Section 11
Below the Hook Lifting Devices

Training Objective

At the completion of this section, students should have a thorough knowledge of:

- The frequency and scope of crane and hoist inspections as defined by OSHA regulations and ASME and CMAA standards.

ASME/ANSI B30.20
Below the Hook Lifting Devices

ASME B30.20-1	Structural and Mechanical Lifting Devices
ASME B30.20-2	Vacuum Lifting Devices
ASME B30.20-3	Close Proximity Operated Lifting Magnets
ASME B30.20-4	Remotely Operated Lifting Devices
ASME B30.20-5	Scrap & Material-Handling Grapples
ASME B30.20-6	Clamps

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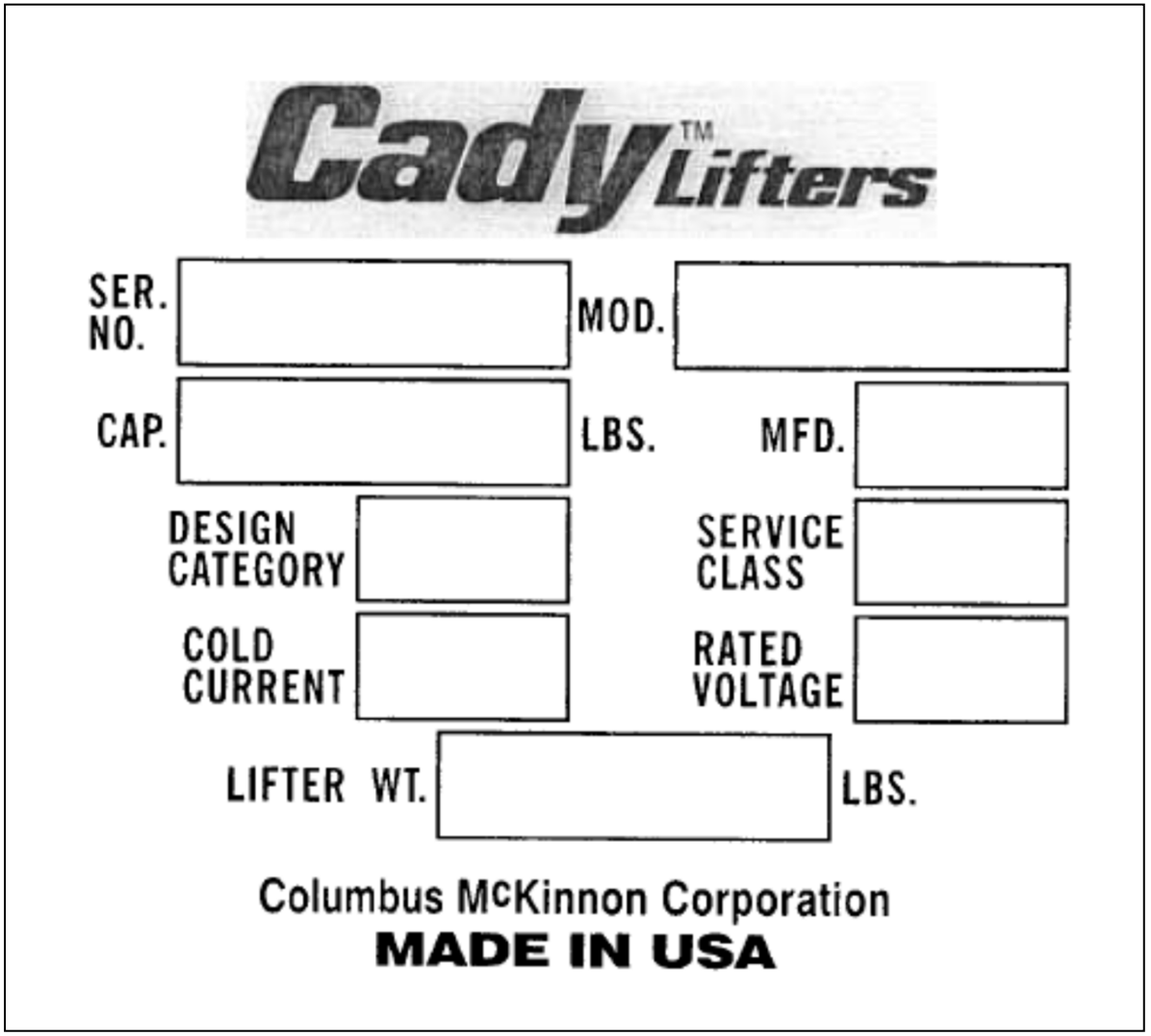
Required Markings per ASME B30.20-1.2

New Lifters: (Unaltered)



ASME/ANSI B30.20
Below the Hook Lifting Devices

20-1.3.7 Repairs

Damage disclosed by the inspection requirements of Section 20-1.3 shall be corrected according to the procedures outlined in para. 20-1.3.9 before operation of the lifter is resumed, unless a qualified person determines the damage does not constitute a hazard. Repairs of slings (ASME B30.9), hooks (ASME B30.10), rigging hardware (ASME B30.26), or other special devices shall comply with repair requirements in the applicable volumes or standards.

SECTION 20-1.3: INSPECTION, TESTING, AND MAINTENANCE

20-1.3.9 Maintenance

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LOAD TEST ASME B30.20-1.3.8.2

(a) Prior to initial use, all new, altered, or repaired lifting devices should be tested and inspected. If performed, tests shall be done under the direction of the manufacturer or a qualified person and a written report be furnished by such a person, confirming the load rating of the lifter. The load rating should not be more than 80% of the maximum load sustained during the test. Test loads shall not be more than 125% of the rated load unless otherwise recommended by the manufacturer. Test reports should be available.

