The centrepiece of the test field

EOL functional test

EOL function test stand

Sensor test (temperature, pressure, rotation speed)

Shift actuator function | Cooling/lubrication function

Functional test of the mechanical and electrical components

E-motor function | Structure-borne sound test

Implementation within just 14 months

JW Froehlich was responsible for the complete design of the assembly processes, test scope, synchronisation between the stations, simulations, data communication and commissioning for the project. The system includes all loading and unloading units, manual and automatic test stations including the platforms, as well as the necessary equipment and logistics. Under JWFroehlich's project management, an optimised assembly and test system was created – in a one-stop-shop. The time from the start of the project to the start of production was just 14 months.

Have we piqued your interest?
For questions about the project and its technical details, please refer to your direct contact:

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Test and Assembly Solutions for Powertrain
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7-minute-cycle: Testing e-axles for heavy goods vehicles

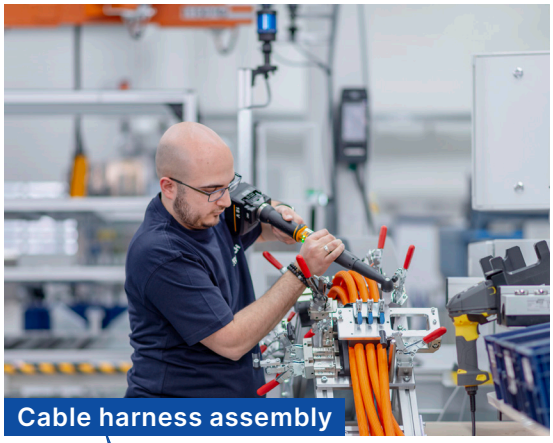
The project of a German OEM: End-of-line assembly and test field

A one-stop-shop

In this project for a German vehicle manufacturer, JW Froehlich implemented a complex assembly and test field for HGV e-axles – from design all the way to commissioning. What's more, JW Froehlich managed the entire project, which allowed the efficient integration of all the processes required for a state-of-the-art end-of-line (EOL) assembly and test field.

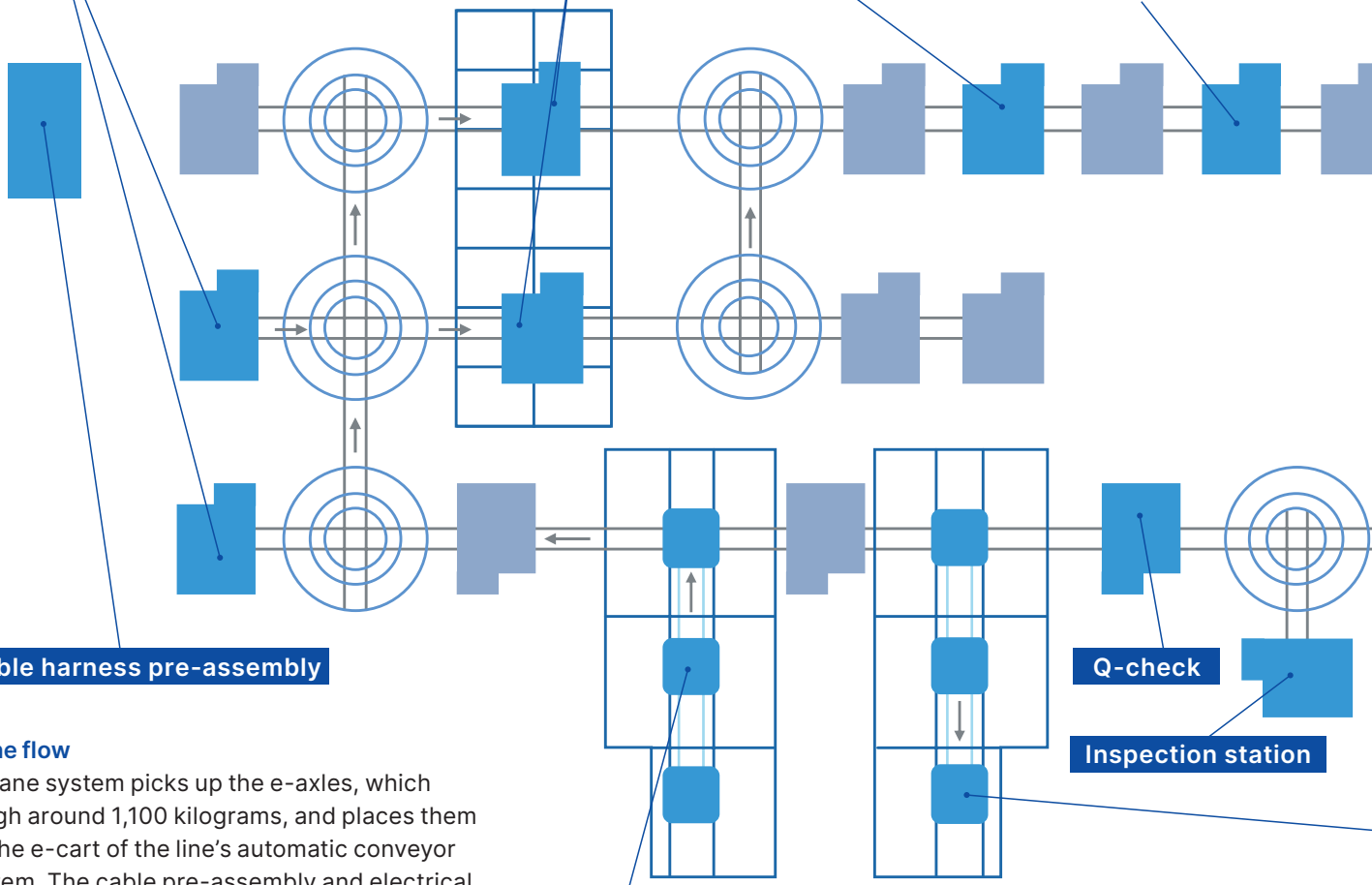
JW Froehlich is where decades of experience with the development of highly complex test stands meet extensive e-mobility expertise. Our test systems are developed and customised in close consultation with our clients to meet their exact requirements. The combined technological know-how of our in-house experts and cooperation partners enables the development of complete, user-oriented testing solutions. The result is a one-stop-shop for the total design, simulation, implementation and on-site commissioning.

