

**LTBR //X**

Large Engines Diesel  
Test Bench

Common Rail  
Micro-Pilot Injection Systems

**CloudX**

The Premier Professional  
Solution for Large  
Engines and Heavy-Duty  
Diesel Systems.



→  
SHIPPING  
MARINES  
GENERATORS  
HD ENGINES  
MACHINERY  
LOCOMOTIVES  
AND MORE

**X Series 2024**

## SYSTEMS TESTED



### 2-STROKE ENGINES

Wärtsilä X-DF Diesel 2-stroke engines  
[Conventional Electronic Injectors and  
Pilot Pumps]

MAN ME Diesel 2-stroke engines  
[Conventional and Slide-Valve Injectors]

Mitsubishi 2-stroke engines



### 4-STROKE ENGINES

Wärtsilä Diesel 4-stroke engines Conventional  
& Electrical [Injectors and Pilot Pumps (CR / DF)]

MAN Diesel 4-stroke engines Mechanical  
& electronic [Injectors and Pilot Pumps (CR / DF)]

HiMSEN [Injectors and Pilot Pumps DF]

YANMAR [Injectors]

DEUTZ [Injectors]

MTU [Electronic Injectors and Pumps]

CAT / MAK [Conventional & Electronic Injectors and  
Pumps]

CUMMINS [Electronic Injectors and Pumps]

Daihatsu [Injectors]

Other Auxiliary / Main Engines Systems

All Makes & Types of Light, Medium  
and Heavy Duty Modern Diesel Engines



**INNOVATION  
TO DRIVE  
FORWARD  
MOBILITY  
SOLUTIONS**

## Heavy Duty Diesel Systems

**Setting the Benchmark  
for Large Engines Tests  
Benches**



Building on our expertise and extensive experience, we have applied innovative thinking to create the new **LTBR-X**, which incorporates a cutting-edge design, state-of-the-art hardware, and enhanced AZO software.

# LTBR **///X**

## Large Engines Diesel Test Bench

**2800Bar+**

### → Key Features

#### 01. Versatile Testing Capabilities:

- Primary Engines: Supports testing for Low, Medium, and High-Speed primary engines.
- Dual-Fuel Systems: Equipped to manage the complexities of dual-fuel engine systems with precision.
- Secondary & Auxiliary Engines: Provides thorough testing for all secondary and auxiliary engines currently available in the market.

#### 02. Universal Compatibility:

Designed to test all makes and models of diesel pumps and injectors, ensuring complete versatility across various engine platforms.

#### 03. Precision and Reliability:

Engineered to deliver highly accurate and consistent results, ensuring each test adheres to the highest industry standards for performance and safety.

#### 04. Robust Construction:

Built with heavy-duty materials and components to ensure long-lasting durability, capable of withstanding the demands of rigorous daily operation.

#### 05. User-Friendly Interface:

Features an intuitive control system and advanced software powered by CloudX, simplifying operation and configuration, thereby enhancing productivity and reducing downtime.

#### 06. Scalable and Future-Ready:

Designed with scalability in mind, the bench can be easily upgraded to accommodate emerging Diesel technologies, ensuring long-term relevance and utility.

#### 07. Comprehensive Safety Features:

Incorporates multiple safety mechanisms to protect operators and equipment, in full compliance with industry standards.

This diesel test bench is an essential tool for specialists who require a robust, versatile, and reliable solution for testing a diverse array of diesel fuel system components. Its advanced features and superior build quality make it the ideal choice for professional workshops and testing facilities.

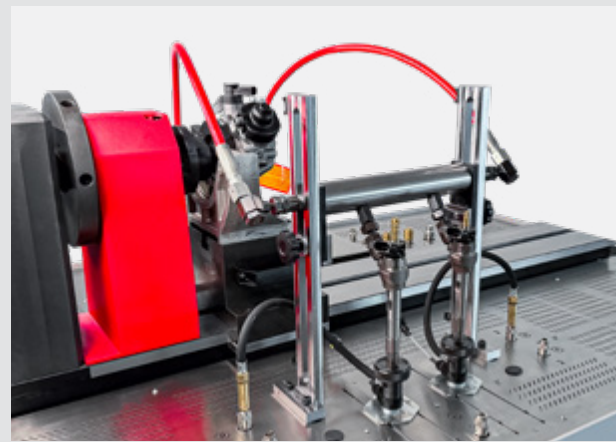
*\*New database and Coding is continuously being updated to new EU6 applications*

### LTBR **///X** → Points

#### 01.

##### Versatile Injector Rail and Holder.

Designed for seamless coupling and compatibility with all types and sizes of diesel injectors, this robust and fully adjustable fixture ensures the quickest and most efficient placement and testing on today's diesel test benches. The inclusion of illuminated multilayer glass chambers enables detailed nozzle and spray pattern analysis during dynamic injector testing. Additionally, integrated Nozzle Response Time measurement sensors provide real-time monitoring of internal component efficiency, optimizing overall test outcomes.



