STD.ASME B30.10-ENGL 1999 0759670 0616254 855

The American Society of Mechanical Engineers

HOOKS

AN AMERICAN NATIONAL STANDARD

ASME B30.10-1999

(Revision of ASME B30.10-1993)

The American Society of
Mechanical Engineers

AN AMERICAN NATIONAL STANDARD

HOOKS

ASME B30.10-1999

(Revision of ASME B30.10-1993)

SAFETY STANDARD FOR CABLEWAYS, CRANES, DERRICKS, HOISTS, HOOKS, JACKS, AND SLINGS

Date of Issuance: March 31, 2000

The 1999 edition of this Standard is being issued with an automatic addenda subscription service. The use of an addenda allows revisions made in response to public review comments or committee actions to be published on a regular yearly basis; revisions published in addenda will become effective 1 year after the Date of Issuance of the addenda. The next edition of this Standard is scheduled for publication in 2004.

ASME issues written replies to inquiries concerning interpretations of technical aspects of this Standard. The interpretations will be included with the above addenda service.

The American Society of Mechanical Engineers
Three Park Avenue, New York, NY 10016-5990

FOREWORD

This American National Standard, Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings, has been developed under the procedures accredited by the American National Standards Institute (formerly the United States of America Standards Institute). This Standard had its beginning in December 1916 when an eight-page Code of Safety Standards for Cranes, prepared by an ASME Committee on the Protection of Industrial Workers, was presented to the annual meeting of the ASME.

Meetings and discussions regarding safety on cranes, derricks, and hoists were held from 1920 to 1925, involving the ASME Safety Code Correlating Committee, the Association of Iron and Steel Electrical Engineers, the American Museum of Safety, the American Engineering Standards Committee (later changed to American Standards Association and subsequently to the USA Standards Institute). Department of Labor — State of New Jersey, Department of Labor and Industry — State of Pennsylvania, and the Locomotive Crane Manufacturers Association. On June 11, 1925, the American Engineering Standards Committee approved the ASME Safety Code Correlating Committee's recommendation and authorized the project with the U.S. Department of the Navy, Bureau of Yards and Docks, and ASME as sponsors.

In March 1926, invitations were issued to 50 organizations to appoint representatives to a Sectional Committee. The call for organization of this Sectional Committee was sent out October 2, 1926, and the committee was organized November 4, 1926, with 57 members representing 29 national organizations. The Safety Code for Cranes, Derricks, and Hoists, ASA B30.2-1943, was created from the eight-page document referred to in the first paragraph. This document was reaffirmed in 1952 and widely accepted as a safety standard.

Due to changes in design, advancement in techniques, and general interest of labor and industry in safety, the Sectional Committee, under the joint sponsorship of ASME and the Naval Facilities Engineering Command, U.S. Department of the Navy, was reorganized as an American National Standards Committee on January 31, 1962, with 39 members representing 27 national organizations.

The format of the previous code was changed so that separate standards (each complete as to construction and installation; inspection, testing, and maintenance; and operation) will cover the different types of equipment included in the scope of B30.

In 1982, the Committee was reorganized as an Accredited Organization Committee, operating under procedures developed by the ASME and accredited by the American National Standards Institute.

This Standard presents a coordinated set of rules that may serve as a guide to government and other regulatory bodies and municipal authorities responsible for the guarding and inspection of the equipment falling within its scope. The suggestions leading to accident prevention are given both as mandatory and advisory provisions; compliance with both types may be required by employers of their employees.

In case of practical difficulties, new developments, or unnecessary hardship, the administrative or regulatory authority may grant variances from the literal requirements or permit the use of other devices or methods, but only when it is clearly evident that an equivalent degree of protection is thereby secured. To secure uniform application and interpretation of this Standard, administrative or regulatory authorities are urged to consult the B30

Committee, in accordance with the format described in Section III, before rendering decisions on disputed points.

This volume of the Standard, which was approved by the B30 Committee and by ASME, was approved by ANSI and designated as an American National Standard on June 24, 1999.

Safety codes and standards are intended to enhance public safety. Revisions result from committee consideration of factors such as technological advances, new data, and changing environmental and industry needs. Revisions do not imply that previous editions were inadequate.

ASME B30 COMMITTEE
Safety Standards for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings

(The following is the roster of the Committee at the time of approval of this Standard.)

OFFICERS

P. S. Zorich, *Chair*
B. D. Closson, *Vice Chair*
J. Pang, *Secretary*

COMMITTEE PERSONNEL*

ALLIANCE OF AMERICAN INSURERS
T. A. Christensen, Liberty Mutual Insurance Co.
G. D. Tolbert, *Alternate,* Liberty Mutual Insurance Co.

ASSOCIATED GENERAL CONTRACTORS OF AMERICA
C. L. Huneycutt, J. A. Jones Construction
W. P. Rollins, *Alternate,* J. A. Jones Construction

ASSOCIATED WIRE ROPE FABRICATORS
D. Sayenga, Associated Wire Rope Fabricators
D. J. Bishop, *Alternate,* Bishop Lifting Products, Inc.

ASSOCIATION OF CONSTRUCTION EQUIPMENT MANAGERS
H. E. Livermore, Bechtel Leasing, Inc.
J. C. Ryan, *Alternate,* Boh Bros. Construction Co.

ASSOCIATION OF IRON AND STEEL ENGINEERS
J. W. Rowland, Bethlehem Steel

EQUIPMENT MANUFACTURERS INSTITUTE
D. N. Wolff, National Crane Corp.
J. H. Crowley, *Alternate,* Equipment Manufacturers Institute

FORGING INDUSTRY ASSOCIATION
G. F. Hoffa, *Consultant,* Columbus McKinnon Corp.
E. K. Marburg, *Alternate,* Columbus McKinnon Corp.

