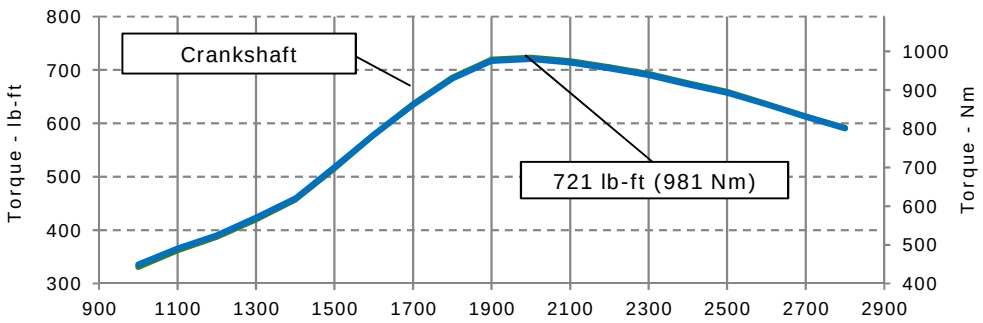
ENGINE PERFORMANCE CURVE

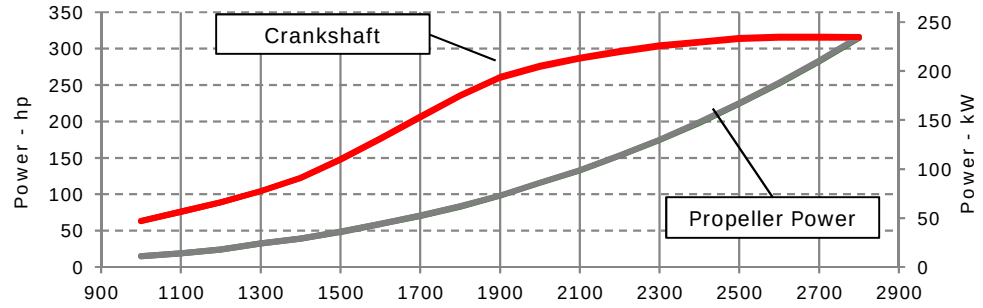
JOHN DEERE

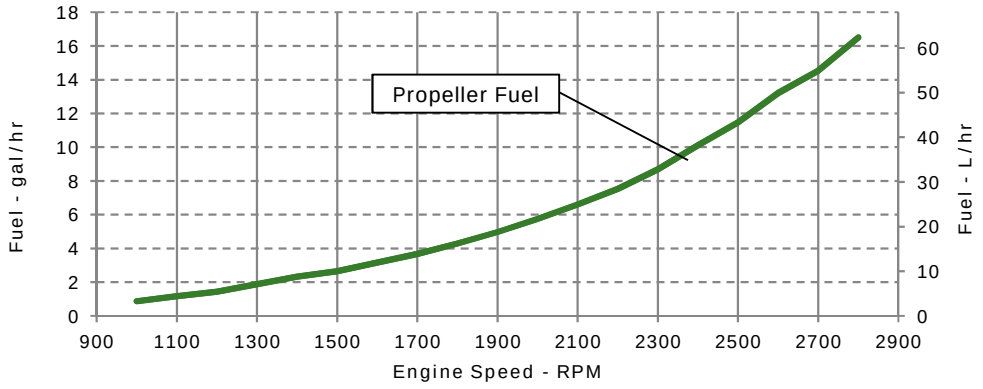
Rating: M5 - 315hp (235kW) @ 2800 RPM
Application: Marine

PowerTech™ 4.5L Engine

Model: 4045SFM85







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 ISO 8665/SAE J1228 and ISO 3046/SAE J1995
Test 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:

M5: The M5 rating is for marine proprulsion applications that operate 1000 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:	Certified by:
• EPA Marine Tier 3 Commercial (40 CFR 1042) • IMO Tier II Compliant (MARPOL Annex VI) • EU Stage IIIa Inland Waterways (NRMM 97/68/EC, as amended) • Recreational Craft Directive 2 (2013/53/EU)	
Ref: Engine Emission Label	29-Oct-18

