



APTA PR-M-S-032-24

First Published: Feb. 13, 2024

PRESS Mechanical Working Group

Passenger Brake Alarm and Crew Emergency Brake Device

Abstract: This document provides standards for the application and functionality of passenger brake alarm and crew emergency brake device for new passenger equipment in the passenger railroad industry. This document is based upon the Tier III regulations per 49 CFR §238.731.

Keywords: conductor's valve, emergency brake device, emergency brake valves, passenger brake alarm

Summary: This document provides standards for the application and functionality of the passenger brake alarm and crew emergency brake device for new passenger equipment in the passenger railroad industry, including the design, activation and reset. The document is applicable to new passenger equipment as specified by the railroad. When applied to new Tier I and Tier II passenger cars/MU locomotives, the railroad should consult the FRA about a potential waiver regarding the direct acting emergency brake as contained in 49 CFR §238.5 and 49 CFR §238.231 prior to implementing the passenger brake alarm.



Foreword

The American Public Transportation Association is a standards development organization in North America. The process of developing standards is managed by the APTA Standards Program's Standards Development Oversight Council (SDOC). These activities are carried out through several standards policy and planning committees that have been established to address specific transportation modes, safety and security requirements, interoperability, and other topics.

APTA used a consensus-based process to develop this document and its continued maintenance, which is detailed in the [manual for the APTA Standards Program](#). This document was drafted in accordance with the approval criteria and editorial policy as described. Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

This document was prepared by the PRESS Mechanical Working Group as directed by the Passenger Rail Equipment Safety Standards Policy and Planning Committee.

This document represents a common viewpoint of those parties concerned with its provisions, namely transit operating/planning agencies, manufacturers, consultants, engineers and general interest groups. APTA standards are mandatory to the extent incorporated by an applicable statute or regulation. In some cases, federal and/or state regulations govern portions of a transit system's operations. In cases where there is a conflict or contradiction between an applicable law or regulation and this document, consult with a legal adviser to determine which document takes precedence.

This is a new document.



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Participants

The American Public Transportation Association greatly appreciates the contributions of the **Mechanical Brake Sub-Working Group of the PRESS Mechanical Working Group**, which provided the primary effort in the drafting of this document.

Paul E. Jamieson, Chair, *Retired*

Taft Bearden, *AtkinsRéalis*

Jonathan Bernat, *Knorr Brake Corp.*

Eric Bisailon, *Wabtec Corp.*

B. A. “Brad” Black, *Virginkar and Associates, Inc.*

Greg Buzby, *SEPTA*

Paul Callaghan, *Transport Canada*

John Condrasky, *Retired*

Joshua Coran, *Talgo, Inc.*

Michael Craft, *MxV Rail*

Brendan Crowley, *Knorr Brake Corp.*

Adam Eby, *Amtrak*

Logan Ferguson, *Knorr Brake Corp.*

Dooheon Ghim, *WMATA*

Robert Glen, *Jacobs*

Eric Harden, *Knorr Brake Corp.*

Lew Hoens, *MTA Metro-North Railroad*

Robert Jones, *Stadler*

Joseph Kenas, *Alstom*

Heinz-Peter Kotz, *Siemens Mobility, Inc.*

Pallavi Lal, *Hatch*

Chris Madden, *Amtrak*

Frank Maldari, *MTA Long Island Rail Road*

Eloy Martinez, *Hatch*

Francis Mascarenhas, *Metra*

Patrick McCunney, *AtkinsRéalis*

Thomas O’Brien, *KLD Labs, Inc.*

Martin Petzoldt, *Wabtec Corp.*

Benoit Poulin, *Alstom*

Daniel Rice, *Wabtec Corp.*

Kurt Rindgen, *Hatch*

Jean-Francois Savaria, *Alstom*

Gerhard Schmidt, *Siemens Mobility, Inc.*

Melissa Shurland, *Federal Railroad Administration*

Benjamin Spears, *Hatch*

Lukasz Szymasiak, *Via Rail Canada, Inc.*

Medhi Taheri, *Raul V. Bravo + Associates, Inc.*

Jeff Thompson, *SEPTA*

Yi Wang, *MxV Rail*

Brian Whitten, *AtkinsRéalis*

At the time this standard was completed, the **Mechanical Working Group** included the following members:

Chris Madden, Amtrak, *Chair*

Greg Buzby, SEPTA, *Vice Chair*

Benjamin Spears, Hatch, *Secretary*

Mohamed Alimirah, *Metra*

Carl Atencio, *American Rocky Mountaineer*

Gordon Bachinsky, *Advanced Rail Management*

Frank Banko, *WSP USA*

Juan Barahona, *Talgo, Inc.*

Michael Barnes, *Jacobs*

Taft Bearden, *AtkinsRéalis*

David Bennett, *Capital Metro. Transp. Auth.*

Jonathan Bernat, *Knorr Brake Corp.*

Eric Bisailon, *Wabtec Corp.*

Kristoffer Bittner, *MTA Long Island Rail Road*

B. A. “Brad” Black, *Virginkar and Associates, Inc.*

Casey Blaze, *GCRTA*

Stephen Bonina, *WSP USA*

Glenn Brandimarte, *ORX*

Richard Bruss, *Retired*

Dennis Cabigting, *STV, Inc.*

Elvin Calderon, *Denver Transit Operators*

Rob Caldwell, *NRC*

Paul Callaghan, *Transport Canada*

Julia Camacho, *Talgo, Inc.*

Gordon Campbell, *Crosslinx Transit Solutions*

Kevin Carmody, *STV, Inc.*

David Carter, *New Jersey Transit Corp.*

Steve Cavanaugh, *Metrolinx*

Dion Church, *AtkinsRéalis*



Vlad Ciobanu, *Siemens Mobility, Inc.*
John Condrasky, *Retired*
Joshua Coran, *Talgo, Inc.*
Michael Craft, *MxV Rail*
Brian Creely, *Siemens Mobility, Inc.*
Brendan Crowley, *Knorr Brake Corp.*
Ryan Crowley, *AtkinsRéalis K'Moy Daye, MTA Metro-North Railroad*
Joe Di Liello, *Via Rail Canada, Inc.*
David Diaz, *Hatch*
Adam Eby, *Amtrak*
Terran Engle, *Stadler*
Phillippe Etchessahar, *Alstom*
Gary Fairbanks, *Federal Railroad Administration*
Robert Festa, *MTA Long Island Rail Road*
Steve Finegan, *AtkinsRéalis*
Gavin Fraser, *Jacobs*
Francesco Paolo Fumarola, *Alstom*
Edward Gacsi, *New Jersey Transit Corp.*
Joe Gagliardino, *McConway & Torley LLC*
Sebastian Geraud, *Alstom*
Dooheon Ghim, *WMATA*
Jeffrey Gordon, *Federal Railroad Administration*
Emily Greve, *Amtrak*
Christian Gschnitzer-Baerenthaler, *Stadler*
Stan Gurule, *MxV Rail*
Joanna Hallisy, *Timken*
Guillaume Ham-Livet, *Alstom*
Eric Harden, *Knorr Brake Corp.*
Nicholas Harris, *Hatch*
Juan Hernandez, *Mott McDonald*
Lew Hoens, *MTA Metro-North Railroad*
Christopher Holliday, *STV, Inc.*
Gregory Holt, *Penn Machine Company*
George Hud, *Hatch*
Jessica, Iacobucci, *Hatch*
Paul Jamieson, *Retired*
John Janiszewski, *Hatch*
MaryClara Jones, *MxV Rail*
Robert Jones, *Stadler*
Larry Kelterborn, *LDK Advisory*
Joseph Kenas, *Alstom*
Peter Klauser, *Vehicle Dynamics*
Christian Knapp, *Denver Transit Operators*
Karan Kothari, *Amtrak*
Heinz-Peter Kotz, *Siemens Mobility, Inc.*
Scott Kramer, *McConway & Torley LLC*

