



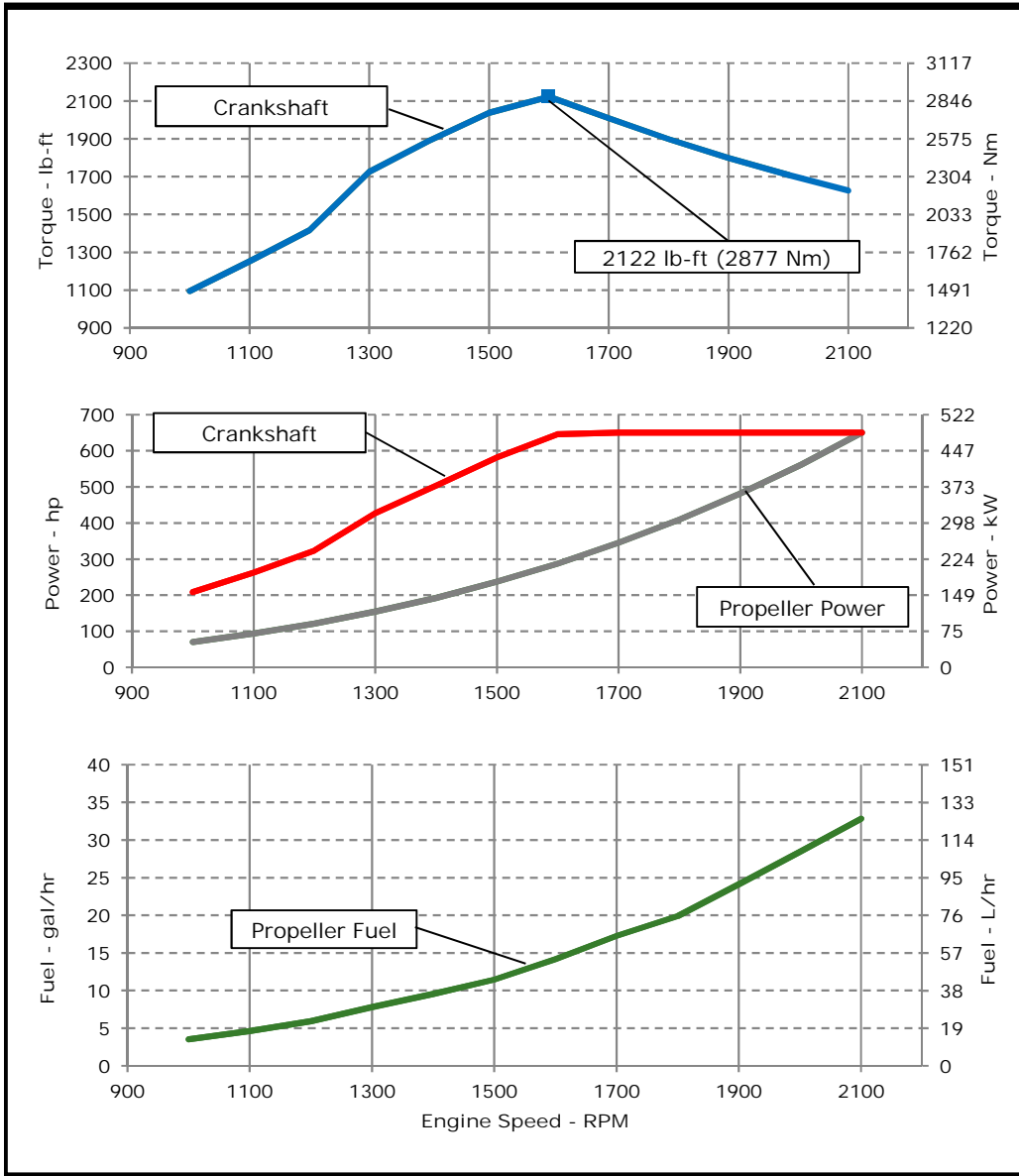
JOHN DEERE

ENGINE PERFORMANCE CURVE

Rating: M4 - 650hp (485kW) @ 2100 RPM
 Application: Marine

PowerTech™ 13.5L Engine

Model: 6135SFM85



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:

M4: The M4 rating is for marine propulsion applications that typically operate between 1,000-3,000 hours per year and have load factors below 40 percent. This rating is for applications that use full power no more than 1 hour out of each 12 hours of operation. The remaining time of operation is at or below cruising speed.

