Deere shoots for power, efficiency in 8030 tractors

By most accounts, John **Deere** engineers have hit the bull's-eye via the hunt for technology for its new 8030 tractors in terms of power, performance, and fuel economy. Eight models constitute the line of tractors, which are the next evolution of a long line of 8000 Series tractors.

The primary catalyst for all of the above three goals can be tracked back to the all-new **John Deere Power Systems** PowerTech Plus 9-L, six-cylinder, diesel engine, which is said to offer better fuel efficiency and greater power than its predecessor engines, leading of course to improved performance. Designed with four valves per cylinder, exhaust gas recirculation (EGR), and a variable geometry turbo (VGT), these "cleaner-burning" engines also manage to increase fuel economy while meeting Tier-3 emissions standards.

The VGT uses variable turbine inlet vanes that adjust according to power requirements. At low speeds and high loads, the inlet vanes narrow to increase boost and power. At high speeds and lower loads, the vanes open for increased efficiency.

The EGR system on the engine mixes cooled exhaust gas with the intake air, a design feature Deere claims lowers combustion temperatures by reducing oxygen and controlling emissions without hindering injection timing. The four-valve cylinder head allows for improved overall engine air flow for higher low-speed torque. New high-strength-steel pistons with directed oil cooling and a hardened steel camshaft with roller followers were designed in for increased durability.

Engine efficiency is enhanced with a new cooling package, including the patented Vari-Cool fan drive and cooling system. The mechanical-type fan runs only at the necessary speed to meet the cooling requirements of the tractor.

In the variable-speed sheave design, the upper sheave moves in and out using engine oil pressure, the lower sheave is spring loaded so it reacts to the movement of the upper sheave. The speed can be varied as needed to maintain proper engine coolant temperature, and do it in a small package to maintain visibility. In fact, the inclusion of the compact Vari-Cool system on the 8030 tractors translated to an increase in visibility off the hood by about 5 ft (1.5 m).

Because the Vari-Cool system has no slippage and runs only at the speed it needs to maintain proper engine temperature, the system uses less power to run than the viscous fan drive it replaces. This feature adds to the efficiency of the system: Since less power is needed to drive the fan, more power can be directed elsewhere in the tractor.

Two transmission options are available on the 8030 Series tractors. The 16-speed PowerShift is base equipment on all models except the 8530. This transmission with 16-forward and four-reverse speeds features automatic shifting, which saves fuel under varying load conditions. Updated closed-loop shifting improves overall shift performance.

The new Infinitely Variable Transmission (IVT) with right-hand reverser is base equipment on the 8530 tractor and optional on other 8030 Series wheel tractors. The Deere-designed transmission is said to

The combination of its own engines, cooling systems, and other tractor elements allowed Deere engineers to integrate technology into the 8030 Series tractors that it says results in a 2 to 5% reduction in fuel consumption compared to the models the tractors will replace.

The new six-cylinder PowerTech Plus 9-L engines that will be powering the 8030 tractors are rated at 2100 rpm for improved fuel economy and reduced noise, and feature an 11% power bulge at 1800 rpm and 40% torque rise at 1600 rpm for pull-through in tough field conditions.

Deere's Infinitely Variable Transmission with right-hand reverser is standard on the 8530 tractor, and optional on all other 8030 wheel tractors (which come standard with a 16-forward and four-reverse speed PowerShift). An optional left-hand reverser is available for the IVT according to customer needs.

offer smooth, seamless shifts without clutching and unlimited speed choices up to 26 mph (42 km/h). An optional left-hand reverser is also available to meet differing customer needs and to enhance overall operation of the IVT.

The 8030 tractors feature a large CommandView Cab that Deere says provides improvements in operator comfort, control, and visibility, and includes a CommandCenter with sound resonators that provide a more quiet cab environment. An optional ActiveSeat suspension system adjusts 200 times per second to reduce excessive seat movement for the operator. This exclusive system contributes to faster field speeds while enhancing operator comfort and control.

The right-hand console inside the cab of the 8030 tractors keeps controls within arm's reach with the CommandCenter, allowing the operator to monitor such features as fuel-use-per-acre or -hour, time until empty, percent slip, area efficiency, and other information to help maintain productivity in the field.

