

1st edition, March 2002

Translation

OR

Characteristics of a.c. overhead contact systems for high-speed lines worked at speeds of over 200 km/h

Caractéristiques des caténaires alimentées en courant alternatif pour les lignes parcourues à des vitesses supérieures à 200 km/h

Kenndaten für Oberleitungen mit AC-Versorgung für Strecken, die mit Geschwindigkeiten über 200 km/h befahren werden



UNION INTERNATIONALE DES CHEMINS DE FER
INTERNATIONALER EISENBAHNVERBAND
INTERNATIONAL UNION OF RAILWAYS

Leaflet to be classified in Volumes :

V - Traction and Rolling Stock

VII - Way and Works

Application :

With effect from 1 January 2000

All members of the International Union of Railways

The person responsible for this leaflet is named in the UIC Code

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Printed by the International Union of Railways (UIC)
16, rue Jean Rey 75015 Paris - France, March 2002
Dépôt Légal March 2002

ISBN 2-7461-2-7461-0168-8 (French version)
ISBN 2-7461-2-7461-0169-6 (German version)
ISBN 2-7461-2-7461-0170-X (English version)

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Summary

This leaflet contains requirements and recommendations to ensure reliable interaction between pantograph and a.c. overhead equipment at speeds of over 200 km/h.

The recommendations contained in the leaflet are in line with the state of the art and reflect the experience gained by the railways in high-speed Rail transport whilst ensuring reliability and cost-effectiveness.

Account has been taken of the stipulations laid down for international traffic in the Technical Specifications for Interoperability (TSI).

Pantographs with a bow profile corresponding to that defined in *UIC Leaflet 794* can be used in conjunction with the overhead contact systems defined in this leaflet.

Definitions

Speed ranges, voltage and frequency levels, rolling stock profile, assessment criteria for pantograph/OHL interaction.

Key characteristics of overhead lines

Static characteristics

Standard height of contact wire, maximum difference in contact wire height, minimum contact wire height for design speed ≤ 230 km/h, maximum contact wire height for design speed ≤ 230 km/h, permissible contact line gradient and change of gradient, maximum distance between OHL sections supplied at different phases.

Dynamic characteristics

Maximum permissible uplift of contact wire as pantograph passes at the support (without climatic influences), maximum aerodynamic contact force at maximum speed, maximum permissible dynamic contact force of the pantograph, minimum permissible dynamic contact force of the pantograph.

Electrical characteristics

Constant current capacity, short time rating, short-circuit current, thermal time constant, permissible current when stationary.

Climatic influences

Ambient temperature range, maximum wind speed, ice load.

Design parameters

Maximum span lengths, maximum difference in length between two successive spans, length of shortest dropper for standard system, standard system height (encumbrance), design of support, minimum uplift at the support, design of registration arm for supports, dropper spacing, sag, maximum lateral deflection of contact wire at support (stagger), minimum lateral variation in horizontal profile of contact wire per 100 m length, permissible lateral deflection of contact wire within one span with

maximum side wind, number of spans per changeover of tension length, run-in of contact wire at switches, type of tensioning of contact wire and messenger wire.

Parameters for the conductor material

Contact wire, number of contact wires, nominal cross-section of contact wire, specific tensile stress of contact wire, maximum permissible tensile stress in contact wire with worn cross-section, maximum permissible wear of contact wear, number of messenger wires, auxiliary messenger wire, stitch wire, length of stitch wire, tensile stress of stitch wire, reinforcing wire, return conductor, protective conductor.

Physical parameters

Compliance, degree of variability, wave propagation speed, Doppler effect, reflection factor, amplification factor.

Simulation programs and measuring procedure

Simulation programs, provisions relating to measurement of contact forces, provisions relating to arc measurement.

Relationships between the various structural parameters governing dynamic performance and the wear of overhead equipment on high-speed lines

Static criteria

Compliance, variability of overhead lines.

Dynamic criteria

Wave propagation speed/Doppler effect, reflection factor/amplification factor.

Relationships and effects

Static and dynamic criteria, their inter-relationships and effects.