AN AMERICAN NATIONAL STANDARD

POWERED AND NONPOWERED INDUSTRIAL TRUCKS

ASME B56.9a-1992

ADDENDA

to

ASME B56.9–1992
SAFETY STANDARD FOR OPERATOR CONTROLLED INDUSTRIAL TOW TRACTORS

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

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ASME B56.9a-1992

Following approval by the ASME B56 Committee and ASME, and after public review, ASME B56.9a-1992 was approved by the American National Standards Institute on December 8, 1992.

Addenda to the 1992 edition of ASME B56.9 are issued in the form of replacement pages. Revisions, additions, and deletions are incorporated directly into the affected pages. It is advisable, however, that this page, the Addenda title and copyright pages, and all replaced pages be retained for reference.

SUMMARY OF CHANGES

This is the first Addenda to be published to ASME B56.9-1992.

Replace or insert the pages listed. Changes given below are identified on the pages by a margin note, (a), placed next to the affected area. The pages not listed are the reverse sides of the listed pages and contain no changes.

Page	*Location*	*Change*
15	Appendix A	Following references revised: ANSI/NFPA 30 ANSI/IES RP7

SPECIAL NOTE:

The Interpretation to ASME B56.9-1992 issued in November 1991 is included in this Addenda as a separate section for the user's convenience. The Interpretation, however, is not part of this Addenda or of the Standard itself.

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APPENDIX A (92)
REFERENCES

(This Appendix is an integral part of ASME B56.9-1992 and is placed after the main text for convenience.)

The following are safety standards and codes (unless otherwise noted) referenced within this Standard. It is the intent of this Standard to refer to the standards and codes listed below in their latest editions when they are referenced within the Standard.

	ANSI Z94.0-1989	Industrial Engineering Terminology (not a safety standard)
(a)	ANSI/NFPA 30-1990	Flammable and Combustible Liquids Code
	ANSI/NFPA 58-1989	Liquefied Petroleum Gases, Storage and Handling of
	ANSI/NFPA 505-1987	Powered Industrial Trucks, Type Designations, Areas of Use, Maintenance and Operation
	UL 558 (latest revision)	Industrial Trucks, Internal Combustion Engine-Powered
	UL 583 (latest revision)	Industrial Trucks, Electric-Battery-Powered
	ANSI Z53.1-1979	Marking Physical Hazards
(a)	ANSI/IES RP7-1990	Industrial Lighting, Practice for (not a safety standard)

The following are related documents:

ASME/ANSI B56.1-1988 (including Addenda)	Safety Standard for Low lift and High Lift Trucks
ASME/ANSI B56.5-1988 (including Addenda)	Safety Standard for Guided Industrial Vehicles

Copies of the publications listed above are available from:

ANSI	American National Standards Institute, Inc. 11 W. 42nd Street, New York, NY 10036
ASME	The American Society of Mechanical Engineers 345 E. 47th Street, New York, NY 10017 ASME Order Department 22 Law Drive, Box 2300, Fairfield, NJ 07007-2300
NFPA	National Fire Protection Association Batterymarch Park, Quincy, MA 02269
UL	Underwriters Laboratories, Inc. 333 Pfingsten Road Northbrook, IL 60062

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Interpretation: 9-2

Subject: ASME/ANSI B56.9-1987

Date Issued: April 29, 1991

Question (1): With regard to para. 7.11.7, do both the positive and negative battery leads need to be disconnected?

Reply (1): Paragraph 7.11.7 reads: ''Means readily accessible to the operator in the normal operating position shall be provided to shut off all power to the tow tractor.''

The intent of this paragraph is to provide the operator with an emergency means to disconnect all power in the event of a fault or malfunction of the tow tractor. Many manufacturers accomplish this with a battery connector, often in conjunction with a handle, which disconnects both the positive and negative leads. This ensures that ''all'' power to the tow tractor is shut off.

Question (2): Can a solenoid be used as the disconnect?

Reply (2): The system design must ensure that ''all'' power can be shut off in an emergency situation. The design must guarantee all power is disconnected to the tractor or truck.

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ASME B56.9 92 ■ 0759670 0531141 607 ■

Interpretation: 9-3

Subject: ASME/ANSI B56.9-1987 and USAS B56.1-1969

Date Issued: November 12, 1991

Question (1): Is there an interpretation or quantitative definition of the term "speed greater than inching speed" as used in Section 4.13 of USAS B56.1-1969?

Reply (1): The Committee is not aware of any interpretation or quantitative definition of the term "speed greater than inching speed" having been made subsequent to its incorporation in Section 4.13 of USAS B56.1-1969. It has been the usual practice of the Committee not to define words or phrases thought to be sufficiently defined in commonly available dictionaries. For example, The American Heritage Dictionary, Second College Edition: "inch . . . to move or cause to move slowly or by small degrees." The Random House Dictionary of the English Language, Unabridged Edition: "inch . . . to move by inches or small degrees: *We inched our way along the road.*"

Question (2): What is the rationale for the removal of the reference to inching speed from, and the inclusion of reference to a positive neutral in, the 1983 Edition of B56.1?

Reply (2): 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. It may be worth noting that when ANSI/ASME B56.1-1983 said, in part, in para. 7.19.1, "A positive neutral position or control should be provided," a new para. 7.19.2 was also included which said, "Engine speed should be no greater than low idle unless the acceleration control has been intentionally actuated." By the use of the word "should," both these items were recommendations rather than requirements.

Question (3): Why did para. 7.12.1 of the 1987 Edition of B56.9 include reference to "positive neutral" and not to "inching speed"?

Reply (3): Where possible, the B56.9 Subcommittee adopts the wording of the B56.1 Standard to try to maintain some uniformity among the B56 Standards. In this instance, it was the consensus of the Subcommittee members that the adoption of the B56.1 wording was applicable and proper.

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STD.ASME B56.9-ENGL 1992 ■ 0759670 0619959 485 ■

ASME B56.9-1992

(REVISION OF ASME/ANSI B56.9-1987)

POWERED AND NONPOWERED INDUSTRIAL TRUCKS

REAFFIRMED 2000

FOR CURRENT COMMITTEE PERSONNEL
PLEASE SEE ASME MANUAL AS-11

Safety Standard for Operator Controlled Industrial Tow Tractors

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

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AN AMERICAN NATIONAL STANDARD

POWERED AND NONPOWERED INDUSTRIAL TRUCKS

Safety Standard for Operator Controlled Industrial Tow Tractors

ASME B56.9-1992

(REVISION OF ASME/ANSI B56.9-1987)

The American Society of Mechanical Engineers

345 East 47th Street, New York, N.Y. 10017

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Date of Issuance: February 15, 1992

The 1992 edition of this Standard is being issued with an automatic addenda subscription service. The use of an addenda allows revisions made in response to public review comments or committee actions to be published on a regular yearly basis; revisions published in addenda will become effective 1 year after the Date of Issuance of the addenda. The next edition of this Standard is scheduled for publication in 1997.

