
99903669

2003i Crane Operation, Safety & Maintenance Manual

Revised 20070212



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Revisions

DATE	LOCATION	DESCRIPTION
20050830		MODEL CHANGES TO 3203i, 4004i, AND 6006i

CHAPTER 1

Introduction

GENERAL

The information contained in this manual is designed to help provide you with the knowledge necessary in the safe and proper operation of your IMT crane. This information is not intended to replace any governmental regulations, safety codes or insurance carrier requirements. Operators, maintenance and test personnel must read and understand all safety procedures applicable to the equipment in use.

WARNING

FAILURE TO READ, UNDERSTAND AND FOLLOW ANY SAFETY PROCEDURES APPLICABLE TO YOUR EQUIPMENT MAY RESULT IN EQUIPMENT DAMAGE, SERIOUS INJURY, OR DEATH.

In addition to reading the manual, it is your responsibility to become familiar with government regulations, hazards, and the specific operation of your crane. Use caution and common sense while operating and maintaining the crane, and follow all safety procedures and regulations. Refer to ANSI/ASME B30.5, the standard for Telescoping and Mobile Boom Cranes, for more information on crane design and test criteria. (You may obtain this publication from the American Society of Mechanical Engineers at www.asme.org.) Crane operators must also be familiar with OSHA 29CFR, Subpart N, Article 1926.550 and CAL-OSHA Title 8, Article 93 (California).

CRANE AND SAFETY EQUIPMENT MODIFICATIONS

Modifications to your crane must be performed with IMT approved accessories, parts and optional equipment. If in doubt about the safety, compatibility, or appropriateness of any modifications, contact IMT prior to making those modifications. **DO NOT** alter or modify any safety device! All safety devices must be inspected, tested and maintained in proper working condition.

Decals regarding crane safety and operation are considered to be safety equipment. They must be maintained just as any other safety device. Decals must be kept clean and legible to the operator, operational personnel, and bystanders as specified in the decal section of this manual. **DO NOT** remove, disable, or disregard any safety device attached to your crane.

OWNER RESPONSIBILITIES

It is the user's responsibility to maintain and operate this unit in a manner that will result in the safest working conditions possible, and to be aware of existing Federal, State, and Local codes and regulations governing the safe use and maintenance of this unit.

The owner and/or designated employee is responsible for informing all operators, maintenance personnel, and others involved in equipment operation about the safe operation and maintenance of the crane. If questions arise concerning safe crane operation, contact IMT or your IMT distributor for clarification.

MANUAL STRUCTURE

Throughout this manual, three means are used to draw the attention of personnel. They are NOTES, CAUTIONs and WARNINGs 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.

WARRANTY

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

NOTICE TO THE OWNER / USER

If your equipment is involved in a property damage accident, contact your IMT distributor immediately and provide them with the details of the accident and the serial number of the equipment. If an accident involves personal injury, immediately notify your distributor and IMT's Technical Support at:

IOWA MOLD TOOLING CO., INC.
500 HWY 18 WEST
GARNER, IA 50438
641 - 923 - 3711

CHAPTER 2

Operation

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Safety

WARNING

KEEP CHILDREN, BY-STANDERS, AND PERSONS NOT REQUIRED IN THE OPERATION OF EQUIPMENT AT LEAST 10'-0" (3.05 m) FROM THE OUTERMOST RANGE OF THE CRANE.

CRANE OPERATION

- Before engaging the PTO, be sure the carrier vehicle's transmission is in neutral and the parking brake is applied.
- Stand clear of all moving outriggers.
- Know the position of the booms at all times while operating the crane.
- Eliminate swing by positioning the boom tip directly over the center of the load before lifting.
- Never drag a load.
- Check the safety of the load by first lifting the load barely off the ground.
- Stop all crane operation at a signal from anyone.
- When you rotate the crane, the load may change from being supported by the outriggers to the vehicle suspension. Be cautious as you rotate the crane, because the springs on the carrier vehicle will respond differently to the load than the tires will.
- Position the crane in its stowed position when not in use.

FIRE PRECAUTIONS

To avoid fires,

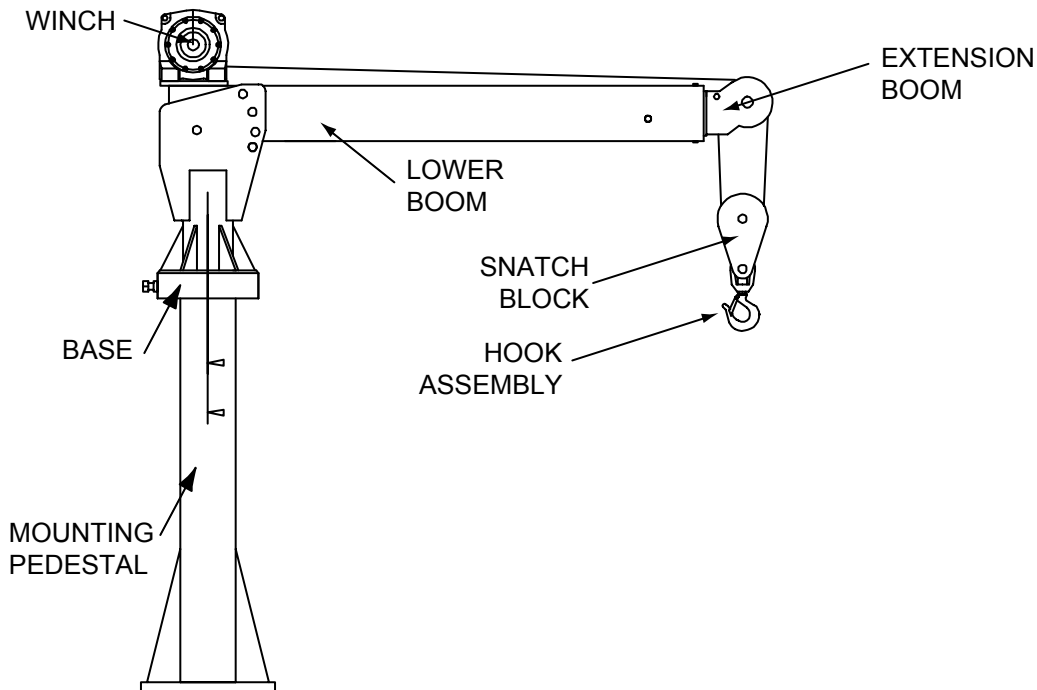
- Use safety-type portable gasoline containers equipped with an automatic closing cap and flame arrester.
- DO NOT refuel while the vehicle engine is running.
- DO NOT smoke in a refueling area.
- Install in the vehicle cab a portable fire extinguisher with a basic minimum extinguisher rating of 10 BC *and know how to use the fire extinguisher.*

READ THE ENTIRE MANUAL BEFORE OPERATING THE CRANE.

Use this manual for reference and for training operators. This manual covers the basics of safe and correct operation of your crane. However, success and safety depends greatly upon the skill and caution of the person actually doing the work. Persons engaging in these procedures do so entirely at their own risk.

2003i Major Assemblies

IMT electric cranes are designed to lift a variety of materials. These cranes are typically mounted on a vehicle chassis, but they can have stationary mounts. Instructions on how to operate the crane may refer to various crane components. Use the crane layout to help you identify the appropriate crane components.



