engcon NEWS
TILT & ROTATE
No 5 | 2017



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Our products, **your safety**



One of the most important watchwords in our R&D programme is spelt **S·A·F·E·T·Y**. Over the years we've developed many safe and innovative products. Our safety efforts began officially with the launch of Q-Safe, the world's safest quick hitch for excavators, which offers sophisticated features such as having to rest the bucket on the ground in order to disconnect it. In other words, it is NOT possible to drop or disconnect the bucket by mistake, and the machine's slew function is restricted if the bucket is not connected properly.

In addition to this, we've developed QSC – a standardised locking system for every quick hitch brand and type on the market. No car manufacturer today would consider introducing their own locations for the accelerator and brake pedals, and we apply a comparable kind of standardisation concept when it comes to your safety. For customers who want it, we also offer training in how to handle our products safely and securely.

In this issue of Tilt & Rotate, you can read about contractors who've chosen the Q-Safe quick hitch and the praise we've received for our safety work. I hope that more and more of you will climb aboard and join us on our safety train and wish all of our readers continued safety in the world of excavators.

Stig Engström
Owner and founder of Engcon

Automatic test process boosts engcon quality

engcon, the world-leading manufacturer of tiltrotators for excavators from 1.5 to 33 tonnes, invested in two automated test facilities at its factory in Stromsund, Sweden. This investment is the latest step in the company's increased commitment to improving product quality and safety in recent years. All engcon tiltrotators will be tested to the max at these facilities before delivery to the customer.



Alexander Sveed begins the test process with a visual check before he activates the automatic test software.

The test stations were developed in a collaboration between Electrum in Umeå, which developed the test software; hydraulics supplier Specma, which supplied all the components, and engcon's own staff, who run the project and build the stations.

"We test every tiltrotator and the automatic testing always provides the same type of procedure and isn't dependent on staff being available to run the test," says Test Manager Håkan Nässtrom.

Håkan tells us that tests begin with a visual inspection of the tiltrotator before connecting it via computer to a test programme that automatically tests every function to its limits. This is done to ensure full mobility without the risk of damaging hoses. The hydraulics are also put under maximum load to ensure that any leaks are detected. The control system and extra functions are also tested.

"All test data is stored in a database and linked to the tiltrotator under test. We can also see which fitter built the tiltrotator, who tested it and any deviations detected during the test," says engcon Group Quality Manager Mats-Erik Wiktorsson.

Mats-Erik tells us that engcon is certified to ISO 9001:2015 quality standards, which covers everything from how the company handles its clients, documentation, processes, and follow-up to product quality.

"We also work with environmental management and engcon is certified according to ISO 14001:2015 environmental standards."

"Our certifications boost company credibility, strengthen the brand and improve efficiency and quality, resulting ultimately in better products that increase customer profitability," says Mats-Erik.

ENGCON – ALSO LEADERS ON THE SOCIAL FRONT

Most people in our industry know that we are world leaders in tiltrotators for excavators, but not all of them know we are the leading tiltrotator manufacturer when it comes to social media. At the time of writing (November 2017) we have a total of 47.500 followers on our social networks.

Facebook
Several years have passed since we started our 'official' engcon Facebook page, which has amassed many hundreds of likes. Since then, we've started up local Facebook pages and these days every market with its own engcon office also has its own Facebook page. This is to help all of our fans feel at home and have the opportunity to read local news and themselves write posts in their own language.

The 'official' engcon page is only in English and acts as a broader meeting place for all engcon enthusiasts, but its followers are mainly those of our fans whose markets do not have their own pages.

Your 'local' Facebook
We have created a UK a Facebook page that speaks "your" language. There's news from engcon, the shows and the fairs we be exhibiting at in your market; read about customers who use our products, local events and enjoy posts from fans, etc.

Sometimes it will share posts from our other pages, but for the most part UK posts rule.
Just go to www.facebook.com/engconuk and "like" the page to get our posts in your feed.

Of course, you're also welcome to like our other pages and read about what's going on in our other markets.
Here's a list of all our pages.

Official	www.facebook.com/engcon
Sweden	www.facebook.com/engconsweden
Norway	www.facebook.com/engconnorge
Finland	www.facebook.com/engconfi
Denmark	www.facebook.com/engcondenmark
United Kingdom	www.facebook.com/engconuk
The Netherlands	www.facebook.com/engconnetherlands
Germany	www.facebook.com/engcongermany
France	www.facebook.com/engconfrance
North America	www.facebook.com/engcon-north-america

Instagram
Our Instagram page has loads of fabulous square format pictures. Because the page focuses mainly on the photographic aspect and less on captions, there is only one single page for the entire engcon Group. We also intersperse the pictures with video clips.
Go and take a look at all the pictures and videos and like our page. Just search for engcon_group on your smartphone or tablet or enter www.instagram.com/engcon_group on your computer.

