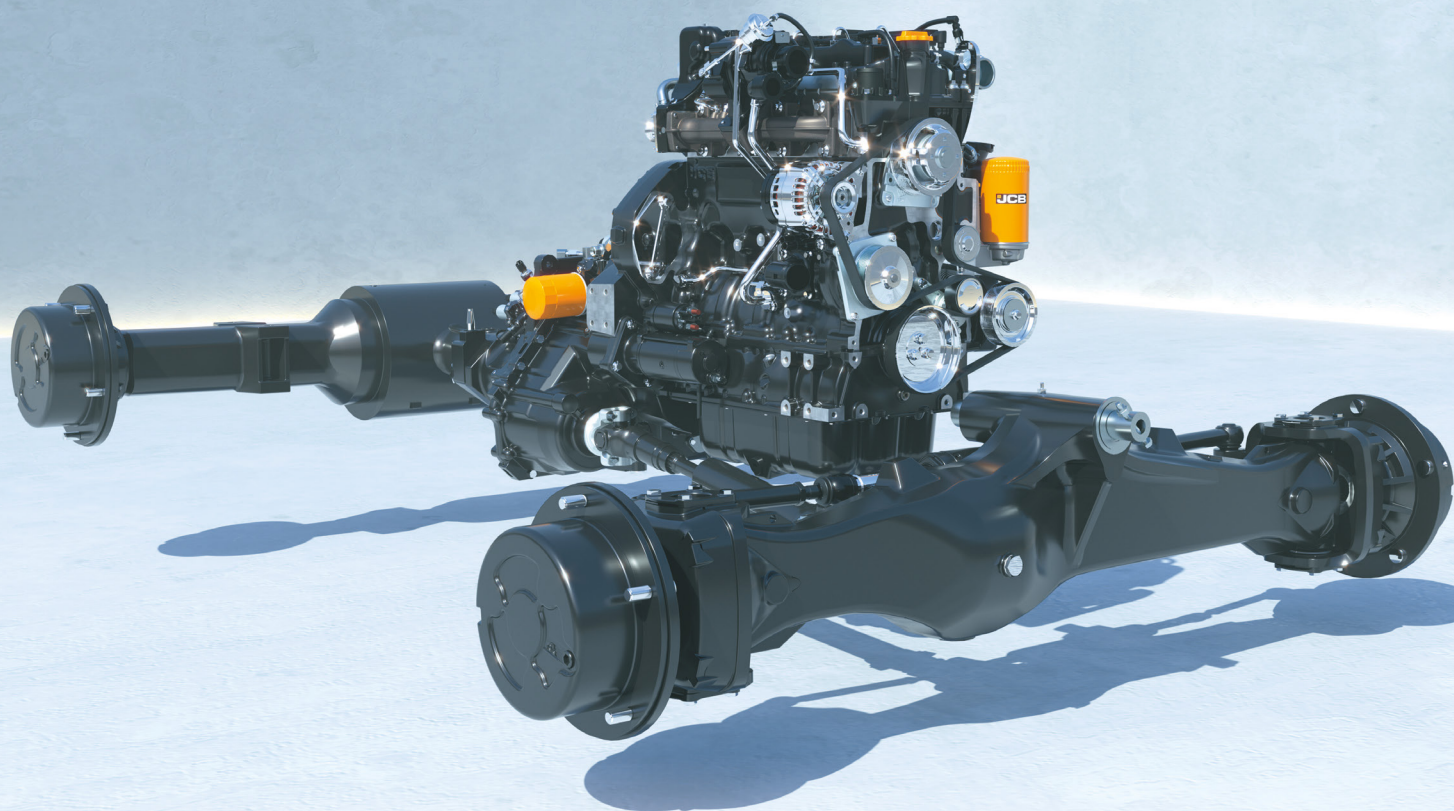


torque

2024



THE STORY SO FAR

JCB Power Systems celebrates 20 years of engine production

CUSTOMER FOCUS

Exploring the wide and wonderful global uses for JCB engines

HYDROGEN IS HERE

A look at our hydrogen combustion engine and opportunities ahead





WELCOME TO TORQUE

It was a normal Monday morning, I was driving to work, gathering my thoughts for the week ahead. As I passed the JCB Demonstration Quarry, I realised I was following our hydrogen JCB 3CX backhoe loader - on the move to JCB World Headquarters.

The hydrogen-powered machine in front of me was a stark reminder of the power and the responsibility that we at JCB, and particularly my team in Powertrain, have. The power and responsibility to deliver a zero-emission future to all of the OEMs we serve. This is our 'Why'. Our reason for being. And it is here, right in front of me, on my way to work, on a normal Monday morning.

Significant moments like this happen a lot at JCB - because every day we are pushing the boundaries, challenging what is possible, and always looking for a better way. You could dismiss this as 'marketing speak', but it is real. It is tangi-

ble and in my short time at JCB, I already feel it.

We are at the forefront of hydrogen internal combustion engine technology. However, we know that the transition to large scale, fully sustainable energy systems will come over the long term. Infrastructure must be developed, technologies which are suitable for the power, performance and environmental conditions of operation must be adopted, and unregulated regions must determine the best way forward.

Until then our clean diesel engines continue to be the product of choice for those applications which require excellent power quality, high torque, robust operation, and high serviceability. Our OEM customers know they can rely on us to deliver complete powertrains or any combinations of individual components – engines, axles, transmissions, and more. There are many stories in the coming pages of how our distributors have gone above and beyond to ensure

complete satisfaction and of how our direct customers are achieving success in their markets. You will also read a series of features highlighting our successes in drivetrain for OEM applications.

Over the last 12 months, we have transformed the engine team, adding fresh talent in applications engineering, marketing, sales and strategy - with talent from diverse backgrounds joining from within JCB and other leading engine industry players. You will meet them later in this issue. It is a team that is strong, serious and committed to driving more value for our current and future customers and partners.

The future is bright green for JCB Powertrain – we will be there to support all of our partners and customers through their upcoming transition to zero emissions. It is our commitment and responsibility to create a better future.

This is our 'Why'. I hope you'll join us on our [road to zero](#). ●



Jess Keen
Head of Sales & Marketing
JCB Powertrain

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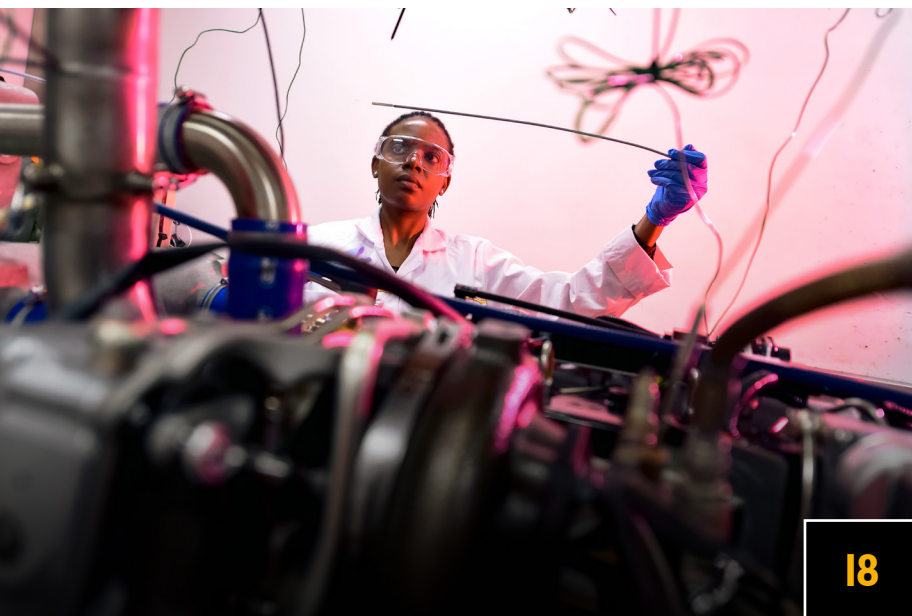
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EUROPEAN EXPANSION

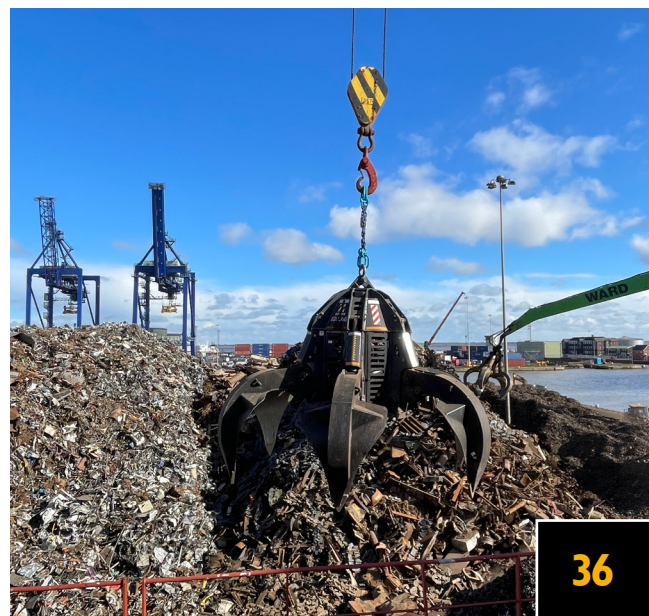
We highlight two recent additions to our distributor network in Europe – further strengthening our presence and expertise on the continent.



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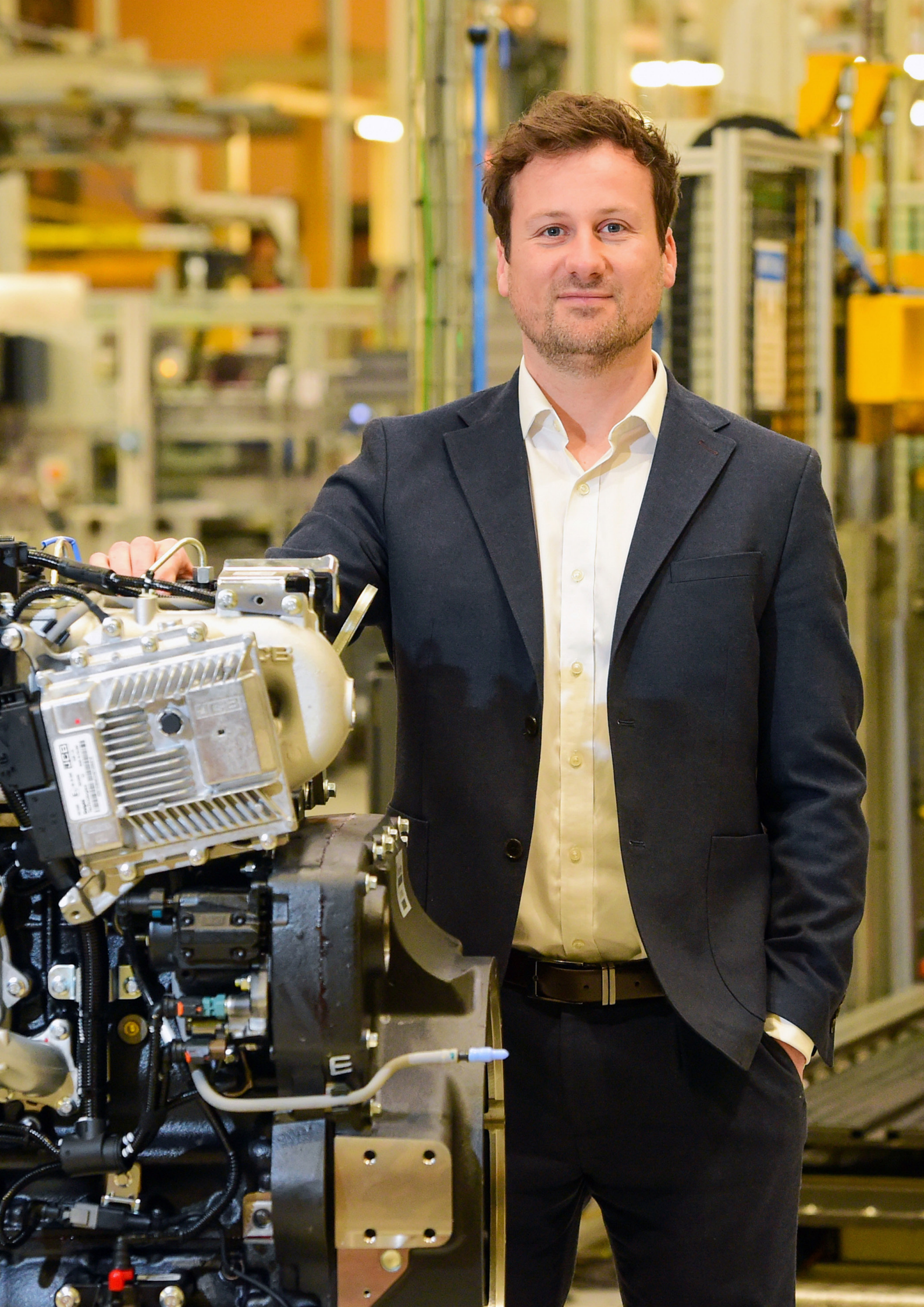
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POWERFUL PROGRESS

We sat down with JCB Powertrain's Global Sales & Applications Manager, Jon McNulty, to review a period of significant evolution and progress for the business.

How has the last year been?

I think the best word to sum up the last year is ENERGY. I felt this through my entire new role, taking over managing the sales function in addition to my application engineering duties. I felt it through our new leadership and direction with Jess Keen coming on board from the engine industry and consolidating the engine and drivetrain teams. I felt it through my travels, visiting 10 US states, 2 Canadian provinces and a further 8 countries, in addition to visiting all of our distributors and direct customers in the UK. And above all I felt it when I went to India for the first time, I've never witnessed so much energy before. Last year just hit differently, it felt like the first normal year back to business, returning to shows, seeing customers and applications face to face, and really feeling the drive to move the needle and make something happen.

The energy in India is phenomenal, I was lucky enough to visit Delhi and Bangalore last year, and the vibrant sights, sounds and energy coming from the people is incredible. It is such an amazing country. JCB is very well known in India, and the reception by people was wonderful and made my experience even more

special. We travelled around visiting current and potential customers, meeting with all of our counterparts at JCB Power Systems India, and having many cultural experiences including a traditional Thali meal and visiting the India Gate and the sights around Delhi. At the Excon show in December we displayed our India-built clean diesel engines and promoted our hydrogen technology and I was astounded by the energy on the stand. From the Dancing Diggers, to the DJ and the beating drums of the 'house' band, to the AR displays and the full meeting rooms, it was a show I will never forget.

