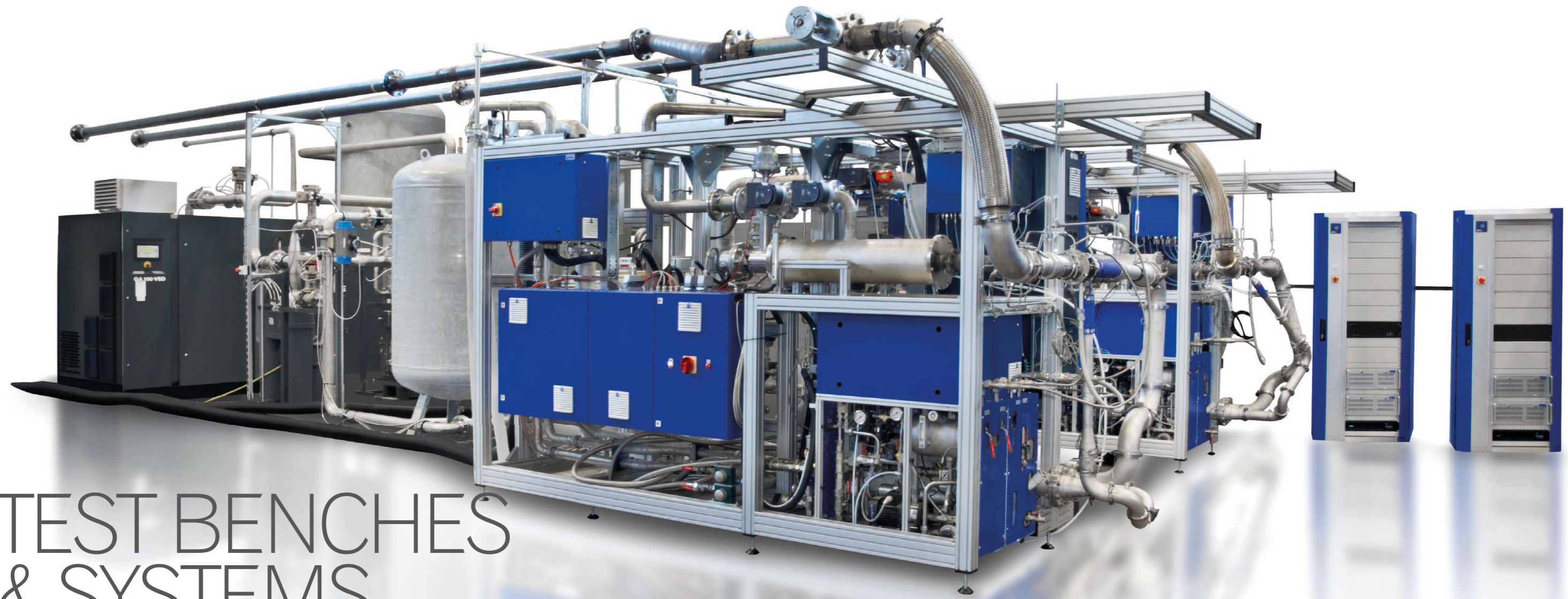


HAINZL
TECHNOLOGY FOR HIGHER STANDARDS.



**TEST BENCHES
& SYSTEMS**



TEST BENCHES & SYSTEMS

002003

HAINZL – TECHNOLOGY FOR HIGHER STANDARDS



Test benches and systems for higher standards are manufactured at our 56,000 m² site.

We are one of Europe's leading system suppliers and offer our customers complete high-end solutions from a single source. When it comes to test bench technology, we offer integrated solutions incorporating automated test benches and systems. Our main focus is on test applications for components, assemblies and systems.

Our customers operate primarily in the hydraulics, automotive and aviation sectors. They appreciate our adherence to high international standards regarding quality, reliability and sustainability.

For Hainzl, our claim "technology for higher standards", in practice, means highly qualified consultation, interdisciplinary engineering and competent product management. Our services are rounded off by first class manufacturing, assembly and service capabilities.

