The Engineering Society For Advancing Mobility Land Sea Air and Space®
SAE INTERNATIONAL
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SURFACE VEHICLE RECOMMENDED PRACTICE

SAE J135

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Submitted for recognition as an American National Standard

SERVICE BRAKE SYSTEM PERFORMANCE REQUIREMENTS— PASSENGER CAR-TRAILER COMBINATIONS

Foreword—This Reaffirmed Document has been changed only to reflect the new SAE Technical Standards Board Format.

The performance requirements in this SAE Recommended Practice represent the accumulation of the best information available from investigations of the service brake system performance of combinations of new passenger cars and new trailers (braked or unbraked) designed for roadway use. They also represent the minimum performance recognized as acceptable by vehicle, brake system, and component manufacturers. This document may be used to determine the maximum weight of unbraked trailers the towing vehicle is recommended to pull.

1. ***Scope***—This SAE Recommended Practice presents service brake performance requirements for brake systems of all combinations of new passenger cars and new trailers (braked or unbraked) intended for roadway use (excluding special-purpose vehicles such as ambulances, hearses, etc.).

Acceptable performance requirements are based on data obtained from SAE J134.

1.1 **Purpose**—The purpose of this document is to establish the minimum service brake system performance requirements with regard to:

1.1.1 STOPPING ABILITY

1.1.1.1 Of cold brakes as affected by vehicle speed.

1.1.1.2 Of hot brakes as affected by vehicle speed and duty cycles.

1.1.1.3 Of cold brakes during emergency or inoperative power assist conditions.

1.1.2 PEDAL FORCE—Maximum and/or minimum force allowable.

1.1.3 BRAKE STABILITY

1.1.4 BRAKE SYSTEM INTEGRITY

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2. *References*

2.1 Applicable Publication—The following publication forms a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply.

2.1.1 SAE PUBLICATION—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J134—Brake System Road Test Code—Passenger Car and Light Duty Truck-Trailer Combinations

3. Instrumentation—See SAE J134, Section 4.

4. Installation Details—See SAE J134, Section 5.

5. Test Procedure—See SAE J134, Section 6.

6. Acceptable Performance Requirements

6.1 Preburnish Check—See SAE J134, 6.2.

6.1.1 Pedal force shall be between 45 and 245 N (10 and 55 lb) inclusive, for 3 m/s^2 (10 ft/s^2) stops from 48 km/h (30 mph).

6.2 Effectiveness Test—See SAE J134, 6.3, 6.5, and 6.14.

6.2.1 48 km/h (30 mph)—Pedal force shall be between 67 and 445 N (15 and 100 lb) inclusive, for 4.9 m/s^2 (16 ft/s^2).

6.2.2 96 km/h (60 mph)—Pedal force shall be between 67 and 534 N (15 and 120 lb) inclusive, for 4.9 m/s^2 (16 ft/s^2).

6.3 Emergency Brake System Test—See SAE J134, 6.6.

6.3.1 Maximum stopping distance of 305 m (1000 ft) with a maximum pedal force of 890 N (200 lb) without causing any tire of either vehicle to leave a 3.7 m (12 ft) lane.

6.4 Inoperative Power System Test—See SAE J134, 6.7.

6.4.1 Maximum stopping distance of 183 m (600 ft) with a maximum pedal force of 890 N (200 lb) without leaving a 3.7 m (12 ft) lane.

6.5 First Fade and Recovery Test—See SAE J134, 6.8.

6.5.1 FADE—Pedal force for first four 4.6 m/s^2 (15 ft/s^2) stops shall not exceed 534, 654, 770, and 890 N (120, 147, 173, and 200 lb), respectively.

6.5.2 RECOVERY—A minimum of 1.5 m/s^2 (5 ft/s^2) shall be maintained at a maximum pedal force of 890 N (200 lb) for the first five recovery stops, and the pedal force shall be below 667 N (150 lb) at 3 m/s^2 (10 ft/s^2) by stop 6.

6.6 Second Fade and Recovery Test—See SAE J134, 6.11.

6.6.1 FADE—Pedal force for first eight at 4.6 m/s^2 (15 ft/s^2) stops shall not exceed 534, 587, 636, 689, 738, 787, 841, and 890 N (120, 132, 143, 155, 166, 177, 189, and 200 lb), respectively.