ASME issues written replies to inquiries concerning interpretations of technical aspects of this Standard. The interpretations will be included with the above addenda service. Interpretations are not part of the addenda to the Standard.

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FOREWORD (92)

(This Foreword is not part of ASME B56.9-1992.)

On September 28, 1979, the B56.9 Subcommittee started work on this Standard at the direction of the B56 Committee and sponsor, The American Society of Mechanical Engineers (ASME).

Following a number of work sessions and ballots within the Subcommittee and the B56 Committee, it was submitted for B56 Committee ballot, public review, and ASME approval. After obtaining such approval, the Standard was submitted to the American National Standards Institute, Inc. (ANSI). ANSI approval to issue the first edition of this Standard as American National Standard B56.9 was granted on August 6, 1987.

Following approval by the B56 Committee and ASME, and after public review, ASME B56.9-1992 was approved by ANSI on January 3, 1992.

The Standard and subsequent revisions published by addenda shall become effective one year after their respective date of issuance. Part III applies only to tow tractors manufactured after the effective date. Revisions published by addenda to Part III apply only to tow tractors manufactured after the effective date of the addenda.

Safety codes and standards are intended to enhance public health and 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.

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Powered and Nonpowered Industrial Trucks

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ASME B56.9-1992
SUMMARY OF CHANGES

The 1992 edition of ASME B56.9 includes all revisions and corrections introduced in B56.9a-1988, B56.9b-1989, and B56.9c-1991, as well as the following changes, identified by **(92)**:

Page	*Location*	*Change*
iii	Foreword	Revised
1	General	(1) Third paragraph revised (2) Footnote revised
9	6.2.16	Revised
15	Appendix A	(1) Reference to Z94.0 revised (2) Address of ANSI revised

SPECIAL NOTE:

The Interpretations to ASME B56.9 issued in 1990 and 1991 are included in this edition for the user's convenience. The Interpretations, however, are not part of this Standard or its Addenda.

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POWERED AND NONPOWERED INDUSTRIAL TRUCKS

(92) GENERAL

This Standard is one of a series that has been formulated with The American Society of Mechanical Engineers as sponsor in accordance with the Accredited Organization method, the procedures accredited by The American National Standards Institute, Inc., and the following scope.

> Establishment of the safety requirements relating to the elements of design, operation, and maintenance; also the standardization relating to principal dimensions to facilitate interchangeability, test methods, and test procedures of powered and nonpowered industrial trucks (not including vehicles intended primarily for earth moving or over-the-road hauling); and to maintain liaison with ISO in all matters pertaining to powered and nonpowered industrial trucks.

One purpose of the Standard is to serve as a guide to governmental authorities having jurisdiction over subjects within the scope of the Standard. It is expected, however, that the Standard will find a major application in industry, serving as a guide to both manufacturers of equipment and to the purchasers and users of the equipment.

For convenience, Standards for Powered and Nonpowered Industrial Trucks have been divided into separate volumes:

Safety Standards

B56.1 Low Lift and High Lift Trucks
B56.5 Guided Industrial Vehicles
B56.6 Rough Terrain Forklift Trucks
B56.7 Industrial Crane Trucks
B56.8 Personnel and Burden Carriers
B56.9 Operator Controlled Industrial Tow Tractors
B56.10 Manually Propelled High Lift Industrial Trucks[1]

Standardization Standards

B56.11.1 Double Race or Bi-Level Swivel and Rigid Industrial Casters
B56.11.3 Load Handling Symbols for Powered Industrial Trucks
B56.11.4 Hook-Type Forks and Fork Carriers for Powered Industrial Forklift Trucks
B56.11.5 Measurement of Sound Emitted by Low Lift, High Lift, and Rough Terrain Powered Industrial Trucks
B56.11.6 Evaluation of Visibility From Powered Industrial Trucks[1]

Safety standards that were previously listed as B56 volumes but now have different identification due to a recent change in standards development assignments are as follows.

NFPA 505 Fire Safety Standard for Powered Industrial Trucks — Type Designations, Areas of Use, Maintenance and Operation (formerly B56.2)
UL 583 Standard for Safety for Electric-Battery-Powered Industrial Trucks (formerly B56.3)
UL 558 Standard for Safety for Internal Combustion Engine-Powered Industrial Trucks (formerly B56.4)

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

The use of powered and nonpowered industrial trucks is subject to certain hazards that cannot be completely eliminated by mechanical means, but the risks can be minimized by the exercise of intelligence, care, and common sense. It is therefore essential to have competent and careful operators, physically and mentally fit, thoroughly trained in the safe operation of the equipment and the handling of the loads. Serious hazards are overloading, instability of the load, obstruction to the free passage of the load, poor maintenance, and using equipment for a purpose for which it was not intended or designed.

[1]B56.10 and B56.11.6 are in the developmental stage.

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Suggestions for improvement of these Standards, especially those based on actual experience in their application, shall be submitted to the Secretary of the B56 Committee, ASME, United Engineering Center, 345 East 47th Street, New York, NY 10017.

Comments shall be written in accordance with the following format:

(*a*) specify paragraph designation of the pertinent standard;

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

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

(*d*) submit suggested changes to more than one paragraph in the order that they appear in the standard.

The appropriate B56 Subcommittee will consider each suggested revision at its first meeting after receipt of the suggested revision(s).

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SAFETY STANDARD FOR OPERATOR CONTROLLED INDUSTRIAL TOW TRACTORS

Part I
Introduction

1 SCOPE

This Standard defines the safety requirements relating to the elements of design, operation, and maintenance of operator controlled industrial tow tractors up to and including 15,000 lb (66,750 N) maximum rated drawbar pull.

2 PURPOSE

The purpose of this Standard is to promote safety in the design, construction, application, operation, and maintenance of operator controlled industrial tow tractors.

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 operator controlled industrial tow tractors.

3 INTERPRETATION

3.1 Mandatory and Advisory Roles

To carry out the provisions of this Standard, the word *shall* is to be understood as mandatory and the word *should* as recommended.

3.2 Classification of Approved Tow Tractors

The word *approved* means the classification or listing of tow tractors as to fire, explosion, and 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, Inc., and Factory Mutual Research Corp.

3.3 Terminology

For terminology not included in Appendix B, refer to ANSI Z94.0.

3.4 Requests for Interpretation

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, United Engineering Center, 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 which 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.

3.5 Metric Conversions

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

Part II
For the User

4 GENERAL SAFETY PRACTICES

4.1 Introduction

4.1.1 Like other vehicles, tow tractors can cause injury if improperly used or maintained.

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4.1.2 Part II contains broad safety standards applicable to tow tractor operation. Only authorized operators trained to adhere strictly to the operating instructions stated in Section 5 shall be permitted to operate tow tractors. Unusual operating conditions may require additional safety precautions and special operating instructions.

