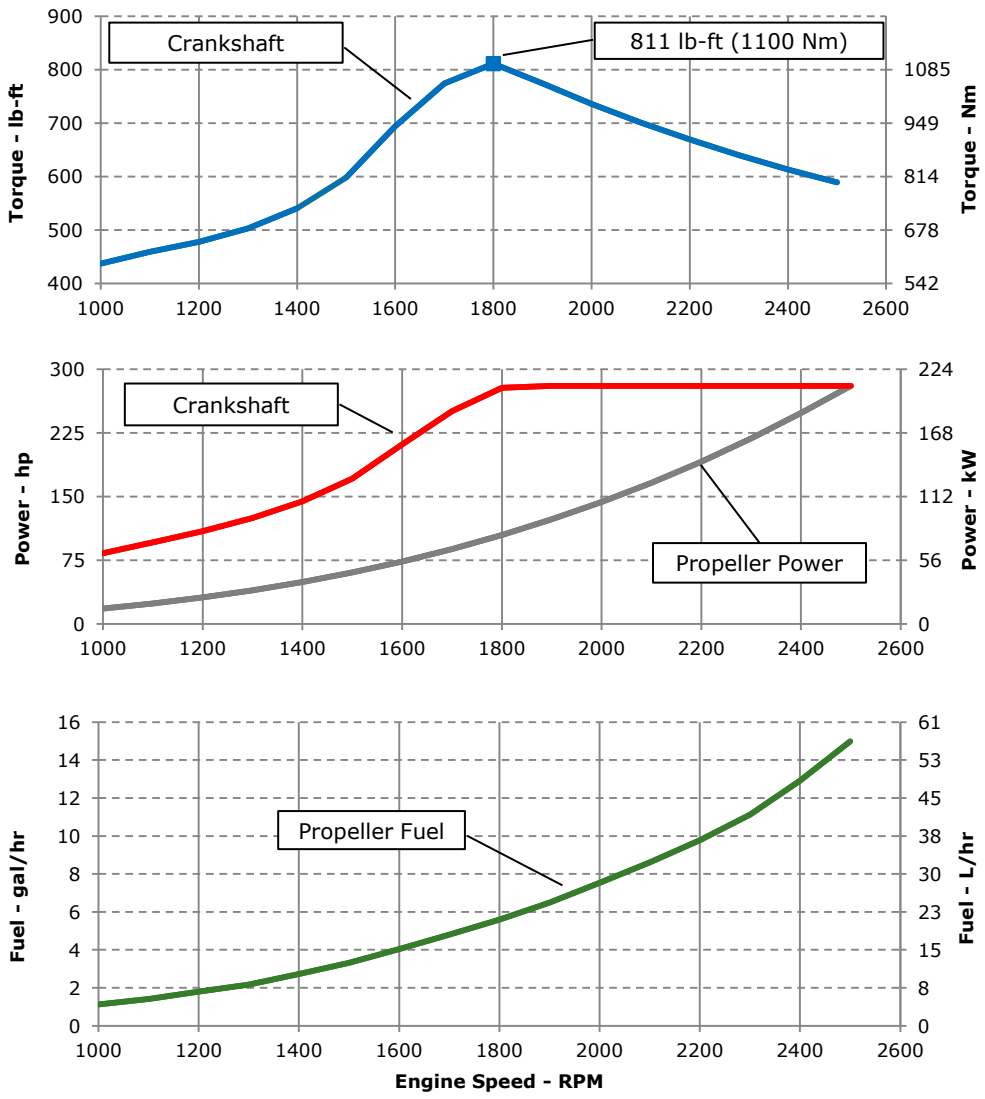
ENGINE PERFORMANCE CURVE

JOHN DEERE

Rating: **M2 - 280 HP (209 kW) @ 2500 rpm**
Application: **Marine**

PowerTech™ 6.8L Engine
Model: 6068SFM85



REFERENCE CONDITIONS

Air Intake Restriction.....12 in.H_2O (3 kPa)
Exhaust Back Pressure..... 30 in.H_2O (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:

M2: The M2 rating is for marine propulsion applications that operate up to 3,000 hours per year and have load factors up to 65%. This rating is for applications that are in continuous use, and use full power for no more than 16 hours out of each 24 hours of operation. The remaining time of operation must be at cruising speeds.

