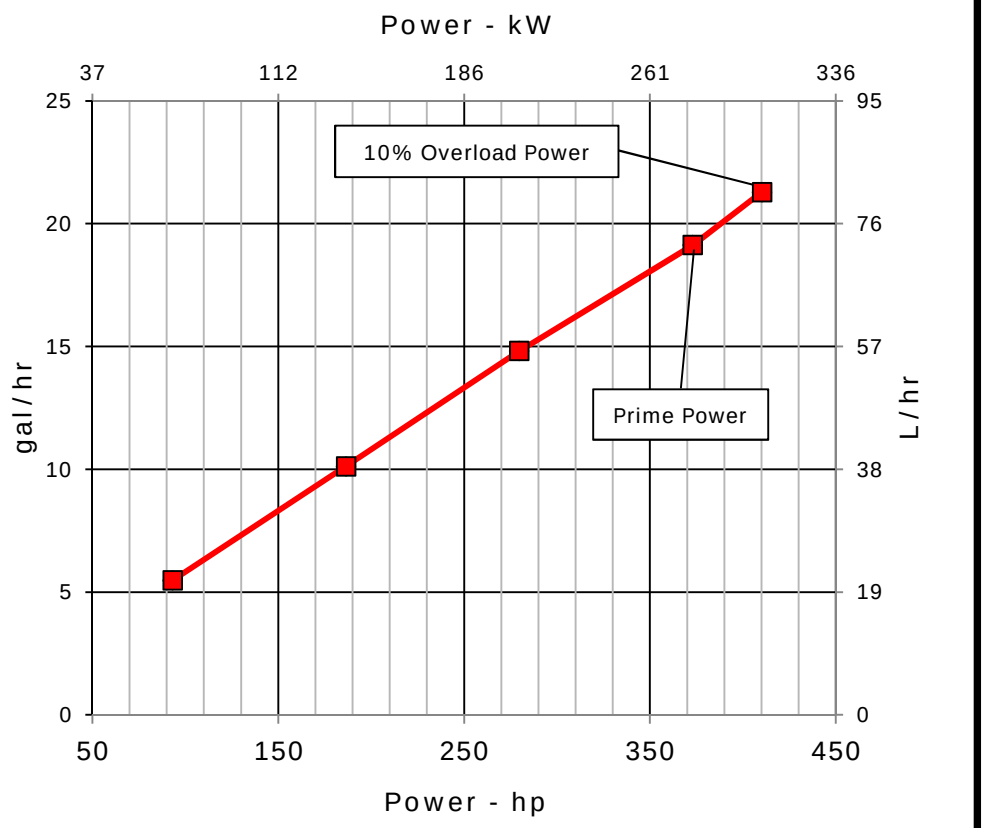
ENGINE PERFORMANCE CURVE

Rating: 50 Hz - 373hp (278kW) @ 1500 RPM
Application: Marine

PowerTech™ 13.5L Engine
Model: 6135AFM85

Generator Efficiency (%)	Power Factor	Calculated Gen-Set Rating kW	Calculated Gen-Set Rating kVA	Prime Power hp (kW)	10% Overload Power hp (kW)
88-92	0.8	245-256	306-320	373 (278)	410 (306)



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:

Constant Speed Auxiliary – 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 percent overload capability, and conforms to ISO 8528 prime power. Average load over a 24-hour period shall not exceed 67 percent of the prime rating, of which no more than two hours are between 100 percent and 110 percent of the prime rating.

Possible applications: This rating is use for applications that require constant speed operation in power generation or auxiliary applications such as generators and hydraulic pumps.

