May 2024 Draft
PASE-20XX

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PASE-20XX, Safety Standard for Portable Automotive Service Equipment
(Proposed Revisions of ASME PASE-2019)

TENTATIVE
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ASME Codes and Standards
5.1.2 Configuration

(a) mechanical screw jacks consisting of concentric telescoping screws, or a single screw, that actuate an adapter or saddle, extended and retracted by a gear system, for engaging a load.

5.4.1 Load Tests

Each jack’s ability to sustain a load and limit a load shall be tested by applying a load centrally to the saddle or adapter with the lifting mechanism positioned as follows and using the jack’s actuating handle to raise and lower the load over the entire range of the jack.

18.1.2 Configuration

Portable hydraulic power kits covered by this Part typically include hydraulic pumps, hoses, cylinders, feet, adapters, and spreaders used in conjunction with extension tubes and adapters, which may be assembled in various configurations. An example of a typical kit is ...

Figure 19-1.3-1 Typical Engine Support Tools

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6.4.1 Load Tests

6.4.1.1 Off-Center Load Test. Auxiliary stands are excluded from the off-center load test. A horizontally constrained vertical load equal to rated capacity shall be applied. The column and the saddle shall be moved to the most disadvantageous position. This test shall be conducted in both the fully extended position and the lowest possible position of the column that can be achieved regardless of whether the locking device is engaged. On saddles comprising lugs, the load shall be applied to the most disadvantageous lug. On flat saddles, the load shall be applied to the most disadvantageous edge by a load application surface flush with the edge and with a width not exceeding 1 in. (25.4 mm). The load shall be applied for at least 10 min on the lug or edge of the saddle as shown in Figure 6-4.1.1-1. The saddle’s ability to retain the load shall not be adversely affected by this test. A permanent reduction in height, measured after the removal of the load, at the point of load contact as shown in Figure 6-4.1.1-1 shall not exceed 0.125 in. (3.18 mm). The test shall be repeated on all lugs and edges.
A preload of not more than 100% of rated capacity may be applied and removed to establish initial overall height.

**Record 20-2722**

6-2.3 Locking Device

The locking device of vehicle stands, high-reach stands, and supplementary stands shall prevent adjustment of the column height after the load has been applied. If the column is supported by means of a locking pin, the pin shall be attached to the stand to prevent its removal. Screw connections are considered self-locking if an axially applied force does not cause the screw to turn. Otherwise, a nut may be required to lock the screw connection and prevent adjustment.

**6-3 SAFETY MARKINGS AND MESSAGES**

6-3.1 Safety Markings

The following are examples of safety markings:

(a) Vehicle Stands

... 

(8) Ensure locking device is fully engaged with column before lowering vehicle onto stands. 

(9) Carefully lower vehicle onto both stands simultaneously.

(10) Failure to heed these markings may result in personal injury and/or property damage.

(b) High-Reach Stands

... 

(8) Ensure locking device is fully engaged with column before lowering vehicle onto stands.

(9) Carefully lower the vehicle onto all stands simultaneously.

(10) Center load on saddles.

(11) Do not apply horizontal forces or large torque loads to vehicle while the vehicle is supported on stands.

(12) Failure to heed these markings may result in personal injury and/or property damage.

**Record 20-2857**

**PART 11**

**COMPONENT DOLLIES AND JACKS**

11-2 DESIGN

11-2.1.1 Positioning Mechanism. When positioning mechanism adjustments are provided, they shall require intentional positive action by the operator to change the position. Positioning mechanisms typically

(a) adjust the angular position of the lifting member assembly about two principal independent axes (longitudinal and lateral), and shall be capable of sustaining a proof load, as defined in para. 11-2.3, at any angle within the desired angular range to a maximum of 10 deg in all directions.

