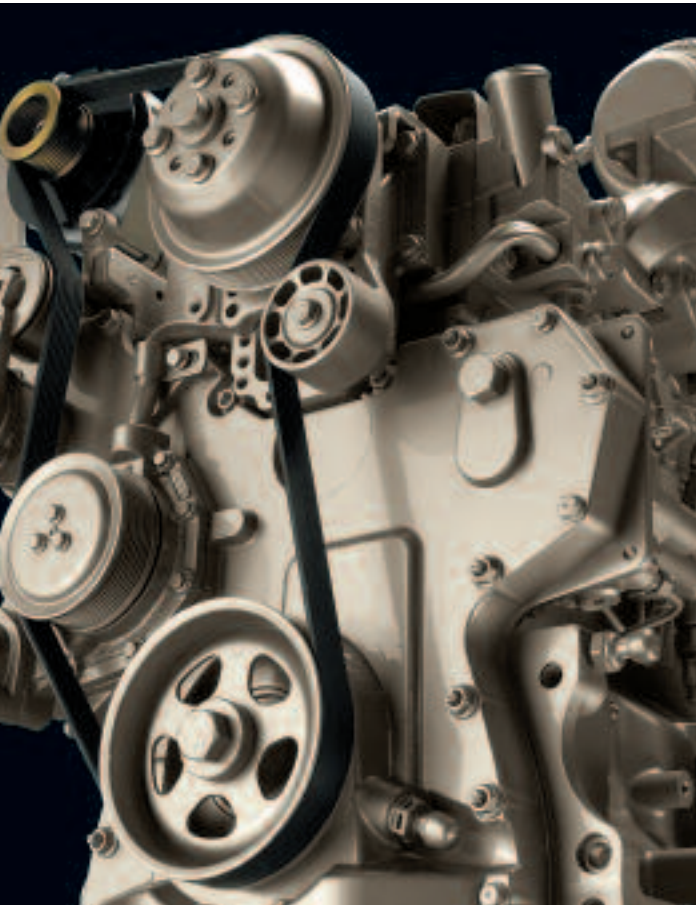
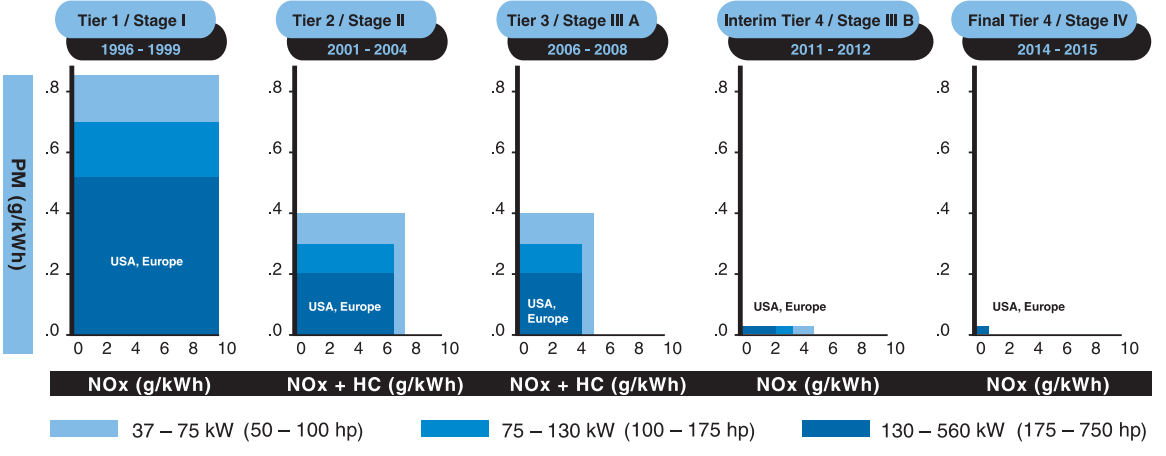
JOHN DEERE

