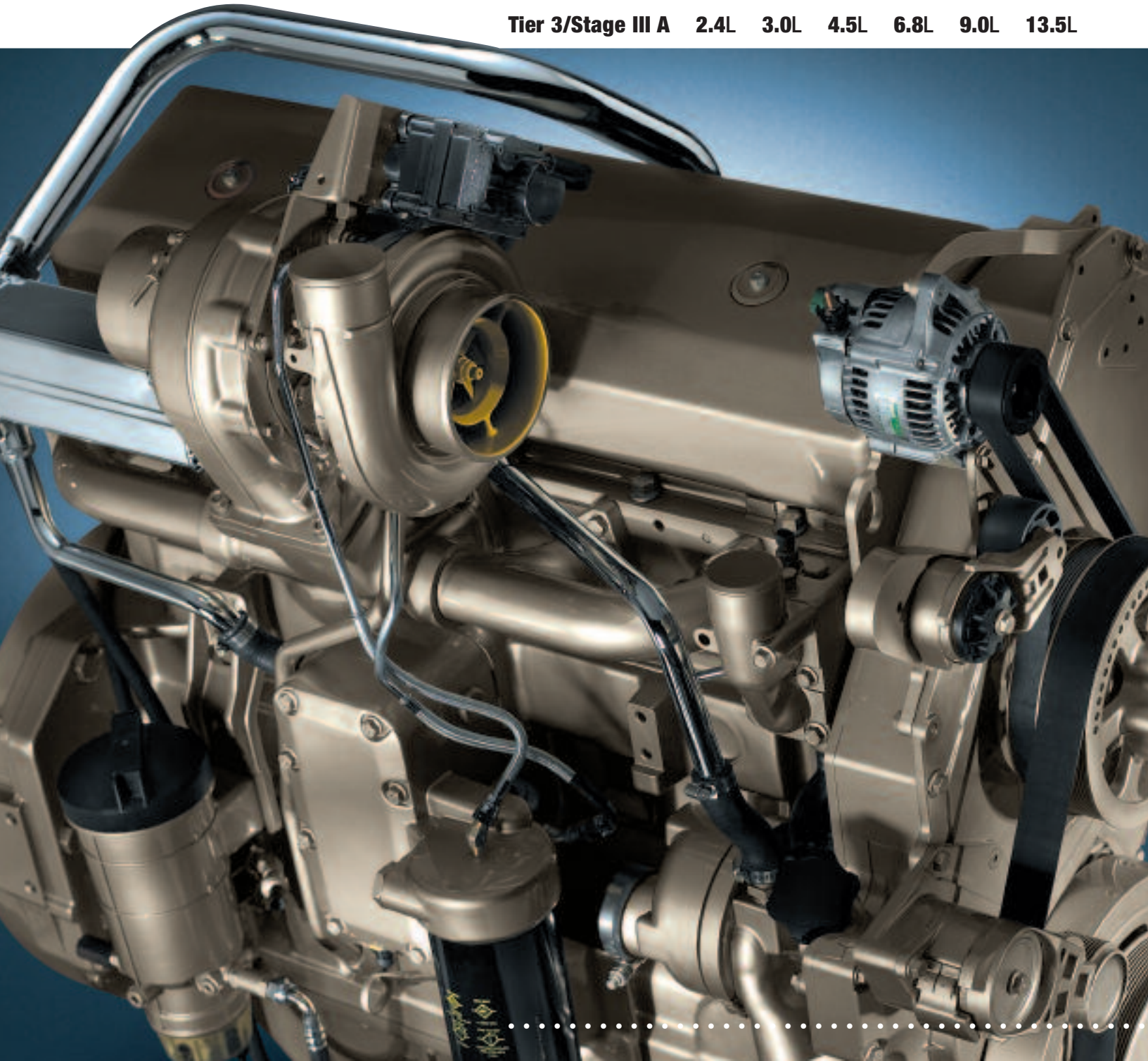
JOHN DEERE

PowerTech Diesel Engines

Tier 3/Stage III A **2.4L** **3.0L** **4.5L** **6.8L** **9.0L** **13.5L**



Introducing the new Tier 3/Stage III A engines from John Deere: Proven solutions for different applications.

Engines 130 kW (175 hp) and above are the first to be affected by EPA Tier 3 and EU Stage III A regulations. Building on our success with Tier 1/Stage I and Tier 2/Stage II, John Deere is now applying proven engine technologies to the Tier 3/Stage III A engines in the PowerTech™ family.

