

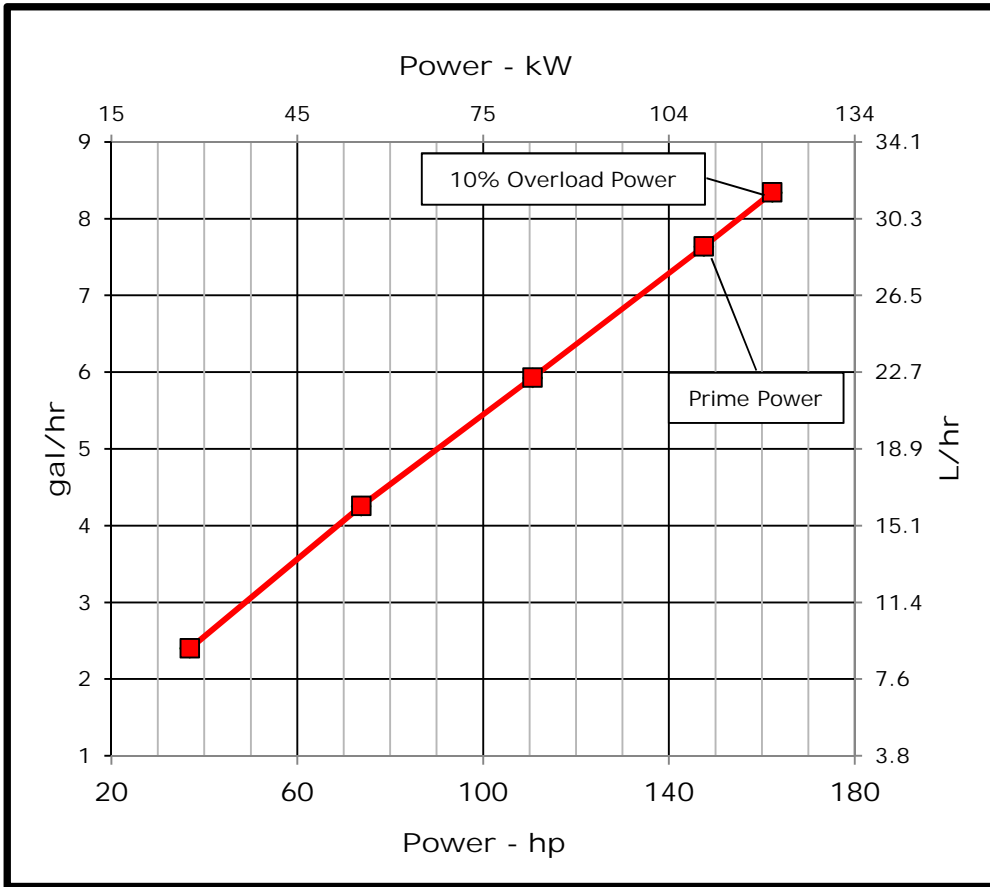


**ENGINE PERFORMANCE CURVE**

Rating: 60 Hz - 148hp (110kW) @ 1800 RPM  
 Application: Marine

PowerTech™ 4.5L Engine  
 Model: 4045AFM85

Generator Efficiency (%)	Power Factor	Calculated Gen-Set Rating		Prime Power	10% Overload Power
		kW	kVA	hp (kW)	hp (kW)
88-92	0.8	97-101	121-126	148 (110)	162 (121)



**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 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:*

**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.  
 The marine generator rating is restricted to generator applications only. The criteria used to establish marine generator application ratings are the same used to establish industrial prime power generator application ratings

Designed/Calibrated to meet:

- EPA Commercial Marine Tier 3
- IMO MARPOL Annex VI Compliant

Certified by:

*Adam Paulk*

Ref: Engine Emission Label

Performance Curve: 4045AFM85\_E

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

# Engine Installation Criteria

## General Data

Model	4045AFM85		
Number of Cylinders	4		
Bore	107 mm	4.21 in	
Stroke	127 mm	5.00 in	
Displacement	4.48 L	273 in <sup>3</sup>	
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	Engine coolant		
Engine Crankcase Vent System	Closed		

