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BETWEEN the BRANCHES

Bom Dia Tigercat

Tigercat recently made history in Brasil with the extremely successful delivery of its first logging machine in this country.

Imported as an H860 track harvester, the package included the Tigercat 5000 series saw and the Tigercat 650 Woodking harvesting head. This allows the customer, Chamflora, the flexibility of working the machine as a feller buncher or harvester.

The unit was initially set-up as a buncher and immediately put to the test. Potential operators put the machine through its sprints in the felling and bunching of Eucalyptus grandis pulpwood.

Brasil has a burgeoning plantation forest industry. Planted with 2 x 3 m (6 1/2 x 10 ft.) or 3 x 3 m (10 x 10 ft.) spacing, the vast forests resemble corn fields. The plantations are generally clear-felled at six to seven years with yields ranging from 180 - 280 metric tons (177 - 276 tons). The site the 860 feller buncher was first put into had trees reaching heights of 25 m (82 ft.) with 16 cm (6 in.) average diameter and average volume of 0.15 m^3 (5.3 ft^3)

Each operator's first task was to get used to the large accumulating area the 5000 series saw commands compared to the heads they were used to felling with. Quickly accomplished, the operators were soon accumulating 7 - 9 trees in a single bunch.

With superior reach and lift capacity compared with prior machines, the operators now had to become familiar with a new concept of not using the track drives to the degree that they are used to. By day 5, the operators were collecting a full bunch which was now up to 9 - 11 trees. Hotshot operators were collecting 14 trees without moving the tracks.

So what does this all mean for a customer tempted by smaller, cheaper machines? To justify the additional capital expenditure, the machine had to produce an additional 12 % over traditionally used equipment. This was achieved by the first operator in the first hour of operation. By the end of the first week this figure was consistently above 25%.

Brasil's popular beaches and warm weather is not the place for cold start kits. A logging machine's ability to operate in high ambient temperatures is an important requirement.

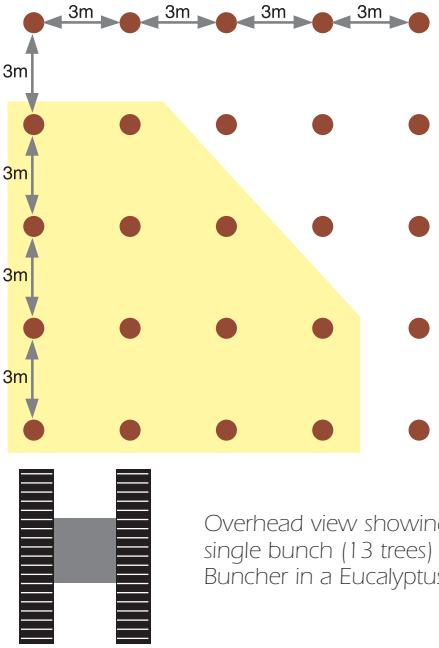
Traditional operations plan for regular machine shutdowns to allow the machine to

cont. pg2

Tigercat 860 Feller Buncher.

INSIDE

Tigercat Tough • Reliable • Productive



Overhead view showing the felling pattern for a single bunch (13 trees) used by the 860 Feller Buncher in a Eucalyptus plantation.

cont. from pg 1

cool and the operator to clean out the heat exchanger screens. With the superior cooling capacity of the Tigercat 860, these shutdown periods are less frequent.

As good as the machine is, product support is essential. To this end, Tigercat dealer Latin Equipment Do Brasil is up to the task at hand. Chamflora's Forestry Manager, Oswaldo Deperiu was impressed with the support and attention to detail provided both by Tigercat and Latin Equipment. ■

Virtual Tigers

3D Models Enhance the Design Process at Tigercat

A 3-D model of a 720 rear chassis created with SolidWorks.

We are all aware that the days of the drafting board are gone forever. The more efficient computer based drawing applications that followed have introduced design process efficiencies and shortened product development cycles. However, modeled after the flat drafting table, PC-based drawing applications may soon suffer the same fate.

