

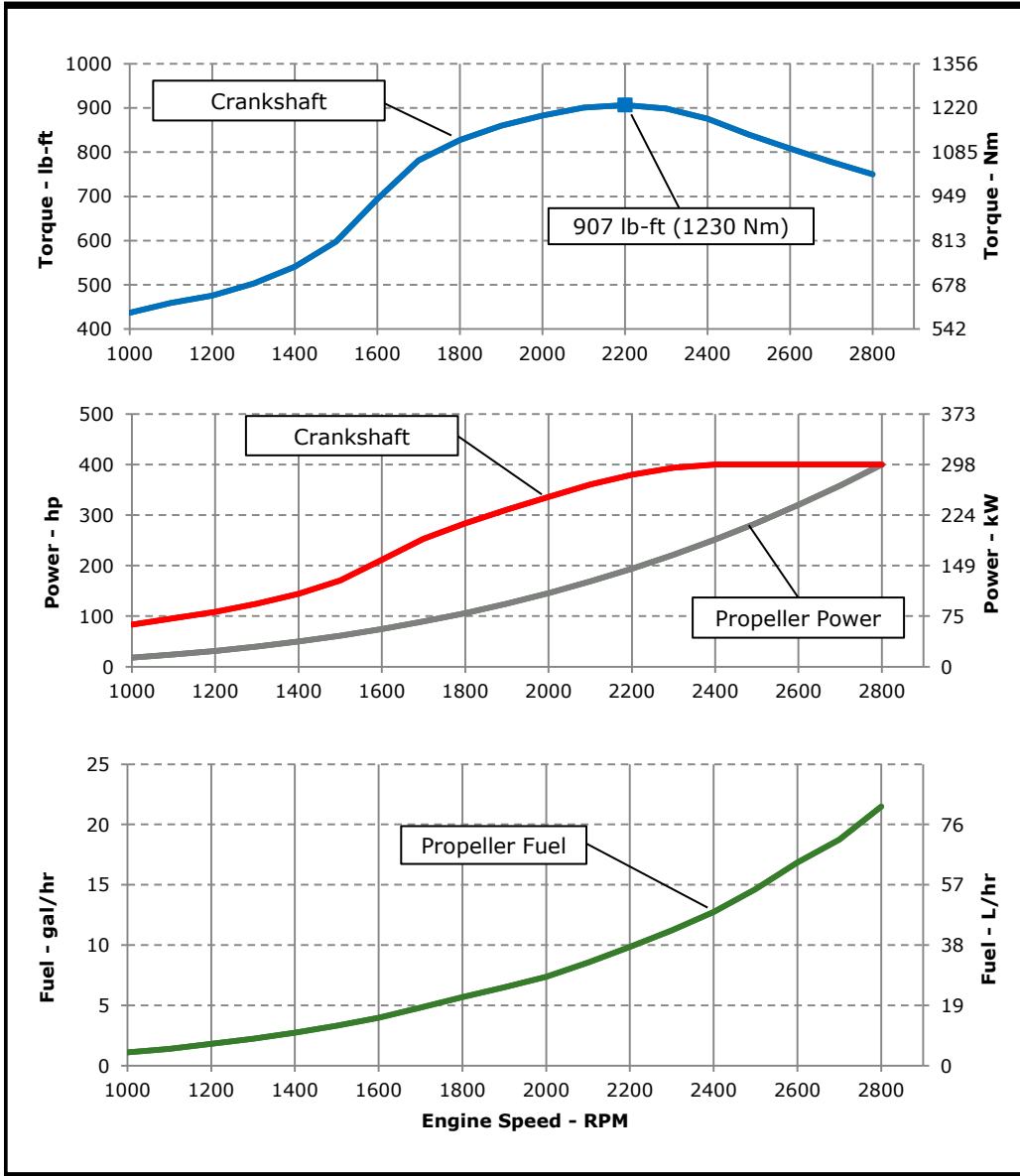


JOHN DEERE

ENGINE PERFORMANCE CURVE

Rating: **M5 - 400 HP (298 kW) @ 2800 rpm**
Application: **Marine**

PowerTech™ 6.8L Engine
Model: 6068SFM85



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.