YouTube
We have our own video channel on YouTube with many videos showing our products in action, and as with Instagram, we only have one 'official' channel.
Grab some crisps, popcorn and other good stuff, browse your way to www.youtube.com/engcondotcom and enjoy moreish excavator videos starring engcon in action. You can subscribe to news from our YouTube channel. We will alert you whenever we upload a new video.

Twitter
Because the size of the various social networks in the different markets we do business in varies, we've chosen to have two Twitter accounts. One "official" account and one for the UK market. Some of our communications take place here, so if you are a frequent Twitter user, feel free to use one or both accounts.

Official	www.twitter.com/engcon_
United Kingdom	www.twitter.com/engcon_uk

LinkedIn
We use LinkedIn mainly for recruiting staff for our operations. It's a fantastic database with endless numbers of skills so if you're keen to work for engcon you can always check out LinkedIn to see what's in demand.



And last but not least, we must of course mention our website. It's our base for all of our official information – the place where you can find all of our products, a machine guide, staff contact information, press releases, news, product sheets, catalogues and magazines etc. Welcome to www.engcon.com

Living the dream!

When he decided to strike out on his own less than two years ago, independent owner operator, Richard Collett , couldn't have dreamt that he'd now be running his own plant hire business in Newark, Nottinghamshire with six JCB excavators. One of the most recent additions to his fleet is a new JS130 13-tonne tracked excavator, fully equipped with an EC214 Engcon tiltrotator, Q-Safe and EC-Oil system.





Richard explains how the chance to take on a large civils job that required a 13-tonne machine and tiltrotator prompted this investment. “Although buying new equipment for what could have been just one contract was a potential risk, great support from JCB and Engcon has made it a risk worth taking. The Engcon system is brilliant – even better than I thought it would be!” he says enthusiastically..

Life-changing decision

Established in October 2015, Richard’s business, Collett Plant Hire Ltd, has gone from strength to strength. His success story began when he went along to one of JCB’s Be Your Own Boss events and was inspired to make a life-changing decision. “I was fed up working for someone else so thought I’d check it out,“ says Richard. Hearing stories from people who had taken the plunge, and the advice available through JCB’s programme, helped him make up his mind to go for it. “It’s turned out to be one of the best decisions I’ve ever made,“ he says.

Great deal

Richard’s EC214 tiltrotator, complete with Q-Safe and EC-Oil, is an ex-demo system from Engcon’s Training and Demonstration facilities at CTA in Doncaster. He comments: “Engcon gave me a great deal and was also able to supply custom-made buckets to UK width specifications, which are essential for the kind of excavation services I offer.“

Although Richard admits it was a bit nerve-wracking when he first got into the cab and saw the tiltrotator sitting above the bucket, he soon got used to it. An array of tools and attachments complement his core system including grading beams and a compactor plate. He is also getting kerb grabs that will enable him to lay kerbs to within centimetres of the required position, making this task much less labour-intensive. He also finds the wide swivel range very useful when using his tiltrotator with a fork. “I’m discovering new things I can do with my Engcon system all the time – it’s so versatile.”

Generating new business

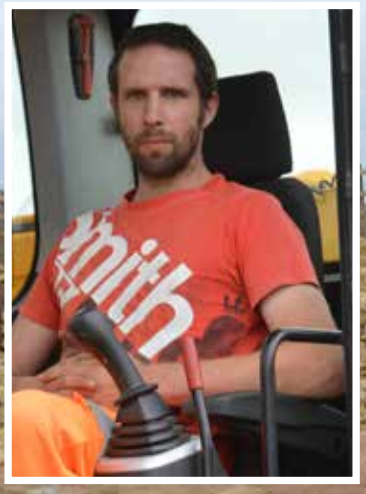
Richard currently offers his JS130/EC214 combo on an operated plant hire basis at an hourly rate, calculated to reflect his capital investment and running costs. So far, he says he’s getting a good return and the equipment is very much in demand. Initially purchased for one particular contract, the Engcon system is now attracting new business. The photos he’s posted on social media of his Engcon system in action have already generated a number of enquiries from potential customers.

