



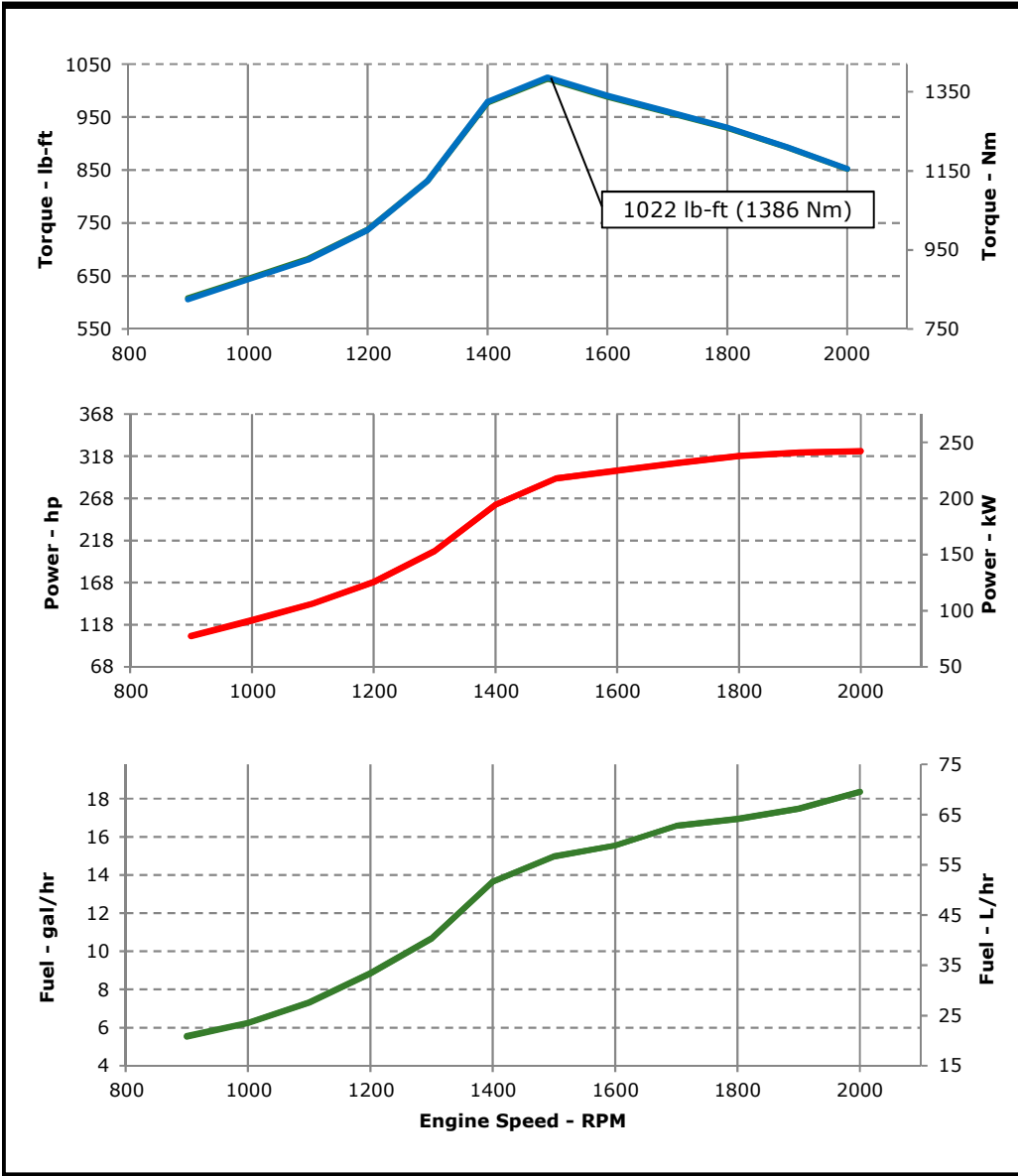
JOHN DEERE

ENGINE PERFORMANCE CURVE

Rating: **325 hp (242 kW) @ 2000 RPM**
Application: **Marine - Variable Speed**

PowerTech™ 9.0L Engine

Model: 6090HFM85



REFERENCE CONDITIONS	
Air Intake Restriction.....	12 in.H ₂ O (3 kPa)
Exhaust Back Pressure.....	30 in.H ₂ O (7.5 kPa)
Rated speed and power Gross power guaranteed within ±5% at SAE J1995 and ISO 3046 J1995 and ISO 3046 conditions:	
77 °F (25 °C) air inlet temperature	
29.31 in.Hg (99 kPa) barometric pressure	
104 °F (40 °C) fuel inlet temperature	
0.853 fuel specific gravity @ 60 °F (15.5 °C)	
Ambient air temperature is defined to be the temperature of ambient air close to operating vessel that is not influenced in any manner by operating characteristics of the vessel (free field temp).	
Conversion factors: Power: kW = hp x 0.746 Fuel: 1 gal = 7.1 lb, 1 L = 0.85 kg Torque: N·m = lb-ft x 1.356	
All values from currently available data. Subject to manufacturing and measurement variations and to change without notice. Actual performance is subject to application and operation conditions outside of John Deere control.	
All pressures shown in gauge pressure	

Notes:

Variable Speed Auxiliary: The Variable Speed ABS Auxiliary engine has an application rating equating to the Industrial Intermittent Rating. This allows usage of an unlimited number of hours per year, with an average load factor of 70% or less.

