

NOTES

This leaflet forms part of a series which also includes:

- Leaflet 505-1 OI: Kinematic gauge for powered units used on international services.
- Leaflet 505-2 OI: Kinematic gauge for coaches and vans used on international services.
- Leaflet 505-3 ORI: Kinematic gauge for wagons used on international services.
- Leaflet 505-4 ORI: Effects of the application of the kinematic gauges defined in the 505 series of leaflets on the positioning of structures in relation to the tracks and of the tracks in relation to each other.
- Leaflet 505-5 OI: Basic conditions common to Leaflets 505-1 to 505-4 - Notes on the preparation and provisions of these leaflets.
- Leaflet 505-6 1): Effects of the application of the kinematic gauges defined in the 505 series of leaflets on overhead line system design.
- Leaflet 505-7 1): Rules for the application of the expanded A, B and C gauges.
- Leaflet 600 OR: Electric traction with aerial contact lines.
- Leaflet 608 R: Conditions to be complied with for the pantographs of tractive units used on international services.

1) In course of preparation.

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0 - GENERAL

0.1 - Purpose of the leaflet

This leaflet gives the technical provisions for the installation of contact lines operating at 25 kilovolts, 50 or 60 hertz.

0.2 - Scope

This leaflet applies to installations to be constructed or modified at joint stations and on lines on which through working of electric traction units is envisaged.

The instructions of each railway, with regard to operating and safety, only apply to those installations situated within the confines of its territory, unless special arrangements have been made as a result of agreements between the railways concerned.

0.3 - Voltage and frequency

The permissible values and variations of the voltage and frequency are specified in Leaflet 600 OR 1).

0.4 - Definition of the gauge

The definition of the gauge is given by the following leaflets:

- 505-1 01: Kinematic gauge for powered units used on international services.
- 505-2 01: Kinematic gauge for coaches and vans used on international services.
- 505-3 ORI: Kinematic gauge for wagons used on international services.
- 505-4 ORI: Effects of the application of the kinematic gauges defined in the 505 series of leaflets on the positioning of structures in relation to the tracks and of the tracks in relation to each other.

1) The value relating to the 60 Hz frequency are not yet indicated in Leaflet 600 OR.

505-5 01: Basic conditions common to Leaflets 505-1 to 505-4 - Notes on the preparation and provisions of these leaflets.

505-6 1): Effects of the application of the kinematic gauges defined in the 505 series of leaflets on overhead line system design.

505-7 1): Rules for the application of the expanded A, B and C gauges.

1 - CONTACT LINE

1.1 - Height of the contact wire

* 1.1.1 - The minimum height of the contact wire is determined as indicated in Leaflet 505-6 1).

* 1.1.2 - The height of the contact wire must not exceed 6.50 m, taking uplift into account. It is determined in accordance with Leaflet 505-6 1).

1.2 - Stagger of the contact wire

* 1.2.1 - Stagger of the contact wire level with the support and in the span, must be determined so that the contact wire does not leave the working zone of the pantograph head, in spite of the movements of the pantograph and of the contact wire. Leaflet 505-6 1) gives the method of calculation to be applied.

* 1.2.2 - On straight track and on curves of radius greater than 5000 m, stagger should not exceed 0.200 m at the support.

* 1.2.3 - On curves with radii of 5000 m or less, stagger must not exceed 0.240 m at the support.

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1.3 - Neutral section

* 1.3.1 - The current systems of adjacent railways must be separated by a neutral section.

1.3.2 - It is desirable for the intermediate zone to be earthed to the rail.

1.3.3 - There may also be neutral sections at joint stations and on lines used by through-worked powered units.

* 1.3.4 - The neutral section must not be situated at a point where it is obligatory for powered units to come to a halt, for example at a signal.

* 1.3.5 - If it is necessary for through-working purposes to envisage the use of traction vehicles where the arrangement of the pantographs may result in bridging of a neutral section, the railways concerned must agree on instructions to be observed when passing under this section.

* 1.4 - Air-gap overlap span

The distance between conductors of two adjacent catenaries must be at least 0.400 m in the static position.

