

(c) *Electrical Equipment.* External power supply, electrical equipment, and wiring for below-the-hook lifters shall be in accordance with ASME BTH-1.

(d) *Alterations.* Structural and mechanical lifters may be altered or rerated, provided such alterations are analyzed and approved by the equipment manufacturer or a qualified person. A rerated lifter, or one whose components have been altered, shall conform to para. 20-1.2.2 and be tested according to para. 20-1.3.8. New rated load shall be displayed in accordance with para. 20-1.2.1.

(e) *Slings.* When employed, slings shall meet the requirements of ASME B30.9.

(f) *Hooks.* When employed, hooks shall meet the requirements of ASME B30.10.

(g) *Rigging Hardware.* When employed, rigging hardware shall meet the requirements of ASME B30.26.

### 20-1.2.3 Installation

(a) The lifter shall be installed in accordance with the manufacturer's instructions.

(b) The installer shall check for correct rotation of all motors.

## SECTION 20-1.3: INSPECTION, TESTING, AND MAINTENANCE

### (18) 20-1.3.1 Inspection Classification

*General.* All inspections shall be performed by a designated person. Any deficiencies identified shall be examined and a determination made by a qualified person as to whether they constitute a hazard, and if so, what additional steps need to be taken to address the hazard.

Inspection of slings (ASME B30.9), hooks (ASME B30.10), rigging hardware (ASME B30.26), or other special devices shall comply with the inspection requirements in the applicable volume.

#### (a) Initial Inspection

(1) New and reinstalled lifters shall be inspected prior to initial use to verify compliance with applicable provisions of this Volume.

(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.

(b) *Inspection Intervals.* Inspection procedure for lifters in regular service is divided into three general classifications based upon the intervals at which inspection should be performed. The intervals, in turn, are dependent upon the critical components of the lifters and the degree of their exposure to wear, deterioration, or malfunction. The three general classifications are herein designated as *every lift*, *frequent*, and *periodic*, with respective intervals between inspections as defined below.

(1) *Every Lift Inspection.* Visual examination by the operator before and during each lift made by the lifter.

(2) *Frequent Inspection.* Visual examinations by the operator or other designated persons with records not required.

(-a) Normal service — monthly

(-b) Heavy service — weekly to monthly

(-c) Severe service — daily to weekly

(-d) Special or infrequent service — as recommended by a qualified person before and after each lift

(3) *Periodic Inspection.* Visual inspection making records of apparent external conditions to provide the basis for a continuing evaluation. An external code mark on the lifter is an acceptable identification in lieu of records.

(-a) Normal service for equipment in place — yearly

(-b) Heavy service — semiannually

(-c) Severe service — quarterly

(-d) Special or infrequent service — as recommended by a qualified person before the first such lift and as directed by the qualified person for any subsequent lifts

### 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

### 20-1.3.3 Frequent Inspection (See Also Table 20-1.3.3-1)

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 misadjustments interfering with operation

(d) missing or illegible operating control markings

(18)

**Table 20-1.3.3-1 Minimum Inspection for Below-the-Hook Lifting Devices**

Item	Normal Service		Heavy Service		Severe Service	
	Visual, Monthly [Note (1)]	Record Yearly [Note (2)]	Visual, Weekly to Monthly [Note (1)]	Record Semiannually [Note (3)]	Visual, Daily to Weekly [Note (3)]	Record Quarterly [Note (3)]
Frequent Inspection (refer to para. 20-1.3.3) — structural deformation, cracks, or excessive wear of any part of the lifter	X	...	X	...	X	...
Loose or missing guards, fasteners, covers, stops, or nameplates	X	...	X	...	X	...
All functional operating mechanisms and automatic hold and release mechanisms for misadjustments interfering with operation	X	...	X	...	X	...
Periodic Inspection (refer to para. 20-1.3.4) — loose bolts or fasteners	...	X	...	X	...	X
Cracked or worn gears, pulleys, sheaves, sprockets, bearings, drive chains, and belts	...	X	...	X	...	X
Excessive wear of linkages and other mechanical parts	...	X	...	X	...	X
Excessive wear at hoist hooking points and load support clevises, or pins	...	X	...	X	...	X

## NOTES:

(1) By operator or designated person with records not required.

(2) Visual inspection by designated person making records of apparent external conditions to provide the basis for a continuing evaluation.

(3) As in Note (2), unless external conditions indicate that disassembly should be done to permit detailed inspection.

**20-1.3.4 Periodic Inspection (See Also Table 20-1.3.3-1)**

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)

**20-1.3.5 Lifting Devices Not in Regular Use**

A lifter that has been idle for a period of 1 month to 1 yr shall be inspected in accordance with para. 20-1.3.3 before being placed in service. A lifter that has been idle for a period of 1 yr or more shall be inspected in accordance with para. 20-1.3.4 before being returned to service.

