ASME B30.22-2005
(Revision of ASME B30.22-2000)

Articulating Boom Cranes

Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings

AN AMERICAN NATIONAL STANDARD

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ASME issues written replies to inquiries concerning interpretations of technical aspects of this Standard. Interpretations are published on the ASME Web site under the Committee Pages at http://www.asme.org/codes/ as they are issued, and will also be published within the next edition of the Standard.

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CONTENTS

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 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 September 28, 2005.

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 STANDARDS 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.)

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

(05)

B30 STANDARD INTRODUCTION

SECTION I: SCOPE

The ASME B30 Standard contains provisions that apply to the construction, installation, operation, inspection, testing, maintenance, and use of cranes and other lifting and material-handling related equipment. For the convenience of the reader, the Standard has been divided into separate volumes. Each Volume has been written under the direction of the ASME B30 Standards Committee and has successfully completed a consensus approval process under the general auspices of the American National Standards Institute (ANSI).

As of the date of issuance of this Volume, the B30 Standard comprises the following 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 Systems
B30.24 Container Cranes[1]
B30.25 Scrap and Material Handlers
B30.26 Rigging Hardware
B30.27 Material Placement Systems
B30.28 Balance Lifting Units[1]

SECTION II: SCOPE EXCLUSIONS

The B30 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 covered under the scope of the following standards: A10, A17, A90, A92, A120, B20, B56, and B77.

SECTION III: PURPOSE

The B30 Standard is intended to

(a) prevent or minimize injury to workers, and otherwise provide for the protection of life, limb, and property by prescribing safety requirements

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

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

SECTION IV: USE BY REGULATORY AGENCIES

This Standard may be adopted in whole or in part for governmental or regulatory use. 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.

[1] These volumes are currently in development.

SECTION V: EFFECTIVE DATE

(a) Effective Date. The effective date of this Volume of the B30 Standard shall be one year after its date of issuance. Construction, installation, inspection, testing, maintenance, and operation of equipment manufactured and facilities constructed after the effective date of this Standard shall conform to the mandatory requirements of this Standard.

(b) Existing Installations. Equipment manufactured and facilities constructed prior to the effective date of this Volume of the B30 Standard shall be subject to the inspection, testing, maintenance, and operation requirements of this Standard after the effective date.

It is not the intent of this Volume of the B30 Standard to require retrofitting of existing equipment. However, when an item is being modified, its performance requirements shall be reviewed relative to the requirements within the current volume. 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 1 year.

SECTION VI: REQUIREMENTS AND RECOMMENDATIONS

Requirements of this Standard are characterized by use of the word *shall*. Recommendations of this Standard are characterized by the word *should*.

SECTION VII: USE OF MEASUREMENT UNITS

This Standard contains SI (metric) units as well as U.S. Customary units. The values stated in customary units are to be regarded as the standard. The SI units are a direct (soft) conversion from the customary units.

SECTION VIII: REQUESTS FOR REVISION

The B30 Standards Committee will consider requests for revision of any of the volumes within the B30 Standard. Such requests should be directed to:

Secretary of the B30 Committee, ASME, Three Park Avenue, New York, NY 10016-5990

The requests should be in the following format:

Volume: Cite the designation and title of the volume.

Edition: Cite the applicable edition of the volume.

Subject: Cite the applicable paragraph number(s) and the relevant heading(s).

Request: Indicate the suggested revision.

Rationale: State the rationale for the suggested revision.

Upon receipt by the Secretary, the request will be forwarded to the relevant B30 Subcommittee for consideration and action. Correspondence will be provided to the requester defining the actions undertaken by the B30 Standards Committee.

SECTION IX: REQUESTS FOR INTERPRETATION

The B30 Standards Committee will render an interpretation of the provisions of the B30 Standard. Such requests should be directed to:

Secretary of the B30 Committee, ASME, Three Park Avenue, New York, NY 10016-5990

The requests should be in the following format:

Volume: Cite the designation and title of the volume.

Edition: Cite the applicable edition of the volume.

Subject: Cite the applicable paragraph number(s) and the relevant heading(s).

Question: Phrase the question as a request for an interpretation of a specific provision suitable for general understanding and use, not as a request for approval of a proprietary design or situation. Plans or drawings that explain the question may be submitted to clarify the question. However, they should not contain any proprietary names or information.

Upon receipt by the Secretary, the request will be forwarded to the relevant B30 Subcommittee for a draft response, which will then be subject to approval by the B30 Standards Committee prior to its formal issuance.

Interpretations to the B30 Standard will be published in the subsequent edition of the respective volume and will be available online at http://cstools.asme.org.

