



Ultrasonic Testing System for Hollow Shaft Axles and Mobile Use

Hollow Shaft Axles Testing System HWP-C 2500/30-90



GMH Prüftechnik

GmbH · ND · Testing · Systems · Services

Hollow Shaft Axle Testing System HWP-C 2500/30/90



Brief description

The hollow shaft axle testing system HWP-C 2500/30-90 offers operators and workshops of wheel-rail systems the possibility of testing hollow shaft axles with different bore diameters in a mobile and mechanised manner. Thus, it represents the optimum solution for repeated ultrasonic testing of mounted wheel set axles at the highest level.

The innovative design in combination with the patented flange technology and the very powerful software sets new standards for resolution, verifiability and flexibility when testing wheel set axles during maintenance of vehicles and wheel sets in the workshop. Additionally to the already mentioned advantages,

the testing system specifically has been designed for often very tight spaces. Due to its small size, it offers a high degree of mobility and in connection with the individually moveable test extension a maximum of operating comfort.

In addition, a patented flange technology requires no additional adapter flange at the axle whereby extensive set-up and assembly times either disappear completely or can be substantially shortened. In collaboration with a powerful operating and evaluation software, the testing system can be adapted in a very short time to the most different testing requirements and thus satisfies highest testing demands.

Hollow Shaft Axle Testing System HWP-C 2500/30/90



Software

Features

- Very easy handling
- No additional adapter at the shaft due to patented flange technology
- High test speed therefore short test times with high resolution
- Optimum support in the equipping for new axles types due to 2D-CAD-Interface
- Evaluation of the test results according to applicable standards
- Presentation of the test results in A-, B-, C-scan
- Extendable according to customer requirements
- Simple control of the adjustment through digital reference cards

Control system

- Fully integrated PC-based drive and control and system
- Automatic control of the test sequence
- Extremely low-noise precision servo drives
- Lowest interference in testing technology
- Direct move of scanner to indicators via C-scan
- High degree of safety

Automation and mechanics

- Mobile test system for use in the workshop
- Rigid chain principle for positioning of the probes
- Integrated rotation drive with positioning encoder
- Precision guide of the probes in the bore
- Additional manual or electrical height setting of extension

| | |
|---|--|
| Swivel range (horizontal) | 270° |
| Axle bores | 30 mm ... 90 mm |
| Axle length | max. 2500 mm |
| Height of bore centre | 300 mm ... 1400 mm (2100 mm optional) |
| Repeat accuracy of the test head position | ± 2,0 mm |
| Displacement resolution | ± 0,1 mm min. |
| Test speed (typical) | < 20 min/Axle |
| Overall dimensions (w x h x d) | ca. 1300 x 1000 x 1500 mm |
| Weight | Approx. 360 kg |

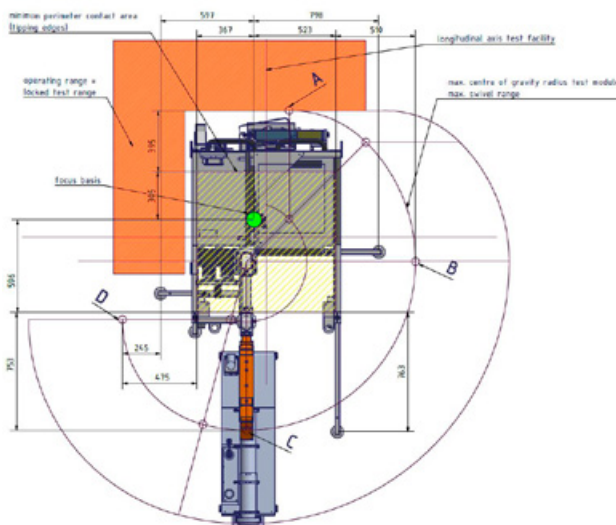
Power consumption

- Power consumption during testing with \varnothing 60 mm: 420 VA
- Power consumption with no load: 230 VA

Ultrasonic testing system

- Fully integrated 12-channel ultrasonic test system
- Test results displayed on a 27"-monitor
- Various access hierarchies always ensured by using passwords
- HELIX-Scan for optimized test sequence
- DAC – dynamic depth compensation
- Apertures according to geometry

| | |
|-------------------------------|--|
| No. of ultrasonic probes | 11 |
| Incidence angle and direction | ± 40°, ± 60° lateral flaw, ± 63° longitudinal flaw, 2 x 0° volume near / far |
| Probe frequency | 5 MHz (type) |
| Flaw detection | ≥ FBH 1 volume testing ≥ 5 x 1 mm groove lat. flaws |



Schematic representation of the working area incl. operating area (orange).

