ASME B56.1 INTERPRETATIONS

Replies to Technical Inquiries
January 2000 through October 2002

FOREWORD

This publication includes all of the written replies issued between the indicated dates by the Secretary, speaking for the ASME B56 Committee on Powered and Nonpowered Industrial Trucks, to inquiries concerning interpretations of technical aspects of ASME B56.1, Safety Standard for Low Lift and High Lift Trucks.

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 and 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.

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Interpretation: 1-61

Subject: ASME B56.1-1993, Mast Rollers

Date Issued: January 7, 2000

Question: Does the structural safety factor mentioned in para. 7.35.1(g) apply to the mast rollers?

Reply: Yes. Mast rollers would be one of the load-supporting elements in the system elevating the platform, and as such, would be subjected to this requirement.

Interpretation: 1-62

Subject: ASME B56.1-1988, Self-Dumping Hopper

Date Issued: January 7, 2000

Question: Does a two-yard capacity self-dumping hopper constitute either a forklift truck "attachment" or "removable" as defined by ASME B56.1-1988, Appendix B?

Reply: Yes. A self-dumping hopper is defined as a device that is mechanically engaged by the forks of the lift truck to allow the truck to handle loose materials in the hopper in order to dump those materials into some other container or location. Such a device allows the lift truck to handle loose and irregular materials that could not be handled with normal forks, and therefore is an "attachment."

Since the device is placed on the forks of the lift truck, and does not require disassembly of any portion of the lifting system to install or remove, it would also fall under the definition of a "removable attachment."

Interpretation: 1-63

Subject: ASME B56.1a-1995, Modifications

Date Issued: July 19, 2000

Question: Paragraph 4.2.1 states that "modifications and additions that affect capacity and safe operation shall not be performed without the manufacturer's prior written approval." Would a replacement seat suspension system, installed on a sit down, center-controlled counterbalanced forklift truck, require prior manufacturer's approval? This system is attached to the overhead guard posts by way of clamps. These clamps would not require holes in, nor any welding to, the overhead guard posts. The original seat would be removed from the truck mounting and attached to the suspension system.

Reply: Yes, for two major reasons. First, while the installation does not alter the overhead guard posts, the additional dynamic forces induced into the overhead guard posts by the weight of the seat system and operator needs to be evaluated to assure the continued integrity of the overhead guard support system.

Secondly, the operator restraint system required by para. 7.39 often is integral to the seat and/or seat structure. By remounting the attachment of the seat from the truck proper, to a separately attached structure, the integrity and continued appropriateness of the restraint system needs to be analyzed and approved by the original truck manufacturer.

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Interpretation: 1-64

Subject: ASME B56.1-1993, Wheel Chocks

Date Issued: June 8, 2001

Question: Please advise whether paras. 4.14.1, 4.19.4(b)(3), and 5.2.14 place an affirmative duty on a forklift operator to ensure that wheel chocks are in place before driving a forklift on and off a highway trailer.

Reply: Yes. Each paragraph provides instructions as to the duty of different individuals, the user, the trainer, and the operator. Please note that B56.1 has been re-issued as ASME B56.1-2000, and the language noted in the question remains the same as in ASME B56.1-1993.

Interpretation: 1-65

Subject: ASME B56.1-2000, Brake Performance

Date Issued: June 8, 2001

Question (1): Paragraph 7.15 regarding brake performance implies the standard is applicable to forklift trucks up to and including 31,750 kg loaded truck weight. What rules apply for forklift trucks above the specified 31,750 kg loaded truck weight limit?

Reply (1): Currently, the standard does not address brake performance issues for trucks with a loaded weight in excess of 31,750 kg. Manufacturers of forklift trucks that large need to consider the braking capabilities based on their engineering judgment. They may wish to look to extrapolating the existing standard as a guide.

Question (2): Paragraph 7.7 regarding tilting platform test for determining forklift truck ratings references Table 1, which indicates it is applicable to trucks up to and including 13,600 kg at 600 mm load center. What rules should apply for forklifts having capacities above the specified 13,600 kg limit?

Reply (2): Currently, the standard does not address tilt table testing for forklift trucks with a capacity in excess of 13,600 kg. Manufacturers of forklift trucks that large need to consider stability and rated capacities based on their engineering judgment. They may wish to look to extrapolating the existing standard as a guide.

Question (3): The Standard does not address tilt table test criteria for forklift trucks handling freight containers. What rules should apply for forklift trucks used to handle freight containers?

Reply (3): Texts for trucks used for this purpose are currently being considered and will be published when approved. Manufacturers of forklift trucks for handling freight containers need to consider stability and rated capacities based on their engineering judgment until the standard published approves test criteria.

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Interpretation: 1-66

Subject: ASME B56.1-2000, Operator Restraint Systems

Date Issued: June 8, 2001

Question (1): Referring to para. 7.40 (Operator Restraint Systems); is this paragraph intended to include sit-down, end-controlled reach trucks?

Reply (1): No. This requirement is only directed to the trucks defined in the paragraph, counterbalanced, center control, high lift trucks that have sit-down, nonelevating operator positions.

Question (2): If sit-down reach trucks are *not* included in para. 7.40, then what is the position of ASME B56.1 on restraint systems for these trucks?