#### 02.

##### Reinforced Flatbed Base for Enhanced Stability and Large-Diameter Pump Accommodation.

This reinforced flatbed base is engineered for exceptional stability and is specifically designed to accommodate large-diameter pumps. With a central area that exceeds standard industry dimensions, it provides the necessary support for handling oversized components, ensuring precise and reliable testing even for the most demanding applications.



### 03.

#### Comprehensive Hydraulic Control Panel.

The machine control panel is an integral component of the diesel test bench, providing comprehensive control over all hydraulic functions necessary for pump testing. From this panel, operators can manage the oil supply to the pumps, as well as regulate and test both the low-pressure supply and the vacuum generated by the 2 pump under examination. The panel also includes the hydraulic oil setup for the Cambox, ensuring reliable operation.

### 04.

#### Enhanced Accessibility and Safety in Design.

The machine is designed with ample working space and allows for easy access from 3-sides, enhancing operational efficiency. Additionally, it features a transparent protective hood, ensuring both safety and full visibility during the testing process.

### 05.

#### Accessible HP Rail System.

The flatbed of the machine offers convenient access to the high-pressure rails connected to the DRV, which controls the system's high-pressure. This setup is designed to facilitate efficient and accurate maintenance of the machine, ensuring optimal performance and reliability.

Scan Carbon Zapp  
Digital Product  
Catalog



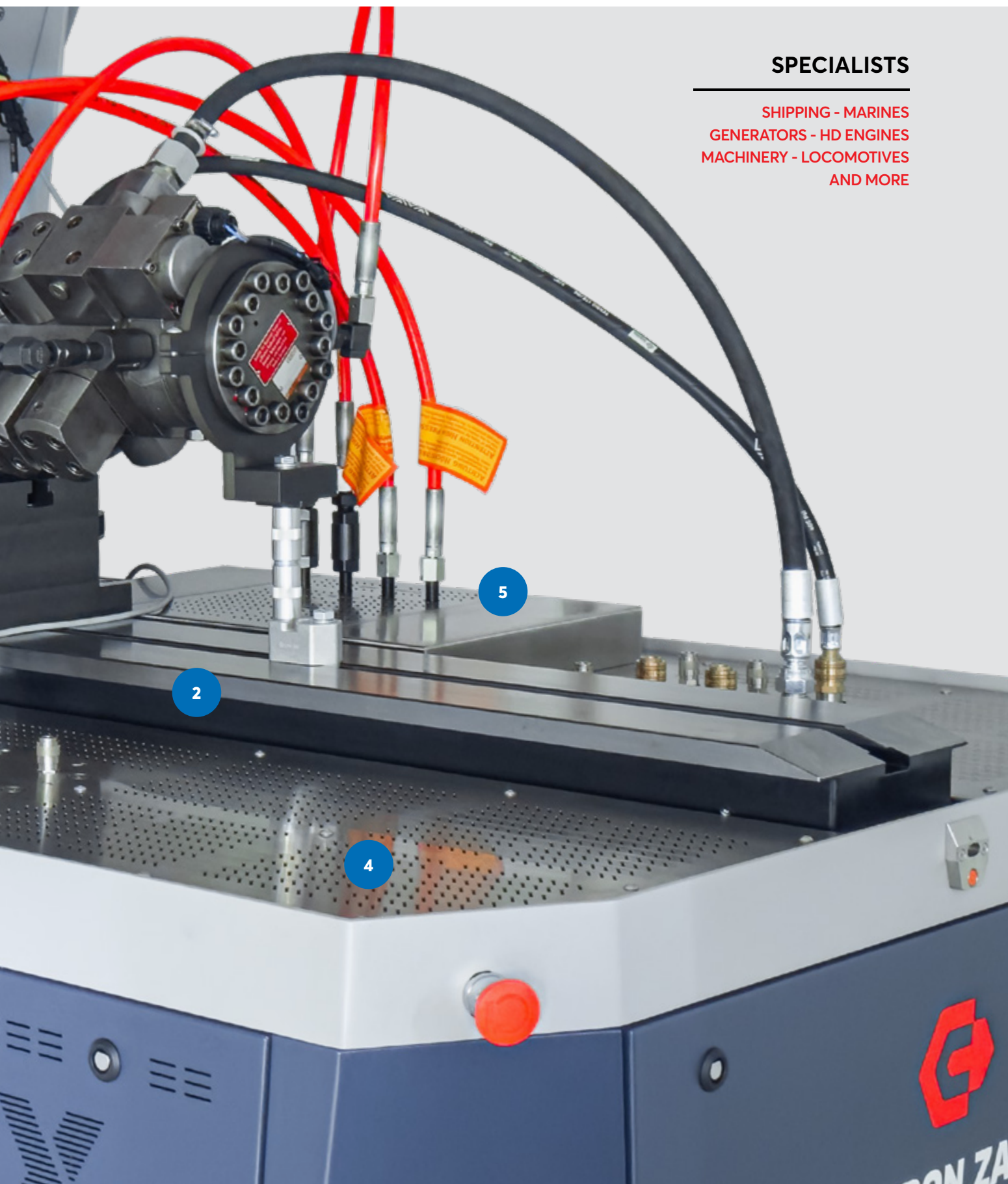
## Standalone HD and LE Diesel Test Bench for Specialists

