

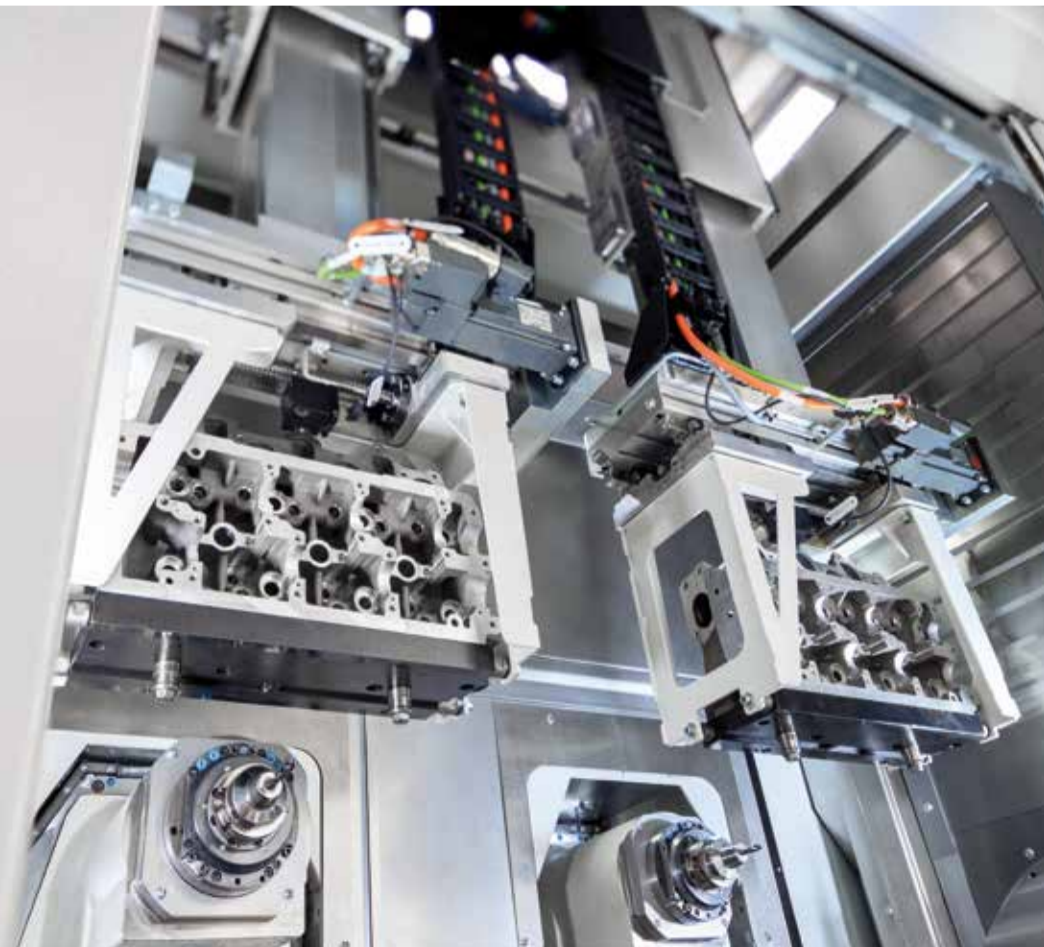
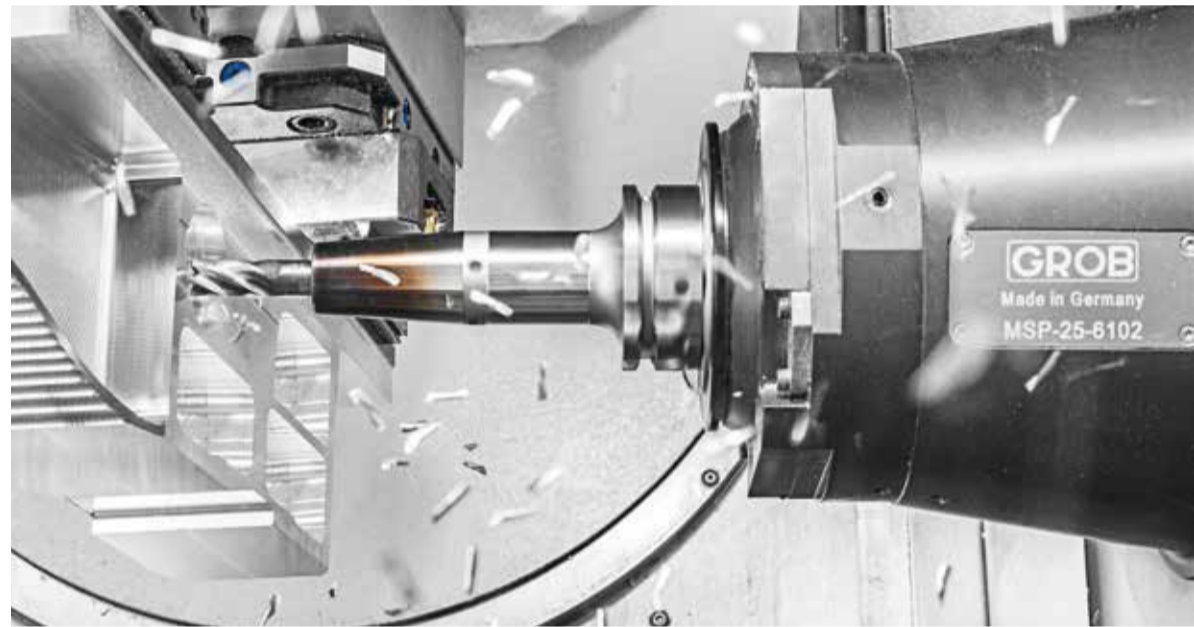
**GROB IS ESTABLISHING ITSELF AS
A SUCCESSFUL
SYSTEM PROVIDER FOR
ELECTRO MOBILITY
AND REMAINS A STRONG
PARTNER FOR THE
AUTOMOTIVE INDUSTRY**

GROB

INTERNATIONAL

Edition

01/18



DEAR COLLEAGUES, GROB business partners and friends,



Christian Grob,
Chairman of the Supervisory Board

After a successful end to the 2017/18 financial year and noteworthy overall performance of 1.54 billion euros across the GROB Group, we have seen a very dynamic first half in 2018. Thanks to

plenty of commitment and hard work, new development activity in the electro mobility area is in full swing. An order level worth 200 million euros for this new technology is a reflection of our success and hard-earned expertise. We can proudly say that we have achieved a massive amount as a company in recent years in terms of securing our future. We have proven to our existing system business automotive OEM client base that GROB will also be a suitably skilled and reliable partner with a wealth of expertise when it comes to new technology. We are ideally positioned for the future, with the capacity to pursue and consolidate our global strategic role as partner to the automotive industry.

The process of transformation within the automotive industry has triggered an unstoppable process of change within the company – now fully underway. Such change will happen differently through-

out the various regions in the world and will influence the focus of our plants abroad. Europe and Asia will come first, followed by the USA and the rest of the world. New e-mobility technology is currently being developed, trialed, tested and readied for series production at our headquarters in Mindelheim – working alongside our Turin plant. This expertise will be transferred throughout the entire GROB Group, with the clear objective of enabling all overseas branches to offer and produce the technology independently to local markets.

We still have a long way to go. But we are confident that this is the right approach for us to take. Success will continue to depend on our iron will and focused flexibility. We will also continue expanding our traditional machining business. Our present G-module machine range will be refined and optimized, with particular reference to market requirements and regional needs.

As a family business, we are proud that we have managed to take the company to where it is today: with 6,600 staff around the world, a global footprint, family-owned and every opportunity of taking it into a new era.

Our solid basis, technical know-how and capabilities are the right ingredients for staying on course for success. We hold the keys to our own success. Highly motivated and totally committed, we will step up to the challenges of the future. The past has shown that we in common, as one large unity and one family, can be powerful and successful. As we change direction, these qualities are more in demand than ever before.

We look forward to shaping our future with you.

