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# POWER CRAZY

The telehandler continues to be one of the most popular materials handling machines in the construction and agricultural markets in a growing number of countries. The past few years has seen increased competition leading to a wider range of products in terms of reach, capacity and power with all-electric machines already a reality, while hydrogen power is being tested. More recently Chinese manufacturers have started dipping their toes into the market with models launched in Europe and North America.

In the following pages we take a look at some of these developments and introductions, while Nick Johnson reviews Faresin's 17 metre 17.45 All Electric and the latest Bobcat R series machines, while looking at JCB's hydrogen power project.

## SHOW TIME

Anyone visiting a major equipment show over the past year must have noticed the arrival of telehandlers on Chinese manufacturers' stands, often tucked away behind the excavators or other equipment and launched with little fuss, almost as if they had been around for years. They haven't - and their introduction is a subtle warning shot across the bows of the traditional, 'dominant' market leaders - Manitou and JCB in Europe and JLG in North America. Until recently the telehandler market seemed to have reached mature market status with annual production of around 60,000 units. A sizeable figure given that most are sold in just a few large markets, such as the UK, France and - only due to its size - the USA.

That appears to be changing, as contractors in other countries start to appreciate their usefulness - something that several Chinese companies have already spotted and are gearing up for telehandler sales to take off in the larger emerging markets, where they are well placed to exploit it. So if their machines do not prove a massive success in Europe it is of little consequence.

The telehandler market is a tough one. Any new entrant is obliged to use existing western componentry such as axles, engines and

transmissions which makes up much of the cost. The market is not tolerant of radical new designs leaving little room for substantial innovations or to significantly change overall weights and dimensions, meaning it is very much a 'Me Too' product although the market leaders have a massive supply chain advantage thanks to their volumes.

The market has already just about 'seen off' companies such as Caterpillar, Komatsu, New Holland, Case, Volvo and others, while Liebherr - no shrinking violet - has been slowly plugging away at it for more than a decade and would readily admit that it has not really got anywhere. If sales in the developing world were to take off however... Chinese equipment manufacturers are best placed to benefit, having been quietly gaining traction throughout Africa, much of Asia and more recently Russia.

## NEW TELEHANDLERS FROM CHINA

Chinese manufacturers exporting 'European style' telehandlers now include Sany, Sunward, XCMG, LGMG and Zoomlion - with others likely to join this list over the next year or two... although the lack of any significant domestic market and price advantage may curb the attraction?

XCMG showed one of two new telehandlers at Bauma, the XC6-2506E - a six metre/2,500kg compact all-electric machine - has a maximum forward reach of 3.45 metres at which it can handle 1,000kg, while managing 2,000kg at full height and can take the 2,500kg to five metres. The 930mm wide cab features heating and air conditioning and is pressurised to keep out dust.



A JLG R11100 Roto



A Liebherr T60-9s at Bauma



XCMG's all-electric XC6-2506E

Overall weight is 5.3 tonnes and the battery pack can be recharged in a little as two hours with a fast charger. The company also plans to launch the 17 metre/4,500kg 1056VN North American model with a 17.2 metre lift height, 13.1 metre forward reach - at which it can handle up to 1,400kg - and a total weight of 14,000kg.



Also, at Bauma LGMG showed its first ever telehandler - the H1840 - with a 17.6 metre lift height, 4,000kg capacity, Perkins Euro V diesel and hydrostatic transmission. Total weight is 12,350kg and standard specification includes stabilisers and self-diagnostics system.

Sany launched three telehandlers for the North American market at Conexpo, the 10 metre/2,700kg STH 634A, the 13 metre/3,630kg STH844A and the 17 metre/4,535kg STH1056A. The company will also introduce the 17 metre/5,450kg STH1256A.

Sany has also launched two European models, the 14 metre/4,000kg STH1440 and the 18 metre/4,000kg STH1840. Standard features include all-round visibility from the German designed cab, low boom, sloping covers and low dashboard. A rear view camera with sensor and visual and acoustic warnings helps visibility, while a safety lock prevents movement when the driver is not seated. Sany is also planning compact models.



