

This month's editorial focus is on agricultural vehicle technology.

by David Alexander

## Smooth shifting from Massey Ferguson

original equipment



The Massey Ferguson 7400-series tractors have separate oil reservoirs for transmission and auxiliary hydraulics.



The 6.0-L 1106C Perkins diesel engine powers the MF 7465, 7475, and 7480 tractors, with a PTO from 95 to 115 hp (71 to 86 kW).



The 8400 Series tractors from Massey Ferguson are powered by SisuDiesel engines.



Power for the MF 8450 and 8460 comes from a 7.4-L SisuDiesel 74 ETA delivering 180 hp (134 kW) and 195 hp (145 kW) PTO, respectively.

The new 7400 Series **Massey Ferguson** tractors feature smoother transmissions, more powerful engines, and a design that delivers a tighter turning radius and better lines of sight than the previous models. The four-wheel-drive tractors with their close-centered hydraulics and electronic controls combine power and technology with a simple design that makes them easy to operate.

The Dyna-Step transmission, manufactured at the **AGCO** plant in Germany, features a variable 15% speed increase with each step, eliminating the rapid increase in speed that usually accompanies power-shift transmissions. The transmission's transport range offers 21F x 15R speeds with a top speed of 25 mph (40 km/h), while the work range offers 21F x 18R speeds up to 17 mph (27 km/h). When equipped with the optional creeper transmission, 21 speeds all under 6.2 mph (10 km/h) are available.

With no clutch packs and fewer moving parts in the transmission there is less chance for wear and less potential for breakdown. Service intervals have been increased to 2000 h. The MF 7400s have separate oil reservoirs for transmission and auxiliary hydraulics.

The hydraulic system has a 29-gal/min (110-L/min) maximum flow and is enhanced with the optional Remote Valve Management System (RMS) and Dot Matrix display. The RMS joystick, mounted in the armrest, controls two electrohydraulic proportional spool valves, while the Dot Matrix screen and touch pad allow the operator to adjust both timed detents and flow from the cab. RMS also contains a memory function that can be used to memorize, set, and recall flow rate in and out of each spool valve.

All six MF 7400 Series models feature turbo-charged, air-to-air cooled engines with electronic injection that are Tier II emissions compliant. The MF 7465, 7475, and 7480 are powered by 6.0-L 1106C **Perkins** engines delivering from 95 to 115 hp (71 to 86 kW) PTO. The MF 7485, 7490, and 7495 are powered by 6.6-L 66 ETA **SisuDiesel** engines that produce from 125 to 155 hp (93 to 116 kW) PTO. Both engines use a structural cast-iron block that, with the structural oil pan, provides a narrower frame for a tighter turning radius and improved line of sight for the operator. The engine sound levels are 3 dB lower than previous high-power Massey Ferguson tractors.

The Electronic Engine Management (EEM) feature lets an operator preset two engine speeds and then select either at the push of a button. Engine speeds can also be programmed into the Headland Management System, so that if a three-point implement is raised or lowered, the engine speed automatically adjusts.

EEM, RMS, and Dot Matrix are at the operator's fingertips in the new cab. Designed for visibility,



*Electronic Engine Management and Remote Valve Management System are at the operator's fingertips in the new Massey Ferguson 7400-series tractor cab.*

control, and comfort, the cab features an air-suspension seat and easy-to-read front console and instrument panel with tractor system displays and function readouts. The right-hand control console is home to all major tractor and implement operational controls.

Controls for air and sound systems are located overhead for easy access and within the line of sight. The cab itself is isolated from the chassis by rubber roller mounts that reduce vibration transfer. An optional dual-stage pneumatic cab suspension system, similar to that in use in on-highway trucks, is also available for an even smoother and quieter ride.

The Dyna-Step transmission is also featured on the four new

8400 Series tractors from Massey Ferguson, with other features such as the park lock and shuttle speed settings. The park lock, located on the shuttle lever, prevents the tractor from moving and locks the shuttle as well. Shuttle speed aggressiveness can be adjusted to one of four settings, dialing up for faster cycle times, such as loader applications, or down when towing a heavy implement.

Power for the MF 8400 Series comes from two new SisuDiesel engines. The 7.4-L ETA SisuDiesel powers the MF 8450 and MF 8460, delivering 180 hp (134 kW) and 195 hp (145 kW) PTO, respectively. The MF 8470 and MF 8480 are powered by the 8.4-L ETA SisuDiesel, which provides 220 or 240 hp (164 or 179 kW) PTO. Both turbocharged and inter-cooled engines are Tier II emissions compliant. All four MF 8400 Series tractors are equipped with EEM.

Hydraulic oil pressure on the MF 8400 Series is supplied by three separate pumps. A closed center pump with 39 gal/min (148 L/min) maximum flow provides oil to four hydraulic remotes (a fifth is optional) and the three-point hitch. Steering and braking oil flow is supplied by a second pump. To reduce potential cross-contamination, a third hydraulic pump with a separate sump supplies the transmission and lubrication needs.