Hollow Shaft Axle Testing System HWP-C 2500/30/90



Option: Control unit for electric travel drive with two-hand operation and pinch protection

27" Monitor

Option: Mobile remote screen (tablet) for optimal assessment of indications on the wheelset shaft



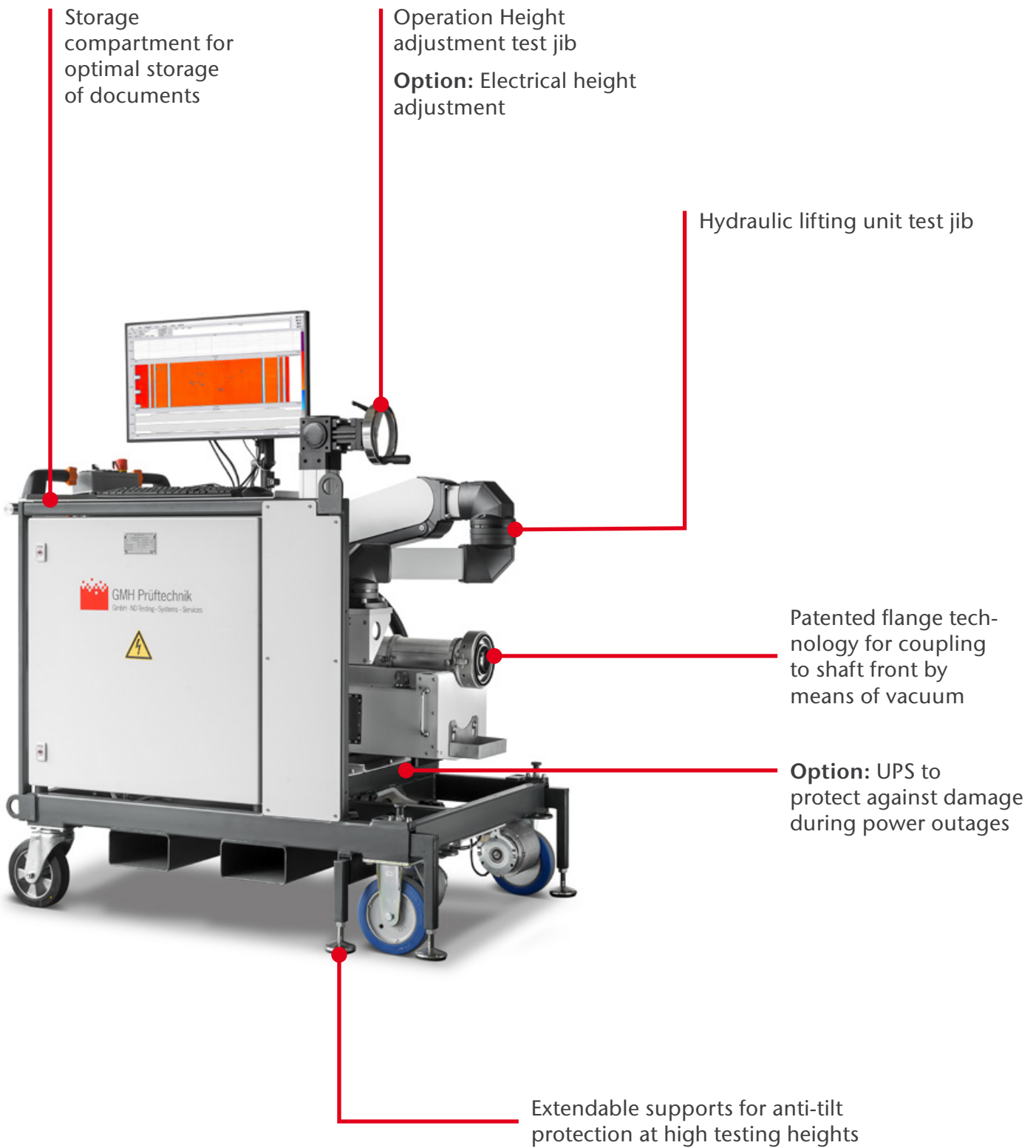
Crane attachment points

Option: drawbar for moving the unit by means of towing vehicle

Cable reel 25m

Vibration-free decoupled control cabinet

Option: Forklift shoes for safe loading of the machine by means of a forklift truck