Zoomlion also has a range of telehandlers to launch. At APEX it just had basic details of the 12.7m/3,500kg 74kW Cummins powered ZTH3513 but also revealed four other models including the 6.1m/2,500kg 55kW Kubota powered ZTH2506, the 7m/3,000kg 74kW Weichai powered ZTH3507, and two 360 degree machines - the 18m/4,500kg 89kW Cummins ZTH4518R and the 24.8m/4,500kg 89kW Cummins powered ZTH4525R.



Sunward has been showing a 'new' telehandler at exhibitions for almost 15 years but never seems to follow through to production or distribution. This year was no exception - at Conexpo it showed the 17 metre/4,500kg SWTH1056.

At the ARA earlier this year Genie launched its new 17 metre/5,400kg GTH-1256 which can take 2.7 tonnes at its maximum lift height or 1.59 tonnes to its maximum forward reach of 12.8 metres. Deutz power is matched to a four speed powershift transmission, with limited slip differentials on both axles. A new cab design features improved visibility, a seven inch display, reverse back-up camera, rear proximity alarm and full air conditioning. The unit also includes Genie's 'Quick Attach' system for faster, easier swapping of attachments and includes the same options as the GTH-1056 with rotating and swing carriages.



JCB has announced a new sub-compact telehandler - the four metre/1,400kg 514-40 - its smallest telehandler to date. Based on the current 516-40 it can take 1,300kg to its full height and handle 525kg at a maximum forward reach of 2.5



metres. It can also extend a tonne to 1.5 metres. The 514-40 is 1.56 metres wide, 1.8 metres high and less than three metres long. Overall weight is 2,915kg. Features include a full width cab - claimed to be 200mm wider than competitors - while power comes from a low maintenance 1.1 litre three cylinder diesel.

**NEW MANITOU**  
At the ARA Manitou presented a 'sneak preview' of an all-new North American telehandler line - the MTA series - which will include the MTA 642, MTA 842, MTA 1055, MTA 1242 AND MTA 1255. The company says that it is aiming to win a 25 percent share of the North American market in the years ahead. The longer wheelbase models employ many European features such as automatic parking brakes, with the engine mounted at 90 degrees to the machine length so mechanics can reach both sides of the engine. The company also showed the 22 metre/6,000kg MRT2260 electric/hybrid 360 degree telehandler, with battery pack and optional range extender diesel.

**NEW MT MODELS**  
Manitou has also introduced four new MT telehandlers - the MT735, MT935, MT1135 and MT1335 - for both Europe and North America. All four have a maximum capacity of 3,500kg with lift heights of seven, nine, 11 and 13 metres respectively. Overall width is 2.28 metres making them easier to load on a truck, or a standard container. Initially they will be diesel powered only, with electric versions to follow. The machines employ Manitou's latest technology platform which enables features such as automatic parking brakes, engine Start & Stop, more efficient hydraulics with load sensing pump and flow sharing for multifunction operation, along with the latest telematics, in cab information and operational display screen.



All four feature a new wider cab with increased glazed area, including a windscreen cut out for a better view of the load at low boom angles, and benefit from a narrower, sturdier floating fork carriage designed to improve visibility when the boom is lowered while being compatible with Manitou's 14 and 18 metre models. Shipments are expected to begin late next year.

**NEW ALL ELECTRIC 360°**  
At APEX the company showed the all-electric MRT2236e Vision+, a new 26 metre/6,000kg



360 degree model with a forward reach of 21.7 metres. Using a 65kWh lithium battery it weighs in at 18 tonnes and has a maximum travel speed of 38kph. When the outriggers are set it can operate on an AC electricity supply while also recharging with the on-board charger. Alternatively, the Yanmar powered E-Extra generator offers a faster recharge time.

**HYDROGEN POWER DEVELOPMENT**

Both JCB and Manitou are working on hydrogen powered telehandlers. JCB is putting a seven metre/3,200kg 532-70 through a final test programme, part of its £100 million hydrogen project (see page 45). Meanwhile Manitou is testing a modified version of an existing 14 metre model which it hopes to send for field testing at the end of next year.

Manitou's development programme will evaluate two types of hydrogen technology - a diesel engine modified to take Hydrogen fuel, and a hydrogen fuel cell, a prototype of which is currently on the test bed. The company says that it will choose the solution that best meets the needs of its customers although much will depend on how the relevant hydrogen fuel infrastructures develop. If all goes well the company will begin hydrogen telehandler production in 2026 - just over two years away.