Reply (2): The B56.1 Subcommittee has not addressed this specific configuration of truck as to a need for operator restraint systems. By omission, a restraint system would not be required. The analysis and decision for whether or not such a system should be included is left to the manufacturer.

Interpretation: 1-67

Subject: ASME B56.1-2000, High Lift Order Picker Rider Trucks

Date Issued: June 8, 2001

Question (1): Are high lift order picker rider trucks considered to be operator-up trucks?

Reply (1): Yes.

Question (2): Is it acceptable to use a work platform on a high lift order picker rider truck to transport personnel in addition to the operator for training or any other purpose?

Reply (2): Yes, provided that work platform meets all requirements of para. 7.36.3.

Question (3): If a work platform is attached to a high lift order picker rider truck, is it acceptable for personnel to leave the work platform when elevated and enter into the racking or other storage location?

Reply (3): No.

Question (4): Is a cut-off switch required for the work platform so that the high lift order picker rider truck is rendered inoperable if the additional personnel leave the platform while elevated?

Reply (4): Not applicable. See answer to Question (3).

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Interpretation: 1-68

Subject: ASME B56.1-2000, Maximum/Minimum Braking Performance

Date Issued: June 8, 2001

Question: Does B56.1 allow for lift trucks to stop with a consideration for the stability of the load and the safety of the operator? The concern is for trucks that stop too abruptly such that the load and/or operator is thrown forward when the brakes are applied automatically.

Reply: ASME B56.1-2000 specifies the minimum braking performance required for the design of the truck involved, see para. 7.15. It does not specify a design requirement addressing a maximum braking performance.

Interpretation: 1-69

Subject: ASME B56.1-2000, Warning Devices

Date Issued: June 8, 2001

Question (1): Paragraph 4.15.1 addresses warning devices. Is there a requirement to have backup alarms on forklift trucks?

Reply (1): No. Paragraph 4.15.1 deals with warning devices under operator control, not devices that are activated automatically. See para. 4.15.2 for requirements for additional devices that would include backup alarms.

Question (2): At the end of para. 4.15.1 it states, "or other sound-producing device(s)." Would this be a backup alarm?

Reply (2): No. Backup alarms are devices that automatically sound whenever the truck is in reverse, not devices that are activated only under operator control.

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Interpretation: 1-70

Subject: ASME B56.1-2000, Loads

Date Issued: July 12, 2001

Question (1): Paragraph 5.4.5 states in part, "When handling suspended loads: (a) do not exceed the truck manufacturer's capacity of the trucks as equipped for handling suspended loads." Does this provision imply that only trucks that have been rated by their manufacturer for handling suspended loads with certain lifting equipment may be used to handle suspended loads?

Reply (1): Yes.

Question (2): Paragraphs 5.4.5(b) through (e) offer further advice on safely handling suspended loads but are silent with respect to the type(s) of equipment that must or may be used to suspend the load. Is the direct attachment to, or placement of, rigging equipment (slings, shackles, rings, etc.) onto the forks of a lift truck to affect a suspended lift a permissible practice or a prohibited practice?

Reply (2): The Standard does not define what device may be used for handling suspended loads. When the manufacturer provides the approval and ratings for the handling of suspended loads, the particular device to be used will be defined in the written approval for using that device, as the weight and the applied load center of the device will enter into the determination of the rated capacity.

Question (3): Paragraph 4.2.1 states, "Modifications and additions that affect capacity or safe operation shall not be performed without the manufacturer's prior written approval." Does the handling of suspended loads by means of rigging equipment attached directly to the forks constitute a "modification or addition" that would require the user to seek the manufacturer's approval?

Reply (3): Yes.

Question (4): Paragraph 4.2.2 requires special markings "if the truck is equipped with a front-end attachment(s)..." Is the use of a fork-supported crane arm, manlift safety cage, or other removable attachment devices subject to this requirement?

Reply (4): Yes. Separate provisions are incorporated in the B56.1 Standard that address the requirements for elevated work platforms (see para. 7.35.3). Special markings are required on the work platform, not on the truck itself.

Interpretation: 1-71

Subject: ASME B56.1a-2001, Para. 7.6.4(i)(1), Tilting Platform Tests

Date Issued: May 20, 2002

Question: Are the values of 100 mm and 4 in. absolute numbers or are they nominal numbers that a reasonable manufacturing tolerance (±1.5 mm or 0.060 in.) may be applied to?

Reply: The 100 mm is a maximum dimension. Manufacturing and mounting tolerances of + 0 mm must be utilized. The 100 mm is the "official dimension" and the 4 in. dimension is used for reference only. The accurate equivalent to 100 mm is 3.94 in., not 4 in.

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Interpretation: 1-72

Subject: ASME B56.1-2000, Section 1, Scope

Date Issued: May 28, 2002

Question: What is the maximum size of a forklift covered by this Standard? Is there a particular size or height where a vehicle is defined as a crane as opposed to a lift truck?

Reply: There is no limit to the size or lift height of high lift industrial trucks covered in the B56.1 Standard. All high lift industrial trucks need to meet the various requirements of the Standard (stability, braking, etc.) no matter what capacity or lift height.

No high lift industrial truck intended for use on compacted, improved surfaces is considered to be a "crane," irrespective of truck style, lift height, or capacity.