The major directive of Tier 3/Stage III A regulations is a 40 percent reduction in oxides of nitrogen (NOx). The challenge for engine manufacturers is that reducing NOx tends to increase the presence of particulate matter (PM). Thanks to a number of proven technologies, John Deere has found a way to reduce NOx, maintain PM at an acceptable level, and achieve the proper balance of both.

The PowerTech family of engines is the foundation we'll build upon for future EPA regulations. Thus, our Tier 3/Stage III A platforms will be the basis for Tier 4/Stage IV engines. We have already begun exploring a number of technologies–including in-cylinder and aftertreatment solutions–that will be applied to the existing Tier 3/Stage III A platforms.

Three solutions—because you have your own challenges.

When John Deere began selecting technologies to meet Tier 3/Stage III A regulations, we did so with the understanding that different markets have different needs. In performance markets, for instance, machines require more power, more torque, and higher performance overall.

Other markets simply don't have the need for high-performance features. With that in mind, we've developed three distinct solutions:

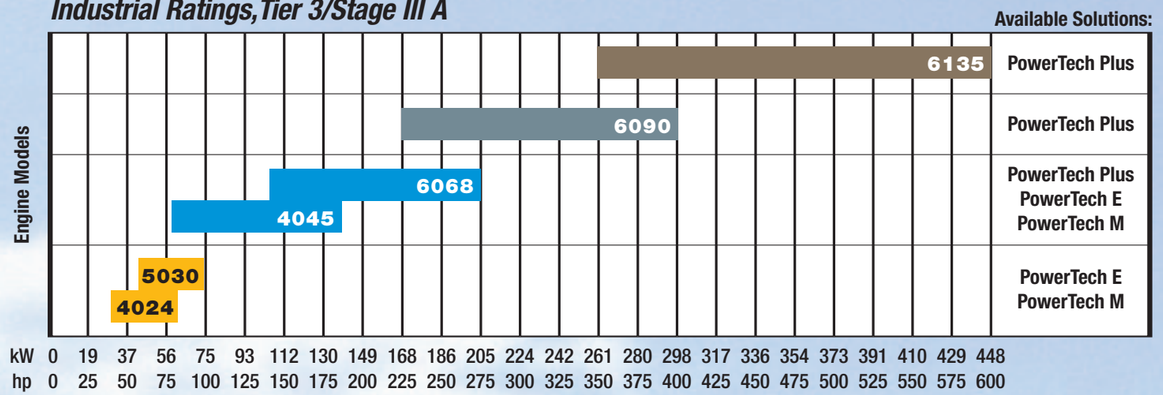
PowerTech Plus™, proven technology, larger displacement, better performance, and best-in-class fuel economy.

PowerTech E™, high-pressure common rail fuel system (4.5L and 6.8L), electronic unit pumps (2.4L and 3.0L), full authority electronic controls, plus all the performance of Tier 2/Stage II engines and more.

PowerTech M™, featuring economy of design and mechanical controls for efficient performance, plus all the performance of Tier 2/Stage II.

The PowerTech family of Tier 3/Stage III A engines meets regulations, offers you flexibility and cost-efficiency, and gives you exactly the performance you need.

John Deere has applied these technologies to its proven engine displacement families.



PowerTech Plus 4.5L, 6.8L, 9.0L, and 13.5L Engines

The ultimate in emissions compliance, performance, and fuel economy

John Deere offers 4.5L, 6.8L, 9.0L, and 13.5L engines in the PowerTech Plus category, which includes cooled exhaust gas recirculation (EGR) and variable geometry turbocharger (VGT) technologies for the ultimate in Tier 3/Stage III A efficiency and performance.

The higher an engine's peak combustion temperature, the greater the amount of NOx created. Cooled EGR is an effective method of lowering peak combustion temperature.

The concept is simple. With cooled EGR, measured amounts of exhaust gas are cooled and mixed with incoming fresh air to lower peak combustion temperatures, thereby reducing NOx.

Another key feature of our Tier 3/Stage III A engines is the variable geometry turbocharger, which helps drive EGR.

The VGT tailors the amount of recirculated exhaust gas that mixes with the fresh air. The amount of EGR required is determined by load and speed. Thus, when the engine load increases, the electronic control unit adjusts the VGT vanes to the appropriate pitch.

Cooled EGR and the use of VGT technology results in increased power density, allowing the use of smaller displacement engines. It also provides excellent performance across the entire operating range of the engine, improves fuel economy, and is a highly effective approach to meeting Tier 3/Stage III A regulations. It also reduces the number of turbocharger options, and provides users the ability to select from a larger power range within a family of emission components.

