SAE International [®]	SURFACE VEHICLE	SAE J670 JAN2008	
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	PRACTICE	Superseding	J670e JUL1976
(R) Vehicle Dynamics Terminology			

RATIONALE

SAE J670 was last updated over 30 years ago. Since the last revision, the field of vehicle dynamics has changed significantly. New systems such as four-wheel steering and active control have been applied to enhance the performance of vehicles. The terminology for vehicle dynamics needed to be updated to accommodate these new technologies and to make the definitions consistent with current usage in the field. Accordingly, many new terms have been added to the terminology to provide formal definitions for terms that are associated with these new technologies. A number of existing definitions, which were based on front-wheel steer vehicles with passive control, were also revised to accommodate new technologies.

In addition, new SAE and ISO standards have been published since the last revision of SAE J670 that directly relate to topics considered in SAE J670. The content of these new standards also indicated the need to revise SAE J670.

Specifically, in 1987, SAE published J1594, containing aerodynamics terminology previously appearing in SAE J670e. The aerodynamics section of SAE J670e is not included in the revised document, because those terms are now defined in SAE J1594.

In 1991, the International Organization for Standardization (ISO) published a vehicle dynamics vocabulary, ISO 8855. SAE J670e and ISO 8855 are incompatible in several aspects, the most notable being the axis systems defined in the two documents. SAE J670e utilizes an axis system based on aeronautical practice, with positive X forward, positive Y to the right, and positive Z down. ISO 8855 utilizes an axis system with positive X forward, positive Y to the left, and positive Z up. The revised SAE J670 embraces both of these axis orientations. The revised SAE J670 additionally addresses technical shortcomings found in both SAE J670e and ISO 8855 and is a harmonized superset of the two documents.

In 1998, SAE published J2047, containing definitions for tire performance terms that were previously defined in SAE J670e. The revised SAE J670 utilizes many definitions excerpted from SAE J2047, although some of these definitions are revised to enhance their applicability to vehicle dynamics.

Several of the sections of SAE J670e dealing with vibration terminology are not included in the new SAE J670, as the terms that were defined in these sections are commonly defined in engineering textbooks and the definitions are not specific to vehicle dynamics.

Finally, the terminology is extended to include definitions for many suspension and steering components, to enhance communication among vehicle dynamics professionals.

This seventh edition of SAE J670 replaces the preceding edition (SAE J670e) in its entirety.

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FOREWORD

This terminology is intended to be sufficient to allow meaningful communication between vehicle dynamics professionals who need to describe the static and dynamic characteristics of automobiles, light trucks, and trailers. The terminology is to be used for presenting results and findings concerning the longitudinal, lateral, vertical and rotational dynamic performance of the applicable vehicles as predicted by analyses and simulations or as measured in tests and operational situations.

The purpose of this terminology is not to cover all terms in the manner of a dictionary or terms found in a basic engineering textbook. Rather, this document contains compatible definitions that have been carefully selected to aid in conveying ideas with rigor and accuracy in a readily understood and generally acceptable manner.

The terminology draws upon terms and definitions previously appearing in SAE J670e and ISO 8855 and further develops those that are applicable to the subjects covered by this document. For application to the study of vehicle dynamics, the tire terminology in this document contains pertinent definitions extracted from or based upon SAE J2047. Definitions for many chassis components are also provided.

Many of the definitions in the document contain terms appearing in italic font. Definitions for terms in italic may be found elsewhere in the document.

INTRODUCTION

ISO 8855:1991 is the international standard corresponding to SAE J670. The scopes of these two standards are different. The scope of SAE J670 is limited to passenger cars and light trucks with two axles, plus those vehicles in combination with single-axle trailers. The scope of ISO 8855 additionally includes heavy commercial vehicles, with multiple axles and multiple units. SAE J670 recognizes axis systems with both Z-Up and Z-Down orientations, while ISO 8855 only recognizes the Z-Up orientation. SAE J670 defines five axis systems: Earth, intermediate, vehicle, tire, and wheel, while ISO 8855 defines four axis systems: Earth, intermediate, vehicle, and wheel (equivalent to the SAE J670 tire system). SAE J670 accommodates four-wheel steering, while ISO 8855 does not. SAE J670 accommodates an inclined road surface that is non-uniform, while ISO 8855 is limited to application on a flat, horizontal road surface. SAE J670 includes definitions for many suspension and steering components, while component definitions are not included in ISO 8855. SAE J670 also defines many more terms (over 600) than are defined in ISO 8855 (approximately 130).

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