

More power, less emissions for Cat's D-Series

With the EPA's new Tier 3 emissions now in effect, **Caterpillar** has taken the opportunity to not only reduce engine noise and pollution in its midsize hydraulic excavators, but also to increase power and fuel efficiency. Thanks to ACERT technology, power for the new D-Series machines has increased 8 to 12% compared to the popular C-Series machines they replace.

"The biggest driver was Tier 3 emissions," said Mark McClain, Cat's Worldwide Product Manager. "Those emissions regulations really set some very hard dates, levels of technology, and levels of sophistication, and then the rest of the program worked around that."

The smallest of the three new machines, the 324D L, has an operating mass of 54,660 lb (24,790 kg) and net flywheel power of 188 hp (140 kW), an increase of 12% compared to the 322C L it replaces. The 325D L's operating mass is 64,460 lb (29,240 kg) and its net power is 204 hp (152 kW), up 8% from the 325C L. The 79,700-lb (36,150-kg) 330D L operates at 268 hp (200 kW), 9% more than the 330C L. The 324D and 325D are powered by the Cat C7 engine, and the C9 powers the 330D.

System pressures are also increased across all three machines, providing increased breakout force and greater lift force. The D-Series machines generate 5080 psi (350 bar) in standard operation and 5220 psi (360 bar) with the heavy-lift circuit engaged.

"If you kick it into heavy lift, it goes to 5220 [psi], but it backs down on engine rpm, and that does a couple things," said Steve Stonehocker, Commercial Supervisor of Large Excavators, Scrap, Demolition, Waste, and Custom Products. "It makes it quieter on the job and it also slows down your hydraulic flow. The machine moves slower, and it's just a lot safer. If you're moving a heavy load, you don't need to be doing it fast."

The hydraulic system across the D-Series features a component layout that minimizes the lengths of lines and tubes for high efficiency and reduced heat and sound around the cab.

Overall, noise in the cab has been reduced by 3 dB, according to Cat, which is a reduction of 50% when compared to the C-Series.

The cab itself has been redesigned for added comfort, and an effort was made to standardize cabs across all large Cat machines.

"We always want to try and do what we can to make the ease of operation as simple and intuitive as possible," said James P. Shurts, Senior Project Engineer. "If you can have a common interface for the entire product line, you can get on any machine and the form and function is the same."

The cab features a new full-color LCD monitor that can be adjusted to minimize glare. Compared to the monitor in the C-Series, the new display is easier to read and navigate, according to Cat. A pre-start



The Cat 324D is the smallest of the three new machines. It has a mass of 54,660 lb (24,790 kg) and offers 188 hp (140 kW).



The D-Series cab is designed to be spacious, quiet, and comfortable. Cat claims that the new monitor is easier to read and navigate for both operators and maintenance technicians than the C-Series' monitor.

check feature warns the operator through the monitor of low fluid levels. The monitor can also be used to track component hours and work tool usage and set maintenance reminders in 27 different languages.

C-Series boom and stick options have been carried over to the D-Series; however, a new super-long-reach boom is also available for attachment on the 324D and 325D. This configuration offers reaches of more than 60 ft (8.3 m).

"[Operators] wanted to do a little bit more that they couldn't do with the C model, so we added a couple track links, lengthened the track, and that gives us additional stability [and] the ability to grow the stick and get more reach to do the same work," said Stonehocker.

Matt Monaghan

original equipment

Massey Ferguson builds on utility tractors

The 500 Series is a new line of utility tractors introduced last month by **Massey Ferguson** that includes seven models ranging in size from 44 to 85 PTO hp (33 to 63 kW). Along with upgraded design features, the 500 Series tractors contain a number of engineering improvements to provide more versatility for a variety of agriculture, construction, and landscaping applications.



Massey Ferguson has used Perkins engines in its tractors more than 40 years, with a three-cylinder engine going in the 533, 543, and 563 (shown) and a four-cylinder engine powering the other four tractors in the new 500 Series utility tractors.



