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STANDARD

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PRESS Mechanical Working Group

ECP Passenger Cable-Based Braking System—ECP-Ready Configurations

Abstract: This document defines the requirements for the procurement of passenger rail cars, cab cars and locomotives that can be equipped with passenger electronically controlled pneumatic (ECP) brake equipment as used in the general railroad system.

Keywords: brake, cab car, car locomotive, ECP passenger, ECP ready, train

Summary: This standard defines the various ways a passenger car, cab car and locomotive are configured for the future application of ECP brake systems. The configuration levels are used by a railroad to define the level of ECP equipment to be provided during a new or overhaul procurement.

Scope and purpose: This document identifies the differences in the ECP equipment to be provided so that future upgrades can be made without a redesign of the brake equipment installation from conventional pneumatics to full ECP implementation.

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Introduction

This introduction is not part of APTA PR-M-S-030-21, "ECP Passenger Cable-Based Braking System – ECP Ready Configurations."

This standard applies to all:

1. railroads that operate intercity or commuter passenger train service on the general railroad system of transportation; and
2. 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:

1. rapid transit operations in an urban area that are not connected to the general railroad system of transportation;
2. tourist, scenic, historic or excursion operations, whether on or off the general railroad system of transportation;
3. operation of private cars, including business/office cars and circus trains; or
4. railroads that operate only on track inside an installation that is not part of the general railroad system of transportation.

ECP Passenger Cable-Based Braking System—ECP-Ready Configurations

1. Configuration requirements

ECP-ready configurations are divided into two different levels to provide guidance to the railroad and vehicle manufacturer regarding the amount of design effort required for electronically controlled pneumatic (ECP) equipment to be installed and easily retrofitted in the future.

The two configuration types are provided in **Table 1**.

TABLE 1
Configuration and Vehicle Types

Configuration Type		Vehicle Types	
Type	**Description**	**Locomotive or Cab Car**	**Coach Car**
1	Minimum requirements	X	X
2	Full requirements	X	X

The railroad must specify the ECP-ready configuration to be provided. A full description of each type is provided in the following subsections.

1.1 Minimum requirements

The minimum requirements are as follows:

1. All design documentation specifying the exact routing of the ECP trainline cable through the vehicle, from end to end, must be established by the vehicle builder working in conjunction with ECP suppliers. If a permanent conduit is required to contain the cable, then the vehicle must be fitted with that conduit.
2. The mounting locations and mounting methods for all ECP components and ECP end-of-car connectors must be established. All brackets, plates, fasteners, etc., necessary to secure the hardware and cabling must be present, with any required mounting holes or guides pre-drilled to accommodate equipment from any ECP manufacturer.
3. Exposed ends of conduit pipes and any other design feature that would allow the entry and collection of contaminants must be securely sealed.
4. For cab cars and locomotives, a display location shall be identified. If the ECP display content is incorporated into an existing cab display, then a separate display location is not required.
5. If the end-of-train (EOT) functionality is not directly incorporated into the coach ECP controls, then the EOT device/termination solution must be identified.

1.2 Full requirements

The full requirements are as follows:

1. All the minimum requirements contained in Section 1.1 shall be met.
2. The ECP trainline cable is installed and secured to the vehicle. The installation includes carbody junction boxes for cable termination as defined in APTA PR-M-S-022-18, latest revision. Intercar cables are not provided. If a permanent conduit is established in the vehicle, then the cable is installed through that conduit, and the conduit is fully sealed against liquid ingress with liquid-tight fittings, including the carbody junction box plug connector. In the absence of a conduit, armored ECP trainline cable must be used. The cable must be secured to the vehicle body, and all exposed conductors and connectors environmentally sealed.

Related APTA standards

The following standards are the complete set of Passenger ECP standards:

APTA PR-M-S-020-17, "ECP Passenger Emulation Braking System—Performance Requirements"
APTA PR-M-S-021-17, "ECP Passenger Cable-Based Braking System—Performance Requirements"
APTA PR-M-S-022-18, "ECP Passenger Cable-Based Brake System Cable, Connectors and Junction Boxes—Performance Requirements"
APTA PR-M-S-023-18, "ECP Passenger Cable-Based Brake DC Power Supply—Performance Requirements"
APTA PR-M-S-024-18, "Intratrain Communication Requirements for ECP Cable-Based Passenger Train Control Systems"
APTA PR-M-S-025-18, "ECP Passenger Cable-Based and Passenger Emulation Braking System—Approval Procedure"
APTA PR-M-S-026-18, "ECP Passenger Cable-Based Braking System—Interoperability Procedure"
APTA PR-M-S-027-18, "ECP Passenger Cable-Based Braking System—Configuration Management"
APTA PR-M-S-030-20, "ECP Passenger Cable-Based Braking System—ECP-Ready Configuration"

Definitions

electronically controlled pneumatics (ECP): A train power braking system actuated by compressed air and controlled by electronic signals originated at the locomotive/cab car for service and emergency applications. An ECP brake system is composed of ECP locomotive/cab car equipment, ECP car equipment and an ECP end-of-train (EOT) device. ECP locomotive/cab car equipment includes a head-end unit (HEU), locomotive ID module and trainline power supply (TPS). ECP car equipment includes a car control device (CCD) and a car ID module.

Abbreviations and acronyms

CCD car control device
ECP electronically controlled pneumatics
EOT end-of-train
HEU head-end unit
NATSA North American Transportation Services Association
TPS trainline power supply

Document history

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