If an MF 8400 Series tractor is equipped with the optional Datatronic III color monitor, the operator can monitor and control time and flow rate for all hydraulic remotes as well as other tractor and implement functions. The headland management system will store and recall a timed sequence of instructions to all valves for tractor and implement operation, and stores up to six sets of instructions for hydraulic systems—by operator, field, or implement.

## At Kavlico Our Sensors are the Solution !

For on & off-highway vehicles, when it comes to aggressive, high vibration, broad temperature range environments, Kavlico OEM sensors and transducers are unequaled. Our high accuracy, field-proven designs offer reliable, cost-effective solutions for engine mounted, underhood, and emissions applications.

Our sensors operate in hostile media environments, where temperatures range from  $-50^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$  with an accuracy spec of better than 1%. Pressure ranges are available from  $\pm 1''\text{H}_2\text{O}$  to 23,000 psi gage, absolute, differential, and combined pressure and temperature.

- EGR Differential Pressure
- Barometric/Manifold (BAP/MAP)
- Engine Oil Pressure
- Common Rail Fuel pressure
- Exhaust Back-Pressure
- Particulate Trap Differential
- Crankcase Pressure
- Compressed Air Pressure
- Tilt
- Coolant Pressure
- Turbo Boost
- Oil Level/Quality

Circle 236

14501 Princeton Avenue • Moorpark, CA 93021

Tel: (805) 523-2000 Fax: (805) 523-7125 • Web: [www.kavlico.com](http://www.kavlico.com) • E-Mail: [sales@kavlico.com](mailto:sales@kavlico.com)

**KAVLICO**  
CORPORATION

# Cotton picking machine from Deere

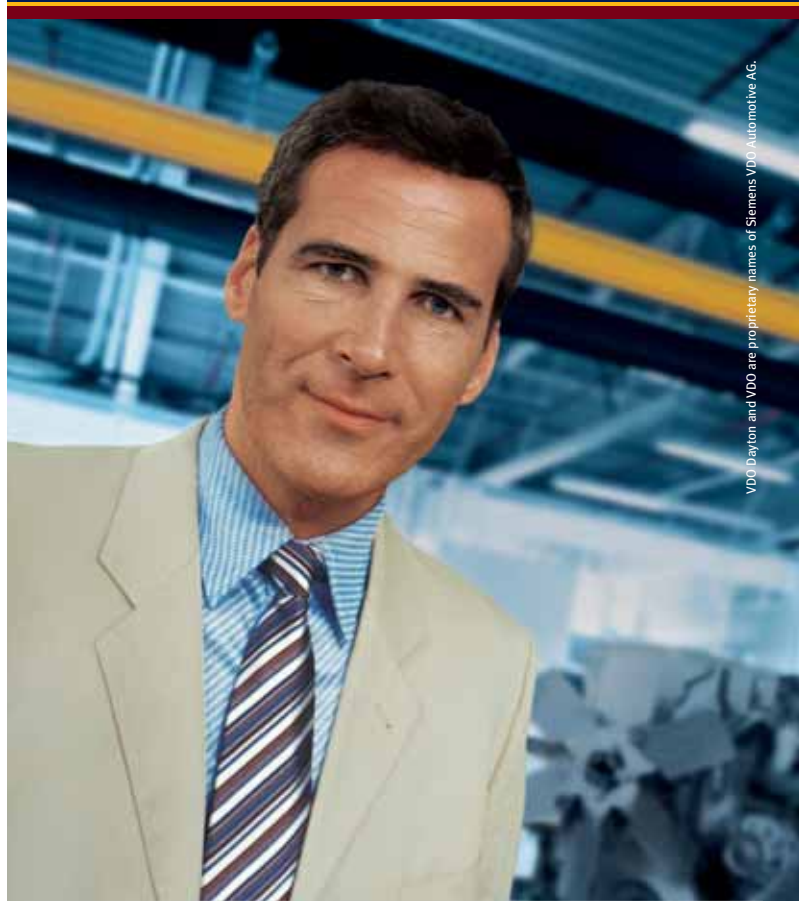
Many cotton growers are harvesting more acres of high-yielding cotton in tougher field conditions. To help growers cover more area in less time, John **Deere** has introduced the new 9996 Cotton Picker.

The new cotton picker features a 350-hp (261-kW), 8.1-L PowerTech Tier II compliant engine that is 25 hp (19 kW) more powerful than the previous model. The engine also has a 9.5% power boost to maintain performance while packing cotton in the basket, and is transverse-mounted to free up space and provide more room for the moistener system, lube, and fuel tanks at the rear of the machine. This design also improves mass distribution for better traction in the field and allows for ground level serviceability.