- HAINZL - TECHNOLOGY FOR HIGHER STANDARDS
- COMPLETE SYSTEMS
- R&D TEST BENCHES
- PRODUCTION TEST BENCHES / SERVICE
- SUBSYSTEMS / EQUIPMENT

- 002-003
- 004-005
- 006-007
- 008-009
- 010-011

HAINZL
TECHNOLOGY FOR HIGHER STANDARDS

COMPLETE SYSTEMS

Optimum system solutions 
Individual and customized test system design. The optimum solution for each customer is assured through joint design reviews.

Optimum communication 
A technical expert accompanies the entire life cycle acting as a central contact.

Central system responsibility 
Complete systems are designed, engineered and manufactured in house.

Extensive technical competences 
Internal Competence Centres provide support for the following areas: mechatronics, mechanical engineering, fluid technology, automation technology and condition monitoring.

Individual & competent 
Wide ranging expertise, gained over decades of involvement, specifically with regard to hydraulic and automotive test benches.

BENEFITS

004005

COMPLETE SYSTEMS

We are able to realise complex test applications, from individual standalone special test benches for R&D applications, to fully integrated and automated end-of-line test systems in series production. We support our customers in meeting the ever increasing, and ever more complex, demands made of their products.

With our smart and networked automated solutions, we are helping our customers to raise productivity and plant availability. We also provide assistance in formulating and developing test and measuring concepts.

Test benches & systems for hydraulic components

- Hydraulic valves
- Hydraulic pumps and motors
- Hydraulic cylinders
- Filter systems
- Heat exchangers
- and much more

Test benches & systems for automotive components

- Water pumps
- Cooling systems
- Damping systems
- Gearboxes
- Generators
- Mechatronic actuators
- and much more



Valve test bench for ATEX application

Shock absorber test system

Valve test bench



Hydraulic hose test bench



KERS test system



Material test bench



R&D test bench for the aviation industry

R&D TEST BENCHES

DEVELOPMENT & PRODUCTIONS

Through our know-how and experience in test bench technology, we are able to support our customers in the specification of requirements, and the development of the technical basis, by helping to write the initial specification either jointly with, or for, our customers. We have already realised test applications for the following development tests:

- Performance tests
- Function tests
- Tests to verify product specifications
- Durability tests / aging tests
- Impulse tests / stress tests
- Burst tests
- Tightness tests

INDIVIDUAL & VERSATILE

In the R&D sector, we see it as our task to develop innovative solutions tailored to the needs of our customers, while taking advantage of technology that meets the highest demands. Hainzl offers a variety of options, enabling us to develop and manufacture test benches and systems for a whole range of applications across a

number of industries, especially the hydraulics, automotive and aviation sectors. This means we can draw upon the experience gained from earlier applications, where a Hainzl test system was able to make a significant contribution to the development of leading technologies.



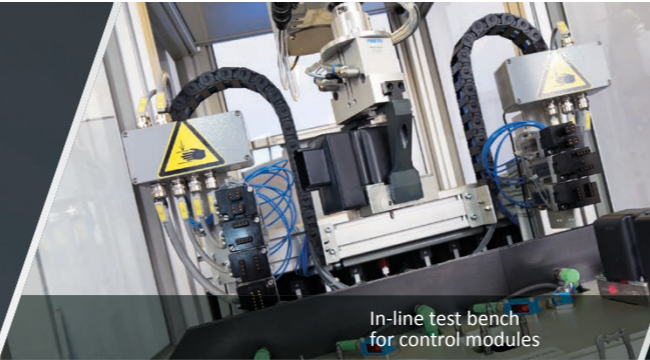
Hydraulics test bench



Impulse test bench



Development test bench for gearboxes



End-of-line valve test bench

In-line test bench for control modules

End-of-line valve test bench

Mobile pressure test device

PRODUCTION TEST BENCHES

IN-LINE / END-OF-LINE

Test benches and systems for in-line and end-of-line applications are used for almost every product manufactured in series in the hydraulics and automotive sector. Here, they have the task of testing products for their full functionality. Our test benches and systems stand out on account of their exceptionally high reliability and low

downtime. By using our systems, our customers have been enjoying benefits, such as production optimisation and reduction of rejects over many years. Full and extensive test bench automation assures high cost efficiency in production for our customers.

