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Top of the technical tree?

The loader crane market is one of the more varied and diverse products that we cover, ranging from ultra small models installed on vans or light trucks, to behemoths which require the full payload of a five axle chassis and everything in between. We also have specialist ranges for forestry and timber, brick deliveries, waste and recycling to removing soil - 'Muck Away's as they are sometimes called. We take a brief look at some of the latest products and technology, followed by our first ever report on the 'dark horse' of the loader crane market, Hyva, which has been quietly expanding over the years in emerging and other markets to challenge the market leaders in terms of sales. Transport specialist Mark Carrington also takes a look at the niche market of cranes on articulated trucks.

This year has seen few new product launches as manufacturers filled in gaps in new product lines from last year and added the odd special application models. At the same time the major manufacturers - which include three publicly quoted companies, one private equity owned and one family owned - have continued to do very well financially through to the end of March. They have also continued to adopt increasingly impressive technology from electronics and control systems to steel fabrication and forming techniques, putting loader cranes right at the top of the technical tree, at least in the markets we report.

The Hiab K-505 HiPro'



Palfinger completes 25 to 60t/m TEC range

Palfinger has introduced four new 40 to 60 tonne/metre cranes this year, two TECC 5 models - the 43.7t/m PK 45.002 TEC 5 and 53.1t/m PK 55.002 TEC 5 - plus the TEC 7s the 45.7t/m PK 48.002 TEC 7 and the 55.5 tonne/metre PK 58.002 TEC 7, rounding out its 25 to 60 tonne/metre line up. The new cranes offer maximum lift capacities from 15.6 to 20 tonnes with maximum tip heights of up to 37 metres and outreach of up to 33.7 metres thanks to a wide range of jibs and extensions. All four use Palfinger's 'P' - Polygon - boom profile.

Standard features include 360 degree continuous slew with a choice of single or dual slew motors, radio remote controls - Scanreco on the Tec 5s and PALcom P7 on the



The 45.7t/m Palfinger PK 48.002 TEC 7



C&a

loader cranes

Hiab S-HiPro 230W

Palfinger adds to TEC range



Tec 7s - DPS Dual Power System for full lifting power in jib mode - DPS-Plus for the TEC 5, and DPS-C for the TEC 7 - along with the HPSC-Plus module which monitors the crane bed tilt to provide increased capacities and improved stability by taking the load on the truck into consideration. This allows higher capacities when fully laden which reduces as it is unloaded.

Special application models from Hiab

Meanwhile Hiab has been integrating its Effer acquisition into its distribution network but currently it continues to produce two full product lines. It also introduced a new crane for the waste collection market, the S-HiPro 230W. Designed for emptying underground refuse containers, the new crane joins the S-HiPro 130W launched in 2014, but offers 30 percent better lift capacity while being around 150kg lighter. It features a four section, full power telescopic boom and the whole crane folds flat on top of the truck's waste hopper. It is also equipped with the latest HiPro remote control system which is said to make it easier for novice crane operators to use, along with Hiab's Semi-Automatic Motion system.

It also unveiled the K-505 HiPro specialist drywall crane for the US and Canadian markets - its longest, heaviest and strongest drywall

crane to date - with a maximum load moment of 41 tonne/metres and the ability to deliver drywall sheets as high as the ninth floor of a building.

Tractor mounted Fassi for Sijperda

Fassi has been busy delivering production units of its 130 tonne/metre F1650 line, and more recently Dutch rental company Sijperda Verhuur took delivery of a 54 tonne/metre Fassi F545 mounted on a Volvo FH460 Euro 6 tractor unit. Equipped with Volvo Dynamic Steering, it allows the power steering to be adjusted digitally according to suit the driver. The crane has 360 degrees slew and a maximum outreach/radius of 14 metres, matched to an extendable three axle Nooteboom semi-low loader with fold-down bed, hydraulically extendable loading floor and the extra-wide five metre ramps. The rig will be used for transporting a wide range of bulky products, including large aerial work platforms and cabins.



Hyva know-how

Last year saw the 40th anniversary of lifting and loading equipment manufacturer Hyva coincide with the introduction of its new 40 model Edge range of loader cranes. Looking to find out more about the company, its latest products and how its worldwide presence is helping it become one of the leading players in the loader crane industry, C&A spoke with its loader crane product managers Riccardo Cuppi and Giuseppe Bevacqua.

