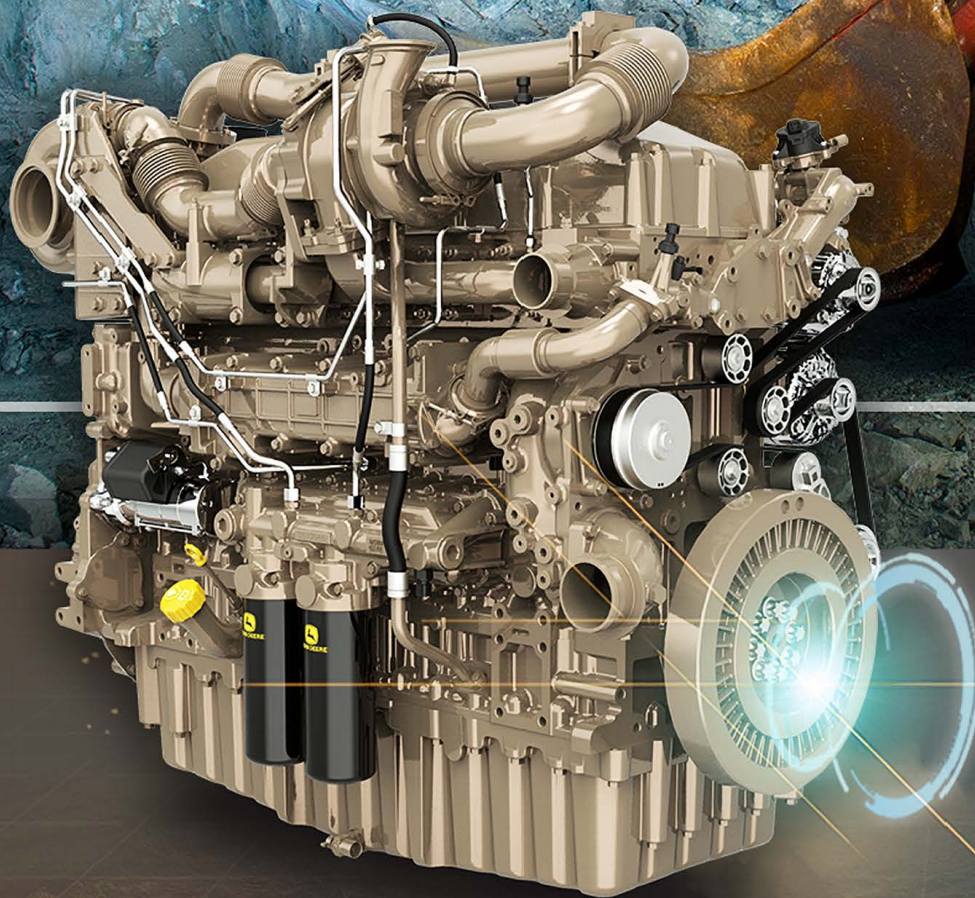


# POWER MEETS **PROGRESS**

- + INDUSTRIAL ENGINES
- + DRIVETRAIN COMPONENTS



**JOHN DEERE**



## No Dig, No Problem



Horizontal directional drilling (HDD) can be a profitable alternative to open-cut trenching, provided you have the right setup. No-dig specialist Gunnar Guldbland A/S in Tarm, Denmark, integrated a drill rig, mud mixing system generator set, and more into a new truck for customer Eco Drilling. But this didn't leave much space for another essential component: a 100-kVA generator. John Deere engine distributor West Diesel A/S brought the solution.

### The business case for horizontal directional drilling

Horizontal directional drilling has been around since the 1960s, offering a no-dig (trenchless boring) option for installing or replacing underground pipelines, cables, and service conduits without disrupting the surface. This makes it a popular choice for busy roads and housing estates.

"A typical HDD project requires multiple pieces of equipment, including the rig, drill bits, rods, drill pipes, mixing tanks, power units, and a trailer to move everything from A to B," says Dennis Guldbland of Gunnar Guldbland. "It's an investment, but one that can pay off tremendously. The horizontal directional drilling market is expected to grow significantly by 2030\*, as cities become more congested and contractors are pressured to adopt boring methods that minimize disruptions to traffic."

### Gunnar Guldbland helps contractors get the job done

Gunnar Guldbland represents German directional drill rig manufacturer Tracto Technik in Denmark and Norway.



The family company was founded in 1981 by Gunnar Guldbland; and his son, Dennis, is at the helm today. The company delivers drill rigs and complete setups that help large and small contractors alike get the job done. "Our customers' needs vary significantly. Larger contractors usually cater to a variety of drilling operations.

They generally have a fleet of rig setups that they pull together themselves to meet the needs of each project," says Guldbland. "Smaller contractors, on the other hand, tend to specialize in one type of job. They prefer us to deliver a complete, customized 'get up and go' setup. Every rig is different; I don't believe we've ever delivered two identical machines."

### The truck challenge: A tight space for the generator set

Eco Drilling from Dokka in Norway is a pioneer in the drilling industry and is always looking for ways to get more done, more conscientiously. The company bought a rig truck to be able to tackle a myriad of drilling applications and jobsites while leaving as small an environmental footprint as possible.

With the rig and mud mixing system in place, there was only a 2.45-meter (8-foot) long space left for the generator. Standard generators proved too large to fit, and manufacturers were not open to designing a bespoke solution. Guldbland reached out to Rasmus Sørensen at West Diesel A/S, the John Deere engine distributor for Denmark and Finland, to see if they had a solution. They did.



The solution: a customized John Deere engine that fits like a glove. Eco Drilling had specified a 100-kVA generator that had proven itself in similar applications and would be backed by excellent after-market support. Sørensen coupled a John Deere 4.5L Stage V engine with a Stamford alternator fitted with a permanent magnet

generator (PMG) exciter.

"The slot was really tight, but we found that by moving the AdBlue selective catalytic reduction (SCR) system to the right, the generator set fit like a glove while keeping all engine service points easily accessible for maintenance," says Sørensen.

The finished truck allows for fast rig-up, rig-down, and re-deployment of the drill rig. Boasting a diesel-driven Grundodrill drill rig, a mud mixing system, and John Deere-powered generator set, it gives Eco Drilling a complete solution that is ready to start work in minutes. And it's already proven its flexibility in the field. In addition to the standard rig, Eco Drilling recently used the truck with a larger 80-ton rig.

In due time, the standard diesel-driven rig will be replaced with a full-electric one. "With this in mind, we added the PMG exciter to the generator," says Sørensen. "It will supply any necessary extra voltage needed in the future."

Eco Drilling has been on the road with the truck daily for the past six months, and Gunnar Guldbland has already received inquiries from other drilling contractors.

"We couldn't have made it all fit without Rasmus and his team. Communication with them is easy; they understand how generators are used in real life and are willing to customize even when it concerns only one piece of equipment," says Guldbland. "Rasmus kept us in the loop throughout the generator set development process and delivered as promised. West Diesel's flexibility to review and modify the engine to fit it into this narrow space allowed us to help our customer with a unique solution."

All images courtesy of Eco Drilling AS / Jorn Soderholm, Praktisk Talt AS.



## A Trenchless Triumph



As one of the oldest continuous manufacturers of auger boring machines in the U.S., Michael Byrne Manufacturing (MBM) has been a driving force in trenchless technology with advancements in technology, safety, and other innovations like its own custom gearbox.

The company's rugged, heavy-duty auger boring machines are designed to take on demanding trenchless construction projects. Auger boring is a trenchless application in which a steel casing pipe is jacked through the earth to form a horizontal bore. Just as important as having a ruggedly built machine is having a reliable engine that can power through the most challenging bores. That's why MBM turned to John Deere industrial diesel engines for their continuous power and performance.

### A Family Legacy

For over 50 years, MBM has been a family-owned and -operated business. The company was started in 1966 in Mansfield, Ohio, by namesake Michael (Mike) Byrne. MBM is now led by Mike's son-in-law, Jim Weist, who is the owner, and Mike's granddaughter, Leslie Weist, who serves as vice president of operations.