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LOAD TEST ASME B30.20-1.3.8.2

(b) The load test, if made, shall consist of the following operations as a minimum requirement:
(1) Hoist the test load a sufficient distance to ensure the load is supported by the lifter, or apply the required load if the test is made using a testing machine.
(2) After the test load is released, visually inspect the lifter for deformation, cracks, or other defects.
(c) Tests of altered or repaired lifters may be limited to the components affected by the alteration or repair, as determined by a qualified person with guidance from the manufacturer.

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Every Lift Inspection

20-1.3.2 Every Lift Inspection

Items such as the following shall be inspected by the operator before and/or during every lift for any indication of damage as specifically indicated, including observations during operation for any damage that might occur during the lift:

(a) surface of the load for debris

(b) condition and operation of the controls

(c) condition and operation of the indicators and meters when installed

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Who is responsible for this inspection?

OPERATOR OR USER

20-1.4.1 Operators

Below-the-hook lifting devices shall be operated only by trained, designated persons.

operator: directly controls the lifting device's functions.
owner: has custodial control of a lifting device by virtue of lease or ownership.
These persons and roles may or may not match the persons and roles associated with the hoisting equipment in use.

Frequent Inspection

20-1.3.3 Frequent Inspection

Items such as the following shall be inspected for damage at intervals as defined in para. 20-1.3.1(b)(2), including observations during operation for any indications of damage that might appear between inspections. A qualified person shall determine whether any indications of damage constitute a hazard or will require more frequent inspection. For all lifters, inspect

(a) structural members for deformation, cracks, or excessive wear on any part of the lifter

(b) loose or missing guards, fasteners, covers, stops, or nameplates

(c) all functional operating mechanisms and automatic hold-and-release mechanisms for mis-adjustments interfering with operation

(d) missing or illegible operating control markings

20-1.3.1(b)(2) Altered or repaired lifters shall be inspected. The inspection may be limited to the components affected by the alteration or repair, as determined by a qualified person.

RECORDS NOT REQUIRED

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Periodic Inspection

20-1.3.4 Periodic Inspection

Complete inspection of the lifter shall be performed at intervals as defined in para. 20-1.3.1(b)(3). Any deficiencies, such as listed below, shall be examined and determination made as to whether they constitute a hazard. These inspections shall include the requirements of para. 20-1.3.3 and, in addition, items such as the following:

(a) loose bolts or fasteners

(b) cracked or worn gears, pulleys, sheaves, sprockets, bearings, drive chains, and belts

(c) excessive wear of friction pads, linkages, and other mechanical parts

(d) excessive wear at hoist hooking points and load support clevises or pins

(e) missing or illegible product safety labels required by para. 20-1.2.1(d)

Dated inspection records shall be made on critical items listed under Periodic Inspection and any time the device is repaired or modified.

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Records

20-2.3.6 Inspection Records

Dated inspection reports shall be made on critical items such as those listed in para. 20-2.3.4. Records should be available for each periodic inspection and when the vacuum lifter is either altered or repaired.

(a) external evidence of
(1) looseness
(2) wear
(3) deformation
(4) cracking
(5) Corrosion

(b) external evidence of damage to
(1) supporting structure
(2) motors
(3) controls
(4) other auxiliary components
(c) missing or illegible product safety labels required

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How long must inspection records be kept?

20-1.3.6 Inspection Records

Dated inspection reports shall be made on critical items such as those listed in para. 20-1.3.4. Records should be available for each periodic inspection and when the lifter is either altered or repaired.

BUT

CMAA 78 4.4.5.1

Reports for Periodic Inspections documenting the inspection items shall be kept on file by the owner &, if applicable, the inspection company. The reports should be maintained for at least 3 years.

Note: the last item on CMAA 78 table 4.4-2 (P.21)

List of Periodic Inspection Items, Below the Hook Devices

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Below the Hook Lifting Devices
(Supporting, Friction and Pressure Devices)

Supporting Device

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Below the Hook Lifting Devices
(Supporting, Friction and Pressure Devices)

Friction Device

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Below the Hook Lifting Devices
(Supporting, Friction and Pressure Devices)

