



**JOHN DEERE**

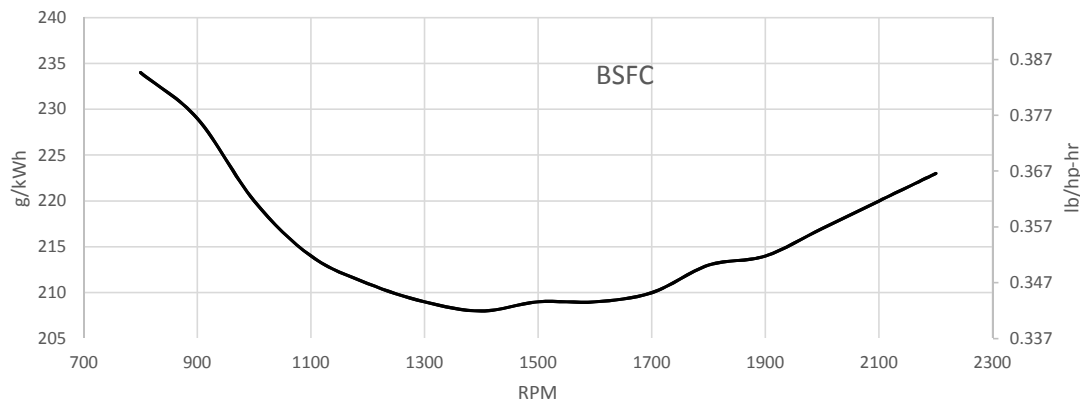
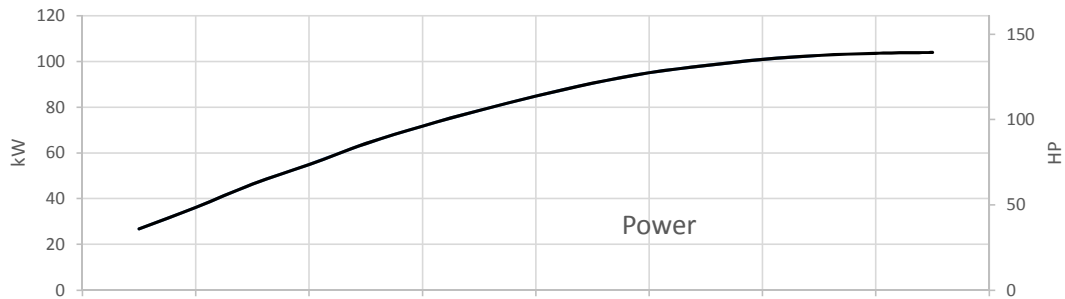
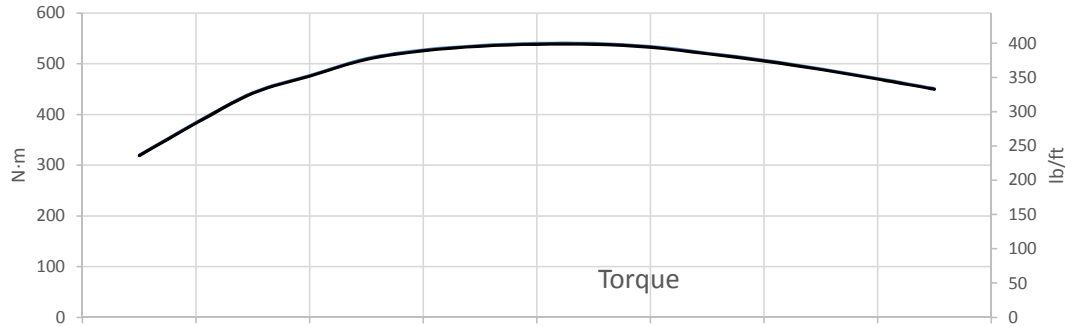
## ENGINE PERFORMANCE CURVE