Tigercat is providing its entire engineering staff with the ability to design in 3-D. SolidWorks Computer Aided Design (CAD) software allows the designer to visualize spatial relationships between components more easily and ensure that components fit together virtually, before they are ever fabricated or assembled. Accurate analysis of the mass properties of individual components or entire assemblies is also available with little effort. With a few mouse clicks, manufacturing drawings are generated automatically.

SolidWorks is said to be "parametric" because the models are driven by input parameters that are easily changed by the user. Changing a parameter modifies the part appropriately, allowing the designer to run through "what-if" scenarios simply by entering new numbers into the corresponding fields. This process can be quite tedious in two-dimensional CAD systems.

SolidWorks can also "unfold" a bent sheet steel component. The software automatically calculates the flat plate profile required, speeding up design time, while reducing errors. The designer can experiment with the thickness of material and the angle or radius of the bends, without repetitive manual calculations.

An additional benefit of three-dimensional

CAD is the ability to perform structural analysis of a component. To this end, Tigercat has also acquired CosmosWorks, a finite element analysis program that allows engineers to impose various loading conditions on "virtual" parts and determine where the maximum stresses will occur. CosmosWorks creates a fine mesh of pyramids called tetrahedrons to approximate the volume of the analyzed part or assembly. The designer specifies restraints and loads and the program determines how the component will react. These two powerful software tools allow Tigercat designers to make informed decisions early in the design process.

The 3-D model is then used downstream in complex computer aided manufacturing processes such as LASER profile cutting, CNC machining and robotic welding. So productivity gains are achieved not just in the initial design but also in the manufacture of a given component.

Remember, each Tigercat machine is a vast collection of machined and fabricated steel components. 3-D modeling technology will help Tigercat to create these components more quickly and cost effectively. It's another step in Tigercat's ongoing drive to speed reaction time to changing market requirements and introduce product enhancements even more quickly. ■

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A Three Way Partnership

As new Tigercat customer, Richard Chamulak says, "It's really a partnership, Tigercat, Strongco and myself"

It was a cold day last November when Steve Crosdale, of Strongco Equipment, Edmonton rode into the bush with Tigercat service technician, Rick Routliffe, harvesting head engineer, Derek Tremblay and factory representative for Alberta, James Farquhar. Their purpose was to demo an H845B harvester with a Tigercat 650 Woodking harvesting head at Richard Chamulak's shortwood, final fell operation in the Rocky Mountain foothills near Robb, Alberta.

They were quickly confronted with one unhappy logger. Chamulak recalls, "They were hardly out of the truck before I bombarded them... I was extremely frustrated to say the least."

Chamulak, who works for Hinton based, Echo Logging comes from a long line of forest professionals; it's no surprise he makes his living in the bush. However, increasing ownership and maintenance costs, lower mill rates and serious product support problems had Richard thinking there was little reason to continue. "I was at the point of going on to something else," relates Richard. "Whenever salesmen or mechanics showed up, they walked into a barrage of abuse."

Undeterred, the Tigercat and Strongco representatives got the demo underway. While Richard took the machine through its paces, Tremblay, Farquahar and Routliffe, stayed until 11:00 pm that night properly setting up his old head, a 7000 hour Woodking 650 on a Komatsu carrier. "They told me I wasn't going to get a bill and I didn't," comments Chamulak.

In 1999 Tigercat acquired Swedish cut-to-length manufacturer Hemek and with it, the Woodking line. Tigercat has spent a number of months re-engineering the 650 model to boost performance and properly match it to rigorous North American harvesting conditions. A topping saw is also in the works.

Chamulak was impressed with the machine. One month after the demo he worked out a deal with Strongco to have

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Steve Crosdale (right) of Strongco Equipment handing over the keys to Richard Chamulak.

Multi-stem processing and large diameter timber capability.

3 way... cont.

his old 650 Woodking updated and installed on the brand new H845B carrier.

The H845B's high pressure flow-on-demand hydraulic system coaxes optimal performance from the 650 head. Chamulak's cut blocks normally consist of 12-23 inch pine and spruce. Tremblay worked with Strongco to complete the Woodking updates then spent a week onsite training the operators and observing the machine. The head excels in the 12-23 inch pine and spruce and is capable of felling and processing larger diameter trees up to 26 inch butt diameter.

