



AUTOMOTIVE

MOTORSPORT

MARINE

AEROSPACE



Xtrac Limited, Gables Way, Kennet Park, Thatcham, Berks RG194ZA, England
Tel: +44 (0) 1635 293 800 Fax: +44 (0) 1635 293 700

Xtrac Inc, 6183 West 80th Street, Indianapolis IN 46278, USA
Tel: 00 1 (317) 472 2454, Fax: 00 1 (317) 472 2455

www.xtrac.com





"Xtrac specialises in vehicle transmission technology and from top to bottom is an organisation completely focussed on delivering the quality, service, price and technical innovation demanded by clients in the aerospace, automotive, defence, marine and motorsport sectors."



SPECIALISTS

COMPLETE EXPERTISE IN VEHICLE TRANSMISSION TECHNOLOGY

The aerospace, automotive, defence, marine and motorsport sectors are all high technology industries that demand high standards of engineering design and manufacture from their suppliers.

Supporting low volume requirements with high quality components for niche applications, ranging from pre-production prototypes to high performance vehicles, demands a high added value supplier with specialist know-how. For more than two decades Xtrac has ensured that whatever the vehicle, customers with a transmission and driveline requirement can meet, or even exceed, their engineering objectives by drawing on the company's unique capabilities.

To maintain its position as a leading specialist supplier of transmission and driveline components for projects ranging from marine to aircraft to high performance race cars, Xtrac operates a continuous improvement policy. This promotes investment in talented people

and sophisticated computer-aided engineering and production systems.

Working with industry and academic bodies, Xtrac runs modern apprenticeship schemes alongside undergraduate and postgraduate training programmes and other personal development initiatives.

Nearly every employee is a shareholder through the company's award-winning Employee Benefit Trust and all appreciate the need to re-invest and increase the level of service to customers.

Xtrac's purpose-built factory can work round the clock with skilled machine operators on every shift. Customers benefit from material specifications uniquely developed by the company. Complex components are machined directly from CAD data to meet deadlines that would have been considered impossible just a few years ago, delivering on time to customers throughout the world.

"Our 100 per cent focus on transmission technology - and the approach we take to client confidentiality, attention to detail, 'can do' attitude and achieving on-time solutions - consistently delivers real value to our customers in the aerospace, automotive, defence, marine and motorsport sectors." Peter Digby, Managing Director.



TRANSMISSION TECHNOLOGY



INNOVATION

ORIGINAL THOUGHT LEADS TO GROUND-BREAKING DESIGN SOLUTIONS

Innovative solutions at Xtrac result from an efficient design process that combines expertise in the key areas of product design and production engineering. Xtrac's advanced research and development facilities tackle fundamental transmission matters such as sub-system behaviour, gear technology, rotating dynamics and metallurgy. Paying attention to these critical engineering disciplines helps keep Xtrac and its customers ahead of the competition.

Xtrac's 3D computer-aided facilities employ proprietary software such as Unigraphics CAD, Ansys Finite Element Analysis and MatLab for simulation modelling. This state-of-the-art software is used alongside powerful codes developed in-house, which allow the product design process to continually push the boundaries of what can be designed for manufacture. In addition each project team, led by a senior design engineer, can draw from a pool of expertise developed over many years, thereby ensuring that innovation is designed

for manufacture that meets or even exceeds the expectations of the customer.

Xtrac's understanding of gear forms and bearings is continually expanded as its engineers carry out sophisticated analysis and validation of advanced designs and new profiles that reduce component mass while optimising strength, durability and reliability. To further optimise component performance, material specification is becoming ever more critical, and in this area Xtrac is an acknowledged market expert. By studying the structure and properties of metals in a modern research laboratory, Xtrac in conjunction with industry leader Corus, has been able to develop its own range of high strength steels, which are heat treated in-house following a sophisticated high quality regime using sealed quench furnaces.

Up-to-date analysis and constant validation of design initiatives further helps maintain the integrity of critical parts, components and assemblies.

"As we seek to reduce friction, raise efficiency and improve the reliability through the use of advanced materials, all aspects of transmission and driveline component design are rigorously examined and validated in a laboratory environment using, for example, dynamic test rigs. It's an essential audit of the effectiveness of our design department before we commit to production." Adrian Moore, Technical Director





P R E C I S I O N

EXACTNESS AND ACCURACY STEMS FROM CLOSE ATTENTION TO DETAIL

Xtrac's manufacturing resources comprise all that's necessary to build a complete transmission system: from manufacturing resin patterns and making rapid prototype models for investment castings directly from CAD data, through soft and hard CNC turning and milling operations, to high precision machine operations for hobbing, broaching, shaping, grinding and finishing of many types of internal and external splines and gear forms.

