



JOHN DEERE

ENGINE PERFORMANCE CURVE

Rating: Gross Power
 Application: Generator
 50 kWe Standby Market
 1800 RPM (60 Hz)

PowerTech™ M 4.5L Engine
Model: 4045TF290

67 hp (50 kW) Prime
 74 hp (55 kW) Standby

Nominal Engine Power @ 1800 RPM			
Prime		Standby	
HP	kW	HP	kW
67	50	74	55

Generator Efficiency %	Fan Power (% of Standby)		Power Factor	Prime Rating		Standby Rating		ISO 8528 G2 Block Load Capability
	hp	kW		kWe	kVA	kWe	kVA	
88-92	2.5	1.9	0.8	42-44	53-55	47-49	59-62	NA

Note 1: Based on nominal engine power.

Note 2: kWe/kVA rating assumes 90% efficiency. "Generator Efficiency %" will vary.

STANDARD CONDITIONS

Air Intake Restriction.....12 in.H₂O (3 kPa)
 Exhaust Back Pressure.....60 in.H₂O (15 kPa)

Gross power guaranteed within + or - 5% at SAE J1995 and ISO 3046 conditions:

- 77 °F (25 °C) air inlet temperature
- 29.31 in.Hg (99 kPa) barometer
- 104 °F (40 °C) fuel inlet temperature
- 0.853 fuel specific gravity @ 60 °F (15.5 °C)

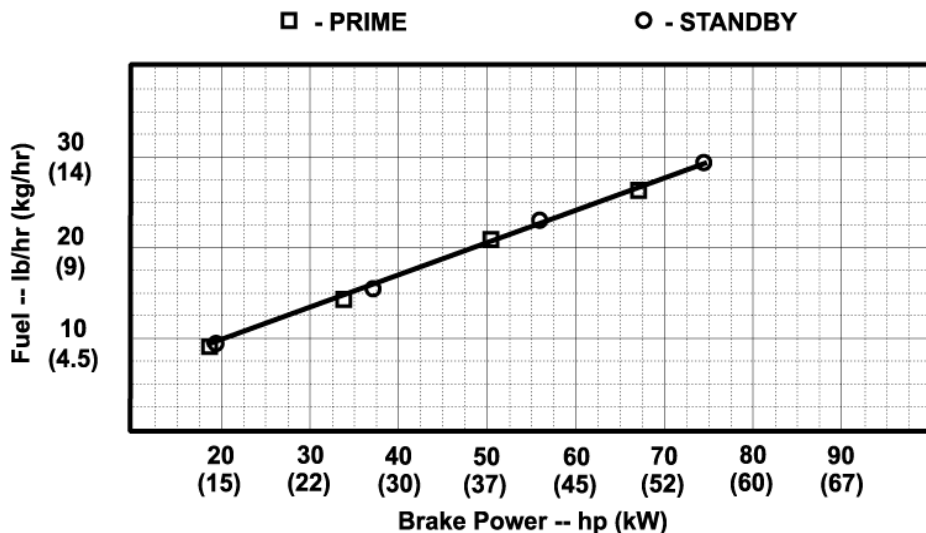
Conversion factors:

- Power: kW = hp x 0.746
- Fuel: 1 gal = 7.1 lb, 1 L = 0.85kg
- Torque: N·m = lb-ft x 1.356

All values are from currently available data and are subject to change without notice.

Notes:

- 1) This Performance Curve provides installation requirements necessary for the engine to emit at its certified emission levels. For additional information necessary to meet applicable regulatory requirements, refer to the John Deere Emissions-related Installation Instructions: https://jdpower.deere.com/psdistrib/engapp/App_Guidelines/AG01.pdf.
- 2) A crankshaft Torsional Vibration Analysis is required on all Gen Set applications.



