



# HOISTING APPARATUS Inspection Guidelines

This is a guide to assist in meeting the requirements of paragraph 211(2)(a) of the *General Regulation 91-191* under the *Occupational Health and Safety (OHS) Act*. The checklists provided may not be inclusive for all types of hoisting apparatuses. For a complete checklist of the unit to be inspected, please consult the manufacturer's specifications.

WorkSafeNB has developed separate logbooks and checklists for mobile cranes and overhead cranes. These logbooks are available by contacting any WorkSafeNB office.

**Base-Mounted Drum Hoist**

**Articulating Boom Crane**

**Automotive Hoist**

**Hand-Operated / Lever-Operated Chain Hoist**

**Electric / Pneumatic Hoist**

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# WorkSafeNB Regional Offices

## New Brunswick

### NORTHWEST

Phone: 506 475-2550

Fax: 506 475-2568

### NORTHEAST

Phone: 506 547-7300

Fax: 506 547-7311

### SOUTHWEST

Phone: 506 738-8411

Fax: 506 738-4467

### SOUTHEAST

Phone: 506 867-0525

Fax: 506 859-6911



1 800 999-9775

[www.worksafenb.ca](http://www.worksafenb.ca)

## LEGISLATIVE INTERPRETATIONS

Topic:	Interpretations of Act / Regulation	Issued by:	Legal Department
Statute:	<i>General Regulation 91-191</i>	Date Issued:	June 15, 2001
Section, subsection or paragraph:	Definition of “Hoisting Apparatus”	Date Revised:	

“Hoisting apparatus” means mobile cranes, tower cranes, electric overhead traveling cranes, vehicle hoists, winches, and other similar equipment, but does not include elevators, dumbwaiters, or mine hoists.

### Question:

Do chainfalls with a two-ton capacity fall under the category of a hoisting apparatus? Do the people repairing this type of lifting equipment have to be certified by an agency or can a competent person repair chainfalls?

### Answer:

A chainfall falls within the meaning of “other similar apparatus” in the definition of “hoisting apparatus”. Any device or piece of equipment used to lift or lower material or equipment is considered a hoisting apparatus. Examples include, but are not limited to:

- come-a-long used to lift
- jacks
- turfer
- lever-operated hoists
- hand chain hoists
- manual pullers

It should be noted that, since the June 2001 amendments, the exemption for hoisting apparatuses with a lifting capacity of less than 1,815 kg applies only to the logbook requirement.

Those who repair the equipment do not have to be certified by an agency but must be competent. A competent person would include a certified mechanic or a person who met the requirements of the definition of “competent” in *Regulation 91-191*.

## LEGISLATIVE INTERPRETATIONS

Topic:	Interpretations of Act / Regulation	Issued by:	Legal Department
Statute :	<i>General Regulation 91-191</i>	Date Issued:	June 15, 2001
Section, subsection or paragraph:	Competent Person - Yearly Inspection	Date Revised:	

**210.01(1)** An employer shall ensure that a hoisting apparatus is inspected every 12 months by a competent person to ensure that the apparatus meets the manufacturer’s specifications.

**Question:**

Subsection 210.01(1) requires that a competent person inspect hoisting apparatuses annually and certify the apparatus meets the manufacturer’s specifications. How will you know if a person is competent to certify the hoisting apparatus?

**Answer:**

Competency requirements will vary with each type of equipment. However, since the *Regulation* makes reference to several Canadian Standards Association (CSA) standards that address this issue, WorkSafeNB will reference the requirements outlined in these standards for guidance.

Other standards such as the American National Standards Institute (ANSI) and the American Society of Mechanical Engineers (ASME), which cover types of hoisting apparatuses not covered by CSA, may also be used for guidance in determining competency.

It is recommended that employers, who are responsible for appointing competent inspectors, also follow these guidelines to assist them in ensuring their appointments are appropriate.

# Hoisting Apparatus Inspection Requirements

## Daily / Shift Inspection

There are many manufacturers of hoisting equipment. These hoists all operate on basically the same principle to facilitate material handling in shops, factories and heavy work areas. Common faults encountered with hoists are unsafe cables or chains, faulty brakes and defective limit switches. Under the *OHS Act*, paragraph 211(2)(a) of *General Regulation 91-191* requires an operator to inspect a hoisting apparatus before it is put into use at the beginning of the shift (daily) and record the results in a logbook, as specified in subsection 210(3) of *Regulation 91-191*.