INTERNATIONAL UNION OF OPERATING ENGINEERS
W. J. Smith, Jr., International Union of Operating Engineers
S. C. Buck, *Alternate,* International Union of Operating Engineers, Local 150

NATIONAL CONSTRUCTORS ASSOCIATION
M. F. Ernhart, Leonard Construction Co.
R. E. Peterson, *Alternate,* ABB C-E Services, Inc.

NATIONAL ERECTORS ASSOCIATION
B. E. Weir, Jr., Norris Brothers Co., Inc.
J. Conant, *Alternate,* Conant Crane Rental Co.

POWER, CRANE, AND SHOVEL ASSOCIATION BUREAU OF THE CONSTRUCTION INDUSTRY MANUFACTURERS ASSOCIATION (CIMA)
N. C. Hargreaves, Terex Corp.
D. G. Quinn, *Alternate,* FMC Construction Equipment Corp.

* The members listed, except for those listed under the heading for individual members, were nominated by their respective organizations.

SPECIALIZED CARRIERS AND RIGGING ASSOCIATION
H. I. Shapiro, Howard I. Shapiro & Associates
R. M. Kohner, *Alternate,* Landmark Engineering Service
STEEL PLATE FABRICATORS ASSOCIATION
K. Miller, CBI NA-CON, Inc.
W. Romsos, *Alternate, Consultant*
U.S. DEPARTMENT OF THE ARMY
E. E. Rudy, Mobility Technology Center, U.S. Army
U.S. DEPARTMENT OF THE NAVY
J. E. Richardson, Naval Facilities Engineering Command
WIRE ROPE TECHNICAL BOARD
L. D. Means, Wire Rope Corp. of America, Inc.
D. A. Henninger, *Alternate,* Paulsen Wire Rope Corp.

INDIVIDUAL MEMBERS

T. Asenato, Jr., Eastman Kodak Co.
R. J. Bolen, E. I. du Pont de Nemours & Co., Inc.
A. D. Brown, OSHA, U.S. Department of Labor
P.L. Rossi, *Alternate,* OSHA, U.S. Department of Labor
K. J. Chlad, Material Handling Division of Caterpillar
J. W. Downs, Jr., *Alternate,* Downs Crane and Hoist Co., Inc.
B. D. Closson, North American Crane Bureau West
T. L. Blanton, *Alternate,* North American Crane Bureau
R. A. Dahlin, Walker Magnetic Group, Inc.
D. W. Eckstine, Grove Worldwide
A. Miller, *Alternate,* Grove Worldwide
R. H. Fowler, U. S. Department of the Air Force
J. L. Franks, South Carolina State Port Authority
R. C. Slater, *Alternate,* McKay International Engineering
J. J. Headley, Crane Institute of America, Inc.
J. D. Heppner, Liftex, Inc.
C. W. Ireland, Amclyde Engineered Products
L. S. Johnson, American Equipment
G. L. Owens, *Alternate,* Granite Construction Co.
J. M. Klibert, *Honorary Member,* Lift-All Co., Inc.
H. G. Leidich, Ingersoll-Rand Co.
J. T. Perkins, *Alternate,* Ingersoll Rand
T. S. McKosky, *Honorary Member,* Consultant
G. H. O'Gary, 3M Co.
J. A. Zieglmeier, *Alternate,* 3M Co.
R. W. Parry, *Honorary Member,* Consultant
R. R. Reisinger, FKI Industries, Inc.
J. L. Gordon, *Alternate,* FKI Industries, Inc.
A. R. Toth, *Consultant,* Morris Material Handling
S. J. McCormick, *Alternate,* Morris Material Handling
R. C. Wild, U.S. Army Corps of Engineers
R. E. Scott, *Alternate,* U.S. Army Corps of Engineers
P. S. Zorich, RZP International Ltd.

STD.ASME B30.10-ENGL 1999 ■ 0759670 0616261 T95 ■

CONTENTS

Table

SUMMARY OF CHANGES

The 1999 edition of ASME B30.10 includes editorial changes, revisions, and corrections introduced in B30.10a-1996 and B30.10b-1998, as well as the following changes identified by **(99)**.

Page	*Location*	*Change*
1, 2	Introduction	Under General: (1) In the B30 standard listing of the second paragraph, footnote references deleted from B30.23 and B30.25 (2) Ninth paragraph revised
	Footnote 1	Revised
	Section III	First paragraph revised
5	10-0.2	Definition of *qualified person* revised
7	Fig. 6	Corrected by Errata

SPECIAL NOTE:

The interpretations to ASME B30.10 are included as a separate section for the user's convenience.

SAFETY STANDARD FOR CABLEWAYS, CRANES, DERRICKS, HOISTS, HOOKS, JACKS, AND SLINGS

INTRODUCTION

(99) General

This Standard is one of a series of safety standards on various subjects that have been formulated under the general auspices of the American National Standards Institute. One purpose of the Standard is to serve as a guide to governmental authorities having jurisdiction over subjects within the scope of the Standard. It is expected, however, that the Standard will find a major application in industry, serving as a guide to manufacturers, purchasers, and users of the equipment.

