INNOVATION. QUALITY. TRUST.
MADE IN FLENSBURG

FFG – HIGHTECH WITH TRADITION

The origins of FFG lie in the shipbuilding industry and go back to the year 1872. Initially, sailing ships were built here and then steam-ships. As early as 1963, when the German armed forces looked for a reliable partner for the repair of tracked vehicles, the extensive experience and highly developed know-how led to a partnership that continues to this day. In 1980, the initially founded tracked vehicle division of the shipyard finally became the FFG.

Based on the enormous knowledge in the field of maintenance and repair, we further developed to become a specialist for combat value enhancements and service life extensions. What began with the conversion of the German infantry fighting vehicle Marder in the 1980s culminated in the development of various modernisation concepts for the international market.

With the comprehensive know-how and years of experience as an upgrade specialist the step to become a vehicle manufacturer and the establishment of FFG as a system house were the logical continuation of the company's successful development.

COMPLETE SOLUTIONS FROM **A** TO **Z**

Today, we are an international high-tech company that sets new standards with innovations in the field of defence technology and with around 1,000 employees in our group of companies we are active all over the world.

In addition to maintenance, which is and has always been a mainstay of our activities, our key competences have expended into the development, manufacture, conversion and optimisation of tracked and wheeled armoured vehicles including safety concepts to protect the crew against mines and ballistic threats.

The company's proprietary developments WiSENT 2, ACSV G5, the armoured recovery module (ARM) for the Boxer and our GENESIS are impressive results of our evolution.

The FFG quality management system is certified in accordence with DIN EN ISO 9001 and guarantees optimal design and standardisation of our corporate processes. Our claim is to maintain and increase effectiveness and efficiency without losing sight of the necessary flexibility.

FFG continues to offer complete solutions from A to Z and supports its customers with innovations, quality and trust.

FFG-DEVELOPMENTS

FROM **UPGRADE SPECIALIST** TO **VEHICLE MANUFACTURER**

With decades of experience in the field of vehicle repair, modernisation and the construction of technology demonstrators, FFG has developed into a vehicle manufacturer and system house for innovative and reliable vehicle systems.

FFG combines individual solutions with the highest quality standards and thus offers tailor-made solutions for the specific requirements of each customer.

FFG's vehicle systems are characterised by a high degree of individualisation as well as maintenance-friendly and durable design.

Technology carriers such as the multi-purpose vehicle HiMoLaP or the world's first hybrid-powered wheeled armoured vehicle the GENESIS are examples of our high level innovations which recommend and qualify FFG as a technology supplier for future requirements.

Our first design of a vehicle solution already focuses on the benefits to the customer.

Integrated Logistics Support (ILS) is involved in this process at an early stage to ensure smooth operation by the customer from the very beginning.


Idea
INNOVATION
Research
Improvement

WiSENT 2

THE **GAMECHANGER** FOR EVERY **CHALLENGE**

The WiSENT 2 is the world's most advanced multifunctional vehicle platform. Its basis is the Leopard 2 – one of the most successful tracked vehicles in the world. By doing this, the WiSENT 2 benefits from a mature design which has been proven in combat through absolute safety and reliability. With the WiSENT 2, FFG is offering a support vehicle which has been specially developed for current requirements and operational scenarios.

The WiSENT 2 is a modular platform that can be used as an armoured recovery vehicle, armoured engineer vehicle, mine-clearing or bridge-laying vehicle. Its modular design allows the WiSENT 2, for example, to be converted from an armoured recovery vehicle to an armoured engineer vehicle and vice versa in less than 5 hours.

In the basic version, a 400 kN main winch, the 30 kN auxiliary winch and the unmatched basic protection against mines and ballistic threats in combination with the mobility of a Leopard 2 set new standards in this class. A high degree of digitalisation including the implementation of remote weapon stations, battle management systems or 360-degree camera solutions ensuring high growth potential.

As an armoured recovery tank, the WiSENT 2 offers a 32-ton crane arm and a sophisticated Combat Recovery System (CRS), which enables the recovery of other vehicles under full protection.