Possible Applications: On-deck variable speed pumps

Designed/Calibrated to meet:	Certified by:
<ul style="list-style-type: none"> US EPA Marine Tier 3 Compliant 	
Ref: Engine Emission Label	9-Jun-20
Performance Curve: 6090HFM85_A	

All values at rated speed, power, and standard conditions, per SAE J1995 unless otherwise noted.

Engine Installation Criteria

General Data

Model	6090HFM85		
Number of Cylinders	6		
Bore	118.4 mm	4.66 in	
Stroke	136 mm	5.35 in	
Displacement	9.0 L	549 in ³	
Compression Ratio	16.3:1		
Valves per Cylinder, Intake/Exhaust	2/2		
Combustion System	Direct Injection		
Firing Order	1-5-3-6-2-4		
Engine Type	In line, 4 Cycle		
Aspiration	Turbocharged and Aftercooled		
Aftercooling System	Air-to-Air		
Engine Crankcase Vent System	Open/Closed (Option Based)		

Cooling System*

Engine Heat Rejection	166 kW	9466 BTU/min
Coolant Flow	338 L/min	89 gal/min
Min. Coolant Pump Inlet Pressure	30.3 kPa	4.4 psi
Thermostat Start to Open	82 °C	180 °F
Thermostat Fully Open	94 °C	202 °F
Engine Coolant Capacity	17 L	4.5 gal
Minimum Air-to-Boil Temperature	47 °C	117 °F
Min. Coolant Fill Rate	12 L/min	3.2 gal/min
Min. Pressure Cap	110.3 kPa	16 psi
Max. External Coolant Restriction	40 kPa	5.8 psi
Normal Operation Max Top Tank Temperature	100 °C	212 °F
≤ 5% of Total Operating Time Top Tank Temp	100-110 °C	212-230 °F
Absolute Max Top Tank Temperature	110 °C	230 °F
Recommended Fuel Cooler	4 kW	213 BTU/min
Engine Radiated Heat	17 kW	993 BTU/min

Physical Data

Length to rear face of block	1081 mm	42.6 in
Length to rear face of flywheel housing (SAE #1)	1233 mm	48.5 in
Length maximum	1469 mm	57.8 in
Width maximum	714 mm	28.1 in
Height, crank centerline to top	645 mm	25.4 in
Height, crank centerline to bottom	320 mm	12.6 in
Weight, with oil, no coolant (includes engine, flywheel housing, flywheel, and electronics)	TBD kg	TBD lb
Center of Gravity Location, X-axis From Rear Face of Block	TBD mm	TBD in
Center of Gravity Location, Y-axis Right of Crankshaft	TBD mm	TBD in
Center of Gravity Location, Z-axis Above Crankshaft	TBD mm	TBD in
Max. Allowable Static Bending Moment At Rear Face of Flywheel Housing (for installations up to 5-G)	814 Nm	600 lb-ft
Thrust Bearing Load Limit, Forward Continuous	8.6 kN	1933 lbf
Thrust Bearing Load Limit, Forward Intermittent	13 kN	2923 lbf
Thrust Bearing Load Limit, Rearward Continuous	4 kN	899 lbf
Thrust Bearing Load Limit, Rearward Intermittent	6 kN	1349 lbf
Max. Continuous Damper Temperature	82 °C	180 °F

Electrical System

Min. Recommended Battery Capacity, 12V @32 °F (0 °C)	1100 amps
Min. Recommended Battery Capacity, 24V @32 °F (0 °C)	750 amps
Starter Rolling Current, 12V @32 °F (0 °C)	500 amps
Starter Rolling Current, 24V @32 °F (0 °C)	300 amps
Min. Voltage at ECU during Cranking, 12V	6 volts
Min. Voltage at ECU during Cranking, 24V	10 volts
Max. Allowable Start Circuit Resistance, 12V	0.002 ohms
Max. Allowable Start Circuit Resistance, 24V	0.0012 ohms
Electrical Component Maximum Temperature Limit	125 °C 257 °F
Maximum ECU Temperature	105 °C 221 °F

