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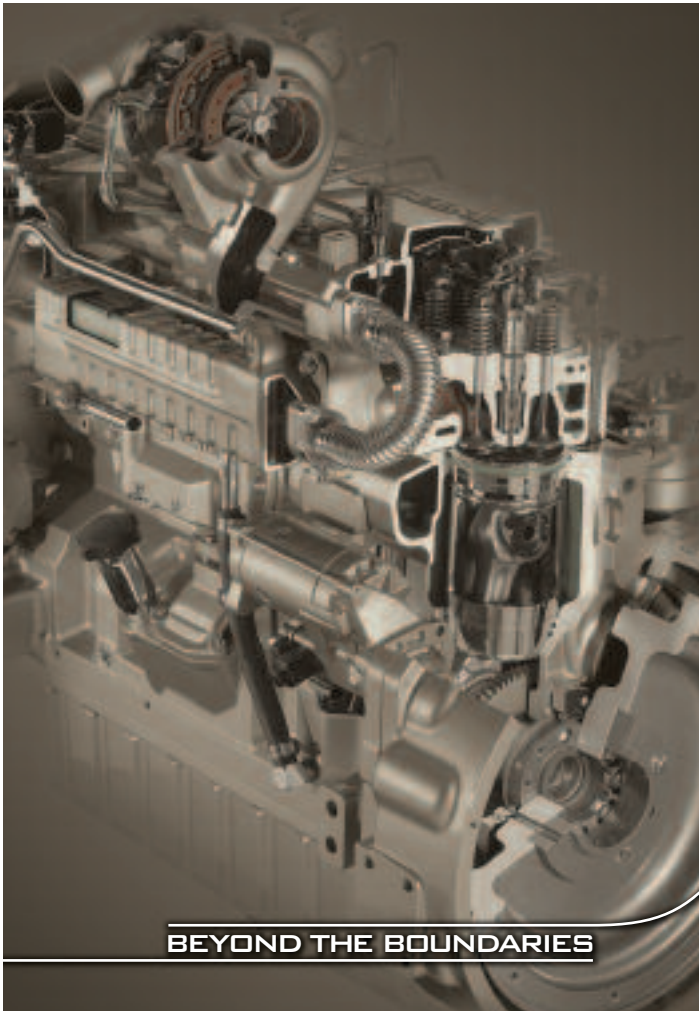
Tier 3/Stage III A

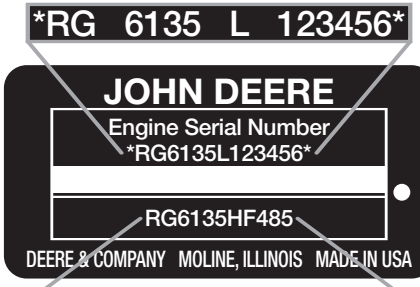
Diesel Engine Ratings



Contents

PowerTech Plus™ 9.0L
Tier 3/Stage III A

Identification Plate



Factory Manufactured by:

RG	Waterloo, IA
CD	Saran, France
PE	Torreon, Mexico
PY	Pune, India

Number of Cylinders and Total Displacement

6135	6 Cylinders, 13.5 Liters
6125	6 Cylinders, 12.5 Liters
6090	6 Cylinders, 9.0 Liters
6081	6 Cylinders, 8.1 Liters
6068	6 Cylinders, 6.8 Liters
4045	4 Cylinders, 4.5 Liters
4039	4 Cylinders, 3.9 Liters
5030	5 Cylinders, 3.0 Liters
3029	3 Cylinders, 2.9 Liters
4024	4 Cylinders, 2.4 Liters

Emissions Certificate

B	Non-emissions regulated
C, E, F	Tier 1/Stage I
G, J, K	Tier 2/Stage II
L, M, N, P	Tier 3/Stage III A

Engine Serial Number

Emissions Certification

120,160, 220, 425	Non-emissions regulated
001, 150, 180, 250	Tier 1/Stage I
270, 275, 070, 475	Tier 2/Stage II
280, 285, 485	Tier 3/Stage III A
290, 295, 495	Interim Tier 4/Stage III B

Engine Controls (Starting with some Tier 2/Stage II engines)

0	Mechanical Controls
4 or 5	Electronic Controls

Valves Per Cylinder (Starting with some Tier 2/Stage II engines)

2	2 Valves
4	4 Valves

User Type

F	OEM (John Deere Power Systems)
XX	Other letters are used to identify John Deere Equipment Manufacturing Locations

Air Intake System

D	Naturally Aspirated
T	Turbocharged
A	Turbocharged and Aftercooled, Air-to-Water
H	Turbocharged and Aftercooled, Air-to-Air

Model Designation Key

Below is a key for the engine models shown in this guide.

