

AN ASME STANDARD

SAFETY STANDARDS FOR PORTABLE
AUTOMOTIVE LIFTING DEVICES

WHEEL DOLLIES

ASME/ANSI PALD-11-1986

AN AMERICAN NATIONAL STANDARD

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FOREWORD

(This Foreword is not part of ASME/ANSI PALD-11-1986.)

This ASME Standard, Safety Standards for Portable Automotive Lifting Devices, has been developed under the procedures for the ASME Codes and Standards Development Committee. This specific Standard had its beginnings in June 1979 when the Jack Institute addressed the B30 Committee on Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings. The Jack Institute requested the B30 Committee either to develop a standard for automotive jacks or include this equipment as part of the revision of B30.1, Jacks. The B30 Committee declined this request.

As a result, the Jack Institute petitioned ANSI in July 1979 for the formation of a committee to promulgate safety and/or performance standards for portable automotive lifting devices, requesting the designation of ASME as sponsor of the project.

In September 1979, ASME's Policy Board, Codes and Standards, approved sponsorship of the committee to operate under the procedures developed by ASME and accredited by ANSI. A nominating committee was appointed to recommend a proposed membership to the ASME Safety Codes and Standards Committee for approval. The membership was approved at the beginning of May 1980.

The inaugural meeting of the ASME Committee on Portable Automotive Lifting Devices (PALD) was held in July 1980. The Committee determined that the format of this Standard would be such that separate standards, each complete as to design, marking, identification, testing, operation, inspection, and maintenance, would cover the different type of equipment included in the PALD scope.

This Standard presents a coordinated set of rules which may serve as a guide to manufacturers, to government and other regulatory bodies, to municipal authorities, and to commercial users responsible for the inspection, maintenance, and instruction in the use of the equipment falling within its scope.

This Standard, which was approved by the ASME Committee on Portable Automotive Lifting Devices and by the ASME, was approved and designated as an American National Standard by the American National Standards Institute on June 12, 1986.

The effective date of this Edition shall be 3 months after the date of publication with prospective application only. Revisions published by addenda become effective 3 months after the date of publication of the addenda.

ASME SAFETY STANDARDS COMMITTEE Portable Automotive Lifting Devices

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

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SAFETY STANDARDS FOR PORTABLE AUTOMOTIVE LIFTING DEVICES**Introduction****General**

This Standard is one of a series of safety standards on various subjects which have been formulated under the general auspices of The American Society of Mechanical Engineers (ASME). One purpose of the Standard is to serve as a guide to governmental authorities having jurisdiction over subjects within the scope of the Standard. It is expected, however, that the Standard will find a major application in industry, serving as a guide to manufacturers, purchasers, and operators of the equipment.

For the convenience of the operator, the Standard has been divided into separate volumes such as the following:

- (a) hand jacks
- (b) transmission jacks
 - (1) low profile low-lift
 - (2) underhoist high-lift
- (c) service jacks
- (d) upright-type mobile lifts
- (e) swing-type mobile lifts
- (f) scissors-type mobile lifts
- (g) engine stands
- (h) vehicle support stands
- (i) auxiliary support stands
- (j) wheel dollies
- (k) portable shop cranes
- (l) ramps
- (m) screw jacks
- (n) scissor jacks
- (o) bumper jacks
- (p) frame jacks

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

The use of portable automotive lifting devices is subject to certain hazards that cannot be precluded by mechanical means, but only by the exercise of intelligence, care, and common sense. It is therefore essential to have personnel involved in the use and operation of equipment who are careful, competent, and trained and qualified in the safe operation of the equipment and the proper use when servicing motor vehicles and their components. Examples of hazards are dropping, tipping, or slipping of motor vehicles or their components caused primarily by improperly securing loads, overloading, off-centered loads, use on other than hard level surfaces, and use of equipment for a purpose for which it was not designed.

The Standards Committee fully realizes the importance of proper size, strength, and stability as safety factors in the design of this equipment. This equipment is used on various motor vehicles and their components under variable working conditions. These conditions have been taken into consideration to provide safety and flexibility in its use. The requirements given in this Standard must be interpreted accordingly, and judgment should be used in determining their application.

Comments on the Standard's requirements and suggestions for its improvement, based on actual experience in the application of the rules, may be sent to the Standards Committee.

The suggestions for changes to the Standard should be submitted to the Secretary of the Committee on Portable Automotive Lifting Devices, ASME, 345 East 47th Street, New York, NY 10017, and be in accordance with the following format:

- (a) cite the specific 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 PALD Committee will consider each suggested change in a timely manner in accordance with its procedures.

