

MTBr ///X | PTBr ///X

The Ultimate Diesel Test Bench



MTBr ///X

The Universal Diesel & Gasoline Test Bench

Flagship Specialist Service Station. Every System. Every Brand. Zero Compromise.



CRi · CRp · EUi/EUp · HEUp · GDI · MI · FSC

All-in-One Specialist Service Station. One Platform. Every System.

PTBR //X

The Dedicated High-Pressure
Pump Test Bench

Specialist Service Station. Every
Diesel & GDi Pump Diagnostics
in One Bench.



CRp · HEUp · GDp · FSC

MTBR-X Portable Tool Cart

Organized storage for adapters, fittings,
cables and injector/pump clamping sets,
within arm's reach of the bench.

MTBR **///X** | PTBR **///X**

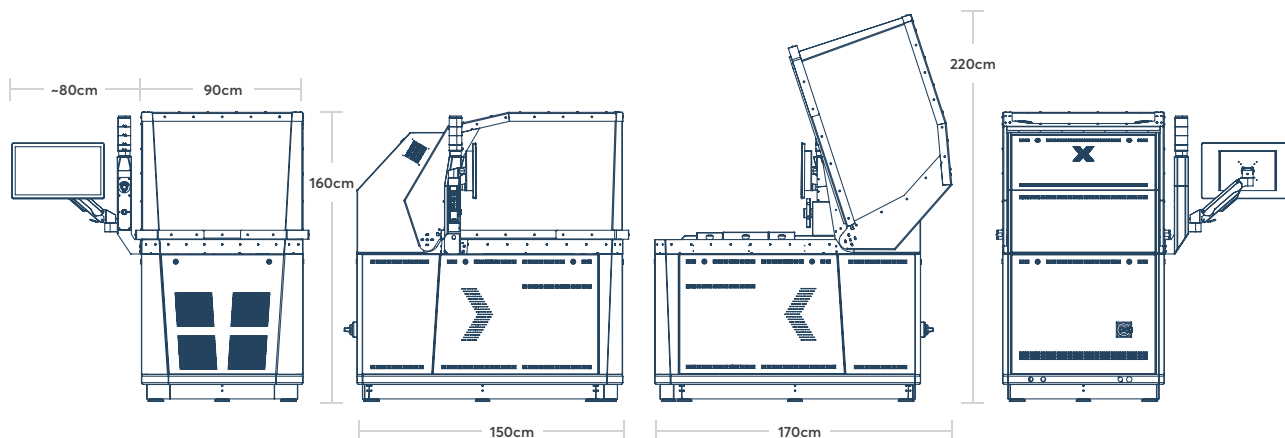


**Every System.
One Platform.
Zero Compromise.**

The MTBR-X does the work of an entire diesel-and-gasoline test room, CR injectors and pumps, GDi injectors and pumps, EUI / EUP and fuel-system components, on a single platform, one database, one operator.

SPECS & METRICS

Weight	915kg	Voltage	380-480 V · 3P+PE · 50/60 Hz	Current	63 A
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EU6 / EU7 testing standards.

Future-proof from day one

Pressure up to 3,000 bar

for the highest-performance
injectors on the road

Authorized Solution for
Schaeffler / Continental
Continental

CloudX AZO

TOTAL SYSTEM COVERAGE

- **All major systems on one platform:**
CRI · CRp · EUi/EUp · HEUp · GDI · MI · FSC
- The market's most extensive injector coding capability
- **Drive power:** 18.5 kW / 25 HP
- **11,000+** part numbers in the factory database, continuously updated
- **Built-in Test Plan Editor:** for OEMs, remanufacturers and engineering labs

ENGINEERED FOR PRECISION

- Integrated waste tank with injector and pump flushing
- Advanced closed-loop temperature control: EU6 / EU7 compliant
- Water or Air cooling system
- Powered by CloudX: every result encrypted, cloud-stored, GDPR-compliant. No third-party sharing. Industry 4.0 ready.
- AZO operating system: the most intuitive, user-friendly HMI on the market

OEM-AUTHORIZED. OEM-TRUSTED.