Pressure Device

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Turn over Hoist

Supporting Device

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Reference

ASME B30.20-1.2.1
MARKING

ASME B30.20-1.3.2
EVERY LIFT

ASME B30.20-1.3.3
FREQUENT

ASME B30.20-1.3.4
PERIODIC

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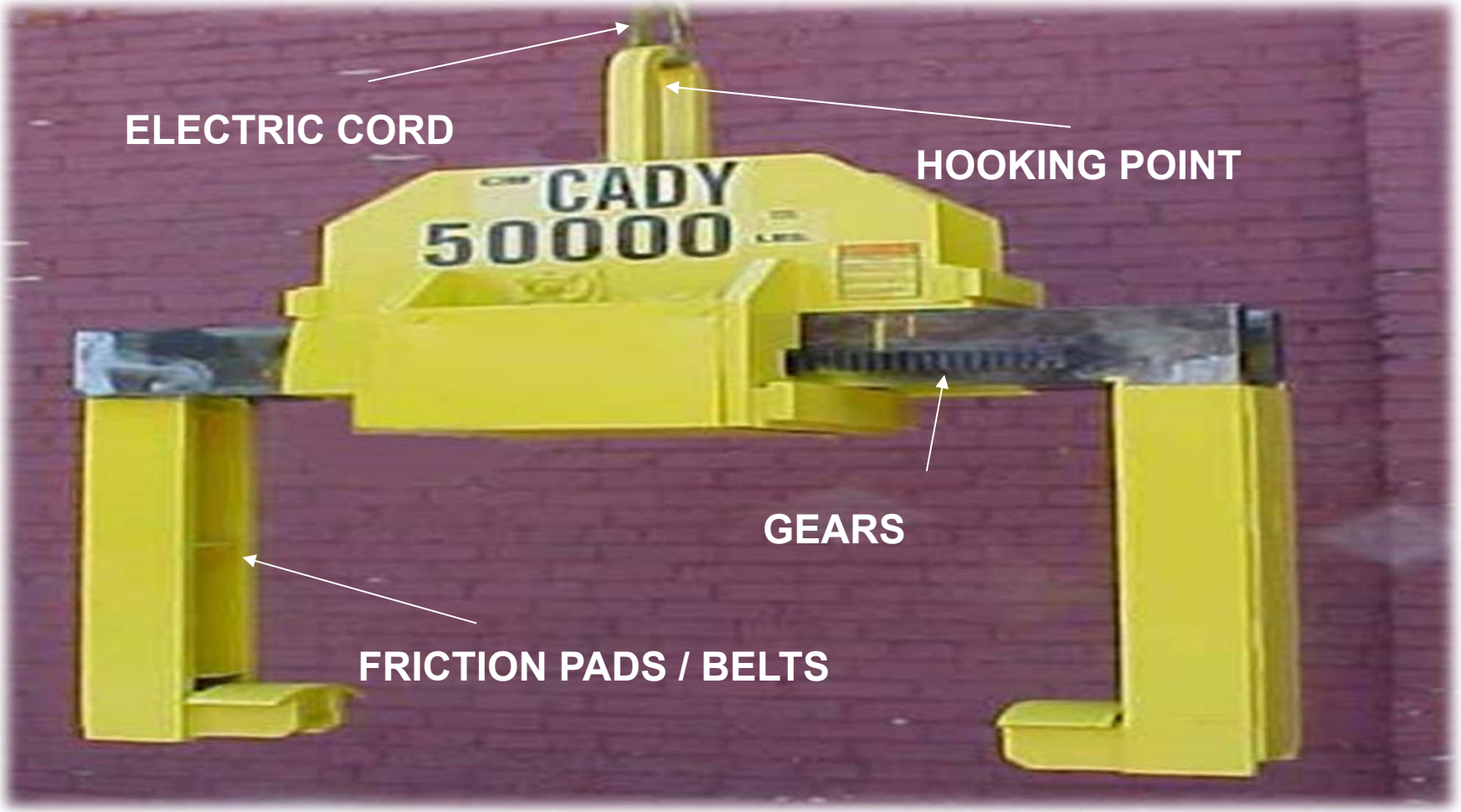
Items to Inspect

- REQUIRED ID
- SAFETY LABELS
- STRUCTURE *(Deformation, welds, cracks and wear)*
- LOOSE OR MISSING PARTS *(Guards, fasteners, covers, stops or nameplates)*
- GEARS, PULLEYS SHEAVES, SPROCKETS, CHAINS, BELTS
- EXCESSIVE WEAR ON FRICTION PADS OR BELTS
- WEAR AT HOOKING POINT
- BUSHINGS, BEARINGS, TOGGLE DEVICE
- LUBRICATION

Motorized Tong Coil Lifter



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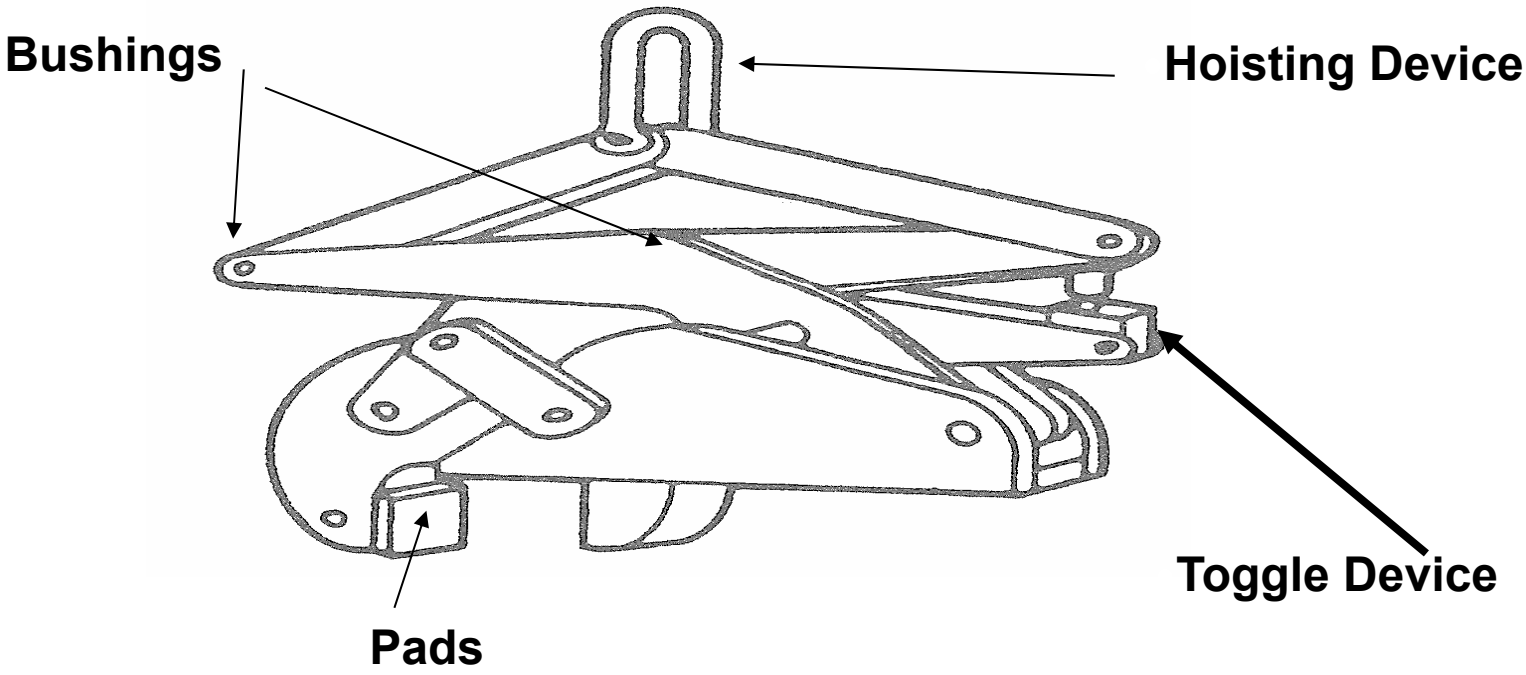
Vertical Axis Coil Grabber