4.2 Modifications, Nameplates, Marking, and Capacity

4.2.1 Modifications and additions which affect capacity or safe operation shall not be performed by the user 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 The user shall see that all nameplates, caution, and instruction markings are in place and legible.

4.2.3 The user shall consider that changes in load(s), dimension(s), coupling(s), and position(s), may affect capacities.

4.3 Stopping Distance

4.3.1 General. The tow tractor rated brake drawbar drag is based on dry level floor operation with specified coupler height. The actual brake drawbar drag capability on a particular surface, as well as speed, load, and grades, affect stopping distance. The determination of stopping distance depends on many factors, such as other vehicle and pedestrian traffic, clearances for evasive action, and stability of loads on trailers. Changes in weather and surface conditions affect the amount of brake drag force available, and speeds and loads should be adjusted accordingly.

4.3.2 Descending Grades

(*a*) 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: reducing speed, limiting loads, allowing adequate clear space at the bottom of the grade, etc. (See para. 5.3.7.)

(*b*) Approximate theoretical stopping distance for a dry clean asphalt, brushed concrete, or equivalent surface may be determined from the following formulas:

$$s = \frac{3.34v^2}{D_1 - G}$$

or

$$s_1 = \frac{0.394v_1^2}{D_1 - G}$$

where

s = distance to stop, ft
D_1 = drawbar drag as a percent of gross tractor weight (e.g., 25 for 25%)
G = percent grade (e.g., 5 for 5%)
v = velocity, mph
s_1 = distance to stop, m
v_1 = velocity, km/h

4.4 Fuel Handling and Storage

4.4.1 The storage and handling of liquid fuels (such as gasoline and diesel fuel) shall be in accordance with ANSI/NFPA 505 and ANSI/NFPA 30.

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

4.5 Changing and Charging Storage Batteries for Electric Tow Tractors

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

4.5.2 The charger connector shall not be plugged into the tow tractor connector under any circumstances.

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

4.6 Hazardous Locations

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

4.6.2 Dependent on the proposed type of tow tractor and area, approved tow tractors shall be built in compliance with UL 558 or UL 583.

4.6.3 Tow tractors and areas of use shall be marked in accordance with ANSI/NFPA 505.

4.7 Aisles and Obstructions

4.7.1 Permanent aisles, roadways or passageways, floors, and ramps shall be defined in some fashion or marked to conform with ANSI Z53.1.

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

4.8 Lighting for Operating Areas

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

4.8.2 Where operating conditions indicate, the user shall be responsible for having the tow tractor equipped with lights.

4.9 Control of Noxious Gases and Fumes

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

4.9.2 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 in "Threshold Limit Values of Airborne Contaminants." This includes the atmosphere within the tow tractor cab when a cab is provided.

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

4.10 Sound

Tow tractors can contribute to the ambient sound in the work area. Consideration should be given to the sound exposure of personnel in the work area.

4.11 Warning Device

4.11.1 Every tow tractor shall be equipped with an operator controlled horn, whistle, gong, or other sound-producing device(s).

4.11.2 The user shall determine if operating conditions require the tow tractor to be equipped with additional sound-producing or visual (such as lights or blinkers) devices, and be responsible for providing and maintaining such devices.

4.12 Relocating Tow Tractors

4.12.1 When utilizing lifting equipment such as elevators, cranes, ship hoisting gear, etc., to relocate a tow tractor, the user shall ensure that the capacity of the hoisting equipment being used is not exceeded.

4.12.2 Before entering or leaving an elevator with a tow tractor, all personnel other than the operator should leave the elevator.

4.13 Steering

4.13.1 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 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. A steering knob(s) shall be within the periphery of the steering handwheel.

4.13.2 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 is engaged by the operator's hand from the top, and shall be within the periphery of the steering handwheel.

4.14 Operator Qualifications

Only trained and authorized personnel shall be permitted to operate a tow tractor. Operators of tow tractors shall be qualified as to visual, auditory, physical, and mental ability to operate the equipment safely according to para. 4.15, and all other applicable parts of Section 4.

4.15 Operator Training

4.15.1 The user shall ensure that operators understand that safe operation is the operator's responsibility. The user shall also ensure that operators are knowledgeable of, and observe, the safety rules and practices in paras. 5.2, 5.3, and 5.4.

4.15.2 An effective operator training program should center around the user company's policies, operating conditions, and tow tractors. The program should be presented completely to all new operators and not condensed for those claiming previous experience.

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4.15.3 Information on operator training is available from several sources, including tow tractor manufacturers.

4.15.4 An operator training program should consist of the following:

(*a*) careful selection of the operator, considering physical qualifications, job attitude, and aptitude;

(*b*) emphasis on safety of stock, equipment, operator, and other personnel, including citing of rules and why they were formulated;

(*c*) basic fundamentals of tow tractor, trailer, and component design as related to safety, i.e., loading, mechanical limitations, drawbar pull, stopping ability, stability, etc.;

(*d*) introduction to equipment, control locations, and functions, explanation of how they work when used properly, and problems when used improperly;

(*e*) supervised practice designed to simulate actual operations, i.e., trailer coupling, loading, etc., which the operator will be authorized to perform;

(*f*) oral, written, and operational performance tests and evaluations during, and at completion of, the course;

(*g*) refresher courses, which may be condensed versions of the primary course, and periodic, "on-the-job" operator evaluation;

(*h*) understanding of nameplate data, operator instructions, and warning information appearing on the tow tractor.

5 OPERATING SAFETY RULES AND PRACTICES

5.1 Operator Responsibility

5.1.1 Safe operation is the responsibility of the operator.

5.1.2 This equipment can be dangerous if not used properly. The operator shall develop safe working habits and also be aware of hazardous conditions in order to protect himself, other personnel, the tow tractor, and other material.

5.1.3 The operator shall be familiar with the operation and function of all controls and instruments before undertaking to operate the tow tractor.

5.1.4 Before operating any tow tractor, tow tractor operators shall have read and be familiar with operator's manual for the particular tow tractor being operated, and they shall also abide by the safety rules and practices in paras. 5.2, 5.3, and 5.4.

5.2 General

5.2.1 Before starting to operate the tow tractor:

(*a*) be in operating position;

(*b*) place directional controls in neutral;

(*c*) disengage clutch on manual transmission-equipped tow tractors, or apply brake on power shift or automatic transmission-equipped tow tractors and electric tow tractors;

(*d*) start engine or turn switch of electric tow tractors to the "on" position.

5.2.2 Do not start or operate the tow tractor from any place other than from the designated operator's position.

5.2.3 Keep hands and feet inside the operator's designated area or compartment on rider tow tractors. Do not put any part of the body outside the operator compartment of the tow tractor, except while engaging hitch.

5.2.4 Understand tow tractor limitations and operate the tow tractor in a safe manner so as not to cause injury to any personnel. Safeguard pedestrians at all times. Do not drive a tow tractor up to anyone standing in front of an object. Exercise particular care at cross aisles, doorways, and other locations where pedestrians may step into the path of travel of the tow tractor.

