	LIFTING DEVICES AND RIGGING ALL-AOA-00-000-HST-0002	Retention Code: <i>CG01 - CA</i>
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Document History

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February 2020	David Reaich	Usability Mapped – Issued for Use

About this Standard

Purpose

The purpose of this standard is to provide the requirements to safely manage work involving lifting devices and rigging.

1. Lifting Devices and Rigging

1.1.General

Recommended Defenses

Hazards associated with work using lifting devices and rigging must be assessed and defenses implemented as required for:

- Dropped Objects
- Equipment and lifting gear failure
- Overhead powerlines
- Ditches and soft spots on the ground

Equipment required

The following equipment may be required for lifting and rigging operations including:

- Rig matting
- Blocks for outriggers
- Barricades and flagging
- Tag lines and/or push poles
- Communication devices

Severe weather

Lifting equipment must not be operated in severe weather. Ensure visibility allows for safe operations and follow manufacture's recommendations for:

- Wind speed
- temperature



NOTE: Follow local lightning notification and work restriction criteria.

2. Lifting Devices

2.1. Load Rating and Log Books

Load Rating Labels Lifting device must have a plate or weatherproof label affixed indicating:

- Load rating
- manufacturers' name, model and serial number or professional engineer's certification

Load charts Load charts must be available to mobile crane operators or boom trucks and include:

- Load capacities at vertical and / or horizontal angles of a boom
- Load capacities at various boom extensions
- Environmental limitations e.g., temperature, wind, etc.,
- Equipment limitations e.g., outrigger use / position, tire-pressure etc.,

Log book requirements A log book (electronic or paper) must be kept for each lifting device at the work location according to the following jurisdictions:

Jurisdiction	Requirement
Alberta	<ul style="list-style-type: none"> • Lifting devices with a rated capacity greater than 2,000kg excluding manually operated lifting devices
British Columbia	<ul style="list-style-type: none"> • Cranes or hoists with a rated capacity greater than 900kg • All cranes and hoists used to support workers • All mobile cranes and boom trucks

Log book contents The log book must contain the following information:

Information	Details
Hours of service	<ul style="list-style-type: none"> • Length of time in service • hours of service are recorded if equipped with a manufacturer's hour meter
Safety items	<ul style="list-style-type: none"> • Any matter or incident affecting safe operation of lifting device • All defects or deficiencies and when detected
Inspections	<ul style="list-style-type: none"> • Date and time work was performed on lifting device • Inspections, including examination check and tests as specified by manufacturer • Repairs or modifications performed • A record of certification


3. Inspection Requirements

3.1. Mobile Lifting Equipment

Mobile crane and boom truck Inspection Frequency

All mobile cranes and boom trucks must be inspected as follows:

Inspection type	Frequency of Inspection
Daily	<ul style="list-style-type: none"> To be performed daily
Periodic	<ul style="list-style-type: none"> Every 3 months or Or every 350 hours of machine time
Annual	<ul style="list-style-type: none"> To be performed annually



NOTE: complete structural inspection of telescopic boom is required any time it's disassembled, every 10 years, or 10,000 hours of service.

Mobile crane and boom truck Inspection Requirements

Inspection frequency requirements are as follows:

Daily Inspection	Requirement
Structural	<ul style="list-style-type: none"> all rope reeving, including load lines, jib suspension, boom hoist and mid-point suspension all air, hydraulic, lubricating and cooling systems for deterioration or leakage hooks and latches for deformation, chemical and heat damage, cracks and wear swivels for freedom of rotation outriggers, outrigger boxes, and tires
Mechanical	<ul style="list-style-type: none"> all control mechanisms for incorrect and/or malfunctions interfering with proper operation all control mechanisms for excessive wear of components and contamination by lubricants or other foreign matter electrical apparatus for malfunction, signs of excessive deterioration, dirt, icing and / or moisture accumulation hydraulic system for proper oil level clutches, brakes and attachments for malfunction

