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The changing face of the scissor lift market

The majority of self-propelled scissor lifts have been electric powered since the market began to take off in the late 1970s, gathering pace in the mid 1980s. With almost 90 percent of all scissor lifts already battery powered we take a look at the remaining 10 to 15 percent of the market that remains diesel powered – mostly full size Rough Terrain models. This, along with a look at some of the latest new product launches in the rest of the scissor lift market.

The self-propelled scissor lift forms the bedrock of most aerial lift rental fleets, representing almost two thirds of all self-propelled aerial work platforms currently in operation. The split between boom and scissor lifts has not changed much over the past 10 years, although the survey for the latest IPAF Global Powered Access Rental Market Reports indicates that there has been a slight shift towards boom lifts in US and European fleets. The reports – which are well worth a look if the lift rental market interests you – indicate that scissor lifts now represent 61 percent of the units in rental fleets across 10 European countries, the USA and China, which equates to 610,000 units in daily operation. The actual number, taking in end users and those not surveyed, is considerably higher.

If you then look at power sources, the difference between booms and scissors is stark. Around 90 percent of all scissor lifts in Europe are battery powered, compared to around 40 percent of boom lifts. Although this is changing as more end users move towards all electric or hybrid booms for their projects. The preponderance of electric power for scissor lifts has little to do with the latest trend towards emission free construction equipment – although that is one of the driving forces towards the adoption of big electric Rough Terrains. The majority of scissor lifts have always been battery powered due to the fact that slab electric scissor lifts need to be compact enough to pass through doors and 'ride' elevators etc... which leaves little room for an engine and given that they are used indoors for much of the time, diesel noise and emissions are undesirable.



The Rough Terrain market

Looking at the rump of the scissor lift market that remains internal combustion powered, it is predominately made up of classic full size Rough Terrain models due to compact Rough Terrains being increasingly electric. The market for big Rough Terrains is highly cyclical in terms of rental utilisation and therefore sales. The reason being that they are mostly employed in the commercial construction market, on tasks such as cladding, steelwork and sprinkler pipe installation etc... Jobs that require plenty of 'grunt' and four wheel drive to cope with poor ground conditions plus a big deck and decent platform capacities. All of which has required an internal combustion engine, especially as electric power is not always available on job sites until later in the build, making a pure electric powered platform less than practical.

Classic full size Rough Terrain

scissor lifts tend to run from working heights of around 11 to 17 and more recently 18 metres. Most manufacturers run three model product lines built around a central 'base' model with a platform height of around 40 to 43ft offering a working height of 15 metres. From this, two derivatives are often produced. The first is a smaller 30 to 33ft model with a working height of 11 to 12 metres and a higher platform capacity, while the second is a larger 50 to 53ft model with a 17 to 18 metre working height but a lower platform capacity. Greater height has not, until recently, been a major factor in this market, given that most warehouse/big box retail buildings have typically been no more than 10 and 15 metres high. Platform capacity and deck size have been more important, this is not a product where you choose the model with the highest platform height on the basis that it can cover the lower level work when necessary.



Cladding is a typical application for full size RT scissor lifts



Electric wheel drive motors are now much more compact

So what's changing?

When it comes to these full size Rough Terrain scissor lifts, a key trend that is only just beginning to gather pace is the shift from diesel to battery power. The change has partly been spurred on by the fact that the technology now available makes them an increasingly practical and attractive proposition. Not that big electric Rough Terrains are anything new - when UpRight launched its LX Rough Terrain scissor lifts in the mid 1990s, it used direct electric wheel motors on the rear axle and could match the diesel units in terms of performance and gradeability. However, these models were only two wheel drive, as electric wheel motors were not compact or rugged enough to be mounted on the steering axle. They were probably better than the diesel versions, in terms of reliability and performance, but were too far ahead of their time and some were concerned about the lead acid battery pack – eight six volt, 350Ah units – in terms of battery life, even though a diesel/generator option was offered.

The difference today is that electric wheel drive motors are now state of the art - mostly AC - waterproof, rugged, compact and powerful. At

the same time battery technology has moved on with several options available, including lithium-ion or phosphate, that are not only compact and maintenance free, but also offer the benefit of 'opportunity' and rapid charging.

The new models coming on to the market offer direct electric four wheel drive, zero emissions and low noise levels, while in some cases outperforming their diesel counterparts. All of which appeals to the growing number of contractors looking to lower their 'carbon footprint', particularly on sites in the increasing number of ultra-low emission zones.