John Deere PowerTech Plus and PowerTech E Tier 3/Stage III A Information



EPA and EU Non-Road Emissions Regulations



PowerTech Plus™ 4.5L, 6.8L, 9.0L, & 13.5L Engines

Tier 3/Stage III A

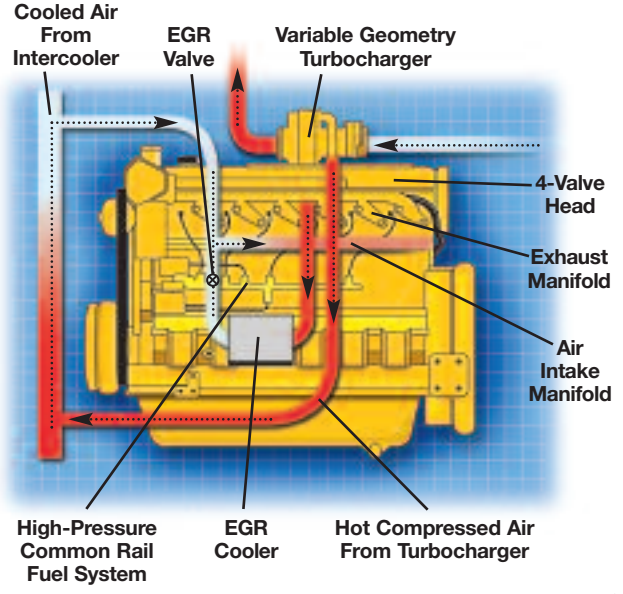
The ultimate in emissions compliance, performance, and fuel economy is now available in the Ag and Industrial markets.

Presenting the John Deere PowerTech Plus engines.

EPA Tier 3 emissions regulations are now being phased in for non-road equipment, as shown in the EPA and EU Non-Road Emissions Regulations chart on page 2. This means emissions of NOx (oxides of nitrogen) must be reduced by at least 40%.

The new John Deere PowerTech Plus engines meet all new Tier 3 regulations while offering better performance, fuel economy that meets or exceeds Tier 2, and reduced noise–all thanks to the right combination of proven technologies.

PowerTech Plus Technology



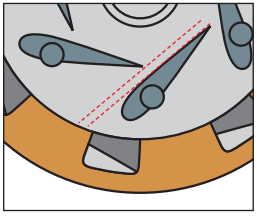
PowerTech Plus Engines Features and Benefits

Cooled Exhaust Gas Recirculation – EGR (New)

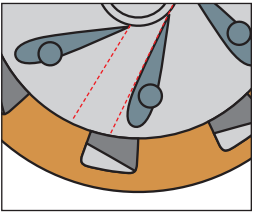
- Cools and mixes measured amounts of cooled exhaust gas with incoming fresh air to lower peak combustion temperatures, thereby reducing NOx

Variable Geometry Turbocharger – VGT (New)

- Varies exhaust pressure based on load and speed to ensure proper EGR flow; greater low-speed torque, quicker transient response, higher peak torque, and best-in-class fuel economy



Narrow vane openings increase boost at low speeds and load



Wider vane openings increase efficiency at high speeds and load

4-Valve Cylinder Head

- Provides excellent airflow resulting in greater low speed torque and better transient response time. Cross-flow design on the 4.5L, 6.8L, and 13.5L. New 4-valve U-flow head design on the 9.0L

High Pressure Electronic Fuel Injection Systems

- 4.5L, 6.8L, and 9.0L: HPCR – Higher injection pressures, up to 1600 bar (23,500 PSI) variable injection pressure, variable timing control, and multiple injections
- 13.5L: Electronic Unit Injector – Increased injection pressure, up to 2000 bar (29,000 PSI); variable timing control, and multiple injections

Compact Size

- Horsepower/displacement ratio is best-in-class (lower installed cost)
- Mounting points for Tier 3/Stage III A engine models are the same as Tier 2/Stage II engine models

Air-to-Air Intercooling

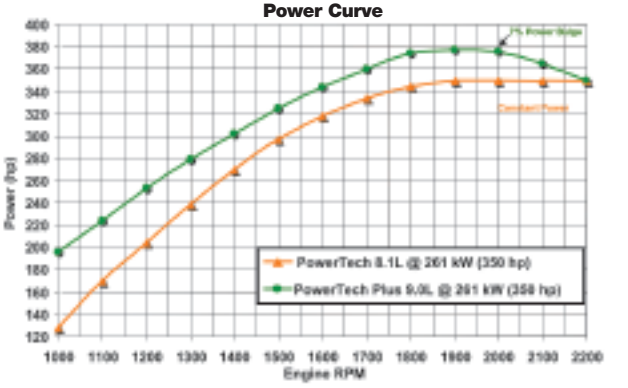
- Most efficient method of cooling intake air to help reduce engine emissions while maintaining low speed torque, transient response time, and peak torque. Enables an engine to meet emissions with better fuel economy and the lowest installed costs

