B30.5-201X
(Proposed revision of
ASME B30.5-2011)

Mobile and Locomotive Cranes

March 2014 Draft Revisions

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ASME Codes and Standards
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 (ANSI). 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 at 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 (AESC) (later changed to American Standards Association (ASA), then to the United States of America Standards Institute (USASI), and finally to ANSI), 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, AESC 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. Commencing June 1, 1927, and using the eight-page code published by ASME in 1916 as a basis, the Sectional Committee developed the “Safety Code for Cranes, Derricks, and Hoists”. The early drafts of this safety code included requirements for “Jacks” but, due to inputs and comments on those drafts, the Sectional Committee decided in 1938 to make the requirements for “Jacks” a separate code. In January 1943, ASA B30.2-1943 was published addressing a multitude of equipment types and in August 1943, ASA B30.1-1943 was published just addressing “Jacks”. Both documents were reaffirmed in 1952 and widely accepted as safety standards.

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, Bureau of Yards and Docks (now the Naval Facilities Engineering Command) was reorganized on January 31, 1962, with 39 members representing 27 national organizations. The new committee changed the format of ASA B30.2-1943 so that the multitude of equipment types it addressed could be published in separate volumes that could completely cover the construction, installation, inspection, testing, maintenance and operation of each type of equipment that was included in the scope of ASA B30.2. This format change resulted in the initial publication of B30.3, B30.5, B30.6, B30.11 and B30.16 being designated as “Revisions” of B30.2 with the remainder of the B30 volumes being published as totally new volumes. ASA changed its name to USASI in 1966 and to ANSI in 1969, which resulted in B30 volumes from 1943 to 1968 being designated as either “ASA B30”, “USAS B30” or “ANSI B30” depending on their date of publication.”

In 1982, the Committee was reorganized as an Accredited Organization Committee, operating under procedures developed by ASME and accredited by ANSI. 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 IX of the Introduction, before rendering decisions on disputed points.

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.

The ASME B30.5-2007 edition added Responsibilities to be assigned in the work site organization. The 2011 edition included minor revisions and the addition of the Nonmandatory Appendix A on Critical Lifts. This 2014 edition incorporates many global B30 changes including the addition of Personnel competence and translation requirements as well as other revisions made throughout the document.

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 XXXX.
### B30.5 - Mobile and Locomotive Cranes
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5-3.1.3.1.2 (User Responsibilities)
d) verifying that the crane has the necessary lifting capacity to perform the proposed lifting operations in the planned configuration. *Load rating charts may be temporarily removed from the crane for lift planning or other purposes provided the charts are replaced in the manufacturer’s designated location before operating the crane.*

5-3.1.3.3.1 (Operator Responsibilities)
e) using the crane’s load rating chart(s) and diagrams and applying all notes and warnings related to the charts to confirm the correct crane configuration to suit the load, site and lift conditions. *Load rating chart(s) may be temporarily removed from the crane for lift planning or other purposes provided the charts are replaced in the manufacturers designated location before operating the crane.*

Rationale: *Sub-committee agreed to move to operations section. Users are temporarily removing charts for lift planning. This is a good reason and planning should be supported. This practice promotes safety and should be expressly permitted.*
Section 5-1.1: LOAD RATINGS AND TECHNICAL INFORMATION
   (a) The crane manufacturer shall provide load rating charts and information for all crane configurations for which lifting is permitted.
   (b) The manufacturer shall provide instructions for the proper assembly, disassembly, operation, inspection and maintenance of the crane.
   (c) The wire rope information listed in 5-1.1.4(b) shall be provided by the crane manufacturer for any ropes supplied with the crane. If wire rope is supplied by someone other than the crane manufacturer, the wire rope information shall be provided by the rope supplier.

5-1-1-1 Load Ratings – Where Stability Governs Lifting Performance
   Unchanged

5-1.1.2 Load Ratings – Where Structural Competence Governs Lifting Performance
   Unchanged

5-1.1.3 Load Rating Chart
   (a) A durable load rating chart(s) with legible letters and figures shall be provided in paper, plastic, metal or electronic display form with each crane and attached in a location accessible to the operator while at the controls. The data and information to be provided on these charts shall include, but not be limited to, the following:
      (1) Unchanged
      (2) Unchanged
      (3) Unchanged
      (4) Unchanged
      (5) Recommended reeving for the hoist lines.
      (6) The diameter, rotation resistant or non-rotation resistant, minimum breaking force, and the maximum allowable load per line for hoist ropes recommended by the crane manufacturer.
      (7) If the weight of any portion of the hoist rope is required to be considered as part of the crane’s lifted load, the method for determining such rope weight shall be provided.
      (8) Cautions, warnings and notes relative to limitations on the load ratings
      (9)(b)(5) Position of the gantry and requirements for intermediate boom
suspension, where applicable

(10) (b)(11) Maximum loads permitted during the actual boom extending operation, and any limiting conditions or cautions, where applicable

(11) (b)(3) Tire pressure, where applicable

(b) 5-1.1.4 Additional Information

(a) In addition to the data required on the load rating chart, the following information shall be shown provided either on with the load rating chart or in the operating manual.

