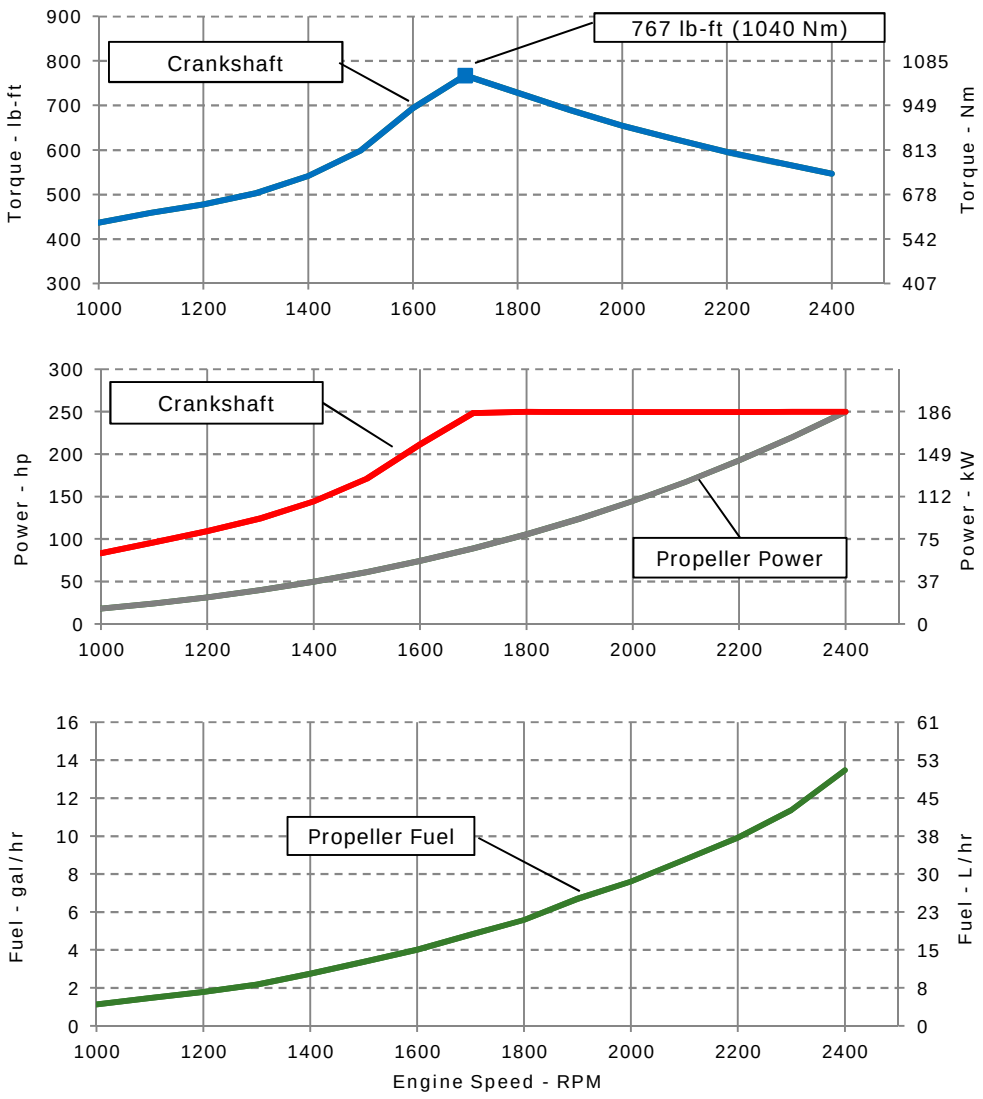
ENGINE PERFORMANCE CURVE

JOHN DEERE

Rating: M1 - 249 HP (186 kW) @ 2400 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:

M1: The M1 rating is for marine propulsion applications that may operate up to 24 hours per day uninterrupted full power. These applications typically operate over 3,000 hours per year and have load factors over 65%. The M1 rating is the ISO 8665 standard power rating and the SAE J1228 crankshaft power rating. Both are defined as the power level at which an engine can run continuously between recommended service intervals.