All of this energy has recharged and renewed my passion for this business, and I hope through these pages you will find a refreshed outlook on the Powertrain business that will charge up your energy banks too.

How would you describe the current outlook for the OEM engine sector?

We are seeing continued investment and the growth of clean diesel across the Americas, Africa, Europe and Asia. Clean diesel will continue to be the chosen technology for the foreseeable future, while the world begins to invest

in more sustainable energy infrastructures. Many public and private entities are turning to full electrification, but there are many off-highway applications where electrification is simply not viable.

Clean diesel will continue to play a vital role until global production and distribution infrastructure is in place.

Which geopolitical factors do you think will have most impact and how?

The biggest challenge facing our planet is the road to zero emissions, and this directly impacts original equipment manufacturers. Our Chairman, Lord Bamford, has personally driven our charge towards hydrogen internal combustion technology to find our customers the most affordable and practical way to transition to a renewable energy source. I am very proud to be part of a company which is at the forefront of this technology change. While JCB is already a global household name for pioneering agriculture and construction equipment such as the iconic backhoe loader, I believe the JCB brand will be recognised by my children and future generations as a hydrogen technology leader. ▶

JCB at CONEXPO-CON/AGG (Las Vegas, USA) ▶



What have been the highlights of the last year from an operational and commercial perspective?

There have been many highlights for the past year. We've seen Powertrain volume grow by 17% in Europe and 39% in the ROW vs the previous year. Engines alone saw a 3% increase in Europe and Drivetrain approved 14 new OEM applications which we will start production of this year.

Another standout success was our massive growth in the road sweeping industry within Turkey where we now dominate with a 50% market share.

Growing the business into the crushing and screening sector, notably with [Terex Powerscreen](#), was a particular highlight for me

personally, as I previously worked in this industry. It was rewarding to pair both my former and present passions together. I've had the opportunity to grow my early career - designing screener powerpacks - to now taking responsibility for our relationship with a market leader, overseeing installation appraisal through to supply. It has given me immense pride and a complete 360° perspective of this industry.

Can you highlight any major product developments that have been introduced?

Words cannot express how excited I am to see the development of the hydrogen internal combustion engine unfold, driven as it is from our UK manufacturing facility. We are witnessing pro-

gress on a weekly basis. The sense of urgency and atmosphere within the factory is unprecedented. I have never experienced a team so united, so passionate and working so hard – all unified behind this future technology path. I feel very privileged to be part of this story.

Within the OEM product range, we have also developed a new SAE 2 flywheel and housing solution to complement our existing range of 448 and 672 engine families. The rigorous endurance testing completed both in a test cell environment and in customer application really shows the depth of expertise in our engineering department and the extreme lengths we go to in order to ensure the most robust solution is released to market.



“We have seen significant development over the last 24 months in Northern Ireland as we have continued to make inroads with major customers in the crushing and screening industry.”



The Terex Powerscreen Warrior 1400X screener – now powered by a JCB Stage V IPU engine. ▲

Specifically looking at the hydrogen engine, what progress has there been since the project was announced?

The project has developed at a remarkable pace since it commenced in 2020. Having achieved Lord Bamford’s ambitious development targets, we now see hydrogen engines being produced on the same production line as our current diesel engines every day. Proof that the original bold thinking has truly become a reality.

The interest levels across our global exhibition appearances have been unprecedented. From the largest OEMs to students, owner operators, competitors and small and medium sized businesses, everyone took the time to visit the JCB stand to see our technology and the hydrogen solution engine in the flesh. Visitors delighted in the fact that the JCB H₂ engine delivers no compromise on power, performance, and space – unlike any other green technology path currently available. And that buzz shows no sign of abating.

Are there any other exciting developments on the horizon for JCB Powertrain that you can share?

We are continuing to invest in our existing product line and developing more features to complement our current product platforms. We are also focused on providing our customers with more value out of complete powertrain and the continual expansion of our global distribution network will continue to extend our reach and create further opportunities for growth.

Can you outline some of the most interesting new applications JCB engines have been used in recently?

It is hard to select a few as we have so many interesting applications in many industries around the world. However, a truly memorable project was delivered in partnership with our Italian dis-

tributor, [Pitteri Violini](#), who delivered an engine for a vertical drill rig machine commissioned by [Casagrande S.p.A.](#)

The machine had to be split into three sub-assemblies with a max weight of 500 kg each, to enable transport by helicopter into remote mountainous areas which are inaccessible by road. The sections can then be re-assembled within 20 minutes for maximum productivity and minimal disruption upon arrival to the job site. The first deployment was at high altitude in the Italian Alps which would have been unreachable for a conventional machine of its type, and it performed with zero power de-rate.

What new countries or territories have seen the most growth over the last 12 months?

We have seen significant development over the last 24 months in Northern Ireland as we have continued to make inroads with major customers in the crushing and screening industry. Given that our Stage V IPU engines are perfectly suited for the rugged, challenging environments this equipment typically works in, we have high hopes for even further expansion in this market.

Our strong and dedicated distributors in both Australia and New Zealand continue to drive growth in Australasia while our South American presence has been bolstered by the appointment of [Motormart](#) as a distributor in Mexico, [Dercomaq](#) in Chile, and [LMA](#) in Argentina, to further extend our sales and support network in the region.

We are now turning our attention back to Europe to develop our distribution network further and ensure we have optimum coverage here. As we have already touched upon, we must give credit to [SIF](#) - our partner in Turkey - for the sterling success in the road sweeper industry, and we are pleased to welcome new partners in Sweden and Switzerland later in this issue. ●

THE STORY SO FAR



This year JCB Power Systems celebrates its 20th Anniversary.

JCB Power Systems first began operations back in 2004. It has been a torque-infused tale of success ever since. One which has seen JCB Power Systems propelled from a fledgling market entrant to the leading global engine manufacturer it is today.

In 2004, JCB became the first company in the UK to begin diesel engine manufacture for 60 years using the most modern design and manufacturing facilities. A total of 487 engines were manufactured in the first 12 months. Fast forward 20 years and almost as many are rolling off the production line each day. And the company is rapidly approaching a significant milestone – the production of its millionth engine.

Engines span from our earliest Stage II / Tier 2 models through to today's award-winning Stage V and Tier 4 Final technology. Our engines power off-highway mobile equipment through to static products including water pumps and gensets. We power applications on six continents, supported by 26 distribution partners, and a network of 770 dealers. Our engines have saved bil-

ions of tonnes of CO₂, reduced NO_x emissions and - with the inception of our ground-breaking hydrogen combustion variant - look set to eradicate harmful emissions altogether.

From high altitude in snow-capped mountains, to the middle of the ocean or the arid Bonneville Salt Flats, today JCB engines play a critical role in vastly diverse applications across the world.

Here's the story so far.

MAJOR INVESTMENT

JCB Power Systems Ltd was formed as JCB forged ahead with plans to produce its own diesel engines by acquiring a multi-million-pound manufacturing plant. The company completed the purchase of a 160,000 ft² facility at Dove Valley Park in Derbyshire, UK in 2004 – and the site remains the global engine production hub and innovation centre today.

Diesel engines first began rolling off the line at JCB Power Systems in November 2004 when the company employed just 64 people.

The £80 million project was the culmination of a five-year programme, emerging from extensive engine feasibility studies by JCB spanning more than a quarter of a century.

The first JCB engines to be manufactured were three four-cylinder, inline, four-valves-per cylinder, direct injection JCB Dieselmox models. The smallest output model was a naturally aspirated diesel offering 74 hp at 2200 rpm, followed by a turbocharged model with an output of up to 99 hp at 2200 rpm. The biggest was a turbocharged aftercooled engine rated at 125 hp.

RECORD BREAKER

In 2006, two modified Dieselmox engines powered the JCB Dieselmox Streamliner to a diesel land speed record of 350.092 mph on the Bonneville Salt Flats in the USA. It's a world record that still stands today.

The idea to attempt the record attempt was originated by JCB Chairman, Anthony Bamford, born of his desire to showcase the extreme performance of the JCB 444 diesel engine. ●



Bucher Municipal has introduced JCB's Dieselmix engine across its world-leading road sweeper range. ▶

2005

External engine sales to the OEM off-highway application market began.



OEM ORIGINS

While initially supplying engines for JCB's own range of off-highway equipment, the opportunity to develop engines and drivetrain solutions for other OEMs was soon realised.

External engine sales to the OEM off-highway application market began in 2005. Stage II / Tier 2 mechanical engines were sold to new customers in a variety of industry sectors, including power generation, water pumping, crushing, screening and marine. It was here that JCB Powertrain's own journey began.

RANGE EXPANSION

In 2008, JCB strengthened its presence in the engine manufacturing industry with the introduction of a series of new variants to its record-breaking JCB Dieselmix 444 platform. These included the introduction of a new JCB Dieselmix 448 engine, four new Stage IIIA / Tier 3 mechanical engines and three new Stage IIIA / Tier 3 common rail electronic engines.

Four new G-drive engines (50 Hz) were also launched specifically for electrical power generation applications while B20 Biofuel compatibility was introduced across the range.

2008

Introduction of a series of new variants to the record-breaking JCB Dieselmix 444 platform.



Skytrac use JCB engines to power the emergency evacuation drives fitted to its ski lifts. ▼

JCB India's HQ in Ballabgarh. ▼



2010

JCB India began production of engines at its headquarters in Ballabgarh, allowing domestic customers to benefit from the performance and reliability of JCB's world-beating engines for the first time.

ECOMAX ERA

In 2010, JCB engine production commenced in India with the opening of a dedicated engine manufacturing and assembly line at JCB India's HQ in Ballabgarh, near Delhi. The facility mirrors its UK counterpart in delivering efficiency, consistency and quality control. It is identical to our UK production approach in every way, and at one stage the facilities were even run by two brothers!

The start of the new decade also marked a seismic shift on the embryonic road to zero, as JCB made one of the biggest investments in its history to develop the off-highway sector's cleanest engine in readiness for incoming emissions legislation. To begin with, the company invested a further £80 million in the research and development of a new combustion system for the new JCB Ecomax Stage IIIB / Tier 4 Interim 4.4-litre engine.

The engine underwent full in-field testing before going into production in 2012. It represented an industry-first solution which eliminated the need for any exhaust after-treatment and

delivered tangible cost savings for customers.

Key benefits of this first JCB Ecomax innovation - such as reduced fuel consumption, reduced cost of ownership, better reliability and no compromise on machine design - were to become hallmarks of our engine developments ever since.

The company's strategy was to meet Stage IV / Tier 4 Final emission standards without a DPF but also to achieve this without any exhaust after-treatment. Research and development were focused on a high efficiency combustion system; making sure the pollutants were not created to begin with rather than try and deal with them later. This approach also enabled very low fuel consumption levels.

The move into 6-cylinder engine production in 2013 was a historic moment for our business and a natural step to take, setting new standards in performance and fuel efficiency. The JCB Dieselmox 672 was based on the company's successful four-cylinder 4.8-litre Dieselmox engine, with a high degree of parts commonality across the two engine platforms. ►

ROYAL RECOGNITION

In 2016 JCB Power Systems celebrated winning two Queen’s Awards. The first was for Innovation for the development of the JCB Ecomax engine with its low-emission combustion system. The second award was for International Trade, recognising the growth in overseas OEM sales of the engine by more than 325% between 2012 and 2014.

2017 was a major year for JCB Power Systems’ manufacturing capability. The company invested £10 million in new CNC machining centres and associated automated processes at its UK engine facility. This investment created new jobs and allowed the company to produce cylinder heads, engine blocks and bedplates in-house for the first time.

JCB Power Systems also celebrated a massive milestone: producing its 500,000th engine. It took eight years to build the first 200,000 JCB engines and only five years to build the next 300,000 – highlighting the rapid growth of the business which by now offered base engine, industrial power units and G-drive configurations to the OEM market.

This year also saw production start on a brand new fuel-efficient JCB diesel engine,

marking the culmination of a £31 million investment programme. The brand new 3.0-litre JCB 430 Dieselmix engine joined the proven 4.4, 4.8 and 7.2-litre models.

WORLD’S FASTEST

JCB’s earlier exploits on the Bonneville Salt Flats whetted the appetite for speed and in 2019 it was the turn of the six-cylinder Dieselmix engine to enter the record books. A derivative of the engine was pushed to extremes, powering a specially modified JCB Fastrac to success in a Guinness World Record attempt to become the World’s Fastest Tractor.

The unique JCB Fastrac hit a peak speed of 153.771 mph (247.470 km/h) on its way to an average speed of 135.191 mph (217.568 km/h). The Fastrac’s six-cylinder engine was equipped with a larger turbocharger and an electrically driven supercharger, along with water injection and charge air intercooling through ice tanks. This resulted in a peak output of 757 kW and more than 2,500 Nm (1,843 lb-ft) of torque. While such power is certainly not standard for industrial specifications for this size of engine, it demonstrated the inherent strength and durability of the JCB Dieselmix design.

SIMPLY THE BEST

JCB Power Systems won Engine of the Year at the sector’s leading global awards in 2021. At the Diesel Progress Summit held in Rosemont, Illinois, it was announced that the company was victorious in the under 175 hp category with its EU Stage V compliant, JCB 430 Dieselmix engine.

Judges considered innovations relating to engine design, emissions, telemetry/connectivity, control technology, packaging, ease of maintenance and ownership. The winning Stage V 430 Dieselmix engine is 24% smaller and 30% lighter than its predecessor yet offers 10% higher torque output plus an 8% fuel saving. Showcasing the hallmarks of JCB’s Stage V engines first unveiled in 2019, it brings higher torque at low engine speeds, greater fuel efficiency across its performance spectrum and brings significantly reduced service and maintenance costs compared to all major competitors.

The Engine Of The Year announcement was yet another highlight in the continued rise and later that year – just four years on from the 500,000th engine milestone - JCB celebrated the production of the landmark 750,000th unit as capability and demand continued at pace. ▶



2016

JCB Power Systems celebrated winning two Queen’s Awards for Innovation and International Trade.

2021

At the Diesel Progress Summit, the 430 Dieselmix won the Engine of the Year Award for engines up to 175 hp.