Sincerely,
Christian Grob

DEAR COLLEAGUES,

The changes to drive technology in the automotive industry are now fully reflected in our current production program. Around 300 mechanical construction and electrical design engineers are already working on current assembly technologies and electro mobility orders in our New Technology and Assembly Technology divisions. This includes projects such as the VOLKSWAGEN modular electrical construction kit including stator and rotor production and assembly of both components, plus projects for FORD and SIEMENS. We supply the stator line to BMW and their pre-production engines are produced on the prototyping system in hall 2. We also recently received an order from the Daimler AG subsidiary Deutsche ACCUmotive for battery module assembly. All of these orders are a reflection of our customers' faith in the skills of GROB as a company.

Our production departments are mainly concerned with the components for these orders – and they are processed with the utmost speed. We make increasingly more space available for these technologies in our assembly halls – principally halls 4, 11 and 13. Alongside electro mobility chal-

lenges, our universal machining centers and the new machines for frame and structural component machining account for an ever-increasing percentage of GROB Group sales. New machinery and projects are generating increased order volumes for these new technology components in our production departments.

The paradigm shift in technology and machinery has brought about massive change to the company. It is equally important for all of us to step up to the interesting challenges of a new era, keeping up with the latest technological standards as times change. A paradigm shift is affecting all markets to some degree. In the USA, major investment in systems for combustion engines and gearboxes is on the wane with our big customers. In South America, the economic situation is set to remain at a low point in coming months. And in Europe, automakers are already ploughing half of their budgets into new drive technology for e-mobility. Only China and Asia still have a decent requirement for machinery and systems for conventional combustion engines – but demand is very much on the up for e-mobility equipment.

We saw the trend in the automotive industry and markets at an early stage, enabling us to reposition ourselves to meet the new demand for different machinery and systems for manufacturing electric motors and battery modules at the right time. This is why GROB is now able to offer the right solutions for differing global market and technology trends within the automotive industry in the shape of innovative con-

cepts and excellent machines and systems. Whatever the impact and restructuring brought about by changes to vehicle technology, GROB can always provide the right processes and production equipment for modern drive technology of the future.

**Management Board for
GROB-WERKE GmbH & Co. KG**



Management Board: CFO Wolfram Weber, CEO German Wankmiller, CSO Jochen Nahl (left to right)

GROB UNIVERSAL MACHINE BUSINESS

From isolated machine components to automation



From pallet changers to fully automated machining cells – GROB satisfies all individual automation applications

For many years, the machines themselves were the main focus of customers' attention. Now, however, automation is emerging as the dominant trend. New developments such as rotary pallet storage systems and robot loading systems enable machines to automatically run in shifts without manual intervention. GROB is an automation specialist from the automotive industry and so this is not a difficult step for us to take. In fact, we are practically predestined to supply this automation technology.

The products in the universal machine series G350, G550 and G750 were designed as 5-axis machines for complete machining in one clamping operation. In recent years, GROB has developed and successfully launched the second generation of these machines. We also developed the G1050 as an expansion of the 5-axis machine, marking a shift to larger components. Driven by evolving customer requirements and technical developments, we continually expand and modify our standard optional package for G-modules. GROB is committed to continuing its strategy here, identifying emerging market needs early on and developing the

right solutions for our customers. Demand for tool magazines with even larger storage capacity is growing, fueled by the requirements of unmanned operation and increasingly complex work pieces. New cutting materials will open the way for us to achieve new maximum speeds and performance parameters for spindles, especially as customers expect longer service lives for components.

The challenge of automation in the universal machine business

Integrating automation systems for universal machines represents another major challenge. Unlike large-scale manufacturing, this mainly involves pallet automation or combined pallet and work piece handling systems. Solutions that enable our customers to operate their flexible production processes without operator intervention, even with small batch volumes and dozens of different work pieces in the production cell. GROB has already taken its first successful step here with its rotary pallet storage system (PSS-R for pallet sizes 400 mm and 630 mm). Last year, GROB sold and installed 68 of these rotary pallet storage systems. This trend is set to accelerate even more rapidly over the coming years as cost pressures continue to rise due

to globalization. "We are a successful partner in production lines for the automotive industry and so our customers in the universal machine business know they can trust us", explains Alexander Attenberger, Head of Sales for the universal machine business. "They rely on our many years of experience in the production and automation of extremely reliable machine tools. This opens up huge opportunities for us to win additional market share."

Cost pressures, flexibility and digital technology

Rising cost pressures and the need for increased flexibility will be major challenges for our customers over the coming years. To keep pace with this development, they need partners who provide outstanding support even after their machines have been accepted. This is built on exemplary, high quality 24/7 service with an equally outstanding spare parts supply. Being able to retrofit existing customer machines, for example, with larger tool magazines or automation systems without having to make major alterations is also becoming increasingly important. Customers are already starting to look specifically for suppliers that can offer all-round solutions from a single source – if possible from a

single company without interfaces with third, or even fourth parties.

But it's not just hardware requirements that are rising. Software is also having an increasing influence on the entire value chain in the universal machine business. Today, manufacturers are having to offer solutions for post-processors, real-time simulations, low-paper (paperless) production and intelligent machine networking from a single source. GROB is well prepared and strongly positioned for this trend with its GROB-NET⁴Industry products such as GROB⁴Line and GROB⁴Analyze solutions. The GROB⁴Pilot control panel provides the perfect platform for machines. The large touchscreen with multi-frame technology provides operators with the optimum human-machine interface.

The machine tool is and will remain the basis for modern production cells as demands on performance continue to rise fueled by the need for increased automation. Longer component service lives, shorter delivery and start-up times, and desensitization (shifting away from excessively high-tech solutions) are further important points in the technical specifications for GROB machining centers.



Automation through combined pallet and workpiece handling systems



Machine control panel GROB⁴Pilot

GROB SYSTEM BUSINESS

GROB stands up to changes in the system business



Visit by the OPEL project team in May 2018 for the acceptance testing of the first EB2-Motor, which was built on our assembly line

Highly compact, extremely dynamic and outstanding flexibility when it comes to production volumes. And all, of course, with even shorter delivery times. The system business has changed and so too has the GROB world. There are the new components, new component groups, new control units and new soft-

ware. And also new simulation for the virtual commissioning of complete systems. Now, GROB machines can prove that they are the best. That they meet deadlines and deliver the right quality levels. And that employees in particular at GROB are capable of successfully meeting these new challenges.

In the past, the system business was primarily about engines and transmissions. Now, however, there are new components such as frame structural components, turbine housing production and, as of this year, the production of battery housings. The market now needs large machines because the automotive industry has discovered, that its battery modules have to be installed in stable housings to combat the risk of fire and accidents. GROB can provide these kinds of machines. Ones that successfully make the transition from conventional components and meet the needs of new components.

still require the same effort for project management. In some areas, this trend requires new ways of working as issues are no longer discussed directly with the OEM but with their production partners. This reduces scope for configuring workpiece tolerances and clamping principles but increases the need for advice and support with automation solutions.



The modular principle of the G-modules meets all market requirements



Long and large-size tools can be managed easily in the 6th generation model



GROB can even satisfy the demand for shorter lead times

And this is exactly one of GROB's core areas of competence: Backed by its years of process know-how, GROB is ideally positioned to provide its customers with expert advice on system layout.

The shift from special-purpose machines to machining centers

The trend towards smaller manufacturing facilities is flanked by falling demand for special-purpose machines. Special-purpose machines had a price advantage over G-modules, especially when it came to high production runs. Now, more and more critical machining processes such as precision machining of camshafts are being moved to G-modules. We have already proven in many projects that these processes can be carried out on GROB machines. The new phase 6 in particular has enabled us to further improve the way long, large tools such as drill rods are managed in the magazine. In older phases, special solutions with limited tool capacities often had to be designed for

machines, or these processes had to be carried out on special-purpose machines.

Delivery times of less than ten months

The change in the system business is also reflected in delivery times. Our (new) customers receive their orders at short notice from automakers and then require new manufacturing facilities very quickly. This automatically reduces delivery times for GROB. In the past, due to the long-term project planning of our automotive customers, delivery times were often more than twelve months after order intake. Now, customers are increasingly looking for turnarounds of ten months or even less. To meet this huge challenge, the sales, design and material management teams at GROB work very closely together to ensure that decisions for planning materials with very long delivery times are made at an early stage in project development. Efficient material planning is crucial to ensuring we can meet



Shorter throughput times through virtual commissioning

the two competing goals of "low inventory levels" and "high material availability" in assembly. This is especially true in the current market situation where delivery times for core machine components such as ball screws, rail guides and precision bearings are rising.