New to the 8030 are the optional GreenStar Display (GSD) 2100 or 2600 color monitors that show critical tractor functions. Designed with push-button controls, and a touch screen on the GSD 2600, the new displays are mounted within easy reach of the operator along with push-button remote display controls that are conveniently mounted in the CommandArm of the tractors.

The GSD also operates guidance systems such as GreenStar AutoTrac, which is fully compatible and highly integrated with the 8030. A new GSD connector enhances component mobility from machine to machine and allows plug-and-play in all new Deere tractors. AutoTrac allows operators more efficiency in the field by minimizing overlap, reducing operator fatigue, and enhancing overall field performance and fuel efficiency.

Other new features on the tractors include a hydraulic system with redesigned hydraulic pump circuits, two filters, and a 1500-h service interval. The new system increases hydraulic oil flow at lower engine rpm, which adds responsiveness for all hydraulic functions and improves steering, especially with front dual wheels.

The 8030 is available in two-wheel drive, mechanical front-wheel drive (MFWD), MFWD with independent link suspension, and track configurations.

Jean L. Broge

Peterbilt expands Model 357 range

Expanding on what it regards as one of the industry's most versatile vocational products, **Peterbilt Motors** has launched the Model 357 in a specialized heavy haul configuration. Peterbilt is a division of **PACCAR**.

The Model 357 Heavy Haul is equipped with a new high-capacity cooling system that has a 1440-in^2 (9290-cm^2) radiator core. It can be specified with a variety of powerful trucking engines, including the 625-hp (466-kW) **Caterpillar** C15, and it can be customized with a wide range of heavy-duty options such as axles, frame rails and liners, suspensions, and pusher or tag axles.

Peterbilt considers the new configuration well suited for other demanding applications such as dump, logging, stationary oil field and well drilling, and snowplowing, when the optional front engine power take-off (FEPTO) and frame extensions are used. When specified with a manual transmission, the

When specified with a manual transmission, the Peterbilt Model 357 Heavy Haul can accommodate engines up to 625 hp (466 kW).

The Peterbilt Model 357-115 has a deep front axle position that is 68.5 in (1740 mm) from the back of the cab to improve front axle weight distribution for increased payload and improved maneuverability.

The Caterpillar C9 engine, which reduces mass by 780 lb (354 kg) when compared with the C11, is available with power ratings of 335 and 350 hp (250 and 261 kW) for the Peterbilt Model 357-115 and Model 357-111.

Model 357 Heavy Haul can accommodate engines up to 625 hp (466 kW). With automatic transmissions, only engines with power up to 475 hp (354 kW) are permitted.

Available in both truck and tractor configurations, the Model 357 Heavy Haul has a 119-in (3023-mm) BBC (bumper to back-of-cab) and a set-back front axle. It features a stationary grille that allows the hood to open without interfering with auxiliary equipment mounted to the front bumper. The Model 357 is also available in a 115-in (2921-mm) BBC, set-back front axle configuration that provides optimum weight distribution and maneuverability.

The Model 357-115 has a deeper front axle position that is 68.5 in (1740 mm) from the back of the cab. This location improves front axle weight distribution for increased payloads and improves maneuverability for safer and more efficient operation on congested job sites—two benefits with particular appeal to mixer operators that will also be popular among dump and refuse customers.

Additionally, the new configuration features a sloped hood and a lowered crown and grille that improve groundstrike. Side visibility is also increased by about 17% from a redesigned door that has a lower beltline.

FEPTO provisions are standard, as are a stationary grille and heavy-duty frame rail extensions for secure, stable mounting of auxiliary equipment such as a hydraulic pump to power a mixer barrel. FEPTO-driven equipment is typically easier to service than back-of-cab mounted equipment. For additional strength and rigidity, optional frame rail liners are available.

The Model 357-115 is available with the Caterpillar C9 engine, which reduces mass by 780 lb (354 kg) when compared with the C11, for additional payload gains. The C9 is available with power ratings of 335 and 350 hp (250 and 261 kW), and respective torque available is 1050 and 1100 lb·ft (1424 and 1491 N·m). Both front and rear PTO options are available for the C9.

The C9 will also be available for the Peterbilt Model 357 with a 111-in (2819-mm) BBC. The Model 357-111 is also available with Caterpillar's C11 and C13 engines, and **Cummins** ISL and ISM engines.