Haulotte's new Pulseo

The latest and largest manufacturer to enter the market is Haulotte, which unveiled its new Pulseo electric/hybrid big scissor lift range in November. The first two models include the 43ft HS15E and 53ft HS18E – the HS4390 E and HS5390 E in North America. The new models are available with a basic or 'Pro' specification and are new from the ground up. They include four wheel electric drive using heavy duty telehandler type axles and a large centrally mounted/inboard AC electric drive motor attached to a central transfer box. An oscillating front axle is standard on the Pro models, while the rear axle has a traditional differential lock to aid performance on slippery or sticky ground and makes the most of the 40 and 45 percent gradeability. Non-marking perforated rough terrain tyres are standard.

When it comes to batteries Haulotte has decided to keep it traditional, with a lead acid battery pack rather than lithium. The 48 volt pack comprises eight six volt 435Amp hour Trojan L16H-AC



Haulotte's 'Range Extender' diesel regenerator pack

units, with Haulotte's Activ'Energy Management centralised top up system standard on the Pro. The battery pack is said to be sufficient for a typical full shift, while charging options include a regular 110/230 volt on board charger, or a three phase fast charger which it says can take the battery pack from empty to 80 percent in three hours. An optional fully self-contained 'Range Extender' Stage V diesel generator pack is also available, which can be moved between machines, allowing rental companies to offer it as a chargeable option. The machines can also be operated while 'on charge' either from a mains power source or the Range Extender engine.

Other electric RTs

Before moving on to other full size scissor lifts it is worth mentioning that there are already plenty of battery powered Rough Terrain scissors on the market, but mostly in the form of compact Rough Terrains. In fact, most manufacturers have several models in their product lines. They are usually 69 inches/1.75 metres wide, offer four wheel drive - an increasing number with electric wheel motors - outriggers, either as standard or optional, while platform heights tend to be 26/27ft, 33ft and 39/40ft with a few 47ft for working heights of 10, 12, 14 and 16 metres.

Capacities can run from 680kg on the smallest to 350kg on the highest model. The up and coming Chinese producers, such as Dingli, Sinoboom and LGMG, already have compact Rough Terrain models in their ranges. Last year Snorkel added a lithium-ion option for its S2770RTE/S3370RTE and S3970RTE, with a single or dual battery pack option.

Meanwhile JLG's new generation of compact Rough Terrain scissors includes four models, the RT2669, RT3369, RT4069 and RT4769, all available with diesel or lithium-ion battery power – the ERTs. Overall widths are 69 inches/1.76m, with working heights of 10, 12, 14 and 16 metres. The extended platform has an overall length of 4.4 metres, while capacities range from 680kg to 363kg. One unusual feature is the LCD display on the platform controller, providing a wide range of machine information.

The new JLG 4069ERT



Haulotte's new all electric Pulseo 4x4 Rough Terrain scissors can match or outperform diesels on rough ground



Snorkel's compact RTE scissors now have a single or dual lithium-ion battery pack option



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So plenty of compact Rough Terrain electric scissor lifts to choose from, but companies are only just beginning to take the electrification of full size models seriously – Haulotte’s move will help stir things up though. Having said this companies making the largest ‘mega’ scissor lift models such as Holland Lift have offered electric or hybrid power for many years. But most ‘full size’ scissor lifts still come from North American companies where demand for larger scissor lifts has always been weak. Oddly two companies that have offered such machines are Italian - Airo and Imer.

The Italian scissors

Airo has a reasonably wide choice of full size scissor lifts with 15.8 and 19 metre working heights, big dual deck models with either diesel or battery electric power. The drive system however remains traditional hydraulic, which generally means a little more noise and significantly greater battery draw down when driving. The same is true of fellow Italian manufacturer Imer which also offers electric and hybrid versions

of its big Rough Terrains. We have included the 47ft IM 14220E in our comparison below even though it is a little higher than the others as it has similar dimensions and performance, but naturally a little heavier and offers an 800kg platform capacity, possibly making it a good, slightly lower alternative to the 53ft models.