Tammy Krause, *STV, Inc.*
Pierre Laberge, *Alstom*
Pallavi Lal, *Hatch*
Peter Lapre, *Federal Railroad Administration*
Brand Loney, *WMATA*
Cameron Lonsdale, *Amsted Rail*
Daniel Luskin, *Amtrak*
John MacEwan, *SEPTA*
Eric Magel, *Retired*
Daniel Magnus, *KLD Labs, Inc.*
Frank Maldari, *MTA Long Island Rail Road*
Brian Marquis, *Federal Railroad Administration*
Eloy Martinez, *Hatch*
Francis Mascarenhas, *Metra*
Maria Mauri, *Wabtec Corp.*
Ronald Mayville, *Retired*
Katie McCabe, *ORX*
William McClellan, *ACI*
Patrick McCunney, *AtkinsRéalis*
Gerard McIntyre, *Knorr Brake Corp.*
William Minnick, *Omni Strategy, LLC*
Felix Moreau, *MTA Long Island Rail Road*
Luke Morscheck, *Steady-On Engineering*
Karl Mullinix, *Knorr Brake Corp.*
Paul O'Brien, *UTA*
Thomas O'Brien, *KLD Labs, Inc.*
Chase Patterson, *Voith*
Joe Patterson, *Amsted Rail*
Martin Petzoldt, *Wabtec Corp.*
Ian Pirie, *STV, Inc.*
Brian Pitcavage, *Hatch*
Benoit Poulin, *Alstom*
Ian Pradhan, *Stadler*
Brandon Reilly-Evans, *Hatch*
Peter Reumueller, *Siemens Mobility, Inc.*
Daniel Rice, *Wabtec Corp.*
Kurt Rindgen, *Hatch*
Jeffrey Rogers, *Amtrak*
Carol Rose, *STV, Inc.*
Thomas Rusin, *Rusin Consulting*
Mehrddad Samani, *Jacobs*
Jean-Francois Savaria, *Alstom*
Gerhard Schmidt, *Siemens Mobility, Inc.*
Ralph Schorr, *Amsted Rail*
Martin Schroeder, *Jacobs*
George Scoullous, *New Jersey Transit Corp.*
Richard Seaton, *TDG International, Inc.*



Frederic Setan, *Alstom*
Patrick Sheeran, *Hatch*
Xinggao Shu, *MxV Rail*
Melissa Shurland, *Federal Railroad Administration*
Marcel Silva, *Hatch*
David Skillman, *Amtrak*
Rick Spencer, *Knorr Brake Corp.*
Mark Stewart, *Hatch*
Jonathan Sunde, *Strato, Inc.*
Lukasz Szymasiak, *Via Rail Canada, Inc.*
Medhi Taheri, *Raul V. Bravo + Associates, Inc.*
Ali Tajaddini, *Federal Railroad Administration*
Jeff Thompson, *SEPTA*
Ben Titus, *Jacobs*
Matthew Todt, *Amsted Rail*
Michael Trosino, *Amtrak*
Ronald Truitt, *HTSI*
Anthony Ursone, *UTCRAAS, LLC*

Frank Ursone, *UTCRAAS, LLC*
Rudy Vazquez, *Amtrak*
Gary Wagner, *Amsted Rail*
Michael Walsh, *MBTA*
David Warner, *STV, Inc.*
Michael Wetherell, *McKissack & McKissack*
Brian Whitten, *AtkinsRéalis* Kristian Williams,
Amtrak
Todd Williams, *Penn Machine Company*
Nicholas Wilson, *MxV Rail*
Timothy Wineke, *Knorr Brake Corp.*
Reggie Wingate, *Knorr Brake Corp.*
Tamar Yassa, *Transport Canada*
Aleksy Yelesin, *Alstom*
Kevin Young, *Amsted Rail*
Gregory Yovich, *NICTD*
Steven Zuiderveen, *Federal Railroad Administration*

Project team

Nathan Leventon, *American Public Transportation Association*

Introduction

This introduction is not part of APTA PR-M-S-032-24, “Passenger Brake Alarm and Crew Emergency Brake Device.”