A model designated as 6135H is a 6-cylinder, 13.5-liter turbocharged and aftercooled, air-to-air engine. A model designated as a 4045T is a 4-cylinder, 4.5-liter turbocharged engine.

6135H

- **H** — Indicates Air Intake System
- **135** — Displacement in Liters
- **6** — Number of Cylinders

Tier 1/Stage I	PowerTech technology
Tier 2/Stage II	PowerTech technology
Tier 3/Stage III A	PowerTech Plus, PowerTech E, or PowerTech M technology

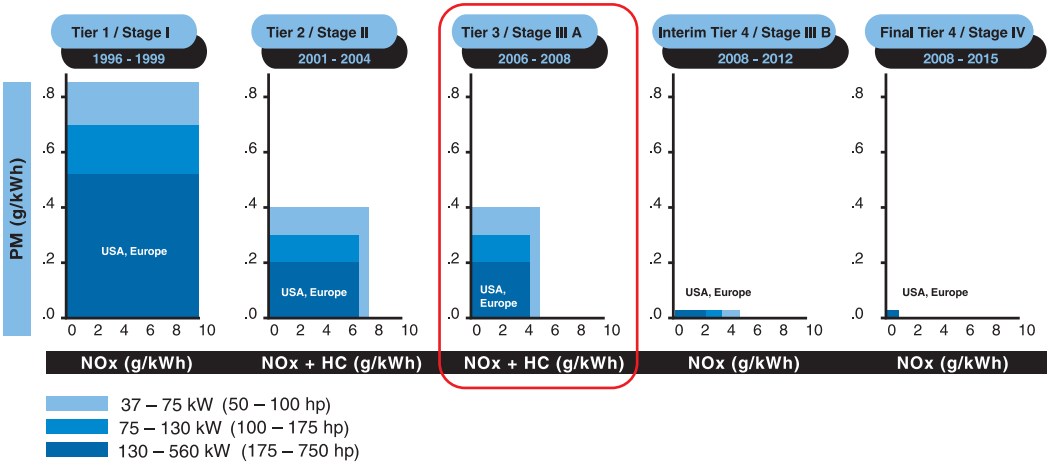
Emissions Information

The ultimate in performance, fuel economy, and emissions compliance is available with John Deere engines.

To meet Tier 3/Stage III A standards, John Deere worked closely with equipment manufacturers to identify engine technologies that best suited their needs. We quickly recognized that no single technology would satisfy the diverse needs of our off-highway customers. This is why we created three engine solutions: PowerTech M™, PowerTech E™, and PowerTech Plus™.

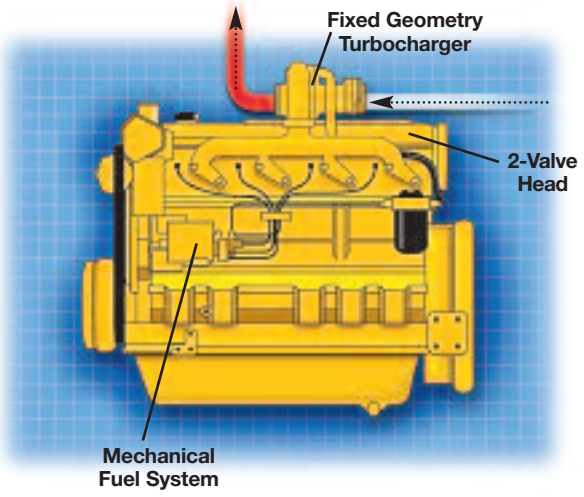
John Deere engines comply with non-road emissions regulations for the U.S. Environmental Protection Agency (EPA), the European Union (EU), and the California Area Resources Board (CARB). John Deere also provides Tier 1/Stage I and Tier 2/Stage II engines for non-regulated countries.

NON-ROAD EMISSIONS REGULATIONS
37 – 560 kW (50 – 750 hp)



PowerTech M™

2.4L and 4.5L Engines



2-Valve Cylinder Head
Cross-flow head design provides excellent breathing from a lower-cost 2-valve cylinder head.

Mechanical Rotary Fuel Pump
The timing and fuel injection pressures are optimized to maximize performance and fuel economy at a given rated speed (4.5L).

Mechanical Unit Fuel Pump
This system uses a camshaft driven pump, connected to the injector by a short fuel line. This short fuel line between the unit pump and the injector helps to alleviate after-injection, secondary injection, and other injection abnormalities (2.4L).

Fixed Geometry or Wastegated Turbocharger
Dependent on power rating, fixed geometry or wastegated turbochargers are precisely matched to the power level and application.

