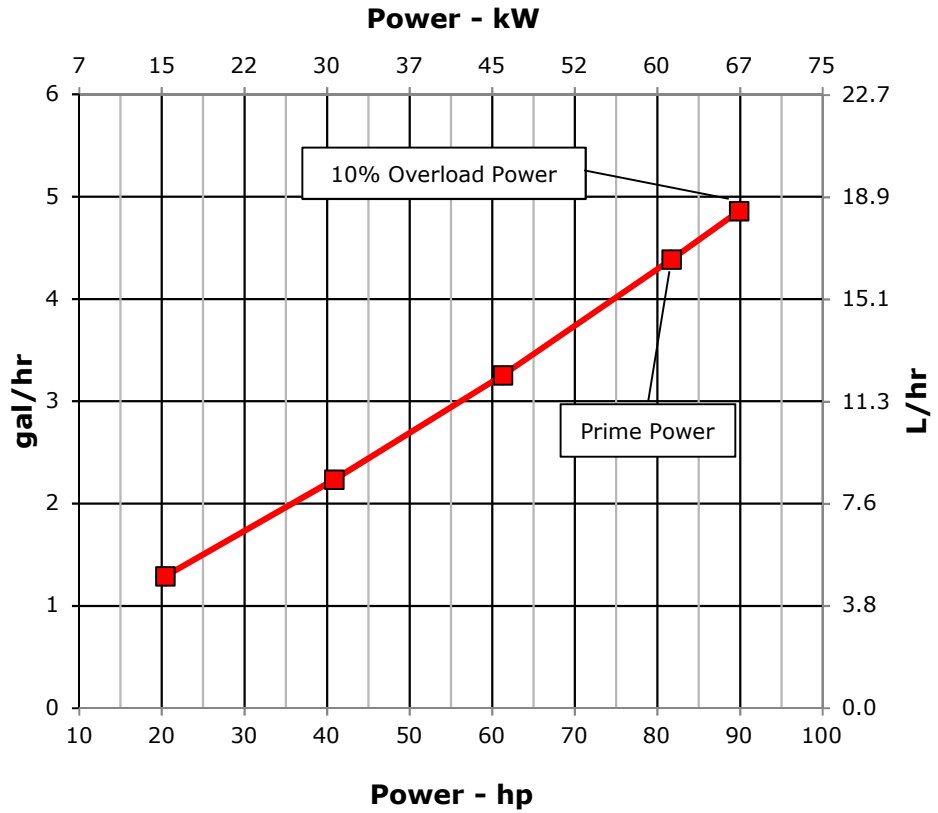
ENGINE PERFORMANCE CURVE

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_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 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 proppeller, hybrid porpulsion 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:	Certified by:
• IMO Exempt (<130 kW) · China Stage 2 Constant Speed Auxiliary (GB15097-2016)	Scott D. 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^3
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

Performance Curve: 4045TFM85_B

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

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.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	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^3/min	148	ft^3/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 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	0.026	m^2	40	in^2

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^3/min	371	ft^3/min
Exhaust Flow @ gas STP	4.47	m^3/min	158	ft^3/min
Exhaust Temperature	482	°C	899.6	°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

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

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%	15	20	81	60	4.9	1.3	273
50%	30	41	162	119	8.5	2.2	236
75%	46	61	242	179	12.3	3.3	229
100%	61	82	323	238	16.6	4.4	232
110%	67	90	355	262	18.4	4.9	233

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