Alan Tolley and Robert Payne accept two Queen’s Awards. ◀

153 MPH

The unique JCB Fastrac hit a peak speed of 153.771 mph (247.470 km/h) on its way to an average speed of 135.191 mph (217.568 km/h).

JCB entered the record books for the second time with the world's fastest tractor. ▼



2023

JCB's pioneering hydrogen combustion engine made its international debut at a series of global trade shows.



GLOBAL MANUFACTURE

Today JCB is nearing the production of its millionth engine. In the UK, models are built from 55-212 kW, meeting a broad spectrum of emissions legislation from Stage II / Tier 2 to Stage V and Tier 4 Final. These are still used internally in our own JCB products as well as being supplied to OEMs around the world.

JCB India manufactures 58 variants including 444 and 448 engines from 55-129 kW. Meeting BSIII and BSIV emissions legislation, there are approximately 200,000 of these engines already operating successfully in the Indian market. Machines fitted with them are exported to over 80 countries around the globe.

THE ROAD TO ZERO

As a business, JCB is absolutely focused on overcoming the challenges we all face due to climate change and rising global temperatures. JCB Power Systems has long been committed to helping to make off-highway equipment cleaner. Cutting exposure to air pollutants and reducing greenhouse gas emissions is something we take very seriously and innovation has been at the heart of our ground-breaking clean diesel engine development.

Investment has already helped to make existing engines dramatically better.

At Stage V our engines have almost eradicated harmful emissions. NOx is down 97% and soot particulates are down by 98%. In JCB's own machines alone, clean diesel technology has helped deliver a 50% reduction in CO₂ emissions by improving fuel efficiency - saving more than 2.5 billion litres of diesel and counting. Through JCB Powertrain the company has the opportunity to influence even more equipment in even more sectors as the power behind so many OEM products and equipment.

As JCB Chairman, Anthony Bamford said: "Whether it be clean diesel, electric or hydrogen, power sources developed, engineered and supported by JCB Power Systems will be at the forefront of the road to zero in virtually every sector and on every continent in the world.

"We are in a uniquely privileged position to power machines and equipment that touch everyone's lives – from boats to pumps to diggers – working in factories, farms, quarries and more. Products that build infrastructure, enhance productivity, protect livelihoods and improve standards of living. Most importantly, products that do so in a way that will help protect the planet for future generations."

With the development of more than 90 prototypes, JCB is well down the road to developing a power source for the future. Designed to

optimise the combustion of hydrogen it aims to deliver identical power, torque, and efficiency as existing diesel engines, but in a zero-carbon way. Prototype JCB hydrogen engines are already powering backhoe loader and loadall telescopic handler machines under test conditions in the UK.

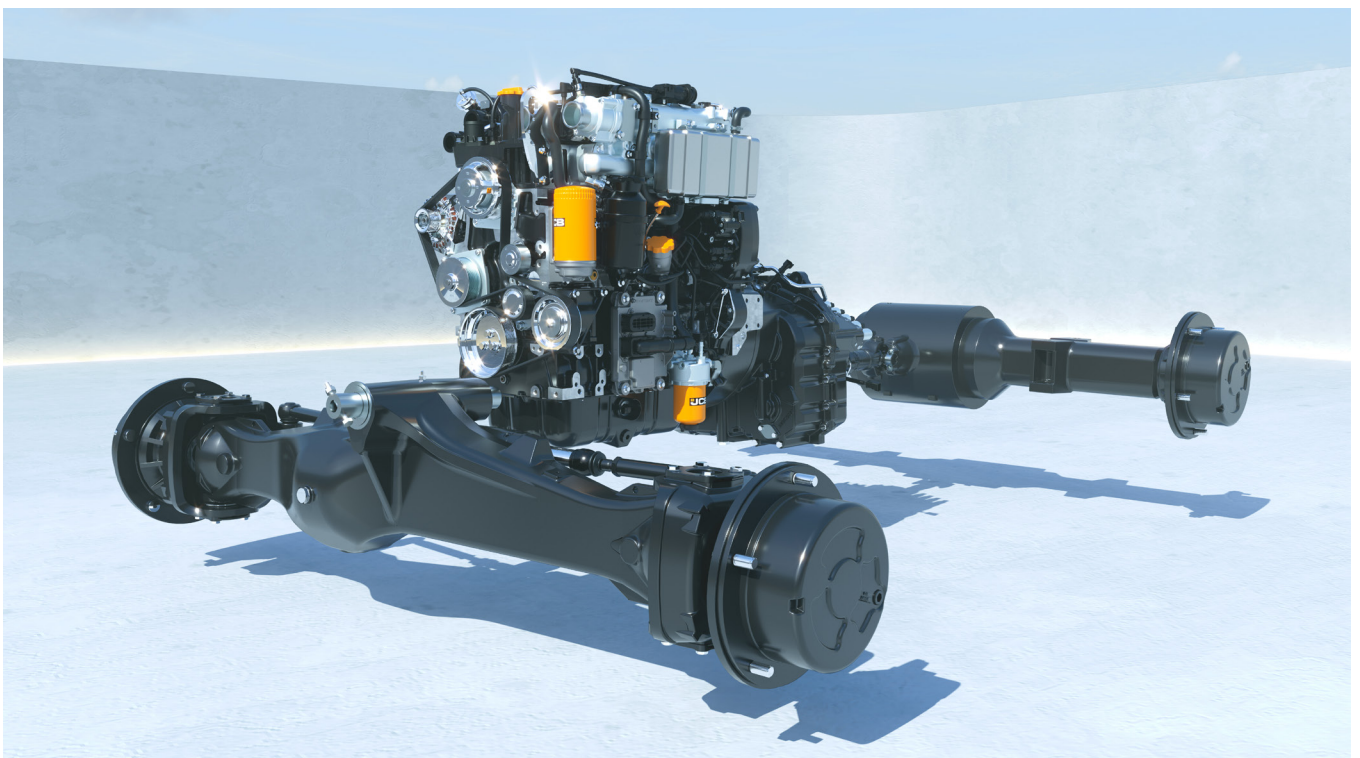
As Lord Bamford said: "Our developments in hydrogen power represent a zero emission, sustainable innovation which we believe will change the face of global industry."

JCB POWERTRAIN

To bring the journey right up to date, 2024 has seen our OEM engine division formally joining forces with JCB Drivetrain Systems under the new JCB Powertrain banner. This consolidation of expertise further strengthens the existing alignment and synergy between the two and delivers an even more seamless solution for customers. We can supply engines, axles, transmissions and integrated powertrains for off-highway applications to OEMs around the world within the 55-212 kW power range.

The unique combination forms a complete OEM powertrain for mobile applications where engine, transmission and axles are all built by the same manufacturer. The culmination of 20 years of innovation and it's the start of an even brighter future. ●

JCB's unique, fully integrated powertrain solution. ▼





DREAM TEAM

As we mark our marvellous 20-year milestone, we asked 20 members of our team that have played a key part in the story so far, what they believe makes JCB Power Systems so special.

Doris Khaemba, Senior Engineer ▲

Every business claims its people are its biggest asset, but at JCB Power Systems our people truly are the power behind our success now and in the future. A huge number of them have spent their entire working lives with us or built a significant proportion of their careers here.

The famous JCB sense of urgency is not for the faint-hearted but it creates a hugely fulfilling and rewarding career path with challenges to embrace and opportunities aplenty. With so much achieved in such a short space of time, it has formed a unique bond.

And while we recognise that every member of our 15,000-strong global team plays a critical role, for this anniversary edition of Torque we've interviewed twenty influential JCB Power Systems employees – past and present – to help us chart the history of the business and tell us how they helped make it happen.

HUMBLE BEGINNINGS

Bob Womersley spent 14 years as Chief Engineer at JCB Power Systems overseeing the development of some of the key products in our history. He recalls: "In 1985, I remember being taken aback when Mr JCB (JCB Founder Joseph Cyril Bamford) said to me, 'I want to build an engine'. From that point on I remember his meticulous attention to detail, analysing the minutiae of how the engine should be, because he knew exactly what he wanted - he wanted the best engine in the world. Well from little acorns, mighty oak trees grow!

"That initial goal sowed the seed for the creation of JCB Power Systems nearly 20 years

later and the rest, as they say is history." Bob continues. "All of a sudden we're now at the vanguard. I've seen the company's evolution from an aspiring market entrant to a world leader in the space of a couple of decades, which is an awesome progression. We've realised Mr JCB's dream."

Marketing Manager Ann Bracken has been here since day one, working in a variety of roles across the business. She recalls: "Starting in a team of 20, to now working in a facility employing over 300 people really demonstrates the evolution of not just our product range but the facility and organisation as a whole. Progressing from prototype engines designed and developed in a project office to a mass scale production line has been incredible to watch and be part of.

"It was recognised early on that the JCB engine was also well suited to a vast variety of OEM machines and that's been proven over the years. Through our external sales of engines we've been able to enter sectors beyond those where JCB has its traditional strengths. The merger with JCB Drivetrain Systems is an exciting next step for us in the JCB Powertrain team, providing us with increased opportunities to open doors with other customers and territories looking for the full powertrain package."

Manufacturing Engineering Manager, Mark Deaville adds: "There have been some massive changes in the last 20 years and I have been lucky enough to be involved in many of the key projects personally. It's been interesting to watch this expansion and evolution over those two decades and the variety of products now is immense – totalling over 750 product variants." ▶

Bob Womersley, Product Innovation Director ▼



Marco Bersellini, Group Executive Director ▼



David Phillips, Applications Manager ▲



Mollie Wheatley, Development Technician ▲



A REMARKABLE RISE

Chief Engineer, Chris Ward outlines how major ongoing investment since the inception of JCB Power Systems has enabled a significant transformation to the facilities and capabilities of the business. He explains: “The business has evolved massively in my time here. Beyond the outer shell of the building, we’re simply unrecognisable from before. As well as the new lines we’ve added a lot of the sub-assemblies, new machining centres, transfer lines, washes, and inspection areas. Our testing capabilities are enhanced too with emissions measurements, mechanical development, testing and endurance all now in-house within this facility.”

Applications Manager Dave Phillips tells a similar tale, he said: “The development of the business over my 15 and a half years has been quite something, with a significant technology shift from mechanical FIE and early common rail engines, through to today’s highly complex Tier 4 Final and Stage V engines with aftertreatment. That’s been in part enabled by a significant growth in the size of the engineering team to deliver products to meet challenging new emissions legislation requirements.”

Development Technician Mollie Wheatley highlights the development of the workforce as well as the facility, she said, “In terms of women in engineering it has been really nice to see an increase of females, mainly apprentices, within the engineering teams. When I first started there was only two. This year alone we got three new apprentices, all females so definitely a really refreshing and positive sight.”

Reinforcing the team’s reflections, Engineering Director Ryan Ballard sums up the company’s evolution as he hails the remarkable rise: “The size of the business, the complexity, the number of engines we make and the emissions levels we cover have all grown enormously. When I started working here, we were preparing for the Stage IIIB and Tier 4 Interim legislation – becoming the first in the industry to have an engine requiring no aftertreatment.

“Since then, we’ve achieved Tier 4 Interim, Tier 4 Final, BS5 in India, Stage V in the UK and Europe - and then obviously there’s hydrogen combustion which just blows us all away. We’re going to be one of the first manufacturers in the world to release a production hydrogen internal combustion engine, delivering a zero emissions solution. I find it really gratifying to be a small part of the team, delivering a fantastic product that can really have the power to change our world for the good, and the OEM opportunity for the future is enormous.

“We started our journey on hydrogen

engines in 2020, not only less than 4 years ago but also right in the middle of an unprecedented global pandemic. So, it is fair to say that this really has been a remarkable project. That’s also how I’d encapsulate our evolution in general, remarkable. Certainly, in terms of size and capability but we’re also becoming more and more professional in the way we go about things, the way we plan strategy, the way we execute the work that we do. The designs, the testing, the way we sell and market the products and finally the way we interact with the rest of the JCB Group, it’s all just great. It really is phenomenal how this business has grown up.”

GOING EXTERNAL

Within the wider JCB Power Systems organisation, our OEM team – now JCB Powertrain – is focused on developing solutions for external customers rather than JCB’s own equipment.

Marco Bersellini – now Group Executive Director at JCB – originally joined JCB as Sales Director at JCB Power Systems in 2006. He was responsible for developing sales of the Dieselmox engine to OEMs and appointing a dedicated network of global distributors. Marco recalls: “I moved here from the USA specifically to work at JCB Power Systems. We only had a few distributors at that time, so my focus was growing the channel, which would be the foundation of our success. It was an exciting time because we had this brand new engine and everybody wanted it because they trusted the JCB brand. With just a small sales team we expanded from 3 distributors to 13 distributors in just a few short years, but we were also contacting OEMs directly and trying to win business through both channels.

“The JCB team was excited because they could see things happening, the business was growing. There was a real buzz because it was very easy to ring any door. The reputation of JCB in the market was amazing, it was a great ‘business card’ for JCB’s offering.”

Dave Phillips said: “The growth of the OEM business had had a big impact. Sales revenue contributes to growth and profitability, while also raising the profile of JCB and its capabilities outside of the construction and agricultural equipment sectors. The ongoing development of dealer and customer relationships, allied with the closed loop feedback process has undoubtedly led to product improvement which in turn breeds customer loyalty, confidence in the brand and further sales. There is always something valuable to learn about how customers use our engines every time one is installed for a new application.” ▶

A SPECIAL RELATIONSHIP

Brijender Singh is Head of Manufacturing Engineering, Supplier Development and Maintenance at JCB Power Systems in India. The JCB engine business there has mirrored the UK, not just in terms of the identical manufacturing facility but also the seismic growth in a short space of time. He commented, “The JCB India engine manufacturing plant set up in 2010 is one of the best facilities in the locality and we follow the exact manufacturing techniques of the UK facility. Over the period, we have upgraded our technology to build reduced emission engines, moving from BS III to BS IV and now to BS V electronic engines. Recently we have crossed the 400,000-engine production milestone in India with best-in-class technology, so it has been very rewarding and fulfilling for our entire team. I am honoured to be part of this winning team and I am confident that it will achieve greater success in the future.

