



IEEE Recommended Practice for Maintenance of DC Overhead Contact Systems for Transit Systems

IEEE Vehicular Technology Society

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Rail Transit Vehicle Interface Standards Committee

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25 September 2009

IEEE Std 1628™-2009

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IEEE Recommended Practice for Maintenance of DC Overhead Contact Systems for Transit Systems

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IEEE Rail Transit Vehicle Interface Standards Committee
of the
IEEE Vehicular Technology Society

Approved 17 June 2009

IEEE-SA Standards Board

Abstract: This recommended practice provides a set of guidelines that can be used by the operators of new start-up systems seeking guidance in developing manuals, methods, practices, and procedures for the safe and effective maintenance of their Overhead Contact System (OCS), or by the maintenance organizations of existing well-established systems to amplify or refine their existing practices. This recommended practice provides general recommendations for performing maintenance work on dc OCS for transit systems. These recommendations are based on sound engineering principles, engineering safety considerations and field experience by many transit agencies. Included are technical explanations to cover certain testing of tools and equipment; field maintenance and care of tools and equipment; work methods for the maintenance of the OCS; and recommended safety practices and procedures for persons working in the vicinity of energized lines. Since local conditions and circumstances differ from one transit agency to the next, acceptance or rejection of any or all of the recommendations contained therein is left to the discretion of the individual agency, which should determine their applicability to its proposed or existing operating practices and procedures. It is not intended that the guidelines replace present proven transit agency procedures or that the recommended practices form the basis for a mandatory standard.

Keywords: auto-tension, backbone, balance weight, cantilever, catenary, contact wire, cross-span, door bridge, electric trolleybus, electrification, ETB, fixed termination, headspan, hi-rail, insulator, jumper, maintenance, messenger wire, OCS, overhead contact system, pantograph, qualified person, section insulator, special work, surge arrester, trolley, trolley pole

The Institute of Electrical and Electronics Engineers, Inc.
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PDF: ISBN 978-0-7381-6000-9 STD95945
Print: ISBN 978-0-7381-6001-6 STDPD95945

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Introduction

This introduction is not part of IEEE Std 1628-2008, IEEE Recommended Practice for Maintenance of DC Overhead Contact Systems for Transit Systems.

The vast majority of the presently operating electrified rail transit systems use overhead contact systems (OCS) or third rail to supply direct-current (dc) power to the rail vehicles. The OCS Sub-Committee for Rail Transit Systems was formed in 2001 with the purpose of developing standards and guidelines governing the design, construction, and maintenance of OCS for transit systems. One of the primary concerns of the committee, regarding OCS for light rail and electric trolleybus (ETB) systems, was the lack of uniform practices for the maintenance of the OCS, including but not limited to the structural supports, components and hardware, system parameters and operating procedures, and equipment.

The purpose of this recommended practice is to provide a set of guidelines that can be used by the operators of new start-up systems to develop manuals, safety guidelines, practices, and procedures for effective maintenance of their OCS, or by the maintenance organizations of existing well-established systems to amplify or refine their existing practices. It is not intended that these recommended practices form the basis for a mandatory standard. Acceptance or rejection of any or all of the recommendations contained herein is left to the discretion of the individual agency, which should determine their applicability to its proposed or existing operating practices and procedures.

Acknowledgments

The Overhead Contact System Maintenance Working Group wishes to thank the following individuals who were responsible for the preparation of the figures in this recommended practice.

Figure 1 – Balance weight assembly, Michael N. Lewis, P.E., C.Eng., I.Mech.E (Retired)

Figure 2 – Single contact wire (SCW) OCS, Michael N. Lewis, P.E., C.Eng., I.Mech.E (Retired)

Figure 3 – Simple catenary OCS, Michael N. Lewis, P.E., C.Eng., I.Mech.E (Retired)

Figure 4 – Typical impedance bond arrangement, Philip F. Shepley, Senior Vice President – Transit, Mass. Electric Construction Company

Figure 5 – Method of applying temporary rail jumpers in electrified territory when connections from impedance bond to one or both rails are to be removed or when neutral bond (center tap) is to be opened, Philip F. Shepley, Senior Vice President – Transit, Mass. Electric Construction Company

Figure 6 – Method of applying temporary rail jumpers in electrified territory when rail to which impedance bond is connected is to be removed from track, Philip F. Shepley, Senior Vice President – Transit, Mass. Electric Construction Company

Figure 7 – Method of applying temporary rail jumpers in electrified territory when rail is to be removed from jointed track, Philip F. Shepley, Senior Vice President – Transit, Mass. Electric Construction Company

Figure 8 – Method of applying temporary rail jumpers in electrified territory when rail is to be removed from continuous welded rail track, Philip F. Shepley, Senior Vice President – Transit, Mass. Electric Construction Company

Figure 9 – Mobile track ladder, Santiago Muniz, Vice President, STS EL Division, Siemens Transportation Systems, Inc.

Figure 10 – Contact wire twisting tool, Santiago Muniz, Vice President, STS EL Division, Siemens Transportation Systems, Inc.

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1. Overview

1.1 Scope

This recommended practice provides overhead contact system maintenance practices and procedures including maintenance techniques, site inspection and test procedures, and maintenance tolerances, for heavy rail, light rail, and trolley bus systems.

1.2 Purpose

There are no known industry-wide guidelines. Guidelines will result in improved reliability and reduced maintenance costs of overhead contact systems for transit.

1.3 Application

The OCS Sub-Committee for Rail Transit Systems was formed in 2001 with the purpose of developing standards and guidelines governing the design, construction, and maintenance of overhead contact system