The engineer tank variant is equipped with a powerful industrial-grade articulated excavator arm. This vehicle can be fitted with a variety of standard tools as well as FFG's own 1.3 m^3 backhoe bucket. Solutions for supplying electrical, hydraulic or pneumatic power to the attachments are obligatory and make the WiSENT 2 a Swiss Army Knife on the battlefield.

Equipped with a mine plow as well as systems such as lane marking, Magnetic Signature Duplicator (MSD) and Mine Clearing Line Charge (MICLIC), the WiSENT 2 takes the right path for every mission. The variant as a tactical bridge layer with its MLC 80 bridge makes the vehicle a true trailblazer.

ACSV G5

MISSION **POSSIBLE**

The ACSV G5 (Armoured Combat Support Vehicle) provides armed forces with optimal support on the battlefield and covers a broad spectrum of applications with the flexible use of mission modules.

FFG has developed this highly innovative support vehicle from scratch. Findings from more than 1,600 vehicles modernised in numerous international projects, as well as results from extensive tests and trials of the FFG demonstrator PMMC G5 have been incorporated into the final design of the ACSV G5.

The ACSV G5 uses the latest technologies and represents the current state-of-the-art of tracked vehicles. The electronic design corresponds to the NATO Generic Vehicle Architecture (NGVA) and meets extremely high requirements for electromagnetic compatibility (EMC) and data security through consistent red-black separation. The CAN bus allows fast data exchange between the individual vehicle components and enables rapid fault analysis.

The ACSV G5 runs on a composite rubber track system which drastically reduces vibrations and noise, both inside and outside the vehicle. As a result, the rubber track reduces the strain on the equipment as well as on the soldiers inside the vehicle. The track contact length and the width of the track ensure very low ground pressure and guarantee excellent mobility on all surfaces, especially on snow, soft sand or boggy ground.

The power pack which is manufactured in Germany consists of an MTU engine and a ZF transmission, both of which are field-proven. The user benefits from outstanding mobility and at the same time is comprehensively protected against today's threats.

The ACSV G5 offers maximum availability with long service intervals and low life-cycle costs. FFG's proven technical service supports our customers worldwide. In addition, the user benefits from the long-term availability of spare parts.

All in all, the ACSV G5 is the logical choice for armies around the world and offers optimum investment security.

MODERNISATIONS

ALWAYS **STATE-OF-THE-ART**

As early as the 1980s of the last century, FFG developed its first modernisation concept for military vehicles and benefits from almost 60 years of experience in the maintenance and repair of vehicles.

Armies around the world are regularly faced with the decision to either replace or modernise their vehicle fleets to eliminate obsolescence and adapt their vehicles to current threat scenarios and capability profiles.

Budgetary restrictions and the effort required to introduce new systems often make modernisation more attractive than acquisitions.

FFG has taken up this challenge with the clear goal of upgrading existing vehicles to the latest state-of-the-art. This regularly includes new solutions for protection, mobility and ergonomics. In doing so, FFG always takes into account the life cycle costs.

FFG has a proven track record in retrofitted solutions for tracked and wheeled vehicle platforms of Western and Eastern origins. Upgrade projects include, among others:

- the conversion of protected personnel carriers (APCs) into protected ambulances,
- the conversion of self-propelled howitzers into fire control vehicles for heavy artillery and into mortar carriers, and
- the conversion of personnel carriers into various roles such as communication nodes, Command and Control, light recovery vehicles, fire fighting vehicles, reconnaissance and driver training variants.

To date, FFG has modernised thousands of vehicles in various configurations, always with the focus on the individual requirements of each customer.

