They're back!

More than 30 years since exiting specialised forestry markets, international trucking and construction heavyweight, Volvo, has launched a new range of forestry specific carriers, has a series of feller bunchers awaiting release next month, and is working on a forwarder the likes of which the industry has never seen. ***Chris Cann*** *visited Volvo's burgeoning forestry arm in Finland*

'**Total solutions'**. That's the marketing line from Volvo, which has re-entered forestry-specific markets after an extensive absence from harvesting activities with several new machines that are set to complement the company's trucking and loading units already prolifically used in the forestry sector. Crudely speaking, the company plans to be a 'one stop shop' for forest owners.

Volvo began this move more than four years ago by appointing Ken Kelly to analyse the possibilities of expanding the tracked carrier range into the harvesting sector. The forestry focus was strengthened two years ago with the recruitment of now Global Forestry Solutions Director, Jukka Moisander. Moisander was with John Deere/Timberjack for some 37 years and was brought onboard to add much needed forestry expertise. He has since recruited further staff members devoted to Russia/Eastern Europe and the Americas, along with a forestry communications specialist. Under the banner of Volvo Forestry and with help from the specialised team at the Korean excavator factory, the group's first C-series range of forestry-specific tracked carriers has been produced. In addition, Moisander has worked with Volvo's North American acquisition, feller buncher manufacturer Direct Technologies, to develop the Volvo feller buncher family; and has teamed with a New Zealand innovator to

Volvo has made the leap into specialised harvesting machine markets

Jukka Moisander discusses the tracked forestry carriers with major Finnish contractor, Pertti Lehtomäki

develop the the LevelMax leveling option for tracked carriers. Furthermore, Moisander has been the chief driver of a joint venture between Volvo and Swedish company El-forest that has produced a hybrid forwarder. Volvo plans to supply mobile equipment for both CTL and TL operations. The skidder market is the only sector in which the company is not yet represented.

"What this shows is that Volvo is serious about forestry," Moisander told *International Forest Industries*.

He said though Volvo was limited in its supply of harvesting machines compared to suppliers such as John Deere, Komatsu or Ponsse, the group already considered itself the number one supplier to the forestry industry from an overall perspective. Volvo, through its dominance of the trucking business and its prominent position in both the construction and lifting industries, already supplies more equipment to the forestry sector than any other.

"We are, today, already the number one 'total solutions' provider for the forestry industry," Moisander said. He said the forestry process began with building the roads to access the forest resource, which required both the machines to build the roads and the trucks to transport those machines to site. The next step was harvesting, for which Volvo had previously supplied only its tracked carriers that could accommodate several different harvester heads and other forestry attachments. Volvo also has the machinery to load the logs roadside, truck them to the woodyard, then unload, stockpile and feed to the sawmilling process.

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The finished product then has to be distributed, which of course can be done with the help of Volvo loaders and Volvo trucks. "Our aim is to have all the mobile equipment required for this process, which begins with the standing forest and ends with the finished wood products, available for the consumer market."

The introduction of new forestry specific equipment merely strengthens the company's position and enhances its ability to provide solutions throughout the whole forestry chain. Moisander said by providing forestry specific equipment in the form of factory-built tracked forestry carriers (TFC), feller bunchers and other mobile forestry equipment, Volvo was able to provide a better case for clients to use just one manufacturer. He said customers would see great appeal in the prospect of dealing with a sole supplier that could be relied upon throughout the logging process rather than several different groups. Volvo's reputation for quality, safety, and service was therefore crucial to its strategy.

The ideal candidates for Volvo's 'total solutions' strategy are forest owners in emerging forestry nations that needed to start from scratch, according to Moisander. "If countries that are building their industries – Russia and some South American and Asian countries – get each of their machines for each of the steps in the forestry process from

different manufacturers, it is almost impossible for them to figure out how many products they need, who should support them, and what the total cost is for running them. Then it's a big puzzle. But if someone provides that complete puzzle to them, it's much easier. It is far less complicated to organise one large project with one partner than many small projects with many different partners."

The other logical user would be a forest owner or contractor looking to switch from TL to CTL. Though Volvo would ideally like customers to use the full range of Volvo machines, the company understands that it may make sense for operators to use sections of the machine sequence where applicable or even just individual machines.

Tracked Forestry Carriers

The TFC concept was born when the company's existing forestry clients starting asking for a more forestry specific machine. Adaptations were made to the excavator and the first machine from the TFC C-Series, the FC2121C, was unveiled at the Bauma exhibition in Germany last year. Since then, Volvo has added further machines to the range and there are currently four different size classes of TFC ranging from 24 t-capacity machines to 38 t-capacity machines – FC2121C, FC2421C, FC2924C and FC3329C. The company is looking to expand the range later with a smaller model. There are set to be two factory built models and one local modificaiton on show at FinnMETKO.

