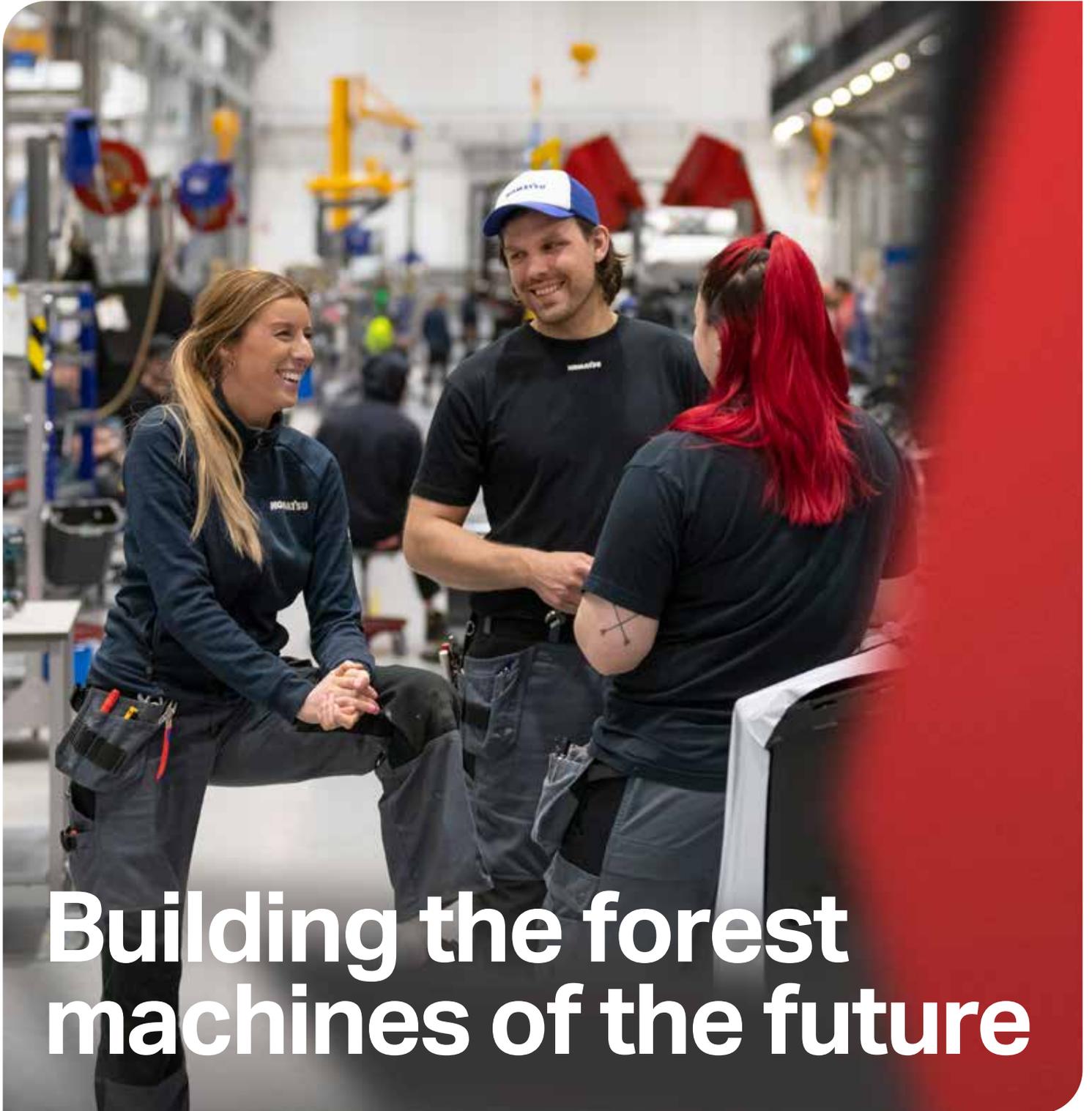


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1/2022

Just Forest

International Magazine from Komatsu Forest



**Building the forest
machines of the future**

KOMATSU



Creating value together

Forestry provides the valuable essentials we all benefit from – material for housing and fencing, packaging for goods and consumables, energy to heat our houses, or printing paper for our children's books. It is your hard work that makes it possible. Thank you. We want to be the partner to rely on when creating those values.

KOMATSU

For a better future

After two years marred by the pandemic, together with many others, I had hoped that the effects would soon ease off and the world would return to something more like normal. Unfortunately, this was not to be the case as the war in Ukraine affects us all, and we are deeply moved by the human suffering. In these turbulent times, we are trying to manage supply chains that once again are being pushed to their limits by high demand coupled with limited access to inputs. Parallel to this, the cost of living is on the increase, which also affects us as a company. Just like previous generations have successfully overcome the challenges they faced, we are confident that we too will overcome these challenges. Difficult times test us, and Komatsu, which celebrated its centennial in 2021, has over the space of that time grown from a small company manufacturing mining equipment to a global enterprise with more than 60,000 employees.

Despite these bleak times, we believe in the future. In this issue, you can read about Centipede, a unique project in which together with eight forestry companies, we presented a concept machine for low-impact forestry. A machine combining lower ground pressure and high operator comfort and productivity with lower fuel consumption.

This project is a crucial step toward our goal of reducing carbon emissions from forest machines and the associated processes by fifty percent by 2030 and making them fully carbon neutral by 2050. Extremely ambitious goals requiring many technological inno-

vations as well as process improvements within forestry, none of which will be achieved without dedicated employees, owners, suppliers, and customers.

We believe that technological advances can contribute to a better world in which we use less resources to produce more with a smaller climate footprint, more favorable running costs, and an improved work environment. This may sound challenging, but these are things that we work with every day. In this issue, you can read more about a number of new products that contribute to this aim: Komatsu Smart Crane, Komatsu Comfort Ride, ProAct, a new head for eucalyptus, and, not least, tips for productive, low-impact forestry.