To offset the increase in particulate matter caused by the reduction of NOx, we've taken the following steps:

- Increased fuel injection pressure by utilizing high-pressure common rail fuel systems and electronic unit injector technology
- Improved power cylinder components, resulting in reduced oil consumption
- Adopted VGT to control transient smoke
- Improved the shape of the combustion bowl to maximize air/fuel mixing and optimize the combustion process, reducing the amount of emissions.

The new Engine Control Unit (ECU) electronically controls the air-to-fuel ratio, multiple fuel injections, the amount of EGR, and VGT output. Our patented ECU Flexbox design uses a 32-bit, Power PC-based ECU with twice the memory and five times the computing power of units found on Tier 2/Stage II engines. This ECU also features snapshot diagnostics, which can record and store up to seven different sets of diagnostic data.

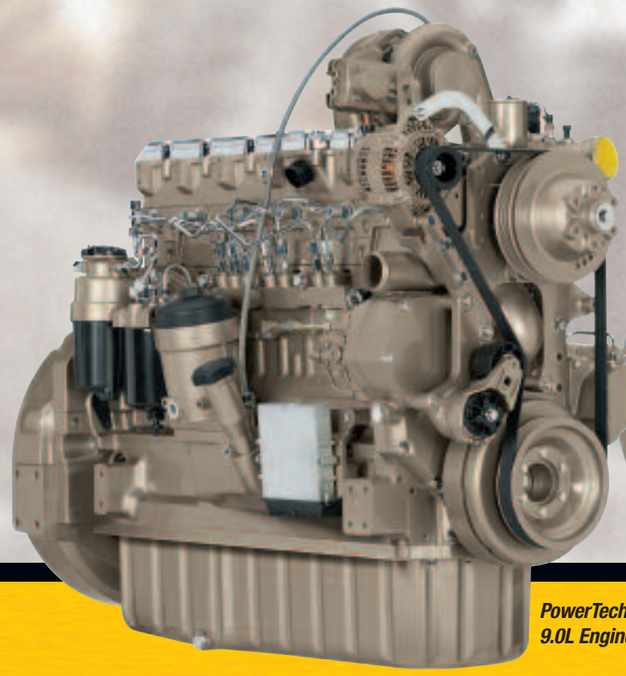
It all comes down to performance.

The emissions-control technology used by John Deere and increasing the displacement on the 8.1L engine to 9.0L and on the 12.5L to 13.5L, have made it possible for us to achieve the following goals for our PowerTech Plus engines:

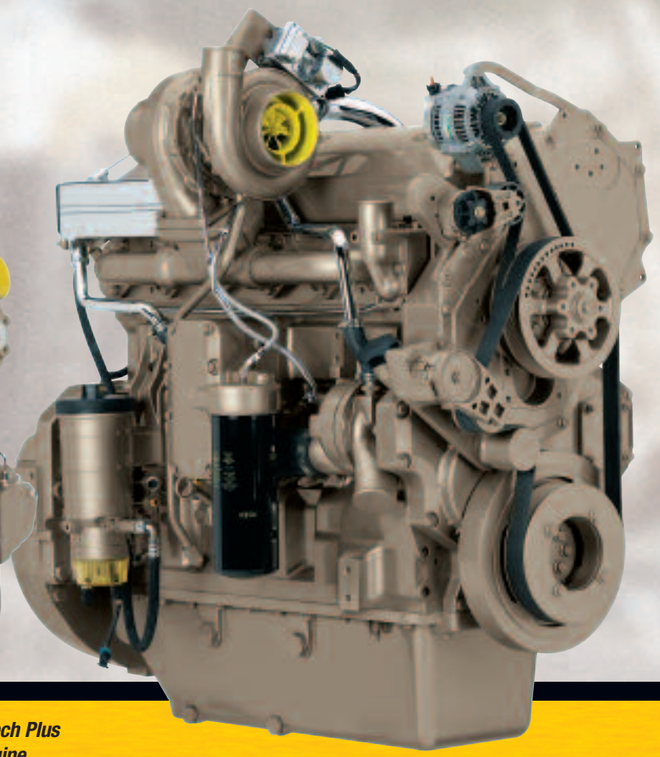
- Current power ratings for each level of displacement–maintained in 6.8L and 13.5L and extended in 4.5L and 9.0L
- Peak torque levels–maintained or improved
- Power bulge added to 4.5L and 6.8L, maintained or increased in 9.0L and 13.5L
- Low-speed torque–maintained or improved
- Fuel economy–best in class
- Transient response time–maintained or improved
- Cold weather starting–maintained or improved

PowerTech Plus 4.5L Engine

PowerTech Plus 6.8L Engine



PowerTech Plus 9.0L Engine



PowerTech Plus 13.5L Engine

PowerTech Plus Engines

Variable geometry turbocharger controls the amount of recirculated exhaust gas that mixes with the fresh air