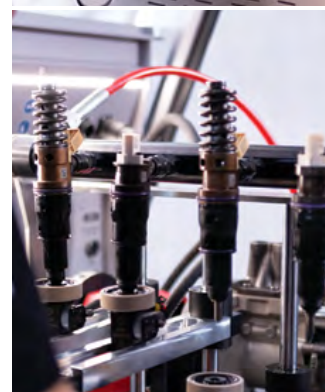
Authorized by Schaeffler / Continental; built to OEM testing standards across Bosch, Delphi, Denso, Stanadyne, Caterpillar, Liebherr, MTU, L'Orange and Cummins platforms. Additional authorizations pending.

AFTERMARKET-READY. INDUSTRY-CONNECTED.

CLOUDX REPAIR HUB. Certified third-party repair solutions, built to complement the market, not compete with it. Hard-to-source parts, test plans not published by OEMs, and calibrations from approved specialists. Co-branded with our partners. OEM testing stays primary; the Repair Hub fills the gaps, optional and clearly marked. You decide what to use.

ERGONOMICS

- All-round workspace access
- 22" industrial-grade Android HMI (fully adjustable)
- Easy pump and cambox mounting (portable trolley); fast cambox setup (EZO kit)
- Injector mounting designed for mass production
- HP-hose-free injector system (fully adjustable)
- Intuitive cable and hose management; auxiliary racks and shelves (optional)



MTB | PLATFORM

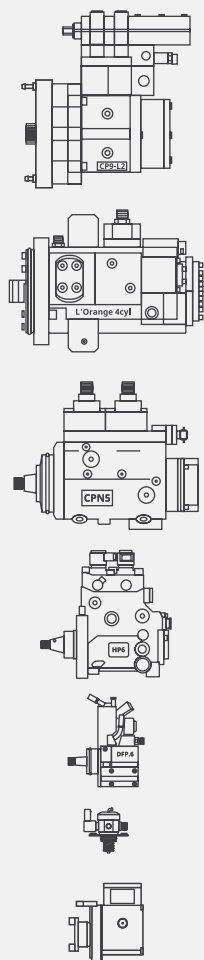
MTBR-X

PTBR-X

SPECIALISTS SOLUTIONS

MTBR | PTBR

Universal high-pressure testing
for every diesel & gasoline pump
in production worldwide.

