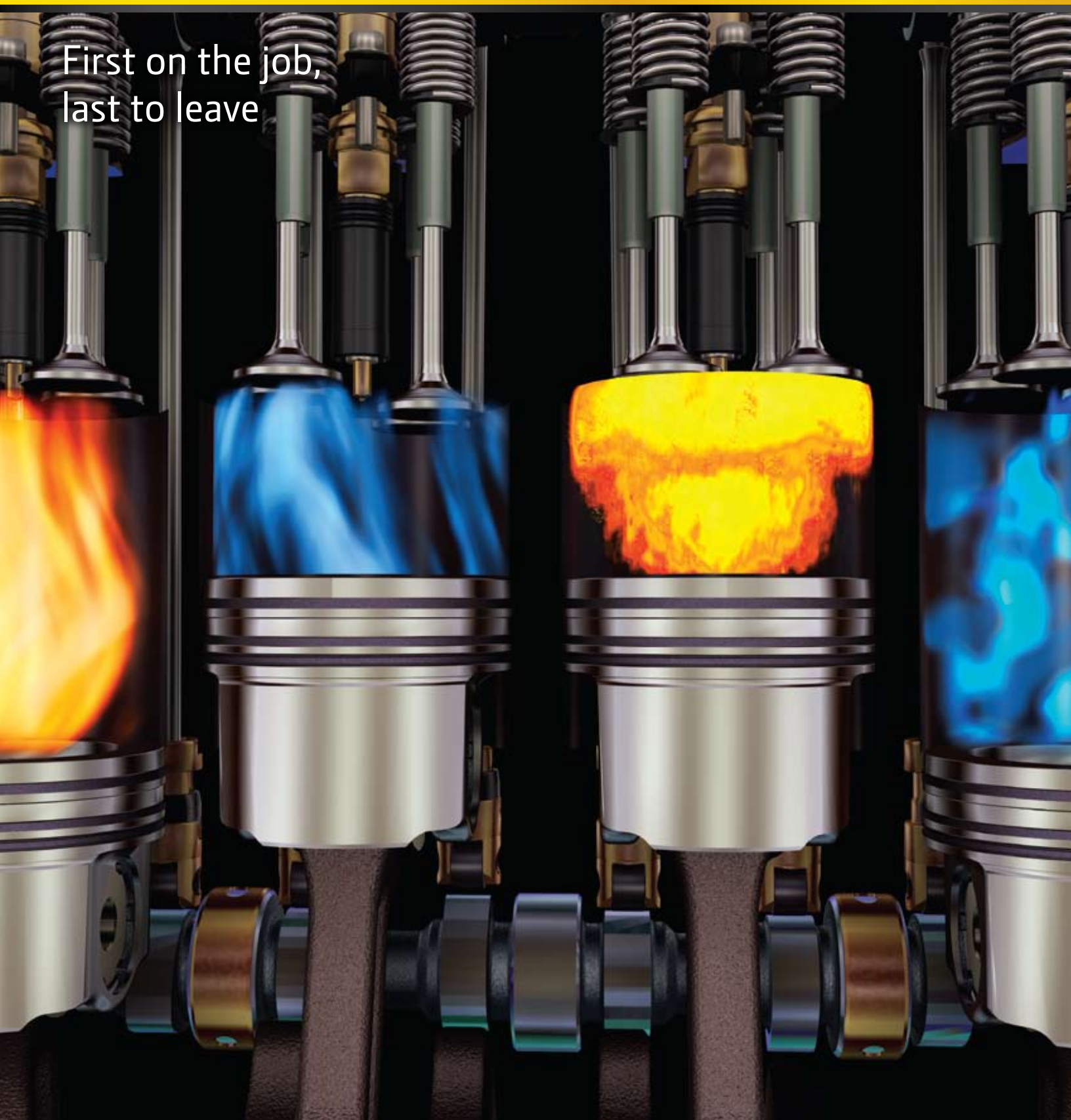
Off-Highway Diesel Engines

Interim Tier 4/Stage III B

JOHN DEERE



Off-highway leadership where it counts the most

Off-highway leadership. You can expect more from John Deere — a company that built its name powering off-highway equipment in rugged applications. You'll receive more when you run with the John Deere family of PowerTech™ Interim Tier 4/Stage III B engines.

Job-proven performance

We have an unparalleled track record for providing hard-working, reliable, and efficient engines that don't let you down, even in the most extreme conditions. Whatever you throw at them — vibration, extreme temperatures, dust — John Deere engines keep working day after day.

Interim Tier 4/Stage III B engine identification for engines 56 kW (75 hp) and above.

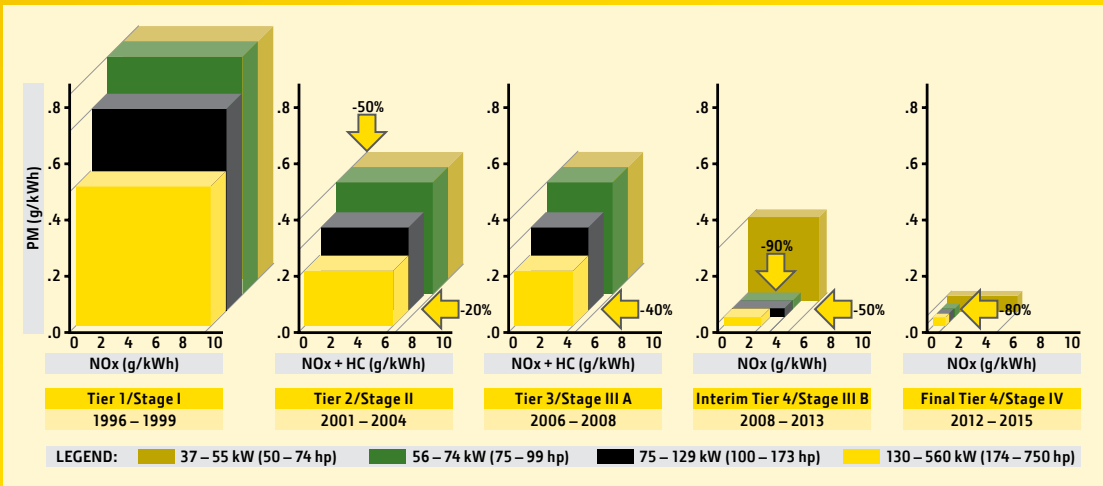
PowerTech PSX 6.8L

- **Displacement**
- **Exhaust Filter**
- **Turbocharger**
  - **V** – Variable Geometry Turbocharger (VGT)
  - **S** – Series Turbocharging
  - **W**– Wastegate Turbocharging
- **Technology**
  - **P** – Plus

Biggest emissions reductions yet

The move to Interim Tier 4/Stage III B emissions regulations is unquestionably the most significant to date. The regulations call for a 90 percent reduction in particulate matter (PM) along with a 50 percent drop in nitrogen oxides (NOx). Final Tier 4/Stage IV emissions regulations, which will be fully implemented by 2015, will take PM and NOx emissions to near-zero levels.

EPA and EU nonroad emissions regulations: 37 – 560 kW (50 – 750 hp)

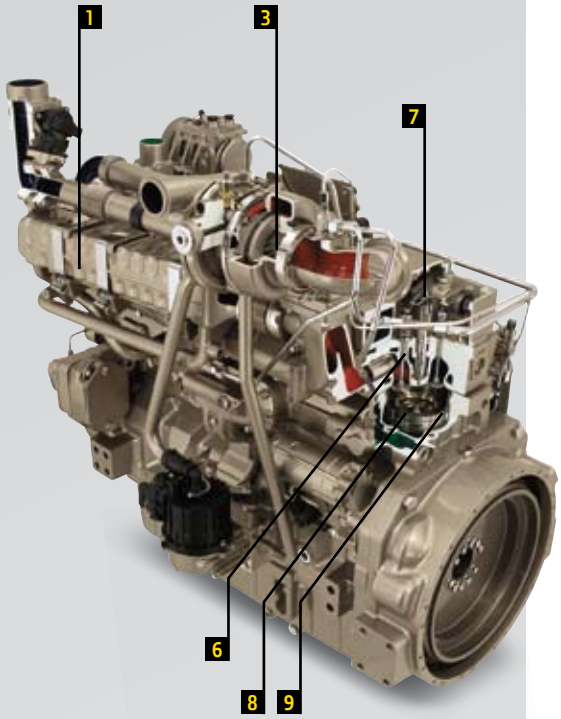


NOx – Nitrogen oxides, which react in the atmosphere with hydrocarbons
HC – Hydrocarbons, a by-product of combustion
PM – Particulate matter, a non-gaseous product of combustion

Industrial Engine Power Ratings

Engine	Power Rating	Turbocharging	Exhaust Filter	Dosing	Power Range
PowerTech M 2.4L	36 kW (48 hp)	Fixed	No	NA	
PowerTech E 2.4L	45 – 49 kW (60 – 66 hp)	Fixed	No	NA	
PowerTech M 4.5L	55 kW (74 hp)	Fixed	No	NA	
PowerTech PWX 4.5L	56 – 91 kW (75 – 122 hp)	Wastegate	Yes	Internal	
PowerTech PVX 4.5L	93 – 129 kW (125 – 173 hp)	VGT	Yes	Internal	
PowerTech PVX 6.8L	104 – 129 kW (140 – 173 hp)	VGT	Yes	Internal	
PowerTech PVX 6.8L	138 – 187 kW (185 – 250 hp)	VGT	Yes	External	
PowerTech PSX 6.8L	168 – 224 kW (225 – 300 hp)	Series	Yes	External	
PowerTech PVX 9.0L	187 – 224 kW (250 – 300 hp)	VGT	Yes	External	
PowerTech PSX 9.0L	242 – 317 kW (325 – 425 hp)	Series	Yes	External	
PowerTech PSX 13.5L	298 – 448 kW (400 – 600 hp)	Series	Yes	External	

kW 0 37 75 112 149 186 224 261 298 336 373 410 448
hp 0 50 100 150 200 250 300 350 400 450 500 550 600



Many of the engine features proven with our PowerTech Plus engines have been enhanced for Interim Tier 4/Stage III B. We continue to improve performance while meeting more stringent emissions regulations.