The carrier itself is well matched to the tough terrain and slopes that Chamulak is up against. In fact, Echo is assigning the tougher terrain blocks to Chamulak, reasoning that he is best equipped to handle them.

Chamulak is running the combination seven days a week with operators who are relatively new to the head. Productivity has been exceptional. "I'm extremely happy with the uptime of this machine," says Chamulak.

In a 25-day period shortly after taking delivery, Chamulak lost only four hours, "due to the head and the fact that the operators don't know enough about it yet."

"It's really a partnership - Tigercat, Strongco and myself. It has been great, unlike some of my previous experiences with other companies. For a guy who just six weeks ago was fed up with logging, I have a new lease on life." ■

650 Quick Specs

WEIGHT . . . . . .2,855 lbs (1,325 kg)

HYDRAULIC SYSTEM

MOTORS . . . . . .(2) 780cc

OPERATING PRESSURE . .Up to 4,300 psi (30 MPa)

FEEDING

ROLLERS . . . . . .Hydrostatically driven; rubber or steel

FEED FORCE . . . . . .6,200 lbs (28 kN)

FEED SPEED . . . . . .0 - 5.3 m/ sec (0-17.5 ft/s)

MEASURING AND CONTROL SYSTEM

CONTROL SYSTEM . . . .DASA 280C

FELLING/CUTTING

BAR SAW . . . . . .Hydrostatic powered with FCS

MAXIMUM CUT DIA. . . . .26" (650 mm)

CHAIN PITCH . . . . . .0.404" (10 mm)

CHAIN SPEED . . . . . .130 ft./sec (40 m/s)

Tigercat Parts Pro-activity

PROMOTING UP-TIME

Tigercat prides itself on its quality service and parts availability. In 2000, the Tigercat parts department filled machine down orders at rate of 97%. With the addition of a new parts warehouse in Georgia, used specifically for "rush" orders, our fill rate in 2001 should increase while reducing freight costs. A 24-hour emergency parts line is also available to minimize down time.

Performing Your Own Maintenance?

Tigercat has a selection of specialized service tools and testing equipment including a pressure gauge kit and a hose contamination cleaning kit. Contact your Tigercat dealer for a complete list of available items.

Tigercat Remanufactured Components

Tigercat's in house rebuild centre provides quality remanufactured components including hydraulic pumps and motors for all Tigercat machine models. Many components are in stock and available for immediate delivery at a significant cost savings when compared with the equivalent new component. Warranty protection is always equal to new component warranty when installed by your Tigercat dealer. Ask your Tigercat dealer for details about our exciting new core credit program.

Undercarriage Components Special

Tigercat is pleased to offer new, competitive pricing for all undercarriage components. Track bolts, nuts, pins, bushings, links and much more are available at significantly reduced prices. Contact your Tigercat dealer for pricing details.

Look for Tigercat products and people at these upcoming equipment shows and live demonstrations.

Interior Logging Association . . April 19-22 .Vernon, BC

Northeastern Loggers Association . . May 4-5 . . .Bangor, ME

Forestry 21 Live Demo . . . . . May 12 . . . .LaFayette, AL

Northern Alberta Forestry Show . . . . . May 10-12 .Grande Prairie, AB

Ligna Hannover 2001 . May 21-25 .Hannover, Germany

Elmia Wood 2001 . . . . June 6-9 . . .Jonkoping, Sweden

Forest Products Machinery /Equipment Expo . . . . July 19-21 . .Atlanta, GA

Saskatchewan Forestry Expo . . . . . Aug.8-10 . .Prince Albert

Logfor . . . . . Sept .6-8 . . .Quebec City, PQ

Lake States Logging Congress . . . . Sept. 6-8 . . .Ignance, MI

Carolina Log'n Demo. . Nov. 3 . . . .Vass, NC

Tigercat 726
Pioneering Productivity

726B with Tigercat 5600 series bunching saw.