Reliability and performance

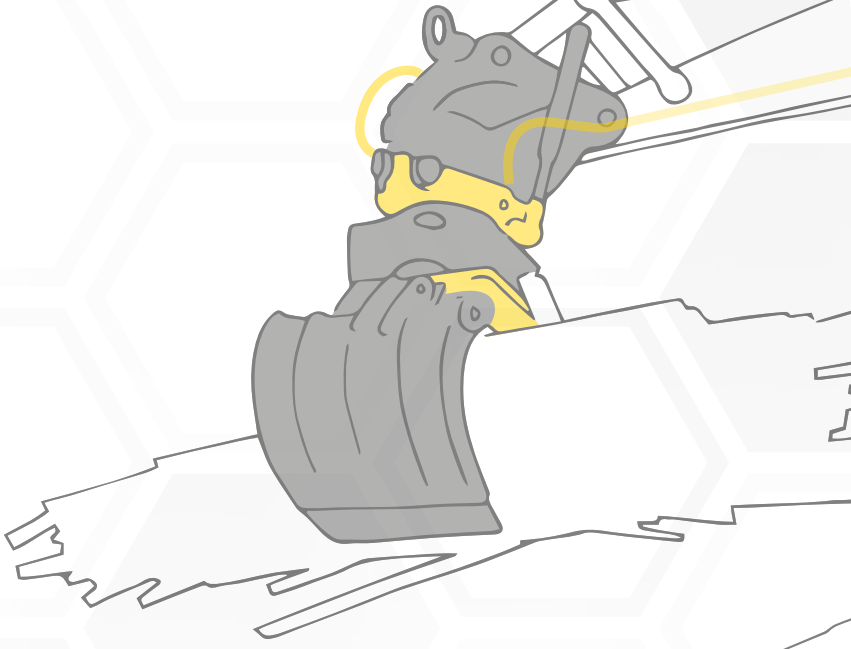
As an independent plant operator, Richard recognises the importance of providing a dependable and cost-effective service for all his customers’ projects, from excavation and site clearance to drainage and ditch maintenance. He believes his investment in JCB and Engcon is enabling him to deliver reliable, high quality service that will help him to continue building his business on repeat custom and positive referrals from satisfied customers.



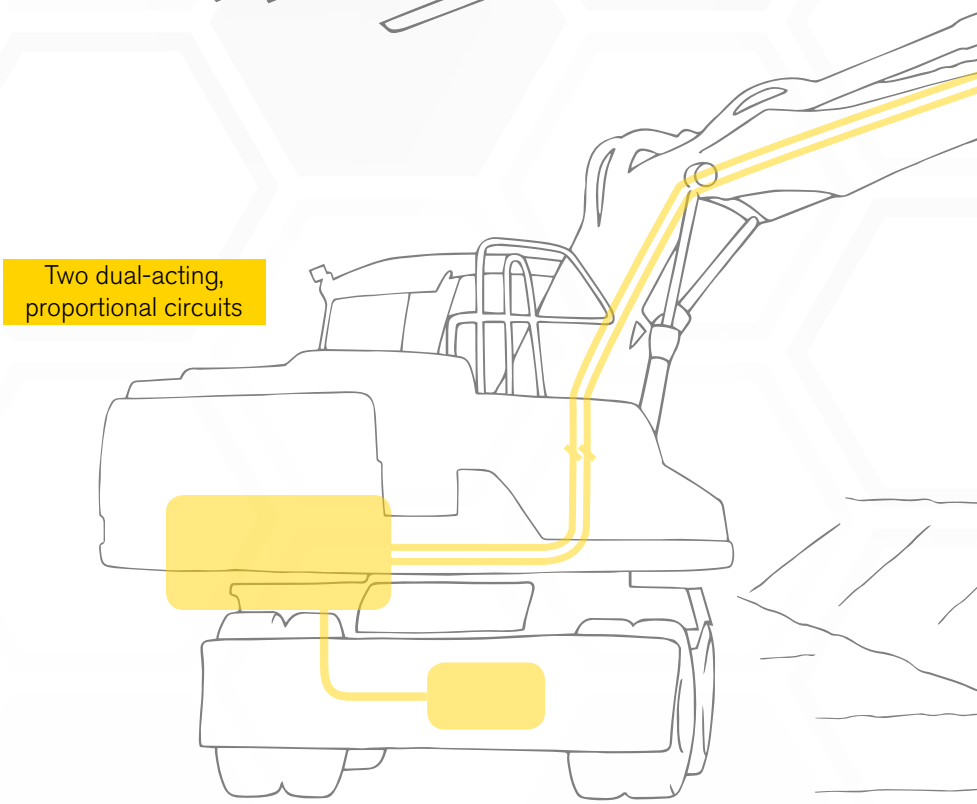
> Engcon gave me a great deal and was also able to supply custom-made buckets to UK width specifications, which are essential for the kind of excavation services I offer.