## Annual Inspection

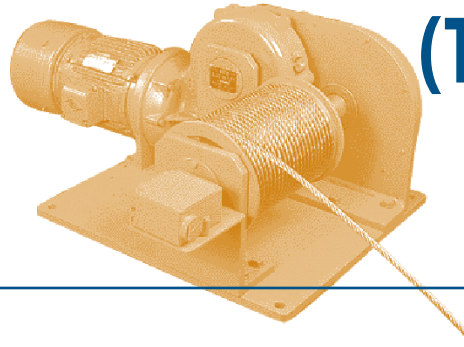
In addition to the daily inspection, subsection 210.01(1) requires an annual inspection of the hoisting apparatus by a competent person who certifies in writing that the apparatus meets the manufacturer's specifications.

The results of the annual / periodic inspection, including repairs, adjustments and other findings shall be included in the logbook and made available to an officer upon request.

*General Regulation 91-191* defines competent as:

- (a) qualified, because of such factors as knowledge, training and experience, to do assigned work in a manner that will ensure the health and safety of persons,
- (b) knowledgeable about the provisions of the *Act* and the regulations that apply to the assigned work, and
- (c) knowledgeable about potential or actual danger to health or safety connected with the assigned work.

# Base-Mounted Drum Hoist (Tugger)



## Daily Inspection ✓

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- Check all control mechanisms for malfunction.
- Check limit switches for malfunction.
- Check air or hydraulic systems for deterioration or leakage.
- Check load carrying ropes for excessive wear, kinking or broken strands.
- Check electrical apparatus for malfunction.
- Check anchorage points and foundation for breakage.
- Ensure guards are installed over exposed moving parts.

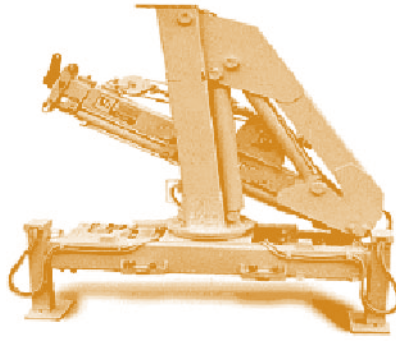
## Annual Inspection ✓

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*Conditions such as the following shall be examined by a competent person on an annual basis. The competent person shall certify the unit meets the manufacturer's specifications.*

- Check control mechanisms for malfunction.
- Check limit switches for malfunction.
- Check air or hydraulic systems for deterioration or leakage.
- Check load carrying ropes for excessive wear, kinking, broken strands or stretching.
- Check electrical apparatus for malfunction.
- Check anchorage and foundation points for ability to support sustained loads.
- Check for deformed, cracked, or corroded members.
- Check for loose bolts and rivets.
- Check for cracked or worn drums and sheaves.
- Check brake, clutch system parts and linings, pawls, and ratchets for excessive wear or damage.
- Check power plants for improper performance.
- Check chain drive sprockets for excessive wear and chain stretch.
- Check electrical apparatus for malfunction and deterioration.
- Check for worn, cracked, or distorted parts such as pins, bearings, shafts, gears, rollers, and locking and clamping devices.

# Articulating Boom Cranes



## Daily Inspection ✓

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### Control Mechanism

Check for malfunction, control motion identification legibility, excessive wear and contamination.

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### Safety Devices

Check for malfunction.

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### Hydraulic Hoses

Check for evidence of leakage, especially at threaded or clamped joints. Check for blistering, abrasion, scrubbing or abnormal deformation to outer covering.

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### Hook and Latches

Check for deformation, cracks and wear.

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### Rope Reeving

Check wire rope for broken strands, birdcaging or kinking. Ensure rope is spooled on drum evenly.

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### Hydraulic System

Check for leaks and proper oil levels.

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### Connecting Pins

Check for wear and damage.

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### Mounting Bolts

Check for evidence of loose or broken bolts.

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### Boom Sections

Check for cracks, broken welds and deformation.



