

N45 Tier4b / StageIV

Engine Performance Data Sheet



Industrial Market

Number Cylinders: 4
Displacement: 4.5 L

Aspiration: Turbocharged Charge Air Cooled
Fuel System: Bosch HPCR

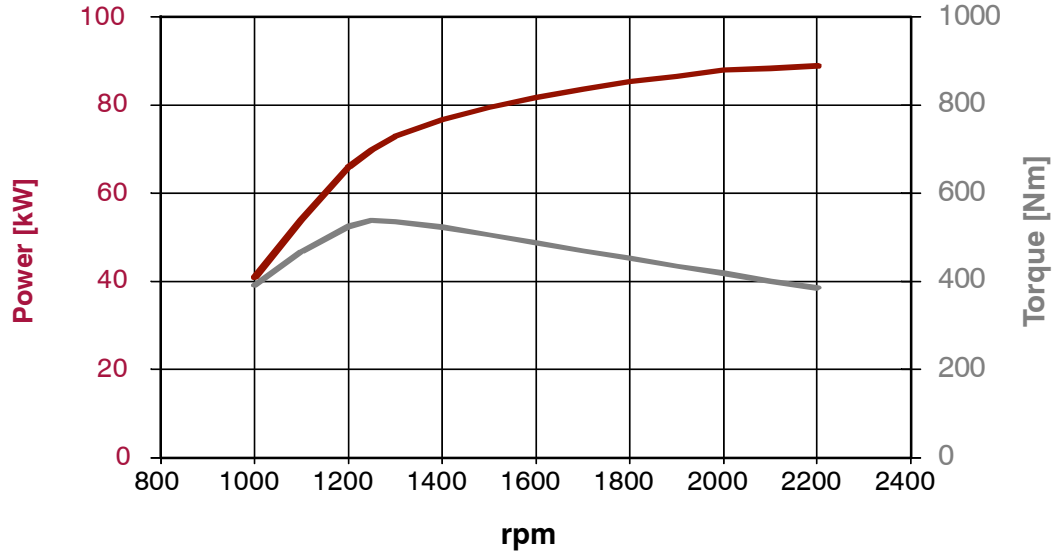
Revision: 39
Data : 30/09/2014

Power : 89 kW @ 2200 rpm

Torque : 539 Nm @ 1250 rpm

Status for curves and data: Approved

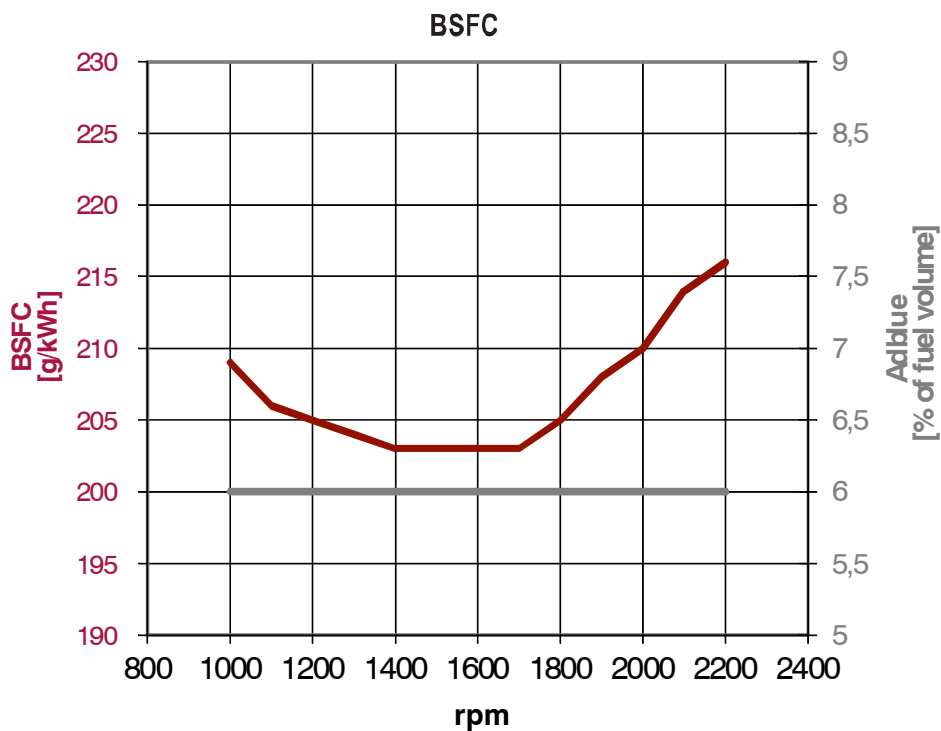
Tolerance on values: ± 5% (N/A for Alpha/Beta/Preliminary Engines)



rpm	Power Output (kW)	Torque Output (Nm)
1000	41	391
1100	54	468
1200	66	525
1250	70	539
1300	73	536
1400	76.8	523
1500	79.5	506
1600	81.8	488
1700	83.7	470
1800	85.4	453
1900	86.6	435
2000	88	419
2100	88.4	401
2200	89	386