Tiltrotator hydraulics explained



Tiltrotator hydraulics are seen by many as a bit of a 'black art' (even by those who own an Engcon) and guiding owner-operators through the selection process is something that we do here in Tewkesbury on a daily basis.



Most of it is good old common-sense stuff, but without a roadmap it can seem pretty daunting; so we've prepared this simple guide to help the less experienced through the jungle. Before going into detail, it's worth looking at some of the options in terms of excavator hydraulics, as this heavily influences the selection process later on.

Most modern excavators will be fitted with some form of hydraulic services to the end of the dipper to run attachments. The most common one is a so-called 'Hammer Line' which, as the name suggests, is used to run a hydraulic breaker. It can however be used to run other tools and this is where the jargon gets more difficult.

Depending upon the nature of the attachment, the control of the hydraulic flow required to run it becomes important. A breaker is simple: It needs a continuous flow of oil (the on/off nature of the hammer action is created in the attachment itself) and an open tank return line to allow the oil to return to the excavator's oil reservoir without restriction. Note; this is why, on an hydraulically enabled quick hitch such as Engcon's Q-Safe with EC-Oil, two tank return circuits as well as the pressure line are required on the headstock of a breaker: In order for the attachment to function correctly, a freely-flowing return line is required, which means two ports.

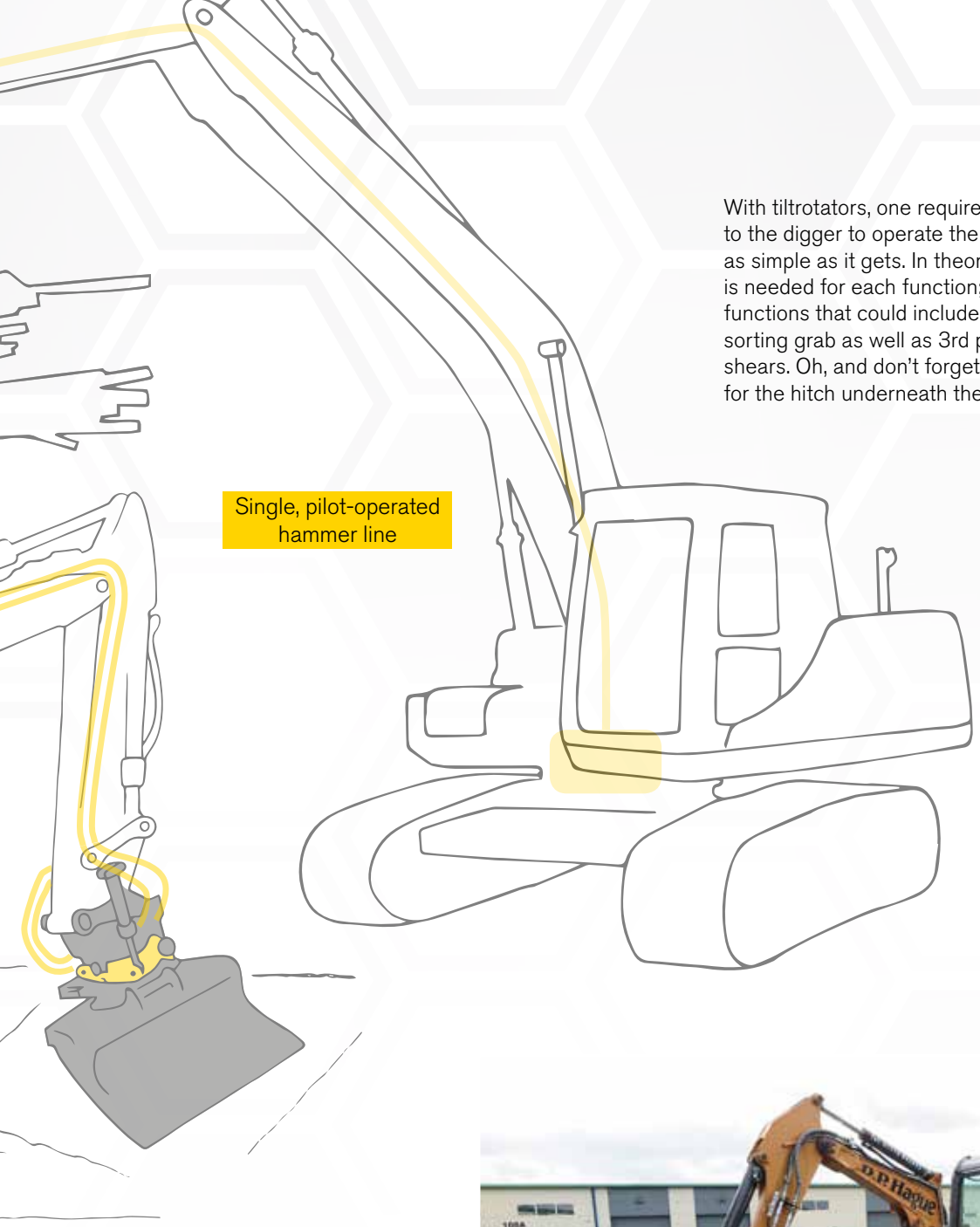
In the case of a breaker, the flow of oil only needs to be one-way. This is called a 'Single Acting' circuit. For other attachments, the flow may need to be reversible – a rotating attachment is a good example in that it can then rotate in both directions, depending on which way the flow of oil is directed. In these circumstances, the circuit is said to be 'Double Acting'. A double acting circuit can often be switched to single acting operation and when this is the case the circuits are said to be acting in 'Shear mode' and 'Hammer mode' respectively.

