



SURFACE VEHICLE STANDARD

J2258™

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Superseding J2258 NOV2016

Light Utility Vehicles

RATIONALE

Updated occupant protection system to reflect recommendations of SAE Ride and Seating Committee and others.

Added attachments in appropriate definitions and test procedures.

Reviewed and revised roof crush test procedure.

Reformatted the headlamp section to reflect recommendations of SAE Lighting Committee and align with other SAE Standards regarding headlamps and recommending SAE J1623.

Clarified test vehicle and battery state of charge for speed and braking tests.

Clarified longitudinal stability test acceptance to align with that of lateral test acceptance.

Added proposal to determine coefficient of traction and pavement friction, and incorporated in new Appendix C.

FOREWORD

This standard has been formulated with SAE as sponsor in accordance with the accepted practice and procedures of SAE and the following scope. Establishment of the requirements relating to the elements of design, operation, and maintenance; also, the standardization relating to principal dimensions to facilitate test methods and test procedures of light utility vehicles.

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

If adopted for governmental use, references to other national standards may be changed to refer to the corresponding governmental regulations. A second purpose of this standard is to provide design and performance requirements to aid in minimizing accidents and injuries associated with the operation and maintenance of light utility vehicles.

The use of light utility vehicles is subject to certain hazards that cannot be eliminated by mechanical means, but only by the exercise of intelligence, care, and common sense. It is therefore essential to have competent and careful operators, who are not physically or mentally impaired, thoroughly trained in the safe operation of the equipment and the handling of the loads. It is recommended that the operator be capable of obtaining a valid motor vehicle operator's license. Serious hazards include, but are not limited to, hillside operation, overloading, instability of the load, oversize loads, poor maintenance, and using equipment for a purpose for which it was not intended or designed.

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1. SCOPE

This SAE Standard defines requirements relating to the elements of design, operation, and maintenance of light utility vehicles (LUVs). The safety specifications in this document apply to any self-propelled, operator-controlled, off-highway vehicle 1829 mm (72 inches) or less in overall width, exclusive of added accessories and attachments, operable on three or more wheels or tracks, primarily intended to transport material loads or people, with a gross vehicle weight of 2500 kg (5500 pounds) or less, and a maximum design speed less than or equal to 40.23 km/h (25 mph).

This document is not intended to cover go-karts (ASTM F2007-07a), fun-karts (ASTM F2011-02e1), dune buggies, and all terrain-vehicles (ATVs) complying with ANSI/SVIA 1.

1.1 Purpose

The purpose of this document is to promote safety in the design, application, operation, and maintenance of light utility vehicles. This document may be used as a guide by governmental authorities desiring to formulate safety rules and regulations. This document is also intended for voluntary use by others associated with manufacturing or utilizing light utility vehicles.

1.2 Effective Date

The effective date for this document is the date of publication.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J115	Safety Signs for Off-Road Work Machines
SAE J268	Rear View Mirrors - Motorcycles
SAE J383	Motor Vehicle Seat Belt Anchorages - Design Recommendations
SAE J384	Motor Vehicle Seat Belt Anchorages - Test Procedure
SAE J386	Operator Restraint System for Off-Road Work Machines
SAE J585	Tail Lamps (Rear Position Lamps) for Use on Motor Vehicles Less than 2032 mm in Overall Width
SAE J586	Stop Lamps for Use on Motor Vehicles Less than 2032 mm in Overall Width
SAE J588	Turn Signal Lamps for Use on Motor Vehicles Less than 2032 mm in Overall Width
SAE J592	Sidemarkers Lamps for Use on Road Vehicles Less than 2032 mm in Overall Width
SAE J594	Reflex Reflectors
SAE J843	Brake System Road Test Code - Passenger Car and Light-Duty Truck

- SAE J1623 Off-Highway Vehicle Headlamps
- SAE J1718 Measurement of Hydrogen Gas Emission from Battery-Powered Passenger Cars and Light Trucks During Battery Charging
- SAE J2292 Combination Pelvic and Upper Torso Operator and Occupant Restraint Systems for Off-Road Work Machines

2.1.2 ACGIH Publications

Available from American Conference of Governmental Industrial Hygienists, 1330 Kemper Meadow Drive, Cincinnati, OH 45240, Tel: 513-742-2020, www.acgih.org.

2003 TLVs® and BEIs® ACGIH® Publication #0103, ISBN: 1-882417-49-6

2.1.3 ANSI Accredited Publications

Copies of these documents are available online at <http://webstore.ansi.org/>.

ANSI Z535.4 Product Safety Signs and Labels

2.1.4 ISO Publications

Copies of these documents are available online at <http://webstore.ansi.org/>.