Naturally Aspirated
In naturally aspirated engines, the combustion air is drawn into the cylinder when the piston moves down. The amount of air is limited by the displacement of the engine (2.4L).

Turbocharged
In turbocharged engines, the air is pre-compressed. Due to the higher pressure, more air is supplied into the combustion chamber allowing a corresponding increase in fuel injection, which results in greater engine output (2.4L and 4.5L).

Air-to-Air Intercooling
This is the most efficient method of cooling intake air to help reduce engine emissions while maintaining low-speed torque, transient response time, and peak torque. It enables an engine to meet emissions regulations with better fuel economy and the lowest installed costs (4.5L).

Compact Size
Mounting points are the same as Tier 2/Stage II engine models.

Engine Performance
- Multiple rated speeds to further reduce noise and improve fuel economy
- New power bulge feature (4.5L)
- New higher-peak torque speed

Additional Features
- Self-adjusting poly-vee fan drive
- Forged-steel connecting rods
- Replaceable wet-type cylinder liners (4.5L)
- Either-side service
- 500-hour oil change
- Optional final fuel filter with water separator and water-in-fuel sensor (4.5L)
- Optional balancer shafts

PowerTech M 2.4L Engines

- Power range:
  4024D: 31 – 35 kW (42 – 46 hp)
  4024T: 36 – 37 kW (48 – 49 hp)
- Improved unit pumps
- Improved governor serviceability
- Improved timing cover access

PowerTech M 2.4L Engine

Interim Tier 4 and Stage III A PowerTech M 2.4L Engines

Engine Model	Rated Power		Rated Speed (RPM)
	kW	hp	
4024DF290*	31	42	2400
4024DF290*	35	46	2800
4024TF290	36	48	2400
4024TF290	37	49	2800

*Advanced rating.

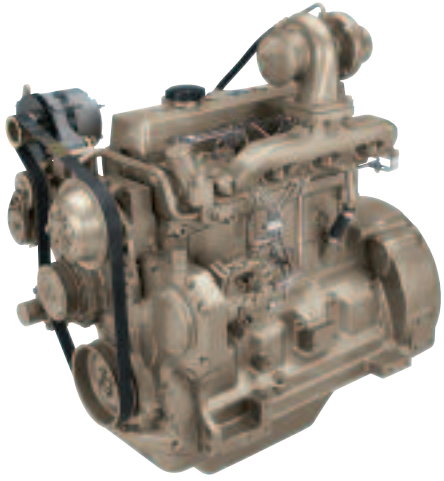
Bore		Stroke		Length		Width		Height		Weight	
mm	in	mm	in	mm	in	mm	in	mm	in	kg	lb
86	3.4	105	4.1	662	26.1	541	21.3	772	30.4	251	554

Ratings are subject to change.

PowerTech M 4.5L Engines

- Power range:
  4045T: 56 – 63 kW (75 – 85 hp)
  4045H: 74 kW (99 hp)
- New power bulge feature – up to 2%
- Higher-peak torque speed
- World-class fuel economy
- Lower-rated speeds 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

PowerTech M 4.5L Engine



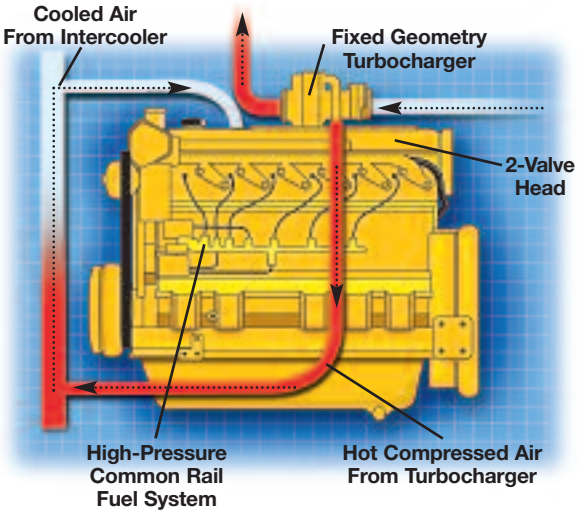
Tier 3/Stage III A PowerTech M 4.5L Engines

Engine Model	Rated Power		Rated Speed (RPM)	Peak Power		Peak Power (RPM)	Peak Torque		Peak Torque (RPM)
	kW	hp		kW	hp		Nm	lb-ft	
4045TF280	56	75	2200	56	75	2400	280	207	1600
4045TF280	60	80	2400	60	382	2400	285	210	1600
4045TF280	63	85	2400	63	85	2400	300	221	1600
4045HF280	74	99	2500	75	101	2200	366	270	1600

Bore		Stroke		Length		Width		Height		Weight	
mm	in	mm	in	mm	in	mm	in	mm	in	kg	lb
106	4.2	127	5.0	860	33.9	612	24.1	856	33.7	387	851

PowerTech E™

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



2-Valve Cylinder Head

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

High-Pressure Common Rail Fuel System (HPCR)

The HPCR system provides higher injection pressures, up to 1600 bar (23,500 PSI), variable injection pressure, variable timing control, and multiple injections (4.5L and 6.8L).