Bushings, Bearings, Toggle Device

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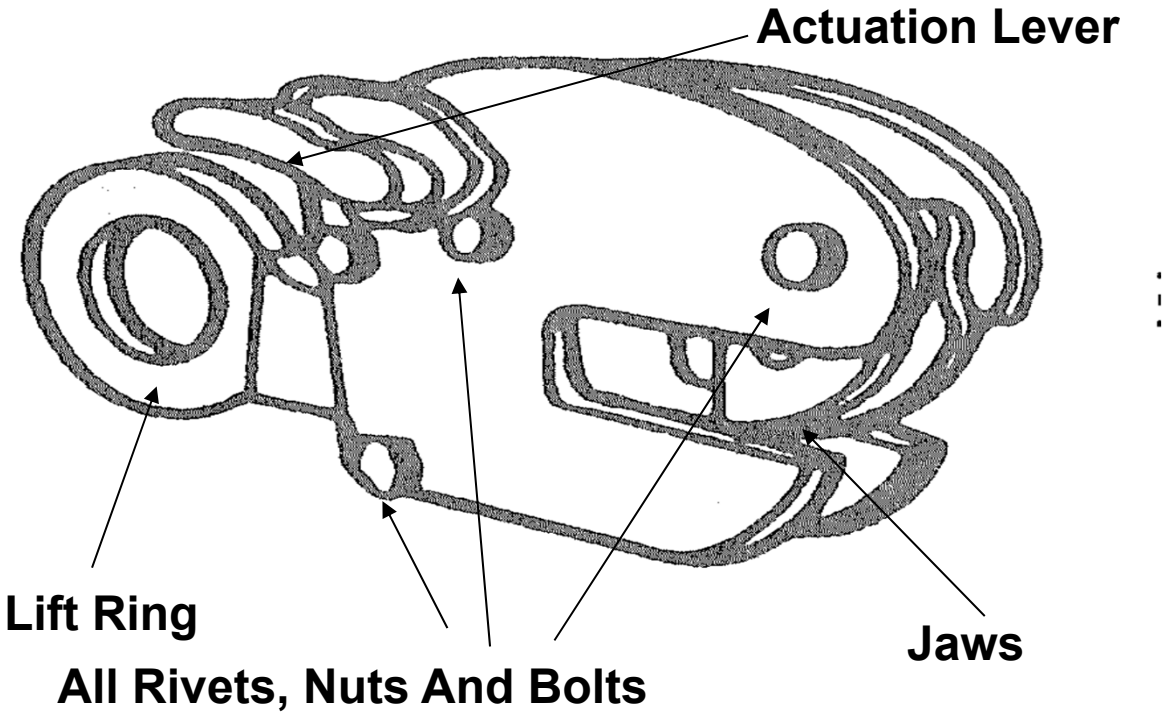
Plate Clamps



Vacuum Lifting Devices
ASME B30.20-3.2

New Lifters: (Unaltered)
Rated Load Marking, Maximum Width, Length and **Thickness of the load to be Lifted** (main structure or on a tag)

- Manufacturer's Name and Address
- Model Number
- Serial Number
- Lifter Weight
- Electrical Power Requirements
- Pressure and Volume of Compressed Air (when required)

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Records

20-2.3.7 Repairs

Damage disclosed by the inspection requirements of Section 20-2.3 shall be corrected according to the procedures outlined in para. 20-2.3.9 before operation of the lifter is resumed, unless a qualified person determines the damage does not constitute a hazard. Repairs of slings (ASME B30.9), hooks (ASME B30.10), rigging hardware (ASME B30.26), or other special devices shall comply with repair requirements in the applicable volumes or standards.