1. **Increased levels of cooled EGR lower exhaust temperature and reduce NOx.**
2. **Air-to-air aftercooled aspiration lowers in-cylinder temperatures, reduces NOx, and increases power density.**
3. **VGT varies exhaust pressure based on load and speed to ensure proper EGR flow and provide increased performance.**
4. **Low-pressure fuel system with auto prime feature eliminates hand priming and hard starting. It provides sensors that detect water in fuel and low fuel pressure.**
5. **Faster electronic controls are integrated to manage the exhaust filter as well as the fuel system, air-to-fuel ratio, VGT output, and cooled EGR.**
6. **4-valve cylinder head increases efficiency, power, and torque.**
7. **Electronic unit injector (13.5L) and HPCR (4.5L, 6.8L and 9.0L) fuel systems provide increased fuel pressures for more efficient combustion and PM reduction.**
8. **Low-friction, single-piece steel piston improves fuel economy, reduces emissions, and increases durability (9.0L and 13.5L).**
9. **Directed top liner cooling contributes to improved oil control and increased durability (9.0L and 13.5L).**
10. **500-hour oil change intervals.**

Built on proven PowerTech Plus technology

John Deere has always been ahead of the game when it comes to meeting emissions regulations. Interim Tier 4/Stage III B is no exception. We pioneered the use of many advanced technologies with our Tier 3/Stage III A engines and proved their performance in off-highway applications. This gives us a head start for fuel economy as well as delivering higher power bulge, more torque rise, and faster transient response time.

First in the field

John Deere was the first engine manufacturer to take advantage of cooled exhaust gas recirculation (EGR) and variable geometry turbocharger (VGT) technologies in off-highway applications, introducing them with Tier 3/Stage III A emissions regulations. Our engines have a proven record of emissions reduction, best-in-class fuel economy, and rugged reliability. By choosing EGR first, we proved that we could meet emissions regulations and deliver high performance without the continuing cost and inconvenience of selective catalytic reduction (SCR). When it comes to off-highway performance, other engine manufacturers can only follow in our tracks.

Fuel efficient

John Deere engines continue to provide the best total fluid economy and value with a simple, single-fluid solution. Our cooled EGR engines operate efficiently with ultra-low sulfur diesel (ULSD) as well as biodiesel blends, providing optimal performance and fuel-choice flexibility.

John Deere PowerTech Plus engines already lead the market for fuel efficiency. Other engine manufacturers are just now adopting technologies such as cooled EGR and SCR for off-highway applications. So even if some may claim improved fuel economy for IT4, we expect to maintain our leadership position.

You have to take into account the total fluid consumption of engines equipped with SCR. Considering you need approximately one gallon of diesel exhaust fluid (DEF) for every 20 gallons of diesel fuel, and the fact that DEF can cost as much as or more than diesel fuel — our single-fluid solution is the right choice now.

Off-highway durability

The jobs that John Deere PowerTech engines tackle every day are as varied as the equipment they power. That's why John Deere Interim Tier 4/Stage III B engines integrate many technologies designed to meet the unique needs of off-highway equipment. PowerTech 4.5L, 6.8L, 9.0L, and 13.5L engines use our proven PowerTech Plus technology, which includes 4-valve cylinder heads, cooled EGR, VGT, air-to-air aftercooling, high-pressure fuel systems, and wet-type cylinder liners.

Smart exhaust filters

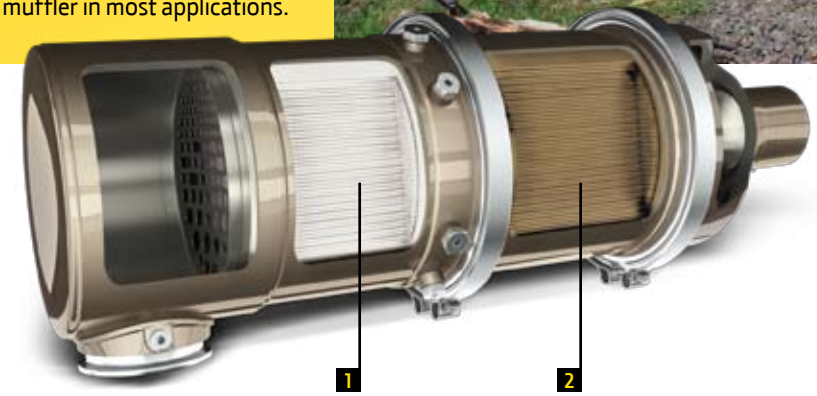
John Deere exhaust filters are designed to meet the demands of rugged off-highway applications. Our dedicated exhaust technology team explored all aspects of exhaust filter science to develop the John Deere solution. Because we manage the design of the exhaust filter, as well as the engine and electronic controls, we are able to integrate and optimize all components and vehicle systems for best performance.

PowerTech Interim Tier 4/Stage III B engines 56 kW (75 hp) and above utilize a catalyzed exhaust filter that contains a diesel oxidation catalyst (DOC) and a diesel particulate filter (DPF). Under normal operating conditions, the DOC reacts with exhaust gases to reduce carbon monoxide, hydrocarbons, and some particulate matter (PM). The downstream DPF forces exhaust gases to flow through porous channel walls, trapping and holding the remaining PM. Trapped particles are eventually oxidized within the DPF through a self-activating cleaning process called passive regeneration, utilizing exhaust heat created under normal operating conditions.

Exhaust temperature management (ETM)

Here's where John Deere exhaust filters really show their intelligence. If passive regeneration cannot be achieved due to low temperature, load, or speed, then PM is removed using active regeneration — an automatic cleaning process controlled by the exhaust temperature management system. ETM increases the DOC inlet temperature by fine-tuning the amount of air intake, adjusting injection timing, and controlling idle speeds. At just the right moment, a small quantity of fuel is injected into the exhaust stream to create the heat needed to oxidize the PM trapped in the DPF. ETM also increases the durability of the exhaust filter by controlling warm-up and cool-down periods.

In most cases, the regeneration process does not have an impact on machine operation or require operator involvement. Another benefit of the exhaust filter is that it replaces the muffler in most applications.



1 Diesel oxidation catalyst (DOC)

2 Diesel particulate filter (DPF)

The PowerTech M and PowerTech E engine lineups meet emissions regulations without the addition of cooled EGR or an exhaust filter.

PowerTech E engine shown

PowerTech M

The simplest of the PowerTech family, these engines have 2-valve heads, fixed geometry turbochargers, and mechanical fuel systems. PowerTech M engines are perfect for less demanding applications. Their mechanical controls are simple to operate and maintain.

PowerTech M Engines	
PowerTech M 2.4L	36 kW (48 hp)*
PowerTech M 4.5L	55 kW (74 hp)**

*Meets Interim Tier 4 and Stage III A emissions regulations.
**Meets Interim Tier 4 emissions regulations.

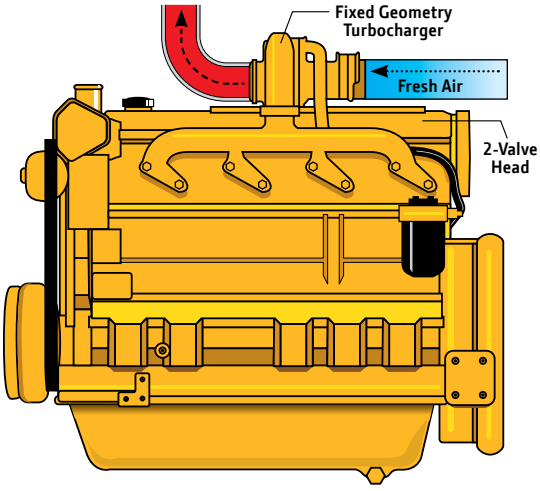
PowerTech E

These engines also have 2-valve heads and fixed geometry turbochargers, but introduce full-authority electronic controls, more sophisticated fuel delivery and electronic unit pump fuel systems.

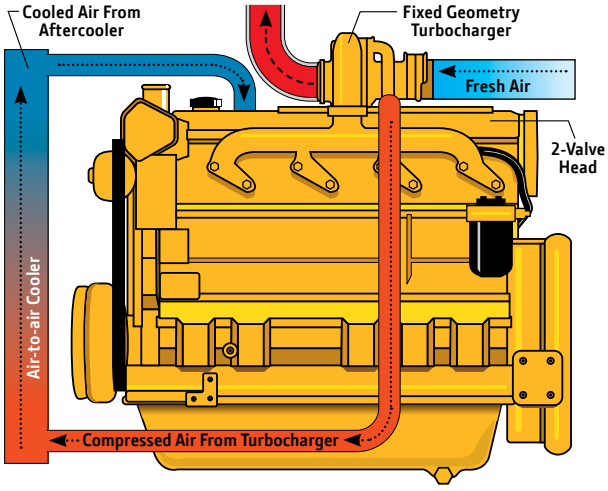
PowerTech E Engines	
PowerTech E 2.4L	45 – 49 kW (60 – 66 hp)*

*Meets Interim Tier 4 and Stage III A emissions regulations.

PowerTech M technology



PowerTech E technology



Fixed geometry turbocharger

Fixed geometry turbochargers are sized for a specific power range and optimized to provide excellent performance across the entire torque curve. They are also designed to maximize fuel economy between the engine's rated speed and peak torque.

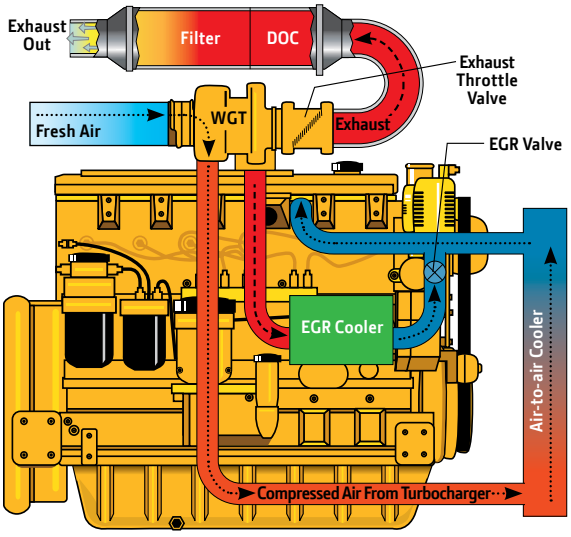
PowerTech PWX

Tried-and-true performance

Equipment owners who want straightforward, cost-effective power rely on PowerTech PWX 4.5L engines. These compact engines blend advanced emissions-control technology with simple and reliable wastegated turbocharging to maintain transient response and peak torque in all operating conditions. Their 4-valve cylinder heads also provide excellent airflow for greater low-speed torque. Multiple rated speeds let you fine-tune your engine selection to reduce noise and improve fuel economy.

PowerTech PWX Engines	
PowerTech PWX 4.5L	56 – 91 kW (75 – 122 hp)

PowerTech PWX Interim Tier 4 technology



Wastegated turbocharger

Wastegated turbochargers are designed to develop more airflow at lower engine speeds to improve low-speed torque. The wastegate control device bleeds off a portion of the exhaust flow at higher engine speeds. Wastegated turbos deliver improved transient response and higher peak torque without compromising engine envelope size. They also provide the lowest installed cost across a given power range.

