



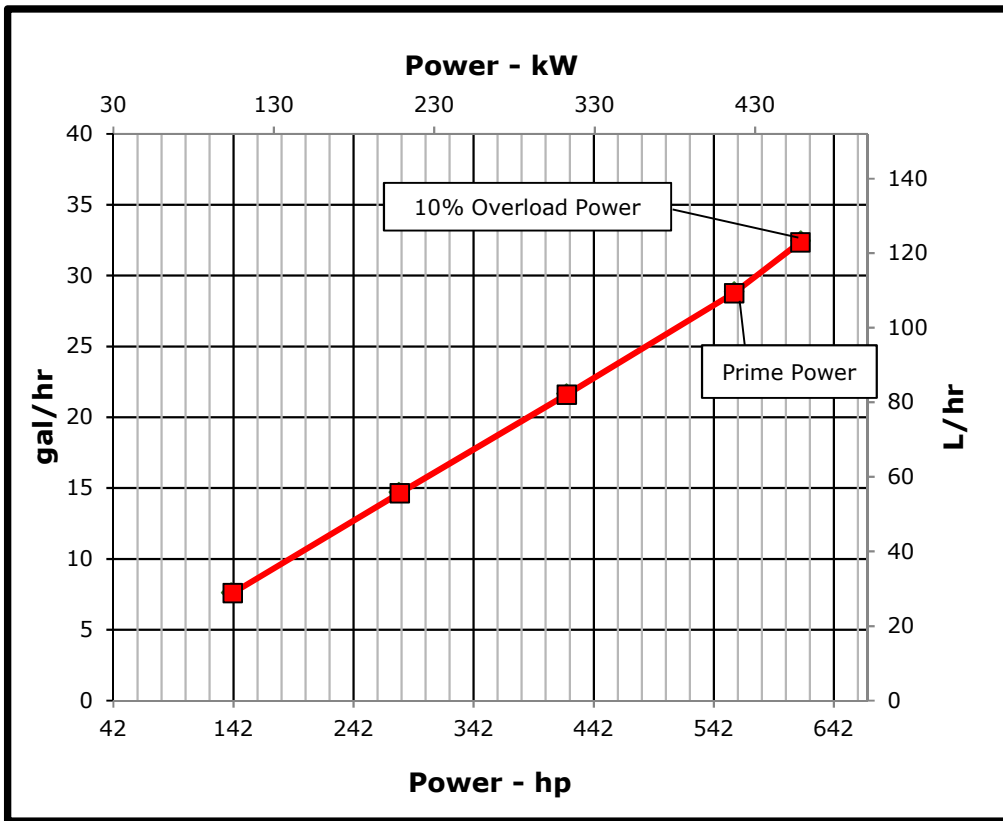
JOHN DEERE

ENGINE PERFORMANCE CURVE

Rating: **559 hp (417 kW) @ 1800 RPM**
 Application: **Marine - Constant Speed**

PowerTech™ 13.5L Engine
Model: 6135HFM85

Generator Efficiency (%)	Estimated Fan Power	Power Factor	Calculated Gen-Set Rating		Prime Power	10% Overload Power
	hp (kW)		kWe	kVA	hp (kW)	hp (kW)
88-92	43 (32)	0.8	346-354	433-495	559(417)	614(458)



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.

Notes:
Constant Speed Auxiliary: The Constant Speed Auxiliary 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:	Certified by:
<ul style="list-style-type: none"> EPA Marine Tier 3 Constant Speed Auxiliary (40 CFR 1042) IMO Tier II Compliant (MARPOL Annex VI) 	 12-Mar-18
Ref: Engine Emission Label	
Performance Curve: 6135HFM85_B	

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

Engine Installation Criteria

General Data

Model	6135HFM85		
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	Air-to-Air		
Engine Crankcase Vent System	Open/Closed (Option Based)		