David Alexander

Cat moves more

Two new **Caterpillar** H-Series medium wheel loaders, the 950H and 962H, feature a new proprietary load-sensing hydraulic implement system that improves fuel economy by 4 to 7% and offers a 20% increase in lift force over the previous models. The new models replace the 950G Series II and 962G Series II.

Along with improved productivity, enhanced operator comfort and serviceability have been built into the 950H and 962H. Key changes include electrohydraulic implement controls with simultaneous lift and tilt capabilities, a new cooling system, and centralized hydraulic and electric service centers for improved maintenance.

The new wheel loaders are designed to handle a wide range of tasks in construction, aggregates, forestry, and bulk materials handling. The 950H produces 216 hp (161 kW) gross and handles buckets of 3.3 to 4.6 yd^3 (2.5 to 3.5 m^3). The 962H produces 230 hp (172 kW) gross and uses buckets of 3.8 to 5.0 yd^3 (2.9 to 3.8 m^3).

Building on Caterpillar's track record with on-highway engines using its proprietary ACERT technology, the two new loaders feature the Cat C7 engine. The ACERT technology is **EPA** Tier-3 compliant and provides advanced electronic control, precision fuel delivery, and refined air management for high performance and durability.

The Cat C7 is a 7.2-L, inline six-cylinder diesel engine with mechanically actuated electronic fuel injection (MEUI). The Cat MEUI fuel system is comprised of four major components: injectors; a low-pressure fuel transfer pump; sensors to monitor speed, temperature and pressure; and an ADEM A4:E4V2 controller.

The ADEM A4 controller is the brains behind engine responsiveness, self-diagnosis, emissions control, and fuel economy. The system provides constant net power through the operating range regardless of parasitic loads such as air conditioning.

For additional efficiencies, the 950H and 962H offer the new Engine Idle Management Software (EIMS), designed to maximize fuel efficiency by enabling customers to change idle speeds to best suit the application. EIMS has four idle control settings: hibernate (fuel economy), work (set idle per application requirements), warm-up (cold-weather operations), and low-voltage mode.

The new, proprietary Load Sensing Hydraulic Implement System is a closed-loop system that automatically adjusts to operating conditions to provide only the hydraulic flow required by the implement. The result is optimum fuel efficiency. Additional benefits are found with a new proprietary valve, the M3PC Priority Proportional Pressure Compensated Valve with

The Caterpillar 950H medium wheel loader features ACERT engine technology for improved fuel economy and reduced emissions.

A new hydraulic service center for all the Cat H-Series loaders is located in a swing-out door just below the right side access platform, with easy access to transmission oil and hydraulic filters.

Biggest of Cat's new line is the 988H wheel loader, which features a new Cat C18 engine rated at 354 kW (475 hp) net.

integrated functions. The valve can set priority of one function over another and proportionally decrease or increase pressure on both the lift and tilt function to ensure no work stalls. With integrated functions on the M3PC valve, such as ride control and anti-drift, there are fewer line connections and less time required to retrofit.

The H-Series electrohydraulic implement controls feature soft detents. With electrohydraulic controls and the new load-sensing system, the operator can simultaneously lift and tilt the bucket. The result is better bucket control and less spillage.

As with the GII Series, the 950H and 962H offer a choice of the standard steering wheel or the optional Command Control steering wheel. Turning the Command Control steering wheel about 70° from the center point achieves full machine articulation. The system reduces operator effort in applications such as truck loading.

The 950H and 962H offer enhanced serviceability with a redesigned hood and counterweight and key changes to maintenance points. The new non-metallic hood has reinforcing ribs and a new contour that adds rigidity. The new one-piece counterweight is integrated into the machine design and styling, and the rear bumper counterweight incorporates the rear lights in the top structure.

For ease of maintenance, grease fittings have been grouped on the right side of the machine in two convenient locations. An access panel below the right side service platform covers all the remote pressure ports for the steering, hydraulic system, and brakes. A new hydraulic service center is located with a swing-out door just below the right side access platform. It allows easy access to transmission oil and hydraulic filters. The hydraulic filter has a 500-h service interval and the transmission filter has a 1000-h interval. The H-Series also provides ground level sight gauges for the transmission oil, hydraulic oil, and radiator coolant.