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Periodic Inspection	Requirement
Structural	<p>All daily inspection items and the following:</p> <ul style="list-style-type: none"> • deformed or corroded and cracked members or welds in the crane structure or boom • loose bolts, nuts or pins • cracked, worn or distorted parts such as: <ul style="list-style-type: none"> ○ pins ○ gears ○ rollers ○ locking devices • wear on brake and clutch system parts such as linings • pawls and ratchets • load, boom angle and other indicators • all power plants • hooks
Mechanical	<ul style="list-style-type: none"> • all control mechanisms for excessive wear and contamination • travel steering and braking system for malfunction • hoses, fitting and tubing for leakage, blistering, deformation, tight joints, excessive abrasion or scrubbing • hydraulic and pneumatic pumps and motors for loose bolts, fasteners, leaks, shaft seal leaks, unusual noises or vibration, loss of operating speed, excessive heating or loss of pressure • valve for cracks, leaks, sticking or failure • cylinder for leaking, seals, weld joints, scored, nicked, dented rods, dented case, loose, deformed rod eyes and joints • filters • windows, horn, wipers, heater, defroster, lights, gauges, transmissions, differential, cooling, fuel, electrical system, drive belts, suspension, steering, brake systems, crawler chain, tracks, sprockets and rollers

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Annual Inspection	Requirement
Structural	<p>All daily and periodic inspection items including test load, if specified by the manufacturer and the following:</p> <ul style="list-style-type: none"> • outrigger and outrigger boxes • steering knuckles • boom foot section and lattice boom • boom head • boom hoist • boom sections including sheaves, hooks, blocks and wedge sockets
Mechanical	<ul style="list-style-type: none"> • teardown inspection and lubrication of swivel hook and block assembly at least every 5 years • hooknut disassembled and inspected for corrosion and wear

3.2.Overhead Travelling Cranes

Service types, class descriptions and Inspection Frequency

Overhead travelling crane service types, class descriptions, and inspection requirements are as follows:

Service	Class Description	Inspection Frequency
Light	Class A, Standby or Infrequent Use <ul style="list-style-type: none"> Precise handling of equipment at slow speeds with long idle periods between lifts Used for initial installation of equipment and infrequent maintenance Examples: motor rooms, MCC rooms, compressor buildings, etc., 	Monthly operational / visual inspection
	Class B, Light <ul style="list-style-type: none"> Low speed, light service requirements Occasional full rated loads Approximately 2-5 lifts/hours, averaging 3m/lift Examples: cranes in repair shops, light assembly operations, service buildings, warehouses, etc. 	Annual Periodic Inspection
Heavy	Class C, Moderate <ul style="list-style-type: none"> Average 50% of rated capacity Approximately 5-10 lifts/hour averaging 3m/lift, less than 50% of lifts at rated capacity Examples: cranes in manufacturing, machine shops, or papermill machine rooms. 	Weekly to monthly operational / visual inspections
	Class D, Heavy <ul style="list-style-type: none"> Loads approaching 50% of rated capacity 10-20 lifts/hour averaging 5m/lift Examples: cranes in heavy machine shops, foundries, steel warehouse, container yards. 	Semi-annual periodic inspection

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Inspection requirements

Inspection requirements for overhead travelling cranes are as follows:

Inspection Type	Requirements
Operational/Visual	<ul style="list-style-type: none"> • Conducted by operator or designate • Recorded in log book • Identify defects, malfunctions and damage • Inspect for leaks, wear, cracks, certification labels • Test limit devices and breaks
Periodic	<ul style="list-style-type: none"> • Conducted by crane inspector and recorded in log book. • Verifies supporting structure is suitable for max load rating. • Identify defects, malfunctions and damage.



NOTE: Cranes out of service for 1 month but less than a year require an operational inspection. Cranes out of service >1 year require a periodic inspection.