MBM serves a global customer base, and its auger boring machines are utilized across a wide range of applications, including infrastructure development and installing underground utility lines such as water, sewer, gas, oil, electric, telecommunications. The company offers machines from 24 inches in diameter all the way up to 84 inches. MBM is known for "overbuilding" its machines; but with the uncertain terrain of auger boring, the company is committed to providing customers with the most robust machines that can drill through whatever they may come across.

Like many in the off-highway industry, when Final Tier 4/Stage V emissions standards were rolled out, MBM had to redesign their machines around Final Tier 4 engines in order to be emissions-compliant. The company turned to John Deere distributor Superior Diesel for support in navigating these changes.

## Trusted Collaborator for Final Tier 4 Transition



The

transition to Final Tier 4-compliant engines had a major impact on the auger boring industry due to the physical size required by these new engine platforms.

"Everything had to be redesigned to fit around that. Where these machines operate makes it even more difficult because they're typically down in trenches with trench boxes that have cross beams on them that pose height limitations," says Jim. "Auger boring machines have gotten much taller than they were before. It really impacted our customers and how we design our machines."

The experts at Superior Diesel were there to support MBM through this transition as the companies worked together to redesign the machines. MBM was looking for an engine package that offered the most compact envelope possible while still meeting horsepower requirements. Superior Diesel helped put together two engine packages using the John Deere 4.5L industrial diesel engine, offering 140 hp (104 kW), and 6.8L industrial diesel engine, offering 250 hp (186 kW).

"One thing we wanted was a proven, reliable engine — something that had plenty of testing on it and a history of working in tough environments. Knowing that these engines are used in other construction equipment applications that are run in harsh environments gave us confidence in going with John Deere," says Leslie. "The John Deere global support system was another factor in our decision because we know that no matter where our machines go in the world, if there's a problem with the engine, they'll be able to find someone to help get it fixed."

The auger boring machine redesign also required MBM to adapt its hydraulic system. Superior Diesel helped to design a drop-in solution that gave the machine more hydraulic power and versatility to use auxiliary hydraulic power on other equipment or attachments if needed. Together with the new engine package, this solution strengthened the thrusting capabilities of the auger boring machines.

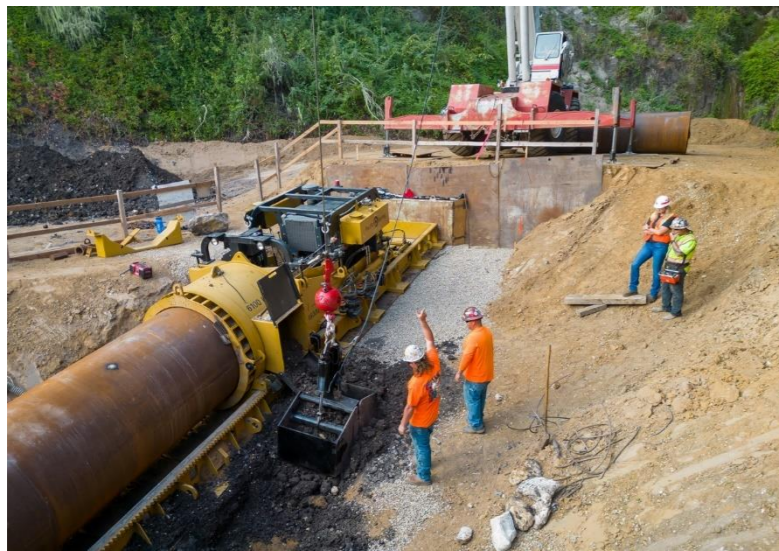
### New Auger Boring Machine Put to the Test

MBM's redesigned D60/72-1.5 auger boring machine was put to the test by long-time customer Pacific Boring when the tunneling contractor was tasked with installing a new 60-inch drainage culvert on San Miguelito



Road in Lompoc, California. Pacific Boring has been working with MBM equipment since the '80s.

"We're a small company but we work on really big jobs. Pacific Boring specializes in trenchless work, so we're always drilling under railroads, highways, those types of infrastructure projects," says Steven Gallyer, president of Pacific Boring. "We're seeing more and more of these types of projects, especially on California's Central Coast, as culvert infrastructure fails and the heavy rains wash out roads and highways."



After a large winter rainstorm caused significant damage to the highway, Pacific Boring was hired to replace a damaged drainage culvert that couldn't keep up with the flooding. Santa Barbara County officials were counting on the contractor to get the new culvert in place before the highway was eroded further. But the job was not without its challenges. The area in which the crew would be working was steep, rocky terrain with unknown and quickly changing ground conditions.

"Originally we were looking at doing the job with a tunnel boring machine, but we just knew that it wasn't going to make it through the rocks, cobbles and boulders. We swapped to an auger boring machine that would allow us to remove the augers from within the casing and go to the front of the machine and deal with boulders as we encountered them," says Gallyer.

The project required the team to install 140 feet of the 60-inch casing at a slope of negative 15 percent. Most auger boring machines run on a flat or almost flat surface but with the extreme jobs that Pacific Boring takes on, the contractor needed a machine that could handle steep grades when boring. MBM specially designed Pacific Boring's machine with extra-heavy-duty drives to hold it in place so it doesn't slide while it's boring. And thanks to the John Deere 6.8L industrial engine, the machine also had the reliable power that would be needed to complete the job.

"Having the horsepower obviously lets us get through multiple ground conditions, even as they change and we fight our way through them," says Gallyer. "You don't always know what you're going to run into, especially on emergency jobs like this where we do hit boulders and cobble-size material and other buried obstructions. It's absolutely essential that we have the right engine size and the power to be able to perform the work."

As the crew navigated tight timelines, variable ground conditions, and the steep grade, the MBM machine engine powered through to successfully complete the project ahead of schedule.

"We actually daylighted or reached the receiving side two days before we originally anticipated we would," says Gallyer. "Even with all of the issues we had — unforeseen obstructions, boulder-sized rocks, repairs that we had to make to the drill bit because of the unforeseen ground conditions — we were able to get through it, and everyone's happy."

## You need PACE... To win the RACE!

The skillfully versatile XA(T)S 400 range offers you two models with multiple possibilities. Thanks to its intuitive PACE system (Pressure Adjusted thru Cognitive Electronics) the new 400 cfm models give you the most options from a single compressor. This pioneering technology enables multiple pressure and flow settings, ensuring you match air flow and pressure to your application needs.


Optimize your fleet investment, improve utilization and get a higher return on investment. If you are using multiple machines to cover flow demands between 340-440 cfm and pressure ranges from 100-200 psi, then now is the time to stop.

The 400 cfm models also feature our legendary air element together with a John Deere Stage IV Engine. Ensuring higher efficiency, longer service intervals, unmatched reliability, increased lifetime and the lowest cost of ownership.



Compressor		XAS 440 JD T4F	XATS 400 JD T4F
Working pressure	psi (g)	100	150
Free air delivery (1) (FAD)	cfm	440	397
Max. sound pressure level @ 23' (7m) at normal working speed & pressure (2)	dB(A)	76	76
Compression stages		1	1
Air receiver capacity	US gal (l)	11 (41.6)	11 (41.6)
Compressor oil capacity	US gal (l)	6.3 (23.8)	6.3 (23.8)
Approximate air outlet temperature	°F (°C)	200 (93)	200 (93)
Air compressor outlets		2 x ¾" & 1 x 1 ½"	2 x ¾" & 1 x 1 ½"
Max. ambient temperature at sea level (3)	°F (°C)	125 (51)	125 (51)
Maximum altitude	Ft (m)	14,000 (4267)	14,000 (4267)
Min. starting temperature (without cold weather options)	°F (°C)	14 (-10)	14 (-10)
Min. starting temperature (with cold weather options)	°F (°C)	-4 (-20)	-4 (-20)
Engine			
Model		John Deere 4045HFC04	John Deere 4045HFC04
Number of cylinders		4	4
Emissions regulation	US EPA Tier	T4F	T4F
Output at rated speed (2400 rpm)	hp	115	125
Aspiration		Turbocharged	Turbocharged
Displacement	cu in (l)	269 (4.5)	269 (4.5)
Engine speed (unloaded)	rpm	1500	1500
Engine speed (maximum loaded)	rpm	2400	2000
Capacity and consumption			
Engine oil capacity	US gal (l)	5.4 (20.5)	5.4 (20.5)
Engine oil required		Low Ash Oil per API CJ-4, ACEA C9	Low Ash Oil per API CJ-4, ACEA C9
Engine coolant capacity	US gal (l)	6.25 (23.6)	6.25 (23.6)
Fuel tank capacity	US gal (l)	52 (197)	52 (197)
DEF tank capacity	US gal (l)	5.7 (21.7)	5.7 (21.7)
Battery capacity (cold cranking amps) (4)	A	1100	1100
Dimensions and weight (trailer/Skid mounted)			
Length	in	161 / 113	161 / 113
Width	in	71.5 / 71.5	71.5 / 71.5
Height	in	70 / 65	70 / 65
Weight (wet)	lbs	4555 / 4590	4470 / 4555

(1) According to ISO 1217 ed.3 1996 annex D.  
 (2) Measured in accordance with ISO 2151 under free field conditions @ 7m distance.  
 (3) Consult Atlas Copco for proper de-rating instructions for operation beyond ambient limitations.  
 (4) According to DIN 72311.