This standard applies to all:

- railroads that operate intercity or commuter passenger train service on the general railroad system of transportation; and
- railroads that provide commuter or other short-haul rail passenger train service in a metropolitan or suburban area, including public authorities operating passenger train service.

This standard does not apply to:

- rapid transit operations in an urban area that are not connected to the general railroad system of transportation;
- tourist, scenic, historic, host railroads or excursion operations, whether on or off the general railroad system of transportation;
- operation of private cars, including business/office cars and circus trains unless otherwise required by other standards or regulations; or
- railroads that operate only on track inside an installation that is not part of the general railroad system of transportation.



Scope and purpose

The purpose of this standard is to provide for common configuration and operation of the passenger brake alarm and crew emergency brake device for new passenger equipment as it promotes safe and reliable initiation of an emergency brake application.

The passenger brake alarm and crew emergency brake device configuration addresses safety concerns with stopping a train after a boarding platform departure in potential unsafe locations and conditions. The Engineer is knowledgeable of the risk associated with emergency brake activation and should have the ability to make the decision if an emergency brake application should be initiated when requested by passengers. Unsafe locations and conditions are determined by the railroad. Some potential unsafe locations may include tunnels, high embankments, deep cuts, overhead structures including bridges, etc. Some potential unsafe conditions may include fire, smoke, flood, etc.

Passenger Brake Alarm and Crew Emergency Brake Device

1. Passenger brake alarm requirements

IMPORTANT: When applied to new passenger equipment operated in the United States, the railroad shall obtain from the FRA a waiver from the regulation for a direct acting emergency brake as contained in 49 CFR §238.5 and 49 CFR §238.231 prior to implementing the passenger brake alarm.

IMPORTANT: When applied to new passenger equipment operated in Canada, the railroad shall enter into discussions with Transport Canada regarding the intention to implement this standard.

IMPORTANT: Compliance with APTA PR-S-M-007, “Passenger and Crew Emergency Brake Device in New Passenger Equipment,” is required per section 2 Cab/Crew Emergency Brake Device.

NOTE: It is recommended to ensure that all cars and locomotives in a single train implement the same type of passenger/crew emergency brake system.

1.1 Technical

NOTE: The technical requirements contained in this section were developed and supplemented to the requirements contained in 49 CFR §238.731(d).

The passenger brake alarm (PBA) implementation requires that the train shall be equipped with the network system that provides train-wide information to the engineer and train crew.

The emergency brake device shall be located no more than 45 ft (13.7 m) from a seated passenger and preferably near an exterior door on each passenger car/MU locomotive. Emergency brake devices shall be accessible to passengers in the passenger compartment..

The words “Passenger Brake Alarm” shall be legibly marked on each device or adjacent badge plate per APTA PR-PS-006-22, latest revision.

The distance from the floor to the top of the PBA operating device shall not exceed 73 in. (1850 mm). Device actuation shall not require more than 30 lbf (133 N) of force applied to its operating handle.

PBA actuation device, distance above floor and operating force required for actuation shall be approved by the railroad..

The PBA shall be directly attached to a slip-resistant operating device.

Cables or linkage shall be designed to preclude the possibility of jamming, loosening or other malfunctions that could impede the alarm’s operation. Cords of any type are not permissible.

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All PBAs shall be installed to prevent accidental activation.

During departure from the boarding platform, and while any car in train is at platform, activation of the PBA shall result in an emergency brake application..