A leading player

The company was founded in the small town of Alphen aan den Rijn - half way between Amsterdam and Rotterdam in the Netherlands - in 1979 to build hydraulic cylinders. It has since developed to become one of the world's leading producers of cylinders for the heavy duty truck market and in 2017 celebrated the production of its two millionth hydraulic cylinder. In between it has grown steadily through good times and bad, setting up new manufacturing and distribution subsidiaries all over the world while making a series of acquisitions, most of which have helped diversify its product range. Hyva now offers a wide range of hydraulic related products including hook and skip loaders, compactors and waste collection bodies and - importantly for us - loader cranes.

The company has tended to be overlooked, seemingly

overshadowed by the likes of Hiab, Palfinger, Fassi, HMF and PM. In fact this is the first time Cranes & Access has taken a look at the company in more than 21 years. Today, the company produces more than 100 different crane models under three brands, with capacities ranging from one to 160 tonne/ metres with a number of specialist models for the agricultural, timber and recycling markets. Although loader crane sales only account for between 15 to 25 percent of the company's total revenues, year on year growth since 2008 has seen it reach a point where it says it now competes with the likes of Fassi and PM behind market leaders Palfinger and Hiab.

Global product manager, Cuppi said: "According to our estimations we are now within the top three or four manufacturers in the loader crane industry. Much of Hyva's success comes from emerging markets and, as well as benefitting from



multiple brands, we also benefit from worldwide coverage, which is supported by one of the world's most extensive customer support networks in the industry."

Dates back to 1991

The company's first foray into the loader crane market dates back to 1991 following the acquisition of Dutch roll loader crane manufacturer Kennis. Then in 2004 private equity group 3i funded the Management Buy Out of Hyva from Alpha, taking a 65 percent stake with the management and previous owner holding the remainder. This led to further expansion and in 2007 Hyva acquired Italian loader crane manufacturer Amco Veba, which also included the Ferrari brand of

loader cranes, providing it with a serious position in the loader crane market.

The move also brought Amco Veba's more than 40 years 'know how' as well as its production facility in Poviglio, Italy - a region renowned for producing high quality components. Cuppi says: "Following the acquisition of Amco, we were able to leverage the know-how and experience of an industry pioneer that dates back to the early 1970s. There is a lot of heritage and legacy at the Poviglio facility which is located in a region not only regarded for its craftsmanship in Italy but also around the world. We therefore optimised our supply chain to take advantage of the synergies with the



Hyva cranes ready for delivery



Today, the company produces more than 100 different crane models

companies based in this area.”

Following the acquisition Hyva decided to adopt a multi brand strategy, retaining the Amco Veba and Ferrari brands alongside Kennis - all of which are manufactured at the 21,000 square metre Poviglio facility. It was also at this time that the company produced its first Hyva branded loader cranes, with the group benefitting from shared products, practices and technologies.

“The production, research, development and product management structure here in Poviglio are shared between the three brands. However, each brand is marketed with strategies according to geographic regions and distribution network.”

Worldwide presence

Hyva's has a surprisingly strong global presence, having established its first overseas subsidiaries - Hyva France and Hyva Belgium - in 1980. Germany, the UK, Spain and Portugal followed in quick succession and then in 1991 it opened its first operation outside of Europe - in Malaysia - and has since built a particularly strong presence in emerging markets operating in 130 countries worldwide, with 39 subsidiaries and 13 manufacturing plants.

In 2010 the company was acquired from 3i by Hong Kong-based Unitas Capital which paid €525 million for a 70 percent stake, prompted by Hyva's growing presence in emerging markets - around 70

percent of its revenues were generated outside of Europe, Africa and the Middle East. Unitas chief information officer, John Lewis said at the time: “This acquisition is a rare opportunity to buy a company that has significant market leading position in three of the four BRIC economies of China, India and Brazil.”

In the years since the acquisition Hyva has continued to strengthen this position with the opening of additional production plants in

China, India and Brazil as well as the addition of eight new subsidiaries outside of Europe. In terms of revenues Hyva is coy on disclosing it but estimates suggest \$800 million or so.