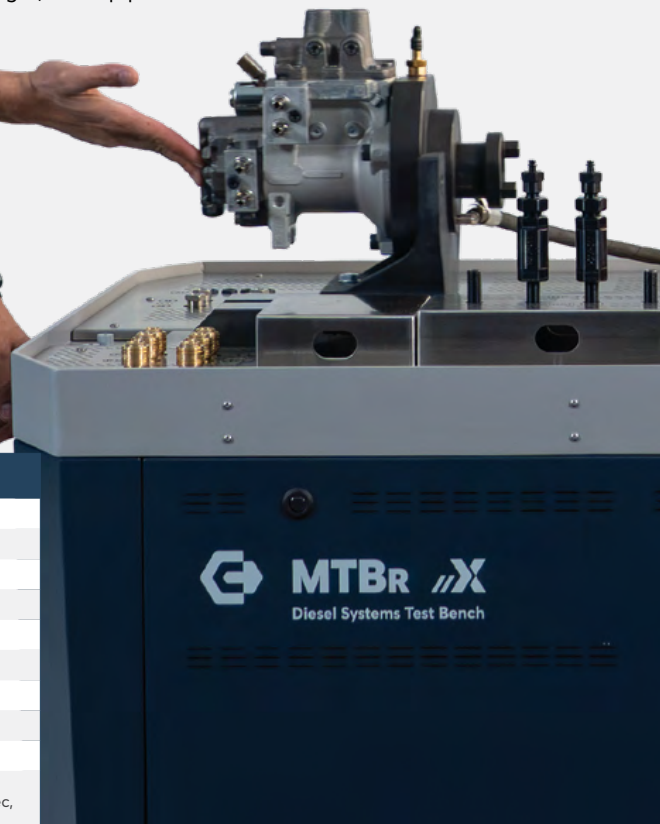


FEATURES

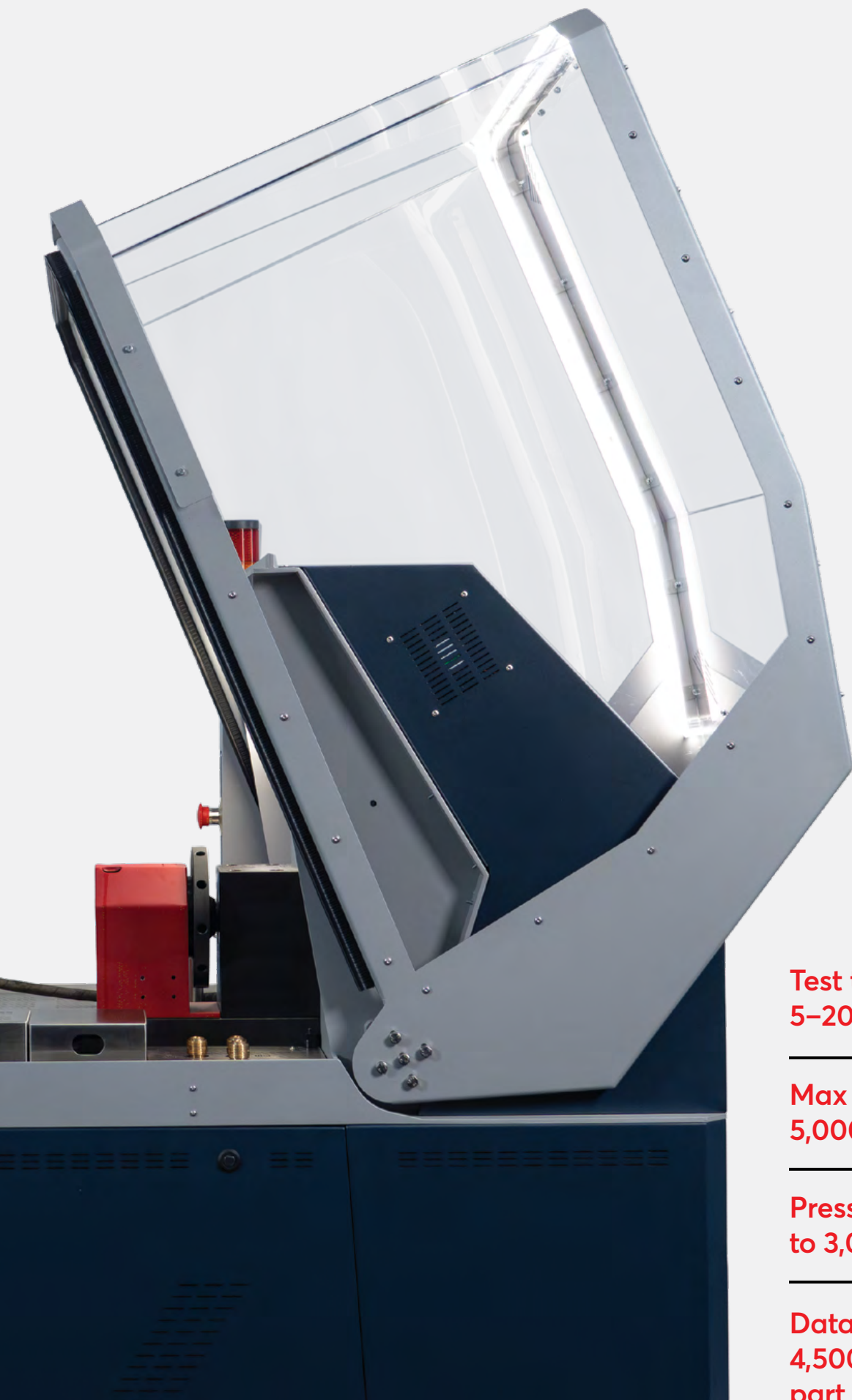
- Tested to OEM Standards
- Lubrication supply / drainage: no mess, no oil waste (aCPL)
- CAN-Bus communication protocol
- 18.5 kW / 25 HP drive power: covers heavy-duty CP9, CPN5/6, XPI 3-cyl, L'Orange DCO
- Dual measurement system: up to 1,000 L/H