Electronic Unit Pump Fuel System (EUP)

Regulated rated speed flexibility and improved cold-start and warm-up control (2.4L and 3.0L).

Fixed Geometry or Wastegated Turbocharger

Dependent on power rating, fixed geometry or wastegated turbochargers are precisely matched to the power level and application.

Turbocharged

In turbocharged engines, the air is pre-compressed. Due to the higher pressure, more air is supplied into the combustion chamber allowing a corresponding increase in fuel injection which results in greater engine output (2.4L, 3.0L, and 4.5L).

Air-to-Air Intercooling

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

Compact Size

Mounting points are the same as Tier 2/Stage II engine models.

Multiple Injection Strategy

The new HPCR fuel system and engine control unit (ECU) allow for multiple fuel injections. The number of fuel injections, based on speed and load, help contribute to lower combustion temperatures, which reduce the formation of NOx and particulates. The multiple injection strategy also provides an added benefit of noise reduction (4.5L and 6.8L).

John Deere Electronic Engine Controls

Electronic engine controls monitor critical engine functions providing warning and/or shutdown to prevent costly engine repairs and eliminate the need for add-on governing components all lowering total installed costs. Snapshot diagnostic data can be retrieved using commonly available diagnostic service tools.

Controls utilize new common wiring interface connector for vehicles or available OEM instrumentation packages; new solid conduit and "T" connectors reduce wiring stress, providing greater durability and improving appearance.

Factory installed, engine mounted ECU comes with wiring harness and associated components. Industry standard SAE J1939 interface 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
- New higher-peak torque ratings
- Faster torque rise
- Multiple rated speeds to further reduce noise and improve fuel economy

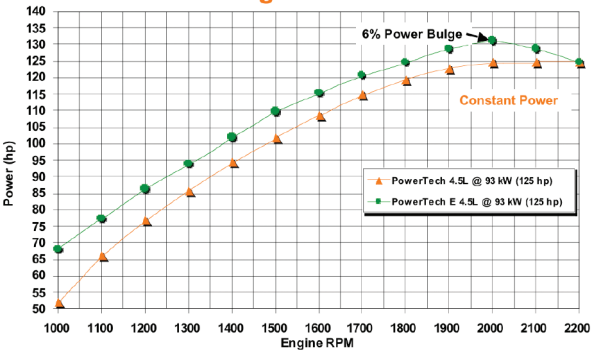
Additional Features

- Self-adjusting poly-vee fan drive
- Forged-steel connecting rods
- Replaceable wet-type cylinder liners (4.5L and 6.8L)
- Either-side service
- 500-hour oil change
- Standard gear auxiliary drive

Engine Performance Curves

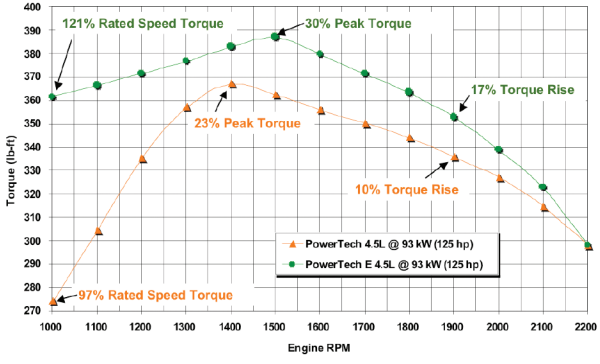
Power Curves

Tier 3/Stage III A PowerTech E 4.5L
vs. Tier 2/Stage II PowerTech 4.5L



Torque Curves

Tier 3/Stage III A PowerTech E 4.5L
vs. Tier 2/Stage II PowerTech 4.5L



PowerTech E 2.4L Engines

- Power range: 45 – 60 kW (60 – 80 hp)
- Superior cold-start and warm-up capability
- Torque curve shaping capability
- Improved smoke control
- Higher supply pressure for the EUP Fuel System

PowerTech E 2.4L Engine

Tier 3/Stage III A PowerTech E 2.4L Engines

Engine Model	Rated Power		Rated Speed (RPM)
	kW	hp	
4024HF295*	45	60	2400
4024HF295*	46	61	2800
4024HF295*	49	66	2800
4024HF295*	51	68	2400
4024HF285	60	80	2800

