

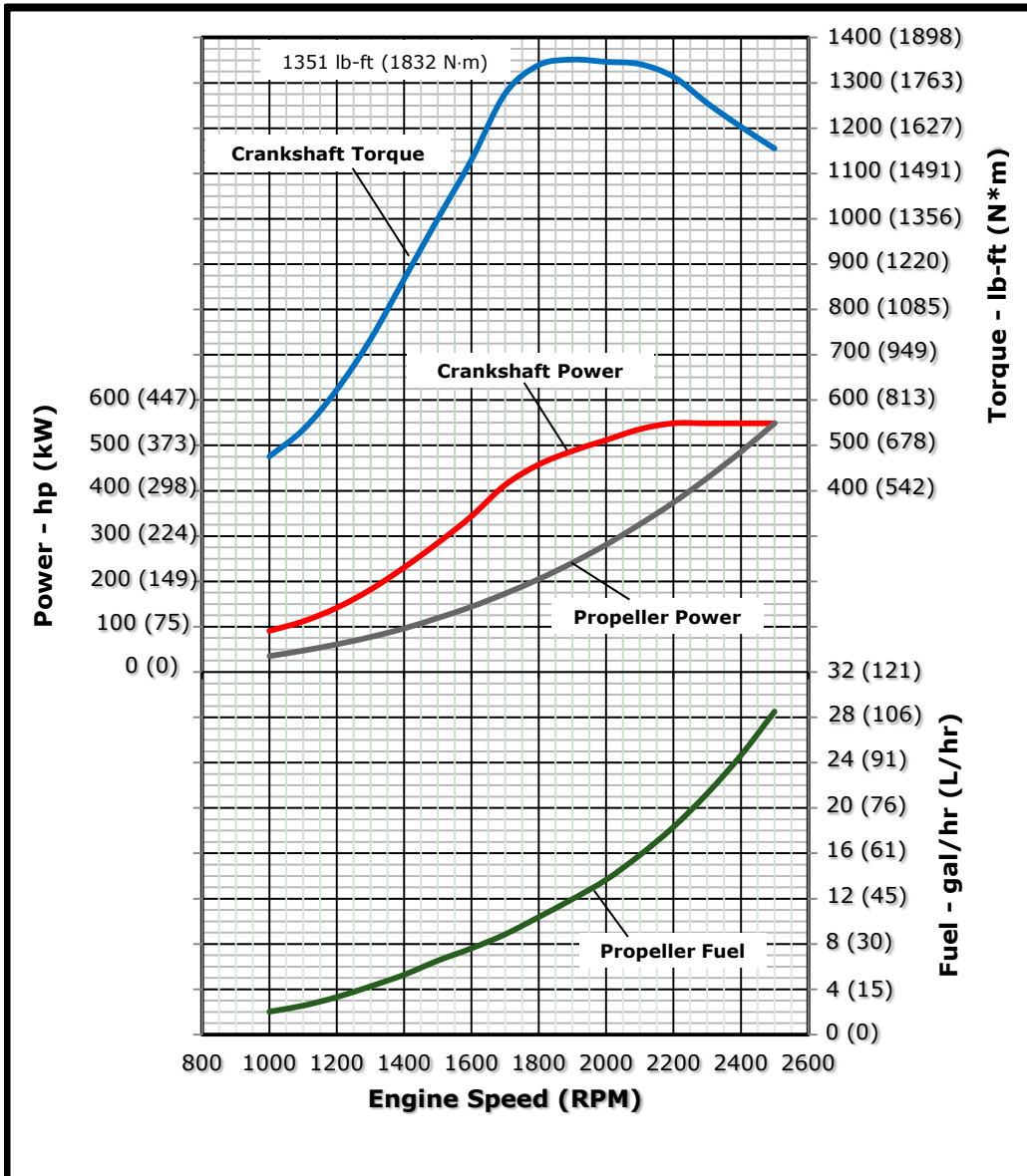


JOHN DEERE

ENGINE PERFORMANCE CURVE

Rating: M5 - 550 (410 kW) @ 2500 RPM
 Application: Marine

PowerTech™ 9.0L Engine
Model: 6090SFM75
 550 hp @ 2500 RPM
 410 kW @ 2500 RPM
 See Option Code Table



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:

M5: The M5 rating is for marine recreational propulsion applications that operate 300 hours or less per year and have load factors below 35%. This rating is for applications that use full power for no more than 30 minutes out of each 8 hours and cruising speed the remainder of the 8 hours, and do not operate for the remaining 16 hours of the day.

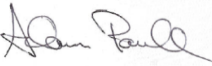
Possible applications: Recreational boats in the U.S., tactical military vessels, and rescue boats outside the U.S.

Designed/Calibrated to meet:

- EPA Recreational Marine Tier 2 / RCD (2003/44/EC)
- IMO MARPOL Annex VI Compliant
- IWT (2004/26/EC)

Ref: Engine Emission Label

Certified by:



Performance Curve: 6090SFM75_G

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

Engine Installation Criteria

General Data

Model	6090SFM75	
Number of Cylinders	6	
Bore	118 mm	4.6 in
Stroke	127 mm	5.0 in
Displacement	9.0 L	549 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	
Engine Crankcase Vent System	Closed	