4. Rigging

4.1. Safety

Working load limits

Working load limits are as follows:

- Rigging maximum load rating must be legibly indicated on rigging
- Available to workers if markings cannot be placed on rigging
- Must be checked for each rigging component prior to any lift

Rigging must not be subjected to a load more than the following:

Lifts	% of breaking strength of rigging weakest part
Rigging for workers	• 10
All other lifts	• 20

Safety factors and rigging components

Rigging components must be rated relative to their ultimate breaking strength per the following minimum safety factors:

Components	Safety Factor
Running lines	• 3.5 to 1
Non-rotating hoist lines	• 5 to 1
Tugger lines / block for pulling	• 3 to 1
Pendant lines / guy lines	• 3 to 1
Winch lines	• 2 to 1

Tow operations




Rigging components or hoisting lines used in a tow operation must not be used for a hoist operation.

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Safety hooks and latches

Hooks must be replaced with the following types where hook dislodgement could injure workers:

Hook type	Visual example
Hook with safety latch	
Anchor-type shackle with bolt, nut and retaining pin	
“moused” hook e.g., wrapping of soft wire, rope, etc.,	


Suspended Personnel baskets

Suspended personnel basket requirements are as follows:

- All personnel baskets must be commercially manufactured or designed and certified by a professional engineer
- Pre-use inspection required
- Secondary safety device must be attached between basket and hoist line above the hook assembly
- Workers in the personnel basket must use fall protection equipment per [ConocoPhillips Fall Protection SOP](#).

Chain Rigging

Rigging with Chains is by exception only, shall be used in special circumstances and approved by CPC.



WARNING: Transport chains are never permitted for lifting and rigging operations.

4.2. Inspection and Repair

Rigging and component Inspection

All rigging and components must be inspected to ensure functionality and safety prior to each use.

Removal from service examples

Rigging equipment must be removed from service when the following is observed:

- Damage is above manufacturers' tolerances
- Chemical damage including melting and charring or electrical contact.
- Broken or worn stitching
- Distorted rope structure such as bulging, kinking, or bird caging.
- Cracked, broken, corroded, or distorted fittings
- Load hooks are open more than 15% of normal throat opening, are 10° out of plane or if any dimension has been reduced by more than 10%
- Broken, corroded, or distorted strands on wire rope such. Follow provincial regulations for running and stationary wire rope.

Rigging repair

Rigging repair requirements are as follows:

- Makeshift fittings or attachments is not permitted
- Welding repairs to rigging chains and fittings must be certified safe for use by a professional engineer

Storage

Rigging must be stored in a designated storage area when not in use.

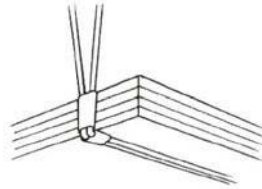
5. Safe Operating Practices

5.1.Planning

Weight of load being lifted Weight of the load being lifted must be determined and communicated to the operator and any person rigging the load. The weight must not exceed safe working load (SWL) of the weakest rated rigging component used.

Slings When using slings consider the following:

- Size, weight, configuration and balance of load must be determined and arranged so sling will not slip or fall off
- Equally divide load when using multiple slings
- Do not lift loads using one leg of a multi-leg sling until unused legs are secured.
- Slings and straps should be protected from damage where slings contact sharp objects or may be exposed to bending
- Be aware of horizontal sling angles – angles greater than 45° are recommended. A ling angle of 30° takes full load.
- Use spreader bars to increase angles.



Lift plans Lift plans must be completed during the hazard assessment / permitting process.

