

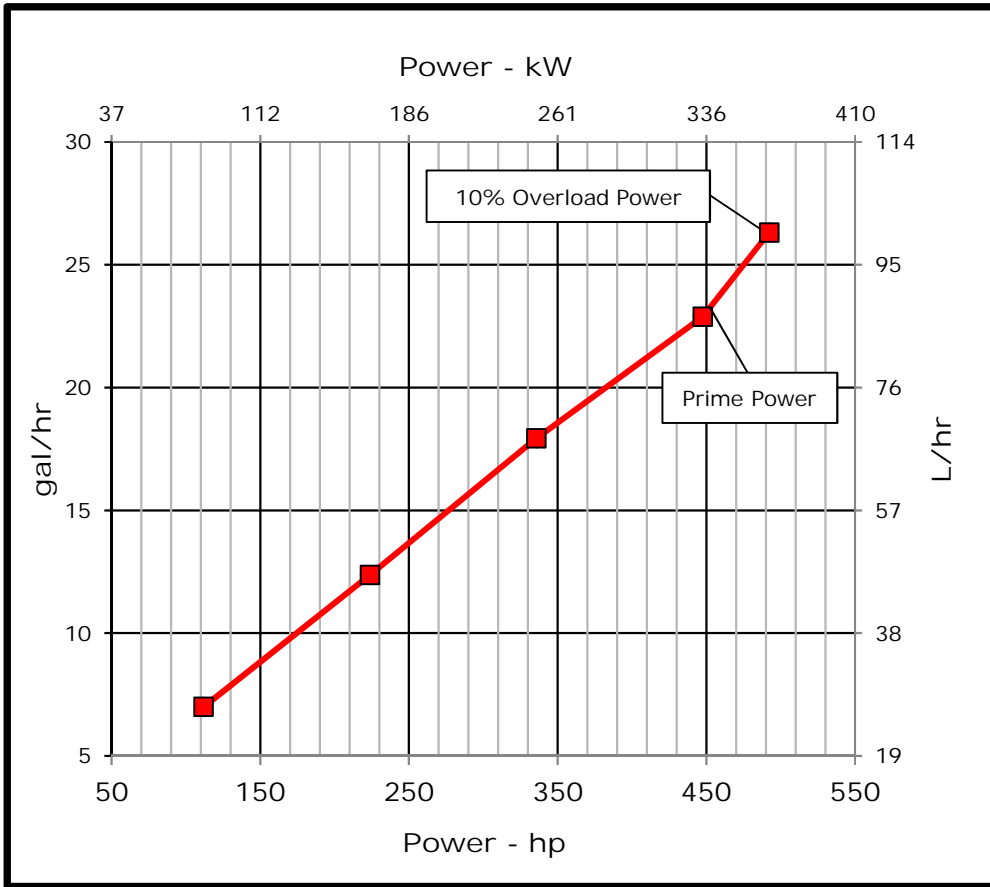


ENGINE PERFORMANCE CURVE

Rating: 60 Hz - 447hp (334kW) @ 1800 RPM
 Application: Marine

PowerTech™ 13.5L Engine
 Model: 6135AFM85

Generator Efficiency (%)	Power Factor	Calculated Gen-Set Rating		Prime Power	10% Overload Power
		kWe	kVA	hp (kW)	hp (kW)
88-92	0.8	294-307	367-384	447 (334)	492 (367)



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:

- EPA Marine Tier 3 Constant Speed Auxiliary (40 CFR 1042)
- IMO Tier II Compliant (MARPOL Annex VI)

Certified by:

Ref: Engine Emission Label

30-Oct-18

Performance Curve: 6135AFM85_E

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

Engine Installation Criteria

General Data

Model	6135AFM85		
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	Engine coolant		
Engine Crankcase Vent System	Closed		