**LOWER CAPITAL INVESTMENT** 

One machine covers multiple applications

**FUEL SAVINGS** 

Both efficiency and autonomy

**INCREASED UTILIZATION** 

Simple service and long service intervals



Photos and illustrations contained herein might depict products with optional and/or extra components which are not included with the standard version of the product and, therefore, are not included in a purchase of such product unless the customer specifically purchases such optional/extra components. We reserve the right to change the specifications and design of products described in this literature without notice. Not all products are available in all markets.



KEEP IT RUNNING



# JOHN DEERE CONNECTED SUPPORT™

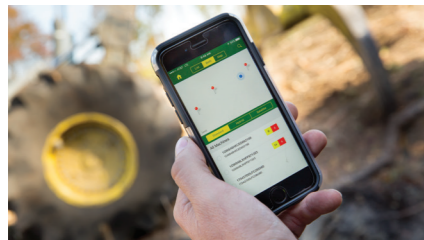
For OEM industrial and marine engines



## WHEN IT COMES TO MAINTAINING ENGINE UPTIME, IT'S GOOD TO HAVE CONNECTIONS

With John Deere engines, you are never left to fend for yourself. Besides always being supported by our worldwide network of more than 9,000 John Deere service dealers, John Deere OEM industrial and marine engines can be protected by **John Deere Connected Support** remote monitoring and diagnostic services.\* So instead of reacting to issues, you and your authorized John Deere dealer or distributor can proactively anticipate and prevent unplanned machine downtime.

## HOW IT WORKS



### MACHINE HEALTH MONITORING

Think of John Deere Connected Support as a wellness program for John Deere-powered equipment. It not only tracks the health of engine and emissions components, but it is also capable of proactively discovering improper engine operation that could lead to downtime.



### PREDICTIVE ALERTS

John Deere Connected Support is a proactive monitoring system that sends predictive alerts to dealers (with a customer's permission) of potential engine concerns. This allows technicians to diagnose OEM equipment remotely and fix issues before they happen.\*

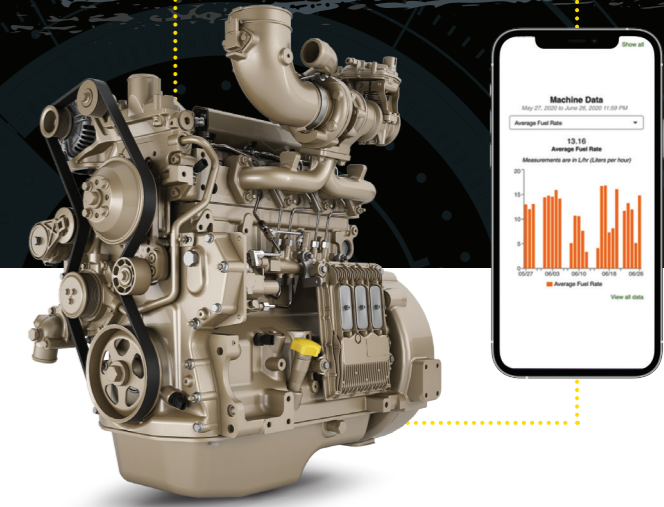


### REMOTE DIAGNOSTICS

John Deere dealers or distributors can manage engine trouble codes without having to visit your site. Sometimes the solution is as simple as sending a software update to your machine. If a service call is required, the technician can arrive with the right parts to keep your equipment running.

\*Contact your John Deere dealer or distributor for availability on specific engine models.

## STAY CONNECTED TO WHAT COUNTS



**John Deere Connected Support** remote monitoring and diagnostics helps you and your John Deere dealer keep your OEM equipment running at peak performance.

### AVAILABLE FOR OEM EQUIPMENT

John Deere Connected Support with JDLINK™ is available on several John Deere engines, and it can be added to existing machines that use John Deere electronic engines.\* **THERE ARE NO SUBSCRIPTION FEES OR ONGOING EXPENSES.** The data collected by JDLINK is transmitted by cellular technology to the John Deere cloud server. It is made available online to registered users in the Operations Center dashboard on MyJohnDeere.com or through apps for iOS and Android mobile devices.

### EQUIPMENT OPTIMIZATION

Having access to real-time engine telematics enables OEM equipment owners to optimize not only uptime, but also the productivity and management of their John Deere-powered machines. You can tell which machines are generating revenue and which are idling. Engine and fuel utilization data can help you determine how to better use the machine and manage fuel consumption.

### MANAGE YOUR ENTIRE FLEET

Through the full integration with John Deere construction and agricultural equipment, fleet managers can monitor, protect, and maintain their John Deere-powered OEM equipment in the same place they monitor their John Deere machines.

### PREVENTIVE MAINTENANCE

John Deere remote monitoring also simplifies preventive maintenance and documentation. The system tracks service status and sends reminders of scheduled maintenance to help you optimize equipment performance and extend machine life.

### MACHINE SECURITY

Location and geofencing services provide logistics management and equipment security. If a machine is operating outside of set work hours or removed from a job site, you get an instant alert. The system also aids the recovery of stolen machines through GPS tracking.

Ask your local John Deere dealer or engine distributor about connecting John Deere-powered OEM equipment.



\*Contact your John Deere dealer or distributor for availability of John Deere Connected Support on specific engine models. iOS is a U.S.-registered trademark of Apple Inc. Android is a trademark of Google Inc.

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The PowerTech EWX 4.5L engine meets Final Tier 4/Stage IV emissions using a wastegated turbocharger designed to develop more airflow at lower engine speeds, as well as a diesel oxidation catalyst and diesel particulate filter (shown here).

## PRIMED FOR EMISSIONS COMPLIANCE



Just as a plant's xylem draws water from its roots to grow, Xylem Inc. is in the business of moving water using industry-leading technologies that are helping make our world a greener place. A global manufacturer of pumps, Xylem Inc. is taking an environmental lead in the clean air effort by offering the Godwin range of diesel-driven portable pumps with John Deere Final Tier 4 engines.

The Godwin NC150 Dri-Prime pump now meets Final Tier 4/Stage IV emissions with a 55-kW (74-hp) PowerTech EWX 4.5L engine. The portable pump is suitable for both sewage and clean water applications.



## More than a clean-water pump

Godwin Dri-Prime pumps have the ability to self-prime completely from dry with long suction lines, making them ideal for a variety of dewatering and pumping applications. Built simple and rugged, Godwin pumps have the solids-handling capability to continuously pump sewage and debris-laden wastewater.

and flow. "It's really about matching pump performance to the requirements of the application. In a lot of applications, the performance requirements of our pumps can change from hour to hour, depending on the conditions," explains Ramos. "The ECU gives us the opportunity to vary pump speed in response to these changes, which improves fuel economy."

**Xylem also recently introduced Field Smart Technology (FST) that works in conjunction with the PrimeGuard Controller. FST allows customers to constantly monitor and control equipment remotely to ensure optimum performance.**

Using cellular combined with redundant satellite technology, off-site operators can monitor the amount of soot accumulation in Final Tier 4 engine systems, as well as fluid pressures, temperatures, and fuel consumption.