**REVITALISING OLD TELEHANDLERS**

In the meantime, Manitou and French international rental group Kiloutou have signed a partnership agreement to convert used diesel telehandlers to battery electric power. Phase one of the project is

already underway at Manitou's Ancenis facility, where a battery electric retrofit kit has been installed in a "high reach" Kiloutou telehandler. The machine will then go to Kiloutou's test centre in Lille where a full test programme will evaluate it for technical and economic feasibility. Assuming the test programme is positive, Manitou will provide retrofit electrification kits to Kiloutou for an exclusive 12 month period from the start of 2024. The kits include a lithium-ion battery pack feeding a large electric motor which will drive the pumps in place of the engine. Kiloutou will put the retrofitted machines back into its French rental fleet where it expects them to be used for around five years.



A retrofitted Kiloutou telehandler



Faresin 6.26s with Sunbelt Rental

**TOP END ELECTRIC**

Following its launch at Vertikal Days Nick Johnson took a closer look at Faresin's new 17 metre fully electric telehandler before it was returned to the factory in Italy, courtesy of UK distributor GGR.

Having stolen a march on more established telehandler manufacturers when it launched the first battery electric model in 2019, Faresin is now using its experience to introduce larger all-electric models, building on the commercial success of its 5.9 metre/2,600kg 6.26 model. The move follows last year's introduction of new, improved battery options.



Faresin's largest Full Electric telehandler was a star of Vertikal Days 2023

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## EASY CHARGER

To make charging as easy as possible, the 17.45 is equipped with an on-board charger and a universal charging socket, identical to that used on road vehicles. The intelligent interface accepts 220V single-phase and 400V three-phase inputs, with the option of a fast charging station. Consequently, the machine's batteries can be conveniently charged or topped up, with whatever power source is available on site.

At the Haddenham facility this charging versatility was demonstrated first by plugging into a 415V three-phase 32Amp charging point in the yard, where the e-Station visual display on the charging cable proved to be really informative. Subsequently the machine moved to the car park at the front of the facility where there are standard 220V single phase 16Amp Ropec charging pillars for owners of electric cars.

This ability to utilise existing charging points such as those in parking bays is a big bonus - however the lower the voltage, the longer a recharge takes. At present there is no 110V charging option, but GGR says that this may be introduced in future if there is sufficient demand.

The physical characteristics of the 17.45 Full Electric follow well established telehandler design principles, with a low rear boom pivot to maximise all round visibility and four equal sized wheels, all wheel drive and steering and a turning radius of four metres. The down angled front stabilisers fold within its 2.36 metre overall width, while side slope frame levelling is standard. Boom suspension is optional.

## NICE CAB

The side mounted cab has a stylish curved front screen which provides good forward visibility. However, some rental companies prefer flat glass on the grounds that replacements are easier to source and cheaper. The spacious cab is entered through a side, split opening, stable door. The top half of the door swings back through 180 degrees and can be safely secured in the fully open position. Inside the cab there is convenient space behind the seat for the stowage of personal items. Air conditioning is an option as are front and rear LED lights.

The proportional hydraulic joystick allows convenient control of all hydraulic functions and there is a clear interactive colour display providing useful operating and diagnostic information. The 3B6 Load Moment Indicator takes readings from the rear axle and helps prevent moving into an unstable position when the maximum capacity is reached. The machine also comes as standard with a reversing beeper and a forward travel Acoustic Vehicle Alerting System (AVAS) is a

handy option with a different sounding buzzer which can be adjusted in volume or even switched off to suit particular site requirements.

## SELLING LIKE HOT CAKES

The standard headstock on the 17.45 is a Faresin design with a good tilt angle, and options include a Euro headstock and adapters to facilitate the use of other company's attachments. The interest in the new machine was such that orders for nine units were received at the launch. First in line at Bauma was Flannery Plant Hire which spoke highly of its fleet of 6.26 Full Electrics which have proved to be very popular with its customers. Operations director Niall Hester is looking forward to adding the 17.45 to its electric fleet.

Flannery is also using the Faresin Farmatics telematics system and has worked closely with the manufacturer and GGR to feed the diagnostic information it generates directly into the MachineMax telematics platform that the company uses. Two companies ordered the 17.45 Full Electric without even seeing it, Explore Plant and Transport Solutions ordered five units while L Lynch Plant & Haulage has ordered three units. Deliveries are expected to begin this autumn.