Storage compartment for optimal storage of documents

Operation Height adjustment test jib

Option: Electrical height adjustment

Hydraulic lifting unit test jib

Patented flange technology for coupling to shaft front by means of vacuum

Option: UPS to protect against damage during power outages

Extendable supports for anti-tilt protection at high testing heights

Hollow Shaft Axle Testing System HWP-C 2500/30/90



Software

Description

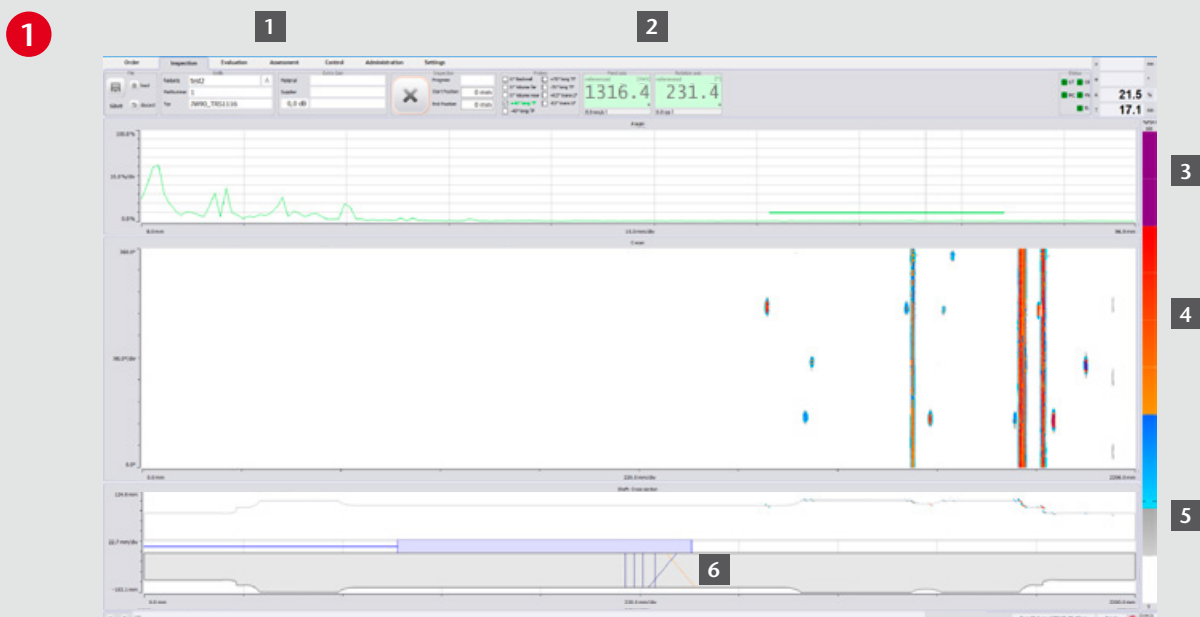
- Operating system Windows 11 IoT Enterprise LTSC 64 Bit
- Very simple and intuitive operation
- Optimum support in the equipping for new axles types due to 2D-CAD-Interface
- Display of test results in A-scan and C-scan, optionally as B-scan **1**
- Flexible adjustment of the test sensitivity over the shaft position **2**
- Optimal support for the adjustment **3**
- Testing of A and B sides with the same testing program
- Direct approach to indications via C-scan
- Display of echo heights optionally in dB or %BSH
- Language of the software can be changed at runtime
- Statistics about performed tests and running time of the machine
- Extensive user management
- Powerful report generator with various export functions
- Connection to post-processing
- Data backup via USB drive or LAN/WLAN
- Revision of all test-relevant data
- Remote diagnostics and offline analysis functions

Evaluation

- Analysis of A-scan and C-scan, optional B-scan
- Marking of indications incl. automatic evaluation in a list of all indications **4**
- 1:1 comparison with C-scan of a reference test of the same shaft type **5**
- Evaluation of the test with automatic creation of a test report
- Freely adjustable evaluation thresholds

Optional features

- Evaluation additionally in B-scan **1**
- Fast control of the adjustment by means of digital reference card
- Input of test and sample data via barcode or QR code scanner
- Customization of the C-scan display
- Customization of test and sample data
- Control of the machine via a mobile tablet when directly approaching indications