Everything in one line – everything from a one-stop-shop



Cable harness assembly

Leak test



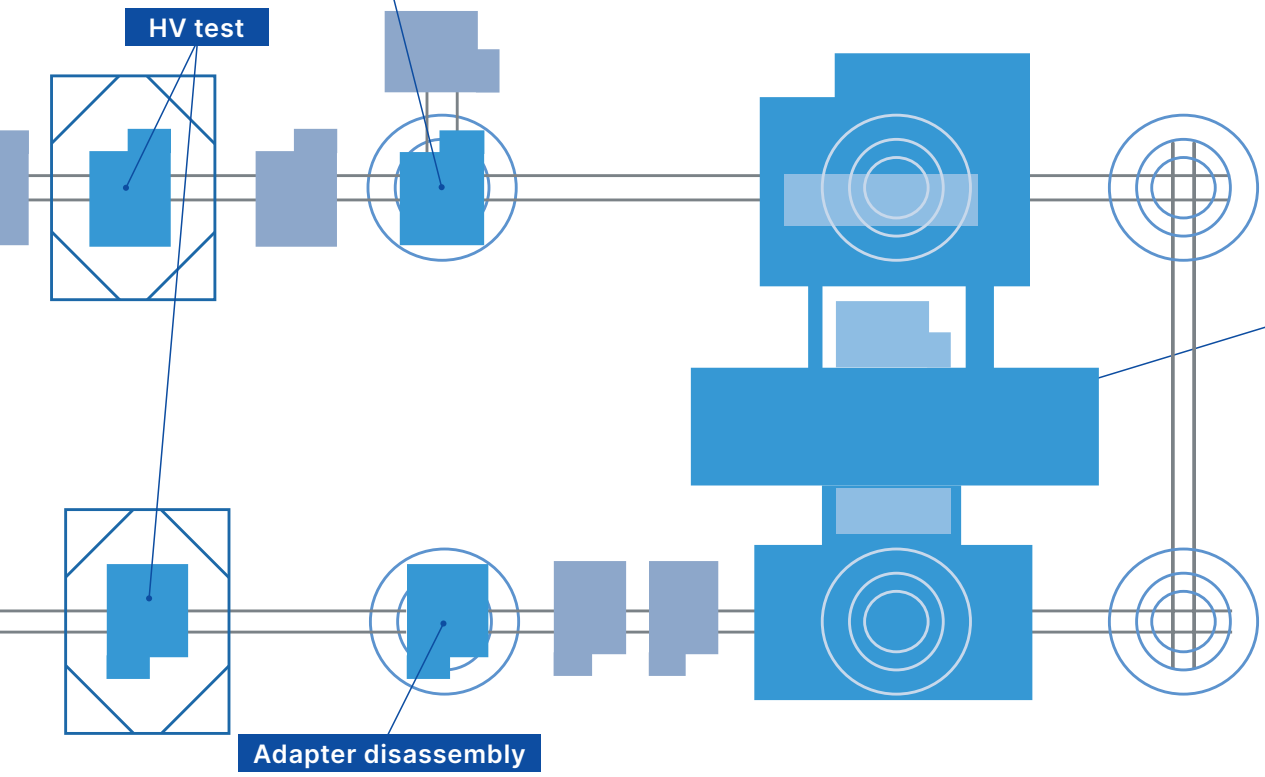
In the flow

A crane system picks up the e-axles, which weigh around 1,100 kilograms, and places them on the e-cart of the line's automatic conveyor system. The cable pre-assembly and electrical cabling are carried out manually. The system then automatically checks the leak tightness of all five testing spaces, fills the gearbox and electric motor compartments with oil and carries out resistance and insulation tests on the first HV test stand. The operators can then attach drive adapters to the e-axles to enable the start of the functional test on the end-of-line test stand. Once the adapters have been manually disassembled, the e-axles undergo a second HV test run. If a test part shows deviations, the operators perform a visual inspection and rework the part. All test parts that meet the client's quality standard are labelled, masked and prepared for dispatch at the last station.

Delivery and loading

Smart use of virtual reality

The system can test up to 150 axles per day in three-shift operation. JW Froehlich used VR simulation to develop a coherent ergonomic concept for the manual work-stations. In the virtual environment, adapter assembly and disassembly could be experienced during the planning process to improve working conditions and design the line to perfectly accommodate with the 7-minute cycles and eight operators.



EU- and NAFTA-compliant test scope

The tested HGV e-axles in our client's large trucks are powered by battery or fuel cell units and are driven all around the world. This means they must comply both with EU and with NAFTA standards – which has a significant impact on the flexibility of the test field. JW Froehlich routinely met our client's requirements, namely compliance of the test scope with the standards applicable in both trade zones.