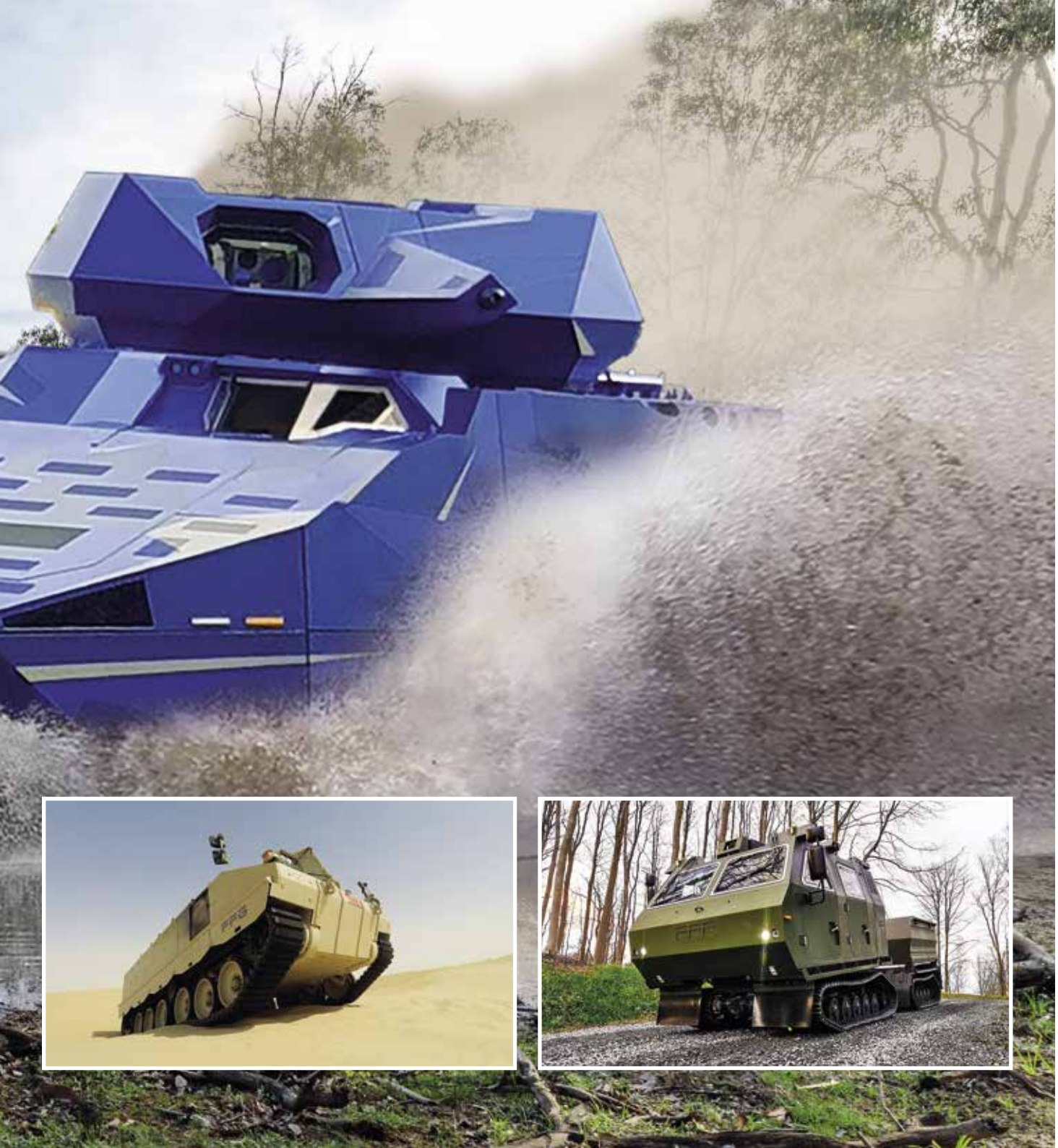
TECHNOLOGY CARRIERS

CLASSIC **USE** – STATE-OF-THE-ART **TECHNOLOGY**

As an innovation promoter in the areas of development, upgrading and production of vehicles, FFG actively develops technology demonstrators to test new vehicle technologies and to demonstrate and refine their functionality. In addition, FFG conducts extensive research projects in the fields of mobility, propulsion and protection.