Cutting Edge

More recently the company launched its all-new Hyva Edge range of loader cranes which is also available under the Amco Veba and Ferrari brands as its New Age and Next Generation ranges. Originally unveiled in 2016, it wasn't until



Last year saw the 40th anniversary of lifting and loading equipment manufacturer Hyva

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Day by day, Fassi works towards the future. It does so by focusing on **digital and mechatronic innovation**, introducing **applications and technology to support human operators**. These devices are developed entirely by Fassi and can be activated either remotely or via selector switches and can assist the operator both in terms

of control and safety. **Predictive diagnostics, connectivity** between machines, **control** of load handling and **cabin safety** are just some of the **innovative functions** available which make the work of the operator ever more important and central.

More about: fassi.com

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Bauma last year that the company completed the range, which offers capacities ranging from nine to 66 tonne/metres.

Spread throughout its compact telescopic HT, articulated HB, articulated double linkage HC and HCK ranges, features of the new line include 425 degree slew, extra wide stabilisers and a new control station for improved visibility and easier operation. The HC-K models also feature a short retractable secondary boom configuration that provides a high lifting point to make it easier to handle loads close to the crane boom. It also allows for the boom to comfortably fit within a short truck body during transport.

The Edge range also includes a number of innovations including Extra Extension Speed (EES) which reuses hydraulic oil to increase the speed of extensions and its Lift Control System (LCS) which can reduce the speed of the crane in order to increase the capacity of the crane by 10 percent when lifting heavy loads. Additional features include the Dynamic Load Diagram system and graphic display, which clearly indicates the available working envelope based on the truck's actual stability and weight of load, and the Magic Touch feature that allows automatic boom stowage and unfolding from travel to ready to work position.



Dynamic Load Diagram system

When explaining the rationale behind the new range of cranes, Cuppi says: "The most obvious difference in this range from previous models

is the design, which had to be modified in order to match perfectly with the latest truck body designs. The ergonomics and ease of use were also factors as well as the use of more robust materials, along with state of the art electronic and hydraulic components. We are so confident of the quality with the Edge line that we have included the best warranty conditions in the industry."

In the field

Shortly after the launch of the Edge range, the company announced an extended three year warranty on all crane components and five years structural warranty. This move, according to product manager Bevacqua, was a result of the improved components and materials as well as the company's growing confidence in its development process, along with intensive testing simulating more than 10 years of high usage.

Bevacqua adds: "The warranty is proof of the reliability and is the result of a solid development process of design, prototyping and field testing which is pretty unique in our industry. In order to have the confidence to offer our warranty we needed to make sure they were tested rigorously. The cranes underwent at least 64,000 cycles under maximum work-load conditions as part of the fatigue testing. This is a constant cycle that takes three or four weeks, day and night. As well as these cycles we also test the crane in different configurations and then again every time it is fitted with any new elements - such as new stabilisers or a fly jib - so on average our cranes are tested 100,000/105,000 cycles, which is well over the amount required."

Following its internal test programmes, the cranes are also



Hyva HC161

subjected to an extended field testing programme in real day to day operating conditions, with any end user comments and suggestions fed back to the team.

"We have partnerships with trusted customers and provide them a field test machine to test not only the lifting capabilities but also but also the real life conditions, such as driving over potholes or the use of the cranes that are not as constrained as our testing. Truck drivers for example seem to always push the cranes to their maximum, and although this is not always ideal, it is real life and we think it's necessary to complete the testing and fine tune our products."

Growth continues

The largest cranes in the Edge range - the 63.2 tonne/metre HC661e and the 57.5 tonne/metre HC601e - are scheduled for launch later this year, having been previewed at Bauma. They will be available for both the CE and non CE markets. The HC661 has a maximum capacity of 14.2 tonnes and can handle 650kg at a maximum radius of 31 metres. The slightly smaller HC601e on the other hand can handle a maximum capacity of 13 tonnes and take 500kg out to 31 metres.

Features specific to these larger models include continuous 360 degree slew, an auto levelling system, an operator auto detection

system which detects the stabiliser closest to the operator and the company's Active Awareness Radio (AAR) which alerts the operator through joystick vibrations of any potential hazards. The new models are the largest cranes it has introduced since the 95 tonne/metre HC951, 115 tonne/metre HC1151 and 165 tonne/metre HC1651 were launched in 2017.

