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# INTEGRAL HYDRAULIK

Prüfstandssysteme

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## Testing devices for extreme temperature

In the automotive industry testing devices have today become indispensable. They play an important role in research and development and help to reduce development time and costs.



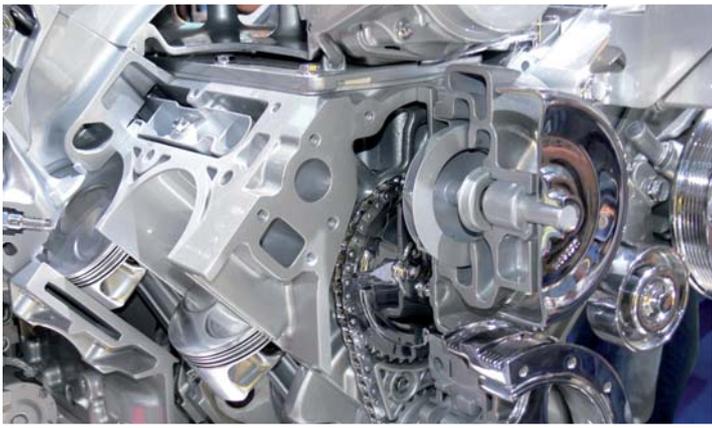
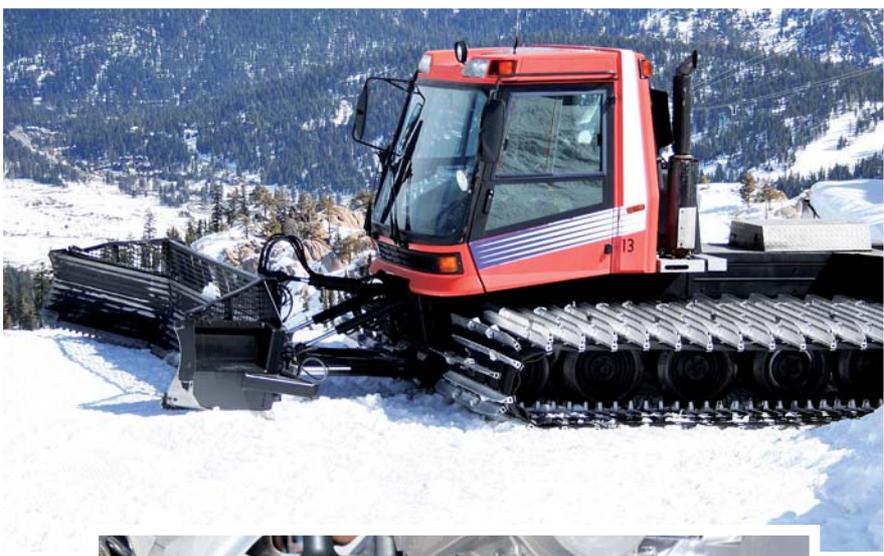
Particularly, the simulation of the broad temperature range that vehicles are exposed to between the polar circle and the equator is getting more and more important. Using INTEGRAL HYDRAULIK testing devices you can adapt a temperature range from  $-40^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$ .

Testing devices from INTEGRAL HYDRAULIK generally allow precise computer based testing of every single component for both new and further developments. So, you may quickly find out if your dual clutch gear allows seamless smooth gearshifts. But you may also want to test other components such as transmission control, anti-lock breaking system or traction control under extreme thermal conditions. This saves you any test drives in Alaska or the Sahara desert.



## Testing devices for arctic conditions

When exposed to the lowest of low ambient temperatures mechanical components have to withstand extreme strain. The durability of materials declines, materials become brittle and the component strength demands special attention. The oil flow in the components increases the viscosity and the over proportional growing flow resistance decelerates movements. Testing under extreme conditions is absolutely necessary to meet traffic safety regulations.