Section I — Scope

The scope of the ASME Committee on Portable Automotive Lifting Devices is the standardization of safety and performance requirements for portable automotive lifting equipment including:

- (a) hand jacks
- (b) transmission jacks
 - (1) low profile low-lift
 - (2) underhoist high-lift
- (c) service jacks
- (d) upright-type mobile lifts
- (e) swing-type mobile lifts
- (f) scissors-type mobile lifts
- (g) engine stands
- (h) vehicle support stands
- (i) auxiliary support stands
- (j) wheel dollies
- (k) portable shop cranes
- (l) ramps
- (m) screw jacks
- (n) scissor jacks
- (o) bumper jacks
- (p) frame jacks

This Standard may include requirements for safety, health, design, production, construction, maintenance, performance or operation of equipment, or qualification of personnel.

Section II — Application

This Standard applies to the design, construction, marking, operation maintenance, and inspection of the portable automotive lifting devices listed previously, used during automotive service, maintenance, and storage. Operation and maintenance instructions in this Safety Standard are intended for general applications. The equipment manufacturer and/or seller shall be consulted for specific operating and maintenance instructions.

This Standard does not apply to similar lifting devices designed and manufactured for other commercial or industrial use, such as those coming within the scope of the American National Standard B30.1.

Section III — Purpose

This Standard is designed:

- (a) to guard against and mitigate injury to workers, and otherwise provide for the protection of life, limb, and property by prescribing safety requirements;
- (b) to provide direction to purchasers, owners, employers, supervisors, and others concerned with, or responsible for, its application; and
- (c) to guide governments and other regulatory bodies in the development, promulgation, and enforcement of appropriate safety directives.

Section IV — Interpretations

Upon request, the Committee on Portable Automotive Lifting Devices will render an interpretation of any requirement of the Standard. Interpretations can only be rendered in response to a written request sent to the Secretary of the PALD Committee, ASME, 345 East 47th Street, New York, NY 10017.

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

- Subject: Cite the applicable paragraph number(s) and provide a concise description.
- Edition: Cite the applicable edition of the pertinent 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 an 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.

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

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.

Section V — Mandatory and Advisory Rules

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

Section VI — Metric Conversions

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



WHEEL DOLLIES

Section 1 — Scope, Purpose, Classification, and Illustration

1.1 Scope

This Standard applies to hydraulic and mechanical wheel dollies characterized by a pair of laterally spaced lifting members that raise and lower in unison and are so arranged as to contact the vehicle wheel(s) at two areas on its circumference for the purpose of raising, removing, transporting, and replacing wheel and tire assemblies.

1.2 Purpose

The purpose of this Standard is to establish guidelines with respect to the construction, care, and use of wheel dollies. It is intended to provide a basis for understanding among manufacturers, distributors, and operators of wheel dollies.

1.3 Classification

Hydraulic and mechanical are the two classifications for which this Standard applies.

1.4 Illustration

The following illustration (see Fig. 1) shows typical wheel dollies covered by this Standard and is not intended to be all inclusive.

Section 2 — Definitions

functional damage — any permanent deformation of the wheel dolly structure and/or loss of load sustaining capacity to its hydraulic and/or mechanical components which render the wheel dolly unable to meet the design qualification testing section of this Standard

hydraulic wheel dolly — a wheel dolly which employs

a relatively incompressible fluid, such as oil, as the force-transmitting medium

lifting frame — the stationary portion of a wheel dolly to which the lifting member is attached and on which it operates

lifting member — the moving portion of the wheel dolly which engages the tire and wheel assemblies

load restraint — a device used to retain the load to the lifting member

mechanical wheel dolly — a wheel dolly which employs mechanical lifting means, such as cables, gears, screws, or chains as the force-transmitting medium

operating controls — the mechanism(s) which must be manipulated to initiate and control the raising, lowering, and tilting of the lifting member of the wheel dolly

overload — a load which exceeds the rated capacity of the wheel dolly

proof load — a nondestructive load equal to or greater than the rated capacity, applied to the lifting member to confirm the integrity of the structure

rated capacity — the maximum published operating load which the wheel dolly is designed to lift, support, and transport

rollers — mechanisms attached to the lifting member which rotate about it

tilt mechanism — a device that allows the lifting member to be angularly adjusted relative to the horizontal plane

warning — a statement used to alert the owner and/or operator of possible hazards which may be encountered when using this equipment