5.2.5 Do not permit passengers to ride on tow tractors unless a safe place to ride has been provided by the manufacturer. Motorized hand tow tractors shall not be ridden unless they are of the hand/rider design.

5.2.6 A tow tractor is attended when the operator is less than 25 ft (7.6 m) from the tow tractor, which remains in his view.

5.2.7 A tow tractor is unattended when the operator is more than 25 ft (7.6 m) from the tow tractor, which remains in his view, or whenever the operator leaves the tow tractor and it is not in his view.

5.2.8 Before leaving the operator's position:

(*a*) bring tow tractor to a complete stop;

(*b*) place directional controls in neutral;

(*c*) apply the parking brake.

In addition, when leaving the tow tractor unattended:

(*d*) stop the engine or turn off the controls;

(*e*) if the tow tractor must be left on an incline, block the wheels.

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

5.2.10 In areas classified as hazardous, use only tow tractors approved for use in those areas.

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5.2.11 Report all accidents involving personnel, building structures, and equipment to the supervisor or as directed.

5.2.12 Do not add to, or modify, the tow tractor.

5.2.13 Do not block access to fire aisles, stairways, and fire equipment.

5.3 Traveling

5.3.1 Observe all traffic regulations, including authorized plant speed limits. Under normal traffic conditions, keep to the right. Maintain a safe distance, based on speed of travel, from the vehicle ahead, and keep the tow tractor under control at all times.

5.3.2 Yield the right of way to pedestrians and emergency vehicles such as ambulances and fire trucks.

5.3.3 Do not pass another vehicle traveling in the same direction at intersections, blind spots, or at other dangerous locations.

5.3.4 Slow down and sound the audible warning device(s) at cross aisles and other locations where vision is obstructed.

5.3.5 Cross railroad tracks at an angle wherever possible. Do not park closer than 6 ft (1.8 m) to the nearest rail of a railroad track.

5.3.6 Always face in the direction of travel. Keep a clear view of the path of travel and observe for other traffic, personnel, and safe clearances.

5.3.7 Ascend or descend grades slowly, and with caution. Avoid turning, if possible, and use extreme caution on grades, ramps, or inclines; normally travel straight up and down.

5.3.8 Under all travel conditions, operate the tow tractor at a speed that will permit it to be brought to a stop in a safe manner.

5.3.9 Make starts, stops, turns, or direction reversals in a smooth manner so as not to shift load.

5.3.10 Do not indulge in stunt driving or horseplay.

5.3.11 Slow down for wet and slippery floors.

5.3.12 Before driving over a dockboard or bridge plate, be sure that it is properly secured. Drive carefully and slowly across the dockboard or bridge plate, and never exceed its rated capacity.

5.3.13 Do not drive tow tractors onto any elevator unless specifically authorized to do so. Approach elevators slowly, and then enter squarely after the elevator car is properly leveled. Once on the elevator, neutralize the controls, shut off power, and set brakes. It is advisable that all other personnel leave the elevator before a tow tractor is allowed to enter or leave.

5.3.14 Avoid running over loose objects on the roadway surface.

5.3.15 When negotiating turns, reduce speed to a safe level consistent with the operating environment, and turn the hand steering mechanism in a smooth, sweeping motion. Except when maneuvering at a very low speed, turn the hand steering mechanism at a moderate, even rate.

5.3.16 Motorized hand tow tractor operation requires special safety considerations as follows:

(*a*) never operate with greasy hands;
(*b*) foot protection is recommended;
(*c*) do not ride on the tow tractor;
(*d*) keep feet clear of tow tractor frame while operating;
(*e*) always keep hands and fingers inside the protected area of the control handle;
(*f*) never travel at a speed greater than normal walking speed [approximately 3.5 mph (5.0 km/h)].
(*g*) always place both hands on the control handle when operating with the towing end leading;
(*h*) always operate with one hand on controls, and when possible, walk ahead and to the side of the tongue when traveling forward (towing end trailing);
(*i*) enter elevator or other confined areas with the towing end leading;
(*j*) tow only stable or safely arranged loads. When towing off-center loads which cannot be centered, operate with extra caution;
(*k*) tow only loads within the capacity of the tow tractor;
(*l*) use caution when turning. The trailers tend to cut the corner;
(*m*) check couplers for engagement.

5.4 Operator Care of the Tow Tractor

5.4.1 At the beginning of each shift and before operating the tow tractor, check its condition, giving special attention to the following:

(*a*) tires and inflation pressure of pneumatic tires
(*b*) warning and safety devices
(*c*) lights
(*d*) battery
(*e*) controller
(*f*) brakes
(*g*) steering mechanism

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(*h*) fuel system(s)
(*i*) couplers

5.4.2 If the tow tractor is found to be in need of repair or in any way unsafe, or contributes to an unsafe condition, the matter shall be reported immediately to the user's designated authority, and the tow tractor shall not be operated until it has been restored to safe operating condition.

5.4.3 If during operation the tow tractor becomes unsafe in any way, the matter shall be reported immediately to the user's designated authority, and the tow tractor shall not be operated until it has been restored to safe operating condition.

5.4.4 Do not make repairs or adjustments unless specifically authorized to do so.

5.4.5 The engine shall be stopped, and no one shall be on the tow tractor while refueling.

5.4.6 Spillage of oil or fuel shall be carefully and completely absorbed or evaporated, and the fuel tank cap replaced before restarting engine.

5.4.7 Do not use open flames when checking electrolyte level in storage batteries, liquid level in fuel tanks, or the condition of LPG fuel lines and connectors.

6 MAINTENANCE PRACTICES

6.1 Provisions for Maintenance

Operation of tow tractors may be hazardous if maintenance is neglected or repairs, rebuilds, or adjustments are not performed in accordance with the manufacturer's design criteria. Therefore, maintenance facilities (on or off premises), trained personnel, and detailed procedures shall be provided.

6.1.1 Parts manuals and maintenance manuals may be obtained from the tow tractor manufacturer.

6.1.2 In unusual cases not covered by the manuals referred to in para. 6.1.1, consult the tow tractor manufacturer.

6.2 Performance of Maintenance

Maintenance and inspection of all tow tractors shall be performed in conformance with the manufacturers' and users' recommendations, and the following practices.

(*a*) A scheduled planned maintenance, lubrication, and inspection system shall be followed.

(*b*) Only trained and authorized personnel shall be permitted to maintain, repair, adjust, and inspect tow tractors, in accordance with manufacturer's specifications.

6.2.1 Before starting inspection and repair of tow tractor:

(*a*) raise drive wheels free of floor, disconnect battery, or use chocks or other positive tow tractor-positioning devices;

(*b*) before disconnecting any part of the engine fuel system of gasoline-powered tow tractors with gravity feed fuel systems, take precaution to eliminate any possibility of unintentional fuel escape;

(*c*) before disconnecting any part of the engine fuel system of LP gas-powered tow tractors, close LP tank valve and run engine until fuel in system is depleted and engine stops. If the engine will not run, close LP tank valve and vent fuel slowly in a nonhazardous area;

(*d*) disconnect battery before working on the electrical system;

(*e*) the charger connector shall be plugged only into the battery connector and never into the tow tractor connector.

