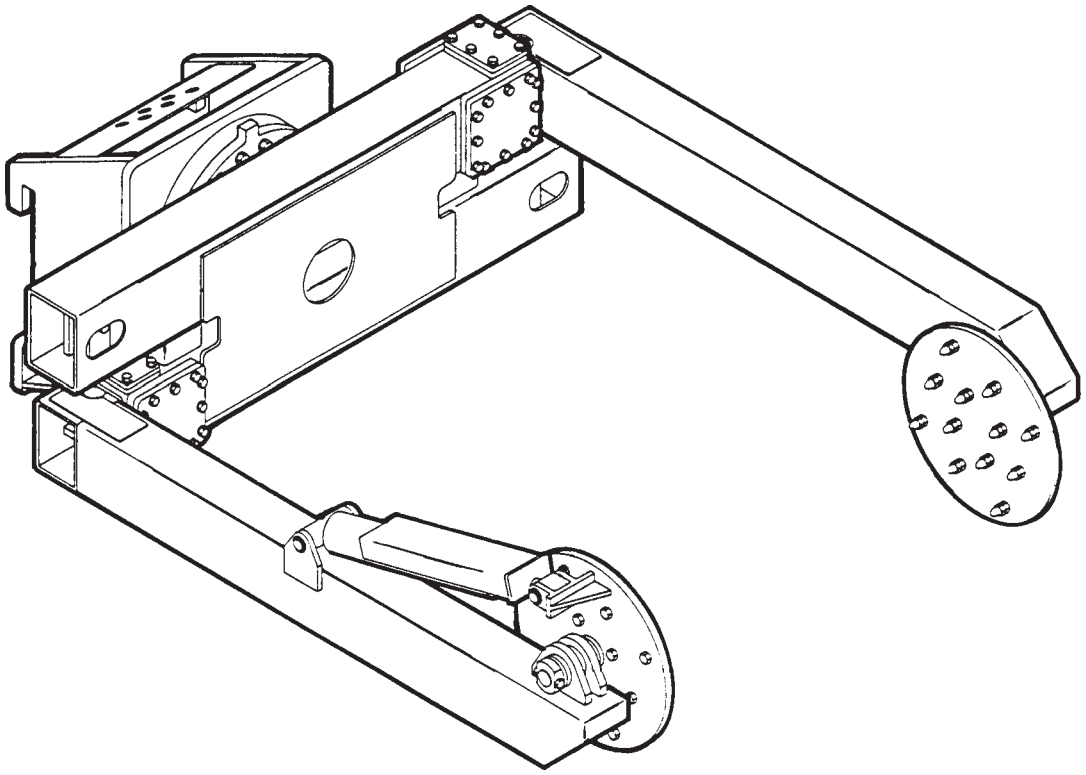
Tirehand 1449A

SERVICE MANUAL



IOWA MOLD TOOLING CO., INC.
BOX 189, GARNER, IA 50438-0189
TEL: 641-923-3711
TECHNICAL SUPPORT FAX: 641-923-2424
MANUAL PART NUMBER 99900368

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.

REVISIONS LIST

DATE	LOCATION	DESCRIPTION OF CHANGE
2-6-2006	7-1,20	WARRANTY
3-21-2007	COVER, 3-3	UPDATED OWNERSHIP STATEMENT, LOGO, SERIAL NUMBER PLACARD
1-7-2008	5-15	ADDED 99904165 DECAL PLACEMENT DRAWING.
2-12-2008	1-5	ECN 10661 - NEW CAPACITY CHART
12-31-2008	1-3	UPDATED TIREHAND SPECIFICATIONS
1-28-2009	5-13	UPDATED HYD KIT DRAWING AND HOSES
9-14-2009	2-4	ECN 11103 - REMOVED SELECTOR VALVE DECAL.
5-22-2012		ECN 11615 - UPDATED CYLINDERS TO REPLACE WAFER LOCKS WITH STOP TUBES.
7-15-2013	Section 7	ADDED CHAPTER 7 PER ENGINEERING MARKUP.

SECTION 1. TIREHAND 1449A SPECIFICATIONS

NOTES

TIREHAND 1449A SPECIFICATIONS

GENERAL SPECIFICATIONS

TIREHAND MAXIMUM CAPACITY	4200 lb (1905 kg)
BODY ROTATION	350° (6.11 Rad)
CLAMPING SPAN	50" to 110" (127.0 - 279.4cm)
METHOD OF CLAMPING	Horizontally telescoping
CLAMPING PAD ROTATION	120° (2.09 Rad.)
SIDE SHIFT	Provided by forklift. 8" on loader style.
CLAMPING LOAD HOLDING VALVES	Counterbalance valves
HYDRAULIC CONTROL VALVE	Located on head assembly
HYDRAULIC CONTROLS	3-function remote control. 4 with side shift.
ROTATION SYSTEM	Spur gear drive
TIREHAND WEIGHT	2020 lbs (916.3 kg)
TIREHAND HORIZONTAL CENTER OF GRAVITY FROM VEHICLE ATTACHMENT POINT	28" (71.1cm)
TIREHAND HORIZONTAL CENTER OF GRAVITY WITH A 37.5-39 TIRE FROM VEHICLE ATTACHMENT POINT	62" (157.5cm)
OPTIMUM PUMP CAPACITY	5 U.S. GPM @ 2300 PSI (18.9 liters/min @ 158.6 bar)
COUNTERWEIGHT NEEDED	As required for stabilization
ALLOWABLE BEAD BREAKING METHOD	Push Bar, ONLY

CYLINDERS

	BORE	STROKE
CLAMPING	2-1/2" (6.35cm)	30" (76.2cm)
PAD ROTATION	3" (7.62cm)	13" (33cm)

VEHICLE COMPATABILITY

The Tirehand 1449A will permanently adapt to either a forklift truck or a front-end loader. When mounting to a forklift truck, it is recommended that the truck be equipped with a sideshifter. If adapted to a front-end loader, quick couplers are available which enable the disconnection of the Tirehand so that the original bucket can be quickly coupled to the machine for normal operations.

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

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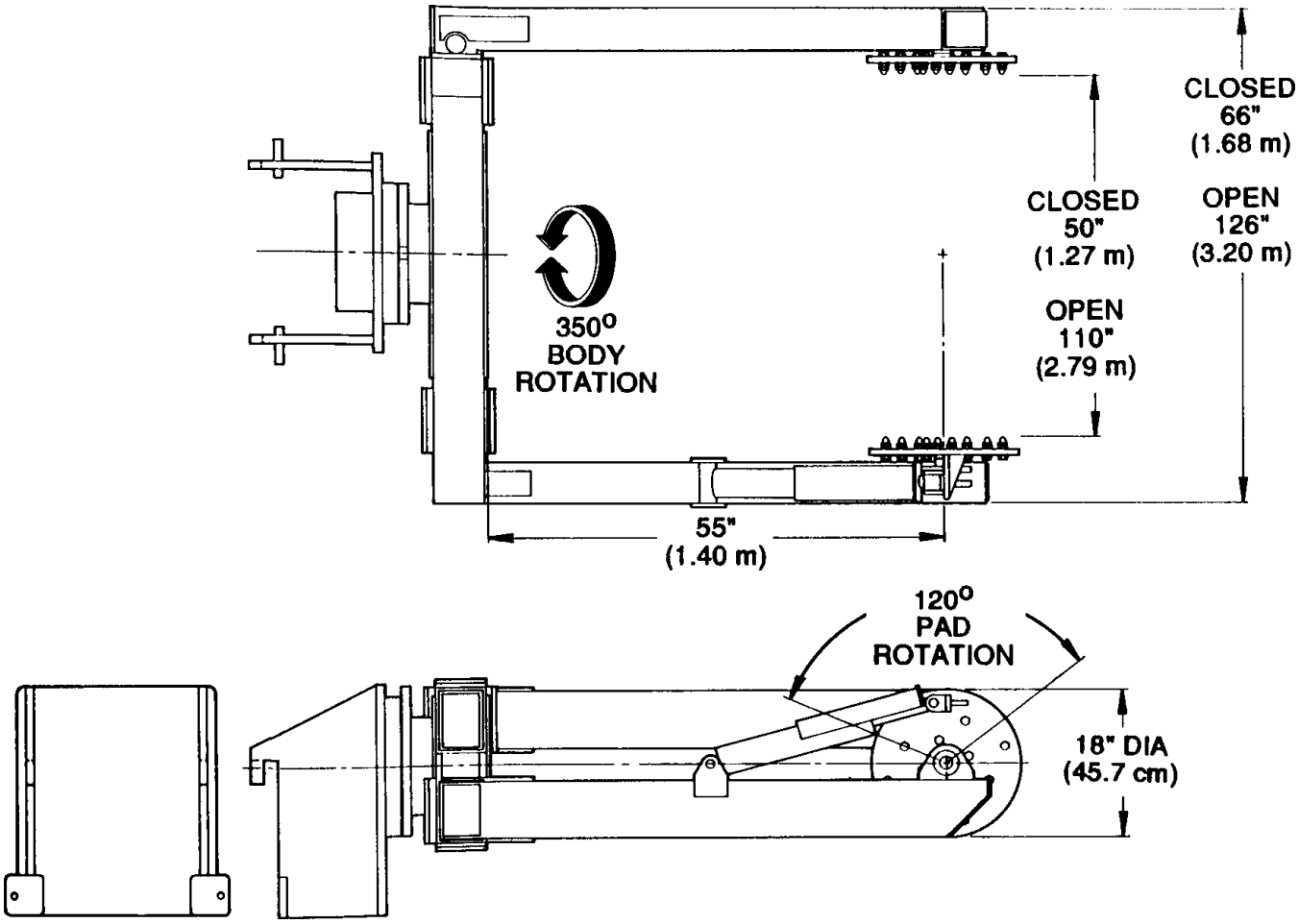
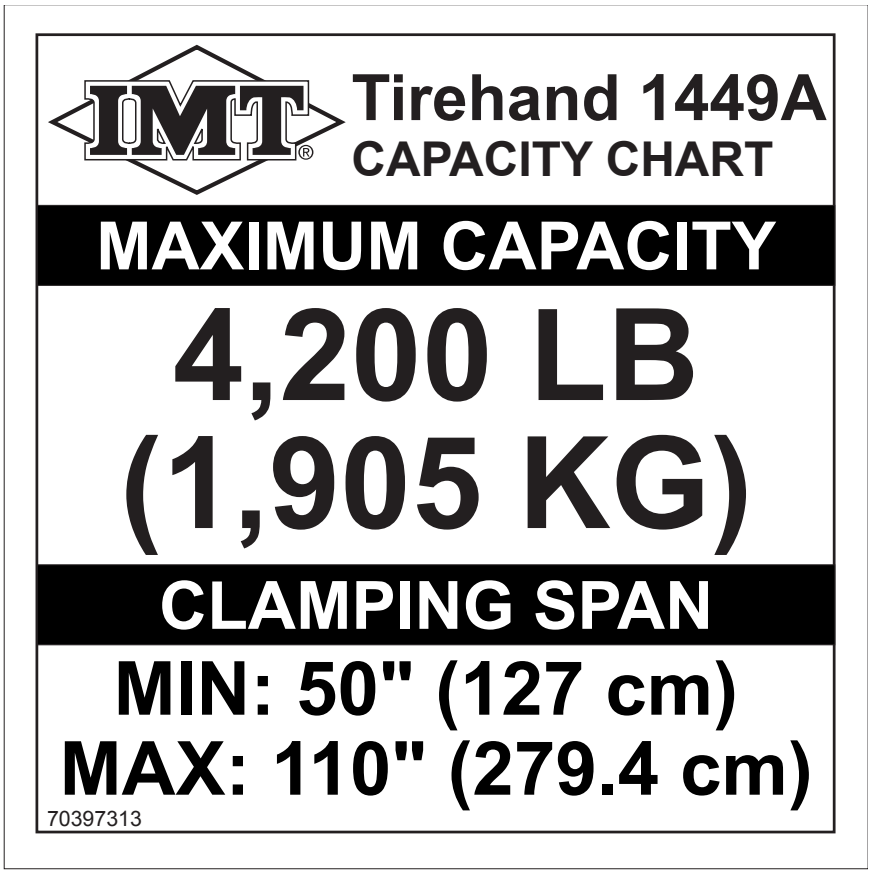
GEOMETRIC CONFIGURATION




IMT®
Tirehand 1449A
CAPACITY CHART
MAXIMUM CAPACITY
4,200 LB
(1,905 KG)
CLAMPING SPAN
MIN: 50" (127 cm)
MAX: 110" (279.4 cm)
70397313

NOTES

SECTION 2. TIREHAND 1449A INSTALLATION

NOTES

GENERAL

Since each installation of the Tirehand 1449A is a unique situation, this section will deal only in general instructions. Carefully read and completely understand this section before beginning the installation.

VALVEBANK INSTALLATION

Carefully examine the interior of the cab of the carrier vehicle for the best possible location of the valvebank. During this inspection, consider:

1. Ease of operation.
2. Ease of installation
3. Lack of niterference with other controls or components of the loader

NOTE

Unless specified otherwise, the term “LOADER” can mean either a front-end loader or a forklift.

Having decided the best location for the valvebank, either fabricate a bracket for mounting the valvebank or bolt the valvebank directly to the instrument panel or bulkhead panel of the loader. Bear in mind that whichever method is selected, the valvebank should be held rigid and must be accessible to the hydraulic hoses. Install the valvebank.

TIREHAND INSTALLATION

The Tirehand 1449A may be installed on any front-end loader or forklift having sufficient lifting capacity and stability. Usually the Tirehand is equipped with a base unless the customer specifies otherwise. The base specifically designed to interface with a particular type of loader. This base is pinned to the carrier vehicle and the Tirehand sub-base, in turn, is pinned to the base through the side-shift shafts riding on linear bushings. Again, it must be emphasized - each installation is unique.

1. Pin the Tirehand to the loader.
2. Check all fittings for adequate lubrication.
3. Test operate the carrier vehicle for vertical freedom of movement. If there is a point at which the Tirehand or loader may be damaged by raising or lowering the Tirehand, install stop blocks to prevent the loader from damaging itself or the Tirehand.

HYDRAULIC INSTALLATION

If necessary, cut a hole in the cab to provide a means for routing the hoses between the valvebank and the Tirehand. Depending on the loader, the Tirehand may or may not have a side-shift function. If the base is equipped with side-shift cylinders, install the hoses. Otherwise, plug the ports on the valvebank and remove the handles if a 4-section valvebank is supplied.

TESTING

Raise the Tirehand until the clearance is sufficient to allow operation of all Tirehand functions. Test operate all functions and check for leaks.

WARNING

Stay clear of all pinch points while operating this unit. Failure to comply may result in a serious injury or death.

NOTE

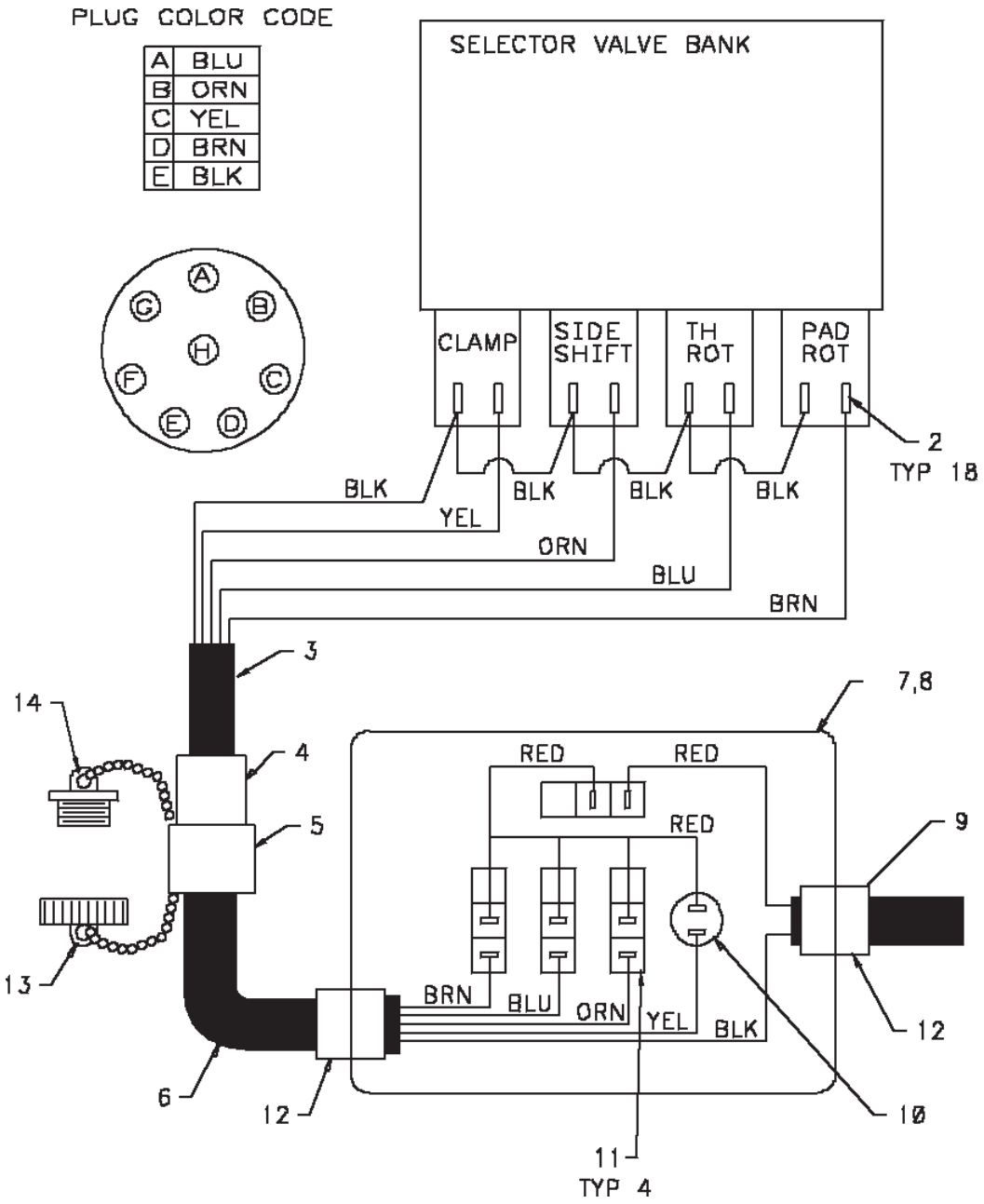
If the motion of the Tirehand is bumpy or erratic, it indicates the presence of air in the system. Purge the air from the system.

Test the unit at rated capacity and note the points of instability. Add counterweights as necessary.

If the loader is articulated, make certain that none of the Tirehand hoses interfere with the steering. Check all hose routings for exposure to excessive abrasion.

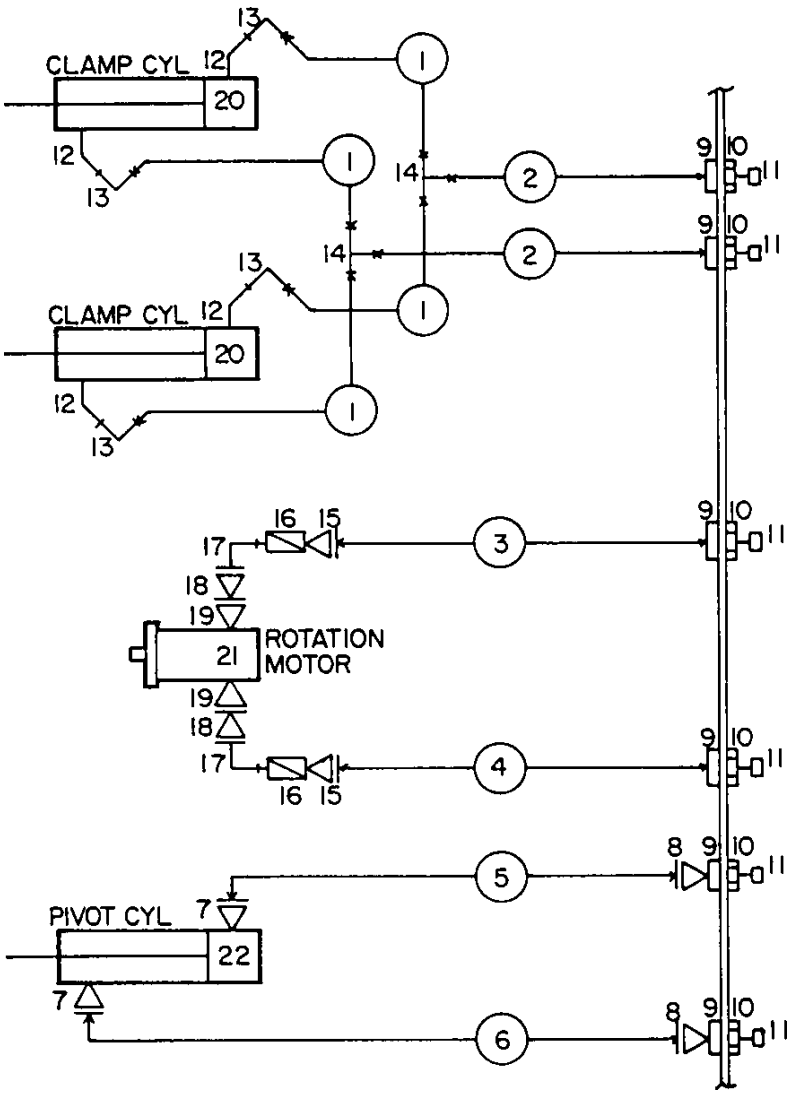
CONTROL KIT (90707628)

ITEM	PART	DESCRIPTION	QTY
2.	77040186	TERMINAL 1/4"	18
3.	89044108	CABLE 18GA/8 WIRE	18"
4.	77044486	RECEPTACLE	1
5.	77044489	PLUG	1
6.	89044108	CABLE 18GA/8 WIRE	22.5'
7.	60111300	JIC BOX	1
8.	70392549	CONTROL DECAL	1
9.	89044188	CABLE 14GA/2 WIRE	13’
10.	77041347	TOGGLE SWITCH - DBL THR	1
11.	77041345	TOGGLE SWITCH - SGL THR	4
12.	77044018	STRAIN RELIEF	2
13.	77044488	CAP AND CHAIN	1
14.	77044487	PLUG AND CHAIN	1



HYDRAULIC KIT (91705523)

ITEM	PART	DESCRIPTION	QTY
1.	51704206	HOSE ASM 3/8X28"	4
2.	51704448	HOSE ASM 3/8X19"	2
3.	51703701	HOSE ASM 3/8X10"	1
4.	51703704	HOSE ASM 3/8X12"	1
5.	51703544	HOSE ASM 1/4X114"	1
6.	51705364	HOSE ASM 1/4X128"	1
7.	72532351	ADAPTER #4MSTR #4MJIC	2
8.	72532665	ADAPTER #4MJIC #8FJIC	2
9.	72532672	BULKHEAD UNION 37°JIC #8	6
10.	72531708	BULKHEAD NUT 37°JIC #8	6
11.	72532675	CAP #8JIC	6
12.	72053777	ELBOW #8MSTR #8MJIC 45°	4
13.	72532658	ELBOW #8MJIC #8FJIC 90°	4
14.	72531205	TEE #8MJIC 1/2TUBE	2
15.	72053670	ADAPTER 3/8MPT #8MJIC	2
16.	73054139	COLORFLOW VALVE 3/8FPT	2
17.	72053563	STREET ELBOW 3/8NPT 45°	2
18.	72053723	ADAPTER 3/8MPT 3/8MPT	2
19.	72053743	ADAPTER #10MSTR 3/8FPT	2
20.		CLAMP CYLINDER	2REF
21.		ROTATION MOTOR	1REF
22.		PIVOT CYLINDER	1REF



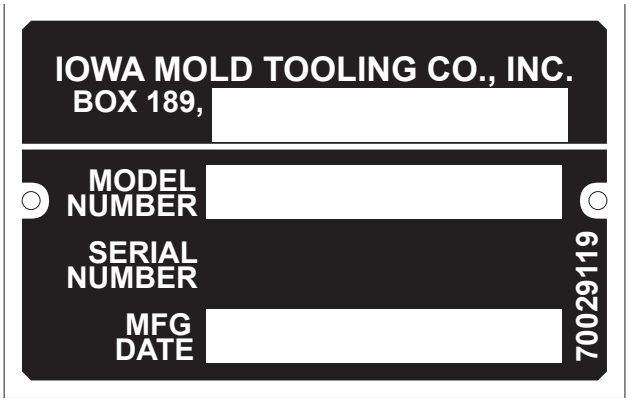
NOTES

SECTION 3. TIREHAND 1449A OPERATION

NOTES

GENERAL

Every Tirehand has an identification placard, see drawing below, fastened to the unit between the clamping arms. When ordering parts, communicating warranty information or referring to the unit in correspondence, always include the assigned serial number and model numbers. All inquiries should be addressed to Iowa Mold Tooling Co., Inc., 500 Hwy 18 West, Garner, Iowa 50438
or
telephone (641) 923-3711.



