



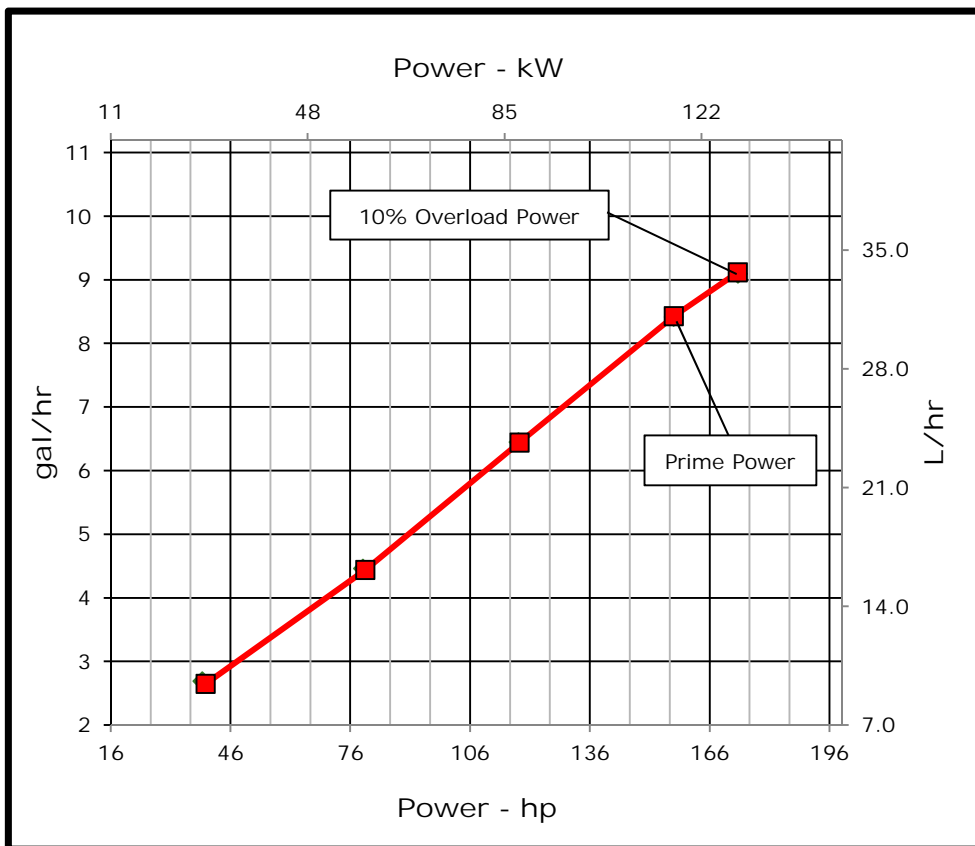
# ENGINE PERFORMANCE CURVE

Rating: 50 Hz - 157hp (117kW) @ 1500 RPM  
 Application: Marine

PowerTech™ 6.8L Engine

Model: 6068AFM85

| Generator Efficiency (%) | Power Factor | Calculated Gen-Set Rating |         | Prime Power | 10% Overload Power |
|--------------------------|--------------|---------------------------|---------|-------------|--------------------|
|                          |              | kWe                       | kVA     | hp (kW)     | hp (kW)            |
| 88-92                    | 0.8          | 103-108                   | 129-135 | 157(117)    | 173(129)           |



### 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.

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 MARPOL Annex VI Exempt (<130 kW)

Certified by:

Ref: Engine Emission Label

4-Oct-16

Performance Curve: 6068AFM85\_G

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

# Engine Installation Criteria

## General Data

|                                     |                              |      |                 |  |
|-------------------------------------|------------------------------|------|-----------------|--|
| Model                               | 6068AFM85                    |      |                 |  |
| Number of Cylinders                 | 6                            |      |                 |  |
| Bore                                | 107 mm                       | 4.21 | in              |  |
| Stroke                              | 127 mm                       | 5.00 | in              |  |
| Displacement                        | 6.8 L                        | 415  | in <sup>3</sup> |  |
| Compression Ratio                   | 16.7:1                       |      |                 |  |
| 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                 | Engine Coolant               |      |                 |  |
| Engine Crankcase Vent System        | Closed                       |      |                 |  |