Designed/Calibrated to meet:	Certified by:
<ul style="list-style-type: none"> • CARB • EPA 	<p><i>Advance Information</i></p>
Ref: Engine Emission Label	

Performance Curve: 4045TF290_B

Engine Installation Criteria

General Data

Model	4045TF290	
Number of Cylinders	4	
Bore	106 mm	4.2 in.
Stroke	127 mm	5.0 in.
Displacement	4.5 L	275 in. ³
Compression Ratio	19.0:1	
Valves per Cylinder, Intake/Exhaust	1 / 1	
Firing Order	1-3-4-2	
Combustion System	Direct Injection	
Engine Type	In-line, 4-Cycle	
Aspiration	Turbocharged	
Engine Crankcase Vent System	Open	

Physical Data

Length	860 mm	33.9 in.
Width	612 mm	24.1 in.
Height	994 mm	39.1 in.
Weight, with oil & no coolant (Includes engine, flywheel housing, flywheel & electrics)	396 kg	873 lb
Center of Gravity Location, X-axis From Rear Face of Block	269 mm	10.6 in.
Center of Gravity Location, Y-axis Right of Crankshaft	-8 mm	-0.3 in.
Center of Gravity Location, Z-axis Above Crankshaft	151 mm	5.9 in.
Max. Allowable Static Bending Moment At Rear Face of Flywheel Housing with 5-G Load	814 N-m	600 lb-ft
Thrust Bearing Load Limit Forward, Intermittent	4003 N	900 lb
Thrust Bearing Load Limit Forward, Continuous	2224 N	500 lb
Thrust Bearing Load Limit Rearward, Intermittent	2000 N	450 lb
Thrust Bearing Load Limit Rearward, Continuous	1000 N	225 lb
Max. Torsional Vibration, Front of Crank	0.25 DDA	

Electrical System

Recommended Battery Capacity, 12V @32 °F (0 °C)	640 amps
Recommended Battery Capacity, 24V @32 °F (0 °C)	570 amps
Starter Rolling Current, 12V @32 °F (0 °C)	780 amps
Starter Rolling Current, 24V @32 °F (0 °C)	600 amps
Starter Rolling Current, 12V @-22 °F (-30 °C)	1000 amps
Starter Rolling Current, 24V @-22 °F (-30 °C)	700 amps
Max. Allowable Start Circuit Resistance, 24V	0.002 Ohm
Max. Allowable Start Circuit Resistance, 12V	0.0012 Ohm
Max. Voltage From Engine to Crankshaft, 12V	0.15 volts
Max. Voltage From Engine to Crankshaft, 24V	0.15 volts

Cooling System

Engine Heat Rejection, Prime	29 kW	1651 BTU/min
Engine Heat Rejection, Standby	31 kW	1765 BTU/min
Coolant Flow	144 L/min	38 gal/min
Thermostat Start to Open	82 °C	180 °F
Thermostat Fully Open	94 °C	201 °F
Engine Coolant Capacity	8.5 Liter	9.0 quart
Min. Pressure Cap	100 kPa	15 psi
Max. Water Pump Inlet Pressure	kPaa	
Min. Pump Inlet Pressure @194°F (90°C) Coolant	kPaa	
Min. Pump Inlet Pressure @203°F (95°C) Coolant	kPaa	
Min. Pump Inlet Pressure @Max. Top Tank Temperature	kPaa	
Min. External Coolant Restriction	kPa	
Max. External Coolant Restriction	kPa	
Max. Top Tank Temperature	110 °C	230 °F
Max. Top Tank Temperature 95% of Operating Hours	°C	
Min. Limiting Ambient Temperature	47 °C	117 °F
Min. Coolant Fill Rate	11 L/min	2.9 gal/min