A new 200-gal (757-L) fuel tank and 345-gal (1306-L) water tank helps keep operators in the field longer during extended harvest days. An optional factory-installed powered rear-wheel axle is available for better traction in muddy or hilly conditions.

Power to the wheels is delivered by a three-speed transmission with hydrostatic drive that features two independent hydraulic systems to assure full power to the ground as well as the picking units. A large-capacity hydraulic pump provides plenty of power in all three gears. The transmission has been redesigned to allow scrapping speeds up to 4.9 mph (7.9 km/h) in second gear.

The 9996 Cotton Picker features a comfortable, spacious cab that has good visibility of the entire row unit toolbar, and allows the operator to sit without leaning or twisting forward. The ComfortCommand seat adjusts five ways and all cab controls are color-coded for easy identification and reach. An optional air-suspension seat is available and a training seat is



VDO Dayton and VDO are proprietary names of Siemens VDO Automotive AG.



The Deere 9996 cotton picker is powered by a 350-hp (261-kW), 8.1-L PowerTech Tier II compliant engine (below).



## Success

**CANcockpit** – the flexible solution for a wide range of applications.



Circle 237

**New VDO instrumentation for multiple CAN protocols.**

From vehicles for the construction industry or agriculture and forestry operations to specialist sports cars and stationary machines, **CANcockpit** is adaptable enough to meet your specific needs. It supports the processing of multiple CAN protocols – including two simultaneously if required. Featuring compatibility with analogue sensors, **CANcockpit** can easily be integrated into panel solutions and combined instrument displays. The central speedometer or tachometer controls up to 16 additional display instruments, ensuring that **CANcockpit** offers the ultimate in flexibility.

standard. Using the CommandTouch console borrowed from the new John Deere combines allows for easy control of the pickers.

The Pro-Series row units add even more productivity to the new cotton pickers. The Pro-12 units provide a 12-bar front and 12-bar rear drum, while the Pro-16 units feature 16-bar front drum and a 12-bar rear drum to enhance picking efficiency in tall, high-yielding cotton. The new Pro-12 VRS units allow picking from 15- to 40-in (380- to 1015-mm) rows.

Row-Trak guidance is a productivity-enhancing option available on the 9996 pickers, which keeps the picker unit on the row and allows the operator to maximize field speed for more efficiency.

A high-capacity loading and unloading system is built into the 9996. A high-performance fan improves airflow for better

distribution and conveying efficiency. A large-capacity basket boasts 1400 ft<sup>3</sup> (39.6 m<sup>3</sup>) of storage with a standard basket lid extension.

The Pro-Lift basket also offers an innovative unloading system. The basket raises at an angle as the door lowers, providing good stability while putting the basket where it is needed.

Other features that add productivity to the machine are the 360° lighting system for nighttime harvesting, wide cab platform for safe and easy inspection of ducts, and a quick remote lube fill to keep a six-row machine lubricated for up to a week.

Also, Harvest Doc Cotton is now available to map and document cotton yields. Using the three common GreenStar components—the display, the mobile processor, and the StarFire iTC receiver—the operator can record field data while harvesting and then download this data to create maps and reports.

## Specialty tractors from Fendt

With standard wheel tracks as narrow as 44 in (1120 mm) and 39 in (990 mm) available by special order, versatility was designed into the **Fendt** 200 Series tractors just introduced to North America by **AGCO**. The new generation Fendt 200 Series is specifically designed for labor-intensive orchard, vineyard, hops, and other high-value crops. Front-, mid-, and rear-mount options, flexible hydraulic outlet positioning, and a three-point hitch system allow multitasking with advanced implements.

Growers can match their particular needs to one of four models in the 60 to 90 hp (45 to 67 kW) range, choosing from very narrow to wide configurations, two- or four-wheel drive, and cab or ROPS (rollover protective structure) designs. New Tier II, high-capacity, **Deutz** 914 air-cooled, inline diesel engines produce 15% more torque while using 5% less fuel than the previous models.

The 3.2-L three-cylinder Deutz engine in the Fendt 206 produces 50-hp (37-kW) PTO, while in the 207 tractor output is 60-hp (45-kW) PTO. The 4.3-L four-cylinder in the Fendt 208 puts out 70-hp (52-kW) PTO, and in the 209 tractors, 80-hp (60-kW) PTO is available. Transmission options include the standard 19F x 6R synchromesh, 19F x 19R shuttle, and the 19F x 6R synchromesh with additional 9F x 3R creeper gears offering speeds as low as 0.18 mph (0.3 km/h) on the 200V models. The Fendt 208P and 209P tractors feature two additional speeds and a top speed of up to 25 mph (40 km/h).