Engine control unit controls fuel system; also controls air-to-fuel ratio, VGT output, cooled exhaust gas and fresh air mixing

Engine or remote mounted ECU

Air-to-air aspiration reduces NOx and increases power density

Electronic Unit Injector (13.5L) **and high-pressure common rail** (4.5L, 6.8L, 9.0L) fuel systems increase fuel pressure for more efficient combustion

Cooled EGR allows measured amounts of cooled exhaust gas to mix with incoming fresh air, lowering exhaust temperature and reducing NOx

4-valve cylinder head dramatically increases efficiency, power, and torque

500-hour oil change

Directed top liner cooling contributes to improved oil control and increased durability (9.0L and 13.5L)

Dual fuel filter system with water-in-fuel sensor, 10/2 micron filtering capabilities and low pressure fuel sensor

Low friction, single-piece steel piston provides improved fuel economy, reduced emissions, and increased durability (9.0L and 13.5L)

PowerTech Plus 9.0L 4-Valve Engine

Power Ratings for 2006 and 2007 Tier 3/Stage III A Regulations

Engine Model	Disp.	Rated Power kW	Rated Power hp	Rated Speed (RPM)	Peak Power kW	Peak Power hp	Peak Power (RPM)	Peak Torque Nm	Peak Torque lb-ft	Peak Torque (RPM)
4045	4.5L	111	149	2000	116	156	1800	645	476	1400
4045	4.5L	115	155	2200	125	167	2000	645	476	1400
4045	4.5L	115	155	2400	-	-	-	574	423	1400
4045	4.5L	129	173	2400	-	-	-	645	476	1400
4045	4.5L	138	185	2400	-	-	-	645	476	1400
6068	6.8L	134	180	2000	137	183	1600	838	618	1400
6068	6.8L	138	185	2200	151	202	1800	838	618	1400
6068	6.8L	138	185	2200	144	193	2000	744	549	1400
6068	6.8L	138	185	2400	-	-	-	690	509	1400
6068	6.8L	144	193	2000	151	202	1800	838	618	1400
6068	6.8L	144	193	2000	152	204	1700	934	689	1400
6068	6.8L	149	200	2200	168	225	1800	934	689	1400
6068	6.8L	149	200	2200	162	217	2000	838	618	1400
6068	6.8L	149	200	2400	-	-	-	744	549	1400
6068	6.8L	162	217	2000	168	225	1800	1024	755	1400
6068	6.8L	162	217	2000	168	225	1800	934	689	1400
6068	6.8L	168	225	2200	185	248	1800	1024	755	1400
6068	6.8L	168	225	2200	181	243	2000	934	689	1400
6068	6.8L	168	225	2400	-	-	-	838	618	1400
6068	6.8L	181	243	2000	185	248	1800	1024	755	1400
6068	6.8L	187	250	2200	198	266	2000	1024	755	1400
6068	6.8L	187	250	2400	-	-	-	934	689	1400
6068	6.8L	205	275	2400	-	-	-	1024	755	1400

Engine Model	Disp.	Rated Power kW	Rated Power hp	Rated Speed (RPM)	Peak Power kW	Peak Power hp	Peak Power (RPM)	Peak Torque Nm	Peak Torque lb-ft	Peak Torque (RPM)
6090	9.0L	168	225	2000	187	251	1800	1095	808	1500
6090	9.0L	168	225	2200	187	251	2000	1095	808	1500
6090	9.0L	168	225	2200	-	-	-	984	726	1500
6090	9.0L	187	250	2000	207	275	1800	1201	886	1500
6090	9.0L	187	250	2200	205	275	2000	1201	886	1500
6090	9.0L	187	250	2200	-	-	-	1095	808	1500
6090	9.0L	205	275	2000	224	300	1800	1313	968	1500
6090	9.0L	205	275	2200	224	300	2000	1313	968	1500
6090	9.0L	205	275	2200	-	-	-	1201	886	1500
6090	9.0L	224	300	2000	243	326	1800	1421	1048	1500
6090	9.0L	224	300	2200	243	326	2000	1421	1048	1500
6090	9.0L	224	300	2200	-	-	-	1313	968	1500
6090	9.0L	242	325	2000	261	350	1800	1530	1128	1500
6090	9.0L	242	325	2200	261	350	2000	1530	1128	1500
6090	9.0L	242	325	2200	-	-	-	1421	1048	1500
6090	9.0L	261	350	2000	279	374	1800	1554	1146	1500
6090	9.0L	261	350	2200	281	377	2000	1543	1138	1500
6090	9.0L	261	350	2200	-	-	-	1530	1128	1500
6090	9.0L	280	375	2200	-	-	-	1543	1138	1500
6090	9.0L	298	400	2200	-	-	-	1554	1146	1500