(b) adjust the component relative to the lifting member

11-2.1.3 Load Restraint. The load restraint shall be so designed and positioned as to prevent the inadvertent release loss of load during operation and movement.
11-2.1.4 Capacity vs. Tilt Angle. Any jack with a lifting member assembly that can be positioned beyond 10 deg in any direction but not sustain the proof load as defined in para. 11-2.3, shall provide a means of indicating the tilt angle(s) and the corresponding reduced capacity rating(s). As a minimum, the jack or its instructions shall include a table indicating the jack capacity at each 10 deg. compound tilt increment (simultaneously longitudinal and lateral) up to and including the maximum compound tilt permitted by the mechanism.

See Table 11-2.1.4 for an example of a tilt angle table.

<table>
<thead>
<tr>
<th>Compound Tilt Angle Deg</th>
<th>Capacity lbs/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/10</td>
<td>---</td>
</tr>
<tr>
<td>20/20</td>
<td>---</td>
</tr>
<tr>
<td>30/30</td>
<td>---</td>
</tr>
</tbody>
</table>

11-3 SAFETY MARKINGS AND MESSAGES

11-3.1 Safety Markings
The following are examples of safety markings:
(a) Study, understand, and follow all instructions before operating the device.
(b) Adequately support the vehicle before starting repairs.
(c) Do not exceed rated capacity.
(d) Use only on a hard, level surface capable of supporting the load.
(e) Before moving, lower the load to the lowest possible height.
(f) The capacity of this jack may be reduced when the lift member assembly is tilted.
(g) Failure to heed these markings may result in personal injury and/or property damage.

11-3.2 Safety Messages
The following are examples of safety messages:
(a) Before moving the jack or tilting the load, ensure that the center of gravity of the load is established and centered, and the load is secured with a load-restraint device.
(b) Only attachments and/or adapters supplied by the manufacturer shall be used.
(c) No alterations shall be made to this product.

11-4 DESIGN QUALIFICATION TESTING

11-4.1.6 Tipping Test. Devices shall support the maximum load corresponding to each identified compound tilt angle with the lifting member at maximum height and positioned to its greatest angle in all directions. The device shall be moved forward and backward at least 1 ft (305 mm) and shall not lose the load or tip over without the wheels or casters lifting from the surface. The force to move the jack shall be applied closely beneath the lifting member.

Record 21-1297

17-4.1 Operational Tests
The handler shall be loaded with water to its rated capacity. The opening to the reservoir system (if any) shall be closed. If the reservoir opening is automatic and closes upon application of air pressure, the reservoir shall be pressurized. The handler shall be readily movable and shall not leak fluid.
4.1.2 Mobility Test. The handler shall be prepared as described in para. 17-4.1.1 and shall be movable in all directions over the floor. It shall be moved at 1.5 ft/sec to 2 ft/sec (457 mm/s to 610 mm/s) across a 0.5-in. (12.7-mm) high, 15-deg-slope rise in the floor, at an approach angle that will bring only one caster at a time in contact with the rise and drop. The handler shall traverse the rise and drop without functional damage or spilling fluid.

Record 21-2355

2-4.2 Identification

All PASE shall include identification or identifying marks of the original manufacturer or supplier by casting imprint, metal stamp, or use of durable materials and attachment methods. The manufacturer shall be able to identify the date month and year of manufacture of all PASE.

Record 22-2254

PART 2
GENERAL REQUIREMENTS

2-1.2 Definitions

load-loss control: a means to prevent sudden upward travel of a pneumatic lift if the load is suddenly removed.

PART 8
MOBILE VEHICLE LIFTS AND JACKS

8-1 SCOPE, CONFIGURATION AND ILLUSTRATIONS

8-1.1 Scope

This Part applies to the following:
(a) upright mobile lifts
   (1) end lifts used individually for lifting but not supporting one end of a vehicle
   (2) wheel lifts used as an identical pair to lift and support one end of a vehicle by cradling opposing tires
(b) bridge jacks used on the floor or over a service pit for lifting and supporting a vehicle

This Part does not apply to bridge jacks used with an automotive lift or service pit. see covered by ANSI/ALI ALCTV for requirements regarding these types of bridge jacks.