Fendt 200 Series tractors feature an all-new 19.5 gal/min (74 L/min) hydraulics system. Shock load stabilizing reduces equipment wear and tear by using hydraulics to actively control rear implement bounce and keep the front wheels on the ground. The right-hand console hosts the hydraulic center with electrohydraulic control of up to six spool valves; the Electronic Powerlift Control (EPC); and the swinging, rear, three-point hitch controls. A single lever operates any two hydraulic valves, essential for proportional control such as lifting and leveling a bucket loader. Also located on the console are controls for the front and rear PTO, three-point hitch, and four-wheel-drive activation. Three circuits, the EPC, and the swinging rear three-point hitch can all be operated independently and simultaneously, each under constant oil flow for up to four multitasking operations.

Operators can adjust lateral and horizontal movement of implements and attachments using the swinging/tilting rear three-point hitch, locking a unit in position or allowing it to float from side to side. One side can be higher or lower than the other, which is useful for doing blade or tillage work on hillsides.

The Fendt 200 Series features an air-conditioned cab with a roof window for improved overhead visibility and large, wide-swinging doors. A display allows monitoring of pressures, ground speed, fuel, and engine functions.



The new 200 Series tractors from Fendt have front-, mid-, and rear-mount options, electrohydraulic control of up to six spool valves, and a three-point hitch system.



Fendt 200 Series tractors have road speeds as high as 25 mph (40 km/h) and creeper gears for speeds as low as 0.18 mph (0.3 km/h).



Variations of the Deutz 914 engine power the new 200 Series tractors from Fendt.

# New Kubota tractors

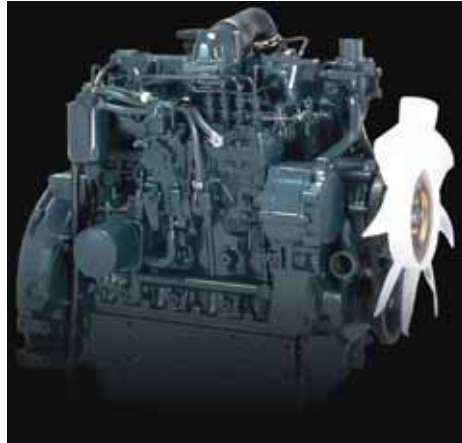
**Kubota Tractor** specializes in the under-100-hp (75-kW) tractor market. Building on that tradition, the company has introduced the M105X, and now enters the higher-powered class with the all-new M125X.

The M125X is equipped with a five-cylinder 125-hp (93-kW) Kubota F5802 diesel engine with direct injection that delivers 103-hp (77-kW) PTO. The all-new M105X with 90-hp (67-kW) PTO has a four-cylinder, net 105-hp (78-kW) Kubota V3800 diesel engine with a center direct-injection system (CDIS) that uses an intercooled turbocharger. The turbochargers use Kubota's waste-gate system, allowing the M105X and M125X to generate high output even at low rpm. Both engines meet the **EPA** Tier II emissions standards.

Both models are equipped with the Intelli-Shift transmission, an eight-speed, dual-range powershift with auto-mode. The auto-mode feature senses when the load or terrain changes to automatically shift from one to three gears. Electrohydraulic differential locks are standard on the M105X and M125X.

The 16F x 16R transmission is operated by a single lever that controls the powershift and the range shift. There is an optional cassette-type, creep-speed kit, bringing the total speeds to 24F x 24R. Upshift and downshift are controlled by a micro-processor that enables smooth powershifting. This feature allows for less changing of the gears during operation, reducing operator fatigue.

Kubota designers equipped the M Series with many features that allow the operator to maneuver the tractor with ease, such as Bi-Speed Turn. Once the front wheels exceed a turning



Power for the Kubota M95S, M105S, and M105X tractors comes from the four-cylinder V3800 diesel engine with a center direct-injection system.



A single-lever joystick operates the front loader on the Kubota M125X, which has a mechanical self-leveling linkage.



The M955 utility tractor from Kubota comes standard with a fully synchronized main and hydraulic shuttle transmission with Swing Shift or Swing Shift Plus.

angle of 35°, the front wheels will turn at a rate of speed nearly twice that of the rear wheels, resulting in a smooth, tight turn allowing the operator to maneuver the tractor in and out of rows precisely. The M105X/M125X tractors also are equipped with Kubota's exclusive bevel-gear front axle that enables the tractor wheels to turn up to 55°.

A single-lever joystick operates the front loader, which has a mechanical self-leveling linkage to maintain the bucket angle automatically, and a heavy-duty hydraulic system for fast bucket operation. Attaching and detaching the front loader is made simple with the use of the boom stands and two mounting pins—there are no tools required. The operator can quickly attach and detach a variety of skid-steer-type attachments, including the pallet fork and bale spear.

