



JOHN DEERE

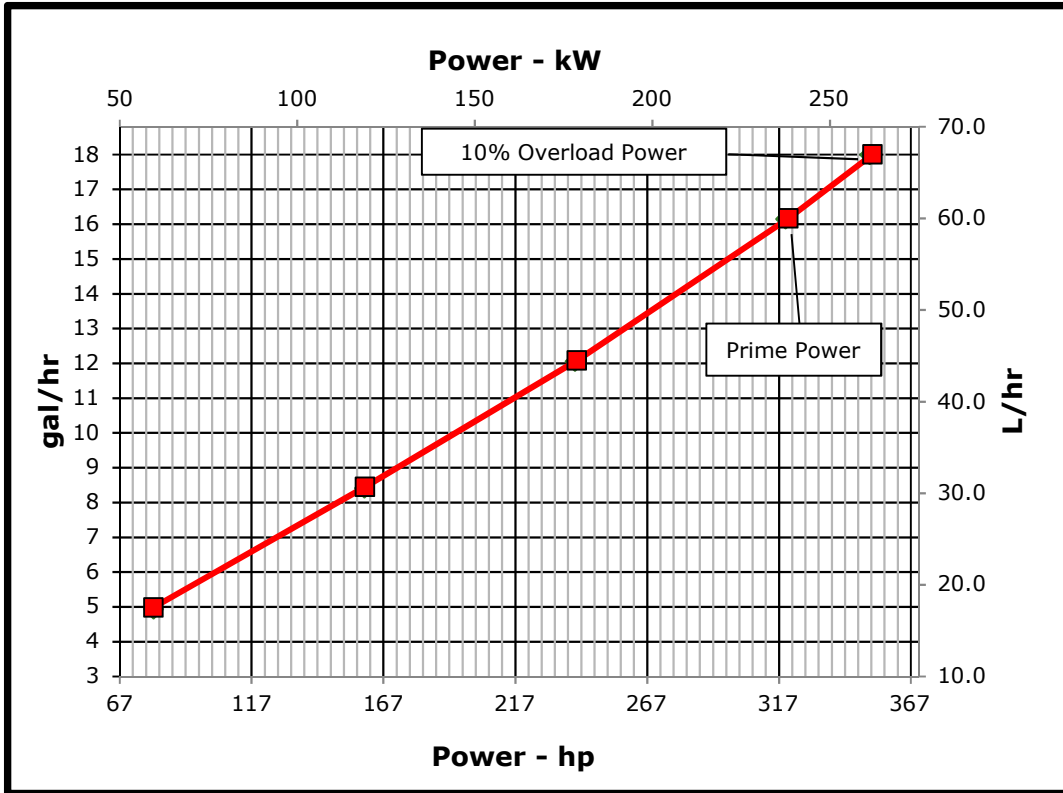
ENGINE PERFORMANCE CURVE

Rating: **319 hp (238 kW) @ 1800 RPM**
 Application: **Marine - Constant Speed**

PowerTech™ 9.0L Engine

Model: 6090HFM85

Generator Efficiency (%)	Estimated Fan Power	Power Factor	Calculated Gen-Set Rating		Prime Power	10% Overload Power
	hp (kW)		kWe	kVA	hp (kW)	hp (kW)
88-92	25 (18)	0.8	198-202	261-274	319(238)	351(262)



REFERENCE CONDITIONS

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

Constant Speed Auxiliary: The Constant Speed Auxiliary engine rating is the power available under normal varying electrical load factors for an unlimited number of hours per year in commercial applications. This rating incorporates a 10% overload capability, and conforms to ISO 8528 prime power. Average load over a 24-hour period shall not exceed 67% of the prime rating, of which no more than 2 hours are between 100% and 110% of the prime rating.

Constant speed engines are not certified for constant speed propulsion applications (i.e. variable pitch propeller, hybrid propulsion system).

Possible applications: This rating is used for applications that require constant speed operation in power generation or auxiliary applications such as generators and hydraulic pumps.

Designed/Calibrated to meet:

- US EPA Marine Tier 3 Compliant

Certified by:

Ref: Engine Emission Label

9-Jun-20

Performance Curve: 6090HFM85_B

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 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 Coolant Heat Rejection	161 kW	9181 BTU/min
Coolant Flow	304 L/min	80 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	225 BTU/min
Engine Radiated Heat	15 kW	857 BTU/min

Physical Data

Length to rear face of block	1081 mm	42.6 in
Length to rear face of flywheel housing (SAE #3)	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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Engine Installation Criteria

Fuel System

ECU Description	L14		
Fuel Injection Pump	HPCR		
Governor Type	Electronic		
Volumetric Fuel Consumption, Prime	60 L/hr	15.8 gal/hr	
Mass Fuel Consumption, Prime	51 kg/hr	112 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 1800 RPM**	263 kPa	38 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	40 kW	2265 BTU/min	
Compressor Discharge Temp (Rated) @ 25°C Aml	171 °C	340 °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	18.4 m ³ /min	651 ft ³ /min	
Intake Manifold Pressure	73 kPa	10.6 psig	
Manifold Air Temperature @ Rated (ECU reading)	63 °C	145 °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

Prime Power	238 kW	319 hp	
10% Overload Power	262 kW	351 hp	
Rated Speed	1800	RPM	
Low Idle Speed	1000	RPM	
Prime Torque	1264 Nm	932 lb-ft	
BMEP, Prime	1764 kPa	256 psi	
Rated Pferdestärke, Prime (metric hp)	324	ps	
Front Drive Capacity, Intermittent	955 Nm	704 lb-ft	
Front Drive Capacity, Continuous	955 Nm	704 lb-ft	
Friction Power @ Rated Speed	23.8 kW	31.89 hp	

Exhaust System

Exhaust Flow	44.7 m ³ /min	1578 ft ³ /min	
Exhaust Temperature	475 °C	887.6 °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	127.0 mm	5.0 in	

Performance Curve: 6090HFM85_B

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Engine Installation Criteria

Engine Performance Data Table

Engine Power	Crank Power		Crank Torque		Fuel Consumption		BSFC
	kW	hp	Nm	lb-ft	L/hr	gal/hr	
25%	60	80	316	233	17.5	4.6	250
50%	119	160	632	466	30.7	8.1	219
75%	179	240	948	699	44.5	11.8	212
100%	238	319	1264	932	60.0	15.8	214
110%	262	351	1390	1025	67.0	17.7	217

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