



SURFACE VEHICLE INFORMATION REPORT

J3352™

DEC2025

Issued

2025-12

Conventional Towing System
0 up to 9072 kg (20000 Pounds) Trailer GVW

RATIONALE

With the increase in chassis capacity in the automotive industry, there is no minimum performance standard for conventional towing systems from 4536 to 9072 kg (10001 to 20000 pounds). This standard reflects a more modern approach using fatigue life cycle testing and creates a Class 5 rating. This standard is intended to replace only the weight carrying hitch test loads in SAE J684. This does not apply to the weight distributing hitch loads.

FOREWORD

This report was developed to create a Class 5 minimum performance criteria for conventional towing systems. The Class 5 rating will be from 4536 up to 9072 kg (10001 to 20000 pounds) Gross Trailer Weight. Dynamic performance criteria will be implemented in all Class ratings. This report is intended to replace all weight carrying hitch loading from SAE J684. This specification was developed through SAE by industry representatives, including tow vehicle, trailer, and towing component manufacturers. Live road data, SAE J2638, and SAE J684 were used to develop this information report.

1. SCOPE

This document establishes a minimum performance criteria for conventional towing systems for the towing interface between a tow vehicle and trailer up to 9072 kg (20000 pounds) Gross Trailer Weight Rating. This does not include weight distributing hitches. This creates the minimum performance criteria for the hitch, trailer attachment structure, coupling, and tow vehicle attachment structure. This standard may be used as a regulatory guide in the selection of products covered. This document is intended to be used voluntarily by the industry producing these products.

2. REFERENCES

2.1 Applicable Documents

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

2.1.1 SAE Publications

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

SAE J670 Vehicle Dynamics Terminology

SAE J3085 Terminology for Light and Medium Duty Trailers and Components

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2.1.2 Code of Federal Regulations (CFR) Publications

Copies of these documents are available online at www.ecfr.gov.

49 CFR § 390.5 Federal Motor Carrier Safety Regulations; General: Definitions

49 CFR § 571.3 Federal Motor Vehicle Safety Standards: Definitions

NOTE: The Code of Federal Regulations (CFR) is a codification of the general and permanent rules published in the Federal Register by the Executive departments and agencies of the Federal Government.

2.2 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

2.2.1 SAE Publications

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

SAE J684 Trailer Couplings, Hitches, and Safety Chains—Automotive Type

SAE J2638 Fifth Wheel and Gooseneck Attachment Performance Up to 13608/kg (30000/lb) Trailer Weight

2.2.2 European Union Publications

Copies of these documents are available online at <https://european-union.europa.eu>.

Directive 94/20/EC of the European Parliament and of the Council of 30 May 1994 relating to the mechanical coupling devices of motor vehicles and their trailers and their attachment to those vehicles

2.2.3 ISO Publications

Copies of these documents are available online at www.iso.org/store.

ISO 3853 Road vehicles — Towing vehicle coupling device to tow caravans or light trailers — Mechanical strength test

3. DEFINITIONS

3.1 General Definitions

3.1.1 GVWR

Gross Vehicle Weight Rating (refer to 49 CFR §§ 390.5 and 571.3).

3.1.2 GVW

Gross Vehicle Weight (refer to 49 CFR §§ 390.5 and 571.3).

3.1.3 VERTICAL TONGUE LOAD RATING (VR)

Maximum static vertical load that can be applied to the connection between the tow vehicle and trailer.

3.1.4 TRAILER TOW RATING

Maximum Trailer GVW.

3.2 CONVENTIONAL TRAILER

A semi-trailer with a coupling device designed to attach to a hitch at the rear of the tow vehicle. This does not include fifth wheel or gooseneck trailers. Sometimes called "Bumper Pull" trailer.

3.2.1 HITCH

Refer to SAE J3085.

3.2.2 BALL

Refer to SAE J3085.

Spherical shaped pin that is attached to a bumper or drawbar. This is the connector between the hitch and the trailer coupler.

3.2.3 TRAILER COUPLER

Mechanism attaching to the trailer structure that locks onto the ball.

4. TEST METHODS

4.1 General Test Conditions

4.1.1 The test conditions described in 4.2 are static and dynamic tests. These shall be performed on a test bed or fixture.

4.1.2 The components to be tested shall be attached in accordance with manufacturer's instructions and shall be positioned to create max stress conditions.

4.1.3 The test fixture should be generally a rigid fixture or representative of a typical vehicle structure.

4.1.4 Longitudinal and transverse loads may be stabilized with a vertical load not to exceed the lesser of maximum allowable tongue weight rating of the hitch or coupler being tested or 15% of the maximum allowable trailer weight.

4.1.5 Shims may be utilized to reduce connection clearances so that the required load frequency can be met.

4.1.6 For load coordinate system, refer to SAE J670.

4.1.7 For typical conventional load direction, see Figures 1 and 2.