ENGINE PERFORMANCE CURVE

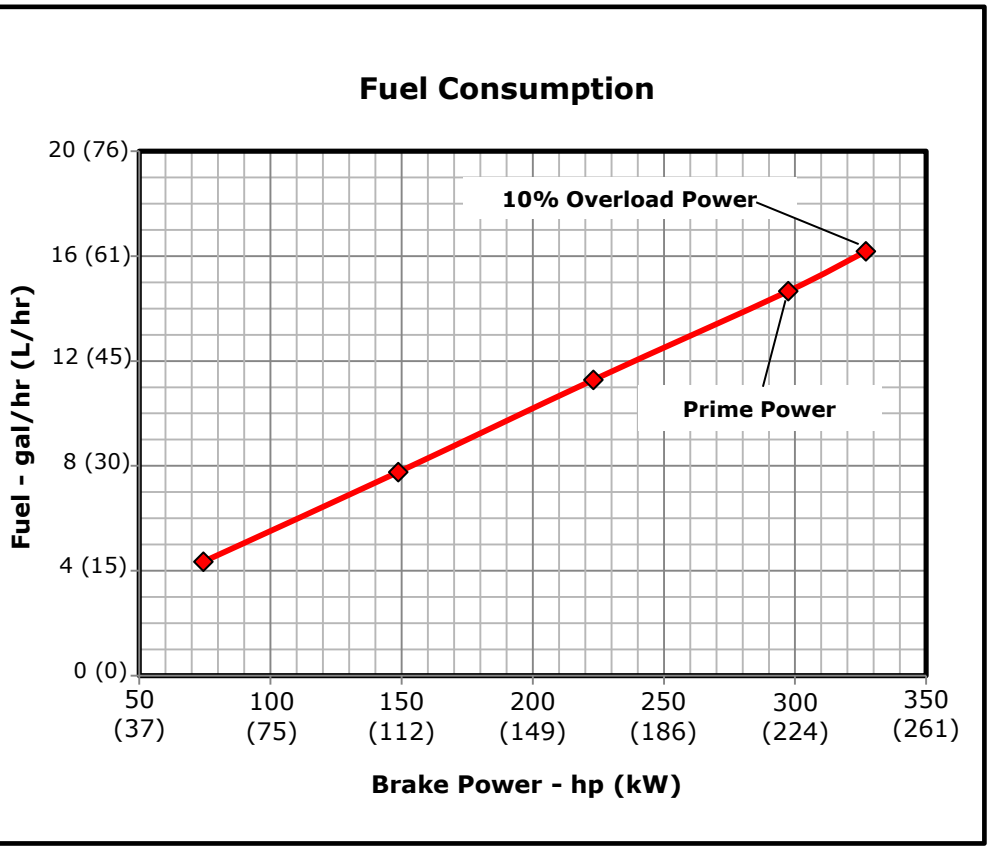
JOHN DEERE

Rating: Marine

Application: Generator (60 Hz)
Prime Power

PowerTech™ 9.0L Engine
Model: 6090AFM75
297 hp @ 1800 RPM
222 kW @ 1800 RPM
See Option Code Table

Generator Efficiency (%)	Power Factor	Calculated Gen-Set Rating		Prime Power	10% Overload Power
		kW	kVA	hp (kW)	hp (kW)
88-92	0.8	195-204	244-255	297 (222)	327 (244)



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:

Marine Generator: The Marine generator engine rating is the power available under normal varying electrical load factors for an unlimited number of hours per year in commercial applications.
This rating incorporates a 10% overload capability, and conforms to ISO 8528 prime power. Average load over a 24-hour period shall not exceed 67% of the prime rating, of which no more than 2 hours are between 100% and 110% of the prime rating.

The marine generator rating is restricted to generator applications only. The criteria used to establish marine generator application ratings are the same used to establish industrial prime power generator application ratings

Designed/Calibrated to meet:	Certified by:
• EPA Commercial Marine Tier 2 • IMO MARPOL Annex VI Compliant Ref: Engine Emission Label	

Performance Curve: 6090AFM75_E

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**	202 kW	11498 BTU/min
Max. Pressure Drop Across Keel Cooler	40 kPa	5.8 psi
Coolant Flow	282 L/min	74.6 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 Face of Block	434 mm	17.8 in
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	55.5 L/hr	14.6 gal/hr
Mass Fuel Consumption	47.2 kg/hr	104 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_2O
Max. Fuel Inlet Pressure	20 kPa	80 in.H_2O
Max. Fuel Height Above Transfer Pump	2.41 m	7.9 ft
Max Fuel Return Pressure	20 kPa	80 in.H2O
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 1800 RPM	265 kPa	38.4 psi
Max. Crankcase Pressure	2 kPa	8 in.H_2O
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

Air Intake System

Engine Air Flow	15.1 m^3/min	533.3 ft^3/min
Intake Manifold Pressure	153.2 kPa	22.2 psi
Manifold Air Temperature	92 °C	198 °F
Maximum Manifold Air Temperature	130 °C	266 °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	0.093 m^2	144 in^2

Performance Data

Prime Power	222 kW	297 hp
10% Overload Power	244 kW	327 hp
Rated Speed	1800 RPM	
Low Idle Speed	1800 RPM	
Prime Torque	1177 Nm	868 lb-ft
BMEP, Prime	1643 kPa	238 psi
Rated Pferdestärke, Prime	298.6 ps	
Front Drive Capacity, Intermittent	550 Nm	406 lb-ft
Front Drive Capacity, Continuous	468 Nm	348 lb-ft
Software and Label Convertible to 50 Hz?	NO	

Exhaust System

Exhaust Flow	39.7 m^3/min	1402 ft^3/min
Exhaust Flow @ gas STP	16.4 m^3/min	579.2 ft^3/min
Exhaust Temperature	506 °C	943 °F
Max. Allowable Exhaust Restriction	7.5 kPa	30 in.H_2O
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_E

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

Engine Performance Data Table

Engine Power	Crank Power		Crank Torque		Fuel Consumption		BSFC
	kW	hp	Nm	lb-ft	L/hr	gal/hr	g/kW-hr
25%	55.5	74.4	294	217	16.5	4.3	252.2
50%	110.9	148.7	588	434	29.4	7.8	225.2
75%	166.4	223.1	883	651	42.7	11.3	218.2
100%	221.8	297.4	1177	868	55.5	14.7	212.7
110%	244	327	1295	955	61.2	16.2	213.3

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