SECTION 20-2.3: INSPECTION, TESTING, AND MAINTENANCE

20-2.3.9 Maintenance

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Repaired or Modified Lifters

- Name and Address of Repairer or Modifier
- Repairer's or Modifier's Unit Identification
- Lifter Weight (if altered)
- Rated Load (if altered)
- **LOAD TEST RECORD ASME B30.20-2.3.8.2**

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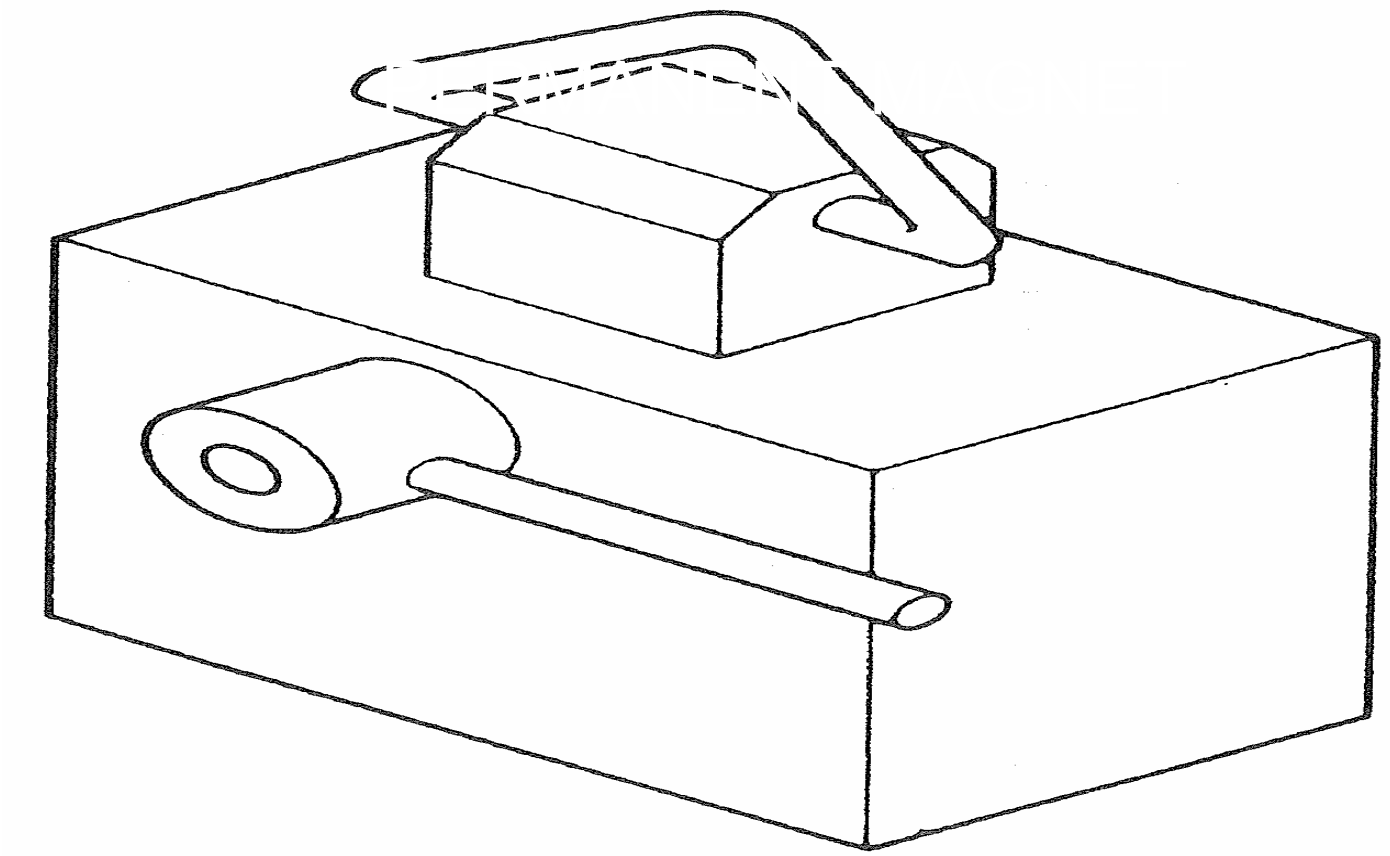
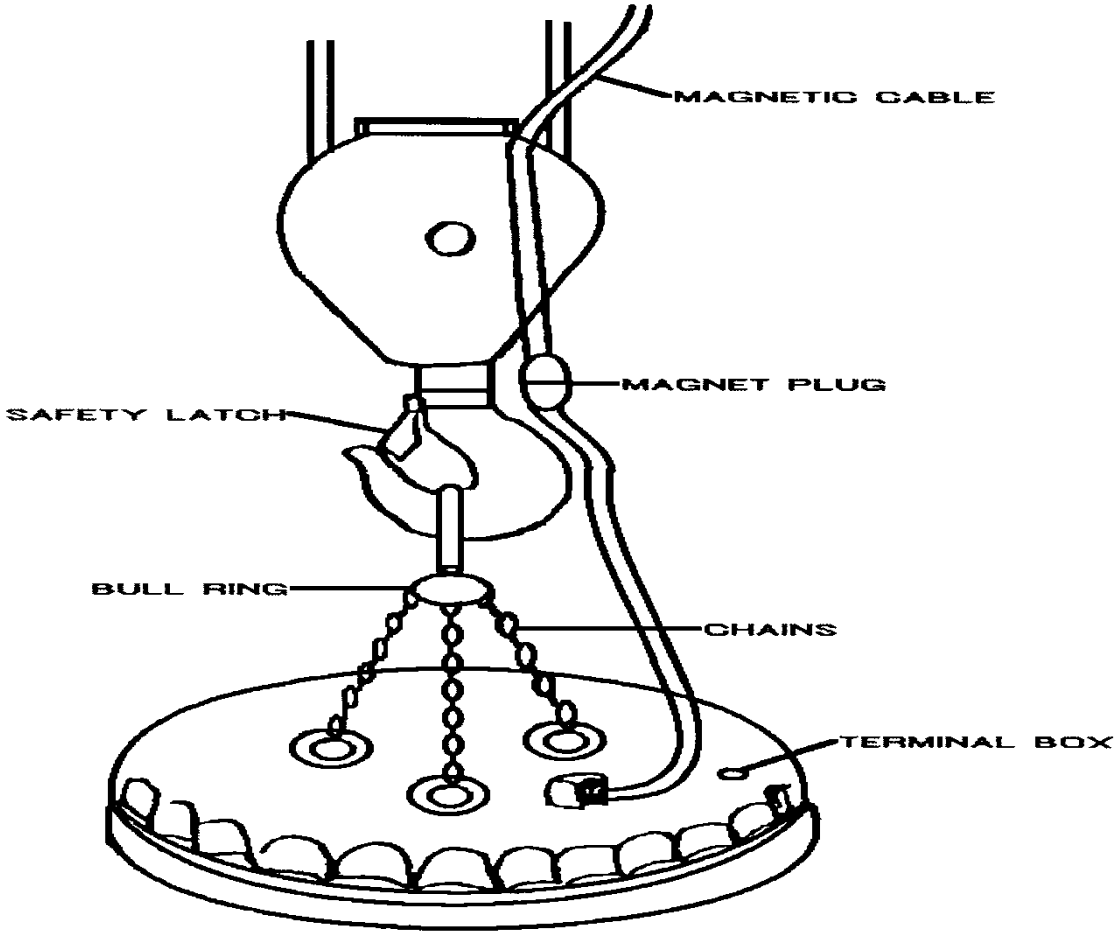
Permanent Magnet