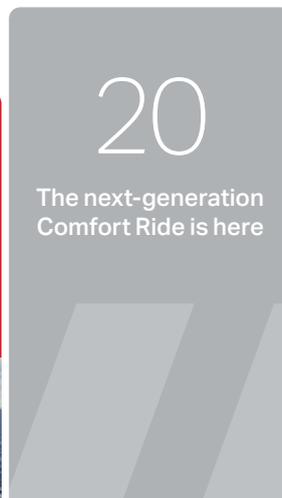
Another crucial step in our environmental efforts is that our new factory in Umeå has been commissioned. This will enable us to meet the growing demand for forest machines and sustainable production while reducing our climate footprint. Moreover, we have also created the workplace of the future for our employees in Umeå.

As the havoc caused by the pandemic hopefully subsides, I hope to meet you at our new factory or in your local area. I also hope that this magazine offers you some interesting reading.

In closing, I hope that the situation in Ukraine will soon be resolved peacefully and that you all look after yourselves and your loved ones.



JENS
BENGTSSON,
CEO OF
KOMATSU
FOREST



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With low- impact forestry in mind

Centipede is the name of the concept machine developed by eight forestry companies together with Komatsu Forest. This collaborative project was started in 2019 and the aim has been to develop the next-generation forest machine fulfilling a range of strict criteria for low-impact forestry.

»The machine is built to mitigate damage to the forest floor, to increase transport speed, and to radically reduce the whole-body vibration experienced by the operator.«



ERIK NILSSON, CTO KOMATSU FOREST

Forestry faces a number of key challenges, with sustainability to the fore. These challenges include minimizing ground damage for lower-impact forestry, attracting operators to the industry, and moving toward higher productivity.

A versatile machine with minimal impact

The project members agreed to design a versatile rather than a niche machine, one that fundamentally challenges today's technology and steps into the future.

The Centipede is designed to traverse various types of terrain with minimal impact and to pass obstacles with ease. The design reduces ground pressure and thereby impact on the forest floor.

"Making use of newly developed technology, even during the wettest periods the machine can navigate areas that are normally considered winter areas, enabling the timber supply to be secured all year round," says Erik Nilsson, CTO of Komatsu Forest.

Increased productivity

In addition to securing the timber supply throughout the year and thereby creating better conditions for profitable harvesting, the Centipede boasts several characteristics that directly enhance productivity.

The innovative design enables the Centipede to navigate the terrain considerably faster. It also permits a heavier load than the Komatsu 855, which has been used as a reference. Both of these characteristics create the conditions for significant increases in productivity.

Moreover, simulations show that the Centipede reduces fuel consumption by up to fifteen percent in soft terrain, benefitting both the environment and profitability.

"The machine is built to mitigate damage to the forest floor, to increase transport speed, and to radically reduce the whole-body vibration experienced by the operator. In terms of technology, the machine has a new track system with considerable ground contact specially developed for forestry. It also has a fully suspended chassis to handle uneven terrain, which means that the machine's ground speed can be increased significantly without amplifying vibration," Erik continues.

Good operator comfort for an attractive profession

A forest machine must have a favorable work environment to ensure the operator's wellbeing and productivity. This is also a prerequisite for attracting the operators of the future to the industry.

One major challenge is whole-body vibration, and radically reducing this phenomenon has been prioritized in development efforts. Reduced vibration enables faster operation as well as greater operator comfort than today's machines.

Simulations show that the machine achieves the goal to reduce whole-body vibration by more than fifty percent – even at higher speeds than the those used by today's machines.

"The Centipede is a concept machine, which means that the machine concept will be thoroughly tested and evaluated before deciding whether serial production should begin," Erik ends.





The project members

- BillerudKorsnäs
- Holmen
- Komatsu Forest
- Mellanskog
- Norra Skog
- SCA
- Stora Enso
- Sveaskog
- Södra

Finally!

The new factory is up and running

When Komatsu Forest's employees returned from their summer vacation in August 2021, work began in earnest at the newly built factory outside Umeå in northern Sweden. Since then, they have been burning the midnight oil, working hard to get the last pieces of the puzzle in place at the new plant. The challenges have been many, but so have the lessons learned. CEO Jens Bengtsson and plant manager Anna Fredriksson have faith in the future.

Looming over the road is a six-story wooden building housing offices and other communal areas for the company's employees. The entire premises are characterized by bright, open spaces, with a company canteen providing a natural gathering point for factory and office workers alike.

Behind the striking office building lies the enormous factory building, covering some 323,000 sq ft (30,000 m²). Inside the walls of this unique building, we now find the company's entire forest machine production facilities, with everything produced on a single production line.

But let's start at the beginning. So, getting back to August:

"Unfortunately, the commissioning of the new





323,000 sq ft (30,000 m²) The company's entire production is conducted on a single production line on the open factory floor.



plant didn't quite go as planned," says Jens. "The underlying conditions for handling production components differ compared to our old plant, and that was something we had to adjust to. In terms of not only where and how we stock different components, but also how our IT systems support the internal logistics."

The delays that this entailed impacted efforts to get the last pieces of the puzzle in place on the actual production line. Although the production staff had practiced the various assembly tasks already before the move, we knew that some modifications and alterations would still have to be made to better suit actual conditions.

"Unfortunately, even the global situation means that we're not where we want to be," Jens continues. "For most of the year, we've had highly unpredictable supply chains for our components, which has disrupted production and increased component costs. This is something that we expect to continue affecting us for much of 2022 as well. Due to the pandemic and seasonal influenza, throughout the winter



»Having the company's various functions close to each other sets the scene for better cooperation.«