PowerTech PVX

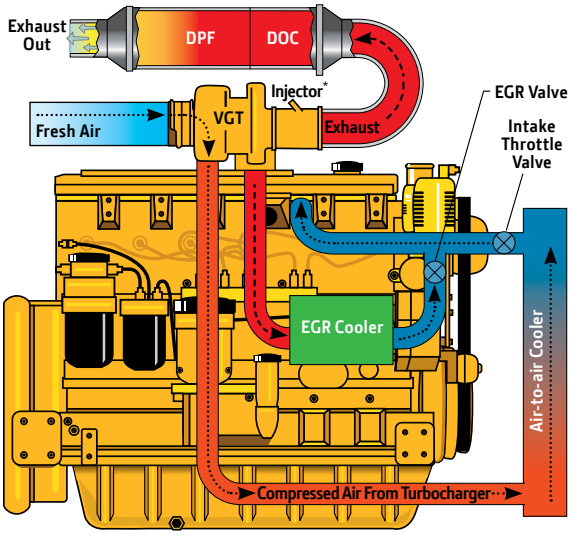
Improved performance and efficiency

When you need unparalleled performance, PowerTech PVX 4.5L, 6.8L, or 9.0L engines are the perfect fit for your application. These displacements utilize our proven PowerTech Plus technology with variable geometry turbocharging (VGT) to improve performance and combustion efficiency, reduce emissions, and increase fuel economy.

Engines below 130 kW (174 hp) use an in-cylinder dosing system for active regeneration, while larger engines use an external dosing system.

PowerTech PVX Engines	
PowerTech PVX 4.5L	93 – 129 kW (125 – 173 hp)
PowerTech PVX 6.8L	104 – 129 kW (140 – 173 hp)
PowerTech PVX 6.8L	138 – 187 kW (185 – 250 hp)
PowerTech PVX 9.0L	187 – 224 kW (250 – 300 hp)

PowerTech PVX Interim Tier 4 technology*

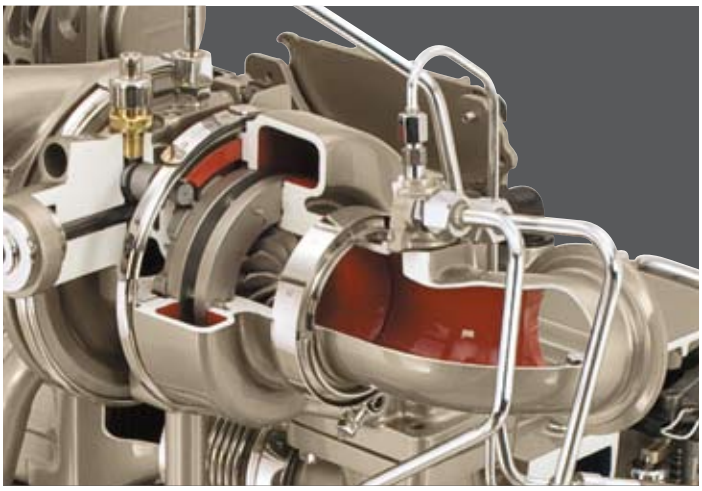


*For engines 130 kW (174 hp) and greater.

Variable geometry turbochargers

We know VGT technology. The performance of our PowerTech Plus Tier 3/Stage III A engines proved it. That's why we decided to continue this technology with our Interim Tier 4/Stage III B engine lineup.

VGT tailors the amount of recirculated exhaust gas that mixes with the fresh air. Precise electronic controls open or close the variable vanes in the turbocharger depending on engine load and speed. The optimized airflow generates more boost while maximizing low-speed torque, transient response, peak torque, and fuel economy.



VGT delivers power and efficiency

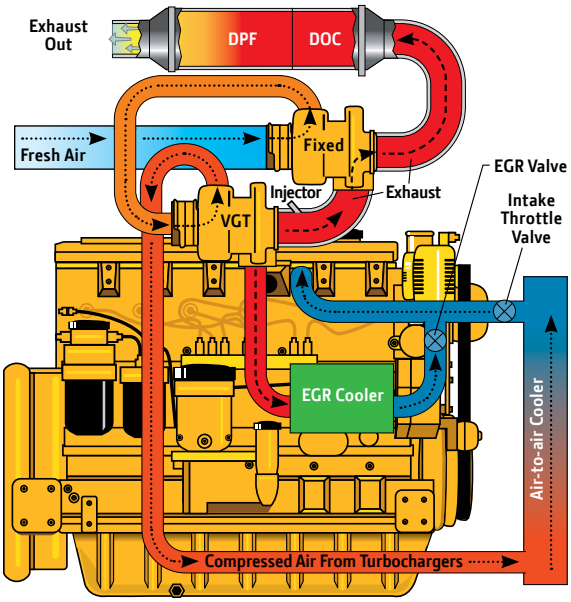
PowerTech PSX

Ultimate performance and responsiveness

For ultimate performance in off-highway applications that take you up and down steep grades at high altitudes. Or when you simply want maximum transient response and low-speed torque. A PowerTech PSX 6.8L, 9.0L, or 13.5L engine is exactly what you need. Along with proven PowerTech Plus technology, all three displacements feature series turbochargers that improve performance and responsiveness.

PowerTech PSX Engines	
PowerTech PSX 6.8L	168 – 224 kW (225 – 300 hp)
PowerTech PSX 9.0L	242 – 317 kW (325 – 425 hp)
PowerTech PSX 13.5L	298 – 448 kW (400 – 600 hp)

PowerTech PSX Interim Tier 4 technology

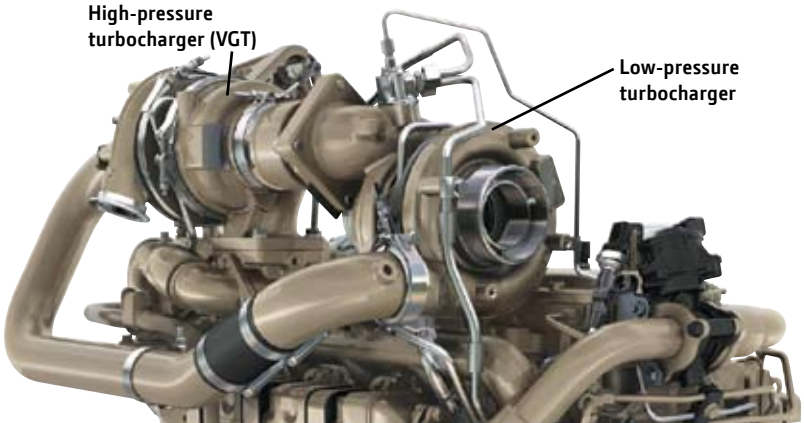


Two turbochargers give you more

In series turbocharging, fresh air is drawn into the low-pressure turbocharger (fixed geometry), where air pressure is boosted. This pressurized or boosted air is then drawn into the high-pressure turbocharger (VGT), where air intake pressure is further raised. The high-pressure air is then routed to an air-to-air aftercooler, where the air is cooled and then routed to the engine's intake manifold.

By splitting the compression of the charge air between two turbochargers, both can operate at peak efficiency and at slower rotating speeds. This lowers stress on turbocharger components and improves reliability. Series turbocharging also delivers higher power density, improved low-speed torque, and improved high-altitude operation.

Series turbochargers



Clean and convenient

Cleaner emissions

John Deere has determined that cooled EGR, combined with exhaust filter technology, is the right choice to meet Interim Tier 4 (IT4) emissions regulations because it is simple, more proven, and more cost-effective.

NOx reduction through cooled EGR. During certain conditions of engine operation, the EGR valve opens and measured amounts of cooled exhaust gas are routed back into the intake manifold and mixed with the incoming fresh air. Since this process removes oxygen from the air, the exhaust temperatures in the combustion process are lowered and the levels of NOx are reduced.

PM reduction through exhaust filters. The DPF traps and holds particulates in the exhaust stream. During normal operating conditions (temperature, load, and speed) the engine's natural heat breaks down the PM and cleans the exhaust filter. An exhaust filter also has the benefit of replacing the muffler in most applications.

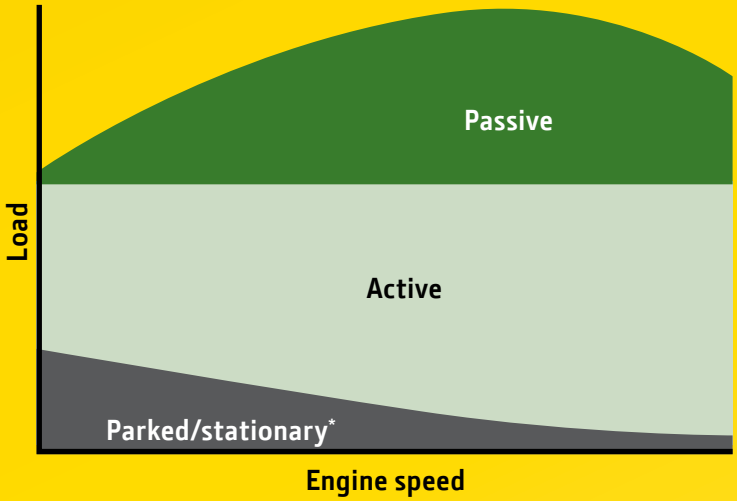
Convenient exhaust filter cleaning

Our exhaust filter is integrated into the engine design to provide a convenient and reliable solution. The engine control unit (ECU) and exhaust temperature management (ETM) system work together to continuously regenerate, or clean, the exhaust filter.

Passive regeneration. John Deere engines and exhaust filter components are designed for uninterrupted operation using passive regeneration, a natural cleaning process. It occurs during normal engine operating conditions, which is the most fuel-efficient way to clean. Passive regeneration does not impact machine operation or require operator involvement.

Active regeneration. If passive regeneration cannot be achieved, then PM must be removed using active regeneration, an automatic cleaning process. This requires injecting fuel in the exhaust stream and elevating exhaust temperatures to clean the filter. Remember, active regeneration cleaning occurs only when passive regeneration is not possible based on temperature, load, and speed. It serves as a backup system. In most cases, active regeneration does not impact machine operation or require operator involvement.

Cleaning regions



*Parked or stationary regeneration may be necessary if active regeneration is overridden by the operator, or in rare instances when the engine does not reach normal temperature, load, or speed for long periods of time.

Ready for Final Tier 4/Stage IV

John Deere is continuously developing and testing the technologies it will adopt to achieve Final Tier 4/Stage IV emissions regulations. The purpose of Final Tier 4 emissions regulations is to further reduce NOx. For engines 130 kW (174 hp) and greater beginning in January 2014, proven technologies such as cooled EGR and VGT will likely be the foundation for meeting those regulations. However, we are evaluating emerging technologies for their effectiveness and for their ability to provide reliable and durable products in off-highway applications. We'll continue to tailor our Final Tier 4 engine solutions to fit the variety of off-highway applications and customer requirements.

To learn more about IT4 technologies and to take an animated tour of a John Deere engine, visit www.JohnDeere.com/tier4.