SERIAL NUMBER PLACARD

SAFETY FACTORS

Three important factors in the safe operation of the unit are a competent operator, mechanical soundness of the unit and absolute assurance that the unit is not loaded to exceed its maximum rated capacity. The safety precautions contained in this section should be read and observed at all times during operation.

LOAD LIMITS

The Tirehand is designed to give satisfactory service if operated within maximum allowable load limits of 4200 lbs. (1906 kgs). Overloading the unit may result in potentially serious safety hazards and shortened service life of the unit - exceeding the stated load limit can cause tipping or structural failure.

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

EQUIPMENT INSPECTION

Before operating the unit, always perform the safety checks outlined below. These procedures are vital to the detection of equipment malfunctions and damage which may be potential safety hazards.

STRUCTURAL SOUNDNESS
Inspect the unit for damaged and/or loose nuts or bolts.

HYDRAULIC OIL SUPPLY
Check oil level in the hydraulic oil reservoir and fill if necessary.

LEAKAGE
Examine all visible hoses for frays, blisters and signs of excessive wear. Look for signs of lubricating or hydraulic oil leakage.

CONTROLS
Make a short test for proper control operation.

REPAIRS
Before putting the unit into service, correct all defects and malfunctions.

This equipment check should be performed before every work task and as a periodic preventive maintenance check.

WORK STATION POSITIONING

The best location for the working unit is on firm, level and dry pavement or ground. Overhead obstructions should be avoided as much as possible.

Care should be taken to assure that all personnel are clear of the work area before starting operation.

At job sites where terrain is graded or unfirm, unit operation should be restricted to compensate for reduced stability.

WARNING

The operator should be alert at all times for the presence of personnel in the work area. Operations must be suspended until the work area is cleared.

OPERATOR TRAINING

The Tirehand is designed for operator simplicity. Prior to operating the unit at job sites, the operator should be thoroughly familiar with control operations, prescribed operating procedures and safety precautions. In addition, the operator should be prepared to take any necessary remedial action in an emergency situation.

CONTROLS

The controls for the Tirehand and the carrier vehicle are located in the cab of the loader.

VEHICLE CONTROLS

The vehicle is equipped with controls which enable the operator to raise, lower and tilt the Tirehand.

UNIT CONTROLS

The controls for the Tirehand are located in the cab of the carrier vehicle. Their function and operation is as follows:

CLAMP

Move the function switch to CLAMP/ RELEASE and move the hydrostatic control to operate.

WARNING

Attempting to use the clamping action of the Tirehand to seat the bead of the tire is a hazardous practice and should not be attempted.

SIDE-SHIFT

Move the function switch to SIDE-SHIFT Left/ Right, move the hydrostatic control to operate.

ROTATION

Move the function switch to ROTATION CW/ CCW and move the hydrostatic control to operate.

NOTE

Speed and direction are controlled by the vehicle hydrostatic control.

PAD ROTATION

Move the function switch to AXIAL (pad rotation) and move the hydrostatic control to operate.

NOTE

Direction of pad rotation is as seen from the operators station with the “TOP” decal pointing up. Rotating the Tirehand 180o (3.14 Rad.) will result in causing the pads to rotate in a direction opposite to that shown on the control decal (see illustrations).

TASK PERFORMANCE

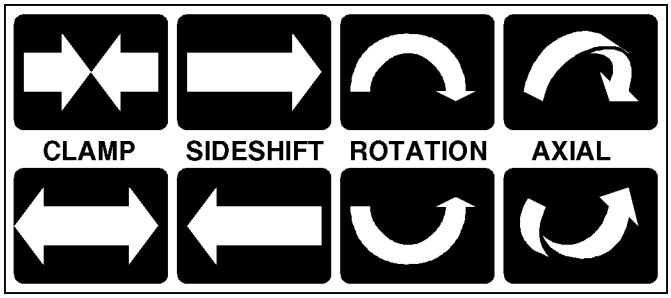
Prior to operating this unit, thoroughly familiarize yourself with the operating restrictions and requirements. To initiate operation:

1. Manuever the vehicle into a position which provides proper orientation of the Tirehand to the tire with the loader boom at the proper elevation.
2. Position the opened hand in order to properly grasp the tire

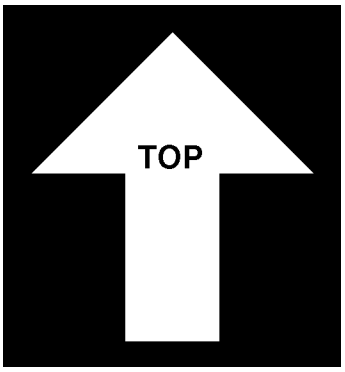
WARNING

Make certain personnel are clear before continuing.

3. Advance the loader, manipulate the controls to perform the desired function and grasp the tire.



CONTROL DECAL



“TOP” DECAL

POWER LINE PROXIMITY

Except where the electrical distribution and transmission lines have been de-energized and visibly grounded at point of work, or where insulating barriers not a part of or an attachment to the unit have been erected to prevent physical contact with the lines, unit shall be operated proximate to, under, over, by or near power lines only in accordance with the following:

1. For lines rated 50 kV or below, minimum clearance between the lines and any part or the unit or load shall be ten (10) feet (3.05m).

2. For lines rated over 50 kV, minimum clearance between the lines and any part of the unit or load shall be ten (10) feet plus 0.4 inch (3.05m plus 1 cm) for each 1 kV over 50 kV, or use twice the length of the insulator but never less than ten (10) feet (3.05m).

3. In transit with no load and boom lowered, the clearance shall be a minimum of four (4) feet (1.22m)

4. It is recommended that a person be designated to observe the clearance and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means.

In addition to the above mentioned safety measures, the operator must take into account sag, sway and deflection factors, in allowing for proper clearances.

OPERATING REQUIREMENTS DECAL

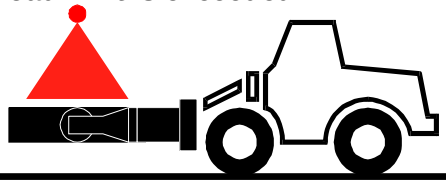
DANGER

FAILURE TO OBEY THE FOLLOWING WILL RESULT IN

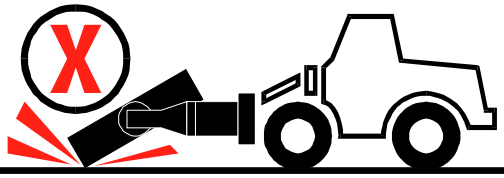
DEATH, SERIOUS INJURY,

INSTABILITY OR EQUIPMENT DAMAGE

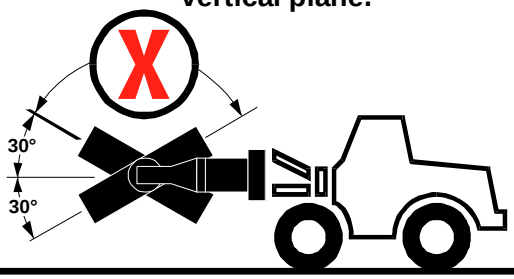
NEVER attempt to handle tires filled with ballast. Stability or structural failure may result if load limit is exceeded.



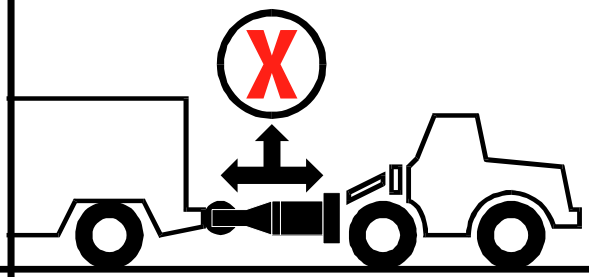
NEVER drag the tire - the unit is designed to lift and carry.



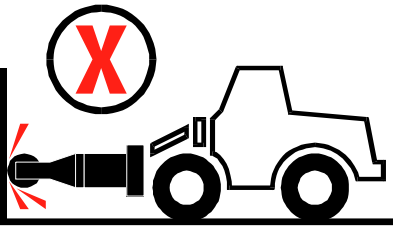
NEVER transport a tire rotatyed more than 30° off the horizontal plane.
FOR EXAMPLE: Do not transport in a vertical plane.



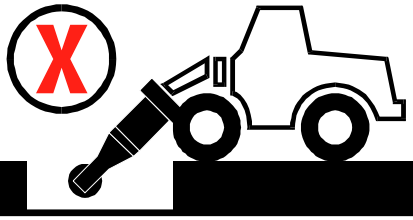
NEVER use the unit for any jacking, pulling or dragging operation involving an object or another vehicle.



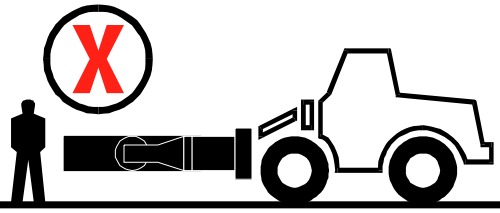
NEVER impact-load or hammer-push with the unit.



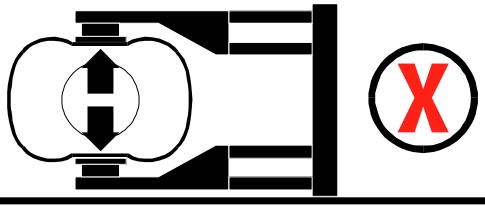
NEVER operate hand below ground level.



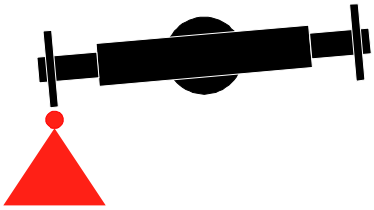
NEVER operate the unit while persons not required for operation are in the work area.



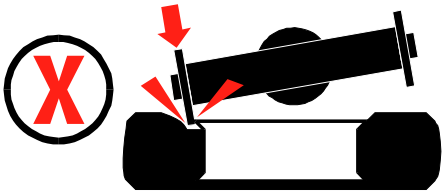
NEVER clamp an uninflated tire and then inflate. Damage or injury WILL result.



NEVER sling a load using one arm of the Tirehand.



NEVER use one arm of the Tirehand to break beads.



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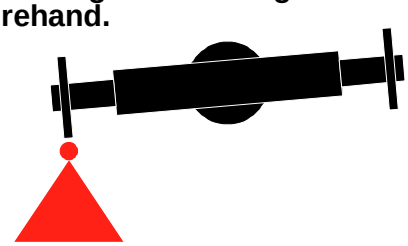
OPERATING RESTRICTIONS DECAL

TIREHAND OPERATING RESTRICTIONS

The Tirehand 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 while attempting to break tire beads **with one arm** of the Tirehand, or by slinging a load **under one arm** of the Tirehand

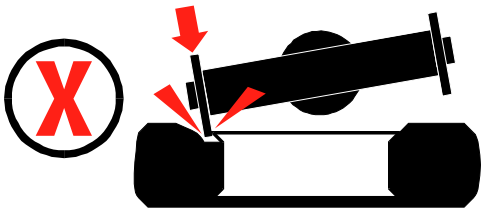
Use of a single Tirehand arm for lifting or carrying a load will void the tire hand warranty.

NEVER sling a load using one arm of the Tirehand.



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. 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.**

NEVER use one arm of the Tirehand to break beads.



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.

SECTION 4. TIREHAND 1449A MAINTENANCE

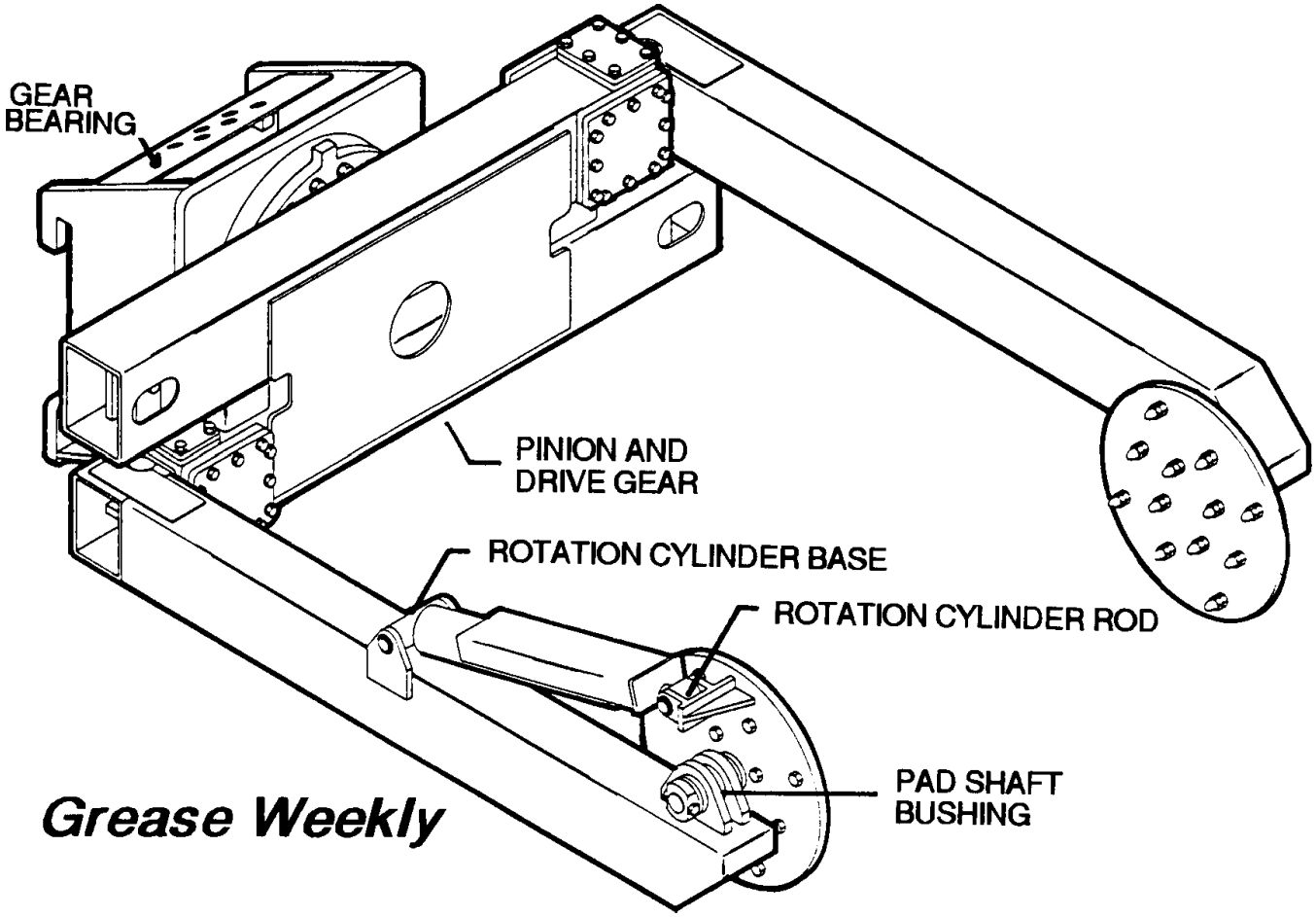
NOTES

GENERAL

Proper maintenance on a regular schedule is essential to keep your unit operating efficiently. Outlined in this section are proper maintenance procedures and necessary service intervals. Personnel responsible for unit upkeep should become familiar with frequency and type of maintenance required and perform these tasks at the recommended intervals

LUBRICATION

Maintaining the proper lubrication schedule will vary with climatic conditions and frequency of use. The lubrication chart is intended to serve as a schedule for a normal work load and moderate weather variance. Periods of heavy use would shorten service intervals.



LUBRICATION POINTS

HYDRAULIC SYSTEM

HYDRAULIC FLUID SELECTION

Minimum viscosity specifications for hydraulic oil to be used in the Tirehand are given in Table below. Any major oil company can supply products which meet these requirements.

Oils selected for use with this class of equipment, in addition to meeting viscosity specifications, should have the following additives:

1. Antifoam Inhibitors
2. Antioxidant Inhibitors
3. Rust Resistant Additives
4. Antiwear Additives

HYDRAULIC FLUID SPECIFICATIONS

Table below states oil specifications for a full range of operating temperatures encountered in the temperate zones. Arctic conditions present special requirements which are not in the scope of this chart and must be analyzed individually. Consult your oil supplier for the proper hydraulic fluids for working under these severe conditions. Electric reservoir heaters are available to improve operation at extremely low temperatures.

HYDRAULIC FLUID DETERIORATION

Contamination of the hydraulic fluid by solvents, water, dust or other abrasives will cause deterioration of the fluid. Sustained presence of these impurities will result in premature breakdown of antifoam, lubrication and antirust and viscosity properties. Introduction of water to the system and operation at high temperatures (above 180oF) will result in an increase in the oil oxidation rate. Oxidation produces varnish-forming materials and sludge in the oil. Operating the system on a sustained basis with contaminated oil or broken down oil will increase wear and the efficient service life of the unit can be significantly shortened. Periodically, draw off a sample of the oil and check the oil for breakdown. To check oil quality:

1. Place oil sample in a clean glass.
2. Smell the oil to detect a burnt or rancid odor.
3. Visually examine the sample for a dark or cloudy color.
4. Allow the sample to stand for several minutes. Inspect the sample for water which will settle to the bottom of the glass if present. Water can result from a leak in the system or condensation due to temperature extremes.

LUBRICATION CHART

APPLICATION POINT	LUBRICATION PRODUCT	APPLICATION MEANS	INTERVAL
CARRIER BOOM PIVOT POINTS LINEAR BUSHING (4) HINGE PINS (8) CLAW GEAR-BEARINGS (2) CLAW DRIVE GEARS (2) CLAW PINION GEARS (2) CLAMP CYLINDERS (2) BODY GEAR-BEARING BODY DRIVE GEAR	SHELL ALVANIA 2EP OR SHELL RETINAX "A" OR EQUIVALENT	HAND GREASE GUN OR PNEUMATIC PRESSURE GUN	WEEKLY

HYDRAULIC FLUID SPECIFICATIONS

AMBIENT TEMPERATURE RANGE, ^{O}F	0-90	BELOW 32	32 - 90	ABOVE 90
MINIMUM POUR POINT, ^{O}F	-30	-25	+10	+10
MAXIMUM VISCOSITY, SSU @ 0^{O}F	4,000	4,000	---	---
MINIMUM VISCOSITY, SSU @ 100^{O}F	140 - 190	100 - 130	150 - 200	200 - 315
MINIMUM VISCOSITY, SSU @ 210^{O}F	48	41	43	47
MINIMUM VISCOSITY INDEX	139	90	90	90

When any of these conditions is observed, the system should be purged and filled with new oil. In addition, the oil should be changed in the reservoir and complete system:

1. After every 800 hours of operation or every six months, whichever occurs first.
2. After pump or other major hydraulic component failure.

HYDRAULIC SYSTEM PURGING

Purging the hydraulic system requires a new oil supply sufficient to completely fill the reservoir, lines, cylinders, etc., and an extra allowance for loss during this operation. To reduce oil loss during this process, operate the vehicle engine at a reduced speed. In purging, new oil is supplied to the pump pressure line and old oil is discharged from the reservoir return line. Two operators will be required during this procedure - one to operate the controls and the other to regulate pump flow (engine speed).

CAUTION

Do not allow the reservoir level to drop below 1/3 capacity during this operation.

Purging is accomplished as follows:

1. Locate the unit in an area that provides solid, level footing and space to accomodate the full operating range of the unit. Shift the loader into neutral.
2. Raise the loader's boom approximately 5 feet above ground level. Operate the SIDE-SHIFT function fully in one direction.
3. With the Tirehand right side up, rotate it so that it is 30o off the horizontal position. Extend the clamping arms full stroke.
4. Kill the engine, drain the hydraulic reservoir and remove the suction hose and the hose to the pump. Drain and reassemble.

NOTE

Follow any Federal, State and Local regulations in the disposal of waste oil.

5. Disconnect the reservoir return line and direct the discharge into a sump or waste container. Plug the return line port on the reservoir and fill the reservoir with clean oil (refer to Paragraph 4-3-1).

NOTE

Be thoroughly familiar with the following steps and prepared to perform them in an uninterrupted sequence or stop the engine at the end of each step. If this is not done, excessive oil waste will occur.

6. Start the engine and engage the pump if necessary. With the return line directed into a sump (step 5), retract the clamping arms, rotate pads and operate side shift full stroke. Rotate the Tirehand back to the horizontal position. Stop the engine.
7. Reconnect the return line to the reservoir port and change the return filter. All components of the Tirehand are now purged.
8. Check the reservoir oil level and add oil as required.

NOTE

This section covered the Tirehand purging. The loader's hydraulic system is covered in the manufacturer's service manual.

PURGING TRAPPED AIR

Air may be introduced into the hydraulic system either through a leak in the system or due to disconnecting a hydraulic component for servicing. Air in the system will cause erratic operation and must be corrected.

To purge air from the system, fully extend and retract the affected cylinder(s) several times. At the end of the stroke, hold the control valve open about 10-15 seconds longer. Continue extending and retracting the cylinder until operation is smooth and continuous.

FILTER ELEMENT REPLACEMENT

NOTE

Some of the loaders may not be equipped with both a suction and return filter. On those vehicles, it is our policy to install filters. These instructions apply only to those vehicles which require IMT installed filters. On those vehicles equipped with suction and return line filters by the manufacturer, refer to the manufacturer's instructions.

To avoid residue accumulation in the reservoir and to protect hydraulic components - valves, cylinders, motors and pumps - the filter must be serviced on a regular basis. They must be changed after the initial 50 hours of new unit operation and every 200 hours thereafter. To change filter elements:

1. Close the gate valve and remove the filter element.
2. Install the new filter ensuring proper rubber seal seating and tighten as much as possible using both hands.
3. Open the gate valve and check for leaks.

CAUTION

Pump failure can result if the shut-off (gate) valve is left closed.

PREVENTIVE MAINTENANCE

The preventive maintenance check list (Table on next page) is designed to assist you in keeping your Tirehand in efficient operating condition. Items in this section apply to the Tirehand only. The loader should also be inspected periodically (refer to the manufacturer's servic manual).

REGULAR INSPECTION

Every three months or more often when the equipment is subjected to heavy use, the following inspections should be performed in addition to the preventive maintenance check list.

TIREHAND ARM ASSEMBLIES

1. Check for structural defects evidenced in weld cracks, dents or bends.
2. Check cylinder holding valves.
3. Check cylinders for leaks.
4. Check both internal and external clamping arm bearings for wear and lubrication.
5. Check operating timing - both clamping arms should function together at the same rate of motion.

AXIAL PAD ROTATION

1. Check for structural defects.
2. Check motors for leaks.
3. Check disc bearings located on support shafts.
4. Check all pins and their retainers.

HYDRAULIC SYSTEM

CYLINDERS

1. Check rods for damage such as scarring, nicks and dents and check for rust on out-of-service units.
2. Check for leaks at weld joints and rod seals.
3. Check for drift indicating leakage around pistons.
4. Check cylinder barrel for dents and cracks.

HYDRAULIC PUMP

1. Check for leaks at shaft seal and section joints.
2. Check for a drop in operating speed.
3. Check hydraulic oil for excessive heating.
4. Check bolts and fasteners for tightness and note unusual vibration or noise.

HYDRAULIC CONTROL VALVES

1. Check spools for sticking and failure to return to neutral position. Inspect for leaks at joints and spools.
2. Inspect valve housing for cracks.
3. Make certain relief valve reaches the proper relief setting.

HYDRAULIC RESERVOIR AND HOSES

1. Check filters for clogged elements.
2. Check oil level in reservoir.
3. Check all hoses for damage.

CARRIER BOOM AND CYLINDERS

1. Check for structural defects evidenced in weld cracks, dents or bends.
2. Check all pins and their retainers on loader boom and cylinders.
3. Check cylinder rods for damage and check for leaks.