continued

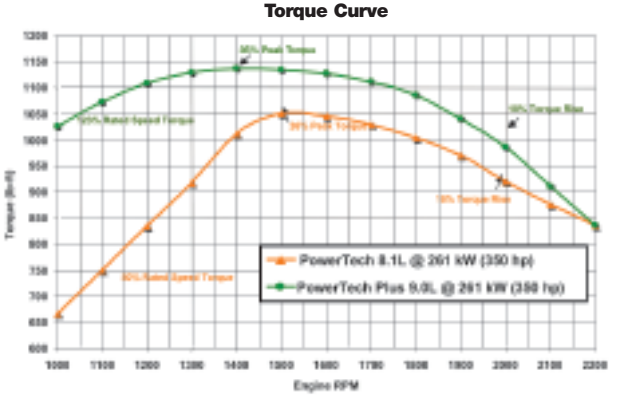
Engine Performance

- Multiple rated speeds to further reduce noise and improve fuel economy
- New higher peak torque ratings
- Better transient response time
- Greater levels of low speed torque
- New “power bulge” feature (4.5L and 6.8L)
- Higher levels of power bulge (9.0L and 13.5L)

Tier 3 PowerTech Plus 9.0L vs. Tier 2 PowerTech 8.1L



Tier 3 PowerTech Plus 9.0L vs. Tier 2 PowerTech 8.1L



John Deere Electronic Engine Controls (New)

- Monitors critical engine functions providing warning and/or shutdown to prevent costly engine repairs; eliminates need for add-on governing components; all lowering total installed costs. Snapshot diagnostic data that can be retrieved using commonly available diagnostic service tools
- New common wiring interface connector for vehicles or available OEM instrumentation packages; new solid conduit and "T" connectors to reduce wiring stress and provide greater durability and improved appearance
- Factory installed, engine mounted ECU or remote mounted ECU, wiring harness and associated components
- Industry standard SAE J1939 interface which communicates with other vehicle systems, eliminating redundant sensors and reducing vehicle installed cost

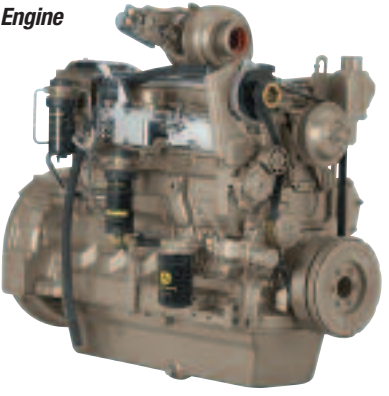
Additional Features

- **4.5L and 6.8L:** Glow plugs; gear-driven auxiliary drive; optional 500-hour oil change; self-adjusting poly-vee fan drive, R.H. and L.H. engine mounted fuel filters (6.8L)
- **9.0L:** Single-piece low friction piston (new); directed top-liner cooling; gear-driven auxiliary drive; optional 500-hour oil change (new); self-adjusting poly-vee fan drive; optional rear PTO; low-pressure fuel system with "auto-prime" feature (new)
- **13.5L:** Single-piece low friction piston (new); directed top-liner cooling; gear-driven auxiliary drive; optional 500-hour oil change (new); self-adjusting poly-vee fan drive; optional rear PTO

PowerTech Plus 4.5L Highlights

- Expanded horsepower range: 111 – 138 kW (149 – 185 hp)
- New "power bulge" feature: up to 9%
- Higher level of peak torque: up to 29%
- More low speed (1000 RPM) torque – up to 123% of rated speed torque
- Transient response that meets or exceeds Tier 2/Stage II
- Best-in-class fuel economy
- Lower rated speed to reduce noise and improve fuel economy
- Cold starting capabilities that meet or exceed Tier 2/Stage II
- Maintained compact size and same mounting locations

PowerTech Plus 6.8L Engine



PowerTech Plus 4.5L Engine

PowerTech Plus 6.8L Highlights

- Maintained horsepower range: 134 – 205 kW (180 – 275 hp)
- New "power bulge" feature: up to 13%
- Higher level of peak torque: up to 44%
- More low speed (1000 RPM) torque – up to 145% of rated speed torque
- Transient response that meets or exceeds Tier 2/Stage II
- Best-in-class fuel economy
- Lower rated speed to reduce noise and improve fuel economy
- Cold starting capabilities that meet or exceed Tier 2/Stage II
- New rear exhaust turbocharger and exhaust elbow options
- Maintained compact size and same mounting locations

