



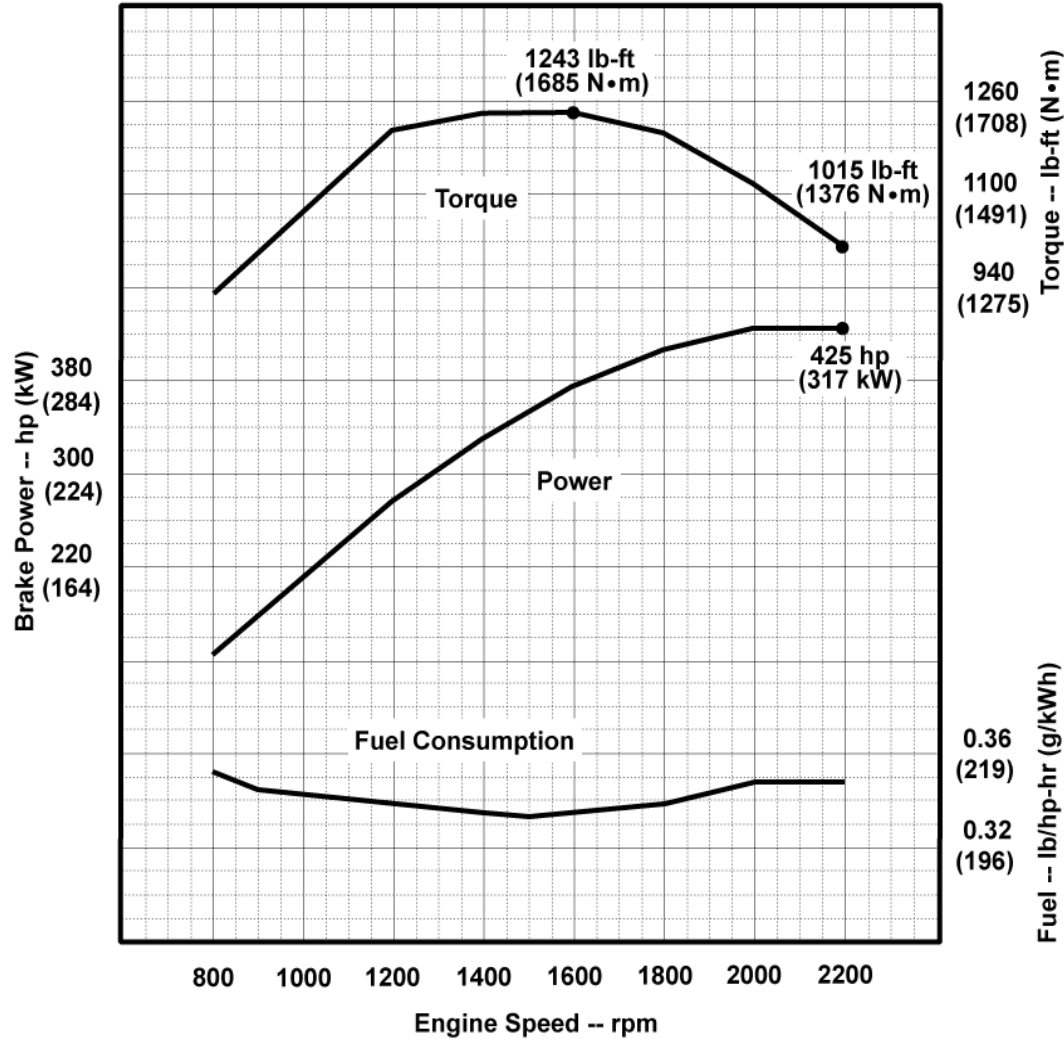
JOHN DEERE

ENGINE PERFORMANCE CURVE

Rating: Gross Power
Application: Intermittent
** RESTRICTED RATING **
Power Bulge - 0%
Torque Rise - 22%

**PowerTech™ PSS 9.0L Engine
Model: 6090HFC09**

425 hp @ 2200 rpm
317 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: 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/apguidelines>.
2) RESTRICTED RATING - Approval from Application Engineering required