General

To operate this crane, you must conform to physical and behavioral requirements and must have certain abilities as defined by ANSI B30.22 chapter 22-3 and the Occupational Safety and Health Administration (OSHA). There may be additional operator requirements defined by local, state or federal regulations in your area. Make sure you are following all regulations regarding crane operation.

Prior to beginning work at a job site, you should understand:

- Crane Safety
- Crane Controls
- Crane Load Limits
- Operating Procedures

You should have the chance to practice operating the crane prior to using the crane in a job site application.

The operator must understand what to do in case of emergency, and be prepared to take emergency action at any time. Safe operation is the responsibility of the operator, maintenance and inspection personnel. Safety has been a major consideration in the design and manufacture of this equipment, but only the operator and maintenance personnel can insure a safe work environment.

Daily Safety Inspection

Using the Crane Log, IMT Manual No. 99900686, or the inspection checklist in the reference section of this manual, inspect the crane on a daily, weekly, and monthly basis. Use the following list as a guide when you are inspecting your unit at start-up and during operation:

- 1 Vehicle - Check oil level, battery, lights, brakes, and tires for inflation, pressure, cuts, and loose or missing wheel lugs.
- 2 Safety Accessories - Check for proper function, oil levels, leaks and malfunctions.
- 3 Weldments - Check visually for damage, especially cracks or breaks in welds.
- 4 Fasteners - Check pins, sheaves, nuts and bolts for breakage, excessive wear and tightness.
- 5 Crane Hooks - Check for the presence of a safety catch, twists, cracks, or damage.
- 6 Covers and Guards - Check for missing or improperly maintained covers and guards.
- 7 Operation Placards and Safety Decals - Check for illegible or missing decals and placards. Refer to the decal section of this manual for more information on the required decals.

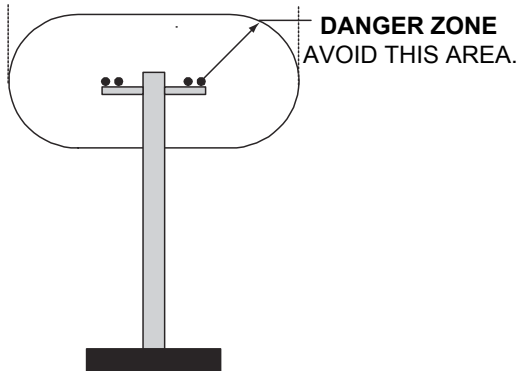
Replace or repair any items as needed prior to equipment operation.

Electrical Hazards

Always operate the crane so that no part of the crane or load enters the "Danger Zone", the minimum clearance distance for a powerline.

NOTE

THE DANGER ZONE OF A PARTICULAR POWERLINE IS BASED UPON ITS VOLTAGE. HIGH VOLTAGE LEVELS INCREASE THE DANGER ZONE. SEE FIGURE.



DANGER ZONE FOR CRANES
OPERATING NEAR ELECTRICAL
POWERLINES

REQUIRED CLEARANCE OF CRANES FROM ELECTRICAL TRANSMISSION LINES		
	NORMAL VOLTAGE kV (Phase to Phase)	MINIMUM CLEARANCE REQUIRED Feet (meters)
OPERATION NEAR HIGH VOLTAGE POWERLINES	From 0 to 50	10 (3.05)
	From 50 to 200	15 (4.60)
	From 200 to 350	20 (6.10)
	From 350 to 500	25 (7.62)
	From 500 to 750	35 (10.67)
	From 750 to 1000	45 (13.72)
OPERATION IN TRANSIT WITH NO LOAD AND BOOM OR MAST LOWERED	From 0 to 0.75	4 (0.22)
	From 0.75 to 50	6 (0.83)
	From 50 to 345	10 (3.05)
	From 345 to 750	16 (4.87)
	From 750 to 1000	20 (8.10)

For maximum safety during work near powerlines, adhere to the following guidelines:


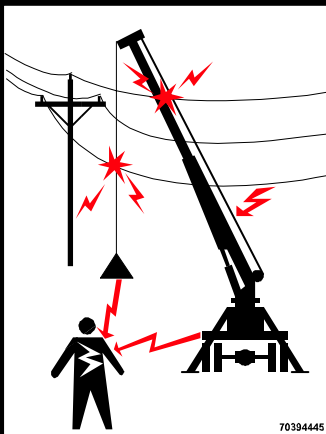
- During windy conditions, allow additional clearance.
- Do not rely on cage-type boom guards, insulating links, or proximity warning devices for safety. Adhere to the required distances listed in table titled *REQUIRED CLEARANCE OF CRANES FROM ELECTRICAL TRANSMISSION LINES*.
- Contact the utility company before beginning work near powerlines.
- Always assume overhead lines to be energized.
- Avoid transporting a crane over uneven terrain.
- When using rope to steady a load or restrain spinning of the load, be aware that rope will also conduct electricity, especially if wet or damp.
- Reduce operating speed when in close proximity to powerlines in order to allow the operator more reaction time.

IF ELECTRICAL CONTACT OCCURS:

- 1 Shut off all power.
- 2 Break contact of any person in contact with a live conductor by using rubber hose, dry rope, or dry wood. **DO NOT** attempt this unless you are certain that all power is off.
- 3 Call 911 or the local emergency service.
- 4 Administer first aid.
- 5 Avoid the area around the crane, as high voltage travelling through a crane will charge the ground.

ELECTRICAL CONTACT FOLLOW-UP:

- 1 Inspect and repair any equipment affected by electrical contact.
- 2 Replace any wire rope which has had high voltage contact.

 DANGER	
ELECTROCUTION HAZARD DEATH OR SERIOUS INJURY	
will result from contact with or proximity to the load, loadline, the crane or the vehicle if the boom, load, or loadline should become electrically charged.	
KEEP CLEAR OF TRUCK AND LOAD	<small>70394445</small>

Crane Capacity

The IMT crane is designed to lift specific loads. These loads are defined on the capacity placard mounted near the operator's station and on the crane. Exceeding the limits presented on the capacity placard will create severe safety hazards and will shorten the life of the crane. The operator and other concerned personnel must know the load capacity of the crane and the weight of the load being lifted!

WARNING

NEVER EXCEED THE CRANE'S RATED LOAD CAPACITIES. DOING SO WILL CAUSE STRUCTURAL DAMAGE AND DAMAGE TO WINCHES AND CABLES WHICH CAN LEAD TO DEATH OR SERIOUS INJURY.

NOTE

LOAD LIMIT INFORMATION ON THE CAPACITY PLACARD IS FORMULATED ON 85% OF TIPPING. TIPPING REFERS TO THE CRANE ACTUALLY TIPPING WITH ITS OPPOSITE OUTRIGGER AND TIRES HAVING BROKEN CONTACT WITH THE SURFACE.

