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# Putting the smooth into the Rough



c&a

RT scissors

Rough Terrain scissor lifts have been around since the earliest days of the self-propelled aerial work platform. The first self-propelled scissor lift is credited to Selma Manlift, which added a chain drive system to a push around hydraulic scissor lift in the late 1960's. We take a look at how the RT scissor lifts have developed and review some of the latest trends and platforms.

The idea of a RT scissor was spurred on by the early cherry pickers and boom lifts that were already self-propelled, but unlike those units developed originally for fruit picking, the scissor was specifically developed for the rental market. It all started when Los Angeles-based rental pioneer Bob Irving, having purchased some of the first Manlift Tree Farmers for construction use, pointed out a Sky Witch scissor lift to Carl Ruegg of Selma Trailer, the company that produced the Tree Farmer, and commented that it would make an excellent rental item if only it was self-propelled. The machine was shipped up to the company's Selma factory and converted into a self-propelled unit and it proved an immediate success. Bob Irving went on to start producing his own smaller lifts and formed a company that he named after his son Mark - Mark Lift which became a leading player in later years.

The big self-propelled scissor concept was so successful that Selma Manlift as it was renamed, developed it into a standard product and the first units quickly developed into an effective Rough Terrain scissor lift. Although only two wheel drive, the units which became best sellers, had large tyres, were relatively light weight, had a big

platform and in effect a differential lock. As a result they could handle most job site ground conditions with ease.

Transportation was easy too as the drive mechanism could be quickly disconnected, allowing the units to be towed behind a 4x4 or pick-up truck. However the main reason for their success was that they were perfect for rental, being highly reliable, easy to use, easy to transport and dirt cheap to maintain or repair. Anyone could work on them and replacement parts were



The Manlift SM42RT (above) and the SM31RT were perfect for rental - reliable, easy to use and transport and cheap and easy to repair.

readily available, mostly being general automotive components. The product remained in production after the company was acquired by Grove Manufacturing as a two model range - the SM31RT and SM42RT.

A neighbouring company in the tiny town of Selma California - UpRight - soon got in on the act, introducing its Flying Carpet in 1972. However the original models were more of a hard surface machine. The company followed it up with the 8000 series Flying Carpet designed to 'eat' rough terrain. Again they only featured two wheel drive but had huge tractor type tyres and a massive chassis structure. The lifts had their fans and the brand 'Flying Carpet' became a generic term in several countries. However the lower cost, more rental friendly Manlift machines were the market leading rough terrain scissors until the mid to late-1980's when the hydrostatic drive and 4x4 models, launched by companies such as JLG were finally accepted by rental companies and made the old Manlift units look decidedly dated. The change when it came was rapid and Grove never managed to regain the leadership of a market it had led for up to eight years.

## The relevance of it all

The point of all this reminiscing is that the importance of a product is not all about technology and not even performance ... although this is of course important. The critical point has to be a product's ability to turn a profit for the rental company and be effective when working for a contractor.

This point is of particular interest for Rough Terrain scissor lifts, as unlike slab scissors their usage is cyclical, closely following the fate of the commercial construction market. With most of them working on cladding and sprinkler installation, they suffer when work on big sheds slows and rental rates plummet to



This rough terrain UpRight Flying Carpet of the early 70s has a platform height of 47ft with a 6ft hydraulic cantilever platform and a dual fuel petrol/propane system. Other features included a tow bar, 120psi and 120V power to the platform, spark arrestor exhaust system and foam filled tyres.



platform heights of 30, 40 and 50ft and a mean lift capacity of 680kg - is no longer that popular. Although such units that can handle extended decks of seven metres or more are still required for cladding work, the heavier duty models are increasingly preferred with their big capacities and even larger decks.

*A Snorkel S3370RT working at the Toffee Factory site in Newcastle upon Tyne.*



*RT scissor usage is cyclical, closely following the fate of the commercial construction market. With most working on cladding and sprinkler installation, they suffer when work on big sheds slows and rental rates plummet.*

the levels of a micro scissor - or less. Conversely when construction is booming, they are heavily in demand and yet... rental companies rarely manage to achieve the rates that such demand would normally justify and so it rarely compensates during a boom for the down period of the cycle. In spite of this they remain popular among rental salesmen as work is easy to identify and when construction is buoyant they are an easy sale. Many savvy rental companies have made their fortunes by avoiding the sector, but if you want to be a full service supplier this sort of tactic is usually seen as too much of a luxury.