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

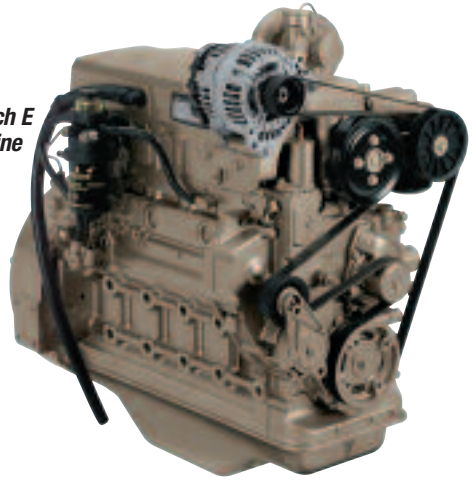
Bore		Stroke		Length		Width		Height		Weight	
mm	in	mm	in	mm	in	mm	in	mm	in	kg	lb
86	3.4	105	4.1	662	26.1	541	21.3	772	30.4	251	554

Ratings are subject to change.

PowerTech E 3.0L Engines

- Power range:
  5030T: 48 kW (65 hp)
  5030H: 57 – 74 kW (76 – 99 hp)
- Superior cold-start and warm-up capability
- Torque curve shaping capability
- Improved smoke control
- Higher supply pressure for the EUP Fuel System

PowerTech E 3.0L Engine



Tier 3/Stage III A PowerTech E 3.0L Engines

Engine Model	Rated Power		Rated Speed (RPM)
	kW	hp	
5030TF295*†	48	65	2400
5030HF285	57	76	2800
5030HF285	62	82	2800
5030HF285	68	91	2800
5030HF285	74	99	2800

*Meets both Interim Tier 4 and Stage III A emissions regulations.
†Advanced rating.

Bore		Stroke		Length		Width		Height		Weight	
mm	in	mm	in	mm	in	mm	in	mm	in	kg	lb
86	3.4	105	4.1	799	31.5	566	22.3	800	31.5	287	633

PowerTech E 4.5L Engines

- Power range:
  4045T: 63 – 74 kW (85 – 99 hp)
  4045H: 86 – 104 kW (115 – 140 hp)
- New power bulge feature – up to 6%
- Higher-peak torque – up to 30%
- More low-speed (1000 RPM) torque – up to 130% of rated speed torque
- Transient response that meets or exceeds Tier 2/Stage II
- World-class fuel economy
- Lower-rated speeds 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

PowerTech E 4.5L Engine

Tier 3/Stage III A PowerTech E 4.5L Engines

Engine Model	Rated Power		Rated Speed	Peak Power		Peak Power	Peak Torque		Peak Torque
	kW	hp	(RPM)	kW	hp	(RPM)	Nm	lb-ft	(RPM)
4045TF285	63	85	2200	65	87	2000	353	261	1600
4045TF285	63	85	2400	63	84	2400	313	231	1600
4045TF285	74	99	2400	74	99	2400	353	261	1600
4045HF285	86	115	2200	89	120	2000	481	355	1500
4045HF285	86	115	2400	86	115	2400	430	317	1500
4045HF285	93	125	2200	99	133	2000	525	387	1500
4045HF285	93	125	2400	93	125	2400	481	355	1500
4045HF285	104	140	2400	104	140	2400	525	387	1500

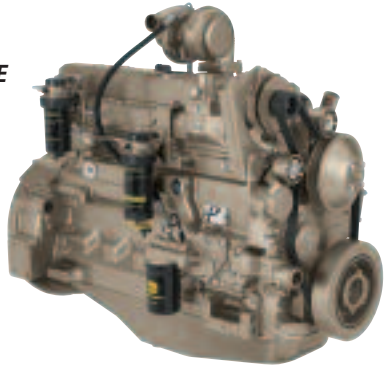
Bore		Stroke		Length		Width		Height		Weight	
mm	in	mm	in	mm	in	mm	in	mm	in	kg	lb
106	4.2	127	5.0	860	33.9	612	24.1	1039	40.9	491	1083

Ratings are subject to change.