When questioned on the company's plans for the heavy end of the market, Cuppi said: "We are currently completing the mid size range first, with cranes from nine to 21 tonne/metres, but the plan is to focus on developing bigger cranes in response to market demands. The process takes time, but we certainly want to be stronger in this market segment."

Looking to the future

As well as looking to move into the heavy duty market the company also has plans to develop more sustainable products. "As well as investing in new partnerships, products, and Research & Development, we are also keen to provide environmentally friendly solutions. This move goes beyond the demands of our customers or the general market and is in response to the environmental climate. Going forward I expect Hyva to take a lead in this area," says Cuppi.



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LIFETIME EXCELLENCE



A recent example of this is the introduction of the company's first electric powered Kennis e-Power roll loader crane. Introduced at Bauma last year on its 16 tonne/metre 16-R, the crane's diesel engine has been replaced with an electric motor and battery pack which the company claims does not compromise the lifting performance of the crane. As well as offering reduced emissions and noise levels, the e-Power's On Road Recharging System (ORRS) is able to top up the batteries when in transit, while a plug-in charging solution is also available.

"We decided to start with a particular model of crane because it is a market that is already very sensitive to this requirement," said

Bevacqua. "The other reason is the truck mounted cranes would require a completely separate controls, while the roll loader crane is already autonomously moving because of its diesel engine."

Access to all areas

Another area the company is exploring is the powered access industry, having announced plans back in March 2019 to offer a 30 model range of truck mounted platforms through its dealer network.

The company has initially formed an OEM partnership with Italian manufacturer CTE to create the AT telescopic model line with working heights from 15 to 28 metres, and the AZ articulated boom line from



The Hyva AZ20.3H in partnership with CTE

13 to 29 metres. A pick up version will also be available. The first unit available last year was the 20 metre AZ20.3 (the CTE Zed 20.3 HV) which it is selling through the Hyva distribution network.

Speaking shortly after the

announcement last year, Hyva crane business director, Davide Catellani, said: "The new aerial platform line represents another brick in the construction of the most extensive product portfolio in the industry for lifting and loading solutions. This underlines Hyva's commitment to support our worldwide customer base to cover a wide range of applications and market needs."

Given the company's worldwide market coverage this might prove to be a shrewd move that not only adds to its portfolio but also opens the door to new market sectors and customers and perhaps leads it further into the truck mounted lift market?





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Not for the faint hearted

Mark Carrington of Hickmire consulting and non-executive director for truck bodybuilder Kurt Hobbs Coachworks takes a look at the challenges and decisions involved with mounting loader cranes on articulated trucks.

The loader crane market has been growing steadily as lifting and handling rules have become tighter. Today cranes mounted on trucks and even vans are now commonplace, however loader cranes on articulated trucks are rarer and a more specific investment that requires the buyer to know exactly what they want and why. This is because they are a more expensive and considered purchase.

A specialist solution

Whether the crane is mounted on the tractor unit or the trailer, each has its own special engineering and operating problems meaning that operators are unlikely to invest unless they already have experience with this configuration, or have a specific task that warrants such a specific and long term investment. Most companies running cranes on articulated rigs are long established specialist companies with machine tool moving and factory installations forming a key market sector. Also a wide range of heavy, valuable or bulky cargoes that have their own special requirements, suit this type of crane mounting.

When specifying a loader crane on

an artic, a key factor is optimising the vehicle's payload. The fundamental choice is therefore whether to mount the crane on the tractor unit or the trailer, and if on the trailer, should it be front or rear mounted? Whichever option is chosen it pays to get specialist engineering advice.

When mounting a crane on a semi-trailer, the larger the crane, the more likely it is to be fitted at the rear as the torsional stability of the trailer is important and the more important the footprint of the trailer bogie and its stabilisers becomes. Cranes up to 200 tonne/metres can be fitted to low loaders but co-operation between trailer builder and crane installer is critical. On these higher capacity cranes the weight of the overall vehicle can be around 45 tonnes so operation in SGT0 Cat 2 - up to 80 tonnes gross combination - is necessary. Smaller cranes can be operated within Construction and Use regulations within 44 tonnes gross weight.

Fundamentally the crane installation and operation depends on the self-weight and footprint of the trailer and the crane outriggers and their fixing, so it is crucial that the



engineers at both trailer builder and crane installer co-operate fully in order to avoid future problems.

On the trailer or tractor?