Interpretation: 1-73

Subject: ASME B56.1-2000, Para. 6.2(b), Maintenance and Inspection

Date Issued: September 17, 2002

Question: Paragraph 6.2(b) states that only trained and authorized personnel shall be permitted to maintain, repair, adjust, and inspect industrial trucks.

What is ASME's definition of "trained and authorized personnel"? In the Glossary of Commonly Used Words and Phrases of the B56.1 Standard, nothing is listed for *trained*, but it does cover *authorized personnel* as persons designated by the user to operate or maintain the equipment.

Can shop-trained mechanics repair forklifts if they are not trained by the forklift manufacturer?

Reply: Training by the OEM is recommended, but not required; especially in the case where the OEM is no longer in business. As there are specific safety considerations that are unique to forklift trucks, the training, no matter from what source, should be from someone with training and experience on the brands/models being serviced.

Interpretation: 1-74

Subject: ASME B56.1-2000, Safety Factors or Pallet Forks, Fig. 12

Date Issued: October 9, 2002

Question: Is it the intent of the B56.1 Standard to maintain a safety factor of 3 to 1 on the yield strength of the pallet forks and linkage that raises these forks a few inches above the rollers that contact the floor, the same as that for cantilever forks?

Reply: The B56.1 Standard has a safety factor of 3 to 1 on all solid forks. There are no standards for nonsolid forks. There are no plans to set a standard for nonsolid forks at this time within B56.1.

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ASME B56.1-1993 INTERPRETATIONS

Replies to Technical Inquiries
January 1994 — January 1995

FOREWORD

This publication includes all of the written replies issued between the indicated dates by the Secretary, speaking for the ASME B56 Committee on Powered and Nonpowered Industrial Trucks, to inquiries concerning interpretations of technical aspects of ASME B56.1, Safety Standard for Low Lift and High Lift Trucks.

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.

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SAFETY STANDARD FOR LOW LIFT AND HIGH LIFT TRUCKS

PART I
INTRODUCTION

1 SCOPE

This Standard defines the safety requirements relating to the elements of design, operation, and maintenance of low lift and high lift powered industrial trucks controlled by a riding or walking operator, and intended for use on compacted, improved surfaces.

2 PURPOSE

The purpose of this Standard is to promote safety through the design, construction, application, operation, and maintenance of low lift and high lift powered industrial trucks. This Standard may be used as a guide by governmental authorities desiring to formulate safety rules and regulations. This Standard is also intended for voluntary use by others associated with the manufacture or use of low lift and high lift powered industrial trucks.

3 INTERPRETATION

3.1 Mandatory and Advisory Rules

To carry out the provisions of this Standard, all items in Parts II and III are mandatory except those including the word *should*, which are recommendations.

3.2 Classification of Approved Trucks

The word *approved* means the classification or listing of trucks as to fire, explosion, and/or electric shock hazard by a nationally recognized testing laboratory, i.e., a laboratory qualified and equipped to conduct examinations and tests such as those prescribed by Underwriters Laboratories, Incorporated.

3.3 Requests for Interpretation (a)

The B56 Committee will render an interpretation of any requirement of this Standard. Interpretations will be rendered only in response to a written request sent to the Secretary of the B56 Committee, ASME, 345 East 47th Street, New York, NY 10017. The request for interpretation shall be in the following format.

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

Edition: Cite the applicable edition of the pertinent standard 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 which are necessary to explain the question; however, they should not contain proprietary names or information.

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.

3.4 Metric Conversions (a)

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

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PART II
FOR THE USER

4 GENERAL SAFETY PRACTICES

4.1 Introduction

4.1.1 Part II contains requirements for the users of powered industrial trucks. Included are requirements for operator qualifications and training, operating safety rules, and maintenance practices.

4.1.2 Unusual operating conditions may require additional safety precautions and special operating instructions.

4.1.3 Supervision is an essential element in the safe operation of powered industrial trucks.

4.2 Modifications, Nameplates, Markings, and Capacity

4.2.1 Modifications and additions that affect capacity or safe operation shall not be performed without the manufacturer's prior written approval. Where such authorization is granted, capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly.

4.2.2 If the truck is equipped with front end attachment(s), including fork extensions, the user shall see that the truck is marked to identify the attachment(s), show the approximate weight of the truck and attachment combination, and show the capacity of the truck with attachment(s) at maximum elevation with load laterally centered.

4.2.3 The user shall see that all nameplates and caution and instruction markings are in place and legible.

4.2.4 The user shall consider that changes in load dimension may affect truck capacity.

4.2.5 Fork extensions shall be designed for the application.

(93) **4.2.6** When modifications involve rebuild and repair of the basic unit, they shall be made in accordance with the manufacturer's established criteria and procedures (see para. 6.2).

4.2.7 Where steering must be accomplished with one hand and a steering handwheel is used, a steering knob(s) or equivalent shall be used to promote safe and effective operation. The steering handwheel and knob configuration shall be of a design that will minimize the hazard from a spinning handwheel due to a road reaction feedback, or the steering mechanism shall be of a type that prevents road reactions from causing the steering handwheel to spin. The steering knob(s) shall be within the periphery of the steering handwheel.