While some projects focus exclusively on the improvement of a specific feature, FFG generally takes a holistic approach to research projects. Thus, all areas where improvements can be achieved through the use of disruptive innovations are taken into account. In R&D activities FFG places a strong focus on actual usability and always evaluates the results in the context of general military conditions (e. g. climatic conditions and EMC requirements) and additional customer-specific requirements and specifications.

FFG is constantly working on disruptive technologies for track and suspension systems, increasingly in combination with innovative power sources, as well as on protection technologies, and emergency and back-up solutions for mobility, survivability and power supply.



All technologies and systems are developed, prototype tested, integrated and demonstrated. In its R&D work FFG does not limit itself to a specific area of focus – R&D work is carried out for very light vehicles with a total weight of 3 tons as well as for vehicles over 70 tons, for tracked and wheeled vehicles and for general military equipment. Provided that these innovative technologies and systems have proven themselves, we use them in our serial upgrade and production programs.

EXAMPLES FOR FFG TECHNOLOGY CARRIERS

- GENESIS
- HiMoLaP
- PMMC G5
- Wiesel Diok

MAINTENANCE

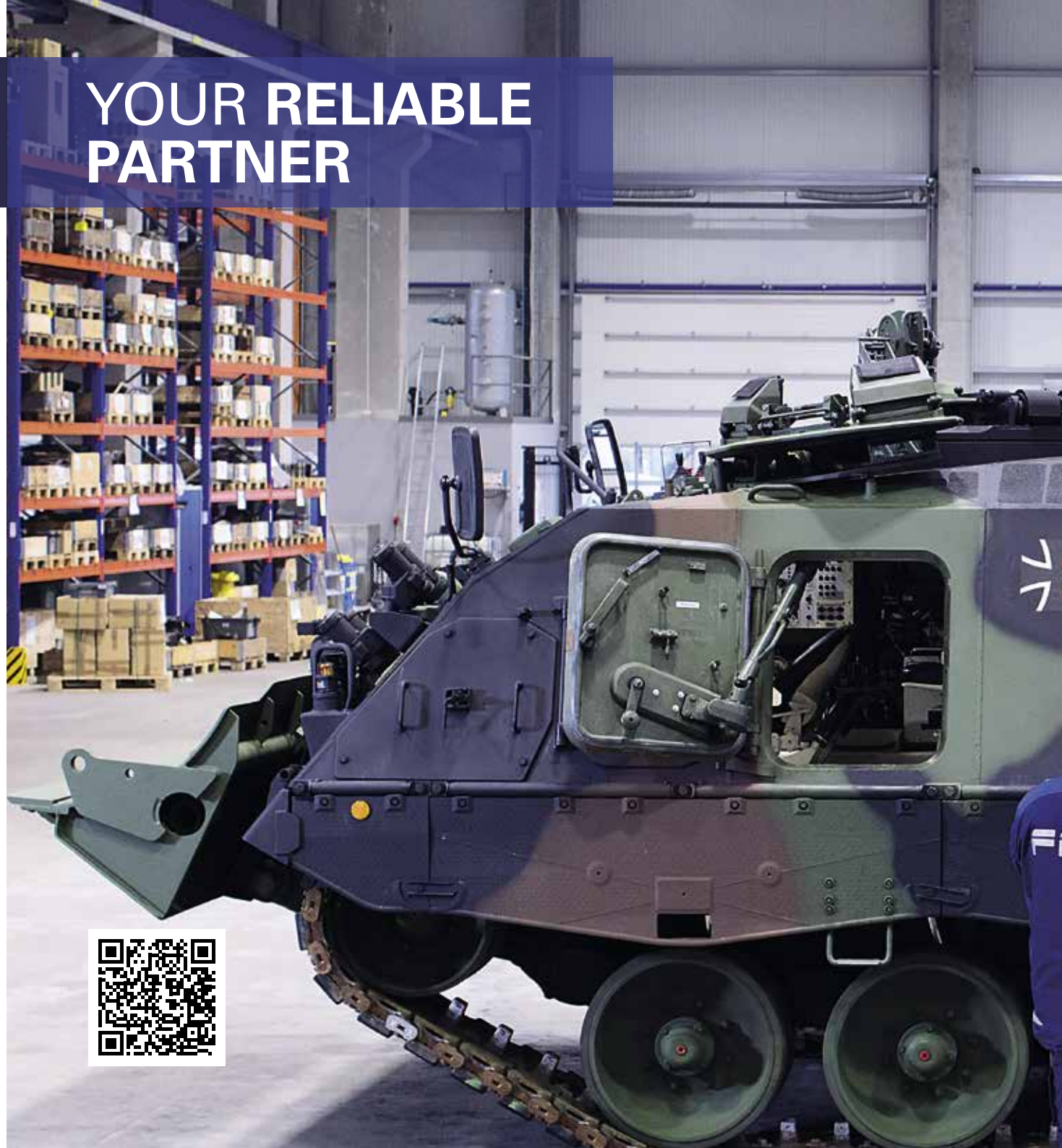
One of our core competences is the repair of military vehicle systems and their assemblies.