# Annual Inspection ✓

*Conditions such as the following shall be examined by a competent person on an annual basis.*

*The competent person shall certify the unit meets the manufacturer's specifications.*

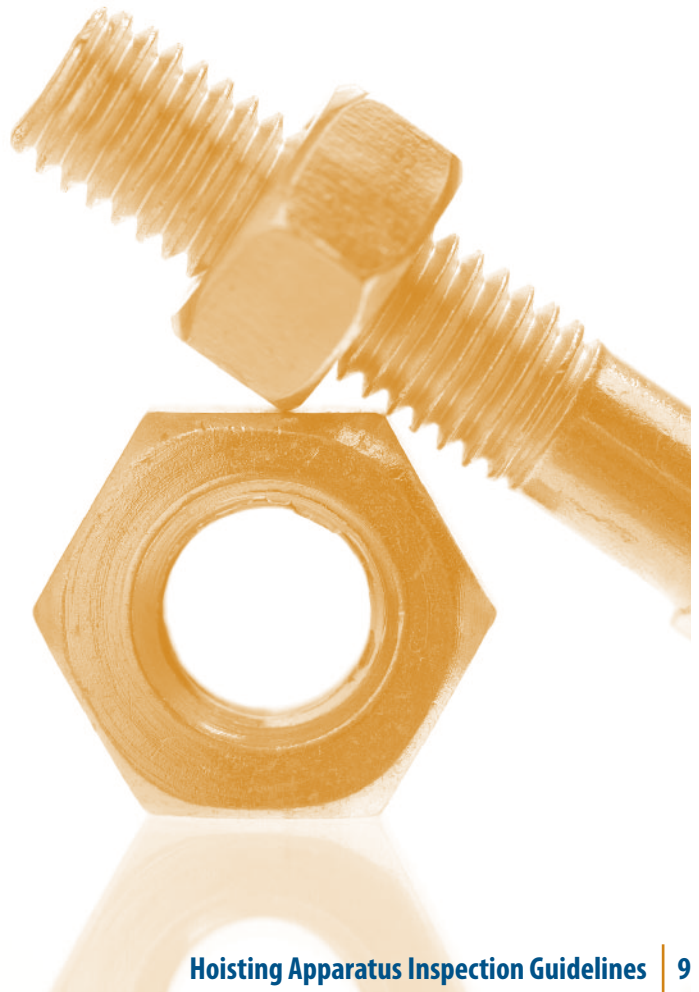
- Deformed, cracked, or corroded members in the crane structure and carrier.
- Loose bolts, particularly mounting bolts.
- Cracked or worn sheaves and drums.
- Worn, cracked, or distorted parts such as pins, bearings, shafts, gears, rollers and locking devices.
- Excessive wear on brake and clutch system parts and linings.
- Crane hooks for cracks, wear, or deformation.
- Travel steering, braking, and locking devices for malfunction.
- Warning and operating labels in place and legible.

## Hydraulic and pneumatic hoses, fittings and tubing

- Evidence of leakage at the surface of flexible hose or its junction with metal end couplings.
- Blistering or abnormal deformation to the outer covering of hydraulic or pneumatic hoses.
- Leakage at threaded or clamped joints.
- Evidence of excessive abrasion or scrubbing on the outer surface of hose, rigid tube, or fitting. Means should be taken to protect components from unnecessary contact with external elements.

## Hydraulic and pneumatic pumps and motors, valves and cylinders

- Loose bolts and fasteners.
- Leaks at joints.
- Shaft seal leaks.
- Unusual noises or vibration.
- Loss of pressure.
- Cracks in valve housing.
- Improper return of spool to neutral position.
- Leaks at spools and joints.
- Sticking spools.
- Drifting caused by fluid leaking across cylinder.
- Rod seal leaking.
- Leaks at welded joints.
- Scored, nicked or dented cylinder rods.
- Damaged cylinder case.
- Loose or deformed rod eyes or connecting joints.



# Automotive Hoist



## Daily Inspection ✓

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- Ensure warning labels, rated load capacity and safety tips are accessible and readable.
- Check operating controls, restraints and locking devices for malfunction.
- Check structural components for excessive wear or deformation.
- Check other components such as hoses, electrical wires, drive chains, cables and screws for excessive wear or deformation.
- Check contact points that engage vehicles during lifts for damage or excessive wear.
- Check for hydraulic or pneumatic leaks.
- Check hydraulic reservoirs for correct oil levels.
- Check for any unusual noise, sudden movements, erratic operation or evidence of chips or filings during use.
- Check for cracks or loose concrete around floor anchor bolts.
- Check floor anchor bolts for evidence of looseness or breakage.