Next up in size for Cat's H-Series medium wheel loaders are the 966H and 972H. The new models replace the 966G Series II and 972G Series II. The 966H produces 283 hp (211 kW) and handles buckets of 4.5 to 5.5 yd^3 (3.4 to 4.2 m^3). The 972H produces 307 hp (229 kW) gross and uses buckets of 5.0 to 6.5 yd^3 (3.8 to 5.0 m^3).

The 972H leverages ACERT technology with the new 12.5-L Cat C13 engine, and the 966H uses the 11.1-L Cat C11. Both are inline six-cylinder engines with MEUI.

Biggest of the new line is the 988H wheel loader, which retains the best features of the 988G, including its unique fabricated box boom linkage, electrohydraulic controls and spacious cab. The most significant change to the 988H is its engine, a new Cat C18, rated at 354 kW (475 hp) net.

Like its predecessor, the 988H incorporates a fabricated box boom linkage, rather than the steel plate lift arms used on traditional loaders. This feature increases breakout force, lift capacity, and dump clearance. It also enhances visibility to the corners of the bucket and offers superior torsional strength for long life.

David Alexander

Champion beefs up for long life

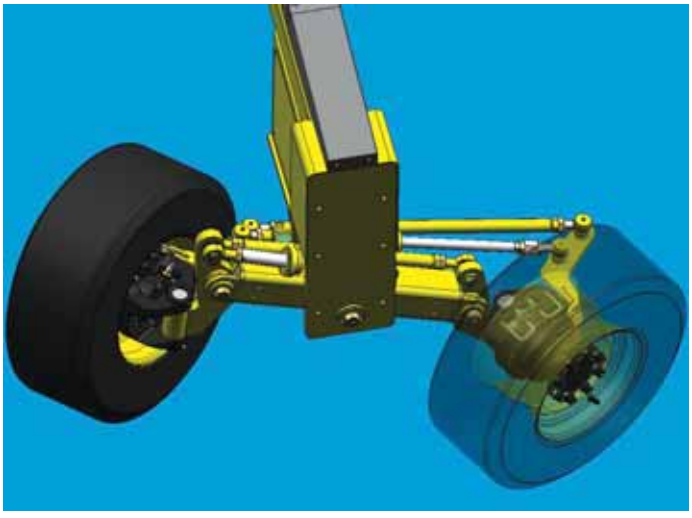
A compact grader that thinks like a big grader is the first of the next generation of **Champion Motor Graders** equipment—the C80 C and the C86 C models. According to Bryan Abernathy, Vice President of Marketing and Sales at Champion, the changes included a redesign of the front axle, the moldboard and blade lift arrangement, and the articulation cylinder.

The completely redesigned front axle now provides 50° of steering angle left and right. The previous design allowed only 35°. "Our straight-frame turning radius is now only 25 ft, and when fully articulated is now a radius of only 19 ft. This gives the C80/C86 C Series the tightest turning radius in its class," said Abernathy.

The new 50° axle was designed to reduce turning radius and also part count. The current axle has been in production since 1984 and is still used on lower-production machines. A tubular design reduced part count, weld, and assembly time.

"A motor grader axle not only turns, but also oscillates up and down, and the wheels also lean left and right" said Abernathy. "The entire design was modeled in Solid Edge [from **UGS**], which allowed us to put the axle through all the geometric motions and correct interferences prior to prototyping. Further development is in process, which will reduce part count and welding even more by using castings in certain areas."

Champion took out the replaceable ball joints and engineered in clevis-style mountings for greater strength at the articulation cylinders.



Champion modeled the axle of its C80/C86 C Series graders in Solid Edge to put it through all its possible motions and correct interferences prior to prototyping.

The C80/C86 C Series from Champion Motor Graders features redesigned front axle components, the moldboard and blade lift arrangement, and the articulation cylinder.

"And designing the front axle using spherical bearings at all moving points will provide operators with a lifetime of service," said Jeff McKee, Vice President of Engineering and Customer Support.

Champion also received input from operators who were looking for additional ground clearance at the front axle.

"Our all-new box-type design provides 6 more inches of ground clearance for a total of 22 in," said Abernathy. "At this height, the steering cylinder, tie rod, and other moving parts are higher and hidden behind the front axle, which provides additional protection to the critical parts and allows the Champion Motor Grader operators to go where the big graders go."