The 56ft Airo X19E electric



Imer’s 47ft electric IM14220E full sized RT

Having touched on Imer, it might be worth reminding that it emerged from Iteco, an early pioneer of big electric powered scissor lifts which started off building Marklift scissor lifts in Europe under licence, developing battery powered versions along the way. They used custom made full traction forklift battery packs, the use of which is now mostly limited to the very largest scissor lifts such as Holland Lift’s 104ft HL-340 E30 4WDS. A

problem in the early days was a lack of battery care on site. A ruined full traction custom made battery pack could easily blow six months rental profit. Automatic top up and monitoring, such as Haulotte’s Activ’Energy Management, is an essential feature for big lead acid battery packs. A growing alternative of course is lithium or other maintenance free batteries.

Skyjack revamp

Skyjack has been the leading player in the full size Rough Terrain scissor lift market for many years with its SJ9250 with dual deck extensions – a concept it virtually invented. Two years ago, it announced a new range of big scissors that look similar to the units they replaced, but in fact are totally different. The company needed to make some changes to meet the new ANSI standards, but took the decision to do a full revamp at the same time. Platform heights are now 33, 43 and 53ft, with a 64ft on the way. Capacities range from 1,250kg on the 33ft SJ9233RT to 455kg on the 53ft model. Skyjack said that one reason for moving from

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The new Skyjack SJ9243RT on the test track



The Skyjack SJ5343RT

50ft to 53ft on its flagship model was to eliminate the disadvantage of selling a 17 metre working height against the increasing number of machines offering 18 metres. The 63ft SJ9263 will in fact now be the SJ9664 with a 21.5 metre working height, a platform capacity of 513kg, an overall width of 2.44 metres, an overall length of 4.57 metres and a total weight of 9,980kg. The company has no plans for an electric version, but will be announcing new models at the end of the month. Interestingly more North American manufacturers are now looking at higher models.

The arrival of 60ft units

In the past year or two, a number of manufactures have unveiled Rough Terrain scissor lifts in the 60ft platform height range. This trend can be traced all the way back to 2013, when US manufacturer MEC launched the 60ft 6092RT. It offers a full 20.1 metre working height, with a 7.5 metre dual deck and

540kg platform capacity. However it remains a traditional diesel model. Last year GMG - which is run by Jim Tolle, who was directly involved with the MEC unit - announced the 60ft 6093-RT which also offers a 7.55 metre extended double deck and 540kg platform capacity. Both units have an overall weight of less than 10 tonnes - the MEC is 9,880kg and the GMG 9,276kg, as it is slightly wider at 2.38 metres. GMG is now about to launch an all electric version of this machine - the 6094ERT - with four wheel direct AC electric wheel motor drive, traction control, power re-generation on braking and an AGM maintenance free battery pack with high frequency battery charger for quick recharging. As with the Haulotte Pulseo, a diesel generator pack will be available, while automatic levelling jacks and an oscillating axle are standard. The first units are scheduled to ship to Europe in May.

Chinese alternatives

Dingli also launched its full size 66ft JCPT 2223DC electric scissor last year with AC direct electric drive wheel motors for maximum torque and energy efficiency. The new models are part of Dingli's environmental 'Plan G' strategy and uses the same lithium-ion power pack as its new all electric boom lift range. Maximum working height is 22.2 metres, with a 750kg platform capacity and an extended deck of



The new GMG 6094ERT is one of three new big electric scissors



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Model	Working height	Platform capacity	Platform size	Platform extensions	Extended platform	Overall width	Overall length	Weight	Drive	Oscillating axle	Drive height
Haulotte HS15E*	15m	750kg	3.82 x 1.9m	Dual	7.4m	2.3m	4.4m	7,480kg	4x4	Yes	15m
Skyjack SJ9243 RT	15m	907kg	4.5 x 2.3m	Dual	7.5m	2.3m	4.5m	6,810kg	4x4	No	15m
Genie GS 4390	14.75m	680kg	3.98 x 1.83m	Dual	7.38m	2.29m	5.4m	5,850kg	4x4	Yes	14.75m
Snorkel S9043RT	15.1m	680kg	3.6 x 2.28m	Dual	6.7m	2.28m	3.7m	6,350kg	4x4	Yes	15.1m
Dingli JCPT1523RT*	15m	680kg	3.98 x 1.83m	Dual	6.6m	2.27m	4.88m	8,200kg	4x4	Yes	15m
GMG 4694-ERT*	15.9m	680kg	5.23 x 1.9m	Dual	7.5m	2.38m	5.23m	7,500kg	4x4	Yes	15m
JLG 430LRT	15.1m	568kg	3.86 x 1.79m	Dual	6.14m	2.35m	4.88m	6,500kg	4x4	Yes	15.1m
Sinoboom 1323RD	15.1m	680kg	3.98 x 1.83m	Dual	6.7m	2.25m	4.88m	7,980kg	4x4	yes	15.1m
LGMG SR1323D	15m	910kg	3.98 x 1.83m	Dual	7.4m	2.3m	4.9m	7,460kg	4x4	Yes	8.5m
Airo XL16-E-1*	15.8m	500kg	4.04 x 1.87m	Dual	6.38m	2.12m	4.32m	7,050kg	4x4	Yes	15.8m
Imer IM 14220D*	16.2m	800kg	3.9 x 2.0m	Dual	6.8m	2.2m	3.92m	7,950kg	4x4	Yes	16.2m
Holland Lift HL-160 E20*	15.7m	750kg	4.07 x 1.85m	Single	6.07m	2.0m	4.57m	7,760kg	4x4	Yes	15.7m