## Annual Inspection ✓

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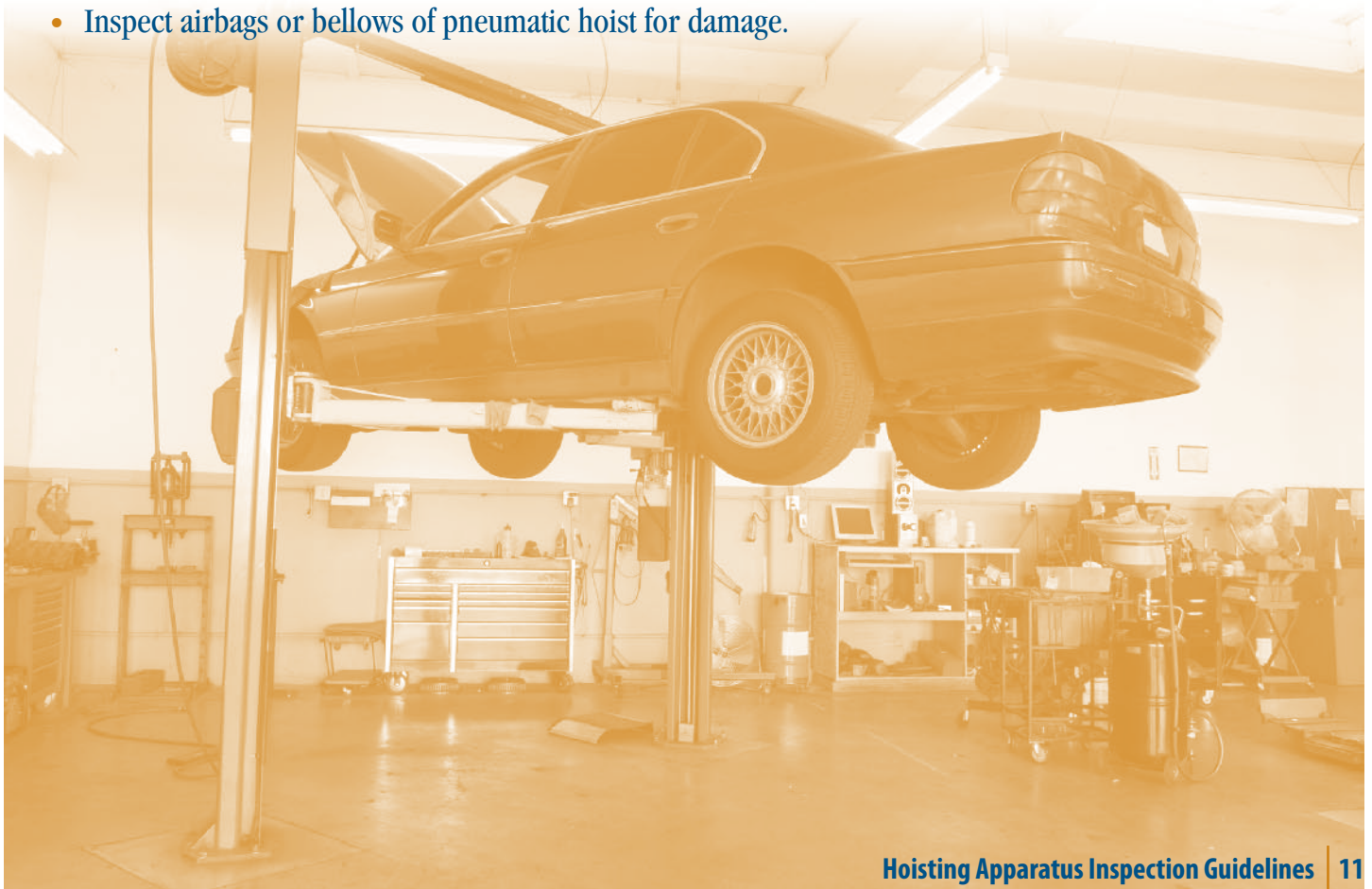
*Conditions such as the following shall be examined by a competent person on an annual basis. The competent person shall certify the unit meets the manufacturer's specifications.*

