



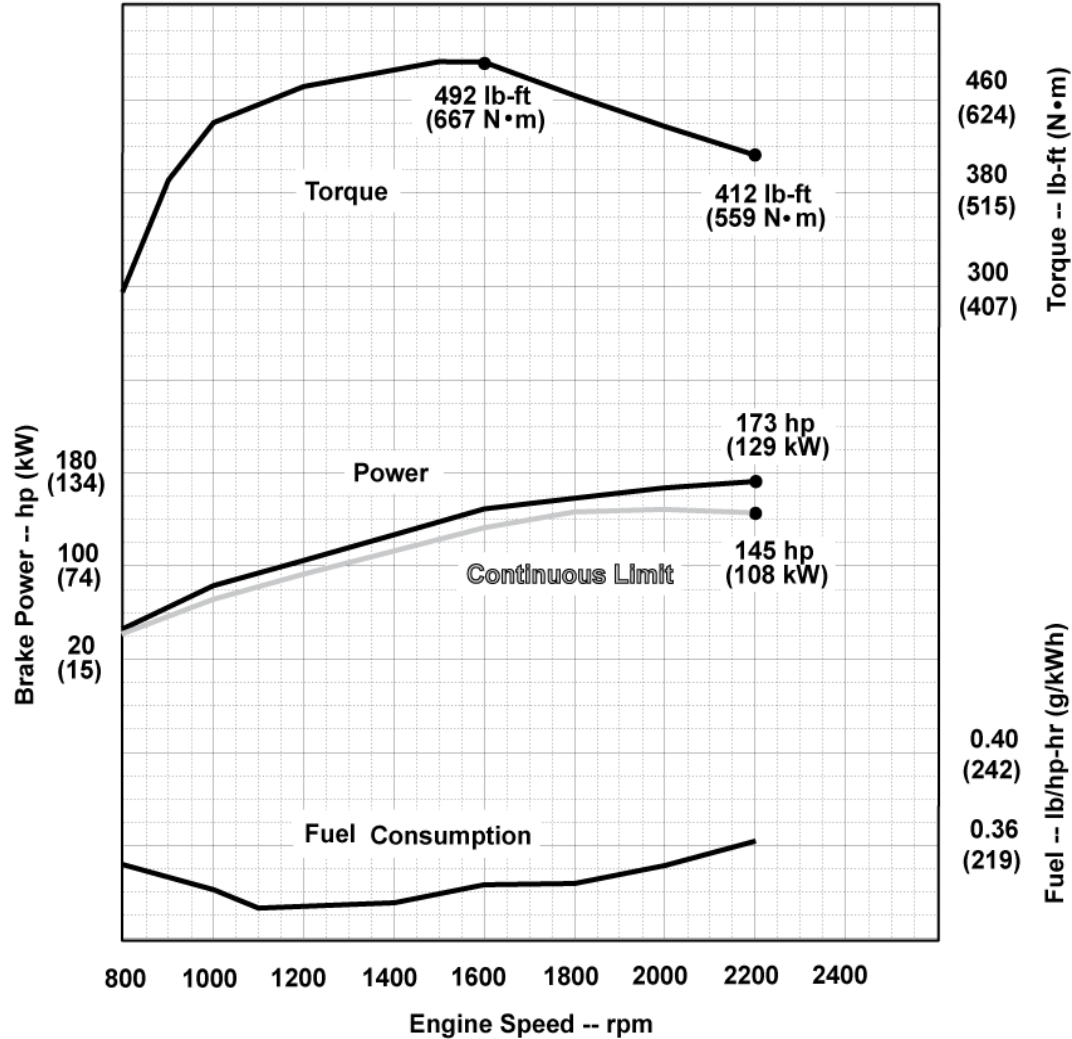
JOHN DEERE

ENGINE PERFORMANCE CURVE

Rating: Gross Power
 Application: Intermittent
 Power Bulge - 0%
 Torque Rise - 19%

**PowerTech™ PSS 4.5L Engine
 Model: 4045HFC09**

173 hp @ 2200 rpm
 129 kW @ 2200 rpm



STANDARD CONDITIONS

Air Intake Restriction.....12 in.H₂O (3 kPa)
 Exhaust Back Pressure.....30 in.H₂O (7.5 kPa)

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 = 0.85kg
 Torque: N·m = lb-ft x 1.356

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

Notes: 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/apguidelines>.