Acronyms used in this brochure

DEF	Diesel exhaust fluid
DOC	Diesel oxidation catalyst
DPF	Diesel particulate filter
ECU	Engine control unit
EGR	Exhaust gas recirculation
ETM	Exhaust temperature management
IT4	Interim Tier 4
NOx	Nitrogen oxides
PM	Particulate matter
ppm	Parts per million
SCR	Selective catalytic reduction
ULSD	Ultra-low sulfur diesel
VGT	Variable geometry turbocharger

Interim Tier 4/Stage III B frequently asked questions

Why use cooled EGR and exhaust filters for Interim Tier 4 engines greater than 56 kW (75 hp)?

Based on customer input regarding the different technology options, John Deere will continue to utilize cooled EGR, combined with exhaust filter technology, to meet Interim Tier 4/Stage III B regulations. The EGR solution, for NOx control, requires less operator involvement and is simpler, proven, fuel-efficient and a less costly technology compared to alternative solutions. Like the cooled EGR system and the VGT, the exhaust filter was specifically designed to meet the demands of off-highway applications. The exhaust filter also has the benefit of replacing the muffler in most applications.

Does cooled EGR add more complexity than other technologies?

While cooled EGR engines require additional sensors and actuators, the control logic is designed into the engine control unit, which allows the complexity to be transparent. The technology may appear complex to the average individual, but it is the key to the product's function, performance, and reliability. Cooled EGR is a proven technology that is used to control NOx emissions by most on-road diesel engine manufacturers, as well as millions of gasoline and diesel passenger cars.

Does use of cooled EGR decrease power density?

With cooled EGR and the VGT, John Deere has maintained or increased the power density for each engine platform. With PowerTech engines, you will never be forced to go up in platform size. In fact, using John Deere PowerTech engines may allow customers to go down in platform size, if they choose to do so, and lower their installed cost.

What is regeneration?

The exhaust filter is integrated into the engine design to provide a simple and reliable solution for reducing particulate matter (PM). A single engine control unit (ECU) manages both the engine and exhaust filter, via an exhaust temperature management (ETM) system, to regenerate (clean) the exhaust filter when sufficient heat cannot be generated to passively clean the filter.

Passive regeneration — John Deere engines and exhaust filter components are designed for uninterrupted operation using passive regeneration, a natural cleaning process where engine exhaust temperatures are sufficient enough to oxidize the PM trapped in the exhaust filter. The process occurs during normal engine operating conditions, which is the most fuel-efficient way to clean. Passive regeneration does not impact machine operation or require operator involvement.

Active regeneration — If conditions (temperature, speed and load) for passive regeneration cannot be achieved, then PM must be removed using active regeneration, an automatic cleaning process. For a short duration, this requires injecting a small quantity of fuel in the exhaust stream and elevating exhaust temperatures to clean the filter. Remember, active regeneration cleaning occurs only when passive regeneration is not possible based on temperature, load and speed. It serves as a backup system. In most cases, active regeneration does not impact machine operation or require operator involvement.

Parked or stationary regeneration may be necessary if active regeneration is overridden by the operator, or in rare instances when the engine does not reach normal operating temperatures because of lighter loads, reduced speeds or cool ambient conditions for extended periods of time.

How do the regeneration process steps work?

Interim Tier 4/Stage III B PowerTech engines 130 kW (174 hp) and above will utilize a catalyzed exhaust filter that contains a diesel oxidation catalyst (DOC) and a diesel particulate filter (DPF). Under normal operating conditions, the DOC reacts with exhaust gases to reduce carbon monoxide, hydrocarbons and some PM. The downstream DPF forces exhaust gases to flow through porous channel walls, trapping and holding the remaining PM. Trapped particles are eventually oxidized within the DPF through a continuous cleaning process called passive regeneration, utilizing exhaust heat created under normal operating conditions.

How does ETM work?

If conditions (ambient temperature, speed and load) for passive regeneration cannot be achieved, ETM is an automated engine operating mode used to increase the DOC inlet temperature above 572°F (300°C) to initiate and maintain an active regeneration. To increase the DOC inlet temperature, ETM may reduce the amount of fresh air entering the engine via intake air throttle valve, include a later post injection (after main injection event), retard engine timing for the main injection event, vary the VGT vane position and elevate low idle speed. Once the needed DOC inlet temperature is achieved, a small quantity of fuel is injected into the exhaust stream. This process creates the heat needed to oxidize the PM trapped in the DPF when passive conditions cannot be achieved. In addition, ETM provides an additional benefit of a controlled warm-up and cool-down period, increasing the durability of the exhaust filter.

Does the exhaust filter replace the muffler?

Test results indicate that a muffler will not be required in most applications. Our experience has been that noise attenuation provided with the exhaust filter meets or exceeds that of a conventional muffler. However, each application is different, and actual results may vary.

How will John Deere Interim Tier 4/Stage III B engines stand out from the competition?

John Deere is an innovator in the commercial application of cooled EGR and variable geometry turbocharger (VGT) technologies for off-highway use. Throughout Tier 3/Stage III A, John Deere has gained experience with these technologies over a wide range of applications and has established a proven record of reliability; other engine manufacturers are just now considering adopting these technologies for off-highway applications. John Deere engines have a strong reputation of performance, durability and reliability, and we are designing our new engines to exceed those expectations. These new engines will also feature more power and increased performance, world-class fuel economy, reduced noise, and low overall operating costs.

The SCR system has been adopted by several manufacturers. Why is John Deere choosing EGR first?

For Interim Tier 4/Stage III B, John Deere is looking at not only fuel economy, but also total fluid economy. We have prioritized the needs of the owner and operator during every step of developing our complete Interim Tier 4/Stage III B lineup. The single-fluid approach of cooled EGR means the technology will be easy for operators to use and will not require additional fluid costs.

John Deere has researched both of the different technologies, and from a global perspective, believes that cooled EGR with the addition of an exhaust filter is the best approach for meeting Interim Tier 4/Stage III B emissions regulations. John Deere remains confident that our world-class fuel economy position attained with Tier 3/Stage III A engines utilizing cooled EGR will be maintained with the use of only one fluid (diesel). Cooled EGR is a simple approach, has a proven track record throughout Tier 3, and is already supported by our global network of John Deere dealers.

How does the total fluid consumption with an SCR system compare to conventional EGR diesel engine?

The claim that engines designed to operate on selective catalytic reduction (SCR) consume less fuel is not accurate.

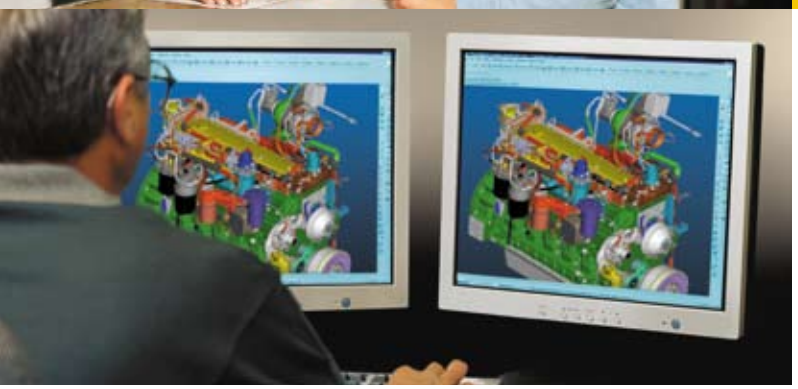
Regarding engines utilizing SCR we must consider the total fluid consumption — that is, the consumption of diesel fuel and the diesel exhaust fluid (DEF) additive. Competitive engine manufacturers who utilize SCR have stated their engines could provide up to 5 percent better fuel economy compared to their non-SCR engines. When you consider that urea consumption is approximately 3 to 5 percent of diesel fuel consumption and the fact that urea cost is similar or higher than diesel fuel, there is no advantage for engines utilizing SCR from a total fluid consumption and cost perspective.

Depending on the engine model, John Deere Interim Tier 4/Stage III B bare engine fuel consumption will be similar or equal to Tier 3/Stage III A. Overall fuel economy will improve in some vehicles/applications due to drivetrain optimization and engine/vehicle integration.

John Deere Tier 3/Stage III A engines currently hold a 5 to 10 percent fuel economy advantage when compared to most competitive engines. As a result, John Deere Interim Tier 4/Stage III B engines will continue to maintain their fuel-economy leadership without utilizing SCR for Interim Tier 4.

In regards to decreased system cost, research shows that Interim Tier 4/Stage III B engines with SCR systems are comparable in total installed engine cost compared to engines utilizing cooled EGR and exhaust filters. When considering SCR system cost, end users will need to consider sourcing, inventory and distribution costs associated with SCR. John Deere engines/vehicles will continue to provide the best value with a simple (one fluid) and proven technology (cooled EGR and variable geometry turbochargers).

Customer support



Log on to www.JohnDeere.com/dealer to find the service dealer nearest you.

The power of a worldwide support network

With John Deere, you never have far to go to find expert assistance and advice. Get service when and where you need it at any of our 4,000+ service locations worldwide.

Fast parts delivery

You can count on genuine John Deere parts. Our worldwide parts distribution system has overnight delivery available in most areas of the world. For even faster service, our dealers keep many maintenance and replacement parts in stock to get you back to work immediately.

A warranty you can count on

Equipment operators can't afford downtime or unexpected repairs. That's why we offer a 2-Year/2,000-Hour and 1-Year/ Unlimited-Hour Warranty. This warranty takes effect the date that the engine begins operation. In addition, extended warranties are available under certain conditions. Be sure to register your engine for warranty support.

Application integration support

John Deere Power Systems is one of the few companies that integrates entire powertrain systems — from the engine and electronics to the drivetrain components. Our highly-trained distributors have experience integrating engines, drivetrain components, and electronics into a wide variety of applications. We also provide equipment manufacturers with product and engineering support to maximize performance and fuel economy while meeting emissions regulations.

Engine oils and diesel fuels

Engine oil type and diesel fuel have always played a role in emissions. But products used and technologies needed to meet Interim Tier 4/ Stage III B and Final Tier 4/ Stage IV emissions regulations make them even more important.

With the introduction of exhaust filters, the type of engine oil used can have a significant impact on the proper functioning and ash service life of these devices. Ash, a by-products of inorganic solids, will collect in the exhaust filter over time as a result of the combustion process. The use of oils meeting API CJ-4 and ACEA E9 standards, both with reduced trace metals content, are required in order to reduce ash accumulation and increase exhaust filter service life for Interim Tier 4/Stage III B engines.

Similar to oils, the type of diesel fuel used can also have a significant impact on emission control devices. The use of exhaust filters on Interim Tier 4/Stage III B engines will require using diesel fuel with a sulfur content of less than 15 ppm (ultra-low sulfur diesel or ULSD). Using diesel fuels with a higher sulfur content can damage the exhaust filter, creating the need for an increased number of regenerations and leading to early replacement of the exhaust filter.

First on the job, last to leave

At the end of the day, you need an engine that meets emissions regulations while delivering maximum performance, efficiency, and durability. John Deere stands behind that promise with our family of PowerTech engines.