*The Faresin Full Electric telehandler line-up now extends from the 6.26 to the new 17.45*

Unveiled at Bauma in October, the Faresin 'Big Range Full Electric' series comprises the 14.42, 17.40 and 17.45 models with 14 and 17 metre lift heights and maximum capacities of 4,200kg, 4,000kg and 4,500kg respectively.

Dominating GGRs stand at Vertical Days, the Full Electric 17.45 was displayed with the boom extended to its maximum lift height of 16.4 metres. The new model uses most of the structural elements from Faresin's 17.45 diesel, reducing new content. Maximum forward reach is 12.6 metres at which point it can handle 500kg.

After the show, I was able to take a closer look at the 17.45 Full Electric at GGR's Haddenham facility in Buckinghamshire, allowing me to check out the new machine's clever charging system first hand.

## ADVANCED BATTERIES

Faresin has worked closely with lithium-ion battery supplier Aliant to develop improved power sources for its Full Electric telehandlers. Last year it unveiled the fruits of its labours in the form of the new 24kW/h (315Ah), 32kW/h (420Ah) and 43kW/h (560Ah) batteries for its popular 6.26 Full Electric telehandler. This advance in battery technology has been a key factor in electrifying Faresin's larger telehandlers.

With the 45kW/h lithium-ion battery pack, the 17.45 Full Electric is said to have run times of up to eight hours for non-intensive use and up to 3.5 hours intensive use. The battery feeds two electric motors, a 51kW motor for the drive transmission and a 23kW motor for the lifting functions. Faresin maintains that its electric telehandlers offer equal performance to its diesel models. On the 17.45 Full Electric, the optimised transmission management provides a peak traction force of 44.3kN and a maximum travel speed of 25 km/h - managed by a two speed gearbox.



*The latest Aliant lithium-ion battery technology powers the new Faresin*



*The 17.45 Full Electric telehandler plugged into a 415V three-phase 32Amp charging point*



*The side-mounted cab has a stylish curved front screen for good forward visibility*



*The low boom provides good side visibility*



*Frame levelling for side slopes*



*The universal charging system allows the use of standard 220V single phase 16Amp car charging pillars*

# R-SERIES BOOST FOR BOBCAT

With the development of its latest 12 model R-Series of telescopic handlers Bobcat appears to be better placed to improve its share of this lucrative market sector. Nick Johnson reports.

In the construction machinery business, the Bobcat name remains closely associated with the original skid steer loader introduced back in 1960 by Melroe Manufacturing Company of North Dakota, USA, although the famous brand name is now found on a range of other equipment, including telehandlers.