Performance Curve: 4045SFM85_B

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

Engine Installation Criteria

General Data

Model	4045SFM85			
Number of Cylinders	4			
Bore	107	mm	4.21	in
Stroke	127	mm	5.00	in
Displacement	4.5	L	275	in^3
Compression Ratio	16.7:1			
Valves per Cylinder, Intake/Exhaust	2/2			
Combustion System	Direct Injection			
Firing Order	1-3-4-2			
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**	153.8	kW	8756	BTU/min
Aftercooler Heat Rejection**	55.3	kW	3146	BTU/min
Max. Pressure Drop Across KC and Piping	40	kPa	5.8	psi
Coolant Flow	276	L/min	73	gal/min
Min. Coolant Pump Inlet Pressure	30.3	kPa	4.4	psi
Thermostat Start to Open	66	°C	151	°F
Thermostat Fully Open	79	°C	174	°F
Engine Coolant Capacity, HE	20	L	5.3	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
Recommended Fuel Cooler	2	kW	105	BTU/min
Engine Radiated Heat	31	kW	1781	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	762	mm	30.0	in
Length to rear face of flywheel housing (SAE #3)	900	mm	35.4	in
Length maximum	1145	mm	45.1	in
Width maximum	829	mm	32.7	in
Height, crank centerline to top	611	mm	24.0	in
Height, crank centerline to bottom	311	mm	12.2	in
Weight, with oil, no coolant (includes engine, flywheel housing, flywheel, and electronics) ***	558	kg	1230	lb
Center of Gravity Location, X-axis From Rear Face of Block	286	mm	11.3	in
Center of Gravity Location, Y-axis Right of Crankshaft	8.4	mm	0.3	in
Center of Gravity Location, Z-axis Above Crankshaft	170	mm	6.7	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)	640	amps		
Min. Recommended Battery Capacity, 24V @32 °F (0 °C)	570	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

*** Estimated value

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Engine Installation Criteria

Fuel System

ECU Description			L14	
Fuel Injection Pump			HPCR	
Governor Type			Electronic	
Volumetric Fuel Consumption	62.3	L/hr	16.5	gal/hr
Mass Fuel Consumption	53	kg/hr	117	lb/hr
Total Fuel Volumetric Flow	152	L/hr	40.2	gal/hr
Total Fuel Mass Flow	129	kg/hr	285	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	6.64	mm	0.26	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	355	kPa	52	psi
Oil Pressure at Low Idle (600rpm)**	135	kPa	20	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***			35	deg
Engine Angularity Limits Any Direction, Intermittent***			45	deg

Seawater Pump System

Seawater Pump Flow	252	L/min	67	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	17.2	m^3/min	606	ft^3/min
Intake Manifold Pressure	233	kPa	34.6	psi
Manifold Air Temperature	51	°C	124	°F
Maximum Manifold Air Temperature	77	°C	170.6	°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	0.11	m^2	164	in^2

Performance Data

Rated Power	235	kW	315	hp
Rated Speed		2800	RPM	
Peak Torque Speed		2000	RPM	
Low Idle Speed		600	RPM	
Rated Torque	801	Nm	591	ft-lb
Peak Torque	980	Nm	723	ft-lb
BMEP, Rated	2238	kPa	325	psi
Rated Pferdestärke (metric hp)		320	ps	
Front Drive Capacity, Intermittent	621	Nm	458	lb-ft
Front Drive Capacity, Continuous	621	Nm	458	lb-ft

Exhaust System

Exhaust Flow	41.5	m^3/min	1465	ft^3/min
Exhaust Flow @ gas STP	18	m^3/min	625	ft^3/min
Exhaust Temperature	478	°C	893	°F
Max. Allowable Exhaust Restriction	10	kPa	40	in.H_2O
Max. Shear on Turbocharger Exhaust Outlet	11	kg	24.3	lb
Max. Bending Moment on Turbocharger Exhaus Outlet	7	Nm	15.4	lb-ft
Min. Exhaust Pipe Diameter, Dry	101.6	mm	4.0	in
Min. Exhaust Pipe Diameter, Wet	127	mm	5.0	in

* With clean filters

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

*** With 19CZ option

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

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
2800	235	315	801	591	235	315	62	16	226
2700	235	315	831	613	211	282	55	15	222
2600	235	315	863	637	188	252	50	13	226
2500	234	314	893	659	167	224	43	11	220
2400	230	308	915	675	148	198	38	10	220
2300	226	303	939	693	130	174	33	9	215
2200	220	295	956	705	114	153	28	8	212
2100	214	286	971	716	99	133	25	7	214
2000	205	275	980	723	86	115	22	6	215
1900	194	260	975	719	73	98	19	5	219
1800	175	235	930	686	62	83	16	4	222
1700	153	206	862	636	53	70	14	4	225
1600	131	176	784	578	44	59	12	3	231
1500	110	147	700	516	36	48	10	3	237
1400	91	122	620	457	29	39	9	2	258
1300	78	104	570	420	24	32	7	2	252
1200	66	88	525	387	18	24	5	1	256
1100	57	76	491	362	14	19	4	1	270
1000	47	63	449	331	11	15	3	1	255

* Theoretical 3.0 exponent propeller curve , measured at flywheel

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