Notes:

M5: The M5 rating is for marine recreational propulsion applications that operate 300 hours or less per year and have load factors below 35%. This rating is for applications that use full power for no more than 30 minutes out of each 8 hours and cruising speed the remainder of the 8 hours, and do not operate for the remaining 16 hours of the day.

Possible applications: Recreational boats in the U.S., tactical military vessels, and rescue boats outside the U.S.

Designed/Calibrated to meet:

- EPA Recreational Marine Tier 3 / RCD (2003/44/EC)
- IMO MARPOL Annex VI Compliant
- NRMM (97/68/EC), as amended

Ref: Engine Emission Label

Certified by:

15-Aug-12

Performance Curve: 6068SFM85_E

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

Engine Installation Criteria

General Data

Model	6068SFM85		
Number of Cylinders	6		
Bore	106 mm	4.17	in
Stroke	127 mm	5.00	in
Displacement	6.8 L	415	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	Seawater cooled		
Engine Crankcase Vent System	Closed		

Cooling System*

Total Engine to Seawater Heat Rejection**	231.19 kW	13159 BTU/min
Aftercooler Heat Rejection	70.15 kW	3993 BTU/min
Coolant Flow	271 L/min	72 gal/min
Thermostat Start to Open	82 °C	180 °F
Thermostat Fully Open	95 °C	203 °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 Temperature	100-110 °C	212-230 °F
Absolute Max Top Tank Temperature	110 °C	230 °F
Recommended Fuel Cooler	8 kW	469 BTU/min
Engine Radiated Heat	41 kW	2324 BTU/min

* The cooling system should be capable of typical at ambient up to the maximum conditions in which the vessel will operate.

Typical operation is defined as the average load sustainable in the vessel over 10 min.

** Reference 32 °C Sea Water Temperature

Physical Data

Length to rear face of block	1027 mm	40.4 in
Length maximum	1317 mm	51.9 in
Width maximum	872 mm	34.3 in
Height, crank centerline to top	645 mm	25.4 in
Height, crank centerline to bottom	293 mm	293 in
Weight, with oil, no coolant (includes engine, flywheel housing, flywheel, and electronics)	0 kg	0 lb
Center of Gravity Location, X-axis From Rear Face of Block	0 mm	0.0 in
Center of Gravity Location, Y-axis Right of Crankshaft	0 mm	0.0 in
Center of Gravity Location, Z-axis Above Crankshaft	0 mm	0.0 in
Max. Allowable Static Bending Moment At Rear Face of Flywheel Housing with 5-G Load	814 Nm	600 lb-ft
Thrust Bearing Load Limit, Forward Continuous	2.2 kN	495 lbf
Thrust Bearing Load Limit, Forward Intermittent	4 kN	899 lbf
Thrust Bearing Load Limit, Rearward Continuous	1 kN	225 lbf
Thrust Bearing Load Limit, Rearward Intermittent	2 kN	450 lbf

Electrical System

Min. Recommended Battery Capacity, 12V @32 °F (0 °C)	925 amps
Min. Recommended Battery Capacity, 24V @32 °F (0 °C)	625 amps
Starter Rolling Current, 12V @32 °F (0 °C)	920 amps
Starter Rolling Current, 24V @32 °F (0 °C)	600 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
Recommended Starter Cable, 12V 100"	#00
Recommended Starter Cable, 24V 100"	#2
Recommended Starter Cable, 12V 200"	#0000 or 2 #00
Recommended Starter Cable, 24V 200"	#0
Electrical Component Maximum Temperature Limit	125 °C 257 °F

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Engine Installation Criteria