## SAMBRON HERITAGE

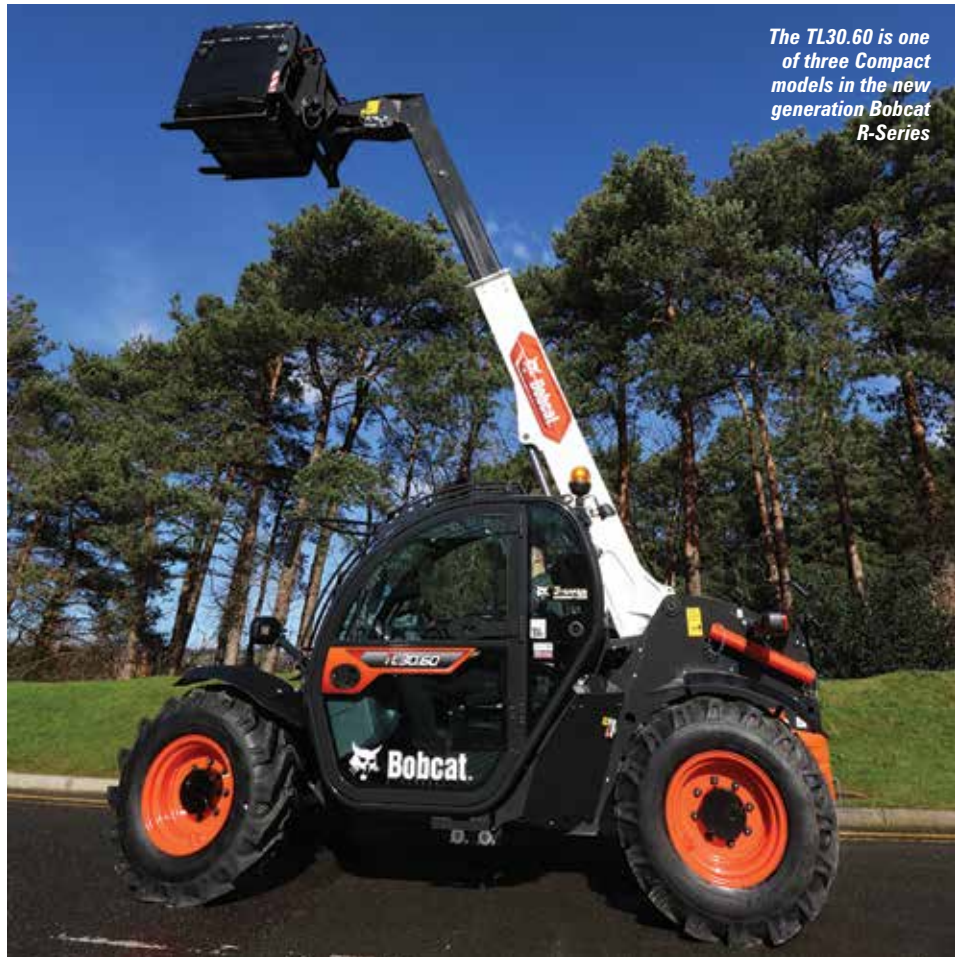
Telescopic handlers have been an important part of the Bobcat range since 2000 when the then parent company Ingersoll-Rand acquired the Sambron business in France. Sambron had been making telehandlers at its Pontchateau factory since 1979 when the Drop 2000 model was launched. The purchase provided Bobcat with the extensive experience needed to introduce and develop its own TL range of fixed frame telehandlers.

The latest Bobcat telehandlers to go into production at the Pontchateau factory are the R-Series. First introduced in 2021, all 13 models use Stage V compliant Bobcat D34 engines, with DPF after-treatment and electronic regulated hydrostatic transmissions. The arrival of these new generation machines coincided with Bobcat boldly proclaiming that it intended to double telehandler production by 2025.

## ONE OF THREE COMPACTS

At the lower end of the R-Series, the six metre/3,000kg TL30.60 is the middle machine of three Compact models. I recently had the opportunity take a closer look at one courtesy of Kent based Bobcat dealer Versatile Equipment. The TL30.60 has an overall width of 2.1 metres and an overall height of 2.29 metres. Maximum capacity is 3,000kg, while 2,500kg can be handled at the maximum lift height of 5.8 metres. Maximum forward reach is 3.1 metres where the capacity is a useful 1,250kg.

The TL30.60 features an improved cab common



The TL30.60 is one of three Compact models in the new generation Bobcat R-Series

to all R-Series telehandlers, with an overall width of 930mm it is more spacious than earlier models, while the more rounded front screen and upper FOPS grill contribute to a claimed 52 percent greater visibility. The slim vertical pillars of the cab also maximise the glazed area and reduce blind spots.

## BETTER CONTROLS

Inside the cab a new dashboard design has intuitive controls including automotive style colour-coded soft touch switches. The improved joystick helps the operator to maintain smooth control of all the lift functions, while the enhanced inching pedal allowed more precise manoeuvring.

A particular R-Series enhancement is the new five inch interactive LCD display which provides clear operating information and can be used to show images from the rear view camera. Other useful safety aids include the load moment indicator, the



The controls and new LED screen aid easy operation of the TL30.60

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*Improved access to the Stage V Bobcat diesel*

simple side slope indicator and the white noise reverse alarm.

Attention to detail improvements on the R-Series include a more accessible door latch, an intermediate lock position for the upper door window and the ability to unlock it from its fully open position from outside the cab. Other

enhancements include a reduced offset front left mirror, a more durable seat fabric, the provision of USB sockets, more internal storage space and a unique key for all locks (including the AdBlue cap). On the right hand side of the machine, the engine cover has been redesigned with a steeper profile to reduce offside blind spots by 15 percent. It is raised by two gas struts - rather than one before - and there is improved service access, aided by the relocation of the battery to the front.