SECTION X: ADDITIONAL GUIDANCE

The equipment covered by the B30 Standard is subject to hazards that cannot be abated 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 proper operation of the equipment and the handling of loads. Serious hazards include, but are not limited to, improper or inadequate maintenance, overloading, dropping or slipping of the load, obstructing the free passage of the load, and using equipment for a purpose for which it was not intended or designed.

The B30 Standards Committee fully realizes the importance of proper design factors, minimum or maximum dimensions, and other limiting criteria 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 variables that must be considered in each individual case. The requirements and recommendations provided in the volumes must be interpreted accordingly, and judgment used in determining their application.

ASME B30.22-2005
SUMMARY OF CHANGES

Following approval by the ASME B30 Committee and ASME, and after public review, ASME B30.22-2005 was approved by the American National Standards Institute on September 28, 2005.

ASME B30.22-2005 includes editorial changes, revisions, and corrections identified by a margin note, **(05)**.

Page	*Location*	*Change*
viii–x	Introduction	Revised in its entirety
8	Section 22-0.3	Legend for Figs. 12 through 15 redesignated as Section 22-0.3
13	Section 22-0.4	Added
14	Section 22-0.5	Former 22-0.3 redesignated and updated
18	Section 22-1.9	Added
23	22-3.1.2*(f)*	Revised

SPECIAL NOTE:

The interpretations to ASME B30.22 are intended in this edition as a separate section for the user's convenience.

ARTICULATING BOOM CRANES

Chapter 22-0
Scope, Definitions, and References

SECTION 22-0.1: SCOPE OF B30.22

The scope includes only cranes of the types described in para. 22-0.2.1, articulated by hydraulic cylinders, which are powered by internal combustion engines or electric motors and are mounted on a mobile chassis or stationary installation. Frequently, articulating cranes are equipped with a load hoist mechanism to broaden their versatility. Load hoist mechanisms equipped machines are covered by this Volume.

Some basic machine types within this scope are convertible for excavating work and other uses not considered to be lifting service. The requirements of this Volume are applicable only to such machines when used as lifting cranes.

Exemptions from this Volume include

(a) all units with a maximum rated capacity of 1 ton or less

(b) all units with booms constructed of nonconductive-type materials

(c) all units equipped with or designed primarily for personnel baskets, platforms, ladders, etc.

(d) all units when equipped with nonlifting attachments

(e) all units used in forestry and logging applications

(f) telescoping boom cranes that do not articulate (covered under B30.5)

(g) scrap and material handlers

SECTION 22-0.2: DEFINITIONS

22-0.2.1 Types of Articulating Boom Cranes

commercial truck-mounted: a crane, consisting of a rotating mast, mainframe or base, boom, and one or more operator's stations, such as ground controls (Fig. 1), top seat controls (Fig. 2), or remote controls (Fig. 3), mounted on a frame attached to a commercial truck chassis, retaining a payload capability whose power source may power the crane. The function is to lift, lower, and swing loads at various radii.

stationary: a crane, consisting of a rotating mast, mainframe or base, and boom, mounted on a stationary structure. The function is to lift, lower, and swing loads at various radii from a fixed center of rotation. See Fig. 4.

trailer or rail car-mounted: a crane, consisting of a rotating mast, mainframe or base, and boom, mounted on a trailer or rail car. The function is to lift, lower, and swing loads at various radii. See Figs. 5 and 6.

traveling base-mounted: a crane, consisting of a rotating mast, boom, mainframe or base, and one or more operator's stations, mounted on a traveling base. The function is to lift, lower, and swing loads at various radii. See Fig. 7.

wheel- or crawler-mounted (multiple control stations): a crane, consisting of a rotating mast, mainframe or base, operator's station, and boom, mounted on an off-road carrier equipped with axles, rubber-tired wheels, or crawlers for travel, a power source(s), and having separate stations for driving and operating. Its function is to lift, lower, and swing loads at various radii. See Figs. 8 and 9.

wheel- or crawler-mounted (single control station): a crane, consisting of a rotating mast, mainframe or base, and boom, mounted on an off-road carrier equipped with axles, rubber-tired wheels, or crawlers for travel, a power source, and having a single control station for driving and operating. Its function is to lift, lower, and swing loads at various radii. See Figs. 10 and 11.

22-0.2.2 General Definitions

accessory: a secondary part or assembly of parts that contributes to the overall function and usefulness of a crane.

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.

authorized: appointed by a duly constituted administrative or regulatory authority.

axle: the shaft or spindle with which or about which a wheel rotates. On wheel-mounted cranes, it refers to a type of axle assembly, including housings, gearing, differential, bearings, and mounting appurtenances.