In certain cases, this condition implies stagger of one of the contact wires above the limits indicated in 1.2.

* 1.5 - Running speed

The speed of trains must not be restricted by the overhead line equipment.

2 - CLEARANCE DISTANCES

2.1 - Clearance distances for 25 kV

These are divided as indicated in Leaflet 505-6 1).

For the nominal voltage of 25 kV, the following values shall be adopted:

2.1.1 - $b_1 + b_2 = 70 \text{ mm}$

This value takes into account the variations in atmospheric pressure, temperature and air humidity.

2.1.2 - $b_3 = 50 \text{ mm}$

This distance applies in certain polluted zones (running of thermal engines, proximity of the sea, industrial pollution, etc.).

2.1.3 - $b_4 = 30 \text{ mm}$

This distance represents the unequal distribution of the electrical field.

2.1.4 - $b_5 = 100 \text{ mm}$

This distance takes overvoltages into consideration.

2.1.5 - $b_6 = 70 \text{ mm}$

This distance is recommended as a safety margin.

1) In course of preparation.

2.2 - Clearance distances between live parts of the contact line or the pantograph and mass of structure or rolling stock

It is advisable to have the largest possible clearances between bare conducting parts and earths, and to adopt values at least equivalent to those shown in the following table, unless national instructions prescribe otherwise.

Zone	Dynamic situation 1)		Static situation 2)	
	normal	minimum	normal	minimum
non-polluted	$b_1+b_2=70$ $b_3=30$ $b_6=70$	$b_1+b_2=70$	$b_1+b_2=70$ $b_3=30$ $b_4=100$ $b_5=70$	$b_1+b_2=70$ $b_3=30$ $b_5=100$
	$b = 170 \text{ mm}$	$b = 70 \text{ mm}$	$b = 270 \text{ mm}$	$b = 200 \text{ mm}$
polluted	$b_1+b_2=70$ $b_3=50$ $b_4=30$ $b_6=70$	$b_1+b_2=70$ $b_3=50$	$b_1+b_2=70$ $b_3=50$ $b_4=30$ $b_5=100$ $b_6=70$	$b_1+b_2=70$ $b_3=50$ $b_4=30$ $b_5=100$
	$b = 220 \text{ mm}$	$b = 120 \text{ mm}$	$b = 320 \text{ mm}$	$b = 250 \text{ mm}$

The values shown should be regarded as minimum distances unless it can be proved that the local conditions enable them to be reduced.

- 1) Overhead line set in motion (passage of the pantograph, wind, etc.) with moving vehicle.
- 2) Overhead line stationary, vehicle at standstill.

3 - REQUIREMENTS CONCERNING PANTOGRAPHS

Pantographs must comply with the provisions of Leaflet 608 R.

APPLICATION

With effect from 1 January 1986 for obligatory provisions.

All Railways in the Union.

RECORD REFERENCES

Owing to the forthcoming publication of Leaflet 606-1, Leaflet 606 shall, henceforth, be renumbered "606-2".

Headings under which the question has been dealt with:

- Study of joint proposals concerning catenary lines to be installed for single-phase current electrification at 50 cycles 25000 V.

(5th Committee E.: Copenhagen, May 1956).

- Additions to be made to the leaflets of the UIC Code to take into account the adoption of a reduced voltage of 6.25 kV - 50 Hz.

(5th Committee T.: Paris, May 1961; Portsmouth, May 1962).

- Revision of Leaflet 606 "Installation of overhead contact lines for electric traction systems using single-phase current at nominal voltage of 25 kilovolts or 6.25 kilovolts".

(5th Committee T.: Stockholm, May 1967; Sub-Committee for Electric Traction : Paris, January 1969).

- Revision of Leaflet 606 "Installation of contact lines at 25 kilovolts and 50 or 60 Hertz and requirements concerning pantographs".

(7th Committee: Paris, June 1984; Working Party for Catenaries: Paris, January 1985; Way and Works Committee: Copenhagen, June 1985).