Loggers across the American southeast are seeing the market change daily. Increased pressure is being placed on the typical logger to pay larger bills while getting less for each load, and with desirable tracts becoming more infrequent. A common question being asked by loggers is, how are the equipment manufacturers changing or adapting?

Don Tant, of Don Tant Logging in Georgetown, Louisiana sees the majority of equipment manufacturers "falling behind the times" while the loggers are forced to change and adapt almost daily. Tant views Tigercat as the exception to the mainstream manufacturers.

"Tigercat is continually moving forward, and giving the customer exactly what he wants," says Tant.

After extensive discussions with southeastern U.S. loggers in 1991, Tigercat president Tony Iarocci and his elite team of engineers developed the 726 wheel feller-buncher. The prototype debuted in Tifton, GA in the spring of 1992.

The 726 offered loggers a more durable and productive option, forever upsetting the drive-to-tree buncher market.

Improvements included dedicated pumps, elimination of the rear canopy, a skylight and a strong centre section. The major design feature was an innovative engine orientation with superior cooling airflow and ease of service.

According to Jon Cooper, one of Tigercat's original designers, the culmination of the advantages and features found on the original Tigercat 726 "set a new standard that other equipment manufacturers were forced to copy - and still to this day, are trying to copy."

In terms of performance Tant says that the 726B "has handled anything that we have come up against". Tant, who purchased the Tigercat 726B for final-felling in the fall of 1999 from Patrick-Miller Tractor Co. (Many, LA), maintains that there is "no comparison with the competition."

In Cuthbert, GA, Robert Moore of Moore and Moore Pulpwood states that his first Tigercat 726B, purchased in the fall of 1998, from Tidewater Equipment Co. (Thomasville, GA) was "without doubt the best machine I ever bought".

Moore maintains that his 726B has been virtually "trouble-free" and points out that the attention to detail comes from the roots of the organization. "Everybody from Tigercat has been so nice, and they make me feel like I am part of that family. I know almost everybody right up to Tony Iarocci. There are no other OEMs that I could speak to the president of the company."

In August 2000, the USDA Forest Service, Southern Research Station observed a Tigercat 726B feller-buncher operating in a clearcut harvest of a loblolly pine plantation containing a small component of hardwood pulp in Macon County, Alabama. The analysis clearly demonstrates the awesome productivity of the machine. Following is an excerpt from that study:

A total of 290 trees were measured for DBH (Diameter Breast Height) in a random area within the stand. Time study elements analyzed included move/cut, move-to-dump, and dump.

cont. pg. 6

The prototype 726 is still producing today.

726.. cont.

Specifications and Costs:

The model 726B was mounted on Firestone 67x34.00 tires. Other features included a high-speed continuous rotation 22 inch circular saw and a Cummins 6CT8.3, 205 hp engine. The machine averaged 134.1 merchantable tons per PMH (Productive Machine Hour) with a minimum of 72 and a maximum of 234 tons per PMH. Of the trees cut, fifty-seven percent were saw-timber size while the remaining forty-three percent were pulpwood size. Time study data indicate that on average the feller-buncher required 33.6 sec to cut and pile four trees. Seventy percent of the time was spent moving between trees and cutting, while thirty percent was spent moving to dump and dumping. Total cycle time ranged from 0.30 to 0.90 min. A summary of the time study data is displayed in Table 1.

Total machine cost was estimated at $66 per SMH (Scheduled Machine Hour), with a cost per merchantable ton of $0.75. Estimated ownership, operating, and total costs are shown in Table 2. ■

Table 1.
Time study summary for Tigercat 726B

Variable	Mean	Range
Move/cut (min)	0.39	0.17 - 0.76
Move to dump (min)	0.14	0.04 - 0.27
Dump (min)	0.02	0.01 - 0.08
Total time (min)	0.56	0.30 - 0.90
Productivity (tons/PMH)[1]	134.1	72.1 - 234.2
Stems per cycle	4.0	2.0 - 7.0
DBH per cycle (in)	9.21	7.02 - 11.95
Basal area per cycle (ft^2)	1.85	1.24 - 2.35