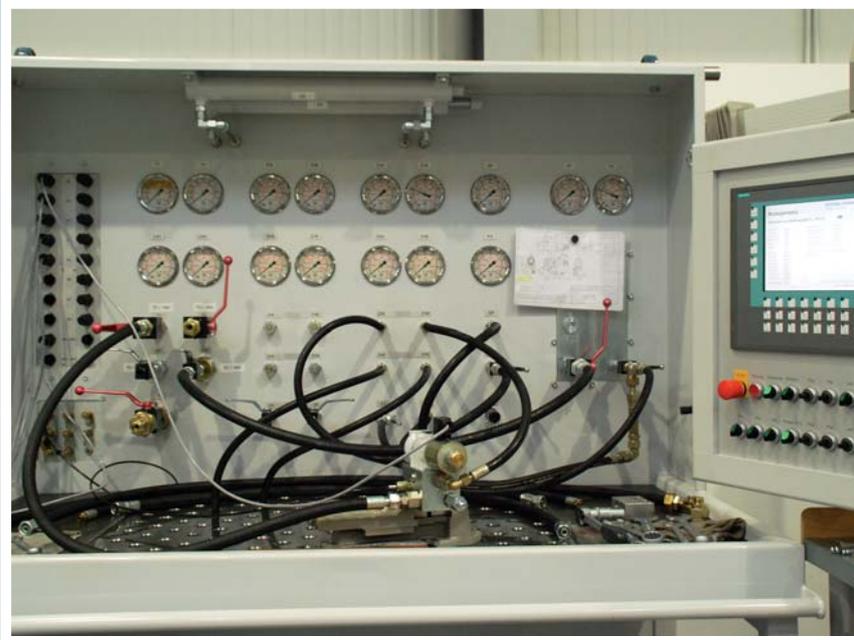
Arctic ambient temperatures are a challenge for the lubrication of systems or any components such as anti-friction bearings, chains and drives. However, testing devices with oil conditioning from INTEGRAL HYDRAULIK can simulate extreme temperatures down to  $-40^{\circ}$  and thus ensure functional efficiency of anti-lock breaking systems, power steering or transmission control at low temperatures.



## More efficient fuel consumption

In 2012 the average emissions of CO<sub>2</sub>/km from new passenger cars in the EU will be reduced to max. 130 g by law. And the automobile industry will have to drastically reduce fuel consumption of their cars. This demands further research and development.

Testing devices from INTEGRAL HYDRAULIK support engineers in developing and providing efficient power engines, steering systems, innovative actuators as well as camshaft adjustments and transmission control.



In order to reduce nitrogen oxide emission of diesel-engined cars Daimler-Benz has developed the Bluetec concept. AdBlue Injection treats exhaust gases with a urea solution which releases ammonia, reducing nitrogen oxides to harmless nitrogen and water. The problem with AdBlue, however, is the freezing point of -14°.

Testing devices from INTEGRAL HYDRAULIK support manufacturers of Bluetec-systems in developing Adblue components in order to extend application to all temperatures.



## Simulation models

Our electro-hydraulic simulation systems enable testing to be performed accurately and reliably from an early stage of an engine's development cycle through to data acquisition and final evaluation.

**INTEGRAL HYDRAULIK** provides solutions in all applications of engine and vehicle testing such as simulating different soil conditions for excavator shovels, different terrains to optimize chassis frames or testing durability of engine components.



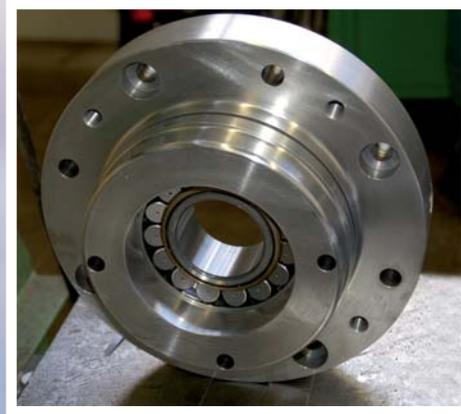
Testing devices from **INTEGRAL HYDRAULIK** allow load testing under real ambient conditions and thus support engineers to optimize drive concepts. Examples are PC supported load deflection curves and multiaxial load units with optional data acquisition, evaluation and storage. We offer a full range of services that adapt to individual consumer needs. Our engineering and service covers elaboration of specifications, design and construction of mechanics, hydraulics and control units as well as installation, assembly and commissioning of the system.