## Case IH spreads the load

The new **Case IH** SPX3310 Patriot sprayer uses the same configuration first introduced to the industry on the Case IH SPX4260 sprayer in 1998. The 5.9-L, 200-hp (149-kW) engine—produced by the Consolidated Diesel Company (CDC), a joint venture between **CNH** and **Cummins**—has been shifted to the rear and the 1000-gal (3785-L) stainless-steel product tank to the middle. When the product tank is full and the booms are fully extended, the SPX3310's weight distribution is 47% at the front and 53% in the rear. According to Case, this design feature allows the new SPX3310 sprayer to get into wet field conditions because the weight is better balanced for a more even footprint across the field. The machine makes visibly fewer ruts and less compaction.



By moving the engine to the rear and the product tank to the middle, the new Case IH SPX3310 Patriot sprayer achieves an almost equal weight distribution for a more balanced footprint in the field.

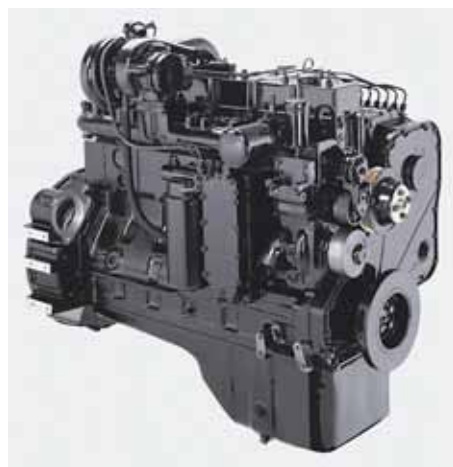
Cabs have been redesigned to provide the operator with an ergonomically smart control console. All operating controls and switches are within easy reach on the operator's right-hand side. A new, digital LCD panel informs the operator of precise travel speed and PTO rpm. Additionally, the exhaust pipe has been repositioned to the corner for improved visibility. The operator has a deluxe air-ride seat with automatic weight and height adjustment. The cab provides year-round operator comfort with an air-conditioning and heating system.

Kubota's mid-sized diesel tractor line has also become bigger with the introduction of the M955 and M1055. These new M Series tractors have a turbocharged diesel engine using a four-valve CDIS to produce a higher torque rise for greater pulling power. The M1055 comes standard with an intercooler for increased power using waste-gate technology that increases engine torque at low rpm. The engine is rated at net 105 hp (78 kW) with a PTO output of 93 hp (69 kW). The M955 has net 95 hp (71 kW) with a PTO output of 84 hp (63 kW).

The M955 and M1055 come standard with a fully synchronized main and hydraulic shuttle transmission with Swing Shift or Swing Shift Plus. The hydraulic shuttle shift can be accessed by a finger-operated, steering-column-mounted lever, allowing the operator to shift smoothly from forward to reverse without using a clutch or stopping the tractor. This transmission provides the operator with 16F x 16R speeds to choose from. In addition, there are two models equipped with Swing Shift Plus with dual speed changer, allowing the operator to choose between 32F x 32R speeds. There is a creep-speed option for 24F x 24R or 48F x 48R transmissions. The M955 and M1055 rely on a multiple wet-disc hydraulic main clutch for long life.

The M955 and M1055 are equipped with a ROPS (rollover protection system)-certified cab that comes standard with suspension seat, air conditioning, and is pre-wired for audio with antenna and speakers.

Installing the engine in the rear offers additional, less obvious advantages. Better weight distribution allows for lower rolling resistance, which results in more efficient use of power. The SPX3310 is able to match the performance of higher power machines with more traditional designs. A new 120-gal (454-L) fuel tank allows the operator to stay in the field longer with more than 10 h of running time. By moving a major heat source away from the cab, the air-conditioning system is also more efficient.



Power for the Case IH sprayer comes from a 5.9-L, 200-hp (149-kW) diesel engine produced by CDC, a joint venture created by CNH and Cummins.

In addition, with the engine separated from the cab, noise levels are markedly reduced. The cab is also isolated on rubber to protect it from frame vibrations, and it contains soundproofing material. All this brings the cab to a 70-dB sound rating.

Adjustable 60/80- or 60/90-ft (18.3/24.4- or 18.3/27.4-m) booms are available in five- or six-section configurations. Standard, low-rate, and high-rate plumbing options are available. Any of these configurations can be equipped with the optional AIM Command spray system, which manages the droplet size of the product by varying the pressure independent of the speed or flow. AIM Command offers the added value of equipping standard-flow plumbing to perform low-flow rates, delivering as little as 2 gal/acre at 10 mph (16 km/h) using half the boom.

A new Case IH SCS 4600 controller allows the operator to monitor information on its large, monochrome screen. It works in concert with the boom section controls, allowing the operator to have a visual confirmation of up to 10 active sections. The boom and sparge pressure gauges have also been integrated into the monitor. Available as an upgrade to the SCS 4600, the Case IH Viper combines the functionality of a rate controller with the added features of a task computer. The task computer functionality, with the appropriate software, sets the stage for variable rate applications, DGPS guidance, and expansion from "as applied" recording and mapping to the use of controlling maps for rates.