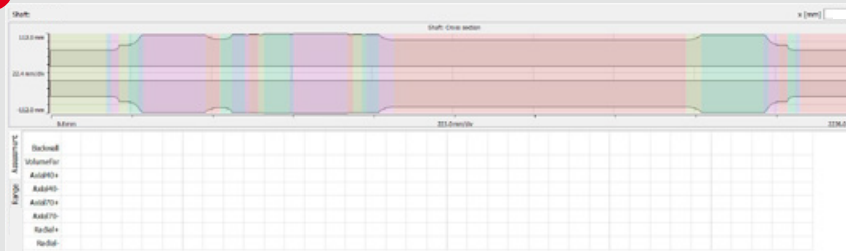


Displays during the inspection with **1** order data, **2** current position of the probe carrier **3** A-scan, **4** C-scan, **5** B-scan and **6** wheelset geometry incl. display of the sonic beams of all probe units.



Software

2



Flexible adaptation of the test length by defining ranges with additional gains / gain reductions for the individual test channels.

3

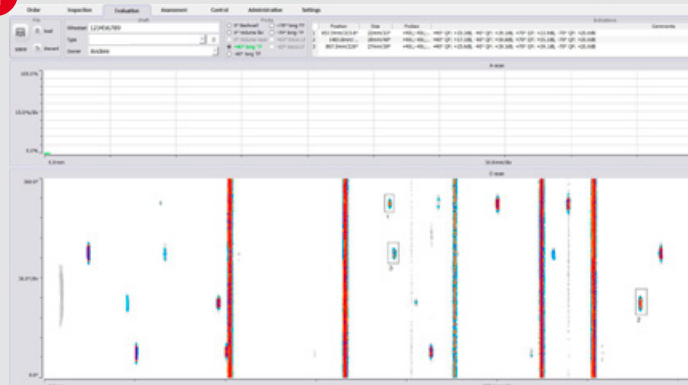
Hohlwellenprüfung - Prüfeinheit bearbeiten

| Channel | Gain [dB] | Delay [µs] |
|-----------|-----------|------------|
| Backwall | 33 | 1,15 |
| VolumeFer | 29 | 1,15 |
| VolN | 31 | 9,5 |
| +40L | 44 | 2,75 |
| -40L | 45 | 2,75 |
| +70L | 69 | 3,75 |
| -70L | 70 | 3,75 |
| +63Q | 53 | 5,5 |
| -63Q | 52 | 5,5 |

OK Cancel

Simplified adjustment through suitable dialogs.

4



Marking indications in the C-scan with automatically generated list of indications.

5

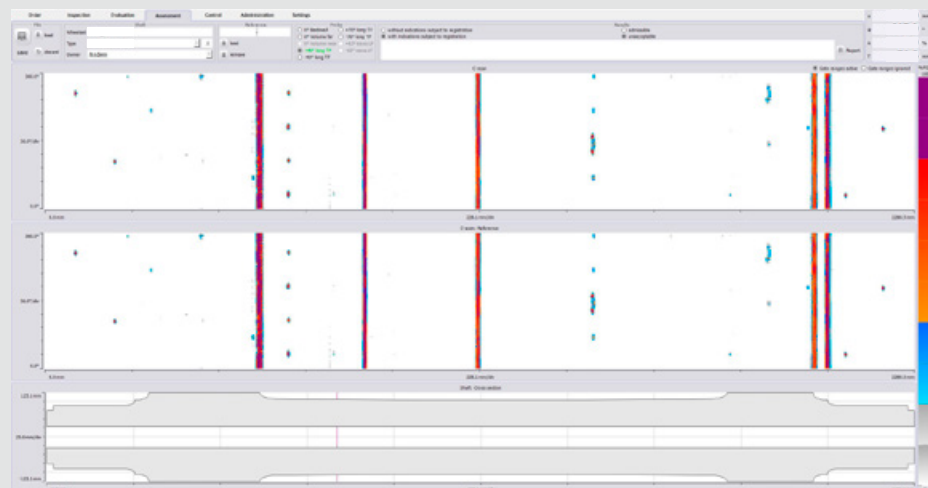
C-scan of the current test

↕

Δ Testing interval

↕

C-Scan of a reference test of the same shaft



Comparison of the current test (upper C-scan) with a reference test of the same shaft type (lower C-scan).



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