



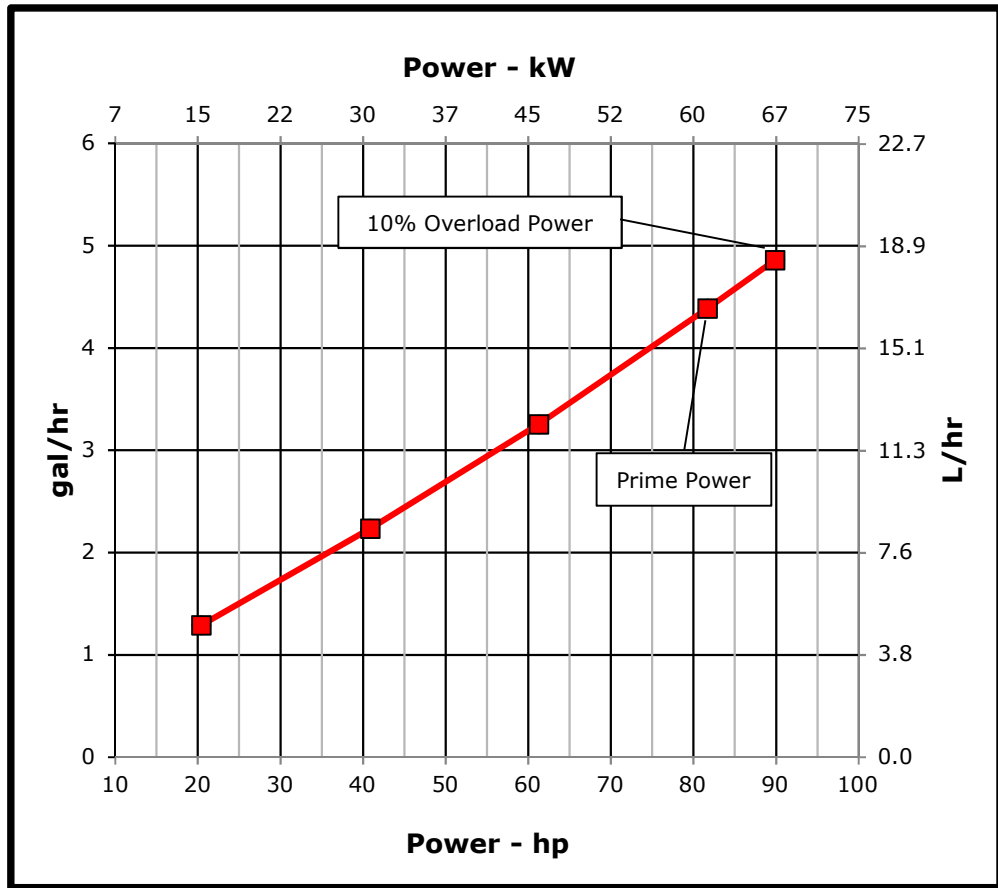
JOHN DEERE

**ENGINE PERFORMANCE CURVE**

Rating: **50 Hz - 82hp (61kW) @ 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  
 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:**

**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:

- IMO Exempt (<130 kW)
- China Stage 2 Constant Speed Auxiliary (GB15097-2016)

Certified by:

*Scott A. Ochsner*

Ref: Engine Emission Label

29-Jun-20

Performance Curve: 4045TFM85\_B

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**	70 kW	3984 BTU/min	
Max. Pressure Drop Across Keel Cooler	40 kPa	6 psi	
Coolant Flow	82.9 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	
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	67 BTU/min	
Engine Radiated Heat	4 kW	237 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	9.83 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	7.86 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	ohms
Max. Allowable Start Circuit Resistance, 24V	0	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	16.6 L/hr	4.4 gal/hr	
Mass Fuel Consumption, Prime	14.1 kg/hr	31 lb/hr	
Total Fuel Volumetric Flow	71 L/hr	18.8 gal/hr	
Total Fuel Mass Flow	62.9 kg/hr	139 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	4.63 mm	0.18 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.H2O	
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	76 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	4.2 m <sup>3</sup> /min	148 ft <sup>3</sup> /min	
Intake Manifold Pressure	67 kPa	9.7 psi	
Manifold Air Temperature	95 °C	203 °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.H2O	
Max. Air Intake Restriction, Dirty Air Cleaner	6.25 kPa	25 in.H2O	
Min. Ventilation Area	0.026 m <sup>2</sup>	40 in <sup>2</sup>	

### Performance Data

Prime Power	61 kW	82 hp	
10% Overload Power	67 kW	90 hp	
Rated Speed	1500	RPM	
Low Idle Speed	1000	RPM	
Prime Torque	388 Nm	286 lb-ft	
BMEP, Prime	1083 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	13 Hp	

### Exhaust System

Exhaust Flow	10.51 m <sup>3</sup> /min	371 ft <sup>3</sup> /min	
Exhaust Flow @ gas STP	4.47 m <sup>3</sup> /min	158 ft <sup>3</sup> /min	
Exhaust Temperature	482 °C	899.6 °F	
Max. Allowable Exhaust Restriction	7.5 kPa	30 in.H2O	
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	
<b>25%</b>	15	20	81	60	4.9	1.3	273
<b>50%</b>	30	41	162	119	8.5	2.2	236
<b>75%</b>	46	61	242	179	12.3	3.3	229
<b>100%</b>	61	82	323	238	16.6	4.4	232
<b>110%</b>	67	90	355	262	18.4	4.9	233

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