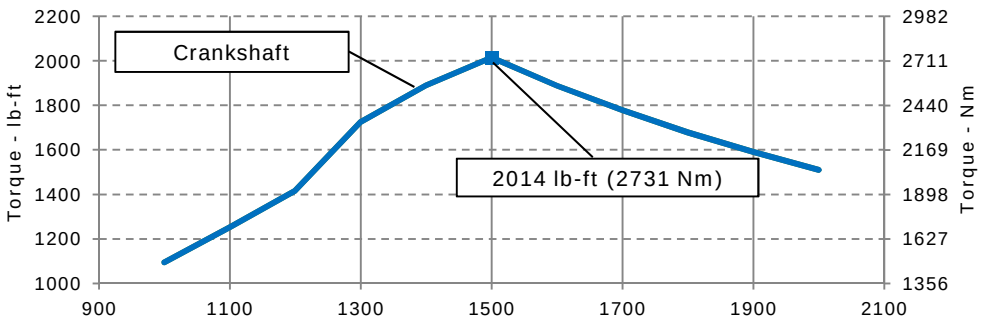
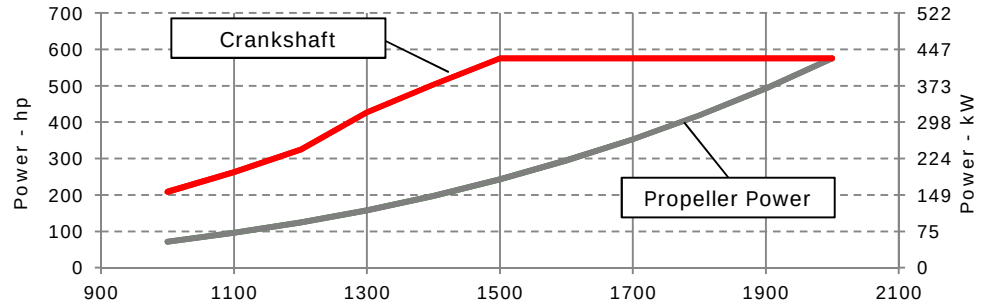
ENGINE PERFORMANCE CURVE

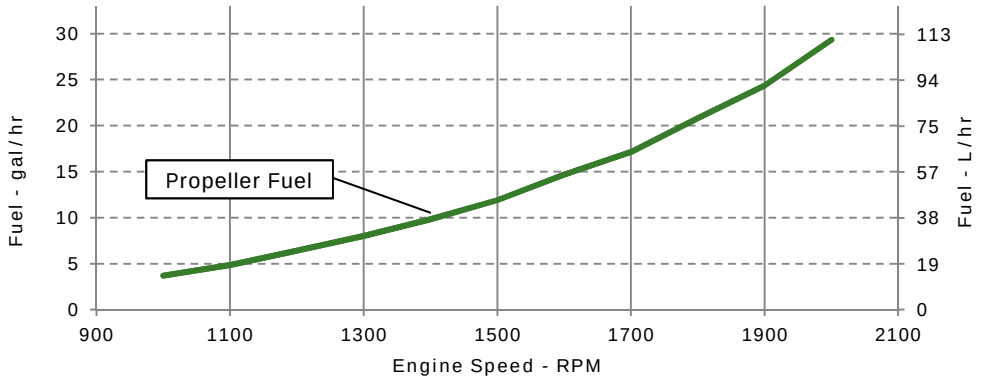
JOHN DEERE

Rating: M3 - 575hp (429kW) @ 2000 RPM
Application: Marine

PowerTech™ 13.5L Engine
Model: 6135SFM85







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:

M3: The M3 rating is for marine propulsion applications that typically operate between 2,000-4,000 hours per year and have load factors up to 50 percent. This rating is for applications that use full power for no more than 4 hours out of each 12 hours of operation. The remaining time of operation is at or below cruising speed.

Possible applications: Coastal fishing boats offshore crew boats, research boats. Short range ferryboats and dinner cruise boats.

Designed/Calibrated to meet:	Certified by:
• EPA Commercial Marine Tier 3 • IMO MARPOL Annex VI Compliant • NRMM (97/68/EC), as amended	Adam Paull
Ref: Engine Emission Label	12-Mar-14

Performance Curve: 6135SFM85_C

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**	271.1	kW	15431	BTU/min
Aftercooler Heat Rejection	125.95	kW	7169	BTU/min
Coolant Flow	264	L/min	70	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	12	kW	673	BTU/min
Engine Radiated Heat	56	kW	3170	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	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

* 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

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Engine Installation Criteria

Fuel System

ECU Description			L15	
Fuel Injection Pump			EUI	
Governor Type			Electronic	
Volumetric Fuel Consumption	111	L/hr	29.3	gal/hr
Mass Fuel Consumption	94.3	kg/hr	208	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	398	L/min	105	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	38	m^3/min	1342	ft^3/min
Intake Manifold Pressure	238.5	kPa	34.6	psi
Manifold Air Temperature	58	°C	136	°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	0.234	m^2	362	in^2

Performance Data

Rated Power	429	kW	575	hp
Rated Speed		2000	RPM	
Peak Torque Speed		1500	RPM	
Low Idle Speed		600	RPM	
Rated Torque	2048	Nm	1511	ft-lb
Peak Torque	2731	Nm	2014	ft-lb
BMEP, Rated	1907	kPa	276	psi
Rated Pferdestärke (metric hp)		583	ps	
Front Drive Capacity, Intermittent	542	Nm	400	lb-ft
Front Drive Capacity, Continuous	542	Nm	400	lb-ft

Exhaust System

Exhaust Flow	82.66	m^3/min	2919	ft^3/min
Exhaust Flow @ gas STP	37	m^3/min	1307	ft^3/min
Exhaust Temperature	388	°C	730	°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	139.7	mm	5.5	in
Min. Exhaust Pipe Diameter, Wet	152.4	mm	6.0	in

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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	g/kW-hr
2000	429	575	2048	1511	429	575	111	29	220
1900	429	575	2156	1590	368	493	92	24	213
1800	429	575	2276	1679	313	419	79	21	214
1700	429	575	2410	1778	263	353	65	17	209
1600	429	575	2560	1888	220	295	55	15	214
1500	429	575	2731	2014	181	243	45	12	212
1400	376	504	2561	1889	147	197	37	10	215
1300	318	427	2339	1725	118	158	30	8	219
1200	241	324	1920	1416	93	124	24	6	222
1100	196	262	1698	1252	71	96	18	5	218
1000	155	208	1484	1095	54	72	14	4	222

* Theoretical 3.0 exponent propeller curve , measured at flywheel

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