PowerTech E 6.8L Engines

- Power range: 104 – 149 kW (139 – 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
- World-class fuel economy
- Lower-rated speeds 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

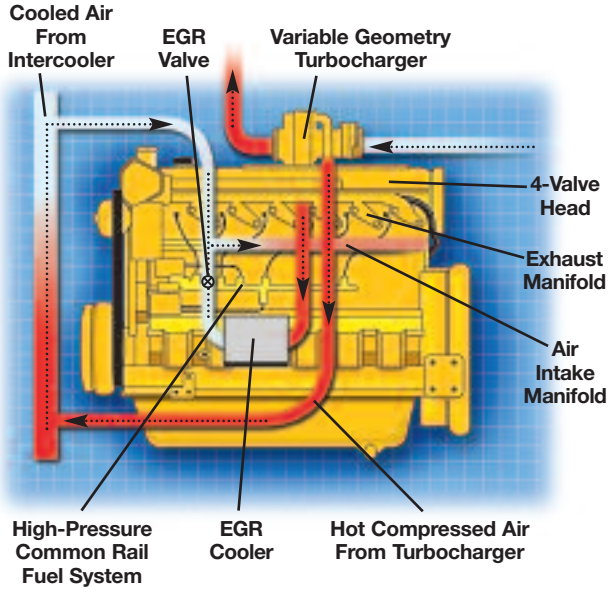
PowerTech E 6.8L Engine



Tier 3/Stage III A PowerTech E 6.8L Engines

Engine Model	Rated Power		Rated Speed	Peak Power		Peak Power	Peak Torque		Peak Torque
	kW	hp	(RPM)	kW	hp	(RPM)	Nm	lb-ft	(RPM)
6068HF285	104	139	2200	111	149	2000	598	441	1500
6068HF285	104	139	2400	104	139	2400	538	397	1500
6068HF285	116	155	2200	124	166	2000	667	492	1500
6068HF285	116	155	2400	116	156	2400	598	441	1500
6068HF285	129	173	2200	132	177	2000	714	527	1500
6068HF285	129	173	2400	129	173	2400	667	492	1500
6068HF285	138	185	2200	144	193	2000	785	579	1500
6068HF285	138	185	2400	138	185	2400	714	527	1500
6068HF285	149	200	2400	149	200	2400	785	579	1500

Bore		Stroke		Length		Width		Height		Weight	
mm	in	mm	in	mm	in	mm	in	mm	in	kg	lb
106	4.2	127	5.0	1123	44.2	657	25.9	1036	40.8	608	1340



4-Valve Cylinder Head

The 4-valve cylinder head provides excellent airflow resulting in greater low-speed torque and better transient response time. There are the cross-flow design (4.5L, 6.8L, and 13.5L) and the new 4-valve U-flow head design (9.0L).

High-Pressure Electronic Fuel Injection Systems

The HPCR system provides higher injection pressures, up to 1600 bar (23,500 PSI) variable injection pressure, and variable timing control (4.5L, 6.8L, and 9.0L).

Electronic Unit Injector provides increased injection pressure up to 2000 bar (29,000 PSI), and variable timing control (13.5L).

Cooled Exhaust Gas Recirculation (EGR)

EGR 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)

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.

Air-to-Air Intercooling

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

Compact Size

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

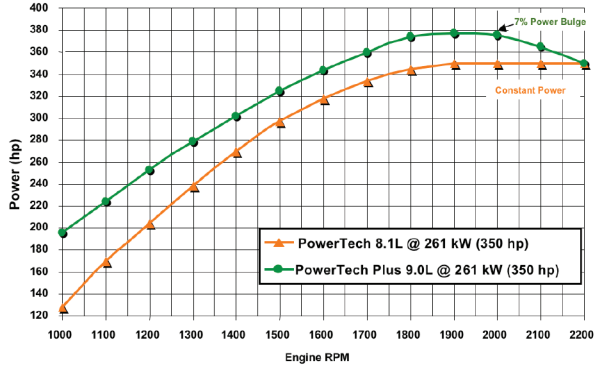
Engine Performance

- 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)

Engine Performance Curves

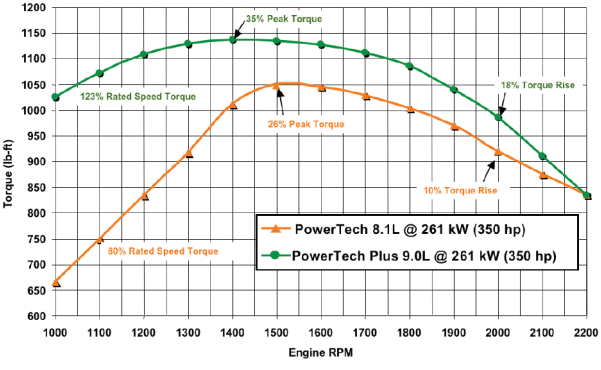
Power Curves

Tier 3/Stage III A PowerTech Plus 9.0L vs. Tier 2/Stage II PowerTech 8.1L



Torque Curves

Tier 3/Stage III A PowerTech Plus 9.0L vs. Tier 2/Stage II A PowerTech 8.1L



John Deere Electronic Engine Controls

Electronic engine controls monitor critical engine functions, providing warning and/or shutdown to prevent costly engine repairs and eliminate the need for add-on governing components all lowering total installed costs. Snapshot diagnostic data can be retrieved using commonly available diagnostic service tools.