The Case IH SPX3310 sprayer also integrates some features from the SPX4410. The redesigned product plumbing circuit, which uses a variable-speed pump regulated by pulse-width modulated (PWM) hydraulics, has been adopted. The new de-



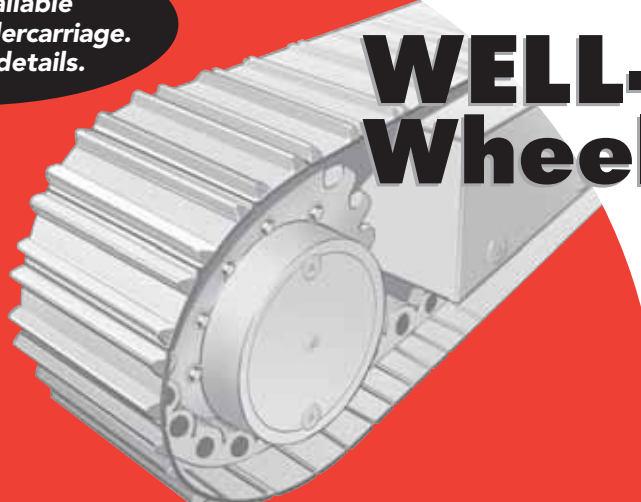
The new Case IH SPX3310 offers adjustable 60/80- or 60/90-ft (18.3/24.4- or 18.3/27.4-m) booms in five- or six-section configurations.

sign promotes longer pump life and peak sprayer performance. Because of the new PWM hydraulics in the plumbing circuit, a manually controlled servo valve is no longer required when using the eductor or product pump to fill at the remote service center.

Service access at the engine is simplified for daily maintenance. A fold-down ladder provides easy access to check the engine oil, belts, hydraulic reservoir, and air cleaner in one spot. An upgraded hub on the final drives extends the service interval.

Now available with undercarriage. Ask for details.

# WELL-ROUNDED Wheel Motors



Hydraulic Motor/Valve

Reduction Gear

Parking Brake

## Nachi All-in-One Wheel Motors for Track Drives Completely Satisfy Your Design Requirements.

- Intergrated Hydraulic Motor, Gearbox and Brake
- Incorporates Easily into Your Design
- Compact Design
- Piston Motor Provides Higher Efficiency
- Reliable Performance
- Two-Speed and Auto Kick-Down Motors Available

# NACHI

Nachi America Inc.  
17500 Twenty-Three Mile Road • Macomb, MI 48044  
Phone: 800.622.4410 • Facsimile: 586.226.5289  
e-mail: hydraulics@nachi-ind.com  
Web site: www.nachiamerica.com

## More utility from McCormick

**McCormick International** USA has further enhanced the McCormick tractor line by adding the all-new C-Max Series, a new range of utility tractors. The C-Max Series features five models ranging from 59 to 99 hp (44 to 74 kW) that use the latest generation of three- and four-cylinder **Perkins 1100-Series** engines. The 3.3- and 4.4-L engines not only meet Stage 2 Tier II emission levels, but also run more quietly.

The engines feature a cross-flow cylinder head with the intake and exhaust manifolds on opposite sides of the engine to



The McCormick tractor line now includes the all-new C-Max Series, powered by Perkins engines.



C-Max tractors feature a Category II linkage, with mechanical top link hydraulic sensing that provides a maximum lift capacity of 5290 lb (2400 kg) or up to 8160 lb (3700 kg) with twin assistor rams.

ensure no pre-heating of the inlet air. Cooler inlet air results in a combustion process that is more efficient. Both engines use a rotary-type fuel-injection pump.

Low running costs are an additional benefit across the C-Max Series, as the Perkins 1100-Series engines promise economical fuel use. The new C-Max Series also offers low maintenance costs by having oil and filter changes at 500-h rather than 300-h intervals, or annually, whichever comes first.

Customers can choose between three transmission options: 12F x 12R, 24F x 12R with creep, and 24F x 12R with overdrive. All feature a dry-clutch synchronized shuttle to ensure easy operation of directional change. The shuttle lever incorporates a neutral position for operations that require periodic pauses. If the tractor is fitted with either an overdrive or creep transmission, selection is also made using this lever. Creep speed reduces the standard speeds by 80%, allowing travel speeds to go as low as 0.19 mph (0.3 km/h).

An open-center hydraulic system delivers flow rates of 14 gal/min (53 L/min) at the standard remote. Customers can choose up to four auxiliary remotes. The valves are operated by two individual levers and an optional joystick control. The joystick is dedicated to control two valves for operating attachments such as front-end loaders. The C-Max features a Category II linkage, with mechanical top link hydraulic sensing that provides a maximum lift capacity of 5290 lb (2400 kg) or up to 8160 lb (3700 kg) with twin assistor rams.