Ramos says the transition to Final Tier 4 required teamwork between Bell Power Systems and Godwin suppliers. "Bell Power Systems supplied 3-D drawings of the engine for the incorporation into our package. They worked with our suppliers to make sure that those pieces all fit together and worked together," says Ramos.

During extensive testing at the company's test facility, the CD150M was placed under various load conditions. "Bell Power helped us fine-tune the ECU setting to ensure that we were getting the required horsepower out of the engine," says Ramos. "As a result, the engine is very responsive to changes in load and speed. It also did well on the regeneration and performed as expected, even under very lightly loaded conditions."

## A legacy continued

Mike Delzingaro, vice president and director of sales, says he expects the PowerTech EWX 4.5L engine to deliver the same solid performance as its predecessors. "We've started with the 4039D, migrated to the 4045D, and finished with the 4045T over the past 20 years. We know it will be reliable, efficient, and the technology is proven. John Deere offers a broad range of engines, and the John Deere support network is second to none. That's why we've bought thousands of their engines over the past two decades."

According to Delzingaro, all future sales of the Godwin Dri-Prime model CD150M 6-inch pumps will include John Deere Final Tier 4/Stage IV engines. Xylem will strategically place the new pumping units into the company's rental fleet in order to serve large metropolitan cities like Chicago, New York, and Philadelphia that require Final Tier 4/Stage IV engines.

"We've adopted the technology, we've been using it, and we've embraced it," says Delzingaro. "Reducing emissions is more sustainable for our future, and for our kids. That's the most important thing."

Engine distributor: Bell Power Systems in Essex, Connecticut. [www.bellpower.com](http://www.bellpower.com)



Mike Ramos, director of operations and engineering for Xylem's Godwin brand, says he's been working closely with John Deere engine distributor Bell Power Systems to develop Final Tier 4 pumping units. Two years ago, Xylem developed a Godwin HL225M pump with a PowerTech PSS 9.0L engine. During the last quarter of 2014, the company began offering the PowerTech EWX 4.5L engine on several models of Dri-Prime pumps, including Godwin's flagship model, the 6-inch CD150M. Other pumps powered by this engine include the NC150 non-clogging sewage pump, the HL80M high-head pump, and the hydraulic-submersible Heidra range.

## Built with smarts

Electronically governed, the PowerTech EWX 4.5L replaces the mechanical PowerTech M 4.5L Interim Tier 4 engine, which previously powered these pumps. Ramos explains that while the move to Final Tier 4 increased the overall size and price of the pumping unit, there are advantages. He says today's clean-air engine technologies led to advances in engine electronics, which have improved the communication of its pumping units.

Godwin pairs the Final Tier 4 engines with a PrimeGuard controller, a fully programmable microprocessor-engine-control system that offers auto-throttling of the engine rpm in response to changing pressure, level,

Godwin pairs the Final Tier 4 engines with a PrimeGuard controller, a fully programmable, microprocessor-engine-control system that offers auto-throttling of the engine rpm in response to changing pressure, level, and flow.



# A 'MASTER CLASS' IN RECYCLING



For both the RM 100GO! and RM 120GO!, customers can choose between a PowerTech Plus 9.0L Tier 3/Stage III A or a PSS 9.0L Final Tier 4/Stage IV engine.

## Rubble Master's RM 100GO! and RM 120GO! crush recycling industry expectations

Recycling has clear value for the planet, but Rubble Master GmbH makes sure it creates value for businesses as well. This Austrian company specializes in impact crushers that turn mobile rubble recycling into a revenue-generating activity for companies of any size. And its latest RM 100GO! and RM 120GO! units, powered by John Deere Final Tier 4/Stage IV engines, are literally "crushing it" in a myriad of applications — and opening new opportunities.

Rubble Master GmbH has used John Deere engines since 2005, allowing it to naturally evolve alongside in terms of emissions

regulations. "We're pioneers in our field and aim to have a global impact; we see these same qualities in John Deere. John Deere has a good reputation and a high-quality product that has proven reliable for us, even in tough applications, for over a decade," says Gerald Hanisch, CEO.

Originally designing solutions for entry-level crushing, Rubble Master has never stopped developing its product line. But it always combines simplicity and productivity with power and output, comments Heinz Jank, research and development manager. "Our mobile compact crushers offer great weight-

to-size ratio and excellent throughput capacity. Yet they can be operated with the touch of a button, without in-depth technical knowledge. Combining reliability, productivity, and efficiency to keep operating costs very low is critical to create value in the competitive recycling sector."

The company's drive for excellence has resulted in some industry surprises. "We demonstrated that a Rubble Master impact crusher can even process hard stone — usually the job of a jaw or cone crusher. And, in certain applications, a single Rubble Master crusher can do the work of two other

crushers processing material," explains Shaun Montgomery, sales manager.

## The new RM 100GO!: concretely different

"Customers are astounded by what the RM 100GO! can process, in materials as well as throughput," Montgomery continues. The RM 100GO! has a throughput of up to 250 tons per hour, but weighs only 29 tons. This star of the Rubble Master range can crush mineral materials, including construction and demolition (C&D) waste, concrete, asphalt, glass, coal, natural rock, and even reinforced concrete for production of high-quality construction materials. The RM 100GO! is available with a John Deere PowerTech™ Plus Tier 3/Stage III A or a 235-kW (315-hp) PSS 9.0L Final Tier 4/ Stage IV engine, depending on the customer's location and application.

## Breaking ground with the RM 120GO!

Boasting outstanding performance, high output, and excellent final aggregate quality, the RM 120GO! has catapulted Rubble Master into a new league. "Customers asked for a bigger version of our crushers to compete with other heavier crushers," says Montgomery. "But of course, we gave it our own spin, designing a unique machine from the first brushstroke to the final design." The flagship of the company, the RM 120GO! offers an output of up to 350 metric tons (386 U.S. tons) per hour. As it weighs only 35 metric tons (38.6 U.S. tons), it can still be transported on a flatbed trailer. Handling numerous applications, the RM 120GO! has even opened up a new market for Rubble Master: the mining sector.

The RM 120GO! features new solutions, including a release system that ensures an even more homogeneous final aggregate in regular operation and impact plates that enable the operator to switch between recycling and natural stone applications quickly. Customers can choose between a PowerTech Plus 9.0L Tier 3/Stage III A or 286-kW (386-hp) PSS 9.0L Final Tier 4/ Stage IV engine.



The RM 100GO! crushes natural rock in Perth, Australia.



The RM 120GO! enables contractors to recycle asphalt quickly and efficiently.


## In it for the long haul

"Our reasons for using the John Deere engines are similar for both the RM 100GO! and RM 120GO!," concludes Jank. "The dynamics of a crusher require a good engine response to maintain a constant speed at highly fluctuating load. These engines deliver that."

Rubble Master sees John Deere engine distributor Hamilton AG in Lauterach as a true, long-term partner. "They always provide us with detailed technical information on the engines and about the Final Tier 4/Stage IV powertrain technology. They show great flexibility in scheduling engine approvals and warranties. We are pleased to work with John Deere and Hamilton AG and are looking forward to a long, mutually beneficial relationship."

## RM GO! SMART SERVICE TOOL

Another Rubble Master innovation is the RM GO! SMART software tool that saves customers downtime and unnecessary costs. Integrating mobile devices such as smartphones and tablets in the infrastructure of Rubble Master impact crushers, the system enables remote maintenance regardless of network coverage. All required machine parameters are displayed, allowing customers to monitor machine performance and carry out troubleshooting routines easily.

 **Distributor: Hamilton AG in Lauterach, Austria;**  
[www.drivingsolutions.ch](http://www.drivingsolutions.ch)





# CRUSHERS

**EvoQuip opens up new crushing and screening perspectives with its compact, intuitive, and agile Bison 280 jaw crusher**

For small and medium-sized contractors, crushing leftover materials on-site can make all the difference in cutting costs and increasing revenue streams. It reduces transportation and landfill expenses and creates an additional salable product for the contractor. The EvoQuip® Bison 280 jaw crusher is a profitable crusher. Its quick setup times; simple, intuitive operation; and ease of transport make this machine an ideal solution for applications, and is well-suited for beginner and experienced contractors alike.