1. Recommended parts of load hoist reeving, size, and type of rope for various crane loads a reeving diagram and the rope length for all hoist drums on the crane

2. Recommended boom hoist reeving, reeving diagram, and length of rope where applicable

3. Cautions, warnings and notes relative to limitations on equipment, crane set up, and operating procedures, including indication of the least stable direction

4. Tire pressure, where applicable

5. Instructions for boom erection and conditions under which the boom, or boom and jib combinations may be raised or lowered

6. Cautionary or warning notes relative to limitations on equipment and operating procedures, including indication of the least stable direction

7. Position of the gantry and requirements for intermediate boom suspension, where applicable

8. Whether the hoist holding mechanism is automatically controlled, manually controlled, whether free-fall is available, or any combination thereof

9. The maximum telescopic travel length of each boom telescopic section

10. Whether sections are telescoped with power or manually

11. The sequence and procedures for extending and retracting the telescopic boom section

12. Maximum loads permitted during the actual boom extending operation, and any limiting conditions or cautions

13. Hydraulic relief valve settings specified by the manufacturer

(b) The information listed below shall be provided in legible form for the wire rope installed on each drum. A wire rope test certificate may be used provided in lieu of the following individual items.

1. Rope diameter (e.g. 1 inch, 25mm)

2. Type and construction (e.g. filler wire, Seale, rotation resistant)

3. Classification (e.g. 6X19, 34X7)

4. Rope grade (IPS, EEIP, 1770)

5. Rope core (e.g. IWRC, fiber core)

6. Direction and lay (e.g. RRL, LAL)

7. Minimum breaking force (e.g. 54 tons, 480 KN)

8. Weight per foot

9. Drum designation

10. Rope length
Rationale: The text of 5-1.1 has been reorganized into a more consistent and complete format. The wire rope information listed identifies a particular rope for purposes of replacement or establishment of a long term inspection program. The text previously balloted as 08-1549 has been modified and included here in accordance with comments reviewed at the May 2009 main committee meeting.
5-3.1.3.1.1 The crane owner’s responsibilities shall include the following:

(i) Maintaining the rope information listed in 5-1.1.4(b) for the rope currently installed on each drum

Rationale: Para. 5-1.1.4(b) lists the information which must be available for the wire rope installed on the crane. This assigns the crane owner the responsibility to maintain that information.

5-3.1.3.1.2 The crane user’s responsibilities shall include the following:

(k) Informing the crane owner if any rope on the crane is replaced or shortened. If a rope is replaced the wire rope information listed in 5-1.1.4(b) shall be provided as well as the date of replacement.

Rationale: If the crane user replaces or shortens a wire rope without the crane owner’s knowledge, the data listed in 5-1.1.4(b) as well as the rope length must be supplied to the crane owner so that information can be maintained for ropes currently installed.
SECTION 5-2.4: ROPE INSPECTION, REPLACEMENT, AND MAINTENANCE

5-2.4.1 General

Due to crane design configuration to maintain mobility, sheave diameters, drum diameters, and rope design factors are limited. Because of these limited design parameters, inspection to detect deterioration in accordance with para. 5-2.4.2 and timely replacement in accordance with para. 5-2.4.3 are essential. The information listed in para. 5-1.1.4(b) should be reviewed prior to periodic inspection to determine if the ropes currently installed on the crane correspond to the records.

Rationale: Before inspection begins it should be determined that the rope believed to be on the crane is actually the rope installed.

5-2.4.3 Rope Replacement

(d) The design factor for replacement wire rope shall be in accordance with para. 5-1.7.1.

(d) Replacement rope shall have a strength rating at least as great as the original rope furnished or recommended by the crane manufacturer. Any deviation from the original size, grade, or construction shall be specified by a rope manufacturer, the crane manufacturer, or a qualified person.

(e) Hoist Replacement ropes shall meet the diameter and specifications shown on the load rating chart and shall meet or exceed the minimum breaking force shown, unless deviations are approved by the crane manufacturer, rope manufacturer or a qualified person.

(f) If load hoist ropes installed on a crane deviate from the crane manufacturer’s recommendations shown on the load rating chart the following shall apply:

(1) The load ratings and allowable line pull shown on the load rating chart shall not be exceeded.

(2) If changes to the reeving specifications and/or a reduction in load ratings are necessary, these changes shall be approved by the crane manufacturer or a qualified person. Prior to lift operations the changes shall be durably noted and maintained with the load rating chart.

(g) When replacement wire ropes are installed on a crane, the requirements of 5-1.1.4(b) shall be followed. The date of installation shall be noted.
Existing items (e), (f), and (g) to be renumbered to (h), (i), and (k).

Rationale: Wire rope is a consumable structural component of a crane. It is critical to safety that operators, inspectors, and persons replacing rope know what rope is currently on the crane and that replacement ropes must be compatible with the load rating chart for the crane and with the manufacturer’s specifications. This text, with four editorial changes, was previously balloted as ballot 08-1549.
5-2.1: INSPECTION - GENERAL

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. The manufacturer shall furnish required field assembly, operation, and maintenance information.

Rationale: Field assembly and operation do not fall under this Chapter. Deleted requirements have been added to 5-1.1 under ballot TR09-1117. These new words are a global change mandated by the main committee.
5-1.7.2 Ropes

(a) Ropes shall be in accordance with the requirements of the crane manufacturer, rope manufacturer or a qualified person, and should be in accordance with ASTM A1023/A1023M.

(a) The ropes shall be of a construction recommended by the rope or crane manufacturer or a qualified person.

Rationale: ASTM1023/A1023M is a recognized standard for wire rope and provides valuable technical information. This text was previously balloted as 08-1549.
Add:

5-3.4.6 - Induced Electrical Charges

When a potentially hazardous condition exists due to an electrical charge that can be or is being induced into the equipment or materials being handled, a qualified person shall be contacted and their recommendation for corrective actions shall be followed.