8-1.2 Configuration

(a) Upright Mobile Lifts. A typical design has a lifting member attached to a vertical structure mounted in a mobile frame with a base or a scissors mechanism. Pneumatic cylinders normally actuate the lifting member, although hydraulic or other means may be used. Typical configurations are
   (1) end lifts having saddles attached to the lifting member, contacting the vehicle at two points across the bumper, bumper supports, or frame members, or front/rear axle, or suspension components
   (2) wheel lifts having forks attached to the lifting member that cradle the wheel tires during lifting of the vehicle
(b) Bridge Jacks Designed to Be Used on the Floor and Over a Service Pit. These are designed with a pair of laterally spaced saddles that raise and lower in unison, attached to a lifting member in a rolling or sliding frame. Typically, the
lifting member is actuated by a scissors mechanism with hydraulic cylinder(s) or pneumatic cylinders that swing into lifting position.

8-1.3 Illustrations
The illustrations show typical configurations and are not intended to be all-inclusive. Figure 8-1.3-1 shows typical end lifts. Figure 8-1.3-2 shows a typical wheel lift. Figure 8-1.3-2 shows bridge jacks.

8-2 DESIGN
In addition to Part 2, General Requirements, and Part 3, Attachments, Adapters, and Accessories, the requirements in paras. 8-2.1 through 8-2.37 apply.

8-2.1 Upright Mobile Lifts
8-2.1.1 Mobility. When unloaded, mobile vehicle lifts shall be readily movable to engage or disengage the vehicle lift points. When loaded, the base of the unit shall be in full contact with the floor and shall not be movable.

8-2.1.2 End Lifts
8-2.1.2a Saddles. The saddles on end lifts and bridge jacks shall have raised protrusions, e.g., a tang or rail, on the leading and trailing edges to act as a load restraint. Means shall be incorporated to limit the outward lateral adjustment of the saddles. The contact surface of the forks on wheel lifts shall have a raised profile to prevent movement between the tire and the fork.

8-2.1.2b Secondary Load-Holding Means. Pneumatic-operated lifts shall be equipped with a device to prevent unrestricted lowering of the load in the event of loss of pressure.

8-2.1.2c Load Loss Control. Pneumatic-operated lifts shall have a restraint to prevent the lifting member from extending in an unrestrained manner if the load is suddenly removed from the lift.

8-2.1.3 Wheel Lifts
(a) Operating Controls. Individual controls shall be provided to allow level lifting.
(b) Stability. The forks shall lie within the base envelope to prevent tipping when loaded.
(c) Mechanical Supports. Mechanical supports shall be incrementally spaced on the lift columns that are capable of supporting the loads as required in section 8-4.
(d) Locking Device. A locking device, e.g., a pin, shall be used to lock the lifts in position after the vehicle is lowered onto the mechanical supports and the pressure is removed.

8-2.2 Bridge Jacks
(a) Saddles. The saddles shall be configured to restrain the vehicle when lifted by the manufacturer’s lift points. Means shall be incorporated to limit the outward lateral adjustment of saddles.
(b) Secondary Load-Holding Means. Mechanical supports shall be placed on the lifting mechanism that are capable of supporting the loads as required in section 8-4.
(c) Locking Device. A locking device shall be used to lock the jack in position after the vehicle is lowered onto the mechanical supports.

8-2.2 Secondary Load-Holding Means
8-2.2.1 All upright mobile lifts and bridge jacks, except those using self-braking screw drive systems, shall incorporate an automatically engaging mechanical load-holding device (e.g., a latching system) to prevent downward movement of more than six (6) inches after stopping motion. Function shall begin within six (6) inches of rise and shall continue to the full rise position. Load holding devices shall require positive action for release.

8-2.2.2 Automatic release of latches is prohibited unless
(a) the default position is where engagement will occur upon unintentional lowering;
(b) release cannot be caused by any other input (intended or unintentioned); and
(c) operating instructions clearly explain the automatic release.
8-2.3 Mobility

When unloaded, upright mobile lifts and bridge jacks shall be readily movable to engage or disengage the vehicle lift points. When loaded, the base of the unit shall be in contact with the floor and shall not be movable.