# Automation and Quality Management

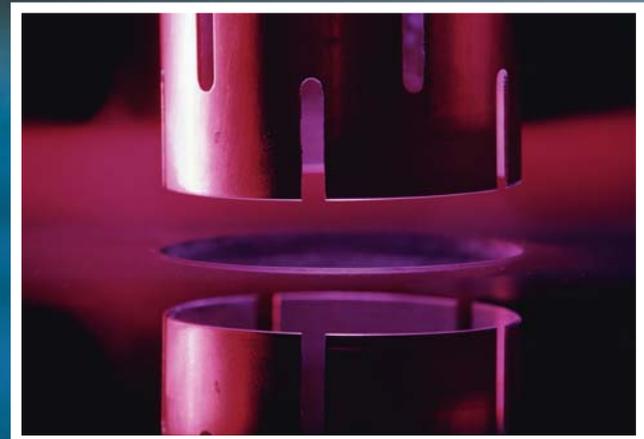
Our measurement systems are an integral part of the production process and a strategic asset in meeting goals for improved quality, manufacturing efficiency, and lower costs. The non-destructive testing guarantees process reliability.

An interface integrated into the control unit permits the adaptation of SPC. INTEGRAL HYDRAULIK provides innovative solutions for a big variety of industries that strictly respond to the customer's specific needs and demands of the consumers.



For example, in order to force a rubber coated pipe into a second metal pipe three process steps are necessary: forcing in – testing – adjustment ...

This manufacturing process was in practice dependent on the skills of our staff. A new production line, however, developed by INTEGRAL HYDRAULIK and based on special requirements from the customers automated this process and thus reduced production time as well as the scrap rate. The integrated control unit permits a quick changeover to other production orders.



## Setting the course for the future

In the railway industry point operating units are subject to numerous functional tests. INTEGRAL HYDRAULIK has engineered such a testing device, which does not only allow to examine but also to document all the necessary tests. This includes how long it takes and which forces are necessary to position a point operating unit, the parameters for emergency release as well as a functional control in case of low voltage.

The testing device also enables to simulate different country-specific electric power supplies. A special software program gives you further support and designed to fulfill individual requirements.



Anzeigemenü		INTEGRAL HYDRAULIK Anlagen + Systeme	
Gleichspannung Schaltmagnete M1...M8 [V]:		24,0	
Druck P1 [bar]	0,0	Volumenstrom P1 [l/min]	0,0
Druck P2 [bar]	0,0	Volumenstrom P2 [l/min]	0,0
Druck LA1 [bar]	0,1	Volumenstrom LA1 [l/min]	0,0
Druck LA2 [bar]	0,0	Volumenstrom LA2 [l/min]	0,0
Druck T1 [bar]	50,0	Volumenstrom T1 [l/min]	0,0
Druck T2 [bar]	50,0	Volumenstrom T2 [l/min]	0,0
Druck p1 [bar]	0,0	Eingabe Gleichspannung mit "Enter" abschliessen!	
Druck p2 [bar]	0,8		
Druck p3 [bar]	0,0		
Druck p4 [bar]	0,0		
Druck p5 [bar]	0,0		
Druck p6 [bar]	0,0		
Druck p7 [bar]	0,1		
Druck p8 [bar]	50,0		
Öltemperatur [°C]	30,2	F20: Zurück zum Hauptmenü	



In the tunneling industry testing devices are also used. For example, INTEGRAL HYDRAULIK was asked by the project responsible of the fourth Elbe-Tunnel-Section – which is with a diameter of 14m the fourth Elbe-Tunnel-Section the world's largest road tunnel in loose rock – to design and manufacture an appropriate testing device in order to evaluate the static calculations.

The weight of the overlying ground was hydraulically simulated on a section of the tunnel pipe by 96 hydraulic cylinders with up to 200.000 kN. More than 600 sensors were used to ascertain the level of force and distortion.



## INTEGRAL HYDRAULIK [capability characteristics]:

Founded in 1959, INTEGRAL HYDRAULIK has established a reputation as an innovative and highly specialized manufacturer of hydraulic assemblies and systems to industries such as energy and power stations, cement and crushing industry, smelting and steel industry, wood and paper industry and hydraulic (water) engineering industry.

Particularly we design and manufacture hydraulic testing devices for the automotive, rail and other industries.

As an engineering office with on-site production our main benefit is that we offer a full range of services from the planning to the assembling of hydraulic systems. In close co-operation with our customers we generate solutions especially designed to fulfill individual requirements.

INTEGRAL HYDRAULIK forms part of AKV Verwaltungs GmbH. AKV Verwaltungs GmbH is a family-owned holding company for a group of medium-sized manufacturing companies with business activities in the automotive industry as well as in the machine engineering industry.



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## Prüfstandssysteme

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