Critical lift plans Critical lift plans e.g., [CPC-ALL-HSE-FRM-2129](#) or contractor equivalent are required for lifts meeting any of the following criteria:

- Lifts exceeding 75% of the crane’s rated capacity as shown on load charts for the crane configuration to be use
- Lifts of a person in a work platform suspended by a crane
- Lifts of a load over or between energized, high voltage electrical conductors
- Lift over live process equipment or piping

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British Columbia
critical lifts

The following are considered critical lifts in British Columbia:

- Lifts in which the load's centre of gravity or sling leg length changes during the lift
- Lifts involving two cranes if the load on one crane or hoist is greater than 75% of rated capacity
- Lifts involving simultaneous use of more than two lifting devices

Critical lift plan
contents

A critical lift plan must be completed by a qualified person and contain the following:

- Rigging details
- Wind speed limitations
- Maximum hoist line speed
- Maximum crane travel speed, if applicable
- Load distribution
- Signalers and their positioning, if applicable

Use of signalperson

Use of signalperson requirements are as follows:

- A signalperson must be present when the lift operator does not have full view of the entire operation
- Only one person should provide signals to the lift operator except to warn of a hazardous situation
- The Standard signal system should be used e.g., Industry Recommended Practice 12 or signals provided in provincial OHS code/regulation
- Radio communication or another equally effective method must be used for blind lifts

Tag lines on loads

When using tag line on loads:

- Avoid tying tag line to lifting gear
- Tag line must be long enough to properly control load and prevents load from striking the worker controlling the tag line
- Workers guiding loads must have an escape route during the lift



WARNING: Tag lines may present additional hazards that will require defenses. Consider push poles as an alternative to tag lines to keep workers out of line of fire.

5.2.Pre-Lift Checks and Defense Recommendations

Pre-Lift Checks

Prior to initiating a lift, complete the following pre-lift checks:

Item	Check
Operator is trained and qualified with tickets	<input type="checkbox"/>
Crane Pre-use Inspection completed	<input type="checkbox"/>
Rigging is installed and inspected	<input type="checkbox"/>
Flagging and barricading in place	<input type="checkbox"/>
Load weight confirmed and load chart reviewed	<input type="checkbox"/>
Load is checked to ensure it is not welded, bolted or clamped to surface.	<input type="checkbox"/>

Defenses During the lift

During a lift, ensure defenses are in place to address the following:

Element	Requirements
Personnel	<ul style="list-style-type: none"> The lifting device operator must be in full control of equipment and must not perform other duties while in operation of the equipment No personnel are allowed to work under a suspended load No loads must be lifted over workers Only members of the immediate lift team are allowed in proximity of crane while a critical lift is in progress No worker shall be allowed to ride the load or any other rigging equipment Personnel are to be kept clear of the load while load is hoisted Assign designated signalperson as identified in work planning
Load	<ul style="list-style-type: none"> Load is checked to ensure it is not welded, bolted or clamed to the surface Check for loose or hidden debris that could fall during lift Do not drag loads along the ground Position hook directly over load and seat sling squarely on the hook bowl Guard against shock loading by taking up slack slowly. A hook must not be side, back or tip-loaded, unless the hook has been specifically designed for this purpose Loads must not be left suspended Laydown area must be checked to ensure adequate size and ability to hold the load

6. Training & Roles and Responsibilities

6.1. Training

Competencies for using lifting devices or rigging

Personnel must be deemed competent by an appropriate representative of their company demonstrating competency in:

- Operation of the specific lifting / rigging equipment and practices
- Use of load charts
- Use of the code of signals for hoisting operations

All workers and operators must be authorized to operate the specific equipment and provide proof of training at all times.

British Columbia requirements

In British Columbia, mobile and tower cranes must be operated only:

- By a person with a valid operator's certificate
- Per conditions stipulated on the certificate

6.2. Roles and Accountable Positions

Lifting and rigging Responsibilities by Role

Responsibilities for workers involved in lifting and rigging operations are:

Role	Responsibilities
Supervisor	<ul style="list-style-type: none"> • Ensure workers are trained and competent to operate the specific devices at the worksite • Ensure adequate rigging is available
Personnel	<ul style="list-style-type: none"> • Be competent to operate specific lifting devices • Be familiar with recent log book entries prior to operating lifting devices • Be able to provide proof of training at all times

References

Reference the following documents as required.

Document Name	Document ID
Critical Lift Plans	
Canadian Standards Association	