The company conducted interviews with operators, and one of the requests was to get a taller moldboard that would eliminate excessive spillover.

"Our new 21-in moldboard provides operators with the tallest moldboard in the category," said Abernathy. "Furthermore, experienced grading operators like to tilt the board forward and keep their eyes on the top edge of the moldboard. With our new board, the additional height allows them to do that, increasing their productivity and in applications like asphalt, get a roll going."

Another designed-in big-grader feature is the blade lift arrangement.

"To increase featherability and provide operators with the big-grader feel that they like, the blade lift stance has been increased by 14 in to a full 4 ft across," said Abernathy. "This is a situation where it has been proven that wider is better and at 48 in, our latest design feature makes it the widest in the class."

One thing all motor graders have in common is that the main blade raises and lowers with independent cylinders located on each side. The main blade is hardly ever used in a "flat" position and must be capable of many different angles. The entire assembly operates from six different hydraulic cylinders, and the

previous design had some interference problems that had been overcome by limiting the travel of two of the cylinders.

"Also with Solid Edge, the entire assembly was modeled, and we have eliminated the need for any cylinder stops, which has made the new blade even more maneuverable," said Abernathy.

To increase overall productivity and reliability, McKee and Abernathy examined what could be done to strengthen the articulation cylinders. The prior design used a replaceable ball joint, as occasionally a ball joint can break from normal wear.

"We saw an increase in ball joint part orders and some warranty issues. We decided that the C80 and C86 had just grown too large and powerful for the old ball joint," said Abernathy.

"There is a lot of stress applied to those points, especially under load or when attachments are hooked on," said McKee. Champion took out the replaceable ball joints and engineered in clevis-style mountings for greater strength. Similar to the front axle design, the cylinders are mounted on spherical bearings for increased service life.

David Alexander

Case IH maximizes muscle tractors

In a move designed to offer producers more choices to meet the demands of their ranch or farmstead, **Case IH** has added two new configurations to the MXM Series Maxxum tractor line: the Case IH MXM130 and MXM140 models. Customer input indicated that some farmers are looking for simpler operational features to better match their needs. Case IH responded by adding configurations with a majority of mechanical controls vs. electronic. Examples include mechanical right-hand transmission and shuttle controls, and mechanical hitch and draft controls. The new configurations work well for jobs such as haying, fertilizer applications, operating smaller planters, secondary tillage, occasional loader work, and general utility use, such as pulling wagons and feed boxes.

The MXM130 offers a 105-hp (78-kW) PTO rating, while the MXM140 is rated at 115 hp (86 kW) PTO. Both are powered by a 7.5-L engine designed for good torque response and fuel economy.

A 20F x 16R transmission provides four ranges, five synchronized gears, and 12 speeds in the 2 to 8 mph (3.2 to 12.9 km/h) working range. A smooth-operating, synchronized shuttle delivers fast cycle times when performing repetitive tasks. The power transfer includes a heavy-duty, 13-in (330-mm) clutch assembly for added durability under tough working conditions.

The new models include an open center hydraulic system with a 14-gal/min (53-L/min) implement pump and a separate

Case IH is adding two new configurations of the MXM130 and MXM140 tractors to the current MXM Series Maxxum tractors. The MXM130 offers 105-hp (78-kW) PTO and a majority of mechanical features, including mechanical right-hand transmission and shuttle controls, and mechanical hitch and draft controls.

The Case MXM 140 is powered by a version of the 7.5-L diesel engine that powers the rest of the MXM Series tractors, in this instance producing 115-hp (86-kW) PTO.

10.5-gal/min (40-L/min) steering pump for ample flow when operating tillage or harvesting equipment.

The simple three-point hitch lift incorporates manual hitch control with manual position and draft control. This enables the operator to easily control position, draft or float with easy-to-operate controls. For quick maneuvers like headland turns, the mechanical fast-raise and -lower system allows quick response at the push of a button, without altering load or position settings.

To better manage today's larger implements, the new models feature substantial lift capacities—8000 lb (3630 kg) for the MXM130 and 9050 lb (4105 kg) for the MXM140—with standard-equipped telescoping link ends for easy hook-up.

David Alexander