Common sources of induced electrical charges include energized power lines, as well as radio frequency (RF), radar, microwave, and other electromagnetic energy transmitters.

Renumber existing paragraphs 5-3.4.6 through 5-3.4.9 to 5-3.4.7 through 5-3.4.10

Rationale:

Any conductive (metal) object in close proximity of high power RF fields can exhibit inductance of RF energy, thus posing a strong shock or burn potential.
Item 1: This is a new section to be added to B30.5

Definition: 5-0.2.2 Multiple load line operation: simultaneous use of two or more lines reeved over sheaves on a single shaft or multiple shafts of a crane with multiple load drums to lift, rotate or hold a single load.

Item 2: 5-3.2.3 Multiple Load Line Operation.

Multiple load line operation shall only be permitted when the equipment and procedures required by this volume and those required by the crane manufacturer or qualified person are applied.

a. Simultaneously lifting or suspending individual loads on separate lines is prohibited.

b. Personnel lifting is prohibited.

c. Before operation with multiple load lines begins the following actions shall be accomplished:

   (1) A qualified person shall approve the planned operation.

   (2) The lift director shall ensure that the crane operator has selected the correct load rating charts (example: boom or jib load rating chart) for the configuration being used i.e., position of the load being lifted, lifting points, etc.

   (3) The crane operator and the lift director shall verify that the load on any individual load line and the total weight of the load including hook blocks, hook balls, slings and rigging, etc. does not exceed the capabilities of the crane.

   (4) The crane operator and the lift director shall review the operational characteristics and limitations of the crane established by the crane manufacturer or qualified person that relate to simultaneous multiple drum operation i.e., same or opposite direction of rotation of drums, limited rope layers on tandem drums, etc.

d. Each load line shall be equipped with an anti-two-block device.

e. Unless each lift point is capable of individually supporting the entire load weight, each load line shall be equipped with a load indicator readable during the lift by a designated person.
f. **Prior to and during lifting operations, load lines and rigging shall be monitored for interference.** If interference occurs, operations shall be stopped and a qualified person shall determine whether the interference constitutes a hazard. Any hazard identified shall be corrected before lifting operations continue.

g. **Side loading of booms, jibs and sheaves shall not exceed the limitations established by the crane manufacturer.**

**Rationale:** *Establish procedures for simultaneous lifting with multiple load lines and hooks which are becoming more common. Lifting a single load with multiple load lines/hooks from a single crane can have detrimental effects on crane operation. Cranes are designed for freely suspended loads. This operation excludes pile driving, dragline, and clamshell operations.*
Proposal: Add the following to B30.5 as 5-1.9.3 (b) and re-number existing (b) – (d):

5-1.9.3 Outriggers

(a) Means shall be provided to hold all outriggers in the retracted position while traveling or in the extended position when set for operating.

(b) An indicator shall be provided at the operator’s station(s) that allows the operator to visually determine if the horizontal outrigger beam positions coincide with the positions specified on the load rating chart.

(c) Power-actuated jacks, where used, shall be provided with the means (such as an integral load hold check valves on hydraulic cylinders, mechanical locks, etc.) to prevent loss of support under load.

(d) Means shall be provided for fastening outrigger floats to the ends of the outriggers or jack cylinder rods when in use.

(e) Partially Extended Outrigger Beams, Outrigger Beam Position

(1) A device shall be provided that accurately locates the outrigger beam horizontal position(s) to coincide with the partially extended outrigger position(s) specified on the load rating chart.

(2) Visible indication of the manufacturer’s specified outrigger beam horizontal positions shall be provided by means such as stripes painted on the outrigger beams.

Rational:
This requirement is proposed based on OSHA 1926.1416(5)(i). This is proposed text to address outrigger monitoring to prevent swinging over partially extended outriggers without warning the operator. The intent is to require a display in the operator’s position that displays horizontal displacements of outrigger beam positions. It does not require that the “outrigger monitoring system” limit the RCI/RCL system. 1926.1416 does not address drop down or swing-out outrigger beams. This ”system” requirement does not address sensing ground contact with the outrigger cylinders. (d) changes were made to be clarify where the floats were to be fastened.

From OSHA 1926.1416:

(5) The following devices are required on equipment manufactured after November 8, 2011:
(i) Outrigger/stabilizer position (horizontal beam extension) sensor/monitor if the equipment has outriggers or stabilizers. Temporary alternative measures: The operator must verify that the position of the outriggers or stabilizers is correct (in accordance with manufacturer procedures) before beginning operations requiring outrigger or stabilizer deployment.
5-3.2.1.6 Wind speed shall be monitored at all sites where it can adversely affect crane operations. This should be accomplished with a device mounted at the highest unshielded point on the crane or located at the site.

**Rationale:**
Wind speed information is critical for the operator to have when performing lift operations. Manufacturers consider this a limiting factor that must be taken into consideration for operating their cranes safely. This addition to the Volume recognizes wind effects on suspended loads.
Delete the following (Currently Figure 5-1.7.3-1 in B30.5-2011):

![Dead Ending Rope in a Socket](image)

Extra piece of same size rope is clipped to main rope

Loop back method

Replace with the following and renumber to Figure 5-1.7.3-1:
**Fig. 14 Dead Ending Rope in a Socket**

**See Note**

**Installation**

**Correct**

**This type of clip must prevent crimping and damage to the live end of a wire rope while stopping load transfer to the dead end.**
SECTION 5-0.3: REFERENCES
The following is a list of publications referenced in this Standard.