A PBA request that occurs after the train has safely cleared the boarding platform shall be acknowledged by the engineer within the time period specified by the railroad, as approved by the FRA, for train operation to remain under full control of the engineer. The method used to confirm that the train has safely cleared the boarding platform shall be defined by the railroad as approved by the FRA.

If the engineer does not acknowledge the PBA within the time period specified, at a minimum, a retrievable full service brake application shall be automatically initiated until the train has stopped unless the engineer intervenes as further described.

To retrieve the full service brake application as described above, the engineer must first acknowledge the PBA and activate the appropriate controls to issue a command for a brake application specified by the railroad, as approved by the FRA.

A visual and/or audible indication shall be provided at the PBA location that the request was sent.

The train crew including the engineer shall be provided with the PBA activation location (car identification).

The PBA request and PBA override shall be an input to the event recorder.

All unsafe locations and conditions for engineer not to apply brake in response to PBA shall be determined and documented by the railroad operating rules and training. The means to reset the PBA after request shall be performed manually from the point of request by a train crew member.

1.2 Safety

A safety analysis for the complete system shall be provided to and approved by the railroad.

2. Cab/crew emergency brake device requirements

The cab/crew emergency brake device requirements are specified in APTA PR-M-S-007-98 latest revision.

The cab/crew emergency brake activation device(s) shall be provided to the train crew and not accessible to the passengers.

3. Pneumatic requirements

Pneumatic piping shall comply with the applicable requirements in the latest revision of APTA PR-M-S-029-20, latest revision, for the attachment to brake pipe and equipment supplier's requirements.

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Related APTA standards

APTA PR-M-S-007-98, “Passenger and Crew Emergency Brake Device in New Passenger Equipment”
APTA PR-M-S-029-20, “Pneumatic Piping for Vehicles”
APTA PR-PS-S-006-22, “Emergency Egress/Access Signage and Low-Level Exit Path Markings for Passenger Rail Equipment”

References

49 CFR §229.47, Locomotive Safety Standards – Emergency Brake Valve

49 CFR §238, Passenger Equipment Safety Standards

Definitions

brake pipe pressure: Air pressure that exists in a system of piping including trainline connections used for connecting locomotives and all cars for the passage of air to control the locomotive and car air brakes.

emergency brake (49 CFR §238.5 definition): Emergency brake application means an irretrievable brake application resulting in the maximum retarding force available from the train brake system.

emergency brake device: A manually actuated device that can initiate an emergency brake application.

passenger brake alarm: An alarm device located in the passenger compartments that results in an emergency brake application when the train is on a boarding platform or departing from a boarding platform. After departing a boarding platform, the alarm shall provide that request to the engineer and train crew.

railroad (49 CFR §270.5 definition):

(1) Any form of non-highway ground transportation that runs on rails or electromagnetic guideways, including -

- (i) Commuter or other short-haul rail passenger service in a metropolitan or suburban area and commuter railroad service that was operated by the Consolidated Rail Corporation on January 1, 1979; and
- (ii) High speed ground transportation systems that connect metropolitan areas, without regard to whether those systems use new technologies not associated with traditional railroads, but does not include rapid transit operations in an urban area that are not connected to the general railroad system of transportation; and

(2) A person or organization that provides railroad transportation, whether directly or by contracting out operation of the railroad to another person.

train crew: Railroad personnel such as conductors, brake operators and others employed by the operating railroad.

Abbreviations and acronyms

BP	brake pipe
EP	emergency pipe
FRA	Federal Railroad Administration
in	inches
lbf	pound-force
mm	millimeters

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MU multiple unit
N Newtons
PBA passenger brake alarm

Document history

Document Version	Working Group Vote	Public Comment/ Technical Oversight	Rail CEO Approval	Policy & Planning Approval	Publish Date
First published	Sept. 15, 2023	Nov. 30, 2023	Jan. 21, 2024	Feb. 12, 2024	Feb. 13, 2024