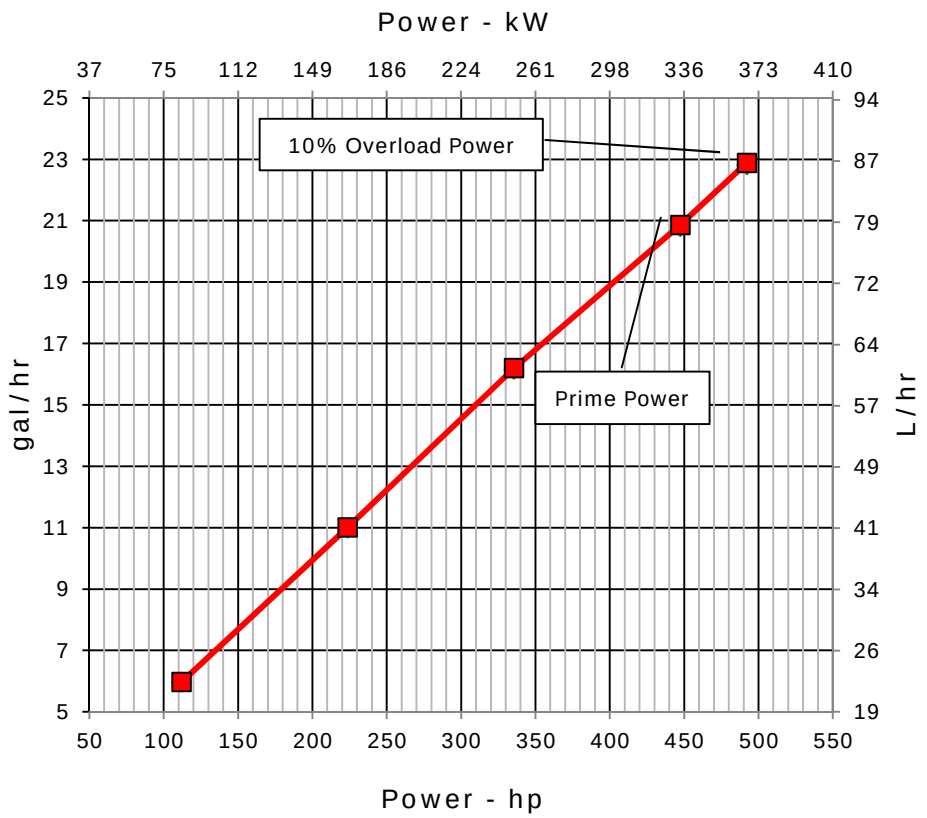
# ENGINE PERFORMANCE CURVE

Rating: 50 Hz - 447hp (334kW) @ 1500 RPM
Application: Marine

PowerTech™ 13.5L Engine
Model: 6135SFM85

| 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 | 294-307 | 367-384 | 447 (334) | 492 (367) |




## 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:*

Constant Speed Auxiliary – 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 percent overload capability, and conforms to ISO 8528 prime power. Average load over a 24-hour period shall not exceed 67 percent of the prime rating, of which no more than two hours are between 100 percent and 110 percent of the prime rating.

*Possible applications: This rating is use 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 MARPOL Annex VI Compliant | Adam Paull |
| Ref: Engine Emission Label | 12-Mar-14 |

Performance Curve: 6135SFM85_G

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

# Engine Installation Criteria

## General Data

| | | | | |
|---|---|---|---|---|
| Model | 6135SFM85 | | | |
| Number of Cylinders | 6 | | | |
| Bore | 132 | mm | 5.20 | in |
| Stroke | 165 | mm | 6.50 | in |
| Displacement | 13.5 | L | 824 | $in^3$ |
| Compression Ratio | 16.0:1 | | | |
| Valves per Cylinder, Intake/Exhaust | 2/2 | | | |
| Combustion System | Direct injection | | | |
| Firing Order | 1-5-3-6-2-4 | | | |
| Engine Type | In line, 4 Cycle | | | |
| Aspiration | Turbocharged and Aftercooled | | | |
| Aftercooling System | Seawater cooled | | | |
| Engine Crankcase Vent System | Closed | | | |

## Cooling System*

| | | | | |
|---|---|---|---|---|
| Total Engine to Seawater Heat Rejection** | 209 | kW | 11896 | BTU/min |
| Aftercooler Heat Rejection | 75 | kW | 4269 | BTU/min |
| Coolant Flow | 220 | L/min | 58 | gal/min |
| Thermostat Start to Open | 82 | °C | 180 | °F |
| Thermostat Fully Open | 92 | °C | 197 | °F |
| Min. Coolant Fill Rate | 12 | L/min | 3.2 | gal/min |
| Min. Pressure Cap | 110.3 | kPa | 16 | 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 | 100-105 | °C | 212-230 | °F |
| Absolute Max Top Tank Temperature | 105 | °C | 221 | °F |
| Recommended Fuel Cooler | 14 | kW | 810 | BTU/min |
| Engine Radiated Heat | 40 | kW | 2249 | BTU/min |