6.2.2 Operation of the tow tractor to check performance shall be conducted in an authorized area where safe clearance exists.

6.2.3 Before starting to operate the tow tractor:

(*a*) be in operating position;

(*b*) disengage clutch on manual transmission-equipped tow tractors, or apply brake on power shift or automatic transmission-equipped tow tractors and electric tow tractors;

(*c*) place directional controls in neutral;

(*d*) start engine or turn switch of electric tow tractors to the "on" position;

(*e*) check functioning of directional and speed controls, steering, warning devices, and brakes.

6.2.4 Before leaving the tow tractor:

(*a*) stop tow tractor;
(*b*) place directional controls in neutral;
(*c*) apply the parking brake;
(*d*) stop the engine or turn off power;
(*e*) turn off the control or ignition circuit;
(*f*) if the tow tractor must be left on an incline, block the wheels.

6.2.5 Avoid fire hazards and have fire protection equipment present in the work area. Do not use an open flame to check for level, or leakage of fuel, electrolyte, or coolant. Do not use open pans of fuel or flammable cleaning fluids for cleaning parts.

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6.2.6 Properly ventilate work area, vent exhaust fumes, and keep shop clean and dry.

6.2.7 Handle LP gas cylinders with care. Physical damage such as dents, scrapes, or gouges may dangerously weaken the tank and make it unsafe for use.

6.2.8 Brakes, steering mechanisms, control mechanisms, warning devices, lights, governors, guards and safety devices, suspension components, frame members, and couplers shall be carefully and regularly inspected and maintained in safe operating condition.

6.2.9 Special tow tractors or devices designed and approved for hazardous area operation shall receive special attention to ensure that maintenance preserves the original, approved, safe operating features.

6.2.10 Fuel systems shall be checked for leaks and condition of parts. Special consideration shall be given in the case of a leak in the fuel system. Action shall be taken to prevent the use of the tow tractor until the leak has been corrected.

6.2.11 The tow tractor manufacturer's capacity, operation, and maintenance instruction plates, tags, or decals shall be maintained in legible condition.

6.2.12 Batteries, motors, controllers, limit switches, protective devices, electrical conductors, and connections shall be inspected and maintained in conformance with good practice. Special attention shall be paid to the condition of electrical connections.

6.2.13 To avoid injury to personnel or damage to the equipment, follow manufacturer's procedures in replacing contacts in any battery connector.

6.2.14 Tow tractors shall be kept in a clean condition to minimize fire hazards and facilitate detection of loose or defective parts.

6.2.15 Modifications and additions which affect capacity and safe tow tractor operation shall not be performed without manufacturer's prior written approval. Capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly.

(92) **6.2.16** Care shall be taken to assure that all replacement parts, including tires, are interchangeable with the original parts and of a quality at least equal to that provided in the original equipment.

6.2.17 When removing tires, follow industry safety practices. Most important, deflate pneumatic tires completely prior to removal. Following assembly of tires on multi-piece rims, use a safety cage or restraining device while inflating.

6.2.18 When changing batteries on electric tow tractors, replacement batteries shall be of the service weight that falls within the minimum/maximum range specified on the tow tractor nameplate by the tow tractor manufacturer.

Part III
For the Manufacturer

7 DESIGN AND CONSTRUCTION STANDARDS

7.1 Introduction

This Part sets forth safety standards for the design and construction of tow tractors at the time of manufacture.

7.2 Operating Instructions

7.2.1 The manufacturer shall provide instructions covering the operation of the specific type of tow tractor.

7.3 Capacity

7.3.1 Both electric and internal combustion tow tractors shall be rated at a maximum drawbar pull.

7.3.2 In addition, electric tow tractors shall be rated at a normal rated drawbar pull.

7.4 Drawbar Pull

7.4.1 Drawbar pull ratings are based on level, dry surfaces having a minimum coefficient of friction with the driving and braking tire of 0.6. If applicable, the battery weight and size used shall be within limits stated on the vehicle nameplate.

7.4.2 Maximum drawbar pull in pounds (newtons) shall be defined by the manufacturer at the specified coupler height under the conditions of para. 7.4.1 when traveling at a minimum of 44 ft/min (0.22 m/sec) and for a minimum of 30 sec.

7.4.3 Normal rated drawbar pull is the greatest continuous towing force in pounds (newtons) which can be sustained under the rated load conditions of para. 7.4.1 and the test conditions of para. 7.4.4.

7.4.4 Drawbar pull rating tests shall be performed as follows.

(*a*) *Test Conditions*

(*1*) course surface to be as defined in para. 7.4.1;

(2) one trailer train loaded to require a measured drawbar pull equal to the normal rated drawbar pull;

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(*3*) one trailer train loaded to require a measured drawbar pull equal to 10% of the normal rated drawbar pull.

(*b*) *Test Methods*

(*1*) sixty percent of total test time, the vehicle will be towing a test load;

(*2*) the test cycle is made up of:

(*a*) one 200 ft (61 m) run with trailer load as per (a) (2) above;

(*b*) one 200 ft (61 m) run with trailer load as per (a) (3) above;

(*c*) vehicle shall accelerate to maximum controlled speed during each run and loads shall be cycled at least 6 times per hour;

(*d*) continuous test until a stable temperature range has been reached for a minimum of 1 hr on components.

(*c*) In addition to the above test, alternate rated drawbar pulls may be established to suit the user's operation.

7.5 Nameplates and Markings (See Para. 7.3)

7.5.1 The manufacturer shall stamp or otherwise permanently affix the serial number to the frame of the tow tractor.

7.5.2 On every tow tractor the manufacturer shall install a durable, corrosion resistant nameplate(s), legibly inscribed with the following information:

(*a*) tow tractor model and tow tractor serial number;

(*b*) approximate service weight of tow tractor [for electric tow tractor, see paras. 7.5.4(b) and (c)];

(*c*) designation of compliance with the mandatory requirements of this Standard, applicable to the manufacturer;

(*d*) type designation to show conformance with the requirements, such as those prescribed by Underwriters Laboratories, Inc., or Factory Mutual Research Corp.;

(*e*) maximum drawbar pull and coupler height.

7.5.3 Markings authorized by the appropriate nationally recognized testing laboratory shall be installed on approved tow tractors.