“The OEM sales business has huge potential for new markets and customers and the future looks very promising. The OEM business is a strategic opportunity to diversify and elevate the JCB engine brand in the construction equipment industry and beyond. It has a very positive impact on the overall JCB business in India as it is strengthening the partnership and collaboration between ourselves and wider OEM customers. We can always improve our processes through collaborative learnings.”

JCB Power Systems Warranty Manager Mick Egan has worked at the company since it was established, with a series of roles including an ex-pat experience that still holds a special place for him: “I had the opportunity to take an international assignment at JCB India from January 2010 to January 2015 and it was a life changing experience for which I am very grateful to JCB.

“JCB India is a huge part of the JCB worldwide family. Today we still retain close ties with them, and there is continued learning between both parties. This two-way process has resulted in a true global manufacturing process for the 430 Stage V project with both UK and India totally aligned in the process.”

MANUFACTURING EXCELLENCE

As already established, the JCB Power Systems facility at Dove Valley Park, Derbyshire UK has been developed into an ultra modern plant at the cutting edge of industrial engine design and manufacture.

Head of Sales & Marketing for JCB’s Powertrain Division, Jess Keen is immensely proud of what is has become. She said, “JCB Power Systems is the factory where the JCB engine story was born and it’s the place that is now delivering world beating developments in hydrogen combustion technology. Our engines are the beating heart of a machine,

and this is the factory that has started it all for JCB back in 2020 when we started looking closely at hydrogen internal combustion. Within its four walls, it contains some of the brightest and most advanced hydrogen engineers and technicians in the world. This factory will continue to deliver groundbreaking new technology across our engine range, and it will serve as our central knowledge base for hydrogen internal combustion technologies.”

Manufacturing Engineer, Lucy Houghton said: “I’ve only been here about two years now, but in that time, I’ve seen a genuine, real drive for continuous improvement, across every aspect of the business we are actively seeking to enhance efficiency, productivity and automation. There’s a relentless commitment to never stand still and always improve and as a result the plant is getting even more streamlined, efficient and generally more productive. OEM is a big driver of that need for continuous improvement with the demand it generates for a greater variety of agile products. That leads to further expertise, specialist components and different assembly processes so we can make sure we have systems in place to make the products right first time, every time.”

Customer Quality Engineer, Lynden Cross adds: “Our commitment to innovation and quality has propelled us to the forefront of the industry. Notable accomplishments include the development of cutting-edge power solutions, expansions into new markets, sustained customer satisfaction and a demonstrated dedication to sustainability. These milestones underscore the lasting impact of JCB Power Systems globally, solidifying our position as a leader in the engines sector.”

JCB Power Systems Chief Engineer, Paul McCarthy, outlines the extent of the capabilities. He said, “I’ve seen the business go from strength to strength in terms of engine production volumes, the size of the teams and the wide range of products available servicing engine requirements on a global scale.

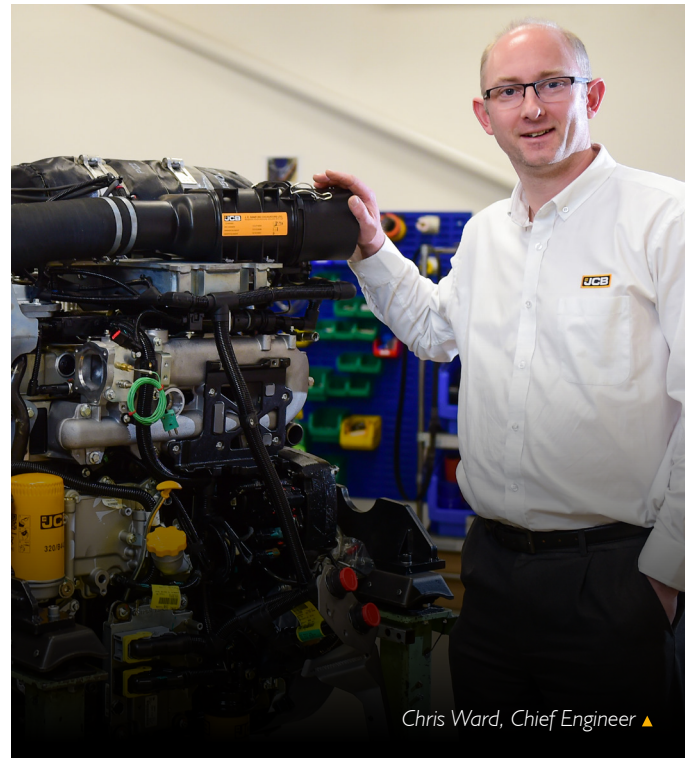
“The investment in the production facility has seen year on year efficiency improvements and advanced manufacturing capabilities. The engineering centre is truly world class and capable of the complete development process - from clean sheet of paper design, predictive analysis, development, testing and validation. Our support for modern electronically controlled engines with smart features, service tools, immobilisers, and telematics is second to none.

“JCB’s expertise and commitment to a zero-carbon future is evident in the pioneering work being carried out on H₂ combustion. I have had the genuine pleasure of leading the team working on this exciting new technology that forms part of our sustainable future.” ▶

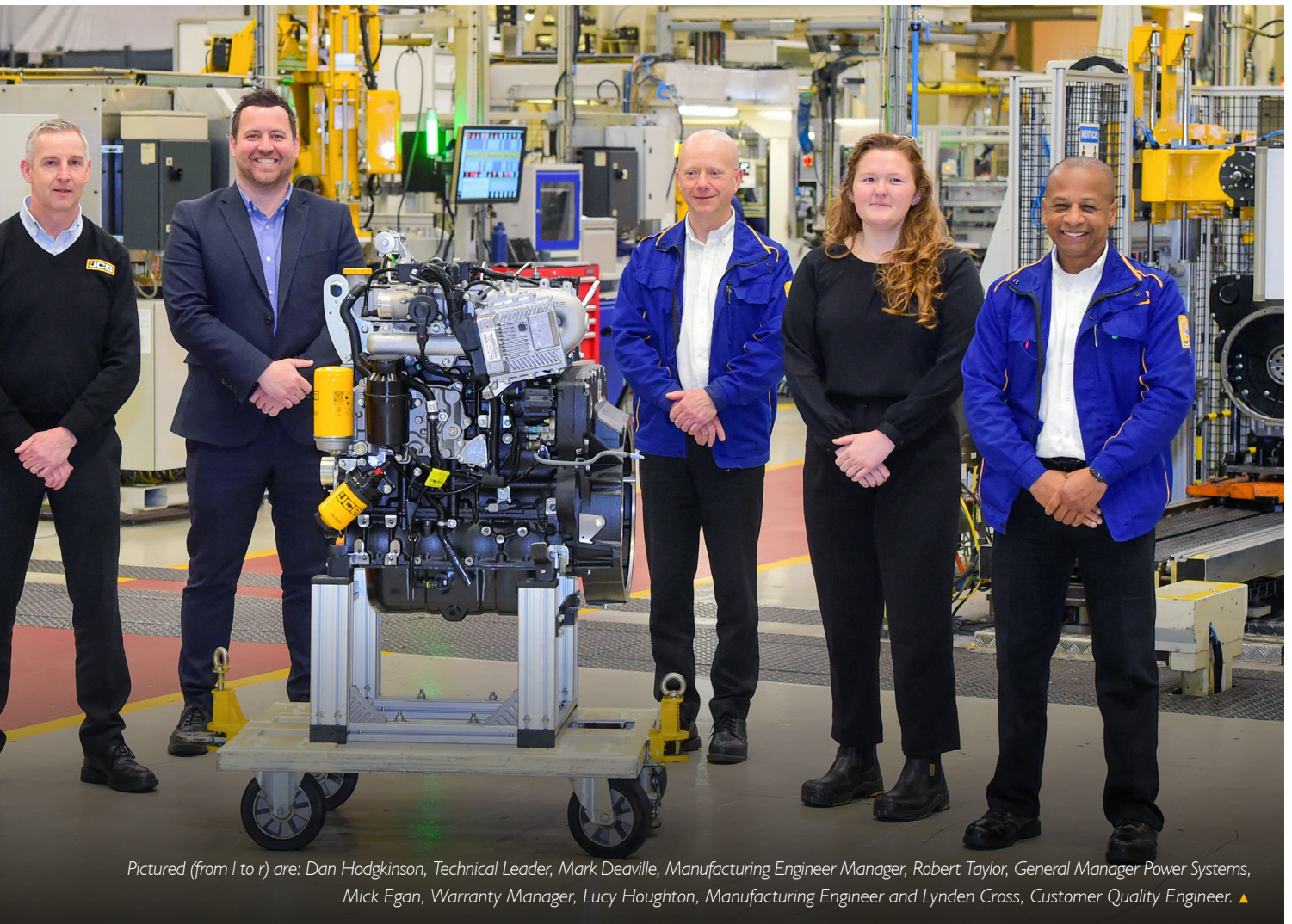




Pictured (from l to r) are: Ann Bracken, Marketing Manager, Cameron Sellors, Sales Manager – Europe and ROW and Jess Keen, Head of Sales and Marketing . ▲



Chris Ward, Chief Engineer ▲



Pictured (from l to r) are: Dan Hodgkinson, Technical Leader, Mark Deaville, Manufacturing Engineer Manager, Robert Taylor, General Manager Power Systems, Mick Egan, Warranty Manager, Lucy Houghton, Manufacturing Engineer and Lynden Cross, Customer Quality Engineer. ▲



Paul McCarthy, Chief Engineer ▲

“JCB’s expertise and commitment to a zero-carbon future is evident in the pioneering work being carried out on H₂ combustion. I have had the genuine pleasure of leading the team working on this exciting new technology that forms part of our sustainable future”

UNRIVALLED EXPERTISE

JCB’s Group Business Director – Material Handling – Peter Jowett’s affinity for the business is confirmed by his two stints at JCB Power Systems during his 30 years at JCB in total. Previously Director & General Manager of JCB Power Systems and additionally overseeing all JCB component manufacturing sites, Peter is well placed to review the talent within the business past and present: “My key role was setting out the roadmap for Stage V engine development and the introduction of the 430 Dieselmix. It has been a privilege to be involved and play a part in the journey.

“It’s not just the production facility that is world class, the people that run it and all the employees are too. They are truly fantastic assets for the company. I’ve seen instances of individuals making split second decisions or pulling together in adversity to overcome challenges that have had huge benefits for the business. And for me that is the true spirit of JCB.

“We also have world class engineers that are totally in command of the detail and I strongly believe that we produce the best diesel engine on the market. The growth in volumes has been

phenomenal and the OEM business has huge potential for further expansion too. Despite the success to date, there is still unlimited untapped potential with external customers for our highly efficient low emissions engines.”

Chris Ward agrees: “This team can really react quickly and come up with new answers that other teams wouldn’t come up with and they can then turn those ideas into a reality. The bit I most enjoyed was being part of developing the 6-cylinder engine. It was a small team of very specifically dedicated individuals. I recall when we transformed the engine from a 4.8-litre to a 7.2-litre. We increased the power, increased the torque, and ensured the reliability was validated on three continents and put it into production. We did that in an incredibly short time, it was within a 3-year time scale.

“The capabilities of the people here are awesome, it’s something I’m personally very proud of, I think the rest of JCB is also proud of it too which gives us a good foundation for a bright future. We’ve done awesome stuff in the first 20 years; I can’t wait to see what the next 20 years looks like.”

A UNIQUE SPIRIT

The people make the business as JCB Powertrain Sales Manager - Europe and ROW, Cameron Sellors testifies: "For me, JCB Power Systems has been a great place for me to work and start my career providing an excellent foundation to grow and take on new challenges with projects and role progression. I owe a lot to JCB Power Systems and the people that work here."

Ann Bracken added, "A key part of my time here has been the people I've met and worked with, they really are a testament to JCB Power Systems and how we work and pull together. There's a lot of people here who are straight from school, just like me, that have genuinely grown up with the business. The people really make it for me, we have a wonderful team here within JCB Power Systems and within OEM specifically."

Senior Engineer Doris Khaemba shares that

view: "JCB Power Systems is a very dynamic place, so there are all sorts of challenges. If you are the kind of person who enjoys innovating and problem solving, there is no better place to be. I've been here for two years and it's gone by so quickly. You are always doing something different, it's never the same. As an organisation JCB is so supportive and welcoming. I received flowers from the company when I was recovering from an illness, and it made my day. For a new person in the business it really showed that they care."

Lucy Houghton believes JCB Power Systems is a unique environment. She said, "Everybody's input, no matter where it comes from, is taken seriously, considered and if appropriate, acted upon. Whether that be customer feedback, our engineers, or our operators on the shopfloor, if it adds value we will do something about it. This adds to a culture where we are trying to make

this the best place to work, where we make products we can all be proud of and continuously improve."

Customer Quality Engineer, Lynden Cross reinforces the message: "I would like to mention an incredible team of people that have helped achieve these goals for the business globally. I've worked with some incredibly talented and caring colleagues who promote great teamwork, good camaraderie and a 'can do' attitude and it has been a real privilege to work with such lovely people. I look forward to working with the next generation who will take the business forward too."

"We must be positive and proactive as innovation is the key to the success of the business and customer satisfaction is another key component. I'm confident our enthusiastic, dedicated and committed people will continue to grow this business." ▶

Peter Jowett, JCB's Group Business Director – Material Handling ▼



HISTORICAL HIGHLIGHTS

Looking back at their time here during the first 20 years of JCB Power Systems, the team reflects on their personal highlights and favourite moments. There are some wonderful and inspiring memories.

Paul McCarthy begins: "I have many fond memories of product launches and working on advanced research projects. The sense of achievement working with such a talented and committed team form my favourite memories. In 2021 it was an honour to represent the engineering team at the Dewar Trophy award ceremony at the Royal Automobile Club where JCB received the Award for 'Outstanding British Technical Achievement in the Automotive Industry'. That was a special moment as it was a prestigious recognition for our achievements so far on hydrogen."

Mollie Wheatley also remembers the trophy and a special event to celebrate the success of the hydrogen project to date: "All of the engineering team from Research & Development were once invited to JCB Headquarters for an 'H₂ Thank You' event run by the Chairman. We were invited to speak to Lord Bamford about his original vision for the H₂ engine and expressed to us how we as a team had helped to achieve that vision.

"Looking at how small of a team we were, especially back then, gave me an immense sense of pride about the part I had played in this. We won the Dewar Trophy that year too so the event was used to showcase the award. We were invited up to the stage to have photographs

with the trophy. The event genuinely made us feel like we were the reason we won the award."