Designed/Calibrated to meet:	Certified by:
<ul style="list-style-type: none"> • CARB • EPA Tier 4 • EU Stage IV 	 24 Oct 2014
Ref: Engine Emission Label	

Performance Curve: 4045HFC09_B_P

Engine Installation Criteria

General Data

Model	4045HFC09	
Number of Cylinders	4	
Bore	106 mm	4.2 in.
Stroke	127 mm	5.0 in.
Displacement	4.5 L	275 in. ³
Compression Ratio	17.2 : 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 and air-to-air aftercooled	
Engine Crankcase Vent System	Open	

Physical Data

Length	870 mm	34.3 in.
Width	635 mm	25.0 in.
Height	1130 mm	44.5 in.
Center of Gravity Location, X-axis From Rear Face of Block	265 mm	10.4 in.
Center of Gravity Location, Y-axis Right of Crankshaft	8 mm	0.3 in.
Center of Gravity Location, Z-axis Above Crankshaft	155 mm	6.1 in.
Max. Bending Moment about Main Bearings Front and Rear	480 N·m	354 lb·ft
Max. Allowable Static Bending Moment At Rear Face of Flywheel Housing with 5-G Load	814 N·m	600 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
Weight, with oil & no coolant (Includes engine, flywheel housing, flywheel & electrics)	570 kg	1257 lb
Max. Continuous Damper Temp	NA	
Max. ECU Vibration, All Axis	6.00 gRMS	
Max. Torsional Vibration, Front of Crank	0.25 DDA	
Max. Engine Torsional Vibration in Overspeed	0.40 DDA	

Electrical System

Min. Instantaneous Cranking	50 rpm	
Min. 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. Voltage From Engine to Crankshaft, 12V	NA	
Max. Voltage From Engine to Crankshaft, 24V	NA	
Max. ECU Temperature	105 °C	221 °F
Max. VTG Actuator Surface Temp	NA	
Max. Air Throttle Electrical Actuator Temperature	NA	
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

Performance Curve: 4045HFC09_B_P

Engine Installation Criteria

Charge Air Cooling System

Air-to-Air Heat Rejection	23 kW	1309 BTU/min
Compressor Discharge Temperature @77°F(25°C) Ambient Air	179 °C	354 °F
Intake Manifold Pressure	185 kPa	26.8 psi
Compressor Discharge Temperature @117°F(47°C) 80 kPa Barometric pressure	219 °C	426 °F
Max. Temperature Out of Charge Air Cooler @All Ambient Conditions	88 °C	190 °F
Max. CAC System Volume	25 Liter	26 quart
Max. Pressure Drop through CAC	10 kPa	40.0 in. H ₂ O
Min. Pressure Drop through CAC	5 kPa	20.0 in. H ₂ 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	47 °C	117 °F
Max. Bending Moment on Compressor Outlet	3.5 N·m	3 lb-ft
Max. Shear on Compressor Outlet	2.5 kg	6 lb