Section 3 — Design

3.1 Operating Controls

Operating controls shall be so designed and positioned that they are readily visible and accessible to the operator, and shall be designed so that the operator's

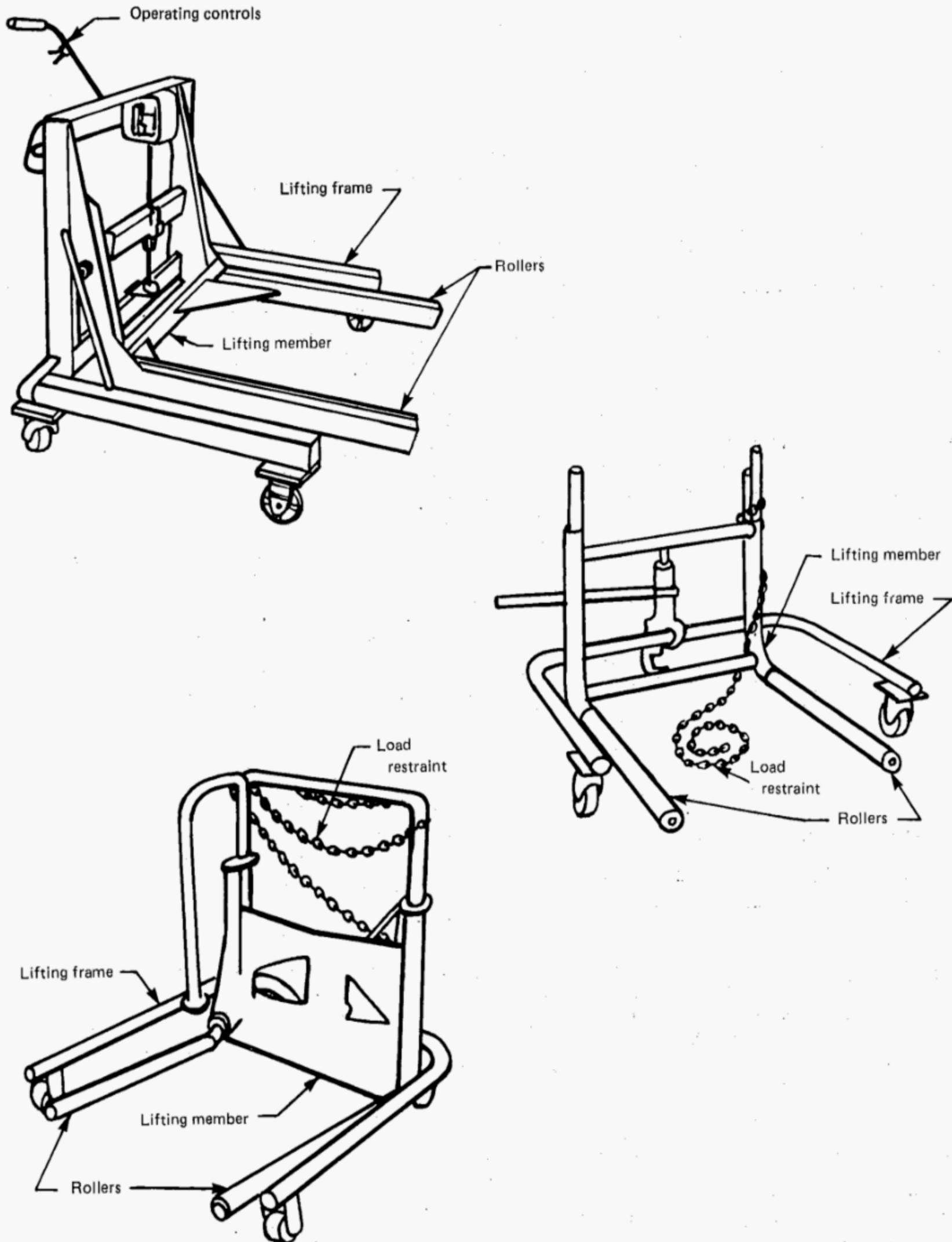


FIG. 1 TYPICAL WHEEL DOLLIES

WHEEL DOLLIES

hands will not be subjected to pinch points, sharp edges, or snagging hazards. The release system shall require positive action by the operator for release in order to prevent accidental lowering.

3.2 Travel Limit

Each wheel dolly shall be provided with a positive means to prevent the load from being raised or lowered beyond the design limit of travel.

3.3 Overload Capacity

All wheel dollies shall be designed to meet the requirements of para. 3.4 of this Standard as minimum overload capacity.