Designed/Calibrated to meet:	Certified by:
<ul style="list-style-type: none"> • CARB • EPA Tier 4 • EU Stage IV 	 11 March 2016
Ref: Engine Emission Label	

Performance Curve: 6090HFC09_-A

Engine Installation Criteria

General Data

Model	6090HFC09	
Number of Cylinders	6	
Bore	118.4 mm	4.7 in.
Stroke	136 mm	5.4 in.
Displacement	9.0 L	549 in. ³
Compression Ratio	16.0 : 1	
Valves per Cylinder, Intake/Exhaust	2 / 2	
Firing Order	1-5-3-6-2-4	
Combustion System	HPCR	
Engine Type	In-line, 4-cycle	
Aspiration	Turbocharged and air-to-air aftercooled	
Engine Crankcase Vent System	Open	

Physical Data

Length	1326 mm	52.2 in.
Width	879 mm	34.6 in.
Height	1266 mm	49.8 in.
Center of Gravity Location, X-axis From Rear Face of Block	460 mm	18.1 in.
Center of Gravity Location, Y-axis Right of Crankshaft	0 mm	0 in.
Center of Gravity Location, Z-axis Above Crankshaft	81 mm	3.2 in.
Max. Bending Moment about Main Bearings Front and Rear	550 N-m	406 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	2932 N	659 lb
Thrust Bearing Load Limit Forward, Continuous	1933 N	435 lb
Thrust Bearing Load Limit Rearward, Intermittent	139 N	31 lb
Thrust Bearing Load Limit Rearward, Continuous	899 N	202 lb
Weight, with oil & no coolant (Includes engine, flywheel housing, flywheel & electrics)	1096.8 kg	2418 lb
Max. Continuous Damper Temp	200 °C	392 °F
Max. ECU Vibration, All Axis	6.00 gRMS	
Max. Torsional Vibration, Front of Crank	0.29 DDA	
Max. Engine Torsional Vibration in Overspeed	0.37 DDA	

Electrical System

Min. Instantaneous Cranking	50 rpm	
Min. Steady State Cranking	120 rpm	
Starter Rolling Current, 12V @32 °F (0 °C)	920 amps	
Starter Rolling Current, 24V @32 °F (0 °C)	600 amps	
Starter Rolling Current, 12V @-22 °F (-30 °C)	1300 amps	
Starter Rolling Current, 24V @-22 °F (-30 °C)	700 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	180 °C	356 °F
Max. Air Throttle Electrical Actuator Temperature	125 °C	257 °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	77.0 kW	4383 BTU/min
Compressor Discharge Temperature @77°F(25°C) Ambient Air	226 °C	439 °F
Intake Manifold Pressure	261.3 kPa	37.9 psi
Compressor Discharge Temperature @117°F(47°C) 80 kPa Barometric pressure	°C	
Max. Temperature Out of Charge Air Cooler @All Ambient Conditions	88 °C	190 °F
Max. CAC System Volume	NA	
Max. Pressure Drop through CAC	16 kPa	64.0 in. H ₂ O
Min. Pressure Drop through CAC	8 kPa	32.0 in. H ₂ O
Max. Temperature Out of Charge Air Cooler @77°F (25°C) Ambient Air	52 °C	126 °F
Min. Temperature Out of Charge Air Cooler @77°F (25°C) Ambient Air	48 °C	118 °F
Max. Bending Moment on Compressor Outlet	6 N-m	4 lb-ft
Max. Shear on Compressor Outlet	4 kg	9 lb