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JOHN DEERE

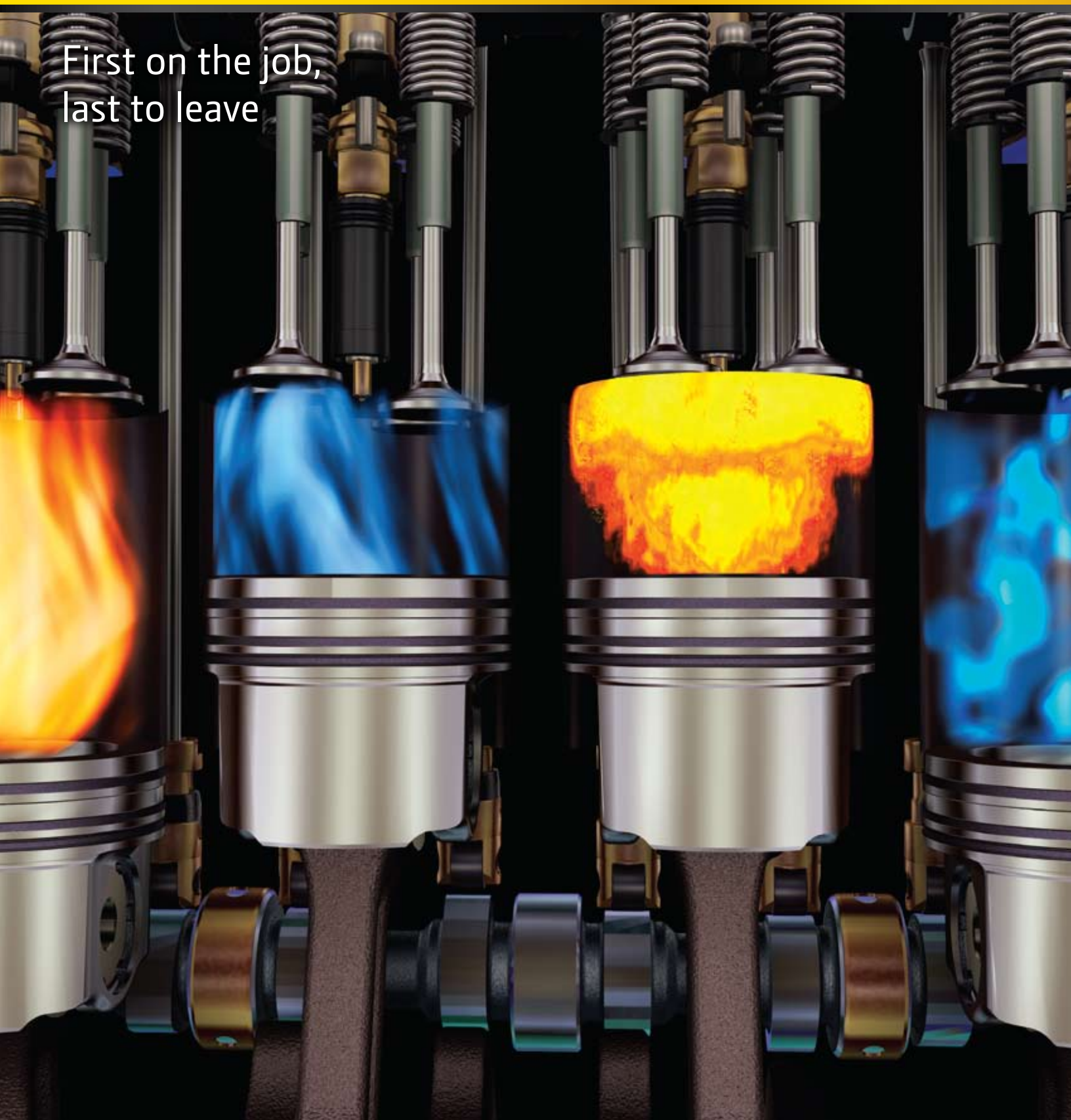
DSWT67 Litho in U.S.A. (10-03)

www.JohnDeere.com/tier4

Off-Highway Diesel Engines

Interim Tier 4/Stage III B

JOHN DEERE



Off-highway leadership where it counts the most

Off-highway leadership. You can expect more from John Deere — a company that built its name powering off-highway equipment in rugged applications. You'll receive more when you run with the John Deere family of PowerTech™ Interim Tier 4/Stage III B engines.

Job-proven performance

We have an unparalleled track record for providing hard-working, reliable, and efficient engines that don't let you down, even in the most extreme conditions. Whatever you throw at them — vibration, extreme temperatures, dust — John Deere engines keep working day after day.

Interim Tier 4/Stage III B engine identification for engines 56 kW (75 hp) and above.

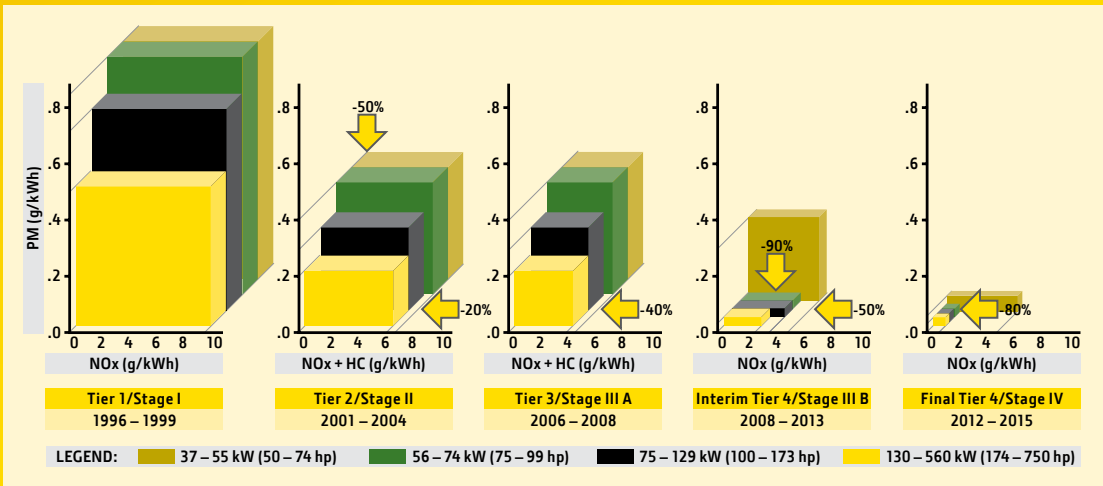
PowerTech PSX 6.8L

- **Displacement**
- **Exhaust Filter**
- **Turbocharger**
  - **V** – Variable Geometry Turbocharger (VGT)
  - **S** – Series Turbocharging
  - **W**– Wastegate Turbocharging
- **Technology**
  - **P** – Plus

Biggest emissions reductions yet

The move to Interim Tier 4/Stage III B emissions regulations is unquestionably the most significant to date. The regulations call for a 90 percent reduction in particulate matter (PM) along with a 50 percent drop in nitrogen oxides (NOx). Final Tier 4/Stage IV emissions regulations, which will be fully implemented by 2015, will take PM and NOx emissions to near-zero levels.

EPA and EU nonroad emissions regulations: 37 – 560 kW (50 – 750 hp)

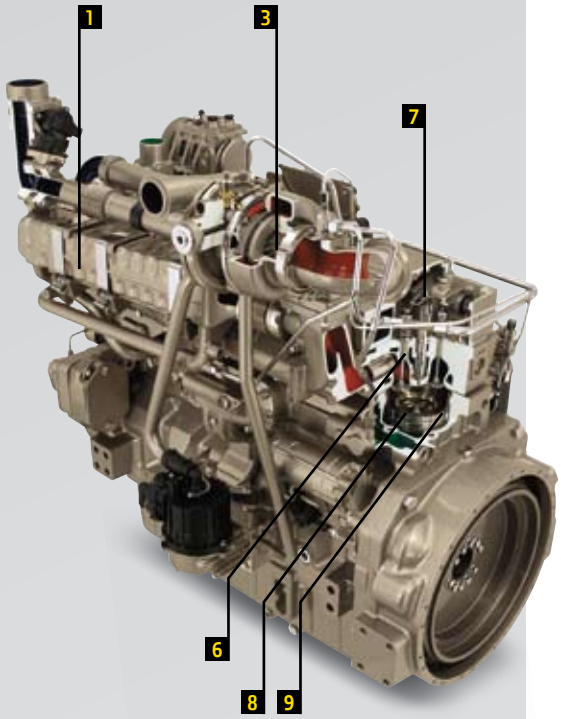


NOx – Nitrogen oxides, which react in the atmosphere with hydrocarbons
HC – Hydrocarbons, a by-product of combustion
PM – Particulate matter, a non-gaseous product of combustion

Industrial Engine Power Ratings

Engine	Power Rating	Turbocharging	Exhaust Filter	Dosing	Power Range
PowerTech M 2.4L	36 kW (48 hp)	Fixed	No	NA	
PowerTech E 2.4L	45 – 49 kW (60 – 66 hp)	Fixed	No	NA	
PowerTech M 4.5L	55 kW (74 hp)	Fixed	No	NA	
PowerTech PWX 4.5L	56 – 91 kW (75 – 122 hp)	Wastegate	Yes	Internal	
PowerTech PVX 4.5L	93 – 129 kW (125 – 173 hp)	VGT	Yes	Internal	
PowerTech PVX 6.8L	104 – 129 kW (140 – 173 hp)	VGT	Yes	Internal	
PowerTech PVX 6.8L	138 – 187 kW (185 – 250 hp)	VGT	Yes	External	
PowerTech PSX 6.8L	168 – 224 kW (225 – 300 hp)	Series	Yes	External	
PowerTech PVX 9.0L	187 – 224 kW (250 – 300 hp)	VGT	Yes	External	
PowerTech PSX 9.0L	242 – 317 kW (325 – 425 hp)	Series	Yes	External	
PowerTech PSX 13.5L	298 – 448 kW (400 – 600 hp)	Series	Yes	External	

kW 0 37 75 112 149 186 224 261 298 336 373 410 448
hp 0 50 100 150 200 250 300 350 400 450 500 550 600



Many of the engine features proven with our PowerTech Plus engines have been enhanced for Interim Tier 4/Stage III B. We continue to improve performance while meeting more stringent emissions regulations.