TESTS PERFORMED

- Flow vs pressure
- Flow vs speed (RPM)
- Multiple conditions, torque, power up to 5,000 RPM
- Control valves (PCV, VCV, IMV, EAV, ZME, SCV)
- Smart Sync Control Valve [EU6]: Bosch CP4-EU6, Denso HP5, Schaeffler / Continental
- Return flow • Seal integrity • IP transfer-pump pressure (auto) • VAC transfer-pump vacuum (auto) • Control valve electrical / insulation • Pressure-curve visual analysis (plunger) • Pump pressure-sensor test



Brand	Families & Applications
Bosch	CP1x, CPN2, CP3x, CP4x, CP5, CPN5, CP8, CPN6, CBxx, CP9-L2
Delphi	DFP1, DFP3, DFP4, DFP5, DFP6, DFP7, DFP8, DFP9*
Denso	HP0, HP2, HP3, HP4, HP5 (S/D), HP6, HP7
Schaeffler / Continental	K10, K16, PCR1, PCR2, PCR2.1, PCR3
Stanadyne	DCR (1 / 2 / 6 piston)
Caterpillar	C-HPCR – C4.4, C6.6, C7.1, C9.3 ACERT
Cummins	XPI 1-cyl, XPI 2-cyl, XPI 3-cyl, Denso HPCR
Liebherr	LP7.2, LP11.2, LP11.5, LP11.6
Woodward L'Orange	DCO (4-cyl)
GDI High-Pressure Pumps	All rotary & cam-driven – Bosch HDP1/2/3/5, Continental, Hitachi, Denso; Ford EcoBoost, VW TSI/TFPI, BMW N20/N55/B58, GM Ecotec, Hyundai GDI



Test time:
5–20 min

Max RPM:
5,000

Pressure: up
to 3,000 bar

Database:
4,500+
part numbers

MTB | PLATFORM

MTBR-X

PTBR-X

SPECIALISTS SOLUTIONS

MTBR **X**

Complete coverage of every Common-Rail Diesel and Gasoline injector platform, from passenger-car piezo to large-engine CRIN-LE. Full testing and coding, extending the MTBR-X beyond diesel to modern gasoline direct injection.