ANSI/SAE J185-2003 J2703, Access Systems for Off-Road Machines Crane – Access and Egress

ANSI/SAE J765- OCT 1990, Crane Load Stability Test Code

ANSI/SAE J987- AUG 2012 2003, Crane Structures — Method of Test

ANSI/SAE J1028- OCT 1998, Mobile Crane Working Area Definitions

ANSI/SAE J1063- NOV 1993 Cantilevered Boom Crane Structures — Method of Test Publisher: Society of Automotive Engineers (SAE), 400 Commonwealth Drive, Warren dale, PA 15096-0001 USA (www.sae.org)

ASME B30.26-2010, Rigging Hardware

ASME B30.8-20042010, Floating Cranes and Floating Derricks

ASME B30.10-19992009, Hooks

ASME B30.23-19982011, Personnel Lifting Systems Publisher: The American Society of Mechanical Engineers (ASME), Three Park Avenue, New York, NY 10016-5990; Order Department: 22 Law Drive, P.O. Box 2900, Fairfield, NJ 07007-2900 (www.asme.org)
SECTION 5-1.8: CABS
5-1.8.1 Construction

(b) All cab glazing shall be safety glazing material as defined in ANSI Z26.1-1996.

5-1.9.5 Welded Construction
All welding procedures and welding operator qualifications shall be in accordance with ANSI/AWS D14.3/D14.3M when welding is to be performed on load-sustaining members. Where special steels or other materials are used, the manufacturer shall provide welding procedures.

5-1.8.2 Platforms to Cab

(a) Principal walking surfaces shall be of a skid-resistant type.

(b) Outside platforms, if furnished, shall be provided with guardrails in accordance with ANSI/SAE J1852703. Where platforms are too narrow to use guardrails, handholds shall be provided at convenient points above the platform.

5-1.8.4 Cab Roof
Where necessary for rigging or service requirements, a ladder or steps shall be provided to give access to the cab roof. The ladder or steps shall conform to the requirements of ANSI/SAE J1852703. Where necessary, areas of the cab roof shall be capable of supporting, without permanent distortion, the weight of a 200 lb (90 kg) person.

5-1.1.1 Load Ratings — Where Stability Governs Lifting Performance

(c) Stipulations governing the application of the values in para. 5-1.1.1(a) shall be in accordance with ANSI/SAE J765.
SECTION 5-1.10: STRUCTURAL PERFORMANCE

(a) Prototype booms, jibs, gantries, masts, outriggers, carrier frames, and upper frames of production models of rope-supported lattice boom cranes shall meet the performance requirements of ANSI/SAE J987. On special designs (not production models) or specific lift situations, calculations that verify the equipment’s ability to meet the performance requirements of ANSI/SAE J987, done by the crane manufacturer or a qualified person, are acceptable.

NOTE Bottom of Page 9

1 Illustrations (a) through (d) of Fig. 5-1.1.3-1 are reproduced from ANSI/SAE J1028, Recommended Practice, by permission of the Society of Automotive Engineers, Inc.

SECTION 5-1.10: STRUCTURAL PERFORMANCE

(b) Prototype booms, jibs, masts, lattice extensions (jibs), outriggers, carrier frames, and upper frames of production models of telescopic cantilever boom cranes shall meet the performance requirements of ANSI/SAE J1063. On special designs (not production models) or specific lift situations, calculations that verify the equipment’s ability to meet the performance requirements of ANSI/SAE J1063, done by the crane manufacturer or a qualified person, are acceptable.
5-1.1.3 Load Rating Chart

(a) Load rating charts shall be marked with a serial number, part number, or other traceable method that allows for the matching of charts to a specific crane(s).

(b) Re-letter existing “a” as “b” and then continue.

Rationale:
It’s important to be able to identify if a rating chart is compatible with a specific crane because charts are allowed to be temporally removed prior to operation.
Proposed Changes:

1. Eliminate the term “Stabilizer” from the definitions—no change to the definition of outrigger.
2. Table 1—eliminate the word “stabilizer” and replace with “outrigger” from Table 1
3. Figure 5-1.1.3-1(formerly Figure 11) (e), (f) & (g)—change the word stabilizers, all places, to outriggers.
4. 5-3.2.1.5(h)—change wording as follows: (delete the words “load rating chart” and add the words “if specified” – see new (h) below)

(h) Any time outriggers are used, the outriggers shall be extended and deployed per the crane manufacturer’s load rating chart specifications, instructions and, if specified, set to remove the machine weight from the wheels, except for locomotive cranes. (For locomotive cranes, refer to para 5-3.2.1.5 (j)). …….

Rationale:

There are slightly different definitions for outrigger and stabilizer. The term “outrigger” is used many places (66 places) within the standard while the word “stabilizer” is used only 8 times—almost always, when the standard uses the term “outrigger”, it means both “outrigger” and “stabilizer”. With the minor proposed changes to the text in 5-3.2.1.5 (h), regarding following the manufacturer’s specifications for removing the weight from the wheels, we can eliminate the term “stabilizer” from B30.5 and avoid using the term “outrigger and stabilizers” or the term “outrigger/stabilizers” in every location within the volume.
Proposal: Modify the paragraphs below as follows:

5-1.9.9.1 Two-Blocking Features

(a) Telescopic boom cranes shall be equipped with an anti-two-block device or a two-block damage prevention feature for all points of two-blocking (i.e., jibs, extensions; see Introduction, Section V, Effective Date).

