

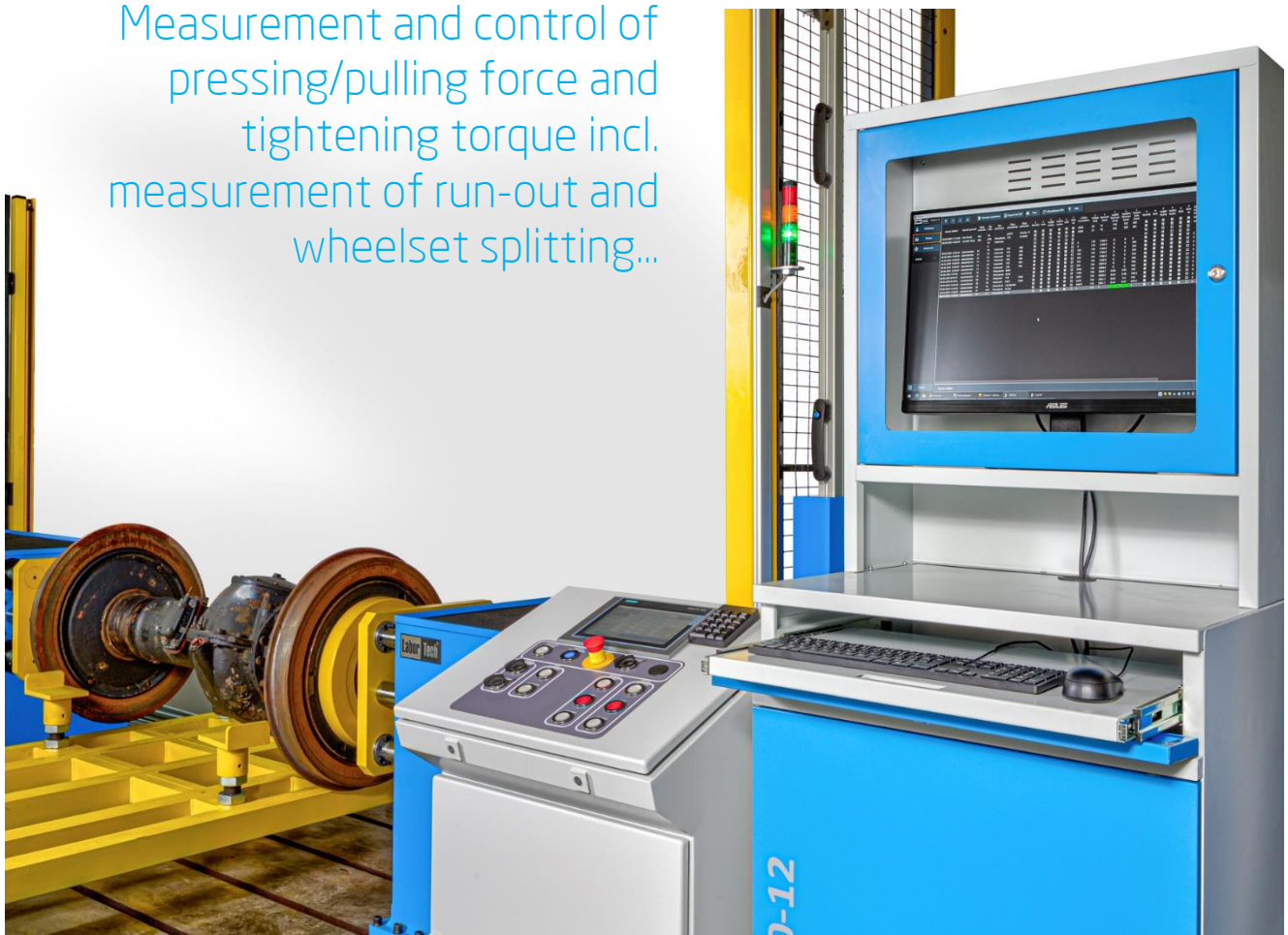


Torque mounting and tightening bench for tram wheelsets

LabTest TWS 300-12

LabTest TWS 300-12 – moment mounting and tightening bench for pressing and dismounting wheelsets for trams from LABORTECH is a special device that allows safely, efficiently, accurately and controlled disassembly and assembly of two-wheelers so that the necessary maintenance work can be performed. This machine is a key tool for tram operators and workshops dealing with the maintenance and repair of trams. All accurate measurements on a tram wheelset with the TWS 300-12 are crucial to ensure safe, efficient and reliable operation of trams and rolling stock. Monitoring and setting of these parameters via PC and touch monitor allows quick response to potential setup problems and improves the overall safety and performance of the tram system.