SIDE SHIFT ASSEMBLY

1. Check cylinders for leaks and damage.
2. Check linear bushings for damage and lubrication.
3. Check for structural defects.
4. Check cylinder retaining pins.

ROTATION ASSEMBLY

1. Check gear box for proper anchoring and bolt torque.
2. Check gear-bearing bolt torque.
3. Check pinion gear/gear-bearing backlash.

ITEM	DESCRIPTION	FREQUENCY
WALK AROUND	VISUALLY INSPECT UNIT ON ALL SIDES FOR HYDRAULIC LEAKS, LOOSE PARTS AND OBVIOUS DAMAGE TO EXTERNAL STRUCTURAL MEMBERS.	DAILY
CYLINDERS	CHECK FOR SECURING PINS ON CYLINDERS AND ATTACHED MEMBERS FOR PROPER INSTALLATION.	MONTHLY
HYDRAULIC HOSES AND FITTINGS	INSPECT HOSE SURFACES AND METAL END COUPLING JUNCTIONS FOR OIL LEAKAGE. CHECK OUTER HOSE COVERINGS FOR BLISTERING, EXCESSIVE WEAR OR FLATTENING.	DAILY
ROTATION SYSTEMS	CHECK FOR EXCESSIVE BACKLASH (PLAY) IN ROTATIONAL STOPS. NORMAL VARIATION IS NOT TO EXCEED 1/8" TO 3/16".	WEEKLY
STRUCTURAL DAMAGE	INSPECT ALL STRUCTURAL MEMBERS FOR BROKEN WELDS OR FATIQUE CRACKS. CHECK CARRIER VEHICLE BOOM(S) FOR STRUCTURAL DEFECTS - BENDS, WELD CRACKS OR DENTS.	MONTHLY
COUNTER-BALANCE VALVES	CONDUCT A HOLDING TEST WITH LOADED TIREHAND TO ASSURE PROPER OPERATION OF COUNTER-BALANCE VALVES ON BOTH CLAMPING CYLINDERS.	WEEKLY
RESERVOIR	WITH ALL CYLINDERS RETRACTED, CHECK FLUID LEVEL.	DAILY
OIL LEAKS	INSPECT ALL VALVES AND CYLINDERS FOR SIGNS OF LEAKAGE.	MONTHLY

PREVENTIVE MAINTENANCE CHECKLIST

NOTES

SECTION 5. TIREHAND 1449A PARTS

NOTES

GENERAL

This section contains the exploded parts drawings with accompanying parts lists for the assemblies used on the Tirehand. These drawings are intended to be used for ordering parts only.

CYLINDER IDENTIFICATION

To ensure proper replacement parts are received, it is necessary to specify a complete number/letter sequence for any part request. You must use the number stamped on the cylinder case when ordering parts.

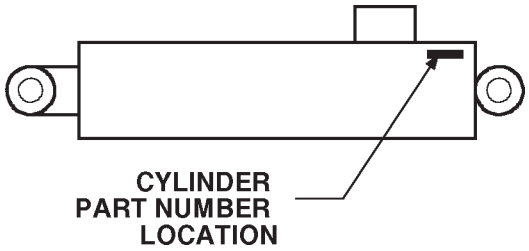
WELDMENT IDENTIFICATION

Each of the major weldments bears a stamped part number. Anytime a major weldment is replaced, you must specify the complete part number as stamped on the weldment. The locations of the part numbers are as shown below.

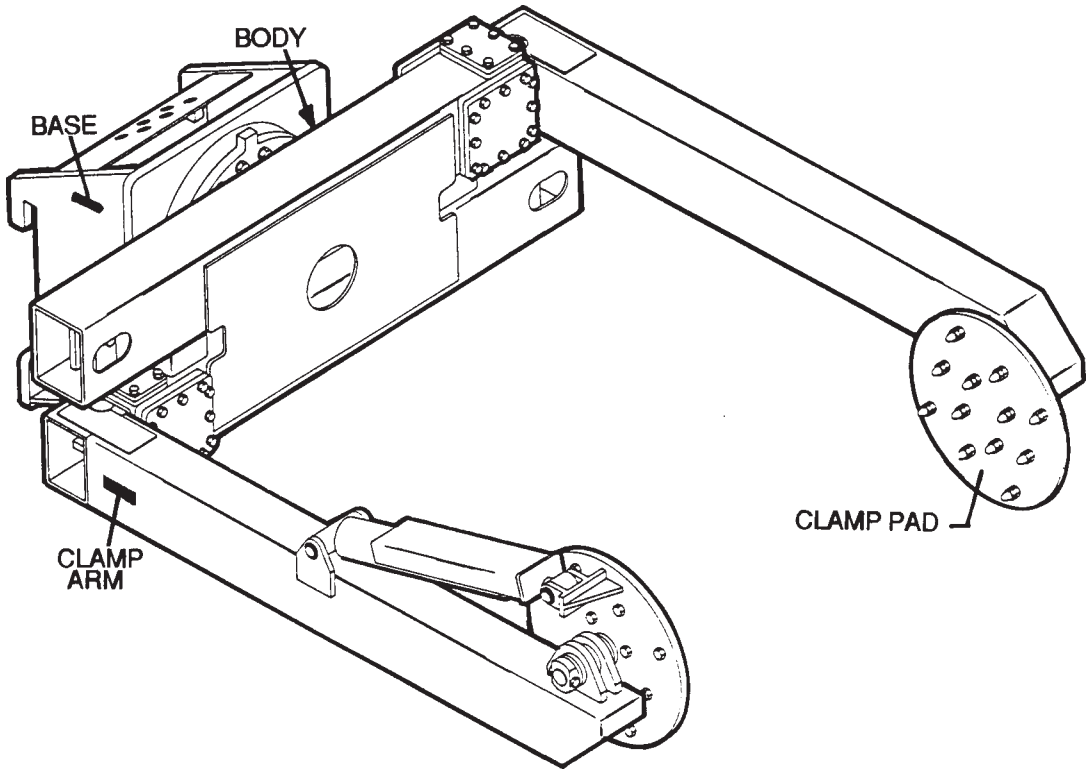
ORDERING REPAIR PARTS

When ordering replacement parts:

1. Give the serial number of the unit.
2. Give the model 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.



CYLINDER PART NUMBER LOCATION



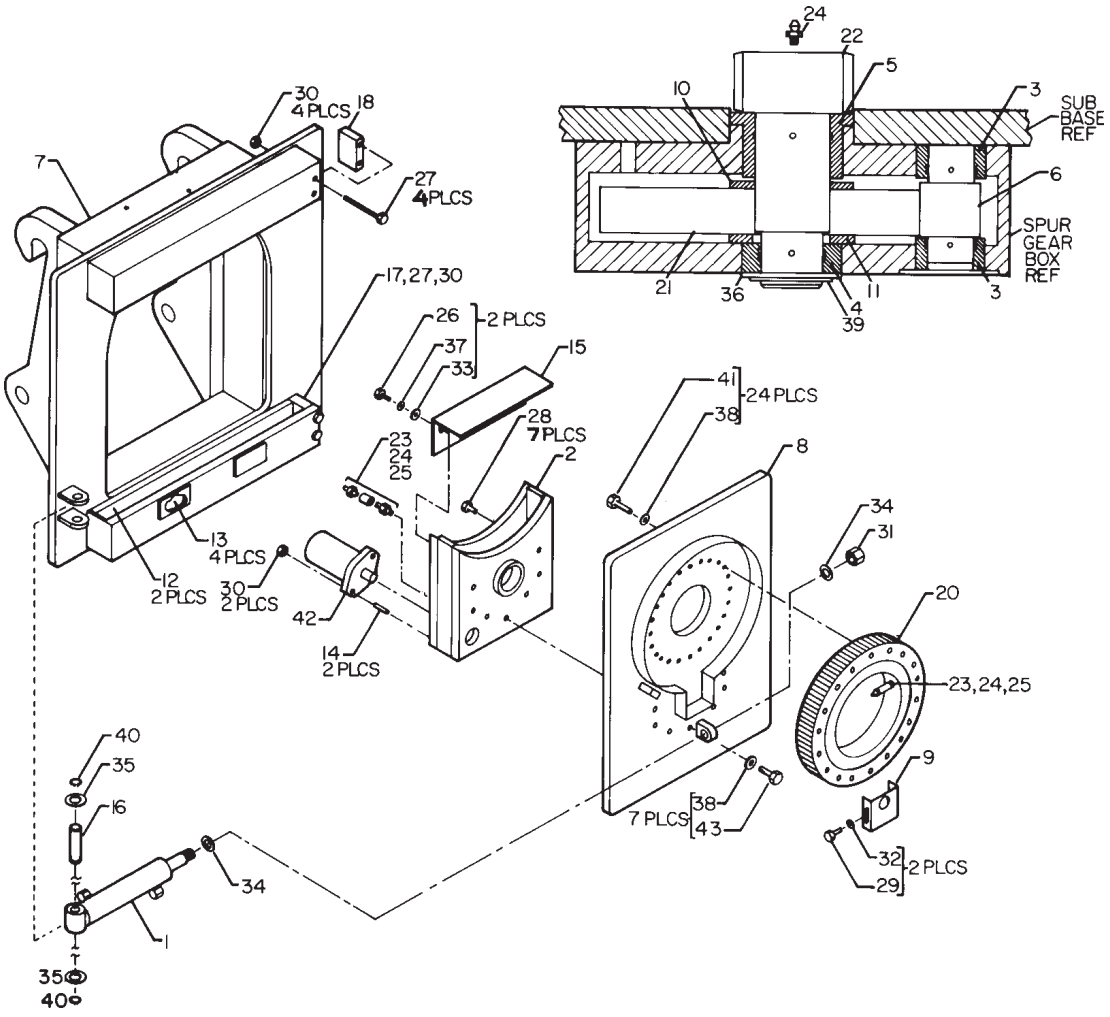
WELDMENT PART NUMBER LOCATION

BASE (40709589) (IT-28 LOADER)

ITEM	PART	DESCRIPTION	QTY
1.	3B160870	SIDESHIFT CYLINDER	1
2.	51703654	GEAR BOX (INCL: 3-6)	1
3.	60020180	BUSHING (PART OF 2)	2REF
4.	60020181	BUSHING (PART OF 2)	1REF
5.	60020182	BUSHING (PART OF 2)	1REF
6.	60106309	DRIVE GEAR (PART OF 2)	1REF
7.	52707383	BASE	1
8.	52707386	SUB BASE	1
9.	60010235	PINION GEAR COVER	1
10.	60020033	THRUST WASHER	1
11.	60020123	THRUST WASHER	1
12.	60030128	SLIDE PAD	2
13.	60030129	WEAR PAD	4
14.	60106032	STUD 1/2-13X2	2
15.	60108431	GEAR BOX COVER	1
16.	60110998	PIN 1 X 4-3/8	1
17.	60110999	BEARING RETAINER PLATE	1
18.	60111000	BEARING RETAINER PLATE	1
19.	70392524	DECAL - ROTATE/GREASE	1
20.	71056389	TURNTABLE GEAR-BEARING	1
21.	71056264	INTERMEDIATE GEAR	1
22.	71056265	PINION GEAR	1
23.	72053301	COUPLING 1/8	2
24.	72053508	GREASE ZERK 1/8	3
25.	72053719	ADAPTER 1/8MPT 1/8MPT	2
26.	72060091	CAP SCR 1/2-13X1 HHGR5	2
27.	72060102	CAP SCR 1/2-13X5-1/2 GR5	4
28.	72060147	CAP SCR 5/8-11X1 HHGR5	7
29.	72060833	SCR-SLF TPG 5/16-18X3/4	2
30.	72062080	NUT 1/2-13 LOCK	6
31.	72062114	NUT 3/4-10 LOCK	1
32.	72063002	WASHER 5/16 WRT	2
33.	72063005	WASHER 1/2 WRT	2
34.	72063008	WASHER 3/4 WRT	2
35.	72063034	MACH BUSHING 1 X 10GA NR	2
36.	72063039	MACH BUSHING 2 X 10GA NR	1
37.	72063053	WASHER 1/2 LOCK	2
38.	72063119	WASHER 5/8 FLAT HARD	31
39.	72066095	RETAINING RING 2" EXT	1
40.	72066125	RETAINING RING 1" EXT	2
41.	72060931	CAP SCR 5/8-11X2 HHGR8	24
42.	73051384	HYDRAULIC MOTOR	1
43.	72060151	CAP SCR 5/8-11X2 HHGR8	7

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 fatique, causing serious injury or death.

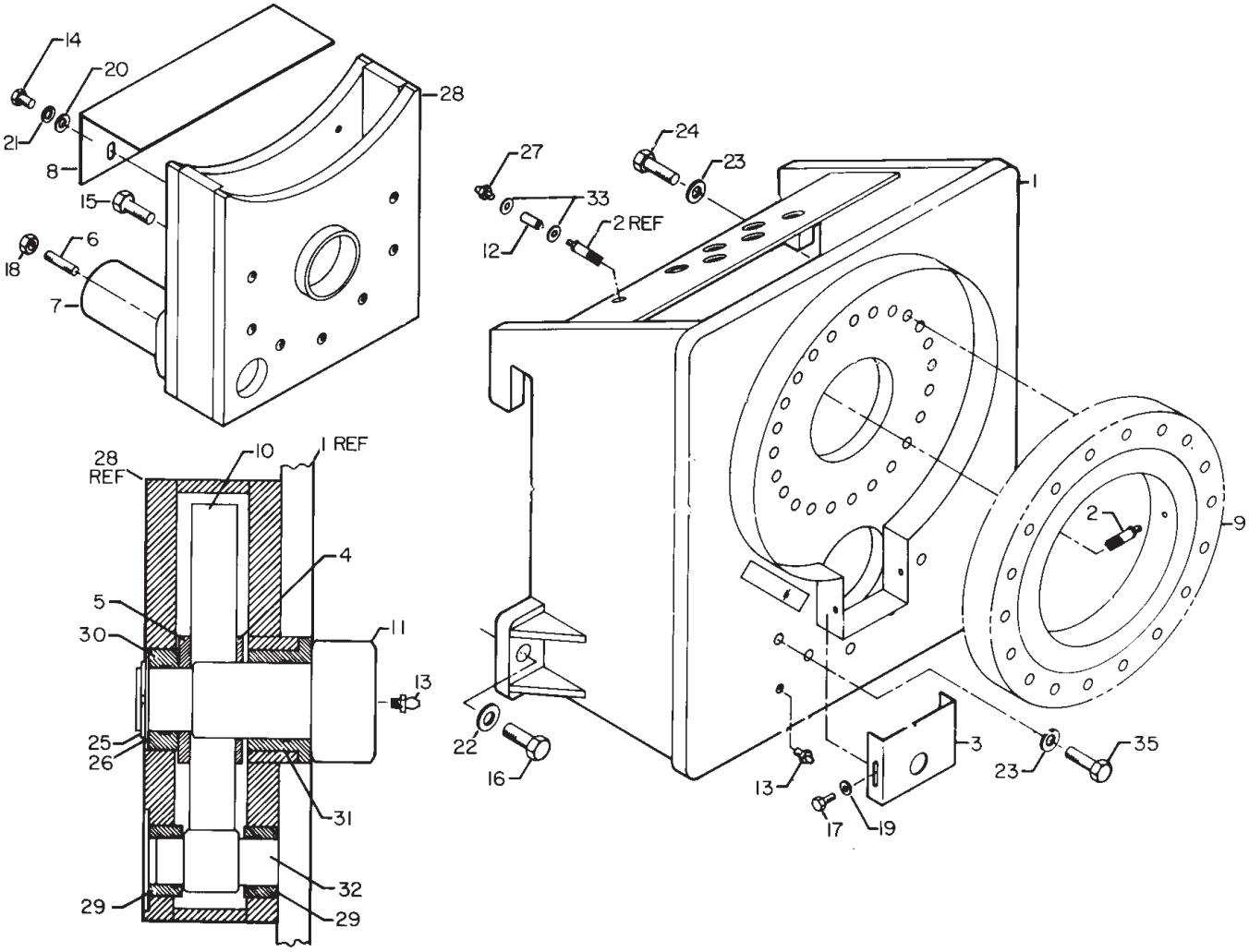


BASE (40709588) (SELLECK LOADER)

ITEM	PART NO.	DESCRIPTION	QTY
1.	52705532	BASE	1
2.	53000703	GREASE EXTENSION 20"	1
3.	60010235	PINION GEAR COVER	1
4.	60020033	THRUST WASHER	1
5.	60020123	THRUST WASHER	1
6.	60106032	STUD 1/2-13 X 2	2
7.	73051384	HYDRAULIC MOTOR	1
8.	60108431	COVER	1
9.	71056389	TURNTABLE GEAR BEARING (incl: 27)	1
10.	71056264	INTERMEDIATE GEAR	1
11.	71056265	PINION GEAR	1
12.	72053301	COUPLING 1/8	1
13.	72053508	GREASE ZERK 1/8	2
14.	72060091	CAP SCR 1/2-13 X 1 HH GR5	2
15.	72060147	CAP SCR 5/8-11 X 1 HH GR5	7
16.	72060206	CAP SCR 3/4-10 X 2 HH GR8	2
17.	72060833	SCR-SLF TPG 5/16-18 X 3/4	2
18.	72062080	NUT 1/2-13 LOCK	2
19.	72063002	WASHER 5/16 WRT	2
20.	72063005	WASHER 1/2 WRT	2
21.	72063053	WASHER 1/2 LOCK	2
22.	72063116	WASHER 3/4 FLAT GR8	2
23.	72063119	WASHER 5/8 FLAT GR8	31
24.	72060931	CAP SCR 5/8-11 X 2-3/4 GR8	24
25.	72066095	RETAINING RING 2" STD	1
26.	72063039	MACH BUSHING 2 X 10GA NR	1
27.	72053508	GREASE ZERK 1/8 (part of 9)	1REF
28.	51703654	GEAR BOX (incl: 29-32)	1
29.	60020180	BUSHING (part of 28)	1REF
30.	60020181	BUSHING (part of 28)	1REF
31.	60020182	BUSHING (part of 28)	1REF
32.	60106309	DRIVE GEAR (part of 28)	1REF
33.	72063003	WASHER 3/8 WRT	2
34.	70392524	DECAL - GREASE/ROTATE	1
35.	72060151	CAP SCR 5/8-11 X 2 HH GR8	7

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 fatique, causing serious injury or death.



BASE - (40714627) (1449A 966F CAT)

ITEM	PART NO.	DESCRIPTION	QTY
1.	3B160870	CYLINDER	1
2.	51703654	SPUR GEAR BOX (INCL: 3-6)	1
3.	60020180	BUSHING (PART OF 2)	2REF
4.	60020181	BUSHING (PART OF 2)	1REF
5.	60020182	BUSHING (PART OF 2)	1REF
6.	60106309	GEAR-DRIVE (PART OF 2)	1REF
7	52714626	BASE WLDMT	1
8.	52707386	SUB BASE WLDMT	1
9.	60010235	COVER-PINION GEAR	1
10.	60020033	THRUST WASHER	1
11.	60020123	THRUST WASHER	1
12.	60030128	SLIDE PAD	2
13.	60030129	WEAR PAD	4
14.	60106032	STUD	2
15.	60108431	COVER-GEAR BOX	1
16.	60110998	PIN	1
17.	60110999	RETAINER PLATE-BRG	1
18.	60111000	RETAINER PLATE-BRG	1
19.	70392524	DECAL-ROTATE/GREASE	1
20.	71056389	GEAR-TRNTBL BRG	1
21.	71056264	GEAR-INTMD	1
22.	71056265	GEAR-PINION	1
23.	72053301	COUPLING-BLK	2
24.	72053508	ZERK	3
25.	72053719	ADPTR	2
26.	72060091	CAP SCR 1/2-13X1 HHGR5	2
27.	72060102	CAP SCR 1/2-13X5-1/2 HHGR5	4
28.	72060147	CAP SCR 5/8-11X1 HHGR5	9
29.	72060833	SCR 5/16-18X3/4 SLFTPG	2
30.	72062080	NUT 1/2-13 HEX	6
31.	72062114	NUT 3/4-10 HEX	1
32.	72063002	WASHER 5/16W	2
33.	72063005	WASHER 1/2W	2
34.	72063008	WASHER 3/4W	2
35.	72063034	MACH BUSHING 1X10GA	2
36.	72063039	MACH BUSHING 2X10GA	1
37.	72063053	WASHER 1/2 LOCK	2
38.	72063119	WASHER 5/8N FLAT	30
39.	72066095	RETAINING RING	1
40.	72066125	RETAINING RING	2
41.	72060151	CAP SCR 5/8-11X2 HHGR8	30
42.	73051384	MOTOR-HYD	1
43.	60106332	RETAINER PLT	2
44.	72060182	CAP SCR 3/4-10X1-1/4 HHGR5	1
45.	52704916	PIN	2
46.	52704917	PIN	1
47.	60010118	HOSE CLAMP	2
48.	72062103	NUT 3/8-16 HEX NYLOC	2

NOTES:

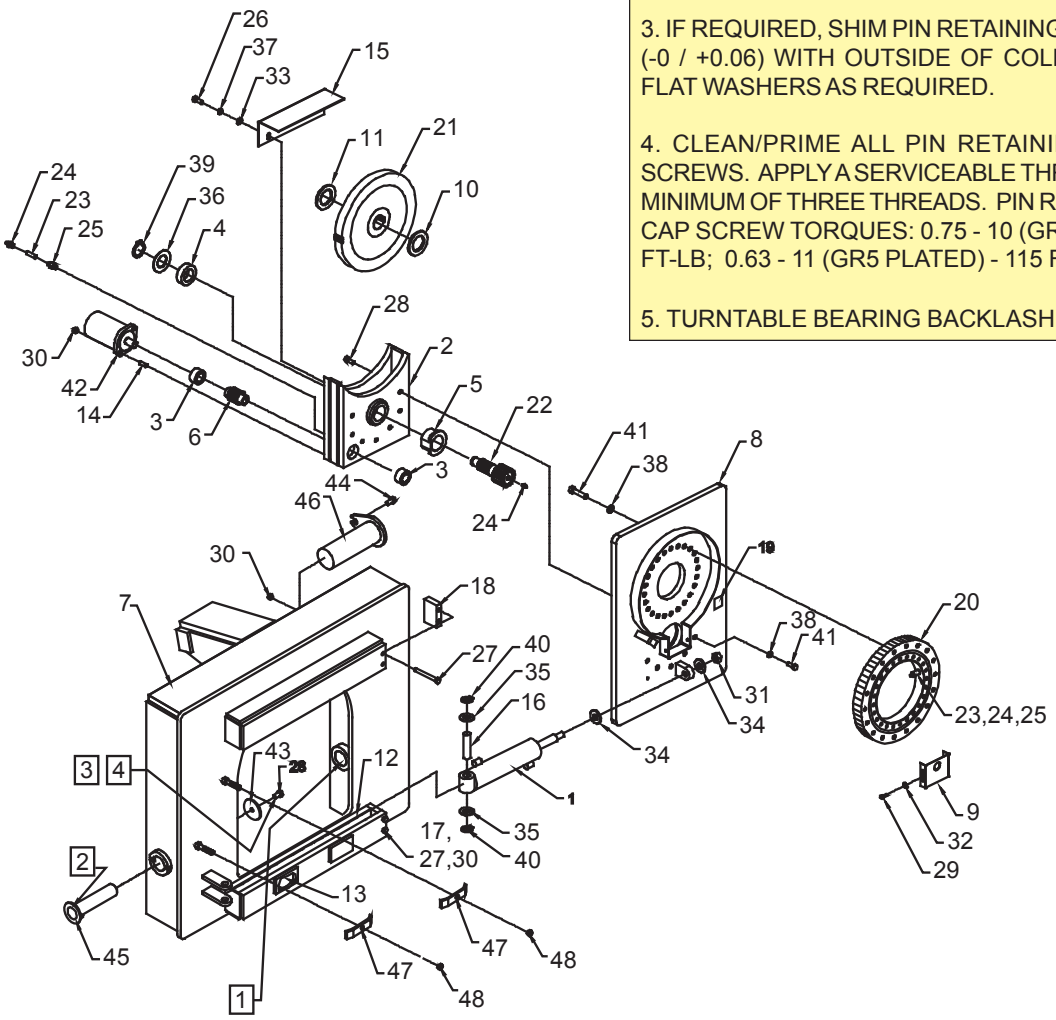
1. APPLY NEVER-SEEZ TO COLLAR I.D. (TYPICAL 3 PLACES.)