To give but two examples, straight-cut bevel gears can be generated using a Gleason Coniflex® system while spiral bevel and hypoid gears can be formed using the Klingelnberg Cyclo-Paloid method and designed, analysed and manufactured using the 'Klingelnberg Integrated Manufacture of Spiral Bevel Gears' (KIMoS) closed loop system. As a further demonstration of its commitment to world class manufacturing, Xtrac has implemented an efficient best-practice system of self contained manufacturing cells; each cell comprising the most significant machinery required to make complete sets of components. At the heart of the

manufacturing facility is extensive investment in Okuma lathes, Matsuura 5 axis milling machines with off line full 3D Unigraphics CAM programming; an extensive array of Pfauter hobbing machines, four Kapp VUS 55P full form gear grinders, an entire Studer CNC grinding shop operating under laboratory conditions, extensive Charmilles spark and wire eroding capability and a major investment in various finishing operations.

The proximity of machine tools enables multi-skilled operators to work as a closely knit team so they can see the production flow and prioritise each task. If necessary they can switch between stations to ensure the sequencing of machine operations remains balanced for the most efficient throughput. Developments such as these reduce the number of set-ups and lead-times required, and improve customer service.

Machining operations are complemented by multi-axis Vacublast shot-peening systems, electron beam welding and Xtrem and Xtec polishing – Xtrac developed burnishing processes that improve surface finish and increase component life.

"Xtrac understands that to exceed customer expectations it's crucial to invest in state-of-the-art production processes – only then can it assure clients that it can produce close tolerance components to world class standards."

Simon Barker, Operations Director.



TRANSMISSION TECHNOLOGY



INTEGRITY

QUALITY IS WHAT YOU GET WHEN YOU ADHERE TO PROFESSIONAL STANDARDS

To meet the exacting requirements of its customers, Xtrac designs, manufactures, assembles and tests its transmission systems with close attention to detail. Quality is delivered through vigilant monitoring and rigorous control of all processes. It's a deeply embedded characteristic of the company's culture, so that any problems can be spotted and rectified at the earliest possible stage.

From receiving raw materials to supplying finished assemblies, every step is recorded and every part is fully traceable. 'First Article Inspection' reports and control plans ensure manufacturing process control. Rigorous test programmes ensure gearboxes, differentials, drive-shafts and other gearbox mechanisms perform reliably and meet their performance criteria. In addition, the quality system is constantly refined to meet ever-increasing customer expectations.

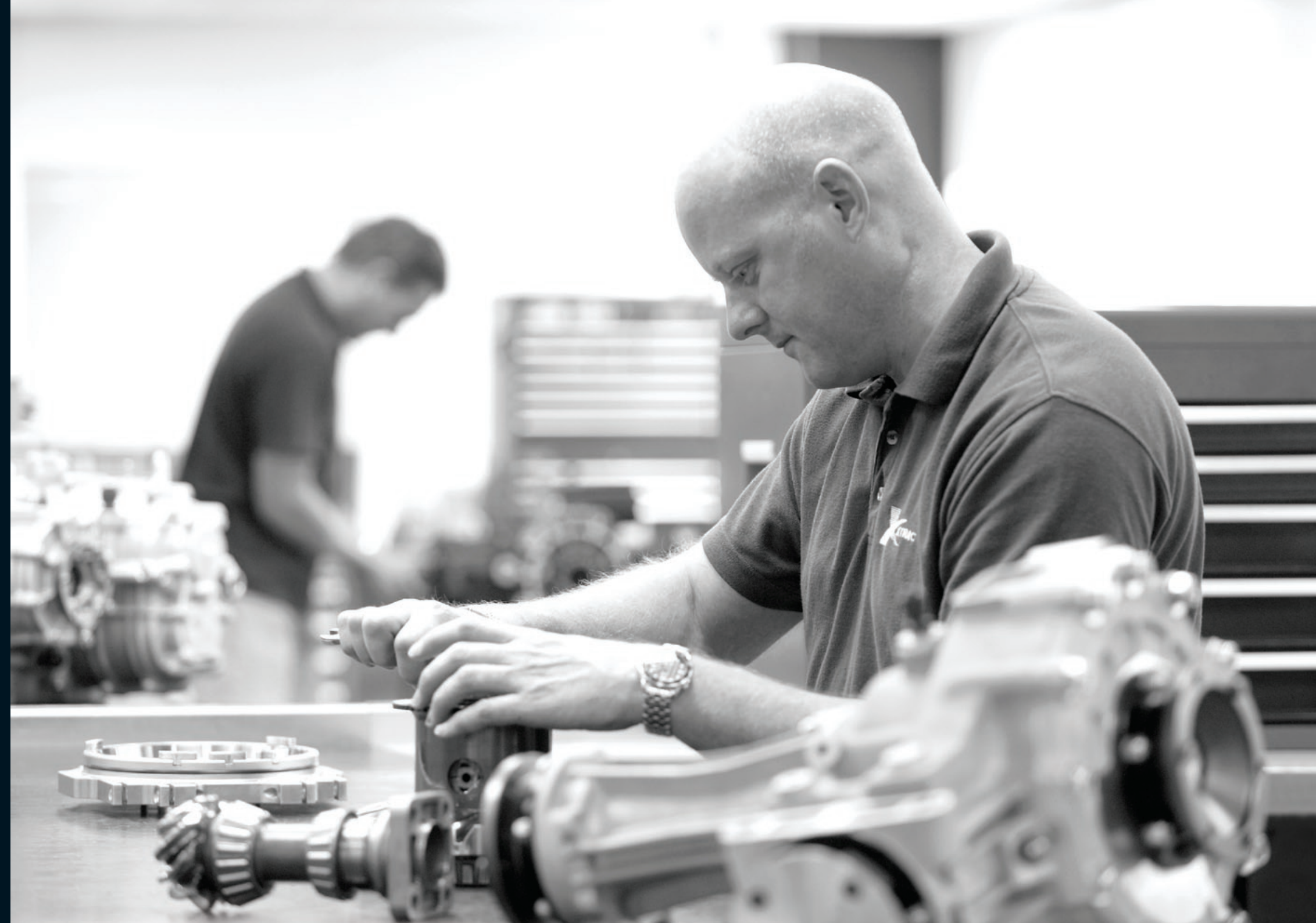
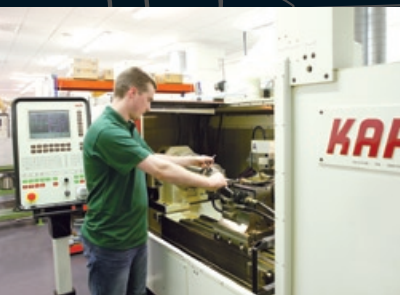
Continual improvement is delivered through training initiatives, a personal development programme for every staff member and by encouraging and rewarding team