For the convenience of the user, the Standard has been divided into separate volumes:

B30.1 Jacks
B30.2 Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist)
B30.3 Construction Tower Cranes
B30.4 Portal, Tower, and Pedestal Cranes
B30.5 Mobile and Locomotive Cranes
B30.6 Derricks
B30.7 Base Mounted Drum Hoists
B30.8 Floating Cranes and Floating Derricks
B30.9 Slings
B30.10 Hooks
B30.11 Monorails and Underhung Cranes
B30.12 Handling Loads Suspended From Rotorcraft
B30.13 Storage/Retrieval (S/R) Machines and Associated Equipment
B30.14 Side Boom Tractors
B30.15 Mobile Hydraulic Cranes
Note: B30.15-1973 has been withdrawn. The revision of B30.15 is included in the latest edition of B30.5.
B30.16 Overhead Hoists (Underhung)
B30.17 Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist)
B30.18 Stacker Cranes (Top or Under Running Bridge, Multiple Girder With Top or Under Running Trolley Hoist)
B30.19 Cableways
B30.20 Below-the-Hook Lifting Devices
B30.21 Manually Lever Operated Hoists
B30.22 Articulating Boom Cranes
B30.23 Personnel Lifting System
B30.24 Container Cranes[1]
B30.25 Scrap and Material Handlers

If adopted for governmental use, the references to other national codes and standards in the specific volumes may be changed to refer to the corresponding regulations of the governmental authorities.

The use of cableways, cranes, derricks, hoists, hooks, jacks, and slings is subject to certain hazards that cannot be met by mechanical means but only by the exercise of intelligence, care, and common sense. It is therefore essential to have personnel involved in the use and operation of equipment who are competent, careful, physically and mentally qualified, and trained in the safe operation of the equipment and the handling of the loads. Serious hazards are overloading, dropping or slipping of the load caused by improper hitching or slinging, obstructing the free passage of the load, and using equipment for a purpose for which it was not intended or designed.

The Standards Committee fully realizes the importance of proper design factors, minimum or maximum sizes, and other limiting dimensions of wire rope or chain and their fastenings, sheaves, sprockets, drums, and similar equipment covered by the Standard, all of which are closely connected with safety. Sizes, strengths, and similar criteria are dependent on many different factors, often varying with the installation and uses. These factors depend on the condition of the equipment or material; on the loads; on the acceleration or speed of the ropes, chains, sheaves, sprockets, or drums; on the type of attachments; on the number, size, and arrangement of sheaves or other parts; on environmental conditions causing corrosion or wear; and on many variable factors that must be considered in each individual case. The rules given in the Standard must be

[1] B30.24 is in the developmental stage. (99)

interpreted accordingly, and judgment used in determining their application.

Some of the provisions of this Standard require compliance with information found in manuals or other documents supplied by the manufacturer with the equipment. The information includes recommendations, requirements, and instructions (e.g., "the reeving shall be checked for compliance with the recommendations of the manufacturer").

Compliance with the provisions should not preclude the possibility of consulting a qualified person. This is true particularly when: the equipment has been altered, repaired, or modified; the manuals or documents supplied by the manufacturer are no longer available; or the manufacturer or a successor is no longer in business and the manuals are no longer available. However, the purpose of consulting a qualified person shall not be to avoid contacting the manufacturer and using the information supplied by the manufacturer.

The Standards Committee will be glad to receive criticisms of this Standard's requirements and suggestions for its improvement, especially those based on actual experience in application of the rules.

Suggestions for changes to the Standard should be submitted to the Secretary of the B30 Committee, ASME, Three Park Avenue, New York, NY 10016-5990, and should be in accordance with the following format:

(a) cite the specific paragraph designation of the pertinent volume;

(b) indicate the suggested change (addition, deletion, revision, etc.);

(c) briefly state the reason and/or evidence for the suggested change;

(d) submit suggested changes to more than one paragraph in the order that the paragraphs appear in the volume.

The B30 Committee will consider each suggested change in a timely manner in accordance with its procedures.

Section I: Scope

This Standard applies to the construction, installation, operation, inspection, and maintenance of jacks; power-operated cranes, monorails, and crane runways; power-operated and manually operated derricks and hoists; lifting devices, hooks, and slings; and cableways.

This Standard does not apply to track and automotive jacks, railway or automobile wrecking cranes, shipboard cranes, shipboard cargo-handling equipment, well-drilling derricks, skip hoists, mine hoists, truck body hoists, car or barge pullers, conveyors, excavating equipment, or equipment coming within the scope of the following Committees: A10, A17, A90, A92, A120, B20, B56, and B77.

Section II: Purpose

This Standard is designed to:

(a) guard against and minimize injury to workers, and otherwise provide for protection of life, limb, and property by prescribing safety requirements;

(b) provide direction to owners, employers, supervisors, and others concerned with, or responsible for, its application; and

(c) guide governments and other regulatory bodies in the development, promulgation, and enforcement of appropriate safety directives.

Section III: Interpretations (99)

Upon request, the B30 Committee will render an interpretation of any requirement of the Standard. Interpretations can be rendered only in response to a written request sent to the Secretary of the B30 Committee, ASME, Three Park Avenue, New York, NY 10016-5990.

The request for interpretation should be clear and unambiguous. It is further recommended that the inquirer submit his request utilizing the following format:

Subject: Cite the applicable paragraph number(s) and provide a concise description.

Edition: Cite the applicable edition of the pertinent volume for which the interpretation is being requested.

Question: Phrase the question as a request for an interpretation of a specific requirement suitable for general understanding and use, not as a request for approval of a proprietary design or situation. The inquirer may also include any plans or drawings that are necessary to explain the question; however, they should not contain any proprietary names or information.

Requests that are not in this format will be rewritten in this format by the Committee prior to being answered, which could change the intent of the original request.