Our service ranges from maintenance and major overhaul to modernisation as well as conversion of armoured vehicle systems. For the repair of main and sub-assemblies as well as of individual parts of vehicle systems we can offer not only a particularly broad but also a very deep repair portfolio.

Thanks to our in-house production we are also able to manufacture a large number of spare parts. Flexible and goal-oriented action enables us to optimally adapt to the constantly changing requirements of modern technology in the field of defence.

We can draw on expertise that has grown over half a century to bring out optimum performance and efficiency for our customers.

YOUR **RELIABLE PARTNER**




DURST
DURST

VEHICLE SYSTEMS

From the light armoured weapon carrier Wiesel 1 to the Leopard 2 main battle tank, from the two-axled Wolf to the four-axled Boxer MRAV: FFG is always the right partner when it comes to the repair and/or maintenance of tracked and wheeled vehicles.

In our various specialist groups for the repair of vehicle systems, we not only have the necessary special tools but also decades of know-how.

If necessary, most defective assemblies such as engines, gearboxes, final drives etc., as well as axles are directly sent to the relevant specialist department for repair. This not only reduces repair costs, but also ensures a short turnaround time for the system.

In these specialist departments we have numerous test benches on which the assemblies are precisely tested for their functionality and performance.

FFG has an extensive infrastructure for the repair of vehicle systems. Complex four-wheel drive vehicles such as the Boxer can also be tested on our own brake test stand. In addition, we have a steep slope, test drive track, wading pool, welding shop, blasting and painting cabins and much more for optimal repair. With our wide range and depth of repairs, we are always in a position to ensure that our customers' vehicle systems are quickly and reliably ready for use.

COMPETENCE IN **REPAIR** AND **MODERNISATION**

OUR REPAIR PORTFOLIO

In addition to the vehicles we manufacture, we also repair and maintain the following vehicle systems:

- Leopard 2 MBT, ARV 3 (Buffalo)
- ARV 2 (Leopard), Beaver AVLB, Badger AEV
- Marder IFV, M113, Wiesel AWC
- Boxer MRAV, Fox APC/ATV, Fennec Scout Car
- Truck 15t Multi, Iveco Trakker
- Vehicle Cranes, Fire Engine 8000
- LAPV Enok, LIV Wolf
- KZO launch vehicle

The vehicle systems mentioned are only a selection from our extensive repair portfolio. Of course, we are always ready and eager to integrate new vehicle systems into our repair portfolio and to adapt to the latest technical standards.

ASSEMBLIES

PERFECTION IS OUR DRIVING FORCE

The repair of various assemblies is another core competence and in its unique depth and breadth of execution, a unique selling point of FFG. Due to many years of experience in the processing of components with extraordinary dimensions and the use of test bench technologies, FFG is your competent partner for system solutions of all kinds.

The comprehensive know-how in design and functioning of numerous assemblies enables FFG to deal competently with all mechanical, hydraulic, pneumatic and electrical components as well as engines and gearboxes of any size. In the testing and repair of assemblies, FFG makes use of the most modern technologies and is also in a position to manufacture the required individual parts quickly and cost-effectively. The entire handling process of each individual component at FFG provides a secure basis for quality work for our customers.