Measurement and control of
pressing/pulling force and
tightening torque incl.
measurement of run-out and
wheelset splitting...



Key features of the TWS 300-12



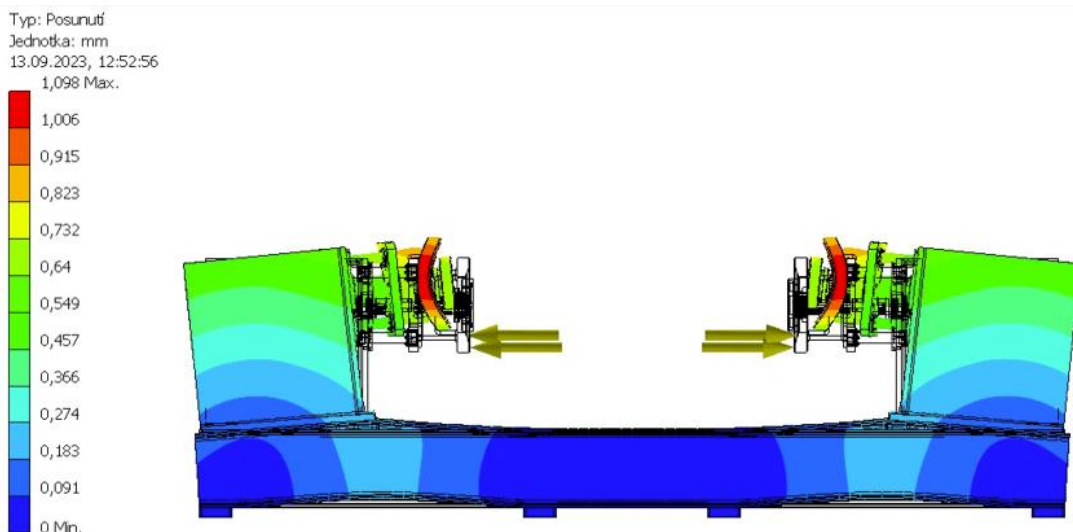
Industrial deployment

- Railway industry – production of rolling stock and trams
- Repair shops for rolling stock, transport companies, etc.
- Railway repair and engineering works



Machine test frame

- The wheelset pressing and dismantling machine is built on a robust weld structure base that provides the stability, rigidity and strength needed to handle heavy wheelsets by trams.
- The test frame is stressed not only to the tensile and compressive force of 300 kN, but above all to the tightening and loosening torque of 12,000 Nm.
- Thanks to the FEM method (solid element method including simulation of stress waveform, deformation and natural frequency), the rigidity of the test frame is designed with sufficient margin for abnormal tensile, compressive and torsional stresses. –see picture below



- The test frame has a self-supporting structure, so it is not necessary to make a special concrete fit under the machine.
- The machine frame complies with ergonomic design principles in accordance with EN 614-1:2006+A1:2009.

Hydraulic bench

- A key component of this device is a combined hydraulic test-assembly bench that works separately for each part of the axle – wheels.
- The combination bench is able to develop controlled axle pressure and precisely controlled torque when loosening and tightening nuts with high repeatability thanks to proportional valves.
- The tightening mechanism can be retrofitted with various extensions and clamping mechanisms according to the type of nuts, which make it possible to hold the tram two-wheelers firmly and then dismantle or assemble them.
- Hydraulic components and components meet the general rules and safety requirements for hydraulic systems and their components according to **EN ISO 4413:2010**.



Control and evaluation system

- The machine is equipped with a modern electronic safety control SIEMENS – SIMATIC S7, which enables precise control, adjustment and control of force, torque, position and various parameters not only of the testing process, but also of diagnostics of the overall hydraulic system HALT 18 in accordance with **EN ISO 60204-1:2018**.
- The test bench is equipped with a digital LCD touch screen with integrated TWSFest-S software to indicate the type of wheelset, pressing force of tightening torque, etc..
- The actual process of pressing, disassembly, moment release and retraction, including wheel runout measurement, can be monitored in the TWSFest software on a 24" LCD TOUCH monitor and PC.