8-2.4 Load Loss Control

Pneumatic operated upright mobile lifts and bridge jacks shall have a restraint to prevent the lifting member from extending beyond its maximum travel if the load is suddenly removed from the lift. In addition, in the event of load loss at any elevation, the lift shall not leave the ground by more than 1.0 ft (305 mm) and the lifting member, saddles, and attachments shall remain affixed to the lift assembly.

8-2.5 Operating Controls

Individual controls shall be provided to facilitate level lifting and lowering when wheel lifts or bridge jacks are used in pairs.

Lowering controls may be adjustable and shall permit the lowering speed to be limited to no more than 3 in/sec (76.2 mm/sec) when averaged over full range of travel.

NOTE: In normal use, the rate of descent may exceed 3 in/sec (76.2 mm/sec).

8-2.6 Stability

The forks of a wheel lift shall lie within the base envelope to prevent tipping when loaded.

8-2.7 Proof Load

Each upright mobile vehicle lift and bridge jack shall be capable of performing the proof load test of para. 8-4.2 with the following proof loads:

(a) for each end lifts, wheel lift, and bridge jack, 150% of the rated load capacity
(b) in addition, each wheel lift and bridge jack, 200% of rated load with secondary load holding means engaged for wheel lifts, 200% of rated capacity
(c) for bridge jacks, 200% of rated capacity

8-3 SAFETY MARKINGS AND MESSAGES

8-3.1 Safety Markings

8-3.1.1 End Lifts. The following are examples of safety markings for end lifts:

(a) Study, understand, and follow all instructions before operating the device.
(b) Use only a hard, level surface capable of supporting the load.
(c) Do not raise one end of the vehicle if the other end is supported raised.
(d) Do not exceed rated capacity.
(e) Disengage parking brake and place the transmission in neutral after the end lift has been placed to engage the vehicle.
(f) Lift only on areas of the vehicle as specified by the vehicle manufacturer.
(g) Load saddles equally.
(h) Support the vehicle with appropriate means immediately after lifting.
(i) Failure to heed these markings may result in personal injury and/or property damage.

8-3.1.2 Wheel Lifts. The following are examples of safety markings for wheel lifts:
(a) Study, understand, and follow all instructions before operating the device.
(b) Use only on a hard, level surface capable of supporting the load.
(c) Do not raise one end of the vehicle if the other end is supported raised.
(d) Do not exceed rated capacity of the wheel lifts.
(e) Wheel lifts shall be used in identical pairs.
(f) Disengage parking brake and place the transmission in neutral after the wheel lifts have been placed to engage the vehicle tires.
(g) Do not allow any part of your body under the vehicle until the load loss control has been activated, both of the wheel lifts are pinned as stands.
(h) Failure to heed and understand these markings may result in personal injury and/or property damage.

8-3.1.3 Bridge Jacks. The following are examples of safety markings for bridge jacks:
(a) Study, understand, and follow all instructions before operating the device.
(b) Use only a hard, level surface capable of supporting the load.
(c) Do not exceed rated capacity. Place jack(s) under vehicle at manufacturer’s recommended lift points.
(d) Disengage parking brake and place the transmission in neutral after the bridge jack has been placed to engage the vehicle.
(e) Lift only on areas of the vehicle as specified by the vehicle manufacturer.
(f) Load saddles equally.
(g) Lower jack to the nearest locking position before getting under the vehicle.
(h) Not for use on automotive lifts. Do not raise or lower the automotive lift with the vehicle supported on jacks.
(i) Failure to heed these markings may result in personal injury and/or property damage.

8-3.2 Safety Messages
8-3.2.1 End Lifts. The following are examples of safety messages for end lifts:
(a) Only attachments and/or adapters supplied by the manufacturer shall be used.
(b) Do not lift the entire vehicle with multiple sets of lifts.
(c) No alterations shall be made to this product.