* Electric versions - diesel power is also available

7.3 metres, but it comes from a single 2.7 metre long extension, rather than the more usual dual decks. Overall width is 2.3 metres with a relatively compact overall length of 4.95 metres. Four wheel drive and steer are standard however it does have a fairly hefty 13 tonne overall weight.



The 66ft Dingli electric Rough Terrain scissor lift

Fellow Chinese manufacturer LGMG is also doing well with new full size scissor lifts. It has delivered a substantial number of its 52.5ft SR1623, which offers a 17.9 metre working height, is 2.3 metres wide and comes complete with four wheel drive, levelling jacks, and dual roll out extensions - taking the platform length from 3.98 metres retracted to 6.58 metres. Maximum platform capacity is a healthy 680kg while overall weight is around 8,500kg with dual decks and poly tyres. Sales have been particularly strong in the UK, where Quick Reach, UPA, and Hire Safe Solutions have all taken multiple units. More recently Zoomlion introduced a very similar machine in the form of the ZS1623RT with almost identical specifications but currently it is only available with diesel power.

Finally, Sinoboom currently offers two models with its 42ft 1323RD and its 53ft 1623RD. 1.2 and 1.5 metre deck extensions are available for an extended platform length of 6.68 metres with 680kg capacity on both models. It offers an overall width of 2.27 metres, a length of 4.88 metres and an overall weight of 8,800kg. Four wheel drive, outriggers, and oscillating axle are all standard, although they are currently only available with a diesel power source.

70ft Snorkel

Moving up a little further, Snorkel unveiled its new 70ft S9070RT-HC heavy duty scissor lift at Conexpo last year, which the company says is the first model in a family of four new high capacity large deck scissor lifts with platform capacities of up to 1,814kg. The S9070RT-HC offers a maximum working height of 23.3 metres with a platform capacity of 907kg. It has a 4.87 by 2.28 metre deck, while standard dual hydraulic deck extensions take the platform length to 8.23 metres to provide 18.7 square metres of working space. The unit has an overall width of 2.28 metres – note that the deck extends to the full width of the machine – and an overall length of 4.87 metres. Total weight is a reasonable 11,570kg, given that this includes the decks, outriggers and oscillating axle. The second model in the range will be the 56ft S9056RT which shares the S9070RT-HC's features and specifications but offers a platform capacity of 1,134kg, which may well make this the most popular model of the four. Expect the other two to be a 43ft and mega capacity 33ft unit. We believe that the company also has plans to offer a lithium-ion power option on these

full size scissors, while power options currently include diesel or petrol/LPG.

Tall & skinny

The warehouse construction market has diverged into two sub sectors with the arrival of high cube automated distribution warehouses. These differ in a number of ways to classic warehouse/commercial construction and has grown rapidly across Europe over the past 15 years with that growth looking set to continue, at least for the next few years, as more such warehousing is ordered to keep pace with the increase in online shopping which has been accelerated by the current pandemic. These buildings



The 53ft Sinoboom 1623-RD



The Dingli JCPT 2223DC Battery pack



LGMG's big RTs sold well in the UK last year – these two for Quick Reach



The new 70ft Snorkel S9070RT-HC



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Holland Lift's 104ft HL-340 D30 4WDS Rough Terrain is available with electric or diesel power

naturally require significantly higher scissor lifts to do the same jobs. The market was originally catered for by companies such as Holland Lift and Liftlux - which was ultimately absorbed by JLG. Their original units were simply very big heavy duty versions of the full size Rough Terrains, longer, heavier with massive scissor arms and up to 1,000kg platform capacity. How was it that a small Dutch manufacturer pioneered these monster machines you might ask? Simple - the high rise warehouse idea first took off in the Netherlands and northern Germany. And only when automated stock pickers became more mainstream did the concept spread more widely. Since those early days there has been a step change in the way such buildings are built, driven once again by Dutch contractors. Not only does the concrete base go down at the start, or very early on, but the installation of the massive racking systems now begins well