C-Max tractors feature a choice of 540- or 1000-rpm PTO with mechanical engagement and an independent multi-plate dry clutch. An interchangeable PTO shaft allows the six-spline shaft to be replaced quickly by a 21-spline shaft. Ground-speed PTO is standard on all models, which is useful with PTO-driven spreaders, sprayers, and other implements where it is important to keep the PTO proportional to forward speed.

Optional four-wheel drive (4WD) is a simple mechanical engagement to provide additional traction requirements. A 55° steering angle provides a turning radius of 13 ft (4 m) when equipped with 4WD. Working in conjunction with the rear brakes, the C-Max Series also can be equipped with a front axle Integral Braking System (fitted on all 4WD models as standard) that incorporates four wet discs (two per side) within the front axle housing.

The operator platform sits on four "silent bloc" mounting points, enhancing driver comfort and reducing vibration and noise. A shallow transmission tunnel contributes to a spacious operating environment. A foldable two-post ROPS (rollover protection system) frame is standard equipment and can also be fitted with a canopy. A totally new cab design is available that incorporates rear-hinged full-length doors, which not only offer good visibility, but wide open access. The cab models fea-

**Bring It On!**  
Hella Lights Can Take It.



Visit Hella at CONEXPO  
CON/AGG Booth C-6120

Featuring the latest in Free-Form technology, our rugged Halogen and Xenon lamps put the light where you need it most. With a variety of shapes, sizes, and beam patterns, our technologically advanced modular systems make it easy to retrofit and upgrade any application. Hella's industry-leading Work Lamps are designed specifically to meet the rigors of today's Construction and Agricultural environments. Got a tough job? Bring it on!



Hella, Inc.  
1-877-224-3552  
www.hellausa.com

ture air conditioning and a layout with controls in logical, easy-to-reach positions.

Two types of exhaust systems are fitted on the C-Max. For ROPS models, a vertical pipe comes through the hood with the muffler located above the engine. The hood can be lifted without removing the pipe. For cab models, the exhaust pipe is mounted on the A-post for good visibility without compromising access to the cab. The C-Max features a 27-gal (102-L) fuel tank that can be filled from ground level and sits in front of the operator platform.

Daily service is convenient with a one-piece rear-hinged hood that provides convenient access to the radiator and air cleaner, even when fitted with a front-end loader. For complete engine access, the side panels can be removed.

## Beefier windrowers from Challenger

Not quite two years after the introduction of its SP Series self-propelled windrowers, **Challenger** has launched three new "B" models. Labeled the SP85B, SP115B, and SP185B, the upgraded self-propelled windrowers have been designed for big-acreage hay and small grain producers. To handle higher-speed windrowing in rough hay fields, the new B-series models feature heavier frames.

To enable the use of bigger headers and higher cutting speeds, each model has more power than its predecessor in the form of new Tier II compliant engines. The largest model in the series, the SP185B, uses a new electronically fuel-injected 5.9-L, six-cylinder diesel engine that is turbo-

charged and air-to-air intercooled to produce 185 hp (138 kW), representing an increase of 20 hp (15 kW) over the SP165 it replaces.

The SP85B and SP115B now feature the **Caterpillar** 3054 engine. The 4.4-L powerplant is naturally aspirated on the SP85B, and turbocharged with electronic fuel injection on the SP115B, for 85 and 115 hp (63 and 86 kW), respectively.

On the SP185B, a step-up gearbox is incorporated on the tandem ground-drive pumps. The high pump speed allows the use of a lower gear ratio planetary for better torque in low range, as well as faster ground speeds in both low and high ranges. Heightened productivity and operator comfort results



*B-series windrowers from Challenger have a computer that tells the tractor which header is attached when the electrical wiring harness is connected, and hydraulic flow to the drive motor automatically adjusts to match drive-speed requirements.*

# API Heat Transfer

*World leaders in heat transfer technology*

Knowledge  
Technology  
Innovation

API Airtech

Air-Cooled Products  
Vacuum Brazed  
Aluminum Bar & Plate  
Fan-Cooled  
(585) 496-5755

API Basco

Shell & Tube Products  
Standard S&T Designs  
Custom S&T Designs  
Plate Fin  
(716) 684-6700

API Schmidt-Bretten

Plate Products  
Gasketed  
Brazed  
Welded  
Semi-Welded  
(716) 684-6700

1.877.API.HEAT

www.apiheattransfer.com

API Heat Transfer  
Corporate Headquarter  
2777 Walden Avenue  
Buffalo, NY 14225  
P: (716) 684-6700  
F: (716) 684-2129

Heat Exchangers for the  
Off-Highway Industry

Custom solutions for  
your cooling needs:

- Oil Coolers
- Custom Cores
- Aluminum Radiators
- Charge Air-Coolers
- Intercoolers
- Copper-Brass Radiators



Our Product Design:

- All aluminum bar & plate
- Vacuum brazed
- Cast or fabricated headers
- Variety of fin patterns
- Custom mounting