Cooling System

Engine Heat Rejection	88 kW	5009 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 L/min	3.2 gal/min
Max. Water Pump Inlet Pressure	235 kPaa	34 psia
Min. Pump Inlet Pressure @203°F (95°C) Coolant	103 kPaa	15 psia
Min. Pump Inlet Pressure @Max. Top Tank Temperature	165 kPaa	24 psia
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	18.9 m ³ /min	667 ft. ³ /min
Exhaust Temperature	484 °C	903 °F
Max. Allowable Exhaust Restriction	27.8 kPa	111 in. H ₂ 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	4; Gen 1.0	
Exhaust Filter Pressure Drop (Clean)	22.8 kPa	91 in. H ₂ O
Min. Mixing Length, Outlet to Exhaust Filter	NA	
Max. Bending Moment on Exhaust Filter Inlet	83 N·m	61 lb-ft
Max. Bending Moment on Exhaust Filter Outlet	75 N·m	55 lb-ft
Max. Exhaust Leakage Rate, Engine to Exhaust Filter @30kPa	5 L/min	1.3 gal/min
Max. Temperature Drop, Engine to Exhaust Filter	30 Δ°C	54 Δ°F

Fuel System

ECU Description	L34 Controller	
Fuel Injection Pump	Denso HP3	
Governor Type	Electronic	
Total Fuel Flow	52 kg/hr	115 lb/hr
Fuel Consumption	28.4 kg/hr	62.6 lb/hr
Fuel Temperature Rise, Inlet to Return	24 Δ°C	43 Δ°F
Min. Fuel Inlet Pressure	-30 kPa	-120 in. H ₂ O
Max. Fuel Return Pressure	20 kPa	80 in. H ₂ O
Min. Fuel Return Pressure	0 kPa	0 in. H ₂ 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	1.0 kPa	4 in. H ₂ O

Performance Curve: 4045HFC09_B_P

Engine Installation Criteria

Air Intake System

Engine Air Flow	9.2 m ³ /min	325 ft. ³ /min
Air Mass Flow	630 kg/hr	1389 lb/hr
Maximum Allowable Temperature Rise, Ambient Air to Engine Inlet	8 Δ°C	15 Δ°F
Max. Air Intake Restriction, Clean Air Cleaner	3.75 kPa	15.0 in. H ₂ O
Max. Air Intake Restriction, Dirty Air Cleaner	6.25 kPa	25.0 in. H ₂ O
Air Cleaner Efficiency	99.9 %	

Performance Data

Rated Power	129 kW	173 HP
Rated Speed	2200 rpm	
Max. Fast Idle Speed	2400 rpm	
Breakaway Speed	2250 rpm	
Power Bulge Speed	NA	
Peak Torque Speed	1600 rpm	
Low Idle Speed	800 rpm	
Rated Torque	559 N·m	412 lb-ft
Peak Torque	667 N·m	492 lb-ft
Torque Rise	19 %	
BMEP, Rated	1585 kPa	230 psi
BMEP, Peak Torque	1875 kPa	272 psi
Altitude Capability	1981 m	6500 ft
Friction Power @Rated Speed	24 kW	32 HP
Air:Fuel Ratio	21.6 : 1	
Noise @1 m	90.5 dB(A)	
Power Bulge	0 %	

Engine Speed	Power		Torque		BSFC	
	rpm	kW	hp	N·M	lb-ft	g/kWh
2200	129	173	559	412	220	0.361
2100	127	170	579	427	216	0.354
2000	125	168	595	439	214	0.351
1900	122	164	613	452	212	0.348
1800	119	160	631	465	210	0.344
1700	116	156	649	479	209	0.343
1600	112	150	667	492	209	0.343
1500	105	141	667	492	205	0.336
1400	96	129	655	483	204	0.335
1300	88	118	648	478	203	0.333
1200	80	107	640	472	203	0.333
1100	72	97	625	461	203	0.333
1000	63	84	598	441	208	0.341
900	50	67	530	391	210	0.344
800	34	46	400	295	214	0.351

DEF Data

Load Factor	Engine Speed	DEF Consumption*		Percent of Diesel Consumption**
		%	RPM	
100	2200	8.6	0.01415	3.0
Peak Torque	1600	10.1	0.01662	3.8

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

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

Performance Curve: 4045HFC09_B_P