



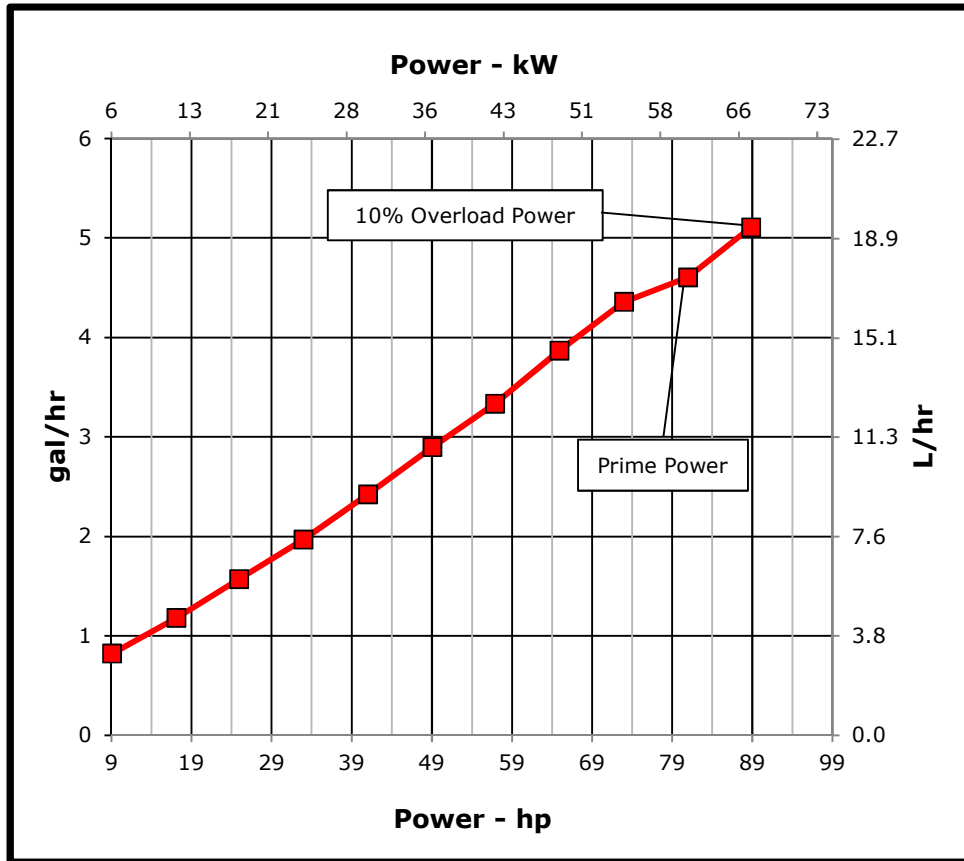
JOHN DEERE

# ENGINE PERFORMANCE CURVE

Rating: **50 Hz - 82 hp (61 kW) @ 1500 RPM**  
Application: **Marine**

**PowerTech™ 4.5L Engine**  
**Model: 4045TFM85**

Generator Efficiency (%)	Power Factor	Calculated Gen-Set Rating		Prime Power	10% Overload Power
		kWe	kVA	hp (kW)	hp (kW)
88-92	0.8	54-56	68-70	82(61)	90(67)



## REFERENCE CONDITIONS

Air Intake Restriction.....12 in.H<sub>2</sub>O (3 kPa)  
Exhaust Back Pressure..... 30 in.H<sub>2</sub>O (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 @ 60°F (15.5°C)  
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 in gage pressure

### Notes:

**Marine Generator:** The Marine generator engine rating is the power available under normal varying electrical load factors for an unlimited number of hours per year in commercial applications. This rating incorporates a 10% overload capability, and conforms to ISO 8528 prime power. Average load over a 24-hour period shall not exceed 67% of the prime rating, of which no more than 2 hours are between 100% and 110% of the prime rating.

Constant speed engines are not certified for constant speed propulsion applications (i.e. variable pitch propeller, hybrid propulsion system).

Possible applications: This rating is used for applications that require constant speed operation in power generation or auxiliary applications such as generators and hydraulic pumps.

Designed/Calibrated to meet:

- EU Stage V Inland Waterways Constant Speed Auxiliary (2016/1628)
- IMO MARPOL Annex VI Exempt (<130 kW)

Ref: Engine Emission Label

Certified by:

24-Jul-20

Performance Curve: 4045TFM85 E

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

## Engine Installation Criteria

### General Data

Model	4045TFM85		
Number of Cylinders	4		
Bore	106 mm	4.17	in
Stroke	127 mm	5.00	in
Displacement	4.5 L	275	in <sup>3</sup>
Compression Ratio	19.0:1		
Valves per Cylinder, Intake/Exhaust	1/1		
Combustion System	Direct injection		
Firing Order	1-3-4-2		
Engine Type	In line, 4 Cycle		
Aspiration	Turbocharged		
Aftercooling System	None		
Engine Crankcase Vent System	None, Offered as Accessory		