008009

SERVICE & MAINTENANCE

COMPETENT & RELIABLE

Our competent and experienced team is able to meet the highest customer demands. A constantly expanding international team of specialised service engineers ensures optimum customer support post system delivery. Customers can call on different service and maintenance options for our test benches and systems, such as

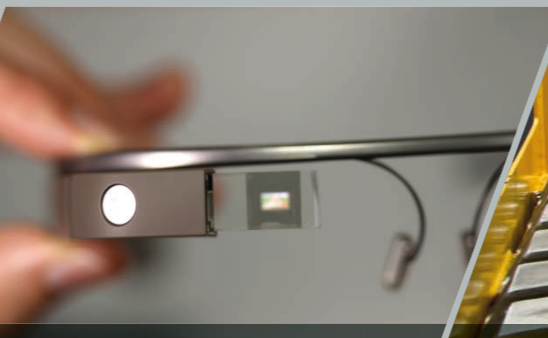
telephone support, remote maintenance, on site service, augmented reality support or predictive maintenance systems. The high quality of our products, our flexibility and outstanding service concept make us your reliable partner for test bench requirements worldwide.



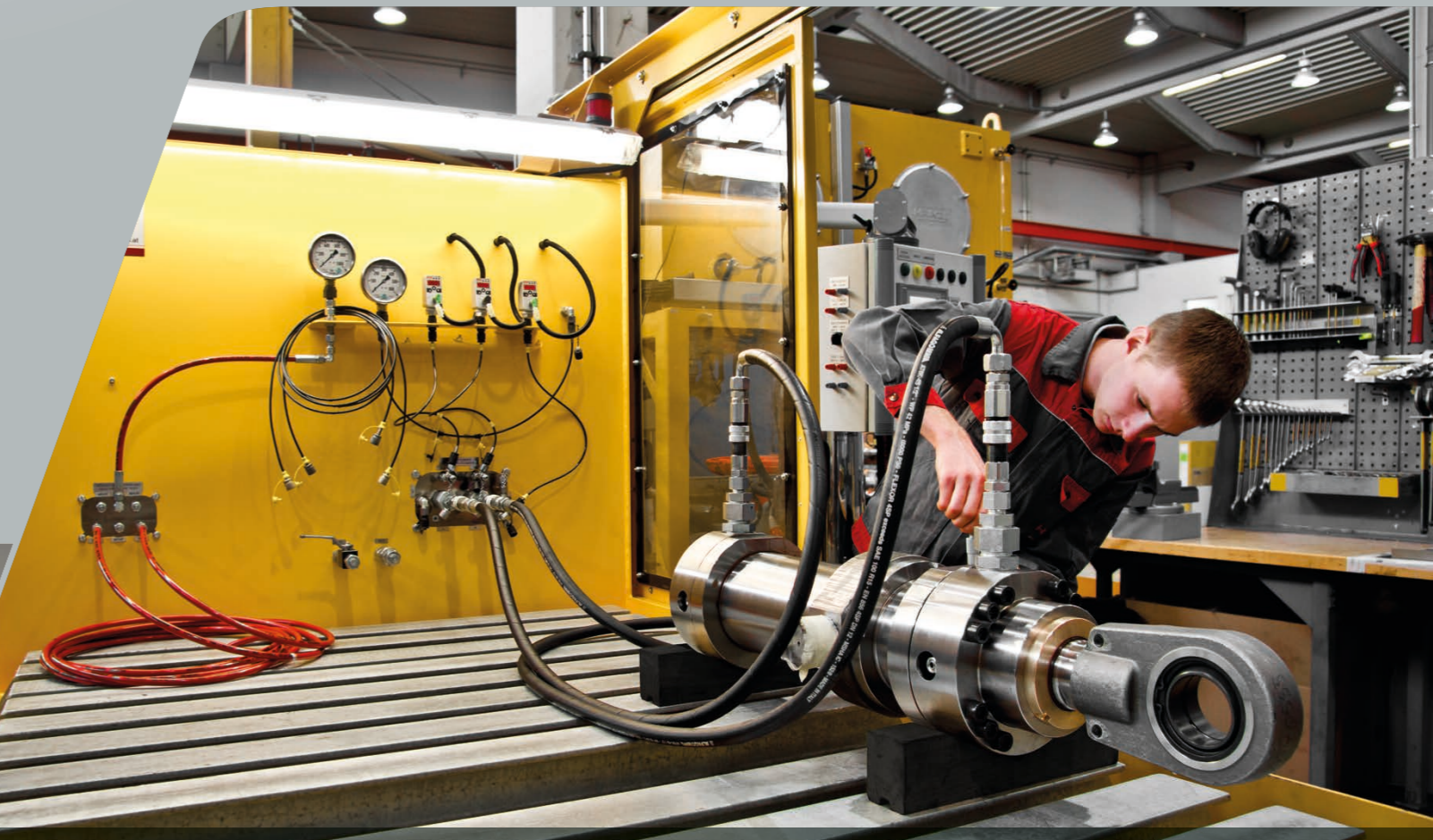
Competent service



Global application



Augmented Reality Support



Pressure test on a cylinder test bench

SUBSYSTEMS & EQUIPMENT

SYSTEM STATUS

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TEST SYSTEMS MONITORING

Parameter	Current	Setpoint
Aggregat power	ON	ON
System pressure	54.00 bar	55.00 bar
Oil temperature	70 °C	65 °C
Purity level	17	14
Flow	223 l / min	

Parameter	Current	Setpoint
Value condition	OK	
Oscillator state	ON	ON
Servo axis frequency	3.9	
Servo axis amplitude	5.2	

Parameter	Current
Speed	33 1/m
Vibration RMS	7 mm / s
Number of cycles	137
DUT ID	1572-A

Power Unit Test System Device under test

ANALYSE CENTER SETTING

Conditioning devices
for regulating flow rate, pressure, temperature of different fluids as well as special modules, such as oil/air separators or vacuum systems.

Handling systems