## Aggressively flexible

The Bison 280 offers customers exceptional versatility as it can be used in a multitude of natural stone applications, including granite, river gravel, and basalt. Additionally, it can

be used in recycling applications, such as construction and demolition waste, recycled concrete, and reclaimed railway sleepers.

The compact footprint, 12.4 meters (41 feet) long x 2.4 meters (8 feet) wide x 3.2 meters (11 feet) high, makes the Bison 280 easy to transport, and makes it an ideal machine for working in urban areas or on jobsites where space is a premium.

This model boasts top-level features, such as the proven Terex 900 x 600-millimeter (36 x 24-inch) single-toggle jaw crusher. With the user-friendly hydraulic jaw adjustment system, the operator can adjust the crusher setting easily between 40- and 130-millimeter (1.6- and 5.1-inch) Closed Side Setting (CSS), without the need for tools.

## Compact impact

The Bison 280's extremely fuel-efficient and powerful direct drive system runs the crusher. Featuring a John Deere PowerTech™ E 4.5L engine, it ensures excellent performance for recycling, contracting, and quarrying businesses. "We like the simplicity of the constant speed engine; we see a lot of interest in our crushers with this engine," says Matt Dickson, global product line director for EvoQuip. "The 4.5L model provides excellent performance across the entire torque curve and helps maximize fuel economy. John Deere Power Systems gives us great support in engineering integration and installation signoff. And with spare parts readily available, even on short notice, we have so far achieved zero failures."



**How it works:** The jaw crusher reduces larger rocks through compression. The fixed jaw is the stationary breaking surface, while the movable (swing) jaw exerts force on the rock. The opening at the bottom of the crusher setting determines the size of the product. Sizes can vary between 55 to 140 millimeters (2.2 to 5.5 inches), including minus rock that contains fines that help a product compact.

# WINNING

# SUCCESS

## Go with the flow

With the 4.5L engine and a simple jaw adjustment, the operator can create a high-quality end product. The vibrating feeder automatically and optimally regulates the flow of material into the crusher. The impressive under-jaw clearance and tunneling keep that flow moving, even with the harshest recycling applications. Depending on the material being crushed, the Bison 280 has an output potential of 200 metric tons (220 U.S. tons) per hour.

This kind of innovation is becoming standard for EvoQuip. The young Terex brand, located in Dungannon, County Tyrone, Ireland, was founded in 2016,

but has very quickly made its mark. In 2018, the ambitious brand launched three new products based on feedback from the market: two impact crushers and a scalping screen. "As a brand, we aim to reinvigorate the focus on the basics of crushing and screening, helping contractors retain staff and ensure a steady workload – and income – throughout the year," says Dickson.

EvoQuip takes great care to maximize the performance, life cycle, safety, and value of its equipment. "Our help desk and aftersales service team play a major role in keeping customers productive and ensuring residual value of the machine and, of course, as do the John Deere engines."

The quick setup times, simple, intuitive operation, and ease of transport make the Bison 280 jaw crusher an ideal solution for applications.



The Bison 280 weighs 27.7 metric tons (30.5 U.S. tons) and measures 12.4 meters (40 feet) long and 3.2 meters (10 feet) wide.



# MAXIMUM IMPACT

## Prall-Tec's first tracked, mobile impact crusher provides flexible "no compromises" recycling strength for heavy-duty, hard-to-process waste

In the fast-moving crushing and recycling industry, the demand for increasingly high-quality final products means equipment must do much more than simply crush stones into smaller sizes. Impact crushers that offer flexibility across applications help contractors maximize their bottom line. Prall-Tec GmbH's tracked, mobile PT1.1 Pro impact crusher was built to break down a variety of materials into

salable products, offering ultimate flexibility sure to give contractors the upper hand.

### Flexibility means profitability

For more than 30 years, Prall-Tec has been developing, manufacturing, selling, and repairing impact and hammer mills, jaw crushers, and shredders. "By creating tailor-made solutions using the

customer's ideas and our own knowledge, we can offer the customer the perfect solution for his material and job," says Prall-Tec's managing director, Frederik Teepe. Recycling companies and quarries, in particular, rely upon the company's impact crushers—which use impact instead of pressure to crush material—to turn stone, reinforced concrete, steel, waste slag, and more into gravel and other valuable final products.



The PT1.1 Pro is the biggest and most flexible crusher in the range, ideal for handling reinforced concrete, construction waste, and other hard-to-process materials.



Performance tests showed that, with the 233-kW (317-hp) PowerTech 9.0L generator set engine, Prall-Tec was able to process 250 tons (276 U.S. tons) of material per hour, more than first calculated.

Using its long-term experience building stationary crushers, the ever-innovating company decided to develop its first mobile, tracked impact crusher: the PT1.1 Pro. "We aimed to include the same performance characteristics and flexibility in a machine that can be easily and quickly moved from one place to another," Teepe explains.

The PT1.1 Pro is the biggest and most flexible crusher in the range. With the adjustable rotor speed, large safety opening for foreign material, grinding bar, newly developed hydraulic cylinders, and robust crusher housing, it is ideal for handling reinforced concrete, construction waste, and other hard-to-process materials. An adjustable feed bar ensures optimum use of the impact bars, while an optional grinding path allows the PT1.1 Pro to be used by customers in different fields as a secondary crusher for a variety of materials. The 27-ton (30-U.S. ton) machine processes up to 250 tons (276 U.S. tons) of material per hour; the hopper holds 3.8 cubic meters (134 cubic feet) of inflow material, with feed dimensions of maximum 900 x 600 millimeters (35 x 24 inches).

### Top service all down the line

Prall-Tec approached Crushers Inc. Ltd in Leicester, UK, to build the chassis for the PT1.1 Pro and install the engine. "I saw the quality of their work and ideas," says Teepe. "We collaborated closely to optimize the whole machine."

For the PT1.1 Pro mobile impact crusher, Prall-Tec turned to John Deere engine distributor E.P. Barrus in the U.K. "We've had good experiences with John Deere engines in generators before. We knew we could rely on their performance and on E.P. Barrus' assistance during and after the installation process. However, we did have one particular challenge. Our prototype was sold quickly, so we needed the engine in a hurry to move forward with further tests and demos," recalls Teepe.

### "We can offer the customer the perfect solution for his material and job."

— Frederik Teepe, Prall-Tec's managing director

And Barrus responded quickly, proposing a 233-kW (317-hp) John Deere PowerTech 9.0L generator set engine, which they converted to 24 Volt to meet the required specifications. John Day, general manager Industrial Division at E.P. Barrus, explains the engine choice: "This Tier 3/Stage III A constant-speed engine is a simple and cost-effective solution for industrial applications that do not require variable-speed engines."

E.P. Barrus also assisted with the installation. "The Barrus team was very patient with us, we had so many questions!" comments Teepe. "They were with us all the way, from engine choice to optimizing calibration to final test runs. Even now, as we are planning

more machines, their support couldn't be better."

### Reliability and global support

Day outlined the company's commitment to helping original equipment manufacturers (OEMs) deliver powerful equipment. "John Deere diesel engines offer recycling and surface mining/quarry operations the same advantages that have made the brand famous in the construction sector: uninterrupted power, ultimate reliability and low cost of ownership. They are driving crushers, excavators, loaders, dumpers, generator sets, and air compressors worldwide," he says. "These characteristics made them ideal for powering the PT1.1 Pro. After completing several performance tests with the 9.0L engine, Prall-Tec was able to achieve even greater output than first calculated."

Teepe concludes: "The fuel efficiency of the John Deere engines is an advantage, of course, but what's really critical is reliability: Our customers need their crusher to run every day without problems, wherever they are located," he said. "Machine downtime is extremely costly for them. I was amazed to see the extent of John Deere's product support network; they are literally everywhere. This is very reassuring, for us and for our customers!"

With two PT1.1 Pros in the field, a third in production, and new machines already being planned, there is no doubt that Prall-Tec and its crushers will continue to offer maximum impact for the recycling industry!