### Market and product changes?

So what has changed since the late 1980's and what trends are emerging in terms of products? In a nutshell the market has fragmented in product terms, with ultra heavy duty models from companies like Holland Lift becoming more mainstream, while compact Rough Terrain scissors have taken over a substantial part of the non cladding market. In fact the original product - a scissor lift with an overall width of around 2.4 metres, overall length in the region of four metres, with

market, when Genie added its AC direct electric drive system to a new version of its compact Rough Terrain model range, which has created a great deal of interest. End users are increasingly switching to them thanks to their lower running costs and quiet operation, while rental companies appreciate the fact that they can be used for both indoor and outdoor applications helping avoid

Many in the industry - including Snorkel's regional sales manager for Europe Enrique Garcia Delgado - think that emissions legislation is only going to go one way over the next few years. "This, along with rising diesel prices and the customer's desire for cleaner, quieter lifts will drive innovation in all-electric and hybrid-electric RT scissors," he says. "Snorkel has two bi-energy compact scissors and they are among our most popular products in this category. Bi-energy simplifies the rental requirement for a contractor because they can use the same machine on battery power for working inside a building as they used on diesel power outside the building."

However for growth markets in developing countries, it would appear that the simplicity and durability of some RT scissor lifts will remain a distinct advantage. Customers in these regions are increasingly asking manufacturers to go back to the old school design by building uncomplicated, robust lifts that can be easily serviced and repaired - One can't but think that the scissor Manlifts of the 1980s would be ideal?

### Genie AC drive

Genie was the first company to offer AC electric drive technology a mainstream aerial lift, when it introduced the Z40/23N articulating

A more recent trend that looks like taking off is the appearance of battery electric powered Rough Terrain scissor lifts. These have been around in one form or another for some time, but it is only now with more efficient drive trains and better batteries that the concept is gaining real popularity - spurred perhaps by the rising cost of diesel and emission laws.

Mec was possibly the first company to take electric power concept 'mainstream' promoting the feature with its mid-sized RT scissors and more recently its compact range. It was only late last year that one of the major manufacturers started to treat this as a serious volume

some of the cyclical nature of the construction market.

With the pressure to demonstrate 'environmental friendliness' companies are also finding that having a strong environmental message when bidding to supply corporate or public sector projects has never been more important. The AC drive system is now widespread in the forklift industry representing over 60 percent of the market and this has also spilled over into the pick & carry industrial crane market all of which is going some way to further prove the technology's good performance, reduced maintenance costs and improved energy consumption.



*Genie has introduced AC electric drive technology on its GS-69DC series.*

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*The Genie GS-5390 is the largest RT scissor in the range with 18.15 metre working height, 680kg platform capacity and 40% gradeability*

boom in early 2007 and has now transferred that technology - albeit refined - to its line of compact RT scissors giving a cleaner, quieter and more efficient drive system. The technology is available on its GS-69DC series and Genie says that the platforms' power and performance when operated on outdoor terrain - as well as offering emission-free indoor use - is gaining acceptance.

As well as meeting European directives on emissions, AC drive systems save 'fuel' costs. For example an independent study showed that a forklift may use £4 in electricity whereas a diesel engine variant may need £10 in fuel to achieve the same amount of work. The switch to AC rather than DC drive provides several operational benefits. An AC powered machine such as the Genie GS-69DC still uses a DC battery - of course - but an inverter in the machine's controller converts the DC current to a three-phase AC current which is then delivered to the motor controlling the function speed and acceleration.

Genie says that the advantages of this system include better acceleration, gradeability and lift speeds 'with operators noticing a faster and smoother response which it claims increases productivity'. Fewer moving parts and a brushless and therefore sealed motors resistant to water and dust, helps with the application and results in lower maintenance costs and improved energy consumption. This has traditionally been a weak spot of DC powered equipment which also suffers from decreased

performance as the battery loses its charge. An AC power system offers the control needed to maintain power - even as battery charge runs low - providing up to 30 percent less energy consumption when compared to conventional equipment.

Typical AC systems recover battery energy using three forms of regenerative braking: when the control lever or accelerator is

released (coasting), when the brake is applied and when the directional lever is operated (switch back or plugging). Essentially, the inertia energy that is created by these actions is converted to electrical energy and returned to the battery, extending overall operating times and operating cycles helping ensure that the equipment can work even an extended shift from a single overnight recharge.