ASME procedures provide for reconsideration of any interpretation when or if additional information that

might affect an interpretation is available. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME Committee or Subcommittee. ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

Section IV: New and Existing Installations

(a) Effective Date. The effective date of this volume for the purpose of defining new and existing installations shall be one year after its date of issuance.

(b) New Installation. Construction, installation, inspection, testing, maintenance, and operation of equipment manufactured and facilities constructed after the effective date of this volume shall conform with the mandatory requirements of this volume.

(c) Existing Installations. Inspection, testing, maintenance, and operation of equipment manufactured and facilities constructed prior to the effective date of this volume shall be done, as applicable, in accordance with the requirements of this volume.

It is not the intent of this volume to require retrofitting of existing equipment. However, when an item is being modified, its performance requirements shall be reviewed relative to the current volume. If the performance differs substantially, the need to meet the current requirements shall be evaluated by a qualified person selected by the owner (user). Recommended changes shall be made by the owner (user) within one year.

Section V: Mandatory and Advisory Rules

Mandatory rules of this volume are characterized by use of the word *shall*. If a provision is of an advisory nature, it is indicated by use of the word *should* and is a recommendation to be considered, the advisability of which depends on the facts in each situation.

Section VI: Metric Conversions

The values stated in U.S. Customary units are to be regarded as the standard.

HOOKS

Chapter 10-0
Scope and Definitions

Section 10-0.1: Scope of ASME B30.10

Within the general scope defined in Section I, ASME B30.10 applies to all types of hooks shown in Figs. 1 through 21 used in conjunction with equipment described in other volumes of the B30 Standard. Hooks supporting a load in a direct-pull configuration, with the load carried in the base (bowl/saddle or pin hole — see Figs. 3 and 4) of the hook, are covered in Chapter 10-1. Hooks that do not support a load in a direct-pull configuration are covered in Chapter 10-2.

Section 10-0.2: Definitions

abnormal operating conditions: environmental conditions that are unfavorable, harmful, or detrimental to or for the use of a hook.

administrative or regulatory authority: governmental agency or the employer in the absence of governmental jurisdiction.

appointed: assigned specific responsibilities by the employer or the employer's representative.

crack: a crevice-type discontinuity in the material.

designated person: a person selected or assigned by the employer or the employer's representative as being competent to perform specific duties.

hook, self-closing: a hook with a throat opening that is closed by a spring-loaded latch, gate, or bail that is manually opened for loading and closes upon release. It may be locked in the closed position (see Figs. 8 through 14).

hook, self-locking: a hook with a throat opening that will close and lock when a load is applied, and will not open until unloaded and the lock released (see Figs. 6 and 7).

latch: a mechanical device used to close the throat opening of a hook (see Figs. 1 through 5).

load: the total weight imposed on the hook.

load, proof: the specific load applied in performance of the proof test.

load, rated: the maximum allowable working load.

mouse: rope or wire used to close the throat opening of a hook.

nick or gouge: sharp notch in hook surface which may act as stress riser in the area of the notch.

qualified person: a 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 problems relating to the subject matter and work. (99)

service, heavy: service that involves operating at 85% to 100% of rated load as a regular specified procedure.

service, normal: service that involves operating at less than 85% of rated load except for isolated instances.

service, severe: heavy service coupled with abnormal operating conditions.

test, nondestructive: a test that does not destroy the functional use of the hook, such as but not limited to dye penetrant test, magnetic particle test, radiography test, and ultrasonic test.

test, proof: a nondestructive load test made to verify the manufacturing integrity of the hook.

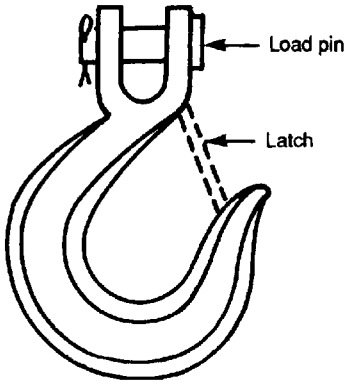


FIG. 1 CLEVIS HOOK
(Latch — When Required)

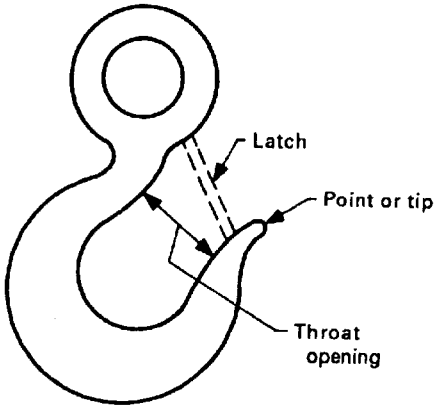


FIG. 2 EYE HOOK
(Latch — When Required)

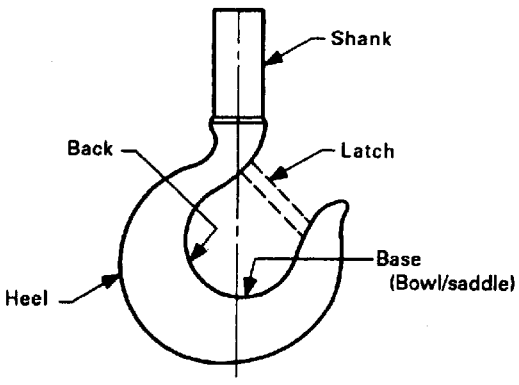


FIG. 3 SHANK HOOK
(Latch — When Required)