Controls utilize new common wiring interface connector for vehicles or available OEM instrumentation packages; new solid conduit and "T" connectors reduce wiring stress and provide greater durability and improved appearance.

Factory-installed, engine-mounted ECU or remote-mounted ECU comes with wiring harness and associated components. Industry-standard SAE J1939 interface communicates with other vehicle systems, eliminating redundant sensors and reducing vehicle installed cost.

Additional Features

- Glow plugs (4.5L and 6.8L)
- Gear-driven auxiliary drives (4.5L, 6.8L, 9.0L, and 13.5L)
- 500-hour oil change (4.5L, 6.8L, 9.0L, and 13.5L)
- Self-adjusting poly-vee fan drive (4.5L, 6.8L, 9.0L, and 13.5L)
- R.H. and L.H. engine mounted fuel filters (6.8L)
- Single-piece low friction piston (9.0L and 13.5L)
- Optional rear PTO (9.0L and 13.5L)
- Low-pressure fuel system with "auto-prime" feature (9.0L)
- Directed top-liner cooling (9.0L and 13.5L)

PowerTech Plus 4.5L Engines

- Expanded power range: 111 – 129 kW (149 – 173 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 speeds 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 Engines

- Maintained power 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 speeds 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

PowerTech Plus 4.5L Engine

PowerTech Plus 6.8L Engine

Tier 3/Stage III A PowerTech Plus 4.5L Engines

Engine Model	Rated Power		Rated Speed	Peak Power		Peak Power	Peak Torque		Peak Torque
	kW	hp	(RPM)	kW	hp	(RPM)	Nm	lb-ft	(RPM)
4045HF485	111	149	2000	116	156	1800	645	476	1400
4045HF485	116	155	2200	125	167	2000	611	450	1400
4045HF485	116	155	2400	115	154	2400	574	424	1400
4045HF485	129	173	2400	129	173	2400	645	476	1400

Bore		Stroke		Length		Width		Height		Weight	
mm	in	mm	in	mm	in	mm	in	mm	in	kg	lb
106	4.2	127	5.0	867	34.1	623	24.5	1027	40.4	517	1140

Tier 3/Stage III A PowerTech Plus 6.8L Engines

Engine Model	Rated Power		Rated Speed	Peak Power		Peak Power	Peak Torque		Peak Torque
	kW	hp	(RPM)	kW	hp	(RPM)	Nm	lb-ft	(RPM)
6068HF485	134	180	2000	138	184	1600	838	618	1400
6068HF485	138	185	2200	144	193	2000	744	549	1400
6068HF485	138	185	2200	151	203	1800	838	618	1400
6068HF485	138	185	2400	138	185	2400	690	509	1400
6068HF485	144	193	2000	151	203	1800	838	618	1400
6068HF485	144	193	2000	153	205	1700	934	689	1400
6068HF485	149	200	2200	162	218	2000	838	618	1400
6068HF485	149	200	2200	168	226	1800	934	689	1400
6068HF485	149	200	2400	149	200	2400	744	549	1400
6068HF485	162	217	2000	168	226	1800	934	689	1400
6068HF485	162	217	2000	168	226	1800	1025	756	1400
6068HF485	168	225	2200	181	242	2000	934	689	1400
6068HF485	168	225	2200	185	247	1800	1025	756	1400
6068HF485	168	225	2400	168	225	2400	838	618	1400
6068HF485	181	243	2000	185	247	1800	1025	756	1400
6068HF485	187	250	2200	198	266	2000	1025	756	1400
6068HF485	187	250	2400	187	250	2400	934	689	1400
6068HF485	205	275	2400	206	275	2400	1025	756	1400

Bore		Stroke		Length		Width		Height		Weight	
mm	in	mm	in	mm	in	mm	in	mm	in	kg	lb
106	4.2	127	5.0	1120	44.1	611	24.1	1058	41.7	678	1495

Ratings are subject to change.

PowerTech Plus 9.0L Engines

- Expanded power 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 speeds 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