Remote Lifting Magnets



ASME B30.20-3.3.2 New Lifters: (Unaltered)

- Rated Load Marking (on magnet or on a tag) (see 20-3.3.2)
- Manufacturer's Name and Address
- Model an Unit ID
- Weight of Magnet
- Cold Current Amps (68°F)
- Voltage of Primary Power Supply
- Product Safety Labels

Per ASME B30.20-3.3.2; Marking, Construction & Installation

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Repaired or Modified lifters

- Name and Address of Repairer or Modifier
- Repairer's or Modifier's Unit Identification
- Lifter Weight (if altered)
- Rated Load (if altered)

Per ASME B30.20-3.3.7 Repairs

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Records

- Dated inspection **records shall be made** on critical items listed under Periodic Inspection and any time the device is repaired or modified.

ASME B30.20-3.3.6

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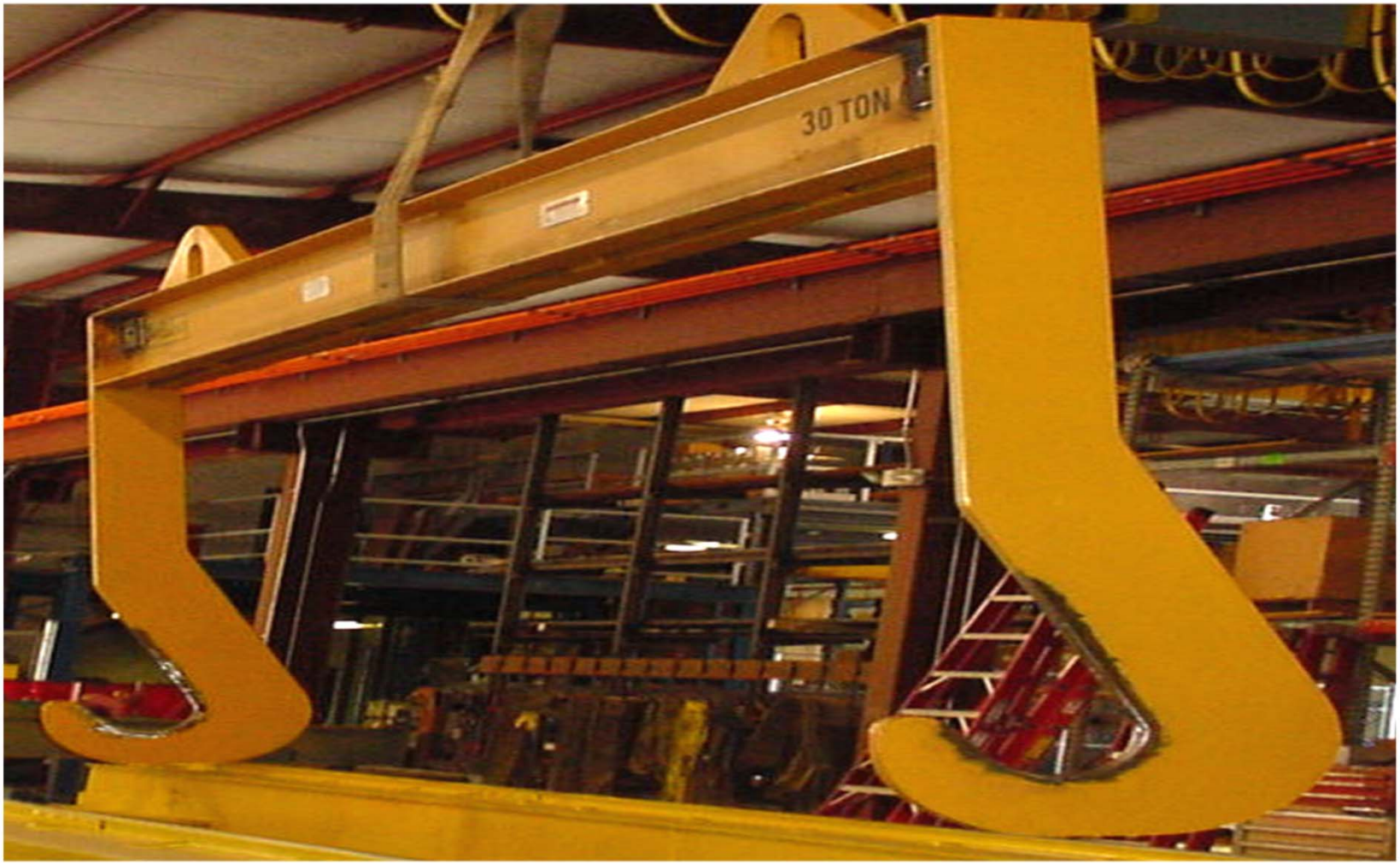
Roll Lifters