Tier 3/Stage III A PowerTech Plus 4.5L & 6.8L Engines

Engine Model	Disp.	Rated Power		Rated Speed	Peak Power		Peak Power	Peak Torque		Peak Torque
		kW	hp	(RPM)	kW	hp	(RPM)	Nm	lb-ft	(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

PowerTech Plus 9.0L Highlights

- Expanded horsepower range: 168 – 298 kW (225 – 400 hp)
- Best-in-class power density
- Higher level of power bulge: up to 11%
- Higher level of peak torque: up to 50%
- More low speed (1000 RPM) torque – up to 150% of rated speed torque
- Transient response that meets or exceeds Tier 2/Stage II
- Best-in-class fuel economy
- Lower rated speed to reduce noise and improve fuel economy
- Cold starting capabilities that meet or exceed Tier 2/Stage II
- New compact size

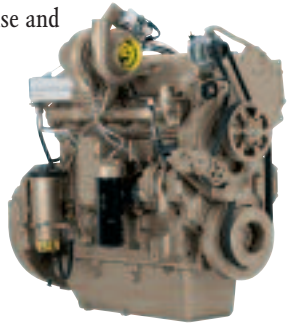
PowerTech Plus 9.0L Engine

Tier 3/Stage III A PowerTech Plus 9.0L Engines

Engine Model	Disp.	Rated Power		Rated Speed	Peak Power		Peak Power	Peak Torque		Peak Torque
		kW	hp	(RPM)	kW	hp	(RPM)	Nm	lb-ft	(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

PowerTech Plus 13.5L Highlights

- Maintained horsepower range: 261 – 448 kW (350 – 600 hp)
- Best-in-class power density
- Higher level of power bulge: up to 14%
- Higher level of peak torque: up to 43%
- More low speed (1000 RPM) torque: up to 138% of rated speed torque
- Transient response that meets or exceeds Tier 2/Stage II
- Best-in-class fuel economy
- Lower rated speed to reduce noise and improve fuel economy
- Cold starting capabilities that meet or exceed Tier 2/Stage II
- Compact size



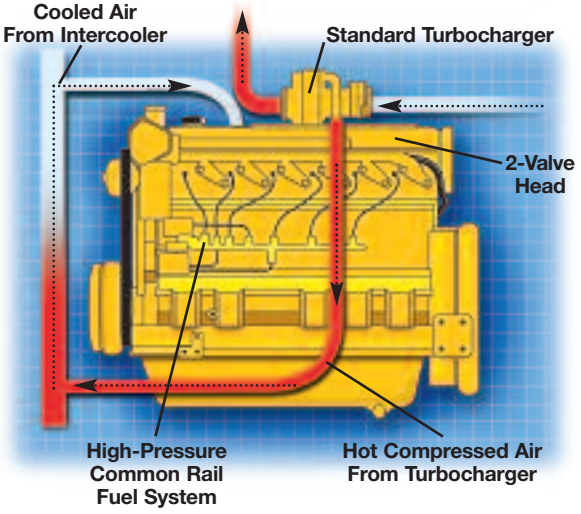
PowerTech Plus 13.5L Engine

Tier 3/Stage III A PowerTech Plus 13.5L Engines

Engine Model	Disp.	Rated Power		Rated Speed	Peak Power		Peak Power	Peak Torque		Peak Torque
		kW	hp	(RPM)	kW	hp	(RPM)	Nm	lb-ft	(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 Engines Features and Benefits

PowerTech E Technology



High Pressure Common Rail Fuel System

- Higher injection pressures, up to 1600 bar (23,500 PSI), variable injection pressure, variable timing control, multiple injections

2-Valve Cylinder Head

- Cross flow head design that provides excellent breathing from a lower cost 2-valve cylinder head

Standard or Wastegated Turbocharger

- Dependent on power rating, standard or wastegated turbochargers precisely matched to the power level and application

Air-to-Air Intercooling

- Most efficient method of cooling intake air to help reduce engine emissions while maintaining low speed torque, transient response time, and peak torque. Enables an engine to meet emissions with better fuel economy and the lowest installed costs

Compact Size

- Mounting points for Tier 3/Stage III A 4.5L and 6.8L engine are the same as Tier 2/Stage II 4.5L and 6.8L engine models