## A Strong Foundation



A solid foundation is key for a strong building. And the strength of a structure's foundation largely depends on the physical properties of the subsoil. This is where the GEORIG 605 multipurpose geotechnical drill rig, built by Geotech AB, comes in. Powered by John Deere PowerTech™ PSS 4.5L Final Tier 4/Stage IV industrial engine, it enables contractors to make a proper study of the soil and rocks so they can decide on their foundation strategy.

Geotech AB in Askim, Sweden, began producing geotechnical drilling rigs in the 1970s to meet the evolving equipment needs of geotechnical investigations. The distinctive soft and sensitive characteristics of the local clay deposits led to the development of geotechnical methods such as Swedish Weight Sounding and Nilcon Vane Testing. "We started building drill rigs that support these methods, working with our customers to ensure that they are efficient, ergonomic, and user-friendly," says Mats Lundmark, deputy CEO of Geotech.

### Fully equipped for regional geotechnical investigation

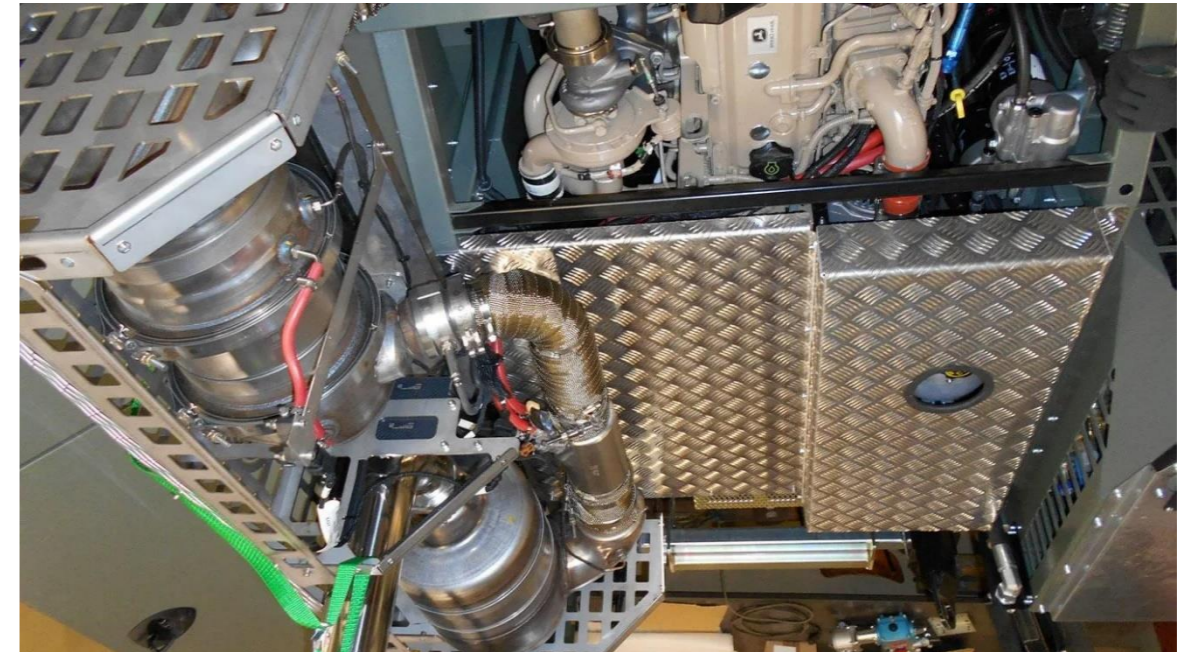
At the midpoint of the range is the GEORIG 605 multipurpose drill rig, designed for contractors in Sweden, Norway, and Finland. It is fully equipped for most of the geotechnical investigation methods used in the region, including Norwegian Total Sounding, Swedish Weight Sounding, dynamic sounding, Cone Penetration Test (CPTu), Nilcon Vane Testing, and Rotary Percussion Sounding, as well as being equipped for sampling. The GEORIG 605 has a maximum pushing force of 70 kiloNewtons (15.7 pound-force), and a maximum pulling force of 130 kiloNewtons (29 pound-force). Drill rig innovation and automation.

Designed to offer the operator a convenient and efficient working environment, the rig comes with standard sensors for feed force, rotation, and depth. Optional sensors include torque, rotation pressure, hammer pressure, flushing media pressure, and flushing media flow. With two rotary units on the same yoke, switching from one to the other takes only seconds.

Several of the survey methods are fully or partly automated, while Geotech's innovative design nearly eliminates the friction between the yoke and the mast for increased accuracy and resolution in the feed force parameter.

## Reliable power for long work hours

To maximize productivity, contractors need rigs that can operate continuously for long hours. That's why Geotech chose the PSS 4.5L industrial engine to power the 605 rig and its hydraulic functions. "It is very powerful for a 4-cylinder engine," Lundmark says. "It performs consistently, is fuel-efficient and quiet, even when operating at full capacity."



Swedish John Deere engine distributor Diesel Power AB delivered the first PSS 4.5L power pack customized in collaboration with the engineers at Geotech to ensure the best possible fit in a rig with limited space. Since then, Geotech has taken delivery of 17 more John Deere Stage IV engines.

## Strong support for a good foundation

"Sweden, Norway, and Finland are key markets for us, and John Deere has a great support network in this region. We also know that Diesel Power has John Deere engines to match our wide range of drill rigs. They are an excellent partner to help us meet our customers' needs for reliability and availability, and we look forward to expanding our cooperation," Lundmark concludes.

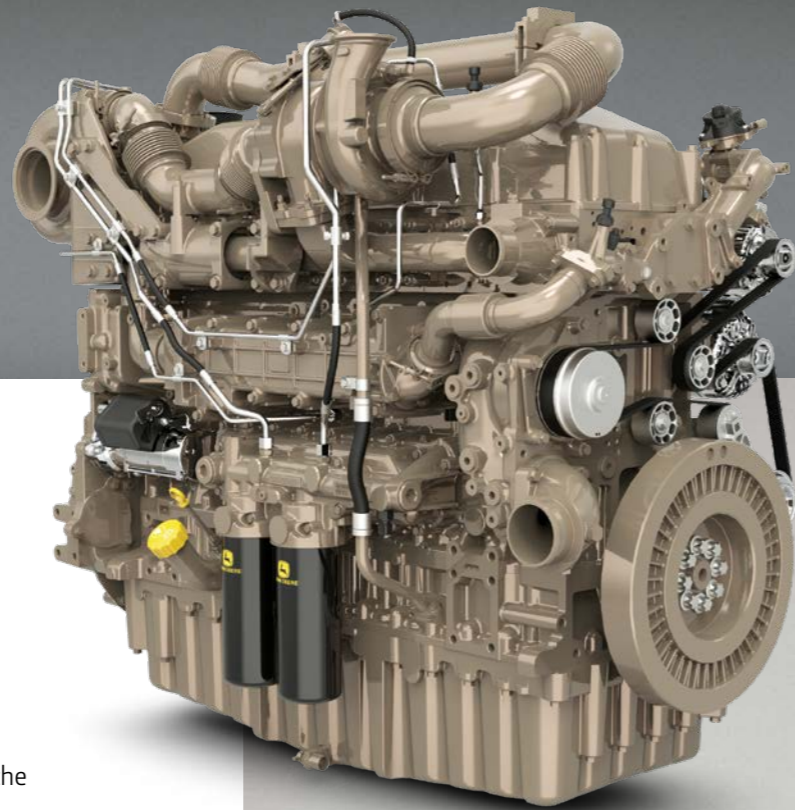


# JD18 Engine

522 – 677 kW (700 – 908 hp)



## Expanded power



### John Deere power range extended.

New to the John Deere lineup, the JD18 extends the rated power range to 522 – 677 kW (700 – 908 hp).

### Uptime-focused controls.

Improved John Deere model-based controls offer better diagnostic capabilities, enabling future prognostics and the ability to target the source of engine performance issues.

### Designed for extreme durability.

The JD18 features a bedplate design, providing structural benefits for extreme durability. It is built for 20,000 hours of operation with the ability to be rebuilt two times.