Engine Model	Disp.	Rated Power kW	Rated Power hp	Rated Speed (RPM)	Peak Power kW	Peak Power hp	Peak Power (RPM)	Peak Torque Nm	Peak Torque lb-ft	Peak Torque (RPM)
6135	13.5L	261	350	1900	298	400	1700	1834	1353	1400
6135	13.5L	261	350	2100	299	401	1900	1602	1182	1400
6135	13.5L	261	350	2100	-	-	-	1602	1182	1400
6135	13.5L	298	400	1900	335	449	1700	2063	1522	1400
6135	13.5L	298	400	2100	336	451	1900	1834	1353	1400
6135	13.5L	298	400	2100	-	-	-	1834	1353	1400
6135	13.5L	317	425	2100	336	451	1900	2063	1522	1400
6135	13.5L	336	450	1900	371	498	1700	2290	1689	1400
6135	13.5L	336	450	2100	373	500	1900	2063	1522	1400
6135	13.5L	336	450	2100	-	-	-	2063	1522	1400
6135	13.5L	373	500	1900	409	548	1700	2430	1792	1400
6135	13.5L	373	500	2100	411	551	1900	2290	1689	1400
6135	13.5L	373	500	2100	-	-	-	2290	1689	1400
6135	13.5L	392	525	2100	411	551	1900	2430	1792	1400
6135	13.5L	410	550	2100	432	579	1900	2430	1792	1400
6135	13.5L	410	550	2100	-	-	-	2430	1792	1400
6135	13.5L	448	600	2100	-	-	-	2505	1848	1600

PowerTech E 2.4L, 3.0L, 4.5L, and 6.8L Engines

Emissions compliance without sacrificing performance

Our Tier 3/Stage III A goal was to meet emissions regulations without sacrificing peak torque, low speed torque, or transient response time. We have exceeded this goal with our PowerTech E 2.4L, 3.0L, 4.5L, and 6.8L engines, and are offering them with the same platform, a similar price, and improved performance compared to the Tier 2/Stage II versions.

PowerTech E engines will give OEMs additional flexibility and installed-cost savings. Technologies used in these engines include:

- 2-valve cylinder heads
- Electronic unit pump (EUP) fuel system in 2.4L and 3.0L
- High-pressure common rail fuel system in 4.5L and 6.8L
- Full authority electronic engine controls
- Turbocharged or air-to-air aspirations

These technologies have made it possible to achieve the following goals:

- Peak torque–maintained or exceeded current level
- Low speed torque–maintained current level
- Transient response time–maintained or exceeded current level
- Price–similar to Tier 2/Stage II engines
- Expanded options

The benefits of electronic controls

PowerTech E engines offer electronically controlled fuel systems with improved cold start performance, precise engine speed control, torque curve shaping, and more. Because these systems have less need for redundant sensors, add-on electronic governors, and shutdown devices, they result in a lower installed cost.

These engines are equipped with the CAN communication link to utilize input from existing sensors and to communicate with other machine systems. They monitor important engine and auxiliary component data, warn the user about high temperatures and low oil pressure, and control such cold starting aids as glow plugs and air intake grid heaters.

In addition, electronic controls enable you to select droop or isochronous engine governing. They boost equipment uptime by derating or shutting down when necessary.

PowerTech E engines offer customer-programmable parameters for specific applications. Snapshot diagnostics record and store up to seven different sets of engine data, while the display panel shows continuous data on engine hours, load factor, engine RPM, and critical operation conditions.

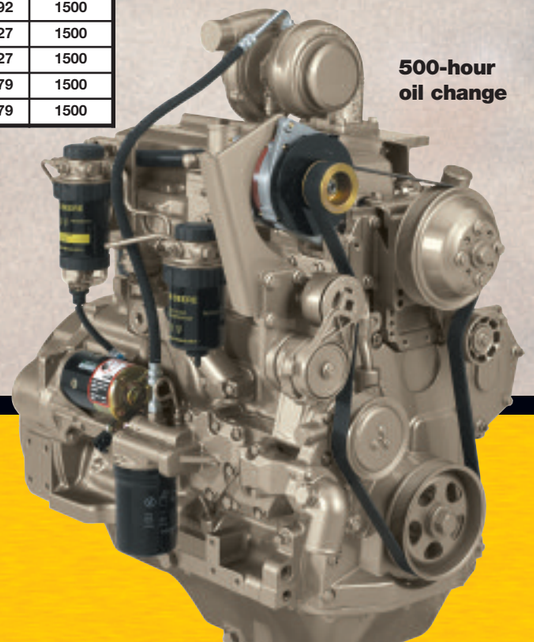
The bottom line: Electronic controls increase productivity, improve fuel economy, lower total installed costs, and reduce ownership costs.