The new dash on the instrument panel available on the 573 (shown), 583, 593, and 596 four-cylinder tractors features a digital hour meter and indicator light cluster to make it easier to track engine information and critical alerts.

Perkins powers the entire range of tractors, with three-cylinder engines in the 533, 543, and 563 tractors, and four-cylinder engines in the 573, 583, 593, and 596. All are based on the previous 400 Series but with several upgrades.

The new cab available on the larger four-cylinder tractors includes plenty of window glass for all-around visibility, and built-in HVAC controls in the headliner for easy reach. Those tractors also have a side-mounted fuel tank that features 35% more capacity, plus ground-level refueling from a tank or 5-gal (19-L) can. All 500 Series tractors feature hydrostatic steering and adjustable, spring-suspension operator seats. Platform

models include a covered storage compartment at the operator's left for storing tools, manuals, etc.

Transmission options for the tractors include an 8Fx2R sliding gear transmission that provides two slow gears, four gears in the fieldwork speed range, and two transport gears. That transmission is standard on the 533, 543, 573, and 583 and is available on the 563. Also offered is an 8Fx8R synchronized shuttle transmission with the shuttle lever located on the left side of the steering column, freeing the operator's right hand for other tasks such as loader work. That transmission is standard on the 563 and is available on the 543, 573, and 583.

All the four-cylinder tractors are available with a 12Fx4R partially synchronized transmission with four slow gears, five fieldwork speeds, and three transport gears. The planetary high/low range box handles high torque loads and delivers better speed matching for improved productivity and longer service life. Four of the 500 Series models (543, 563, 573, and 583) are available with a factory-installed creeper option, offering extra-slow ground speeds for jobs such as transplanting, livestock feeding, vegetable harvesting, etc.

Engine-mounted, tandem-gear-type pumps provide dedicated flow to hydrostatic steering, as well as to the two auxiliary remote valves. A separate pump delivers hydraulic flow to the three-point hitch. A hydraulic combining valve that is standard on the four-cylinder models and optional on the others enables direct flow from the Ferguson three-point hitch pump to the remote spool valves, increasing hydraulic flow to remote valves. Remote hydraulics are standard on all models.

Low-profile models are available in the 573, 583, 593, and 596 for use in limited-clearance sites such as orchards, vineyards, poultry houses, and landscaping jobs. The horizontal exhaust system runs below the operator platform, near the rear axle. Fender line folding ROPS enable operation inside buildings or orchards with low clearance. A steel guard protects the forward side of the side-mounted fuel tank from low branches or debris. The fender line folding ROPS folds below the rear fenders allowing the operator to clear low-hanging fruits or low-clearance buildings.

The tractors are available with live or independent PTO and in four- and two-wheel drive options. All models use a dry transmission clutch.

The four-cylinder tractors are manufactured in Canoas, Brazil by an **AGCO** Corp.-owned facility. Many of the tractor components are also built in various parts of Brazil, including the engine, the **Eaton** transmission, the **Sauer-Danfoss** hydraulic valves, the **MSI** wiring harness, the **Grammer** seats, and the **Visconde** radiator. **Carraro** supplies the transmission from Argentina and **Bosch** the hydraulic pumps from Germany.

Uzel Makina manufactures the three-cylinder tractors in Istanbul, Turkey. The engines for those tractors are supplied from Perkins' Peterborough, UK, facility. **Husco** spool valves are also supplied from the UK. Components supplied from Turkey include the **Murat Ticaret** wiring harness, the Uzel two-wheel-drive transmission, the **Grammar** seats, and the **Kale Oto Radyator** radiator. The four-wheel front axle is supplied by **Dana** out of Italy.

