Press release

Innofreight developed a highly innovative bogie design

PJM carried out structural analysis, laboratory tests and dynamic track tests

Graz, October 2025: **PJ Messtechnik, an accredited test center in accordance with ISO/IEC 17025, was commissioned by Innofreight to carry out all the necessary steps for the approval of the innovative Y25 bogie. Innofreight develops freight wagons, containers and unloading systems and operates 22,000 containers and 3,500 wagons in 20 countries. The Y25 bogie completes the extensive portfolio of the Austrian freight wagon specialist.**

The specifications for the new bogie were demanding: the bogie frame was to be manufactured fully automatically and designed to withstand the highly dynamic loads over 4 decades. Due to the expertise of the PJM team, the task was solvable. The structural analysis was carried out using the latest simulation and assessment methods. On the one hand, the standard loads were extended by the results of MBS simulations. On the other hand, the weld seam assessment was carried out using the effective notch stress concept to improve the prediction accuracy and thus enable lightweight construction.

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PJ Messtechnik implemented the entire validation program in accordance with EN 13749 on the fully developed bogie frame:

- Structural analysis
- Static and fatigue laboratory tests at the Institute for Structural Durability and Railway Technology at Graz University of Technology
- Track tests under extreme conditions to validate the design loads

The result:

- The bogie is manufactured 100% by welding robots.
- The weight has been reduced by 5% compared to conventional designs, while at the same time increasing durability. As a result, the load capacity can be increased by 400 kg in future, which means lower costs and greater efficiency combined with greater robustness.
- Further advantages include less wear on the wheelsets and better braking performance.

'This project has also shown how PJM, as a generalist, combines the specialist knowledge of the various disciplines. Our customers appreciate the added value of having a partner who can implement all the steps required for authorisation. We have the experience and expertise in theory, engineering and rail vehicle testing, as well as the infrastructure at our site,' says Martin Joch, CEO of PJ Messtechnik GmbH.

'The PJM team supported the project with great intensity for two years, from the initial idea through to authorisation. We accepted the challenge of achieving the ambitious goals of our long-standing customer Innofreight with enthusiasm and a high level of commitment. The cooperative and efficient collaboration between the many people involved from different companies was great. We are very pleased to have played a crucial role in such a trend-setting project in freight transport," says Wolfgang Konrad, Project Manager at PJ Messtechnik GmbH.

In-depth engineering system understanding for rail vehicle components

Thanks to the close collaboration of experienced experts in design (CAD), calculation (FEM), simulation (MBS), measurement technology and certification, PJM has gained a unique understanding of systems and expertise in the product development of structural railway components. A brief overview of the special features:

- Pioneering lightweight freight wagon construction through topology optimisation
- TSI-compliant strength analysis of welded steel and aluminum structures
- Support in the standard-compliant design of welded constructions by our IWE (International Welding Engineer)
- Certification of the American AAR WABL Committee for strength verifications of railway wheels in accordance with the S-660 and S-669 standards
- Reducing many time-consuming test runs through efficient comparative multi-body simulations
- Supporting simulations to minimise wear on wheels and rails

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About Innofreight Solutions GmbH

The Austrian rail logistics specialist develops and leases innovative freight wagons, containers and discharging systems. Among other things, Innofreight operates 230 block trains and unloads 2 million containers every year. Innofreight offers freight wagon solutions for numerous sectors, including steel, energy, building materials, timber, agriculture and liquids. The new bogie frame is manufactured in series production in Trieste.
Further information:
https://www.innofreight.com/en

About PJM

PJM is an internationally renowned system specialist for rail transport and has successfully implemented projects in 30 countries on 6 continents.
As an accredited test centre in accordance with ISO/IEC 17025, PJ Messtechnik GmbH carries out tests worldwide for the approval of rail vehicles. These include the new Nightjet generation of ÖBB, the Rhaetian Railway, the Mountaineer passenger train in Canada, the TILO regional railway, the suburban rail in Berlin or the underground trains in Riyadh, Chicago and London, the MPV®-VentuS® multi-purpose vehicle from WINDHOFF or the service jet of Stadler Rail.
With its WaggonTracker system, PJ Monitoring GmbH is a technology leader in the automation and digitalisation of rail freight transport.
PJ Motion GmbH specialises in the authorisation and project management of track-bound vehicles.
Further information: https://pjm.co.at/en