Moisander said the main advantage of a factory-built TCF rather than a locally modified excavator, was cost and time efficiency: "If you build it from the beginning based on global requirements it is clearly more economical. You don't tear down anything or have to re-weld or re-paint anything – double work always costs more. And if the machine is built for forestry applications and doesn't need modifications then it obviously will be ready faster." He said quality from the factory was also superior and Volvo was better able to guarantee the safety of the equipment. The customer also keeps the factory warranty, which would not be the case if the machine was modified.

This TFC levels out on a steep slope using the LevelMax module

The FC2421C splits stumps in Finland

There are several significant changes that have been made to the basic excavator carriers previously used to prepare them for life in the forest. The re-design concerns mainly stronger structures, protection, safety, special options, and attachment installations. Attachment installation in order to complete the carrier for different forestry tasks needs to be done locally by the dealer or by the attachment supplier. The features vary from model to model but are primarily as follows (exceptions mainly concern the intermediate duty FC2121C model):

- The Volvo Forestry Care Cab with standard 457 mm cab riser and full forestry guarding meets global safety standards
- The boom and arm have heavy duty forestry guarding, integrated piping, hydraulic cylinder and work light guarding
- There is a boom cylinder guard and an optional boom foot riser as part of this feature, which increases boom and arm reach and overall machine stability
- The heavy duty swing-ring guarding provides full protection for swing-ring bearing and grease piping
- An enhanced 8 mm underbody guarding with bolt-head protection keeps forestry debris and rocks from damaging the super-structure
- Heavy duty full-length track rock guards. Dual-mounted bottom rollers on top. Reinforced idlers with derail guards
- Purpose-built high-walker undercarriage and high capacity track motors with heavy duty track motor covers
- Punched 305 mm steel plate anti-slip catwalks and platforms provide the necessary grip when servicing in wet or icy conditions
- Heavy duty rear body deflector rail for added protection. An additional 650 litre fuel tank is available as part of this feature

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- Heavy duty right-side body deflector rail and reinforced right corner guard post with spacious lockable tool storage
- Easy-access heavy duty panels, doors, hinges, and lockable latches protect electrical components and simplify ground level maintenance and service
- Reinforced side doors with heavy duty screens protect coolers and pumps, while providing maximum air flow
- The heavy duty top and side panels along with a rear opening engine cover protect the engine components from falling objects and provide safe and easy serviceability
- Optional gull-wing design available on the FC2421C model adds heavy duty protection and user-friendly service access.

Moisander said that while the additional features would increase the cost compared to the standard excavator, it was still significantly cheaper than specialised, wheeled harvesting machines. He said the wheeled machines had some superior features compared to their tracked counterparts "but in many operations those features do not have any significance and they tend to have a very heavy price tag". However, he believes the appeal of a sole supplier plus the advantages of the TFCs would be enough to convince customers to "make

The LevelMax function needs more than its full 21° to cope with this decline

economically feasible decisions".

"Anyhow, no doubt there is a place for both tracked and wheeled carriers in forestry; the question is to find the best solution for each application."

Apart from tracked machines being considerably cheaper than those on wheels, the TFCs are superior in several other ways. Possibly the most attractive hook for customers is the easy access to parts and service expertise for excavators, particularly Volvo machines. The other areas in which the TFCs shadow wheeled harvesters are in the handling of larger trees; lower ground pressure; and steep slope capability. The ability to handle larger trees and in steep conditions was possible because of the TFCs' more powerful boom and their strong slewing.

Moisander said the TFCs were also preferable because of their many applications, which in turn increased their trade-in value. "The combination use is especially important in Nordic countries and in Europe. The same machine that is used to build roads or dig ditches for drainage in the forest during the summer months can be used to harvest the trees during the winter snow period. All you have to do is exchange a bucket for a harvester head. The same applies to stump splitting once the harvesting is over and then replanting. This is even more important these days with the growing need to get more out of biomass materials. It ensures that both the carrier and the operator are occupied all year round as opposed to a specialist harvesting machine that is likely to stand still during some spring or summer months." Other jobs TFCs can do are processing, felling, shovel logging (North America), loading, scarifying, and forest road building.

The machines are made-to-order and Moisander said customers should determine what tasks they needed the machine to perform prior to ordering so it could be fitted appropriately. "You will see there are several features that are needed for some jobs and not for others. For example a cylinder needed on the boom to control a replanting fixture is not necessary for harvester head operation. So if you know you will only be harvesting with the machine then you wouldn't order a machine with that cylinder because it would add unnecessary weight and cost. However, if you plan the machine for 'combi-use' – planting and harvesting – then you would order the cylinder." He said if the application changes during the course of the job, it was relatively simple to add features at a local Volvo service centre. "The versatility of these machines is probably their biggest strength."

The most recent option to be added to the TFC was LevelMax technology, which was launched in March at ConExpo in Las Vegas, and makes the carriers more suitable for the sloped terrain of North America in particular where feller bunchers are the norm. LevelMax is

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a leveling module that can be installed between the undercarriage and the superstructure and can level the cab in all four directions by up to 21° improving visibility and stability. Typically, feller bunchers level a long way forward but only a limited amount to each side. The LevelMax application has been designed so the machine can be used across various applications away from felling.

