

## Volvo CE takes pipelaying to new dimension

Introducing a unique combination of lifting performance and the 360°-swing functionality of an excavator, **Volvo Construction Equipment** will soon deliver to the market a whole new product class of pipelaying machines targeting, primarily, contractors in the on-shore oil and gas industry. Developed from a patented adaptation of Volvo excavator machines combined with modern lifting technology, the Volvo pipelayer offers a number of technical advantages over traditional pipelaying dozers with side-based booms.

Volvo's new class of purpose-built pipelaying equipment includes five models: the Volvo PL4611C, Volvo PL4608C, Volvo PL2904C, Volvo PL7015C, and Volvo PL2102C. Lift capacities range from 20,300 to 152,000 kg (44,800 to 336,000 lb). According to Volvo, the new class of pipelayers will be available to the North American market in the second quarter of 2008.

Built up from an excavator configuration, the new Volvo equipment provides a 360°-swing with full lifting performance and functionality at all radius positions. Conventional pipelayers employ side-based booms that are limited to a fixed position for lifting off one side only with boom mountings on the outside of the track roller frames, limiting stability. By comparison, the Volvo pipelayer has a wider gauge, lower center of gravity, and a lifting platform where the boom is mounted inboard of the track frame and closer to the machine's centerline. This combination offers enhanced stability to work on slopes with much higher lift capacities than conventional equipment—up to 29% higher, according to Volvo CE.

The largest Volvo pipelayer model, the Volvo PL7015C, has a 152,000-kg (336,000-lb) maximum tipping lift capacity, a capacity 41% higher than the largest pipelaying side-based boom dozer. The Volvo pipelayer boom, car body, and roller frames also provide structural integrity to manage these higher loads.

Volvo pipelayers have significantly longer booms that range from 30 to 38 ft (9.1 to 11.6 m), depending on model size, as compared to typical dozer side-based booms of 20 to 28 ft (6.1 to 8.5 m). The pipelayer's extra length facilitates higher hook height for better work positioning, and allows the equipment to work further away from the trench to avoid caving in side walls.

An onboard load management system (LMS) enables the operator to better determine what can be safely picked up depending on the angle of the boom, the cab's position relative to the tracks, and the incline on which the machine is operating. Load charts are constantly updated for 360°-rotation and



*Volvo Construction Equipment is introducing a new product class of pipelaying machines that combine lifting performance with the 360°-swing functionality of an excavator.*



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Longer booms that range from 30 to 38 ft (9.1 to 11.6 m), depending on model size, facilitate higher hook height for better work positioning, and allow the equipment to work further away from the trench to avoid caving in side walls.

infinite machine geometries up to a 35° grade slope. These factors are matched and coordinated to current operating conditions via a graphic display on a monitor in the cab, including a variety of warning and operational aids, such as load-indicating light bars located on the boom tips.

The Volvo pipelayer's elevated cab and an asymmetric boom design provide it with enhanced visibility, and its wide gauge also allows it to straddle the trench if this suits the project layout. An anti-two-block device, designed to improve safety with auto kick-out at full lift, is standard.

Load positioning has been simplified with the Volvo pipelayer as compared with conventional machines, which often require jockeying the entire machine by twisting and turning the tracks, a method that can be time consuming, inaccurate, and unsafe. By contrast, Volvo's pipelayers position their load smoothly by swinging the upper structure like an excavator, resulting in precise, efficient load positioning with increased productivity and safety. A mechanical, upper-structure swing lock is available for working on severe grades.

Positioning and directional changes are simplified by the excavator undercarriage system, which allows for counter-rotation of the tracks. High ground clearance allows the machine to work in rugged terrain and muddy conditions, and single and double grouser shoes are available to ensure solid footing in most conditions.

Their excavator-based construction platform also enables Volvo pipelayers to function as multi-purpose machines. For example, when not being used for laying pipe, the pipelayer can be quickly converted into a high-production excavator or used in applications that would ordinarily require a crane with heavy-lift capability.

Larger models of the pipelayer—the sizes that can be difficult to transport—are designed with variable gauge or easily removable track side frames, counterweights, and booms. The new equipment can self-disassemble and self-reassemble without the need for other lifting machine assistance, with the entire process taking less than one hour, according to Volvo CE.