Engine Performance data

Rated Power (*)	kW (CV)	89
Rated speed	rpm	2200
Specific Power (rated)	kW/l	19.8
Max Power (peak)	kW (CV)	na
Power speed (peak)	rpm	na
Specific Power (peak)	kW/l	na
BMEP @max Power	bar	11.6
Mean Piston Speed	m/s	9.68
Max Torque	Nm	539
Max Torque speed	rpm	1250
Specific Torque	Nm/l	120
BMEP @ max Torque	bar	15.2
Torque rise	%	40
Torque @ 1000 rpm	Nm	391
Max no load governor speed	rpm	2375±50
Nominal idling speed	rpm	750±100
Best Point BSFC	g/kWh	199
Oil consumption @ rated speed	g/kWh	0.15
Engine brake power @ rated speed	kW	20
Engine brake power in over speed	kW	44



Lubrication System

Min oil pressure @ low idle (engine oil temp at 120°C)	kPa (bar)	60
Min oil pressure @ rated speed (engine oil temp at 120°C)	kPa (bar)	200
Max oil pressure @ rated speed (engine oil temp at 120°C)	kPa (bar)	350

Cooling System

Maximum coolant temperature (engine out) with 100 kPa pressure cap	°C	106
Engine out coolant to ambient @ rated speed	delta °C	na
Engine out coolant to ambient @ torque speed	delta °C	na
Charge air cooler outlet to ambient @ max rpm - CAC dT	delta °C	25
Maximum Air intake Manifold Temperature	°C	75-90

Engine Noise

Full load @ Rated Speed (top rating)	dBA	88.9
No load @ Low Idle	dBA	79.2

Maximum Rating Performance Data (*)

		Rated speed	Max power	Peak Torque
Power output	kW	89	na	71
Torque	Nm	386	na	539
Speed	rpm	2200	na	1250
Ambient Temperature	°C	22	na	22
EGR Rate	%	na	na	na
Frictional torque	Nm	87.4	na	61
Fuel Flow	g/s	5	na	4
Fuel consumption (BSFC)	g/kWh	216	na	204
AdBlue consumption	% fuel Volume	6	na	6
Charge Air Flow	g/s	175	na	96
Exhaust Gas Flow	g/s	179	na	100
EGR flow	g/s	na	na	na
EGR Pressure	kPa	na	na	na
Boost Pressure (compressor outlet)	kPa	145	na	120
Temperature after HP-Compressor	°C	na	na	na
Boost Temperature (includes EGR effect)	°C	148	na	130
Exhaust Gas Temp between HP-TC	°C	na	na	na
Exhaust Gas Temp (after TC)	°C	380	na	520
Power engine coolant without EGR & CAC	kW	na	na	na
Power high Temperature EGR Cooler (engine water)	kW	na	na	na
Power LP-CAC (engine water)	kW	na	na	na
Total Water cooling power of engine	kW	46	na	42
Total Pump water flow	l/s	3.7	na	2.5
Radiator Coolant Flow (**)	l/min	na	na	na
EGR Cooler water flow (for $\Delta T=6^{\circ}C$)	l/s	na	na	na
LP-CAC water flow (for $\Delta T=6^{\circ}C$)	l/s	na	na	na
Power of HP CAC	kW	na	na	na
Total CAC power (air to air)	kW	18.8	na	11.5

(*) Power at flywheel according dir. 97/68 EC (w/o fan), after 50 hours of run-in, tolerance $\pm 3\%$, fuel EN 590; Test according ISO 3046/1, turbo air inlet temperature $25^{\circ}C$, atmospheric pressure 100 kPa, humidity 30 % - According also to DIN 6271, BS 5514, SAE J1349. All data is based on the engine operating with fuel system, water pump, lubricating oil pump with inlet and exhaust restriction at or below Datasheet limits. Accessory loads assumed at 20 N-m across from idle to rated rpm. Fan duty cycle must be lower than 20% Radiator Coolant Flow is approximately 5% less with a continuously deaerating system. Coolant: 50/50 - Ethylene Glycol/Water by volume.

(**) Radiator Coolant Flow is approximately 5% less with a continuously deaerating system. Coolant: 50/50 - Ethylene Glycol/Water by volume.

All data is subject to change without notice

Revision	Description	Date
33	First document release	31/01/2014
34		28/02/2014
35		31/03/2014
37		30/04/2014
38		30/06/2014
38.1		31/07/2014
39		30/09/2014