FFG acts as an authorised representative of Allison Transmission and is therefore also able to repair transmissions of the 1000, 2000 and 4000 series gearboxes from Allison and to test them on FFG's own test benches. The Allison transmission series are used, among others, in the Boxer and Eagle vehicle systems.

The high demands on functionality and durability of the components are guaranteed by extensive test and diagnostic equipment.

Just like the original manufacturers, FFG also provides a broad and state-of-the-art infrastructure. For the comprehensive tests of different assemblies various test benches are available. Among others, FFG has five engine test benches, two transmission test benches, three injection pump test benches and two hydraulic test benches.

With this broad portfolio of state-of-the-art test bench technology, FFG has the perfect conditions for in-house repair of engines and gearboxes in a wide range of vehicle systems. These include, among others, the engines and transmissions of the following vehicle systems:

- Leopard 1 and 2 MBT and family of vehicles
- Marder IFV
- Boxer MRAV
- Fox APC/ATV
- Fennec Scout Car
- M113

SERVICE

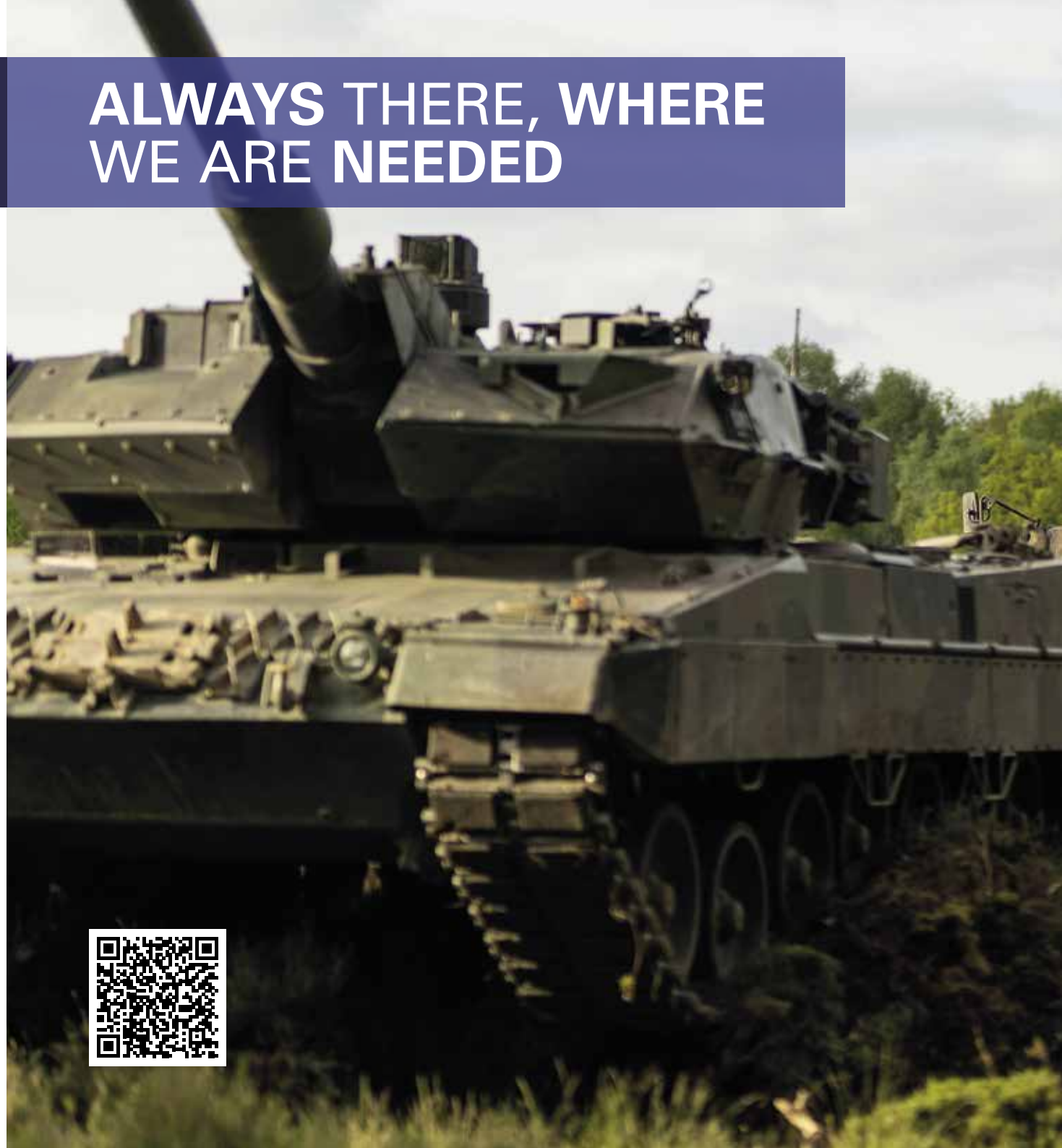
ALWAYS THERE, **WHERE** WE ARE **NEEDED**