Cutting throughput times in GROB production by two months has been a further key aspect in reducing delivery times. In addition to coordinated pre-planning of materials, the company analyzed its entire scheduling process here to find potential for optimization. Buffers after individual processes were consolidated into one joint buffer, wait times at interfaces were eliminated and the entire workflow was accelerated by integrating the system more effectively into our planning software.

Using simulations for virtual startups

Virtual system startup is another way of reducing throughput times. In other

words, the control software is tested using a virtual 3D model before the system is built in the assembly hall. This means that individual workflow scenarios can be simulated much more rapidly in the software than would be possible on the real system. At the same time, it improves programming quality. In the past, it was technically possible to run through all theoretically potential faults and see how the software would respond, but this would have been far too time-consuming in reality. Now, a scenario such as an incorrect limit switch or disconnected cable can easily be simulated. Special workstations were set up in the design department specifically for this modified procedure. Once the kinematic model of a system has been prepared, the workflow processes are tested on a test bench with real controls and HMI, first by the software developers and then by the startup technicians. The 3D model can also be tested on a separate PC.



From virtual to real commissioning

GROB ELECTRIC MOBILITY

First system supplier for electric mobility



New Technology and Application Center for Electric Mobility



Hairpin production line for the production of stators

The (r)evolution of automotive drive technology is accelerating technological change at GROB-WERKE as the company becomes a system supplier for electric mobility. Completely new production machines and systems provide solutions for electric motor production, assembly of battery cells, battery modules and packs, and fuel cell assembly.

The shift towards electric drives in cars has come sooner than expected. Sales of combustion engines are falling and demand for electric drive technologies is rising rapidly, especially in the key Asian market of China. The automobile industry is looking for suppliers that can provide systems for corresponding quantities. Smaller suppliers operating thus far in the market are unable to provide the full process, capacities or experience required here. All of which makes GROB-WERKE the partner of choice for the automotive industry, even capable of delivering extensive, large-scale, turnkey projects. GROB-WERKE has proven its expertise as a successful strategic partner to the automotive, supplier and machine engineering industries for more than 90 years, reliably developing and producing engineering solutions for machining processes that enable the series production of powertrain components, chassis parts and structural parts.

Diverse portfolio of solutions for electric mobility

Over the last three years, GROB has created a broad range of high-quality, series-production solutions for electric motor production, assembling battery cells, battery modules and packs, and fuel cells. These production machines and systems have been newly developed from the ground up in line with GROB's

renowned philosophy that covers the entire value chain:

- Recording and, when necessary, simultaneously engineering customer requirements
- Designing and developing the manufacturing process
- Designing and developing customer-specific system components
- Startup and testing of the entire plant internally at GROB
- Acceptance by the customer
- Setup and handover of the entire system at the customer site – also as a turnkey project if required
- Support during the startup phase until peak production capacity is reached
- Ongoing development work and productivity increases in collaboration with the customer
- 24/7/365 service with on-site teams or employees on call

New Technology and Application Center for Electric Mobility

These activities are bundled over an area of around 2,500 m² (27,000 ft²) in the Technology and Application Center for Electric Mobility at the headquarters in Mindelheim. GROB builds its new machines and plants here and also tests and verifies the production processes.

Thanks to extensive investments in a climatic chamber, battery lab, test benches and a showroom, the company can test, verify and produce prototypes and small-scale production runs. Motivated, highly experienced and expert application teams are on hand to provide meaningful support, analysis and tests. The company has hired additional, highly-specialized engineers and application engineers for this. They collaborate with the established

teams in assembly technology to work on new, ground-breaking customer projects. Confidentiality is crucial here. Separate customer areas and individual access authorizations ensure that the highest levels of secrecy are maintained.

GROB-WERKE has already received numerous contracts from the automotive sector, confirming its position as the partner of choice for electric mobility and underscoring the company's transition to a system provider of electric drive technologies for vehicles of the future. For key processes such as manufacturing hairpin stators, GROB has rapidly developed all machines to a stage where they are suitable for mass production and already implemented these in the first OEM projects. Cycles of less than two seconds were achieved here for hairpin production, including stripping.

Mass producing electric motors

GROB developed and built a dedicated prototype system for the hairpin stator technology. It reproduces all the challenges that this new production technology has to master to create solutions suitable for mass production. As such, it allows us to realize the highly complex and highly accurate production and assembly process required to manufacture stators in house at GROB. This includes bending, groove insulation, stretching, setting, cutting and welding of hairpins as well as the subsequent impregnating and measuring of insulations. We can then offer this process to our customers. Further extensive capabilities in winding processes such as needle winding and feeding technology can be tested at GROB Italy in the halls of what was formerly DMG meccanica. These can then be realized as high-volume production projects. In Mindelheim, we focus

on solutions with rectangular wire, as is the case, for example, with wave winding. In Turin, we develop solutions with round wires. The rotor is assembled, magnetized and balanced while the stator is being produced and assembled. This ensures that a fully assembled and tested electric motor is produced at the end of this process with extremely short cycle times.

Extending GROB's renowned quality assurance to electric mobility

GROB places huge importance on ensuring the highest levels of process safety and quality assurance as standard. This commitment can be clearly seen by the fact that GROB has already installed two computer tomography scanners during the development phases to ensure non-destructive, statistical process checks can be carried out on hairpins. Further extensive quality control tests and investigations are carried out using 3D laser microscopes, measurements of workpiece parameters and hardness tests, to name just a few.

Assembling batteries, battery systems and fuel cells

GROB also offers its customers all-round solutions for the production and assembly of components for batteries, battery systems and fuel cells. A fully automatic system for battery cell assembly and a system for assembling fuel cell stacks are currently in the pre-development stage. GROB engineers collaborate worldwide with leading car manufacturers on all development projects in the field of electric mobility. This results in concepts, prototypes and solutions for mass production in the electric mobility sector that deliver maximum levels of automation and always utilize the latest cutting-edge technology.

GROB DIGITALIZATION

Globally renowned partner with outstanding networking capabilities



Focus on GROB-NET4Industry at the SIMTOS in South Korea ...

By continuously evolving its expertise and systematically building knowledge, GROB has successfully networked systems across the entire globe. The biggest challenge continues to be insufficient infrastructure in Germany and the creation of uniform standards.

GROB started taking its first steps towards digitalization seven years ago with paperless production and the attempt to transition its production activities from a directional to a forward-looking approach. Even back then, GROB was seen across the industry as a trend setter in this new technology. The fact that 75 percent of GROB's digitalization offering is developed in-house confirms this reputation.

GROB's strategy here was to find ever more environmentally sound and resource-efficient production processes. This approach is applied equally to series production and variant management. Uniform standards and open platform concepts build a bridge to other systems and manufacturers, providing customers with added value. Dealing with the vast array of different tasks is one of the biggest challenges here. However, GROB masters this by continually developing its expertise, expanding its knowledge base and collaborating with strong partners.

GROB will continue to develop and test solutions internally before making them available to our customers.

Digitalization: From individual machines to cloud connectivity

GROB has successfully networked systems internally across the entire globe. New, international cloud concepts are providing an entry point to digitalization for customers, some of whom also have to factor in regional and national restrictions. Individual machines can now be connected as standard and their data securely transmitted. This kind of connectivity is opening up new ways for customers to further optimize production. New developments are taking paperless production to new heights. Important steps for data acquisition and transformation have been implemented, bringing the goal of Industry 4.0 ever closer. The Group has laid an important cornerstone here by incorporating connectivity into new machines during development.

Challenges of digitalization

As always, the biggest challenges are the most fundamental. The infrastructure in Germany falls far below what is required. High-speed internet is not available nationwide and there is lack of available specialists capable of rapidly developing solutions and advancing dig-

italization. Furthermore, uniform standards and their content cannot be created by individuals alone. Mechanical engineers, automation specialists, tool manufacturers and controller suppliers all have to work together here. Data protection and safety issues are also continually re-examined to ensure no loopholes occur.