The company says that its three-phase AC motors are also smaller and lighter than an equivalent output DC units and do not suffer the same drop-off in performance. The new AC drive machines are 50 percent faster than the older DC scissors and 30 percent quicker than their rough-terrain diesel- engined counterparts - and all with zero emissions.

The three new models - the GS2669DC, GS3369DC and GS4069DC - have working heights of 9.9, 12 and 14.2 metres respectively and while they only have two driven wheels they are said to be capable of travelling off road and climbing 35 percent gradients. To help achieve this Genie refined its active oscillating front axle which helps keep all four wheels in contact with the ground. The patented full-time oscillating axle automatically senses the terrain and adjusts the axle position to match the ground conditions, regardless of the scissor's elevation.

#### Mec innovation?

As mentioned earlier, California-based Mec produced in that same small town of Selma that spawned the first scissor lift, was

one of the first companies into mainstream electric powered Rough Terrain scissor lifts and currently has three interesting platforms that would fit into the RT scissor category - the Crossover, the Titan boom and the Speed Level in addition to its original mid and large sized models that tend now to be built to order only.

The Speed Level was launched in 2009 and although a virtual copy of the UpRight/Snorkel machines it offered electric power for the first time. As with the products originator, UpRight, the Mec Speed Level comes as with either a 30ft platform height in the form of the 3084RT Speed Level, or the 26ft and two electric powered versions.

Although this concept of machine has never achieved major volumes there is very little reason why this should be the case. The Mec machines can be quickly and easily levelled by up to 14 degrees side to side and 10 degrees fore and aft



*The original Speed Level was launched by UpRight at Intermat in 1990*

without the need for outriggers. There is an operator selectable manual or automatic levelling and the 3084RT offers a working height of 11 metres, a lift capacity of 680kg, optional 4WD, a standard oscillating axle, 45 percent gradeability and power choices that

*Mec Speed Levels can be quickly and easily levelled by up to 14 degrees side to side and 10 degrees fore and aft without the need for outriggers*



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*The idea of an electric scissor lift that can handle gravel and softer ground has been around for more than two decades - one such machine was the UpRight XL24 from the late 80s and early 90s.*

include dual fuel, diesel or electric.

Its second interesting machine is the Mec Crossover - an electric semi Rough Terrain scissor lift which is essentially a compact slab-sized scissor lift with some decent off-slab capability. The idea of an electric scissor lift that can handle gravel and softer ground has been around for more than two decades and recreates the concept of popular products such as the UpRight XL24 or Economy Wildcats of the late 1980s and early 1990s with their battery power, compact dimensions and flotation tyres, which gave way to the modern pure slab machines with their solid tires and minimal ground clearance in the mid-1990s.

The Crossover is available with either a 26 or 32ft platform height - both with an overall width of 59 inches - 1,499mm - so they will pass easily through a set of double doors. Power is battery electric and are intended to be used anywhere you might use a regular slab scissor while retaining the ability to service the outside of the building as well. While a regular platform is available, the vast majority of units have been shipped with a highly unusual offset



*The Mec Crossover is available with a 26 or 32ft platform height - both with an overall width of 59 inches (1,499mm) so they will pass easily through a set of double doors.*

platform design and glazing /sheet ply rack. On the one side of the machine the platform extends to the very edge of the machine, something that you can no longer take for granted on any scissor lift, and so is ideal for regular work up against a façade. The other side is set back in and the space taken by the rack, so that the material while outside the platform is within the overall width of the machine. The idea is that you use the side that suits the work in hand.

The largest Mec scissor type machine is the Titan boom 40-S is said to provide the lift capacity of a small telehandler with the work area of a big deck scissor lift and the reach and rotation of telescopic boom as the platform rotates on the boom which supports it. The Titan may well revolutionise the way some specific work is performed on site. Whilst the typical RT scissor can cope with a fair degree of rough terrain, its lack of outreach means that when working on external cladding for instance the machine must work close to and parallel with the new building line which is likely to have been excavated and backfilled during the foundation phase - not the best place for two wheels of a heavy machine to sit. Where a machine like the Titan scores is the few metres of outreach that can be gained by rotating the platform, allowing the machine to find more stable ground away from the building as well as over-sailing any immovable obstacles.

