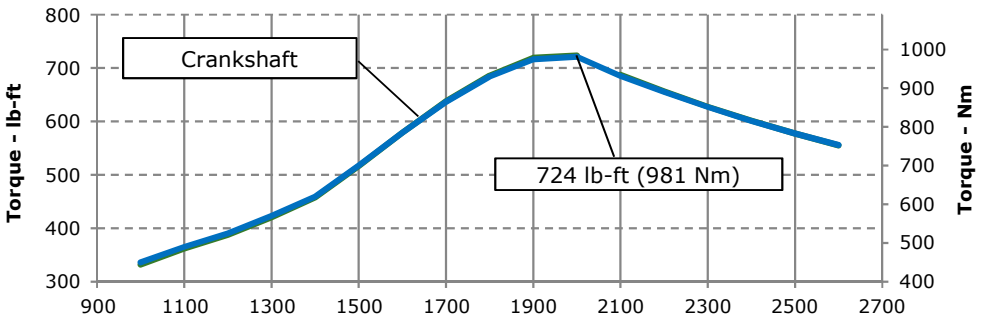
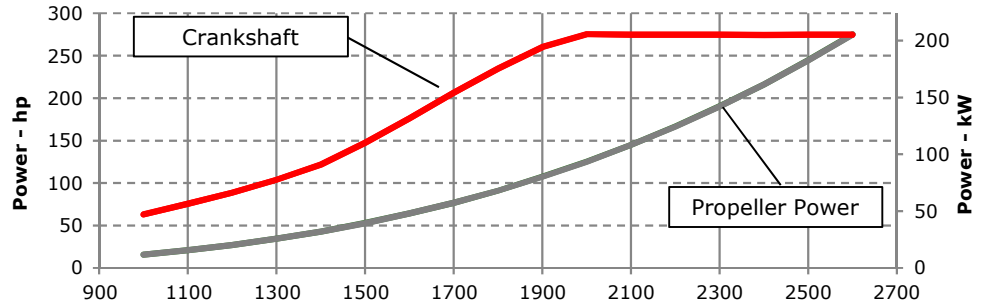
ENGINE PERFORMANCE CURVE

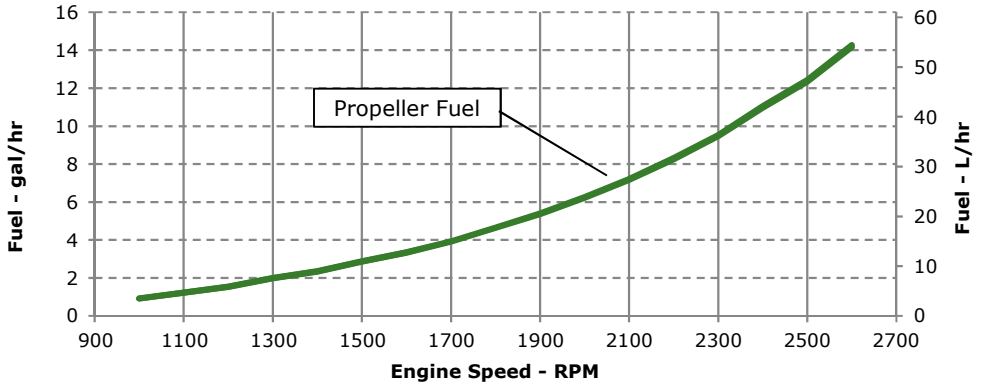
JOHN DEERE

Rating: **M4 - 275hp (205kW) @ 2600 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 show in gauge pressure

Notes:

M4: The M4 rating is for marine propulsion applications that operate 1,000-3,000 hours per year and have load factors below 40%. This rating is for applications that use full power for no more than 1 hour out of each 12 hours of operating. The remaining time of operation must be at cruising speeds.
Possible applications: Inshore crew boats, charter fishing boats, pilot boats, dive boats, and planning hull commercial fishing boats.

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)	Scott D. Ochsner
Ref: Engine Emission Label	24-Jul-20

Performance Curve: 4045SFM85_A

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**	134	kW	7627	BTU/min
Aftercooler Heat Rejection**	50	kW	2841	BTU/min
Max. Pressure Drop Across KC and Piping	40	kPa	5.8	psi
Coolant Flow	252	L/min	67	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	115	BTU/min
Engine Radiated Heat	14	kW	771	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	54	L/hr	14.3	gal/hr
Mass Fuel Consumption	45.9	kg/hr	101	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	243	L/min	64	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	16	m^3/min	570	ft^3/min
Intake Manifold Pressure	233	kPa	33.7	psi
Manifold Air Temperature	47	°C	117	°F
Maximum Manifold Air Temperature	77	°C	171	°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	0.10	m^2	154	in^2

Performance Data

Rated Power	205	kW	275	hp
Rated Speed		2600	RPM	
Peak Torque Speed		2000	RPM	
Low Idle Speed		600	RPM	
Rated Torque	753	Nm	555	ft-lb
Peak Torque	981	Nm	724	ft-lb
BMEP, Rated	2103	kPa	305	psi
Rated Pferdestärke (metric hp)		279	ps	
Front Drive Capacity, Intermittent	621	Nm	458	lb-ft
Front Drive Capacity, Continuous	621	Nm	458	lb-ft

Exhaust System

Exhaust Flow	37.1	m^3/min	1309	ft^3/min
Exhaust Flow @ gas STP	16.6	m^3/min	587	ft^3/min
Exhaust Temperature	442	°C	828	°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 Exhaust 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
2600	205	275	753	555	205	275	54	14	224
2500	205	275	783	578	182	245	47	12	219
2400	205	275	815	601	161	216	42	11	220
2300	205	275	851	628	142	191	36	10	216
2200	205	275	890	656	124	167	31	8	215
2100	205	275	932	687	108	145	27	7	215
2000	205	276	981	724	93	125	24	6	216
1900	194	260	975	719	80	108	20	5	217
1800	175	235	930	686	68	91	18	5	220
1700	154	207	865	638	57	77	15	4	221
1600	132	176	785	579	48	64	13	3	225
1500	110	147	700	516	39	53	11	3	235
1400	91	122	620	457	32	43	9	2	237
1300	78	104	570	420	26	34	8	2	250
1200	66	88	525	387	20	27	6	2	245
1100	56	76	490	361	16	21	5	1	255
1000	47	63	450	332	12	16	3	1	253

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

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