- ISO 1044 Industrial Trucks - Lead Acid Traction Batteries for Electric Trucks - Preferred Voltages
- ISO 3287 Powered Industrial Trucks, Control Symbols
- ISO 3864 Graphical Symbols, Safety Colours and Safety Signs
- ISO 3691 Powered Industrial Trucks - Safety Code
- ISO 11684 Tractors, Machinery for Agriculture and Forestry, Powered Lawn and Garden Equipment - Safety Signs and Hazard Pictorials

2.1.5 NASA Publications

NASA Technical Services, NASA STI Program STI Support Services, Mail Stop 148, NASA Langley Research Center, Hampton, VA 23681-2199, 757-864-9658, Fax: 757-864-6500, <http://ntrs.nasa.gov/>.

Man-Systems Integration Standards, Volume I, Section 3, Anthropometry and Biomechanics, <http://msis.jsc.nasa.gov/sections/section03.htm>.

2.1.6 NFPA Publications

Available from NFPA, 1 Batterymarch Park, Quincy, MA 02169-7471, Tel: 617-770-3000, www.nfpa.org.

- NFPA 30 Flammable and Combustible Liquids Code
- NFPA 58 Storage and Handling of Liquefied Petroleum Gases
- NFPA 505 Fire Safety and Standard for Powered Industrial Trucks-Type Designations, Areas of Use, Maintenance and Operation

2.1.7 SVIA Publications

Available from Specialty Vehicle Industry of America, 2 Jenner Street, Suite 150, Irvine, CA 92618-3812, Tel: 949-727-3727, www.svia.org.

SVIA 1 Four Wheel All Terrain Vehicles- Equipment, Configuration, and Performance

2.1.8 UL Publications

Available from UL, 333 Pfingsten Road, Northbrook, IL 60062-2096, Tel: 847-272-8800, www.ul.com.

UL 558 Standard for Industrial Trucks, Internal Combustion Engine-Powered

UL 583 Standard for Electric-Battery-Powered Industrial Trucks

3. PART I - INTERPRETATION, TERMS, AND DEFINITIONS FOR LIGHT UTILITY VEHICLES

3.1 Interpretation and Definitions

3.1.1 Mandatory and Advisory Rules

To carry out the provisions of this document, the word SHALL is to be understood as mandatory and the word SHOULD as recommended.

3.1.2 Terms

3.1.2.1 VEHICLE

For purposes of this document, the term vehicle shall mean light utility vehicle (LUV).

3.1.3 Definitions

3.1.3.1 ACCELERATOR

A device that controls the speed of a vehicle.

3.1.3.2 ACCESSORY

LUV original equipment manufacturer approved device installation (i.e., tire chains, lights, canopy, cab, etc.) to enhance its utility or appearance (exclusive of attachment).

3.1.3.3 APPROVED VEHICLE

A vehicle that is listed or approved for fire safety purposes for the intended use by a nationally recognized testing laboratory (e.g., Underwriters Laboratories; Factory Mutual Engineering Corp.) using nationally recognized testing standards.

3.1.3.4 ATTACHMENT

LUV original equipment approved components designed primarily to perform a specific task and for mounting on a specific machine, that may utilize the machine's power and control system. These attachments may be detachable, but are not intended to be universally adaptable to other machines (i.e., top dresser, spreader, etc.).

3.1.3.5 BATTERY - ELECTRIC VEHICLE

An electric vehicle in which the power source is a storage battery(s).

3.1.3.6 BODY RESTRAINT

A handhold or combination handhold/hip restraint, anchored securely to the body or seat platform of the vehicle creating a barrier to help prevent an occupant from sliding outside of the vehicle.

3.1.3.7 CENTER OF GRAVITY (OF TEST LOAD)

That point at which the load mass is concentrated. It is located horizontally in the center of the load-bearing surface, and vertically by its distance above the load-bearing surface.

3.1.3.8 CHARGED BATTERY

Charging of vehicle batteries shall be in accordance with the requirements of the vehicle/battery supplier as stated in the owner/operator's manual.

3.1.3.9 CONTROLLING PARTY

The person(s) or organization(s) responsible for the operation and maintenance of a vehicle.

3.1.3.10 ELECTRIC VEHICLE

A vehicle in which the principal energy is transmitted from power sources to motor(s) in the form of electricity.

3.1.3.11 GROSS VEHICLE WEIGHT RATING (GVWR)

The maximum allowable total vehicle weight recommended by the manufacturer, including the vehicle's curb weight plus the combined weights of all vehicle occupants, any cargo loads, the trailer tongue weight, and the weights of any installed options, attachments, and/or accessories. Installation of options, attachments, and/or accessories may reduce the allowable cargo capacity below the stated limit.