Jean L. Broge

Stabilizer fills gap in Wirtgen product line

The new WR 2400 soil stabilizer and reclaiming machine from **Wirtgen** is a compact machine based on the WR 2000 platform. The WR 2400 provides a working width of 94.5 in (2400 mm) and is capable of milling and recycling to a depth of up to 20 in (500 mm), placing it between the 79-in (2007-mm) WR 2000 introduced in 2004 and the 96-in (2438-mm) WR 2500 S and 120-in (3048-mm) WR 3000 S.

When used for soil stabilization, the WR 2400 works its way through difficult terrain due to its powerful all-wheel drive and high reserve capacity. For cold recycling, the WR 2400 restores damaged road pavements to stable layers of high bearing capacity by mixing in liquid or powdered binding agents.

With a Tier 3 diesel engine rating of 563 hp (420 kW), the WR 2400 possesses high reserve capacities for the treatment of difficult soils. The machine features a high ground clearance due to its vertical lifting column design, enabling the WR 2400 to make headway in very rough terrain and to help prevent it from getting stuck.

The WR 2400 also features four different steering modes. The all-wheel steering system with its four modes enables both the maneuvering of tight-curve radii, as well as the parallel approach of curbs or other obstacles.

A four-fold, full-floating lifting column system enables the chassis on the equipment to "glide" on the surface smoothly even in case of pronounced bumps, says Wirtgen. All four lifting columns adapt to the terrain dynamically, thus enabling the smooth behavior, constant working depth, and precise operation of the machine.



The WR 2400 stabilizes construction site terrain by blending into soil a mixture of cement and lime at a depth of 12 in (300 mm).

The WR 2400 offers a full range of cold-recycling applications, enabling the various options of *in-situ* cold recycling to be used in everyday job-site methods. It is equipped with microprocessor-controlled injection systems for water, emulsion, cement slurry, or foamed asphalt, which precisely meter the quantities added to ensure an optimum quality of the mix. The spraying nozzles of the different injection systems can be switched on or off individually. Cleaning of the nozzles is automatic.

The milling drum of the WR 2400 is equipped with the patented quick-change HT11 toolholder system. These toolholders can be replaced quickly, thus reducing machine downtime. As

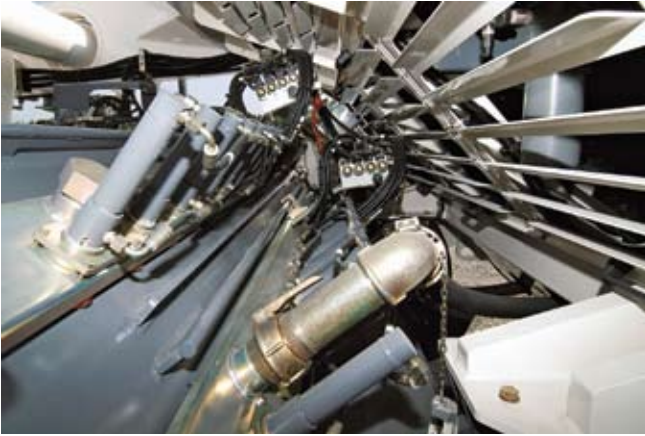
FROM A SOLID-STATE SENSOR TO A COMPLETE TRANSDUCER, WE'LL GIVE YOU STABLE, ACCURATE PRESSURE MEASUREMENT THAT'S PACKAGED THE WAY YOU NEED IT.

AMETEK's state-of-the-art technology provides extremely accurate pressure sensors that are fully compensated for temperature and pressure to give you very stable operation with complete sensor interchangeability. We can meet your OEM needs with sensors, subassemblies, or completely packaged transducers with a variety of pressure ranges and outputs. Digitally compensated transducers are also now available.



AMETEK U.S. Gauge PMT Products
Tel: 888-625-5895 • 215-355-6900
Fax: 215-354-1801
www.ametekusg.com

AMETEK[®]
U.S. GAUGE
PMT PRODUCTS



WR 2400 incorporates high-tech injection systems for the precise metering of binding agents. The systems use microprocessor control to process water, emulsion, foamed asphalt, or cement slurry during the cold-recycling operation.

with all next-generation recyclers, the milling and mixing rotor of the WR 2400 is driven mechanically to ensure maximum efficiency and best use of the diesel engine.

