



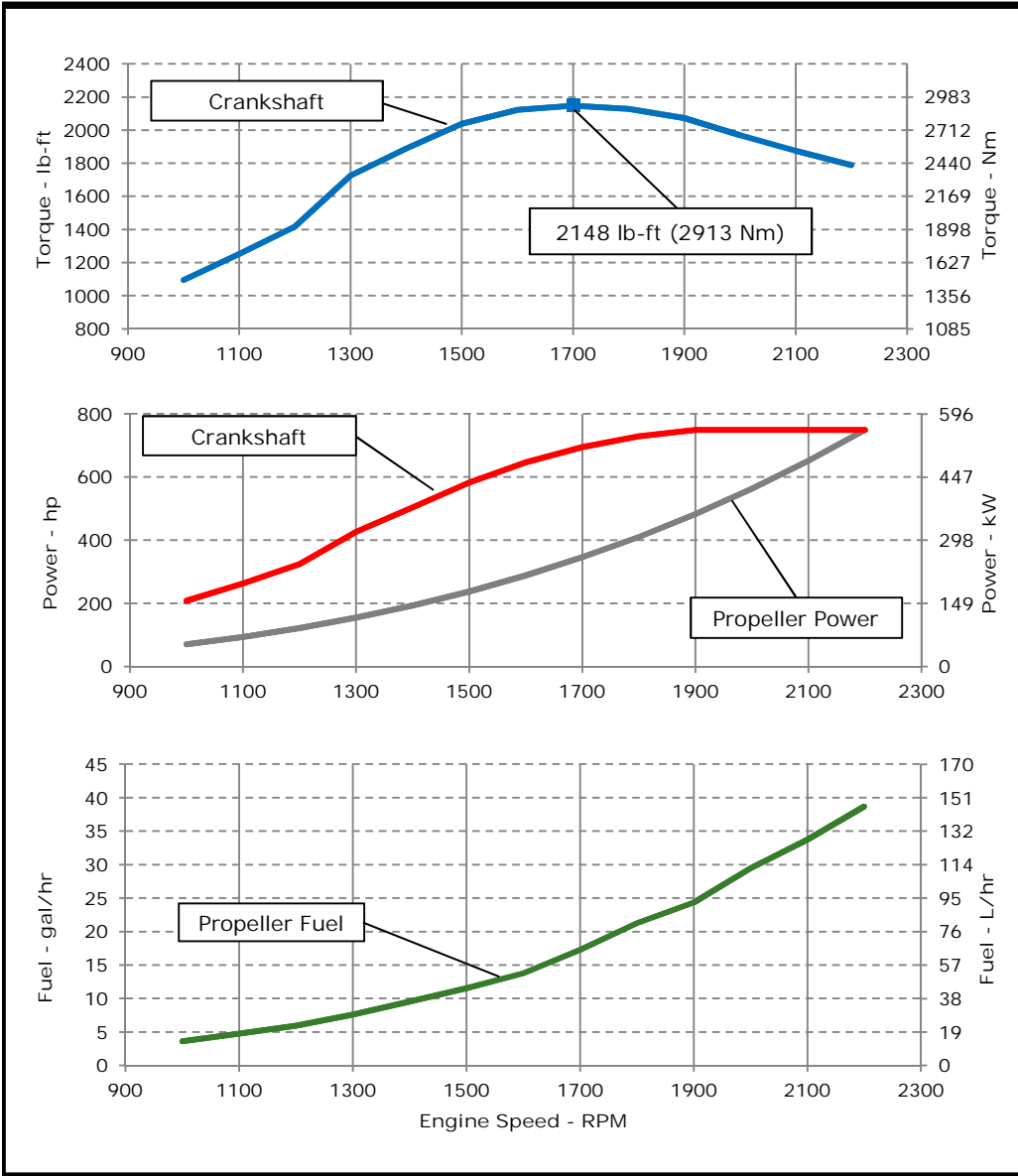
**JOHN DEERE**

**ENGINE PERFORMANCE CURVE**

Rating: M5 - 750hp (559kW) @ 2200 RPM  
 Application: Marine

PowerTech™ 13.5L Engine

Model: 6135SFM85



**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.

*Notes:*

*M5:* The M5 rating is for marine recreational and light duty commercial propulsion applications that operate between 300-1,000 hours per year and have load factors below 35 percent. This rating is for applications that use full power for no more than 30 minutes out of each 8 hours. The remaining time of operation is at or below cruising speed.