Success stories with GROB-NET4Industry

In addition to successful projects with customers and within the company itself, the Group has connected machines on a global scale. In addition to connecting machines securely linked to an IT infrastructure inside plants, GROB has effortlessly networked individual systems at trade shows, transmitting data across the globe and making it available via the cloud. Our first steps in predictive maintenance are yielding results and we are making good progress in further expanding these solutions to all main component groups of our machines. Positive feedback from our customers and our own production teams shows that we are providing practical solutions developed specifically to meet the needs of each application scenario. The GROB-NET4Industry team harnesses effective, intensive communication here that delivers the right information across all areas.

Next steps in digitalization

We laid the foundation for further work in this area with the development of a multi-functional operating panel and a range of productivity-enhancing software solutions. The data we have gathered can be used to develop algorithms capable of predicting future developments and creating early warning systems for machines. Our collaboration in the German Machine Tool Builders' Association and with other machine manufacturers in the association is paying dividends and a uniform standard for connectivity will soon be published.

The development of our GROB4Interface solution together with the support provided by the GROB-NET4Industry department in the association formed the basis for this standard. Partner companies are building on the technology we have provided and developing solutions with unprecedented functional scope. We are also working hard at Mindelheim to drive forward digitalization internally to ensure the company itself always lives up to our own philosophy of being a technology leader. The ultimate goal of Industry 4.0 is to create fully-autonomous systems (cyber-physical systems). Realistically, these could be achieved by 2025 - 2030. "Our philosophy here is very clear", explains Emil Nigl, who is responsible for the GROB-NET4Industry department. "We utilize cutting-edge technologies – not to get lost in visions and promises – but to provide solutions that deliver benefits today while at the same time keeping one eye firmly fixed on the future!"



... and at the CCMT in Shanghai

GROB SALES

The spearhead of the company – still one step ahead



Strategy and development meeting in March 2018 with the factory and branch managers in Mindelheim

Changes in markets and technologies, limited willingness of customers to invest and the structural new orientation of the automotive industry are the conditions and challenges which confront the GROB Sales team today. It is addressing them with a broad spectrum of initiatives. Seldom have markets been in more turmoil than today, and it has seldom been more difficult to assess their development correctly.

The automotive industry and consequently the machine tool industry are in a state of transition all over the world. Investments in the classic powertrain are cautious, as it is difficult to make a clear and confident projection as to how alternative drives will develop. In Europe and China, the development of e-mobility is promoted

for many different reasons – chiefly political ones. In the US, major customers are investing less and less in internal combustion engine and transmission systems, and current US policies mean that there is little focus on e-mobility. In Mexico, investment is also declining, but there is still demand from the automotive supply industry. The need for solutions in e-mobility is hardly an issue in South and Central America.

In South America, the economic situation is at a low point and will make only a very slow recovery. As a result, hardly any investment has been made in new production facilities. There is, however, renewed talk of investment and some reason to hope for better times.

In Asia, and in particular in China, there is still demand for machinery and sys-

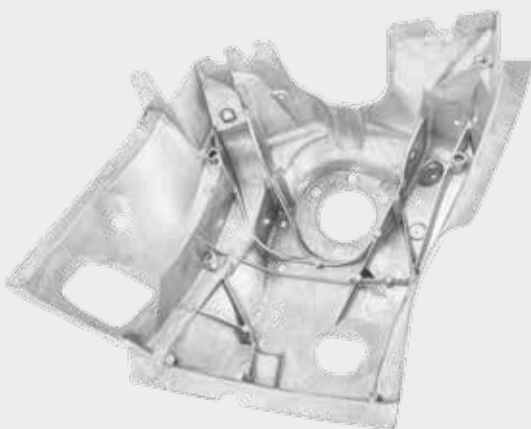
tems for the production of internal combustion engines. Many well-known OEMs plan also to make substantial investments here in the development of e-mobility solutions.

There is a stable demand from OEMs in India, although only on a low cost-basis. The Indian market is in fact picking up speed as there is considerable backlog in demand for modern internal combustion engines. Despite the enormous price pressure, the technical advantages of our machines have enabled us to establish ourselves here as a strategic supplier for well-known OEMs such as MAHINDRA. In India all OEMs are also taking steps to electrify their drives, although under different framework conditions in terms of implementation time and price. In this way, our Sales and Development depart-

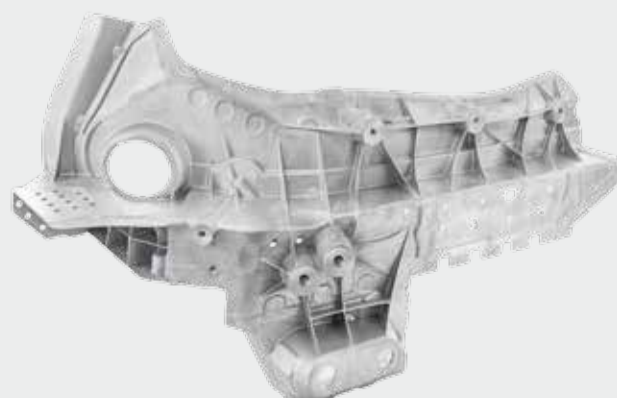
ments worldwide are working hard to enable us not only to respond to inquiries and future projects on time and with competitive technology but, above all, to acquire customers who believe in GROB Technologies.

Serious market shift due to the change in the automotive industry

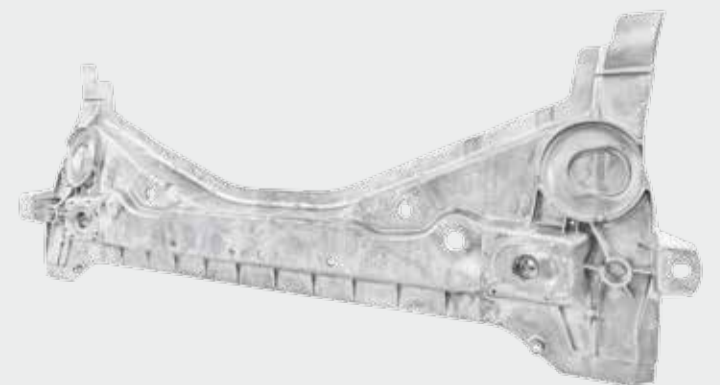
With fewer and smaller projects on the market for conventional drive concepts / components, a bitter price war has arisen, which is further intensified because not all competitors are able to offer new technologies for e-mobility. In addition, most machine manufacturers are aware of the trend towards lightweight construction of frame and chassis parts, especially as these are also used in electrically-powered vehicles. Of course, we at GROB are also



Suspension-strut dome



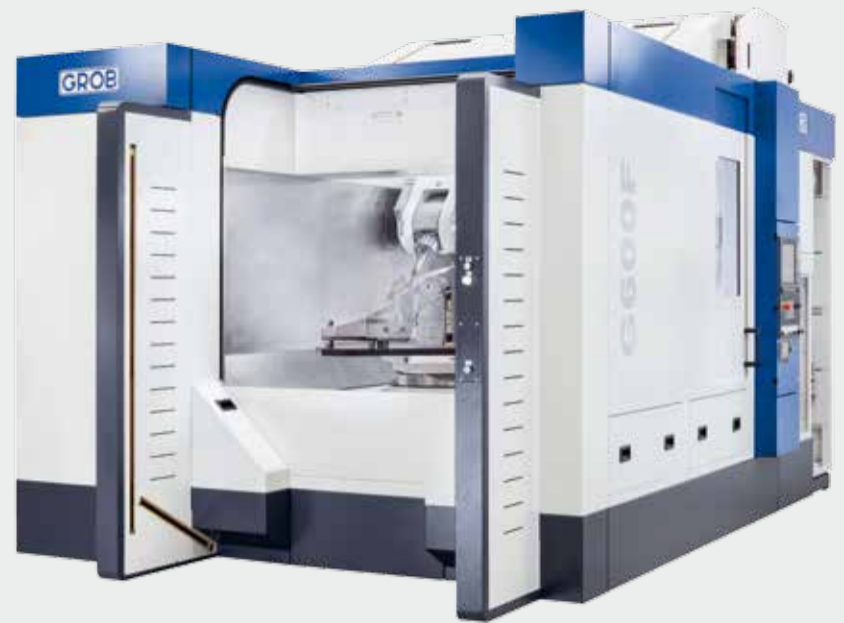
Suspension mounting



Cross-member



Dual-spindle G-module, 6th generation with a pallet changer



G600F – A machine concept for machining frame structure and chassis parts

prepared for this opportunity and can offer suitable solutions with our frame structure machining centers. In addition, the dual-spindle G320 and G520 machines have been released for sale with new pallet changers. These are particularly suitable for special flexible manufacturing strategies such as those required for chassis parts. Our G-modules with the GROB motor spindle with cross-feed device are also ideal for machining turbocharger housings. This puts GROB in a very good position on the product side of things. In sales for system business, the key account manager for our customers is the central contact for all products. For this reason, GROB is investing not only in new machines to meet the changing market requirements, but also in the technical training and continuing education of its key account managers. A broad training program covering everything from e-mobility products to new developments in machinery for process-