A variable mixing chamber ensures constant quality of the mix; the larger the working depth, the larger the quantity of material to be processed in the mixing chamber. This design enables the mixing chamber to increase correspondingly and automatically.

The operator's cabin can be displaced to either side at the push of a button, providing the driver with an optimum view of the milling edge and ensuring precise and safe milling flush to-curb. The operator's console inside the cabin (driver's seat and control panels) can be turned continuously by up to 90°. The steering wheel can be adjusted in height and tilt.

Jean L. Broge

Volvo CE makes change for the better

More stringent exhaust emissions regulations in the U.S. and Europe has lead **Volvo Construction Equipment** to make significant changes to several of its wheel loaders. The most notable change in the L150E is the replacement of its 9-L engine with a **Volvo** 12-L unit. The D12D engine is Tier 3/Stage IIIA compliant and uses Volvo's innovative V-ACT technology, which combines the benefits of a simple and reliable technology with a proven base engine. This engine is the same as that

fitted to the larger L180E and L220E Volvo loaders.

Meeting emissions regulations while maintaining engine performance has not been easy for many engine manufacturers, but Volvo claims its D12D engine not only almost exactly mirrors the maximum power and torque output of the outgoing unit—210 kW (282 hp) and 1432 N·m (1056 lb-ft)—but more importantly produces improved torque at idle engine speeds: a 37% improvement when compared to the former engine. This change will enable operators to do more work at lower engine speeds, reducing strain on the engine and minimizing fuel consumption as well as noise emissions.

The engine has also received a new protection system that helps the operator monitor the engine. The level of protection depends on the likely seriousness of the detected problem. Faults such as low oil pressure, high oil and coolant temperature, or high crankcase pressure result in a red warning light in

- Customers expect value from their investment.
- Users demand reliability and productivity from their equipment.
- You expect value from your engineering dollars.
- Our experience, knowledge, and technical expertise will achieve your project objectives.
- Our engineering team will meet your expectations.

VALUE

PIONEER SOLUTIONS, LLC  www.pioneersolutionsllc.com
HEAVY EQUIPMENT ENGINEERING SERVICES

For immediate answers to your technical needs, contact Joe Kaltenbach, Director of Sales & Marketing at 216-383-3436 or jkaltenbach@pioneersolutionsllc.com

sohe.hotims.com/10722-232X



Volvo CE says new emissions regulations have resulted not only in a more environmentally friendly L150E, but one that also offers significantly improved performance.



Despite extensive modifications that include a new engine, new cooling system, and updated hydraulics, the L110E (top) and L120E will both retain their designations.



the cab. The engine automatically derates itself to an "engine protection" torque curve.

To reduce maintenance requirements, the L150E is fitted with new Volvo designed and branded hydraulic hoses for lift/tilt cylinders and pressure/return lines in center hinges.

Volvo CE has also fitted engines using V-ACT into its 18- to 21-t (19.8- to 23.1-ton) class L110E and L120E wheel loaders to meet emissions regulations. The new D7E Volvo engine reduces NOx by 30% while allowing for a maximum power up to 170 kW (231 hp) for the L110E model and 180 kW (245 hp) for the L120E. Maximum torque has been increased to 1065 N·m (786 lb-ft) at 1500 rpm. The power increase is most noticeable at the bucket filling stage of the loading cycle.

The new D7E engine features high-pressure common-rail fuel injection, an enhanced electronic controller for precise fuelling, and an innovative internal exhaust gas recirculation (IEGR) system. The IEGR system creates a second (much smaller) exhaust valve lift. This extra lift draws exhaust gases back into the cylinder during the inlet stroke. By drawing a small amount of exhaust gas into the combustion process, peak combustion temperatures are lowered, in turn lowering NOx emissions.