- Check accessibility and readability of manufacturer's instructions or generic instructions, safety instructions and safety warning labels.
- Ensure rated load capacity is visible and readable on lift.
- Check adequacy of clearances around lift.
- Check all structural components including welds for cracks or deformation.
- Check electrical components and wiring.
- Check lift controls for malfunction.
- On lifts using runways, ensure proper operation of all features.
- On lifts using swing arms, check telescoping stops.
- On lifts requiring swing arm restraints, check for proper function.

## Annual Inspection - continued

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- Check all fastening devices for tightness, including floor anchor bolts.
- Check exposed surfaces for cracks and deterioration.
- Check positive stops by operating lift.
- On lifts employing adapters, check condition and for proper operation.
- With a representative vehicle on the lift, check the lowering speed.
- Check all points requiring lubrication.
- On lifts incorporating work platforms, railings and stairways, check railings and walking surfaces.
- On lifts incorporating overhead structures, verify safety shut off.
- Inspect all chains and cables for wear and deterioration.
- Check tracking and level winding of cables and chains.
- Check hydraulic cylinders for signs of wear and pitting.
- Check oil levels of hydraulic systems.
- Check all accessible piping, tubing, hoses, valves and fittings.
- Check rotation prevention devices on single-post lifts.
- Check slack suspension cables or slack chain sensing system for proper operation.
- Check screw drive systems for abnormalities and proper lubrication.
- Check screw drive systems for proper operation of follower or safety nut.
- Check for shut off at top and bottom of travel by running lift through its full cycle.
- Check for presence of pressure regulator in supply line of pneumatic-operated hoist.
- Inspect airbags or bellows of pneumatic hoist for damage.



# Hand-Operated / Lever-Operated Chain Hoist



## Safety Operating Guidelines ✓

- Do not exceed the rated capacity of chain blocks.
- Do not use chain blocks as slings.
- Do not use if chain is kinked.
- Do not extend operating levers.
- Do not work or pass under lifting loads.
- Do not use undue force to operate lever hoists.
- Do not use undue force if hand chain fails to move.
- Only use to lift vertically, do not use to drag loads.

## Daily Inspection ✓

### Hooks

Check safety latches on both the support and lifting hooks for distortion or stretching.

### Load Chain

Check for gross damage, kinks and excessive wear. Load chain should not contain splices.

### Support Structure

Check support structure for damage and security.

### Motions

Ensure motions are smooth and regular with no hesitations, vibration, binding, unusual noise, or other irregularity.

## Annual Inspection ✓

*The annual inspection can normally be performed with the hoist in its normal location and does not require the hoist to be dismantled. Covers and other items normally supplied to allow inspection of components should be opened or removed for inspection.*

# Inspection Items ✓

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- Check operating mechanisms or maladjustment and listen to for unusual sounds that may indicate problems.
- Tightness of bolts, nuts, and rivets.
- Excessive wear, corrosion, cracks, or distorted parts in the following:
  - Load blocks
  - Hand chain wheels
  - Clevises
  - Suspension bolts
  - Gears
  - Pins
  - Suspension housings
  - Chain attachments
  - Yokes
  - Shafts
  - Bearings
  - Rollers
  - Locking and clamping devices
- Check hook-retaining nuts, collars, pins, welds or rivets used to secure retaining members for excessive wear or damage.
- Check load and idler sprockets, hand chain wheel, drums and sheaves for excessive wear and damage.
- Check hand chain operated hoists for worn, glazed, or oil contaminated friction discs. Check for worn pawls, cams and ratchets and corroded, stretched, or broken pawl springs in braking mechanism.
- Check support structure and trolley for damage.
- Presence of legible warning labels.
- Check end connection load chains for wear, corrosion, cracks, damage, or distortion.