1Merchantable tons

Table 2.
Cost summary for Tigercat 726B

Variable	US$
Ownership Costs[1]	
Depreciation ($/yr)	40,359
Interest ($/yr)	12,713
Insurance & taxes ($/yr)	572
Operating Costs[2]	
Fuel & Lube ($/PMH)	7.90
Repair & Maint. ($/PMH)	31.05
Tires ($/PMH)	0.87
Labor & Benefits ($/SMH)	13.00
Total Machine Costs	
($/SMH)	65.70
($/ton)	0.75

[1]Based on interest rate of 9%, an insurance and tax rate of 5% of the purchase price (Brinker et al, 1989), a machine life of 4 years, a utilization rate of 65%, $10.00 per hour labor plus 30% benefits, and 2000 SMH per year.
[2] A fuel cost of $1.06 per gallon was used, with a lube and oil rate of 36.8% of hourly fuel cost, and a fuel consumption rate of 0.028 gal/hp-hr (Brinker et al, 1989).

Additional District Managers Appointed in Canada

With the aim to constantly improve customer service, Tigercat has appointed three additional Canadian factory representatives in recent months.

Joel LeClerc; Tigercat District Manager
Joel joined the Tigercat's field staff in December, 2000 as a Product Support Representative for Northern Ontario and Manitoba. Located in Timmins, Joel is working closely with Strongco in a marketing and customer support role. Joel previously held the position of Territory Manager for CTI in Timmins and has many years experience in the sale and service of industrial equipment.

Chris Baldwin; Tigercat District Manager
Chris will serve as Product Support Representative for Nova Scotia, New Brunswick, Newfoundland and Maine. Involved with heavy equipment for over 17 years, Chris is a licensed heavy-duty mechanic. Chris worked on forestry equipment including Tigercat track machines for over four years with former employer Wallace Equipment. When the Deere dealer organization lost distribution rights to the 860 and 845B they also lost Chris.

James Farquhar; Tigercat District Manager
James, a Tigercat team member since 1995, was appointed Product Support Representative for Alberta, Saskatchewan and Northern Manitoba in late 2000. Not one to stand still, James has worked as an assembler, parts coordinator, parts manager, service representative and trainer during his tenure. James and family relocated to Beaumont, Alberta in February.

At Home in the Concrete Jungle

If you live or work in an urban area, traffic delays and congestion due to roadway construction can be a regular annoyance. These necessary disruptions often involve installation or repair of water, sewer, gas or cable utilities located under the road.

Access has been a problem. Concrete saws make two parallel cuts through the road slab. Hoe ramming follows to break up the area between the cuts and then the coarse rubble is excavated and hauled for disposal. The work is loud and dusty. Heavy vibration often damages existing utilities. Scheduling multiple machines to complete the job presents additional problems.

Cooperating with Street Industries of New York, Tigercat developed the T750. Street Industries is responsible for sales and service support while Tigercat controls engineering and manufacturing of the complete machine. The combined objective is to change how street trenching will be conducted in the future.

The machine combines a specially designed articulated carrier with a purpose built cutting head. In an Underground Construction interview, New York Natural Gas Senior Quality Engineer, Edmond Urban calls the T750 “the first advancement in utilities construction in the last 10 years”.

The newly designed rear portion of the T750 is combined with a cab, front frame and lift boom adapted from Tigercat’s premium line of drive-to-tree feller bunchers. The result is a carrier powered by a 400 hp CAT 3196 ATAAC engine with a high capacity cross-flow cooling package. A variable speed reversible fan assures continuous production even on the hottest days.

A variable speed hydrostatic transmission moves the machine as slow as a few feet per minute during heavy trenching and as fast as 15 mph (24 km/hr) when travelling between work sites.

The large diameter, multiple-tooth cutting drum is also hydrostatically driven. Each tooth is fitted with a replaceable tungsten carbide tip. An onboard water spray system cools the tips, extending cutting life.

Prototype T750 during initial field testing, Nov. 1999.