4.2.8 Where steering can be accomplished with either hand, and the steering mechanism is of a type that prevents road reactions from causing the handwheel to spin (power steering or equivalent), steering knobs may be used. When used, steering knobs shall be of a type that can be engaged by the operator's hand from the top, and shall be within the periphery of the steering handwheel.

4.2.9 Batteries used in electric trucks shall comply with the minimum/maximum battery weight range shown on the truck nameplate.

4.3 Stopping Distance (Descending Grades)

4.3.1 When descending a grade, stopping distance will be greater than on level operation. Methods shall be provided to allow for this condition. Some methods are: reduce speed, limit loads, allow adequate clear space at the bottom of the grade, etc. (see para. 5.3.8).

4.3.2 Approximate theoretical stopping distance for a dry clean asphalt, brushed concrete, or equivalent surface may be determined from the following formula:

$$s = \frac{3.34v^2}{D - G}$$

or

$$s_1 = \frac{0.394v_1^2}{D - G}$$

where

s = distance to stop, in ft
D = drawbar drag, as a percent, as determined from Fig. 1 (e.g., 25 for 25%)
G = percent grade (e.g., 5 for 5%)
v = velocity, in mph
s_1 = distance to stop, in m
v_1 = velocity, in km/h

4.4 Stability

4.4.1 Experience has shown that high lift trucks that comply with the stability requirements stated in para. 7.6 are stable when properly operated. However, improper operation, faulty maintenance, or poor housekeeping may contribute to a condition of instability and defeat the purpose of the Standard.

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4.4.2 Some of the conditions that may affect stability are: ground and floor conditions, grade, speed, loading (trucks equipped with attachments behave as partially loaded trucks even when operated without a load on the attachment), battery weight, dynamic and static forces, and the judgment exercised by the operator.

4.4.3 On electric trucks, use only a battery having a service weight within the minimum/maximum range specified on truck nameplate. See para. 7.5.8 for information on battery weight.

4.4.4 Users shall give consideration to special operating conditions. The amount of forward and rearward tilt to be used is governed by the application. The use of maximum rearward tilt is allowable under certain conditions such as traveling with the load lowered. The stability of a truck as determined by the tests outlined in para. 7.6 does not encompass consideration for excessive tilt at high elevations, or the operation of trucks with excessive off-center loads.

4.4.5 Some users may decide to establish, for their own use, stability requirements that will vary from those in para. 7.6. However, the requirements in para. 7.6 should serve as a guide for the user, working with the manufacturer, in establishing his own more stringent requirements.

4.5 Safety Guards

4.5.1 Overhead Guards

4.5.1.1 High lift rider trucks, including order picker trucks, shall be fitted with an overhead guard manufactured in accordance with para. 7.27.

4.5.1.2 An overhead guard is intended to offer protection to the operator from falling objects but cannot protect against every possible impact. Therefore, it should not be considered a substitute for good judgment and care in loading, handling, storage, etc.

4.5.1.3 Under certain unusual operating conditions, a stronger guard, or one having openings of smaller size, may be specified by the user, working with the truck manufacturer.

4.5.1.4 Exceptions

(a) Where overhead obstructions limit the overall lowered height of the truck, normal overhead guard height and the vertical clearance under the guard may be reduced to permit operation with a guard.

(b) The user may operate the truck without the overhead guard, providing all of the following conditions are met:

(1) vertical movement of the lifting mechanism is restricted to 72 in. (1800 mm) or less from the ground;

(2) the truck will operate only in an area where:

(a) the bottom of the top tiered load is not higher than 72 in. (1800 mm) and the top is not more than 120 in. (3000 mm) from the ground when tiered;

(b) only stable (preferably interlocked, unitized, or containerized) loads are handled;

(c) there is protection against falling objects from adjacent high stack areas.

4.5.2 Load Backrest Extension. If the type of load presents a hazard, the user shall equip forklift trucks with a vertical load backrest extension manufactured in accordance with para. 7.26.

4.5.3 Operator Compartment Guards. For stand up, end controlled, narrow aisle trucks, more or less guarding than specified by paras. 7.28 and 7.34 may be required to enhance safe operation. Changes shall be determined through cooperation between the user and manufacturer.

4.6 Fuel Handling and Storage

4.6.1 The storage and handling of liquid fuels (such as gasoline and diesel fuel) shall be in accordance with ANSI/NFPA 505 and ANSI/NFPA No. 30.

4.6.2 The storage and handling of liquefied petroleum gas fuel shall be in accordance with ANSI/NFPA 505 and ANSI/NFPA 58.

4.7 Changing and Charging Storage Batteries for Electric Trucks

4.7.1 Battery changing and charging facilities and procedures shall be in accordance with ANSI/NFPA 505.

4.7.2 The charger connector shall not be plugged into the truck connector under any circumstances.

4.7.3 To avoid damage to equipment or injury to personnel, consult manufacturer's procedures when replacing contacts in any battery connector.

4.7.4 Failure to comply with specified nameplate battery weight range could result in truck instability.

4.8 Hazardous Locations

4.8.1 It shall be the responsibility of the user to determine the hazard classification of any particular atmosphere or location according to ANSI/NFPA 505.

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4.8.2 Powered industrial trucks operated in and batteries used in hazardous areas shall be approved and of the type required by ANSI/NFPA 505.