### THE TL25.60

The latest addition to the new R-Series is the six metre/2,500kg TL25.60 with a 55kW Bobcat engine, a maximum lift height of 5.9 metres and a maximum forward reach of 3.31 metres. Usefully, the TL25.60 features a 'Bob-Tach' carriage with

a choice of manual or hydraulic attachment, allowing use of the full range of accessories from the Bobcat skid steer and compact loader ranges. The smaller model shares componentry with the TL30.6, including the cab and flow sharing valve block.



*A TL30.60 in use by Gavigan Paving during the construction of a new cycle lane in south London*

## POWERING UP WITH HYDROGEN

**Having introduced small electric machines, JCB is now busy developing hydrogen combustion engines for larger equipment as part of its 'Road to Zero' initiative. Nick Johnson reports.**

After adding battery powered versions of an array of its compact machines, JCB is now testing larger equipment fitted with newly developed hydrogen combustion adaptations of its diesel engines, including a seven metre/3,200kg 532-70 telehandler, all part of its £100 million hydrogen project.

Having invested heavily in a large diesel engine manufacturing facility in the mid-2000s, the company has a major incentive to adapt the engines made there to meet the demand for lower emissions, but has looked at a variety of options in its quest to produce the 'greener' machines needed to meet increasingly stringent legislation.

Like most other manufacturers JCB has turned to battery power for its latest generation of compact telehandlers. The company considers that battery power is the best solution for small equipment and



*JCB's hydrogen combustion programme is led by Lord Bamford*

consequently its E-Tech range now includes the 525-60E compact telehandler, the small ITE site dumper, the 1.9 tonne 19C-1E mini excavator and, most recently, a 403E wheel loader.

For larger machines though it is convinced that the combustion engine will remain the most practical power source at least in the midterm. Its research has evaluated a range of fuels, including HVO, biogas, E-fuels, ammonia and hydrogen. It says: "The majority of these alternative fuels require the production of hydrogen to make them, so it makes perfect sense to use hydrogen in the first place because it is a clean, zero carbon fuel which can be produced from renewable energy."

Having homed in on hydrogen as the best power source for its larger machines, JCB built a prototype 20 tonne 220X hydraulic excavator

powered by hydrogen fuel cells. This prototype has performed well, but the company has concluded that hydrogen fuel cells are currently too expensive, too complicated and not robust enough for construction equipment. As a result, a team of 100 engineers have developed a new hydrogen combustion engine, going back to first principles to

completely re-design the combustion process of the JCB Dieselmax engine to work well with hydrogen.

"The unique combustion properties of hydrogen enable the hydrogen engine to deliver the same power, the same torque and the same efficiency that powers JCB machines today, but in a zero carbon way," said JCB. "Hydrogen combustion engines also offer other significant benefits. By leveraging diesel engine technology and components, they do not require rare earth elements and critically, combustion technology is already well proven. It is technology, which is cost effective, robust, reliable and well-known."

By the end of last year, 50 JCB ABH2 hydrogen combustion engines had rolled off the production line at the company's Power Systems factory in Foston, Derbyshire. 2022 also saw testing ramped up on this engine fitted into a 3CX Eco backhoe loader and a 532-70 telescopic handler at the company's Wardlow Quarry test area.

The tank on the hydrogen powered telehandler carries between three and five kilogrammes of hydrogen, refuelling is quick and easy using a hose and nozzle from a delivery tanker. To provide off-road refuelling the company has produced a 100kg capacity hydrogen tanker carried by a Fastrac 4220 4x4 high-speed tractor.

The practical adoption of hydrogen to power construction equipment will, of course, depend on the quality of the supply infrastructure. JCB is convinced that this will come and is already installing an ABH2 engine into a 7.5 tonne Mercedes Benz Atego truck.

As one of the world's leading telehandler manufacturers, JCB has the market position, the funds and certainly the determination - driven by chairman Lord Anthony Bamford - to put hydrogen powered internal combustion machines on the map. Production units are expected within the next 12 months. ■

*The prototype 532-70 telehandler with (insert) the JCB hydrogen internal combustion engine that powers it*



*JCB's hydrogen engine backhoe loader and telehandler with the Fastrac based mobile hydrogen refueller*