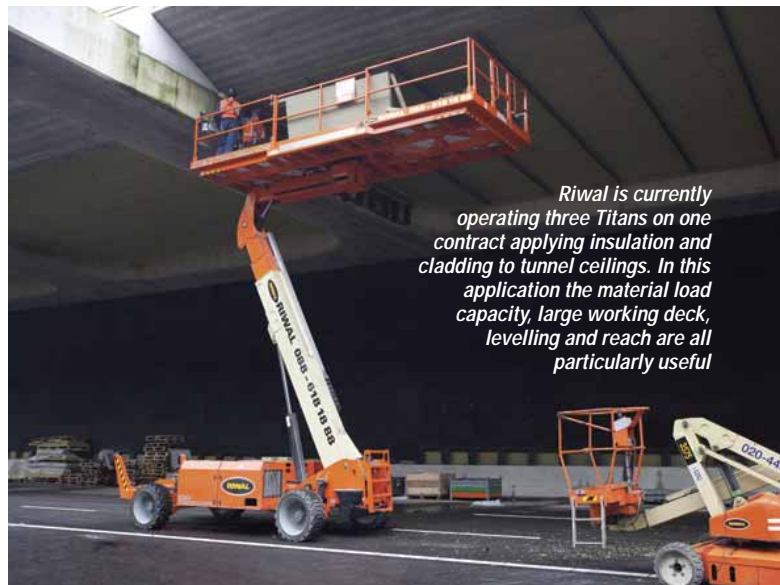
With the 40-S platform capable of handling pallet loads of blocks - up to 1,350kg - in addition to four men

and their tools it is a machine that has the performance to speed up work at height that might normally have required façade scaffolding or perhaps a small mastclimber. By sliding back a centre gate in either side of the Titan's guardrails, a pack of bricks or blocks can be placed in the special load area in the centre of the platform's deck. Using the eight metre telescopic boom, 1.8 metre sliding platform and 180 degree platform rotation, the basket can be moved into precisely the right position to reach the work. The Titan has similar three mode steering to a telehandler - Two wheel, four wheel co-ordinated or crab steer - helping it to position itself in confined spaces. Levelling is automatic and given that the lift is technically a boom with the potential to experience the catapult effect, the platform is equipped with a running lanyard line on each side of the platform floor.

the Titan boom 40 is now available in Europe from international access rental company Rival and has become a 'stock' item at a number of its operations, including the Netherlands, France, UK, Denmark and Norway with other countries due to follow shortly and the company is also looking for local partners to take on the concept Kristian Langseth, manager of Rival Norway says: "We are seeing increasing interest in the MEC Titan. Companies active in tunnel construction and road security are renting it and considering buying it. They are very positive about the lifting capacity, the large working area and the gradeability of the machine. In addition various platform accessories are available to set up material loads on the working deck."

One of Rival's largest customers is currently operating three Titans on one infrastructure project, applying insulation and cladding to tunnel ceilings. In this application the material load capacity, large working deck, levelling and the reach are greatly appreciated.

A sort of forerunner to the Titan 40-S was the Manitou 150TP unveiled at Intermat in 2006 - although it resembled platforms built by Aichi and Tadano in Japan. The 150TP uses a three section telescopic handler boom, giving a platform height of 13 metres, platform length of 6.5 metres when extended and a 1,000kg platform capacity. More useful is its healthy six metres of outreach which requires the setting of its telehandler-type stabilisers at the front of the machine.



*Rival is currently operating three Titans on one contract applying insulation and cladding to tunnel ceilings. In this application the material load capacity, large working deck, levelling and reach are all particularly useful*

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Unfortunately by the time the 150TP was ready for market, the global economy was on the brink of collapse and investment in even well-established access equipment was on its way down. Interestingly exactly the same fate befell the original UpRight Speed Level in the early 1990s. So the 150TP was largely ignored and only around 70 units have been sold to date. However, like the Titan and various Speed Level machines, these 'alternative scissor platforms' have much to offer. But as is always the case with new concepts, availability is limited given the purchasing mentality of the larger rental companies who would rather buy regular, run of the mill products. Perhaps the Titan, available for hire from Riwal will change customer and other rental companies' opinions?

### Back to Battery powered RTs

Electric RT scissor lifts are certainly gaining in popularity right up to the world's largest battery powered lift - Holland Lift's massive 33.7 metre working height Megastar

G-320DL30 4WDS/N. Other manufacturers with big electric Rough Terrains include Iteco - now the access division of the Imer group - with its IT180, IT210 and IT230 ranges. The IT180 offers a working height of 13.9 metres and 500kg platform capacity. The IT210 has a working height of 19 metres and 540kg platform capacity, while the 16.9 metre working height, IT210 offers dual platform extensions to create a 7.1 metre deck, while offering a full 1,000kg platform capacity.