Fuel System

ECU Description	L14			
Fuel Injection Pump	HPCR			
Governor Type	Electronic			
Volumetric Fuel Consumption	81.3	L/hr	21.5	gal/hr
Mass Fuel Consumption	69.1	kg/hr	152	lb/hr
Total Fuel Volumetric Flow	192	L/hr	50.7	gal/hr
Total Fuel Mass Flow	163	kg/hr	360	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
Max. Fuel Height Above Transfer Pump	2.4	m	7.9	ft
Max. Leak-off Return Height	2.4	m	7.9	ft
Max. Fuel Inlet Height Above Fuel Tank Supply	2.4	m	7.9	ft
Normal Operation Fuel Temperature	40	°C	104	°F
Max. Fuel Inlet Temperature	100	°C	212	°F
Min. Recommended Fuel Line Inside Diameter	7.46	mm	0.29	in
Min. Recommended Fuel Line Size	5 (-) AN			
Primary Fuel Filter	10 mic			
Secondary Fuel Filter	2 mic			

Lubrication System

Oil Pressure at Rated Speed	415	kPa	60	psi
Oil Pressure at Low Idle (800rpm)**	180	kPa	26	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***	25 deg			
Engine Angularity Limits Any Direction, Intermittent***	35 deg			

Seawater Pump System

Seawater Pump Flow	250	L/min	66	gal/min
Max. Suction Lift	3	m	9.8	ft
Max. Outlet Pressure	140	kPa	20	psi
Max. Inlet Restriction	30	kPa	4	psi

* With clean filters

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

*** With 19BP option

Air Intake System

Engine Air Flow	22.75	m ³ /min	803	ft ³ /min
Intake Manifold Pressure	259	kPa	40.6	psi
Manifold Air Temperature	36	°C	97	°F
Maximum Manifold Air Temperature	67	°C	152.6	°F
Max. Allowable Temperature Rise, Ambient	17	°C	30	°F
Air to Engine Inlet				
Max. Air Intake Restriction, Clean Air Cleaner	3	kPa	12	in.H2O
Max. Air Intake Restriction, Dirty Air Cleaner	6.25	kPa	25	in.H2O
Min. Ventilation Area	0.14	m ²	217	in ²

Performance Data

Rated Power	298	kW	400	hp
Rated Speed	2800 RPM			
Peak Torque Speed	2200 RPM			
Low Idle Speed	600 RPM			
Rated Torque	1016	Nm	750	ft-lb
Peak Torque	1230	Nm	907	ft-lb
BMEP, Rated	1878	kPa	272	psi
Rated Pferdestärke (metric hp)	405 ps			
Front Drive Capacity, Intermittent	907	Nm	669	lb-ft
Front Drive Capacity, Continuous	907	Nm	669	lb-ft

Exhaust System

Exhaust Flow	55.5	m ³ /min	1960	ft ³ /min
Exhaust Flow @ gas STP	23.9	m ³ /min	844	ft ³ /min
Exhaust Temperature	470	°C	878	°F
Max. Allowable Exhaust Restriction	7.5	kPa	30	in.H2O
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, Dry	127	mm	5.0	in
Min. Exhaust Pipe Diameter, Wet	139.7	mm	5.5	in

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Engine Installation Criteria

Engine Performance Data Table

Engine Speed	Crank Power		Crank Torque		* Prop Power		* Prop Fuel		* Prop BSFC
	RPM	kW	hp	Nm	lb-ft	kW	hp	L/hr	gal/hr
2800	298	400	1017	750	298	400	81	21	232
2700	298	400	1055	778	267	359	71	19	226
2600	298	400	1096	808	239	320	64	17	227
2500	298	400	1139	840	212	285	55	15	222
2400	298	400	1187	876	188	252	48	13	219
2300	293	394	1218	899	165	222	42	11	218
2200	283	380	1230	907	145	194	37	10	219
2100	269	360	1222	901	126	169	32	9	219
2000	251	336	1197	883	109	146	28	7	218
1900	232	311	1166	860	93	125	25	6	224
1800	212	284	1122	828	79	106	22	6	231
1700	189	253	1060	782	67	90	18	5	232
1600	158	211	941	694	56	75	15	4	230
1500	127	171	811	598	46	61	13	3	233
1400	108	144	733	541	37	50	10	3	236
1300	93	124	682	503	30	40	8	2	239
1200	81	109	645	475	23	31	7	2	247
1100	72	96	622	459	18	24	5	1	245
1000	62	83	592	437	14	18	4	1	259

* Theoretical 3.0 exponent propeller curve , measured at flywheel

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