APTA STANDARDS PROGRAM

RECOMMENDED PRACTICE

APTA RT-SC-RP-007-03, Rev. 1

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Signals and Communication Working Group

Presence Detector Inspection and Testing

Abstract: This recommended practice provides guidelines for the inspection and testing of rail transit signal system presence detectors.

Keywords: inspection, presence detector, signal, test, testing

Summary: This recommended practice provides procedures for inspecting and maintaining rail transit agency presence detectors. Individual rail transit agencies may modify these procedures to accommodate their specific equipment and mode of operation.

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 Signals and Communication Working Group as directed by the Rail 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. The application of any recommended practices or guidelines contained herein is voluntary. 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 agency'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 document supersedes APTA RT-SC-RP-007-03, which has been revised. Below is a summary of changes from the previous document version:

- This document has been updated using the latest document template for the APTA Standards Program (e.g. new sections include a summary, foreword, summary of changes, etc.). This document was revised with new language describing the inspection and testing of presence detectors.
- The acronym RTS has been replaced with rail transit system and/or rail transit agency throughout the document in addition to minor grammatical corrections.
- Section 1.3 Materials -Corrections made to remove the use of the language of wayside signal ac power systems to reflect presence detectors
- 1.4 Tools - It was also noted that any tools marked with an asterisk (*) should be calibrated in accordance with OEM and/or rail transit agency requirements
- Section 1.7.1 Inspection - Inspection of hinges or covers, sealing of holes and unused entrances used for ventilation, checks for loose conduit connections and missing or loose components was added to the inspection process

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Introduction

This introduction is not part of APTA RT-SC-RP-007-03, "Presence Detector Inspection and Testing."

APTA rail transit safety standards and recommended practices represent an industry consensus on practices for rail transit agencies to help achieve a high level of safety for passengers, employees and the general public. This recommended practice provides guidelines for inspecting and testing rail transit presence detectors.

APTA recommends the use of this document by:

- individuals or organizations that operate rail transit agencies;
- individuals or organizations that contract with others for the operation of rail transit agencies; and
- individuals or organizations that influence how rail transit agencies are operated (including but not limited to consultants, designers and contractors).

Scope and purpose

This document establishes recommended guidelines for inspecting and testing rail transit presence detectors. The purpose of this recommended practice is to verify that presence detectors are operating safely and as designed through periodic inspection and testing, thereby increasing reliability and reducing the risk of hazards and failures.

Presence Detector Inspection and Testing

1. Inspection and testing provisions

1.1 Inspection and testing frequency

The inspection and testing procedures in this recommended practice should be performed when presence detectors are placed in service; when they are modified, repaired or disarranged; or as otherwise deemed necessary by the rail transit agency.

The rail transit agency should determine the need for additional inspection and testing frequencies for presence detectors. A review of the following factors may be useful in making this assessment:

- OEM-recommended intervals
- industry experience
- operating environment/conditions
- historical data
- reliability-centered maintenance program development
- failure analysis
- rail transit agency testing and experience
- regulatory requirements

The frequency of tasks should comply with applicable federal, state and local regulations.

1.2 Training

The rail transit agency and/or its maintenance contractors should develop and execute training programs that provide employees with the knowledge and skills necessary to safely and effectively perform the tasks outlined in this recommended practice.

1.3 Materials

The following materials are recommended for inspecting and testing presence detectors:

- rail transit agency–approved solvent
- rail transit agency–approved lint-free wipes
- additional materials as required by the OEM and/or rail transit agency

1.4 Tools

The following tools are recommended for inspecting and testing presence detectors:

- electrostatic discharge protection equipment
- multimeter*
- rail transit agency–approved portable radio
- standard tools carried by maintenance personnel
- additional tools as recommended by the OEM and/or rail transit agency

NOTE: Tools marked with an asterisk (*) should be calibrated in accordance with OEM and/or rail transit agency requirements.

1.5 Personal protective equipment

Personal protective equipment, as required by the rail transit agency, should be worn at all times during inspection and testing.

1.6 Safety

Rail transit agency safety rules, procedures and practices shall be followed at all times during inspection and testing.

1.7 Inspection and testing procedures

Presence detector inspection and testing procedures may be modified for each rail transit agency's requirements but should contain the steps listed in sections 1.7.1 and 1.7.2 as a minimum.

1.7.1 Inspection

1. Notify the operations control center (OCC) and/or other authorities of the inspection activities to be performed.
2. Inspect the area for an accumulation of debris. Remove and bag debris.
3. Inspect wayside drains for blockage or ineffective drainage.
4. Inspect the area for damage caused by standing water, water leaks or retention.
5. Inspect the area for any condition that may interfere with the operation of the equipment.
6. Follow rail transit agency electrostatic discharge protection procedures to prevent damage to the equipment.
7. Inspect presence detector equipment for physical damage, frayed or loose wiring, properly secured plugs and connectors, loose or missing hardware, and proper insertion of printed circuit cards and components. Clean equipment as required.
8. Inspect track-mounted wire loops for physical damage, frayed or loose wiring, properly secured plugs and connectors, loose or missing hardware, and broken or missing mounting clips.
9. Inspect equipment and observe system status lights and other indications for proper system operation.
10. Inspect the presence detector room and/or enclosure equipment for damage; cracks; breaks; defective latches, locks, hinges or covers; and loose, deteriorated or damaged conduit connections and hardware. Holes and unused entrances not used for ventilation should be sealed.
11. Inspect polyvinyl chloride (PVC), fiberglass, rubber and other cable conduit material for damage, cracks, breaks, loose conduit connections, and missing or loose components and hardware.
12. Ensure that covers, doors and locks are in place and secured.
13. Notify the OCC and/or other authorities when inspection is complete.

1.7.2 Testing

1. Notify the OCC and/or other authorities of the testing activities to be performed.
2. Perform tests using procedures approved by the rail transit agency and/or OEM to ensure proper operation of all system functions.
3. Measure power sources for proper values and tolerances.
4. Depress test push button on presence detector module, and verify relay operation.
5. Check presence detector tuning and adjust per rail transit agency and/or OEM recommendations if necessary.
6. If possible, verify operation of presence detector equipment under normal operation that includes the presence of a rail vehicle.
7. Ensure that covers and locks are in place and secured.
8. Notify the OCC and/or other authorities when testing is complete.

1.8 Correction of deficiencies

Deficiencies identified during presence detector inspection and testing should be corrected and documented in accordance with OEM and/or rail transit agency requirements.

1.9 Documentation

Inspection and testing activities should be documented, reviewed and filed in accordance with rail transit agency procedures.

Definitions

electrostatic discharge: The release of stored electrical energy.

hazard: Any real or potential condition that can cause injury, death, damage, or loss of equipment or property.

operations control center (OCC): One or more locations designed, equipped and staffed for the purposes of monitoring and controlling rail transit agency activities from one or more central locations. Also called *rail control center*, *rail operations center*, *rail service control center*.

original equipment manufacturer (OEM): The enterprise that initially designs and builds a piece of equipment.

personal protective equipment: All clothing and other work accessories designed to create a barrier against workplace hazards. Examples include safety goggles, blast shields, hard hats, hearing protectors, gloves, respirators, aprons and work boots.

presence detector: A device used to detect the presence of a train in a predetermined section of rail.

Abbreviations and acronyms

DMM digital multimeter
OCC operations control center
OEM original equipment manufacturer
PVC polyvinyl chloride

Document history

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