(b) Lattice boom cranes shall be equipped with an anti-two-block device or a two-block warning feature that functions for all points of two-blocking (see Introduction, Section V, Effective Date).

5-1.9.9.2 Load Indicators, Rated Capacity Indicators, and Rated Capacity Limiters.

All cranes with a maximum rated load capacity of 3 tons or more shall have a load indicator, rated capacity indicator, or rated capacity (load) limiter (see Introduction, Section V, Effective Date).

Rationale:

The NOTE “(see Introduction, Section V, Effective Date).” at the end of these three paragraphs can be misleading not to mention being untrue when it stays in the Volume from one edition to the next. Unfortunately, that does happen because neither ASME staff nor B30.5 has a system for removing these notes after they have lost their marginal usefulness.

A case in point: the wording in 5-1.9.9.1 Two-Blocking Features has been in the volumes at least since the 2000 edition. Reading the 2007 Volume (and following the note’s instructions) one would think these words did not become effective until March 7, 2009 when the 2007 Volume itself became effective; which turns out to be untrue.

Stated slightly differently, if someone received the 2007 volume on the same day it was issued they could surmise, by reading the note, that two-blocking features are not required until one year down the road which is, again, untrue.

Further, when a new volume is published it has a very effective style (that is a format) of imparting knowledge of changes to the volume and consequently the effective date of any new changes.

Conclusion:
These notes are never needed.
Proposal:

5-1.5.3 Travel Brakes and Locks

(c) On wheel-mounted cranes, brakes shall be provided to bring the machine to a stop. Braking performance shall comply with the requirements of SAE J1977.

(ed) On wheel-mounted cranes, means shall be provided to control completely the crane carrier travel when descending maximum grades specified by the manufacturer under maximum loading conditions. Brakes shall be provided to bring the machine to a stop on level ground within a distance of 32 ft (10 m) from a speed of 15 mph (6.7 m/s). Where long or steep grades are to be negotiated, a retarder or similar device should be provided. Means shall be provided to hold the machine stationary on the maximum grade for travel recommended by the manufacturer. Where travel brakes are operated by air pressure, means shall be provided for manually or automatically stopping the vehicle when the operating pressure falls below the specified minimum level.

(e) Where travel brakes are operated by air pressure, means shall be provided for manually or automatically stopping the vehicle when the operating pressure falls below the specified minimum level.

Also add to reference section as:


Rational:
To update the volume to reflect the most current technology on the subject, recommend changing the braking requirement to reflect the SAE standard. Separated primary requirement from requirements for travel on slopes and air operated systems.
Proposed revisions:

1. 5-3.1.3.2.1(j)(4) – Site Supervisor’s Responsibility

   Add new (j)(4) – Multiple Load Line Use

2. 5-3.1.3.2.2(j)(5)

   Add new (j)(5) – Multiple Load Line Use

*Rationale: Special lifting operation requires additional attention.*
Add new para. to Section 5-1.9: General Requirements. Revise 5-2.3.3 Adjustments and Repairs.

5-1.9.6 Replacement Parts

Replacement parts shall be manufactured by using at least the same design factors of the parts they are intended to replace.

Renumber existing 5-1.9.6 to 5-1.9.7 and so on.

5-2.3.3 Adjustments and Repairs

(d) Replacement parts or repairs shall have at least the original design factor. Repairs shall be made according to the manufacturer’s instructions if instructions are available. Absent instructions from the manufacturer, repairs shall be made according to the directions of a qualified person.

(c) Repairs shall return the crane to a condition of structural, mechanical and functional integrity to permit operation of the crane in accordance with the manufacturer’s published performance specifications.

(e)(f) Instructions shall be provided by the manufacturer for the removal of air from the hydraulic circuits.

Rationale: Much of the technical information needed for repairs is considered proprietary. This change is being made to reflect that there is an alternative avenue to have a crane repaired if the manufacturer is not available or is unwilling to participate.

NOTE* No change is being made to 5-2.3.1(b) which states: It is recommended that replacement parts be obtained from the original equipment manufacturer.
Propose adding a new frequent inspection item to the list under 5-2.1.2.

5-2.1.2 Frequent Inspection
(a)
(b)
(c) Structural members for damage or deformation. This inspection may be accomplished by observation from the ground without lowering the boom unless deficiencies are suspected.

Existing items (c) thru (i) would each be moved down to become (d) thru (j)

Rationale:
The fact that structural damage to members is only listed as a periodic (monthly to yearly) inspection requirement can be used as justification for ignoring obviously visible damage such as bent lacings during the daily inspection. Adding this item to the frequent (daily to monthly) list will alert users that obvious damage cannot be ignored.

B30.8 has had a corresponding frequent inspection requirement for decades. It states “8.2.1.2 (a)(2) all chords and lacings – visually inspected daily, when used.”
Proposal: This errata ballot is to correct the reference in section 5-3.4.5.5. Editorial.

(c) A qualified signalperson(s), whose sole responsibility is to verify that the clearances established in para. 5-3.4.5.4(a) are maintained, shall be in constant contact with the crane operator.