Since 1963, we guarantee a wide range of services and reliable operational readiness with our highly qualified service team, both nationally and internationally. Thanks to our flexibility, we can provide staff at short notice even on Sundays and public holidays.

Extensive qualifications and the necessary welding and testing certificates enable us to offer an extensive service portfolio, which is continuously expanded. Our service range includes repair and maintenance of tracked and wheeled vehicles including the vehicle related weapon systems and add-on armour. In addition to maintenance services including all system-related inspections, our team also carries out accident repairs and the installation of technical modifications.

Moreover, we offer a broad spectrum of competence for the repair and modernisation of weapons, air-conditioning, power generator and telecommunication systems. Last but not least, we have expanded our service portfolio with our activities at the facility in Gerolzhofen where the factory overhaul of the FKL/FKM mobile cranes up to maintenance level 4 is completed.

FFG's customer service is available 24/7, 365 days a year, anywhere in the world.



It goes without saying that we take care of the platforms manufactured by us.

We also take care of the comprehensive repair of the following tracked and wheeled vehicles:

REPAIR PORTFOLIO TRACKED VEHICLES

- Leopard 2 MBT, ARV 3 (Buffalo)
- Leopard 1 MBT and family of vehicles
- Marder IFV
- M113
- Wiesel AWC
- BV 206 D

REPAIR PORTFOLIO WHEELED VEHICLES

- Boxer MRAV
- Fox APC/ATV
- Fennec Scout Car
- Truck 15t Multi
- Vehicle Cranes
- LAPV Enok, LIV Wolf

As additional services we offer the welding of steels (including armoured steel) and aluminium.

System-relevant tests are also part of our portfolio as well as the introduction of constructive and technical modifications.

COMPETENCE IN OVER 40 COUNTRIES

SATISFIED CUSTOMERS ALL AROUND THE WORLD

FFG has been a reliable partner of the Bundeswehr and other armed forces for decades. In order to remain competitive and successful in the long term, we are with our customers worldwide and with full commitment – wherever we are needed.

Being active in over 40 countries around the world means working with 40 different cultures and opening up to new ways of thinking.

From Flensburg, highly innovative tracked vehicles go to Norway, WiSENT 1 ARV go to Lithuania, WiSENT 2 AEV to Hungary and spare parts are delivered all over the world. For the Bundeswehr we modify the weapon carrier Wiesel 1 using the latest state-of-the-art technology. With our technology demonstrator GENESIS we have successfully entered into the field of electromobility.

The FFG is much more than just a repair company, upgrade specialist and vehicle manufacturer: As a reliable service provider we operate the CBRN material centre of the Bundeswehr in Kappel in the Hunsrück region, and we are subcontractor for almost the entire material maintenance at the Combat Training Centre of the German Army.

Over the last two decades, FFG has successfully established itself as a system house and is ready for the challenges of the future.

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