ing frame structural parts ensures that all key account managers can respond professionally to any request from our customers. In regular monthly information events and workshops, presentations are given on the latest GROB and economic trends and internal processes are further optimized.

Drive to expand internal and external sales structure

In response to the growth of the company and its markets, the GROB Sales team has been adapted and expanded both internally and externally. Over the past year, for example, the project development side of the Sales team has been particularly strengthened, to ensure prompt compliance with the new requirements of our customers. At the same time, projects are requiring more and more management effort. The proportion of supplementary and conversion offers (including for thirdparty machines) has increased and the diver-

sified product portfolio means that more technical expertise is needed. We also need to focus on the acquisition of new customers and the development of new business areas. Because of this changing situation, our sales volume will in the future show a different distribution from previous years. This applies not only to systems for the machining of chassis and frame structural parts and to turbochargers but also increasingly to assembly systems for the conventional powertrain and e-mobility.

In this way, GROB is continuing to expand its global Sales and Service network. At the start of this year, the company founded two new branches in the Netherlands and Switzerland as part of its drive to extend its reach and provide optimum support for GROB customers. The GROB Benelux BV branch in Hengelo (Holland) started operations at the beginning of January, shortly after the newly founded GROB Schweiz AG

branch in Steinhausen, near Lucerne. GROB's goal for both markets – Benelux countries and Switzerland – as for all 12 of our current branches, is to create significantly more regional development opportunities by establishing closer relationships with customers and embedding local service teams on the ground. We want to convince not just our existing customers from the automotive industry and suppliers, but also smaller and medium-sized companies from other sectors of the technological benefits of GROB's 5-axis machining centers.

The global change in the markets and the associated growth of our company always present the Sales department with a particular challenge in its drive to stay that all-important step ahead. Market knowledge, anticipation of economic trends, and a consistent, worldwide Sales team with excellent technical training have always been the hallmark par excellence of the GROB Group.



CWIEME Shanghai 2018 – Electro mobility trade fair team



Branch manager from GROB Benelux Erik Huiskes (middle) together with the Universal Machines and Marketing Team at the Techni-Show Utrecht 2018

GROB PRODUCTION

Fit for the future thanks to restructuring measures for production



GROB Production – optimizing production processes through new processes and technologies

To increase flexibility and ensure we can respond to continually evolving markets, GROB has almost completely restructured the Production department. After carrying out an extensive value analysis across all departments from Development, Manufacturing and Assembly right through to Production, we have been able to reduce manufacturing costs for G-modules and additional components, and also implement new processes and technologies to streamline production.

Almost no other area in our company has felt the impact of increasing market demands and the need for maximum flexibility levels as strongly as Production.

We have to deliver flexible processes and customized products to ensure a vast array of processes can be mapped to systems in a very short period of time, enabling a broader market to be reached while at the same time reducing delivery times. And all of this has to be done against the backdrop of changing structures that no longer align with the enhanced value stream. In addition, the scope of new components is increasing in manufacturing as a result of electric mobility and this also requires new manufacturing processes. Furthermore, internal production has to be increased to ensure proprietary technologies remain in-house. In order to meet these challenges, GROB carried out a comprehensive value analysis program

across all areas that enabled it to roll out decisive improvements.

Extensive package of measures for streamlining production processes

The package of measures initiated by GROB affected almost all assembly and production halls. The company will also be realigning the material and value streams in assembly from September 2018 on through the consolidation of halls 10 and 11. Furthermore, throughput times have been optimized in all areas, enabling more machines to be built in the same space. By implementing a comprehensive shop floor management structure at Board level, the company can now process issues in a structured manner using Kanbanize software for

lean management. Production targets are defined and set as daily or weekly goals in manufacturing and assembly. Long-term goals are set for internal development and regularly assessed. Throughput times, costs, quality and processes are key areas of focus here. The company rounded off its capacity and technology capabilities by investing in new machines for manufacturing. Motor spindle production has been integrated as an individual segment and its capacities and technological equipment have been enhanced. Sheet metal production has been expanded to enable component manufacturing and pre-assembly in hall 3. As a further measure intended to meet specific market requirements, the “retrofit” area was restructured and an innovative logistics structure for manufacturing was established for supplying nearby sites.

Investments in new processes and technologies

One of the more recent investments in hall 9, spindle production, involves the development and modification of a G550 to create a high-pressure deburring system with up to 1,200 bars of pressure. Its HSK-A100 nozzle tool change system is unique and not available on the market in this design. The machine was developed in-house, with Production carrying out all steps from project planning through design to the actual modification work. Now, cleaning and deburring work can be carried out mechanically in the motor spindle area. With a high throughput and used in combination with the automatic washing system, this has resulted in significant quality gains. The process with the collaborative robot in pre-assembly, which is used to assemble magazine



Collaborating robot for magazine clamp assembly in hall 6



Project team for the development of a GROB high-pressure deburring system

brackets in hall 6, is also an internal GROB development, from project planning and design right through to construction. It carries out combined tasks to support employees and accurately insets brackets using predefined forces. By the end of 2018, two more machines will be available for automatically installing the Z cover and automatically assembling the machine tool drum. These two machines are also in-house developments aimed at improving processes and productivity.

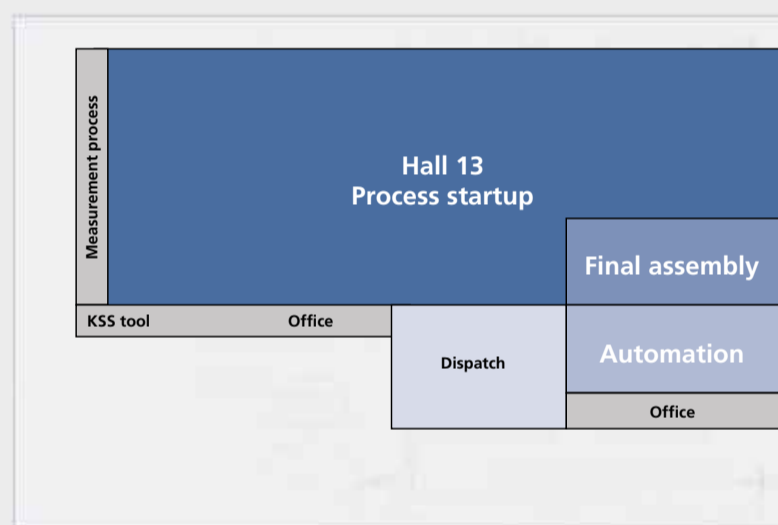
Improving the flow of information with shopfloor-management

The introduction of a shopfloor-management system in a number of areas, including at Board level in Production, is

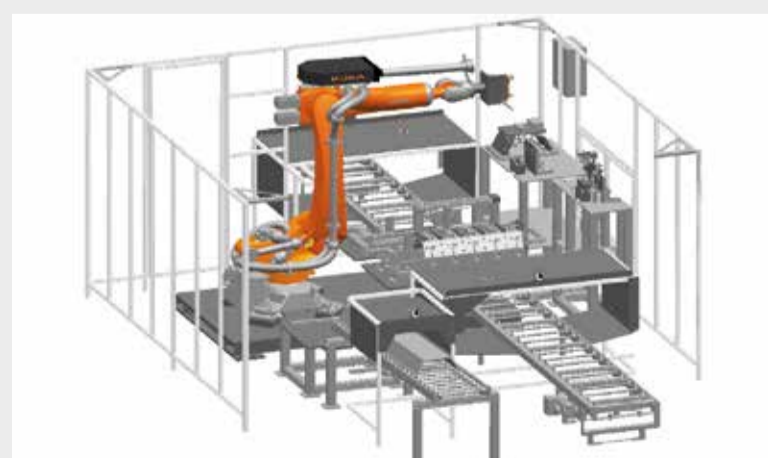
another important tool in the package of measures aimed at improving and streamlining work processes. "We firmly believe that this tool will enable us to become more flexible, make decisions faster and align ourselves more effectively with customer requirements," explains Christian Csokas, Technical Assistant to the Management Board of the Production Department. The management and steering tool will be rolled out across all hierarchy levels. Enabling the structured, efficient flow of information from employees to the director will increase transparency. The resulting improvement projects will then be systematically created in Kanbanize and methodically processed using the CIP calendar.