8-3.2.2 Wheel Lifts. The following are examples of safety messages for wheel lifts:
(a) Only attachments and/or adapters supplied by the manufacturer shall be used.
(b) Do not lift the entire vehicle with multiple sets of wheel lifts.
(c) Use wheel lift only beneath the vehicle tires on opposite ends of the same axle.
(d) When two wheel lifts are used, synchronize the raising and lowering so the vehicle remains laterally level.
(e) No alterations shall be made to this product.

8-3.2.3 Bridge Jacks. The following are examples of safety messages for bridge jacks:
(a) Only attachments and/or adapters supplied by the manufacturer shall be used.
(b) When two bridge jacks are used to raise a vehicle free of the ground, synchronize the raising and lowering.
(c) No alterations shall be made to this product.

8-4 DESIGN QUALIFICATION TESTING
In addition to Part 2, General Requirements, and Part 3, Attachments, Adapters, and Accessories, the requirements in para. 8-4.1 and para. 8-4.2 apply.

8-4.1 Load Tests
8-4.1.1 Load-Sustaining Test. A load not less than the rated capacity shall be applied to the saddles or forks lifting member when positioned at the maximum lifting height with the locking device or secondary load-holding means deactivated. The load shall be equally distributed between both fully extended saddles or forks over the outboard most 3 in (76.2 mm) for end lifts and bridge jacks or 6 in (152 mm) for wheel lifts. The load shall not lower more than a total of 0.125 in (3.18 mm) in the first minute nor more than a total of 0.1875 in (4.76 mm) in 10 min. The initial
measurement shall be taken at each saddle or fork when the full load is applied, and the other measurements taken at the time period specified.

8.4.1.1.1 End Lifts

8.4.1.2 Secondary Load-Holding Means Test. Lifts shall be loaded to not less than rated capacity and operated to raise the load to a position just below each step in the secondary load-holding device. When the internal pressure is released, the secondary load-holding means shall automatically stop the lift and hold the load within a descent of 67.0 in (15278 mm).

8.4.1.2.1 Release Test.

8.4.1.3 Lowering Control Test. A load not less than the rated capacity shall be applied to the saddles lifting member at approximately 100% of its lifting range. The lowering controls release mechanism shall be operated to control the average rate of descent to no more than 3.0 in/sec (76.2 mm/s).

The secondary load-holding device shall be deactivated for this test.

NOTE: In normal use, a rate of descent greater than 3.0 in/sec (76.2 mm/s) is expected.

8.4.1.1.2 Wheel Lifts.

A fixture up to 6 in. by 6 in. (152 mm by 152 mm) may be used to simulate a tire engaged by each of the forks on the carriage. The load shall be applied so that its centerline is 6 in. (152 mm) from the outermost edge of each of the forks on the carriage.

(a) Operational Test. The wheel lift shall be loaded to 150% of rated capacity and then raised and lowered throughout the full range of travel. The load shall be removed and the change from the initial measurement shall not exceed 2 deg. Prior to this test, an initial angular measurement of the lifting forks relative to the floor shall be made.

(b) 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 control the rate of descent to no more than 3.0 in/sec (76.2 mm/s).

NOTE: In normal use, a rate of descent greater than 3.0 in/sec (76.2 mm/s) is expected.

8.4.1.1.3 Bridge Jacks Release Test.

Jacks shall be loaded to not less than rated capacity and operated to raise the load. When the internal pressure is released, the release mechanism shall be operated to control the descent to no more than 1 in/sec (25.4 mm/s).

8.4.2 Proof Load Tests

8.4.2.1 End Lifts

(a) Proof Load. A proof load, as defined in para. 8-2.37, shall be applied to the all saddles set to full extension. The load shall be lifted, sustained, and lowered throughout the range of travel at full extension of all saddles. For purposes of this these tests, any load-limiting device should shall be deactivated. There shall not be any critical failures or deformation that can cause loss of the load.

(b) Load Loss Test. Pneumatic lifts shall be loaded to rated capacity and the lifting member raised to a height determined to provide the maximum momentum to the lifting member should the load be removed. The load shall be removed in such a manner that the vertical height of the lifting member shall not change until the load is completely removed. The lift shall not leave the ground by more than 1.0 ft (305 mm). The lifting member, saddles, and attachments shall remain affixed to the lift assembly.