ANNA FREDRIKSSON, PLANT MANAGER

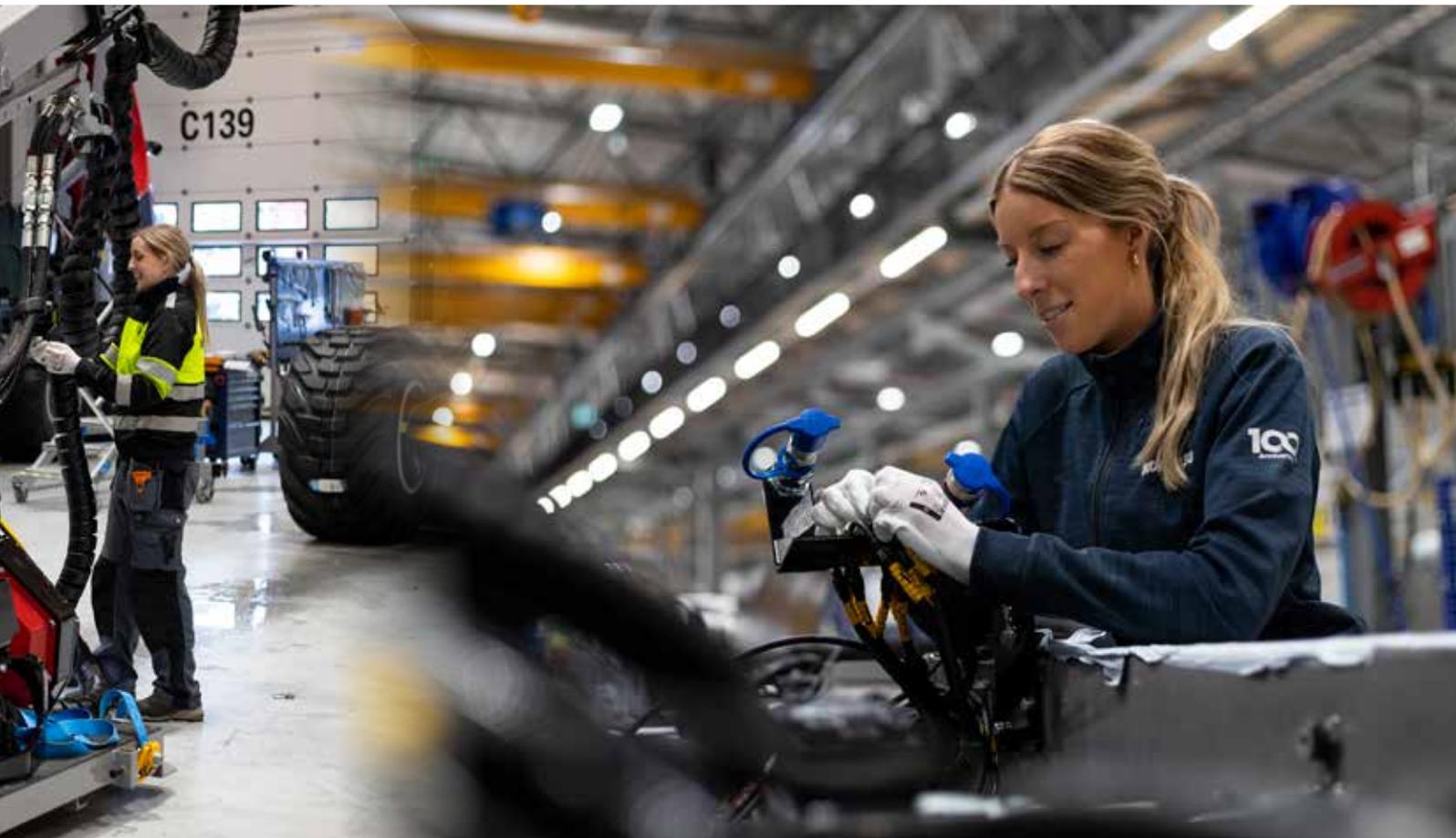
we've had unusually high sick leave among our staff, which has slowed production. Now, though, we hope that the worst of the pandemic is behind us."

Following the uphill struggle of commissioning the plant, Jens and Anna are now looking forward to reaping the benefits of the state-of-the-art facility, the heart of which is the busy assembly line with its red forwarders and harvesters emerging one after the other.

From the mezzanine floor running from one side of the factory to the other, visitors are afforded views of the entire production process. Jens and Anna look out over the factory floor and can say that it feels incredibly satisfying to have everything up and running.

"The entire plant is built with people and the environment in mind, and the company has made a major leap in its efforts to become carbon neutral," says Jens.

"Our new workplace creates a positive atmosphere where, thanks to a mutual sense of commitment, we can tackle obstacles and



solve challenges together," Anna asserts. "With our entire workforce gathered in one place and a state-of-the-art work environment, we all have the makings to be the best versions of ourselves. Having the company's various functions close to each other sets the scene for better cooperation, enabling us to build stronger operations in which all functions have a clearer understanding of and knowledge about the production process and our products. And this is something that customers will eventually benefit from too."

Parallel to commissioning the new plant, practical efforts have been under way to ensure product quality.

"This is something we're clearly seeing the results of now," Anna explains with pride. "By reinforcing the quality assurance process within production, and identifying deviations earlier in the assembly process, we're seeing, for example, that the number of complaints within a machine's first 100 hours of operation has dropped."

"Now, we're looking forward to increasing the production rate at our new plant. We know that many contractors and operators are waiting for their new Komatsu machines, and we're doing everything we can to deliver them as quickly as possible," Jens ends.

Behind him, production staff are busy mounting the cab on a harvester. Everything is checked down to the smallest detail before the machine is moved to the next station on the production line. Before the end of the day, the machine will undergo final testing before being driven out through the main doors on its way to a forest somewhere in the world.

A broad approach

The new plant has been built with people and the environment in mind.



»Now, we're looking forward to increasing the production rate at our new plant.«

JENS BENGTSSON, VD

»We're striving to reduce carbon emissions by fifty percent by 2030.«

ANNELIE PERSSON, PRESS OFFICER



With the environment in mind



Press officer Annelie Persson on how Komatsu Forest always has the environment in mind in its day-to-day operations.

The new factory has a strong focus on the environment, why's that?

"It actually stems from our company's core values, what we stand for – our philosophy. Ever since Komatsu was founded a century ago, the company has been keen to earn the trust of those we interact with, to work together with society, and to work in a way that considers future generations. Thanks to our philosophy, environmental work is a given in everything we do."

Which concrete measures have been taken with regard to the factory?

"We've built the factory with the aim of achieving carbon-neutral production, which is why we've invested in energy sources that are renewable, primarily geothermal heat and solar power.

"Another important aspect is that we've modified our work processes to eliminate any unnecessary environmental impact. One concrete example is that at our new factory, we're able to use one less wheel loader than at our old production unit.

"Throughout the construction process, we've made conscious decisions to create positive environmental improvements across the board. This encompasses everything from low-flow faucets to reduce water consumption to choosing recycled over new furniture for our office building."

What are the plans for your environmental work moving forward?