7.5.4 On electric tow tractors the nameplate shall also show:

(*a*) normal rated drawbar pull and coupler height;

(*b*) tow tractor weight without battery;

(*c*) minimum and maximum service weights of the battery to be used;

(*d*) nominal voltage for which the tow tractor is arranged;

(*e*) when required, maximum rated ampere hour capacity for which the tow tractor is equipped;

(*f*) identification of battery. Identifying letters of batteries are E, EE, EO, and EX, defined as follows:

(*1*) E — a battery assembled as a unit with a cover, and in conformance with UL 583, for use in type E or ES tow tractors which do not have a covered battery compartment;

(*2*) EE — a battery assembled as a unit, and in conformance with UL 583, with a cover that can be locked for use in type EE tow tractors which do not have an enclosed battery compartment with locking means;

(*3*) EO — a battery assembled as a unit without a cover, and in conformance with UL 583, for use in type E tow tractors with a covered battery compartment, in type ES tow tractors with an enclosed battery compartment, or in type EE tow tractors with an enclosed battery compartment with locking means;

(*4*) EX — a battery assembled as a unit, and in conformance with UL 583, with a cover that can be locked for use in type EX tow tractors which do not have a locked battery compartment with locking means.

7.5.5 For tow tractors designated type EX, the class and group of hazardous locations in which they are intended to be used shall be shown on the tow tractor.

7.5.6 The nameplates for batteries installed in electric tow tractors shall show:

(*a*) manufacturer's name

(*b*) model

(*c*) battery identification

(*d*) voltage

(*e*) ampere hour capacity

Batteries for use in electric tow tractors shall have the battery weight legibly stamped on the battery tray near the lifting means as follows: Service Weight _____ lb (kg).

7.5.7 On motorized hand tow tractors (not hand/rider tow tractors) the manufacturer shall label in letters at least 1.5 in. (40 mm) high, "NO RIDING," or an appropriate symbol may be used in lieu thereof.

7.6 Steering Arrangements

7.6.1 Tow tractors employing a horizontal or tillerbar steering control with the operator facing the direction of forward travel shall be steered in such manner that clockwise movement of the handle shall steer the tow tractor to the operator's right.

7.6.2 Tow tractors employing a handwheel with the operator facing the direction of forward travel shall be steered in such manner that clockwise rotation of the handwheel shall steer the tow tractor to the operator's right.

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7.6.3 Tow tractors employing a handwheel with the operator facing at a right angle to the line of travel shall be steered in such manner that clockwise rotation of the handwheel shall steer the tow tractor clockwise when the tow tractor is traveling in its forward direction.

7.6.4 Motorized hand and hand/rider tow tractors employing a steering tongue control which extends beyond the confines of the tow tractor shall be steered in such manner that clockwise movement of the steering tongue shall steer the tow tractor clockwise with the operator facing in the direction of forward travel.

7.6.5 Other steering controls shall execute a sense of movement in the same direction as the desired motion of the tow tractor when the operator is facing in the direction of forward travel.

7.7 Steering Requirements

7.7.1 All steering controls, except for motorized hand and hand/rider tow tractors employing a steering tongue, shall be confined within the plan view outline of the tow tractor or guarded against injury to the operator during movement of the controls when passing obstacles such as walls, columns, and racks.

7.7.2 Steering handles on motorized hand and motorized hand/rider tow tractors employing a steering tongue, shall be provided with means to provide protection for the operator's hands against injury from items such as doors, walls, columns, and racks.

7.7.3 Where steering must be accomplished with one hand and a steering handwheel, crank, or tiller 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 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, crank, or tiller to spin. A steering knob(s) shall be within the periphery of the steering handwheel.

7.7.4 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 is engaged by the operator's hand from the top, and shall be within the periphery of the steering handwheel.

7.8 Service Brake System Performance

7.8.1 A service brake system which meets the performance requirements of this section shall be provided.

7.8.2 The service brake system performance shall be measured by one of two tests, the Drawbar Drag Test [see para. 7.8.5(a)] or the Stopping Distance Test [see para. 7.8.5(b)].

7.8.3 Brake Control Force Limits

(*a*) For pedals having a downward movement to apply the brakes, the required brake performance shall be attained with a pedal force of not more than 150 lb (670 N).

(*b*) For brake pedals having an upward movement to apply brakes, the required brake performance shall be attained with the pedal fully released; however, the brake linkage shall be such that the pedal will be fully depressed and the brakes released by a force of not more than 65 lb (290 N).

(*c*) For handgrip (squeeze) operated brakes, the force shall be limited to a maximum of 50 lb (225 N).

(*d*) Other types of brake actuation, including those applied by position of the steering tongue, may be used.

7.8.4 Test Conditions

(*a*) Test surface shall be level (± 0.5% maximum gradient) clean asphalt, brushed concrete, or equivalent, and of adequate length to permit safe conduct of the test. When using the stopping distance test procedure, it shall also be of sufficient length to permit stabilized travel speed of the tow tractor before application of the brakes.

(*b*) Power boost system, if supplied, shall be operating. Travel controls, including the transmission, shall be in neutral and all brake systems disengaged.

(*c*) Burnishing of brakes prior to test is optional. The following is a suggested procedure:

(*1*) initial road speed — maximum or 15 mph (24 km/h), whichever is less;

(*2*) final road speed — zero (stop);

(*3*) deceleration rate — maximum without sliding tires or lifting steer tires;

(*4*) alternate — forward stop then reverse stop;

(*5*) rest — 30 min after each 50 stops. This is to be used as a guide; if smoke is evident, the rest time may be increased and the number of stops between rests decreased.

(*d*) The tractor shall be tested in both forward and reverse directions.

7.8.5 Test Methods

(*a*) *Drawbar Drag Method*

(*1*) Measure drawbar drag while pulling at no more than 1 mph (1.6 km/h) in both forward and reverse directions.

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TABLE 1 PERFORMANCE REQUIREMENTS — SERVICE BRAKE SYSTEM

Type	$V \leq 8.33$ mph $V_1 \leq 13.4$ km/h	$V > 8.33$ mph $V_1 > 13.4$ km/h
1 or 2 braked wheels	$D_1 = 4.2V$ } 10% $D_1 = 2.6V_1$ } min.	D_1 = 35% max.
3 or 4 braked wheels	$D_1 = 6.0V$ } 10% $D_1 = 3.72V_1$ } min.	D_1 = 50% max.

GENERAL NOTE:
D_1 = drawbar drag as a percent of unloaded tractor weight
V = speed, mph
V_1 = speed, km/h

(*2*) The drawbar shall be horizontal and attached at the specified coupler height but not more than 36 in. (900 mm) above the road surface.

(*3*) Performance requirements shall be as outlined in Table 1 and Fig. 1.

(*b*) *Stopping Distance Method.* Determine that the brakes will stop the tow tractor within the required distance, measured from the point of brake application, calculated from the following formulas:

$$s = \frac{3.34v^2}{D_1}$$

or

$$s_1 = \frac{0.394v_1^2}{D_1}$$

where

s = approximate theoretical stopping distance, ft
v = speed, mph
D_1 = drawbar drag as a percent of gross tractor weight (e.g., 25 for 25%)
s_1 = approximate theoretical stopping distance, m
v_1 = speed, km/h

7.8.6 Strength

(*a*) For tow tractors having a downward movement of the brake pedal to apply the service brake(s), the system shall be capable of withstanding a brake pedal force of 300 lb (1335 N) without failure of any component.