Shopfloor-management as an important tool in leadership and control procedures

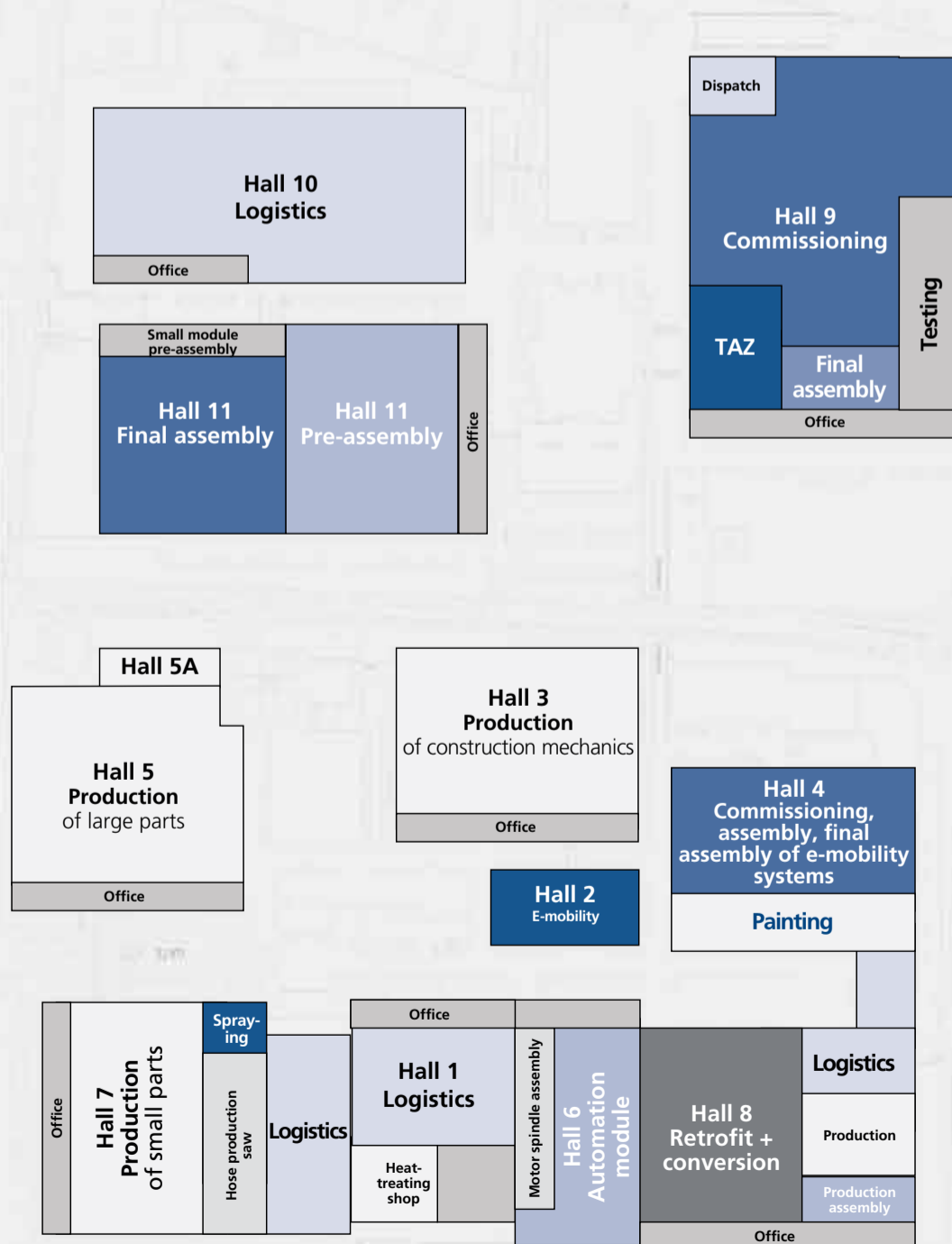


Robot welding



Fixing the hood with robot handling

GROB factory planning in Q4/2019



Layout of all production halls, GROB Mindelheim

GROB WORKS COUNCIL

Managing change in the company with a new Works Council



The biggest ever newly elected GROB Works Council

The new GROB Works Council was elected. The new council now comprises 31 members and is larger than ever before due to the size of the company. Dieter Schübler is Chair person and Sabine Durante is Deputy Chair person.

The new GROB Works Council was elected after the standard four-year cycle on March 22. This year, the Works Council was chosen by an election by list and not, as was previously the case, by a candidate-based election. Voters were able to choose between four lists, each with different lead candidates: Carina Daufratshofer (list 1 "Stronger together"), Robert Egg (list 2 "The independents"), Carmen Rösch (list 3 „Free list“) and Dieter Schübler (list 4 "IG Metall"). The Election Committee was made up of Karl-Heinz Hehn (Chair), Thomas Arloth (Deputy Chair), Verena Wagner (Secretary), Melanie Olejak (Deputy Secretary), Johann Böck, Martin Lutzenberger, Alois Mayer, Franz Mayer and Isamedin Vehabi as well as numerous polling clerks. They were responsible for organizing the entire Works Council elections and for counting the votes. The results of the election were available late in the evening on the polling day. The new Works Council started its duties on May 21, 2018. Due to the increase in employee numbers, the Council is now significantly larger. The Council will comprise 31 members in the future (companies with 5,001 to 6,000 employees eligible to vote). Seats were allocated based on the distribution of votes in the election and individual candidates' respective rankings in the lists.

Dieter Schübler elected Chair of the Works Council in inaugural meeting

Dieter Schübler was elected Chair of the Works Council and Sabine Durante was elected Deputy Chair by the Council in separate, secret ballots during the inaugural meeting on April 12. In addition to this, the future exemptions from work and new members of the Works Council were defined by proportional representation in line with Section 27 of the Works Constitution Act. The following employees were released from their duties to carry out their tasks on the Works Council:

Dieter Schübler (Chair person)
Sabine Durante (Deputy Chair person)
Werner Jensch
Edith Kahr
Anja Hofmann
Carmen Rösch
Michael Goldberg
Michael Holderried

Ambitious plans for the Works Council

The new Works Council chaired by Dieter Schübler has set itself ambitious goals. First of all, it aims to build a team comprising a healthy mix of experienced Council members, who will bring their expertise and knowledge to the table, and motivated new colleagues, who will bring fresh impetus to the council. Having a unified Works Council that can act as a trusted contact partner for the workforce and a competent negotiating partner for management is extremely important, especially in light of the changes the company is experiencing. In addition to tackling change in the automotive industry and the rise of electric mobility, the

Council also needs to address "smaller" issues. Topics such as stress at work and more flexible working times, pay category grouping under the wages and salaries agreement (ERA) and performance evaluation as well as the continued tense parking situation are right at the top of the Works Council's agenda. The implementation of IG Metall's new collective agreement will also involve a number of new tasks. "We would particularly like to thank all employees at Mindelheim. Their participation in the Works Council election delivered key impetus for defining the direction of the new Works Council. Their votes had a real impact", enthuses new Works Council Chair, Dieter Schübler after the election. "We would also like to thank Karl-Heinz Hehn and his skilled team. Their in-depth expertise and effort ensured that the election ran smoothly. We also extend our thanks to all former Works Council members for their constructive work over the past four years."