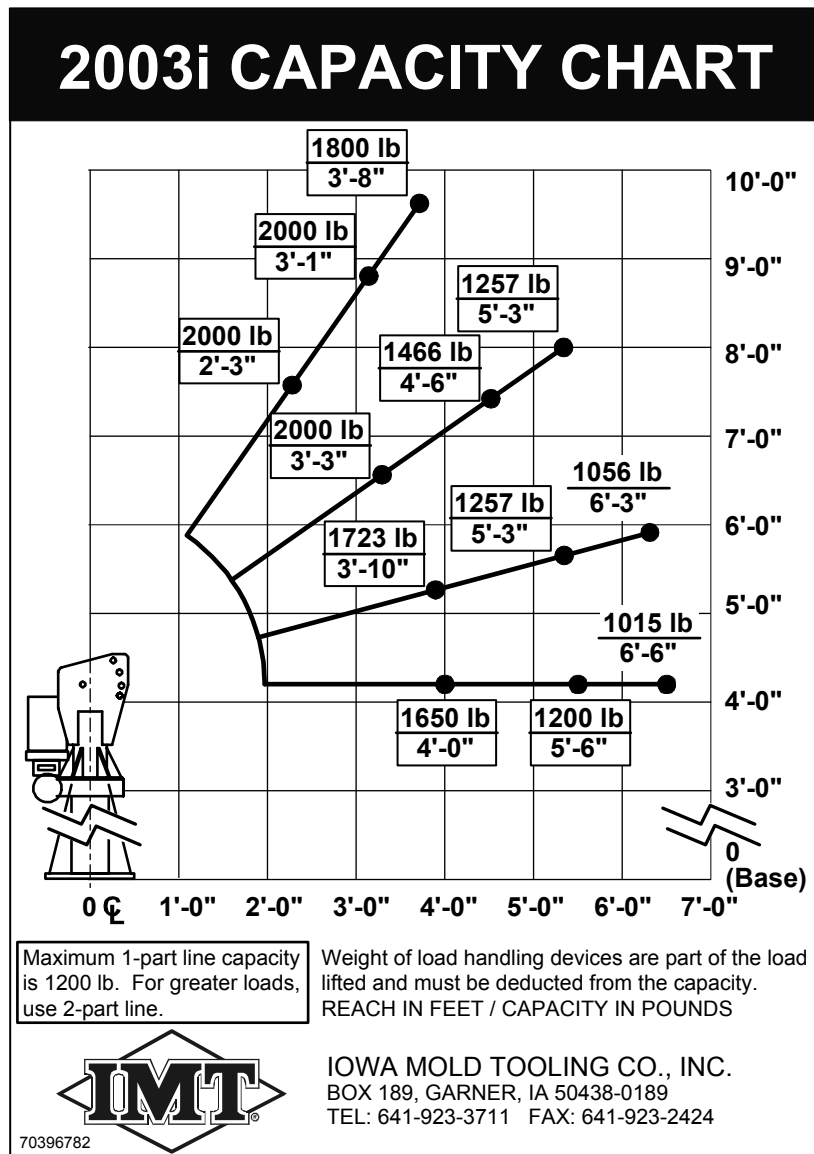
Prior to lifting a load:

- 1 Determine the weight of the load.
- 2 Determine the weight of any load handling devices.
- 3 Add the weight of the load and the weight of the load handling devices. The sum is the total weight of the load being lifted.
- 4 Determine the distance from the centerline of crane rotation to the centerline of the load being lifted.
- 5 Determine the distance from the centerline of crane rotation to the centerline of where the load is to be moved to.
- 6 The actual distance used should be figured as the larger of items 4 and 5 above.

Load Ratings

The maximum load chart is a representation of the MAXIMUM loads for which your crane is rated. The actual load rating for your installation will be determined by other factors. Remember that just because the load chart says a given load is possible, that load may not be possible under some configurations without tipping the truck. Conduct a load stability test in accordance with Crane Load–Stability Test Code, Society of Automotive Engineers (SAE) J765, to determine the actual loading capacities for a given installation. Contact the factory for more information.

Model 2003i Capacity Chart



Outriggers

An outrigger (part # 32000513) or stiffening leg is recommended for stabilizing the truck. It should be deployed before lifting any load. The outrigger extends three feet out to the side of the truck on the crane side, and has the ability to level the truck bed before lifting. Always level the truck bed to within 1% grade before lifting the load. Refer to SAEJ765 “Crane Load–Stability Test Code” procedures for determining crane load stability.

CAUTION

AVOID EQUIPMENT DAMAGE! NEVER LIFT A LOAD WITHOUT DEPLOYING OUTRIGGERS.

Prior to beginning a lift, fully deploy outriggers and lock them into position. If blocking is necessary, it should be strong enough to prevent crushing and of sufficient area and thickness to completely support the stabilizer pad.

Crane Operation

Before operating your crane for the first time, check the crane for proper function. If a problem is found, refer to the troubleshooting section in this manual. Rotate the crane a full circle and back to check for proper clearance.

Size of Load

- 1 Do not load the crane beyond the specifications of the load rating chart, except for test purposes.
- 2 Be sure the load to be lifted is within the rated capacity of the crane in its existing configuration.
- 3 When loads that are not accurately known are to be lifted, make sure the weight of the load does not exceed the crane rating at the maximum radius at which the load is to be handled.

Warning Sign

If there is a warning sign on the crane controls, do not operate the crane until the warning sign has been removed by an appointed person.

Attaching the Load

- 1 Do not wrap the hoist rope around the load.
- 2 Attach the load to the hook using slings or other devices of sufficient capacity.

Holding the Load

- 1** Test crane controls at the start of a new shift. If any controls fail to operate properly, they must be adjusted or repaired before operations are begun.
- 2** Do not leave the controls while the load is suspended.
- 3** Do not allow anyone to stand or pass under a suspended load.

Moving the Load

- 1** Make sure:
 - a) The crane is level and blocked, where necessary.
 - b) The load is well secured and balanced in the sling or lifting device before it is lifted more than a few inches.
 - c) The lift and swing path is clear of obstructions.
- 2** Before starting the lift, make sure:
 - a) The hoist rope is not kinked.
 - b) Multiple-part lines are not twisted around each other.
 - c) The hook is secured to the load in such a manner as to minimize swinging.
 - d) In case of a slack rope condition, the rope must be seated on the drum and in the sheaves as the slack is removed.
 - e) The effect of ambient wind on the load and on crane stability is taken into consideration.
- 3** During the lifting operations, make sure:
 - a) There is no sudden acceleration or deceleration of the moving load.
 - b) The load, boom or other parts of the machine do not contact any obstruction.
- 4** Limit boom side loading to freely suspended loads. The crane must not be used for dragging loads sideways.
- 5** Do not move loads over people.
- 6** Keep more than five full wraps of rope on the winch drum.
- 7** While in transit, take the following additional precautions:
 - a) Position the crane boom in line with the direction of motion of the truck.
 - b) Lash or restrain the empty hook so that it cannot swing freely.
 - c) Do not leave loads suspended from the hook.
- 8** When rotating the crane, avoid sudden starts and stops. When reversing rotation direction, pause to allow load swing to subside before rotating in the opposite direction.
- 9** Do not use this crane for transporting or lifting personnel.

Power Failure

If power fails during operations:

- 1 Move all controls to the off or neutral position.
- 2 Land the suspended load, if practical.

Post Operation

Before leaving the crane unattended:

- 1 Land any load, bucket, lifting magnet or other device.
- 2 Put controls in the off or neutral position.
- 3 Disconnect and stow the control pendant.

The operator must be familiar with the equipment and its proper care. If adjustments or repairs are necessary, the operator shall promptly report this to the appointed person and shall also notify the next operator.

Operation in Adverse Conditions

Operating your crane in adverse weather conditions can affect the crane performance. Please note the following operation procedures for adverse weather conditions.