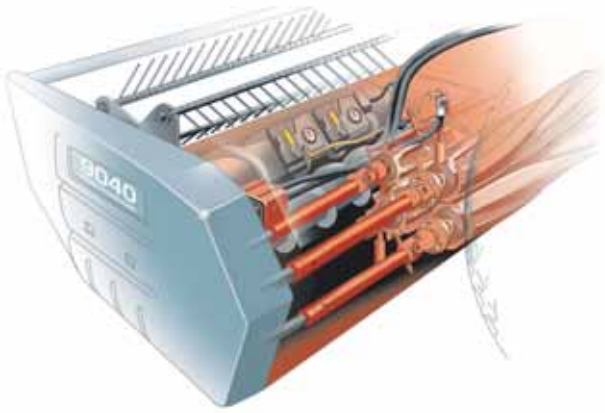


The API Advantage:

- Extensive product line
- Application expertise
- Heavy-duty construction
- High efficiency, low-cost designs







Challenger's new TwinMax auger headers use two separate sets of conditioner rolls positioned in-line for double conditioning.

from larger tires, which also provide increased ground speeds compared to earlier models, and improved ground clearance.

Changes in the drive system include wheel motors that are attached directly to the planetary drive and directly increase torque and radial load characteristics, replacing prior-model drive chains.

Cabs for the new windrowers come standard with an upgraded **Grammer** air-ride seat, a retractable seatbelt, and an instructor's seat featuring a padded backrest. Also included in the cab is a new console gauge cluster with a large speedometer, as well as water temperature gauge, voltmeter, oil pressure gauge, fuel gauge, and hourmeter. A new six-function digital performance monitor is standard equipment on the SP185B and optional on the SP115B and the SP85B.

Probably the most notable feature of the Challenger B-series models is the expanded level of adaptability, which allows



Caterpillar supplies its 3054 engine for the Challenger SP85B and SP115B windrowers. The 4.4-L powerplant is naturally aspirated on the SP85B, and turbocharged with electronic fuel injection on the SP115B, for 85 and 115 hp (63 and 86 kW), respectively.

the operator to more easily change headers. A computer provides a large portion of this adaptability and tells the windrower tractor which header is attached when the electrical wiring harness is connected, and automatically adjusts hydraulic flow to the drive motor to match drive-speed requirements.

Lift arm receivers on the SP185B have been redesigned to accept both auger and draper headers so that it will now accept any header in the Challenger lineup, making it a valuable machine for custom operators or farmers who grow both hay and grain.

Faster dry-down and more uniform hay conditioning are just two of the benefits of Challenger's new TwinMax auger headers. Unlike traditional hay conditioners, the TwinMax uses two separate sets of conditioner rolls positioned in-line for double conditioning. The first pair consists of steel-on-steel rolls that engage for thorough conditioning action on a variety of crops to ensure efficient crimping along the entire length of the plant stems. The second pair consists of intermeshing rubber rolls that sit directly behind the steel rolls, applying a crushing action on plant stems as they direct the crop to the swath or windrow-forming shields.

Another feature is hydraulic tensioning on both sets of rolls, which ensures consistent pressure under various conditions, and permits quicker adjustment between crops, fields, or customers. The roll gap and hydraulic tension can be individually adjusted on both the front and back conditioner rolls to allow the operator to adjust for conditioning action in virtually any crop situation.

Field trials and customer experience with prototype machines have shown faster dry-down and higher hay quality from the TwinMax conditioner vs. standard conditioners, according to Challenger. Reducing drying time offers numerous benefits, such as providing a larger window of opportunity for producers to harvest high-quality hay and improve profitability. Getting the crop off the field quicker also reduces the chances of it being rained on and allows producers who irrigate to get water back on the field earlier. Less time in the field also means less bleaching, for greener hay. Faster dry-down also has the potential to reduce or eliminate additional passes over the field with a rake or tedder, which can reduce both fuel costs and compaction. The amount of preservatives needed to ensure hay quality can be reduced in some environments.

PHONE 231-879-3372 FAX 231-879-4330

**HAYES**

FLEXIBLE DRIVE COUPLINGS  
MADE WITH PRIDE  
IN  
*America*

LARGE INVENTORY  
ON HAND  
FOR FAST DELIVERY



HELPFUL AND  
KNOWLEDGEABLE  
ENGINEERING STAFF



**NSF-ISR**

QUALITY SYSTEM  
REGISTERED TO  
ISO 9001:2000

PRODUCING QUALITY  
PRODUCTS FOR OVER 30 YEARS:  
FLEXIBLE COUPLINGS  
FLYWHEEL COUPLINGS  
PUMP MOUNT PLATES  
ENGINE HOUSINGS  
BEARING SUPPORTED STUB-SHAFTS  
DRIVE SHAFTS AND MORE.....




[www.hayescouplings.com](http://www.hayescouplings.com)