"In our quest to become carbon neutral, we have very clear objectives within the Komatsu Group*. We're striving to reduce carbon emissions by fifty percent by 2030 as well as to increase the share of renewable energy by fifty percent (compared to 2010). After this, our goal is to become carbon neutral – and for 100 percent of the energy we use to be renewable – by 2050. Accordingly, in practice, environmental issues are always in full focus across our operations.

"However, it's also important to point out that this work isn't limited to our production, rather it encompasses the entire chain from sourcing components to machines operating in the forest. For the latter, there are already many solutions available to reduce carbon emissions, but it's an area where we'll see major improvements moving forward, and we're working hard to develop such solutions."

**The Komatsu Group manufactures and sells construction, mining, utility, forestry, and industrial machinery. All in all, more than 60,000 people work for the Komatsu Group.*



Komatsu Forest's new factory was completed in 2021 and is designed with sustainability in mind.

One of the Nordic region's largest solar farms on the roof

When building Komatsu Forest's new plant outside Umeå in northern Sweden, one of the main objectives was to achieve carbon-neutral production. One key piece of the puzzle in that work is the almost 205,000 sq ft (19,000 m²) solar farm on the factory roof.

Umeå offers favorable conditions for using the sun as an energy source, as does northern Sweden in general. Last year, Umeå enjoyed 2,053 hours of sunlight and the solar irradiance is high without the weather being too hot, which can otherwise cause energy losses.

"We've worked actively to find a long-term sustainable energy solution for our new premises, and solar panels are a vital component for achieving carbon-neutral production. The green transition is a must, with solar energy as a given part of the solution," says Martin Årlestig, who is responsible for the project at Komatsu Forest.

The solar farm on the Komatsu Forest factory roof is comprised of 7,154 solar pan-

els covering almost 205,000 sq ft (19,000 m²), which is about two-thirds of the roof's total surface area. This also makes it one of the largest in the Nordic region.

The impressive power plant is estimated to produce 2,625,000 kWh of solar electricity, enough to cover a large part of the Komatsu Forest factory's needs. What's more, any surplus power produced by the solar farm will help to increase the percentage of sustainable energy flowing in Sweden's national grid.

Another positive aspect in terms of sustainability is that the solar cells have a long service life and are estimated to be able to produce electricity for over 30 years.

How it works

- The solar panels are angled ten degrees and face both east and west to capture sunlight from morning to evening.
- The stands holding the panels are held in place by 71.6 tons (65 metric tons) of ballast and there are more than 37 miles (60 km) of electrical cabling on the roof.
- The electrical current produced by the panels is routed to 22 power inverters mounted in the installation space under the roof.
- The power is then routed to switchgear from where it joins the general power supply for the factory.

Komatsu Smart Crane for harvesters – crane operation at its easiest

For a harvester operator, an easily operated crane is important for ensuring a productive working day. Every movement that can be simplified contributes to increased production and, ultimately, greater profitability. And now, Komatsu Forest is taking crane operation to the next level with the introduction of Komatsu Smart Crane Harvesters, with the entire crane controlled by a single joystick movement – from the lifting boom all the way out to the tip of the telescopic arm. The result is faster and easier crane operation as well as a more relaxed and effective operator.

Komatsu Forest presented its first parallel crane for harvesters back in 1999. Its ingenious design linked the lifting and outer booms, thereby eliminating an entire aspect of crane control. Smart Crane takes this development to the next level, with the entire crane moving as a single unit – from the lifting boom all the way out to the tip of the telescopic arm.

Precision and responsiveness are two of the greatest advantages of Smart Crane. The operator can easily steer the head where they want it in smooth, precision movements, contributing to a more relaxed way of working. A relaxed operator can stay focused for longer and work more productively throughout the entire working day. Operators who have tested Smart Crane also experience significantly less vibrations from the crane, which helps to improve operator comfort.

Another Smart Crane advantage is the need for fewer joystick movements. With the telescopic arm under automatic control, it is even easier to steer the crane exactly where you want it – with a single joystick movement returning it from full reach all the way back to the machine.

One area where Smart Crane is particularly useful is the thinning of dense stands, where the operator often works with the head far from the machine, making extensive use of the telescopic arm. The automatic control of the telescopic arm makes work both easier and more efficient while also making it easier, for example, when the operator wants to quickly raise the crane to move the head over the wheels to the other side of the machine.

Since crane operation takes up a fair share of a harvester operator's working day, there are great benefits to optimizing this part of the job. Smart Crane offers the operator a crane that smoothly follows each joystick movement with great precision – all the way out to the tip of the crane. Moreover, it also offers other advantages such as simpler crane operation, less physical strain, and higher productivity. Advantages that will be seen in both profitability and the operator's wellbeing.



Watch our video
on Smart Crane!



With Smart Crane, telescopic arm control is automatic, making crane operation both faster and easier.



Smooth and responsive

Malin Karlsson is a vocational teacher at Södra Viken agricultural high school in Sunne, Sweden, and has previously spent 15 years as a harvester operator. After two days spent testing Smart Crane, she has much good to say.



MALIN KARLSSON,
VOCATIONAL
TEACHER, SUNNE,
SWEDEN

Hi Malin! How did you find Smart Crane?

"Initially, it was difficult not having your thumb on the rocker switch. I'm so used to operating the extender, I almost had to force my thumb to stay away. However, after just ten minutes, I was able to relax. And the crane just does its job, you don't have to think about it – it's great," says Malin.

How did you find the operator ergonomics?

"I have osteoarthritis in my thumb joint, and I noticed right away that my thumb was having an easy time. If you keep your thumb on top, it works just fine, crane operation is smoother and less of a strain on the operator. You don't get the same shudder as when you use the rocker to control the extender. Everything becomes a single, smooth movement," she continues.

Any more lasting impressions of Smart Crane?

"It was extremely easy to get the hang of it. And I have to say, it's a really good function," Malin ends.

»With ProAct, the operator can remain fully focused on their work and need only keep an eye on their machine.«

CÉDRIC CHANTEAU / CHANTEAU TRAVAUX FORESTIERS



Full control over maintenance thanks to ProAct

Cussac, western France, is where Cédric Chanteau runs his company Chanteau Travaux Forestiers. A business Cédric founded in 2008 at 28 years of age. With a background as a forester, he had an early interest in forest machines and wanted to start his own business with his own harvester already at a young age.

