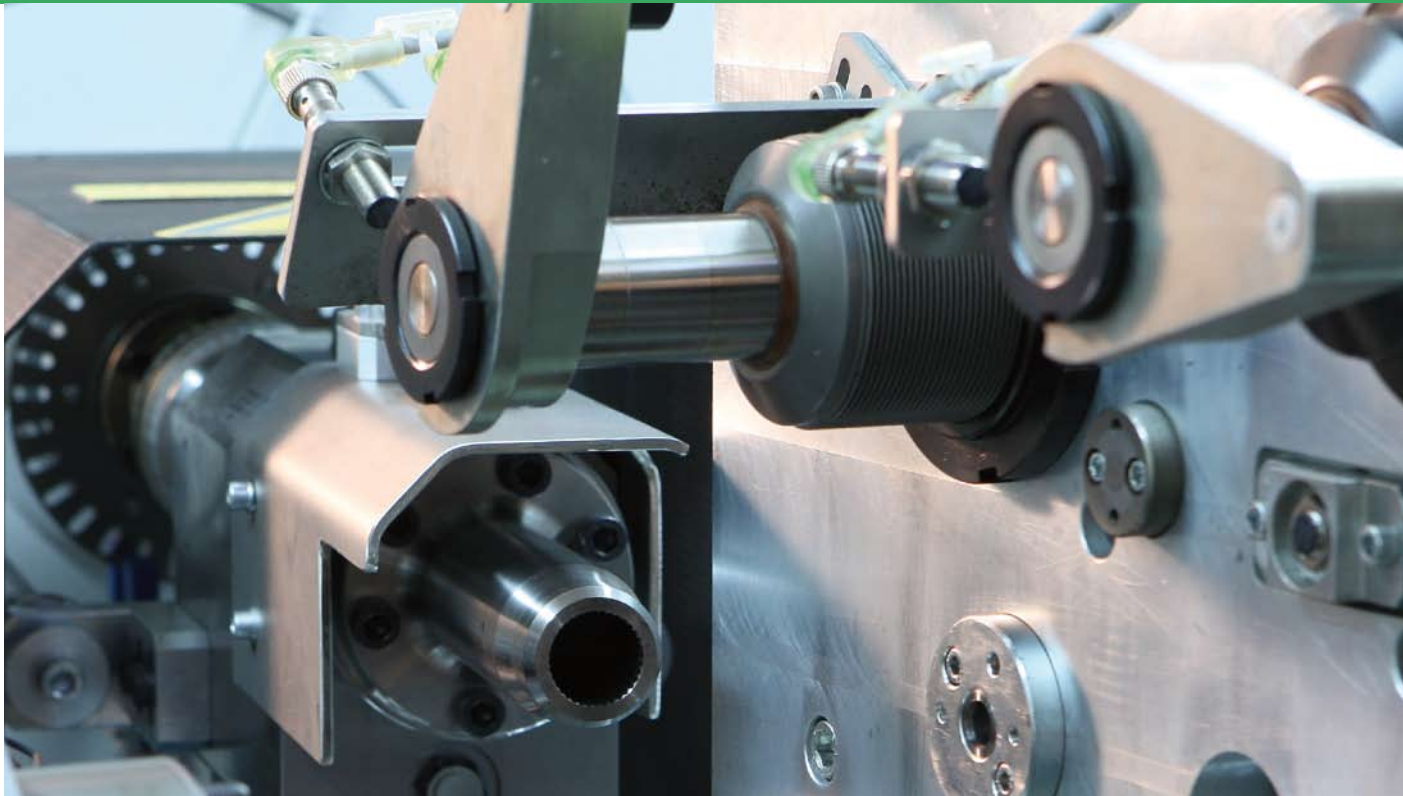


Control systems and drive systems in the automotive industry

Lenze drive solution for complex requirements

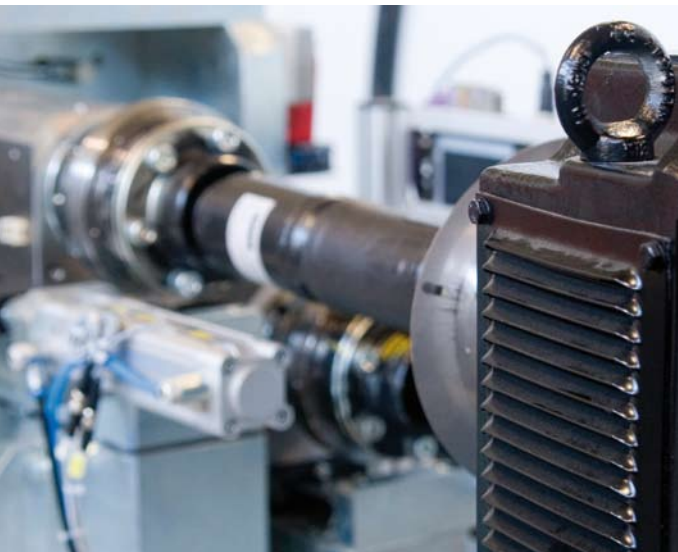


Dynamic Assembly Machines
Anlagenbau GmbH
Employees: 24
Country: Austria
Industry sector: Production systems
engineering
Machine type: Test bench
Internet: www.d-a-m.cc

Founded in 2006, the Austrian company DAM Anlagenbau GmbH offers technical solutions from the field of industrial automation to all sectors. Active primarily in the automotive field, the company has already delivered numerous assembly systems and test benches.

The task at hand

The gamut of tasks assigned to today's transfer gearboxes has expanded hugely with the general trend towards the increasing integration of additional functions - a consequence of ever more complex ABS or DSC programs, for example. What this trend has produced are complex mechatronic solutions. Stringent quality assurance is absolutely vital to make sure that such complex tasks are performed reliably. Based in the Austrian city of Gleisdorf, Dynamic Assembly Machines Anlagenbau GmbH (DAM) manufactures highly specialised test benches for this purpose. For the pilot series stage, the company has developed a universal test bench for both noise and characteristic curve testing. There are three primary demands on the electrical drive technology used in these processes: unusually wide setting ranges for speed and torque, reliability, and energy efficiency.



*Reliable and efficient:
A view of the test bench's
drive train.*

How it works

Optimising – Skilled drive optimisation

Testing noise generation involves between 0 and 7500 rpm at the gearbox input end at torques from -250 to + 250 Nm. At the output end, the characteristics are 0 to 2500 rpm and -700 to +700 Nm. Much higher forces come into play where clutch testing is concerned. In a speed range from 0 to 700 rpm, forces of up to 1600 Nm are reached. It was for these requirements that the