Possible applications: Inshore crew boats, charter fishing boats, pilot boats, dive boats, and planning hull commercial fishing boats.

Designed/Calibrated to meet:	Certified by:
<ul style="list-style-type: none"> EPA Marine Tier 3 Commercial (40 CFR 1042) IMO Tier II Compliant (MARPOL Annex VI) EU Stage IIIa Inland Waterways (NRMM 97/68/EC, as amended) Recreational Craft Directive 2 (2013/53/EU) 	 30-Oct-18
Ref: Engine Emission Label	

Performance Curve: 6135SFM85_D

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*

Jacket Water Heat Rejection**	307 kW	17474	BTU/min
Aftercooler Heat Rejection	143 kW	8140	BTU/min
Coolant Flow	277 L/min	73	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	197	°F
Engine Coolant Capacity, HE	38 L	10	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
Return Fuel Heat Rejection	2 kW	89	BTU/min
Engine Radiated Heat	62 kW	3551	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	1335 mm	52.6	in
Length to rear face of flywheel housing (SAE #1)	1444 mm	56.8	in
Length maximum	1818 mm	71.6	in
Width maximum	1063 mm	41.9	in
Height, crank centerline to top	812 mm	32.0	in
Height, crank centerline to bottom	364 mm	14.3	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 (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	0.002	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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Engine Installation Criteria

Fuel System

ECU Description	L15			
Fuel Injection Pump	EUI			
Governor Type	Electronic			
Volumetric Fuel Consumption	124	L/hr	32.8	gal/hr
Mass Fuel Consumption	106	kg/hr	233	lb/hr
Total Fuel Volumetric Flow	201	L/hr	53.1	gal/hr
Total Fuel Mass Flow	170	kg/hr	375	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	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 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	407	L/min	107	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	40.9	m ³ /min	1444	ft ³ /min
Intake Manifold Pressure	250.9	kPa	36.4	psi
Manifold Air Temperature	61	°C	142	°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	0.252	m ²	390	in ²

Performance Data

Rated Power	485	kW	650	hp
Rated Speed	2100 RPM			
Peak Torque Speed	1600 RPM			
Low Idle Speed	600 RPM			
Rated Torque	2205	Nm	1627	ft-lb
Peak Torque	2877	Nm	2122	ft-lb
BMEP, Rated	2053	kPa	298	psi
Rated Pferdestärke (metric hp)	659 ps			
Front Drive Capacity, Intermittent	542	Nm	400	lb-ft
Front Drive Capacity, Continuous	542	Nm	400	lb-ft

Exhaust System

Exhaust Flow	89	m ³ /min	3143	ft ³ /min
Exhaust Flow @ gas STP	39.1	m ³ /min	1381	ft ³ /min
Exhaust Temperature	411	°C	772	°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

Performance Curve: 6135SFM85_D

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

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
2100	485	650	2205	1626	485	650	124	33	218
2000	485	650	2316	1708	419	562	108	28	219
1900	485	651	2438	1798	359	482	91	24	216
1800	485	650	2573	1898	305	409	75	20	210
1700	485	650	2724	2009	257	345	65	17	216
1600	482	646	2877	2122	214	288	54	14	213
1500	434	582	2763	2038	177	237	43	11	208
1400	375	504	2561	1889	144	193	36	10	214
1300	318	427	2339	1725	115	154	30	8	218
1200	241	324	1920	1416	90	121	22	6	211
1100	196	262	1699	1253	70	93	17	5	213
1000	155	208	1485	1095	52	70	13	4	217

* Theoretical 3.0 exponent propeller curve , measured at flywheel

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