- 1 **Dusty and Sandy Areas** - Operating in dusty or sandy areas presents special problems due to the abrasive action of dust which shortens the life of parts. Make every effort to keep dust and sand out of the moving parts of the crane machinery and engine. Keep lubricants clean, and lubrication and fluid fill areas capped tightly.
- 2 **High Humidity and Salt Air** - Moisture and salt will cause deterioration of paint, cables, wiring and all exposed metallic parts. Keep parts dry and well lubricated in high humidity or salt air conditions. Keep parts thoroughly lubricated, and remove rust and corrosion if and when it appears.
- 3 **High Altitudes** - Operation at high altitudes presents special problems due to lower atmospheric pressure and wide temperature ranges. Consult the vehicle owner's manual regarding operating the vehicle at high altitudes.

Hand Signals

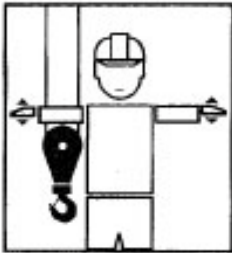
Hand signals can be used to communicate between crane operators and assistants when the job site noise level is too high to communicate in other ways.

Signals to the operator shall follow ASME B30.5 standards, unless voice communication is utilized. Signals shall be discernible or audible at all times. No response by the operator is to be made unless the signal is clearly understood.

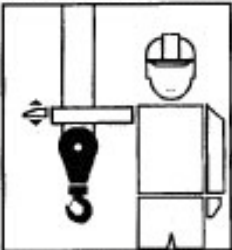
For operations not covered by the ASME hand signals, additions to or modifications may be made. These special signals must be agreed upon by the operator and signal person before the crane is operated.

If verbal instructions are required rather than hand signals, all crane motions must be stopped before doing so. Figure includes an illustration of the hand signal, the operation associated with the signal, and a description of the signal. The operator and signal person must review these signals and agree to their use before implementation. For complete hand signal information, refer to ASME/ANSI B30.5 - Mobile and Locomotive Cranes, published by the American Society of Mechanical Engineers.

The hand signals presented by The American Society of Mechanical Engineers have been accepted by the Occupational Safety and Health Administration (OSHA).



EMERGENCY STOP- Both arms extended, palms down, move arms back and forth horizontally.



STOP- Arm extended, palm down, move arm back and forth horizontally.



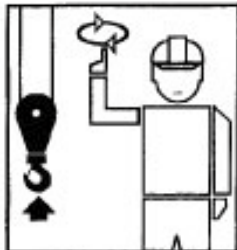
MOVE SLOWLY- One hand gives any motion signal; place other hand motionless in front of that hand. (Hoist slowly shown.)



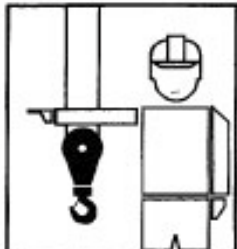
USE MAIN HOIST- Tap fist on head; then use regular signals.



EXTEND BOOM- (Telescoping Booms) One Hand Signal. One fist in front of chest with thumb tapping chest.



HOIST- With forearm vertical, forefinger pointing up, move hand in small horizontal circles.



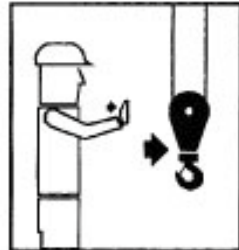
SWING - Arm extended, point with finger in direction of boom swing.



EXTEND BOOM- (Telescoping Booms) Both fists in front of body with thumb pointing outward.



USE WHIPLINE- (Auxiliary Hoist) - Tap elbow with one hand; then use regular signals.



TRAVEL- Arm extended forward, hand open and slightly raised, make pushing motion in direction of travel.



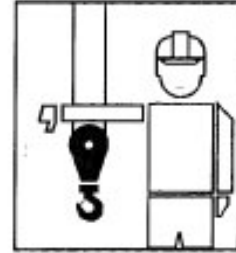
LOWER- With arm extended downward, forefinger pointing down, move hand in small horizontal circle.



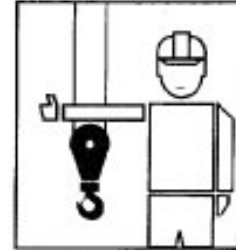
RETRACT BOOM- (Telescoping Booms) Both fists in front of body with thumbs pointing inward.



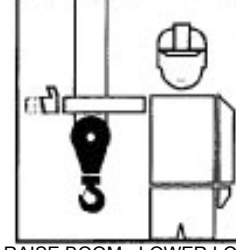
LOWER BOOM - RAISE LOAD Arm extended, thumb pointing down, flex fingers in and out until desired movement is completed.



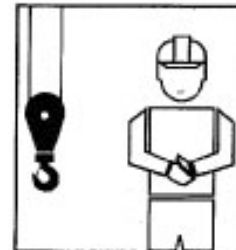
LOWER BOOM - With arm extended, fingers closed, thumb pointing downward.



RAISE BOOM - With arm extended, fingers closed, thumb pointing upward.



RAISE BOOM - LOWER LOAD Arms extended, thumb pointing up flex fingers in and out until desired movement is completed.



DOG EVERYTHING - Clasp hands in front of body.



RETRACT BOOM - (Telescoping Booms) - One Hand Signal. One fist in front of chest, thumb pointing outward and heel of fist tapping chest.

CHAPTER 3

Maintenance

In This Chapter

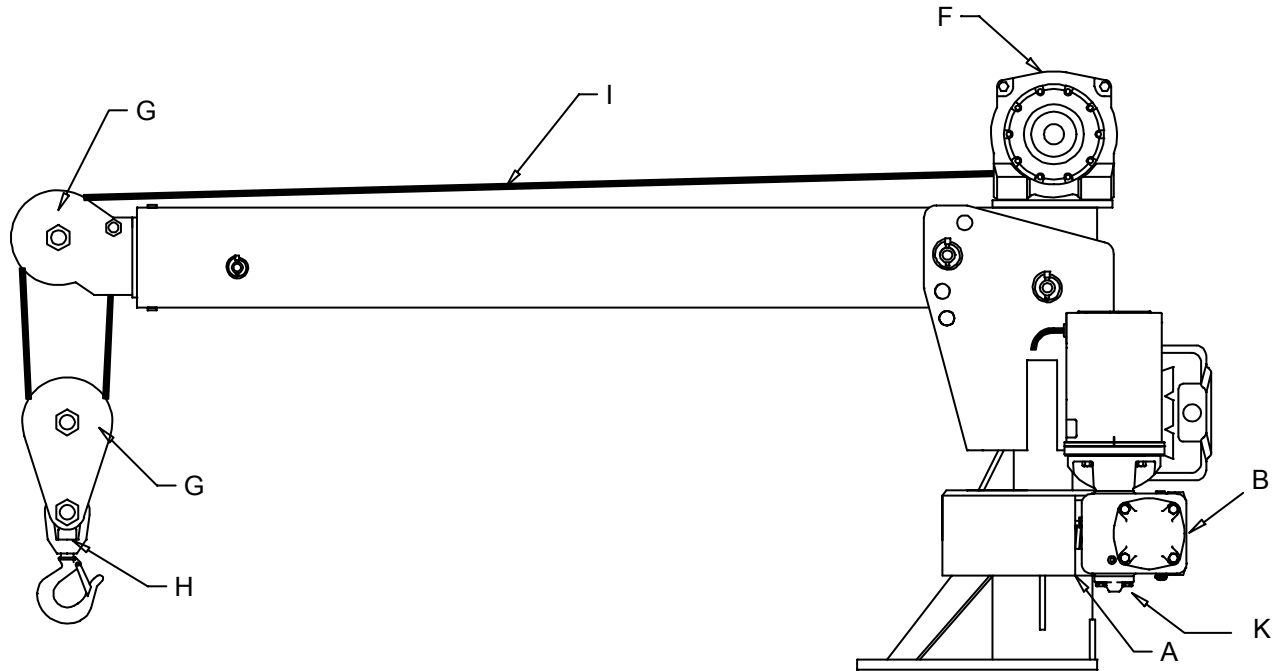
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To obtain reliable and satisfactory service, IMT telescopic cranes require a consistent preventative maintenance schedule. Take necessary safety precautions during maintenance procedures to avoid equipment damage and personal injury. Follow the maintenance schedule included with this manual for best results.