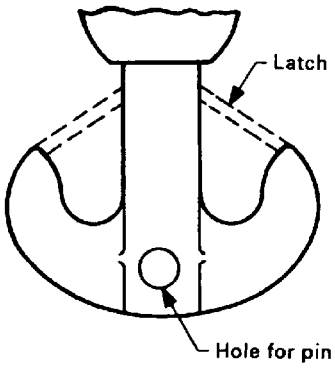
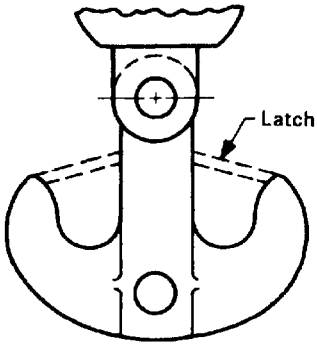
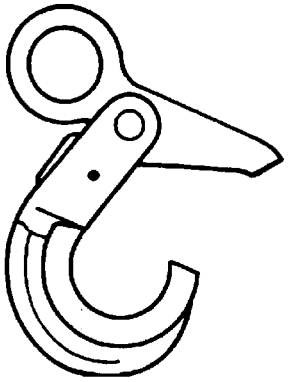


FIG. 4 DUPLEX HOOK (SISTER)
(Hole for Pin Is Optional)
(Latch — When Required)



GENERAL NOTE:
The shape of the bowl of the hook shall be designed such that an unbalanced load positioned directly beneath the pivot point will not allow sling (load attachment) to be dislodged.

FIG. 5 ARTICULATED DUPLEX HOOK (SISTER)
(Hole for Pin Is Optional)
(Latch — When Required)



(99) FIG. 6 SELF-LOCKING EYE HOOK (OPEN)

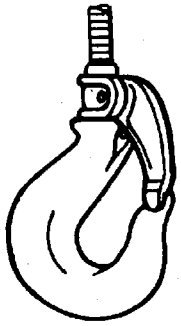


FIG. 9 SELF-CLOSING GATE LATCH (SHANK HOOK)

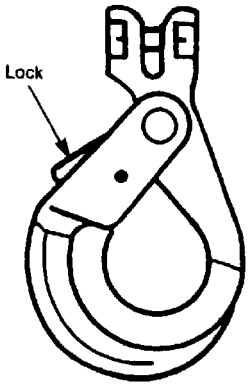


FIG. 7 SELF-LOCKING CLEVIS HOOK (CLOSED)

FIG. 10 SELF-CLOSING FLAPPER LATCH (SHANK HOOK)

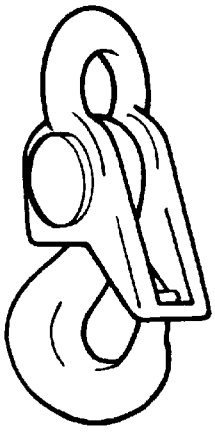


FIG. 8 SELF-CLOSING BAIL (EYE HOOK)

FIG. 11 SELF-CLOSING FLAPPER LATCH (SWIVEL HOOK)

FIG. 12 SELF-CLOSING FLIPPER LATCH (EYE HOOK)

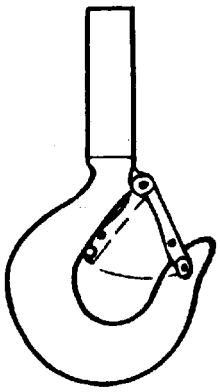


FIG. 13 SELF-CLOSING TIPLOCK LATCH (SHANK HOOK)

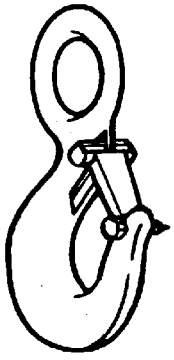


FIG. 14 SELF-CLOSING TIPLOCK LATCH (EYE HOOK)

FIG. 15 SINGLE PLATE HOOK

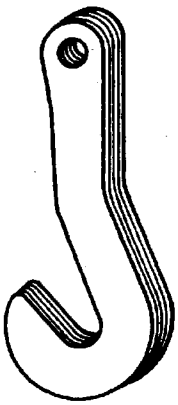


FIG. 16 LAMINATED PLATE HOOK

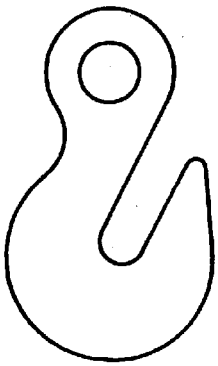


FIG. 17 EYE GRAB HOOK

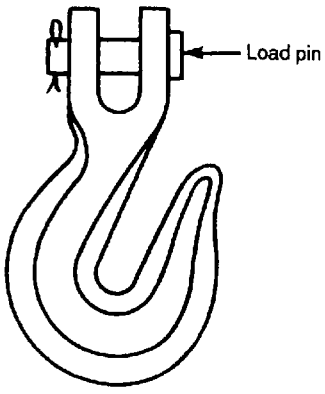


FIG. 18 CLEVIS GRAB HOOK

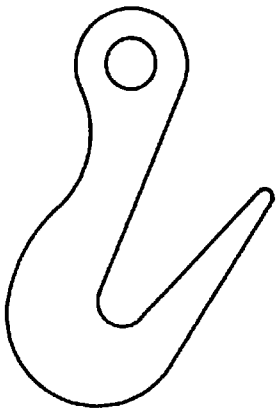


FIG. 20 SORTING HOOK

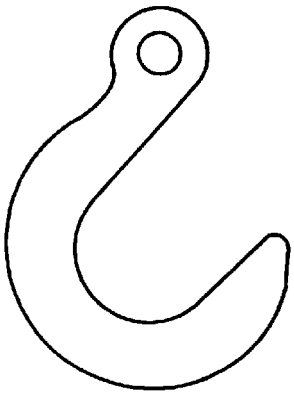


FIG. 19 FOUNDRY HOOK

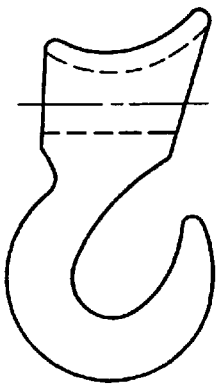


FIG. 21 CHOKER HOOK

Chapter 10-1
Hooks

This Chapter applies to all hooks specifically shown in Figs. 1 through 16 that support a load in a direct-pull configuration where the load is carried in the base (bowl/saddle or pin hole — see Figs. 3 and 4) of the hook.