To accommodate the new engine and meet its increased cooling requirements, a new cooling system with "reversed airflow" has been added. Air is drawn from behind the machine through the coolers and ejected via the side doors and top hatch. A new radiator and grille are also fitted. Other improvements include a better monitoring and protection function for the engine that automatically limits available torque if a problem is encountered. The fuel tank is also increased in capacity by 40 L (10.6 gal) and engine compartment heat is reduced via insulation fitted to the turbo and exhaust. A new counterweight design allows more recovery eyes and a new belly guard gives better ground clearance when steep stockpiling.

Hydraulics on both the L110E and L120E have been revised with the introduction of the Hydraulic Power Control system, which reduces pump displacement at low engine speeds for better engine response. Combined with a load-sensing system that prioritizes (via separate lines) the hydraulics pump and the steering pump as needed, this change results in a more responsive machine that is virtually impossible to cause engine stall, even when working with heavy loads at low engine speeds, claims Volvo.

Jean L. Broge



Connect Transportation Systems



ModICE™

**Need a sealed
electronics package?**

That's a Cinch!

With our new Modular Integrated Connector Enclosures (ModICE™), you've got a rugged enclosure system, heat sink and ferrite-filter options, plus simple assembly. Cinch's ModICE offers up to 60 I/O and meets IP-65, 66, 67 and 69 standards. Heat sinking is integrated into the system. The header accommodates inductive filtering. You mount the header to your board, process the board, slide it into the enclosure, and snap it shut. What could be easier? Call Cinch, today, and meet your connector-enclosure needs, tomorrow.

www.modice.info

Phone: (630) 705-6031

E-mail: transportation@cinch.com

sohe.hotims.com/10722-233X

Compact wheel loaders from New Holland

With increased engine and hydraulic power and a choice of buckets and attachments, the new W50TC and W80TC compact wheel loaders from **New Holland** are suitable for backfilling, digging, grading, hauling, scraping, or stacking applications in tight work spaces.

The machines are powered by direct-injection, 3.1-L **Deutz** engines that offer 136 lb-ft (184 N-m) at 1700 rpm for the W50TC and 158 lb-ft (214 N-m) at 1600 rpm for the W80TC and produce 55 and 75 gross hp (41 and 56 kW), respectively, out of four cylinders. The W50TC is powered by the Deutz F4M2011 and the W80TC by the BF4M2011. The naturally



Both the W50TC and W80TC from New Holland feature all-wheel-drive with planetary axles, an oscillating rear axle, an articulated frame, outboard planetary axles, and limited-slip-differential front axle.



Both of the new compact wheel loaders feature a fully hydrostatic transmission with 2F/2R gears.

aspirated engines are oil-cooled, which reduces corrosion and increase engine lifespan. Operating masses are 10,173 and 12,727 lb (4614 and 5773 kg), while bucket capacities are 1.0 and 1.44 yd³ (0.76 to 1.1 m³).

One of the features that Eric Winkler, Brand Marketing Manager for New Holland, says makes the wheel loader suitable "for a variety of landscaping, industrial material handling, and residential construction applications" include the Universal Link design. The new boom design features one lift cylinder and one bucket cylinder. With better visibility and increased dump reach, operators can focus more on load placement.

"With less than 2° horizontal lift deviation, there's no need for manual correction during forklift operation," said Winkler.

An integrated hydraulic coupler; a quick-attach mounting system; and built-in, front-mounted hydraulic disconnects allow the operator to move quickly and easily between job applications. The versatility of the machines can be increased with a broad range of wheel loader and skid steer loader attachments including a rock bucket, earth auger, snow push, snow blower, snow blade, loader boom, power rake, tree spade, bale hugger, bale spike, and silage defacer.

The hydraulics consist of two separate pumps for improved cycle times—one pump for implements and steering and a second pump for braking and the hydraulic fan.