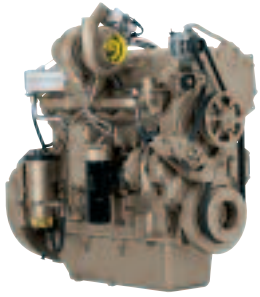
Engine Model	Rated Power		Rated Speed	Peak Power		Peak Power	Peak Torque		Peak Torque
	kW	hp	(RPM)	kW	hp	(RPM)	Nm	lb-ft	(RPM)
6090HF485	168	225	2000	187	251	1800	1095	807	1500
6090HF485	168	225	2200	187	251	2000	1095	807	1500
6090HF485	168	225	2200	168	225	2200	984	726	1500
6090HF485	187	250	2000	205	275	1800	1201	886	1500
6090HF485	187	250	2200	205	275	2000	1201	886	1500
6090HF485	187	250	2200	187	251	2200	1095	807	1500
6090HF485	205	275	2000	224	301	1800	1313	968	1500
6090HF485	205	275	2200	224	301	1800	1313	968	1500
6090HF485	205	275	2200	205	275	2200	1201	886	1500
6090HF485	224	300	2000	243	325	1800	1421	1048	1500
6090HF485	224	300	2200	243	325	2000	1421	1048	1500
6090HF485	224	300	2200	224	300	2200	1313	968	1500
6090HF485	242	325	2000	261	350	1800	1530	1128	1500
6090HF485	242	325	2200	261	350	2000	1530	1128	1500
6090HF485	242	325	2200	242	325	2200	1421	1048	1500
6090HF485	261	350	2000	279	375	1800	1554	1146	1500
6090HF485	261	350	2200	280	375	2000	1543	1138	1500
6090HF485	261	350	2200	261	350	2200	1530	1128	1500
6090HF485	280	375	2200	280	375	2200	1543	1138	1500
6090HF485	298	400	2200	298	400	2200	1550	1143	1500

Bore		Stroke		Length		Width		Height		Weight	
mm	in	mm	in	mm	in	mm	in	mm	in	kg	lb
118	4.7	136	5.4	1208	47.6	630	24.8	1113	43.8	901	1986

Ratings are subject to change.

PowerTech Plus 13.5L Engines

- Maintained power 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 speeds 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	Rated Power		Rated Speed	Peak Power		Peak Power	Peak Torque		Peak Torque
	kW	hp	(RPM)	kW	hp	(RPM)	Nm	lb-ft	(RPM)
6135HF485	261	350	1900	298	399	1700	1834	1353	1400
6135HF485	261	350	2100	298	400	1900	1602	1182	1400
6135HF485	261	350	2100	261	350	2100	1602	1182	1400
6135HF485	298	400	1900	335	449	1700	2063	1521	1400
6135HF485	298	400	2100	336	450	1900	1834	1353	1400
6135HF485	298	400	2100	298	400	2100	1834	1353	1400
6135HF485	317	425	2100	336	450	1800	2063	1521	1400
6135HF485	336	450	1900	371	498	1700	2290	1689	1400
6135HF485	336	450	2100	373	500	1900	2063	1521	1400
6135HF485	336	450	2100	336	450	2100	2063	1521	1400
6135HF485	373	500	1900	409	548	1700	2430	1792	1400
6135HF485	373	500	2100	373	500	2100	2290	1689	1400
6135HF485	373	500	2100	536	400	2100	2290	1689	1400
6135HF485	392	525	2100	410	550	1800	2430	1792	1400
6135HF485	410	550	2100	423	567	2000	2430	1792	1400
6135HF485	410	550	2100	410	550	2100	2430	1792	1400
6135HF485	448	600	2100	448	600	2100	2550	1881	1600

Bore		Stroke		Length		Width		Height		Weight	
mm	in	mm	in	mm	in	mm	in	mm	in	kg	lb
132	5.2	165	6.5	1334	52.5	855	33.7	1512	59.5	1493	3292

Exhaust Gas Recirculation (EGR) Myths

A lot of false and misleading information about cooled EGR and VGT has been circulated by engine manufacturers who 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 for 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: John Deere PowerTech Plus engines are actually increasing maintenance intervals across all models. A 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. As of January 2006, the most commonly available diesel fuel in those parts of the world requiring Tier 3/Stage III A engines was 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.

Conversions

Torque Rise

$$\text{Torque Rise} = \frac{\text{Maximum Torque}}{\text{Torque at Rated Speed}}$$

Power Factor (PF)

$$\text{PF} = \text{kWe/kVA} = \frac{\text{Real Power}}{\text{Apparent Power}}$$

PF Constant = 0.80

Formulas

Newton-meter = lb-ft x 1.356
Newton = lb-force x 4.448
Meter = ft x 0.3048
Millimeter = in x 25.4
Kilogram = lb x 0.454
Liter = gallon x 3.785
Liter = cu in x 0.01639
Horsepower = kW x 1.341
Kilowatt = hp x 0.746

$$\left(\text{Kilowatt} = \frac{\text{volts x amps}}{1000}\right)$$

Celsius = (32° F) x 0.556

Customer Support

With more than 4,000 service locations worldwide, John Deere is always handy when you need service and support. You'll find an authorized John Deere dealer or engine distributor almost 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. In addition, John Deere service personnel are highly trained technicians who stay on top of changing engine technologies and service techniques.

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