Section 10-1.1: Marking and Construction

10-1.1.1 Markings. Manufacturer's identification shall be forged, cast, or die stamped on a low stress and nonwearing area of the hook.

10-1.1.2 Construction

(a) The hook material shall have sufficient ductility to permanently deform before losing the ability to support the load at the temperatures at which the specific hook will be used.

(b) When a latch is profited, it shall be designed to retain such items as, but not limited to, slings and chains under slack conditions. The latch is not intended to support the load.

(c) Attachments, such as handles, latch supports, etc., shall not be welded to a finished hook in field applications. If welding of an attachment such as these is required, it shall be done in manufacturing or fabrication prior to any required final heat treatment.

Section 10-1.2: Inspection, Testing, and Maintenance

10-1.2.1 Inspection

10-1.2.1.1 Inspection Classification

(a) Initial Inspection. Prior to initial use, all new and repaired hooks shall be inspected to verify compliance with the applicable provisions of this volume.

(b) Inspection procedure and record keeping requirements for hooks in regular service shall be governed by the kind of equipment in which they are used. When such requirements for hooks are stated in standards for the specific equipment, they shall take precedence over the following. Otherwise, there shall be two general classifications based upon intervals at which examination shall be performed. The classifications are herein designated *frequent* and *periodic,* with intervals between examinations as defined below.

(1) Frequent Inspection. Visual examinations by the operator or other designated person with records not required:

(a) normal service — monthly;

(b) heavy service — weekly to monthly;

(c) severe service — daily to weekly.

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

(a) normal service — yearly, with equipment in place;

(b) heavy service — semiannually, with equipment in place unless external conditions indicate that disassembly should be done to permit detailed inspection;

(c) severe service — quarterly, as in heavy service [see para. (b)(2)(b) above], except that the detailed inspection may show the need for a nondestructive type of testing.

10-1.2.1.2 Frequent Inspection

(a) Frequent inspections shall include observations during operation.

(b) A designated person shall determine whether conditions found during the inspection constitute a hazard and whether a more detailed inspection is required.

(c) Hooks shall be inspected for the following items:

(1) distortion, such as bending, twisting, or increased throat opening;

(2) wear;

(3) cracks, nicks, or gouges [see para. 10-1.2.3(e)];

(4) latch engagement (if provided);

(5) damaged or malfunctioning latch (if provided);

(6) hook attachment and securing means;

(7) self-locking hooks for proper operation and locking.

10-1.2.1.3 Periodic Inspection

(a) Inspection of hooks shall be performed as defined in para. 10-1.2.1.1(b)(2).

(b) The inspection shall include the requirements of para. 10-1.2.1.2.

(c) Hooks having any of the following conditions shall be removed from service until repaired or replaced.

(1) Deformation. Any bending or twisting exceeding 10 deg (or as recommended by the manufacturer) from the plane of the unbent hook.

(2) Throat Opening. Any distortion causing an increase in throat opening 15% (or as recommended by the manufacturer)

(3) Wear. Any wear exceeding 10% (or as recommended by the manufacturer) of the original section dimension of the hook or its load pin.

(4) Inability to Lock. Any self-locking hook that does not lock.

(5) Inoperative Latch. Any latch that does not close the hook's throat.

10-1.2.2 Testing

(a) When proof tests are used to verify manufacturing process, material, or configuration, the hooks shall be able to withstand the proof load application without permanent deformation when the load is applied for a minimum of 15 sec. This condition shall be considered to have been satisfied if the permanent increase in the throat opening does not exceed 1% or 0.02 in. (0.5 mm), whichever is greater. For such tests, Table 1 states the proof loads that shall be applied to a hook having a rated load capacity.

(b) For duplex (sister) hook having a pin hole, the proof load for the pin hole shall be in accordance with Table 1. The proof load on the hook shall be shared equally between the two prongs of a sister hook, unless designed for unbalanced loading.

(c) Performance testing of hooks shall not be required except where necessary to conform to the requirements for the equipment of which they are a part.

TABLE 1 PROOF TEST LOAD

Rated Load		Proof Load, Min.		
Tons (2000 lb)	kg	Percent of Rated Load	Tons (2000 lb)	kN
0.50	453.6	200	1	8.9
1	907.2	200	2	17.8
5	4,536	200	10	89
10	9,072	200	20	178
15	13,608	200	30	267
20	18,144	200	40	356
25	22,680	200	50	445
30	27,216	200	60	534
35	31,752	200	70	623
40	36,288	200	80	712
45	40,824	200	90	801
50	45,360	200	100	890
60	54,432	193	116	1032.5
75	68,040	183	137	1219
100	90,720	166	166	1477
125	113,400	150	188	1673
150	136,080	133	200	1780
175	158,760	133	233	2074
200	181,440	133	266	2367
250	226,800	133	333	2964
300	272,160	133	399	3551
350	317,520	133	465	4139
400	362,880	133	532	4735
450	408,240	133	598	5322
500	453,600	133	665	5919
Above 500	>453,600	133	...	...