Safety features

- The LabTest TWS 300-12 test bench is equipped with various safety features such as emergency stop, safety barriers, warning light and sound signals and barriers to protect operators and prevent accidents.
- The machine meets all safety parameters defined by the following standards:

EN ISO 12100:2015

Safety of machinery – Risk assessment and reduction

EN ISO 14120:2015

Safety of machinery – Guards

EN ISO 13850:2015

Safety of machinery – Emergency stop function

EN IEC 61000-6-2:2019

Electromagnetic compatibility (EMC)



Essential measurement tasks on tram wheelsets

Precise measurement and control of pressing and pulling forces, including the moment of tightening and measurement of runout and wheel sags on tram wheelsets are important aspects in the operation and maintenance of trams and rolling stock. These parameters help to ensure the safety and efficiency of rolling stock operation.

Measurement and control of pressing/pulling force and tightening torque:

- **Purpose:** measurement and control of pressing/pulling force and tightening torque is an important parameter for achieving the exact distance between the wheels – track gauge.
- Correct gauge is essential for safe operation, reducing rail wear and optimizing energy consumption.
- Both of these measurements are essential to achieve the required quality, safety and efficiency in production and assembly processes, in repair shops of transport companies and tram manufacturers.
- Using the right methods and tools to measure pressing force and tightening torque is critical to achieve optimal results and minimize the risk of component failure or inaccurate assembly.



Measurement of run-out and wheelset (parallelism)

- **Purpose:** measurement of run-out and wheelset spacing is aimed at determining how well the tram holds on the tracks.
- This is important to achieve minimal depreciation and achieve safe, quiet and smooth operation, especially at higher speeds, tight corners and braking.
- Runout and buckling measurements are performed using precise sensors that monitor lateral deflections and wheel tilt angles relative to the tracks.

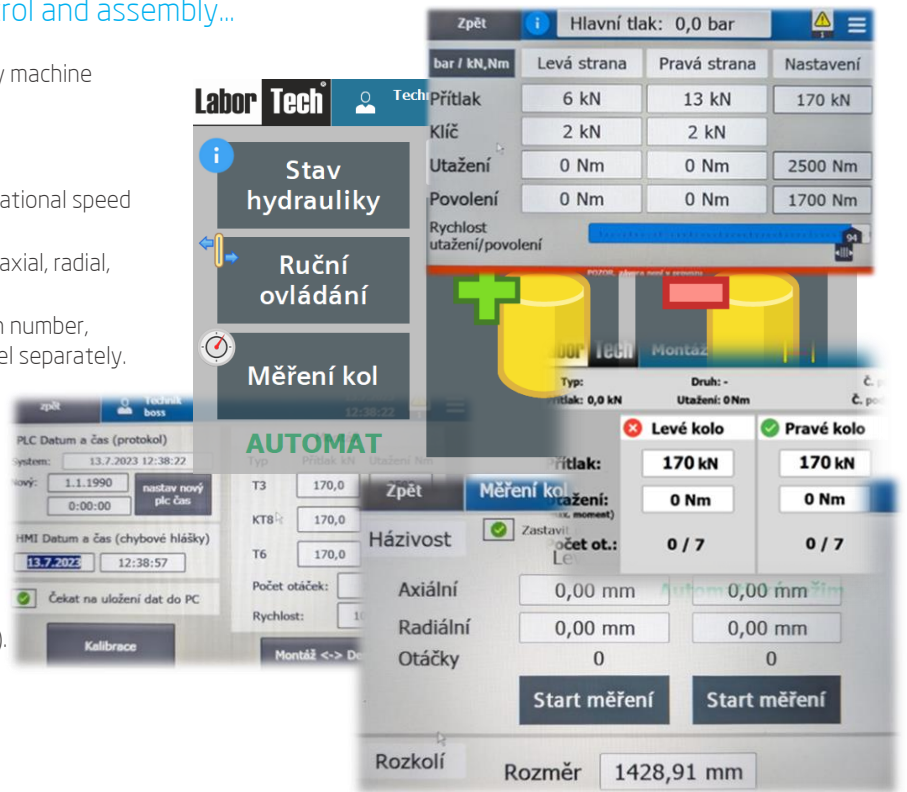


All measurements on railway wheelsets with the TWS 300-12 are crucial to ensure the safe and reliable operation of trams and rolling stock. Monitoring these parameters allows for a quick response to potential problems and improves the overall safety and performance of the tram system.

Software TWSFest-S

System software for wheelset control and assembly...