After training as a harvester operator and with experience as a forwarder operator, he began his entrepreneurial career by leasing a Valmet 921 harvester. At the time, forestry mechanization had recently begun in France, and the 2009 storm in Landes further spurred the transition. Although the leased Valmet 921 was a little long in the tooth, which meant frequent technical problems, he grew fond of the rotating cab and the crane's placement at the side of the cab.

Returns to his harvester cab every day

In 2010 he bought his first used harvester and three years later a forwarder. Over the years, the company has grown and now has seven operators working with four harvesters and three forwarders, with Cédric's wife taking care of the administrative side on a part-time basis. Cédric himself climbs into his harvester cab every day, enabling him to live his dream to the fullest.

In 2018, Cédric's confidence in Komatsu Forest's dealers in France and his appreciation of the comfort and

stability offered by Komatsu machines led to the purchase of his first Komatsu harvester.

Today, his fleet includes no fewer than six red machines, and five of them have ProAct agreements, which the operators consider a major advantage.

"The operator can remain fully focused on their work and need only keep an eye on their machine, because apart from lubrication, they no longer have to conduct any maintenance as it's covered by ProAct. I also appreciate the monthly reports, which I share and discuss with my operators. If any component needs replacing regularly, the operator may need to modify their way of working or pay more attention to their driving," says Cédric.

Consults the technician

He also appreciates the dialog with Komatsu Forest's technician during the inspections conducted prior to each maintenance interval.

"The technician's recommendations are important to avoid expensive repairs later on. Such as minor measures in

conjunction with maintenance, things that we wouldn't have considered before and that one day would probably have required major repairs. When the technician comes to conduct the inspection, we also take the opportunity to discuss any issues we've noticed and make any necessary decisions together."

At first, Cédric was worried that ProAct would result in excessive maintenance, but with the experience he has now, he understands that this isn't the case. ProAct gives him peace of mind and better control over his maintenance costs.

"Before, costs were difficult to predict, but now consumables are included as well. Today, everything is defined, and we know the actual costs. Even though our ProAct agreements are still very new, they'll pay off in the long term," says Cédric.

ProAct has also further strengthened ties with the workshop team at Komatsu Forest in Egleton.

"They have a good understanding of my needs, I feel like they listen, even when it comes to warranty issues, and



ProAct is an investment that pays off. The right maintenance measures are conducted, and the machine owner has control over their costs.

it's great to be able to count on such a good partnership."

Can't manage without MaxiFleet

Cédric's machines are also equipped with MaxiFleet. Even though he only uses part of the system, he'd have a tough time managing things without it today. He mainly uses the service to retrieve accurate volumes for billing and to monitor the performance of his machines.

As for MaxiVision, which is part of MaxiFleet, Cédric's summarizes his experience as follows:

"I see the greatest benefits in thinning, especially for the forwarder. The operator no longer needs to search through the forest, instead they know

both the volumes and the locations in advance, enabling them to avoid unnecessary or excessively long journeys. You can even share this data over a cellphone with an operator working for another company and operating a different brand of forwarder. It really boosts productivity," he says.

Today, Cédric is a dedicated leader surrounded by a capable team, and also someone who cares about the future of the profession. Despite offering a modern work environment with a fleet of new machines and intuitive digital tools, his company struggles with recruitment. Hopefully, a few new and talented operators will soon appear so that the company can continue to grow.

About ProAct

ProAct 2.0 is a comprehensive solution for service and spare parts with planned inspections and proactive service measures.

»Photo of a Komatsu 895. The unit is owned by Leeson Logging and operates in the Gippsland region of Victoria. It shows the size of our Radiate pine at around 26 years of age.«

RICKY LEESON, MD, PLANTATION HARVESTING GIPPSLAND
PREVIOUSLY LEESON LOGGING





The next generation of Komatsu Comfort Ride

A forwarder operator spends many hours a day in the cab, making a pleasant and comfortable work environment extremely important. Forest terrain is often uneven, and the operator is subjected to both jolts and vibrations. These can be tiring and make maintaining a steady and high production rate a chore – and in the long run, they can even prove physically harmful.

Komatsu Comfort Ride has for many years been the forwarder operator's best friend when it comes to ensuring a comfortable work environment or a fully optimized work environment. And now we're introducing the next generation of Komatsu Comfort Ride, with several comfort-enhancing innovations.

It was back in 2013 that Komatsu Forest first launched the Komatsu Comfort Ride forwarder option, a hydraulic cab suspension system with a four-point design that effectively dampens jolts and vibrations.

Comfort Ride quickly became one of the most popular options for Komatsu

forwarders and now it's time to introduce the next generation of Comfort Ride, with several eagerly awaited features.

One new and often requested feature is the ability to adjust the cab suspension's lateral rigidity. This function is geared to the machine's speed to make driving as comfortable as possible regardless of whether the operator is inching over an off-road obstacle or driving unladen from the landing to the next wood pile. However, every operator is unique, so this can be adjusted individually with each operator's preferences automatically saved in MaxiXT. The operator can

also easily adjust the rigidity while driving if necessary, to adapt the machine to varying ground conditions.

Enabling the operator to sit as upright as possible is important for ensuring a comfortable work environment. New Comfort Ride can level the cab laterally on gradients of up to six degrees, provided the machine is stationary or moving slowly. This offers the operator a more comfortable working posture during crane operation, which takes up a fair share of their working day.

When the machine is moving at higher speeds, the longitudinal suspension is given priority to better handle uneven terrain.

Henrik and Tom on Comfort Ride



Henrik Augustsson and Tom Natanaelsson at Vormsele Entreprenad, northern Sweden, have been testing the new Comfort Ride. The pair spent a week trying out the new version, and here they share their findings:

Why do you think comfort is important for a forest machine?

"You spend every day sitting in the cab, so it's obviously pretty important. I have pre-existing problems with my back and shoulders as well. Now, granted I've only been using the new Comfort Ride for a week, but I feel less physically tired

at the end of the working day. There are less jolts and I can stay more relaxed," Tom explains.

How was it working with the new Comfort Ride?