Long-time member leaves the Council

Long-standing Chair of the Works Council, Anton Heiler, did not stand for re-election to the Council due to health reasons and his up-coming transition to part-time work in the run-up to retirement. Anton Heiler was a member of the Works Council since 1981. He served as Chair of this important organization representing employees since 2007. As Chair of the Council, he also spent many years as the direct contact partner to our former owner, Burkhard Grob. During his time as Chair, the company underwent its first period of strong growth and investment since the financial crisis in 2008. "Over many decades, Anton Heiler was able to successfully unify antagonism and diplomacy in such a way as to always get the best results for the workforce in Mindelheim", explains Dieter Schübler. "We would like to thank Anton for his many years in the GROB Works Council and wish him all the very best for this new chapter in his life. We know that we have a great legacy to live up to!"



Exempt members of the works committee

GROB BRAZIL

Record revenue in the midst of a recession



Final assembly and commissioning

GROB Brazil has increased production despite a dramatic downturn in automobile production in Brazil. The expansion plans carried out by B. GROB to Brasil were a highlight for the city council of São Bernardo do Campo and enabled the company to achieve the highest revenue in its history. These are milestones in a turbulent fiscal year that proved challenging for all employees.

Brazil has been in recession since 2014. In addition to this, following twelve years of annual record production volumes, the Brazilian automotive market has slumped to just fifty percent of installed capacity relative to the previous year's volume. Yet despite all the difficulties facing the Brazilian economy, GROB Brazil increased production by 20 percent to achieve sales in excess of EUR 135 million. This development was made possible by the GROB Group's strong coordinated production system.



At 35 percent, intercompany business accounted for more than a third of total sales. However, our Brazilian colleagues also won their fair share of "national projects."

Winning almost all major national contracts

The most important of these was an order from GENERAL MOTORS Brazil for two complete cylinder engine block lines and two complete transmission housing lines with all ancillary machines. A second major contract came from RENAULT Brazil for a new cylinder head line and the complete refurbishment of an older engine block line. The company refurbished a highly flexible engine block line with BZ500 and BZ600 machining centers with transfer functions. An additional workpiece with new G-module cells and new assembly units was integrated into the existing setup. This was a particular challenge as the RENAULT line had been running for over eighteen years and was regarded as the largest, most modern and flexible line in Brazil at the time it was purchased. The old system was offline for just four weeks. The startup of the new machines happened while production continued on the old workpieces.

Record revenue – a major challenge for all areas of the company

To keep pace with rising sales, the company had to increase production by twenty percent and outsource more of its production activities. With strong support from procurement and quality assurance, the company was able to maintain GROB quality levels even with

outsourced products. Productivity in the sheet metal workshop was increased by investing in a "Stopa and TruMatic 7000 system" from Trumpf. The company hired new employees in machine component group assembly, installation and startup. Capacities were also increased in mechanical engineering and electrical design.

North-south relations between GROB Brazil and GROB America are also developing positively. Both production sites work closely together and continually align their activities. As such, they were able to win and process intercompany projects from GENERAL MOTORS USA Spring Hill and GENERAL MOTORS Mexico Ramos Arizpe. This situation was bolstered by the fact that GROB Brazil's extensive efforts to increase productivity are taking effect and delivery times are getting shorter – both of which have significantly improved the company's export capabilities.

Record revenue – impossible without hall expansion

A key prerequisite for achieving this record revenue was the investment in a 22,000 m² (5.4 acre) neighboring plot of land that included two existing production halls with a total area of 9,000 m² (97,000 ft²). This offered sufficient space for pre-assembly and enabled the company to double its urgently needed warehouse and logistics area. Removing pre-assembly freed up space in the old halls, enabling installation and assembly areas to be increased by 40 percent. The renovation project received strong support from the mayor of São Bernardo do Campo. In the midst of the recession, GROB Brazil was the only

company to provide the city council with a real highlight when it revealed its expansion plans.

The difficult topic of electric mobility

Electric mobility is not a relevant subject in Brazil at the moment. Recent talks with OEMs produced sobering results. If a market is ever to be established in Brazil, it will be purely for hybrid solutions. The government is working on a new program between industry and the state that contains important parameters for environmental protection. In terms of vehicle and engine construction, however, the government is only looking to improve combustion engines or – at most – create a hybrid car with an ethanol combustion engine.

Strong prospects for a successful year

As such, this has been a successful fiscal year overall and the prospects for the future are also positive: Automotive production is expected to pick up again, increasing by five percent annually over the coming years. Particularly as a new government incentive program (ROTA 2030) is being launched in a bid to promote investment in technological innovations in Brazil's automotive industry. In addition to this, GROB Brazil has been involved in designing different stations of assembly projects for GROB Mindelheim and GROB Bluffton for around three years now, establishing a further source of income for the company. GROB Brazil has created around 30 - 35 assembly machines/units per year in its design department over the last two years and demand for assembly technology is continually rising.



Extended pre-assembly area

GROB USA

Facing fast-paced growth in the booming American economy



New administration building at the Bluffton site

A new administration building and an electric mobility lab are under construction, fifty percent of universal machines are currently shipped to new customers and the new G500F, G520F and G600F machines are extremely well received by the market. GROB-Bluffton is facing the challenges of the American market and once again plotting its course firmly for future success.

The American economy is booming and the mood across industries remains positive. This is a trend that GROB Systems welcomes as an opportunity to further expand its business in the US. As such, the company is continuing to invest in its Bluffton, Ohio, site. At last, construction can get underway on a new office building. Work started here on Monday, May 7. The building is scheduled to be complete in twelve months' time in summer 2019. The Sales department will then be able to move from its very cramped premises

in the assembly hall to more prestigious offices on the second floor. And that's not all. The new building will provide further office space for new, urgently needed sales personnel. The Mechanical Engineering Department will be moving onto the third floor of the new office building. GROB-Bluffton plans to significantly increase headcount in this area to keep pace with the increasing number of assembly projects for both combustion engines and also electric mobility.

Electrification American-style

Electric mobility is also making headway in the US. It will come – but significantly later than in Europe or in many Asian countries such as China. As tradition dictates, the epicenter of electric mobility is California. This state has always had stringent environmental and emissions regulations, resulting, for example in catalytic converters becoming mandatory in new cars by as early as the end of the 1970s. This was something completely new

for the US automotive industry. It also proved to be a major headache for German car manufacturers. Today, as in the past, California's environmental laws are more of an exception in America's way of thinking, which remains geared towards the high-volume combustion engines so beloved in US trucks. So it is safe to assume that we will see more and more hybrid vehicles on the US market in future and that pure electric drive technologies will only emerge in the long term. Yet American OEMs are talking about electric mobility. And these strategies aren't just being discussed, they are also being pre-defined. This is more than enough reason for our American colleagues to make their own preparations and ensure that all areas – from design through production to sales – are ready for this trend. GROB Systems is currently processing its first order in this area for a North American customer. By the end of 2018, Bluffton will have set up the first "Electric Mobility" lab in America, giving our customers the

chance to install internal prototypes of hairpin stators and rotors.

New technologies for evolving markets

Over the coming years, vehicle production in the US will level off at around 17 million manufactured vehicles, accompanied by reduced willingness to invest among OEMs. Against this backdrop, GROB's portfolio will increasingly shift to new technologies with key tier 1 and tier 2 customers, focusing on smaller projects with shorter throughput times. Despite this trend, the ratio of "fifty percent machining and fifty percent assembly" will not change over the coming years. This is because the market for machining frame and structural components continues to develop positively. The new series range of products G500F, G520F and G600F is resonating strongly among US customers, resulting in a glut of offers, not just in the US market but also in Mexico and Canada. This is a growing market for GROB Systems with strong potential for winning new orders. In terms of chassis parts, our sales colleagues have reported very positive sales of twin-spindle machines with pallet changers.