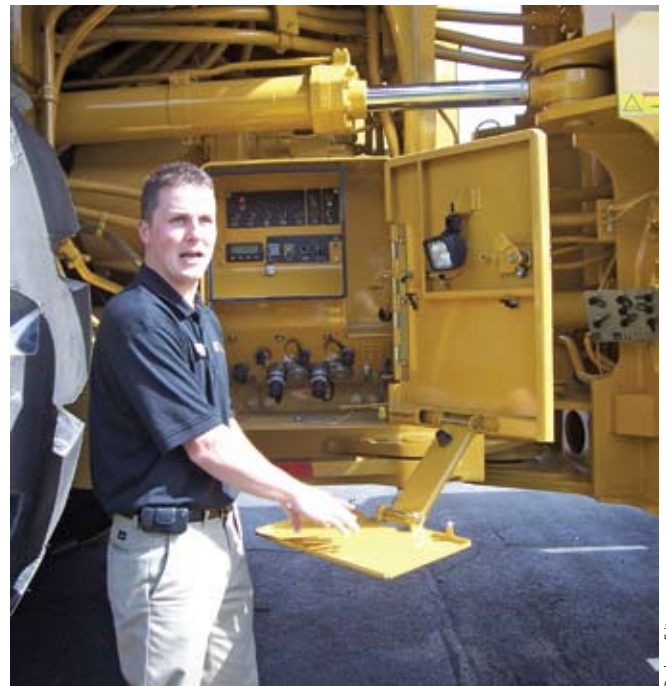
Darlene Fritz

## Cat's tough-digging, fast-loading 993K

The word "big" takes on a whole new meaning when it is used to describe **Caterpillar's** new 993K wheel loader. Built on an all-new platform, the 993K features Z-bar linkage, improved hydraulics, and an upgraded powertrain for solid penetration into the pile and high breakout forces—20% more than the 992G this vehicle replaces. According to Cat, the increased performance and capacity result in a 15 to 20% improvement in productivity compared to the 992G.



Built on an all-new platform, the 993K's 50,000-lb (22,700-kg) loader capacity is four-pass matched to the Cat 777 and six-pass matched to the Cat 785.



Service areas are grouped at ground level for quicker daily maintenance checks.



The 993K's cab is 14% larger than the previous model's, with more room for the operator as well as a trainer seat.



The 993K's optional Rear Access Egress System can lift the operator to and from the cab.

Designed to support key Cat off-highway trucks, the 50,000-lb (22,700-kg) loader capacity is four-pass matched to the Cat 777 and six-pass matched to the Cat 785. Because these trucks can represent a bottleneck for most projects, the 993K's ability to load them in just four or six passes can help many jobsites achieve a new level of productivity.

Powering the new loader is Cat's 12-cylinder, 32-L C32 diesel engine with ACERT technology. U.S. EPA Tier 2/EU Stage IIa compliant, the C32 delivers 708 kW (950 hp)—19% more power and a 5% increase in fuel efficiency as compared to the 3508B engine used in previous mining loaders.

Copper fins in the 993K's next-generation modular radiator (NGMR) help to provide enhanced heat-exchange capacity. Design and construction of the NGMR minimizes the space required for the cooling package and allows enhanced sight lines to the rear.

Positive flow control (PFC) hydraulics, Cat's next generation of load-sensing hydraulics, feature additional sensors at the pumps that are designed to provide enhanced responsiveness the operator can feel and use. The full-return-flow filtration system filters 100% of the implement oil return flow to 6 µm for extended component life and increased uptime. An optional deluxe filtration system prevents downstream contamination in case of a failure.

Cat's electronically controlled planetary power shift transmission provides the 993K with 3F/3R speeds. An impeller clutch torque converter allows the operator to match rimpull to the application and underfoot conditions using a foot pedal combined with adjustments made through the rimpull-control system.

All-wheel drive features four planet carrier gears with planetary double reduction in each wheel. Double reduction final drives significantly re-

duce powertrain stresses and effectively extend powertrain life and durability.