3.1.3.12 HANDHOLD

A readily accessible device mounted securely to the vehicle that can be encircled by the fingers of one hand for the purpose of holding on. A handhold can also function as a body restraint.

3.1.3.13 LIGHT UTILITY VEHICLE

Any self-propelled, operator-controlled, off-highway vehicle 1829 mm (72 inches) or less in overall width, exclusive of added accessories and attachments, operable on three or more wheels or tracks, primarily intended to transport material loads or people, with a gross vehicle weight of 2500 kg (5500 pounds) or less, and a maximum design speed less than or equal to 40.23 km/h (25 mph)

3.1.3.14 MATERIAL LOAD

Weight and dimension of material to be carried, excluding personnel.

3.1.3.15 OCCUPANT PROTECTIVE STRUCTURE

A structure that provides a crush protective environment for the occupants in the event of a vehicle tip-over (rotation of 90 degrees or more about the vehicle's lateral or longitudinal axis) or roll-over (rotation of 180 degrees or more about the vehicle's lateral or longitudinal axis).

3.1.3.16 OCCUPANT PROTECTIVE SYSTEM

The occupant protective structure, seat belt assemblies, and may include passive restraints.

3.1.3.17 OFF-HIGHWAY

Not required to comply with Federal Motor Vehicle Safety Standards (FMVSS).

3.1.3.18 OFF-ROAD

Un-improved terrain. Surfaces which may or may not be modified by the elimination of obstructions and depressions, but not necessarily having a compaction resistance suitable to support motorized vehicles.

3.1.3.19 OPERATING (CURB) WEIGHT

Weight of vehicle with full fuel load, operating fluids, and batteries, without material load or personnel load.

3.1.3.20 OPERATOR

Trained and authorized person who controls any function of the light utility vehicle.

3.1.3.21 OPERATOR'S SEAT

The seat located directly behind the steering controls.

3.1.3.22 OPTIONS

Selectable components necessary to complete vehicle assembly (i.e., tires, batteries, etc.).

3.1.3.23 PARKING BRAKE

A device to prevent the movement of a stationary vehicle.

3.1.3.24 RATED CAPACITY

The total weight of material load and personnel load for a vehicle. The total personnel load for personnel vehicles. Rated capacity = GVW rating less curb weight.

3.1.3.25 SERVICE BRAKE

A device designed to reduce the speed or to bring a moving vehicle to a stop.

3.1.3.26 Test Load

Weight that can be added to the vehicle when combined with curb weight and those attachments, accessories and options that create the least stable condition not to exceed GVWR.

a. $GVWR = \text{Fixed} + \text{Variable}$

b. $\text{Fixed} = \text{Vehicle curb weight}$

c. $\text{Variable} = (\text{Operator} + \text{Passenger} + \text{Option} + \text{Accessory} + \text{Trailer tongue} + \text{Attachments}) \text{ Weight(s)} + \text{Material load weight(s)}$

3.1.3.27 TEST VEHICLE

Unless otherwise stated, the test vehicle shall conform to the manufacturer's specifications for performance. All attachments, optional, and accessory items offered by the original equipment manufacturer shall be considered in performing each test, which shall be conducted with attachments, optional, and accessory items installed, or not installed, so as to create the most severe test conditions.

3.1.3.28 TRAVEL CONTROL

Devices that control the speed, braking, forward, and reverse direction of the vehicle.

4. PART II - FOR THE CONTROLLING PARTY

See Appendix B.

5. OPERATING SAFETY RULES AND PRACTICES

See Appendix B.

6. MAINTENANCE PRACTICES

See Appendix B.

7. PART III - FOR THE MANUFACTURER - DESIGN AND CONSTRUCTION STANDARDS

7.1 Introduction

7.1.1 Part III sets forth safety standards for vehicles at the time of manufacture.

7.2 Nameplates, Markings, and Instructions

7.2.1 On every vehicle, the manufacturer shall install permanent marking(s), with the following information:

- a. Serial number: A unique combination of letters and/or numbers, selected by the manufacturer, intended to distinguish a vehicle from other vehicles with the same model designation..
- b. Approximate curb weight of the vehicle without accessories or attachments in kilograms (kg), pounds, or both.
- c. Designation of compliance with the mandatory requirements of this document.
- d. Type designation if in conformance with ANSI/NFPA 505 and either ANSI/UL 583 or ANSI/UL 558.
- e. Gross vehicle weight rating (GVWR).

7.2.2 Where applicable, marking authorized by an appropriate nationally recognized testing laboratory may be installed on approved vehicles.

7.2.3 On battery-electric vehicles, the nameplate shall also show:

- a. The minimum and maximum service weights of battery (s) and tray, if used.
- b. Nominal voltage for which the vehicle is designed. For recommended voltages, refer to ISO 1044.