There are pros and cons of mounting to either the trailer or the tractor unit. Clearly if the crane is trailer mounted it becomes a self-contained unit and can be installed with its own engine/powerpack therefore utilised with pretty much any tractor unit. When the trailer is not in use it allows the tractor to be used on regular duties. The disadvantage of a trailer installation is that load space is reduced by the space the crane occupies. The overall trailer length tends to be critical for large volume, lighter

weight loads such as cabins or bulky vessels. Where a step frame trailer is used for heavier loads, it is only the lower deck that tends to be used which means space is not so critical.

Many of the biggest loader cranes will be fitted to tractor units where both the weight and short chassis length aid torsional stiffness. The overall load to be imposed determines the truck specification, with tractors up to five axles being used, some solely as a crane with no fifth wheel coupling. A tractor mounted crane can, of course, be used as a self-contained mobile crane - but buyers need to check with the truck manufacturer on



Larger trailer mounted cranes tend to be fitted at the rear



A tractor unit installation makes for a versatile mobile crane

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any warranty limitations. Where a fifth wheel coupling is fitted some compromise may also be required to the trailer specification, as the standard 1.6 metre kingpin may obstruct the crane or wet kit or require the fifth wheel to be fitted further back from its optimum position. In such cases it may be appropriate not only to have a dedicated tractor but also couple it with a 'short neck' trailer as kingpin to rear dimension will be limited to 12 metres and so any deck length saved at the front end of the trailer cannot be added to the overall length.

Grundel solution

A specialist crane trailer has just entered service with Mansfield, UK-based K B Gundel. The company was established more than 30 years ago and provides an unusual fleet of lifting and handling vehicles. The company knows a thing or two about handling awkward and challenging loads and when looking for ways to better serve its customers it built a trailer, shortening a fully steered urban platform trailer to 10.5 metres and installing a Palfinger PK50HD crane at the rear. The resulting vehicle - which allows the tractor unit to be utilised for other purposes when the crane is not required - was designed to offer much greater

versatility than an eight wheel rigid truck and has a 17 tonne payload, compared to the 12 tonnes of the rigid. Whilst the build was something of an experiment, Kevin Gundel found that the crane's full capacity is available through almost 360 degrees. It only comes close to its limit when directly over the rear, but this can be remedied by ballasting the front end of the trailer. The trailer and crane is a useful tool on site and can handle almost three tonnes at 14 metres radius at 45 degrees to the trailer centre line, and a near 10 tonnes at six metres. Gundel believes this delivers much better value for money than an eight wheel rigid.

"Buy the right trailer"

Gundel also has an interesting view about fitting cranes to the trailer neck, which can be summed up as "Buy the right trailer!" A conventional semi-trailer is principally built for cost and payload. In order to achieve the maximum payload the overall weight of the trailer is kept as low as possible. This is perfectly satisfactory when carrying pallets or other conventional loads, but not when it comes to mounting cranes. Grundel prefers to use one of the manufacturers operating in the heavier 'Special Types' market sector, where neck



Grundel's urban artic with trailer steering is as versatile as an eight wheeler but with nearly 50 percent more payload



The Broshuis extender neck was found to have high torsional stiffness - well suited for mounting the crane



Nortons Transport with a similar trailer but tractor mounted Hiab crane



design has to take account of concentrated indivisible loads, and thus the torsional stability can be significantly better even than with the tractor unit. This means that even though the trailer mounted crane is further back than it would be if mounted on the tractor unit, the additional counterbalance created by its weight and length of the trailer means that lifting over the front of the tractor cab is greatly improved. This has been demonstrated on another purchase by Gundel's of a Broshuis extender fitted with a neck mounted Palfinger PK50.

Back or front?

Outreach and versatility also become more important when loader cranes are regularly used not only to unload a cargo from the trailer onto the ground alongside, but to lift loads into place at height or long radii. Cranes fitted to trailer necks are typically used for lifting lighter duties with unwieldy loads such as cabins, where significant outreach is required but high capacity at full extension is less critical. The rear area of the trailer can then be fully utilised. Cranes mounted to the neck of a semi-



With light bulky loads a forward fitted crane frees up load space



trailer give the operator the greatest flexibility for site drops of containers and cabins and long loads which can be offloaded to the side of the trailer. Typically cranes up to 30 tonne/metres are seen on trailer necks which means a site cabin can be placed around seven or eight metres from the centre line of the trailer. Outrigger consideration is critical as in this situation, as already mentioned trailer necks on conventional step-frames offer little torsional stability as it is effectively only mounted to tractor unit through the trailer king pin.