1. **Increased levels of cooled EGR lower exhaust temperature and reduce NOx.**
2. **Air-to-air aftercooled aspiration lowers in-cylinder temperatures, reduces NOx, and increases power density.**
3. **VGT varies exhaust pressure based on load and speed to ensure proper EGR flow and provide increased performance.**
4. **Low-pressure fuel system with auto prime feature eliminates hand priming and hard starting. It provides sensors that detect water in fuel and low fuel pressure.**
5. **Faster electronic controls are integrated to manage the exhaust filter as well as the fuel system, air-to-fuel ratio, VGT output, and cooled EGR.**
6. **4-valve cylinder head increases efficiency, power, and torque.**
7. **Electronic unit injector (13.5L) and HPCR (4.5L, 6.8L and 9.0L) fuel systems provide increased fuel pressures for more efficient combustion and PM reduction.**
8. **Low-friction, single-piece steel piston improves fuel economy, reduces emissions, and increases durability (9.0L and 13.5L).**
9. **Directed top liner cooling contributes to improved oil control and increased durability (9.0L and 13.5L).**
10. **500-hour oil change intervals.**

Built on proven PowerTech Plus technology

John Deere has always been ahead of the game when it comes to meeting emissions regulations. Interim Tier 4/Stage III B is no exception. We pioneered the use of many advanced technologies with our Tier 3/Stage III A engines and proved their performance in off-highway applications. This gives us a head start for fuel economy as well as delivering higher power bulge, more torque rise, and faster transient response time.

First in the field

John Deere was the first engine manufacturer to take advantage of cooled exhaust gas recirculation (EGR) and variable geometry turbocharger (VGT) technologies in off-highway applications, introducing them with Tier 3/Stage III A emissions regulations. Our engines have a proven record of emissions reduction, best-in-class fuel economy, and rugged reliability. By choosing EGR first, we proved that we could meet emissions regulations and deliver high performance without the continuing cost and inconvenience of selective catalytic reduction (SCR). When it comes to off-highway performance, other engine manufacturers can only follow in our tracks.

Fuel efficient

John Deere engines continue to provide the best total fluid economy and value with a simple, single-fluid solution. Our cooled EGR engines operate efficiently with ultra-low sulfur diesel (ULSD) as well as biodiesel blends, providing optimal performance and fuel-choice flexibility.

John Deere PowerTech Plus engines already lead the market for fuel efficiency. Other engine manufacturers are just now adopting technologies such as cooled EGR and SCR for off-highway applications. So even if some may claim improved fuel economy for IT4, we expect to maintain our leadership position.

You have to take into account the total fluid consumption of engines equipped with SCR. Considering you need approximately one gallon of diesel exhaust fluid (DEF) for every 20 gallons of diesel fuel, and the fact that DEF can cost as much as or more than diesel fuel — our single-fluid solution is the right choice now.

Off-highway durability

The jobs that John Deere PowerTech engines tackle every day are as varied as the equipment they power. That's why John Deere Interim Tier 4/Stage III B engines integrate many technologies designed to meet the unique needs of off-highway equipment. PowerTech 4.5L, 6.8L, 9.0L, and 13.5L engines use our proven PowerTech Plus technology, which includes 4-valve cylinder heads, cooled EGR, VGT, air-to-air aftercooling, high-pressure fuel systems, and wet-type cylinder liners.

Smart exhaust filters

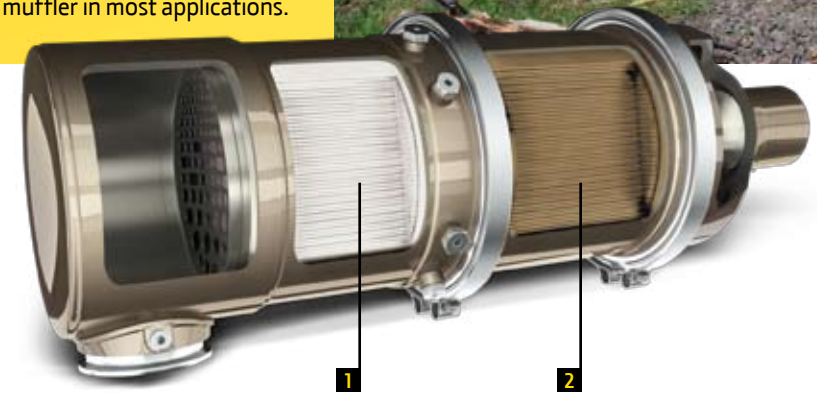
John Deere exhaust filters are designed to meet the demands of rugged off-highway applications. Our dedicated exhaust technology team explored all aspects of exhaust filter science to develop the John Deere solution. Because we manage the design of the exhaust filter, as well as the engine and electronic controls, we are able to integrate and optimize all components and vehicle systems for best performance.

PowerTech Interim Tier 4/Stage III B engines 56 kW (75 hp) and above utilize a catalyzed exhaust filter that contains a diesel oxidation catalyst (DOC) and a diesel particulate filter (DPF). Under normal operating conditions, the DOC reacts with exhaust gases to reduce carbon monoxide, hydrocarbons, and some particulate matter (PM). The downstream DPF forces exhaust gases to flow through porous channel walls, trapping and holding the remaining PM. Trapped particles are eventually oxidized within the DPF through a self-activating cleaning process called passive regeneration, utilizing exhaust heat created under normal operating conditions.

Exhaust temperature management (ETM)

Here's where John Deere exhaust filters really show their intelligence. If passive regeneration cannot be achieved due to low temperature, load, or speed, then PM is removed using active regeneration — an automatic cleaning process controlled by the exhaust temperature management system. ETM increases the DOC inlet temperature by fine-tuning the amount of air intake, adjusting injection timing, and controlling idle speeds. At just the right moment, a small quantity of fuel is injected into the exhaust stream to create the heat needed to oxidize the PM trapped in the DPF. ETM also increases the durability of the exhaust filter by controlling warm-up and cool-down periods.

In most cases, the regeneration process does not have an impact on machine operation or require operator involvement. Another benefit of the exhaust filter is that it replaces the muffler in most applications.



1 Diesel oxidation catalyst (DOC)

2 Diesel particulate filter (DPF)

The PowerTech M and PowerTech E engine lineups meet emissions regulations without the addition of cooled EGR or an exhaust filter.

PowerTech E engine shown

PowerTech M

The simplest of the PowerTech family, these engines have 2-valve heads, fixed geometry turbochargers, and mechanical fuel systems. PowerTech M engines are perfect for less demanding applications. Their mechanical controls are simple to operate and maintain.

PowerTech M Engines	
PowerTech M 2.4L	36 kW (48 hp)*
PowerTech M 4.5L	55 kW (74 hp)**

*Meets Interim Tier 4 and Stage III A emissions regulations.
**Meets Interim Tier 4 emissions regulations.

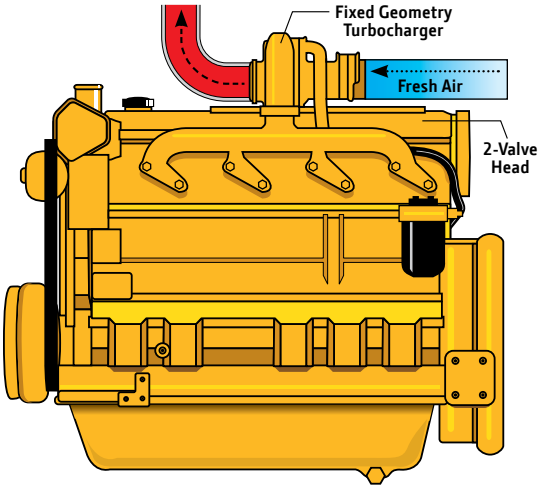
PowerTech E

These engines also have 2-valve heads and fixed geometry turbochargers, but introduce full-authority electronic controls, more sophisticated fuel delivery and electronic unit pump fuel systems.

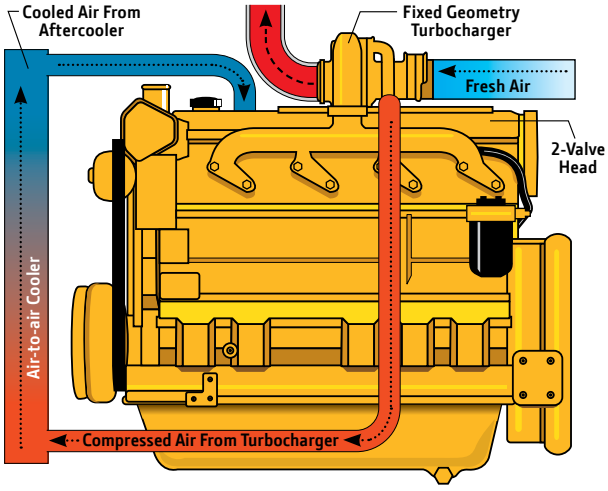
PowerTech E Engines	
PowerTech E 2.4L	45 – 49 kW (60 – 66 hp)*

*Meets Interim Tier 4 and Stage III A emissions regulations.

PowerTech M technology



PowerTech E technology



Fixed geometry turbocharger

Fixed geometry turbochargers are sized for a specific power range and optimized to provide excellent performance across the entire torque curve. They are also designed to maximize fuel economy between the engine's rated speed and peak torque.

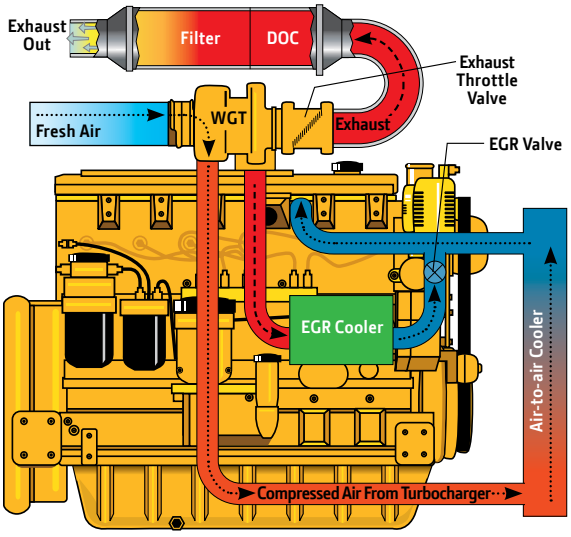
PowerTech PWX

Tried-and-true performance

Equipment owners who want straightforward, cost-effective power rely on PowerTech PWX 4.5L engines. These compact engines blend advanced emissions-control technology with simple and reliable wastegated turbocharging to maintain transient response and peak torque in all operating conditions. Their 4-valve cylinder heads also provide excellent airflow for greater low-speed torque. Multiple rated speeds let you fine-tune your engine selection to reduce noise and improve fuel economy.

PowerTech PWX Engines	
PowerTech PWX 4.5L	56 – 91 kW (75 – 122 hp)

PowerTech PWX Interim Tier 4 technology



Wastegated turbocharger

Wastegated turbochargers are designed to develop more airflow at lower engine speeds to improve low-speed torque. The wastegate control device bleeds off a portion of the exhaust flow at higher engine speeds. Wastegated turbos deliver improved transient response and higher peak torque without compromising engine envelope size. They also provide the lowest installed cost across a given power range.