Rating: Gross power  
 Application: Continuous

Power Bulge 0%  
 Torque Rise 20%

**PowerTech™ PWL 4.5L Engine**

**Model: 4045HFC04**  
 139 hp @2200 rpm  
 104 kW @2200 rpm



### STANDARD CONDITIONS

Air Intake Restriction 12in.H2O (3kPa)  
 Exhaust Back Pressure 30in.H2O (7.5kPa)  
**Gross Power Guaranteed within + or - 5% at SAEJ1995 and ISO 3046 conditions:**  
 Air Inlet Temperature = 77°F (25°C)  
 Barometer = 29.31 in.Hg (99 kPa)  
 Fuel Inlet Temperature = 104°F (40°C)  
 Fuel Specific Gravity @ 60 °F (15.5 °C) = 0.853

### CONVERSION FACTORS:

Power: kW = HP x 0.746  
 Fuel: 1 Gal = 7.1 lb, 1 L = kg  
 Torque: N·m = lb-ft x 1.356

All values are from currently available data and are subject to change without notice.

Notes:1) This Performance Curve provides installation requirements necessary for the engine to emit at its certified emission levels. For additional information necessary to meet applicable regulatory requirements, refer to the John Deere Emissions-related Installation Instructions (AG01):  
<https://power.deere.com/wps/myportal/jdps/products/engines/appguidelines>.

Designed/Calibrated to meet:

Certified By:

CARB  
 EPA Tier 4  
 EU Stage IV

12-Oct-18

Ref: Engine Emission Label

Performance Curve: 4045HFC04\_A

## Engine Installation Criteria

### General Data

Engine Model	4045HFC04	
Number of Cylinders	4	
Bore	106 mm	4.2 in.
Stroke	127 mm	5.0 in.
Displacement	4.5 L	275 in. <sup>3</sup>
Compression Ratio	17.0:1	
Valves per Cylinder, Intake/Exhaust	2/2	
Firing Order	1-3-4-2	
Combustion System	Direct Injection	
Engine Type	In line, 4-Cycle	
Aspiration	Turbocharged & air-to-air aftercooled	
Engine Crankcase Vent System	Open	

### Physical Data

Length	870 mm	34.3 in.
Width	650 mm	25.6 in.
Height	1050 mm	41.3 in.
Weight, with oil&no coolant (Includes engine, flywheel housing, flywheel&electrics)	550 kg	1213 lb
Center of Gravity Location, X-axis From Rear Face of Block	265.0 mm	10.4 in.
Center of Gravity Location, Y-axis Right of Crankshaft	10.0 mm	0.4 in.
Center of Gravity Location, Z-axis Above Crankshaft	140.0 mm	5.5 in.
Max. Bending Moment about Main Bearings Front and Rear	480 N·m	355 lb-ft
Max. Allowable Static Bending Moment At Rear Face of Flywheel Housing with 5-G Load	814 N·m	602 lb-ft
Thrust Bearing Load Limit Forward, Intermittent	4000 N	899 lb
Thrust Bearing Load Limit Forward, Continuous	2200 N	495 lb
Thrust Bearing Load Limit Rearward, Intermittent	2000 N	450 lb
Thrust Bearing Load Limit Rearward, Continuous	1000 N	225 lb
Max. Continuous Damper Temp	#N/A °C	#N/A °F
Max. ECU Vibration, All Axis	6 gRMS	
Max. Torisonal Vibration, Front of Crank	0.25 DDA	
Max. Engine Torisonal Vibration in Overspeed	0.4 DDA	