John Deere Electronic Engine Controls

- Monitor critical engine functions providing warning and/or shutdown to prevent costly engine repairs; eliminate need for add-on governing components; all lowering total installed costs. Snapshot diagnostic data that can be retrieved using commonly available diagnostic service tools
- New common wiring interface connector for vehicles or available OEM instrumentation packages; new solid conduit and "T" connectors to reduce wiring stress, provide greater durability and improve appearance
- Factory installed, engine mounted ECU, wiring harness and associated components; industry standard SAE J1939 interface which communicates with other vehicle systems, eliminating redundant sensors and reducing vehicle total installed cost

Engine Performance

- New "power bulge" feature (4.5L and 6.8L)
- Increased low speed torque
- Multiple rated speeds to further reduce noise and improve fuel economy
- New higher peak torque ratings

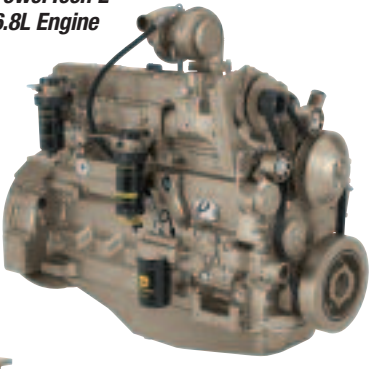
Additional Features

- Self-adjusting, poly-vee fan drive; forged-steel connecting rods; replaceable wet-type cylinder liners; either-side service; optional 500-hour oil change; standard gear auxiliary drive

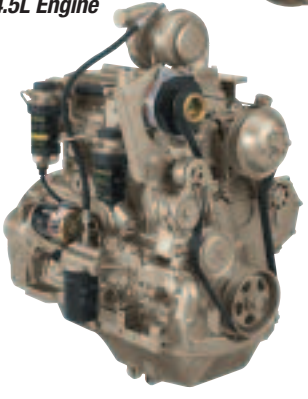
PowerTech E 4.5L and 6.8L Highlights

- Horsepower range
  - 4.5L: 86 – 104 kW (115 – 140 hp)
  - 6.8L: 104 – 149 kW (140 – 200 hp)
- New "power bulge" feature – up to 7%
- Higher peak torque – up to 32%
- More low speed (1000 RPM) torque – up to 132% of rated speed torque
- Transient response that meets or exceeds Tier 2/Stage II
- Excellent fuel economy
- Lower rated speed to reduce noise and improve fuel economy
- Cold starting capabilities that meet or exceed Tier 2/Stage II
- Maintain Tier 2/Stage II compact size and mounting locations
- Similar Tier 2/Stage II cost

PowerTech E 6.8L Engine



PowerTech E 4.5L Engine



Tier 3/Stage III A PowerTech E 4.5L and 6.8L Engines

Engine Model	Disp.	Rated Power		Rated Speed	Peak Power		Peak Power	Peak Torque		Peak Torque
		kW	hp	(RPM)	kW	hp	(RPM)	Nm	lb-ft	(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

PowerTech Plus Tier 3/Stage III A Technology with Cooled EGR

John Deere PowerTech Plus engines with Cooled EGR provide the best possible performance and fuel economy in the simplest most dependable package.

High Performance

With John Deere PowerTech Plus engines we meet Tier 3/Stage III A emissions without sacrificing performance. We have maintained or increased power output from all PowerTech Plus models. In many cases, peak torque levels, transient response time, and cold weather starting have actually been improved compared to Tier 2/Stage II.

Durability

John Deere Tier 3/Stage III A engines are designed for rugged off-road operation, with features such as heavy-duty stainless-steel exhaust heat exchangers and new power cylinder materials for unparalleled durability. The durability of John Deere Tier 3/Stage III A engines will be as good or better than current John Deere engines, which are already known as the best in the industry.

Ease of Installation

Because we can maintain our pre-Tier 3/Stage III A package size without derating power, changing over from Tier 2/Stage II models will be easier and less expensive. John Deere Tier 3/Stage III A PowerTech Plus models will take up less space than many competitive models.

Common Myths About EGR

A lot of false and misleading information about cooled EGR and VGT has been circulated by engine manufacturers that have chosen less effective technologies for Tier 3/Stage III A. Here are some examples:

Myth: Cooled EGR adds more complexity than other technologies.

Fact: While cooled EGR engines require additional sensors and actuators, the control logic is designed into the engine control unit (ECU), which allows the complexity to be transparent, like that of a cell phone or home computer. The technology within may be complex to the average individual, but that technology 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.

Myth: Cooled EGR causes lower power density.