7.2.4 For batteries in a lift-out tray with total combined service weight of batteries and tray exceeding 45 kg (100 pounds), or the maximum combined weight of the batteries and tray shall be legibly identified on the battery tray near the lifting means with the information shown in Figure 1.

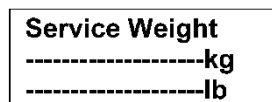


Figure 1 - Marking for lift-out battery tray

7.2.5 Each vehicle shall be supplied with a vehicle operator's manual furnished by the manufacturer. This manual shall contain instructions for setup, assembly, safe and proper operation, and routine service (separate set-up and assembly manuals are acceptable). Operator's manuals should include, but not be limited to, information contained in Sections 4, 5, and 6, where applicable.

7.2.6 Product safety signs and labels should be used for hazard identification in accordance with either ANSI Z535.4, ISO 3864, ISO 11684, or SAE J115.

7.2.7 Universal symbols for operator controls and other displays should be in accordance with ISO 3287.

7.3 General Requirements

7.3.1 The operator and any passengers, in the designated operating position, shall be protected from parts of the vehicle that represent a hazard and from particles thrown by the tires and wheels

7.3.2 Vehicles shall be provided with seat(s) and body restraints (see 7.3.4) for the operator and each intended passenger position.

7.3.3 Operator and passenger stations shall accommodate the 5th to 95th percentile man, as per the National Aeronautics and Space Administration (NASA) publication, and shall be within the plan view outline of the vehicle.

7.3.4 A handhold shall be provided for the operator and each passenger. A steering wheel or two-hand tiller shall be considered a handhold for the operator. A handhold shall be provided for each additional intended passenger and placed in such a manner that when grasping the handhold, the occupant's hands shall be within the plan view outline of the vehicle.

7.3.5 Occupant Protective Systems (OPS)

7.3.5.1 Occupant protective structures and seat belt assemblies shall be provided with light utility vehicles that can be so configured and loaded per the manufacturer's recommendations such that the maximum operation speed (as determined per 7.7) and the lateral stability (as determined per 7.8) fall within the area defined on Figure 2 as "OPS Required."

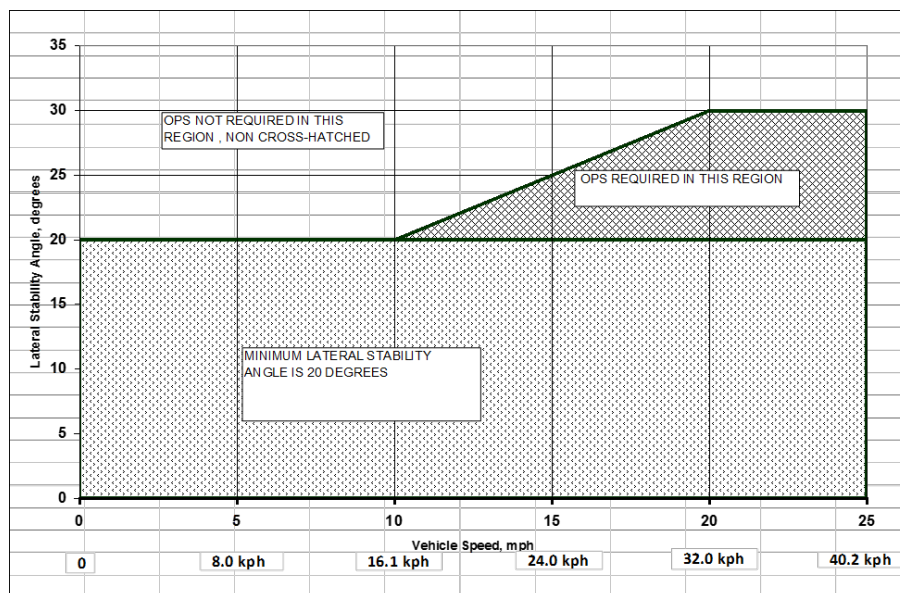


Figure 2 - Vehicle lateral stability versus speed

7.3.5.2 Seat belts shall not be installed on light utility vehicles unless they have occupant protection structures.

7.3.5.3 Operator restraint systems fitted to light utility vehicles shall conform to the following:

7.3.5.3.1 Type 1 seat belt assemblies shall conform to SAE J383 and SAE J384. Type 2 (or Type 1 plus 2A) shall conform to SAE J2292, except the range specified in 5.1.6.1 shall be 60 degrees +15/-30 degrees. The load requirements of 7.3.5.4 shall be used. Where suspension seats are used, the seat belt assemblies shall be fastened to the movable portion of the seats to accommodate the ride motion of the occupants.