Good visibility—a key safety component—has been engineered into the 993K with a redesigned, larger cab that is 2 ft (0.6 m) higher than in the previous model. For enhanced visibility, available options include a rear-vision camera with a cab-mounted display monitor, and rearview heated mirrors for inclement weather conditions. Accessibility enhancements include wider, 600-mm (24-in) side platforms, two side access points, and a ground-level switch to activate stairway access lights. Full-perimeter railing facilitates continuous availability

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for three-point contact, and an optional rear access system can be used to lift the operator to and from the cab.

For sustained operations, the new loader also incorporates features to enhance operator comfort, including a cab that is 14% larger than the previous model's, a trainer seat, and seat-mounted controls that provide precise operation even on rough ground. Cab interior noise has been reduced to an operating level of 72 dB, and high-intensity-discharge lights are available as an option.

Wheel loaders this large often run on a 24x7 schedule, so to keep downtime to a minimum, the 993K incorporates a number of innovative solutions to ease maintenance and boost reliability. One example is Cat's exclusive sleeve bearing pins, which eliminate the need for daily greasing of the front link-

age. For lower life-cycle costs, the 993K is designed to meet mining customer rebuild requirements and have an estimated 45,000-h structure life.

Ground-level service centers are lighted for nighttime access, and most machine lockouts are located in a rear bumper service center. Standard and the optional deluxe service centers enable a technician to perform a variety of service procedures at ground level, and remote pressure ports aid diagnostics work.

The VIMS machine health monitoring system, equipped with an easy-to-navigate advisor display, records data for diagnostics and prognostics. Additional maintenance enhancements are also available.

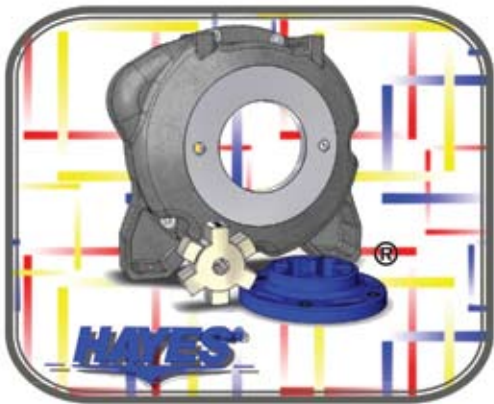
Darlene Fritz

## Deere adds level-headed track feller bunchers

A completely redesigned hydraulic system has boosted performance and enhanced the multifunctioning capabilities of Deere's new 700J-Series track feller bunchers (753J and 759J). The new hydraulic system features a load-managing system that can prioritize hydraulic flow so that each hydraulic function is capable of full torque or effort all of the time. The load-managing system sends power where it is needed the most, with up to 17% higher flow available to the feller attachment compared to previous models, which ensures that the saw circuit receives full power-on-demand. As a result, saw recovery time is improved and power drains from any one area of the hydraulics are avoided. The flow-compensated hydraulic system

also contributes to improved fuel economy, and the increased flow helps the hydraulics run cooler and more efficiently.

J-Series hydraulic systems feature a simplified design—with 100 fewer feet of hoses and tubes and 20 fewer connections—and a cleaner layout. The simpler design and a new hydraulic pump drive gearbox also help to streamline both service and maintenance.



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Deere's new 700J Series track feller bunchers feature a load-managing system that can prioritize hydraulic flow according to demand, providing up to 17% higher flow to the feller attachment compared to previous models.



*Shift-Tilt technology, a four-way leveling system, allows the J-Series feller buncher's upper structure to shift forward by as much as 3 ft (0.9 m) to maintain its center of gravity while on an incline.*

Boom geometry has been redesigned to provide the 700J-Series with a 50% larger cutting swath compared to previous models, which allows operators to make a wide range of strategic and productive cuts with less tracking and traveling. Enhanced boom performance heightens productivity by providing increased maneuverability and quicker cutting times.

"The enhancements to the 700J machines deliver myriad improvements—performance, reliability, and easier maintenance all have received a boost," said Elliott Little, Product Marketing Manager for John Deere Construction & Forestry. "With the right configuration, these machines are ideal for multiple applications and terrain, including thinning, regeneration, swamps, and steep ground."

