



SURFACE VEHICLE RECOMMENDED PRACTICE

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Braking System Definitions - Truck and Bus

RATIONALE

This document has been stabilized because it covers technology, products, or processes which are mature and not likely to change in the foreseeable future.

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Documents

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1. SCOPE

This SAE Recommended Practice identifies and defines terms specifically related to truck and bus braking systems including Antilock Brake Systems (ABS) and Electronically Controlled Braking Systems (ECBS).

2. REFERENCES

2.1 Applicable Publications

The following publications form a part of this specification to the extent specified herein. Unless otherwise specified, 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 724-776-4970 (outside USA), www.sae.org.

SAE J560	Primary and Auxiliary Seven Conductor Electrical Connector for Truck-Trailer Jumper Cable
SAE J592	Sidemarkers Lamps for Use on Road Vehicles Less than 2032 mm in Overall Width
SAE J656	Automotive Brake Definitions and Nomenclature
SAE J1455	Recommended Environmental Practices for Electronic Equipment Design in Heavy-Duty Vehicle Applications
SAE J1587	Electronic Data Interchange Between Microcomputer Systems in Heavy-Duty Vehicle Applications
SAE J1708	Serial Data Communications Between Microcomputer Systems in Heavy-Duty Vehicle Applications
SAE J1922	Powertrain Control Interface for Electronic Controls Used in Medium- and Heavy-Duty Diesel On-Highway Vehicle Applications

SAE J1939	Recommended Practice for a Serial Control and Communications Vehicle Network
SAE J1939-01	Recommended Practice for Control and Communications Network for On-Highway Equipment
SAE J1939-11	Physical Layer, 250K bits/s, Twisted Shielded Pair
SAE J1939-13	Off-Board Diagnostic Connector
SAE J1939-21	Data Link Layer
SAE J1939-31	Network Layer
SAE J1939-71	Vehicle Application Layer
SAE J1939-73	Application Layer—Diagnostics
SAE J1939-81	Network Management
SAE J2497	Power Line Carrier Communications for Commercial Vehicles

2.1.2 FMVSS Publication

Available from the Document Automation and Production Service (DAPS), Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Tel: 215-697-6257, <http://assist.daps.dla.mil/quicksearch/>.

Federal Motor Vehicle Safety Standard 121	Air Brake Systems
Federal Motor Vehicle Safety Standard 105	Hydraulic and Electric Brake Systems

2.1.3 ECE Publication

Available from United Nations Economic Commission for Europe, Palais des Nations, CH-1211, Geneva 10, Switzerland, Tel: +41-0-22-917-12-34, www.unece.org.

ECE R13	Uniform provisions concerning the approval of vehicles of categories M, N and O with regard to braking
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2.1.4 ISO Publications

Available from ANSI, 25 West 43rd Street, New York, NY 10036-8002, Tel: 212-642-4900, www.ansi.org.

ISO 9141	Road vehicles—Diagnostic systems—Requirements for interchange of digital information
ISO 11992-1	Road vehicles—Interchange of digital information on electrical connections between towing and towed vehicles—Part 1: Physical layer and data-link layer—Second edition
ISO 11992-2	Road vehicles—Interchange of digital information on electrical connections between towing and towed vehicles—Part 2: Application layer for brakes and running gear—Second edition
ISO 14230	Road vehicles—Diagnostic systems KWP2000 (Parts 1-4)

3. DEFINITIONS

3.1 1P-1E ECBS Configuration

An Electronically Controlled Braking System in which a single electronic control signal is overlaid onto a single pressure control signal to operate the foundation brakes under normal conditions.

3.2 2P Configuration

A pneumatically controlled braking system in which two isolated pneumatic signals control the service brake system.

3.3 2P-1E ECBS Configuration

An Electronically Controlled Braking System in which a single electronic control signal is overlaid onto the traditional dual pneumatic brake signals to operate the foundation brakes under normal conditions.

3.4 2E ECBS Configuration

An Electronically Controlled Braking System in which two isolated electronic signals control the service brake system.

3.5 2s-1m

An ABS or ECBS control system in which two wheel speed sensors provide the input for control of a single pressure-modulation valve.

3.6 2s-2m

An ABS or ECBS control system in which two wheel speed sensors provide the input for control of two modulation valves.

3.7 4s-2m Axle Control

An ABS or ECBS control system in which four wheel speed sensors provide the input for the control of two pressure-modulation valves that are operated in axle-by-axle mode.

3.8 4s-2m Side Control

An ABS or ECBS control system in which four wheel speed sensors provide the input for the control of two pressure-modulation valves that are operated in side-by-side mode.

3.9 4s-3m

An ABS or ECBS control system in which four wheel speed sensors provide the input for control of three pressure-modulation valves.

3.10 4s-4m

An ABS or ECBS control system in which four wheel speed sensors provide the input for control of four pressure-modulation valves.

3.11 6s-4m

An ABS or ECBS control system in which six wheel speed sensors provide the input for control of four pressure-modulation valves.

3.12 6s-5m

An ABS or ECBS control system in which six wheel speed sensors provide the input for control of five pressure-modulation valves.

3.13 6s-6m

An ABS or ECBS control system in which six wheel speed sensors provide the input for control of six pressure-modulation valves.

3.14 ABS (per FMVSS-121)

Antilock brake system or ABS means a portion of a service brake system that automatically controls the degree of rotational wheel slip during braking by: (1) Sensing the rate of angular rotation of the wheels; (2) Transmitting signals regarding the rate of wheel angular rotation to one or more controlling devices which interpret those signals and generate responsive controlling output signals; and (3) Transmitting those controlling signals to one or more modulators which adjust brake actuating forces in response to those signals.

3.15 ABS (per ECE R13)

An “anti-lock braking system” is a part of a service braking system which automatically controls the degree of slip, in the direction of rotation of the wheel(s), on one or more wheels of the vehicle during braking.

3.16 ACC

Active Cruise Control or Adaptive Cruise Control – A system that uses radar, laser or other sensors in addition to a traditional cruise-control system and ABS or ECBS to monitor traffic ahead of a vehicle, and automatically maintain a preset following interval via engine throttle, auxiliary brakes or the service braking system. ACC typically has three major functions: maintaining a set speed, detecting a vehicle in the travel lane ahead, and maintaining a predefined headway when slower vehicles ahead are detected. Also referred to as Intelligent Cruise Control.

3.17 ADB

Air Disc Brake – A pneumatically actuated disc brake.

3.18 Air Gap

The distance between the face of a wheel speed sensor and tone ring.

3.19 Antilock Malfunction Signal and Circuit (per FMVSS-121, S5.1.6.2)

An indicator lamp, mounted in front of and in clear view of the driver, which is activated whenever there is a malfunction that affects the generation or transmission of response or control signals in the vehicle's antilock brake system. (b)(1) The lamp shall be designed to conform to the performance requirements of SAE International Recommended Practice J592 JUN92, or J592e, July 1972, Clearance, Side Marker, and Identification.

3.20 ALB

Automatic Load-dependent Braking force control – A system that balances the brake force between axles depending on vehicle load distribution. .

3.21 Anti-Compounding

A mechanism that prevents the combined forces of spring brake and service brake from being applied to a foundation brake simultaneously.

3.22 ASR

Automatic Slip Regulation. See ATC.