Handling statues

Charles Russell Transport of Gloucester runs several rear mounted Fassi cranes, the biggest of which is a Fassi F1950 on a specially-built, fully-steered four axle King step-frame. The crane was specified to offer a maximum lift capacity of 30 tonnes at 4.4 metre radius or 12.5 tonnes at its maximum outreach of 11 metres. Another Fassi F1150 is shortly to be delivered on a Nooteboom trailer.

Russell's crane fleet has advanced significantly from when Charles founded the company in 1968 to transport agricultural equipment. A Ford D Series fitted with a Hiab crane was the start of a division now highly respected for its lifting and handling expertise. Russell has invested in a number of increasingly large rear mounted cranes on low loaders. The company has a close relationship with Fassi, informing the manufacturer of its lifting requirement and leaving it to Fassi to specify the model. "If I make it clear what I expect the crane to achieve then it's their responsibility to ensure it does," says Charles Russell.

As the company's involvement in crane transport has increased so has its expertise and now many of the purpose built installations are handled in house. The company's reputation has resulted in customers trusting it implicitly for handling valuable loads, and it is often called upon to relocate artworks and sculptures. One such project which took three years in its planning and execution, involved the transport and installation of a number of large sculptures from a foundry in the UK to Doha where they were installed at the Sidra Medical and Research Centre. In all 14 statues were shipped and installed, the largest being 11 metres high and the heaviest weighing 26 tonnes. The project became known as 'The Miraculous Journey'.

Other projects have included Damien Hurst's 'Verity' in Ilfracombe, Devon and 'The Grain of Rice' in Canary Wharf, London.

Summary

There are differing views on configuration and its very much based on an operator knowing his 'game'. As outlined earlier it is a brave operator who ventures into this market without knowing the specific tasks he wants to perform, but getting it right leads to strong reputations.

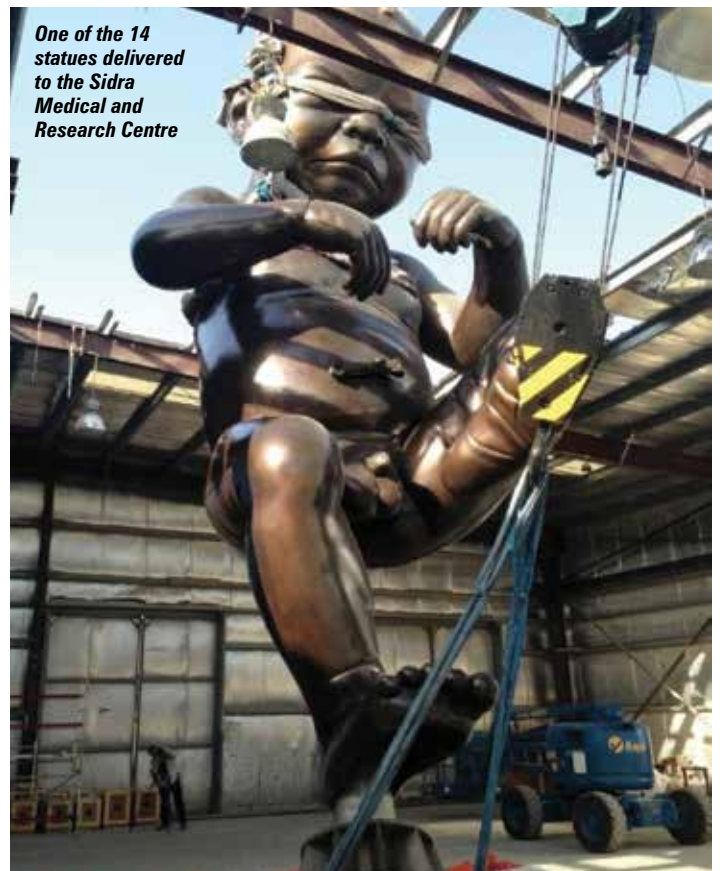
Mark Carrington began his 45 year career in the truck equipment and trailer business in marketing for York Trailers. In 2008 he acquired full ownership of the King Vehicle Engineering Group, which he sold in June 2016. More recently he has been providing advice through his consultancy company Hickmire and is non-executive director for truck bodybuilder Kurt Hobbs Coachworks.