for fully automated handling of test objects inside the test chamber, as well as external test object manipulation prior and post test sequence.

Condition monitoring systems
for the predictive recognition of system failures or monitoring of system conditions by integrated sensor technology.

Data management solutions
for client-specific archiving of data in databases or cloud based systems. Web applications enable system conditions and actual values to be checked at any time.

Calibration stations
for calibrating test pieces prior to test sequences or delivery.

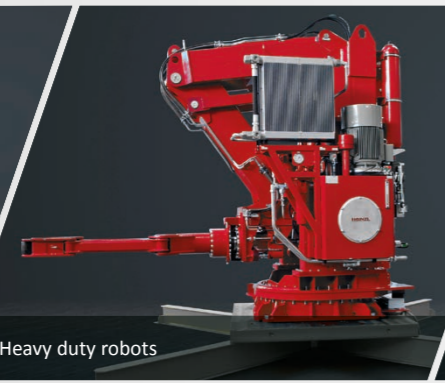


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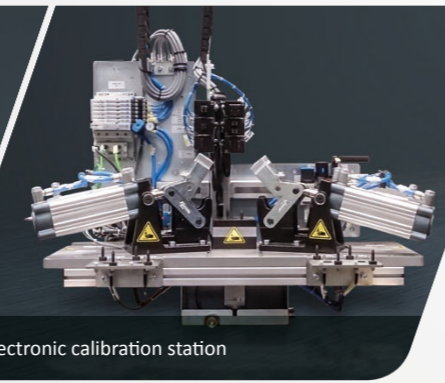
PRODUCT RANGE



Conditioning systems



Heavy duty robots



Electronic calibration station

SUBSYSTEMS & EQUIPMENT

Apart from complete test bench systems, Hainzl also offers a wide range of products in the mechanical and fluid technical sector in the test bench environment. Tempering of media inside the test chamber, highly accurate pressure control by means of servo axes or automation of complex test systems, are just a few examples. Our expertise in fluid conditioning enables us to control parameters such as pressure,

flow rate, temperature, quality or mixing characteristics for a variety of fluids. Our systems can make a significant contribution to our customers' success, whether in the development of internal combustion engines, racing applications or verification of aircraft turbines.



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