

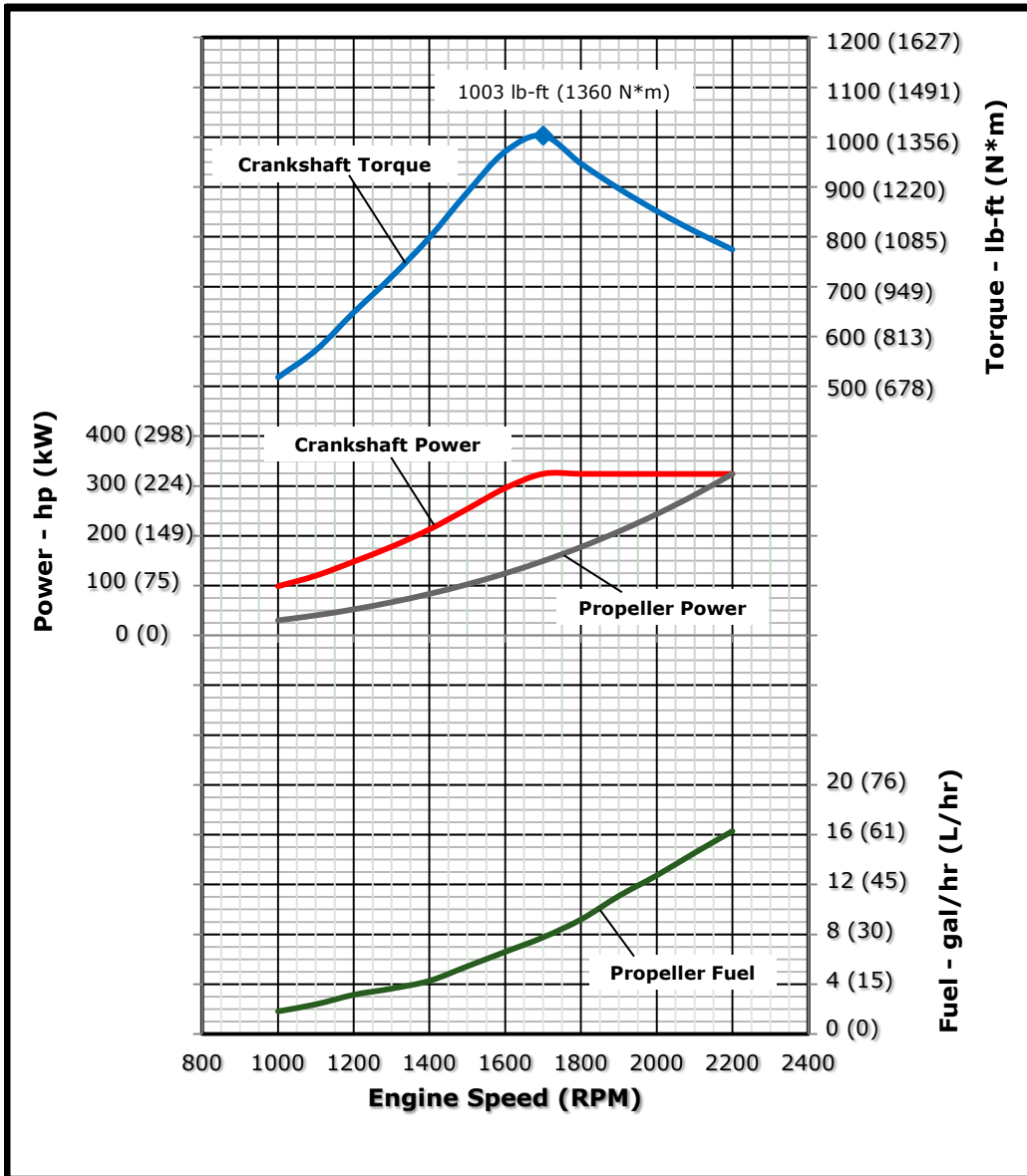


JOHN DEERE

ENGINE PERFORMANCE CURVE

Rating: M2 - 325 (242 kW) @ 2200 RPM
 Application: Marine

PowerTech™ 9.0L Engine
Model: 6090AFM75
 325 hp @ 2200 RPM
 242 kW @ 2200 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:

M2: The M2 rating is for marine propulsion applications that operate up to 3,000 hours per year and have load factors up to 65%. This rating is for applications that are in continuous use, and use full power for no more than 16 hours out of each 24 hours of operation. The remaining time of operation must be at cruising speeds.