Mark Deaville said, "My fondest memory, and one of the most enjoyable, was probably the company wide street parties held last year to celebrate the King's Coronation. I know it was quite recent, but it had a really warm feel factor. I think the company did exceptionally well at bringing all the departments and business units together."

Technical Leader at JCB Power Systems, Dan Hodgkinson said: "Over my 11 years at JCB I'm fortunate enough to have an extensive list of amazing memories. I'm particularly proud of my work helping develop the engineers of the future. I took part in discussions with Lord Bamford and former Secretary of State for Business and Trade, Vince Cable, about early careers and our scope of the upcoming young talent within the business. I then had the opportunity to take on the role of Project Leader within the 'Built by Apprentices' loadall telescopic handler project to raise money for the NSPCC, as well as being invited to represent JCB at the National Apprenticeship Awards. These memories will stay with me for the whole of my career."

JCB's outstanding people are a recurring theme among the team's career highlights, as confirmed by Dave Phillips: "My fondest memories all revolve around people and team working, particularly on key project milestones such as engine certification and machine sign-offs. Specific highlights for me include foreign altitude testing visits in Austria 2006 (Tier 3 / Stage IIIA

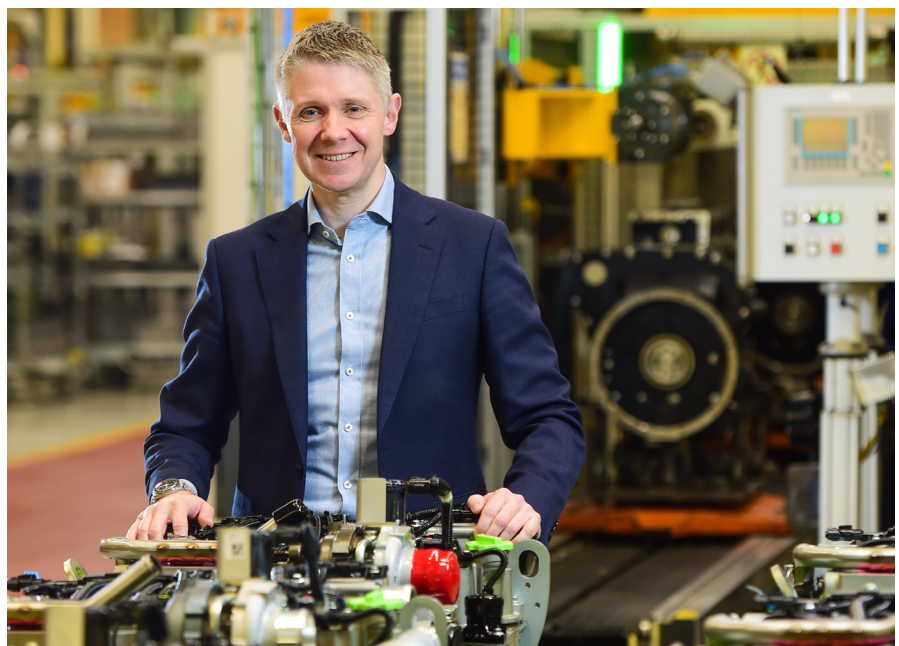
common rail on a JCB loadall) and China 2013 (Tier 4 Interim / Stage IIIB on JCB excavators). A small team of great people, working hard but enjoying the experience made these trips particularly memorable for me."

Ann Bracken added: "A true highlight that stands out for me was the time of the diesel land speed record. We knew they were doing the challenge that day, and back in the UK we were all on tenterhooks awaiting the call with the outcome. We obviously had faith in the JCB products but the sheer effort of achieving a world record was still very daunting. I remember a colleague ringing and saying, 'We did it! We did it!' and the whole office simply erupted with joy. It made us feel like we were there with them. It's crazy to think that such a small team could achieve something so monumental."

Jess Keen's favourite memory so far also gives a nod to the future: "My favourite memory of my time here happens, and is reinforced, every day. We host daily hydrogen visits at JCB Power Systems from government ministers and civil servants to school children and PhD students, to farmers or equipment rental firms through to consulting engineers and OEMs. Over the last four years we have hosted over 2,700 people to view our hydrogen engines, R&D centre, and hydrogen test cells, helping to convey the vision we have for the future of zero emissions. To see the awe and wonder in the faces of our guests and to hear their genuine excitement for this technology breakthrough - these are memories I will never forget."

"All the great developments that are coming within this complete package, are cutting edge technology, that only a few years ago, were not even imagined within the industry"

Ryan Ballard, Engineering Director ▶





The full UK team at JCB Power Systems. ▲

POWERTRAIN PERFORMANCE

Through the newly formed JCB Powertrain division, JCB's external sales efforts will align our OEM engines, axles and transmissions more closely, offering customers a single source solution for their entire powertrain requirements. The move looks set to create exciting opportunities.

Ryan Ballard highlights the benefits of the alignment: "External OEM sales are extremely valuable in many ways. Notably I think it is good and healthy for the engineers to be engaged with OEM projects, making people think laterally and a bit differently. This has an impact on the future products we develop, with the technologies and features we implement. It's fantastic to be part of a business that has a reputation and a name on the world stage for making engines and drivelines, not only for our JCB equipment, but also a myriad of other OEM uses and applications.

"I am really pleased about how closely aligned

JCB Drivetrain Systems and JCB Power Systems are, all within JCB Powertrain. All the great developments that are coming within this complete package, are cutting edge technology, that only a few years ago, were not even imagined within the industry. It's important to add we're introducing this for the right reasons, the fuel efficiency benefits, the ease of operation and the customer attributes that improve, with its use."

Mark Deaville recognises what the wider impact of external sales brings across the business: "One of the key benefits of our Powertrain business pushing products to the OEM market is that it gets our engine out to the industry and aftermarket world - allowing us to showcase our engine and what its capabilities are. I believe we have a high quality, robust product and through applications with our OEM customers we are able to demonstrate its versatility further."

Jess Keen is excited about the prospects pre-

sented by the clearer focus of JCB Powertrain: "We have unquestionably evolved within the Powertrain team over my time at JCB Power Systems. We have combined the axles, transmissions and engine teams together to form one unified Powertrain team. This means added bandwidth and efficiency within the team, sharing best practices, and for our customers, they can come to one team to support all of their Powertrain component requirements.

"The increased diversity of thought within the team enables us to innovate and challenge our existing processes, practices and product offerings, to ensure we are delivering the highest quality products and services to our OEM customers. We are just getting started in the OEM business, and I am thrilled to be part of the team at this auspicious time in the company's history. I can't wait to see where the story takes us next." ►



Mark Lumley, Purchasing Manager – Hydrogen Engines ▲



Alan Tolley, former Group Director - Powertrain ▲

THE FUTURE IS BRIGHT

In many ways the personal development of JCB Power Systems General Manager, Robert Taylor, is a success story that closely mirrors that of the business. Robert joined us as an apprentice in 2004 and has risen to lead the business unit.

He says, “JCB Power Systems has been my entire career to date and what an experience it has been - witnessing first-hand the evolution of our business! I have been part of operations here since the production of the first prototype. Right back at the outset I remember vividly giving team members high-fives to celebrate the completion of three engines in a day. Now we have the capacity to build 260 per day.

“Looking back over that development is rewarding but the future is equally exciting. As we look to extend the engine range, we will have the opportunity to grow our engines into new markets through JCB Powertrain which presents us with a great opportunity. We are always trying to lead from the front. We are leading in hydrogen, we have our electric range, and we will continue to work and progress in clean diesel.

“JCB Power Systems is an exciting place to be as we continue to develop in our technologies, processes and our team. We just have to continue to keep progressing and driving forward. Most of all, we must hold our JCB values to heart, we should always be looking for a better way.”

Dan Hodgkinson is confident: “Our future at Power Systems is bright, as we are constantly striving to grow and develop. The time has come to empower change with the introduction of a hydrogen-fuelled engine, a breakthrough redesign of the Dieselmox engine. With the current changes within the global market and focus on the environmental impact, it would be great to see the introduction of JCB’s hydrogen engines within the OEM sector. I believe this will have a huge impact not only on the business but the rest of the world.”

Former Group Director - Powertrain, Alan Tolley was also interviewed. He said, “There’s a bright future. Engines of various types will be the backbone of JCB’s machines for the next 20 years or more.”

Doris Khaemba adds: “The future is fascinating, given we are heading into truly uncharted territory. I believe H₂ is going to take over in one form or the other. We are introducing technology that is different from what has been there for the last 100 years, so it’s going to be a lot of technical development, testing and new components. As we advance and adapt our engine technology, it’s going to be crucial to understand how our OEM customers will want to adapt and apply this new technology to their needs too.”

Marco Bersellini is equally passionate about future prospects: “I’m an engine guy, so it goes without saying that I really care about this division. There is a huge market opportunity and I can see JCB taking advantage. We are structuring JCB Power Systems to support the higher demand, investing in people, resource, and capacity. There are very passionate engine people in this organisation and there’s a special kind of DNA in engine people. I am absolutely positive that whilst this business has already proved a triumph, it will continue to become even more successful in the future.”

“JCB Power Systems is an exciting place to be as we continue to develop in our technologies, processes and our team. We just have to continue to keep progressing and driving forward. Most of all, we must hold our JCB values to heart, we should always be looking for a better way.”

THE FUTURE IS GREEN

“The future’s bright, the future’s green would be my strapline for our business,” says Mark Lumley, Purchasing Manager – Hydrogen Engines.

“We think that hydrogen is the future for our industry and is the way that we will support the drive for zero emissions and reduce our carbon footprint. Currently it is a very exciting time as we continue to work on the industry’s first hydrogen combustion engine.

“I think there’s lots of opportunities in OEM. There’s going to be lots of people wanting to get involved and introduce H₂ in their applications. With increasing pressures for customers to consider sustainability, I can definitely see a lot of demand and interest for this product. This provides a lot of potential to grow our OEM sales.”

Marco Bersellini agrees: “The sky is the limit with hydrogen. We will be the first one in the market and every OEM will have a sustainability strategy that our solution can support.”

Cameron Sellors sees hydrogen as the perfect solution for powering JCB equipment and other manufacturers’ off-highway machines: “The OEM aspect of the business plays a critical role and is

now gaining deserved recognition. It has allowed me to see how the JCB engines and components work in non-JCB equipment and how that supports diversification and improvement of our offering, with customer requirements in mind.

“I think that particularly applies to hydrogen. Everyone is massively invested and now we have demonstrated the H₂ technology works and the extent of its capabilities. I recently spent a week in Italy and nearly every OEM customer wanted to talk about hydrogen. The possibilities are endless.”

Bob Womersley concludes: “Just as all those years ago Mr JCB set the wheels in motion to build the world’s best diesel engine, now our Chairman’s vision has driven us to a position of world technology leadership with hydrogen engine development too. The next decade of hydrogen progress will be extraordinary to watch. It’s terrific to believe that this same factory that we moved into in 2004 has become a force for good that is right at the cutting edge of low carbon technology.”

We cannot wait to see how that next decade unfolds. ●

Robert Taylor, JCB Power Systems General Manager ▼



FUTURE FUEL



At the turn of the year JCB hosted a series of international press events to showcase its pioneering hydrogen technology. Technical journalist, Dan Gilkes, filed this report.



The UK Government has announced the ban of sales of new petrol and diesel cars and vans by 2035. In 2040, it will add heavy trucks to that list, pushing all road users towards a range of zero-emission solutions. With shipping and aviation also searching for options, as they progress along their own roads to zero, construction and agricultural markets will have to play a part in this seismic shift.

Some manufacturers have already started, with electric equipment now a common option at the lighter end of the market. But what of the heavier machinery? The excavators, loaders and haulers that operate away from urban mains power supply? How will they meet the challenge?

Tim Burnhope, JCB's Group Director - Special Projects, explains that the company has certainly not been slow in looking at the various options on offer: "We believe there is a real place for electric machines under 4 tonnes and in urban operations.

"Above that weight however, things become a little more tricky. Whereas the four batteries that power JCB's mini excavator produce 20 kW and cost around £8,000, upscaling that to a 20-tonne machine would require a huge number of batteries, at a cost that would be unacceptable.

"Technically you can electrify anything, but it's not financially viable for the customer."

JCB has been investigating hydrogen fuel cell technology, building a 20-tonne excavator with a fuel cell almost four years ago and testing a second-generation machine in its R&D quarry more recently. However, what this research has revealed, is that a fuel cell is too delicate for heavy machinery use. It is also slow to start and relatively unresponsive to the operator's inputs. Alongside the actual fuel cell stack, the machine has to have hydrogen tanks, a DC/DC converter, power electronics, power batteries, motors and inverters.

Tim Burnhope said: "The fuel cell tracked excavator is too complicated, not robust enough and too expensive."

That's not to say that the hydrogen that powers a fuel cell is not suitable for use in construction machinery though. JCB believes that hydrogen has a big future within its machines. Hydrogen, which can be transported as a liquid or a gas, carries roughly three times the energy density of diesel and, if it is created as green hydrogen using renewable energy, it can be a true zero-emission fuel, with its only 'emission' being water.

"To succeed with larger machinery, we believe that you need to take the fuel to the machine, not take the machine to the fuel"

JCB initially developed a hydrogen fuel cell powered excavator. ▼





The JCB Mobile Refueller (l) with JCB's 3CX backhoe loader (r) powered by a hydrogen combustion engine. ▲

STAMP OF APPROVAL

JCB Chairman Anthony Bamford set the engine team at JCB Power Systems a challenge in July 2020, to make one of its engines run on hydrogen by the end of that year. He was so determined that this was the future direction for the company, that the resulting hydrogen motor bears the initials AB H₂ on the cylinder head.

While the engine block will look familiar to those with experience of JCB's 448 diesel engine, the hydrogen motor comes with a totally new cylinder head. The engine features a new combustion system, with much lower injection pressures than for diesel. The air charge is ignited using spark plugs and the engine features a far larger turbocharger, to increase compression of the air.

As well as the challenge of operating on hydrogen, Lord Bamford insisted that the engine had to produce the same power and torque as the firm's diesel units and operate for just as long between services. It also had to drop straight into existing JCB machinery, making it easy for customers to adopt.