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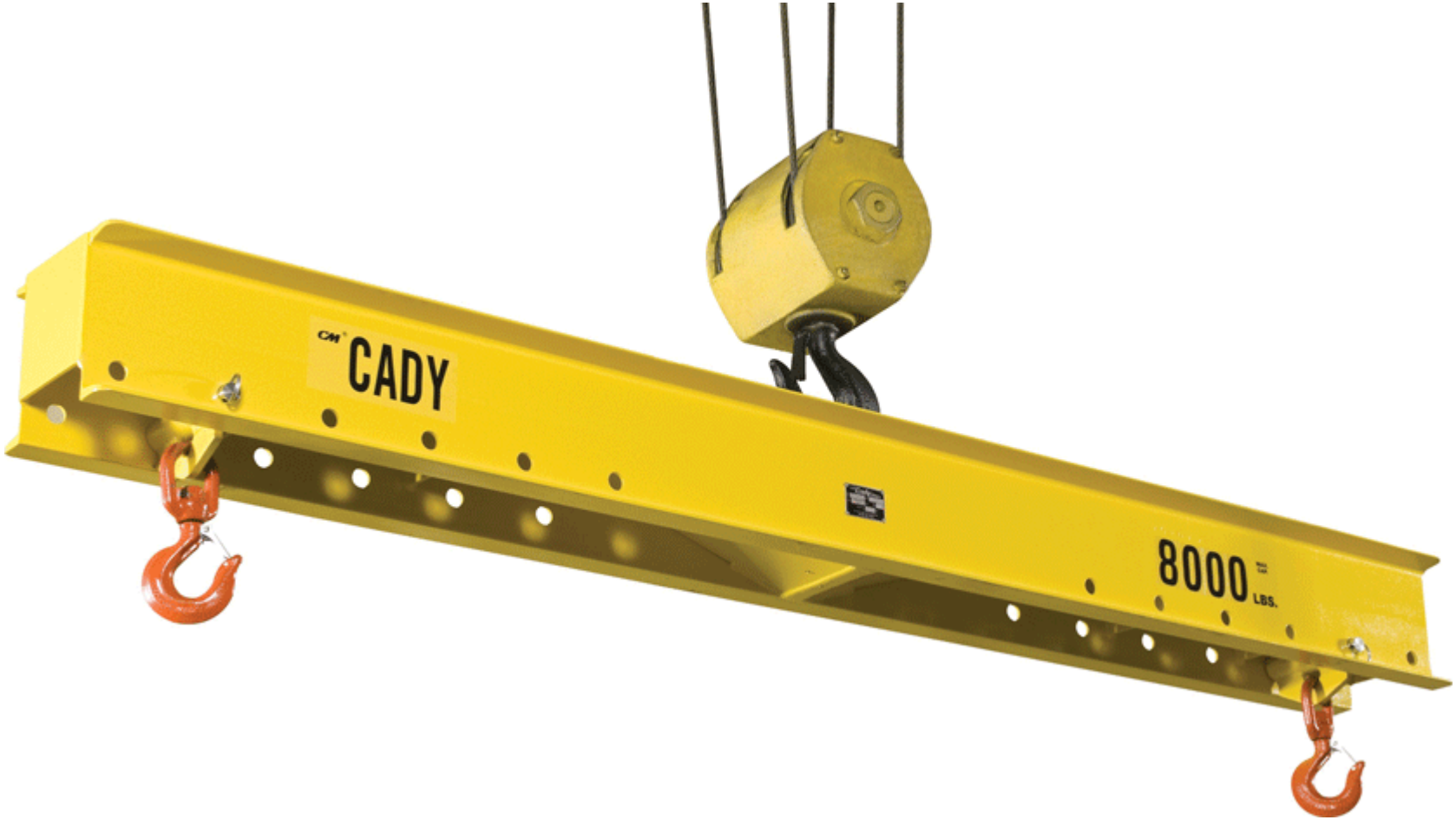
Lifting Beams



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Home Made Devices

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Is this acceptable?

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Home Made Devices

Are home made lifting devices legal?

YES

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....if they meet the following criteria

- Required markings: ASME B30.20-1.2
- **New Lifters:** (Unaltered)
- Rated Load Marking (main structure or on a tag)
- Manufacturer's Name and Address
- Serial Number
- Lifter Weight (if over 100 lbs.)
- Engineered Specifications

Load Test Record
ASME 20-1.3.8.2

Home made devices

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ASME B30.20

The different groups of below the hook lifters:

1. Structural & Mechanical Lifting Devices
2. Vacuum Lifting Devices
3. Close Proximity Operated Lifting Magnets
4. Remotely Operated Lifting Magnets
5. Scrap & Material Handling Grapples
6. Clamps

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ASME B30.20

The different groups all follow the same basic outline in the ASME B30.20 standard. Some have power requirements & some don't. There are other unique things with each lifter. These would need to be addressed by the manufacture as to how to inspect, use, maintain or repair these lifters.