Circuits can also be on/off or proportional. With the former, the valve is either open or closed and oil flow is either on or off. In the case of the latter, the can be opened and closed progressively, usually electrically; but – BEWARE – some diggers will have a foot pedal which is mechanically coupled to the valve chest to (proportionally) control the circuit. This is important to note because in these cases, the control of the oil flow cannot be managed using electronics without potentially expensive upgrades to the digger's hydraulic circuits.

As well as these circuits, a separate form of hydraulic control can be fitted to the dipper to operate an automatic quick hitch. This will almost always be a separate circuit.

So, diggers can have a variety of hydraulic systems fitted, either as standard or as a factory or dealer-fitted optional extra.

With tiltrotators, one requires an hydraulic circuit fitted to the digger to operate the attachment, but that's about as simple as it gets. In theory, a separate hydraulic circuit is needed for each function; tilt, rotate, upto two extra functions that could include a gripper, compactor, timber or sorting grab as well as 3rd party attachments such as tree shears. Oh, and don't forget the separately controlled circuit for the hitch underneath the tiltrotator.



SS1 SYSTEM

The first tiltrotators did just that – tilt and rotate (and nothing else). Then, as now, many excavators had only a double-acting hammer line, pedal controlled with a mechanical link to the valve chest. In order to get both the tilt and rotate functions, a simple solenoid-operated valve was used to switch between tilt and rotate, activated by a non-latching button on the joystick. This simple arrangement was called SS1 (SS – Steering System in Swedish) and is still available today.

Whilst SS1 cannot deliver the levels of control and functionality of its more sophisticated cousins, its simplicity and lack of electronic and hydraulic controls make it, along with SS0 (see later) an ideal option for many who want to experience the benefits of tiltrotator digging for the first time. Because of the limitations of the excavator's hydraulics, this system is only available with a mechanical hitch, but, like the other systems, can be configured as a twin hitch arrangement to allow the tiltrotator to be removed when necessary (for example when digging narrow trenches or using a breaker).

Alongside SS0, Engcon offer SS1 as an entry-level 'plug and play' system for diggers from 1.5t and above from just £5999, including three buckets