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Fuel System

ECU Description	L14			
Fuel Injection Pump	HPCR			
Governor Type	Electronic			
Volumetric Fuel Consumption	69.5	L/hr	18.4	gal/hr
Mass Fuel Consumption	59.1	kg/hr	130	lb/hr
Total Fuel Volumetric Flow	251	L/hr	66.3	gal/hr
Total Fuel Mass Flow	213	kg/hr	470	lb/hr
Max. Fuel Inlet Restriction*	20	kPa	80	in.H2O
Max. Fuel Inlet Pressure	20	kPa	80	in.H2O
Max Fuel Return Pressure	20	kPa	80	in.H2O
Normal Operation Fuel Temperature	40	°C	104	°F
Max. Fuel Inlet Temperature	100	°C	212	°F
Min. Recommended Fuel Line Inside Diameter	8.53	mm	0.34	in
Min. Recommended Fuel Line Size	6 (-) AN			
Primary Fuel Filter	10	mic		
Secondary Fuel Filter	2	mic		

Lubrication System

Oil Pressure at Rated Speed	281	kPa	41	psi
Oil Pressure at Low Idle (800rpm)**	170	kPa	25	psi
Max. Crankcase Pressure	2	kPa	8	in.H2O
Maximum Installed Angle, Front Down	0 deg			
Maximum Installed Angle, Front Up	12 deg			
Engine Angularity Limits Any Direction, Continuous***	20 deg			
Engine Angularity Limits Any Direction, Intermittent***	30 deg			

Charge Air Cooling System

Air-to-Air Exchanger Heat Rejection	54	kW	3071	BTU/min
Compressor Discharge Temp (Rated) @ 25°C Ambi	187	°C	369	°F
Compressor Discharge Temp (Max) @ Peak Torque, 25°C Ambient, 80 kPa Barometer	146	°C	295.6	°F
Maximum Pressure Drop thru CAC	13	kPa	52.2	in. H ₂ O
Max CAC Outlet Temp @ 25°C (77°F) Ambient	60	°C	140	°F
Max CAC Outlet Temp @ any Ambient	88	°C	190	°F

* With clean filters

** With John Deere Plus-50 II™ 15w-40, not applicable with break in oil.

*** With 1932 option

Air Intake System

Engine Air Flow	22	m ³ /min	775	ft ³ /min
Intake Manifold Pressure	92	kPa	13	psig
Manifold Air Temperature @ Rated (ECU reading)	62	°C	144	°F
Maximum Manifold Air Temperature	88	°C	190	°F
Max. Allowable Temperature Rise, Ambient	8	°C	30	°F
Air to Engine Inlet				
Max. Air Intake Restriction, Clean Air Cleaner	3	kPa	12	in.H ₂ O
Max. Air Intake Restriction, Dirty Air Cleaner	6.25	kPa	25	in.H ₂ O

Performance Data

Rated Power	242	kW	325	hp
Rated Speed	2000 RPM			
Peak Torque Speed	1500 RPM			
Low Idle Speed	800 RPM			
Breakaway Speed	RPM			
Fast Idle Speed	RPM			
Rated Torque	1155	Nm	852	ft-lb
Peak Torque	1386	Nm	1022	ft-lb
BMEP, Rated	1613	kPa	234	psi
Rated Pferdestärke (metric hp)	329 ps			
Front Drive Capacity, Intermittent	955	Nm	704	lb-ft
Front Drive Capacity, Continuous	955	Nm	704	lb-ft
Friction Power @ Rated Speed	29.7	kW	39.8	hp

Exhaust System

Exhaust Flow	51.5	m ³ /min	1819	ft ³ /min
Exhaust Temperature	460	°C	859	°F
Max. Allowable Exhaust Restriction	7.5	kPa	30	in.H ₂ O
Max. Shear on Turbocharger Exhaust Outlet	11	kg	24.3	lb
Max. Bending Moment on Turbocharger Exhaust Outlet	7	Nm	15.4	lb-ft
Min. Exhaust Pipe Diameter	127	mm	5.0	in

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Engine Installation Criteria

Engine Performance Data Table

Engine Speed	Crank Power		Crank Torque		Fuel Consumption		BSFC
	RPM	kW	hp	Nm	lb-ft	L/hr	
2000	242	324	1155	852	69.5	18.4	244
1900	241	323	1210	892	66.2	17.5	234
1800	237	318	1260	929	64.1	16.9	230
1700	231	310	1300	959	62.8	16.6	231
1600	225	301	1340	988	58.9	15.5	223
1500	218	292	1386	1022	56.7	15.0	221
1400	194	261	1325	977	51.7	13.7	226
1300	153	205	1125	830	40.4	10.7	224
1200	126	169	1000	738	33.4	8.8	226
1100	107	143	925	682	27.6	7.3	221
1000	92	123	875	645	23.6	6.2	219
900	78	104	825	608	20.9	5.5	229

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