Designed/Calibrated to meet:	Certified by:
• IMO MARPOL Annex VI Compliant	Adam Paull
Ref: Engine Emission Label	12-Mar-14

Performance Curve: 6135AFM85_F

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

Engine Installation Criteria

General Data

Model	6135AFM85			
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	Engine coolant			
Engine Crankcase Vent System	Closed			

Cooling System*

Engine Coolant Heat Rejection**	277	kW	15767	BTU/min
Max. Pressure Drop Across Keel Cooler	40	kPa	6	psi
Coolant Flow	177	L/min	46.8	gal/min
Seawater Flow (heat exchanged)	356	L/min	94	gal/min
Thermostat Start to Open	72	°C	161	°F
Thermostat Fully Open	82	°C	179	°F
Engine Coolant Capacity, HE	43	L	11.4	gal
Engine Coolant Capacity, KC	38	L	10.0	gal
Min. Coolant Fill Rate	12	L/min	3.2	gal/min
Min. Pressure Cap	110.3	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	100-105	°C	212-230	°F
Absolute Max Top Tank Temperature	105	°C	221	°F
Recommended Fuel Cooler	26	kW	1459	BTU/min
Engine Radiated Heat	36	kW	2068	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	1075	mm	42.3	in
Height, crank centerline to top	806	mm	31.7	in
Height, crank centerline to bottom	360	mm	14.2	in
Weight, with oil, no coolant (includes engine, flywheel housing, flywheel, and electronics)	1410	kg	3108	lb
Center of Gravity Location, X-axis From Rear Face of Block	516	mm	20.3	in
Center of Gravity Location, Y-axis Right of Crankshaft	5	mm	0.2	in
Center of Gravity Location, Z-axis Above Crankshaft	239	mm	9.41	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	0.0012	ohms
Max. Allowable Start Circuit Resistance, 24V	0.002	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

Performance Curve: 6135AFM85_F

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Engine Installation Criteria

Fuel System

ECU Description			L15	
Fuel Injection Pump			Unit Injection	
Governor Type			Electronic	
Volumetric Fuel Consumption, Prime	72.4	L/hr	19.1	gal/hr
Mass Fuel Consumption, Prime	61.5	kg/hr	136	lb/hr
Total Fuel Volumetric Flow	417	L/hr	110.2	gal/hr
Total Fuel Mass Flow	354	kg/hr	781	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
Max. Fuel Height Above Transfer Pump	2.88	m	9.4	ft
Max. Leak-off Return Height	2.88	m	9.4	ft
Max. Fuel Inlet Height Above Fuel Tank Supply	2.88	m	9.4	ft
Normal Operation Fuel Temperature	40	°C	104	°F
Max. Fuel Inlet Temperature	80	°C	176	°F
Min. Recommended Fuel Line Inside Diameter	11	mm	0.43	in
Min. Recommended Fuel Line Size			7	(-) AN
Primary Fuel Filter			10	mic
Secondary Fuel Filter			2	mic

Lubrication System

Oil Pressure at 1500 RPM**	314	kPa	46	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

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

*** With 1904 option

Air Intake System

Engine Air Flow	27.6	m^3/min	975	ft^3/min
Intake Manifold Pressure	208	kPa	30.2	psi
Manifold Air Temperature	88	°C	190	°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	0.17	m^2	263	in^2

Performance Data

Prime Power	278	kW	373	hp
10% Overload Power	306	kW	410	hp
Rated Speed		1500	RPM	
Low Idle Speed		1000	RPM	
Prime Torque	1771	Nm	1306	lb-ft
BMEP, Prime	1648	kPa	239	psi
Rated Pferdestärke, Prime (metric hp)		378	ps	
Front Drive Capacity, Intermittent	542	Nm	400	lb-ft
Front Drive Capacity, Continuous	542	Nm	400	lb-ft
Software and Label Convertible to 50 Hz?		YES		

Exhaust System

Exhaust Flow	62	m^3/min	2179	ft^3/min
Exhaust Flow @ gas STP	26.2	m^3/min	925	ft^3/min
Exhaust Temperature	427	°C	800.6	°F
Max. Allowable Exhaust Restriction	7.5	kPa	30	in.H_2O
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	127.0	mm	5.0	in
Min. Exhaust Pipe Diameter, Wet	139.7	mm	5.5	in

Performance Curve: 6135AFM85_F

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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%	70	93	443	326	20.7	5.5	253
50%	139	186	885	653	38.3	10.1	234
75%	209	280	1328	979	56.1	14.8	228
100%	278	373	1770	1306	72.4	19.1	221
110%	306	410	1947	1436	80.6	21.3	224

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