PowerTech PVX

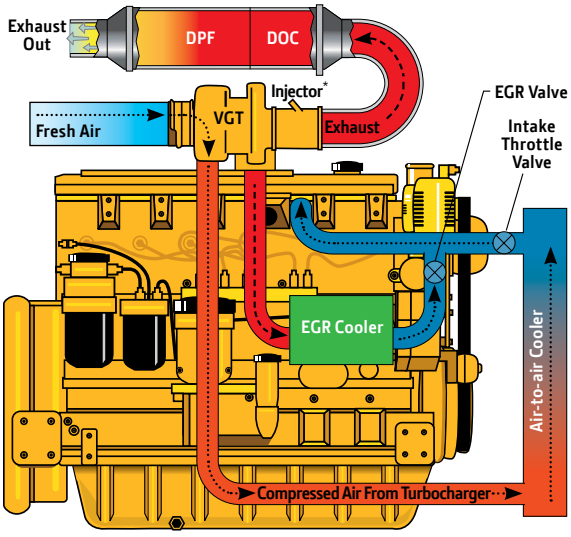
Improved performance and efficiency

When you need unparalleled performance, PowerTech PVX 4.5L, 6.8L, or 9.0L engines are the perfect fit for your application. These displacements utilize our proven PowerTech Plus technology with variable geometry turbocharging (VGT) to improve performance and combustion efficiency, reduce emissions, and increase fuel economy.

Engines below 130 kW (174 hp) use an in-cylinder dosing system for active regeneration, while larger engines use an external dosing system.

PowerTech PVX Engines	
PowerTech PVX 4.5L	93 – 129 kW (125 – 173 hp)
PowerTech PVX 6.8L	104 – 129 kW (140 – 173 hp)
PowerTech PVX 6.8L	138 – 187 kW (185 – 250 hp)
PowerTech PVX 9.0L	187 – 224 kW (250 – 300 hp)

PowerTech PVX Interim Tier 4 technology*

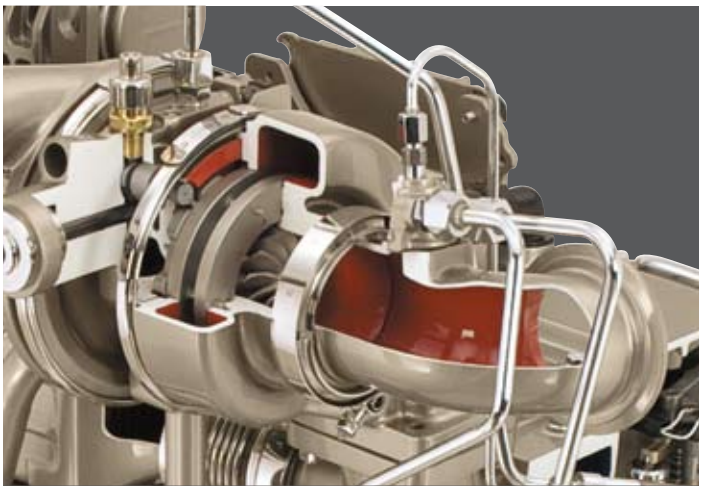


*For engines 130 kW (174 hp) and greater.

Variable geometry turbochargers

We know VGT technology. The performance of our PowerTech Plus Tier 3/Stage III A engines proved it. That's why we decided to continue this technology with our Interim Tier 4/Stage III B engine lineup.

VGT tailors the amount of recirculated exhaust gas that mixes with the fresh air. Precise electronic controls open or close the variable vanes in the turbocharger depending on engine load and speed. The optimized airflow generates more boost while maximizing low-speed torque, transient response, peak torque, and fuel economy.



VGT delivers power and efficiency

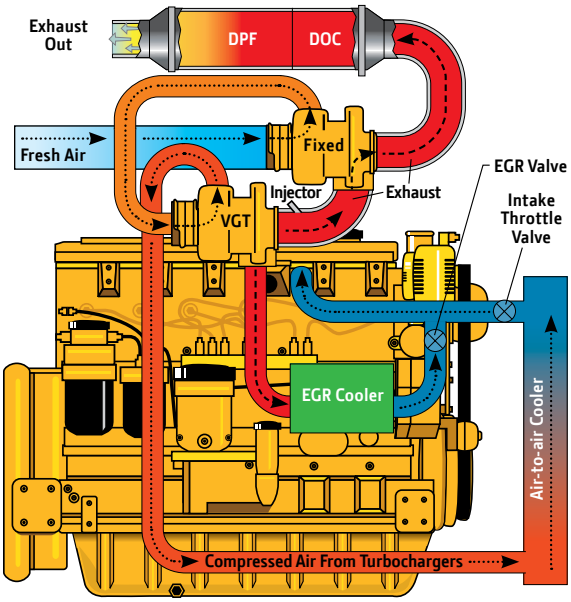
PowerTech PSX

Ultimate performance and responsiveness

For ultimate performance in off-highway applications that take you up and down steep grades at high altitudes. Or when you simply want maximum transient response and low-speed torque. A PowerTech PSX 6.8L, 9.0L, or 13.5L engine is exactly what you need. Along with proven PowerTech Plus technology, all three displacements feature series turbochargers that improve performance and responsiveness.

PowerTech PSX Engines	
PowerTech PSX 6.8L	168 – 224 kW (225 – 300 hp)
PowerTech PSX 9.0L	242 – 317 kW (325 – 425 hp)
PowerTech PSX 13.5L	298 – 448 kW (400 – 600 hp)

PowerTech PSX Interim Tier 4 technology

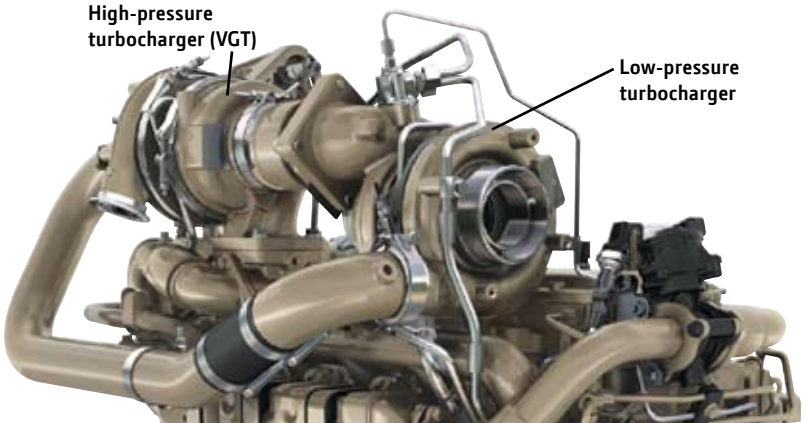


Two turbochargers give you more

In series turbocharging, fresh air is drawn into the low-pressure turbocharger (fixed geometry), where air pressure is boosted. This pressurized or boosted air is then drawn into the high-pressure turbocharger (VGT), where air intake pressure is further raised. The high-pressure air is then routed to an air-to-air aftercooler, where the air is cooled and then routed to the engine's intake manifold.

By splitting the compression of the charge air between two turbochargers, both can operate at peak efficiency and at slower rotating speeds. This lowers stress on turbocharger components and improves reliability. Series turbocharging also delivers higher power density, improved low-speed torque, and improved high-altitude operation.

Series turbochargers



Clean and convenient

Cleaner emissions

John Deere has determined that cooled EGR, combined with exhaust filter technology, is the right choice to meet Interim Tier 4 (IT4) emissions regulations because it is simple, more proven, and more cost-effective.

NOx reduction through cooled EGR. During certain conditions of engine operation, the EGR valve opens and measured amounts of cooled exhaust gas are routed back into the intake manifold and mixed with the incoming fresh air. Since this process removes oxygen from the air, the exhaust temperatures in the combustion process are lowered and the levels of NOx are reduced.

PM reduction through exhaust filters. The DPF traps and holds particulates in the exhaust stream. During normal operating conditions (temperature, load, and speed) the engine's natural heat breaks down the PM and cleans the exhaust filter. An exhaust filter also has the benefit of replacing the muffler in most applications.

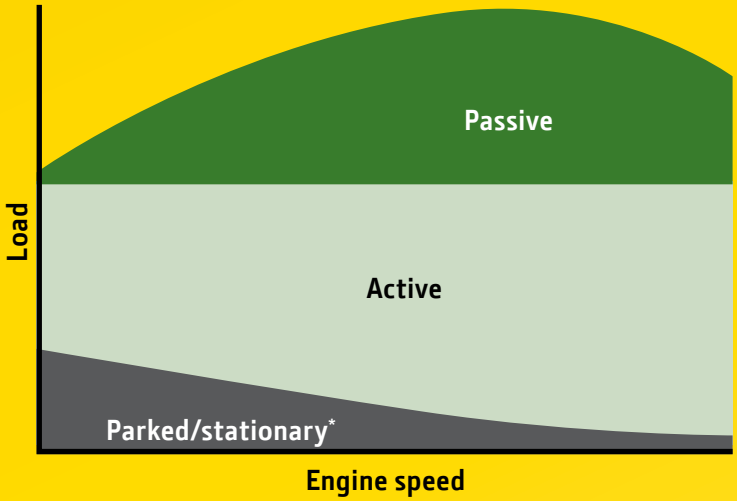
Convenient exhaust filter cleaning

Our exhaust filter is integrated into the engine design to provide a convenient and reliable solution. The engine control unit (ECU) and exhaust temperature management (ETM) system work together to continuously regenerate, or clean, the exhaust filter.

Passive regeneration. John Deere engines and exhaust filter components are designed for uninterrupted operation using passive regeneration, a natural cleaning process. It occurs during normal engine operating conditions, which is the most fuel-efficient way to clean. Passive regeneration does not impact machine operation or require operator involvement.

Active regeneration. If passive regeneration cannot be achieved, then PM must be removed using active regeneration, an automatic cleaning process. This requires injecting fuel in the exhaust stream and elevating exhaust temperatures to clean the filter. Remember, active regeneration cleaning occurs only when passive regeneration is not possible based on temperature, load, and speed. It serves as a backup system. In most cases, active regeneration does not impact machine operation or require operator involvement.

Cleaning regions



*Parked or stationary regeneration may be necessary if active regeneration is overridden by the operator, or in rare instances when the engine does not reach normal temperature, load, or speed for long periods of time.

Ready for Final Tier 4/Stage IV

John Deere is continuously developing and testing the technologies it will adopt to achieve Final Tier 4/Stage IV emissions regulations. The purpose of Final Tier 4 emissions regulations is to further reduce NOx. For engines 130 kW (174 hp) and greater beginning in January 2014, proven technologies such as cooled EGR and VGT will likely be the foundation for meeting those regulations. However, we are evaluating emerging technologies for their effectiveness and for their ability to provide reliable and durable products in off-highway applications. We'll continue to tailor our Final Tier 4 engine solutions to fit the variety of off-highway applications and customer requirements.

To learn more about IT4 technologies and to take an animated tour of a John Deere engine, visit www.JohnDeere.com/tier4.