2. APPLY NEVER-SEEZ TO PIN AT PIN CAP. DO NOT EXCEED WIDTH OF COLLAR.

3. IF REQUIRED, SHIM PIN RETAINING PLATES FLUSH (-0 / +0.06) WITH OUTSIDE OF COLLAR USING 0.75 FLAT WASHERS AS REQUIRED.

4. CLEAN/PRIME ALL PIN RETAINING PLATE CAP SCREWS. APPLY A SERVICEABLE THREAD LOCK TO A MINIMUM OF THREE THREADS. PIN RETAINING PLATE CAP SCREW TORQUES: 0.75 - 10 (GR5 PLATED) - 200 FT-LB; 0.63 - 11 (GR5 PLATED) - 115 FT-LB.

5. TURNTABLE BEARING BACKLASH - 0.006 / 0.010

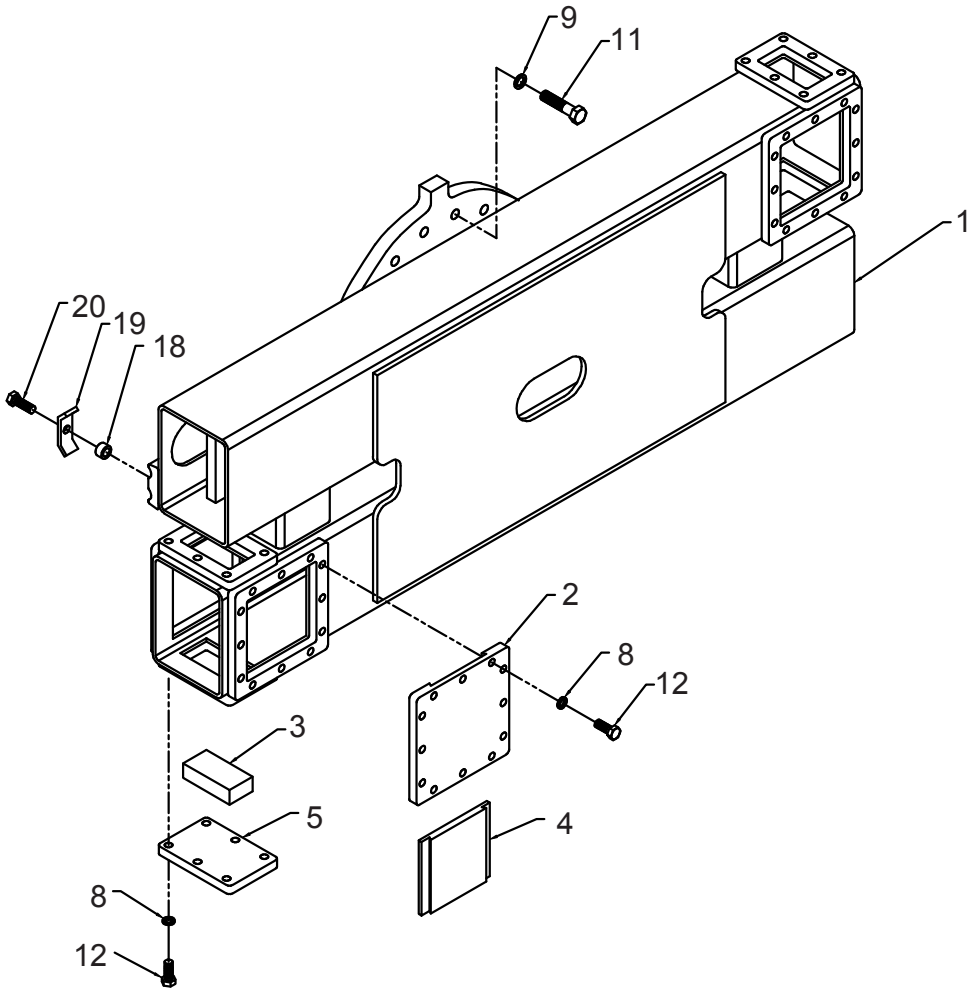


BODY (40709590)

ITEM	PART NO.	DESCRIPTION	QTY
1.	52705518	BODY	1
2.	52705519	WEAR PAD RETAINING PLATE	4
3.	60030110	WEAR PAD	4
4.	60030111	WEAR PAD	4
5.	60108419	WEAR PAD RETAINING PLATE	4
6.	70029119	SERIAL# PLACARD (not shown)	1
8.	72063053	WASHER 1/2 LOCK	72
9.	72063119	WASHER 5/8 FLAT	18
10.	72661638	TACK-METAL (WAS 72066340)	2
11.	72060931	CAP SCR 5/8-11 X 2-3/4 HHGR8	18
12.	72601272	CAP SCR 1/2-13 X 1-1/8 HHGR8	72
18.	60106742	CLAMP SPACER	3
19.	60106744	CLAMP BAR	3
20.	72060093	CAP SCR 1/2-13 X 1-1/2 HH GR5	3

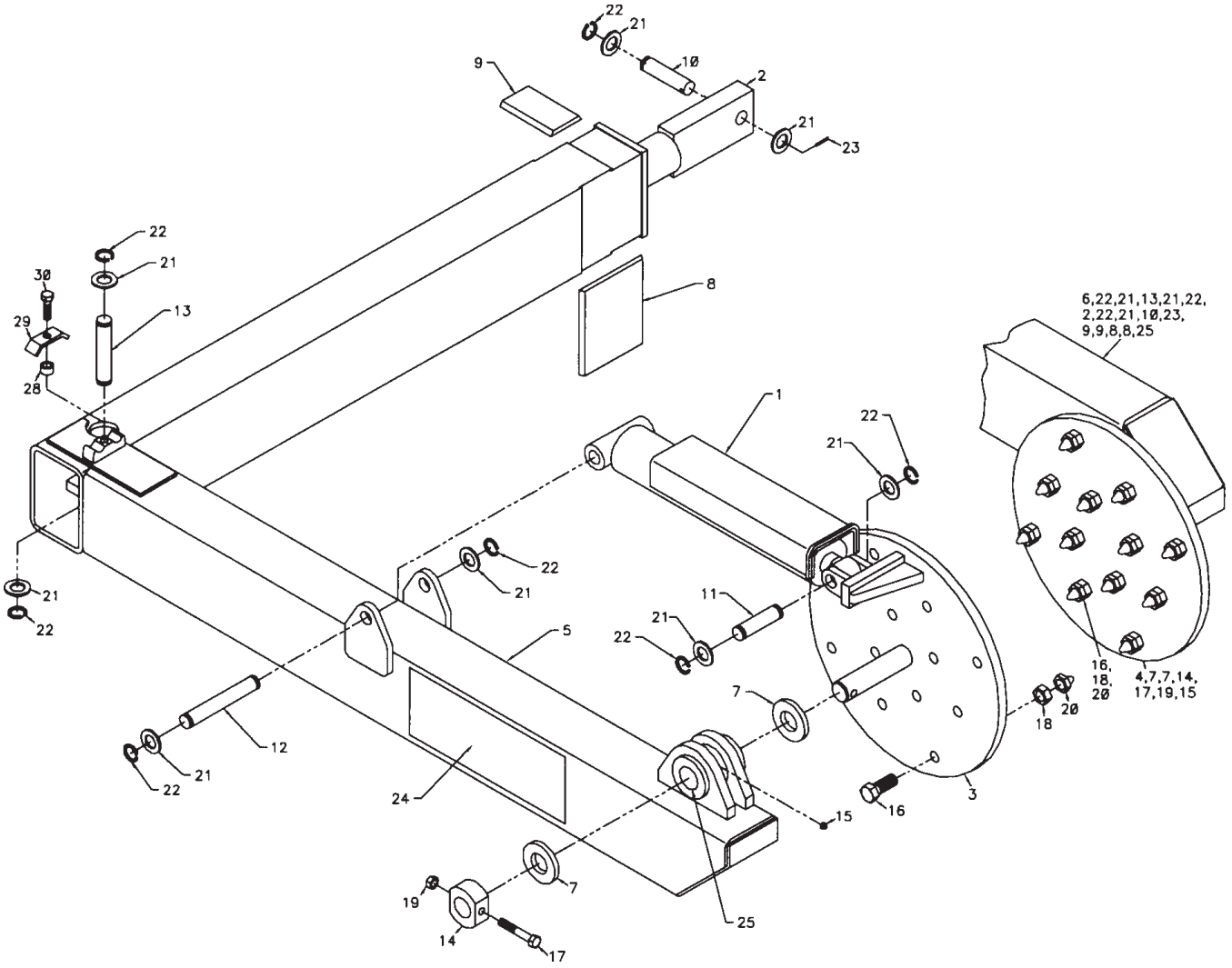
WARNING

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 fatique, causing serious injury or death.



CLAMP ASM (40705524)

ITEM	PART NO.	DESCRIPTION	QTY
1.	3B022850	PIVOT CYLINDER	1
2.	3B309511	CLAMP CYLINDER	2
3.	52705520	PAD	1
4.	52705521	PAD	1
5.	52705529	LOWER ARM (INCL: 2 OF 25)	1
6.	52705530	UPPER ARM (INCL: 2 OF 25)	1
7.	60020206	THRUST WASHER	4
8.	60030077	WEAR PAD	4
9.	60030112	WEAR PAD	4
10.	60101905	PIN	2
11.	60104979	PIN	1
12.	60106065	PIN	1
13.	60106968	PIN	2
14.	60108429	PAD RETAINER	2
15.	72053508	GREASE ZERK 1/8	2
16.	72060206	CAP SCR 3/4-10 X 2 HHGR5	24
17.	72060097	CAP SCR 1/2-13 X 3 HHGR5	2
18.	72062007	NUT 3/4-10 HEX	24
19.	72062107	NUT 1/2-13 HEX CTR LOCKING	2
20.	72062239	NUT 3/4-10 HIGH ACORN	24
21.	72063034	MACH BUSHING 1 X 10GA	12
22.	72066125	RETAINING RING 1" EXT HD	10
23.	72066187	COTTER PIN 5/32 X 1-1/2	2
24.	70393247	DECAL-TH1449A IDENT	2
25.	7BF81215	BUSHING (PART OF 5 & 6)	4REF
28.	60106742	CLAMP SPACER	1
29.	60106744	CLAMP BAR	1
30.	72060093	CAP SCR 1/2-13X1-1/2 HH GR5	1



SIDESHIFT CYLINDER (3B160870)

ITEM	PART NO.	DESCRIPTION	QTY
1.	4B160870	CASE ASM	1
2.	5G160870	ROD	1
3.	6H020012	HEAD	1
4.	6I020075	PISTON	1
5.	9B081012	SEAL KIT-IMT 1.25	1
6.	7R14P012	ROD WIPER (PART OF #5)	1
7.	7R546012	U-CUP (PART OF #5)	1
8.	7T2N8012	WEAR RING-ROD (PART OF #5)	1
9.	7Q10P224	BACKUP RING (PART OF #5)	1
10.	7Q072224	O RING (PART OF #5)	1
11.	7T61N075	LOCK RING-NYLON (PART OF #5)	1
12.	7T66P020	PISTON SEAL (PART OF #5)	1
13.	7Q072129	O RING (PART OF #5)	1
14.	60138271	STOP TUBE (WAS 6A025012)	1
15.	60125699	PIN - LOCK TUBE WALL	1

NOTE

REPLACE ALL COMPONENTS OF THE SEAL KIT WHENEVER THE CYLINDER IS DISASSEMBLED. THIS WILL REDUCE FUTURE DOWNTIME.

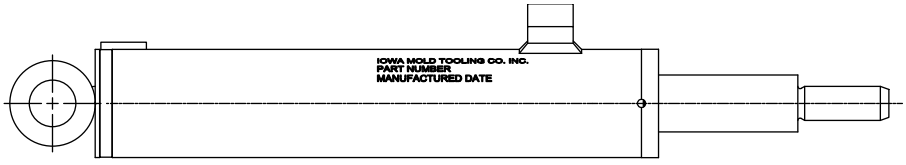
APPLY REGULAR GRADE ANTI-SEIZE AND LUBRICATING COMPOUND TO THREADS ON CYLINDER HEAD ONLY. KEEP AWAY FROM ALL SEALS.

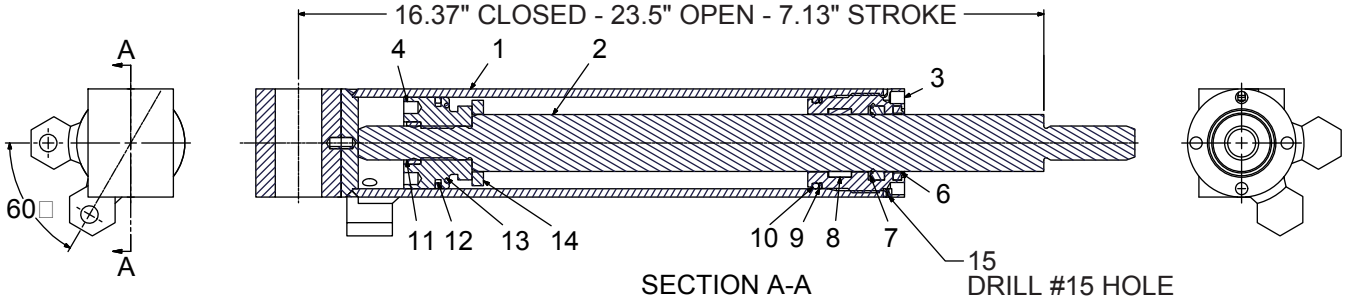
APPLY "LUBRIPLATE" NO. 630-2 MEDIUM HEAVY, MULTI-PURPOSE LUBRICANT, TO ALL PISTON, HEAD GLAND, AND HOLDING VALVE SEALS, NYLON LOCK RING, CAST IRON PISTON RINGS, AND ROD STINGER THREADS.

ITEM #14, STOP TUBE, REPLACES 6A025012 WAFER LOCK. USE STOP TUBE INSTEAD OF WAFER LOCK WHEN RESEALING CYLINDER.

PRESS LOCKING PIN (ITEM #15) INTO #15 HOLE DRILLED 0.188" DEEP.

TORQUE PISTON TO 100-130 FT-LB, HEAD TO 250 FT-LB, LOCKNUT TO 12 FT-LB, AND CAP SCREW TO 16 FT-LB.





SECTION A-A

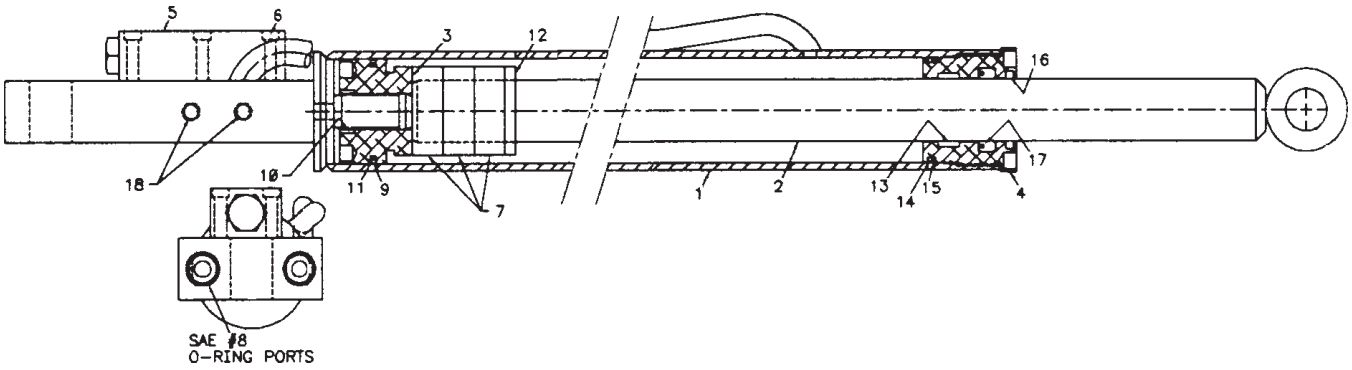
DRILL #15 HOLE
0.188" DEEP.
PRESS IN #60125699.

CLAMP CYLINDER (3B309511)

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

NOTE

Whenever the cylinder is disassembled, replace all of the components in the seal kit. Use NEVER-SEEZ between the head and case when assembling the cylinder.



ROTATION CYLINDER (3B022850)

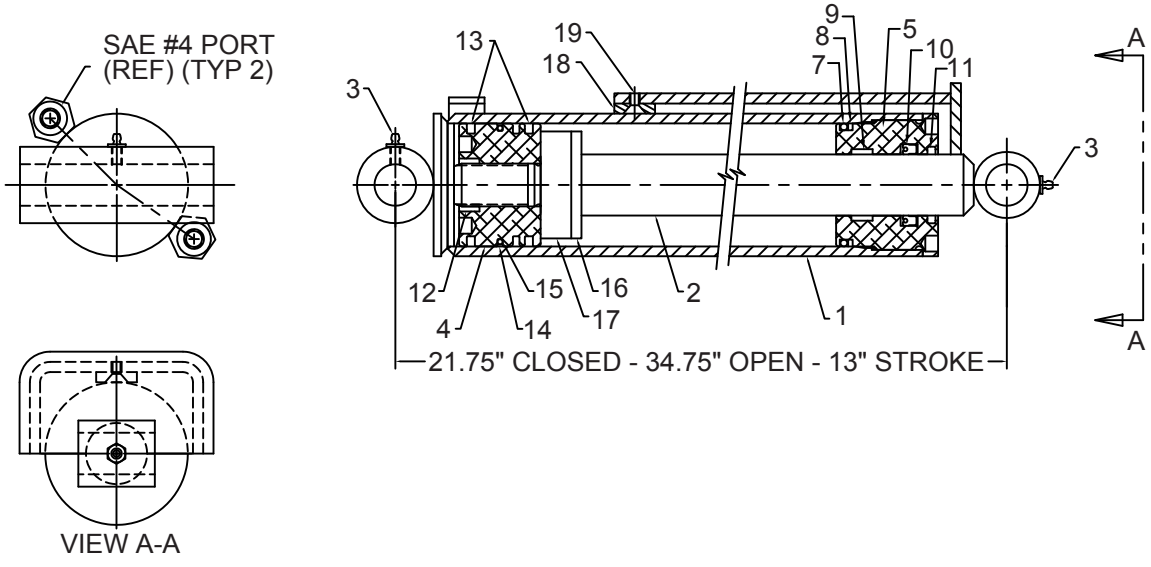
1.	4C022850	CASE ASSEMBLY (INCLUDES 3)	1
2.	4G022850	ROD ASSEMBLY (INCLUDES 3)	1
3.	72053507	GREASE ZERK (PART OF 1 & 20	2REF
4.	6I030106	PISTON	1
5.	6H030015	HEAD	1
6.	9C121217	SEAL KIT	1REF
7.	7Q072334	O-RING	1
8.	7Q10P334	BACKUP RING	1
9.	7T2N8015	WEAR RING	1
10.	7R546015	U-CUP SEAL	1
11.	7R14P015	ROD WIPER	1
12.	7T61N106	LOCK RING	1
13.	7T65I030	PISTON RING	2
14.	7T66P030	PISTON SEAL	1
15.	7Q072145	O-RING	1
16.	60138272	STOP TUBE (WAS 6A025015)	1
17.	6C075015	STOP TUBE	1
18.	5F022850	WEAR PAD	1
19.	72060868	CAP SCR-1/4-20 X 1/2 FLH BR	1
20.	60125699	LOCKING PIN	1

NOTE

Whenever the cylinder is disassembled, replace all of the components in the seal kit. Use NEVER-SEEZ between the head and case when assembling the cylinder.

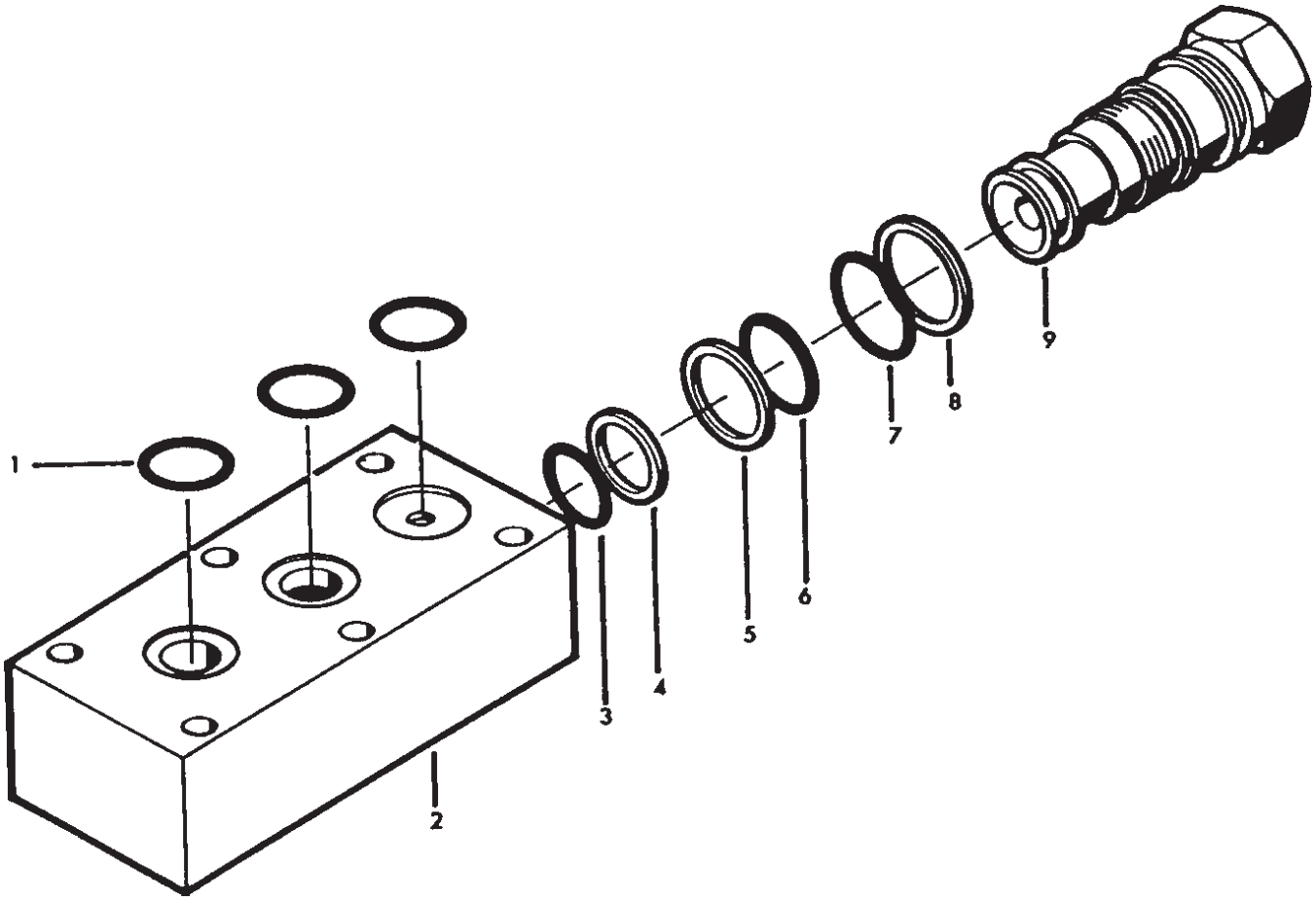
Item #16, stop tube, replaces 6A025015 wafer lock. Use stop tube instead of wafer lock when resealing cylinder.

Press locking pin (item #20) into #15 hole drilled 0.188" deep.