Be sure to follow the B30.20 standard as well as the manufactures recommendations.

If you have any questions about a particular lifter contact the manufacture for assistance.

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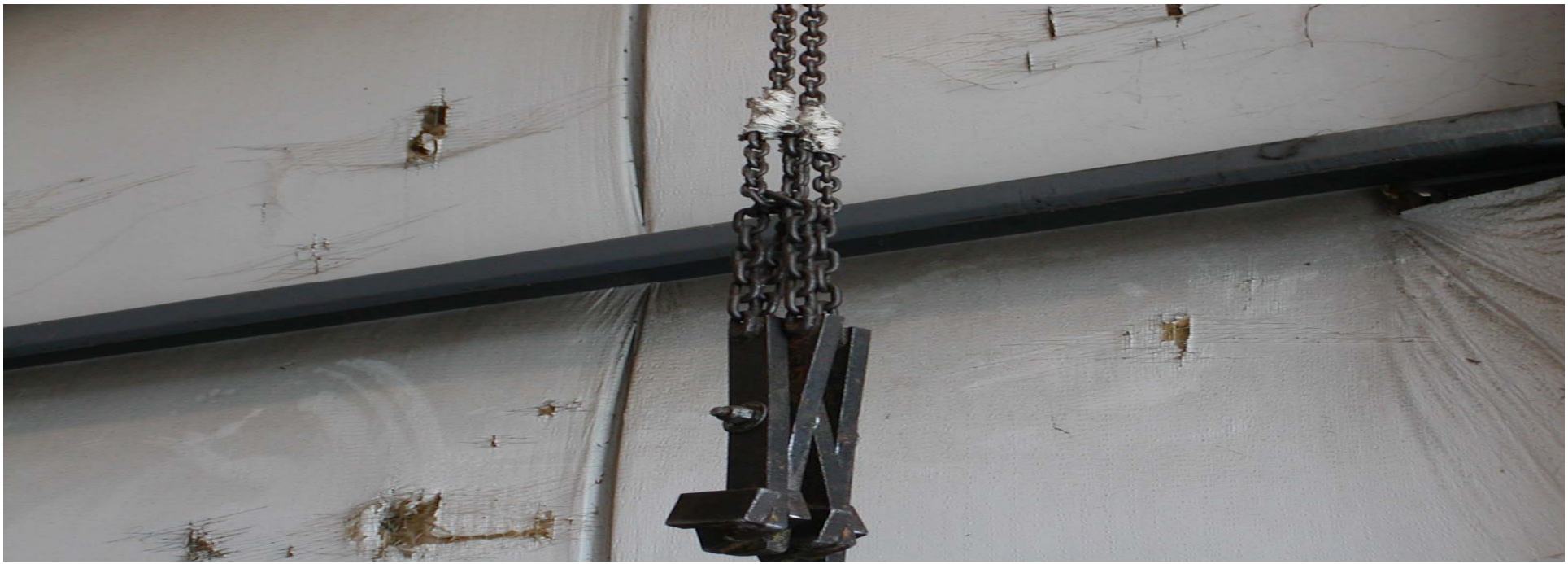
What is wrong with this application?

And this?



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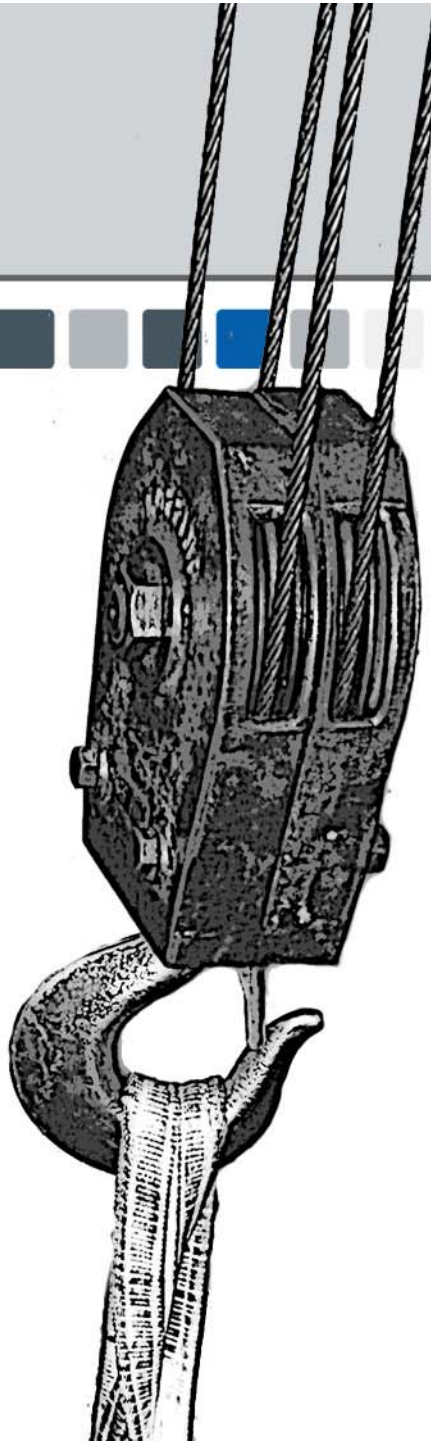
Thank you
for your time!



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Test Time!