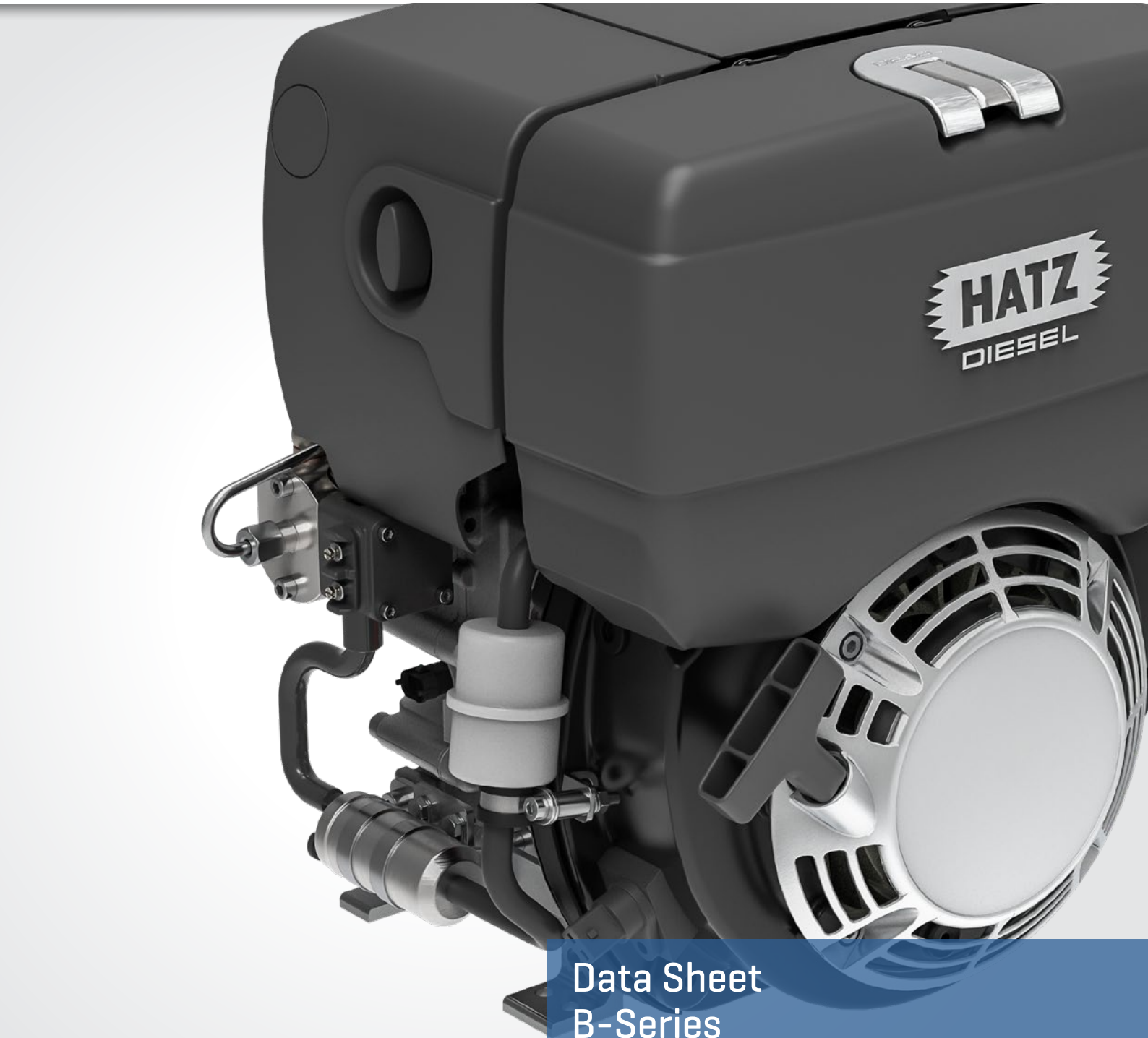
CREATING
POWER
SOLUTIONS



Data Sheet
B-Series
Industrial Diesel Engines

Hatz Drive Solutions

1B30, 1B40, 1B50 Silent
Depending on the engine type the already low noise level can be significantly reduced further, by 2 to 4 decibel (A), by an optional silent noise package, decreased power, and speed. This is possible thanks to optimizations in the area of intake and exhaust components.