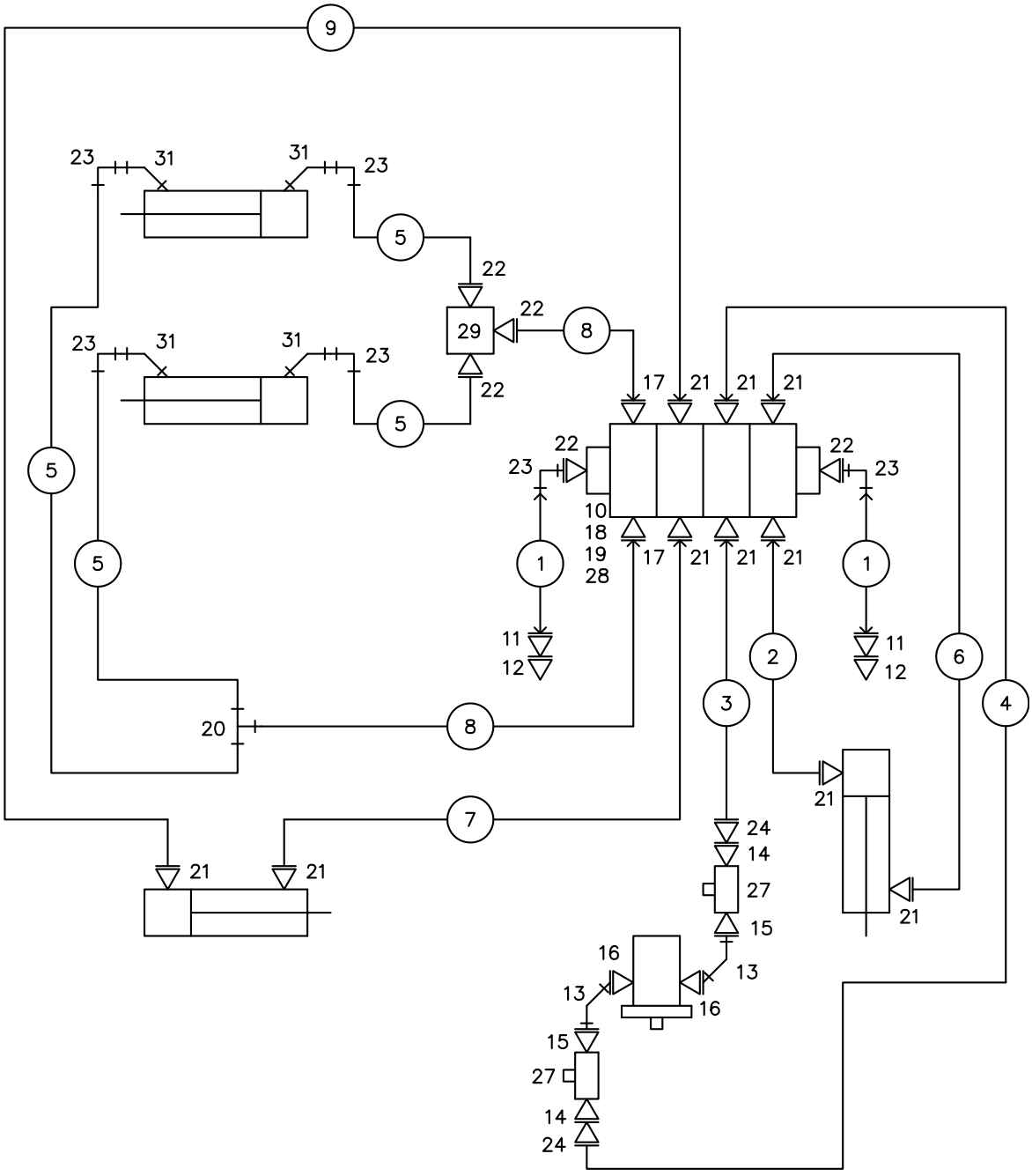
LOCKING / HOLDING VALVE (73054004)

ITEM	PART NO.	DESCRIPTION	QTY
1.	7Q072014	O-RING	3REF
2.		VALVE BLOCK (ORDER ITEM 10)	REF
3.	7Q072015	O-RING	1REF
4.	7Q10P015	BACK-UP RING	1REF
5.	7Q10P017	BACK-UP RING	1REF
6.	7Q072017	O-RING	1REF
7.	7Q072018	O-RING	1REF
8.	7Q10P018	BACK-UP RING	1REF
9.		VALVE BODY (ORDER ITEM 10)	REF
10.	73054004	COMPLETE VALVE (INCL: 1-9)	1



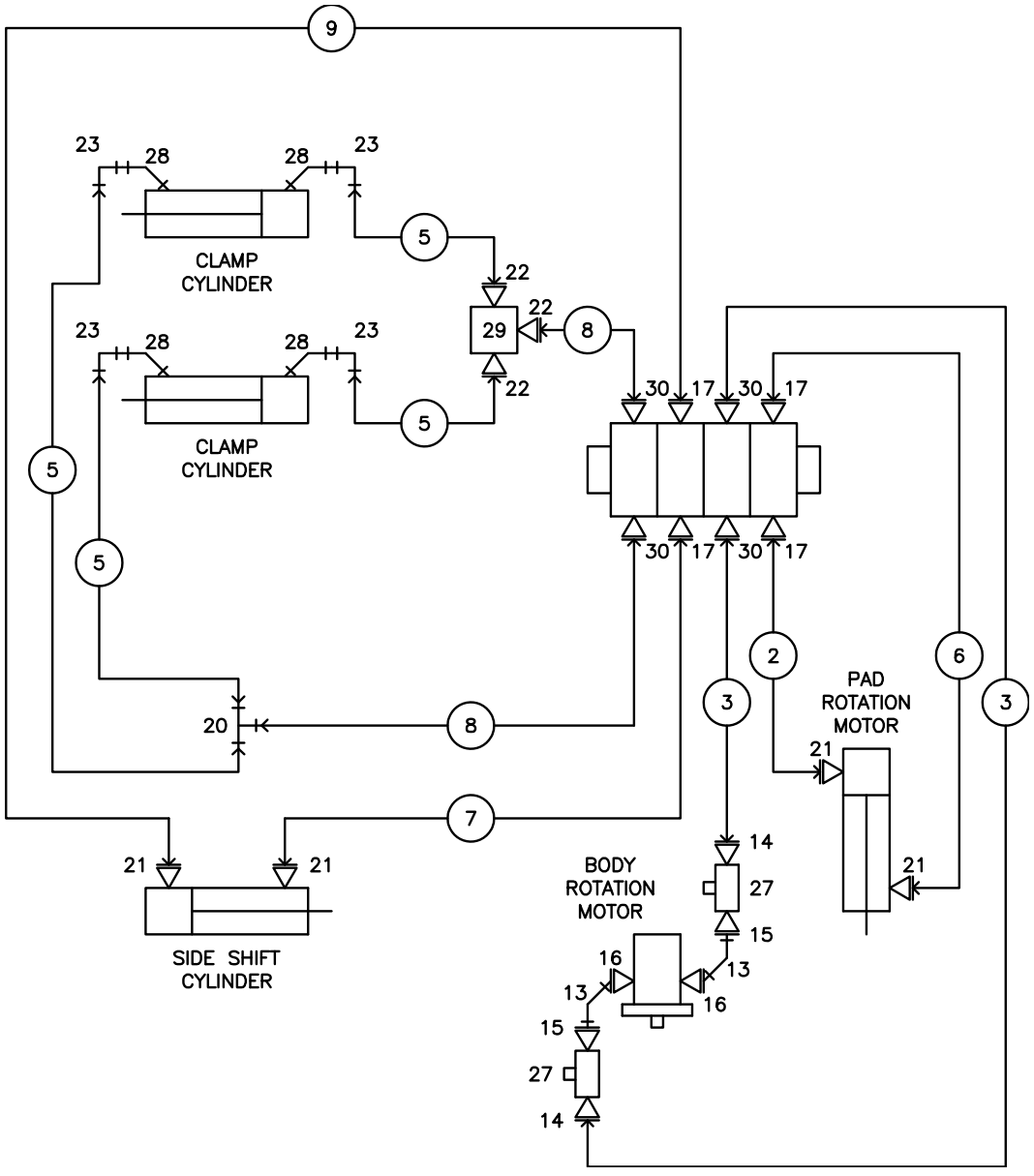
HYD KIT (91707630) (IT-28 LOADER)

ITEM	PART NO.	DESCRIPTION	QTY
1.	51703028	HOSE ASM 3/8X36 AF	2
2.	51703544	HOSE ASM 1/4X114 FF	1
3.	51703591	HOSE ASM 1/4X20 FF	1
4.	51704023	HOSE ASM 1/4X19 FF	1
5.	51704206	HOSE ASM 3/8X28 FF	4
6.	51705364	HOSE ASM 1/4X128 FF	1
7.	51705732	HOSE ASM 1/4X52 FF	1
8.	51711949	HOSE ASM 3/8X24 FF	2
9.	51706233	HOSE ASM 1/4X43 FF	1
10.	60025661	SELECTOR VALVE BLOCK	1
11.	72533101	DISCONNECT COUPLER 3/8FPT	2
12.	72533102	DISCONNECT NIPPLE 3/8FPT	2
13.	72053563	STREET ELBOW 3/8NPT 45°	2
14.	72053670	ADAPTER 3/8MPT #8MJIC	2
15.	72053723	ADAPTER 3/8MPT 3/8MPT HEX	2
16.	72053743	ADAPTER #10MSTR 3/8FPT	2
18.	72060033	CAP SCR 5/16-18X3 HHGR5	2
19.	72063002	WASHER 5/16 WRT	2
20.	72531205	TEE #8MJIC 1/2TUBE	1
21.	72532351	ADAPTER #4MSTR #4MJIC	10
22.	72532358	ADAPTER #8MSTR #8MJIC	4
23.	72532658	ELBOW #8MJIC #8FJIC SWIV	6
24.	72532665	ADAPTER #4MJIC #8FJIC	2
27.	73054139	COLORFLOW VALVE 3/8FPT	2
28.	73054613	SOLENOID VALVE	4
29.	73054614	FLOW DIVIDER	1
31.	72532670	ELBOW #8MJIC #8FJIC 45°	4



HYD KIT W/VALVEBANK (91712446)

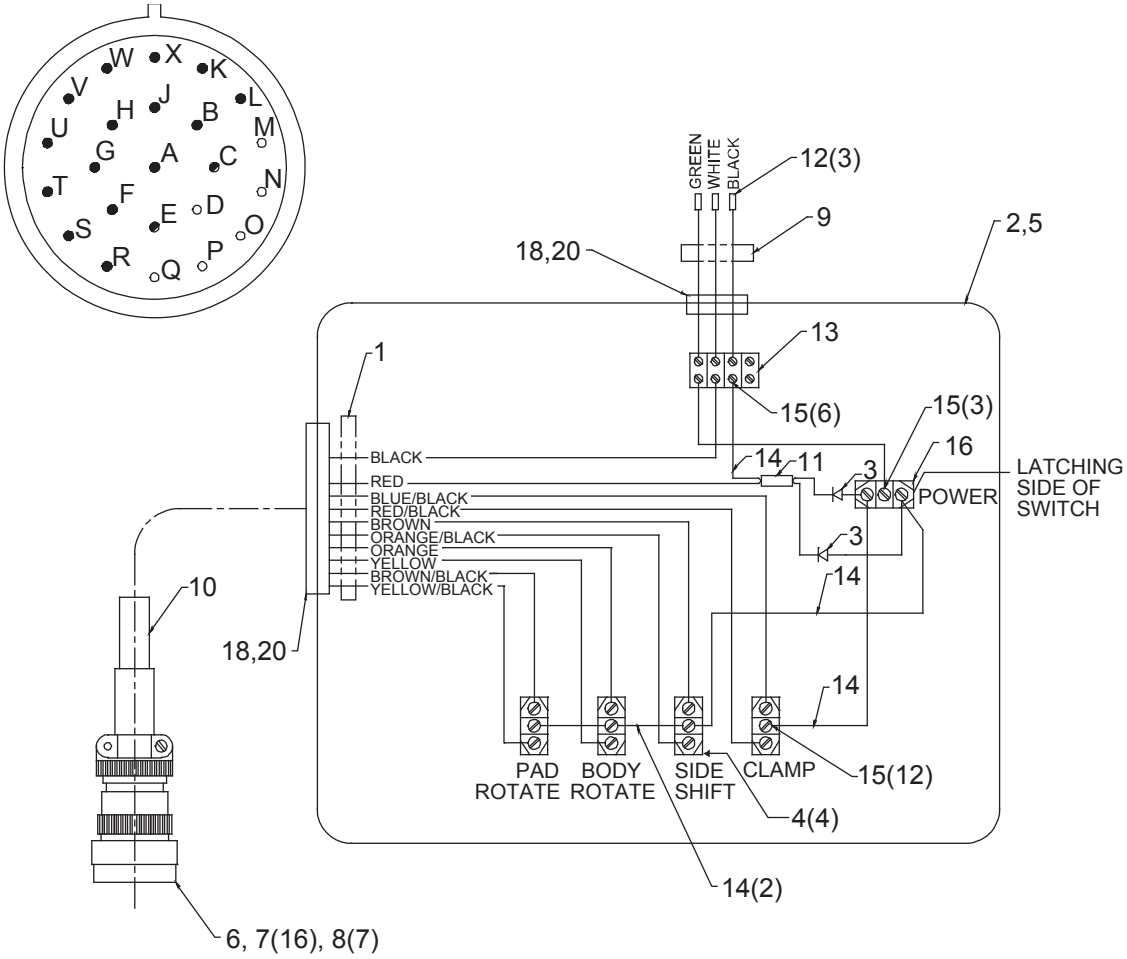
ITEM	PART NO.	DESCRIPTION	QTY
2.	51705364	HOSE ASM 1/4X131 FF	1
3.	51709675	HOSE ASM 3/8X36 FF	2
5.	51704206	HOSE ASM 3/8X28 FF	4
6.	51713360	HOSE ASM 1/4X151 FF	1
7.	51706054	HOSE ASM 1/4X72 FF	1
8.	51705233	HOSE ASM 1/4X46 FF	1
9.	51706348	HOSE ASM 1/4X65 FF	1
13.	72053563	STREET ELBOW 3/8 45°	2
14.	72053670	ADAPTER 3/8MPT #8MJIC	2
15.	72053723	ADAPTER 3/8MPT 3/8MPT HEX	2
16.	72053743	ADAPTER #10MSTR 3/8FPT	2
17.	72532353	ADAPTER #6MSTR #4MJIC	4
20.	72531205	TEE #8MJIC	1
21.	72532351	ADAPTER #4MSTR #4MJIC	4
22.	72532358	ADAPTER #8MSTR #8MJIC	3
23.	72532658	ELBOW #8MJIC #8FJIC SWVL	4
27.	73054139	COLOR FLOW VALVE 3/8FPT	2
28.	72053777	ELBOW #8MSTR #8MJIC 45°	4
29.	73054614	FLOW COMBINER/DIVIDER VLV	1
30.	72532355	ADAPTER #6MSTR #6MJIC	4



HANDLE ASM-CAB CONTROL (51713676)

ITEM	PART NO.	DESCRIPTION	QTY
1.	89044116	CABLE 18GA/16WIRE X 408	1
2.	70392812	DECAL-CONTROL	1
3.	77040373	TOGGLE SWITCH SPDT	1
4.	77040372	TOGGLE SWITCH SPDT	4
5.	60111300	JIC BOX	1
6.	77044579	CONNECTOR	1
7.	77044621	PIN	16
8.	77044668	PLUG-SEALING	7
9.	89044053	CABLE 14AWG 3WIRE	20"
12.	77040186	TERM 1/4 FSLPON 16-14GA	3
13.	77044341	TERMINAL BLOCK-4	1
14.	60045031	WIRE GRN X 4	5
15.	77040051	TERML #8 SPRSPD 16-14GA	21
18.	77044018	STRAIN RELIEF 3/8-1/2	2
20.	77044201	NUT 1/2 ELEC	2

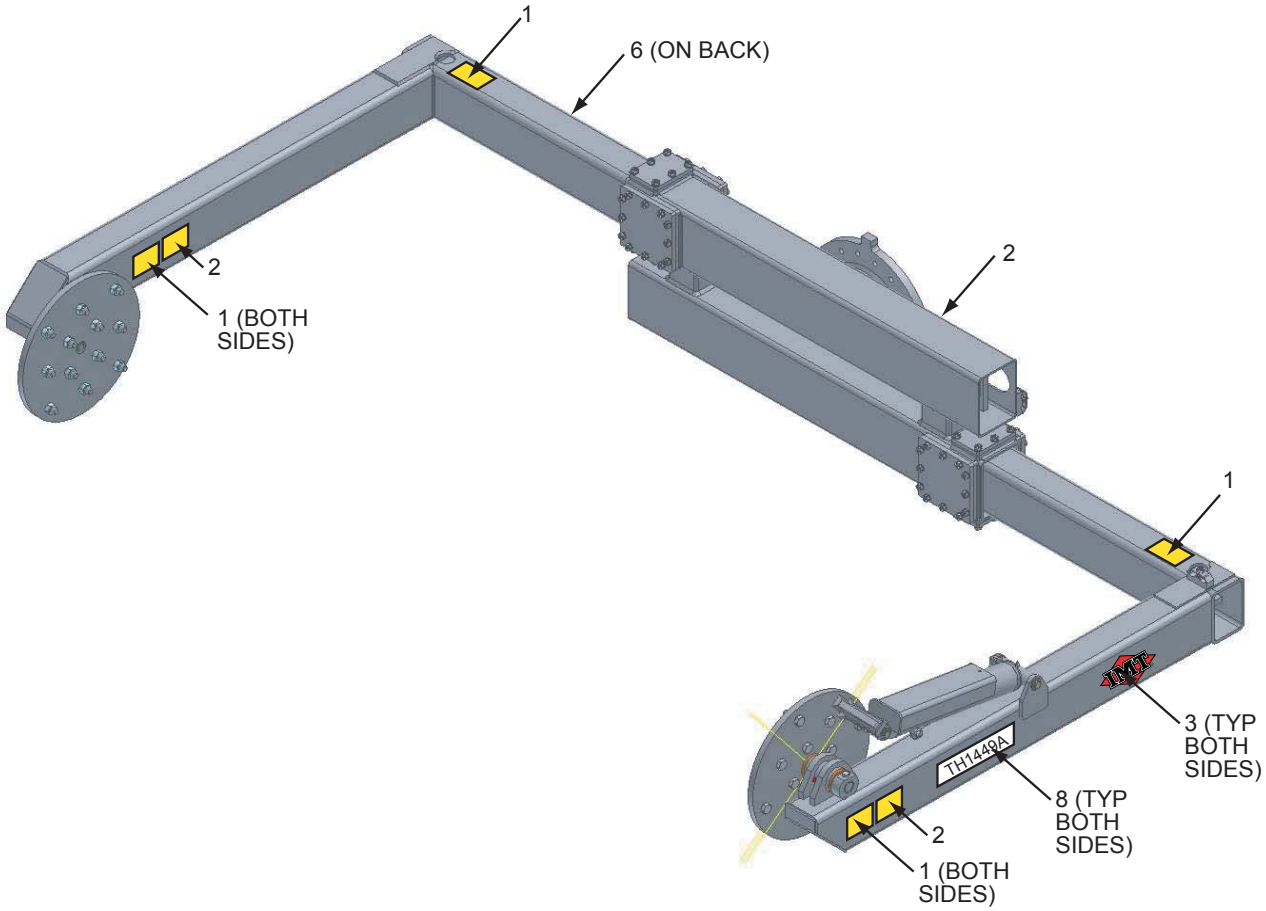
WIRING CHART SOLID/STRIPE		FUNCTION
A	YELLOW/BLACK	PAD ROTATION - FORWARD
B	ORANGE/BLACK	SIDE SHIFT - RIGHT
C	BLUE/BLACK	CLAMP-RELEASE
D	RED/BLACK	CLAMP-CLAMP
E	ORANGE/RED	—
F	BROWN	SIDE SHIFT-LEFT
G	BROWN/RED	—
H	BLUE/RED	—
J	BLACK/RED	—
K	BROWN/BLACK	PAD ROTATION-BACK
L	RED	POWER
M	BLUE	—
N	ORANGE	BODY ROTATE - CCW
O	8	—
P	YELLOW	BODY ROTATE-CW
Q	8	—
R	YELLOW/RED	—
S	BLACK	GROUND
T	8	—
U	8	—
V	8	—
W	8	—
X	8	—



DECAL PLACEMENT (99904165)

1.	70391612	DECAL-GREASE WEEKLY (LEFT)	6
2.	70392524	DECAL-ROTATE CRANE GREAS	4
3.	70391456	DECAL-DIAMOND IMT 2.62 X 4.75	2
4.	70393671	DECAL-TH OPER WARNINGS	2
5.	70393672	DECAL-DANGER TH OPERATION	2
6.	70393704	DECAL-TOP TH	4
7.	70397313	PLACARD-CAPACITY TH1449A	2
8.	70393247	DECAL-1449A IDENT	2

NOTE: ITEMS 4,5, & 7 PLACED AT TIREHAND CONTROLS.



SECTION 6. TIREHAND 1449A REPAIR

NOTES

6-1. GENERAL

This section describes disassembly, repair and assembly of many of the components used on the Tirehand. Some information presented here may not apply to your model of Tirehand.

6-2. HYDRAULIC SYSTEM

Certain procedures involving the hydraulic system require special consideration for proper functioning and service life of the unit. These steps are to be taken whenever a hydraulic component is disconnected.

1. ALWAYS relieve internal hydraulic pressure before proceeding with the repair.

2. NEVER allow foreign matter - dirt, water, metal particles, etc. - to enter the hydraulic system through the open connection. Seal the connection as tightly as possible. If dirt does get in, a filter change is required after about 50 hours of operation.

3. ALWAYS cycle all of the controls after completing a repair. This will eliminate air that is trapped in the cylinders, hoses, spool valves, etc. and avoid bumpy, erratic behavior during actual working conditions.

4. ALWAYS check for hydraulic leaks after a repair. A high pressure leak is hazardous and must be repaired before putting the unit to work.

6-2-1. CYLINDERS

All of the cylinders used on the Tirehand are of the same basic type; therefore, the same disassembly and repair instructions apply. Check the PARTS section for specific information. The following list of tools will be a definite asset in the disassembly and repair of all IMT cylinders.

SPANNER WRENCH - IMT Part Number 3Y140510.

NEEDLE-NOSE PLIERS - For removal and replacement of seals.

ICE PICK or SHARP AWL - For removal and replacement of seals.

PLASTIC HAMMER - Used with the spanner wrench for head and piston assembly.

6-2-1-1. CLAMP CYLINDER REMOVAL AND INSTALLATION

1. Rotate the Tirehand until the clamp cylinder is in a horizontal position.

2. Extend the cylinder full stroke.

3. Shut off the carrier vehicle's engine. Relieve internal hydraulic pressure by cycling the controls.

4. Remove the cover from the body (refer to the appropriate body drawing) and disconnect the hydraulic hoses at the cylinder port block. Cap the hydraulic hoses.

5. Support the hand assembly with a lifting device and straps capable of supporting the assembly. Take up slack in the lifting device

6. Disconnect and cap any hydraulic lines leading to the pad rotation mechanism.

7. Remove the cylinder rod pin by removing the 3/4-10 cap screws and washer securing the pin. Drive out the pin.

8. Make certain the hand assembly is well supported, then remove the two smaller hand/arm pins by removing the 3/4-10 cap screws securing the pins. Drive out the pins.

9. Lift the hand assembly away and place on a clean surface, taking care to keep dirt from the bushing surfaces.

10. Support the clamp cylinder with a lifting device and straps capable of supporting the cylinder.

11. Remove the cylinder base pin securing screw and washer. Drive the pin only far enough to release the cylinder.

12. Lift the cylinder away and repair as necessary.

To install the clamp cylinder:

1. Position the cylinder in the slings of the lifting device and line up the base end pin boss and pin. Seat the pin and secure using the 3/4-10 cap screw and washer. Torque to 265 ft-lb.

2. Lift the hand assembly with the slings and position the pin bosses in line with the pins. Drive in the pins and secure using the 3/4-10 hardware. Torque to 265 ft-lbs.

3. Connect the hydraulic hoses to the clamp cylinder and axial rotation motor.

4. Start the engine, cycle the CLAMP and AXIAL controls through at least five cycles to purge any air trapped in the system. Check for leaks.

5. Check the hydraulic fluid level with all cylinders retracted. Fill if necessary.

6. Test the unit with a simulated job operation before proceeding to the job site.

6-2-1-2. SIDE SHIFT CYLINDER REMOVAL AND INSTALLATION

Cylinder removal is accomplished as follows:

1. Rotate the Tirehand so that the side shift cylinder is in a horizontal position.

2. Disconnect the hydraulic hoses from the cylinder port. Cap the hoses.

3. Remove the retaining rings and bushings from the rod end and base end of the cylinder. Drive out the pins.

4. Disassemble and repair the cylinder.

To install the cylinder:

1. Line up the cylinder base-end pin boss with the holes in the base. Drive in the pin and install the machinery bushing and retaining ring.