Not only does the hydrogen engine have to meet the performance criteria of the existing diesel models, it will have to be built on the same assembly lines in Derbyshire and in India, two facilities that between them produce 400 engines a day. This too has been achieved, with

seven of JCB's dynamometer test cells now running hydrogen engines, rather than diesel-powered motors and prototype hydrogen engines are now rolling off the line.

MAKING IT WORK

So, it is not only possible to run an engine on hydrogen, that engine can produce just as much power and torque and be no more costly to service. How about installation on the machine? Visitors to JCB's test quarry will find that there are hydrogen backhoe loaders, loadall telescopic handlers and a Fastrac tractor already running on the fuel. While their white and green livery is certainly distinctive, there is very little else to let the casual passer-by know that these machines are running on H₂.

On the 3CX backhoe loader for instance, the body panels are unchanged, with the engine fitting under the same sloping bonnet. The diesel tank has been replaced by composite hydrogen tanks, operating at 350 bar pressure. The backhoe uses around 8-10 kg of hydrogen to work for a full day, which is easily held on-board.

Having got the machines to run on the gas, JCB has also looked at how construction sites could distribute hydrogen. It is delivered to site in tube trailers, road-going trailers that are filled with hydrogen tanks operating at around 700 bar

pressure. The JCB Mobile Refueller is a smaller version of the tube tanker, carrying around 100 kg and fitted to the back of a Fastrac tractor, also powered by the hydrogen engine.

Like a conventional bowser, this Refueller would be able to travel around the site, filling each machine in turn. With a flow rate of 1 kg/min, the Refueller can top-up the backhoe loader in just 6-7 minutes, far faster than having to recharge batteries on an electric machine.

"To succeed with larger machinery, we believe that you need to take the fuel to the machine, not take the machine to the fuel," said Tim Burnhope.

With this growing range of hydrogen-fuelled equipment on test, JCB has certainly proven that the gas offers a zero-emission solution for a variety of construction and agricultural machinery. By showcasing means to refuel those machines on site, the company has taken a vital second step towards a potential hydrogen-powered future.

There are no launch dates confirmed for a JCB hydrogen machine yet, but for the company to provide such a clear vision of how this fuel could provide customers with a viable alternative to diesel, it can only be a matter of time. It is certainly a big step further along the Off-Road to Zero. ●

SHOW TIME

JCB Powertrain takes centre stage at a series of international exhibitions.

“Visitors flocked to the JCB stand to learn more about the potential for hydrogen to be the fuel of the future. No other manufacturer has machines working with hydrogen combustion engines”

JCB Powertrain has hit the headlines across the globe as our team has showcased our full range of engine and powertrain capabilities at major trade shows in North America, Europe and Asia.

HOT OFF THE PRESS

In March 2023, JCB was delighted to exhibit its zero-emission hydrogen combustion engine technology for the first time ever on the international stage at CONEXPO-CON/AGG - North America's largest construction trade show.

JCB kicked off the show with a press conference to unveil the technology which makes JCB the first in its sector to have machines operating with hydrogen combustion engines - providing zero-carbon power with no compromise on performance or torque.

JCB's Group Director - Special Products, Tim Burnhope said: "There was a huge amount of interest in the exhibits on the JCB stand, particularly the hydrogen combustion engine. Word has clearly spread around our industry that JCB has come up with a really special innovation. Customers, dealers, and our OEM third-party engine distributors are desperate to have zero-carbon and zero-emission engine

solutions, so they flocked to the JCB stand to learn more about the potential for hydrogen to be the fuel of the future. No other manufacturer has machines working with hydrogen combustion engines, so we've proven how advanced we are on our hydrogen developments. All visitors to the JCB stand left very impressed with what we had achieved so quickly."

ENGINE EVOLUTION

Next up was Agritechnica – one of the world's biggest agricultural trade fairs – held in Hanover, Germany. The stand featured our H₂ and clean diesel engines alongside a complete electric powertrain.

JCB Powertrain Head of Sales & Marketing, Jess Keen said: "Our game-changing engine certainly drew in the crowds – giving us the chance to talk to farmers, equipment manufacturers, engineers, integrators, consultants, distributors, hydrogen manufacturers, engine manufacturers and lots of JCB fans. These visitors were extremely enthusiastic and curious about the technology, so we spent time discussing the combustion engine process, storage pressures, refuelling and government infrastructure plans.

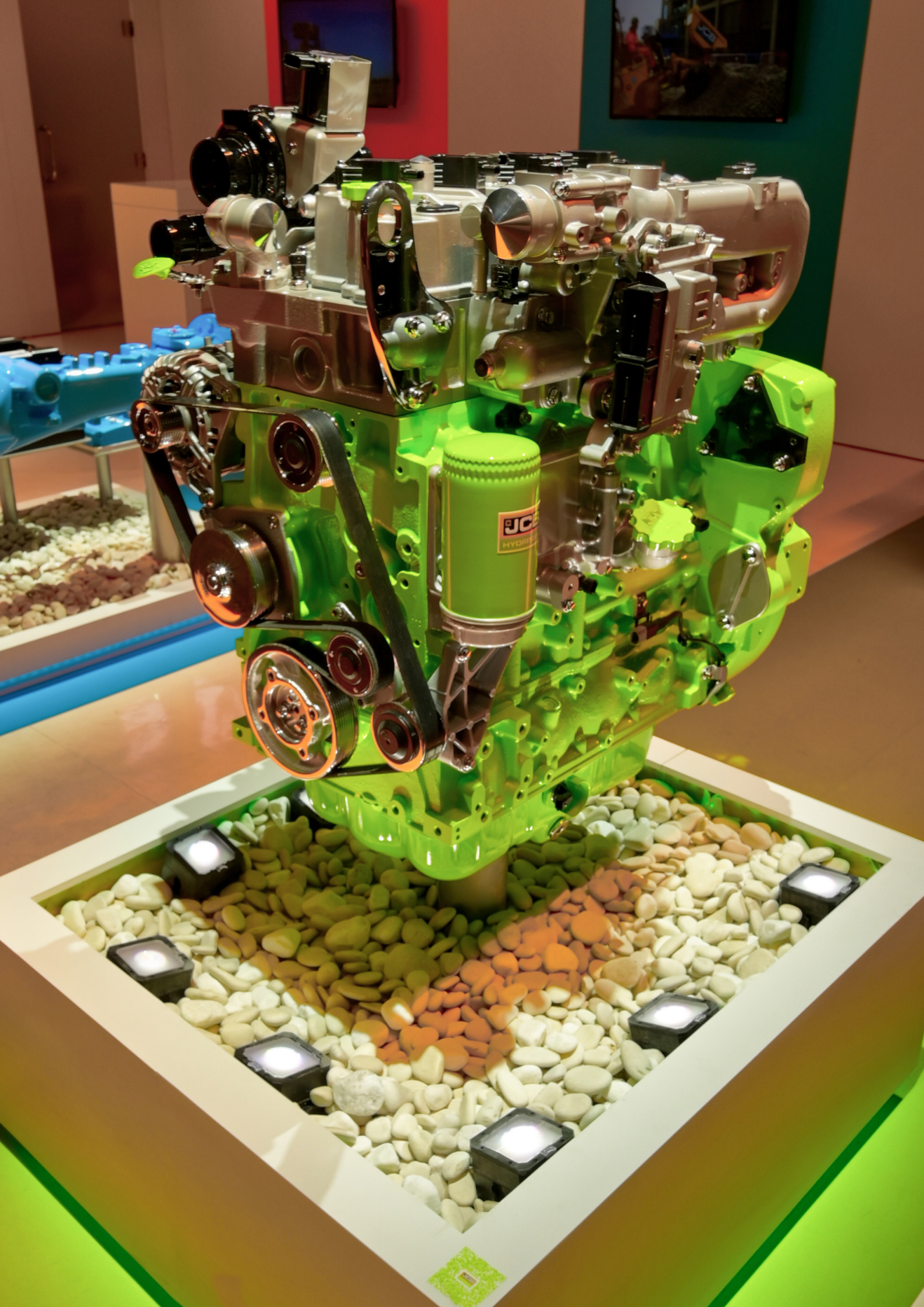
"It's clear there is huge demand for JCB

hydrogen combustion engines as it delivers the same power and performance from the same package size as our diesel equivalent – including the fuel storage onboard. This key advantage enables our OEMs to minimise necessary design changes, saving them time and cost as they consider the evolution to hydrogen."

HYDROGEN AT THE HEART

Then in December, the JCB Powertrain rolled in to Bengaluru for EXCON, India's premier construction equipment trade show. In its first-ever trade show appearance anywhere in the world, the JCB hydrogen-powered backhoe loader prototype was unveiled.

JCB India's CEO and Managing Director, Deepak Shetty said: "Visitors to EXCON saw Asia's first construction machine powered by a hydrogen combustion engine. We are witnessing the beginning of an exciting zero-carbon future in India's earthmoving sector, and hydrogen combustion will be at the heart of that future. As the world has been assessing its collective progress towards achieving its climate goals, JCB is showing it has a practical and affordable technology in place to decarbonise construction, both in India and across the world." ●



FIRST PORT OF CALL

Canadian materials handling equipment specialist, [Bateman Manufacturing](#), has chosen a JCB engine to power one of its key marine sector attachments.

In the brutal world of marine materials handling, reliability, durability and efficiency are everything. All equipment used in port operations must be up to the task and attachments are truly on the front line.

Bateman is a leading global manufacturer of diesel hydraulic grabs which are purpose built for this environment. When they needed to switch to Stage V power to meet the needs of the key European and UK markets, JCB Powertrain distributor, Marindustrial was their first port of call. Bateman's long term trusted partner put forward the 130 hp JCB Stage V IPU engine and it has proved the perfect solution.

STRENGTH TO STRENGTH

Bateman was established in 1989 in Ontario, Canada and in 2019 it was purchased by Quebec-based attachments manufacturer GRYB. Now operating from 35,000 ft² facilities in Oro-Medonte, Ontario it has grown to become one of the leading materials handling equipment manufacturers both domestically and internationally.

Bateman offers an extensive range of attachments for a wide array of sectors. One of its key specialisms is port equipment and diesel hydraulic grabs – also known as ships gear grapples – which are used to sort, load and unload heavy loose materials in port-side handling applications.

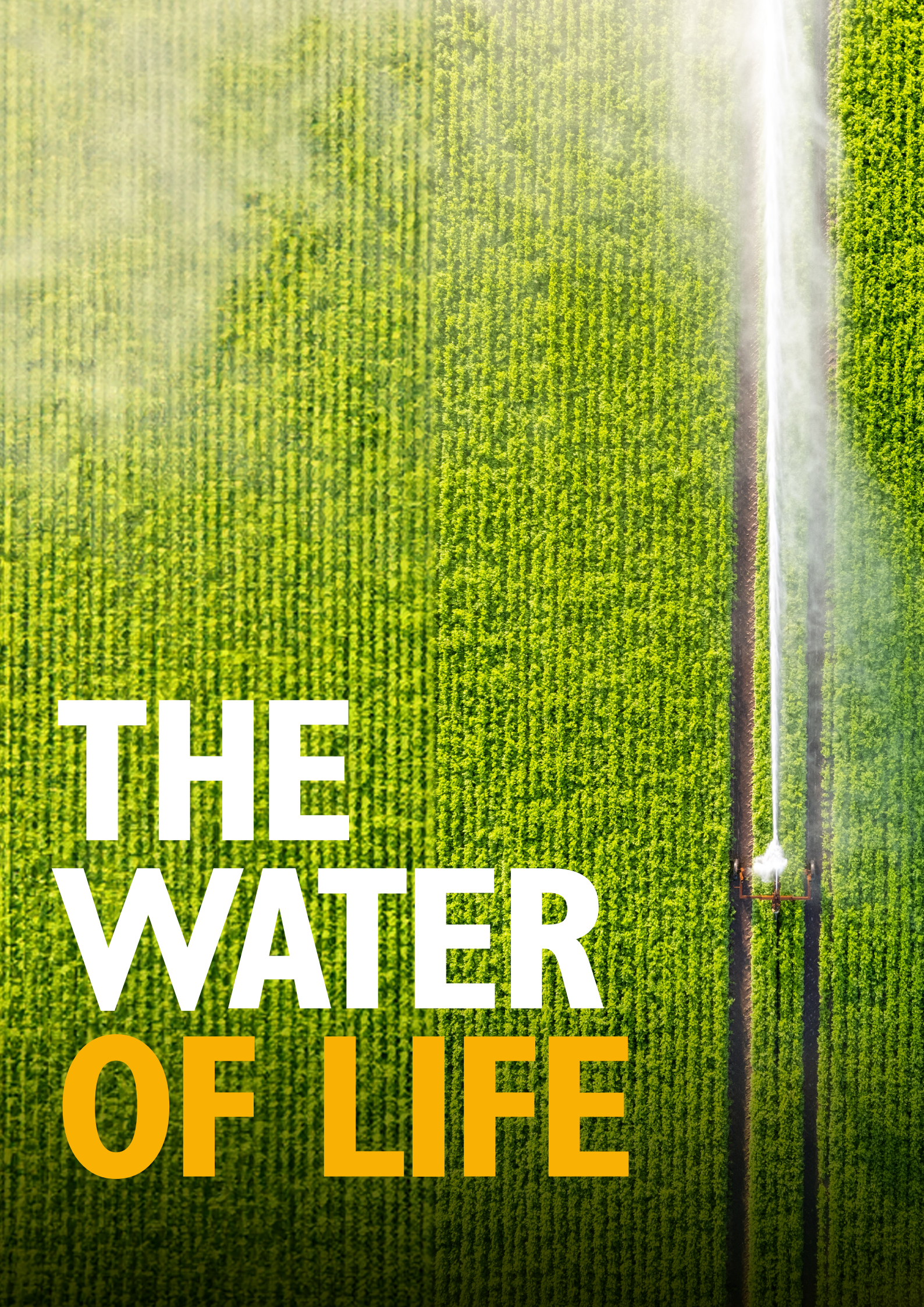
The JCB engine has been incorporated into the B6TD5-1300FC model. Weighing in at over 12.5 tonnes, the remote-operated, 6-tine self-contained grab is capable of handling 10 m³ of material. This high capacity combined with its inherent reliability improves productivity and significantly reduces downtime – reducing the likely demurrage fees which are paid to ports while materials or containers remain in situ before removal.

