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Translation

OR

Passenger rolling stock - Trailer bogies - Running gear - General provisions applicable to the components of trailers bogies

*Matériel pour le transport de voyageurs - Bogies porteurs - Organes de roulement - Dispositions
générales applicables aux organes constitutifs des bogies porteurs
Reisezugwagen - Laufdrehgestelle - Laufwerke - Allgemeine Bestimmungen für die Baugruppen von
Laufdrehgestellen*



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Summary

This leaflet sets out the conditions to be met by the components of trailer bogies for passenger rolling stock, in addition to the conditions specified in *UIC Leaflet 515-3 to 515-5*.

With a view to standardisation, this leaflet also presents technical solutions which have been tried and tested in service on bogies operating under the normal conditions of the principal UIC railways. This standardisation is highly desirable for economic reasons but should not inhibit innovation or progress.

1 - Conditions relating to wheelsets

o 1.1 - General provisions

The masses of the wheelsets and the components connecting them to the bogie frame shall be as low as possible.

1.2 - Wheelsets

o 1.2.1 - The electrical resistance of the wheelset - measured between the treads of the two wheels - shall have a value which meets the requirements set out in *UIC Leaflet 813 and 512*.

R 1.2.2 - To enable wheelsets to be lifted by certain installations used for maintenance, it is recommended that the design of the wheelset, in particular the spaces between brake discs, comply with the specifications shown in Appendix **A - page 13**.

1.3 - Wheels

o 1.3.1 - The wheel diameter when new shall be within the range 800 mm - 1 000 mm. The recommended values are 890 and 920 mm.

o 1.3.2 - The wheels shall be of the monobloc type (solid wheel).

o 1.3.3 - For bogies designed to run at a maximum speed not exceeding 200 km/h, the wheel rim profile shall meet the conditions specified in *UIC Leaflet 510-2*.

o 1.3.4 - The grade of steel shall be chosen from those specified in *UIC Leaflet 813*.

R 1.3.5 - The recommended grade is R7.

R 1.3.6 - The wheel designs given as examples in Appendix **B - page 14** represent solutions which have produced good in-service results under the normal conditions of use for bogies for passenger rolling stock.

o 1.4 - Axles

The dimensions and shape of the axle shall meet the conditions specified in *UIC Leaflet 515-3*.

The diameter and length of the journals shall enable the following two conditions to be met:

- sufficient mechanical strength, as specified in *UIC Leaflet 515-3*,
- proper functioning of the bearings, as specified in *UIC Leaflet 515-5*.

By way of an example, Appendix **C - page 16** shows 130 mm-diameter journals, which have produced good in-service results on bogies used under normal conditions at maximum running speeds not exceeding 200 km/h.

1.5 - Axle boxes - Bearings - Grease

- 1.5.1 - The axle boxes shall have roller bearings.
- 1.5.2 - The axle boxes shall meet the conditions specified in *UIC Leaflet 515-5*.
- 1.5.3 - The axle box bearings shall be held in position on the journals by a locking cap, the design of which is illustrated in Appendix C - page 16 for 130 mm-diameter journals.
- 1.5.4 - The lower part of axle-box casings, below the bearings, shall be visible to hot box detection ground installations. The geometry of this area of the axle-box casing shall meet the conditions illustrated in Appendix D - page 18.
- 1.5.5 - If systems are fitted to the axle ends (e.g. current returns, speed measuring devices, etc.), they shall be attached in such a way that they do not have any effect on the operation of the bearings, even in the event of failure. This can be demonstrated using the tests described in *UIC Leaflet 515-5*.
- 1.5.6 - In order to avoid damage to the bearings and the grease as a result of electric current flowing through them, the bearings shall be electrically insulated with respect to the bogie frame. Earthing contacts and resistances in parallel shall be fitted in accordance with *UIC Leaflet 552*.
- 1.5.7 - Axle boxes shall be designed in such a way that they do not hinder the use of underfloor wheel lathes when wheels are reprofiled.
- 1.5.8 - The grease used in the axle boxes shall meet the requirements of *UIC Leaflet 814*.
- R 1.5.9 - It is recommended that the axle boxes enable additional lubricant to be applied without having to be disassembled.

1.6 - Connections between wheelsets and bogie frames

- R 1.6.1 - It is recommended that the components that connect the wheelset to the bogie frame have the mechanical strength specified in *UIC Leaflet 515-4*. If this is not the case, the expected service life of the components shall be given.
- 1.6.2 - The components that connect the wheelset to the bogie frame shall enable the safety and ride comfort requirements to be met.
- 1.6.3 - The bogie shall be designed and mounted in such a way that, when operating on straight track, the wheelsets are aligned (angle of attack = zero) and do not develop sustained, outwardly-directed lateral forces at the level of wheel/rail contact.
- 1.6.4 - Should the axle box heat up, the components that connect the wheelset to the bogie frame shall retain sufficient mechanical strength to prevent the wheelset separating from the bogie and ensure wheelset guidance.
- 1.6.5 - The components that connect the wheelset to the bogie frame shall enable the wheelsets to be lifted with the bogie frame without endangering staff or the vehicle.

2 - Conditions relating to suspension gear

2.1 - General provisions

- **2.1.1** - Measures shall be taken to ensure that the vehicle height:
 - is maintained at an even level, even when the vehicle weight is unevenly distributed across the bogie support points,
 - can be adjusted to compensate for any wear or reduction in the height of components (wheels, springs, etc.) occurring in service.
- R **2.1.2** - It is recommended that the natural frequencies of the suspension be different from those of the vehicle body.
- **2.1.3** - Measures shall be taken to enable the vehicle to be lifted with its bogies.
- **2.1.4** - The flexibility of the primary and secondary suspension springs shall be chosen so as to meet the safety running requirements and limit as far as possible acceleration on the component parts of the bogie, in order to avoid deterioration.
- **2.1.5** - The suspension components shall be designed to ensure that - in both the laden and tare conditions - the vehicle flexing coefficient is as low as possible, and does not exceed the value 0,4 (*UIC Leaflet 505-1*).
- **2.1.6** - If the system for stabilising bogies which have a maximum service speed greater than 200 km/h is not of the redundant type, a device based on acceleration measurements taken on the bogie frame must enable unacceptable instability to be detected. Detection shall result in a message being transmitted to the driver's cab of the motive power unit or have a direct effect on the braking system.

Detection of instability as specified above should be carried out on new vehicles by measuring lateral acceleration $\ddot{y}_s^+$, on the bogie frame above the wheelset, whose rms value $s\ddot{y}_s^+$ must not exceed the following value:

$$(s\ddot{y}_s^+)_{\text{lim}} = 6 - \frac{M_b}{10} [\text{m/s}^2]$$

where M_b is equal to the bogie mass expressed in tonnes (fully-equipped bogie including axles).

The following filtering procedure shall be applied:

- band-width filtering of the instability frequency $f_0 \pm 2$ Hz, with an attenuation slope greater or equal to 25 dB/octave,
- continuous calculation of the rms value $s\ddot{y}_s^+$ over a length of 100 m (± 10 %) at 10 m intervals (± 10 %).