(*b*) For tow tractors having an upward movement of the brake pedal to apply the service brake(s), a force of 200% of the maximum possible setting of the spring shall not cause failure of any component.

(*c*) For tow tractors having hand grip (squeeze) operated brake(s), the system shall be capable of withstanding a force of 160 lb (715 N) at the midpoint of the brake handle.

7.9 Parking Brake System Performance

7.9.1 A parking brake (or mechanism) which may be a part of, or include, the service brake, shall be provided and capable of holding the tow tractor on the maximum grade which the tow tractor can climb at maximum drawbar pull.

7.9.2 The parking brake system shall be capable of maintaining the specified performance requirement despite any contraction of the brake parts, exhaustion of the source of energy, or leakage of any kind.

7.9.3 The parking brake system shall be operable from, or automatically applied by leaving, the normal operating position.

7.9.4 Brakes may be burnished prior to test.

7.10 Travel Direction Control(s) Marking

Forward and reverse direction control(s) shall be clearly and durably identified on the control or in close proximity.

7.11 Travel Controls — Electric Tow Tractors, Sit Down Rider

7.11.1 Travel control shall be so arranged that the tow tractor will not move unless control(s) have been actuated for both direction and speed.

7.11.2 Means shall be provided to disconnect the travel circuit automatically when the operator leaves the operating position.

7.11.3 A manually operated switch (may be key type) to disconnect all control circuits shall be provided.

7.11.4 Service brakes, if foot operated, shall be energized by downward motion of a pedal located for right foot operation.

7.11.5 Acceleration, if foot operated, shall increase speed by downward motion of a pedal located for right foot operation.

7.11.6 If a single pedal controls both acceleration and braking, downward motion of the pedal shall increase speed, releasing the pedal shall apply brakes, and the pedal shall be located for right foot operation.

7.11.7 Means readily accessible to the operator in the normal operating position shall be provided to shut off all power to the tow tractor.

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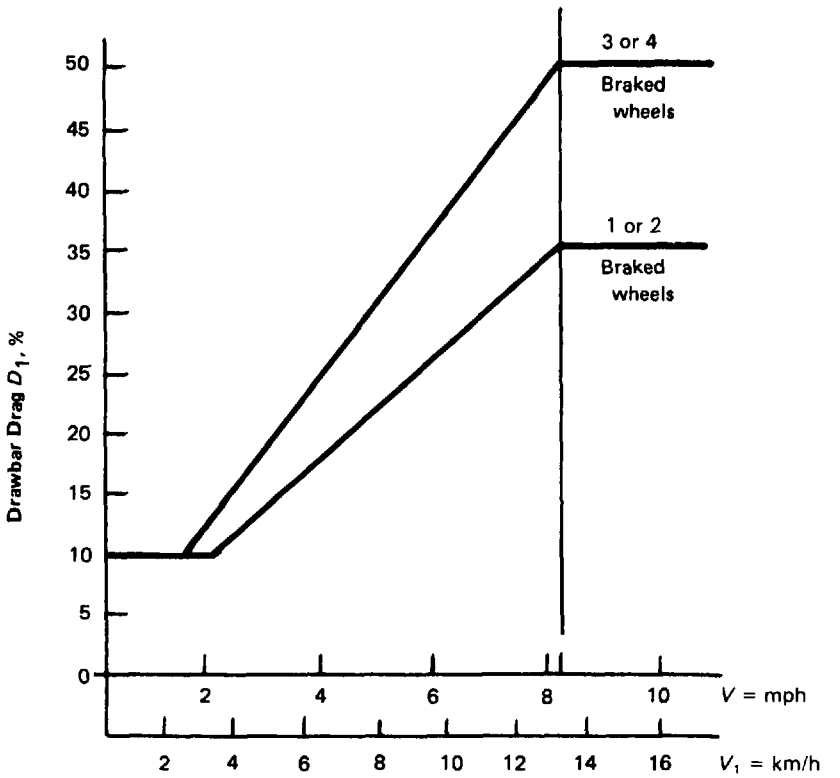

FIG. 1 PERFORMANCE REQUIREMENTS — SERVICE BRAKE SYSTEM

7.12 Travel Controls — Electric Tow Tractors, Stand Up Rider

7.12.1 Means shall be provided so that the travel circuit can be activated only by resetting the speed and/or directional control(s) when the operator assumes the operating position.

7.12.2 Means shall be provided to disconnect the travel circuit automatically when the operator leaves the operating position.

7.12.3 A manually operated switch (may be key type) to disconnect all control circuits shall be provided.

7.12.4 Service brakes may be actuated by either an upward or downward motion.

7.12.5 Means readily accessible to the operator in the normal operating position shall be provided to shut off all power to the tow tractor.

7.13 Travel Controls — Internal Combustion Powered Tow Tractors, Sit Down Rider

7.13.1 Travel controls shall be so arranged that power will be applied to the wheels only when the transmission or direction control has been actuated. A positive neutral position or control shall be provided.

7.13.2 Engine speed should be no greater than low idle unless the acceleration control has been intentionally actuated.

7.13.3 A manually operated engine shutoff device (may be key type) shall be provided.

7.13.4 Service brakes, if foot operated, shall be applied by downward motion of a pedal located for right foot operation.

7.13.5 Clutch pedal, if used, shall disengage the clutch by downward motion, and shall be located for left foot operation.

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7.13.6 If a combination clutch and service brake pedal is used, the initial downward movement shall disengage the clutch and the final downward movement shall apply the service brakes.

7.13.7 Accelerator, if foot operated, shall increase speed by downward motion of a pedal located for right foot operation.

7.13.8 If a combination pedal controls both acceleration and service brakes, downward motion of the brake portion shall apply the service brakes. The combination pedal shall be located for right foot operation.

7.13.9 The normal engine starting system shall not be operable if the operation will produce rotation of the drive wheels.

7.14 Travel Controls — Internal Combustion Powered Tow Tractors, Stand Up Rider

7.14.1 Travel controls shall be so arranged that power will be applied to the wheels only when the transmission or direction control has been actuated.

7.14.2 Accelerator, if foot operated, shall increase speed by downward motion of a pedal located for right foot operation.

7.14.3 A manually operated engine shutoff device (may be key type) shall be provided.

7.14.4 Service brakes may be actuated by either an upward or downward motion.

7.14.5 The normal engine starting system shall not be operable if the operation will produce rotation of the drive wheels.

7.15 Travel Controls — Electric Motorized Hand and Hand/Rider Tow Tractors

7.15.1 Forward and reverse motion of the tow tractor shall be controlled or selected by means of a control device readily accessible when grasping the handle grip on the steering tongue. This control device shall operate directionally in one of the following manners.

(*a*) The control shall have a forward motion for forward travel and a rearward motion for reverse travel.