EC02B-SS1 on Case 26B

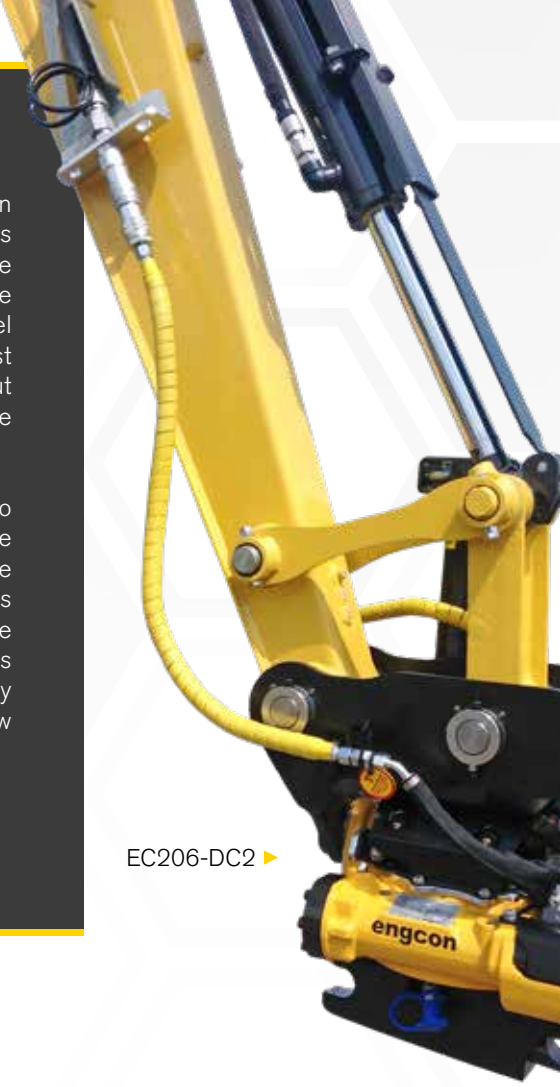
SS5 SYSTEM

The next control system – SS5 – still uses a single hydraulic circuit with valves controlled by electrics, but differs from SS1 in three main respects. Firstly, there are multiple valves (on the top of the tiltrotator) and these are dual-acting, non-proportional. This means that the direction of flow of the oil is controlled by the tiltrotator (rather than the digger) and that they are on/off. The proportional control (if present or required) is provided by the excavator.

Secondly, because these valves are placed on a manifold into which the oil feed is supplied, they can all draw oil flow (and therefore operate the various functions) at the same time, so one no longer has to switch between the tilt and rotate functions and may use them simultaneously.

Finally, this valve chest and the swivel on which it sits mean that extra functions over and above tilt and rotate can be added to the tiltrotator. Moreover, these functions can operate through the swivel to the underside of the tiltrotator. The most obvious of these is the hitch function, but extra 1 and extra 2 are also available depending on specification.

In many ways, this system is close to the top-of-the-range SS10 system (see opposite), although the controls lack some of the more sophisticated safety features of Engcon's DC2/SS10 system and the proportional regulation of the various functions is managed (where present) by a pedal-operated valve which applies flow control to all functions simultaneously.



EC206-DC2 ▶



◀ EC209-SS9

SS9 SYSTEM

'The SS9 system takes advantage of the fact that diggers are becoming more sophisticated and are often available not only with two hydraulic circuits to the end of the dipper, but these are often proportional ones with joystick-mounted rollers to control them. One of the circuits (usually the one controlled by the left-hand joystick) is dedicated to the rotate function. The other circuit is controlled by a latching relay operated by a cab-mounted switch. Operating the relay, switches the oil flow on the second circuit from tilt to the other functions in sequence (e.g. tilt, extra 1 (if fitted), extra 2 (if fitted), hitch and back to tilt again). It should be noted that, for safety reasons, the excavator hitch lock has to be activated before the tiltrotator latching relay can access the hitch function.

Because both excavator circuits are already proportional, cheaper non-proportional tiltrotator valves can be used.

SS9 can also be available in two variants: SS9-IQ allows the quick hitch to be controlled through the latching relay described above (IQ stands for Integrated Quick hitch). SS9-SQ uses a separate (excavator) quick hitch control and, by definition, requires a separate hydraulic circuit to the end of the dipper. These two are sometimes generically known as 'four hose' and 'six hose' setups respectively

SS10 SYSTEM

Finally, there is SS10. This is similar to SS5 in that it allows simultaneous control of all functions but, with the use of proportional valves in the top of the tiltrotator, allows each of the functions that require proportional control to be operated smoothly. A couple of things to note here:



Because the (tiltrotator) control system is managing the oil flow from the excavator valve chest, the hammer line itself needs to be pilot-operated (in other words, capable of electrical control). Also, you need to specify which functions you want to be proportional. As standard, extra 1 and extra 2 below the tiltrotator are non-proportional, but can be uprated at extra cost. The hitch function is always non-proportional.

Engcon's SS10 system is called DC2 (a 2nd generation Digital Control system) which uses CANBUS technology to control the tiltrotator. It takes signals from the joystick controls, digitises them and sends them down the boom-mounted cable to the tiltrotator-mounted module which decodes them and operates the respective valves using analogue signals. The advantages of this system are that it is inherently safer than an analogue system in that the system can shut down an unsafe system if the cabin-mounted control module gets an unexpected response from any of the tiltrotator systems. It also can work with other CANBUS enabled systems such as GPS to allow tiltrotator integration into automated digging. In the UK, the DC2 system is supplied as standard with MIG2 joysticks. The extra cost of a SS10/DC2 control system is, in practice, outweighed by the fact that it bypasses the need for an expensive upgrade in excavator hydraulics With SS10, the control system can often access and manage other excavator functions. As an example, Engcon's DC2 system is regularly used to provide control of steering or track functions, blade and boom control, rearward facing steering and drive functions in Backhoe Loaders as well as other powered functions, both above and below the tiltrotator. This added functionality is often accompanied by other value-added services such as remote support and diagnostics, and multiple user profiles.