"Compared to the previous version of Comfort Ride, which we certainly think

is good, this is still actually much better. There's a greater level of comfort and you feel more relaxed. You feel better physically when you get home at the end of the day," says Tom.

"Yes, and comfort can also affect production. You probably won't notice any increase the first five or six hours. But



Personalized comfort The cab suspension's rigidity is adjusted individually based on the operator's preferences.

When unloading, a clear view of the load area is advantageous. New Comfort Ride features an unloading mode that raises the cab as high as possible. This affords the operator a good overview of the load area and the landing.

The machine can still be moved at low speeds with the cab in this raised position, such as to allow the operator to reposition the machine at the landing. If, however, the speed increases, the cab is automatically lowered back down to its standard position.

In addition to these new features, Komatsu Comfort Ride retains the same popular characteristics as before. The

hydraulic cab suspension dampens vibrations from the tracks to ensure a smooth, comfortable ride for the operator, just as it dampens any jolts during crane operation.

Komatsu Comfort Ride quite simply offers forwarder operators a work environment that is physically more forgiving while the reduction in jolts and vibrations enables them to retain their focus and energy levels for longer. Add to this the new features of our upgraded Komatsu Comfort Ride and you're in for a truly comfortable ride.

About Komatsu Comfort Ride

- Effectively dampens jolts and vibrations
- Ability to adjust the cab suspension's lateral rigidity
- Automatic lateral leveling when stationary as well as at low speed
- Raised position for loading and unloading offers improved visibility

HENRIK AUGUSTSSON,
VORMSELE
ENTREPRENAD



TOM NATANAELSSON,
VORMSELE
ENTREPRENAD



toward the end of your shift, it's easier to stay focused when you feel better both physically and mentally," Henrik fills in.

What do you think of Comfort Ride's new features?

"I didn't notice the automatic leveling, and I mean that in a good way. It levels

perfectly well without me as an operator really noticing it until I look at the hood and see that I'm on a slope. So, it's top marks from me," Henrik says.

"That you can now adjust the cab suspension makes a real difference compared to the previous version of Comfort Ride. The new version is much better. I

have one set of settings for low speed and another for high speed that follow a linear curve. This adapts the damping to the ground below," Tom ends.

A new era in the harvesting of eucalyptus

Eucalyptus harvesting presents unique conditions compared to, say, spruce and pine harvesting. With the new X164E, we have created a head fully adapted to eucalyptus harvesting. It also boasts several innovative solutions – everything from the effective hydraulic shears through the optimally designed feed rollers that enable one-pass debarking to the smart design for reduced operating costs. The Komatsu X164E truly heralds a brand-new era in eucalyptus harvesting.

Ever since the early 1990s, Komatsu Forest has enjoyed a deeply rewarding partnership with the forest industry in Brazil and, with the aid of valuable feedback from partners, has developed several productive debarking heads for South American eucalyptus plantations. However, all of these are modified versions of heads that were originally designed for softwood, that is, for pine and spruce.

To better meet the specific needs and

conditions of eucalyptus harvesting, work was started with a clean slate. The two most important focus areas were that the head would contribute to high machine and head uptime and that the timber would be of high quality. Accordingly, finding smart solutions to reduce both downtime and maintenance costs became a key aspect of the development work.

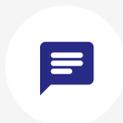
On the X164E, the traditional chain-saw is replaced by extremely powerful

hydraulic shears, which effectively slice through each stem. Reduced service and maintenance costs as well as less downtime are some of the benefits this solution offers. Protected hose routing from crane tip to head valve, with the hoses for the feed rollers routed inside the head instead of around the outside, also improves reliability. However, for a head to be profitable, besides low operating costs, it also needs to be productive.

A major boost to productivity can be

Opinion from Brazil

Sandro Soares, the new product manager for Crawler-based products at Komatsu Forest in Brazil, reveals more about the advantages of the new Komatsu X164E.



Hi Sandro! Could you tell me what's so special about the Komatsu X164E?

"The X164E is the most revolutionary harvester head in the history of mechanization. It has completely altered the concept of what a saw unit should be. The saw bar, the chain, and all the other parts that previously comprised the saw unit are no longer needed. Instead, they've been replaced by powerful

hydraulic shears that slice through the stem. This concept is not only effective, it also drastically reduces maintenance costs, and thereby even operating costs," says Sandro.

How does the X164E help to boost productivity?

"You don't need to stop to replace the chain, and there's no more saw bar

SANDRO SOARES,
PRODUCT MANAGER FOR CRAWLER-
BASED PRODUCTS, KOMATSU
FOREST IN BRAZIL





Brazilian inspiration

The X164E is based on input from partners with extensive experience of harvesting eucalyptus in South America.

Novel innovations

- Powerful hydraulic shears replace saw box
- Less maintenance on chains and the like means more production time
- Protected hose routing for lower maintenance costs and more production time
- One-pass debarking of at least fifty percent of stems minimizes lost production time

found in the challenge of debarking the stem as quickly and effectively as possible, and this is why the development work included strict requirements for the debarking function. Thanks to the specially designed feed system, with a very high degree of contact between the debarking knives and the stem, the X164E achieves the goal of at least half of the stems only needing to be fed through

the head once, known as one-pass debarking. The head also shreds the bark into shorter lengths, minimizing process disruptions at sawmills and greatly benefiting the growth of new stands.

With the Komatsu X164E, eucalyptus harvesting is taking an innovative step forward, and this head is further proof of a successful partnership in which new technology provides new opportunities.

maintenance. Moreover, the protected hose routing helps to increase reliability while reducing spare part costs. The X164E also has four feed rollers that are optimally designed to provide the most efficient debarking process possible. The result is that a single pass through the head is often enough to debark a stem. All in all, the X164E delivers unmatched productivity while keeping operating costs down," says Sandro.

Are there any other advantages?

"Having hydraulic shears instead of a

saw bar offers other advantages. Since no saw chain oil is required, there's less environmental impact. And the risk of chain shot is completely eliminated," explains Sandro.

How has the X164E worked during the trials?

"Here in Brazil, we've been testing the prototype for several years to ensure full functionality and good reliability. We've accumulated over 5,000 hours of testing with very promising results. We estimate a fifteen-percent cut in maintenance

costs and a five-percent increase in productivity compared to previous debarking heads," says Sandro.