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Short video:
https://youtu.be/ZaHcTb2Ns_M

Innofreight's new bogie frame is manufactured fully automatically by welding robots. *Credit: Manuel Hanschitz, free of charge*

Among other things, the PJM engineering team carried out the strength analysis. *Credit: Manuel Hanschitz, free of charge*

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PJM has an optimum infrastructure and in-depth expertise in the preparation of bogies and measuring wheelsets.
Credit: Manuel Hanschitz, free of charge

PJM has a unique system understanding in the product development of structural railway components, due to the close cooperation of experienced experts from design (CAD), calculation (FEM), simulation (MBS), measurement technology and approval.
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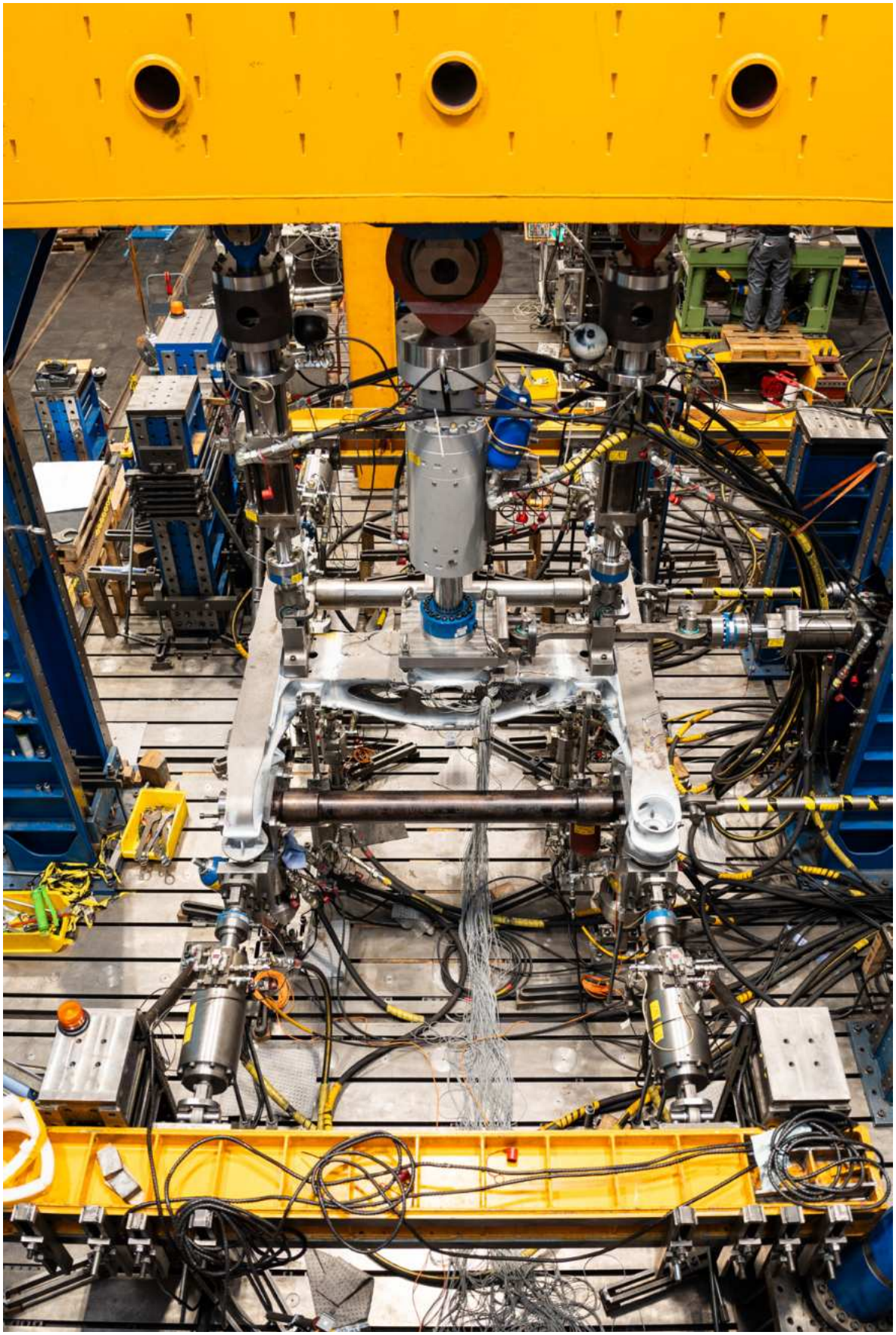