- 1 Maintenance should only be performed by authorized service personnel.
- 2 Disengage the PTO, if applicable, before any service or repair is performed.
- 3 DO NOT disconnect any hydraulic components or hoses while there is pressure in those components.
- 4 Stand clear of high pressure hydraulic fluid leaks. Hot hydraulic fluid will cause serious injury, burns and possibly DEATH.
- 5 Keep the crane clean and free from built-up grease, oil and dirt to prevent slippery conditions and as an aid in the inspection of the crane.
- 6 Perform all checks before each period of use.
- 7 Replace parts with factory approved parts, only.

Repair or have repaired any components found to be inadequate, immediately.

Lubrication Schedule



Refer to the Lubrication Diagram for the locations of the lubrication points referred to in the following schedule.

WEEKLY	Check gear oil level at (B). Use 90 weight gear oil.
	Check rotation gear (A) for coverage and contaminants. Clean and reapply grease as necessary. Use only Moly 29 grease.
MONTHLY	Lubricate rotation bearing via zerk (K).
	Apply small amount of machine oil to hook swivel mechanism (H).
	Apply small amount of grease between polymer rope pulleys (G) and axles.
	Apply rope oil with rag or spray to wire rope (I). Wipe off excess.
YEARLY	Remove load brake from winch (F) and clean and apply a light coat of Lithium base grease to brake. Wipe interior bore of rope drum clean and inspect for damage. If no damage, apply light coat of Lithium grease and reassemble winch.
	Remove end cap from DC motor. Blow out debris and dust. Apply small amount of grease to armature bearing (J) and reassemble.

Adjustments & Repairs

Before starting crane adjustments and repairs, take the following precautions:

- If servicing the electrical system, make sure to disconnect power to the crane.
- Wash and clean the crane periodically as needed. If using a power washer, avoid spraying exposed rotation gear.

Correct any hazardous conditions identified by the inspection requirements of this manual prior to resuming crane operation. Adjustments and repairs shall be done only by designated personnel.

- 1** Adjustments to maintain correct component function, such as:
 - a) Functional operating mechanisms
 - b) Electronic and mechanical control systems
- 2** Repairs or replacements as needed for operation, such as:
 - a) Functional operating mechanisms that are cracked, broken, corroded, bent or excessively worn
 - b) Parts of the crane structure that are cracked, bent, broken, or excessively corroded
 - c) Damaged or worn hooks. IMT recommends hook replacement rather than repair.
- 3** Replacement parts shall have at least the original design factor.

In addition, check the lubricating system for proper delivery of lubricant, and keep crane stationary while lubricants are being applied.

Equipment Inspection

The Crane Inspection Checklist, included in the General Reference section of this manual, is designed to assist you in maintaining the crane in safe operating condition. Become familiar with the checklist prior to operating the crane, and inspect to the instructions shown on the checklist.

ANSI/ASME B30.5A requires that written, dated, and signed inspection reports and records must be maintained monthly on critical items including the brakes, crane hooks, wire rope, hydraulic cylinders, and hydraulic pressure relief valves.

INSPECTION CLASSIFICATIONS:

- Initial Inspection: Prior to initial use, all new and altered cranes shall be inspected by a qualified person to verify compliance with the provision of this volume.
- Regular Inspection: The inspection procedure for cranes in regular service is divided into two general classifications based upon the intervals at which inspection should be performed. The intervals are dependent in turn upon the nature of the critical components of the crane and the degree of their exposure to wear, deterioration, or malfunction. The two general classifications are herein designated as frequent and periodic, with respective intervals between inspection as defined below;
 - Frequent Inspection - Daily to monthly intervals, performed by a designated person.
 - Periodic Inspection - Monthly to annual intervals, or as specifically recommended by the manufacturer or by a qualified person.

Periodic Crane Inspection

Every three months, and more frequently when the equipment is subject to heavy usage, perform the following inspections in addition to those specified in the Crane Inspection Checklist in the Reference Section.

LOWER AND EXTENSION BOOMS

- 1 Check structural defects evidenced in weld cracks, dents or bends.
- 2 Check slide pads for wear.
- 3 Check lower and extension cylinder pins for proper installation. Check hinge pin bushings for excessive wear.

BASE, BOOM & MAST ASSEMBLY

- 1 Check for loose bolts, fatigue cracks or corroded structural members.
- 2 Check base casting housing for cracks.

- 3 Check for proper rotation function by making several start-stop operations. Maximum allowable free-play at mast front should be 1/8" to 3/16".
- 4 Check for proper gear mesh in turntable gear-bearing. Check motor and gear mounting bolts for tightness.

CRANES NOT IN REGULAR USE

- 1 A crane that has been idle for a period of one month or more, but less than six months, must be inspected by a qualified person conforming with the requirements of the initial, regular and frequent inspections
- 2 A crane that has been idle for a period of more than six months must be inspected by a qualified person conforming with the requirements of the initial, regular, frequent, and periodic inspections.

Wire Rope & Hook Maintenance

Wire Rope Inspection

OSHA requires regular inspections and permanent, signed record-keeping on wire rope inspections. These inspections help the crane operator determine whether the rope can be safely used. Inspection criteria, including number and location of broken wires, wear and elongation, have been established by OSHA, ANSI, ASME and similar organizations.

WIRE ROPE INSPECTION CRITERIA

- 1 **INSPECTOR** - The wire rope inspector must keep written reports of the rope condition on file at the work site and must have the authority to order wire rope replacements and keep unsafe wire rope from being used.
- 2 **PERIODS OF INSPECTION** - Set up inspection periods for each material hoist wire rope. Determine inspection frequency by considering environment, degree of hazard to materials, frequency of operation and the frequency with which the wire rope is subjected to its capacity limits. Inspect at least every 30 days.
- 3 **METHODS OF INSPECTION** - To inspect, unwind the working length of the wire rope from the hoist drum. Thoroughly inspect the rope sections that pass over sheaves, drums or contact saddles or which make opposing turns. Inspect the rope close to the end attachments. **DO NOT** open the rope for inspection.
- 4 **USED WIRE ROPE** - Thoroughly inspect used wire rope prior to installation.
- 5 **IDLE EQUIPMENT** - Inspect wire rope on idle equipment prior to operation.

DAILY INSPECTION: Inspect for kinking (sharp bends), crushing, unstranding, birdcaging, core protrusion, rope diameter loss, rope strand unevenness, general corrosion, broken or cut strands, heat damage, and integrity of end attachments.

MONTHLY INSPECTION: Each month, inspect the entire length of the rope, the wire rope eye, and the sheaves, drums and other apparatus with which the rope makes contact.

