



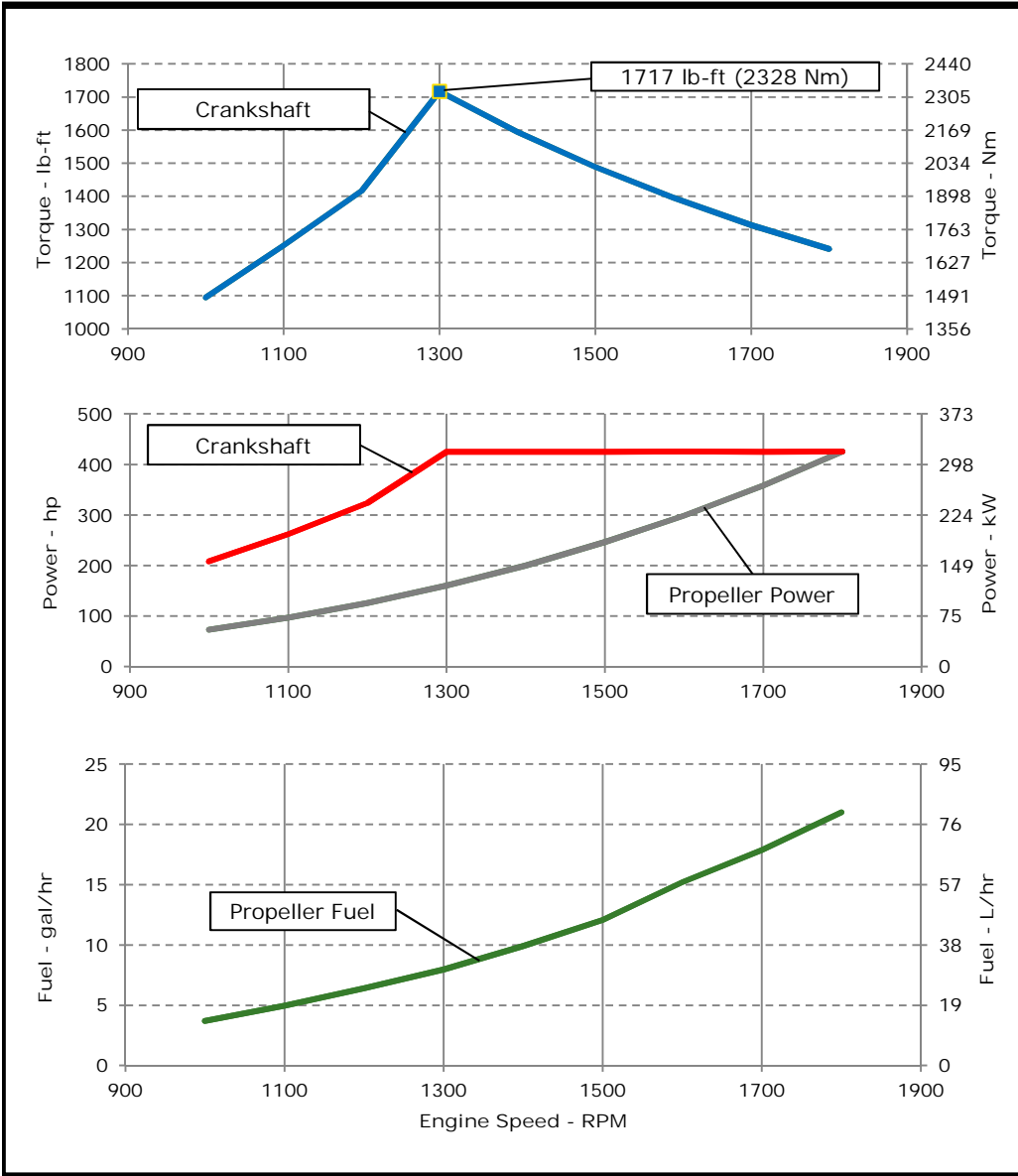
JOHN DEERE

ENGINE PERFORMANCE CURVE

Rating: M1 - 425hp (317kW) @ 1800 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 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:

M1: The M1 rating is for marine propulsion applications that may operate up to 24 hours per day at uninterrupted full power and have load factors greater than 65 percent.

Possible applications: Line hauls tugs and towboats, fish and shrimp trawlers/draggers, and displacement hull fishing boats.

Designed/Calibrated to meet: Certified by:

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

Preliminary

Ref: Engine Emission Label

Performance Curve: 6135SFM85_A

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**	199.6 kW	11361 BTU/min
Aftercooler Heat Rejection	79.9 kW	4548 BTU/min
Coolant Flow	382 L/min	101 gal/min
Thermostat Start to Open	82 °C	180 °F
Thermostat Fully Open	94 °C	202 °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	14 kW	806 BTU/min
Engine Radiated Heat	40 kW	2272 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	79.5	L/hr	21.0	gal/hr
Mass Fuel Consumption	67.6	kg/hr	149	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	260	kPa	38	psi
Oil Pressure at Low Idle (600rpm)**	95	kPa	14	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***	45 deg			
Engine Angularity Limits Any Direction, Intermittent***	N/A 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	28.7	m ³ /min	###	ft ³ /min
Intake Manifold Pressure	164.3	kPa	23.8	psi
Manifold Air Temperature	49	°C	120	°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	0.177	m ²	274	in ²

Performance Data

Rated Power	317	kW	425	hp
Rated Speed	1800 RPM			
Peak Torque Speed	1300 RPM			
Low Idle Speed	600 RPM			
Rated Torque	1682	Nm	1240	ft-lb
Peak Torque	2328	Nm	1717	ft-lb
BMEP, Rated	1565	kPa	227	psi
Rated Pferdestärke (metric hp)	431 ps			
Front Drive Capacity, Intermittent	542	Nm	400	lb-ft
Front Drive Capacity, Continuous	542	Nm	400	lb-ft

Exhaust System

Exhaust Flow	59	m ³ /min	2084	ft ³ /min
Exhaust Flow @ gas STP	27.1	m ³ /min	957	ft ³ /min
Exhaust Temperature	376	°C	709	°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	127	mm	5.0	in
Min. Exhaust Pipe Diameter, Wet	139.7	mm	5.5	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
1800	317	425	1683	1241	317	425	79.5	21.0	213
1700	317	425	1781	1313	267	358	67.7	17.9	215
1600	317	425	1892	1396	223	299	57.5	15.2	220
1500	317	425	2018	1489	184	246	45.7	12.1	212
1400	317	425	2162	1595	149	200	37.5	9.9	214
1300	317	425	2328	1717	119	160	30.1	8.0	214
1200	241	324	1920	1416	94	126	24.2	6.4	219
1100	196	262	1698	1252	72	97	18.8	5.0	221
1000	155	208	1484	1095	54	73	14.0	3.7	219

* Theoretical 3.0 exponent propeller curve , measured at flywheel

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