A crane mounted to the rear of a semi trailer offers greater torsional stability and self-weight and is more suitable for bigger cranes.



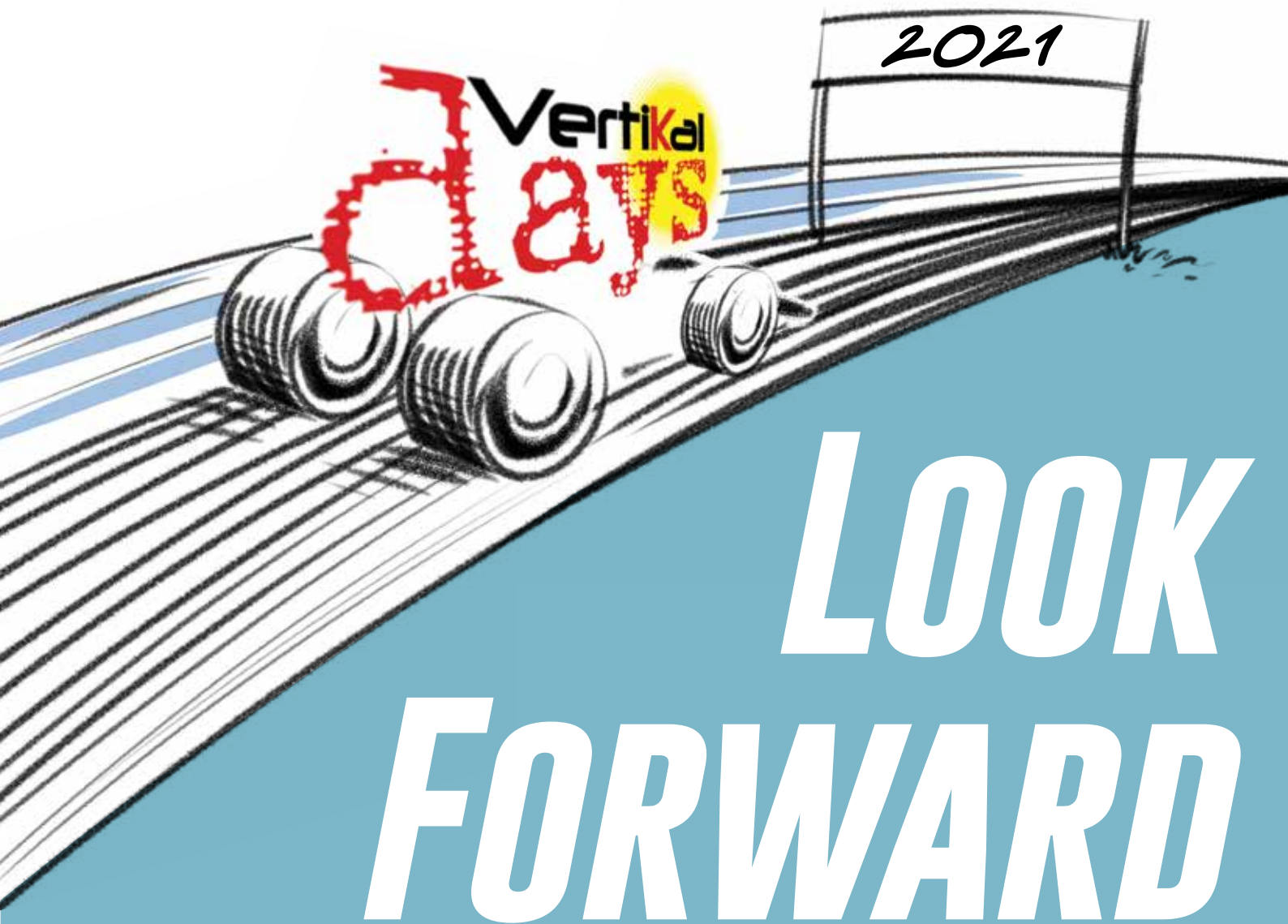
At the top end of trailer mounted cranes is this Fassi F1950 fitted to a King four axle steering trailer



One of the 14 statues delivered to the Sidra Medical and Research Centre



The Verity installation in Ilfracombe.



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