## Cooling System\*

Engine Coolant Heat Rejection**	123 kW	7001 BTU/min
Max. Pressure Drop Across Keel Cooler	40 kPa	6 psi
Coolant Flow	155 L/min	40.9 gal/min
Seawater Flow (heat exchanged)	197 L/min	52 gal/min
Thermostat Start to Open	71 °C	160 °F
Thermostat Fully Open	83 °C	182 °F
Engine Coolant Capacity, HE	17 L	4.4 gal
Engine Coolant Capacity, KC	20 L	5.2 gal
Min. Coolant Fill Rate	12 L/min	3.2 gal/min
Min. Pressure Cap	110.3 kPa	16 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	9 kW	519 BTU/min
Engine Radiated Heat	15 kW	826 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	752 mm	29.6 in
Length maximum	1105 mm	43.5 in
Width maximum	770 mm	30.3 in
Height, crank centerline to top	654 mm	25.7 in
Height, crank centerline to bottom	310 mm	12.2 in
Weight, with oil, no coolant (includes engine, flywheel housing, flywheel, and electronics)	578 kg	1274 lb
Center of Gravity Location, X-axis From Rear Face of Block	273 mm	10.8 in
Center of Gravity Location, Y-axis Right of Crankshaft	4.78 mm	0.2 in
Center of Gravity Location, Z-axis Above Crankshaft	227 mm	8.95 in
Max. Allowable Static Bending Moment At Rear Face of Flywheel Housing with 5-G Load	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
Recommended Starter Cable, 12V 100"	#0
Recommended Starter Cable, 24V 100"	#4
Recommended Starter Cable, 12V 200"	#000 or #2
Recommended Starter Cable, 24V 200"	#2
Electrical Component Maximum Temperature Limit	125 °C 257 °F

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# Engine Installation Criteria

## Fuel System

ECU Description	L14		
Fuel Injection Pump	HPCR		
Governor Type	Electronic		
Volumetric Fuel Consumption, Prime	28.9 L/hr	7.6 gal/hr	
Mass Fuel Consumption, Prime	24.6 kg/hr	54 lb/hr	
Total Fuel Volumetric Flow	152 L/hr	40.0 gal/hr	
Total Fuel Mass Flow	129 kg/hr	284 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	
Max. Fuel Height Above Transfer Pump	2.4 m	7.9 ft	
Max. Leak-off Return Height	2.4 m	7.9 ft	
Max. Fuel Inlet Height Above Fuel Tank Supply	2.4 m	7.9 ft	
Normal Operation Fuel Temperature	40 °C	104 °F	
Max. Fuel Inlet Temperature	100 °C	212 °F	
Min. Recommended Fuel Line Inside Diameter	6.63 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 1800 RPM**	378 kPa	55 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***	35 deg		
Engine Angularity Limits Any Direction, Intermittent***	45 deg		

\* With clean filters

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

\*\*\* With 19CZ option

## Air Intake System

Engine Air Flow	8.5 m <sup>3</sup> /min	301 ft <sup>3</sup> /min
Intake Manifold Pressure	164 kPa	23.7 psi
Manifold Air Temperature	81 °C	178 °F
Maximum Manifold Air Temperature	130 °C	266 °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 <sub>2</sub> O
Max. Air Intake Restriction, Dirty Air Cleaner	6.25 kPa	25 in.H <sub>2</sub> O
Min. Ventilation Area	0.053 m <sup>2</sup>	81 in <sup>2</sup>

## Performance Data

Prime Power	110 kW	148 hp
10% Overload Power	121 kW	162 hp
Rated Speed	1800 RPM	
Low Idle Speed	1800 RPM	
Prime Torque	584 Nm	430 lb-ft
BMEP, Prime	1637 kPa	237 psi
Rated Pferdestärke, Prime (metric hp)	150 ps	
Front Drive Capacity, Intermittent	621 Nm	458 lb-ft
Front Drive Capacity, Continuous	621 Nm	458 lb-ft
Software and Label Convertible to 50 Hz?	YES	

## Exhaust System

Exhaust Flow	19.4 m <sup>3</sup> /min	685 ft <sup>3</sup> /min
Exhaust Flow @ gas STP	8.81 m <sup>3</sup> /min	311 ft <sup>3</sup> /min
Exhaust Temperature	434 °C	813.2 °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	101.6 mm	4.0 in
Min. Exhaust Pipe Diameter, Wet	114.3 mm	4.5 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	
25%	27.5	36.9	145.9	107.6	9.1	2.4	280.7
50%	55.0	73.8	291.8	215.2	16.1	4.3	248.8
75%	82.5	110.6	437.7	322.8	22.4	5.9	231.1
100%	110.0	147.5	583.6	430.4	28.9	7.6	223.3
110%	121.0	162.3	642.0	473.5	31.6	8.3	221.8

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