Power Ratings for 2006 and 2007 Tier 3/Stage III A Regulations

Engine Model	Disp.	Rated Power kW	Rated Power hp	Rated Speed (RPM)	Peak Power kW	Peak Power hp	Peak Power (RPM)	Peak Torque Nm	Peak Torque lb-ft	Peak Torque (RPM)
4045	4.5L	86	115	2400	-	-	-	445	328	1500
4045	4.5L	86	115	2200	89	119	2000	481	355	1500
4045	4.5L	93	125	2400	-	-	-	481	355	1500
4045	4.5L	93	125	2200	99	133	2000	525	387	1500
4045	4.5L	104	140	2400	-	-	-	525	387	1500
6068	6.8L	104	140	2400	-	-	-	538	397	1500
6068	6.8L	104	140	2200	111	149	2000	598	441	1500
6068	6.8L	116	155	2400	-	-	-	598	441	1500
6068	6.8L	116	155	2200	124	166	2000	667	492	1500
6068	6.8L	129	173	2400	-	-	-	667	492	1500
6068	6.8L	129	173	2200	132	177	2000	714	527	1500
6068	6.8L	138	185	2400	-	-	-	714	527	1500
6068	6.8L	138	185	2200	144	193	2000	785	579	1500
6068	6.8L	149	200	2400	-	-	-	785	579	1500

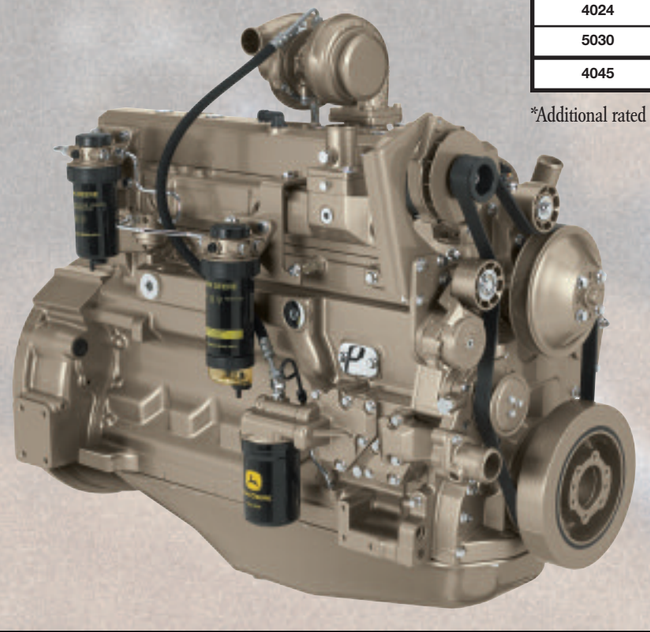
Dual fuel filter system with water-in-fuel sensor, 10/2 micron filtering capabilities and low pressure fuel sensor

500-hour oil change



PowerTech E 4.5L Engine

Engine-mounted or remote-mounted Engine Control Unit (ECU) uses sensors and model based controls to determine fuel quantity, injection timing, and a host of other control parameters to deliver peak engine performance



High-pressure common rail fuel system increases fuel pressure for more efficient combustion

Self-adjusting poly-vee fan drive

Full authority electronic engine controls

PowerTech E 6.8L Engine

Power Ratings for 2008 Tier 3/Stage III A Regulations

Engine Model	Disp.	Power Range kW	Power Range hp	Maximum Rated Speed (RPM)*
4024	2.4L	45-60	60-80	2800
5030	3.0L	41-74	55-99	2800
4045	4.5L	63-74	85-99	2400

*Additional rated speeds available. See your John Deere engine distributor for information.

PowerTech M Engines

Tier 3/Stage III A compliance for flexibility and cost-savings

John Deere offers 2.4L/3.0L and 4.5L engines in the PowerTech M category. Ideal for lower-horsepower applications, these engines are equipped with a new fuel system that creates higher injection pressures.