Possible Applications: Short-range tugs and towboats (pool boats), long-range ferryboats, large passenger vessels, and offshore displacement hull fishing boats under 18 m (60 ft).

Designed/Calibrated to meet:	Certified by:
• EPA Commercial Marine Tier 3 • IMO MARPOL Annex VI Compliant • NRMM (97/68/EC), as amended	Adam Powell
Ref: Engine Emission Label	15-Aug-12

Performance Curve: 6068SFM85_B

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**	161.15	kW	9173	BTU/min
Aftercooler Heat Rejection	39.5	kW	2248	BTU/min
Coolant Flow	242	L/min	64	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	10	kW	573	BTU/min
Engine Radiated Heat	28	kW	1621	BTU/min

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

* 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

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Engine Installation Criteria

Fuel System

ECU Description			L14	
Fuel Injection Pump			HPCR	
Governor Type			Electronic	
Volumetric Fuel Consumption	56.7	L/hr	15.0	gal/hr
Mass Fuel Consumption	48.2	kg/hr	106	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	237	L/min	63	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	17	m^3/min	600.3	ft^3/min
Intake Manifold Pressure	227	kPa	32.9	psi
Manifold Air Temperature	35	°C	95	°F
Maximum Manifold Air Temperature	67	°C	153	°F
Max. Allowable Temperature Rise, Ambient Air to Engine Inlet	17	°C	30	°F
Max. Air Intake Restriction, Clean Air Cleaner	3	kPa	12	in.H_2O
Max. Air Intake Restriction, Dirty Air Cleaner	6.25	kPa	25	in.H_2O
Min. Ventilation Area	0.105	m^2	162	in^2

Performance Data

Rated Power	209	kW	280	hp
Rated Speed		2500	RPM	
Peak Torque Speed		1800	RPM	
Low Idle Speed		600	RPM	
Rated Torque	798	Nm	589	ft-lb
Peak Torque	1100	Nm	811	ft-lb
BMEP, Rated	1475	kPa	214	psi
Rated Pferdestärke (metric hp)		253	ps	
Front Drive Capacity, Intermittent	907	Nm	669	lb-ft
Front Drive Capacity, Continuous	907	Nm	669	lb-ft

Exhaust System

Exhaust Flow	40.1	m^3/min	1416	ft^3/min
Exhaust Flow @ gas STP	17.8	m^3/min	629	ft^3/min
Exhaust Temperature	449	°C	840	°F
Max. Allowable Exhaust Restriction	7.5	kPa	30	in.H_2O
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	114.3	mm	4.5	in
Min. Exhaust Pipe Diameter, Wet	127	mm	5.0	in

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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	g/kW-hr
2500	209	280	799	589	209	280	57	15	231
2400	209	280	832	613	185	248	49	13	225
2300	209	280	868	640	163	218	42	11	220
2200	209	280	907	669	142	191	37	10	221
2100	209	280	951	701	124	166	33	9	223
2000	209	280	998	736	107	144	28	8	226
1900	209	280	1050	774	92	123	25	6	227
1800	207	278	1100	811	78	105	21	6	231
1700	187	251	1050	774	66	88	18	5	235
1600	158	211	941	694	55	74	15	4	237
1500	127	171	811	598	45	61	13	3	236
1400	108	144	733	541	37	49	10	3	238
1300	93	124	682	503	29	39	8	2	238
1200	81	109	648	478	23	31	7	2	250
1100	72	96	622	459	18	24	5	1	255
1000	62	83	593	437	13	18	4	1	272

*** Theoretical 3.0 exponent propeller curve , measured at flywheel**

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