Cooling System*

Engine Coolant Heat Rejection	293 kW	16683	BTU/min
Coolant Flow	454 L/min	120	gal/min
Min. Coolant Pump Inlet Pressure	30.3 kPa	4.4	psi
Thermostat Start to Open	82 °C	180	°F
Thermostat Fully Open	92 °C	198	°F
Engine Coolant Capacity	25 L	6.6	gal
Minimum Air-to-Boil Temperature	47 °C	117	°F
Min. Coolant Fill Rate	12 L/min	3.2	gal/min
Min. Pressure Cap	110 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	212-221	°F
Absolute Max Top Tank Temperature	110 °C	230	°F
Recommended Fuel Cooler	3 kW	192	BTU/min
Engine Radiated Heat	55 kW	3124	BTU/min

Physical Data

Length to rear face of block	1225 mm	48.2	in
Length to rear face of flywheel housing (SAE #1)	1358 mm	53.5	in
Length maximum	1709 mm	67.3	in
Width maximum	838 mm	33	in
Height, crank centerline to top	907 mm	35.7	in
Height, crank centerline to bottom	523 mm	20.6	in
Weight, with oil, no coolant (includes engine, flywheel housing, flywheel, and electronics)	1322 kg	2914	lb
Center of Gravity Location, X-axis From Rear Face of Block	507 mm	19.9	in
Center of Gravity Location, Y-axis Right of Crankshaft	15.8 mm	0.6	in
Center of Gravity Location, Z-axis Above Crankshaft	254 mm	10	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
Max. Continuous Damper Temperature	82 °C	180	°F

Electrical System

Min. Recommended Battery Capacity, 12V @32 °F (0 °C)	1100	amps
Min. Recommended Battery Capacity, 24V @32 °F (0 °C)	750	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

Performance Curve: 6135HFM85_B

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	109 L/hr	28.9 gal/hr	
Mass Fuel Consumption, Prime	93 kg/hr	205 lb/hr	
Total Fuel Volumetric Flow	273 L/hr	72.1 gal/hr	
Total Fuel Mass Flow	232 kg/hr	512 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	100 °C	212 °F	
Min. Recommended Fuel Line Inside Diameter	9 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 1800 RPM**	275 kPa	40 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		

Charge Air Cooling System

Air-to-Air Exchanger Heat Rejection	137 kW	7782 BTU/min	
Compressor Discharge Temp (Rated) @ 25°C Amb	244 °C	471 °F	
Maximum Pressure Drop thru CAC	13 kPa	52.2 in. H ₂ O	
Max CAC Outlet Temp @ 25°C (77°F) Ambient	60 °C	140 °F	
Max CAC Outlet Temp @ any Ambient	88 °C	190 °F	

* With clean filters

** With John Deere Plus-50 II™ 15w-40, not applicable with break in oil.

*** With 1914 option

Air Intake System

Engine Air Flow	39 m ³ /min	1394 ft ³ /min	
Intake Manifold Pressure (gauge pressure)	271 kPa	39.3 psig	
Manifold Air Temperature @ Rated (ECU reading)	63 °C	145 °F	
Maximum Manifold Air Temperature	88 °C	190.4 °F	
Max. Allowable Temperature Rise, Ambient	8 °C	30 °F	
Air to Engine Inlet			
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	

Performance Data

Prime Power	417 kW	559 hp	
10% Overload Power	458 kW	614 hp	
Rated Speed	1800	RPM	
Low Idle Speed	1000	RPM	
Prime Torque	2212 Nm	1632 lb-ft	
BMEP, Prime	2059 kPa	299 psi	
Rated Pferdestärke, Prime (metric hp)	567	ps	
Front Drive Capacity, Intermittent	955 Nm	704 lb-ft	
Front Drive Capacity, Continuous	955 Nm	704 lb-ft	
Friction Power @ Rated Speed	41 kW	55 hp	

Exhaust System

Exhaust Flow	88 m ³ /min	3123 ft ³ /min	
Exhaust Temperature	431 °C	808.1 °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	114.3 mm	4.5 in	

Performance Curve: 6135HFM85_B

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%	104	140	552	407	28.8	7.6	235
50%	208	280	1104	814	55.7	14.7	227
75%	313	419	1655	1221	82.1	21.7	223
100%	417	559	2207	1628	109.3	28.9	223
110%	458	614	2428	1791	122.9	32.5	228

Performance Curve: 6135HFM85_B

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