How do you envision the future?

"Komatsu has held a market-leading position with the 370E for many years. Naturally, it'll take a little time to switch from such a strong top seller. However, we believe that customers will appreciate the many advantages of the X164E and that the head will prove a worthy contender in terms of both reliability and cost per cubic foot," Sandro ends.

We believe in giving back

A central part of Komatsu's business is giving back, reinvesting, and not only in the communities in which we live and work, but across society. Prioritizing activities that will benefit the environment in the fight against climate change and continuing to support our communities and educate future generations are more than simply good business practice. They are part of our fundamental responsibility as a global citizen.

In our work with CSR (Corporate Social Responsibility), we focus on three areas:

Enhancing quality of life – contributing to the sustainability and safety of our customers' operations by means of innovative products, services, and solutions that enable high productivity with the least possible environmental impact.

Developing people – our initiatives to develop our employees, distributors, and suppliers as well as to leverage our knowledge to support talented individuals in the local community.

Growing with society – activities that support society. In ad-

Contributing to skills development

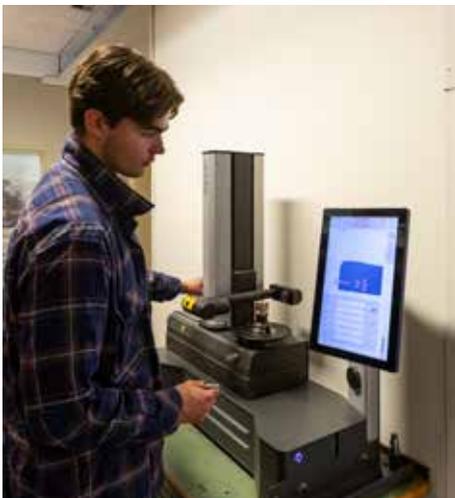
Ten years have passed since Komatsu Forest donated a considerable sum of money to Dragonskolan, a high school in Umeå, northern Sweden. Here, we take a closer look at the outcome of this investment. A state-of-the-art study environment, improved study performance, and students in demand in the labor market are just some of the results.

Dragonskolan's technical study programs are important to the strategic human resource planning of the region's industrial companies, with Komatsu Forest among them. The programs previously faced challenges with run-down

premises and outdated study materials, equipment, and knowledge hampering efforts to meet the needs of the region's industry. Moreover, few girls were tempted to apply to the programs.

In the light of this, back in 2011 and

in conjunction with Komatsu Forest's fiftieth anniversary, the company decided to make a considerable donation to Dragonskolan. A large part of the donation was used to build more suitable premises and to create a study environ-



dition to the responsibilities that we must fulfil without question, such as governance and compliance, these activities include social volunteering, health and humanitarian efforts, and environmental protection.

All Komatsu companies are involved in our CSR work, actively striving to achieve shared environmental objectives with the aim of reducing carbon emissions, saving water, increasing the share of renewable energy, and reducing waste.

ment comparable to that of a modern industrial company.

Parallel to this, a foundation was established with the board members comprised of representatives from Dragonskolan and Komatsu Forest. This enabled investments in new technologies and skills development within the technical study programs. Over the years, this has resulted in numerous new investments, including CAD computers, welding booths, large-format printers, and drawing tablets for the students.

The foundation has also enabled the school's students to regularly visit industrial companies to learn more about them as well as diverse collaborative projects with universities and local industrial companies. Moreover, the students are not limited to theoretical studies as many of them also get internships at local industrial companies. Komatsu Forest, for instance, offers internships to 10–12 students each year.

One important aim of the donation has been to get more girls interested in technical study programs, and so targeted efforts have been made to recruit girls to these programs. There have also been targeted efforts focused on role

models and creating networks for women in industry, connecting students to women already working in the industrial sector. Considering the gradual increase in the number of female students over the years, these efforts seem to have paid off.

The donation has also enabled the teachers to improve their knowledge and skills through courses in subjects such as Lean philosophy, for instance. What's more, each year scholarships are awarded to students who have shown great commitment, with the recipients being rewarded with a study trip to Japan that includes visits to Komatsu's factories.

The overhaul of Dragonskolan's technical study programs has attracted a great deal of national attention in Sweden, with many people impressed by the unique study environment. Interest in technical study programs has increased, as seen by the increasing numbers of tech students in the Umeå area. Students enrolled in the programs at Dragonskolan are in demand in the labor market, and many of them secure jobs even before they graduate.

On a mission in a disaster area

In late July, Komatsu Forest GmbH loaned one of its demo machines, a Komatsu 855 forwarder, to help clear driftwood in the Ahrweiler district of western Germany. This district was one of the areas worst affected by the floods that hit parts of western Europe in the summer of 2021.

Contractor Sebastian Koch operated the machine, which was transported to the site by Frank Holstein of Forstbetrieb Holstein. Dominik Müller-Habbel was responsible for Komatsu Forest's role in the planning.

A big thank you to everyone involved. Even if our ability to help out following the flooding disaster was limited, we are pleased to have been able to do something. With many people doing their bit, however small, you can achieve great things.



»I believe and hope that everyone can use some of these tips in their daily work.«

TOBIAS KOPP,
METHOD INSTRUCTOR,
KOMATSU FOREST GERMANY



7

tips for productive, low-impact forestry

Tobias Kopp has extensive forestry experience. After 17 years as a machine operator, in 2016 he joined Komatsu Forest as a method instructor at our German company. Today, he is a global method instructor on a mission to share his expertise with our instructors all over the world. Here, Tobias shares his tips for low-impact forestry.

For harvester operators

1. Teamwork with the forwarder operator

Consider where the forwarder operator would like the felled timber before you start felling the trees. Also assess how branches and treetops should be placed to avoid and minimize the forwarder's impact on the forest floor – branches and tree-tops are most often needed to improve ground conditions and to avoid leaving ruts. With a well-planned harvesting method, the forwarder need not undertake unnecessary tasks such as sorting timber and covering the ground with brushwood, saving both time and fuel.