EC209-DC2 twin hitch on JCB Hydradig

SS0 SYSTEM

Finally, there is SS0. SS0 is, as the designation implies, free of any (tiltrotator) controls.

The reason that we have not included it at the start of this article is that it wasn't the first control system – SS1 was. It is, however the lowest level of control system in that there are no (tiltrotator) controls involved. The consequence of this is that, for every tiltrotator function to be provided, a separate excavator hydraulic circuit is required. In practice, this means that separate circuits for the tilt and rotate functions are already on the machine. Additionally, if an automatic (tiltrotator) quick hitch is required, then a separate hitch circuit and control must also be fitted. Modern diggers often have these as standard, so it is possible to supply this very simple solution at a lower price.

Because of its simplicity, installation is quick – it can be regarded as plug-and-play – with a typical install taking a few hours and requiring little more than the required number of hoses to be made up and fitted. In practical terms this means that, with either the 'four' or 'six' hose solution referred to above, only tilt and rotate functions are available. However, they are available simultaneously and these functions are, after all, what tiltrotators are all about.

For this reason, SS0 is often referred to (along with SS1) as the 'Entry-level' option. Unlike their more sophisticated brethren, they are not readily upgradable, but they do provide a stepping stone into the land of tiltrotators; from which, as we all know, there is no return...



EC209-SS0 ▶



> We work in a very competitive industry. Although rates for the kind of jobs we do have come down in recent years, we've been able to maintain our margins by increasing productivity and efficiency. Our investment in Engcon has really paid off.









Leap of faith pays off for Scottish contractor

"Money well spent," is how Gordon Skene, Director of GRS Construction Services sums up his investment in Engcon tiltrotators for his fleet of Takeuchi excavators. The successful groundworks and landscaping contractor, based in Buckie on the north east coast of Scotland, has three EC209 systems, an EC214, an EC10B, grading buckets and a host of other tools and attachments.

"I took a leap of faith when we purchased our first units three years ago as it was a really big investment for us, but now I wouldn't be without them," says Gordon - one of the UK's growing number of happy Engcon customers.

Flash in the pan

Initially, Gordon and his dad Robert, who has since retired from the business, thought tiltrotators were just a flash in the pan gadget. Now Gordon is glad he took the time to find out more by reading reviews and talking to his trusted Takeuchi dealer, JMS Equipment Ltd, who recommended John Craig at JCC Engcon Group in Stirling. Gordon was finally convinced to purchase his first Engcon tiltrotator from John when he watched a friend using one and could see the cost and time saving benefits for himself.

Competitive edge

With a combination of powerul yet compact Takeuchi excavators, Engcon tiltrotators and attachments including forks, kerb grabs and brushes, GRS has gained a critical edge in the market. "We work in a very competitive industry," explains Gordon. "Although rates for the kind of jobs we do have come down in recent years, we've been able to maintain our margins by increasing productivity and efficiency. Our investment in Engcon has really paid off." he adds. For example, digging drains and service trenches for a typical four-bedroom house used to take GRS about two days. "Now we can get the same work done in under half that time, and with greater accuracy and a much tider finish," says Gordon with a smile.

Increased safety, less fatigue

One of the many advantages of being able to tilt and rotate buckets and tools using a tilrotator is fewer machinery movements. As well as saving time this also increases safety, which is always a top priority for GRS, as Gordon explains "We are often working on very large and busy construction sites and ensuring the safety of our team and others is paramount for us and for our clients. Gordon has also noticed that his operators are less fatigued at the end of a shift. He believes this is partly due to the fact that they can access different digging positions without having to keep moving their machines around.

Must-have technology

When he had to hire an excavator a few months ago that wasn't fitted with a tiltrotator, Gordon says he found it extremely restrictive and realised just how much he has come to rely on his Engcon units to help his business work more profitably and more safely. As he reflects on his decision to invest in Engcon, he says the technology is fast becoming a must-have for UK owner-operators. "Tiltrotators transform a digger with a bucket into a robotic operator. Life is so much easier with Engcon!'