Explanation/Rationale:

The reference change is needed since a new 5-3.4.5.3 was added into the 2011 volume, 5-3.4.5.4 became 5-3.4.5.5, and the reference in 5-3.4.5.5 (c) was not updated.
Chapter 5-1
Construction and Characteristics

Section 5-1.1: LOAD RATINGS AND TECHNICAL INFORMATION
(a) The crane manufacturer shall provide load rating charts and information for all crane configurations for which lifting is permitted.
(b) The manufacturer shall provide instructions for the proper assembly, disassembly, operation, inspection and maintenance of the crane.
(c) The wire rope information listed in 5-1.1.4(b) shall be provided by the crane manufacturer for any ropes supplied with the crane. If wire rope is supplied by someone other than the crane manufacturer, the wire rope information shall be provided by the rope supplier.
(d) Under certain load conditions, torsion induced in a carbody or carrier frame can cause it to twist resulting in an opposite side outrigger or portion of a crawler lifting free from the supporting surface. This condition does not indicate a loss of stability when working within the limits of the load rating chart. If this condition exists for any crane, the manufacturer shall describe this condition and provide instructions for continued operation if such lift-off occurs.

5-1.1.1 Load Ratings – Where Stability Governs Lifting Performance
(a) The margin of stability for determination of load ratings, with booms of stipulated lengths at stipulated working radii for the various types of crane mountings, is shall be established by taking a percentage of the loads that will produce a condition of tipping or balance with the boom in the least stable direction relative to the mounting. With the indicated types of mounting under conditions stipulated in paras. 5-1.1.1(bc) and (cd), the load ratings shall not exceed the percentages for cranes given in Table 5-1.1.1-1
(b) Lifting in excess of any specified load or radius limit, in directions other than the least stable, may result in overload of the crane components before the crane begins to tip.
(c)(a) The following stipulations shall govern the application of the values in para. 5-1.1.1(a) for locomotive cranes:
(1) The crane shall be standing on a track that is level within 1% grade.
The radius of the load is the horizontal distance from a projection of the axis of rotation to the rail support surface, before loading, to the center of the vertical hoist line or tackle with the load applied.

(3) Tipping loads from which ratings are determined shall be applied under static conditions only, i.e., without the dynamic effect of lifting, lowering, swinging, or booming.

(4) The weight of all auxiliary handling devices such as lower load block, hooks, and slings shall be considered as part of the load.

(d) Stipulations governing the application of the values in para. 5-1.1.1(a) shall be in accordance with ANSI/SAE J765.

(e) The effectiveness of these preceding stability factors will be influenced by such additional factors as freely suspended loads, track, wind, or ground conditions, condition and inflation of rubber tires, boom lengths, proper operating speeds for existing conditions, and in general, careful and competent operation. Any standard attachments to the boom such as jibs and auxiliary or whip lines shall be considered as affecting stability and a deduction shall be made from load ratings in accordance with the manufacturer’s instructions. The effect of lights, pile lead adaptors, or other nonstandard attachments shall also be deducted from load ratings. All of these shall be taken into account.

(f) When cranes included in the scope of B30.5 are mounted on barges or pontoons, factors in addition to those stipulated in paras. 5-1.1.1 and 5-1.1.2 will influence the stability and structural competence. The load rating for a crane on a barge or pontoon shall be modified as recommended by the manufacturer or a qualified person (refer to ASME B30.8).

5-1.1.2 Load Ratings – Where Structural Competence Governs Factors Other Than Stability Govern Lifting Performance

(a) Load ratings for some radii are limited by the stability of the crane. However, in some of the operating ranges the rating may be limited by factors other than stability, such as the conditions described below. Load ratings may be based on structural, mechanical, hydraulic, electrical, pneumatic or limitations other than stability. The working margins associated with these load ratings vary depending on the crane configuration, the lifting radius and the specific system component that is affected.

(1) The loads that will produce a condition of tipping increase rapidly and reach extreme values as the minimum operating radius and tipping fulcrum of the machine are approached. At some radii, these loads are of such magnitude that they cannot be fully taken into account in the crane structure design without excessive weight, which would severely limit performance and ratings at the longer radii where most work is done. Hence, load ratings at some radii may be based on structural competence of the machine rather than stability.

(2) A nonsymmetrical mounting requires a higher loading to produce a condition of tipping in a direction other than that of least stability on which the load ratings are established. Therefore, if the crane specification includes additional ratings for directions other than the least stable, such ratings may also be governed by structural competence rather than stability. For such specified additional ratings, the work area...
shall be indicated; for those ratings that might be governed by tipping loads, the applicable percentage factors in para. 5-1.1.1(a) shall not be exceeded. (b) For all operational applications, the crane load ratings established by the manufacturer shall not be exceeded (refer to para. 5-3.2.1).

5-1.1.3 Load Rating Chart

(a) Load rating charts shall be marked with a serial number, part number, or other traceable method that allows for the matching of charts to a specific crane(s)

(b) A durable load rating chart(s) with legible letters and figures shall be provided in paper, plastic, metal or electronic display form with each crane and attached in a location accessible to the operator while at the controls. The data and information to be provided on these charts shall include, but not be limited to, the following:

(1) Unchanged
(2) Unchanged
(3) Where ratings are limited by structural, hydraulic, or factors other than stability, the limitations shall be shown and emphasized on the load rating charts.
(3) If crane specifications include ratings for lifting in directions other than the least stable, the work area limitations corresponding to such additional ratings shall be clearly defined.
(4) In areas where no load is to be handled, the work area figure and load rating chart shall so state.
(5) Recommended reeving for the hoist lines.
(6) The diameter, rotation resistant or non-rotation resistant, minimum breaking force, and the maximum allowable load per line for hoist ropes
(7) If the weight of any portion of the hoist rope is required to be considered as part of the crane’s lifted load, the method for determining such rope weight shall be provided.
(8) Cautions, warnings and notes relative to limitations on the load ratings
(9) Position of the gantry and requirements for intermediate boom suspension, where applicable
(10) Maximum loads permitted during the actual boom extending operation, and any limiting conditions or cautions, where applicable
(11) Tire pressure, where applicable

(b) 5-1.1.4 Additional Information

(a) In addition to the data required on the load rating chart, the following information shall be provided either with the load rating chart or in the operating manual.