(a) Dependent on the proposed type of truck and area, approved trucks shall be built in compliance with one of the following:

(1) UL 558

(2) UL 583

4.8.3 Trucks and areas of use shall be marked in accordance with ANSI/NFPA 505.

4.9 Aisles and Obstructions

(a) **4.9.1** Permanent aisles, roadways or passageways, floors, and ramps shall be defined in some fashion or marked to conform with ANSI Z535.2.

4.9.2 Permanent or temporary protrusions of loads, equipment, material, and construction facilities into the usual operating area shall be guarded, clearly and distinctively marked, or clearly visible.

4.10 Lighting for Operating Areas

4.10.1 Controlled lighting of adequate intensity should be provided in operating areas in conformance with ANSI/IES RP7.

4.10.2 Where operating conditions indicate, the user shall be responsible for having the truck equipped with lights.

4.11 Control of Noxious Gases and Fumes

4.11.1 Internal combustion engines deplete the oxygen supply within enclosed spaces and may create a hazard unless the oxygen is replaced.

4.11.2 Ventilation shall be provided in enclosed areas where internal combustion powered equipment is used, to maintain an atmosphere that shall not exceed the contamination levels specified by the American Conference of Governmental Industrial Hygienists "Threshold Limit Values of Airborne Contaminants." This includes the atmosphere within the truck cab when a cab is provided.

4.11.3 Questions concerning degree of concentration and methods of sampling to ascertain the conditions should be referred to a qualified person.

4.12 Sound

Powered industrial trucks can contribute to the ambient sound in the work area. Consideration should be given to the sound exposure of personnel in the work area.

4.13 Dockboards (Bridge Plates)[2]

4.13.1 Portable and powered dockboards shall be marked conspicuously with their carrying capacity. The carrying capacity indicated shall not be exceeded.

4.13.2 Portable dockboards shall be secured in position, either by being anchored or by being equipped with devices that will prevent their slipping.

4.13.3 Handholds or other effective means shall be provided on portable dockboards to permit safe handling. Where possible, fork loops or lugs shall be provided for handling by fork trucks.

4.13.4 All types of dockboards shall have a high friction surface designed to reduce the possibility of employees or trucks slipping.

4.13.5 All types of dockboards shall be designed and maintained so that one end will have a substantial contact with the dock (or loading platform) and the other end with the transport vehicle to prevent the dockboard from rocking or sliding.

4.14 Trucks and Railroad Cars

4.14.1 When powered industrial trucks are driven on and off highway trucks or trailers, the brakes on the highway trucks or trailers shall be applied and wheel chocks or other positive mechanical means shall be used to prevent unintentional movement of highway trucks and trailers.

4.14.2 Provision shall be made to prevent railroad cars from being moved during loading and unloading. Wheel stops, hand brakes, or other recognized positive means shall be used to prevent movement during loading and unloading.

4.14.3 Whenever powered industrial trucks are driven on and off semitrailers not coupled to a tractor, supports may be needed to prevent upending or corner dipping.

4.14.4 Maintain a safe distance from the edge of ramps, platforms, or other similar working surfaces.

[2]Dockboard recommendations also apply to bridge plates.

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Interpretation: 1-36

Subject: ASME/ANSI B56.1-1988

Date Issued: January 18, 1994

Question: Certain trucks, typically high lift motorized hand trucks, may be equipped by the manufacturer with remote lift/lower controls which allow the truck to be used as a mobile, elevatable work table. This remote control device allows the operator to change the level of the forks while standing in the vicinity of those forks, and not at the traditional operator's position at the tiller handle or swing arm. Paragraph 5.2.11(g) tells the operator to lower engaging means before leaving the operator's position. Please provide clarification of this paragraph in light of the above described operation.

Reply: The intent of this provision is that when leaving an industrial truck unattended, that it be put in a neutral condition. In the situation described in the question, the truck is not unattended. In fact, while not the standard operating position because a remote operating device has been built into the controls of the truck, operating these secondary lift/lower controls constitutes being in an intended operating position and thus has no conflict with the identified paragraph. The operator is using the industrial truck in an intended mode of operation to accomplish the work assignment.

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Interpretation: 1-37

Subject: USAS B56.1-1969
ANSI/ASME B56.1-1983

Date Issued: January 24, 1994

Question (1): How was Graph A (page 6 of USAS B56.1-1969) derived?

Reply (1): This initial stability limit was established through extensive testing of trucks that were being built at that time. This empirical value resulted from the data collected of products known to have acceptable lateral travel stability characteristics. It is interesting to note that this value became the basic accepted value for other similar standards being developed around the world.

Question (2): Was there consideration of an occupant in the process of deriving the graph? If yes, what was the assumed weight of the occupant? If no, why was this not considered, as the lift truck cannot drive itself?

Reply (2): No. The weight of an operator compared to the total weight of the lift truck, and the effect of that weight on the center of gravity of the total system, is negligible and thus ignored in this test scenario.

Question (3): What dimensions were assumed (center of gravity, wheel base, etc.) to derive this graph?

Reply (3): Since the graph was developed through evaluation of empirical data, the dimensions of the equipment had no bearing on this derived value, they were the dimensions of product that existed and were known to provide acceptable stability.