### ATN extends range

Tonneins, France based ATN is a relative late comer to the Rough Terrain scissor lift market, and in spite of the challenges of the recent recession is ploughing ahead with its plans to offer a three model line-up double deck Rough Terrains scissors. Currently it has two models, the CX12 and CX15 with 12 and 15 metres working heights respectively although it is working on the 18 metre CX18 which may be available later this year. The company claims that its CX-12 is the only scissor on the market



*The Manitou 150TP, like the Titan and various other 'alternative scissor platforms' have much to offer and may yet have their day*

combining a 16 square metre platform area with a platform capacity of 1,100 kg. It also say that

the time taken to raise and lower the platform is very quick with the platform going from the stowed position to maximum height in just 40 seconds, this is something that always appeals to construction users, even though the actual time saved in a day amounts to a few minutes at best.

As with its articulated boom lifts, the platforms include an integrated and protected diagnostic system with a screen located under the covers, able to scan, detect and communicate any technical problem, using a message in the language of the user. This simplifies fault finding, reducing repair and call out time. The same screen can be used to configure the platform without need to connect an auxiliary laptop.

The CX-15 4x4 scissor - 43ft platform height - has dual hydraulic platform extensions giving a total platform length of 7.30 metres - perfect for long horizontal cladding panels. An oscillating axle is standard, to help cope with difficult terrain, as are the auto-level stabilisers.

### Dome attachment

Attachments for access platforms and scissor lifts in particular are increasingly important, enabling work to be carried out both more efficiently and safer. Several



*Holland Lift's massive, electric 33.7 metre working height Megastar G-320DL30 4WDS/N.*



*The ATN CX-15 4x4 scissor has dual hydraulic platform extensions giving a total platform length of 7.30 metres - perfect for long horizontal cladding panels*

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The problem was providing a safe and effective means of installing large curved timber sections weighing between 100 and 250kg



Nationwide Platforms supplied this SkyDuct attachment fitted to a modified Genie GS2646 scissor lift, capable of holding up to 350kg of materials without risk to operators or materials falling to the ground.

companies now produce a range of products allowing board materials and pipes to be carried on the platform in a safe position but also making it easy for the tradesmen to place them in position - speeding up the time taken and helping reduce the strain and risk of manual handling.

In the UK Nationwide Platforms, part of the Lavendon group, operates the

largest fleet of scissors - more than 6,000 - with a full range of platforms up to the large-deck 34 metre machines. Last year the company launched a range of material handling attachments for use on its scissor lifts. These included the SkyRak and a SkyRak Plus, two attachments designed to safely store materials such as steel tubes weighing up to 600kg. The company



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*To overcome any issues involved with accessing the working environment, the scissor lifts complete with SkyDuct attachments were lifted into the working area by a crane*

also developed a powered SkyHandler attachment which features a hydraulic lift controlled by remote control.

As well as helping to carry and lift materials for run of the mill work, attachments can be used to solve complex construction problems such as when working on a domed ceiling. A recent example of this occurred at the Bramall Music Building's state of the art, 450 seat auditorium in Birmingham, where the roof shape offers substantial acoustic benefits to the rehearsal and practice room.

Taking on the challenge of managing the dome build, BAM Construct enlisted sub-contractor Joyce & Reddington Bespoke Architectural and Contract Joinery for the specialist ceiling work. Faced with the task of providing a safe and effective means of installing large curved timber sections weighing between 100 and 250kg, Nationwide Platforms provided the SkyDuct, a modified Genie GS2646 scissor lift, capable of holding up to 350kg of materials without risk to operators or of materials falling to the ground.

After placing the heavy materials onto the modified platform, the roof installation team were able to raise the timber sections to the required

height using remote controls. With the materials placed in the correct spot, the engineers used two other scissor lifts to work from, securing the timber in position. Finally, to overcome any issues involved with accessing the working environment, the scissor lifts, complete with their SkyDuct attachments were lifted into the working area by a crane.

As well as proving to be a highly-efficient means of working at height, the access solution was unmatched by any other means of access - including traditional scaffolding - which offered no clear, safe method of working. It is estimated that the use of the SkyDuct saved three weeks in the installation process.

"Responding to the unique challenges posed by the task, we were eager to use our experience and resources to help our client work as safely and productively as possible," said James Watson, Nationwide Platforms sales director. "By delivering a solution that was tailored to the precise needs of the task, we provided the appropriate equipment and innovations that helped ensure the work was completed ahead of schedule."

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