## Physical Data

| | | | | |
|---|---|---|---|---|
| Length to rear face of block | 1337 | mm | 52.6 | in |
| Length maximum | 1725 | mm | 67.9 | in |
| Width maximum | 975 | mm | 38.4 | in |
| Height, crank centerline to top | 780 | mm | 30.7 | in |
| Height, crank centerline to bottom | 363 | mm | 14.3 | in |
| Weight, with oil, no coolant (includes engine, flywheel housing, flywheel, and electronics) | 1426 | kg | 3143 | lb |
| Center of Gravity Location, X-axis From Rear Face of Block | 476 | mm | 18.7 | in |
| Center of Gravity Location, Y-axis Right of Crankshaft | -9 | mm | -0.4 | in |
| Center of Gravity Location, Z-axis Above Crankshaft | 250 | mm | 9.84 | 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 | 5.4 | kN | 1214 | lbf |
| Thrust Bearing Load Limit, Forward Intermittent | 8.1 | kN | 1821 | lbf |
| Thrust Bearing Load Limit, Rearward Continuous | 2.5 | kN | 562 | lbf |
| Thrust Bearing Load Limit, Rearward Intermittent | 4 | kN | 899 | lbf |

## Electrical System

| | | |
|---|---|---|
| Min. Recommended Battery Capacity, 12V @32 °F (0 °C) | 1900 | amps |
| Min. Recommended Battery Capacity, 24V @32 °F (0 °C) | 925 | 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" | #000 | |
| Recommended Starter Cable, 24V 100" | #1 | |
| Recommended Starter Cable, 12V 200" | 2#000 | |
| Recommended Starter Cable, 24V 200" | #000 | |
| Electrical Component Maximum Temperature Limit | 125 °C | 257 °F |

* 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

Performance Curve: 6135SFM85_G

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

# Engine Installation Criteria

## Fuel System

| | | | | |
|---|---|---|---|---|
| ECU Description | | | L15 | |
| Fuel Injection Pump | | | EUI | |
| Governor Type | | | Electronic | |
| Volumetric Fuel Consumption, Prime | 78.7 | L/hr | 20.8 | gal/hr |
| Mass Fuel Consumption, Prime | 66.9 | kg/hr | 148 | lb/hr |
| Total Fuel Volumetric Flow | 270 | L/hr | 71.3 | gal/hr |
| Total Fuel Mass Flow | 230 | kg/hr | 506 | 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 | 8.85 | mm | 0.35 | in |
| Min. Recommended Fuel Line Size | | | 6 | (-) AN |
| Primary Fuel Filter | | | 10 | mic |
| Secondary Fuel Filter | | | 2 | mic |

## Lubrication System

| | | | | |
|---|---|---|---|---|
| Oil Pressure at 1500 RPM** | 250 | kPa | 41 | 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*** | | | 20 | deg |
| Engine Angularity Limits Any Direction, Intermittent*** | | | 30 | deg |

## Seawater Pump System

| | | | | |
|---|---|---|---|---|
| Seawater Pump Flow | 339 | L/min | 90 | 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 1932 option

## Air Intake System

| | | | | |
|---|---|---|---|---|
| Engine Air Flow | 28.1 | $m^3$/min | 992 | $ft^3$/min |
| Intake Manifold Pressure | 205 | kPa | 29.7 | psi |
| Manifold Air Temperature | 51 | °C | 124 | °F |
| Maximum Manifold Air Temperature | 87 | °C | 189 | °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 | 0.173 | $m^2$ | 268 | $in^2$ |

## Performance Data

| | | | | |
|---|---|---|---|---|
| Prime Power | 334 | kW | 447 | hp |
| 10% Overload Power | 367 | kW | 492 | hp |
| Rated Speed | | 1500 | RPM | |
| Low Idle Speed | | 1000 | RPM | |
| Prime Torque | 2124 | Nm | 1567 | lb-ft |
| BMEP, Prime | 1977 | kPa | 287 | psi |
| Rated Pferdestärke, Prime (metric hp) | | 454 | ps | |
| Front Drive Capacity, Intermittent | 542 | Nm | 400 | lb-ft |
| Front Drive Capacity, Continuous | 542 | Nm | 400 | lb-ft |
| Software and Label Convertible to 50 Hz? | | YES | | |

## Exhaust System

| | | | | |
|---|---|---|---|---|
| Exhaust Flow | 64 | $m^3$/min | 2260 | $ft^3$/min |
| Exhaust Flow @ gas STP | 26.9 | $m^3$/min | 950 | $ft^3$/min |
| Exhaust Temperature | 440 | °C | 824 | °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 | 127.0 | mm | 5.0 | in |
| Min. Exhaust Pipe Diameter, Wet | 139.7 | mm | 139.7 | in |

Performance Curve: 6135SFM85_G

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% | 83 | 112 | 531 | 392 | 22.6 | 6.0 | 230 |
| 50% | 167 | 224 | 1062 | 783 | 41.6 | 11.0 | 212 |
| 75% | 250 | 336 | 1593 | 1175 | 61.1 | 16.1 | 208 |
| 100% | 334 | 447 | 2124 | 1566 | 78.7 | 20.8 | 201 |
| 110% | 367 | 492 | 2336 | 1723 | 86.4 | 22.8 | 200 |

Performance Curve: 6135SFM85_G

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