**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.

**20-1.3.7 Repairs**

(18)

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.

**20-1.3.8 Testing****20-1.3.8.1 Operational Tests**

(18)

(a) New and reinstalled lifting devices shall be tested by a qualified person, or a designated person under the direction of the manufacturer or a qualified person, prior to initial use to verify compliance with applicable provisions of this Volume, including, but not limited to, the following:

(1) *Moving Parts.* Lifters with moving parts shall be tested to determine that the lifter operates in accordance with manufacturer's instructions.

(2) *Latches.* Lifters with manually operated or automatic latches shall be tested to determine that the latch operates in accordance with manufacturer's instructions.

(b) Altered or repaired lifters shall be tested by a qualified person, or a designated person under the direction of the manufacturer or a qualified person. This test may be limited to the components affected by the alteration or

repair, as determined by a qualified person with guidance from the manufacturer.

(c) All indicator lights, gages, horns, bells, alarms, pointers, and other warning devices shall be tested.

(d) Dated reports of all operational tests shall be filed.

(18) **20-1.3.8.2 Load Test**

(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.

(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.

(18) **20-1.3.9 Maintenance**

(a) *Maintenance Program.* A maintenance program shall be established and be based on recommendations made by the lifter manufacturer. If a qualified person determines it is appropriate, the program should also include that individual's additional recommendations based on a review of the lifter application and operations.

(b) *Maintenance Procedure*

(1) Before adjustments and repairs are started on a lifter, the following precautions shall be taken:

(-a) All sources of power shall be disconnected, locked out, and tagged "Out of Service."

(-b) A lifter removed from service for repair shall be tagged "Out of Service."

(-c) Relieve fluid pressure from all circuits before loosening or removing fluid power components.

(2) Only designated persons shall perform adjustments, repairs, and tests when required.

(3) Replacement parts shall be at least equal to the original manufacturer's specifications.

(4) After adjustments and repairs have been made, the lifter shall not be returned to service until it has been inspected according to para. 20-1.3.4.

(5) Dated records of repairs and replacements should be made.

## SECTION 20-1.4: OPERATION

### 20-1.4.1 Operators

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

### 20-1.4.2 Qualifications

(18)

Qualifications for operators of below-the-hook lifting devices are as follows:

(a) The operator shall be instructed in the use of the device by a designated person. Instructions should include, but not be limited to, the following:

(1) application of the lifter to the load and material-handling device, and adjustments, if any, that adapt the lifter to various sizes or kinds of loads

(2) instructions in any special operations or precautions

(3) the manufacturer's suggested operating procedures

(4) condition of the load itself required for operation of the lifter, such as, but not limited to, balance, surface cleanliness, flatness, bending, and load thickness

(5) storage of the lifter to protect it from damage

(6) not exceeding the rated load of the lifting device nor the capacity of the hoisting equipment by the combined weight of the load, the lifting device, and rigging

(7) the proper attachment of adapters to lifting device for special load handling

(b) The operator shall demonstrate the ability to operate the lifter as instructed before assuming responsibility for using the lifter.

(c) The operator shall demonstrate an understanding of standard hand signals when applicable.

### 20-1.4.3 Responsibilities

While the organizational structure of various projects may differ, the following roles are described here for purposes of delineating responsibilities. All responsibilities listed below shall be assigned in the worksite organization. (A single individual may perform one or more of these roles.)

*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.

**20-1.4.3.1 Responsibilities of the Lifting Device Owner** (18)  
The responsibilities of the lifting device owner shall include the following:

(a) providing a lifting device, and all necessary components specified by the manufacturer, that meets the requirements of Sections 20-1.2 and 20-1.3 as well as specific job requirements.

(b) providing all applicable operating instructions.

(c) providing field assembly, and disassembly (if applicable), operation and maintenance information, and warning decals and placards installed as prescribed by the lifting device manufacturer.

(d) establishing an inspection, testing, and maintenance program in accordance with Section 20-1.3.

(e) using designated personnel to perform the required maintenance, repair, and inspections.

(f) ensuring that the lifting device is in proper operating condition prior to initial use at the worksite by the following:

(1) verifying that all inspections have been performed as required by Section 20-1.3

(2) verifying that the lifting device has the necessary lifting capacity to perform the proposed lifting operations in the planned configuration

(g) using operators that meet the requirements of para. 20-1.4.2.

(h) ensuring that all personnel involved in maintenance, repair, assembly, disassembly, and inspection are aware of their responsibilities, assigned duties, and the associated hazards.

(i) determining if additional regulations are applicable to lifting device operations.