(1) recommended parts of load hoist reeving, a reeving diagram and the rope length for all hoist drums on the crane
(2) recommended boom hoist reeving, reeving diagram, and length of rope where applicable
(3) cautions, warnings and notes relative to limitations on equipment, crane set up, and operating procedures, including indication of the least stable direction

(4) instructions for boom erection and conditions under which the boom, or boom and jib combinations may be raised or lowered

(5) whether the hoist holding mechanism is automatically controlled, manually controlled, whether free-fall is available, or any combination thereof

(6) the maximum telescopic travel length of each boom telescopic section

(7) whether sections are telescoped with power or manually

(8) the sequence and procedures for extending and retracting the telescopic boom section

(9) hydraulic relief valve settings specified by the manufacturer

(10) If an outrigger(s) or portion of a crawler is permitted to lift free of its supporting surface while working within the limitations specified on the load rating chart, instructions shall be provided for continued operation if when such lift off occurs.

(b) The information listed below shall be provided in legible form for the wire rope installed on each drum. A wire rope test certificate may be provided in lieu of the following individual items.

(1) Rope diameter (e.g. 1 inch, 25mm)
(2) Type and construction (e.g. filler wire, Seale, rotation resistant)
(3) Classification (e.g. 6X19, 34X7)
(4) Rope grade (IPS, EEIP, 1770)
(5) Rope core (e.g. IWRC, fiber core)
(6) Direction and lay (e.g. RRL, LAL)
(7) Minimum breaking force (e.g. 54 tons, 480 KN)
(8) Weight per foot
(9) Drum Designation
(10) Rope Length

**Rationale:** Previous discussions at the main committee and subcommittee have indicated that the mandatory distinction between load ratings limited by stability and those limited by other factors is often interpreted incorrectly. The subcommittee has removed the requirement regarding formatting of the load rating chart.

In addition the ballot addresses the issue of outrigger lift off in the volume.
Section 5-2.2.2 Rated Load Testing

(a) Test loads shall not exceed load ratings established by the manufacturer unless approved in writing by the manufacturer or a qualified person. If required, operational aids that function to restrict the capacity of the crane may be temporarily overridden to handle the test load during the performance of the test.

(b) Cranes with Altered, Repaired or Replaced Parts

(a) Prior to initial use, all cranes in which load-sustaining parts have been altered, replaced or repaired should be load tested by, or under the direction of, a qualified person who shall determine that the altered, replaced or repaired parts are adequately tested.

(1) The replacement of the rope is specifically excluded from this requirement. However, a functional test of the crane under a normal operating load should be made prior to putting the crane back in service.

(1) Test loads shall not exceed 110% of the manufacturer’s load ratings

(2) Written reports that show test procedures and confirm the adequacy of repairs or alterations shall be furnished by a designated appointed or authorized person.

(3) Operational aids that function to restrict the capacity of the crane may be temporarily overridden during the performance of the rated load test, if required, to handle the test load.

(c) Where rerating is necessary

(1) No crane shall be rerated in excess of the original load ratings unless such rating changes are approved by the crane manufacturer or a qualified person.

(2) Any crane being rerated in excess of the original load ratings shall be tested under the direction of the crane manufacturer or a qualified person to confirm compliance with the requirements of para. 5-1.1.1(c) and section 5-1.10.

(4) Crawler and wheel-mounted cranes shall be tested in accordance with paras. 5-1.1.1(a) and 5-1.1.1(c) for load ratings
where stability governs. Ratings governed by structural competence shall be established by the manufacturer or a qualified person and tested to 110% of the rating.

(2) Locomotive cranes shall be tested in accordance with paras. 5-1.1.1(a) and 5-1.1.1(b) of this Volume.

(3) The rerating test report shall be made available.

(c) If a Rated Load Test is required by an administrative or regulatory authority, the crane shall be tested in accordance with paras. 5-2.2.2(a) and (b).

**Rationale:** To discourage the practice of overloading a crane in the name of testing while simultaneously focusing any testing which may be performed on specific areas of concern. The proposed wording also eliminates the need to distinguish stability limited load ratings from load ratings limited by factors other than stability.
Chapter 5-3
Operation

5-3.2.1.1 Size of Load

(a) No crane shall be loaded beyond the specifications of the load rating chart; except for test purposes as provided in Section 5-2.2,

(b) ……

(c) If an outrigger(s) or portion of a crawler lifts free of its supporting surface while lifting within the limits of the specified load rating chart, refer to the instructions provided by the manufacturer for continued operation. If a lift off condition is not addressed by the manufacturer’s instructions, stop operation and consult the manufacturer or a qualified person for guidance.

Existing (c) and (d) become (d) and (e).

