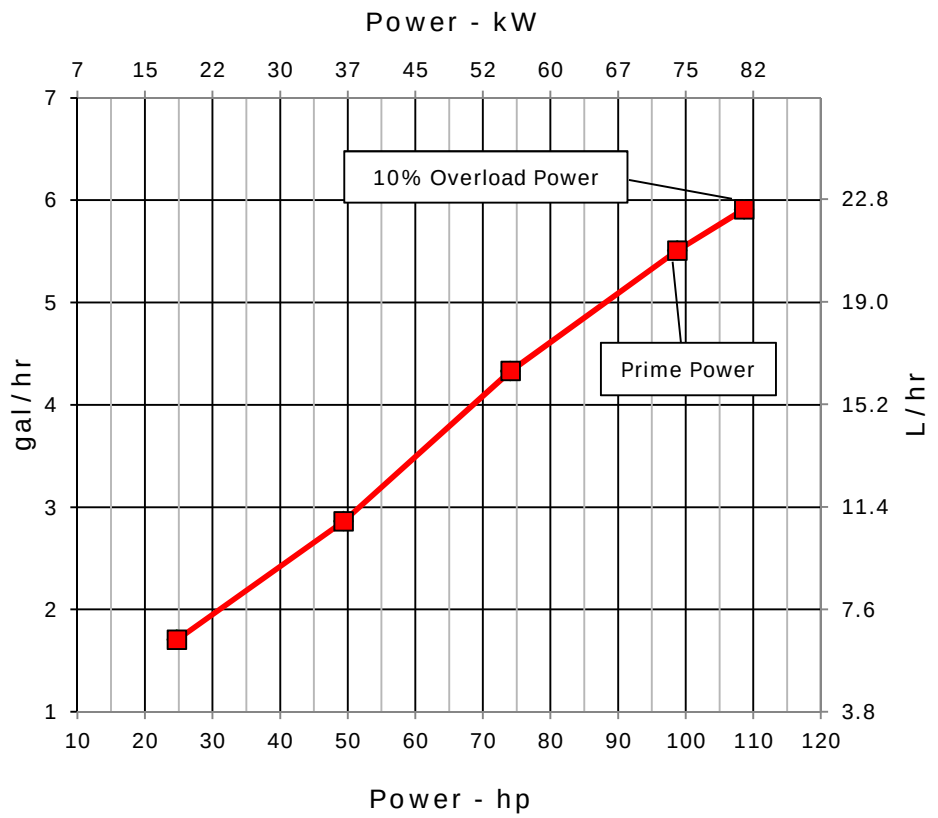
ENGINE PERFORMANCE CURVE

Rating: 60 Hz - 99hp (74kW) @ 1800 RPM
Application: Marine

PowerTech™ 4.5L Engine
Model: 4045TFM85

Generator Efficiency (%)	Power Factor	Calculated Gen-Set Rating kW	Calculated Gen-Set Rating kVA	Prime Power hp (kW)	10% Overload Power hp (kW)
88-92	0.8	65-68	81-85	99 (74)	109 (81)



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 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:	Certified by:
• EPA Commercial Marine Tier 3 • IMO MARPOL Annex VI Compliant Ref: Engine Emission Label	Adam Powell

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^3
Compression Ratio	16:1			
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			
Aftercooling System	None			
Engine Crankcase Vent System	None, Offered as Accessory			

Cooling System*

Engine Coolant Heat Rejection**	80	kW	4548	BTU/min
Max. Pressure Drop Across Keel Cooler	40	kPa	6	psi
Coolant Flow	117	L/min	30.9	gal/min
Seawater Flow (heat exchanged)	91	L/min	78	gal/min
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	4	kW	225	BTU/min
Engine Radiated Heat	10	kW	596	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	732	mm	28.8	in
Length maximum	1007	mm	39.6	in
Width maximum	715	mm	28.1	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 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)	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
Recommended Starter Cable, 12V 100"	#0	
Recommended Starter Cable, 24V 100"	#4	
Recommended Starter Cable, 12V 200"	#000 or 2#00	
Recommended Starter Cable, 24V 200"	#2	
Electrical Component Maximum Temperature Limit	125 °C	257 °F

Performance Curve: 4045TFM85_B

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Engine Installation Criteria

Fuel System

ECU Description			L16	
Fuel Injection Pump			HPCR	
Governor Type			Electronic	
Volumetric Fuel Consumption, Prime	20.8	L/hr	5.5	gal/hr
Mass Fuel Consumption, Prime	17.7	kg/hr	39	lb/hr
Total Fuel Volumetric Flow	74	L/hr	19.5	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
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	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 1800 RPM**	290	kPa	42	psi
Max. Crankcase Pressure	2	kPa	8	in.H_2O
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	90	L/min	24	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	6.1	m^3/min	215	ft^3/min
Intake Manifold Pressure	116	kPa	16.9	psi
Manifold Air Temperature	132	°C	270	°F
Maximum Manifold Air Temperature	157	°C	314.6	°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	0.038	m^2	58	in^2

Performance Data

Prime Power	74	kW	99	hp
10% Overload Power	81	kW	109	hp
Rated Speed		1800	RPM	
Low Idle Speed		1800	RPM	
Prime Torque	391	Nm	288	lb-ft
BMEP, Prime	1091	kPa	158	psi
Rated Pferdestärke, Prime (metric hp)		100	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	14.74	m^3/min	521	ft^3/min
Exhaust Flow @ gas STP	6.52	m^3/min	230	ft^3/min
Exhaust Temperature	452	°C	845.6	°F
Max. Allowable Exhaust Restriction	7.5	kPa	30	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	63.5	mm	2.5	in
Min. Exhaust Pipe Diameter, Wet	76.2	mm	3.0	in

Performance Curve: 4045TFM85_B

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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
25%	18	25	98	72	6.5	1.7	298
50%	37	49	195	144	10.8	2.9	250
75%	55	74	293	216	16.4	4.3	252
100%	74	99	391	288	20.8	5.5	241
110%	81	109	430	317	22.4	5.9	235

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