First Full Electronic and Full Variable Speed Control < 19 kW
The models 1B30E, 1B30VE and 1B50E being part of the E1 family can be controlled by with standard J1939 CAN protocol – thanks to the ECU controlling the engine. It is also possible to use CAN-Displays to monitor the engine performance.

Hatz B-Series:
Flexible Solution for All Areas

The Hatz B-series scores high marks in mobile and stationary operations with compact installation dimensions and for all applications with a power requirement up to 8 kilowatts due to its low weight. With its robustness and longevity, the series sets standards in the market. Regardless of whether on vibration plates or in the inhospitable environment of the Antarctic, the Hatz B-series has been tried and tested a hundred thousand times in harsh surroundings.

From a mechanical masterpiece to the smart engine
The Single Cam System patented by Hatz essentially determines the very short overall length of the mechanically controlled engines. The injection pump and the valves are operated by a single cam and rocker arms. The Hatz E1 technology, on the other hand, controls the injection electronically. It enters into a fruitful relationship with the core engine of the B-series, which has proven its excellence hundreds of thousands of times. And thus creates completely new possibilities.

Raising digital potentials
The engines can be linked to the Hatz Digital Solutions. These allow key information on machine operation to be integrated into fleet management, thereby enabling machine operators to make better decisions. Also possible: optimization of the machine disposition and maintenance, localization and geofencing, and maximization of machine productivity.

Environmental aspects
All B-series engines have been designed for sustainability and environmental compatibility and undergo continuous development. All engines are produced and sold at the highest possible emission level, even if this is not prescribed in the respective target market. The E1 models fulfill all EPA Tier 4 final as well as EU Stage V requirements, even with variable speed across a wide speed range.

One power train – many variants
Thanks to the intelligent design of the engines, it is possible to offer various displacements based on the same power train. For the customer, this provides many options for making the best possible use of the existing space on a machine. Additionally this saves both time and money for the development and construction of entire machinery series.

Optional silent noise package
Depending on the engine type the current low noise level can be significantly reduced further, by up to 4 decibels (A), by a silent noise package. This is possible thanks to optimizations in the area of intake and exhaust components.

Awards
The engines of the E1 family won the Diesel Progress Award 2019 for the achievement of the year for the development of the ground breaking engine technology. In 2020, the fiPMG products which are based on the 1B30E, 1B30VE and 1B50E won the Diesel Progress Award for New Power Technology of the Year.

1B50E DPF with diesel particulate filter
Although not required by law, Hatz offers the 1B50E engine with an optional passive diesel particulate filter for EU Stage V for defined applications. This makes us the only engine manufacturer to fulfill the strict requirements of the German BG Bau and massively reduces exposure to diesel soot.

IFN Rating F/IFN/ICFN Rating

Sales area Exhaust certificate [rpm]	1B20	1B30*E*	1B30	1B30V*E*	1B40	1B50*E*	1B50
US EPA T4f/CARB constant	–	3000, 3100	–	3100	–	1800, 3000, 3600 [1]	–
US EPA T4f variable	–	3000, 3100, 3600	–	3100	–	3000, 3600	–
Europe EU V constant	3000, 3600	3000, 3100	2950–3000, 3600	3100	3000, 3600	1800, 3000, 3600	1500, 3000
Europe EU V variable	2700–3350	3000, 3100, 3600	2000–3600	3100	2250–3600	3000, 3600	2500–3600
Less regulated	1500–3600	3000, 3600	1500–3600	3100	1500–3600	3000, 3600	1500–3600