Rationale: To provide direction for users when an outrigger or crawler track lifts off the supporting surface.
5-1.12 – Translations of Safety-related Information and Control Designations

1. **Translation of non-English documentation into English.**

   a. The wording of written non-English safety information and manuals regarding use, inspection, and maintenance shall be translated into English by professional translation industry standards, which include, but are not limited to:

      i. Translation of the complete paragraph message, instead of word by word;
      ii. Grammatically accurate;
      iii. Respectful of the source document content without omitting or expanding the text;
      iv. Translate the terminology accurately;
      v. Reflect the level of sophistication of the original document.

   b. The finished translation shall be verified for compliance with paragraphs 1.a.i. through 1.a.v. by a qualified person having an understanding of the technical content of the subject matter.

   c. Pictograms used to identify controls shall be described in the manuals. The pictograms should comply with ISO 7000, ISO 7296, or other recognized source, if previously defined. The text of the description shall meet the criteria of paragraphs 1a and 1b. (Letters/numbers dependent on insertion point in the standard.)

2. **Any non-English documentation provided in addition to English shall be translated and reviewed in accordance with the requirements listed above.**

*Rationale: Global change.*
5-3.1.1(a)(2) – Operators

………. While operating the crane, the trainee must be under the direct supervision of a designated, qualified operator. Trainees shall be 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.

**Rationale**: Global change.
Section 5-0.3 – Personnel Competence

1. Persons performing the functions identified in this volume shall meet the applicable qualifying criteria stated in this volume and shall, through education, training, experience, skill and physical fitness, as necessary, be competent and capable to perform the functions as determined by the employer or employer’s representative.

2. Delete the definition for “appointed”.

3. Delete the definition for “authorized”.

4. Delete the definition for “designated person”.

Rationale: Global change.
Normal operating conditions:

**cab-or-station-operated cranes**: conditions during which a crane is performing functions within the manufacturer's operating recommendations. Under these conditions, the operator is at the operator control station described in the instructions for the crane, no other persons, except those designated, are to be on the crane.

**ground-or-floor-operated cranes**: conditions during which a crane is performing functions within the manufacturer's operating recommendations. Under these conditions, the operator is at the operating control devices that are mounted to the crane but operated with the operator off the crane; no other persons, except those appointed, are to be on the crane.

**remote-operated cranes**: conditions during which a crane is performing functions within the manufacturer's operating recommendations. Under these conditions, the operator is at the operating control devices that are not mounted to any part of the crane; no other persons, except those appointed, are to be on the crane.

Rationale

The term “operator control station” is a term used to describe where the operation of a crane is being performed. There is not a need to identify “normal operating conditions” using three different types of operator control stations. Also, the term “appointed” is changed to “designated” to be aligned with the global changes.
Proposal

Change 5-2.2.1 and 5-2.3.2 as follows:

5-2.2.1 Operational Tests

(a) Each new production crane shall be tested by the manufacturer to the extent necessary to ensure compliance with the operational requirements of this Section. Testing shall include, but is not limited to, the following:

(1) load lifting and lowering mechanisms
(2) boom extension and lowering mechanisms
(3) boom extension and retraction mechanism
(4) swinging mechanism
(5) travel mechanism
(6) safety devices
(6) operational aids

(b) Where the complete production crane is not supplied by one manufacturer, such tests shall be conducted at final assembly.

(c) Operational test results shall be made available.

5-2.3.2 Maintenance Procedure

(a) Unchanged
(b) Unchanged

(c) After adjustments and repairs have been made, the crane shall not be returned to service until all guards have been reinstalled, trapped air removed from the hydraulic system, safety devices reactivated, deactivated devices or systems restored to operating condition, and maintenance equipment removed.

Rationale:
There is no definition for Safety Devices in 5-0. Currently, an industry definition for safety devices does not exist and cannot attain consensus agreement.
5-3.1.3.1.1 – Owner

(g) using personnel that meet the requirements for a designated person as defined in para. 5-0.2.2 for the purposes of maintenance, repair, transport, assembly, and disassembly

(g) designating personnel in accordance with para. 5-0.3 for the purpose of maintenance, repair, transport, assembly and disassembly.

(h) using personnel that meet the requirements for a qualified or designated person as defined in para. 5-0.2.2, for inspections as required in Section 5-2.1

(h) designating personnel in accordance with para. 5-0.3 for inspections as required in Section 5-2.1.

5-3.1.3.1.2 – User

(g) using personnel that meet the requirements for a qualified or designated person as defined in para. 5-0.2.2 for inspections as required in Section 5-2.1

(h) designating personnel in accordance with para. 5-0.3 for inspections as required in Section 5-2.1.

(h) using personnel that meet the requirements for a designated person as defined in para. 5-0.2.2 for the purposes of maintenance, repair, transport, assembly, and disassembly

(g) designating personnel in accordance with para. 5-0.3 for the purpose of maintenance, repair, transport, assembly and disassembly.

5-3.1.3.2.1 – Site Supervisor

(l) ensuring that crane maintenance is performed by a designated person.

(l) ensuring that crane maintenance is performed by personnel that meet the competence requirements in para. 5-0.3.

5-3.1.3.2.2 – Lift Director
(n) ensuring that a crane’s load rigging is performed by designated personnel as defined in para. 5-0.2.2.
(n) ensuring that a crane’s load rigging is performed by personnel that meet the competence requirements in para. 5-0.3.

Editorial Note: clauses (g) and (h) in 5-3.1.3.1.2 were switched so they are presented in the same order as in 5-3.1.3.1.1

RATIONALE: Changes in response to Global Change 2011-3, to use the term “designated” only as the standard dictionary definition (“assigned by the employer or supervisor”), since competence was addressed by approved record 12-1599 which inserted the paragraph on Personnel Competence as Section 5-0.3.