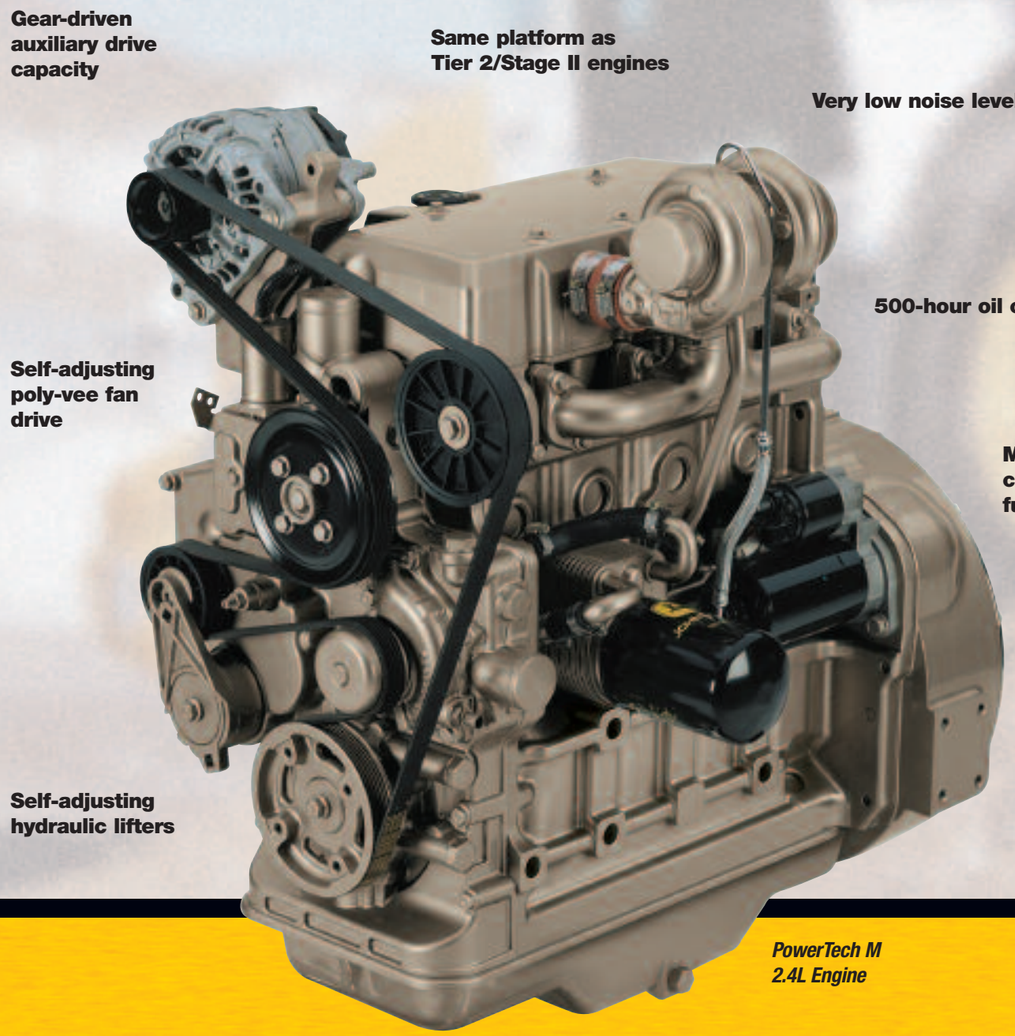
These PowerTech M engines will give OEMs additional flexibility and cost-savings. Technologies used include the following:

- Mechanical fuel system controls
- Two valves per cylinder
- Standard or wastegate turbocharger
- Naturally aspirated, turbocharged, and air-to-air aspirations

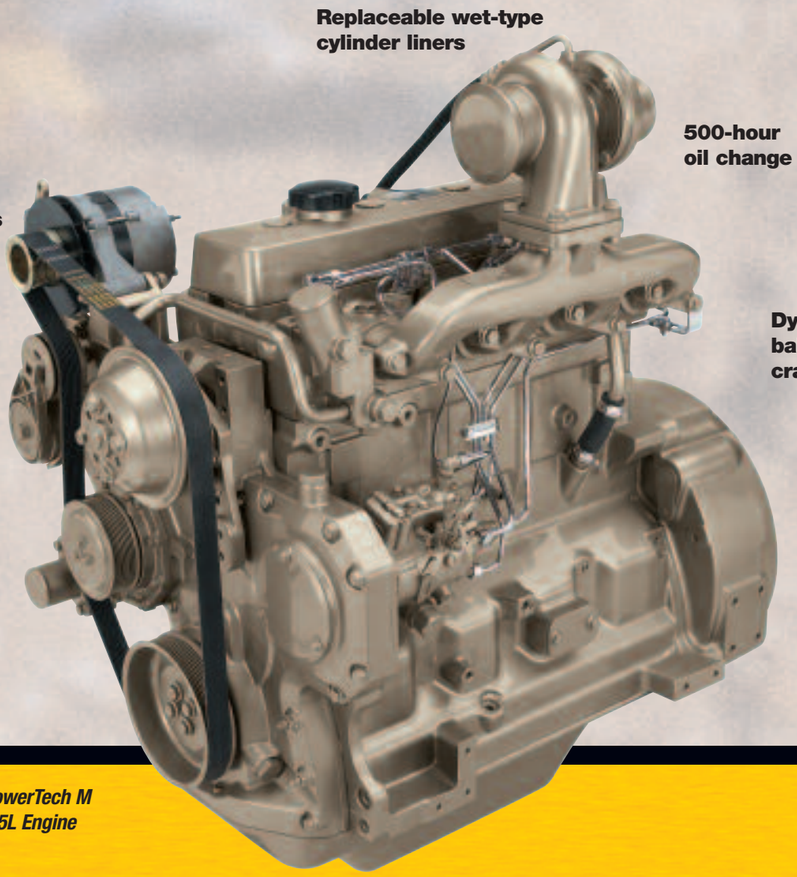
These technologies have made it possible to achieve the following goal for the PowerTech M engines:

- Peak torque–maintained or exceeded current level
- Low speed torque–exceeded current level
- Transient response time–maintained or exceeded current level
- Price–similar to Tier 2/Stage II engines

PowerTech M 2.4L/3.0L, starting at 30 kW (40 hp) and 4.5L starting at 60 kW (80 hp) will be available in advance of EPA regulations, Tier 3 and Interim Tier 4, beginning in January 2008, and EU regulations, Stage III A, beginning in January 2007. See your John Deere engine distributor for information.



PowerTech M 2.4L Engine



PowerTech M 4.5L Engine

For additional information contact:

North America and Brazil
John Deere Power Systems
3801 West Ridgeway Avenue
P.O. Box 5100
Waterloo, IA 50704-5100
Phone: 800-533-6446
Fax: 319-292-5075
e-mail: jdpower@johndeere.com

Australia and New Zealand
John Deere Limited,
Power Systems Division
49 Smeaton Grange Road
Narellan NSW 2567 Australia
Phone: 612 46474857
Fax: 612 46461236

Mexico
Industrias John Deere S.A. de C.V.
Boulevard Diaz Ordaz No. 500
Garza Garcia, Nuevo Leon 66210
Mexico
Phone: 52 (81) 8040-1212
Fax: 52 (81) 1052-8482

Argentina
Industrias John Deere Argentina, S.A.
Juan Orsetti 481
2152 Grandero Baigorria
Sante Fe, Argentina
Phone: 54-341-471-8000
Fax: 54-341-471-8001

Europe, Africa and Middle East
John Deere Power Systems
Usine de Saran
La Foulonnerie – B.P. 11013
45401 Fleury-les-Aubrais Cedex – France
Phone: (33) 2 38 82 61 19
Fax: (33) 2 38 82 60 00
e-mail: jdengine@johndeere.com

Far East
John Deere Asia Ltd
Suite 903, 9th Floor
Lippo Sun Plaza, 28 Canton Road
Tsim Sha Tsui, Kowloon,
Hong Kong
Phone: 852 3105 0818
Fax: 852 3105 0331

Central America, South America and Caribbean
Tradewinds Power Corp.
5820 NW 84th Avenue
Miami, FL 33166
Phone: 305-592-9745
Fax: 305-592-7461

Make the right choice

John Deere has been thinking environmentally for decades, and we're committed to the goal of cleaner air for everyone.

John Deere has an unwavering commitment to our customers, which is why we're focused on developing and manufacturing engines that meet both environmental regulations and your need for reliability, efficiency, and performance.

For additional information, contact your nearest John Deere engine distributor.

Customer Support

When you need service on John Deere-powered equipment, we're nearby–and with more than 4,000 service locations worldwide, that's true virtually anywhere in the world.

We have centralized parts warehouses in the United States and Europe, plus numerous worldwide depots that employ overnight parts shipping–so you'll never have to wait long for parts. If you need a part that isn't in stock locally, our state-of-the-art parts system will promptly find it and ship it to you.

John Deere service personnel are highly trained technicians who stay on top of changing engine technologies and service techniques through factory schools and hands-on training.

John Deere dealers and distributors are your best source for expert service, knowledge, and engine accessories. They're one of the many excellent reasons to specify John Deere engines in all your equipment.

JOHN DEERE

Tier 3/Stage III A 2.4L 3.0L 4.5L 6.8L 9.0L 13.5L

DSWT09 Litho in U.S.A. (05-03)