### Electrical System

Min. Instantaneous Cranking	50 rpm	
Mn. Steady State Cranking	120 rpm	
Starter Rolling Current, 12V @32 °F (0 °C)	450 amps	
Starter Rolling Current, 24V @32 °F (0 °C)	250 amps	
Starter Rolling Current, 12V @-22 °F (-30°C)	700 amps	
Starter Rolling Current, 24V @-22 °F (-30°C)	400 amps	
Min. Voltage at ECU during Cranking, 12V	6 volts	
Min. Voltage at ECU during Cranking, 24V	10 volts	
Max. Voltage Drop, Battery to Starter	0.8 volts	
Max. Allowable Start Circuit Resistance, 12V	0.0012 Ohm	
Max. Allowable Start Circuit Resistance, 24V	0.002 Ohm	
Max. ECU Temperature	105 °C	221 °F
Max. VTG Actuator Surface Temp	#N/A °C	#N/A °F
Max. Air Throttle Electrical Actuator Temperature	#N/A °C	#N/A °F
Max. Harness Temperature	125 °C	257 °F
Max. Alternator Temperature	105 °C	221 °F
Max. Starter Temperature	120 °C	248 °F
Max. Temperature, All Other Electronics	125 °C	257 °F

### Charge Air Cooling System

Air-to-Air Heat Rejection	17.0 kW	967 BTU/min
Compressor Discharge Temperature @ 77°F (25°C) Ambient Air	158 °C	316 °F
Intake Manifold Pressure	144 kPa	20.9 psi
Compressor Discharge Temperature @ 117°F (47°C) 80 kPa Barametric pressure	198 °C	388 °F
Max. Temperature Out of Charge Air Cooler @ All Ambient Conditions	88 °C	190 °F
Max. CAC System Volume	25 L	26 Qt
Max. Pressure Drop through CAC	10 kPa	40 in. H <sub>2</sub> O
Min. Pressure Drop through CAC	5 kPa	20 in. H <sub>2</sub> O
Max. Temperature Out of Charge Air Cooler @77°F(25°C) Ambient Air	56 °C	133 °F
Min. Temperature Out of Charge Air Cooler @77°F(25°C) Ambient Air	48 °C	118 °F
Max. Bending Moment on Compressor Outlet	3.5 N·m	3 lb-ft
Max. Shear on Compressor Outlet	2.5 kg	6 lb

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## Engine Installation Criteria

### Cooling System

Engine Heat Rejection	67.0 kW	3810 BTU/min
Coolant Flow @ 10 kPa External Restriction	302 L/min	80 gal/min
Coolant Flow @ 40 kPa External Restriction	280 L/min	74 gal/min
Max. Auxiliary Coolant Flow	25 L/min	7 gal/min
Thermostat Start to Open	85 °C	185 °F
Thermostat Fully Open	97 °C	207 °F
Engine Coolant Capacity	8.5 Liter	9.0 quart
Min. Coolant Fill Rate	12.0 L/min	3.2 gal/min
Max. Water Pump Inlet Pressure	235 kPa	34 psia
Min. Pump Inlet Pressure @ 203°F (95°C) Coolant	103 kPa	15 psia
Min. Pump Inlet Pressure @ Max. Top Tank Temperature	165 kPa	24 psia
Min. External Coolant Restriction	#N/A kPa	#N/A psi
Max. External Coolant Restriction	40 kPa	6 psi
Max. Top Tank Temperature	113 °C	235 °F
Max. Top Tank temperature 95% of Operating Hours	103 °C	217 °F

### Exhaust System

Exhaust Flow	17.9 m <sup>3</sup> /min	632 ft <sup>3</sup> /min
Exhaust Temperature	475 °C	887 °F
Max. Allowable Exhaust Restriction	18 kPa	71 in. H <sub>2</sub> O
Max. Bending Moment on Turbo Outlet	7.4 N·m	5.5 lb-ft
Max. Shear on Turbine Outlet	2.5 kg	6 lb
Exhaust Filter Size	2 DOC / 3 SCR; Gen 1.0	
Exhaust Filter Pressure Drop (Clean)	12.6 kPa	51 in. H <sub>2</sub> O
Min. Mixing Length, Outlet to Exhaust Filter	NA	
Max. Bending Moment on Exhaust Filter Inlet	172 N·m	127 lb-ft
Max. Bending Moment on Exhaust Filter Outlet	85 N·m	63 lb-ft
Max. Exhaust Leakage Rate, Engine to Exhaust Filter @30kPa	5.0 L/min	1.3 gal/min
Max. Temperature Drop, Engine to exhaust Filter	30 °C	54 °F