Question (4): Why was the standard changed [as published in ANSI/ASME B56.1-1983, Section 7.7.2.4(c), Table 1] as to how to determine the platform slope in reference to the lateral stability test traveling?

Reply (4): The B56.1 subcommittee constantly reviews the content of the B56.1 standard. Through this review process, the standard is regularly revised, both through modifications to existing language and through the addition of new language which the subcommittee believes advances the general safety for the industry. When the 1983 Edition was being developed, the referenced portion of the Standard underwent some modifications which included an increase to the minimum slope values for the Lateral Traveling Test, Test 4.

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Question (5): What was the basis or rationale for these changes?

Reply (5): The rationale for the provisions of this standard reflects the consensus of the individuals in the categories of interest who approved the wording in the standard through ASME Committee and Supervisory Board actions and by public review.

Question (6): Was there consideration of an occupant in the process of deriving the graph? If yes, what was the assumed weight of the occupant? If no, why was this not considered as the lift truck cannot drive itself?

Reply (6): See Reply (2).

Question (7): Why are numbers produced for the platform slope for a given speed different when utilizing the graph in the 1969 edition vs. the table in the 1983 edition?

Reply (7): These differences reflect the changes incorporated in the minimum values for Test 4. The requirement changed from 15 + 1.75 V in 1969 to 15 + 2.25 V in 1983 (V in mph).

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Interpretation: 1-38

Subject: ASME/ANSI B56.1-1988

Date Issued: January 18, 1994

Question (1): Section 7.39 suggests a major change to operator restraints. Please clarify what is meant by this Section, with examples of suitable devices.

Reply (1): The inclusion of Section 7.39 does not suggest so much a change to operator restraints as it does a positive statement of the need for some device or system with the purpose of assisting the operator in reducing the risk of injury in an overturn accident. The means to accomplish this is purposely left nondescript. The Standard does not intend to provide design requirements for acceptable means to accomplish the intent. The Standard leaves it open to the ingenuity of the designer to accomplish that task in whatever way is felt by the manufacturer to best answer the need.

Question (2): This Section would tend to rule out the use of standard lap type seatbelts. Is this clause meant to include wings on the operator's seat or other such devices?

Reply (2): Standard lap type seatbelts, winged seats, and many other such devices would all be included in the definition of restraint device, system, or enclosure.

Question (3): How should existing counterbalanced type forklifts, which currently do not have such devices fitted, be treated?

Reply (3): The requirements published in the Standard become effective one year after their respective Date of Issuance. Section 7.39 became effective as of October 1, 1993. While there is no requirement to retrofit existing trucks to bring them into conformance, truck owners who wish to do so should contact the original truck manufacturer to obtain information and factory approval on the manufacturer's recommendation.

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Interpretation: 1-39

Subject: ANSI/ASME B56.1-1983

Date Issued: February 23, 1994

Question: With reference to Section 5.3.8, when operating motorized hand pallet trucks, what is the recommended procedure for traveling down ramps?

Reply: This question has previously been answered by Interpretation 1-34.

Interpretation: 1-40

Subject: ASME/ANSI B56.1-1992

Date Issued: August 26, 1994

Question: Does Fig. B5 define a truck configuration that would not permit a design wherein the operator stands with his shoulders parallel to the direction of travel?

Reply: No. The figures found at the back of the B56.1 Standard are intended to aid in the visualization of the general style of truck indicated in the Figure. There is no intent that the figures represent any specific design feature of the truck, such as how the operator would be positioned or where the controls are specifically located. Any design definition that is necessary is contained in the body of the Standard itself.

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Interpretation: 1-41

Subject: ASME B56.1-1993

Date Issued: January 6, 1995

Question: Is "an active operator protection device or system," as noted in para. 5.3.19 of ASME B56.1-1993, seatbelts?

Reply: A seatbelt would be an active operator protection device. Seatbelts would not be the only possible device or system.

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ASME B56.1 INTERPRETATIONS

Replies to Technical Inquiries
October 1992 — July 1993

FOREWORD

This publication includes all of the written replies issued between the indicated dates by the Secretary, speaking for the ASME B56 Committee on Powered and Nonpowered Industrial Trucks, to inquiries concerning interpretations of technical aspects of ASME B56.1, Safety Standard for Low Lift and High Lift Trucks.

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 and 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.

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Interpretation: 1-28

Subject: ASME B56 Standards

Date Issued: October 19, 1992

Question: What ASME or ANSI Standards would apply to a machine that fits the following description?

The machine is used for moving containers between railroad flatbeds and flatbed trailer trucks where these large containers are moved by rail and then by truck.

The function of this piece of equipment is to lift and move containers approximately 35 to 40 feet in length between flatbed railroad cars and flatbed trailer trucks. These containers are quite heavy, weighing between 60,000 and 70,000 lbs.

This piece of equipment is powered by a diesel engine. It has hydraulic cylinders to operate the arms that lift and lower the containers. The containers are either lifted by attachments to the top of the container or lifted by hanging hooks that connect to the underside of the containers.

The containers, once attached to this machine, are lifted only about 5 ft. normally.

This piece of equipment can travel at a speed of approximately 15 mph and is not normally used on highways but is used in railroad transfer cars.

Reply: It appears that the piece of equipment described above is a type of straddle carrier or van container handler. Neither of these types of vehicles is covered by the B56 Standards and we are not aware of any other standards that would apply.