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## Welded Chain

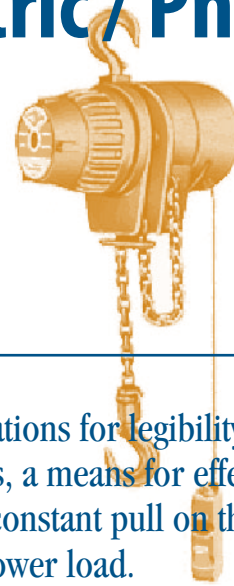
- Hoists should be tested under load in lifting and lowering directions with operation of chains and sprockets observed. Chains should feed smoothly and away from sprockets.
- If chains bind, jump, or are noisy, ensure they are clean and properly lubricated. If trouble persists, inspect chains and mating parts for wear, distortion or other damage.
- Examine chains for gouges, nicks, weld spatter, corrosion and distorted links.
- Move adjacent chain links to one side to inspect for wear at contact points.
- Measure chains according to the hoist manufacturer's instructions.

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## Hook

- Check for cracks, nicks, gouges and weld spatter.
- Latch engagement, damaged or malfunctioning latch.
- Hook attachment and securing means.
- Any bending or twisting exceeding 10 degrees from the plane of the unbent hook.
- Any distortion causing an increase in throat opening to exceed 15%.
- Any wear exceeding 10% of the original section dimension of the hook or its load pin.

# Electric / Pneumatic Hoists



## Daily Inspection ✓

### Operating Control Function

Check for malfunction. Check function labels on pendant control stations for legibility and condition of control housing. On pendant-controlled electric/pneumatic hoists, a means for effecting automatic return to the “off” position should be provided on the control so a constant pull on the control rope or constant push on the control button can be maintained to raise or lower load.

### Hoist Chains

Check for distortion, wear, stretching, nicks or deep gauges. Hoist chains should not contain splices. Contact the manufacturer to repair broken hoist chains.

### Hoist Cable

Check for broken strands, birdcaging and kinking. Ensure at least two wraps of cable on drum when hook is in lowest position.

### Limit Switches

Check top and bottom limit switches for malfunction. Hoists operating on rails must have positive safe limit stops.

### Hooks

Check safety latches on both the support and lifting hooks for any distortion or stretching.

### Support Structure

Check support structure for cracks, bends or distortion.

# Annual Inspection ✓

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*The annual inspection can normally be performed with the hoist in its normal location and does not require the hoist to be dismantled. Covers and other items normally supplied to allow inspection of components should be opened or removed for this inspection.*

## Inspection Items ✓

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- Check operating mechanisms for maladjustment and listen to for unusual sounds that may indicate problems.
  - Tightness of bolts, nuts, and rivets.
  - Excessive wear, corrosion, cracks, or distorted parts in the following:
    - Load blocks
    - Chain attachments
    - Yokes
    - Shafts
    - Bearings
    - Rollers
    - Suspension housings
    - Clevises
    - Suspension bolts
    - Gears
    - Pins
    - Locking and clamping devices
  - Check hook-retaining nuts, collars, pins, welds or rivets used to secure retaining members for excessive wear or damage.
  - Check load sprockets, idler sprockets, drums and sheaves for excessive wear and damage.
  - Check for damage to support structure and trolley.
  - Presence of legible warning labels.
  - Check flanges on cable hoist drums for projections that could damage cable.
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### Hoist Chain / Cable

- Hoists should be tested under load in lifting and lowering directions with operation of chains and sprockets observed. Chains should feed smoothly and away from sprockets.
  - If chains bind, jump, or are noisy, ensure they are clean and properly lubricated. If trouble persists, inspect chains and mating parts for wear, distortion or other damage.
  - Examine chains for gouges, nicks, weld spatter, corrosion and distorted links.
  - Examine wire rope for any broken strands, birdcaging, kinking or other damage.
  - Examine wire rope drum to ensure rope spools on drum evenly.
  - Check hoist drum for any sharp edges or other damage.
  - Move adjacent chain links to one side to inspect for wear at contact points.
  - Measure chains according to the hoist manufacturer's specifications.
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### Hooks

- Check for cracks, nicks, gouges and weld spatter.
- Latch engagement, damaged or malfunctioning latch.
- Hook attachment and securing means.
- Any bending or twisting exceeding 10 degrees from the plane of the unbent hook.
- Any distortion causing an increase in throat opening exceeding 15%.
- Any wear exceeding 10% of the original section dimension of the hook or its load pin.