[1] EPA only

Technical Data, Performance Table

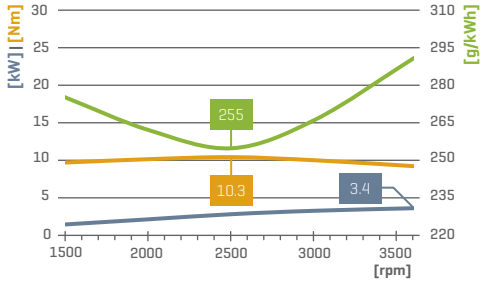
Technical data			1B20	1B30*E*[2]	1B30	1B30V*E*[2]	1B40	1B50*E*[2]	1B50
Engine	Type		Air cooled 4-stroke diesel engine						
	Cylinder		1						
	Direct injection		mechanical	electronical	mechanical	electronical	mechanical	electronical	mechanical
	Position of crank shaft		horizontal	horizontal		vertical	horizontal	horizontal	
	Bore x stroke [mm / in]		69 x 65 / 2.72 x 2.56	80 x 69 / 3.15 x 2.72		80 x 69 / 3.15 x 2.72	88 x 76 / 3.46 x 2.99	93 x 76 / 3.66 x 2.99	
	Displacement [l / cu in]		0.243 / 14.83	0.347 / 21.18		0.347 / 21.18	0.462 / 28.19	0.517 / 31.55	
	Mean piston speed @ 3000 rpm [m/s / ft/min]		6.5 / 1279.53	6.9 / 1358.27		6.9 / 1358.27	7.6 / 1496.06	7.6 / 1496.06	
	Compression ratio		22:1	21.5:1		21.5:1	20.5:1	20.5:1	
	Lubrication oil consumption, related to full load		max. 1 % of fuel consumption						
	Lubrication oil capacity	max. [l / US qts]	0.9 / 0.951	1.1 / 1.162	1.1 / 1.162	1.2 / 1.27	1.5 / 1.528	1.5 / 1.528	1.5 / 1.528
		min. [l / US qts]	0.4 / 0.423	0.6 / 0.634	0.6 / 0.634	0.7 / 0.74	0.7 / 0.739	0.7 / 0.739	0.7 / 0.739
	Speed control	Lowest idle speed [rpm]			approx. 1000			approx. 800	
		Static speed droop @ 3000 rpm	approx. 5 %	configurable	approx. 5 %	configurable	approx. 5 %	configurable	approx. 5 %
		Control method	mechanical	CAN J1939, multi stage switch, analog	mechanical	CAN J1939, multi stage switch, analog	mechanical	CAN J1939, multi stage switch, analog	mechanical
Installation Data	Combustion air required @ 3000 rpm approx. [kg/h / cfm][3]		25.2 / 12.3		37.8 / 18.5		49.8 / 24.3	56.4 / 27.6	
	Cooling air required @ 3000 rpm approx. [kg/h / cfm][3]		306 / 150		432 / 210		528 / 258	552 / 270	
	Starter [V]		12 (1.0 kW / 1.3 hp) | 24 (1.6 kW / 2.1 hp)						
	Alternator charging current @ 3000 / 1500 rpm [A]		14 / 7 (14 V) | 7 / 4 (28 V)						
	Battery capacity min. / max. [Ah]		36 / 55 (12 V) | 24 / 44 (24 V)						
Dimensions	Engine with recoil start [kg / lb]		28.0 / 61.7	–	35.0 / 77.2	–	48.0 / 105.8	–	51.2 / 112.9
	Engine with electric start [kg / lb]		32.8 / 72.3	40.8 / 90.0	39.8 / 87.7	42.8 / 94.4	53.3 / 117.5	57.5 / 126.8	56.5 / 124.6
	L x W x H [mm / in]		292 x 367 x 401 / 11.5 x 14.4 x 15.8	322 x 411 x 431 / 12.7 x 16.2 x 17.0	322 x 404 x 431 / 12.7 x 15.9 x 17.0	398 x 432 x 385 / 15.7 x 17.0 x 15.2	334 x 412 x 480 / 13.1x 16.2 x 18.9	334 x 438 x 480 / 13.1 x 17.2 x 18.9	334 x 412 x 480 / 13.1 x 16.2 x 18.9