The wheel loaders are equipped with a two-speed hydrostatic transmission that allows travel speeds up to 12.4 mph (20 km/h) via an integrated forward/neutral/reverse lever and speed shift selector. An optional high-speed transmission on the W80TC can produce a top speed of 21.7 mph (35 km/h) for faster travel on the job site. The high-speed option includes two electronic ranges—0 to 3.1 mph (0 to 5 km/h) and 0 to 9.9 mph (0 to 16 km/h)—plus the mechanical-gear, high-speed range of 0 to 21.7 mph (0 to 35 km/h). That option also features a limited-slip differential on the front axle and two outboard wet disc brakes, also on the front axle.

"The 41° frame articulation allows the operator to negotiate obstacles and squeeze into the tightest spaces," said Winkler. "The independent rear axle oscillates a full 12° in either direction to climb over uneven terrain and provide stability on rough ground."

Limited-slip-differential front axles, combined with two outboard wet disc brakes on the front axles and good weight



TOUGHTESTER

Designed for fast diagnostic troubleshooting of all types of mobile or stationary hydraulic systems and components, the Flo-tech turbine Sensor Arrays and Portable Hydraulic Testers are second to none.

- Simultaneously measure flow, pressure and temperature
- Achieve laboratory accuracy in the field

Improve productivity, reduce maintenance costs and protect critical investments through reliable flow metering and process technology from Flo-tech.

HEDLAND 
flow meters

Call or visit us online for details. 800-433-5263 • hedland.com/sae906

sohe.hotims.com/10722-234X

distribution, enable work to continue efficiently in changing job site conditions. An optional Ride Control load stabilizer improves material retention while traveling over rough ground.

New Holland has increased bucket rollback to 54° for improved material retention. Operators can also completely invert the bucket to grade or pull material away from walls and foundations.

The seat, steering column, and armrest are all adjustable. What New Holland describes as a “high-performance heater/defroster” with optional air conditioning contributes to operator comfort. The main functions are concentrated in one joystick control. The cab door and right side window fold back 180° for improved ventilation.

The new narrow loader arm design improves all-around visibility and provides a clear view to both coupler and attachment for fast, confident attachment changes. A front sun visor and front and rear wipers are standard. Winkler says the new loaders are equipped with “seamless front windshields, tinted safety glass, and rounded rear hoods” for unobstructed views and improved overall job-site visibility.

An easy-open panel provides fast, ground-level access to the engine and all recommended daily checkpoints. The 1000-h oil change interval on the W50TC and the 500-h oil change interval on the W80TC reduce the number of service stops required to boost productivity and uptime.

Jean L. Broge

Raymond maneuvers ac lift trucks

The new 4700 Series four-wheel, sit-down electric lift trucks from **Raymond** are said by the company to be more maneuverable and more responsive than any truck in their class, translating to increased productivity with both new and experienced users able to efficiently operate the truck.

“With more efficient load handling, operators will find they are able to get more work done in a shift,” said Jeff Leggett, Marketing Director for Class I products at Raymond. “Available in a variety of capacities from 3000 to 6000 lb, and 36- or 48-V configurations, the 4700 Series will fit virtually any application.”

The 4700 Series trucks feature a unique steering system design, enhanced by dual-powered, counter-rotating ac drive motors that provide the Model 4700 C50HM—which has a load capacity of 5000 lb (2268 kg)—with what Raymond has trademarked as the “Perfect Circle Steering.” The tighter turning radius—up to 7 in (178 mm) less than other trucks, says Raymond—provides greater agility and more efficient, faster right angle stacking. In fact, the C50HM will turn within its own footprint; Perfect Circle Steering is also standard on the C30 and C40 models.

Raymond claims its exclusive ACR System delivers more uptime, more performance per battery charge, and lower maintenance costs vs. comparable dc-powered trucks; ac motors have fewer wearable parts than dc motors, so there are



Raymond claims its 4700 Series lift trucks lead their class in maneuverability. Dual ac drive motors on the C30, C40, and C50HM models provide for a tight turning radius, which is a plus in material-handling applications.