GENERAL NOTES:
(a) 1 ton (short, 2000 lb) = 8.9 kN (unit of force).
(b) For hooks with rated loads not shown in the above table, use the next lower rating for determining the percent of rated load to be applied as a proof load.

10-1.2.3 Maintenance

(a) Any conditions disclosed by the inspections performed in accordance with the requirements of paras. 10-1.2.1.2 or 10-1.2.1.3 shall be corrected by repair or replacement before continuing to use the hook.

Hooks shall be removed from service unless a qualified person approves their continued use and initiates corrective action.

(b) Hooks having damage or wear described as follows shall be repaired or replaced:

(1) cracks, nicks, and gouges [see para. (e) below];

(2) wear exceeding 10% (or as recommended by the manufacturer) of the original sectional dimension;

(3) a bend or twist exceeding 10 deg from the plane of the unbent hook;

(4) an increase in the throat opening exceeding 15% (or as recommended by the manufacturer);

(5) inability of self-locking hooks to lock.

(c) A hook latch, when required, that is inoperative shall be repaired or replaced.

(d) A hook with a latch that does not close the throat opening shall be removed from service or moused until the latch is replaced or repaired.

(e) Repair of cracks, nicks, and gouges shall be carried out by a designated person by grinding longitudinally, following the contour of the hook, provided no

dimension is reduced more than 10% (or as recommended by the manufacturer) of its original value

(f) All other repairs shall be performed by the manufacturer or a qualified person.

(g) Replacement parts, such as load pins for clevis hooks, shall be at least equal to the original manufacturer's specifications.

Section 10-1.3: Operating Practices

Personnel using hooks shall be aware of the following.

(a) It shall be determined that the weight of the load to be lifted does not exceed the lesser of the load rating of the hook or the load rating of the equipment of which the hook is a part.

(b) Shock loading should be avoided.

(c) Load shall be centered in the base (bowl/saddle) of the hook to prevent point loading of the hook.

(d) Hooks shall not be used in such a manner as to place a side load or back load on the hook.

(e) When using a device to close the throat opening of the hook, care shall be taken that the load is not carried by the closing device.

(f) Hands, fingers, and body shall be kept from between hook and load.

(g) Duplex (sister) hooks shall be loaded equally on both sides unless the hook is specifically designed for single loading. When using an articulated duplex (sister) hook (see Fig. 5), care should be taken because articulation of the hook may cause instability in the slung load.

(h) If the duplex (sister) hook is loaded at the pin hole instead of at the two saddles, the load applied shall not exceed the rated load that would normally be shared by the two saddles or the rated load of the supporting equipment.

(i) The use of a hook with a latch does not preclude the inadvertent detachment of a slack sling or a load from the hook. Visual verification of proper hook engagement is required in all cases.

(j) Self-locking hooks shall be locked during use.

(k) When a lock is equipped with a latch, the latch should not be restrained from closing during use.

Chapter 10-2
Hooks — Miscellaneous

This Chapter applies to all hooks specifically shown in Figs. 17 through 21 that do not support a load in a direct-pull configuration, such as grab hooks, foundry hooks, sorting hooks, and choker hooks.

Section 10-2.1: Marking and Construction

10-2.1.1 Markings. Manufacturer's identification shall be forged, cast, or die stamped on a low stress and nonwearing area of the hook.

10-2.1.2 Construction

(a) The hook material shall have sufficient ductility to permanently deform before losing the ability to support the load at the temperatures at which the specific hook will be used.

(b) Rated loads for a hook, when used in the manner for which it is intended, shall be equal to or exceed the rated load of the chain, wire rope, or other suspension members to which it is attached. In those instances when this is not feasible, special precautions shall be taken to ensure that the rated load limit of the hook is not exceeded.

Section 10-2.2: Inspection, Testing, and Maintenance

10-2.2.1 Inspection

10-2.2.1.1 Inspection Classification

(a) Initial Inspection. Prior to initial use, all new and repaired hooks shall be inspected to verify compliance with the applicable provisions of this volume.

(b) Inspection procedure and record keeping requirements for hooks in regular service shall be governed by the kind of equipment in which they are used. When such requirements for hooks are stated in standards for the specific equipment, they shall take precedence over the following. Otherwise, there shall be two general classifications based upon intervals at which examination shall be performed. The classifications are herein designated *frequent* and *periodic*, with intervals between examinations as defined below.

(1) Frequent Inspection. Visual examinations by the operator or other designated person with records not required:

(a) normal service — monthly:

(b) heavy service — weekly to monthly;

(c) severe service — daily to weekly.

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

(a) normal service — yearly, with equipment in place;

(b) heavy service — semiannually, with equipment in place unless external conditions indicate that disassembly should be done to permit detailed inspection:

(c) severe service — quarterly, as in heavy service [see para. (b)(2)(b) above], except that the detailed inspection may show the need for a nondestructive type of testing.

10-2.2.1.2 Frequent Inspection

(a) Frequent inspection shall include observations during operation.

(b) A designated person shall determine whether conditions found during the inspection constitute a hazard and whether a more detailed inspection is required.

(c) Hooks shall be inspected for the following items;

(1) distortion, such as bending, twisting, or increased throat opening;

(2) wear;

(3) cracks, nicks, or gouges [see para. 10-2.2.3(b)];

(4) hook attachment and securing means.

10-2.2.1.3 Periodic Inspection

(a) Inspection of hooks shall be performed as defined in para. 10-2.2.1.1(b)(2).

(b) The inspection shall include the requirements of para. 10-2.2.1.2.

(c) Hooks having any of the following conditions shall be removed from service until repaired or replaced.