6.6.2 RECOVERY—Same as First Recovery Requirement, 7.5.

6.7 Stability Requirements—See SAE J134, 6.3, 6.5, and 6.14.

6.7.1 No uncontrollable braking action causing any tire of either vehicle to leave a 3.7 m (12 ft) wide roadway lane is permissible below 4.9 m/s^2 (16 ft/s^2). (Wheel slide permitted.)

6.8 Final Inspection—See SAE J134, 6.15.

6.8.1 LINING—Shall be firmly attached and intact on shoes. (Minor cracks that do not impair attachment are acceptable.)

6.8.2 MECHANICAL—All components of the brake system shall be intact and functional.

6.8.3 HYDRAULIC—All hydraulic components of the brake system shall be leakfree.

6.8.4 ELECTRICAL—All electrical components of the trailer brake system, excluding stop light circuits, shall be intact and functional.

7. Report Form—General Data and Summary Report Form, Figure 1.

GENERAL DATA AND SUMMARY REPORT FORM
SERVICE BRAKE SYSTEM PERFORMANCE REQUIREMENTS: PASSENGER CAR-TRAILER COMBINATIONS

TEST PHASE	REQUIRED		ACTUAL
PREBURNISH CHECK	44-245 N pf	10-55 lb pf	min max N (lb) pf
EFFECTIVENESS TESTS 48 km/h at 4.9 m/s^2 (30 mph at 16 ft/s^2) 97 km/h at 4.9 m/s^2 (60 mph at 16 ft/s^2)	 67-445 N pf 67-534 N pf	 15-100 lb pf 15-120 lb pf	1st 2nd Final N (lb) pf ___ ___ ___ N (lb) pf ___ ___ ___ N (lb) pf
EMERGENCY BRAKE TEST 97 km/h (60 mph) Stopping Distance	305 m and 890 N max pf	1000 ft and 200 lb max	Front ___ m (ft) ___ N (lb) pf Rear ___ m (ft) ___ N (lb) pf
INOPERATIVE POWER SYSTEM TEST 97 km/h (60 mph) Stopping Distance	 183 m and 890 N max pf	Manual ___ Power ___ 600 ft and 200 lb max pf	 ___ m (ft) ___ N (lb) pf
FIRST FADE AND RECOVERY TEST Fade Stops 1-4 Recovery Stops 1-5 Recovery Stops 6-12	 534, 654, 770, 890 N pf 1.5 m/s^2 at 890 N max pf 3 m/s^2 at 667 N max pf	 120, 147, 173, 200 lb pf 5 ft/s^2 at 200 lb max pf 10 ft/s^2 at 150 lb max pf	 ___, ___, ___, ___ N (lb) pf ___ m/s^2 (ft/s^2) at ___ N (lb) max pf ___ N (lb) max pf
SECOND FADE AND RECOVERY TEST Fade Stops 1-8 Recovery Stops 1-5 Recovery Stops 6-12	 534, 587, 636, 689, 738, 787, 841, 890 N 1.5 m/s^2 at 890 N max pf 3 m/s^2 at 667 N max pf	 120, 132, 143, 155, 166, 177, 189, 200 lb pf 5 ft/s^2 at 200 lb max pf 10 ft/s^2 at 150 lb max pf	 ___, ___, ___, ___, ___ ___, ___, ___ N (lb) pf ___ m/s^2 (ft/s^2) at ___ N (lb) max pf ___ N (lb) max pf
STABILITY DURING Effectiveness Tests	No Uncontrollable Braking Causing Car to Leave 3.7 m Lane Below 4.9 m/s^2	No Uncontrollable Braking Causing Car to Leave 12 ft Lane Below 16 ft/s^2	Controllable Braking Below 4.9 m/s^2 (16 ft/s^2) Yes ___ No ___
FINAL INSPECTION Lining Integrity Mechanical Integrity Hydraulic Integrity Electrical Integrity	 Intact and No Cracks Intact and Functional Leakfree Intact and Functional	 Intact and No Cracks Intact and Functional Leakfree Intact and Functional	 Yes ___ No ___ Yes ___ No ___ Yes ___ No ___ Yes ___ No ___

Comments: _____

Reported By: _____ Date: _____

FIGURE 1—GENERAL DATA AND SUMMARY REPORT FORM

PREPARED BY THE SAE BRAKE STANDARDS COMMITTEE 7—ROAD TEST PROCEDURES