*Possible applications:* recreational boats, tactical military vessels and rescue boats.

Designed/Calibrated to meet:

- EPA Commercial Marine Tier 3
- IMO MARPOL Annex VI Compliant
- NRMM (97/68/EC), as amended

Ref: Engine Emission Label

Certified by:

*Adam Paul*

12-Mar-14

Performance Curve: 6135SFM85\_E

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 <sup>3</sup>
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**	368 kW	20946 BTU/min
Aftercooler Heat Rejection	164 kW	9335 BTU/min
Coolant Flow	299 L/min	79 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	9 kW	523 BTU/min
Engine Radiated Heat	73 kW	4183 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	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	363 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	9.8 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

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# Engine Installation Criteria

## Fuel System

ECU Description	L15			
Fuel Injection Pump	EUI			
Governor Type	Electronic			
Volumetric Fuel Consumption	146	L/hr	38.7	gal/hr
Mass Fuel Consumption	124	kg/hr	274	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 Rated Speed	280	kPa	41	psi
Oil Pressure at Low Idle (600rpm)**	120	kPa	17	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	387	L/min	102	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	43	m <sup>3</sup> /min	1519	ft <sup>3</sup> /min
Intake Manifold Pressure	350	kPa	38.7	psi
Manifold Air Temperature	66	°C	151	°F
Maximum Manifold Air Temperature	87	°C	189	°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.H2O
Max. Air Intake Restriction, Dirty Air Cleaner	6.25	kPa	25	in.H2O
Min. Ventilation Area	0.265	m <sup>2</sup>	410	in <sup>2</sup>

## Performance Data

Rated Power	559	kW	750	hp
Rated Speed	2200 RPM			
Peak Torque Speed	1700 RPM			
Low Idle Speed	600 RPM			
Rated Torque	2426	Nm	1790	ft-lb
Peak Torque	2913	Nm	2148	ft-lb
BMEP, Rated	2259	kPa	327	psi
Rated Pferdestärke (metric hp)	760 ps			
Front Drive Capacity, Intermittent	542	Nm	400	lb-ft
Front Drive Capacity, Continuous	542	Nm	400	lb-ft

## Exhaust System

Exhaust Flow	97.4	m <sup>3</sup> /min	3440	ft <sup>3</sup> /min
Exhaust Flow @ gas STP	41	m <sup>3</sup> /min	1448	ft <sup>3</sup> /min
Exhaust Temperature	448	°C	838.4	°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	152.4	mm	6.0	in
Min. Exhaust Pipe Diameter, Wet	203.2	mm	8.0	in

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## Engine Installation Criteria

### Engine Performance Data Table

Engine Speed	Crank Power		Crank Torque		* Prop Power		* Prop Fuel		* Prop BSFC
	RPM	kW	hp	Nm	lb-ft	kW	hp	L/hr	gal/hr
2200	559	749	2426	1789	559	749	146	39	223
2100	559	750	2542	1875	486	652	128	34	223
2000	559	750	2669	1968	420	563	112	29	226
1900	559	750	2809	2072	360	483	92	24	217
1800	544	729	2885	2128	306	410	80	21	224
1700	519	695	2913	2148	258	346	65	17	216
1600	482	646	2877	2122	215	288	52	14	206
1500	434	582	2763	2038	177	238	44	12	209
1400	376	504	2561	1889	144	193	36	10	213
1300	318	427	2339	1725	115	155	29	8	213
1200	241	324	1920	1416	91	122	22	6	210
1100	196	262	1698	1253	70	94	18	5	219
1000	155	208	1484	1094	52	70	14	4	223

\* Theoretical 3.0 exponent propeller curve , measured at flywheel

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