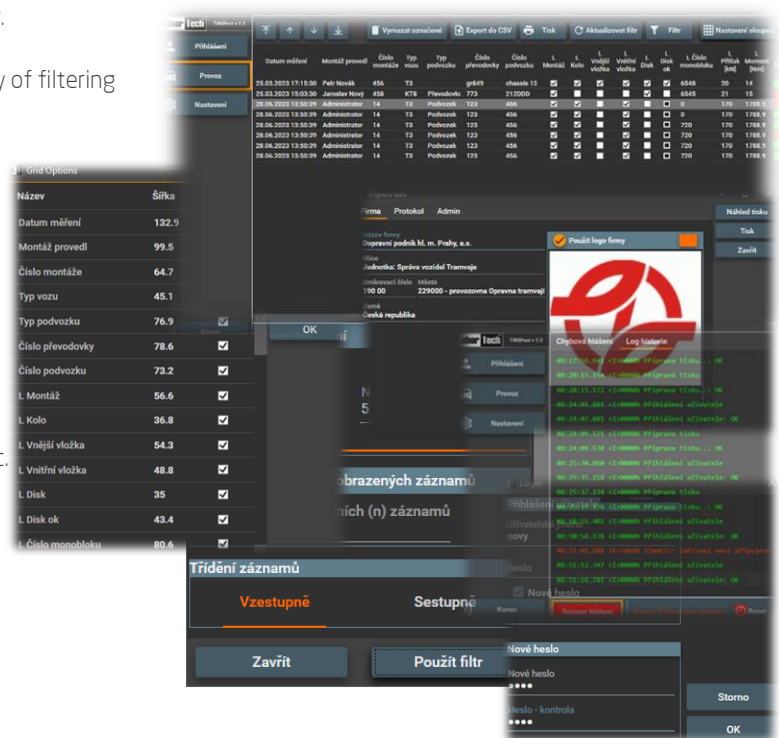
- Intelligent software designed for fast and easy machine operation.
- Device user choice - rights - user permission.
- Manual or automatic control of the machine.
- Choice of pressure, tightening or loosening, rotational speed for each hydraulic bench separately.
- Setting wheel measurement in manual mode – axial, radial, speed.
- Assembly database – vehicle type, transmission number, chassis number, chassis type etc. for each wheel separately.
- Runout and buckling measurements for each wheel separately.
- Data with assembly results.
- Diagnostics of hydraulic unit HALT 18 – pump operation, cooling, filter clogging, emergency temperature, emergency stop, next oil change, number of operating hours, etc.
- Extensive calibration and service program.
- Multilingual version (CZE, EN, POL, RU, ESP etc.).
- Perpetual license.
- Installation on any SIEMENS system.



Software TWSFest-BASIC

Intuitive software for wheelset control and assembly setup for operation...

- Intelligent software designed for data collection and display of measured values from measured channels.
- Simple intuitive operation.
- Setting and saving defined methods – unlimited number.
- Digital display of all current values of active channels.
- Storing measured data in a database with the possibility of filtering by definition, order, date etc.
- Database of measured results.
- Statistical processing of results.
- Export of measured data.
- Accurate information about machine status and error messages.
- Extensive calibration program.
- Multilingual version (CZE, EN, POL, RU, ESP etc.).
- Print the report in PDF format.
- Export dat do CSV – BASIS, nebo do MY SQL a MS SQL.
- Perpetual license.
- Installation on any computer without using a license etc.
- Setting user rights, operator login.



Specification

Ratings	Units	TWS 300-12
Product code		1.12050121
Max. test contact force	kN	300
Max. tightening/retracting torque	Nm	12 000
Max. tightening speed	sp/min	5
Calibration in accordance with the standard		ČSN EN ISO 7500-1, ČSN EN ISO 9513
Flatness/parallelism measurement accuracy	mm	0,001
Stroke of measuring probe flatness/parallelism	mm	50
Hydraulic unit pressure	bar	230
Max. hydraulic bench flow	l/min	23
HA noise level	dB	< 68
Environmental conditions		
Temperature of the working environment	°C	+10 ... +35
Storage temperature	°C	-25 ... +55
Humidity of the working environment	%	< 90
Electrical connection		
Supply voltage/frequency	V/Hz	400/50-60
Number of phases		3
Wattage	kVA	14,4
Other parameters		
Color combination	RAL	1015, 5015
PC interface		Ethernet, USB ...