ENGCON TOTALITY – YOUR ASSURANCE

A single supplier makes support and service easy

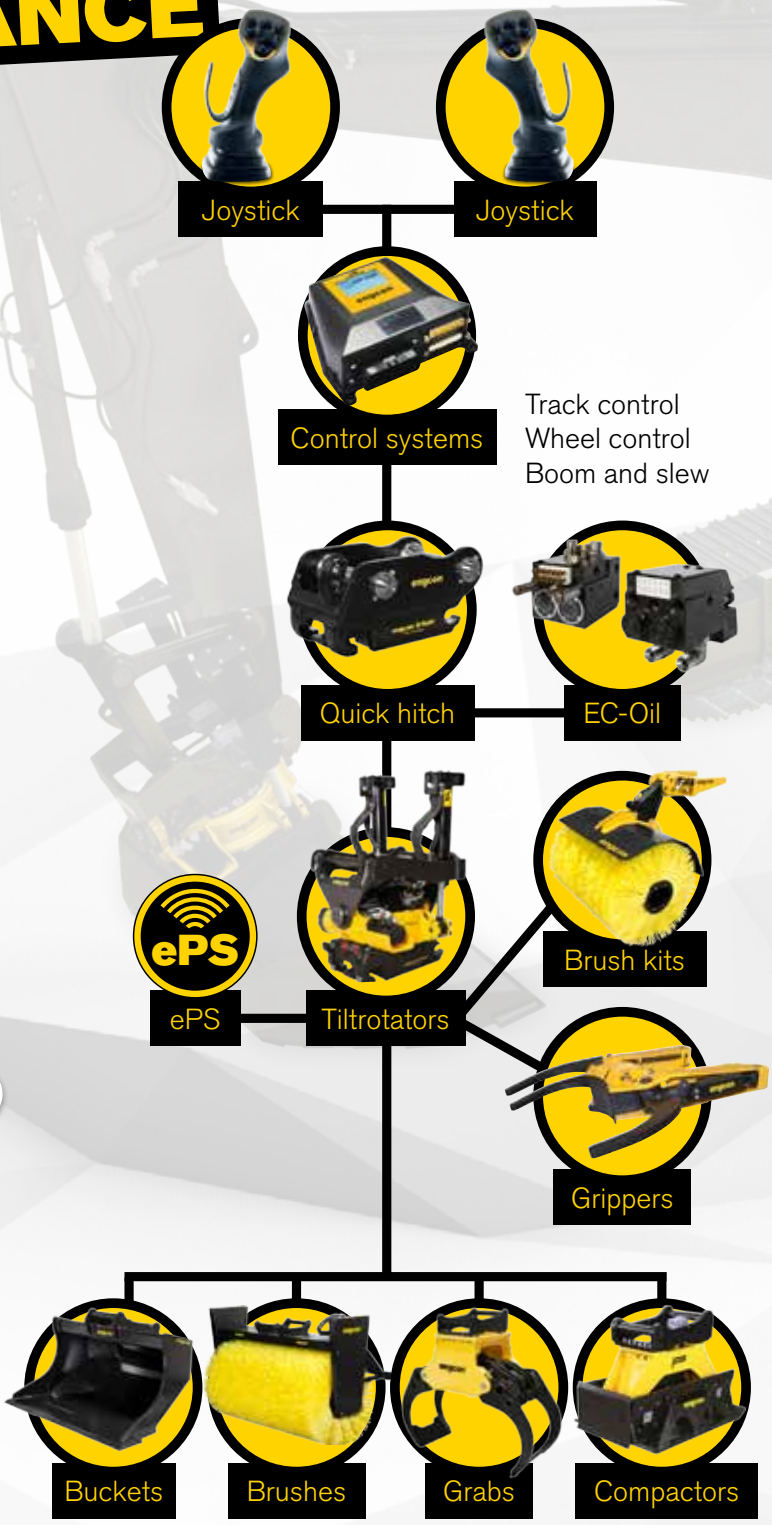
Not only does engcon have the market's widest range of products for your excavator, we get fantastically high marks from our customers year after year for our phenomenal support and aftermarket performance.

We develop all of our products in-house and we take full responsibility for them.

Telephone support or practical service is always available through our skilled personnel, dealers or service partners.

And if you've chosen our smart DC2 control system, we're also able to make adjustments remotely via the mobile telephone network wherever you may be.

One supplier, one total solution – it doesn't get simpler than that.



Contact your nearest dealer, service partner or and engcon team member



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