New high rise warehouses have led to the development of big narrow models

before the building is closed in. At the same time the aisles between the racks have shrunk. Companies like Holland Lift worked with the rental companies and their clients to adapt to this change with the development of massive, heavy duty scissor lifts that are much narrower – for example some of Holland Lift's highest machines are just 1.2 metres wide, which is the same as a classic 26ft slab electric scissor lift! Its 102ft model is just 1.4 metres wide and yet offers a working height of 33 metres! Mind you it weighs almost 24 tonnes and is the best part of seven metres long. The trend towards high rise warehousing seems to be predominant in Europe, whereas the US continues to build lower rise warehousing - possibly due to the greater availability of space and the substantially lower cost of building them?

In addition to Holland Lift and German company PB Lifetechnik, Chinese manufacturers are increasingly moving into the market with some surprising early success. This might be due to long lead times from the two European manufacturers mentioned, coupled by the fact that small Chinese built electric models have proven themselves, overcoming the usual hesitancy of buyers to make the step from trying a relatively inexpensive product such as a 19ft scissor lift, to purchasing larger and substantially more expensive machines.

Something different

For those that want a large platform but also a low platform entry level and some outreach then a 'scissor on a stick' approach might be of interest. MEC has its 40 and 60ft Titan boom lifts which has sold a good number, but at niche market levels. Considerably lower and more compact is a new version of Nagano's 31ft Z11Auj tracked boom with a working height of 11.4 metres which can work on slopes of up to five degrees at full capacity. Developed in partnership with its European distributor Vertimac, it has an unrestricted platform capacity of 600kg with a platform of just over three metres long by two metres wide. The three section telescopic boom provides a maximum outreach of 6.5 metres, which is available at working heights of up to almost nine metres. The machine can also drive at full height and weighs 9,150kg.



JLG's new AE1932 has no hydraulics



Eliminating hydraulics

JLG has started production of the 19ft electric Davinci AE1932 scissor lift that was unveiled at Conexpo last March. It is the first model in a new DaVinci range of all electric lifts designed from the ground up to maximise the latest technology, including the elimination of the hydraulic system, using electromechanical steer and lift cylinders. Other than that, it is a classic 19ft unit with 7.8 metre working height, an overall width at 812mm, overall length of 1.74 metres and stowed height of 2.11 metres - reduced to just under two metres with the Quikfold guardrails. Maximum platform capacity is better than average at 275kg, while the machine's overall weight is 1,565kg. The overall platform width is 810mm, almost the same as the machine's width, while a 910mm deck extension is standard. Drive comes from AC electric wheel motors, each of which is controlled independently for reduced tyre wear or problems when working on sensitive floor surfaces. JLG's mobile control also allows users to operate the machine from a smart phone when stowed for safe loading and unloading.

The stowed machine speed is fast at 4.0mph - 6.44kph - while the elevated drive speed slows down progressively as the platform is raised, rather than dropping immediately to the lowest regulated speed at lift off. It also uses a single, maintenance free 24 volt/72Ah lithium-ion battery which can fully charge in around three and a



The Nagano Z11Auj

half hours, with the potential for opportunity top up charging during breaks. Power is generated when the platform is lowered, providing a small top up to the battery which is expected to have a practical working life of at least 10 years.

Genie E-Drive

Genie has launched a new AC direct electric wheel motor drive for its full range of GS slab electric scissor lifts, which it has dubbed the E-Drive system.

The new brushless E-Drive motors are fully sealed against moisture and water and are totally maintenance free. Machines equipped with them also have 70 percent fewer hydraulic hoses and fittings, substantially reducing the potential for hydraulic leaks. As part of the changeover new side forklift pockets have been added in addition to the rear pockets. The company will continue to offer the hydraulic drive motor versions of its slab scissor lifts up to 26ft - the GS-1530, GS-1532, GS-1930, GS-1932, GS-2032 and the GS-2632 - alongside the new E-Drive models.



Most Genie electric scissor lifts now have direct AC electric wheel motor drive - EDrive

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