2. Connect the hydraulic hoses to the cylinder port.

3. Extend and retract the cylinder until the rod-end pin boss lines up with the holes in the sub-base. Drive in the pin and install the machinery bushing and retaining ring.

4. Extend and retract the cylinder through five (5) complete cycles to purge air that may be trapped in the system. Check for leaks.

5. Check the hydraulic reservoir fluid level with all cylinders retracted. Fill if necessary.

6. Conduct a simulated job operation before proceeding to the job site.

6-2-1-3. CYLINDER DISASSEMBLY

CAUTION

IF SOLVENT IS USED TO CLEAN THE INTERNAL CYLINDER COMPONENTS, ALL TRACES OF SOLVENT MUST BE REMOVED. ANY RESIDUE WILL DAMAGE THE SEALS.

WARNING

DO NOT USE COMPRESSED AIR TO ASSIST IN WITHDRAWING THE PISTON/ROD ASSEMBLY. THE USE OF COMPRESSED AIR MAY RESULT IN PROPELLING THE PISTON/ROD ASSEMBLY OUT OF THE CYLINDER AND MAY CAUSE SERIOUS INJURY OR DEATH.

NOTE

IF THE CYLINDER IS BEING REPAIRED DUE TO A WORN SEAL, WE RECOMMEND REPLACING ALL COMPONENTS FOUND IN THE SEAL KIT. THE SMALL ADDITIONAL EXPENSE MAY SAVE EXPENSIVE EQUIPMENT DOWN-TIME IN THE NEAR FUTURE. REFER TO THE PARTS SECTION FOR SEAL KIT NUMBERS.

1. Thoroughly wash the exterior of the cylinder case.

NOTE

AFTER THE CASE HAS BEEN WASHED, PROCEED WITH DISASSEMBLY IN A CLEAN ENVIRONMENT, ONE THAT IS FREE OF DUST AND DIRT.

2. Remove counterbalance valve if disassembling the clamp cylinder.

3. Place the cylinder on a flat surface near a vise. Slip a pin through the pin boss and clamp the pin in a vise (Figure G-1).

CAUTION

DO NOT CLAMP THE CYLINDER IN A VISE. IT MAY DAMAGE THE CYLINDER CASE.

4. Unscrew the head (Item 4, Figure G-2) in a counterclockwise direction with the spanner wrench. Withdraw the head from the cylinder case.

5. Secure the rod pin boss in the same manner as the cylinder pin boss (Figure G-1).

6. Unscrew the piston (Item 8, Figure G-2) from the rod with the spanner wrench in the same manner as the head (Step 4).

CAUTION

DO NOT CLAMP THE MACHINED SURFACE OF THE ROD IN A VISE. DAMAGE TO THE ROD WILL RESULT.

7. Remove the wafer lock/stop tube ring (Item 13) and the stop tubes (Item 7) from the rod (item 1). The wafer lock/stop tube ring was crushed to secure it and will have to be broken to remove it.

CAUTION

MAKE CERTAIN THE ROD IS NOT DAMAGED DURING REMOVAL OF THE WAFER LOCK/STOP TUBE RING.

8. Slide the head off the rod.

9. Inspect the cylinder interior and the rod for dents, nicks, scratches, etc. and replace if necessary.

CAUTION

FAILURE TO REPLACE A DAMAGED ROD OR CYLINDER MAY RESULT IN LEAKS AND POOR PERFORMANCE THAT WILL HAVE TO BE REPAIRED.

NOTE

FURTHER WORK SHOULD BE DONE IN A WARM ENVIRONMENT (70°F OR WARMER). THIS MAKES THE SEALS MORE PLIABLE AND EASIER TO WORK WITH.

10. Work a slack section into the head seal static o-ring (item 6) and pick it up out of the groove (Figure G-3). Lift the static back-up out of its groove with the needle-nose pliers.

11. Pinch the lip of the rod wiper (Item 2) with the needle-nose pliers and pull it out of the head.

12. Position the head with the top of the head up and lift the wear ring (item 11) with the ice pick. Pry it out of the groove and push it through the head. Remove the rod seal as shown in Figure G-4.

13. Spread the piston rings (item 9) and slide them over the land and off the end of the piston nearest to the ring.

14. Carefully lift the dynamic piston seal (item 10) out of the groove with a thin blade such as a putty knife. Take care not to nick the edges of the groove. Twist and break the seal.

CAUTION

DAMAGING THE EDGES OF THE GROOVE IS LIKELY TO CAUSE PREMATURE SEAL FAILURE.

15. Prick the companion o-ring with a pin or needle and lift it out of the groove. Roll it off the end of the piston.

16. Pry the lock ring (item 12) from its seat in the bottom of the piston.

17. Clean the piston, head, rod and cylinder. Dress any nicks and gouges in the head and piston that may have occurred during disassembly.

6-2-1-4. CYLINDER ASSEMBLY

CAUTION

USE ALL OF THE SEALS IN THE SEAL KIT. IT MAY SAVE EXPENSIVE DOWN-TIME IN THE FUTURE.

1. Install the wear ring (item 11). Make certain it is seated properly.

2. Slide the piston seal (item 10) carefully into position.

CAUTION

WORK THE PISTON SEAL CAREFULLY INTO POSITION FROM THE TOP OF THE PISTON USING THE ASSEMBLY GROOVE. DO NOT ATTEMPT TO INSTALL IT FROM THE BOTTOM OF THE PISTON. YOU MAY STRETCH THE SEAL AND RENDER IT USELESS.

3. Slide the piston rings (item 9) over the lands and allow them to snap into position.

4. Carefully press the lock ring (item 12) into position.

5. Install the static back-up (item 5) and the o-ring (item 6). Make certain that there are no twists.

6. Position the head with the rod wiper pocket up. Grasp the dynamic rod seal (item 3) with the needle-nose pliers (Figure G-5).

CAUTION

DO NOT APPLY TOO MUCH PRESSURE TO THE ROD SEAL OR YOU MAY CUT IT WITH THE NEEDLE-NOSE PLIERS.

7. Insert the dynamic rod seal into the head and allow it to snap into position. Use your fingers to help it if necessary.

8. Install the rod wiper (item 2).

9. Generously lubricate the inside diameter of the head with a non-fibrous bearing grease such as Lubriplate.

10. Carefully slide the head onto the rod. Make certain that the rod wiper (item 2) does not catch on the rod when it is first started. Slide the head all of the way onto the rod and up to the pin boss.

11. Slide the stop tube ring (item 13) and stop tubes (item 7 - if applicable) onto the rod.

12. Lubricate the entire threaded area of the rod and the inside diameter of the piston with non-fibrous bearing grease.

13. Secure the rod as shown in Figure G-1 and screw the piston onto the rod by hand. You should be able to get the piston almost all the way onto the rod before using the spanner wrench.

CAUTION

CHECK TO MAKE CERTAIN THAT THE LOCK RING (ITEM 12) STAYS IN POSITION. IT MUST REMAIN IN POSITION OR LEAKS MAY OCCUR RESULTING IN POOR PERFORMANCE.

14. Torque the piston onto the rod at 250 ft-lbs of torque (Figure G-6).

15. Generously lubricate the outside diameter of both the head and piston with non-fibrous bearing grease. Also lubricate the threads and beveled area at the top of the cylinder case.

16. With a side-to-side or up-and-down motion, work the piston into the cylinder and past the threads and beveled area at the top of the cylinder case.

17. Slide the piston into the cylinder. With a rotating motion, work the o-ring (item 6) and the back-up (item 5) past the threads and hand tighten the cylinder head.

18. Secure the cylinder (Figure G-1) and torque the head in the same manner as the piston (step 14, Figure G-6).

19. Install the holding valves and their o-rings. Make certain that the o-rings are in good position and properly positioned.

6-2-2. COUNTERBALANCE VALVES

Counterbalance valves are considered non-repairable and must be replaced if defective.

6-2-3. HYDRAULIC PUMP

The installer or manufacturer of the carrier vehicle is to make provisions to supply 12 GPM of hydraulic fluid at 3000 PSI.

6-2-4. HYDRAULIC MOTORS

Four hydraulic motors are used on the Tirehand: two for Tirehand rotation and one each side for axial (pad) rotation. These motors are not considered field-repairable and should be replaced if defective.

6-2-4-1. HYDRAULIC MOTOR REMOVAL AND REPLACEMENT

To remove rotation motor:

1. Disconnect and cap the hydraulic hoses.
2. Remove the two motor mounting bolts.
3. Remove the counterbalance block and hose fittings from the old motor.

To install the new motor:

1. Install the counterbalance block and hose fittings from the old motor. Do not use the old o-rings, they should be replaced.

2. Position the motor on the base and install the two mounting bolts. Torque them to the proper value (See Torque Table).

3. Connect the hoses.

4. Start the engine, rotate the Tirehand five (5) times in both directions and check for leaks.

5. With all cylinders retracted, check the fluid level in the reservoir and fill if necessary.

6-2-5. RELIEF VALVE ADJUSTMENT

The hydraulic system is designed to operate at a pressure requirement of 3000 PSI with an optimum oil flow of 12 GPM. If the unit pressure is less than 3000, the unit relief valve may require adjustment or replacement.

The following procedure is recommended for relief valve adjustment:

1. Start the vehicle and engage the pump.

2. With the vehicle transmission in neutral, operate any function full stroke and, with function lever still engaged at end of stroke, read the pressure on the gauge at the control valve. It should read between 3000 PSI.

3. If the pressure reading is low, shut off the engine and remove the relief valve plug (Figure G-8). Install one 0.010" shim which will provide a 125 PSI increase.

4. Reinstall the relief valve plug and start the engine. If the pressure has not increased by 125 PSI, the malfunction indicates pump slippage.

5. If the 125 PSI increase is achieved, add shims as necessary to bring the pressure up to the required 3000 PSI minimum.

6-3. BEARINGS

This paragraph covers the removal and installation of turntable gear-bearings and bushings.

6-3-1. TURNTABLE GEAR-BEARING

To remove the Tirehand rotation gear-bearing:

1. Disconnect and cap the hydraulic hoses from the valvebank.

2. Support the clamp arms with an overhead lifting device capable of supporting the weight of the unit. Take up the slack in the lifting device.

WARNING

THE LIFTING DEVICE MUST BE FASTENED TO THE TIREHAND IN SUCH A MANNER THAT WILL PREVENT SHIFTING OF THE LOAD DUE TO SLIPPAGE.

3. Remove the cover then remove the 18 bolts that secure the body to the gear-bearing. Slowly work the hoses out of the rotation adapter while simultaneously withdrawing the body. Set the body carefully to one side.

4. Disconnect the grease fitting extension from the turntable gear-bearing.

5. Remove the 23 gear-bearing mounting bolts and remove the gear bearing.

To install the gear-bearing:

1. Position the gear-bearing and torque the 41 mounting bolts (see Torque Table).

2. Install the grease fitting extension.

3. Carefully position the body and clamp arms until the holes in the body line up with the holes in the gear-bearing. Install the mounting bolts and torque to the proper value (see Torque Table).

4. Connect the hydraulic hoses to the valvebank.

5. Start the engine and cycle all of the Tirehand controls at least five (5) times in both directions to purge the air in the system.

6. Check the system for leaks and repair any that are found.

7. With all cylinders retracted, check the fluid level in the reservoir and fill if necessary.

6-3-1-2. AXIAL ROTATION GEAR-BEARING

To remove the axial rotation gear-bearing:

1. Remove the 18 pad mounting bolts.

2. Disconnect the grease fitting extension.

3. Remove the 18 gear-bearing mounting bolts and remove the bearing.

To install the bearing:

1. Position the bearing so that the holes align with those in the arm. The grease fitting extension port must be toward the pinion gear. Install and torque the mounting bolts (see Torque Table).

2. Install the grease fitting extension.

3. Position the pad over the gear-bearing, install and torque the mounting bolts (see Torque Table).

6-3-2. BUSHING REMOVAL AND INSTALLATION

To replace a bushing:

1. Remove the weldment containing the bushing.

2. Position the bushing removal tool as shown in Figure G-9 and extract the bushing.

3. To install the bushing, assemble the tool as shown in Figure G-10 and press the bushing in.

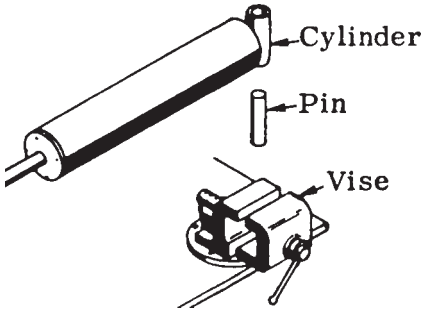


FIGURE G-1. SECURING CYLINDER

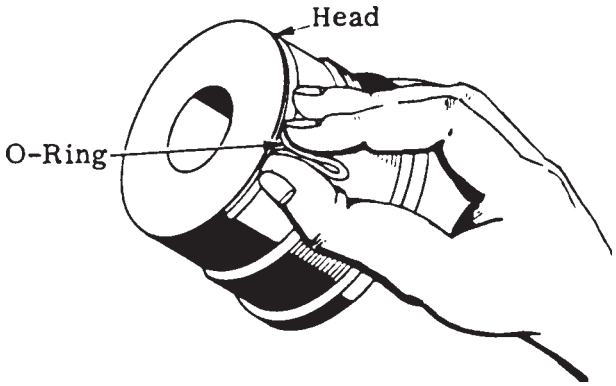


FIGURE G-3. O-RING REMOVAL

1. ROD
2. WIPER
3. DYNAMIC ROD SEAL
4. HEAD
5. STATIC BACK-UP
6. STATIC O-RING
7. STOP TUBE
8. PISTON
9. PISTON RINGS
10. DYNAMIC PISTON SEAL
11. WEAR RING
12. LOCK RING
13. STOP TUBE RING
    (NOTE: WAS WAFER LOCK. REPLACE WAFER LOCK WITH STOP TUBE RING WHEN RESEALING CYLINDER.

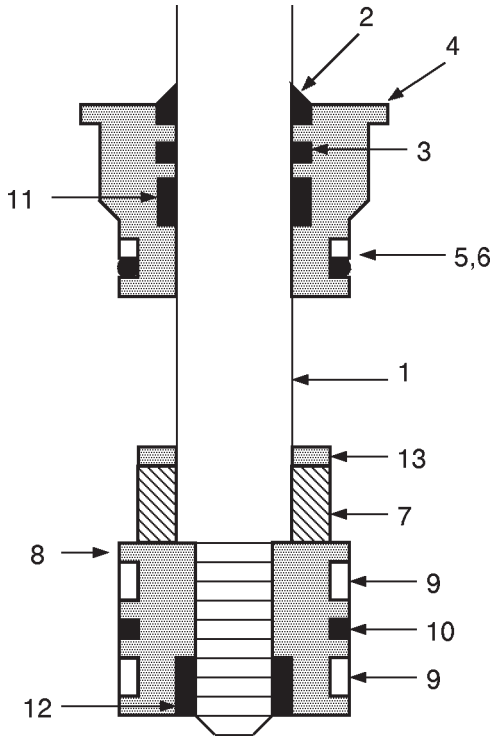


FIGURE G-2. CYLINDER COMPONENTS

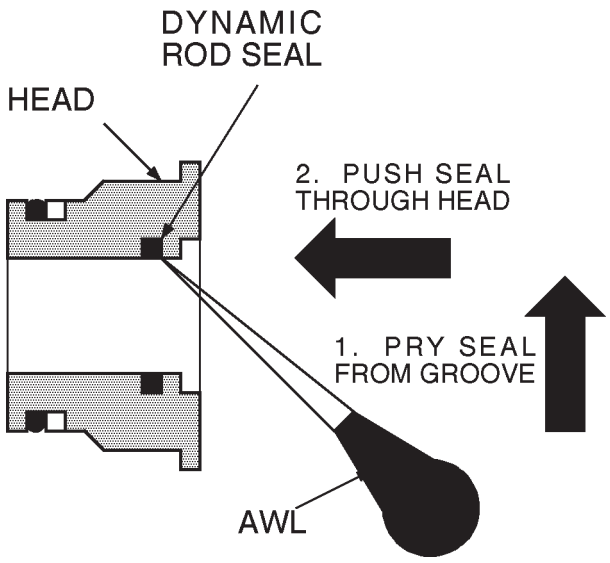


FIGURE G-4. DYNAMIC ROD SEAL REMOVAL

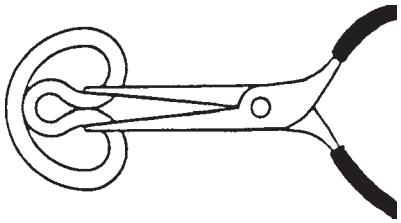


FIGURE G-5. ROD SEAL INSTALLATION

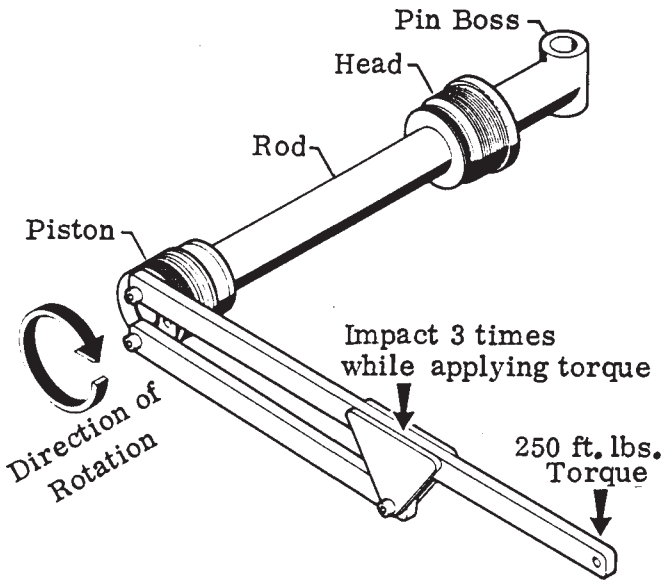


FIGURE G-6. PISTON/ROD ASSEMBLY

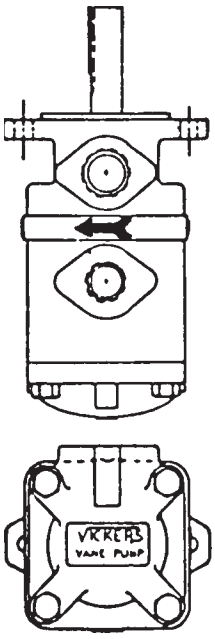


FIGURE G-7. HYDRAULIC PUMP

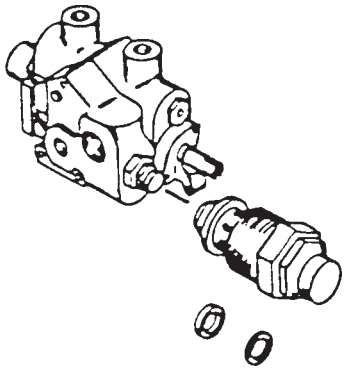


FIGURE G-8. RELIEF VALVE ADJUSTMENT

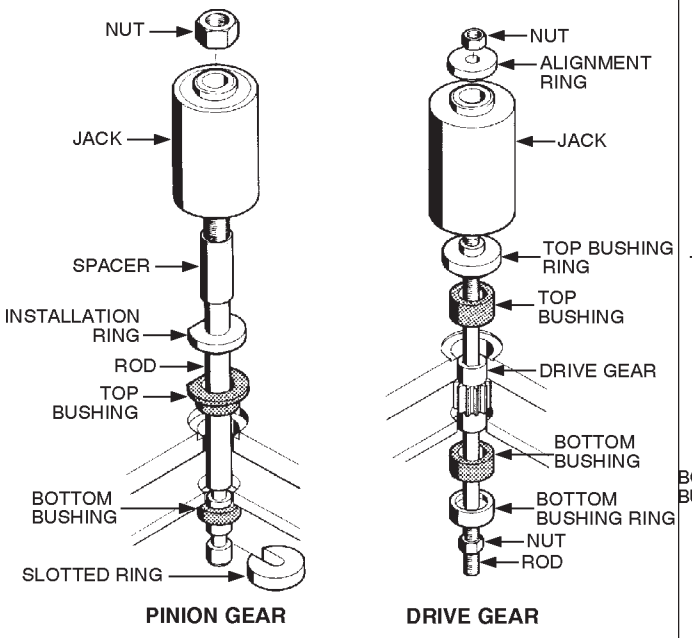


FIGURE G-9. BUSHING REMOVAL

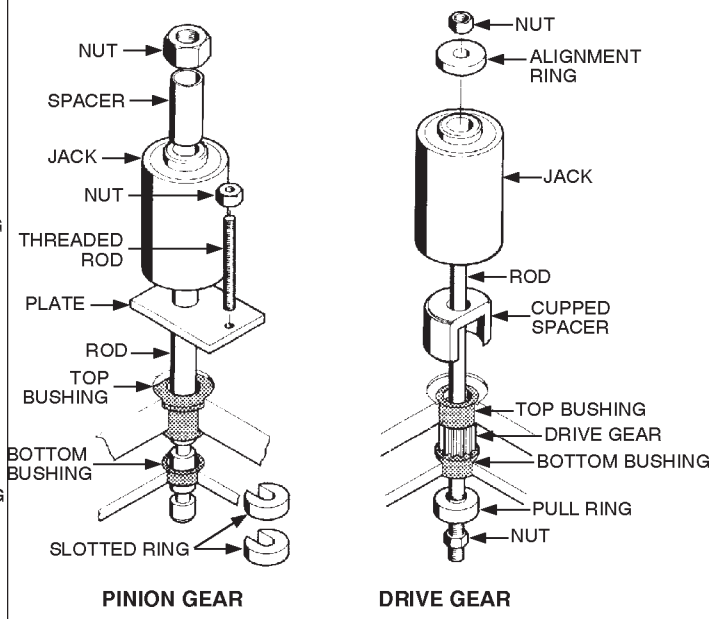


FIGURE G-10. BUSHING INSTALLATION

6-4. TROUBLESHOOTING

Table G-1 is intended for use as a quick reference in diagnosing on-the-job malfunctions. Care has been taken to list the most likely possible causes in order of probable occurence.

TABLE G-1. TROUBLESHOOTING

SYMPTOM	PROBABLE CAUSE
Controls fail to respond	1. Pump not engaged - if supplied with electric clutch. 2. Hydraulic oil supply is low. 3. Hydraulic pressure line is ruptured. 4. Suction line shut-off valve is obstructed. 5. Hydraulic pump is faulty. 6. Relief valve is set incorrectly.
Operation slow down	1. Hydraulic oil supply is low. 2. Hydraulic pump is operating at a reduced speed. 3. Relief valve is set too low.. 4. Pump or cylinder is worn. 5. Pump is slipping due to excessive oil temperature. This is a factor which will increase with worn components. 6. Filter is dirty. 7. Valve spools are inoperative. 8. Obstructed cylinder holding valve.
Rotation control slowed or erratic	1. Internal port orifices are clogged. 2. Rotation gears are locked or damaged.
Arms and pads drift when loaded and controls neutralized	1. Hydraulic oil is bypassing at piston rings. 2. Cylinder holding valves are defective or contaminated.
Unusual noise in operation	1. Cavitation is occurring due to low hydraulic oil supply. 2. Loading is excessive. 3. Restriction or collapse of suction line. 4. Bypass settings on relief valve are too low. 5. Relief valve is damaged. 6. Valve closure is obstructed due to particle accumulation.
Side step chatter or slow	1. Bearings need lubrication. 2. Mechanical damage to bracket. 3. Lower cylinder damaged.
Arm chatter or noise	1. Arms need both internal and external lubrication. 2. Bearing damaged.