### Serviceability and repairability.

The JD18 engine was designed with ease of service and repair in mind. Hydraulic lash adjusters offer a maintenance-free valve train, eliminating the need to reset lash.

### Fluid management.

The JD18 features new combustion technology which allows John Deere to offer an engine in the 522 – 677 kW (700 – 908 hp) power range without aftertreatment. Without the need for DEF, the customer has one less fluid to manage. The high-pressure common-rail (HPCR) fuel system allows the engine to deliver optimized fluid consumption. And the Diamond Like Coating (DLC) improves biodiesel compatibility and system robustness.

### Reliability through innovation.

The new combustion technology offers a simplified air system, with fixed and wastegate turbos, allowing the engine to meet emissions requirements without applying aftertreatment. This feature provides simplified engine integration and a compact package size.

### Auxiliary power.

It features a rear gear train for excellent direct power and quiet operation. With options for up to two rear auxiliary drives, the JD18 produces a total of 902 Nm (665 lb-ft) maximum torque.

JD18	
<b>Performance data</b>	
Rated power	522 – 677 kW (700 – 908 hp)
Rated speed	1900 rpm
Peak torque	4250 Nm (3135 lb-ft) @ 1400 rpm
Low idle	800 rpm
Off-level capability	35°/45°
Service interval	750 hours
<b>General data</b>	
Type	6-cylinder, in-line, 4-stroke, water-cooled
Bore & stroke	148 x 174 mm (5.8 x 6.8 in)
Fuel system	Electronic high-pressure common-rail (HPCR)
Aspiration	Turbocharged, air-to-air aftercooled
Turbo	Series turbochargers (fixed, wastegate)
EGR	External cooled exhaust gas recirculation (EGR)
Dimensions (L* x W x H)	1750 x 920 x 1507 mm (69 x 36 x 59 in)
Weight	2119 kg (4672 lb)
Emissions level	EPA Final Tier 4/EU Stage V
Aftertreatment	None

Preliminary information. \*Engine length without fan drive. Specifications are subject to change. Dimensions may vary based on options selected.

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## Concrete Relationships



Miller Formless of McHenry, Illinois, celebrates its golden anniversary by reflecting on a reputation as solid as the concrete barriers molded by its slipform pavers.

Miller Formless slipform pavers have molded many miles of curbs, gutters, and barrier walls over the past five decades. Taking credit for this work is a trio of slipform pavers that have been product mainstays since their initial introduction. The ever-popular M-1000 curb and gutter machine was developed in 1975; the M-8100 made its debut in 1981; and the M09900 followed in 1988.

While the model numbers have remained the same through the years, the paver's capabilities only continue to improve. Miller Formless is a company that leans on the experience of seasoned employees and millennial talent to lead the company into the future.

Lead engineer Lucas Matthys is one of those millennials, and he's been working closely with his team to enhance the safety and efficiency of the company's slipform pavers. One major advancement includes the addition of operator remote control on both the M-1000 and M-8100. Operators can use the remote control to load and unload the pavers during transport to attach concrete molds.

Another recent improvement includes the addition of a control system to make 3D stringless paving possible. Just as the name implies, stringless technology replaces the traditional stringline with an electronic tracking process that controls the horizontal and vertical operation of the slipform paver. More contractors are adopting stringless technology to reduce labor and time required to stake out jobsites with traditional stringlines and pins.



Just as slipform technologies advance, so do the technologies and capabilities of the John Deere industrial engines that have powered Miller Formless machines for decades.

"John Deere engines have powered our slipform pavers for about 40 years, and exclusively for 25 years," says Darick Franzen, vice president of business development for North America. "That's some pretty good history for both companies." Superior Diesel, established in 1977, is a longtime distributor of John Deere engines and has supported Miller Formless through each rising tier of emissions standards. This includes offering engineering support and designing custom engine packages.

Last year, Miller Formless transitioned to Final Tier 4 engines, installing PowerTech™PWL 4.5L industrial engines in the M-1000 and PowerTech PSL 4.5L industrial engines in the M-8100 and M-8800. Superior Diesel worked closely with Franzen's engineering team to reduce the height of the engines so they would fit under the existing hood.

"We had to move some components, but Superior Diesel was a big help in that," says Lucas Matthys. "They gave us 3D models and were willing to make modifications to the engine package."

Tod Smith, vice president of sales for Miller Formless, has been a witness to the performance of the John Deere engines. "I spend a lot of time in the service department, and I have huge confidence in John Deere products," says Smith. "Previously we used the John Deere 4045 series engine, and it's a very proven power source. While the Final Tier 4 technology is new to our brands, it's not new to John Deere. It's proven out long before we put it into our machines."

Superior Diesel provides Miller Formless with a "drop-in ready" industrial power unit, complete with a John Deere-manufactured Funk pump drive. Smith says the pump drives have proven themselves over the years. "We've used other pump drives and had issues with bearing failures and splines wearing out. The Funk pump drives are very simple and very reliable; I wouldn't go with anything else, to be honest with you."

Slipformers continue to make inroads into the international marketplace. As Miller Formless looks to broaden its global presence, John Deere service and support grow increasingly.



"When new customers ask what we have for engines, we tell them that we're using John Deere, and they find a certain amount of comfort in that because they know they have good support through the John Deere dealer network," says Smith.

The relationship that's formed between the two companies sets them up for success in the years to come, says Franzen. He also recognizes the many loyal customers who continue to operate John Deere-powered slipform pavers after many years.

"We have machines that are 20-plus years old that are still running today on the interstates and roads of America and around the globe. They are the

builders of our world's road infrastructure," says Franzen. "The fact that they use our products makes us pretty proud."

Franzen is also proud of the employees who will carry Miller Formless into the future.

"We are a very entrepreneurial group," he says. "Fifty years from now, we still want to be leaders in slipform concrete paving. That desire will never go away." While the Final Tier 4 technology is new to our brands, it's not new to John Deere. It's proven out long before we put it into our machines. Tod Smith, vice president of sales, Miller Formless

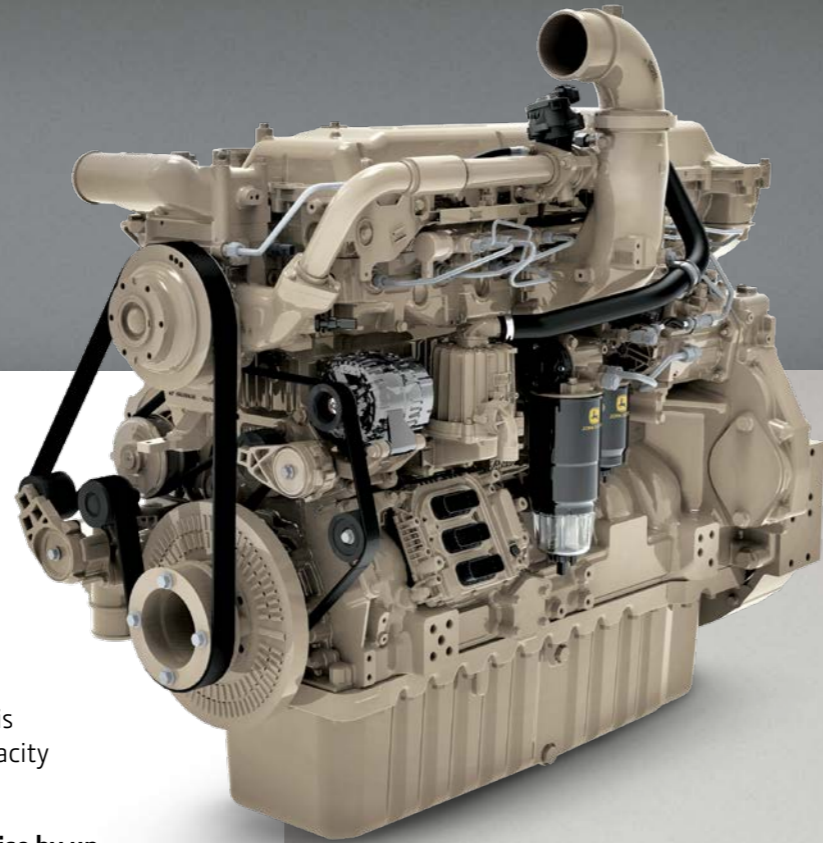


# JD14 Engine

300 – 510 kW (400 – 684 hp)



*Proven  
and ready*



## Solid performance.

The JD14 engine provides more power per liter than 13.5L configurations. With **14% higher power and 11% increased peak torque**, it allows your machines to **work faster, lift more, and operate more efficiently** than ever before. This engine has been shown to increase harvesting capacity by up to 45% on John Deere X Series Combines.