Performance Curve: 4045TF290_B

Engine Installation Criteria

Exhaust System

Exhaust Flow, Prime	12.0 m ³ /min	424 ft. ³ /min
Exhaust Flow, Standby	12.7 m ³ /min	448 ft. ³ /min
Exhaust Temperature, Prime	506 °C	943 °F
Exhaust Temperature, Standby	537 °C	999 °F
Max. Allowable Exhaust Restriction	7.5 kPa	30 in. H ₂ O
Min. Allowable Exhaust Restriction	0 kPa	0 in. H ₂ O
Max. Bending Moment on Turbo Outlet	7.0 N·m	5.2 lb-ft
Max. Shear on Turbine Outlet	11 kg	24 lb
Exhaust Filter Size		
Min. Mixing Length, Outlet to Exhaust Filter	mm	
Max. Bending Moment on Exhaust Filter Inlet	N·m	
Max. Bending Moment on Exhaust Filter Outlet	N·m	
Max. Exhaust Leakage Rate, Engine to Exhaust Filter @30kPa	L/min	
Max. Temperature Drop, Engine to Exhaust Filter	°C	

Fuel System

Fuel Injection Pump	Stanadyne DB4	
Governor Type	Mechanical	
Total Fuel Flow, Prime	96.0 kg/hr	212 lb/hr
Total Fuel Flow, Standby	96.0 kg/hr	212 lb/hr
Fuel Consumption, Prime	12.1 kg/hr	27 lb/hr
Fuel Consumption, Standby	13.4 kg/hr	30 lb/hr
Min. Fuel Inlet Pressure	kPa	
Max. Fuel Inlet Pressure	20 kPa	80 in. H ₂ O
Max. Fuel Return Pressure	20 kPa	80 in. H ₂ O
Min. Fuel Return Pressure	kPa	
Max. Fuel Inlet Temperature	80 °C	176 °F
Fuel Filter @98% Efficiency	mic	

Lubrication System

Oil Pressure at Rated Speed	345 kPa	50 psi
Oil Pressure at Low Idle	kPa	
Max. In-Pan Oil Temperature	°C	
Max. Oil Carryover in Blow-By	1.0 g/hr	0.002 lb/hr
Max. Airflow in Blow-By	100 L/min	26.4 gal/min
Max. Crankcase Pressure	0.5 kPa	2 in. H ₂ O

Air Intake System

Engine Air Flow, Prime	4.3 m ³ /min	152 ft. ³ /min
Engine Air Flow, Standby	4.5 m ³ /min	159 ft. ³ /min
Intake Manifold Pressure, Prime	48 kPa	7.0 psi
Intake Manifold Pressure, Standby	54 kPa	7.8 psi
Maximum Allowable Temperature Rise, Ambient Air to Engine Inlet	8 Δ°C	15 Δ°F
Max. Air Intake Restriction, Clean Air Cleaner	3 kPa	12.0 in. H ₂ O
Max. Air Intake Restriction, Dirty Air Cleaner	6.25 kPa	25.0 in. H ₂ O
Air Cleaner Efficiency	99.9 %	

Performance Curve: 4045TF290_B

Engine Installation Criteria

Performance Data

Rated Power, Prime	50 kW	67 HP
Rated Power, Standby	55 kW	74 HP
Rated Speed		1800 rpm
Low Idle Speed		1150 rpm
Rated Torque, Prime	265 N·m	195 lb-ft
Rated Torque, Standby	292 N·m	215 lb-ft
BMEP, Prime	737 kPa	107 psi
BMEP, Standby	810 kPa	117 psi
Altitude Capability, Prime	3048 m	10000 ft
Altitude Capability, Standby	3048 m	10000 ft
Friction Power @Rated Speed	13 kW	17 HP
Air:Fuel Ratio, Prime		25.6 : 1
Air:Fuel Ratio, Standby		24.4 : 1
Smoke @Rated Speed Prime		1.8 Bosch No.
Smoke @Rated Speed Standby		2.2 Bosch No.
Noise @1 m Prime		86.0 dB(A)
Noise @1 m Standby		86.3 dB(A)

Fuel Consumption	Prime		Standby	
	lb/hr	kg/h	lb/hr	kg/h
25 % Power	9.0	4.1	9.0	4.1
50 % Power	13.9	6.3	15.2	6.9
75 % Power	20.5	9.3	23.1	10.5
100 % Power	26.7	12.1	29.5	13.4

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