This cutting-edge standalone Diesel Test Bench is meticulously engineered for professionals who demand excellence in fuel system diagnostics and maintenance. Designed to accommodate a wide range of engines and components, it is the definitive solution for comprehensive Diesel Systems testing.



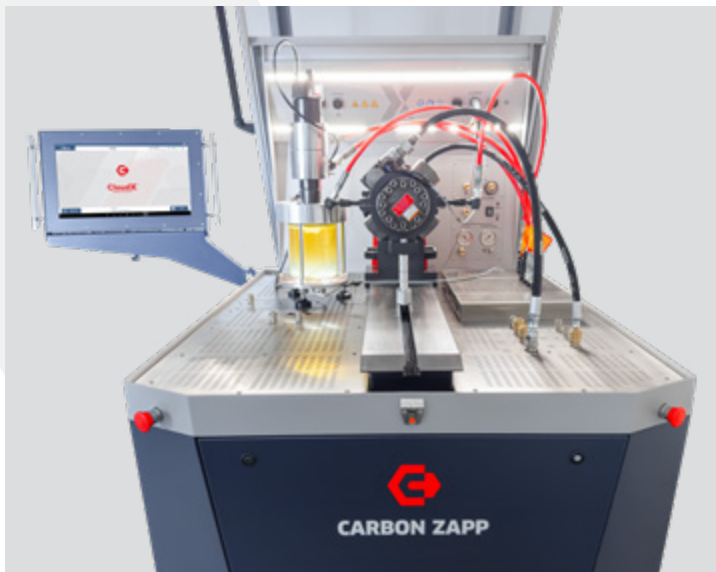
## SPECIALISTS

SHIPPING - MARINES  
GENERATORS - HD ENGINES  
MACHINERY - LOCOMOTIVES  
AND MORE



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AZO SOFTWARE



### Overview of the New LTBR-X

#### Advanced Diesel Test Bench Capabilities

Our state-of-the-art diesel test bench is equipped with the latest technology to deliver precise and comprehensive diagnostics for fuel injection systems. Key functionalities include:

- **Cambox Integration (Optional):**  
Allows for advanced testing features requiring cambox connectivity.
- **Electronic Flow Rate Measurement:**  
Accurate measurement of flow rates across various test plans (iVMs), with Integrated Synchronous Acquisition (ISA) detection.
- **Injector Coding:**  
Supports calibration data generation and trim file creation (IC) for precise injector performance.
- **Dynamic Spray Pattern Analysis:**  
Real-time spray pattern analysis within an illuminated spray chamber (dSPR) for detailed injector diagnostics.
- **Automatic Nozzle Opening Pressure Measurement:**  
Electronic measurement of nozzle opening pressure (aNOP-PCV) for consistent and reliable results.
- **Live Injector Nozzle Response Time Measurement:**  
Real-time measurement of injector nozzle response times (RSP) for dynamic performance assessment.
- **Static and Dynamic Leakage Tests:**  
Electronic measurement of leakage under both static and dynamic conditions (LKT) for comprehensive component evaluation.
- **Volumetric Test Plans for Pumps:**  
Multiple-load test plans (pVMs) to assess volumetric efficiency under various conditions.
- **Pressure vs. Speed Tests for Pumps:**  
Conducts pressure versus speed assessments (PvS) to evaluate pump performance across different operating speeds.
- **Speed vs. Pressure Tests for Pumps:**  
Performs speed versus pressure evaluations (SvP) to determine optimal pump performance parameters.
- **Electrical Valve Diagnosis and Measurement:**  
Advanced diagnosis and measurement of electrical valve functionality (eRLC) for ensuring system integrity.



**VIEW CZ Digital  
Product Catalog**



**Headquarters & Production**

**New Address**

Isiodou 18 (Industrial Park)  
194 00 Koropi, Attica-Greece

**German Branch**

A.I.S. GmbH  
75438 Knittlingen, Germany

**email** [contact@carbonzapp.com](mailto:contact@carbonzapp.com)

**tel** +30 210 9856110

**fax** +30 210 9928655

**[carbonzapp.com](http://carbonzapp.com)**