With integration and installation support from [Marindustrial](#), and the JCB engine at its core, the Bateman ships gear grapple is going from strength to strength in the European market. This opportunity to grow with one of the industry's leading manufacturers is one we plan to grab with both hands. ●



“Weighing in at over 12.5 tonnes, the remote-operated, 6-tine self-contained grab is capable of handling 10m³ of material”





**THE
WATER
OF LIFE**

An agricultural irrigation specialist has chosen Stage V JCB engines to power its pumpsets – bringing vital water to crops across the country.

The UK arable farming sector is suffering unprecedented economic pressure, meaning the focus on maximising yields and efficiency is greater than ever. An increasingly unpredictable climate only adds to the challenge as farmers battle erratically wet winters and scorching summers. To ensure they maximise crop growth, they need to provide burgeoning crops with sufficient water – exactly when and where they need it.

Thanks to ever improving irrigation technology, growers are increasingly taking matters into their own hands. Taking greater control of watering their crops even when they can't rely on the inconsistent British weather. And while farmers have used methods of irrigation for millennia, the latest technologies have truly moved the dial in terms of performance.

A key element of the process is diesel-powered pumpsets – a product developed to aid the artificial application of water to specified areas of dry land. These are used to draw water from an available source and provide pressurised water to hoses. These hoses then serve a choice of distribution equipment such as fixed and mobile sprinklers to focus water application to those fields, or areas of fields, where additional moisture is required.

EARLY ADOPTER

Founded in the year when Britain baked in one of its hottest summers on record, family business [RST Irrigation](#) knows a thing or two about keeping the water flowing for hard-pressed farmers.

It was in 1976 that Bill Smith set up his company – a year when water shortages gripped the country, millions of pounds worth of crops failed and the situation was so serious that the Government appointed a Minister for Drought.

Fast forward to 2024 and Bill has handed over the reins of his family business to his sons Nigel and Terry who have now put their faith into another family business – JCB.

RST Irrigation produces diesel-powered pumpsets to ensure water reaches crops when periods of drought strike.

And its these pumpsets which are now powered by the very latest Stage V engines from JCB Power Systems.

RST's pumpsets are the result of many years' fine tuning of manufacturing ideas, developing one of the leading products on the market. All components are purchased through UK suppliers, with the pumpsets governed by Vision V fully electronic control panels and available with or without sound attenuated canopies.

PUMPED UP

Having previously used a variety of different engines to power its pumpsets, RST assessed the market when the switch to meet Stage V emissions legislation was coming in to force. With guidance and support from its traditional engine supplier, Mitchells Power Systems, the 55 kW (74 hp) JCB 430 base engine was selected. With a class-leading 440 Nm (325 lb-ft) of torque at just 1,150 rpm the 430 engine is 24% smaller, 30% lighter but with 10% higher torque output than its predecessor. It also boasts 8% real world fuel saving. The chosen engine and pump combination has the capacity to supply one or two irrigation hoses.

RST irrigation Managing Director, Nigel Smith said: "We have been a customer of [Mitchells Power Systems](#) for 20 years and have built up a fantastic working relationship with them. So when searching for the Stage V solution for our pumpsets we called on our trusted partner to aid the specification.

"While the introduction of Stage V has required the significant adaptation of our pumpset design, the recommended JCB 430 engine has certainly fitted the bill. It is supplied as a complete power solution and JCB is a world renowned, UK-based company. It makes us proud to partner with another proven British manufacturer."

At a time when their loyal customers in the agricultural sector are facing mounting challenges, JCB Powertrain and RST Irrigation are vowing to keep on pumping in a bid to help alleviate that pressure. ●

TOP GEAR



A longstanding customer of JCB Powertrain has celebrated a major milestone.

Founded in 1973, just outside Kansas City, [Broderson Manufacturing Corporation](#) is the industry's leading manufacturer of industrial carry deck and cab down rough terrain cranes.

In 2023, the US manufacturer celebrated its 50th anniversary, having forged a reputation for market-leading quality and service with 15,000 machines sold to date. For over 25 of those years Broderson has called on components from JCB Powertrain.

With carry deck cranes ranging from 2-23 tonnes and rough terrain cranes up to 18-tonne capacity, Broderson equipment is used across the industrial spectrum. A diverse breadth of applications ranges from oil refineries, petrochemical plants, mechanical contracting, auto manufacturing, domestic and offshore mining through to pulp and paper mills, power plants and more.

SUBSTANTIAL IMPACT

The partnership began in the late 1990s and JCB Powertrain now supplies Powershift transmissions and SD55 Series steer drive axles for Broderson's small and medium carry deck cranes. Specifically they are fitted in the IC-40, IC-80, IC-100, IC-200 and IC-250 models - which represent 75% of its fleet.

Broderson General Manager, Trey Pfister said: "Standing strongly alongside us as we achieved our 15,000th delivery milestone, JCB remains a loyal presence, helping to maintain the engineering integrity our valued customers have come to expect.

"The extent of our teamwork has brought ongoing success to both organisations. Supporting over 75% of Broderson's fleet with drivetrain needs, JCB's partnership has had, and continues to make, a substantial impact in helping provide exceptional products for our customers.

"Built on innovation, Broderson machines have quality, simplicity, and reliability built into every design. There is great synergy with JCB Powertrain in that respect. Our cranes must be agile, mobile, reliable, and versatile and the JCB Powershift transmission and steer drive axles help us deliver on that promise. They stand out from other providers with their ability to perform admirably with the low engine position typical of a carry deck crane."

After delivering its 15,000th machine last year, Broderson continues to go from strength to strength. With 50 years in business and more than 25 in partnership with JCB Powertrain, this expert crane manufacturer is perfectly poised to scale even greater heights. ●



An orange orchard with rows of trees and a dirt path. The trees are lush green and heavily laden with ripe, bright orange fruit. A dirt path runs through the center of the orchard, leading the eye towards the background. The sky is a clear, pale blue.

REIGN SUPREME

A Canadian forklift manufacturer is using JCB transmissions and axles to help maximise efficiency for its agriculture and horticulture customers.



Renowned for its fruit and nut production, the state of California is a horticulture haven - home to growers of delicious crops including pistachios, almonds, oranges and lemons. Yet whatever the produce, there is one common theme: efficiency. For a chance of profitability, the grower must maximise their yield and minimise wastage.

A Canadian equipment manufacturer is supporting this goal with a purpose-built product to help its customers make the most of their available land and optimise productivity at harvest time. [LiftKing Manufacturing Corporation](#) has developed a specific rough terrain forklift with crop production in mind.

Its AG Series models are uniquely narrow compared to standard forklifts, meaning they can pass between rows of crop without damaging branches. As a result, rows can be planted more closely together, meaning greater potential yield from the same acreage. As an added bonus, they come complete with bin clamps to press down the bins of picked crop, eradicating spillage as the forklift passes over bumpy ground.

The LiftKing Ag Series range features the Synchronmesh transmission from JCB Powertrain. These compact synchronmesh transmissions with torque converter drive, combine fast, electro-hydraulically controlled reversing with smooth, positive mechanical gear shifting. With optional 2WD and 4WD, pump drive, internal multi-plate oil immersed park brake and lock up torque converter they offer high performance in the most arduous of operating conditions.

JCB Powertrain also provides the drive steer axles (with wet disc brakes on the front axle for certain LiftKing models) which deliver the tight steer angle and turning radius necessary in these confined working environments and the controlled stopping power demanded on steep inclines.

LiftKing's Director of Sales, Mark Aldrovandi said: "Our AG Series is a uniquely tailored solution for the critical agricultural market. The incorporation of JCB transmission and drive steer axles has helped us create a machine that is lightweight, with compact dimensions, and delivers effortless manoeuvrability. Its development brings immediate benefits in narrow field rows and tight operations while the increased road speed reduces travel time between sites.

"JCB Powertrain is a trusted partner that has been able to support LiftKing by maintaining excellent lead times on its products and global parts support through a period when much of the world's OEM supply chain struggled."

Founded in 1969, LiftKing has been manufacturing forklifts and other material handling equipment for commercial and military applications for over 50 years. It offers an extensive line-up of rough and all-terrain forklifts, fork trucks, container handlers, military forklifts, straight mast forklifts, and other materials handling equipment.

LiftKing has over 10,000 units operating worldwide, with JCB Powertrain components featuring across its AG and M Series products. It's a perfect partnership that is helping LiftKing reign supreme in the groves of California and beyond. ●

THE GOLD STANDARD

JCB Powertrain partners are setting the standard in sales and service with a succession of key award wins.

Each year the Power Progress Summit hosts its prestigious awards ceremony which represents the pinnacle of achievement for the OEM engine sector. Specifically, the Engine Distributor of the Year category recognises the distributors which excelled through the previous year with expanding sales, world-class customer service and innovative dealings with OEMs. These qualities are the hallmarks which JCB Powertrain looks for in its engine distributor network, so it is with great pride that our partners are making a habit of winning.

This recent dynasty began in 2021 when [Brinkmann & Niemeijer \(B&N\)](#) – JCB Powertrain distributor for Belgium, The Netherlands, Luxembourg and Germany – was crowned International Engine Distributor of the Year. Then the following year, [Pitteri Violini Spa](#), which is the JCB Powertrain distributor for Italy and San Marino, succeeded them. Now in the latest edition of the awards, [Engine Power Inc.](#) has scooped the North American Distributor of the Year.

Here we take a closer look at the recent winners who are making a positive difference each side of the Atlantic.

THE ITALIAN JOB

Established for nearly 100 years, Pitteri Violini Spa is a family-owned business which delivers a range of services including parts supply, servicing and manufacturing alongside the provision of power solutions to OEM customers. The company has extensive in-house engineering expertise and specialises in creating, testing and customising bespoke systems to meet the exact needs of its customer base.

It has built significant market share in the supply of power systems for water pumps, trans-

porters, crushers and harvesting equipment. Galvanised by its prestigious award win, the business has gone from strength to strength.

Leonardo Zappella, Managing Director of Pitteri Violini Spa, said: “We were proud to be nominated for this award and even more delighted to win it. It highlights our continued development as a business which has been further strengthened over recent years since joining forces with JCB Powertrain.

“That move has given us a prestigious, strong and well-known engine manufacturer above 50 kW to promote in Italy and San Marino through our network. Italian OEMs now benefit from the highest quality products combined with the expertise and rapid support they have come to expect from us.”

AMERICAN MUSCLE

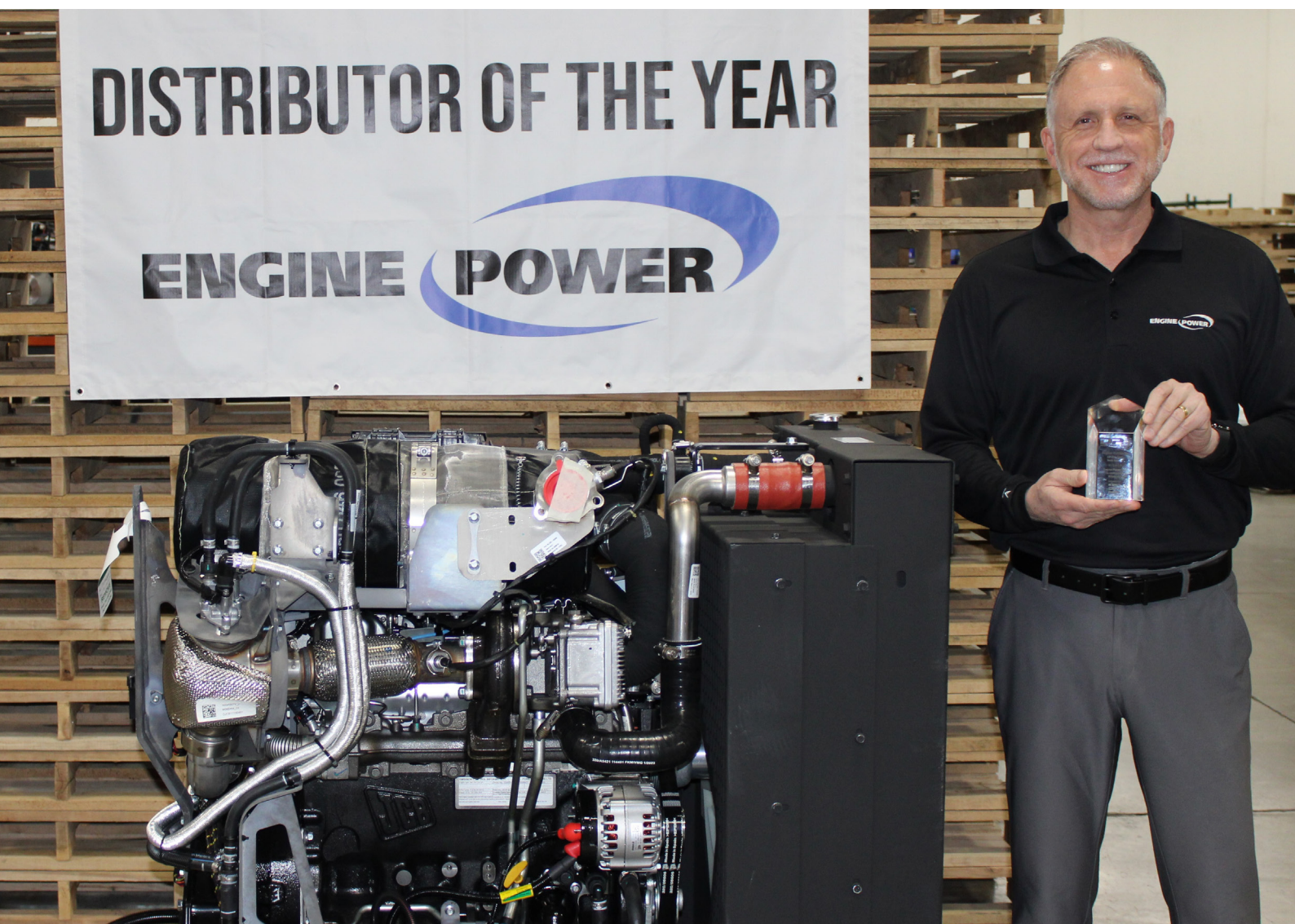
Engine Power Inc. was one of JCB Powertrain’s very first US distributors, joining forces with us in 2012. With locations in Wisconsin and Ohio, they serve the greater Great Lakes region on our behalf. Engine Power’s engineering capabilities are industry leading, providing their OEM clients with bespoke technical solutions.