Business with universal machines has also developed positively in America. The company has reported growth of 54 percent, around fifty percent of which is attributable to new customers. The Aerospace sector remains the most important market in the US and Canada. It is particularly worth noting that this year GROB will be manufacturing the first G350-Generation 2 machines that are "Made in the USA". Producing these products locally will optimize delivery times, meaning that they will be ready to ship by the first quarter of 2019.



Assemblies for the PSS-R rotary pallet storage system



G-module fixed station assembly

GROB CHINA

Second expansion phase in Dalian plant secures further growth



Design meeting at the Dalian plant in China

To keep pace with strong revenue growth in China, the second expansion phase at the Dalian plant started in May. In just nine months, a 6,700 m² (72,000 ft²) extension will be completed here, primarily providing much needed production space for pre- and final assembly.

Thursday, May 10, 2018: Construction work for the second expansion phase at the Dalian plant in China started on schedule. The project is set to be complete by the first quarter of 2019. The expansion and extension will be carried out as a multifunctional project to ensure that all GROB products can be assembled in the extra 6,700 m² (72,000 ft²) of production space, at the same time as construction phase I and II. The additional space will primarily be available to pre- and final assembly teams, resulting in changes to upstream departments such as production, quality and logistics. Following the completion of the first expansion phase in July 2014, GROB-Dalian was able to start processing entire projects and related processes. Once the second expansion phase is complete, GROB will be able to set

up projects directly at the plant, including automation, linear gantries and linking, and also carry out pre-acceptance tests to ensure products meet customer requirements. This approach is modeled on the Mindelheim, Germany, concept and aligns with the needs of our customers in China. This important decision will ensure that major orders such as those placed by SAIC-GM, VW, BBAC and BBA (to name but a few) continue to be realized at the same time as our GA350 and GA550 customers.

Enhanced product portfolio and increased flexibility

During the first step, the product and production scope at the Dalian plant will gradually be increased to include assembly lines. The electric mobility area will be incorporated in the medium term. This means that large, interconnected areas have to be created as assembly lines require up to 2.5 times more space than machining lines. In addition to this, Dalian plans to increase its production volume for universal machines in order to significantly improve delivery times and availability. Assembly technology is another area of focus. An "assembly

technology" group is currently being set up in the design department. A number of specialists from assembly have been sent to GROB's Bluffton, Ohio, and Mindelheim sites for training in new technologies. This will enable them to realize projects in China in the future.

Ambitious timescale – typical for China

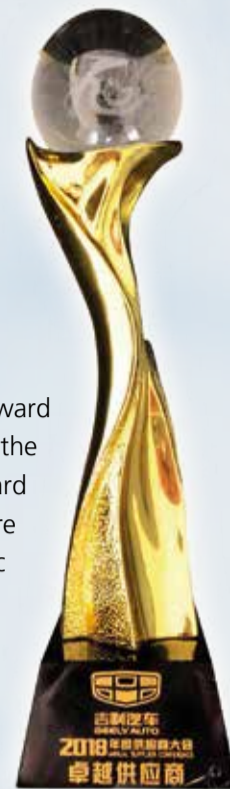
The first independent assembly and design project (DQ200) will be implemented this year for Volkswagen Automatic Transmission (Dalian) Co., Ltd. (VWATD). The plant will receive support from Mindelheim on this project. To prevent customer projects having to be set up in external halls outside of our security system, a number of production facilities will be outsourced due to lack of space. Once the extension to the hall is complete, Dalian will no longer have to lease additional space and will be able to reduce logistical efforts and, subsequently, throughput times.

In the next step, Dalian will focus on "new drive technologies" (electric mobility). Due to the huge space requirements, this step would not be possible without the extension to the hall. Building on positive experiences from other successful product launches, we will continue to follow the tried-and-tested model with GROB China of first training our employees in Mindelheim and then completing initial projects together. The first working groups for this are scheduled for the middle of the year to ensure we are ready to meet the new challenges in production and assembly at GROB China in good time.

GROB receives awards from SAIC-GM and GEELY

GROB-WERKE has added to its collection of prestigious awards with the Special

Contribution Supplier Award from SAIC-GM and the Excellent Supplier Award from GEELY. These are important and symbolic awards for GROB, particularly in China, the largest market in Asia. We have been working with SAIC-GM as a strategic partner for a long time now, not just in China but also across the globe with GM. This is an exceptional sign of recognition for a non-Chinese supplier such as GROB.

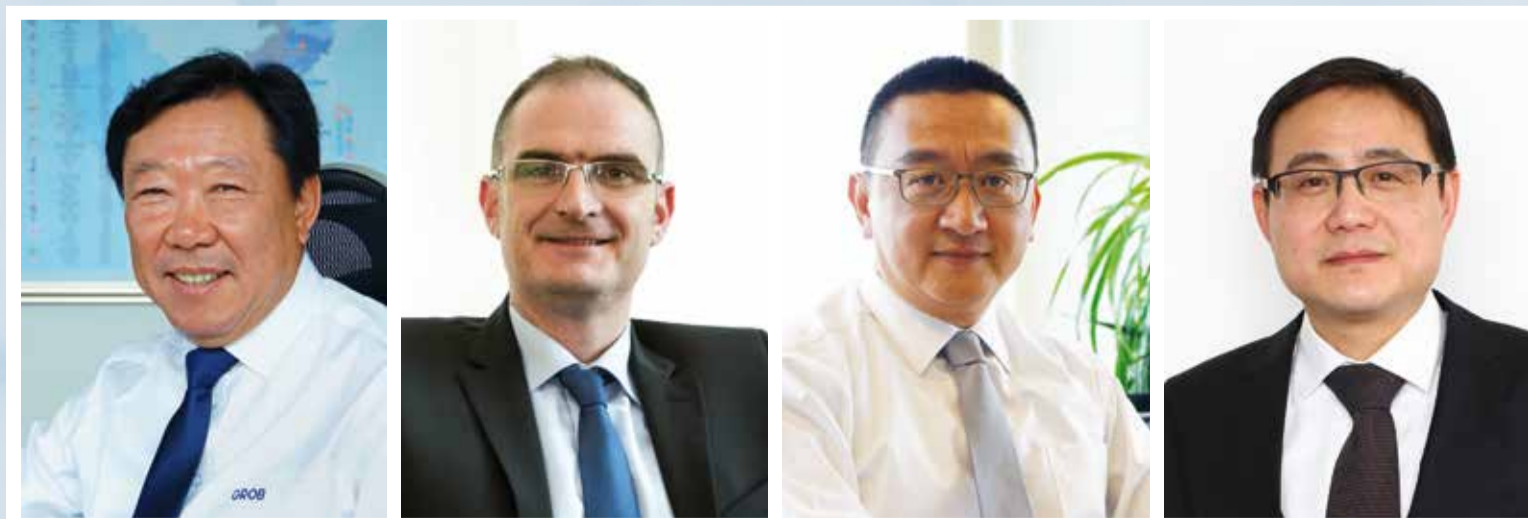


It reflects our important position as a supplier and, in particular, the relationship with our customer SGM. This kind of recognition is built on outstanding product quality, cutting-edge technology and exceptional performance. We accepted the "Geely Excellent Supplier Award" in Sanya (southern China) in mid-March. Following the "Best Supplier Award" from last year, this is the second award in succession that we have received from Geely. These awards confirm that we are on the right path with our strategy here.

Change in management in China and new company structure

The start of this year saw a change in management at our plant in Dalian. The new management team includes our Managing Director, Mr. Hongzhi Ren, Mr. Marcus Ostler, plant manager, Mr. Tao Shen, finance and Mr. Biao Wang, sales. After spending two years at Dalian, Mr. Werner Müller has returned to Mindelheim, where he has assumed responsibility for service.

In the future, there will only be one GROB company in China. "The activities of the GROB Beijing company, which also include GROB Shanghai, will be incorporated into the GROB Dalian company", explains Christian Grob. "At the same time, we are also planning to change the name of GROB Dalian to GROB China to ensure we project a stronger presence in the market as a unified, dominant group." In the future, GROB China will therefore comprise one production plant in Dalian and two branches in Beijing and Shanghai.



The new management team in China



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