team of DAM and Lenze employees had to set about developing a precisely tailored solution. Energy efficiency is an important issue in this context. In gearbox test benches, the main drive, which is referred to as the input motor, plays the role that will ultimately be assigned to the combustion engine, while two further motors simulate the resistance of the wheels at the output end. As a result, the application lends itself to running the controllers in the DC-bus connection. Robert Fandler, who runs the company together with fellow director Gerald Matzer, underlines the energy efficiency of DAM's test bench technology: "This means that we only draw the true power loss from the mains." This is what optimising is all about.

Rightsizing – A scalable product portfolio

Working together with Lenze, DAM dimensioned the drive technology for the maximum anticipated performance data. Accordingly, the system features Lenze servo controllers from the company's Servo Drives 9400 range with a power rating of 370 kW, even though the asynchronous motors used are rated at just 105 kW. A motor current of 690 A is required in order for the high torque to be achieved without gearboxes. At this working point the asynchronous motors, at a frequency of 3.4 Hz, are running virtually in short-circuit operation. "We have taken mechanics and control engineering to the limits. Previously, nobody really knew exactly where these limits lay. It really was a question of entering unknown territory," reflects Gerald Matzer.

This is what rightsizing is all about.

The result

Solutionising – Individual solutions for individual customers

Lenze carried out initial configuration of the complex drive solution in the laboratory. "One of the challenges we faced was to keep the system deviations that are only to be expected at such high power ratings under control, not to mention keeping a handle on costs," continues Matzer. "We found that we were able to do this very well working in partnership with Lenze."