Possible applications: Line haul tugs and towboats, fish and shrimp trawlers/draggers, and displacement hull fishing boats over 18 m (60 ft).

Designed/Calibrated to meet:	Certified by:
• EPA Commercial Marine Tier 3 • IMO MARPOL Annex VI Tier II Compliant • NRMM (97/68/EC), as amended	
Ref: Engine Emission Label	3-Oct-16

Performance Curve: 6068SFM85_A

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*

Jacket Water Heat Rejection**	145.89	kW	8304	BTU/min
Aftercooler Heat Rejection	31.15	kW	1773	BTU/min
Coolant Flow	231	L/min	61	gal/min
Min. Coolant Pump Inlet Pressure	30.3	kPa	4.4	psi
Thermostat Start to Open	81	°C	178	°F
Thermostat Fully Open	95	°C	203	°F
Engine Coolant Capacity, HE	31.5	L	8.3	gal
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
Return Fuel Heat Rejection	3	kW	166	BTU/min
Engine Radiated Heat	26	kW	1457	BTU/min

Physical Data

Length to rear face of block	1034	mm	40.7	in
Length to rear face of flywheel housing (SAE #3)	1172	mm	46.1	in
Length maximum	1489	mm	58.6	in
Width maximum	872	mm	34.3	in
Height, crank centerline to top	640	mm	25.2	in
Height, crank centerline to bottom	291	mm	11.5	in
Weight, with oil, no coolant (includes engine, flywheel housing, flywheel, and electronics)	763	kg	1682	lb
Center of Gravity Location, X-axis From Rear Face of Block	407	mm	16.0	in
Center of Gravity Location, Y-axis Right of Crankshaft	-23	mm	-0.9	in
Center of Gravity Location, Z-axis Above Crankshaft	187	mm	7.4	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	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		
Electrical Component Maximum Temperature Limit	125	°C	257	°F
Maximum ECU Temperature	105	°C	221	°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	51	L/hr	13.5	gal/hr
Mass Fuel Consumption	43.4	kg/hr	96	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
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	334	L/min	88	gal/min
Max. Suction Lift	3	m	9.8	ft
Max. Outlet Pressure	140	kPa	20	psi
Max. Inlet Restriction	30	kPa	4	psi

Air Intake System

Engine Air Flow	15.29	m^3/min	540.0	ft^3/min
Intake Manifold Pressure	213.5	kPa	31.0	psi
Manifold Air Temperature	34	°C	93	°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	0.094	m^2	146	in^2

Performance Data

Rated Power	186	kW	250	hp
Rated Speed		2400	RPM	
Peak Torque Speed		1700	RPM	
Low Idle Speed		600	RPM	
Rated Torque	742	Nm	547	ft-lb
Peak Torque	1040	Nm	767	ft-lb
BMEP, Rated	1371	kPa	199	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	36.2	m^3/min	1278	ft^3/min
Exhaust Flow @ gas STP	16.1	m^3/min	569	ft^3/min
Exhaust Temperature	452	°C	846	°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	101.6	mm	4.0	in
Min. Exhaust Pipe Diameter, Wet	114.3	mm	4.5	in

* With clean filters

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

*** With 19BP option

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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	g/kW-hr
2400	186	250	741	547	186	250	51	13	233
2300	186	250	774	571	164	220	43	11	223
2200	186	249	807	596	143	192	38	10	222
2100	186	249	846	624	125	167	33	9	226
2000	186	249	887	654	108	145	29	8	227
1900	186	249	935	690	92	124	25	7	233
1800	186	250	988	729	79	105	21	6	228
1700	185	248	1040	767	66	89	18	5	234
1600	158	211	941	694	55	74	15	4	234
1500	127	171	811	598	45	61	13	3	238
1400	108	144	734	541	37	50	10	3	239
1300	93	124	681	503	30	40	8	2	237
1200	81	109	647	477	23	31	7	2	245
1100	72	96	622	459	18	24	6	1	262
1000	62	83	592	437	13	18	4	1	268

* Theoretical 3.0 exponent propeller curve , measured at flywheel

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