## Cooling System\*

|   |            |         |         |  |
|---|------------|---------|---------|--|
| Engine Coolant Heat Rejection**           | 128 kW     | 7273    | BTU/min |  |
| Max. Pressure Drop Across KC and Piping   | 40 kPa     | 6       | psi     |  |
| Coolant Flow                              | 158 L/min  | 41.7    | gal/min |  |
| Min. Coolant Pump Inlet Pressure          | 30.3 kPa   | 4.4     | psi     |  |
| Thermostat Start to Open                  | 71 °C      | 160     | °F      |  |
| Thermostat Fully Open                     | 83 °C      | 182     | °F      |  |
| Engine Coolant Capacity, HE               | 34 L       | 9.0     | gal     |  |
| Engine Coolant Capacity, KC               | 33.5 L     | 8.8     | gal     |  |
| 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          | 100-110 °C | 212-230 | °F      |  |
| Tank Temperature                          |            |         |         |  |
| Absolute Max Top Tank Temperature         | 110 °C     | 230     | °F      |  |
| Recommended Fuel Cooler                   | 3 kW       | 154     | BTU/min |  |
| Engine Radiated Heat                      | 16 kW      | 889     | 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  | 1034 mm | 40.7 | in    |  |
| Length to rear face of flywheel housing (SAE #2)  | 1172 mm | 46.1 | in    |  |
| Length maximum  | 1374 mm | 54.1 | in    |  |
| Width maximum   | 862 mm  | 33.9 | in    |  |
| Height, crank centerline to top   | 711 mm  | 28   | in    |  |
| Height, crank centerline to bottom  | 291 mm  | 11.5 | in    |  |
| Weight, with oil, no coolant (includes engine, flywheel housing, flywheel, and electronics)         | 787 kg  | 1735 | lb    |  |
| Center of Gravity Location, X-axis From Rear Face of Block  | 390 mm  | 15.4 | in    |  |
| Center of Gravity Location, Y-axis Right of Crankshaft  | -14 mm  | -0.6 | in    |  |
| Center of Gravity Location, Z-axis Above Crankshaft   | 186 mm  | 7.32 | 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) | 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  |    |
| Electrical Component Maximum Temperature Limit       | 125 °C | 257   | °F |
| Maximum ECU Temperature                              | 105 °C | 221   | °F |

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

# Engine Installation Criteria

## Fuel System

|  |            |             |
|--|------------|-------------|
| ECU Description                            | L14        |             |
| Fuel Injection Pump                        | HPCR       |             |
| Governor Type                              | Electronic |             |
| Volumetric Fuel Consumption, Prime         | 31.1 L/hr  | 8.2 gal/hr  |
| Mass Fuel Consumption, Prime               | 26.4 kg/hr | 58 lb/hr    |
| Total Fuel Volumetric Flow                 | 162 L/hr   | 42.8 gal/hr |
| Total Fuel Mass Flow                       | 138 kg/hr  | 304 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 | 6.85 mm    | 0.27 in     |
| Min. Recommended Fuel Line Size            | 5 (-) AN   |             |
| Primary Fuel Filter                        | 10 mic     |             |
| Secondary Fuel Filter                      | 2 mic      |             |

## Lubrication System

|   |         |                       |
|---|---------|-----------------------|
| Oil Pressure at 1500 RPM**                              | 323 kPa | 47 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***   | 25 deg  |                       |
| Engine Angularity Limits Any Direction, Intermittent*** | 35 deg  |                       |

## Seawater Pump System

|                        |           |            |
|------------------------|-----------|------------|
| Seawater Pump Flow     | 162 L/min | 43 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 19BP option

## Air Intake System

|  |                         |                          |
|--|-------------------------|--------------------------|
| Engine Air Flow                                | 8.7 m <sup>3</sup> /min | 306 ft <sup>3</sup> /min |
| Intake Manifold Pressure                       | 120 kPa                 | 17.4 psi                 |
| Manifold Air Temperature                       | 72 °C                   | 162 °F                   |
| Maximum Manifold Air Temperature               | 130 °C                  | 266 °F                   |
| Max. Allowable Temperature Rise, Ambient       | 17 °C                   | 30 °F                    |
| Air to Engine Inlet                            |                         |                          |
| 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>    | 82 in <sup>2</sup>       |

## Performance Data

|  |          |           |
|--|----------|-----------|
| Prime Power                              | 117 kW   | 157 hp    |
| 10% Overload Power                       | 129 kW   | 173 hp    |
| Rated Speed                              | 1500     | RPM       |
| Low Idle Speed                           | 1000     | RPM       |
| Prime Torque                             | 747 Nm   | 551 lb-ft |
| BMEP, Prime                              | 1380 kPa | 200 psi   |
| Rated Pferdestärke, Prime (metric hp)    | 159      | ps        |
| Front Drive Capacity, Intermittent       | 907 Nm   | 669 lb-ft |
| Front Drive Capacity, Continuous         | 907 Nm   | 669 lb-ft |
| Software and Label Convertible to 60 Hz? | N/A      |           |
| Friction Power @ Rated Speed             | 12.8 kW  | 17.2 hp   |

## Exhaust System

|  |                          |                          |
|--|--------------------------|--------------------------|
| Exhaust Flow                                       | 19.5 m <sup>3</sup> /min | 687 ft <sup>3</sup> /min |
| Exhaust Flow @ gas STP                             | 9.0 m <sup>3</sup> /min  | 316 ft <sup>3</sup> /min |
| Exhaust Temperature                                | 426 °C                   | 799 °F                   |
| Max. Allowable Exhaust Restriction <sup>+</sup>    | 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                    | 127.0 mm                 | 5.0 in                   |

<sup>+</sup> Exhaust system restriction should be limited to 7.5 kPa. When an exhaust aftertreatment system is installed, the maximum design restriction is 15 kPa. Restriction over 7.5 kPa will result in diminished performance. Restriction over 15 kPa may cause engine damage

Performance Curve: 6068AFM85\_G

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

## 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 | g/kW-hr |
| 25%          | 29          | 39  | 186          | 137   | 9.4              | 2.5    | 276     |
| 50%          | 59          | 79  | 373          | 275   | 16.1             | 4.3    | 233     |
| 75%          | 88          | 118 | 559          | 412   | 23.7             | 6.2    | 229     |
| 100%         | 117         | 157 | 746          | 550   | 31.1             | 8.2    | 226     |
| 110%         | 129         | 173 | 820          | 605   | 33.7             | 8.9    | 222     |

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