>> PROFESSIONAL
J1939 AND ISO 11783
DEVELOPMENT



- > Analyze your networks with **CANalyzer**
- > Cover the entire development process with **CANoe**

vector 

Vector CANTech, Inc.
39500 Orchard Hill Place, Suite 550
Novi, MI 48375 USA
(248) 449-9290

www.vector-cantech.com

sohe.hotims.com/10722-235X

lower costs associated with labor and replacement parts.

"Cost savings is another benefit of the 4700 Series," said Leggett. "The ACR System uses less energy, saving on batteries, chargers, and downtime. To cut ownership costs even more, oil-cooled disc brakes are standard on the C30, C40, and C50HM. The sealed brake system keeps out dirt and grime and can last up to twice as long as dry brakes."

All 4700 Series trucks feature a spacious operator's compartment that is easy to access. The semi-suspension seat adjusts for back tilt, operator weight, and lumbar support. A tilt steering wheel is standard.

The truck's controls feature color-coded levers for lift-lower, tilt, and sideshift that are within easy reach of the operator.

Operators take control of Deere feller bunchers

John Deere says its four-way leveling system in the new 909J and 959J track feller bunchers contributes to increased operator control for a best-in-class combination of power and productivity.

In the 909J and 959J, leveling is possible up to 26° forward, 7° rearward, and 14° from side-to-side. Both models feature a Total Machine Control system that enables operators to set the speed and acceleration of the tilt to match the application, terrain, and capabilities, while providing constant position feedback. In addition, the redesigned cab features increased downward visibility for a clear view of the ground conditions below.

Power is another advantage of the new track feller bunchers. The machines provide improved saw blade power with quick recovery time and **SAE** gross 294 hp (219 kW). The

Fingertip controls and bidirectional floor-mounted pedals are available for improved productivity in high-shuttle operations. At the touch of a button, operators can initiate up to six pre-programmed performance speeds that match the application operator and skill level.

Raymond's open view mast design gives operators a wide open view of the load, resulting in more efficient handling and stacking, and less product damage. A variety of options are available for the trucks, including cold-storage conditioning, multiple overhead guard and mast tilt configurations, work lights, a variety of tires, and backup and travel alarms.

Jean L. Broge

The new J-Series feller bunchers from John Deere feature a four-way leveling system that provides stability in steep-sloped and rough-ground applications, with the 959J offering a lift capacity of 18,000 lb (8163 kg).



The 909J comes standard with the new FS22B head, with an optional high-rotation FR22B available. It can also be used for harvesting via the addition of a harvesting boom with the choice of two Waratah heads.



hydraulically driven cooling fan optimizes power and increases fuel efficiency by running only when it's needed. The fan is fully reversible and automatically blows out debris for better airflow into the engine, making it run cooler and more efficient.

Beyond the standard felling head offered, optional heads are available to match the specific logging application. Two felling head options (FS22B and the FR22B) are available on the feller buncher models, and the 909J model can be custom-built for harvesting applications with a woods-ready harvesting boom and optional Waratah processing heads, the HTH622B or HTH624. The HTH622B cuts timber up to 30 in (762 mm) in diameter and can process stems up to 24 in (610 mm), making it suitable for felling, delimiting, measuring, and bucking. The HTH624 cuts up to 31 in (780 mm) and works best in felling stands where 80% of the trees are 20 in (508 mm) or more. It can produce at the landing, roadside, or process at the stump.

Jean L. Broge

Phone 231-879-3372 **HAYES** Fax 231-879-4330
MANUFACTURING, INC.

Power Transmission Products

Flywheel Coupling & Pump Mount Plate

Pump Motor Adapters

Bearing Supported Stub-Shaft

New L-Series Jaw Type Coupling

New HEX-FLX Plastic Coupling

Aluminum Engine Housing Kits

Flexible Coupling with Neoprene, Metal Ring & Clamp locks

Catalog Request: info@hayescouplings.com
New Website Coming Soon www.hayescouplings.com