The control system is automatic with manual mode or manual override functions and communicates with the operator with a colour LCD screen that monitors gradient in addition to the carrier's superstructure position relative to track angle. The LevelMax module's angle and rotating sensors continually monitor the carrier's position relative to the ground, while the onboard computer controls the module's leveling hydraulics, smoothly and automatically keeping the carrier's 'swing-ring' horizontal during travel. The result is greater net swing torque for improved performance, increased operator comfort, less swing component wear, and better fuel economy. There will be an example of the LevelMax at FinnMETKO.

Feller Bunchers

Volvo acquired the product rights and the key people from small North American feller buncher manufacturer, Direct Technologies, 14 months ago. Volvo has since developed its first commercial feller buncher family based on the design of existing Direct products and with the

The Volvo feller bunchers were based on the successful designs by Direct Technologies

> The Volvo feller buncher has been built in the Volvo factory using Volvo components and quality but based on the successful Direct products

help of Direct expertise. Volvo's FB3800C and FBR2800C were due for release at Demo 2008 in Halifax, Canada. There will be a further two models released at a later date.

Volvo's first series of feller bunchers will be based on the Direct 210 Series SR Model with around 300 horse power; the 260 Series standard swing radius, also with about 300 horse power; and the 300 Series with long swing radius, 300 horse power, more stability, and a longer reach. The feller bunchers will later be available with the leveling option.

"Direct Technologies made very nice red feller bunchers but were only a small manufacturer, so when the market went down in North America they got into trouble. They had already very successfully delivered circa 100 units of these very good products, which were highly appreciated by the end users," Moisander said. "The Volvo feller buncher has been built in the Volvo factory using Volvo components and quality but based on the successful Direct products."

El-Forest Forwarder

Volvo is working with Swedish group El-forest, which is developing a hybrid forwarder with an electric power train. Volvo used its risk capital arm, Volvo Technology Transfer, to take a stake in El-forest mid-last year. The plan was to keep the project separate from the main Volvo group in order to "allow fast development of this new technology in very close co-operation with the forest industry steering group to ensure the best results to meet the customer demands and short project duration", Moisander said. The hybrid forwarder, though in the advanced stages of development, will not be brought under the Volvo banner until it is commercially proven to be up to Volvo's safety, quality and environmental standards, which Moisander hoped would be within one to two years. Nonetheless, the partnership was preparing to launch its 'pre-series' at FinnMETKO.

Moisander is more excited about the hybrid technology than any other development because of the technology's implications for not only Volvo Forestry, but the wider group. "I have been pushing this strongly because I believe the next stage of forestry is to start thinking about the power train. We started with a mechanical power train, moved to a hydrodynamic torque converter design and today almost everybody is working with a hydrostatic power train," he explained. "I believe this is going to be the next generation of power trains for not only forest machines but in other machines as well."

The hybrid forwarder has a diesel engine with generators at the end of the engine to produce electricity, which feeds into batteries. Those batteries service electrical hub motors directly using a single cable, negating the need for gear wheels or transmissions. The greatest advantage of the hybrid electric engine is the fuel efficiency. First of all, the diesel engine is half the size of standard diesel engines in operation in this size class today. It works at a constant revolution for optimal fuel consumption. The peaks in energy needs usually catered for by increased output from the engine are serviced by the stored electricity in the battery. In addition, an energy recovery feature is vital. When travelling downhill, all the braking energy goes back to the batteries and is stored. Due to the small engine with optimum revs per minute there is also less vibration, lower emissions and reduced noise.

The forwarder is a six-wheel machine, which allows the automation to control the speed of each individual wheel to fit the turning angle so there is no tearing damage to the soil. It has 14 t-

The El-forest forwarder will continue to be sold in Sweden as the design is developed further

capacity, so is in the largest forwarder class available at the moment. However, Moisander said the El-forest forwarder had much higher "tractive effort" than other machines because each wheel could provide up to 6 t of "tractive effort".

The forwarder also boasts the only rotating cab independent from the boom in the industry. Other manufacturers have cabs that turn with limited capacity but they must remain in a set arc, whereas the El-forest cab can continuously rotate about the axis. This capability will allow the operator to save time turning back, therefore improving efficiency.

Moisander said the forwarder was a direct result of industry demands: "I'm a firm believer that this is the future. This is something the industry wants – it wants lower fuel consumption, lower emissions, lower costs, less ground damage and better cabin maneuverability – and this is responding to those needs. The industry will see this step as a huge positive because it shows that someone is listening to them and trying to meet their needs.

"We have tested the concept machine over a long period and feel very comfortable with its performance." El-forest has already sold its first machine in Sweden, which will be delivered after the FinnMetko show, and the intention is to continue selling machines domestically in Sweden to ensure the support and development potential is optimised for the remainder of this year and into 2009 before the machine is brought into the Volvo family. IFI