Most test cells involve the use of articulated robots to load systems. Once loading is complete, test oil is added automatically and the actuators and sensors, along with the input and output flanges, make contact. Three drives are required for the actual test process – one to provide the driving force upstream of the transfer gearbox and two others operating in generator mode to provide the braking force at the gearbox's two outputs. The combination of high currents with minimum speed means that the three asynchronous machines are forced ventilated. Lenze supplies this tailored drive solution as a complete package. The separate Lenze Systems Engineering team in the Austrian city of Enns is responsible for implementing the control cabinet – and their remit includes commissioning."

This what solutionising is all about.

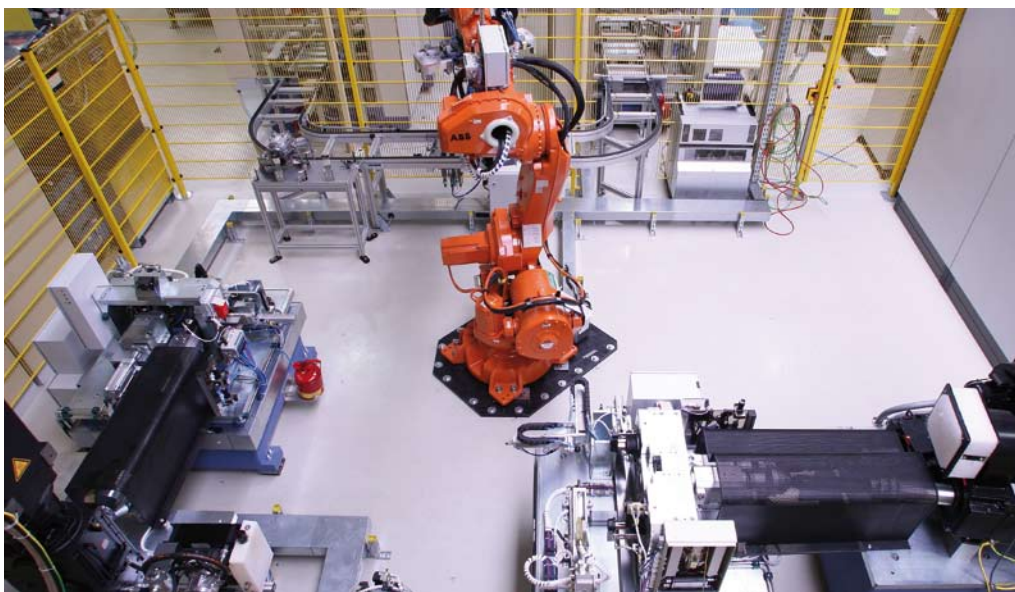
Along with versatility in application, reliability at high power ratings and efficiency across the board are the key features of DAM's universal test bench. A decisive factor in its success is state-of-the-art drive technology which has been precisely tailored to application requirements.

This is what Lenze is all about.

"Working so closely together with Lenze's development engineers proved invaluable, not least because there was no empirical evidence to draw on for our operating conditions."



*Robert Fandler and Gerald Matzer,
managing directors of DAM*



*Overall view of the DAM
test cell*

Customer benefits at a glance

The task at hand

- ▶ Drive solution with high speeds and torques on the universal test bench for transfer gearboxes

The solution

- ▶ A reliable drive solution preconfigured in the laboratory
- ▶ Implementation of the control cabinet by Lenze Systems Engineering

The products

- ▶ Servo Drives 9400 Highline
- ▶ Switchgear planning and switchgear engineering

Driving, controlling, moving: this is what we do and have been doing all over the world for more than 60 years. Specialising in drive and automation technology, we are a solutions partner for our customers. Know-how, products, services: at Lenze, everything is geared towards increasing added value for our customers. As a solutions partner, we offer a broad portfolio of scalable and harmonised products – from three-phase AC motors to frequency and servo inverters and beyond to I/O systems – along with an extensive catalogue of services which provide our customers with an assurance of the best possible support for everything from engineering to remote maintenance.

Vitamin L:

Lenze drive and automation solutions



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