In a single pass, the T750 opens a full width, pulverizing the asphalt, concrete and steel reinforcements into 1 in. (2.5 cm) diameter particles. This material is loosely returned to the trench. Pedestrian and vehicle traffic can cross immediately after the machine has passed. The excavation process - which can be completed anytime afterward - is shorter and quieter since the material is already finely ground.

Material haul and disposal costs are eliminated. According to Urban, “removed roadway material can be recycled into useable backfill, there’s no need to remove spoil from the job site.”

The integrity of the road adjacent to the trench is maintained and edge quality is clean and sharp ensuring excellent bonding during subsequent road restoration.

Productivity ranges from 300 - 900 ft/hr (90-275 m/hr) depending on the strength and depth of the street material and the width of the trench.

Operator-controlled depth of cut ranges from 12-50 cm (6-20 in.) Trench width is determined by the width of the fixed cutting drums, currently sized from 45-105 cm (18-42 in.) Drums can be changed quickly to accommodate differing contract specifications.

With all of these advantages, contractors anxious to improve productivity are quickly adopting the new technology.

For further reading refer to Underground Construction, January 2001 or www.undergroundinfo.com ■

Tigercat Service Tip

Air Care and Your Engine

AIR CLEANER

The air cleaner on Tigercat machines uses 2 filter elements, a primary element and a safety element.

To ensure maximum engine protection, it is important that the elements be serviced correctly and at proper intervals.

If your machine is not equipped with a restriction indicator or if it is not functioning properly, please contact your local Tigercat Dealer.

FILTER RESTRICTION INDICATOR

A filter restriction indicator is located in the engine enclosure. The indicator is either directly mounted on the filter or remote mounted and is connected to the outlet side of the air filter with a hose. Service to the filter is required when the indicator shows RED. This indicator provides a continuous reading whether the engine is running or shut down. After servicing the filter, reset the indicator by pressing the reset button.

AIR CLEANER UNLOADER VALVE

This rubber valve on the tube of the air cleaner housing should be checked at the beginning of every shift. (8 hours) If this valve is missing, damaged or has hardened, it will cause the air cleaner to become ineffective and should be replaced immediately. Otherwise the unloader valve should be replaced every 1000 hours.

Remove the unloader valve from the tube on the air cleaner housing.

Check and clean the valve. A good valve should be soft and flexible. If it is plugged, check the filter elements, they may need replacing. Re-attach the valve to the tube.

The valve should suck closed at about 1/3 full throttle.

When operating in high dust conditions this valve should be checked and squeezed every 2 hours to release dust buildup.

In addition to the LUBRICATION AND MAINTENANCE SCHEDULE, the following instructions should also be noted.

IMPROPER SERVICING

Engine exposure to dust during servicing is the largest single factor contributing to engine damage due to dust. Abrasive particles can easily enter the intake system once the air cleaner element has been removed for replacement. The safety element reduces the risk, however it must also be replaced at every third primary element change.

OVER SERVICING

Filter elements increase in dust cleaning efficiency as dust builds up on the media. Looks can be deceiving. A filter that is dirty is actually more efficient than one that is clean. A filter with dust build up on the media reaches nearly 100% dust cleaning efficiency. Only when a filter is so clogged with dirt that air restriction goes beyond the engine manufacturer's guidelines, should it be replaced.

IMPORTANT STEPS TO FOLLOW

1. Release the seal gently to reduce the amount of dust dislodged.
2. Avoid dislodging dust from filter element(s) by gently pulling the element off the outlet tube.
3. Always clean the sealing surface of the outlet tube before inserting a new filter element.
4. Always clean the inside of the outlet tube.
5. Check the old filter, it can help you detect foreign material on the sealing surface that may be causing leakage.
6. Inspect the new filter for damage.
7. Insert the new filter properly. Apply pressure to the outer rim of the filter, not the flexible center.
8. Check connections and ducts for air tight fit. Ensure that all clamps, bolts and connections are in place and tight. Leaks here send dust directly to the engine.

Note: Do not use air to clean a dirty filter. Always replace with a new element.

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