When a wire rope has been removed from service because it is no longer suitable for use, it must not be re-used on another application. Every wire rope user should be aware of the fact that each type of fitting attached to a wire rope has a specific efficiency rating which can reduce the working load of the rope assembly or rope system, and this must be given due consideration in determining the capacity of a wire rope system.

Wire Rope Lubrication

Wire rope used on IMT cranes does not have continuous lubrication replenishment. Use open gear lubricant to protect the wire rope on your crane. The areas of rope which experience the most wear are located over sheaves or are otherwise hidden, and these areas require the most rope lubrication.

Lubricate the wire rope using ChainMate (TM) Chain and Wire Rope lubricant or equivalent. To lubricate the rope:

- 1 Clean dirt, dust, and foreign matter from the rope.
- 2 Apply ChainMate lubricant or equivalent, penetrating the strands of the rope. Apply according to the lubricant specifications.
- 3 Apply lubricant heavily to portions which encounter bending such as at the sheave and winch.

Wire Rope Maintenance

If the daily wire rope inspection shows a problem with the wire rope, the rope must be repaired or replaced. Use only original wire rope from IMT. Failure to do so may cause problems with the anti-two-block system and the downhaul weights.

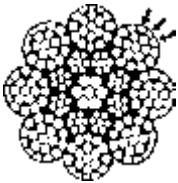
Wire Rope Inspection & Replacement

Wire rope with any of the deficiencies shown below shall be removed and replaced immediately.

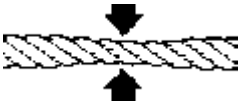
- a Corrosion can be cause for replacement. Any development of corrosion must be noted and monitored closely.
- b When there are either three broken wires in one strand or a total of six broken wires in all strands in any one rope lay.



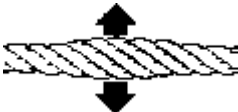
- c When flat spots on the outer wires appear and those outside wires are less than 2/3 the thickness of the unworn outer wire.



- d When there is a decrease of diameter indicating a core failure.



- e When kinking, crushing, birdcaging or other distortion occurs.



- f When there is noticeable heat damage (discoloration) of the rope by any means.



- g When the diameter is reduced from nominal size by 1/32" or more.



- h If a broken wire protrudes or loops out from the core of the rope.



Testing

Operational Tests

All new, altered, modified or extensively repaired cranes shall be tested for operational compliance. The following functions must be tested:

- Load lifting and lowering mechanisms
- Boom lifting and lowering mechanisms
- Boom extension and retraction mechanism
- Swinging mechanism
- Safety devices
- Operating controls comply with appropriate function labels

Operational crane tests results shall be made available to designated person(s).

Rated Load Test

Prior to initial use, all cranes in which load sustaining parts have been altered, replaced or repaired should be load tested by, or under the direction of a qualified person. The replacement of the rope is specifically excluded from this requirement. However a functional test of the crane under a normal operating load should be made prior to putting the crane back in service.

Test load shall not exceed 110% of the manufacturer's load rating.

Written reports shall be furnished by an appointed or authorized person, showing test procedures and confirming the adequacy of repairs or alterations.

CHAPTER 4

Decals

In This Chapter

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"Danger" Decal Descriptions

All operators must familiarize themselves with the "DANGER" decals shown in this section. Your equipment may have additional safety decals that are not described here. Any safety decals affixed to your equipment must be identified, read and understood.

The materials and adhesives used in the production of these decals were designed for maximum durability, adhesion and legibility. Nevertheless, if a decal (including capacity chart) becomes damaged or illegible, replace it at your earliest opportunity. If a crane is repaired or repainted, replace all decals before the crane is put back into service. Individual decals as well as complete decal kits are available from IMT.

The following figures show safety decals used on IMT cranes. They are shown here as an aid in their identification with an explanation of their purpose, where they are placed on the crane and the normal quantity used on each crane.

Danger Decal Figures

Decal Description

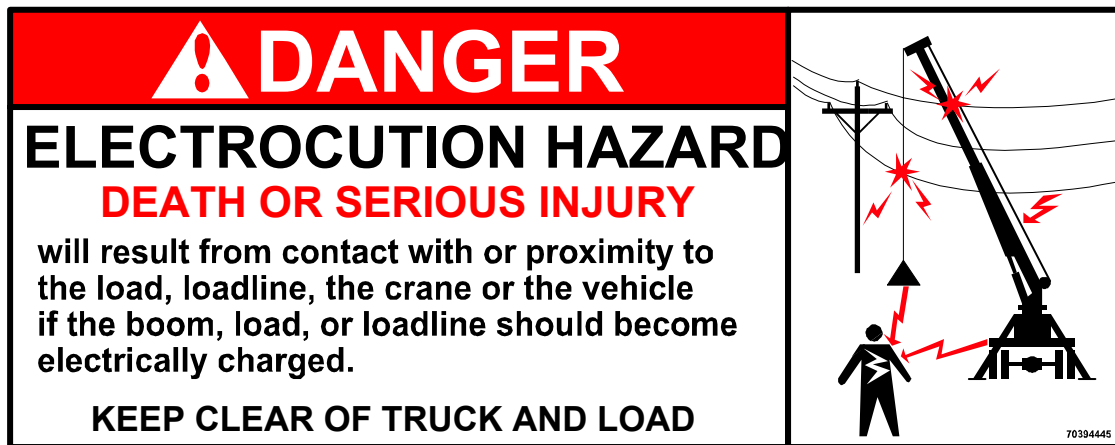
Decal Illustration

Electrocution Hazard (Large)

Part Number: 70394445

Function: To inform operator of hazards associated with contact or proximity to electrical lines, possible consequences should the hazard occur, and how to avoid the hazard.

Placement: On all four sides of truck.

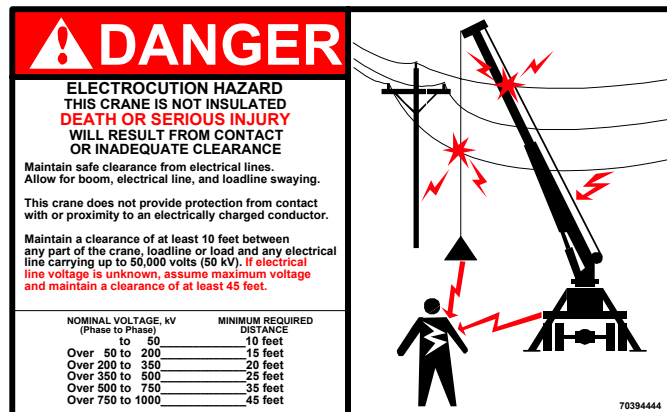


Electrocution Hazard (Small)

Part Number: 70394444

Function: To inform the operator and other personnel in the work area of the hazard associated with contact or proximity to electrical lines, the possible consequences should the hazard occur, and how to avoid the hazard.

Placement: At or near operator control station.