2. Keep your focus in front of the head

When processing a stem, it's a good idea to always pay attention to, say, quality, damage, and crooked sections. Keep your focus a couple of yards in front of the head to assess the stem in advance. This way, you can directly sort the different parts of the stem without feeding it back and forth in the head.

3. Maintain your harvester head

Saw equipment, feed rollers, and delimiting knives need to be regularly checked/sharpened and replaced when necessary. Keeping these components in good condition is crucial to maintaining high quality when processing stems. If the equipment is worn, it's more likely to cause damage or cracks, which can impact the quality of the raw material. Ensure that your equipment is kept in good condition to avoid losses in timber value.



With good planning and preparations, combined with well-considered methods, you can save fuel while working more efficiently, with less impact on both the environment and the forest you are harvesting. Having said that, conditions in the forest vary throughout the world, but I believe and hope that everyone can use some of these tips in their daily work.

For forwarder operators

4. Use smart tools

MaxiVision enables work to be both planned and evaluated efficiently. By planning your work and route carefully, you can avoid unnecessary mileage, which by extension means reduced fuel consumption and less impact on the forest floor.

5. Efficient crane operation

A general tip I usually offer is to lower your crane speed as this often provides several benefits. Optimal crane speed results in smoother workflows and fewer on-the-fly corrections. With the right method, you work more efficiently, save fuel, and reduce emissions. And the Smart Crane function makes crane operation not only easier, but also more efficient.

For forwarder and harvester operators

6. Regularly check your settings

By regularly checking your crane and head settings together with a method instructor, you can reduce fuel consumption while increasing efficiency. This is often a worthwhile investment in terms of productivity and reduced operating costs.

7. Be kind to the forest floor

If you use the wrong tracks and chains, or put them on too late, you can severely damage the forest floor – and in the worst case your machine might get stuck. So, assess the terrain and ground conditions before starting an assignment so that you can choose the right tracks and/or chains.

Here are a few examples of recently introduced improvements and functions.



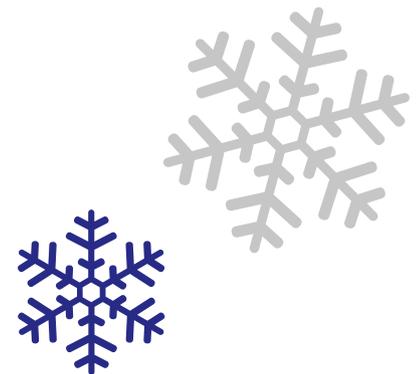
Wider range of hi-vis clothing

The branded hi-vis clothing in our online store has been revamped, with a yellow and blue design to match our new brand profile. The hi-vis clothing range has also been widened and now includes more garments in women's sizes.

Arctic kit for heating the AdBlue®/DEF system in cold climates

We now offer a new kit for machines used in extremely cold climates. The kit includes additional insulation as well as a heating coil to protect the pressure hose that delivers the AdBlue®/DEF to the injector.

A machine fitted with this option will fulfil the functional requirements down to -31°F (-35°C). The option is available for all machine models with a Stage 5 or a Tier 4 Final engine.



Improved Constant Cut on all C heads

Since June 1, 2021, Constant Cut, the saw unit found on all C heads, has an upgraded design. The upgrade encompasses no fewer than 25 modifications and entails a number of improvements, in terms of both increased productivity and improved production flows.



Example improvements:

- Improved chain tensioning to reduce downtime
- Improved bar mount for extended bar life and straighter felling cuts
- Improved Auto-release function for easier saw bar replacement
- More durable material to extend the service life of all saw unit components



Electric oil-level sensor now standard

Since September 1, 2021, an electric oil-level sensor is standard on all machine models. When the machine is powered up, the sensor automatically checks the oil level and triggers an alarm if the level is too low.

This function makes the daily machine inspection both faster and easier. Note that the sensor is not active when the engine is running.

Mobile fuel tank simplifies forest work

To simplify the working day for forestry contractors, we can now offer a new mobile fuel tank with a robust design.

The tank's generous 230 US gallon (872 liter) capacity is enough to refuel a forest machine several times without leaving the forest. The fuel tank is approved for transport on public roads, with the fuel tank loaded on a forwarder for the final stretch in the forest.

Refueling is achieved quickly and safely with the machine's electric filling pump, which pumps the fuel from the tank. While the machine is being refueled, you can always use the time to perform the daily inspection and any service measures.



Improved measuring wheel hydraulics for Komatsu S82, S92, and S172

The measuring wheel hydraulics for the Komatsu S82, S92, and S172 have been upgraded with a new cylinder and hose routing with greater flow capacity. These upgrades provide improved measurement accuracy.



New spare parts warehouse The growing market offers our facility in Türrnitz new opportunities.

Komatsu Forest expanding in Austria

On October 22–23, 2021, there was cause for celebration in northeastern Austria when our remodeled facility in Türrnitz was officially inaugurated.

Following the favorable development seen in recent years, the building needed to be extended and now houses a brand-new spare parts warehouse. In conjunction with the extension, the office and administrative areas were extended and modernized.

"A growing market and more machines ultimately mean more spare parts and so a need for more space. Now, we

can continue to ensure reliable spare parts deliveries to our customers," says Jürgen Munz, CEO of Komatsu Forest GmbH. "The extension also shows our commitment to operating out of Türrnitz."

The inauguration was spread over two days and included an interesting and entertaining program, with the latest new products from Komatsu Forest presented in detail.





Announcements

Stephen Bellas new MD in the UK

Stephen joined Komatsu Forest in 2011 and is a familiar face to many customers. He started out as workshop manager, became service manager, and then aftermarket manager, with responsibility for the workshop, service, and spare parts departments. In August



2021, he took over as the new managing director.

"During my 10 years at Komatsu Forest, my experience heading various departments has given me the opportunity to collaborate with many different people on a wide range of projects. I'm now looking forward to leveraging these experiences in my new role as Managing Director of Komatsu Forest Ltd, heading the dedicated team we have here," says Stephen.



As an official partner of Rally Sweden, we attended the races organized in Umeå, northern Sweden, at the end of February. The competition was a success, and we answered many questions from spectators curious about our machines, our new factory, and our industry. Our simulator and the Farming Simulator video game proved highly popular with visitors wanting to find out what it's like to be a forest machine operator.

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