(j) ensuring that conditions that may adversely affect lifting device operations are addressed. Such conditions include, but are not limited to, the following:

(1) wind velocity or gusting winds

(2) precipitation

(3) fog

(4) extreme temperatures

(5) lighting

(k) addressing safety concerns raised by the operator or other personnel and being responsible if he and a qualified person decide to overrule those concerns and directs lifting device operations to continue. (In all cases, the manufacturer's criteria for safe operation and the requirements of this Volume shall be followed.)

- (18) **20-1.4.3.2 Responsibilities of Operators.** The operator shall be responsible for the following listed items. The operator shall not be responsible for hazards or conditions that are not under his direct control and that adversely affect operation of the lifting device. Whenever the operator has doubt as to the safety of lifting device operations, the operator shall place the load in a safe condition and stop the lifting device's functions in a controlled manner. Use of the lifting device shall resume only after safety concerns have been addressed or the continuation of lifting device operations is directed by the owner.

The operator's responsibilities shall include the following:

(a) reviewing the requirements for the lifting device with the owner before operations.

(b) knowing what types of site conditions could adversely affect the operation of the lifting device and consulting with the owner concerning the possible presence of those conditions.

(c) understanding and applying the information contained in the lifting device manufacturer's operating manual.

(d) understanding the lifting device's functions and limitations as well as its particular operating characteristics.

(e) ensuring an inspection is performed prior to every lift as specified in para. 20-1.3.2.

(f) promptly reporting the need for any adjustments or repairs to a designated person.

(g) following applicable lock out/tag out procedures.

(h) not operating the lifting device when physically or mentally unfit.

(i) ensuring that all controls are in the off or neutral position and that all personnel are in the clear before energizing the lifting device.

(j) not engaging in any practice that will divert his attention while operating the lifting device.

(k) testing the lifting device function controls that will be used and operating the lifting device only if those function controls respond properly.

(l) operating the lifting device's functions, under normal operating conditions, in a smooth and controlled manner.

(m) knowing and following the procedures specified by the manufacturer or approved by a qualified person, for assembly, disassembly, setting up, and reeving/rigging of the lifting device.

(n) considering all factors known that might affect the lifting device capacity and informing the owner of the need to make appropriate adjustments.

(o) understanding basic load attachment procedures.

(p) responding only to instructions from designated persons. However, the operator shall obey a stop order at all times, no matter who gives it.

(q) ensuring that all personnel shall stay clear of the load.

#### 20-1.4.4 Lifting Device Operating Practices (18)

(a) Lifting devices shall be operated only by the following qualified personnel:

(1) designated persons

(2) trainees under the supervision of a designated person, the number of trainees permitted to be supervised by a single designated person, the physical location of the designated person while supervising, and the type of communication required between the designated

person and the trainee shall be determined by a qualified person

(3) maintenance and test personnel, when it is necessary in the performance of their duties

(4) inspectors (lifting devices)

(b) Ensure the weight of the load and its approximate center of gravity have been obtained, provided, or calculated.

(c) The lifting device shall not be loaded in excess of its rated load or handle any load for which it is not designed.

(d) Properly attaching the lifting device to the hook, shackle, or other load handling device.

(e) The lifter shall be applied to the load in accordance with the instruction manual.

(f) Before lifting, the operator shall make sure that lifter ropes or chains are not kinked, and that multiple part lines are not twisted around each other.

(g) Care should be taken to make certain the load is correctly distributed for the lifter being used.

(h) The temperature of the load should not exceed the maximum allowable limits of the lifter.

(i) Verify that the load is well secured and properly balanced in the lifting device when it is initially lifted.

(j) Do not allow load or lifter to come into contact with any obstruction.

(k) The operator shall ensure that the lifting device is adequately protected from damage during use.

(l) The lifter shall not be used for side pulls or sliding the load unless specifically authorized by a qualified person.

(m) The operator shall land any attached load and store the lifter before leaving the lifting device. The operator shall not leave suspended loads unattended.

(n) The operator shall not ride, or allow others to ride loads or the lifting device.

(o) The operation of the lifter shall be observed during use. Any deficiency observed shall be examined by a designated person. If the deficiency constitutes a hazard, the lifter shall be removed from service and tagged "Out of Service." Any indication of a hazardous condition shall be reported to a qualified person for evaluation.

(p) Loads shall be guided in such a manner as to avoid endangering hands or other body parts as the load is moved, or if it drops.

#### 20-1.4.5 Miscellaneous Operating Practices

(a) An operator shall not use a lifting device that is tagged "Out of Service" or otherwise designated as nonfunctioning.

(b) "Out of Service" tags on lifting devices shall not be removed without the approval of the person placing them or a designated person.

(c) The lifter, when not in use, should be stored at an assigned location.

(d) Caution should be taken that operating markings or tags shall not be removed or defaced. Missing or illegible markings or tags shall be replaced.

#### SECTION 20-1.5: INSTRUCTION MANUALS

Operating instructions and maintenance and parts information shall be furnished by the manufacturer.