Cooling System*

Engine Coolant Heat Rejection**	430.5 kW	24504 BTU/min
Coolant Flow	404 L/min	100.6 gal/min
Thermostat Start to Open	82 °C	180 °F
Thermostat Fully Open	94 °C	202 °F
Engine Coolant Capacity	32 L	8.5 gal
Min. Coolant Fill Rate	12 L/min	3 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	100-110 °C	212-230 °F
Absolute Max Top Tank Temperature	110 °C	230 °F
Recommended Fuel Cooler	TBD kW	TBD 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	1714 mm	67.5 in
Width	998 mm	39.3 in
Height, centerline to top	658 mm	25.9 in
Height, centerline to bottom	319 mm	12.6 in
Weight, with oil, no coolant (includes engine, flywheel housing, flywheel, and electronics)	1066 kg	2350 lb
Center of Gravity Location, X-axis From Rear	404 mm	15.9 in
Face of Block		
Center of Gravity Location, Y-axis Right of Crankshaft	-24 mm	-0.9 in
Center of Gravity Location, Z-axis Above Crankshaft	133 mm	5.2 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	8.6 kN	1933 lbf
Thrust Bearing Load Limit, Forward Intermittent	13 kN	2923 lbf
Thrust Bearing Load Limit, Rearward Continuous	4 kN	900 lbf
Thrust Bearing Load Limit, Rearward Intermittent	6 kN	1349 lbf

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	0.0012 ohms
Max. Allowable Start Circuit Resistance, 24V	0.002 ohms
Recommended Starter Cable, 12V 100"	#00
Recommended Starter Cable, 24V 100"	#2
Recommended Starter Cable, 12V 200"	#0000 or 2 #00
Recommended Starter Cable, 24V 200"	#0
Electrical Component Maximum Temperature Limit	125 °C 257 °F

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Engine Installation Criteria

Fuel System

ECU Description	L14	
Fuel Injection Pump	Denso HP4	
Governor Type	Electronic	
Volumetric Fuel Consumption	108 L/hr	28.5 gal/hr
Mass Fuel Consumption	97.8 kg/hr	215 lb/hr
Total Fuel Volumetric Flow*	240 L/hr	63.4 gal/hr
Total Fuel Mass Flow*	204 kg/hr	450 lb/hr
Max. Fuel Inlet Restriction**	30 kPa	120 in.H ₂ O
Max. Fuel Inlet Pressure	20 kPa	80 in.H ₂ O
Max. Fuel Height Above Transfer Pump	2.41 m	7.9 ft
Max Fuel Return Pressure	20 kPa	80 in.H ₂ O
Max. Leak-off Return Height	2.41 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	8.3 mm	0.33 in
Min. Recommended Fuel Line Size	-6	
Primary Fuel Filter	10 mic	
Secondary Fuel Filter	2 mic	

Lubrication System

Oil Pressure at Rated Speed	300 kPa	43.5 psi
Oil Pressure at Low Idle ***	130 kPa	18.85 psi
Max. Crankcase Pressure	2 kPa	8 in.H ₂ O
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	385 L/min	102 gal/min
Max. Suction Lift	3m	9.8 ft
Max. Outlet Pressure	140 kPa	20 psi
Max. Inlet Restriction	30 kPa	4.4 psi

* Total possible flow, including return flow, required to cool components

** With clean filters

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

Air Intake System

Engine Air Flow	33.2 m ³ /min	1172 ft ³ /min
Intake Manifold Pressure	269 kPa	39 psi
Manifold Air Temperature	51.5 °C	125 °F
Maximum Manifold Air Temperature	67 °C	153 °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.H ₂ O
Max. Air Intake Restriction, Dirty Air Cleaner	6.25 kPa	25 in.H ₂ O
Min. Ventilation Area	0.204 m ²	317 in ²

Performance Data

Rated Power	410 kW	550 hp
Rated Speed	2500 RPM	
Peak Torque Speed	1900 RPM	
Low Idle Speed	650 RPM	
Rated Torque	1566 Nm	1155 ft-lb
Peak Torque	1832 Nm	1351 ft-lb
BMEP, Rated	2185 kPa	317 psi
Rated Pferdestärke	557 ps	
Front Drive Capacity, Intermittent	550 Nm	406 lb-ft
Front Drive Capacity, Continuous	468 Nm	345 lb-ft

Exhaust System

Exhaust Flow	77.7 m ³ /min	2744 ft ³ /min
Exhaust Flow @ gas STP	35.8 m ³ /min	1264 ft ³ /min
Exhaust Temperature	427 °C	801 °F
Max. Allowable Exhaust Restriction	7.5 kPa	30 in.H ₂ O
Max. Shear on Turbocharger Exhaust Outlet	11 kg	24 lb
Max. Bending Moment on Turbocharger Exhaust Outlet	7 Nm	5.2 lb-ft
Min. Exhaust Pipe Diameter, Dry	139.7 mm	5.5 in
Min. Exhaust Pipe Diameter, Wet	152.4 mm	6 in

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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
2500	410	549	1566	1155	410	549	108	29	224
2400	410	549	1631	1203	363	486	93	25	219
2300	410	549	1702	1255	319	428	81	21	215
2200	410	549	1780	1313	279	374	69	18	211
2100	400	536	1818	1341	243	326	60	16	210
2000	382	512	1825	1346	210	281	52	14	210
1900	364	488	1832	1351	180	241	45	12	214
1800	342	458	1815	1339	153	205	39	10	218
1700	308	413	1730	1276	129	173	34	9	221
1600	257	344	1532	1130	107	144	29	8	228
1500	213	285	1356	1000	89	119	25	7	237
1400	172	231	1176	867	72	96	20	5	236
1300	135	182	995	734	58	77	16	4	238
1200	106	142	845	623	45	61	13	3	235
1100	84	112	725	535	35	47	10	3	235
1000	68	91	645	476	26	35	8	2	248

* Theoretical 3.0 exponent propeller curve, measured at flywheel

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