3.4 Proof Load

Wheel dollies shall be capable of lifting and sustaining a proof load of 150% of rated capacity applied to the rollers midway between the front and rear of the member.

3.5 Rollers

The lifting member shall be equipped with rollers to permit the rotation of wheel assemblies for the purpose of aligning bolt holes to their mating wheel studs.

3.6 Load Restraint

The load restraint shall be so designed and positioned as to prevent the inadvertent loss of the load during operation and movement of the wheel dolly.

3.7 Tilt Mechanism

When a tilt mechanism is provided, it shall be so designed to allow the lifting member to be adjusted relative to the horizontal plane, and it shall require intentional positive action by the operator to change the angle of tilt.

Section 4 — Production Marking and Identification**4.1 Capacity Information**

All wheel dollies shall have the rated capacity marked in a prominent location on the product by means of casting imprint, metal stamp, or by use of durable materials and attaching methods.

4.2 Identification

Each wheel dolly shall include identification or identifying marks of the original manufacturer by label, decal, cast imprint, or metal stamp.

4.3 Date Stamp

Each wheel dolly shall be marked with a serial number or date code of manufacture.

4.4 Warning

A warning shall be affixed by use of durable materials and attaching methods to each wheel dolly in a location readily visible to the operator. The warning shall be stated per the manufacturer/supplier's preference and shall contain the following:

- (a) the word WARNING as a heading;
- (b) a statement of the hazard related to the warning;
- (c) a statement of what to do to avoid or reduce the hazard;
- (d) a statement to warn the operator to study, understand, and follow all instructions.

The warning statement may include symbols.

Example of a warning:

DO NOT LOAD THIS WHEEL DOLLY BEYOND ITS RATED CAPACITY. OVERLOADING CAN CAUSE DAMAGE TO OR FAILURE OF THE PRODUCT. APPLY LOAD AS CLOSE TO THE LIFTING FRAME AS POSSIBLE. BEFORE MOVING THE LOAD, LOWER THE LIFTING ARMS AND ASSURE THAT LOAD IS CENTERED AND SECURED WITH A LOAD RESTRAINT DEVICE.

THIS WHEEL DOLLY IS DESIGNED FOR USE ONLY ON HARD LEVEL SURFACES CAPABLE OF SUSTAINING THE LOAD. USE ON OTHER THAN HARD LEVEL SURFACES CAN CAUSE INSTABILITY AND POSSIBLE LOSS OF LOAD.

FAILURE TO HEED THESE WARNINGS MAY RESULT IN LOSS OF LOAD, DAMAGE TO THE WHEEL DOLLY, AND/OR FAILURE RESULTING IN PERSONAL INJURY OR PROPERTY DAMAGE.

STUDY, UNDERSTAND, AND FOLLOW ALL INSTRUCTIONS.

Section 5 — Design Qualification Testing**5.1 Proof Tests**

For each design or design change which may affect the wheel dolly's ability to meet this Standard, sample wheel dollies built to design specifications shall be proof

tested. In order to conform with this Standard, the wheel dolly shall perform to design specifications and no functional damage shall occur, nor shall operational characteristics be detrimentally affected.

5.1.1 Proof Load Test. A proof load as defined in para 3.4 shall be applied to the lift member. The load shall be lifted and sustained throughout the entire lifting range of travel with the load located midway between the front and rear of the lifting member.

5.1.2 Travel Limit Test. The lifting member shall be fully extended with no external load. The lifting member shall be operated, and further extension of the lifting member shall be prohibited by the travel limiting means.

5.1.3 Loaded Operational Test. A deadweight load, not less than the rated capacity of the wheel dolly and configured to simulate a dual wheel assembly of maximum wheel diameter with center of gravity about its center line and above midpoint of the lifting member, shall be mounted on the lifting member. The entire load shall be restrained on the lifting member, and the following operational tests shall be performed.

5.1.3.1 Load Sustaining Test. A load not less than the rated capacity shall be applied to the lifting member at approximately 100% of its lifting range. The load shall not lower more than $\frac{1}{8}$ in. (3 mm) in the first minute, nor a total of $\frac{3}{16}$ in. (4.8 mm) in 10 min.

5.1.3.2 Release Test. A load not less than the rated capacity shall be applied to the lifting member at approximately 100% of its lifting range. The release mechanism shall be operated to permit control of the load lowering to a rate of descent of no more than 3 in./sec (75 mm/s).