TORQUE DATA CHART - DOMESTIC

FINE THREAD BOLTS

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

TORQUE DATA CHART - METRIC

FINE THREAD BOLTS

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

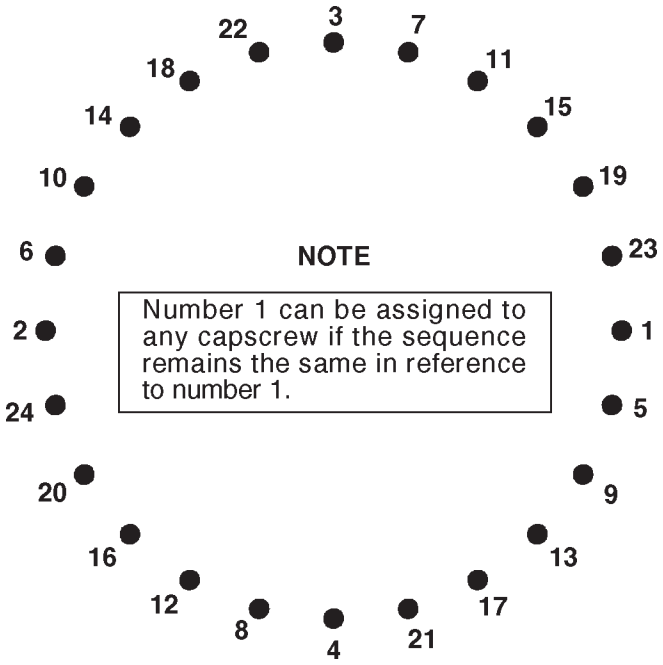
5. Torque values for socket-head capscrews are the same as for Grade 8 capscrews.

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 fatique causing serious injury or DEATH.

TURNTABLE BEARING FASTENER TIGHTENING SEQUENCE

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)
   (EXAMPLE-METRIC: .40 x 36 KG-M = 14.4 KG-M)

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)
   (EXAMPLE-METRIC: .75 x 36 KG-M = 27 KG-M)

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

TURNTABLE 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 bearings internal clearance once mounted on a crane.

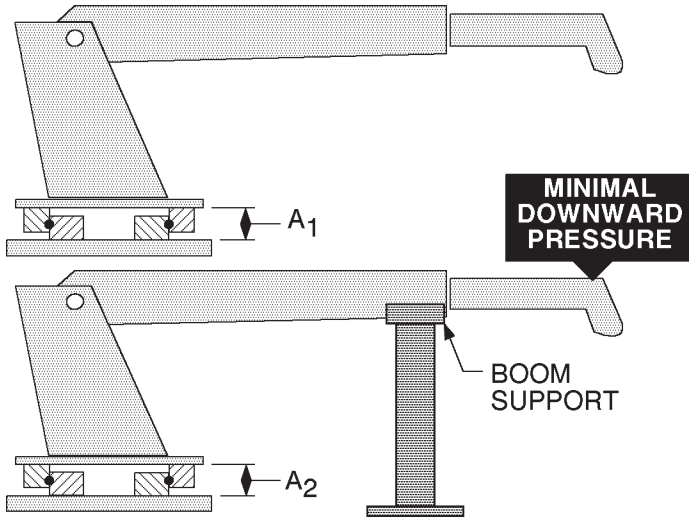
Periodic readings indicating a steady increase in TILT may be an indicator of bearing wear. Note that a bearing found to have no raceway cracks or other structural irregularities should be reassembled and returned to service.

TEST PROCEDURE

STEP 1.
With the crane horizontal and fully extended, measure between the top and bottom mounting surfaces of the turntable bearing (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

NOTE	IMT CRANE, LOADER 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.		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
	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)**

RECOMMENDED SPARE PARTS LIST

1 YEAR SUPPLY
TIREHAND 2551B
FOR MANUAL: 99900777

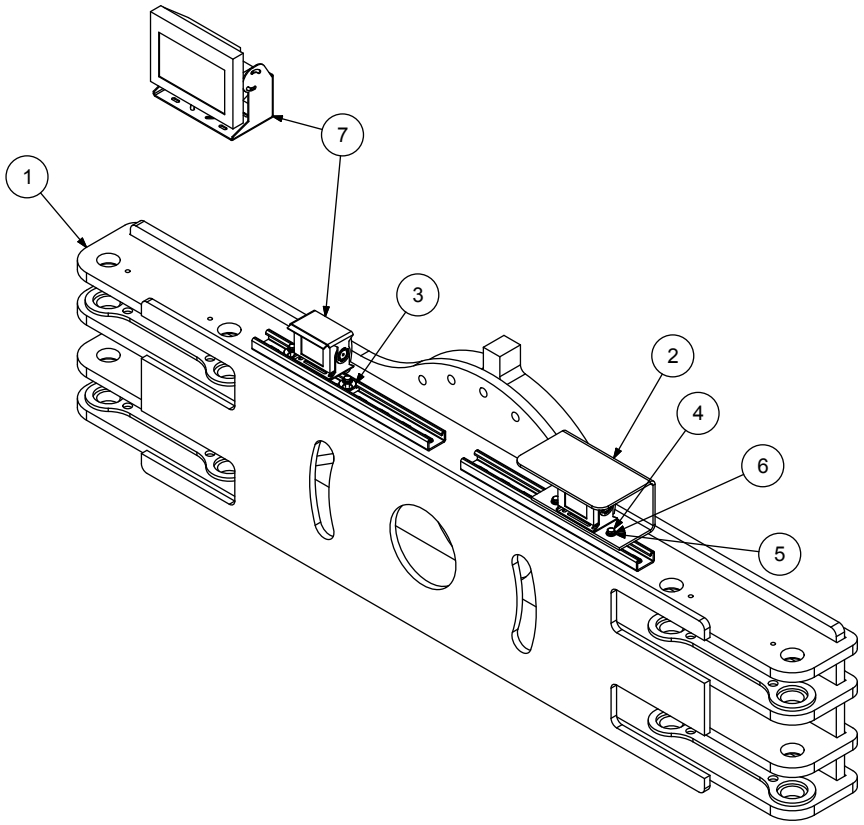
This spare parts list does not necessarily indicate that the items can be expected to fail in the course of a year. It is intended to provide the user with a stock of parts sufficient to keep the unit operating with the minimal down-time waiting for parts. There may be parts failures not covered by this 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
40714619.01.19980204	**BASE ASM W/SIDE SHIFTER**						
	2	60020236	THRUST WASHER	2			
	6	72063117	WASHER	8			
	7	60020122	BUSHING	1			
	8	60020123	THRUST WASHER	2			
	9	60020124	BUSHING	1			
	11	72601472	CAP SCR	23			
	12	72063115	WASHER	23			
	14	72601144	CAP SCR	8			
	24	73054538	C'BALANCE VALVE	4			
	32	7Q072112	O-RING	4			
	33	70034295	BUSHING	1			
	34	60020120	BUSHING	1			
	35	60020121	BUSHING	1			
	39	72601485	CAP SCR	17			
	43	60030253	WEAR PAD	1			
41714620.01.19980204	**BASE ASM USING FORKLIFT SIDE SHIFTER**						
	2	60020236	THRUST WASHER	2			
	6	72063117	WASHER	8			
	7	60020122	BUSHING	1			
	8	60020123	THRUST WASHER	2			
	9	60020124	BUSHING	1			
	11	72601472	CAP SCR	23			
	12	72063115	WASHER	23			
	14	72601144	CAP SCR	8			
	24	73054538	C'BALANCE VALVE	4			
	32	7Q072112	O-RING	4			
	33	70034295	BUSHING	1			
	34	60020120	BUSHING	1			
	35	60020121	BUSHING	1			
40712519.01.19940901	**BODY ASM**						
	5	72601468	CAP SCR	18			
	6	72063116	WASHER	18			
40712518.01.19980106	**CLAMP ASM**						
	5	60020167	BUSHING	16			
	20	73051004	HYD MOTOR	2			
	22	73054538	C'BALANCE VALVE	4			
	25	71056010	PINION GEAR	2			
	26	71056012	INTERMEDIATE GEAR	2			
	27	71056389	TURNTABLE GEAR BEARING	2			
	31	72060931	CAP SCR	72			
	32	72063119	WASHER	72			
	41	71056011	DRIVE GEAR	2			
	42	60020115	BUSHING	2			
	43	60020100	BUSHING	2			
	44	60020114	BUSHING	2			
	45	60020081	BUSHING	2			
3B282930.01.19940901	**SIDESHIFT CYLINDER**						
	5	9B015930	SEAL KIT	1			
3B340820.01.19941011	**CLAMP CYLINDER**						
	3	60020196	BUSHING	8			
	9	73054242	C'BALANCE VALVE	2			
	10	9C162023	SEAL KIT	2			

SECTION 7. CAMERA OPTION

CAMERA KIT (40724928)

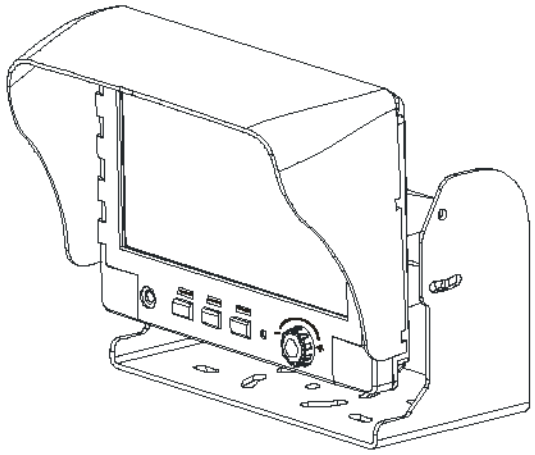
ITEM	PART	DESCRIPTION	QTY
1.	52724661	WLDMT-BODY 5K	1
2.	60140425	CAMERA MOUNT	2
3.	71414717	NUT- 0.25-20 CHANNEL	4
4.	72060004	CAP SCR 0.25-20X 1.00 HH GR5 Z	4
5.	72063001	WASHER 0.25 FLAT	4
6.	72063049	WASHER 0.25 LOCK	4
7.	77734564	CAMERA OPTION-DUAL	1



Thank you for purchasing our product.
Please read this User's Manual before using the product.
Change without Notice

AWT07MLED

7" Q TFT LCD MONITOR (LED Backlighted)
USER MANUAL



SAFETY PRECAUTIONS

Federal Communications Commission (FCC) Statement

This Equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency
energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio / TV technician for help.

- You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference and,
(2) This device must accept any interference received, including interference that may cause undesired operation

TABLE OF CONTENT

MONITOR-DUAL VISION (77734784)

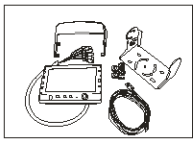
FEATURE

- Advanced OSD Menu for easy use
- Support up to 4 CCD Camera inputs (Mini din connector)
- Extra RCA input for multimedia while parking (VCD, DVD, Game device)
- Provide 2 Video / 1 Audio Signal Output (Live Out)
- Support Single / Dual / Triple / Quad Screen (Cam Out)
- Signal Trigger for Side / Rear View
- Auto Day & Night Control via Photo Diode Sensor
- Auto Detection for NTSC / PAL System
- OSD Control for Individual Normal / Mirror Camera Image for every camera
- Auto power on when users are making left turn or right turn even reverse
- Able to select CAM A / B/C / R's monitoring screen
- Supported 9.6V~32V Car power system working
- Professional Metal Case with Anti Shocking Design

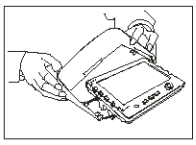
1. Package Contents

Item	Qty.
1. 7" LCD Monitor	1
2. Sun-Hood	1
3. Mounting Bracket	1
4. Accessories	1
5. Control Cable	1
6. User Manual	1

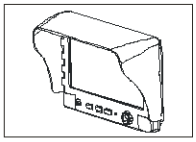
2. TFT Installation



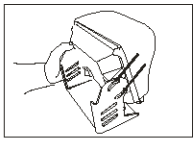
Step 1
Check the package and make sure all parts are included.



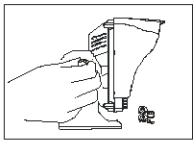
Step 2
Clip the sun-hood on to the monitor.



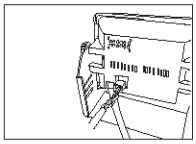
Step 3
Make sure it is installed properly.



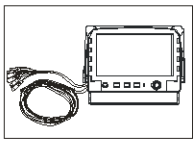
Step 4
Install the monitor on to the bracket.



Step 5
Adjust the monitor to an appropriate / comfortable viewing angle before tightening the screws.

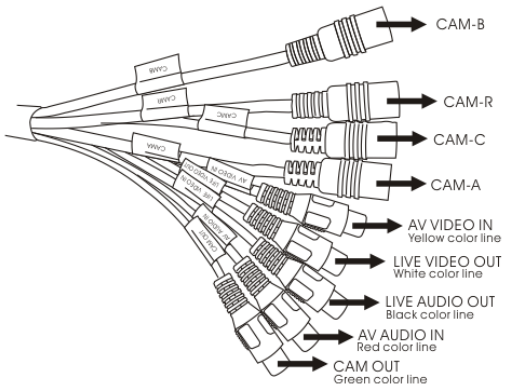


Step 6
Connect the control cable included to the power socket which located at rear side of monitor.



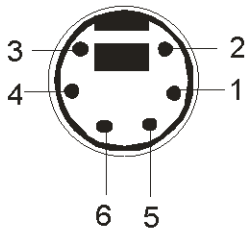
Step 7
Monitor installation is now completed. Each control cable wire is attached with a sticker to indicate its signal function. Referred to the identification sticker for further installation.

3. Signal Cable Description



1. CAM R (Mini din) (NTSC/PAL system presume by this car rear CCD)
   For 1st camera connection
2. CAM A (Mini din)
   For 2nd camera connection
3. CAM B (Mini din)
   For 3rd camera connection
4. CAM C (Mini din)
   For 4th camera connection
5. LIVE VIDEO OUT (White Color RCA Jack)
   On screen video loop out (for recording, second monitor or other device)
6. LIVE AUDIO OUT (Black Color RCA Jack)
   On screen audio loop out (for recording, second monitor or other device)
7. AV VIDEO IN (Yellow Color RCA Jack)
   Connection for any Video signal (DVD, VCD, Game)
8. AV AUDIO IN (Red Color RCA Jack)
   Connection for any Audio signal (such as DVD, VCD, Game)
9. CAM OUT (Green Color RCA Jack)
   Video loop out (for recording, second monitor or other device)

Mini Din Pin Assignment



*** Type 1 (Standard):**

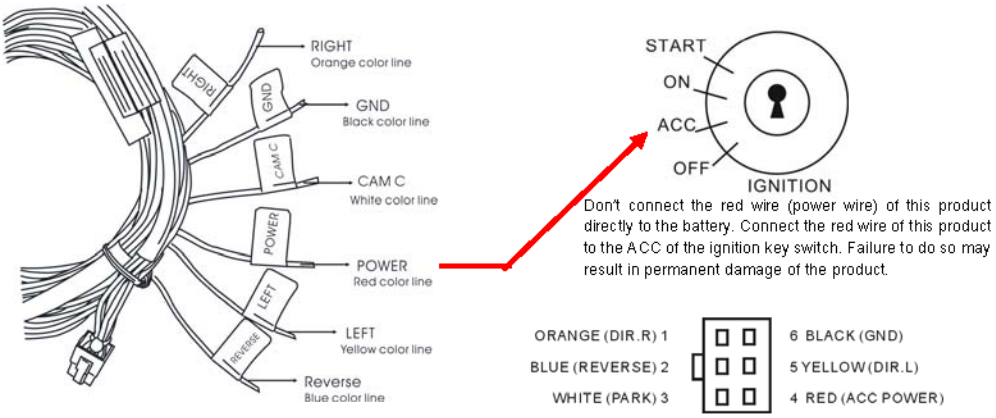
1. Video	4. +12V
2. -------	5. GND
3. Audio	6. -------

Function of the Audio

Cam A	Audio from Cam A
Cam B	Audio from Cam B
Cam C	Audio from Cam C
Cam R	Audio from Cam R
Cam A + Cam B	Audio from Cam A
Cam C+ Cam R	Audio from Cam R
Cam A+ Cam R	Audio from Cam R
Cam R+ Cam B	Audio from Cam R
Cam A + Cam C	Audio from Cam A
Cam C+ Cam B	Audio from Cam C
Cam R / Cam AB	Audio from Cam R
Quad	Audio from Cam R
AV	Audio from AV

※ Cam Out: Composite video loop out signal to recorder, monitor or other device.
※ Live Video/Audio Out: On screen video/audio signal loop out to recorder, monitor or other device.

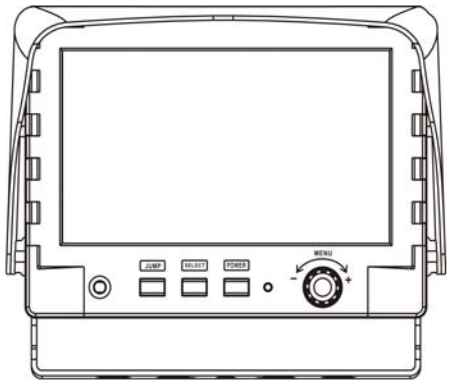
4. Control cable Description



WIRE COLOR	FUNCTION	REMARK	ON SCREEN VIEW
RED	ACC POWER		
BLACK	GND		
WHITE	SW Control	Active Power Level Connect to CAM C	
BLUE	Reverse Control	Active Power Level Connect to Reverse Light	
ORANGE	Right Turn Control	Active Power Level Connect to Direction Light (R)	
YELLOW	Left Turn Control	Active Power Level Connect to Direction Light (L)	

1. The control cable sequence: Reverse > Right / Left / CAM C when Priority is ON. Right / Left / CAM C > Reverse when Priority is OFF.
2. With car power is on, the monitor power is off, when making a reverse / right / left turn, the monitor will display default screen.
3. You may push the "JUMP" button under event trigger when Priority is OFF.

5. Front Panel Control



POWER Press the power button to activate the monitor or to keep the monitor under stand by mode (In Red Led).

SELECT With power on, press this button to select image sequence as below~
AV→CAM A+B→CAM C+R→CAM A+R→CAM R+B→CAM A+C→
CAM C+B→CAM R/AB→CAM R+AB→CAM A→CAM B→CAM C→
CAM R →AV……
Prerequisite：Display menu →Priority option is "ON"

JUMP Press this button to display defined camera input, user can select
QUAD→SEQ→CAM A+B→CAM C+R→CAM A+R→CAM R+B→
CAM A+C→CAM C+B→CAM R/AB →CAM R+AB →CAM A →CAM B
CAM C→CAM R via OSD as default value.
Prerequisite：Display menu →Priority option is "ON"

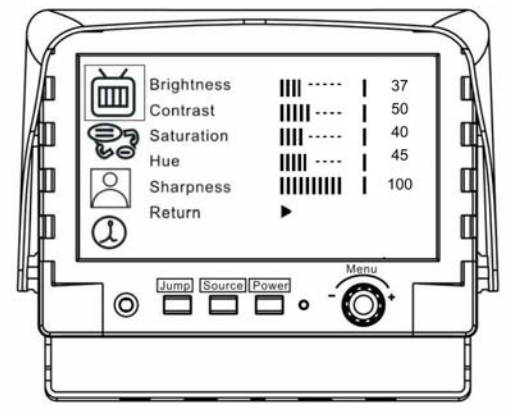
MENU This encoder switch provides the following function:

1. Activate OSD menu: Press the Menu switch to activate the OSD menu. After the OSD menu is activated, in case users does not proceed for further set up, the OSD menu will then automatically turn off within 20 seconds.
2. Enter Function: Press the encoder switch to act as "Enter" function under the OSD menu.
3. Volume Value: Exit the OSD menu, user can turn this switch left or right to adjust the volume value.

OSD Menu

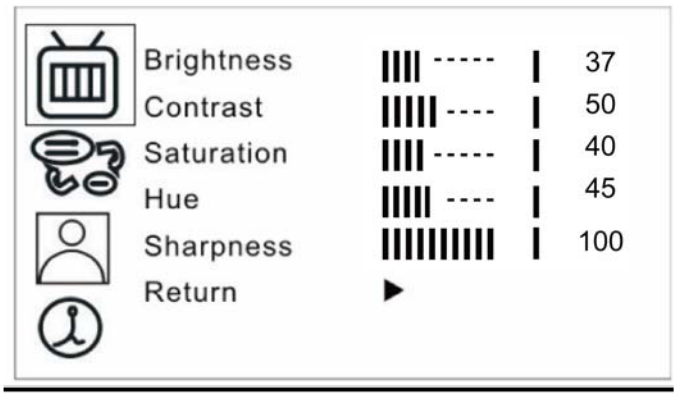
1. Press the MENU button to enter to the OSD Menu
2. Turn the MENU button left or right to select the setting you wish to proceed. The color of the content will turns YELLOW to identify your selection. Turn the MENU button left or right to adjust your setting value.
3. Press the MENU button once back to submenu and then press menu button again in order to return to OSD menu.

Enter to Main menu:



SCREEN Menu

This menu set up contains different setting for the TFT LCD.



Brightness
Provide adjustment for shade and brightness level of TFT display.
Setting value from 0 ~ 100. Default value is 37.

Contrast
Provide adjustment for the light and dark level of the TFT display.
Setting value from 0 ~ 100. Default value is 50.

Saturation
Provide adjustment for the light intensity level of TFT display.
Setting value from 0 ~ 100. Default value is 40.

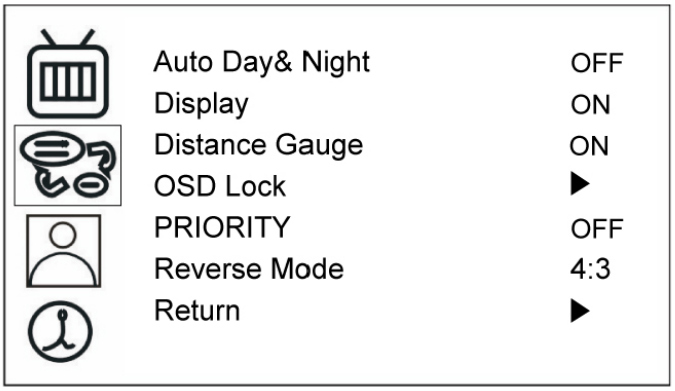
Hue
Provide adjustment for the lightness and colorfulness level of TFT display.
Setting value from 0 ~ 100. Default value is 45.
(Only in NTSC system is available.)

Sharpness
Provide adjustment for the edge contrast (acutance) level of TFT display.
Setting value from 0 ~ 100. Default value is 100.

Return
Return to OSD menu selection screen.

DISPLAY Menu

This menu set up contains the on screen identification and the activation of the distance gauge.



Auto Day&Night

Select “ON” to activate the auto day & night function or “OFF” to deactivate it. Default value is OFF.

Display

Select “ON” to show the SELECT of video input title on screen or “OFF” to keep it invisible. Default value is ON.

Distance Gauge

Set the distance gauge “ON” to show the distance gauge on screen while reserving or “OFF” to deactivate. Default value is ON.
(This “DISTANCE GAUGE” is for user’s reference only)

OSD Lock

This function provides protection when an unauthorized person tries to access the OSD settings. JUMP and SELECT key press simultaneously for over 5 seconds to unlock. Default value is OFF.

※Users must turn on LCD in order to run unlock process. All function buttons are still working during OSD Menu lock up period.

PRIORITY

If Priority is ON

a. Press SOURCE button to select image sequence as below~
AV→CAM A+B→CAM C+R→CAM A+R→CAM R+B→CAM A+C→
CAM C+B→CAM R/AB→CAM R+AB→CAM A→CAM B→CAM C→
CAM R →AV.....
b. Triggered mode priority: Reverse > Right/Left / CAM C
c. JUMP mode: QUAD
d. OSD Lock mode: OFF

If Priority is OFF

a. Press SOURCE button to select image sequence is as below~
AV→ CAM A→CAM B→CAM C→CAM R →AV.....
b. Triggered mode priority: Right/Left/CAM C > Reverse
c. JUMP mode: CAM R
d. OSD Lock mode: ON

Default value is “ON”.
Notice：When you choose “OFF” mode also enable OSD Lock function.

REVERSE MODE

When reversing select LCD profile ratio 4:3 the display show in size 4:3(default), select LCD profile ratio 16:9 the display show in size 16:9

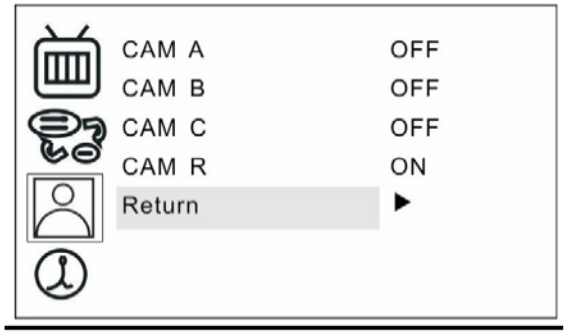
Return

Return to OSD menu selection screen.