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Interpretation: 1-29

Subject: ASME/ANSI B56.1-1988

Date Issued: December 16, 1992

Question: Does the B56.1 Standard require a kill switch in the bucket to enable the employee to shut down power to the truck when forklifts are being used as work platforms by attaching a bucket to the forks?

Reply: The consensus of the B56 Committee is that only those vehicles designed and supplied by a manufacturer for lifting personnel are to be used for that purpose. Requirements for those vehicles are included in the B56.1 Standard.

Recognizing that there are many users that will alter trucks for lifting personnel, and in the interest of safety, the standard also includes guidance for these modifications. These items in no way imply safety equivalents to those in vehicles designed for lifting and/or transporting personnel. A diligent user would be expected to clear their alterations with the truck manufacturer to assure that none of the design safety considerations have been negated.

The B56.1 Safety Standard for Low Lift and High Lift Trucks addresses the issue of trucks used to elevate personnel based on the construction and use of the truck. It covers a variety of requirements based on the design purpose of the truck being used. This includes trucks specifically designed to lift personnel as well as for trucks that have no built in provisions for lifting personnel. The latter situation applies in this case.

In the B56.1 Standard there are several references defining requirements for safe operation of lift trucks used in this manner. These include information on the construction of work platforms as well as for proper operational procedures.

Section 5 of the standard relates to Operating Rules and Practices. It includes the responsibilities of the operators for various operating condtions. Para. 5.2.24(i) states that "Whenever a truck *without* (emphasis added) controls that are elevated with the lifting carriage or forks is used to elevate personnel" the truck operator shall "remain in control position on the truck, or be available to operate controls." This is just one of several requirements for proper operation.

The purpose of this is to be able to protect the elevated personnel from any unplanned movement of the truck, including the operation of any "kill switch" function should the need arise. Therefore, in this mode of operation, a "kill switch" is not required on the work platform.

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Interpretation: 1-30

Subject: ASME/ANSI B56.1-1988

Date Issued: January 28, 1993

Question: Do the following types of machines fall under the scope of the B56.1 Standard or any other B56 Standard?

(1) a manually propelled truck equipped with a manually elevated fork carriage, and provided with a "glide" to ease negotation of stairways;

(2) a manually propelled truck as in (1) above, except having a power operated stair climbing feature;

(3) a manually propelled truck as in (1) above, except having a power elevated fork carriage;

(4) a manually propelled truck as in (3) above, except having a power operated stair climbing feature.

All four trucks are equipped with a load elevating mechanism, and all four are manually propelled for horizontal movement. In addition, the design intent of these trucks is to be tipped toward the operator for horizontal travel on the two rear wheels.

Reply: It is the view of the B56 Committee that these trucks are not covered under B56.1-1988.

It is also felt that these trucks are not covered by any existing B56 Standard. The scope of the new standard, ASME B56.10-1992, Safety Standard for Manually Propelled High Lift Industrial Trucks, clearly states that manually propelled high lift industrial trucks are *intended for use on level, improved surfaces*. It is clear that the types of trucks described above are not.

In addition, by definition of a manually propelled high lift industrial truck, there is an exclusion which states that an elevating-type hand truck whose design intent is to be tipped toward the operator for horizontal travel on the two rear wheels is not a manually propelled high lift industrial truck. It is clear that, for the types of trucks described above, the majority of horizontal movement is in the tipped position.

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Interpretation: 1-31

Subject: ASME/ANSI B56.1-1988

Date Issued: February 18, 1993

Question: Please clarify what is meant by "maintaining of the original overhang" as referred to in para. 7.6.5. Does the standard permit the carriage to be retracted to achieve the "original overhang?"

Reply: "Overhang" refers to the forward projection of the load beyond the center line of the load axle of the truck. In para. 7.6.5(a), a plumb line from the intersection of the front and top surfaces of the forks is taken as a measure of this overhang with the truck level, the mast vertical, and the fork top surfaces approximately 12 in. above the test platform.

When the forks and load are elevated to maximum height, with the platform still level, it may be found that the plumb line projection onto the platform has moved forward of its original location because of mast deflection. Para. 7.6.5(b) requires the change in projection to be eliminated by varying the tilt of the mast, or for fixed masts, by varying the tilt of the forks or carriage, within the design limits of the truck. This is what is meant by "maintaining the original overhang". No other adjustments are addressed; thus, reducing the reach of mast, carriage, or forks would not be permitted.

Para. 7.6.6(c) concerns the need to secure the test load against possible sliding on the forks. This may be especially important if the forks are tilted downward to maintain the overhang per para. 7.6.5(b).

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Interpretation: 1-32

Subject: ASME/ANSI B56.1-1988

Date Issued: March 4, 1993

Questions: (1) When is a load backrest required on a lift truck?
(2) What are the current regulations covering the use of a maintenance platform on a forklift?
(3) When are seatbelts, back-up alarms, flashing lights, and headlights required?
(4) Are there guidelines covering walkie trucks?
(5) Is a new identification tag required when retrofitting an attachment to a lift truck?

Replies: The wording of the inquiry refers to "regulations" while asking for interpretation of the B56.1 Standard. It is important to point out that while the Standard may be used as a guide by governmental authorities such as OSHA in formulating regulations, the Standard is not in itself a regulation.