Cooling System*

Engine Coolant Heat Rejection**	362 kW	20605 BTU/min	
Max. Pressure Drop Across Keel Cooler	40 kPa	6 psi	
Coolant Flow	320 L/min	85 gal/min	
Min. Coolant Pump Inlet Pressure	30.3 kPa	4.4 psi	
Thermostat Start to Open	72 °C	161 °F	
Thermostat Fully Open	82 °C	179 °F	
Engine Coolant Capacity, HE	44 L	11.6 gal	
Engine Coolant Capacity, KC	42 L	11.1 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 Tank Temperature	100-105 °C	212-230 °F	
Absolute Max Top Tank Temperature	105 °C	221 °F	
Recommended Fuel Cooler	1 kW	85 BTU/min	
Engine Radiated Heat	43 kW	2474 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	1316 mm	51.8 in
Length to rear face of flywheel housing (SAE #1)	1425 mm	56.1 in
Length maximum	1800 mm	70.9 in
Width maximum	1062 mm	41.8 in
Height, crank centerline to top	818 mm	32.2 in
Height, crank centerline to bottom	364 mm	14.3 in
Weight, with oil, no coolant (includes engine, flywheel housing, flywheel, and electronics)	1410 kg	3108 lb
Center of Gravity Location, X-axis From Rear Face of Block	516 mm	20.3 in
Center of Gravity Location, Y-axis Right of Crankshaft	5 mm	0.2 in
Center of Gravity Location, Z-axis Above Crankshaft	239 mm	9.41 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	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	0.0012 ohms
Max. Allowable Start Circuit Resistance, 24V	0.002 ohms
Electrical Component Maximum Temperature Limit	125 °C 257 °F
Maximum ECU Temperature	105 °C 221 °F

Performance Curve: 6135AFM85_E

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	Unit Injection		
Governor Type	Electronic		
Volumetric Fuel Consumption, Prime	86.6 L/hr	22.9 gal/hr	
Mass Fuel Consumption, Prime	73.6 kg/hr	162 lb/hr	
Total Fuel Volumetric Flow	159 L/hr	42.0 gal/hr	
Total Fuel Mass Flow	135 kg/hr	298 lb/hr	
Max. Fuel Inlet Restriction*	30 kPa	120 in.H2O	
Max. Fuel Inlet Pressure	24 kPa	96 in.H2O	
Max Fuel Return Pressure	35 kPa	141 in.H2O	
Normal Operation Fuel Temperature	40 °C	104 °F	
Max. Fuel Inlet Temperature	80 °C	176 °F	
Min. Recommended Fuel Line Inside Diameter	6.79 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 1800 RPM**	320 kPa	46 psi	
Max. Crankcase Pressure	2 kPa	8 in.H2O	
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	401 L/min	106 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 1904 option

Air Intake System

Engine Air Flow	34.8 m ³ /min	1229 ft ³ /min	
Intake Manifold Pressure	260 kPa	37.7 psi	
Manifold Air Temperature	98 °C	208 °F	
Maximum Manifold Air Temperature	130 °C	266 °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.H2O	
Max. Air Intake Restriction, Dirty Air Cleaner	6.25 kPa	25 in.H2O	
Min. Ventilation Area	0.214 m ²	332 in ²	

Performance Data

Prime Power	334 kW	447 hp	
10% Overload Power	367 kW	492 hp	
Rated Speed	1800 RPM		
Low Idle Speed	1000 RPM		
Prime Torque	1770 Nm	1305 lb-ft	
BMEP, Prime	1648 kPa	239 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		
Friction Power @ Rated Speed	41.5 kW	55.6 hp	

Exhaust System

Exhaust Flow	73 m ³ /min	2582 ft ³ /min	
Exhaust Flow @ gas STP	33 m ³ /min	1165 ft ³ /min	
Exhaust Temperature	387 °C	728.6 °F	
Max. Allowable Exhaust Restriction	7.5 kPa	30 in.H2O	
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	139.7 mm	5.5 in	
Min. Exhaust Pipe Diameter, Wet	152.4 mm	6.0 in	

Performance Curve: 6135AFM85_E

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	
25%	83	112	442	326	26.5	7.0	270
50%	167	224	885	653	46.8	12.4	238
75%	250	336	1327	979	67.8	17.9	230
100%	334	447	1770	1305	86.6	22.9	221
110%	367	492	1947	1436	99.6	26.3	231

Performance Curve: 6135AFM85_E

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