8.4.2.1 Dynamic Proof Load. The load shall be lifted and lowered three times throughout the range of travel.

8.4.2.2 Static Proof Load. For wheel lifts and bridge jacks, the load defined in para. 8-2.7(b) shall be applied and held for ten (10) minutes with the lifting device at full extension, the secondary load holding means engaged, and the load-loss control engaged.

8.4.2.2.1 Wheel Lifts. Each wheel lift jack shall be engaged on its highest mechanical stop with the locking device engaged. The pressure shall be removed and a proof load, as defined in para. 8-2.3, shall be applied. The load shall be
maintained for 10 min. The load shall be removed and the carriage assembly lowered to the ground without application of external force. There shall not be any critical failures or deformation that can cause loss of the load.

**8-4.2.3 Pneumatic Lifts.** Pneumatic lifts shall be loaded to rated capacity and the lifting member raised to a height determined to provide the maximum momentum to the lifting member should the load be removed. The load loss control shall be activated prior to removing the load. The load shall be removed in such a manner that the vertical height of the lifting member shall not change until the load is completely removed. The lift shall not leave the ground by more than 1.0 ft (305 mm). The lifting member, saddles, and attachments shall remain affixed to the lift assembly.

**8-4.2.3 Bridge Jacks.** A proof load, as defined in para. 8-2.3, shall be applied to the saddles. The load shall be lifted, sustained, and lowered throughout the range of travel at full extension of all saddles. For purposes of this test, any load-limiting device should be deactivated.

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**Record 23-913**

**1-4 References**

The following is a list of standards and specifications referenced in this Standard:

- UL 201, Standard for Safety for Garage Equipment
- **UL 969, Standard for Marking and Labeling Systems**
- UL 2089, Standard for Safety for Vehicle Battery Adapters

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**Part 2**

**General Requirements**

**2-2 DESIGN**

**2-2.1 Durability Assessment**

In the design of all PASE, consideration shall be given to the anticipated useful life of each product, and the cumulative effects of repeated use and other potential changes in properties.

A required marking shall be permanent. With reference to “permanent” in the preceding sentence, all markings shall be located on a part that, if removed, would impair operation of the equipment or on a part that requires tools for removal. A permanent marking shall be either etched, molded, stamped, or etched metal that is permanently secured or is composed of a marking or labeling system complying with UL 969 and be rated for the surface and expected environmental conditions involved and for exposure to oil.

Markings required by the standard shall be durable and legible. In considering the durability of the marking, the effects of normal use and exposure to shop chemicals shall be taken into consideration.
4-2.1.2 Service Jacks. The saddle configuration shall have upward protrusion such as lugs, lips, or tangs to aid in the proper positioning, supporting, and retaining of the load. The jack shall be designed to ensure that the saddle remains within 3 deg parallel to the jack-supporting surface (before and after performing each saddle periphery test of para. 4-4.3.2). The load shall be lifted throughout the range starting with the lift arm parallel to the jack-supporting surface throughout the range, from the lift arm parallel to the lifting surface to maximum height (see Figure 4-2.1.2-1). The saddle periphery, throughout the lifting range as defined above, shall not move outside the imaginary perimeter established by lines connecting centerlines of the front and rear wheels and/or caster pivot points (see Figure 4-2.1.2-2).

4-4.1 Load Tests

Each jack’s ability to sustain a load and limit a load shall be tested by applying a load centrally to the saddle with the lifting mechanism positioned as follows:

…

(b) service jacks – with the lift arm parallel to the lifting surface (see Figure 4-2.1.2-1). The parallel position shall be established when the load is applied, and the lifting arm is parallel to the lifting surface. The test shall be repeated with the extender in the fully extended position and/or with the adapter in place, if so equipped.

Record 24-938

Figure 11-1.3-2 Typical High-Rise Component Dolly and Jacks

b) Power-Train Jack Component Lift Table