The replies to the questions are as follows:

(1) The vertical shanks of the forks and/or the front face of the carriage are considered to be the load backrest. Paras. 4.5.2 and 5.2.18 cover situations where it is necessary to add a load backrest extension. Para. 7.26 describes design and construction requirements for such extensions.

(2) A maintenance platform is defined in the Glossary to be a work platform. Paras. 4.17, particularly 4.17.3, and 5.2.24 cover operation with a work platform, while para. 7.35, especially 7.35.3, is concerned with design and construction requirements of such platforms.

(3) Para. 5.3.19 provides in part that, "an active operator protection device or system, when provided, shall be used". Seat belts have been supplied by many manufacturers of counterbalanced, center control, high lift trucks which have a sit-down nonelevating operator position, in partial fulfillment of the provisions of para. 7.2.2 currently in effect. Seat belts will undoubtedly continue to be furnished as part of the means of compliance with the new para. 7.39, which is effective for trucks manufactured after December 31, 1993. Also, some manufacturers have instituted retrofit programs for the installation of operator restraints to older trucks. Installation or removal of an operator restraint device or system by the user would be a modification or addition requiring approval by the truck manufacturer per para. 4.2.1.

Paras. 4.10 and 4.15 describe the conditions to be considered by the user in determining what lighting and audible warning equipment is necessary for the intended operation. Para. 7.32 requires the truck manufacturer to provide an operator controlled sound-producing device, and allows for installation of other devices when requested by the user.

(4) Motorized hand trucks ("walkies") are included in the scope of the Standard. Para. 5.3.20 has particular application to such trucks, in addition to other provisions of the Standard. Also, para. 7.5.10 requires the truck manufacturer to label such trucks against riding.

(5) Paras. 4.2.1, 4.2.2, and 4.2.3 cover the retrofitting of attachments. This is a modification or addition which requires approval by the truck manufacturer, who can determine the appropriate values of weight and capacity to be included on a new or revised nameplate.

In addition to the replies above, it is suggested that the user refer to other Standards as necessary for trucks not covered by B56.1. These Standards are listed in the General section of each volume, on page 1.

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Interpretation: 1-33

Subject: ASME/ANSI B56.1-1988

Date Issued: May 17, 1993

Questions: (1) With regard to para. 7.12.5, can the steering described be termed "directional reverse steering"?

(2) For consistency of truck steering in a plant where trucks' directional forward steering is used, can a manufacturer whose trucks have the operator facing at right angles to the direction of travel offer directional forward steering?

Replies: (1) By analogy with the steering relationships of para. 7.12.4, the steering arrangement described in para. 7.12.5 could be termed "directional reverse steer".

(2) By analogy with the exception set forth in para. 7.12.4, it would seem reasonable to permit "directional forward steer" to be offered for consistency of operation in a plant. This matter will be taken up at a future meeting of the B56.1 Subcommittee.

Interpretation: 1-34

Subject: ASME/ANSI B56.1-1988

Date Issued: June 30, 1993

Questions: (1) What is the proper truck orientation for engaging a loaded motorized hand truck on a grade when walking?

(2) What is the proper truck orientation for ascending or descending grades less than 5% for loaded rider trucks?

Replies: (1) The intent of paras. 5.3.8(a) and (b) is to minimize the risk to the operator when traveling in the modes listed. For a walking operator, this would indicate that the operator should always be upgrade when the truck is loaded. This was stated in an earlier version, specifically ANSI/ASME B56.1-1975, para. 605G.2. This instruction was not carried over to the 1983 version. The B56.1 Subcommittee will address this item at its next meeting.

(2) If the grade is less than 5%, either orientation, load upgrade or downgrade, would be appropriate.

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Interpretation: 1-35

Subject: ASME/ANSI B56.1-1988

Date Issued: July 23, 1993

Questions: (1) For compliance to Section 7.5.8, who has the responsibility for marking the battery with the battery type identification, the truck manufacturer or the battery manufacturer?

(2) Is there a difference between a nameplate, as designated in the B56.1 Standard, and a decal as designated by UL 583?

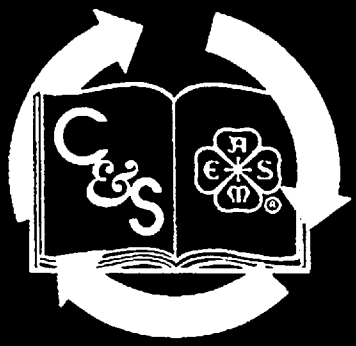
Replies: (1) Section 7.5.8 identifies information which is associated with the battery, irrespective of the source of the truck. The information requested is that which the battery manufacturer, not the truck manufacturer, is in a position to produce. Additionally, many batteries are sold independent of the truck, either with new truck sales or for battery replacement purposes.

The battery manufacturer is responsible for marking the information on the battery.

The truck manufacturer is responsible for identifying the type battery required for the truck.

(2) The information requested in the B56.1 Standard is the same as required in Section 60 of UL 583 as published in September 1991. The B56.1 Standard does not intend to impose any requirement not specified by UL. Therefore, any method for legibly and permanently marking the battery which meets UL 583 would be in conformance with the B56.1 Standard.

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