Engine output max. [kW / hp]	[rpm]	1B20	1B30*E*[2,5]	1B30	1B30V*E*[2,5]	1B40	1B50*E*[2,5]	1B50
Blocked ISO brake horsepower (IFN) for intermittent loading according to ISO 3046-1. For variable speed.	3600	–	4.5 / 6.0	5.0 / 6.7	–	7.3 / 9.8	7.9 / 10.6 8.1 / 10.9[4]	7.9 / 10.6
	3000	3.1 / 4.2	4.1 / 5.6	4.6 / 6.2	4.1 / 5.6	6.8 / 9.1	7.6 / 10.2	7.6 / 10.2
	2800	2.9 / 3.9	4.0 / 5.3	4.5 / 6.0	4.0 / 5.3	6.6 / 8.9	7.3 / 9.8	7.3 / 9.8
	2600	–	3.8 / 5.1	4.2 / 5.6	3.8 / 5.1	6.3 / 8.4	6.9 / 9.3	6.9 / 9.3
	2300	–	3.5 / 4.7	3.9 / 5.2	3.5 / 4.7	5.7 / 7.6	6.2 / 8.3	–
	2000	–	3.1 / 4.1	3.4 / 4.6	3.1 / 4.1	–	5.3 / 7.1	–
Blocked ISO brake horsepower (IFN) for intermittent loading according to ISO 3046-1. For constant speed.	3600	3.4 / 4.6	4.5 / 6.0	5.0 / 6.7	–	7.3 / 9.8	7.9 / 10.6 8.1 / 10.9[4]	7.9 / 10.6
	3100	–	–	–	4.2 / 5.6	–	–	–
	3000	3.1 / 4.2	4.1 / 5.5	4.6 / 6.2	4.1 / 5.5	6.8 / 9.1	7.6 / 10.2	7.6 / 10.2
	1800	–	–	–	–	–	4.7 / 6.3	–
	1500	–	–	–	–	–	–	–
Blocked ISO brake horsepower (IFN) for intermittent loading according to ISO 3046-1. For variable speed. Less regulated markets	3600	3.4 / 4.6	4.5 / 6.0	5.0 / 6.7	–	7.3 / 9.8	7.9 / 10.6 8.1 / 10.9[4]	7.9 / 10.6
	3000	3.1 / 4.2	4.1 / 5.6	4.6 / 6.2	4.1 / 5.6	6.8 / 9.1	7.6 / 10.2	7.6 / 10.2
	2800	2.9 / 3.9	4.0 / 5.3	4.5 / 6.0	4.0 / 5.3	6.6 / 8.9	7.3 / 9.8	7.3 / 9.8
	2600	2.8 / 3.8	3.8 / 5.1	4.2 / 5.6	3.8 / 5.1	6.3 / 8.4	6.9 / 9.3	6.9 / 9.3
	2300	2.5 / 3.4	3.5 / 4.7	3.9 / 5.2	3.5 / 4.7	5.7 / 7.6	6.2 / 8.3	6.2 / 8.3
	2000	2.1 / 2.8	3.1 / 4.1	3.4 / 4.6	3.1 / 4.1	4.9 / 6.6	5.3 / 7.1	5.3 / 7.1
	1800	1.9 / 2.5	2.7 / 3.6	3.0 / 4.0	2.7 / 3.6	4.4 / 5.9	4.7 / 6.3	4.7 / 6.3
	1500	1.5 / 2.0	2.1 / 2.8	2.3 / 3.1	2.1 / 2.8	3.5 / 4.7	3.9 / 5.2	3.9 / 5.2

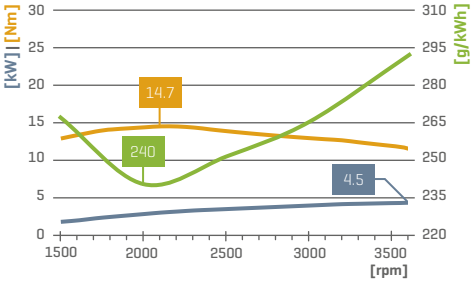
[2] Performance data ICFN [3] For other rpm there is a linear reduction in the air requirement. [4] EU Stage V only [5] Power ratings include generator power