### Cooling System\*

Engine Coolant Heat Rejection**	72 kW	4104	BTU/min
Max. Pressure Drop Across KC and Piping	40 kPa	6	psi
Coolant Flow	83 L/min	21.9	gal/min
Min. Coolant Pump Inlet Pressure	30.3 kPa	4.4	psi
Thermostat Start to Open	82 °C	180	°F
Thermostat Fully Open	94 °C	202	°F
Engine Coolant Capacity, HE	14 L	3.7	gal
Engine Coolant Capacity, KC	17 L	4.5	gal
Min. Coolant Fill Rate	12 L/min	3.2	gal/min
Min. Pressure Cap	69 kPa	10	psi
Min. Pump Inlet Pressure	30 kPa	4.4	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	1 kW	63	BTU/min
Engine Radiated Heat	4 kW	249	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	739 mm	29.1	in
Length to rear face of flywheel housing (SAE #3)	877 mm	34.5	in
Length maximum	1020 mm	40.2	in
Width maximum	808 mm	31.8	in
Height, crank centerline to top	625 mm	24.6	in
Height, crank centerline to bottom	287 mm	11.3	in
Weight, with oil, no coolant (includes engine, flywheel housing, flywheel, and electronics)	507 kg	1117	lb
Center of Gravity Location, X-axis From Rear Face of Block	250 mm	9.84	in
Center of Gravity Location, Y-axis Right of Crankshaft	-3.7 mm	-0.1	in
Center of Gravity Location, Z-axis Above Crankshaft	200 mm	7.87	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)	625	amps
Min. Recommended Battery Capacity, 24V @32 °F (0 °C)	500	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

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## Engine Installation Criteria

### Fuel System

ECU Description	L16	
Fuel Injection Pump	HPCR	
Governor Type	Electronic	
Volumetric Fuel Consumption, Prime	17.4 L/hr	4.6 gal/hr
Mass Fuel Consumption, Prime	14.8 kg/hr	33 lb/hr
Total Fuel Volumetric Flow	71 L/hr	18.8 gal/hr
Total Fuel Mass Flow	60.5 kg/hr	133 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	4.5 mm	0.2 in
Min. Recommended Fuel Line Size	3 (-) AN	
Primary Fuel Filter	10 mic	
Secondary Fuel Filter	2 mic	

### Lubrication System

Oil Pressure at 1500 RPM**	290 kPa	42 psi
Max. Crankcase Pressure	2 kPa	8 in.H <sub>2</sub> O
Maximum Installed Angle, Front Down	0 deg	
Maximum Installed Angle, Front Up	12 deg	
Engine Angularity Limits Any Direction, Continuous***	30 deg	
Engine Angularity Limits Any Direction, Intermittent***	45 deg	

### Seawater Pump System

Seawater Pump Flow	75 L/min	20 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 1954 option

### Air Intake System

Engine Air Flow	4.5 m <sup>3</sup> /min	160 ft <sup>3</sup> /min
Intake Manifold Pressure	74 kPa	10.7 psi
Manifold Air Temperature	103 °C	217 °F
Maximum Manifold Air Temperature	185 °C	365 °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.H <sub>2</sub> O
Max. Air Intake Restriction, Dirty Air Cleaner	6.25 kPa	25 in.H <sub>2</sub> O
Min. Ventilation Area	0.0278 m <sup>2</sup>	43 in <sup>2</sup>

### Performance Data

Prime Power	61 kW	81 hp
10% Overload Power	67 kW	90 hp
Rated Speed	1500 RPM	
Low Idle Speed	1500 RPM	
Prime Torque	387 Nm	285 lb-ft
BMEP, Prime	1080 kPa	157 psi
Rated Pferdestärke, Prime (metric hp)	83 ps	
Front Drive Capacity, Intermittent	542 Nm	400 lb-ft
Front Drive Capacity, Continuous	542 Nm	400 lb-ft
Friction Power @ Rated Speed	9.3 kW	12.462 hp

### Exhaust System

Exhaust Flow	11.2 m <sup>3</sup> /min	397 ft <sup>3</sup> /min
Exhaust Flow @ gas STP	4.7 m <sup>3</sup> /min	166 ft <sup>3</sup> /min
Exhaust Temperature	495 °C	922.24 °F
Max. Allowable Exhaust Restriction	7.5 kPa	30 in.H <sub>2</sub> O
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	63.5 mm	2.5 in
Min. Exhaust Pipe Diameter, Wet	76.2 mm	3.0 in

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## Engine Installation Criteria

### Engine Performance Data Table

Engine Power	Crank Power		Crank Torque		Fuel Consumption		BSFC
	kW	hp	Nm	lb-ft	L/hr	gal/hr	g/kW-hr
<b>10%</b>	6	8	39	28	3.1	0.8	436
<b>20%</b>	12	16	78	57	4.5	1.2	312
<b>30%</b>	18	24	116	85	5.9	1.6	278
<b>40%</b>	24	33	155	114	7.5	2.0	261
<b>50%</b>	30	41	194	143	9.2	2.4	256
<b>60%</b>	37	49	233	172	11.0	2.9	255
<b>70%</b>	42	57	271	200	12.6	3.3	252
<b>80%</b>	49	65	310	228	14.6	3.9	256
<b>90%</b>	55	73	349	257	16.5	4.4	256
<b>100%</b>	61	82	387	286	17.4	4.6	244
<b>110%</b>	67	90	426	314	19.3	5.1	246

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