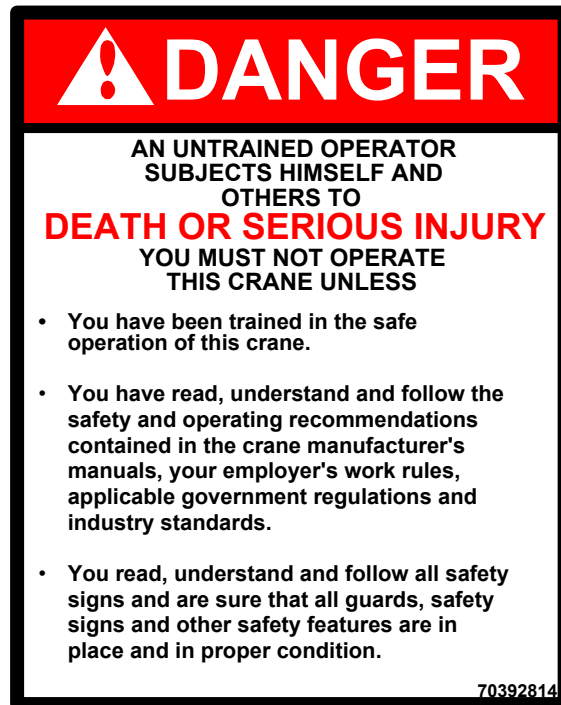


Decal Description**Danger - Operation**

Part Number: 70392814

Function: To inform the operator about reading the manual and following safety regulations and safe operating practices.

Placement: At or near operator control station.

Decal Illustration**Danger - Structural Damage or Instability**

Part Number: 70392888

Function: To inform the operator about following capacity charts and correctly calculating capacities.

Placement: At or near operator control station.



Decal Description

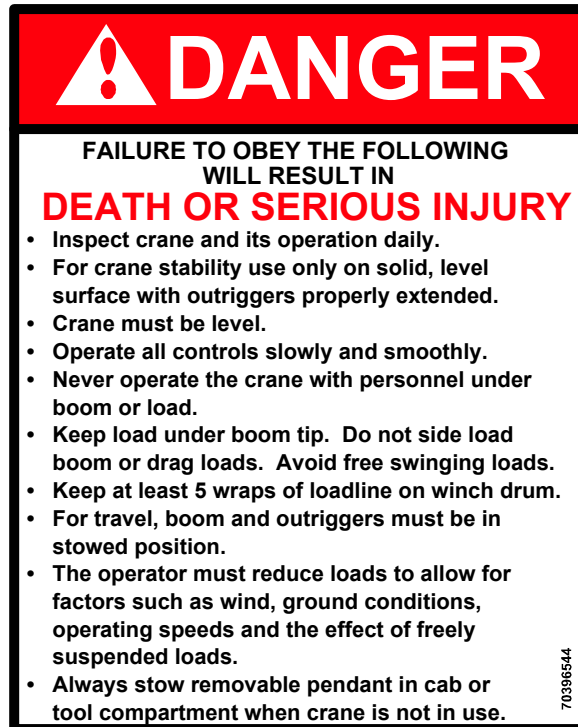
Danger - Operation Instructions

Part Number: 70396544

Function: Instructions for safe crane start-up and operation.

Placement: At or near operator control station.

Decal Illustration



Instruction Decal Descriptions

Decals in this section are instructional decals which may be affixed to your crane. Some are relevant to maintenance while others focus on operation. They are provided here as reference to help you understand their purpose and placement.

Decal Description

Decal Illustration

Grease Weekly

Part Number: 70391612 (Left);
70391613 (Right)



Function: To inform maintenance personnel of the location of grease zerks and the greasing interval.

Placement: At grease zerks with arrow pointing toward the zerk.

Rotate Crane while Greasing

Part Number: 70392524



Function: To inform maintenance personnel that it is necessary to rotate the crane while greasing the turntable gear-bearing. Rotation is required for proper and even distribution of grease to the gear-bearing.

Placement: At on near gear-bearing's grease zerk location.

Suction Line / Return Line

Part Numbers: 70392108 (Suction)
&70392109 (Return)



Function: To aid in the identification of the hydraulic system suction and return lines to minimize errors during hydraulic maintenance.

Placement: On appropriate hydraulic reservoir fluid lines.

Caution - High Pressure Washing

Part Number: 70392213

Function: To inform maintenance personnel not to use high pressure washers and not to wax the crane for a period of 60 days after delivery. The use of high pressure washers and wax is detrimental to the crane's paint until cured.

Placement: Near crane operating station.



Caution - Oil Level

Part Number: 71039134

Function: To caution the operator to check the hydraulic reservoir oil level daily.

Placement: On or near hydraulic oil reservoir.




Hydraulic Oil Reservoir Fill Recommendations

Part Number: 70394189

Function: To inform operator and maintenance personnel of the recommended hydraulic oil to be used under different climactic conditions.

Placement: On or near hydraulic oil reservoir.

Iowa Mold Tooling Co., Inc.
Garner, Iowa, USA
1-641-923-3711



70394189

**HYDRAULIC OIL RESERVOIR
FILL RECOMMENDATION**

HYDRAULIC OIL	AMBIENT TEMPERATURE RANGE	
	°F	°C
Mobil DTE[®] 13M	0° to 90°	-18° to 32°
Mobil DTE[®] 11M	Below 0°	Below -18°
Mobil DTE[®] 25	Above 90°	Above 32°

For Arctic conditions, consult your oil supplier.

**For Mobil Product information:
1-800-662-4525**

CHAPTER 5

Inspection Checklist

In This Chapter

Inspection Checklist	36
Deficiency / Recommendation / Corrective Action Report	40

Inspection Checklist

NOTICE:

The user of this form is responsible for determining that these inspections satisfy all applicable regulatory requirements.

OWNER/COMPANY:	TYPE OF INSPECTION (circle one):			
CONTACT PERSON:	DAILY	MONTHLY	QUARTERLY	ANNUAL
CRANE MAKE & MODEL:	DATE INSPECTED:			
CRANE SERIAL NUMBER:	HOURMETER READING (if applicable):			
UNIT I.D. NUMBER:	INSPECTED BY (print):			
LOCATION OF UNIT:	SIGNATURE OF INSPECTOR:			

<p>TYPE OF INSPECTION</p> <p>NOTES:</p> <p>Daily and monthly inspections are to be performed by a “designated” person, who has been selected or assigned by the employer or the employer’s representative as being competent to perform specific duties.</p> <p>Quarterly and annual inspections are to be performed by a “qualified” person who, by possession of a recognized degree in an applicable field or certificate of professional standing, or who, by extensive knowledge, training and experience has successfully demonstrated the ability to solve or resolve problems related to the subject matter and work.</p> <p>One hour of normal crane operation assumes 20 complete cycles per hour. If operation exceeds 20 cycles per hour, inspection frequency should be increased accordingly.</p> <p>Consult Operator / Service Manual for additional inspection items, service bulletins and other information.</p> <p>Before inspecting and operating crane, crane must be set up away from power lines and leveled with outriggers fully extended.</p> <p>DAILY (D): Before each day of operation, those items designated with a (D) must be inspected. This inspection need not be recorded unless a deficiency (8) is found. If the end user chooses to record all daily inspections and those daily inspections include the monthly inspection requirements, there would be no need for a separate monthly inspection.</p> <p>MONTHLY (M): Monthly inspections or 100 hours of normal operation (which ever comes first) includes all daily inspections plus items designated with an (M). This inspection must be recorded.</p> <p>QUARTERLY (Q): Every three to four months or 300 hours of normal operation (which ever comes first) includes all daily and monthly inspection items plus items designated with a (Q). This inspection must be recorded.</p> <p>ANNUAL (A): Each year or 1200 hours of normal operation (which ever comes first) includes all items on this form which encompasses daily, monthly and quarterly inspections plus those items designated by (A). This inspection must be recorded.</p>