Possible Applications: Short-range tugs and towboats (pool boats), long-range ferryboats, large passenger vessels, and offshore displacement hull fishing boats under 18 m (60 ft).
 Marine auxiliary power engines for dedicated hydraulic pump drives, dredge pumps, or other constant-load marine applications should use the M2 rating.

Designed/Calibrated to meet:	Certified by:
<ul style="list-style-type: none"> EPA Commercial Marine Tier 2 IMO MARPOL Annex VI Compliant IWT (2004/26/EC) Ref: Engine Emission Label	

Performance Curve: 6090AFM75_B

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

Engine Installation Criteria

General Data

Model	6090AFM75	
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	Engine coolant	
Engine Crankcase Vent System	Closed	

Cooling System*

Engine Coolant Heat Rejection**	228 kW	12978 BTU/min
Max. Pressure Drop Across Keel Cooler	40 kPa	5.8 psi
Coolant Flow	344.1 L/min	90.9 gal/min
Thermostat Start to Open	82 °C	180 °F
Thermostat Fully Open	94 °C	202 °F
Engine Coolant Capacity, HE	47.5 L	12.5 gal
Engine Coolant Capacity, KC	43.5 L	11.5 gal
Min. Coolant Fill Rate	12 L/min	3 gal/min
Min. Pressure Cap	110 kPa	16 psi
Min. Pump Inlet Pressure	30 kPa	4.4 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	1682 mm	66.2 in
Width	938 mm	36.9 in
Height, centerline to top	665 mm	26.2 in
Height, centerline to bottom	319 mm	12.6 in
Weight, with oil, no coolant (includes engine, flywheel housing, flywheel, and electronics)	1011 kg	2229 lb
Center of Gravity Location, X-axis From Rear	434 mm	17.8 in
Face of Block		
Center of Gravity Location, Y-axis Right of Crankshaft	4.5 mm	0.18 in
Center of Gravity Location, Z-axis Above Crankshaft	106 mm	4.2 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	63.4 L/hr	16.8 gal/hr
Mass Fuel Consumption	53.9 kg/hr	118.8 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	

* With clean filters

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

Air Intake System

Engine Air Flow	19.4 m ³ /min	683.2 ft ³ /min
Intake Manifold Pressure	165.9 kPa	24.1 psi
Manifold Air Temperature	98 °C	208 °F
Maximum Manifold Air Temperature	130 °C	266 °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	0.119 m ²	184 in ²

Performance Data

Rated Power	242 kW	324 hp
Rated Speed	2200 RPM	
Peak Torque Speed	1700 RPM	
Low Idle Speed	650 RPM	
Rated Torque	1050 Nm	774 ft-lb
Peak Torque	1360 Nm	1003 ft-lb
BMEP, Rated	1466 kPa	213 psi
Rated Pferdestärke	329 ps	
Front Drive Capacity, Intermittent	550 Nm	406 lb-ft
Front Drive Capacity, Continuous	468 Nm	348 lb-ft

Exhaust System

Exhaust Flow	43.7 m ³ /min	1543 ft ³ /min
Exhaust Flow @ gas STP	20.6 m ³ /min	725 ft ³ /min
Exhaust Temperature	408 °C	766 °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	101.6 mm	4.0 in
Min. Exhaust Pipe Diameter, Wet	114.3 mm	4.5 in

Performance Curve: 6090AFM75_B

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
2200	242	324	1050	774	242	324	62	16	217
2100	242	324	1100	811	210	282	55	15	222
2000	242	324	1155	852	182	244	48	13	226
1900	242	324	1216	897	156	209	42	11	229
1800	242	324	1284	947	132	178	35	9	223
1700	242	324	1360	1003	112	150	29	8	224
1600	221	296	1317	971	93	125	25	7	228
1500	189	254	1206	889	77	103	21	5	228
1400	159	213	1083	799	62	84	16	4	221
1300	133	178	976	720	50	67	14	4	235
1200	110	148	879	648	39	53	12	3	258
1100	89	120	776	572	30	41	9	2	253
1000	74	99	702	518	23	30	7	2	259

* Theoretical 3.0 exponent propeller curve, measured at flywheel

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