(1) Deformation. Any bending or twisting exceeding 10 deg (or as recommended by the manufacturer) from the plane of the unbent hook.

(2) Throat Opening. Any distortion causing an

increase in throat opening exceeding 15% (or as recommended by the manufacturer).

(3) Wear. Any wear exceeding 10% (or as recommended by the manufacturer) of the original section dimension of the hook or its load pin.

10-2.2.2 Testing. Performance testing of hooks shall not be required except where necessary to conform to the requirements for the equipment of which they are a part.

10-2.2.3 Maintenance

(a) Any conditions disclosed by the inspections performed in accordance with the requirements of paras. 10-2.2.1.2 or 10-2.2.1.3 shall be corrected by repair or replacement before contintuing to use the hook.

Hooks shall be removed from service unless a qualified person approves their continued use and initiates a corrective action.

(b) Hooks having damage or wear described as follows shall be repaired or replaced:

(1) cracks, nicks, and gouges [see para. (c) below];

(2) wear exceeding 10% (or as recommended by the manufacturer) of the original dimension;

(3) a bend or twist exceeding 10 deg from the plane of the unbent hook, or as recommended by the manufacturer;

(4) an increase in throat opening exceeding 15% (or as recommended by the manufacturer); for grab hooks (see Figs. 17 and 18), when the portions of the hook forming the throat are not parallel.

(c) Repair of cracks, nicks, and gouges shall be carried out by a designated person by grinding longitudinally, following the contour of the hook, provided that no dimension is reduced more than 10% (or as recommended by the manufacturer) of its original value.

(d) All other repairs shall be performed by the manufacturer or a qualified person.

(e) Replacement parts, such as load pins for clevis hooks, shall be at least equal to the original manufacturer's specifications.

Section 10-2.3: Operating Practices

Personnel using miscellaneous hooks shall be aware of the following.

(a) It shall be determined that the load or force required does not exceed the rated load of the hook's assembly, especially when special conditions, such as chocking or grabbing, are considered.

(b) Shock loading should be avoided.

(c) A hook shall not be used in a manner other than that for which it is intended.

(d) Hands, fingers, and body shall be kept away from between the load and the hook.

STD.ASME B30.10-ENGL 1999 ■ 0759670 0616277 352 ■

ASME B30.10 Interpretations

Replies to Technical Inquiries
January 1995 – June 1998

FOREWORD

This publication includes all of the written replies issued between the indicated dates by the Secretary, speaking for the ASME B30 Committee, Safety Standards for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings, to inquiries concerning interpretations of technical aspects of B30.10, Hooks.

These replies are taken verbatim from the original letters except for a few typographical corrections and some minor editorial corrections made for the purpose of improved clarity. In some few instances, a review of the interpretation revealed a need for corrections of a technical nature; in these cases, a corrected interpretation follows immediately after the original reply.

These interpretations were prepared in accordance with the accredited ASME procedures. ASME procedures provide for reconsideration of these interpretations when or if additional information is available which the inquirer believes might affect the interpretation. Further, persons aggrieved by this interpretation may appeal to the cognizant ASME Committee or Subcommittee. ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

Interpretation: 10-10

Subject: ASME B30.10-1993

Date Issued: June 15, 1998

Question: Would it be correct to interpret the throat opening as the narrowest opening between the back of the hook and the tip at the entrance to the bowl as shown in Fig. 2?

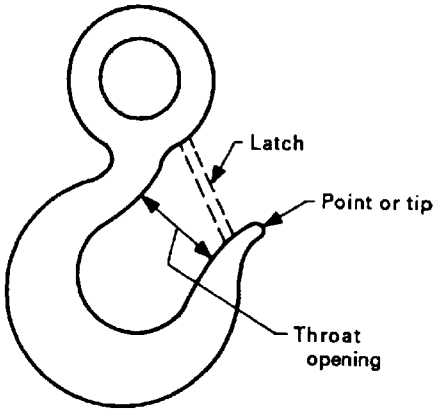


FIG. 2 EYE HOOK
(Latch — When Required)

Reply: Yes, your interpretation is correct for the figure cited. However, your interpretation may not be correct for other hook configurations.

ASME Services

ASME is committed to developing and delivering technical information. At ASME's Information Central, we make every effort to answer your questions and expedite your orders. Our representatives are ready to assist you in the following areas:

ASME Press
Codes & Standards
Credit Card Orders
IMechE Publications
Meetings & Conferences
Member Dues Status
Member Services & Benefits
Other ASME Programs
Payment Inquiries
Professional Development
Short Courses
Publications
Public Information
Self-Study Courses
Shipping Information
Subscriptions/Journals/Magazines
Symposia Volumes
Technical Papers

How can you reach us? It's easier than ever!

There are four options for making inquiries* or placing orders. Simply mail, phone, fax, or E-mail us and an Information Central representative will handle your request.

Mail	*Call Toll Free*	*Fax-24 hours*	*E-Mail-24 hours*
ASME	**US & Canada:** 800-THE-ASME	973-882-1717	Infocentral
22 Law Drive, Box 2900	(800-843-2763)	973-882-5155	@asme.org
Fairfield, New Jersey	**Mexico:** 95-800-THE-ASME		
07007-2900	(95-800-843-2763)		
	Universal: 973-882-1167		

* Information Central staff are not permitted to answer inquiries about the technical content of this code or standard. Information as to whether or not technical inquiries are issued to this code or standard is shown on the copyright page. All technical inquiries must be submitted in writing to the staff secretary. Additional procedures for inquiries may be listed within.

ISBN 0-7918-2589-2

9 780791 825891

J04899