Acronyms used in this brochure

DEF	Diesel exhaust fluid
DOC	Diesel oxidation catalyst
DPF	Diesel particulate filter
ECU	Engine control unit
EGR	Exhaust gas recirculation
ETM	Exhaust temperature management
IT4	Interim Tier 4
NOx	Nitrogen oxides
PM	Particulate matter
ppm	Parts per million
SCR	Selective catalytic reduction
ULSD	Ultra-low sulfur diesel
VGT	Variable geometry turbocharger

Interim Tier 4/Stage III B frequently asked questions

Why use cooled EGR and exhaust filters for Interim Tier 4 engines greater than 56 kW (75 hp)?

Based on customer input regarding the different technology options, John Deere will continue to utilize cooled EGR, combined with exhaust filter technology, to meet Interim Tier 4/Stage III B regulations. The EGR solution, for NOx control, requires less operator involvement and is simpler, proven, fuel-efficient and a less costly technology compared to alternative solutions. Like the cooled EGR system and the VGT, the exhaust filter was specifically designed to meet the demands of off-highway applications. The exhaust filter also has the benefit of replacing the muffler in most applications.

Does cooled EGR add more complexity than other technologies?

While cooled EGR engines require additional sensors and actuators, the control logic is designed into the engine control unit, which allows the complexity to be transparent. The technology may appear complex to the average individual, but it is the key to the product's function, performance, and reliability. Cooled EGR is a proven technology that is used to control NOx emissions by most on-road diesel engine manufacturers, as well as millions of gasoline and diesel passenger cars.

Does use of cooled EGR decrease power density?

With cooled EGR and the VGT, John Deere has maintained or increased the power density for each engine platform. With PowerTech engines, you will never be forced to go up in platform size. In fact, using John Deere PowerTech engines may allow customers to go down in platform size, if they choose to do so, and lower their installed cost.

What is regeneration?

The exhaust filter is integrated into the engine design to provide a simple and reliable solution for reducing particulate matter (PM). A single engine control unit (ECU) manages both the engine and exhaust filter, via an exhaust temperature management (ETM) system, to regenerate (clean) the exhaust filter when sufficient heat cannot be generated to passively clean the filter.

Passive regeneration — John Deere engines and exhaust filter components are designed for uninterrupted operation using passive regeneration, a natural cleaning process where engine exhaust temperatures are sufficient enough to oxidize the PM trapped in the exhaust filter. The process occurs during normal engine operating conditions, which is the most fuel-efficient way to clean. Passive regeneration does not impact machine operation or require operator involvement.

Active regeneration — If conditions (temperature, speed and load) for passive regeneration cannot be achieved, then PM must be removed using active regeneration, an automatic cleaning process. For a short duration, this requires injecting a small quantity of fuel in the exhaust stream and elevating exhaust temperatures to clean the filter. Remember, active regeneration cleaning occurs only when passive regeneration is not possible based on temperature, load and speed. It serves as a backup system. In most cases, active regeneration does not impact machine operation or require operator involvement.

Parked or stationary regeneration may be necessary if active regeneration is overridden by the operator, or in rare instances when the engine does not reach normal operating temperatures because of lighter loads, reduced speeds or cool ambient conditions for extended periods of time.

How do the regeneration process steps work?

Interim Tier 4/Stage III B PowerTech engines 130 kW (174 hp) and above will utilize a catalyzed exhaust filter that contains a diesel oxidation catalyst (DOC) and a diesel particulate filter (DPF). Under normal operating conditions, the DOC reacts with exhaust gases to reduce carbon monoxide, hydrocarbons and some PM. The downstream DPF forces exhaust gases to flow through porous channel walls, trapping and holding the remaining PM. Trapped particles are eventually oxidized within the DPF through a continuous cleaning process called passive regeneration, utilizing exhaust heat created under normal operating conditions.

How does ETM work?

If conditions (ambient temperature, speed and load) for passive regeneration cannot be achieved, ETM is an automated engine operating mode used to increase the DOC inlet temperature above 572°F (300°C) to initiate and maintain an active regeneration. To increase the DOC inlet temperature, ETM may reduce the amount of fresh air entering the engine via intake air throttle valve, include a later post injection (after main injection event), retard engine timing for the main injection event, vary the VGT vane position and elevate low idle speed. Once the needed DOC inlet temperature is achieved, a small quantity of fuel is injected into the exhaust stream. This process creates the heat needed to oxidize the PM trapped in the DPF when passive conditions cannot be achieved. In addition, ETM provides an additional benefit of a controlled warm-up and cool-down period, increasing the durability of the exhaust filter.

Does the exhaust filter replace the muffler?

Test results indicate that a muffler will not be required in most applications. Our experience has been that noise attenuation provided with the exhaust filter meets or exceeds that of a conventional muffler. However, each application is different, and actual results may vary.

How will John Deere Interim Tier 4/Stage III B engines stand out from the competition?

John Deere is an innovator in the commercial application of cooled EGR and variable geometry turbocharger (VGT) technologies for off-highway use. Throughout Tier 3/Stage III A, John Deere has gained experience with these technologies over a wide range of applications and has established a proven record of reliability; other engine manufacturers are just now considering adopting these technologies for off-highway applications. John Deere engines have a strong reputation of performance, durability and reliability, and we are designing our new engines to exceed those expectations. These new engines will also feature more power and increased performance, world-class fuel economy, reduced noise, and low overall operating costs.

The SCR system has been adopted by several manufacturers. Why is John Deere choosing EGR first?

For Interim Tier 4/Stage III B, John Deere is looking at not only fuel economy, but also total fluid economy. We have prioritized the needs of the owner and operator during every step of developing our complete Interim Tier 4/Stage III B lineup. The single-fluid approach of cooled EGR means the technology will be easy for operators to use and will not require additional fluid costs.

John Deere has researched both of the different technologies, and from a global perspective, believes that cooled EGR with the addition of an exhaust filter is the best approach for meeting Interim Tier 4/Stage III B emissions regulations. John Deere remains confident that our world-class fuel economy position attained with Tier 3/Stage III A engines utilizing cooled EGR will be maintained with the use of only one fluid (diesel). Cooled EGR is a simple approach, has a proven track record throughout Tier 3, and is already supported by our global network of John Deere dealers.

How does the total fluid consumption with an SCR system compare to conventional EGR diesel engine?

The claim that engines designed to operate on selective catalytic reduction (SCR) consume less fuel is not accurate.

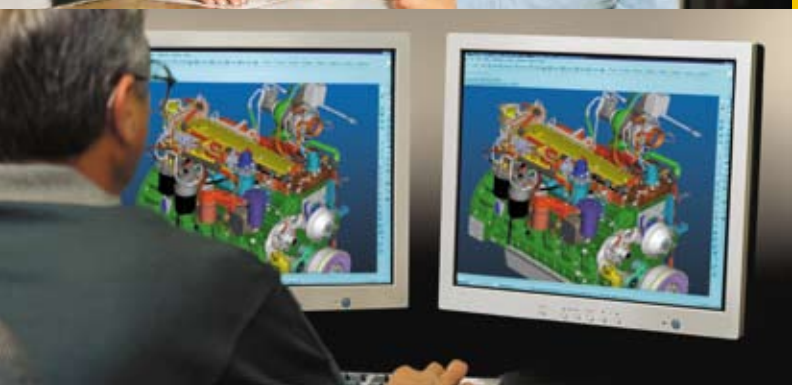
Regarding engines utilizing SCR we must consider the total fluid consumption — that is, the consumption of diesel fuel and the diesel exhaust fluid (DEF) additive. Competitive engine manufacturers who utilize SCR have stated their engines could provide up to 5 percent better fuel economy compared to their non-SCR engines. When you consider that urea consumption is approximately 3 to 5 percent of diesel fuel consumption and the fact that urea cost is similar or higher than diesel fuel, there is no advantage for engines utilizing SCR from a total fluid consumption and cost perspective.

Depending on the engine model, John Deere Interim Tier 4/Stage III B bare engine fuel consumption will be similar or equal to Tier 3/Stage III A. Overall fuel economy will improve in some vehicles/applications due to drivetrain optimization and engine/vehicle integration.

John Deere Tier 3/Stage III A engines currently hold a 5 to 10 percent fuel economy advantage when compared to most competitive engines. As a result, John Deere Interim Tier 4/Stage III B engines will continue to maintain their fuel-economy leadership without utilizing SCR for Interim Tier 4.

In regards to decreased system cost, research shows that Interim Tier 4/Stage III B engines with SCR systems are comparable in total installed engine cost compared to engines utilizing cooled EGR and exhaust filters. When considering SCR system cost, end users will need to consider sourcing, inventory and distribution costs associated with SCR. John Deere engines/vehicles will continue to provide the best value with a simple (one fluid) and proven technology (cooled EGR and variable geometry turbochargers).

Customer support



Log on to www.JohnDeere.com/dealer to find the service dealer nearest you.

The power of a worldwide support network

With John Deere, you never have far to go to find expert assistance and advice. Get service when and where you need it at any of our 4,000+ service locations worldwide.

Fast parts delivery

You can count on genuine John Deere parts. Our worldwide parts distribution system has overnight delivery available in most areas of the world. For even faster service, our dealers keep many maintenance and replacement parts in stock to get you back to work immediately.

A warranty you can count on

Equipment operators can't afford downtime or unexpected repairs. That's why we offer a 2-Year/2,000-Hour and 1-Year/ Unlimited-Hour Warranty. This warranty takes effect the date that the engine begins operation. In addition, extended warranties are available under certain conditions. Be sure to register your engine for warranty support.

Application integration support

John Deere Power Systems is one of the few companies that integrates entire powertrain systems — from the engine and electronics to the drivetrain components. Our highly-trained distributors have experience integrating engines, drivetrain components, and electronics into a wide variety of applications. We also provide equipment manufacturers with product and engineering support to maximize performance and fuel economy while meeting emissions regulations.

Engine oils and diesel fuels

Engine oil type and diesel fuel have always played a role in emissions. But products used and technologies needed to meet Interim Tier 4/ Stage III B and Final Tier 4/ Stage IV emissions regulations make them even more important.

With the introduction of exhaust filters, the type of engine oil used can have a significant impact on the proper functioning and ash service life of these devices. Ash, a by-products of inorganic solids, will collect in the exhaust filter over time as a result of the combustion process. The use of oils meeting API CJ-4 and ACEA E9 standards, both with reduced trace metals content, are required in order to reduce ash accumulation and increase exhaust filter service life for Interim Tier 4/Stage III B engines.

Similar to oils, the type of diesel fuel used can also have a significant impact on emission control devices. The use of exhaust filters on Interim Tier 4/Stage III B engines will require using diesel fuel with a sulfur content of less than 15 ppm (ultra-low sulfur diesel or ULSD). Using diesel fuels with a higher sulfur content can damage the exhaust filter, creating the need for an increased number of regenerations and leading to early replacement of the exhaust filter.

First on the job, last to leave

At the end of the day, you need an engine that meets emissions regulations while delivering maximum performance, efficiency, and durability. John Deere stands behind that promise with our family of PowerTech engines.

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