### Fuel System

ECU Description	L34 Controller	
Fuel Injection Pump	Denso HP3	
Governor Type	Electronic	
Total Fuel Flow	48 kg/hr	106 lb/hr
Fuel Consumption	23.2 kg/hr	51 lb/hr
Fuel Temperature Rise, Inlet to Return	35 °C	63 °F
Min. Fuel Inlet Pressure	-30 kPa	-121 in. H <sub>2</sub> O
Max. Fuel Inlet Pressure	#N/A kPa	#N/A in. H <sub>2</sub> O
Max. Fuel Return Pressure	20 kPa	80 in. H <sub>2</sub> O
Min. Fuel Return Pressure	0 kPa	0 in. H <sub>2</sub> O
Max. Fuel Inlet Temperature	75 °C	167 °F
Fuel Filter @98% Efficiency	2 mic	

### Lubrication System

Oil Pressure at Rated Speed	370 kPa	54 psi
Oil Pressure at Low Idle	150 kPa	22 psi
Max. In-Pan Oil temperature	138 °C	280 °F
Max. Crankcase Pressure	1 kPa	4 in. H <sub>2</sub> O

### Air Intake System

Engine Air Flow	8.1 m <sup>3</sup> /min	286 ft. <sup>3</sup> /min
Air Mass Flow	550 kg/hr	1213 lb/hr
Maximum Allowable Temperature Rise, Ambient Air to Engine Inlet	8 °C	15 °F
Max. Air Intake Restriction, Clean Air Clearer	3.75 kPa	15 in. H <sub>2</sub> O
Max. Air Intake Restriction, Dirty Air Clearer	6.25 kPa	25 in. H <sub>2</sub> O
Air Cleaner Efficiency	99.9 %	

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## Engine Installation Criteria

### Performance Data

Rated Power	104 kW	139 HP
Rated Speed		2200 rpm
Max. Fast Idle Speed		2400 rpm
Breakway Speed		2250 rpm
Power Bulge Speed		rpm
Peak Torque Speed		1600 rpm
Low Idle Speed		800 rpm
Rated Torque	451 N·m	334 lb-ft
Peak Torque	540 N·m	400 lb-ft
Torque Rise		20 %
BMEP, Rated	1260 kPa	183 psi
BMEP, Peak Torque	1490 kPa	216 psi
Attitude Capability	1890 m	6200 ft
Friction Power @Rated Speed	24.7 kW	33 HP
Air Fuel Ratio		23.1:1
Noise @1 m		91 dB(A)
Power Bulge		0 %

### Curved Data

Engine Speed	Power		Torque		BSFC	
	rpm	kW	hp	N·M	lb-ft	g/kWh
800	27	36	320	236	234	0.385
900	36	49	384	283	229	0.376
1000	46	62	443	327	220	0.362
1100	55	74	477	352	214	0.352
1200	64	86	510	376	211	0.347
1300	72	96	527	389	209	0.344
1400	79	105	536	396	208	0.342
1500	85	114	540	399	209	0.344
1600	90	121	540	399	209	0.344
1700	95	127	534	394	210	0.345
1800	98	132	521	384	213	0.350
1900	101	135	507	374	214	0.352
2000	103	138	490	362	217	0.357
2100	104	139	471	348	220	0.362
2200	104	139	451	333	223	0.367

### DEF Data

Load Factor	Engine Speed	DEF Consumption*		Percent of Diesel Consumption**
		g/kWh	lb/hp-hr	
%	RPM			%
100	2200	11.1	0.0183	3.7
Peak Torque	1600	10.2	0.0168	3.7

\*DEF conversion factor: 1.087 kg/l (9.071 lb/gal)

\*\*Percent of diesel consumption by volume at 100% load and peak torque

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