Fact: With cooled EGR and VGT, John Deere has been able to maintain or increase the power density from each engine platform. With PowerTech Plus Tier 3/Stage III A engines, you will never be forced to go up in platform size. In fact, using John Deere PowerTech Plus engines may allow customers to go down in platform size, if they choose to do so, and lower their installed cost for a Tier 3/Stage III A engine compared to Tier 2/Stage II. While John Deere has maintained or increased power density, other manufacturers have announced significant decreases in power density from some Tier 3/Stage III A platforms.

Myth: Cooling systems will have to be larger because cooled EGR has higher heat rejection.

Fact: No one would argue that cooled EGR increases heat rejection to the coolant (radiator) side of an engine's cooling system. However, John Deere has managed this with increased top tank temperatures, increased coolant flows, and decreased fuel consumption. From a Charge-Air-Cooler (CAC) perspective, the VGT has allowed John Deere to better manage airflows and maintain or lower heat rejection to the CAC side compared to

less efficient competitive Tier 3/Stage III A engines. The overall heat rejection rate, relative to John Deere Tier 2/Stage II engines, will increase 10% for the 6.8L PowerTech Plus and 5% for the 9.0L. There is no increase on the 13.5L. As a result, heat rejection from PowerTech Plus engines will be no higher than less efficient competitive technologies. These models could have 5% – 10% higher total heat rejection than some competitive engines, but the difference will be managed by the increased top tank temperatures, increased coolant flows, and best-in-class fuel economy. In many cases, it may be possible to utilize similar sized Tier 2/Stage II cooling components for Tier 3/Stage III A engine platforms.

Myth: Fuel consumption will be worse with cooled EGR because of high fan power requirements.

Fact: Heat rejection for Tier 3/Stage III A engines, regardless of engine manufacturer, will increase. However, with a properly designed (managed) cooling package, there is no reason why fan power has to increase. Even if OEMs choose to run 20% higher fan power, they would realize only a 1% increase in fuel consumption in a typical application. Compared to current Tier 2/Stage II and other Tier 3/Stage III A technologies, PowerTech Plus engines will achieve basic fuel consumption improvements of up to 12%, which far exceeds the 1% consumed by cooling systems with high fan power losses.

Myth: Engines with cooled EGR require more maintenance.

Fact: In fact, John Deere PowerTech Plus engines are actually increasing maintenance intervals across all models. An optional 500-hour oil change interval will be available on all Tier 3/Stage III A OEM engines from John Deere. New fuel filtration systems with water-in-fuel (WIF) and a low-pressure fuel sensor will help extend fuel filter replacement intervals.

Myth: Cooled EGR requires low sulfur on-road diesel fuel.

Fact: Diesel fuel recommendations are unchanged for Tier 3/Stage III A engines. All John Deere Tier 3/Stage III A engines are being developed to use worldwide off-road fuels with up to 5000 PPM sulfur. For those parts of the world that require Tier 3/Stage III A engine platforms, these countries are also mandating the adoption of low-sulfur and ultra-low-sulfur fuels.

By January 2006, the most commonly available diesel fuel in those parts of the world requiring Tier 3/Stage III A engines will be 500 PPM sulfur or less.

Myth: Cooled EGR requires high-grade oils.

Fact: Regardless of the engine technology, oil standards are being upgraded industry-wide. Like all on-road and off-road engine manufacturers, John Deere recommends API CI-4 oils for Tier 3/Stage III A engines. These oils are currently available from all major oil companies and John Deere. John Deere Plus 50 and Torq-Gard Supreme 10W-30 oils already meet the new standard and will continue to be recommended for Tier 3/Stage III A, just as they were for previous engines.

Myth: Cooled EGR causes dangerously low engine life outside North America and Western Europe.

Fact: John Deere PowerTech Plus Tier 3/Stage III A engines have been designed with the same rigorous durability and reliability goals our customers have become accustomed to. When lubricating oils and diesel fuels meet the recommendations specified in the operator's manual (and service is performed at prescribed intervals as well), there are no durability issues associated with cooled EGR technology.

Myth: Cooled EGR cannot be turned off for use outside North America and Western Europe.

Fact: Cooled EGR could easily be "turned off" for use in parts of the world where certified engines are not required. However, John Deere is not planning on this option because there are better, lower cost engine technologies available for use in these markets. In addition, for OEMs who export a significant number of machines to countries that don't require certification, we will continue to manufacture Tier 2/Stage II and Tier 1/Stage I engines in the same platform sizes and power ratings currently provided.

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