PowerTech Plus diesel engines power the 700J-Series models. The six-cylinder, 8.1-L, Tier 2-compliant turbocharged engine delivers 241 hp (180 kW) and 907 lb-ft (1230 N·m) for both the 753J and 759J. An optional Flexxaire system—a pneumatically actuated manual switch fan—offers a reverse-blower function that clears debris that could otherwise block airflow.

Shift-Tilt technology provides the J-Series models with a stable platform for cutting on steep or difficult slopes. This technology features a four-way leveling system that allows the upper structure to shift forward by as much as 3 ft (0.9 m) to maintain its center of gravity while on an incline.

*Darlene Fritz*

## New Komatsu excavators offer productivity, versatility

Komatsu America's new PC300LC-8 and PC300HD-8 hydraulic excavators feature a large drawbar pull, high fuel economy, and the choice of five operating modes that allow the operator to match equipment performance to the task. The new models also offer reduced noise levels inside the cab compared to the previous model.

Although the two machines share the same upper structure, the PC300HD-8 combines that upper structure with the undercarriage of Komatsu's next-larger excavator, the PC400LC-8. This combination allows the PC300HD-8 to offer increased lift capacity and stability, and helps it to deliver premium performance for applications that require long arms or heavy lifting at maximum reach.

Maximum drawbar pull is 264 kN (59,300 lb) for the PC300LC-8 and 329 kN (74,000 lb)—25% higher—for the PC300HD-8. Both excavators offer a maximum arm crowd force of 160 kN (36,000 lb), which can be boosted to

171 kN (38,400 lb) for 8.5 s with the application of Power Max. Maximum bucket digging force is 212 kN (47,700 lb), which can be boosted to 227 kN (51,000 lb) for 8.5 s with Power Max.

Both models are powered by the Komatsu SAA6D114E-5 engine, which incorporates the company's "ecot3" (ecology and economy technology 3). The low-noise, six-cylinder diesel engine, which is compliant with both U.S. EPA Tier 3 and EU Stage 3A emissions requirements, features an electronically controlled heavy-duty, high-pressure common-rail fuel injection system and delivers 184 kW (247 hp).

Smooth movement of the excavator and tools is provided by a two-pump system controlled by HydraMind, a hydraulic mechanical intelligence system. This system powers both the drive and auxiliary circuits, optimizing the efficient use of available engine power and helping to reduce hydraulic loss during operation. Two return hoses improve hy-

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Komatsu America's new PC300LC-8 and PC300HD-8 hydraulic excavators offer five working modes, two boom mode settings, and a Power Max Function that increases digging force by 7% for 8.5 s.



Both excavators feature a new pressurized and viscous-mounted cab with a high-back operator seat and multi-position, pressure-proportional control levers and armrests.

A new easy-to-view, 7-in LCD monitor displays operating modes, air-conditioner status, machine maintenance tracking, and the image from a standard, counterweight-mounted rearview camera system.



draulic performance, and a portion of the oil is returned directly to the tank while operating in the arm out position.

Five working modes are available with both models, with modes designed to match engine speed, pump flow, and system pressure to specific application requirements for the job at hand. Power Mode provides maximum power for high or demanding production and fast cycle times; Lifting Mode provides a 7% boost in lifting capacity by raising the hydraulic pressure; and Economy Mode facilitates operation at higher fuel efficiencies. Breaker Mode provides one-way hydraulics flow, and Attachment Mode provides two-way hydraulic flow; both allow the operator to adjust hydraulic flow directly from the cab. In hard digging applications, a one-touch Power Max Function increases digging force by 7% for 8.5 s, creating a noticeable difference in digging performance.

Automatic three-speed travel shifts speed for both excavators according to pressure demand on the travel circuit. Both models also offer two boom mode settings, including Smooth Mode, which can be used for fine work or scraping down operations. In this mode, the boom can float upward while operating, minimizing lifting of the machine front. In Power Mode, the boom force is at maximum, making this mode the right choice for heavier digging and excavating tasks.