The JD14 features a rear gear train that **reduces noise by up to 3 decibels** compared to the 13.5L engine. That's half as loud, greatly improving operator comfort.

## Easy to maintain. Low service costs.

John Deere engineers streamlined common maintenance steps on the JD14 engine. **Hydraulic lash adjusters decrease valve wear** and provide longer engine life while eliminating valve lash maintenance. An **advanced control system analyzes sensor data** to keep operators working without interruption.

**Prognostic capabilities** are built into the engine to help users identify potential problems and schedule service prior to downtime.

**Proven John Deere cooling packages** are available with JD14 engines for easy, low-cost integration.

## Field proven.

John Deere JD14 engines have been working more than **47,000 hours at high load** in a variety of applications, including John Deere combines and sugar cane harvesters. Likewise, they've demonstrated more than **14,000 hours of torque and lugging power** in tractor operations. So, when you install a John Deere JD14 engine in your application, you can be confident in the performance it delivers.

Many of these operating challenges were even more extreme than typically confronted in the field: repeating **high to low loads** to confirm thermal durability, **block loading** to show strength, and **ultra-low idling** to demonstrate oil pressure capabilities.

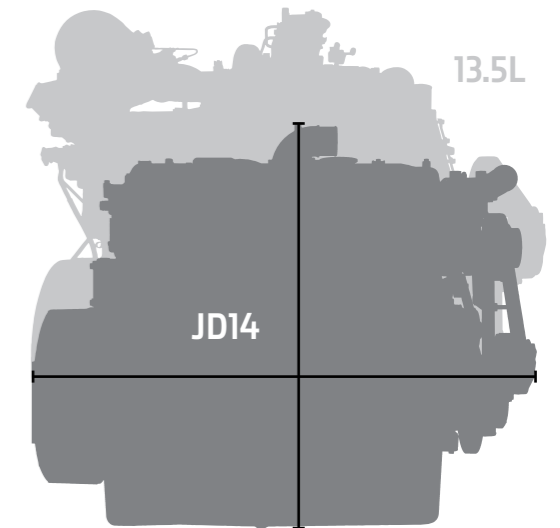
## Operational flexibility.

The **compact JD14 engine** is shorter and narrower to fit in more machines with minimal reconfiguration.

It provides up to **130 kW (174 hp)** through **forward auxiliary connections** and via an **integrated rear SAE-C PTO**.

It has **common connection points** across different emissions configurations for the U.S. and Europe and is available in **single- and dual-turbo configurations** to maximize packaging flexibility.

Our **durable inline aftertreatment** provides unified packaging to reduce connection points and improve reliability. It is available with a DPF for Stage V applications and with **no DPF for Final Tier 4 applications**.



JD14	
<b>Performance data</b>	
Rated power	300 – 510 kW (400 – 684 hp)
Rated speed	2100 rpm
Peak torque	3050 Nm (2250 lb-ft) @ 1550 rpm
Continuous rating	436 kW (585 hp)
<b>General data</b>	
Type	6-cylinder, in-line, 4-stroke, water-cooled
Bore & stroke	132 x 165 mm (5.2 x 6.5 in)
Fuel system	Electronic high-pressure common-rail (HPCR)
Aspiration	Turbocharged, air-to-air aftercooled
Turbo	Single (fixed) or series (fixed, wastegate)
EGR	External cooled exhaust gas recirculation (EGR)
Dimensions (L* x W x H)	1446 x 890 x 1366 mm (57 x 35 x 54 in)
Weight	1468 kg (3237 lb) single turbo 1521 kg (3353 lb) series turbo
Emissions level	EPA Final Tier 4/EU Stage V

Preliminary information. \*Engine length without fan drive. Specifications are subject to change. Dimensions may vary based on options selected.

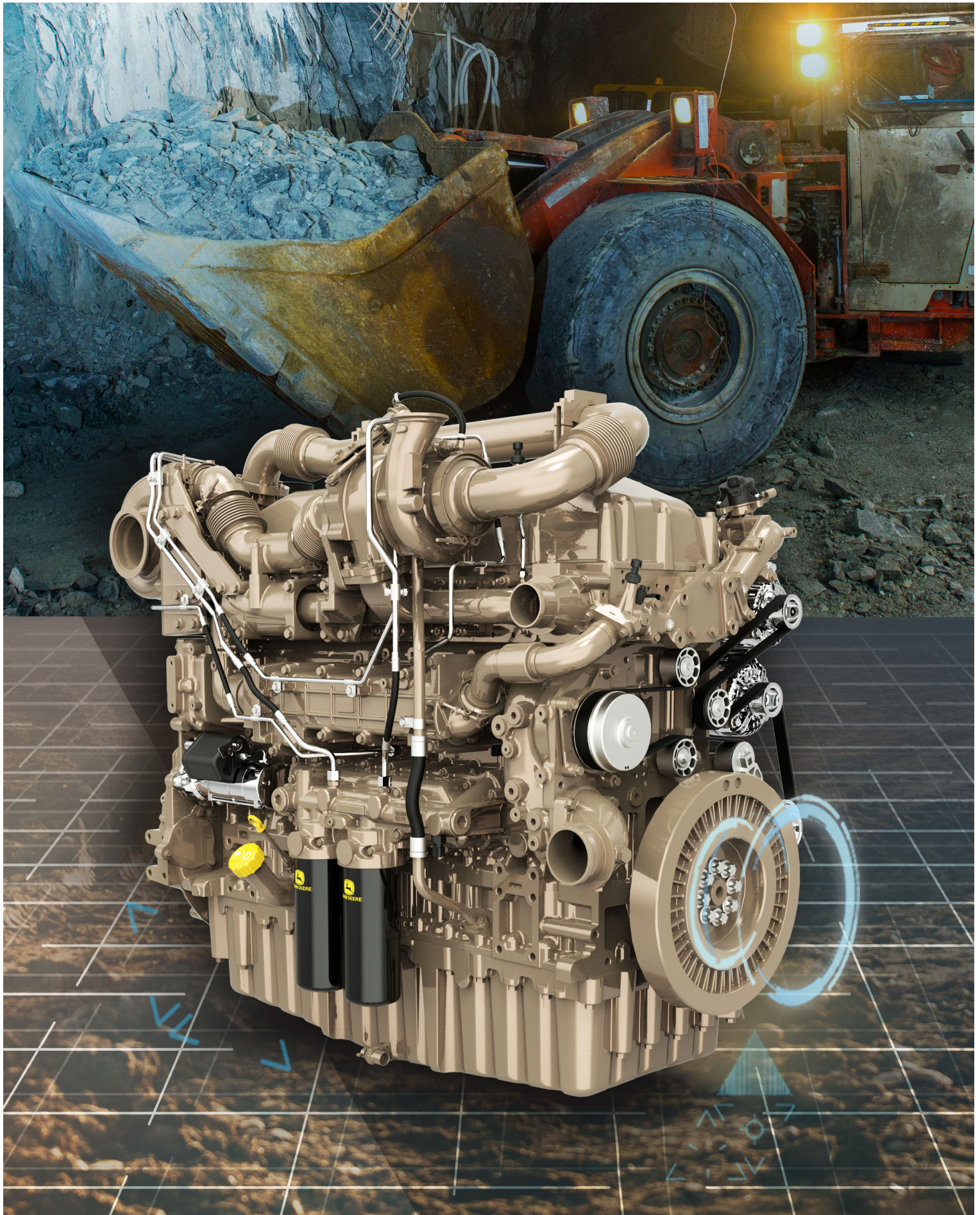
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**John Deere - Supported by Barrus**

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