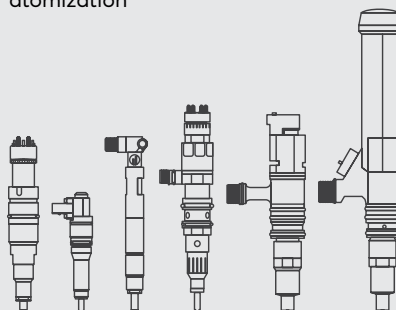
Brand	Families & Applications
Bosch	CR11, CR12, CR13, CRIN1, CRIN2, CRIN3, CRIN4.2X, CRIN-LE, NCC / VCC
Delphi	F2P, F2E, F2R, F3P, F3E, C2i, C3i, C4i
Denso	iART, G4X, G3X, G2X – Volvo, John Deere, Komatsu, Isuzu, GM, Hino, CAT, Case, New Holland, PACCAR
Schaeffler / Continental	PCRS5-EU6, EU5, EU3/4, Ford Power Stroke
Cummins / Scania	XPI – ISX15, X15, QSX15, Scania DC13/DC16
Caterpillar	C4.4, C6.6, C7.1, C9.3, C175, 3512C / 3516C, Perkins 6.6, C3500
Detroit Diesel	DD13, DD15, DD16
MAN / DAF / Volvo / Renault	Bosch CRIN2 / CRIN3 platforms
Liebherr	LI2, LI3 – D946, D966, D9812
MTU / L'Orange	Series 2000, 4000 (VTO), 8000
Cummins QSK MCRS	Bosch CRIN-LE – QSK19 / 23 / 38 / 45 / 50 / 60 / 78 / 95
GDI – Coil	Bosch HDEV (1, 4, 5, 6), Continental, Delphi, Denso, Hitachi; VW, BMW, Mercedes, Ford, GM, PSA, Hyundai/Kia, Toyota, Mazda, Volvo, JLR
GDI – Piezo	Bosch HDEV5/6 Piezo, Siemens-Continental Piezo GDI
Gasoline low-pressure	All makes & types - AdBlue - LPG / CNG / alt-fuels

FEATURES

- Tested to OEM Standards: Bosch, Delphi, Denso, Caterpillar, L'Orange, Cummins procedures
- OEM authorized: Schaeffler / Continental; additional authorizations pending
- EU7-compliant architecture
- Full coding: Bosch IQA/IMA/ISA/ IMA4.2, Denso QR, Delphi C2i/C3i/C4i/ F2x/F3x, Schaeffler / Continental IIC/ IIC.2, Cummins XPI, CAT (TRM), QSK and GCC (GDi coding)
- Up to 9 multiple injections (pilot / main / post), fully configurable
- SPAR: automated piezo-stack degassing: zero trapped air, zero hydraulic lock
- Reverse flushing at 35 bar (GDi)
- Dynamic ultrasonic cleaning (gasoline)

TESTS PERFORMED

- Electrical (coil / piezo) • Insulation
- Back-leak (static / dynamic)
- ISA detection • Volumetric flow (all conditions) • aNOP • Response time (RSP – eRSP) • EU6 technology • iART
- VCC / NCC • DFI mapping • CRG piezo-stack regeneration • CGL gap-lift (OEM method) • NLT / LKT • Low-pressure 0–10 bar • Spray pattern & atomization



Test & code:
6–15 min

Pressure:
up to 3,000 bar

Database:
6,500+ part
numbers, online-
updated



MTBR **X**

Diesel Systems Test Bench

MTBR **X**

EUi · EUp · UI · UP – CAMBOX

Multi-profile camshaft-drive testing for every major Electronic Unit Injector, Unit Pump and Unit Injector platform in production globally.

UIS – Unit Injection Systems (Coverage)

Bosch UIS – Passenger Car (PDE) / Commercial Vehicle / Off-Highway / Agricultural
Delphi EUI – A Series / E1 / E3 / Off-Highway / Land Rover TD5 / F2x / F3x
Schaeffler / Continental
Caterpillar EUI / MEUI-C / Large Bore (3500 Series) / MUI
Cummins CELECT EUI / HPI / QSK / ISX
Detroit Diesel EUI
Volvo / Volvo Penta / Iveco / Scania / Renault / Hyundai / Mack / Actros / Atego / Paccar / John Deere / PF

Strategic Partnership with Hartridge. HK1400 Cambox Platform

Carbon Zapp integrates Hartridge's industry-recognized HK1400 cambox as the mechanical heart of our EUI / EUP / HPI testing platform, chosen for its proven flexibility and adaptability between cam profiles and systems. Around it, Carbon Zapp engineers the complete peripheral architecture, controls, hydraulics, electronics and software, all powered by AZO, with a continuously expanding database now exceeding 1,150+ part numbers.