members to contribute fresh ideas to further improve the quality, service and technology delivered to customers.

Experienced inspectors and quality engineers, supported by a full range of test equipment including a Zeiss Prismo CMM, Klingelnberg P40 and a Mitutoyo SV-C3100W8 Formtracer and electronic instrumentation, are qualified to meticulously apply procedures that further safeguard product quality. Non destructive testing competences include Nital etch, UVMPI, dye penetrant and ultra sonic inspection.

Metallurgical development is a continuous process at Xtrac, but once a material specification is defined, the company operates strictly controlled metallurgical processes to ensure that material physical properties are maintained to precise performance criteria. Ongoing testing of both new and existing materials, again working closely with the customer, allows Xtrac to offer ultra high specifications for transmissions operating in particularly harsh environments.

"Quality control procedures include detailed analysis of gear tooth profiles and the topography of component parts can be measured to an accuracy of one tenth of a micron," Ian Shirlaw, Quality Manager.





DIVERSITY

TRANSMISSION TECHNOLOGY SOLUTIONS FOR A WIDE RANGE OF VEHICLES

Xtrac's complete expertise in transmission technology means it can meet the diverse needs of a wide range of vehicle driveline applications. From simple rack-and-pinion steering mechanisms through complex driveline components to specialised transmission systems, Xtrac is the expert when it comes to ground-breaking design solutions and meticulous manufacturing of all manner of 'gearbox mechanisms' required in relatively low volumes for specialist vehicle applications.

This can mean a one-off gearset for the aerospace industry or 20 driveline components designed for marine craft propulsion. It can mean 30 high strength gearboxes for military vehicles for the defence industry or 50 high performance transmissions for high formula race cars for the motorsport industry. It can mean 80 prototype steering racks for a new car model or a large number

of pre-production gearboxes for a mainstream automotive test and development programme – an essential requirement before the vehicle manufacturer or their Tier 1 supplier commits to high volume production.

Xtrac can design and manufacture bespoke driveline systems and components, tailored precisely to individual customer requirements. Often it can anticipate and pre-empt customer needs with cost-effective off-the-shelf solutions; such as the synchromesh transmission for high performance supercars. Whatever the vehicle – and whether it's for land, sea or air – the goal is always to achieve the most efficient transmission of power and torque through the driveline; ceaselessly requiring fresh ideas and innovation tempered with experience.

"We seek to provide the most innovative design solutions, then manufacture them to the highest engineering standards,"
Cliff Hawkins, Development Director



TRANSMISSION TECHNOLOGY





Transmission technology solutions for Automotive, Aerospace, Motorsport and Marine applications.

