The Engineering Society For Advancing Mobility Land Sea Air and Space®

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SAE J1452 OCT88

Trailer Grade Parking Performance Test Procedure

SAE Recommended Practice
Revised October 1988

Submitted for Recognition as an American National Standard

The Engineering Society For Advancing Mobility Land Sea Air and Space®
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TRUCK AND BUS PRACTICE

SAE J1452

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Superseding J1452 JUN85

Ø TRAILER GRADE PARKING PERFORMANCE TEST PROCEDURE

1. PURPOSE:

This SAE Recommended Practice establishes a uniform procedure for determining the parking performance on a grade of any new trailer with manufacturer's maximum weight rating of more than 10 000 lb (4500 kg) intended for roadway use.

2. SCOPE:

This practice establishes methods to determine grade parking performance with respect to:

2.1 Ability of the parking brake system to lock the braked wheels.

2.2 The trailer holding or sliding on the grade, fully loaded or unloaded.

2.3 Applied manual effort.

2.4 Unburnished or burnished brake lining friction conditions.

2.5 Down and up grade directions.

3. INTRODUCTION:

The ability to hold a trailer stationary on a grade involves two performance factors: 1) overcoming the downhill grade force with the parking brake system by preventing rotation of the braked wheels, and 2) having sufficient weight on the braked wheels to prevent the trailer from sliding on the roadway. By the use of this procedure, the manually applied input effort required to prevent braked wheel rotation can be measured and the stability of a trailer parked on a grade can be observed.

4. INSTRUMENTATION:

4.1 Force measuring device - 0 - 200 lb (0 - 890 N)

4.2 Decelerometer (0 - 1 G)

4.3 Temperature measuring device - 0 - 1000°F (0 - 540°C)

4.4 Stopwatch

5. TEST PREPARATIONS:

5.1 On brakes applied by the parking brake system, use new lining and drums or discs of original equipment material installed in accordance with the trailer manufacturer's specifications.

5.2 Parking brake assemblies and actuation systems are to be installed, lubricated, adjusted, and inspected in accordance with the trailer manufacturer's specifications.

5.3 All trailers are to be tested in both the fully loaded and unloaded condition.

5.3.1 The fully loaded tests shall be conducted on full trailers with the trailer loaded to the manufacturer's maximum rated weight (GVWR if applicable) with the load distributed proportionately to the individual axle GAWRs; the fully loaded weight shall include the weight of any test equipment.

5.3.2 The fully loaded tests shall be conducted on semitrailers with the front end of the semitrailer supported by a dolly and the semitrailer/dolly combination loaded to a weight (including weight of test equipment) which is equivalent to the sum of the GAWRs of the semitrailer axle(s); the load on the dolly axle(s) shall not exceed 20% of the loaded combination test weight.

5.3.3 The unloaded tests shall be conducted on full trailers with no payload but with test equipment.

5.3.4 The unloaded tests shall be conducted on semitrailers, utilizing a dolly to support the front end of the semitrailer, with no payload but with test equipment.

5.4 Tires are to be of the largest diameter specified for the trailer, new or not more than 20% worn, and inflated to pressures specified by the trailer manufacturer.

6. TEST NOTES:

6.1 Conduct the test on a dry, smooth Portland cement concrete surface (or other surface of equivalent coefficient of surface friction) that is free from loose materials and has a grade equal to or greater than any specified grade requirement for the test vehicle, as designated in SAE J293.

6.2 Parking brake system components are to be within a temperature range of 40 - 150°F (4 - 66°C) during the test.

6.3 Parking brake systems employing service brakes shall be tested after burnishing because of the difficulty of obtaining reliable and repeatable preburnish data. The burnish schedule is specified in SAE J880. Parking brake systems which employ a friction brake that is not a part of the service brake system shall be tested after being burnished per the published procedure provided to the purchaser by the trailer manufacturer. If no such procedure is provided, test without burnish.

6.4 Trailer shall be positioned on a test grade either by a powered unit in a manner consistent with normal usage, or by other mechanical means (example: block and tackle).

6.5 Data sheets should provide for recording the following data: gross vehicle test weight (including test equipment) and axle weights for the fully loaded and unloaded condition, percent grade or grade angle, identification of parking brake system, direction of trailer on the grade, applied input effort, and observation of wheel roll or lock and trailer hold or slide.

7. TEST PROCEDURE:

7.1 Connect towing equipment to full trailer or dolly that supports semitrailer in a normally connected attitude.

7.2 Ascend 20% grade until trailer is fully on grade.

7.3 With trailer held on grade by towing equipment, apply trailer parking brake system to a force not exceeding 125 lb (556 N) for hand-operated or 150 lb (667 N) for foot-operated system.

7.4 Render trailer brake system independent of towing equipment brake system.

7.5 Disengage towing equipment so that no retarding force is supplied to the trailer. Deactivate any brakes on a dolly supporting a semitrailer so that they do not retard the trailer. Observe parking performance for at least 5 minutes.

NOTE: Suitable precautions must be taken to stop trailer in case of breakaway on test grade.

7.6 In case of trailer creep, note whether wheels roll or slide.

7.7 Reconnect towing equipment. Release parking brakes and repeat steps 7.2 through 7.6 facing the opposite direction on the grade.

8. REPORTING OF PERFORMANCE:

Trailer parking performance shall be expressed as described in 6.5.

The phi (Ø) symbol is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. If the symbol is next to the report title, it indicates a complete revision of the report.

RATIONALE:

SAE J293 OCT88, Vehicle Grade Parking Performance Requirements

SAE J360 OCT88, Truck & Bus Grade Parking Performance Test Procedure

Proposed revisions to these standards respond to both the need for periodic updating (SAE J293 and J360 were last changed in June, 1972, and November, 1971 respectively) and the assignment of responsibility for these standards to the Truck and Bus Council. Thus, being no longer shared with passenger car/light truck/travel trailer vehicles governed by the Motor Vehicle Council, these standards are applicable only to vehicles with Gross Vehicle Weight ratings over 10 000 pounds.

The draft standards presented here are the harmonized results of Brake Systems Subcommittee and Brake Committee ballots over the past 22 months.

RELATIONSHIP OF SAE STANDARD TO ISO STANDARD:

Not applicable.

REFERENCE SECTION:

SAE J293 OCT88, Vehicle Grade Parking Performance Requirements

J360 OCT88, Motor Vehicle Grade Parking Performance Test Code

APPLICATION:

This SAE Recommended Practice establishes a uniform procedure for determining the parking performance on a grade of any new trailer with manufacturer's maximum weight rating of more than 10 000 lb (4500 kg) intended for roadway use.

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