Engine Power Inc. President, Brian Paulin said: “Engine Power was honoured to be named ‘2023 Distributor of the Year – North America’ by Power Progress. As a value-added service company that relies upon having excellent people available to satisfy our customers’ varied and complex needs, this award affirms the efforts of our knowledgeable and dedicated team of employees.

“In addition, it affirms Engine Power’s considerable investments (over the past 43 years) to develop our engine package designs, engineering systems, product support systems and regulatory compliance systems.” ●

Leonardo Zappella, Managing Director of Pitteri Violini Spa. ►

Engine Power Inc. President, Brian Paulin. ►



TURKISH DELIGHT

JCB engine sales in Turkey have doubled year-on-year since 2021 – driven by a growing and dominant market share in the road sweeper manufacturing sector.





50%

“SIF has seen a massive increase in sales into the road sweeping industry within Turkey with JCB engines now accounting for approximately 50% market share of this industry”

In 2018, JCB Powertrain appointed SIF as its Turkish distributor. No stranger to JCB products, sister company Sif Is Makinaları has sold JCB construction machines since 1957 and been the authorised dealer in Turkey for more than 50 years.

That expertise and market insight has proved the perfect platform for the recent success.

STRONG FOUNDATIONS

Through its longstanding partnership with JCB, SIF's experience spans the construction, industrial and agricultural sectors – providing sales and support to companies working in energy, construction, mining, landscaping, farming and more, across the public and private sectors. It operates from 7 regional centres with 25 authorised service facilities spanning the country.

This extensive market penetration made SIF the perfect partner when JCB Powertrain was looking for an engine distributor in the region. For SIF, the company was confident its heritage would provide a great advantage in sales, installation and aftersales and that it had the technical expertise, infrastructure and personnel to deliver engines sales to the sizeable Turkish OEM market. The only missing ingredient was the right engines.

A PLATFORM FOR GROWTH

Once appointed, SIF was able to capitalise on this market insight and the opportunities

afforded. They knew which sectors the JCB engine range was perfect for, and they knew the Turkish manufacturers operating within them.

After laying foundations and building relationships, sales have begun to snowball – growing rapidly by 54% between 2022 and 2023. With continued investment in the sales and engineering teams, this growth shows no sign of abating with SIF targeting another 86% by the end of 2026.

SIF Aftersales, Marketing and Commercial Operations Manager, Eren Mengütay said: “In the last two years we are truly seeing our hard work come to fruition, as the traction we have built in the market is strongly converting into sales.

“OEMs see their engine manufacturers not only as suppliers but also as solution partners. Therefore, SIF supports with every aspect – from the installation of the engines right through to after-sales. We provide the necessary technical support during the installation of the engine, any required testing and the guidance for possible improvements. Then it is backed by first class service support.

“Manufacturers here also hope to work with a single brand in order to simplify stockholding and enable their teams to specialise technically. With JCB manufacturing engines from Stage II to Stage V emissions legislation and from 55 kW to 212 kW, we can supply OEMs with a full range which they can export all over the world.

“With that in mind, JCB's scale and brand recognition is also critical. Its reputation across

Turkey, Asia, Middle East and Africa - allied to its global service network - provides crucial reassurance for OEMs. They are safe in the knowledge that their products will be accepted and supported, wherever they are in operation.”

SWEEPING UP

While selling and supporting JCB engines across multiple applications, one in particular has truly underpinned the success. SIF has seen a massive increase in sales into the road sweeping industry within Turkey with JCB engines now accounting for approximately 50% market share of this industry.

As we have seen in other geographical markets, JCB engines are perfectly optimised for this role. Producing high torque at low rpm, they can operate at lower speeds compared to other brands, providing an advantage on fuel consumption and running costs. Furthermore, the high-torque dual PTO outputs are ideal for driving the side and front blowers on road sweepers while the high dust, humidity and temperature resistance of the engine allows it to perform in extreme climates. Low vibration levels deliver quiet operation which is perfect for the road sweepers' typical inner-city applications.

With a proven partner boasting superb local knowledge - and an engine that is tailor made for its OEM customers in the road sweeping sector – JCB Powertrain is truly cleaning up in Turkey. ●

PEOPLE POWER

Two new appointments as JCB Powertrain OEM division continues to go from strength to strength.

ADAM CLAXTON | PRINCIPAL APPLICATIONS ENGINEER

Adam Claxton joined JCB Powertrain following an impressive career as a calibration engineer at the Ford Motor Company's Dunton Technical Centre in Essex. There he worked on a series of diesel programmes across passenger and commercial vehicles – including the Ford Fiesta and Transit Custom models - culminating in the lead calibration integration role on the Ford Puma.

Seizing the chance to move off-highway, Adam moved to JCB in 2019, initially working on the launch of our Stage V 448 engine platform and latterly on the hydrogen combustion engine programme.

Seeking more customer interactions, Adam has joined JCB Powertrain as Principal Applications Engineer. His key responsibilities will include engineering support for our direct OEMs and distributors worldwide – working on new installation approvals and driving OEM product improvement – where his technical expertise, honed in the research and development division, will come to the fore.

Adam Claxton said: "With on-highway applications becoming increasingly electrically driven, I recognised that the off-highway sector could face a tough but exciting challenge in developing cleaner power. Working on the development of the hydrogen engine was extremely rewarding

for me and now, in my new role, the opportunity to bring that innovation to market with OEM customers is an exciting next step for us and them.

"I am relishing the opportunity to travel and meet our global network and customer base. I hope that the strong bonds we are developing with our direct OEM customers and our distributors will help drive JCB Powertrain forward. I am genuinely looking forward to the positive global impact we can have together."

CAMERON SELLORS | SALES MANAGER – EUROPE AND ROW

A graduate of the JCB Academy and our own apprenticeship scheme, Cameron Sellors has been appointed as Sales Manager - Europe and ROW at JCB Powertrain.

With a passion for engines and mechanics since an early age, the opportunity to grow and develop his skills and knowledge at JCB Powertrain was unmissable. After completing his level 3 engineering apprenticeship he worked as an engine development technician within JCB Powertrain research and development department. Sponsored by JCB, he will complete his degree in Mechanical Engineering concurrently with his role.

Cameron said: "JCB's presence and stature within the industry excited me and is something I am proud to be a part of. I am looking forward

to progressing in the new role and the chance to see the business from a different perspective. Working with distributors across the UK and globally will show me the true extent and diversity of the equipment that our engines power.

"Completing my studies at JCB, allied to seven years within the R&D department of the business, has allowed me to gain valuable experience with a wide variety of engines and technologies from our existing offering to development projects such as the hydrogen combustion engine. I am excited to bolster the sales team within JCB Powertrain and for the chance to implement my knowledge and expertise in support of customers."

In his previous roles, Cameron has already contributed on a series of major projects. His remit as Engine Development Technician involved running and testing current and prototype engines using the test cells in R&D, processing test data, analysing data logs and recordings and also working on the engines directly by changing components and installing them into the test cells.

Further roles have included cold testing, conformity of production, altitude testing and work as a development engineer in the mechanical development team for the JCB hydrogen combustion engine, where he contributed to testing and developing a number of the pioneering engine's systems. ●

“Working on the development of the hydrogen engine was extremely rewarding for me and now, in my new role, the opportunity to bring that innovation to market with OEM customers is an exciting next step”

*Adam Claxton
Principal Applications Engineer ▶*



“JCB’s presence and stature within the industry excited me and is something I am proud to be a part of. I am looking forward to progressing in the new role”

*Cameron Sellors
Sales Manager – Europe and ROW. ▶*



EUROPEAN EXPANSION

While our global growth continues at pace, here we put Europe in the spotlight with two recent additions to our distributor network - further strengthening our presence and expertise on the continent.

SWISS PRECISION

[Paul Forrer](#) has become JCB Powertrain's first distributor in Switzerland - bolstering our commitment to central Europe.

Established in 1953, Paul Forrer is a family-owned business located in Bergdietikon, South-West of Zurich. They are a market leader in the provision of mobile hydraulic components - such as hoses, couplings, pumps, valves, cylinders, controls - alongside complete system solutions and prime movers. Now on board as a JCB Powertrain distributor, they will offer the Swiss market the complete range of JCB engines including the new hydrogen internal combustion engine once available.

Paul Forrer's Sales Director, Patrick Oertle said: "Becoming the JCB Powertrain distributor in Switzerland was an opportunity we relished. We recognised the opportunity to enhance our existing product portfolio with access to these perfect additions. JCB's range of engines is renowned for quality and their perfect fit, all manufactured by a well-known brand. Our OEM clients will now profit from JCB's proven product quality combined with the well-established Paul Forrer expertise in the design and execution of projects of all scales."

JCB Powertrain's Global Sales & Applications Manager, Jon McNulty added: "With over 70 years as a leading supplier of hydraulics, drive technology and motors for the Swiss market, Paul Forrer is the perfect fit to represent JCB Powertrain in this new region for us. With a team of 100 employees, they have the scale and the capabilities to deliver the highest calibre of engineering and quality service to its existing and prospective customer base."

SCANDI STYLE

JCB Powertrain has joined forces with Power House to sell and support our OEM engines in Sweden, Denmark and Norway.

Founded in 2008, [Power House](#) employs a team of 20 across its head office in Gothenburg, Sweden, and recently added a site in Kristiansand, Norway. The company offers a vast range of services and products to OEM manufacturers including: marine gensets, hydraulic power packs, firefighting equipment, nitrogen pumps, dry bulk handling and the support of offshore and industrial applications.

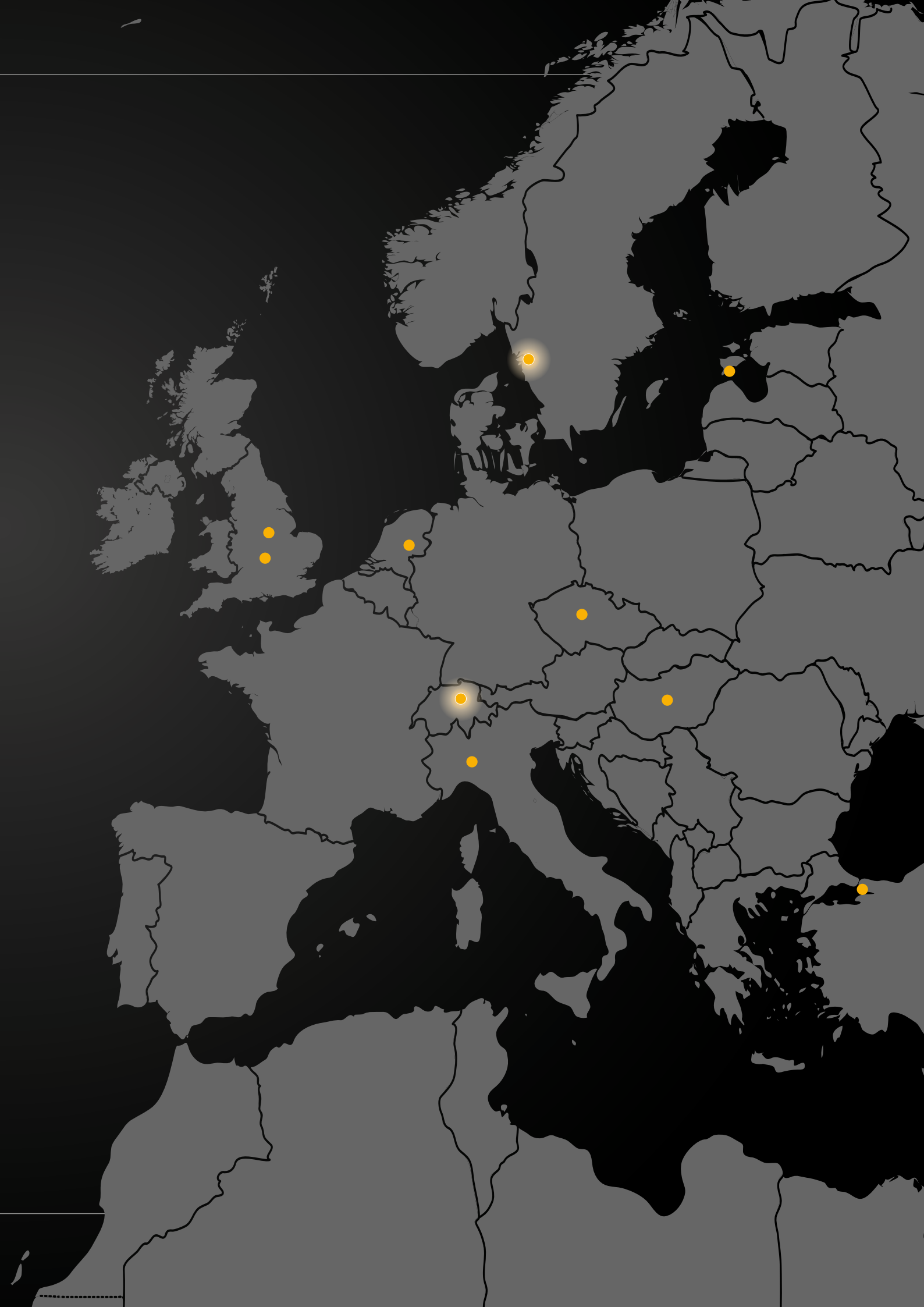
Power House will distribute a wide range of JCB's OEM diesel industrial engines, offering base engines from 55-212 kW, G-drive units

from 47-121 kW and IPU models ranging from 55-129 kW.

Power House CEO, Richard Johansson said: "Our customers demand high quality, reliable products with a strong environmental focus. JCB's products meet those criteria and now give us a complete offering from 55 up to 2000 kW. Allied to our already established service network, this enables us to meet the needs of our customers in Sweden and the rest of Scandinavia.

"JCB is a brand that for us signals strength, reliability, and quality. Both the company and the products have a good reputation in the market. Combined with our know-how, resources, and the existing channels to sell and distribute these products in Scandinavia, we are hoping for a long and prosperous partnership."

JCB Powertrain's Jon McNulty concluded: "Since their inception, Power House has become a leading provider of marine and industrial engines in the Nordic region of Europe. With a dynamic engineering team, a laser focused sales force and market leading customer service, we believe Power House is the perfect partner to represent the JCB brand." ●



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