CAMERA Menu

This menu set up contains the on Camera and Jump setting.

Mirror



Select "ON" to activate the mirror function for different cameras or "OFF" for a normal image. Default values are following below setting.

CAM A	"OFF"
CAM B	"OFF"
CAM C	"OFF"
CAM R	"ON"

Dir Image

The screen image setting of this panel during left / right turn:

TRIPLE: When you are making a right turn or left turn, the screen of panel will display triple images for left hand side, right hand side and rear view when you are making a right turn or left turn.

DUAL: With proper wiring, the screen will display dual image for both rear and right hand side view when making a right turn. While left turning, the screen will show dual image for both rear and left hand side view.

SINGLE: Screen of touch panel shows only single picture on direction turn. The screen will show only left side view on left turn and only right side view on right turn.

Default value is SINGLE.

Rear Setup

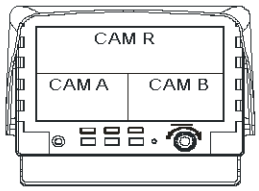
The screen image setting of this panel during reverse gear:

R: Screen will display single image for Cam R only.

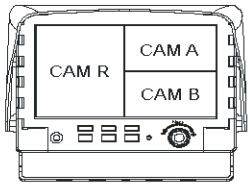
R+A: Screen will display dual image for both Cam R and Cam A.

R+B: Screen will display dual image for both Cam R and Cam B.

R/AB Screen will display triple image from Cam R、Cam A、Cam B.



R+AB Screen will display triple image from Cam R、Cam A、Cam B.



Default value is R.

Jump

By pressing this button, the driver will be able to obtain the image selected under this setting.

QUAD	Obtain image from all camera input in quad picture while pressing the JUMP button and press again to return the default screen.
SEQ.	Corresponding with “SEQ. Timer Step” setting to jump channel by time sequence.
CAM A	Obtain image from camera A while pressing the JUMP button and press again to return the default screen.
CAM B	Obtain image from camera B while pressing the JUMP button and press again to return the default screen.
CAM C	Obtain image from camera C while pressing the JUMP button and press again to return the default screen.
CAM R	Obtain image from camera R while pressing the JUMP button and press again to return the default screen.
CAM A+B	Obtain image from camera A+B in dual picture while pressing the JUMP button and press again to return the default screen.
CAM C+R	Obtain image from camera C+R in dual picture while pressing the JUMP button and press again to return the default screen.
CAM A+R	Obtain image from camera A+R in dual picture while pressing the JUMP button and press again to return the default screen.
CAM R+B	Obtain image from camera R+B in dual picture while pressing the JUMP button and press again to return the default screen.
CAM A+C	Obtain image from camera A+C in dual picture while pressing the JUMP button and press again to return the default screen.
CAM C+B	Obtain image from camera C+B in dual picture while pressing the JUMP button and press again to return the default screen.
CAM R/AB	Obtain image from camera R+A+B in triple picture while pressing the JUMP button and press again to return the default screen.
CAM R+AB	Obtain image from camera R+A+B in triple picture while pressing the JUMP button and press again to return the default screen.

Default value is QUAD.

Cam Out

Composite video loop out to recorder, monitor or other device.

QUAD	Recording or viewing from the output device in quad mode
CAM A	Recording or viewing from the output device for CAM A image
CAM B	Recording or viewing from the output device for CAM B image
CAM C	Recording or viewing from the output device for CAM C image
CAM R	Recording or viewing from the output device for CAM R image

Default value is QUAD.

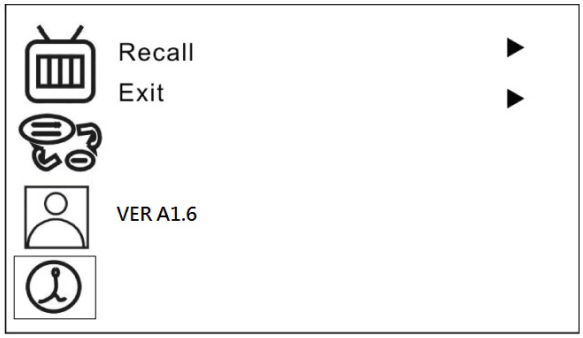
SEQ Time Step

Select Cam A/B/C/R switching time setting value from 02~100
Default value is “02”

Return

Return to OSD menu selection screen.

Information
This menu set up contains Recall & Exit function.

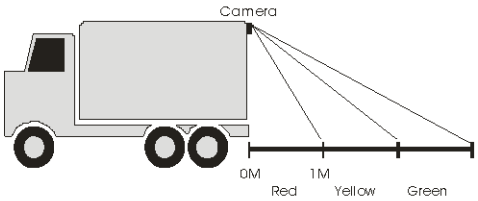


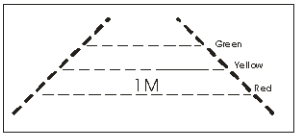
Recall
Recall factory default.

Exit
Exit OSD menu.

Notice：Firmware version has shown on last column.

6. Vehicle Installation



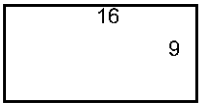


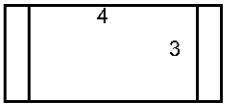
(This " DISTANCE GAUGE" is for user's reference only)

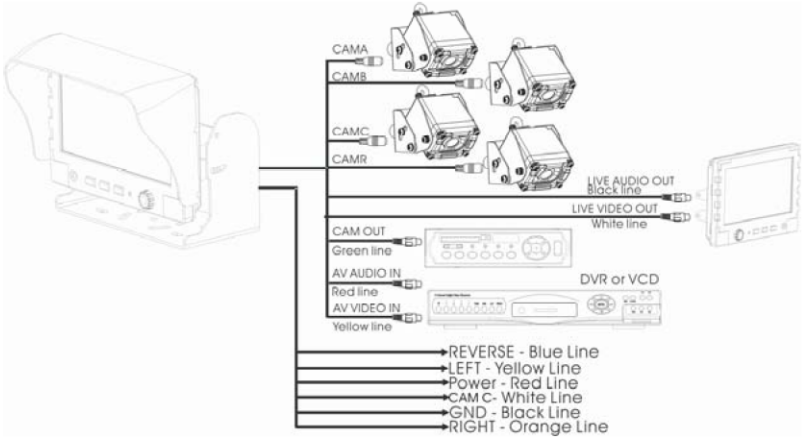
a. Install Camera R (for rear view)
b. Use a measuring tool to mark out the distance behind the vehicle.
c. Adjust the viewing angle of the camera so that the distance gauge shown from the TFT match to the distance marks behind the vehicle.

Switch to Rear view with SELECT button, the screen always display on 16:9
While rear viewing, the screen always display on 4:3 to correct size percentage

SELECT button: Rear viewing:







7. Specification

Screen size	7 Inch Touch Panel (diagonal)
Active area	154.08(H) x 86.58(V)
Pixel configuration	0.107 x 0.370
Resolution	1440(W) x 234 (H)
Viewing angle	UP:40° / Down:60° / Left: 60° / Right:60°
Power source:	DC9.6V ~DC32V
Contrast ratio	300:1 ※
Brightness	450 cd/m^2 ※
AV Video In	
Connector	RCA
Input Signal	1Vpp
Impedance	75 Ohms
Camera MINI DIN In	
Connector	6 PIN MINI DIN (Standard)
Input video signal level	1Vpp
Impedance	75 Ohms
Input audio signal level	1Vpp
Power output for camera	DC12V 350mA
AV Audio In	
Connector	RCA
Input video signal level	1Vpp
Impedance	1K Ohms
Live Video Out	
Connector	RCA
Input signal level	1Vpp
Impedance	75 Ohms
CAM OUT	
Connector	RCA
Input signal level	1Vpp
Impedance	75 Ohms
LIVE Audio Out	
Connector	RCA
Input signal level	1Vpp
Impedance	1K Ohms
Dimension	
W x H x D :	192 x140.5 x 51.8mm
Weight	N.W./G.W.: 2kg/ 2.28kg
Environmental:	
Operation temperature	-10℃~70℃
Storage temperature	-30℃~80℃
Humidity	20%-80%

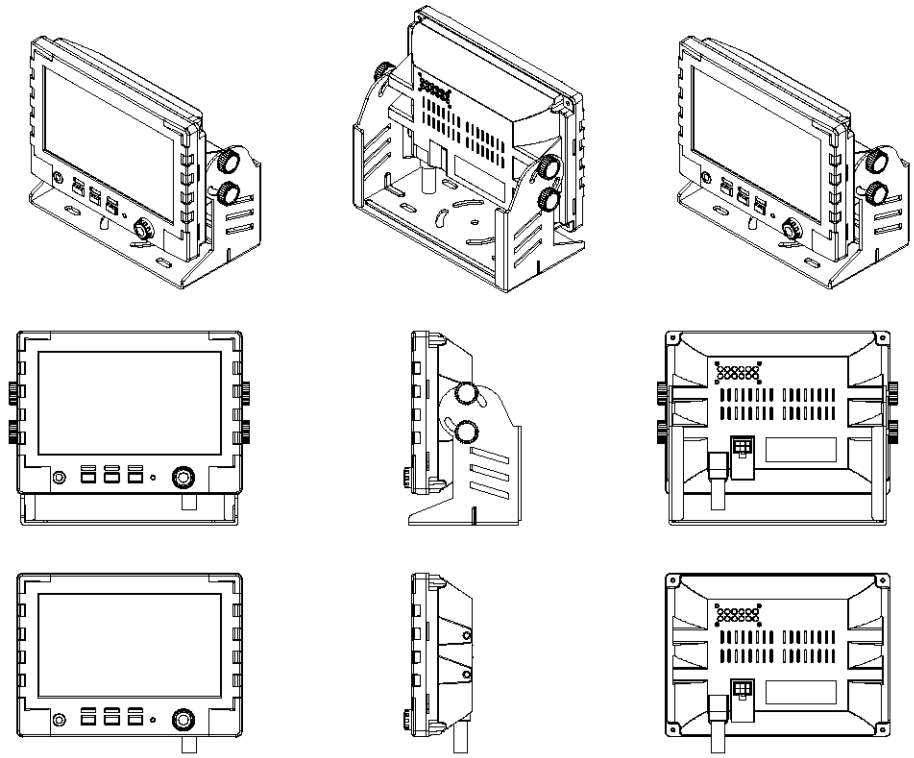
※The brightness and contrast ratio specifications are from panel specification.

Design and Specifications are subject to change without notice.

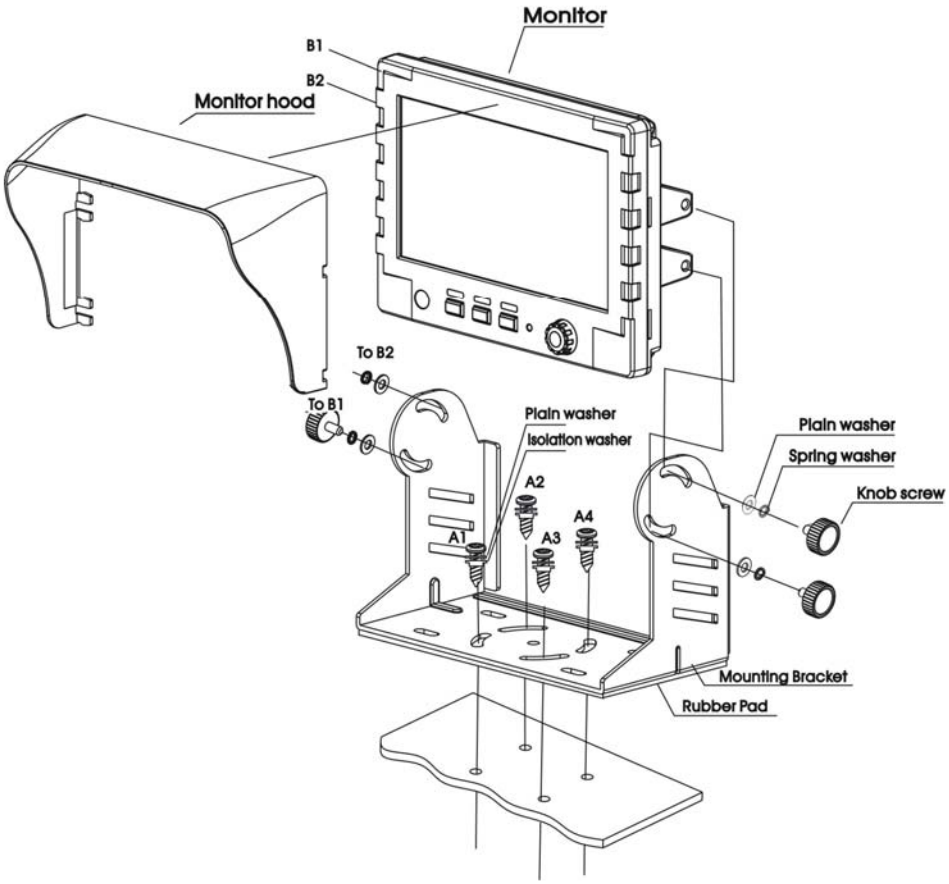
A1.6

8. ATTACHMENT

Attachment 1: Dimension Chart



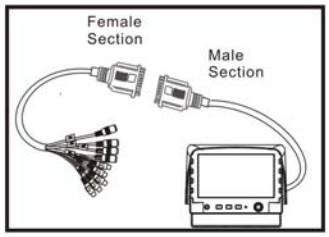
Attachment 2: Installation Chart



Notice:

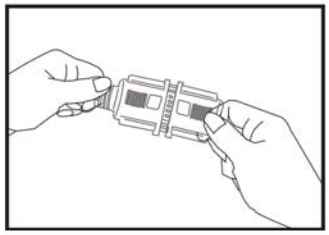
Please proceed with suggested installation instruction according to above picture to avoid any malfunction of the product.

Connecting Steps for Cable of Two-Sections-in-One.



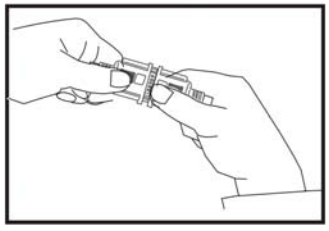
A. The first part of the cable which connected with the LCD Monitor, herewith we called the Male Section

B. The second part of the cable which ended with the RCA/MINI DIN connectors, herewith we called the Female Section.



Connection Steps are:

1. Please connect the "Male Section" to the "Female Section.



2. Please tight up the side screws.

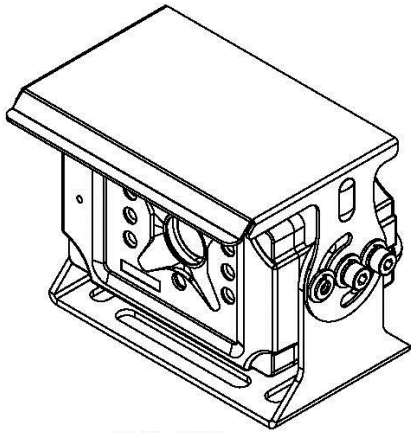
The Cable should be stored in a dry place and please try to avoid the water and humidity, otherwise, it may cause problem of the product itself or even more dangerous.

85-ML072Q-A003G - D

CAMERA-FOR DUAL VISION MONITOR (77734785)

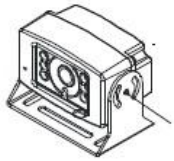
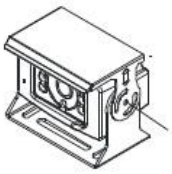
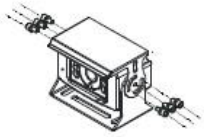
Thank you for purchasing our product.
Please read this User's Manual before
using the product. Change without Notice

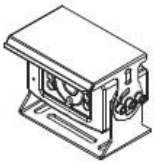
CAR REAR VISION COLOR CCD CAMERA
INSTRUCTION MANUAL



CAMERA-FOR DUAL VISION MONITOR (77734785)

Installation

		
Step 1 Confirm part quantities	**Step 2** Hold the bracket and to aim at middle of screw hole.	**Step 3** Make sure it's on the middle position.
		
Step 4 Put the protection cover on the top of camera.	**Step 5** To aim at middle of screw hole. Same as like step 2	**Step 6** Make screws to aim at all holes each site has 3 screws hole.

	Camera Mirror (M) / Normal (N) Adjustment  
Step 7 Screws tight and done.	1. Screw 2.Unscrew   3. For Mirror Function Turn Arrow to M 4. For Normal Function Turn Arrow to N

CAMERA-FOR DUAL VISION MONITOR (77734785)

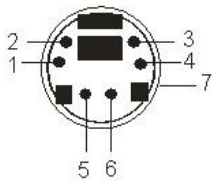
Specification

- Fisheye distortion correction optional
- For Use With 1/3" Format Camera
- Min. Illumination 0 Lux at F2.0 (IR LED ON)
- With 600 TV Lines Horizontal Resolution
- Automatic white balance
- IP 67 weatherproof

Pick up device	1/3" interline transfer CCD	
Total Pixels	NTSC: 811(H) x 508(V) PAL: 795(H) x 598 (V)	
Effective Pixels	NTSC: 768(H) x 494(V) PAL: 752(H) x 582(V)	
Resolution	600 TV lines	
Sync. System	Internal	
Scanning System	2:1 Interlace	
S/N Ratio	More than 50 dB (AGC OFF)	
Electronic Shutter	Auto Electronic Shutter 1/60 (1/50) ~1/100,000 sec.	
Min. Illumination	0Lux (F2.0) with IR LED ON	
Video Output	Composite 1.0 Vp-p / 75 ohm	
Automatic Gain Control	ON	
Aperture Correction	Yes	
Frequency Horizontal	NTSC: 15.734 KHz ; PAL: 15.625 Khz	
Frequency Vertical	NTSC: 59.94Hz ; PAL: 50Hz	
LED Angle	4 PCS 70° / 2PCS 50° total 6PCS LED	
Lens Mount Type	2.27mm F2.0,	2.13mm F2.0
DC power Source	DC9.6~12V	
Power Consumption	3W (Max IR ON)	
Current	250mA (max IR ON))	
Audio Out	700mV (10k OHM)	
Dimension	103.2(W) x 76.05(H) x 79.75(D)mm	
Operation Temperature	-20 to 70℃ (-4 to 158℉)	
Storage Temperature	-30 to 80℃ (-22 to 176℉)	

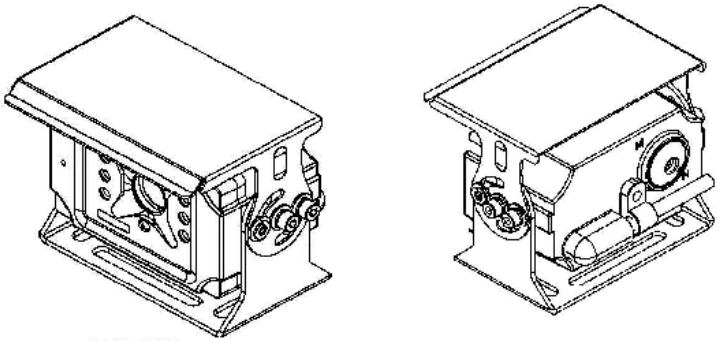
CAMERA-FOR DUAL VISION MONITOR (77734785)

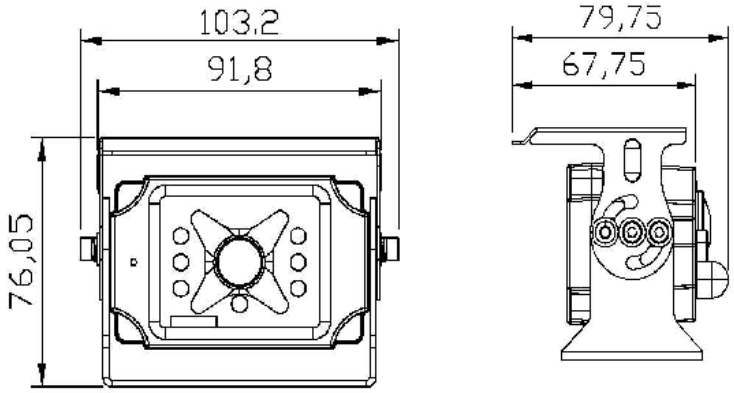
CABLE PIN FUNCITON



1	Video
2	N/A
3	Audio
4	Power
5	GND
6	N/A
7	N/A

Dimension





CABLE-COAX 65' FOR DUAL VISION MONITOR (77734786)

ADAPTER PROGRAM AND ACCESSORIES

"Plug 'N Play" has never been easier. Our custom built adapters fit all major competitor brands allowing you to effortlessly upgrade your current system to the industry leading 3rd Eye MobileVision™ brand.

*Please specify which camera system you are currently using when ordering

AWTCAGE
Heavy Duty Camera Cage

AWTMIRRMNT
Camera Mount for Side Mirrors

AWT-CabMnt
Camera Mount for Side of Cab (Must Specify Side)

AWT-AllyCamMnt
Camera Mount for the Tailgate of the Truck (Must Specify Side)

AWTSVLHD
Heavy Duty Swivel Mount

Standard Cable
AWT065T - 65 ft.
AWT042T - 42 ft.
AWT025T - 25 ft.
AWT010T - 10 ft.

Extension Cable
AWT065TT - 65 ft.
AWT042TT - 42 ft.
AWT025TT - 25 ft.
AWT010TT - 10 ft.

AWT-WinMnt
Glass Mount for Slim Line Monitors (Removable)

BODY BUILDER CABLE

WHAT IS THE BODY BUILDER CABLE?

Body Builder Cable: The most advanced wiring and connector standard

At the request of several national refuse fleets, 3rd Eye MobileVision™ developed a "Pass-Thru" cable to act as the single "Communication Backbone" between the truck chassis and body for advanced video safety systems.

PURPOSE AND SCOPE

A single "Pass-Thru" cable terminated with heavy duty connectors would be the single "communications backbone" between the truck chassis and body.

The cable would support multiple electrical signals including analog video, audio and digital data. The cable is to be installed by the truck chassis OEM when an appropriate cable path is clearly visible.

The cab pre-wire cable is routed with the wiring loom of the truck cab when the truck chassis is manufactured.

The custom multi-conductor cable has 21 circuits that provide multiple functions including: DC low voltage power, ground video, audio, both analog and digital.

Non-proprietary connectors provide easy access and economical connectivity for advanced video, radar sensors and digital information technologies.

CAB ADAPTER #29086

EXT CABLE #29073

SENSORS INTERFACE

3RD EYE #AWT030TT CABLE

BB CAB PRE-WIRE CABLE

BB EXTENSION CABLE #29089

TAILGATE ADAPTER #29059

6 PIN Power Plug

Port "A" Camera In 6 Pin mini DIN
Port "B" Camera In 6 Pin mini DIN
Port "C" Camera In 6 Pin mini DIN
Port "R" Camera In 6 Pin mini DIN

Live Video Out (RCA - White Wire)
Live Audio Out (RCA - Black Wire)
A/V Video In (RCA - Yellow Wire)
A/V Audio In (RCA - Red Wire)
Camera Out (RCA - Green Wire)

CAMERA & A/V INTERFACE HARNESS

POWER & CONTROL CABLE HARNESS

Ignition Power (+9.6~32VDC - Red Wire)
Chassis Ground (GND - Black Wire)
Reverse Trigger (+9.6~32VDC - Blue Wire)
"A" Port Trigger (+9.6~32VDC - Yellow Wire)
"B" Port Trigger (+9.6~32VDC - Orange Wire)
"C" Port Trigger (GND - White Wire)

The Preferred mounting location for the AWT/3rd Eye monitor is overhead. Dual Steer trucks require the use of a swivel base. Camera and monitor controls are to be located for easy access within reasonable reach in all driving positions. If the truck cab has been pre-wired with the AWT Body-Builder Cable kit please contact AWT for in-depth documentation that will assist you.

NOTES

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: _____

☐ REQUEST FOR ADDITION TO MANUAL

DESCRIPTION OF ADDITION: _____

REASON FOR ADDITION: _____

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

IOWA MOLD TOOLING CO., INC.
BOX 189, GARNER, IA 50438-0189
TEL: 641-923-3711
TECHNICAL SUPPORT FAX: 641-923-2424