(*b*) The control shall consist of two buttons located at the top of the control handle when the steering tongue is approximately vertical, arranged so that the forward one is for forward travel and the rearward one is for reverse travel.

(*c*) The control shall have rotary motion, the rotation being in the same direction as the drive wheel rotation.

7.15.2 The brake shall be applied and current to the drive motor shall be cut off whenever the steering tongue is in approximately a vertical position, and the same conditions shall exist whenever the steering tongue is in approximately a horizontal position, or the brake shall be applied and current to the drive motor cut off by release of the device normally used to control travel motion of the tow tractor.

7.15.3 Means readily accessible to the operator shall be provided to shut off all power to the tow tractor.

7.16 Warning Device

7.16.1 Every tow tractor shall be equipped with an operator controlled horn, whistle, gong, or other sound-producing device(s).

7.16.2 In addition, other devices (visible or audible) suitable for the intended area of use may be installed when requested by the user.

7.17 Guards for Wheels

Guards or other means shall be provided to protect the operator, in the normal operating position, from particles thrown by the tires or wheels.

7.18 Guards for Moving Parts

The operator, in the normal operating position, shall be protected from moving parts that represent a hazard.

7.19 Pedal and Platform Surfaces

Control pedals and control platforms stood on, or engaged, by the operator's feet shall have slip resistant surfaces.

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APPENDIX A (92)
REFERENCES

(This Appendix is an integral part of ASME B56.9-1992 and is placed after the main text for convenience.)

The following are safety standards and codes (unless otherwise noted) referenced within this Standard. It is the intent of this Standard to refer to the standards and codes listed below in their latest editions when they are referenced within the Standard.

ANSI Z94.0-1989	Industrial Engineering Terminology (not a safety standard)
ANSI/NFPA 30-1987	Flammable and Combustible Liquids Code
ANSI/NFPA 58-1989	Liquefied Petroleum Gases, Storage and Handling of
ANSI/NFPA 505-1987	Powered Industrial Trucks, Type Designations, Areas of Use, Maintenance and Operation
UL 558 (latest revision)	Industrial Trucks, Internal Combustion Engine-Powered
UL 583 (latest revision)	Industrial Trucks, Electric-Battery-Powered
ANSI Z53.1-1979	Marking Physical Hazards
ANSI/IES RP7-1983	Industrial Lighting, Practice for (not a safety standard)

The following are related documents:

ASME/ANSI B56.1-1988 (including Addenda)	Safety Standard for Low Lift and High Lift Trucks
ASME/ANSI B56.5-1988 (including Addenda)	Safety Standard for Guided Industrial Vehicles

Copies of the publications listed above are available from:

ANSI	American National Standards Institute, Inc. 11 W. 42nd Street, New York, NY 10036
ASME	The American Society of Mechanical Engineers 345 E. 47th Street, New York, NY 10017
	ASME Order Department 22 Law Drive, Box 2300, Fairfield, NJ 07007-2300
NFPA	National Fire Protection Association Batterymarch Park, Quincy, MA 02269
UL	Underwriters Laboratories, Inc. 333 Pfingsten Road Northbrook, IL 60062

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APPENDIX B
GLOSSARY OF COMMONLY USED WORDS AND PHRASES

(This Appendix is not part of ASME B56.9-1992, and is included for information purposes only.)

alternate rated drawbar pull — see *drawbar pull, alternate rated*

approved — the word *approved* means the classification or listing as to fire, explosion, and 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, Inc., and Factory Mutual Research Corp.

authorized personnel — persons designated by the user to operate or maintain the equipment

brake, parking — a device(s) to prevent inadvertent movement of the stationary vehicle

brake, service — the primary means of any type used for stopping and holding the tow tractor

bridge plate — a portable device for spanning the gap between two rail cars

coupler height — the vertical dimension from the working surface to the centerline of the coupler

dockboard — a portable or fixed device for spanning the gap or compensating for difference in level between loading platforms and carriers

drawbar drag — force in pounds (newtons) required at the coupler to retard or stop the tow tractor

drawbar pull, alternate rated — the sustained towing force in pounds (newtons) using special test conditions and test methods to suit the user's operation

drawbar pull, maximum — the maximum pull in pounds (newtons) a tow tractor or vehicle will develop on a level floor having the prescribed coefficient of friction, when moving a load at a uniform rate

industrial tow tractor — see *tow tractor, industrial*

operator — a trained and authorized person who controls any function(s) of an industrial tow tractor

service weight — weight of tow tractor plus battery or full fuel tank, less operator

tow tractor, electric — a tow tractor in which the principal energy is transmitted from power sources to motor(s) in the form of electricity

tow tractor, industrial — a powered industrial truck designed primarily to draw one or more nonpowered trucks, trailers, or other mobile loads

tow tractor, internal combustion engine — a tow tractor in which the power source is a gas or diesel engine

tow tractor, motorized hand — a tow tractor that is designed to be controlled by a walking operator

tow tractor, motorized hand/rider — a dual purpose tow tractor that is designed to be controlled by a walking or by a riding operator

tow tractor, motorized walkie — see *tow tractor, motorized hand*

user — a person or organization responsible for employing industrial tow tractors

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ASME B56.9 Interpretations

Replies to Technical Inquiries
1990–1991

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 B56.9, Safety Standard for Operator Controlled Industrial Tow Tractors.

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

These interpretations were prepared in accordance with the accredited ASME procedures. ASME procedures provide for reconsideration of these interpretations when or if additional information is available which the inquirer believes might affect the interpretation. Further, persons aggrieved by 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.

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Interpretation: 9-2

Subject: ASME/ANSI B56.9-1987

Date Issued: April 29, 1991

Question (1): With regard to para. 7.11.7, do both the positive and negative battery leads need to be disconnected?

Reply (1): Paragraph 7.11.7 reads: "Means readily accessible to the operator in the normal operating position shall be provided to shut off all power to the tow tractor."

The intent of this paragraph is to provide the operator with an emergency means to disconnect all power in the event of a fault or malfunction of the tow tractor. Many manufacturers accomplish this with a battery connector, often in conjunction with a handle, which disconnects both the positive and negative leads. This ensures that "all" power to the tow tractor is shut off.

Question (2): Can a solenoid be used as the disconnect?

Reply (2): The system design must ensure that "all" power can be shut off in an emergency situation. The design must guarantee all power is disconnected to the tractor or truck.

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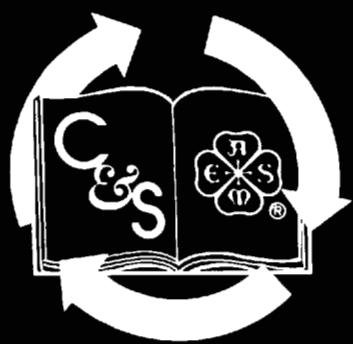
STD.ASME B56.9-ENGL 1992 ■ 0759670 0620554 T52 ■



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