Both excavators feature the same newly redesigned cab built on a rigid frame that offers wide visibility and good sound absorption. The highly pressurized cab keeps dust from entering the operator's compartment, and a multi-layer viscous cab mounting system combines with the high-rigidity deck to provide reduced noise and vibration levels at the operator seat. A high-back operator seat helps to boost operator productivity while avoiding fatigue, and multi-position, pressure-proportional control levers and armrests that are integrated with the console levers allow the operator to work in comfort while maintaining precise control. A high-capacity automatic heating/defrosting/air-conditioning system is provided as standard equipment.

A new easy-to-view, 7-in LCD monitor shows such information as the operating modes, with data displayed in 10 possible languages for global support. The monitor panel also displays air-conditioner status, machine maintenance tracking, and the image from the standard, counterweight-mounted rearview camera system.

All critical excavator systems are monitored continuously by Komatsu's exclusive EMMS (equipment management monitoring system), which alerts and guides the operator should an abnormality occur. EMMS tracks the preventative maintenance schedule, provides onboard tracking, advises current required maintenance, and also provides error codes and troubleshooting assistance to mechanics in order to minimize diagnosis and

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repair time. Service and maintenance have also been simplified with the side-by-side mounting of the radiator and hydraulic oil cooler.

Komtrax technology (Level 3) sends machine operating information to a secure Web site utilizing wireless technology. Data such as operating hours, location, cautions, and maintenance alerts are relayed to the Web application for analysis. The Komtrax fleet monitoring system increases machine availability, reduces the risk of machine theft, allows for remote diagnosis by the distributor, and provides a wealth of other information to drive business efficiency and productivity.

## Terex re-engineers TA30 articulated truck

**Terex** has updated its Generation 7 Articulated Truck line with the reintroduction of the Terex TA30, which features a new independent suspension system and new high-performance wet disc brakes.

The TA30 is powered by a six-cylinder, 10.8-L **Cummins** QSM11 diesel engine that is certified to U.S. **EPA** Tier 3 and EU (non-road mobile machinery directive) Stage III. Turbocharged with air-to-air cooling, the engine delivers 333 net hp (248 kW) and 1310 lb-ft (1776 N-m) at 1400 rpm. A modulating fan reduces noise level and consumes engine power only when cooling is needed.



*The re-engineered Terex TA30 features an independent suspension system that provides a comfortable ride across a wide range of operating terrains.*

Automatic shifting is provided by a **ZF** 6WG 310 RPC, which has an integral torque converter and delivers 6F/3R. A manual override option allows the operator to regain control under difficult operating conditions, and an optional hydraulic retarder provides controlled retardation with less wear on the service breaks.

The suspension system uses rubber elements with four hydraulic dampers to suspend the front axle to the leading arms of a subframe that pivots on the main frame, providing a truly independent suspension. The system eliminates the need for lubrication, yet delivers a more comfortable ride across a wide range of operating terrains.

Three heavy-duty axles operate in permanent all-wheel drive, and differential coupling is provided between the axles to prevent driveline wind-up. Axles contain an automatic limited-slip differential, and the leading rear axle has a through-drive differential that transmits drive to the rear-most axle.

All major components, including the engine, hydraulic pumps, motors, and control valves, are designed and produced by **Komatsu**. Boom and arms exhibit long-term durability and are highly resistant to bending and torsional stress due to large cross-sectional structures, thick high-tensile-strength steel, interior partition walls, and large one-piece castings. **Komatsu** frames are designed using advanced three-dimensional CAD and FEM analysis technology.

*Darlene Fritz*

An all-hydraulic braking system incorporates multiplate sealed oil immersed disc brake packs with high-performance twin calipers at each wheel. Front and rear systems are each serviced by an independent circuit. Hydrostatic power steering is provided by two double-acting cushioned steering cylinders; pressure is supplied by a variable-displacement, load-sensing piston pump.

An expansion of the all-welded construction truck body brought the TA30's maximum payload to 61,800 lb (28,000 kg). Two single-stage, double-acting hoist cylinders, cushioned at both ends of the stroke, can raise the loaded body in 12 s.

*Darlene Fritz*

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- Users demand reliability and productivity from their equipment.
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