

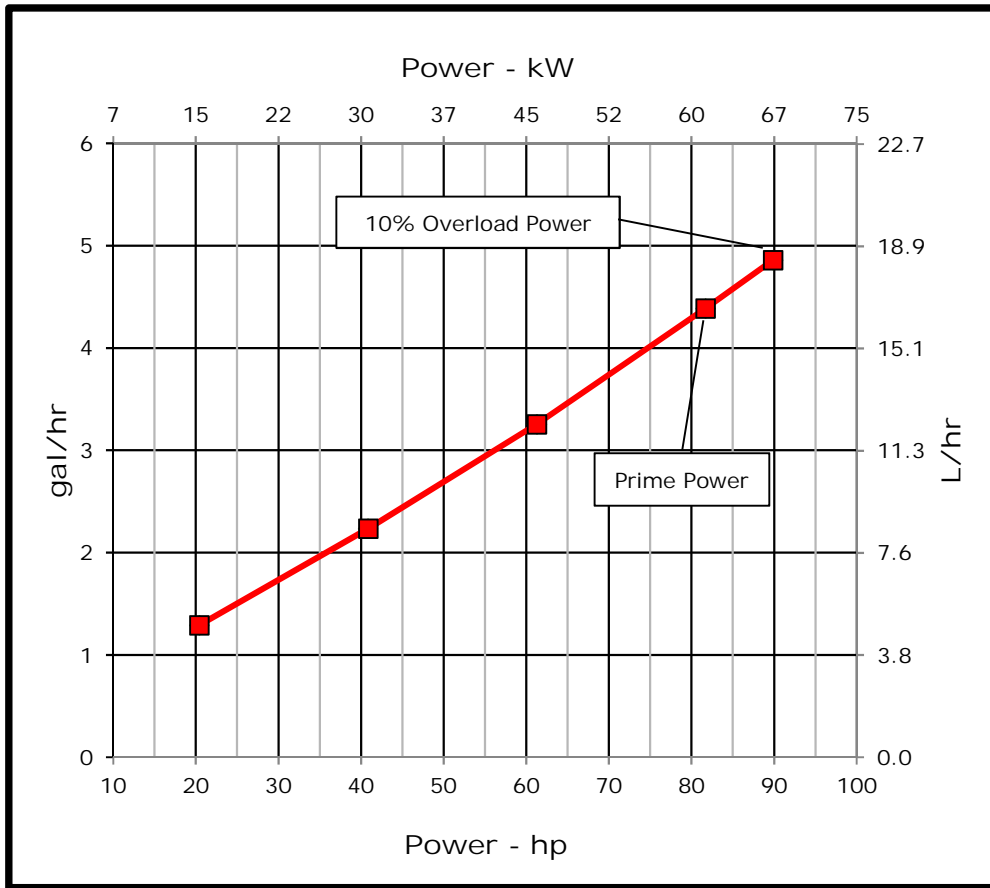


ENGINE PERFORMANCE CURVE

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.H₂O (3 kPa)
 Exhaust Back Pressure..... 30 in.H₂O (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)

Certified by:

Ref: Engine Emission Label

29-Oct-18

Performance Curve: 4045TFM85_A

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 | 8 kW | 474 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_A

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 ₂ 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 | 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 ₂ O | |
| Max. Air Intake Restriction, Dirty Air Cleaner | 6.25 kPa | 25 in.H ₂ O | |
| 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 | 1500 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 | |
| Software and Label Convertible to 60 Hz? | YES | | |
| Friction Power @ Rated Speed | 9.3 kW | 12.5 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 ₂ 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 | |
| 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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