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Cooling System

Engine Heat Rejection	203 kW	11555 BTU/min
Coolant Flow @10 kPa External Restriction	540 L/min	143 gal/min
Coolant Flow @40 kPa External Restriction	496 L/min	131 gal/min
Max. Auxiliary Coolant Flow	32 L/min	8 gal/min
Thermostat Start to Open	85 °C	185 °F
Thermostat Fully Open	95 °C	203 °F
Engine Coolant Capacity	17 Liter	18.0 quart
Min. Coolant Fill Rate	12 L/min	3.2 gal/min
Max. Water Pump Inlet Pressure	235 kPa	34 psia
Min. Pump Inlet Pressure @203°F (95°C) Coolant	118 kPa	17 psia
Min. Pump Inlet Pressure @Max. Top Tank Temperature	172 kPa	25 psia
Min. External Coolant Restriction	15 kPa	2 psi
Max. External Coolant Restriction	60 kPa	9 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	42.1 m ³ /min	1487 ft. ³ /min
Exhaust Temperature	428 °C	802 °F
Max. Allowable Exhaust Restriction	29 kPa	116 in. H ₂ O
Max. Bending Moment on Turbo Outlet	7 N-m	5.2 lb-ft
Max. Shear on Turbine Outlet	11 kg	24 lb
Exhaust Filter Size	6; Gen 1.5	
Exhaust Filter Pressure Drop (Clean)	21.3 kPa	85 in. H ₂ O
Min. Mixing Length, Outlet to Exhaust Filter	NA	
Max. Bending Moment on Exhaust Filter Inlet	180 N-m	133 lb-ft
Max. Bending Moment on Exhaust Filter Outlet	180 N-m	133 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	L33 Controller	
Fuel Injection Pump	Denso HP6	
Governor Type	Electronic	
Total Fuel Flow	140 kg/hr	309 lb/hr
Fuel Consumption	68.6 kg/hr	151.2 lb/hr
Fuel Temperature Rise, Inlet to Return	23 Δ°C	41 Δ°F
Min. Fuel Inlet Pressure	-30 kPa	-120 in. H ₂ O
Max. Fuel Inlet Pressure	20 kPa	80 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	345 kPa	50 psi
Oil Pressure at Low Idle	100 kPa	15 psi
Max. In-Pan Oil Temperature	138 °C	280 °F
Max. Crankcase Pressure	2 kPa	8 in. H ₂ O

Air Intake System

Engine Air Flow	21.9 m ³ /min	773 ft. ³ /min
Air Mass Flow	1481.1 kg/hr	3265 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 %	

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Engine Installation Criteria

Performance Data

Rated Power	317 kW	425 HP
Rated Speed		2200 rpm
Max. Fast Idle Speed		2400 rpm
Breakaway Speed		2250 rpm
Power Bulge Speed		2000 rpm
Peak Torque Speed		1600 rpm
Low Idle Speed		800 rpm
Rated Torque	1376 N-m	1015 lb-ft
Peak Torque	1685 N-m	1243 lb-ft
Torque Rise		22 %
BMEP, Rated	1926 kPa	279 psi
BMEP, Peak Torque	2344 kPa	340 psi
Altitude Capability	1981 m	6500 ft
Friction Power @Rated Speed	37.5 kW	50 HP
Air:Fuel Ratio		21.9 : 1
Noise @1 m		97.9 dB(A)
Power Bulge		0 %

DEF Data

Load Factor	Engine Speed	DEF Consumption*		Percent of Diesel Consumption**
		g/kWh	lb/hp-hr	
%	RPM			%
100	2200	5.7	0.0094	2.1
Peak Torque	1600	6.1	0.01	2.3

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

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

Engine Speed	Power		Torque		BSFC	
	rpm	kW	hp	N-M	lb-ft	g/kWh
2200	317	425	1376	1015	213	0.349
2100	317	425	1441	1063	212	0.348
2000	317	425	1514	1117	213	0.349
1900	311	417	1564	1154	208	0.341
1800	305	409	1620	1195	207	0.339
1700	299	401	1679	1238	207	0.339
1600	282	378	1685	1243	205	0.336
1500	264	354	1683	1241	203	0.333
1400	246	330	1676	1236	204	0.335
1300	226	303	1661	1225	206	0.338
1200	207	278	1644	1213	207	0.339
1100	181	243	1567	1156	210	0.344
1000	153	205	1460	1077	210	0.344
900	128	172	1360	1003	210	0.344
800	106	142	1265	933	215	0.353

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