5.1.3.3 Tilt Mechanism Test (if So Equipped). With the wheel dolly loaded as defined in para. 5.1.3 and with the lift member at its maximum height, the tilt mechanism shall be manipulated throughout its entire range of adjustment.

5.1.3.4 Roller Test. The deadweight load as defined in para. 5.1.3 shall be rotated to simulate the positioning of the wheel on its hub assembly.

5.1.3.5 Mobility Test. The wheel dolly, while loaded symmetrically to rated capacity, shall be moved at 15 ft to 30 ft/min (4.6 m to 9.1 m/min) across a $\frac{1}{2}$ in. (13 mm) high, 15 deg. slope rise in the floor, and a $\frac{1}{2}$ in. (13 mm) drop to the floor, at an approach angle which will bring only one caster or wheel at a time in contact with the rise and drop. The wheel dolly shall traverse the rise and drop without loss of load, tipping over, or sustaining functional damage.

5.1.3.6 Stability Test. The wheel dolly with the lifting member in the lowest possible position shall be moved at 2 ft to 3 ft/sec (0.6 m to 0.9 m/s) against a 2 in. (50 mm) high vertical rise 90 deg. to the direction of movement at an approach angle which will bring one wheel or caster in contact with the rise at the point of greatest instability. The wheel dolly shall not lose the load or tip over.

Section 6 — Product Instructions and Warnings

Each wheel dolly shall be provided with operator's instructions. The instructions shall specify the proper operating procedures and basic function of the components. The instructions shall include the recommended replacement fluid and maintenance and inspection procedures and intervals. The instructions shall convey the following messages, but need not be verbatim or limited to those listed, and shall be written using common words. All warnings shall be in bold letters. The word **WARNING** shall be used as a heading for the following statements.

(a) **DO NOT OVERLOAD. OVERLOADING CAN CAUSE DAMAGE TO OR FAILURE OF THE WHEEL DOLLY.**

(b) **MAKE SURE THAT THE LOAD IS CENTERED, AS CLOSE TO THE FRAME AS POSSIBLE, AND SECURED WITH THE LOAD RESTRAINT DEVICE.**

(c) **STUDY AND UNDERSTAND THE OPERATING INSTRUCTIONS PACKED WITH THIS WHEEL DOLLY BEFORE OPERATING.**

(d) **THIS WHEEL DOLLY IS DESIGNED FOR USE ONLY ON HARD LEVEL SURFACES CAPABLE OF SUSTAINING THE LOAD. USE ON OTHER THAN HARD LEVEL SURFACES CAN RESULT IN WHEEL DOLLY INSTABILITY AND POSSIBLE LOSS OF LOAD.**

(e) **FAILURE TO HEED THESE WARNINGS MAY RESULT IN LOSS OF LOAD, DAMAGE TO THE WHEEL DOLLY, AND/OR FAILURE OF THE WHEEL DOLLY RESULTING IN PERSONAL INJURY OR PROPERTY DAMAGE.**

Copy conveying the intent of Section 7 of this Standard shall be included with the instructions.

Section 7 — Operation, Inspection, and Maintenance

7.1 Owner and/or Operator Responsibility

Owner and/or operator shall study product instructions and retain them for future reference.

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7.1.1 Operation. The owner and/or operator shall have an understanding of the product operating instructions and warnings before operating the wheel dolly. Warning information shall be emphasized and understood. If the operator is not fluent in English, the product instructions and warnings shall be read to and discussed with the operator in the operator's native language by the purchaser/owner, making sure that the operator comprehends its contents.

7.1.2 Maintenance. The wheel dolly shall be maintained in accordance with the product instructions.

7.1.3 Inspection

(a) Visual inspection shall be made before each use of the wheel dolly by checking for leaks and damaged, loose, or missing parts.

(b) Other inspections shall be made per product operating instructions.

(c) Owners and/or operators should be aware that repair of this equipment may require specialized knowledge and facilities. It is recommended that an annual inspection of the wheel dolly be made by a manufacturer/supplier's authorized repair facility and that any defective parts, decals, or warning labels be replaced with manufacturer/supplier's specified parts. A list of authorized repair facilities is available from the manufacturer/supplier.

7.1.4 Damaged Wheel Dollies. Any wheel dolly which appears to be damaged in any way, is found to be badly worn, operates abnormally, or is subjected to an abnormal load or shock **SHALL BE REMOVED FROM SERVICE** until necessary repairs are made by a facility having the necessary equipment, parts meeting the manufacturer's specifications, and personnel trained in the repair and operation of the wheel dolly.