

Rail Vehicle Standard Components Performance Tests - Test Programme.

1. Pivot socket liner for UIC Y25 freight wagon bogies
2. Side slide liner for UIC Y25 freight wagon bogies

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Attachments:

- A. Bogie- chassis unit torsional torque (load torque) measurement sheet.
- B. Pivot socket liner wear measurement sheet.
- C. Side slide liner wear measurement sheet.

1. Objective of Tests

The objective of the performance tests is to evaluate the usability of standard components of freight wagon bogies. The evaluation is the basis on which the Manufacturer applies to the Office for Railway Transport for issuing a permanent commissioning certificate for a standard component of a railway vehicle in conformance to the railway transportation act dated March 28, 2003, art. 76 (Journal of Laws, no 86, item 789).

2. Subject of Tests

The subject of tests includes:

- the pivot socket liner made of flexible graphitamide, working with the side slide liner, designed for UIC Y25 freight wagon bogies, according to WTO – WGS/001/2005. The pivot socket liner corresponds to dwg 200M 1254 012,
- the side slide liner made of flexible graphitamide, working with the pivot socket liner, designed for UIC Y25 freight wagon bogies, according to WTO – WSB/001/2005. The side slide liner corresponds to dwg 300M 1255 017.

The use of the pivot socket liner and the side slide liner follows the technical conditions of railway vehicles operation. The manufacturer of liners is: BECKER Sp. z o.o., Droginia k/Myślenic.

3. Assembly of Components

Components which are subject to the tests will be assembled in UIC Y25 freight wagon bogies, used in freight wagons of 412WE series or 412WB/R series.

The pivot socket liner and the side slide liner which are supplied by the Manufacturer who has applied for the certificate must not be assembled together with components supplied by other manufacturers.

Pivot socket liner

Liners which correspond to dwg 200M 1254 012 will be assembled in the socket made according to dwg 100M 1254 011 and working with the pivot assembled in compliance to dwg 100M 1250 0010.

The pivot socket liner should meet the dimensional tolerances which make it possible to assemble it in the socket without additional adjustment operations.

We recommend carrying the assembly operation with the use of a special tool, following the requirements of the sheets UIC 510 and ORE B 12.17.

The force required to assemble the liner in the socket: $P \leq 5 \text{ kN}$.

The liners which are assembled in the socket should not show any manually enforced radial or axial shifts, according to the requirements of ORE B12.17.

Upper and lower edges of the liners cannot be damaged in the process of assembly (no chipping). Small plastic deformations of the liner edges which do not have any impact on the safety of use are acceptable.

Edges of the liners may not protrude high above the socket surface, according to ORE B12.17.

We accept random quality control of the liner assembly by hitting it with a hammer. It cannot cause any plays between the liner and the cut in the socket.

The socket liners are designed for bogies of the following static loads:

- 360 kN; for pressures of the wheel set on rail up to 200 kN/axle,
- 410 kN; for pressures of the wheel set on rail up to 225 kN/axle.

Side slide liner.

The liner of the spring side slide would be fixed according to dwg 100M 1255 0025.

The liners of the side spring slide continuously bear the load of 16 kN.

4. Scope of tests

The scope of tests of a standard component of a railway vehicle following the regulation of the Minister of Infrastructure dated October 12, 2005

(Journal of Laws no 212, item 1772):

- a. Checking the compliance of the product with production and inspection technical requirements, design documentation and requirements specified in relevant Polish or European standards for railway vehicles, their units, subunits and components.
- b. Checking quality certificates, conformity certificates, qualitative and technical inspection records concerning the units, subunits, components and materials that have been used.
- c. Checking the quality of assembly and the liner surface condition.
- d. Measurement of the torsional torque (load torque) of the bogie for brand new tare wagon and for tare and laden wagon after 6 months of their performance.
- e. Measurement of the liner wear (the geometry of surface) after completing the test travel distance.
- f. Wagon buffer impact tests.

5. Methodology of Tests

The performance tests will be carried for 5 wagons equipped with UIC Y25 bogies. Following the requirements of ORE B12.17, the test travel distance is 100 000 km, completed in tare and laden condition in 1:1 proportion.

We accept shortening the test travel distance to the text period of 6 months and using statistical methods or forecasting the wear on condition that the measurement frequency is increased.

The measurement of the torsional torque will be carried for a single, randomly chosen wagon at the TENSAN stationary testing facility.

The torsional torque for a brand new tare wagon of its own weight of 20 t should amount to 10 ± 4 kNm.

The torsional torque after 6-month performance testing should amount to:

- for a tare wagon - ≤ 20 kNm,
- for a laden wagon of the load of 200 kN/axle - ≤ 40 kNm,
- for a laden wagon of the load of 225 kN/axle.

The socket liners wear measurement should be done according to the measurement sheet which is the Attachment B of the PBE – 01/2005 Tests Programme


The acceptable value of the socket liner spherical surfaces wear after travelling the distance of 100 000 km amounts to 1,0 mm.

The side slide liner wear measurement should be done according to the measurement sheet which is the Attachment C of the PBE – 01/2005 Tests Programme

The acceptable value of the side slide liner wear after travelling the distance of 100 000 km amounts to 0,6 mm.

After completing the test operation, the liners may not show damages which could be put the safety of operation in danger. The below chart specifies the acceptable damages.

Item	Kind of damage	Width [mm]	Length [mm]	Proportion of surface Volume	Notes
1	Radial cracking	-	-	1 scratch	Items 1 i 2 may not occur together
2	Peripheral cracking	-	-	1 scratch $\leq 20\%$ of perimeter	
3	Chipping (upper edge)	5	30	Total of 3 + 4 + 5 ≤ 800 mm	
4	Chipping (lower edge)	5	30		
5	Chipping of surface	10	20		

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The buffer impact tests involving a tare wagon with Y25 bogies with new liners should be carried while keeping the impact speed of 15 km/h against a laden wagon of the load of 200 kN/axle in the series of minimum 10 buffer impacts. The initial play of the pivot should correspond to the maximum tolerance value which is specified in the design documentation. Load of the bumper wagon, types of applied buffers and buffer impact conditions should remain in agreement with the ORE B12.17 report.

6. Assessment of Results

After completing tests which belong to the hereby programme, the testing entity (a renown scientific and testing centre named in the regulation of the Minister of Transportation and Construction Industry dated December 23, 2005, Journal of Laws no __, item __) will juxtapose the obtained results of the tests and draw final conclusions. After the final conclusions are evaluated by the Centralne Biuro Konstrukcyjne [*English: PKP CARGO S.A. Design Centre*], they will constitute the basis for the Urząd Transportu Kolejowego [*English: Office for Railway Transportation*] to issue permanent commissioning certificates for socket liners and side slide liners, according to the railway transportation act dated March 28, 2003; art. 76 (Journal of Laws no 86, item 789).

7. Related terms and standards

- WTO – WGS/001/2005. Production and inspection technical standards. Socket liner.
- WTO – WSB/001/2005. Production and inspection technical standards. Side slide liner.
- UIC 510-3 sheet– Wagons. Strength testing of 2 and 3 –axle bogies on testing rings. 1st edition of 1.1.89. Reprint dated 1.7.94.
- ORE B12.17 Report – Programme of tests to be carried out on wagons with steel chassis and body structure (suitable fitting with the automatic buffing and draw coupler) and on their cast steel frame bogies (8th edition). 01.04.97.

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- Dwg 200M 1254 012 – Socket liner.
- Dwg 300M 1255 017 – Side slide liner.
- Dwg 100M 1254 011 – Socket.
- Dwg 100M 1250 0010 – Pivot.