INSPECTION CHECKLIST STATUS KEY:	
S = Satisfactory	R = Recommendation (should be considered for corrective action)
X = Deficient (must be corrected prior to operation)	NA = Not Applicable

FREQUENCY	ITEM	KEY	INSPECTION DESCRIPTION	STATUS (S,R,X,NA)
D	1	Labels	All load charts, safety & warning labels, and control labels are present and legible.	
D	2	Crane	Check all safety devices for proper operation.	
D	3	Controls	Control mechanisms for proper operation of all functions, leaks and cracks.	
D	4	Station	Control and operator's station for dirt, contamination by lubricants, and foreign material.	
D	5	Hydraulic System	Hydraulic system (hoses, tubes, fittings) for leakage and proper oil level.	
D	6	Hook	Presence and proper operation of hook safety latches.	
D	7	Rope	Proper reeving of wire rope on sheaves and winch drum.	
D	8	Pins	Proper engagement of all connecting pins and pin retaining devices.	
D	9	General	Overall observation of crane for damaged or missing parts, cracked welds, and presence of safety covers.	
D	10	Operation	During operation, observe crane for abnormal performance, unusual wear (loose pins, wire rope damage, etc.). If observed, discontinue use and determine cause and severity of hazard.	
D	11	Remote Ctrl	Operate remote control devices to check for proper operation.	
D	12	Electrical	Operate all lights, alarms, etc. to check for proper operation.	
D	13	Anti 2-Block	Operate anti 2-block device to check for proper operation.	
D	14		Other (Per customer requirements)	
D	15		Other (Per customer requirements)	
M	16	Daily	All daily inspection items.	
M	17	Cylinders	Visual inspection of cylinders for leakage at rod, fittings, and welds. Damage to rod and case.	
M	18	Valves	Holding valves for proper operation.	
M	19	Valves	Control valves for leaks at fittings and between stations.	
M	20	Valves	Control valve linkages for wear, smoothness of operation, and tightness of fasteners.	
M	21	General	Bent, broken, or significantly rusted/corroded parts.	
M	22	Electrical	Electrical systems for presence of dirt, moisture, and frayed wires.	
M	23	Structure	All structural members for damage.	
M	24	Welds	All welds for breaks and cracks.	
M	25	Pins	All pins for proper installation and condition.	
M	26	Hardware	All bolts, fasteners and retaining rings for tightness, wear and corrosion.	
M	27	Wear Pads	Presence of wear pads.	
M	28	Pump & Motor	Hydraulic pumps and motors for leakage at fittings, seals, and between sections.	
M	29	PTO	Transmission/PTO for leakage, abnormal vibration, and noise.	
M	30	Hyd Fluid	Quality of hydraulic fluid and presence of water.	

FREQUENCY	ITEM	KEY	INSPECTION DESCRIPTION	STATUS (S,R,X,NA)
M	31	Hyd Lines	Hoses & tubes for leakage, abrasion damage, blistering, cracking, deterioration, fitting leakage, and secured properly.	
M	32	Hook	Load hook for abnormal throat distance, twist, wear, and cracks.	
M	33	Rope	Condition of load line.	
M	34	Manual	Presence of operator's manual with unit.	
M	35		Other	
Q	36	Daily	All daily inspection items.	
Q	37	Monthly	All monthly inspection items.	
Q	38	Extensions	Condition of wear pads.	
Q	39	Rotation Sys	Rotation bearing for proper torque of all accessible mounting bolts.	
Q	40	Hardware	Base mounting bolts for proper torque.	
Q	41	Structure	All structural members for deformation, cracks and corrosion.	
	42		• Base	
	43		• Outrigger beams and legs	
	44		• Mast	
	45		• Inner Boom	
	46		• Outer Boom	
	47		• Extension(s)	
	48		• Jib boom	
	49		• Jib extension(s)	
	50		• Other	
Q	51	Hardware	Pins, bearing, shafts, gears, rollers, and locking devices for wear, cracks, corrosion and distortion.	
	52		• Rotation bearing(s)	
	53		• Inner boom pivot pin(s) and retainer(s)	
	54		• Outer boom pivot pin(s) and retainer(s)	
	55		• Inner boom cylinder pin(s) and retainer(s)	
	56		• Outer boom cylinder pin(s) and retainer(s)	
	57		• Extension cylinder pin(s) and retainer(s)	
	58		• Jib boom pin(s) and retainer(s)	
	59		• Jib cylinder pin(s) and retainer(s)	
	60		• Jib extension cylinder pin(s) and retainer(s)	
	61		• Boom tip attachment	
	62		• Other	
Q	63	Hyd Lines	Hoses, fittings and tubing for proper routing, leakage, blistering, deformation and excessive abrasion.	
	64		• Pressure line(s) from pump to control valve	
	65		• Return line(s) from control valve to reservoir	
	66		• Suction line(s) from reservoir to pump	
	67		• Pressure line(s) from control valve to each function	
	68		• Load holding valve pipe(s) and hose(s)	
	69		• Other	
Q	70	Pumps, PTO's & Motors	Pumps, PTO's & motors for loose bolts/fasteners, leaks, noise, vibration, loss of performance, heating & excess pressure.	
	71		• Winch motor(s)	
	72		• Rotation motor(s)	
	73		• Other	
Q	74	Valves	Hydraulic valves for cracks, spool return to neutral, sticking spools, proper relief valve setting, relief valve failure.	
	75		• Main control valve	

FREQUENCY	ITEM	KEY	INSPECTION DESCRIPTION	STATUS (S,R,X,NA)
	76		• Load holding valve(s)	
	77		• Outrigger or auxiliary control valve(s)	
	78		• Other valves (per customer requirements)	
	79		• Other (per customer requirements)	
Q	80	Cylinders	Hydraulic cylinders for drifting, rod seal leakage and leakage at welds. Rods for nicks, scores and dents. Case for damage. Case and rod ends for damage and abnormal wear.	
	81		• Outrigger cylinder(s)	
	82		• Inner boom cylinder(s)	
	83		• Outer boom cylinder(s)	
	84		• Extension cylinder(s)	
	85		• Rotation cylinder(s)	
	86		• Jib lift cylinder(s)	
	87		• Jib extension cylinder(s)	
	88		• Other (per customer requirements)	
Q	89	Winch	Winch, sheaves and drums for damage, abnormal wear, abrasions and other irregularities.	
Q	90	Hyd Filters	Hydraulic filters for replacement per maintenance schedule.	
A	91	Daily	All daily inspection items.	
A	92	Monthly	All monthly inspection items.	
A	93	Quarterly	All quarterly inspection items.	
A	94	Hyd Sys	Hydraulic fluid change per maintenance schedule.	
A	95	Controls	Control valve calibration for correct pressure & relief valve settings.	
A	96	Valves	Safety valve calibration for correct pressure & relief valve settings.	
A	97	Valves	Valves for failure to maintain correct settings.	
A	98	Rotation Sys	Rotation drive system for proper backlash clearance & abnormal wear, deformation and cracks.	
A	99	Lubrication	Gear oil change in rotation drive system per maintenance schedule.	
A	100	Hardware	Check tightness of all fasteners and bolts, using torque specifications on component drawings or torque chart.	
A	101	Wear Pads	Wear pads for excessive wear.	
A	102	Loadline	Loadline for proper attachment to drum.	