HK1400 Cambox

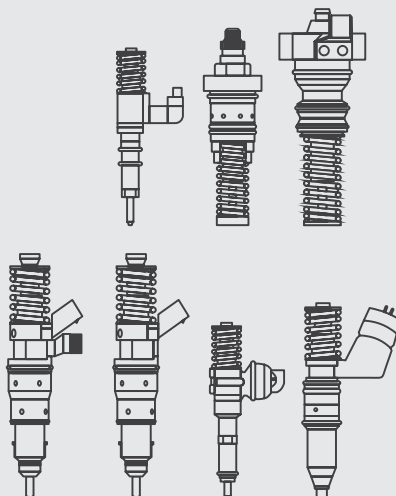


FEATURES

- Tested to OEM Standards
- Cam-angle precision via closed-loop system
- Quick cam setup: no mess, no oil waste (EZO-Kit)
- 12 separate cam profiles
- Cummins HPI / QSK / ISX 16-bar supply control circuit using OE valves (LP-EXT-Control)
- Expandable to new systems

TESTS PERFORMED

- Electrical (coil & piezo)
- Insulation
- Volumetric flow (all conditions)
- Response time (RSP – eRSP)
- Valve response (aBIP)
- Piston leak check
- Multiple-injection profiles (pilots / mains / posts)
- Spray pattern & atomization
- Dual-coil testing (Delphi E3)



Test & code:
6–15 min

Injector Coding
for Delphi

E1, E3, F2x, F3x*, CAT (TRM file)

Database:
1,250+ Part
Numbers

MTBR 
Diesel Systems Test Bench

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FSC · FUEL-SYSTEM COMPONENTS

Integrated diagnostics for HP and LP components: valves, rails, sensors, pump-heads, pumps and regulators.

INTEGRATED FSC DIAGNOSTICS. Dedicated test plans for every major valve, rail, sensor and high-pressure head on the market. Modular FSC kits unlock the hardware you need, purchased separately, configured around the components you service. Software, database and workflow already inside AZO.



Components Tested

RPS / RDS – Rail Pressure Sensor
DRV / PCV – Rail Pressure Control Valve
DBV / PLV – Pressure Limiter Valve (mechanical)
ZME / MPROP / FMU – Suction Metering Unit (Bosch)
IMV – Inlet Metering Valve (Delphi)
SCV – Suction Control Valve (Denso)
ESV – Electric Suction Valve (Bosch HD / large-engine)
HPI Unit Control Valves
High-Pressure Rails
CP4 High-Pressure Head / Pump Element
Transfer / Lift Pumps



FSC Test Capabilities

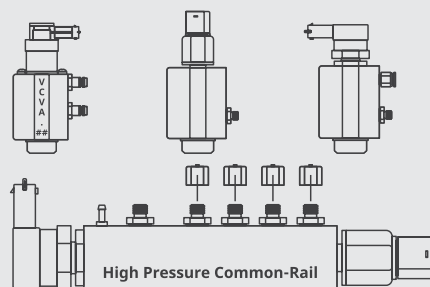
FEATURES

- Electrical tests: resistance, insulation, current draw, response time
- Hydraulic tests: pressure regulation, flow characterization, leak detection
- Closed-loop validation: DRV / ZME / VCV / PCV / IMV / SCV operating curves vs OEM data
- Sensor verification: RDS curve plotting and tolerance check
- CP4 head diagnostics: low / high-pressure side validation

Why It Matters

FSC failures are often misdiagnosed as pump or injector failures. Testing the FSC components first saves the customer the cost of replacing the wrong part. The MTBr-X is the only test bench with full integrated FSC diagnostics.

Future-ready specification. New database and coding continuously updated to new EU6 applications. Specifications subject to configuration.



MTB | PLATFORM

MTBR-X

PTBR-X

SPECIALISTS SOLUTIONS