The laboratory tests for testing statics and fatigue were managed by PJM and were carried out at Graz University of Technology.
Credit: Manuel Hanschitz, free of charge

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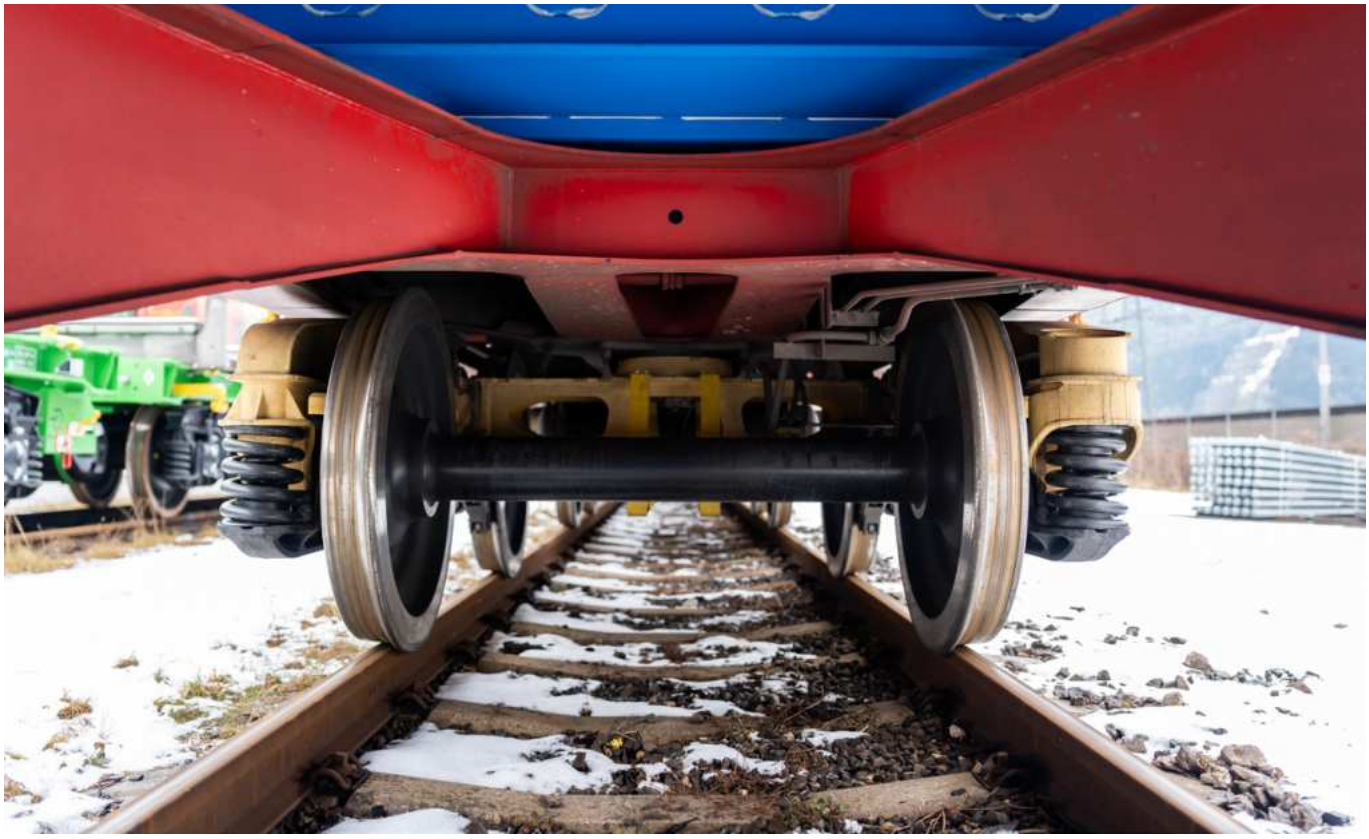

5% lighter and at the same time significantly more robust: the new bogie has been designed to withstand the highly dynamic loads for 40 years. *Credit: Manuel Hanschitz, free of charge*

As an ISO/IEC 17025 accredited test centre, PJM also carried out the dynamic test runs. *Credit: Manuel Hanschitz, free of charge*

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