Maximum Power Output, Torque and Fuel Consumption

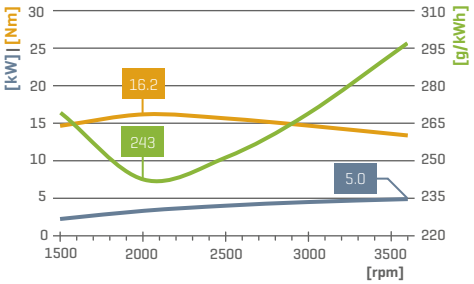
1B20



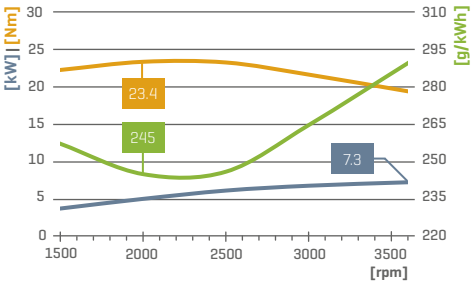
1B30$E^{2,5}$ | 1B30V$E^{2,5}$



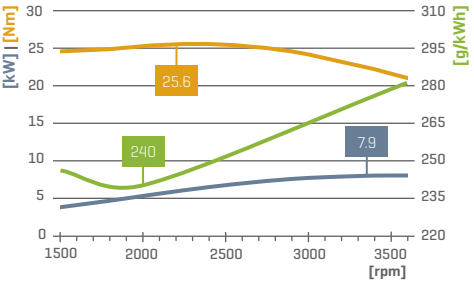
1B30



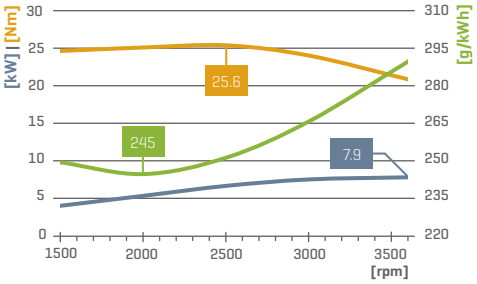
1B40



1B50$E^{2,5}$



1B50



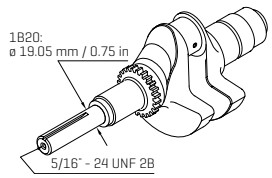
Performance data
Performance data refer to Standard Reference Conditions of ISO 3046-1 (IFN): + 25 °C (77 °F), 100 kPa, relative humidity 30 %.
During running-in period the output increases by approx. 5 % which is taken into consideration at delivery. Power reduction acc. to ISO 3046-1. Standard values: Above 100 m ALT approx. 1 % per 100 m. Above 25 °C (77 °F) approx. 4 % per 10 °C (50 °F). The power taken from charging alternator also has to be added to the demand of power.

Shaft Forms

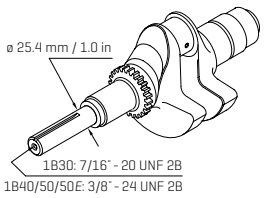
Selection of available shaft forms

Cylindrical with key way

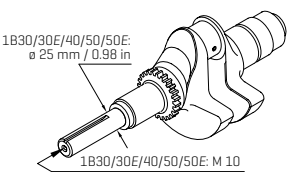
"7" Cyl. 3/4"



"2" [6]

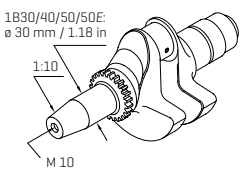


"9" Cyl. [5]

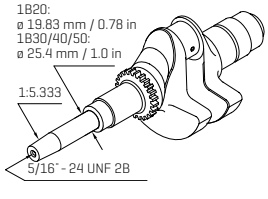


Conical

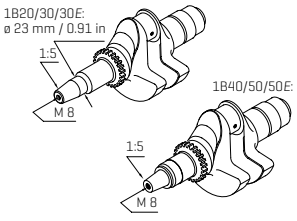
"3" [5]



"4" SAE Gen. [6]

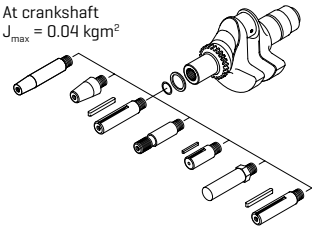


"6" ital.



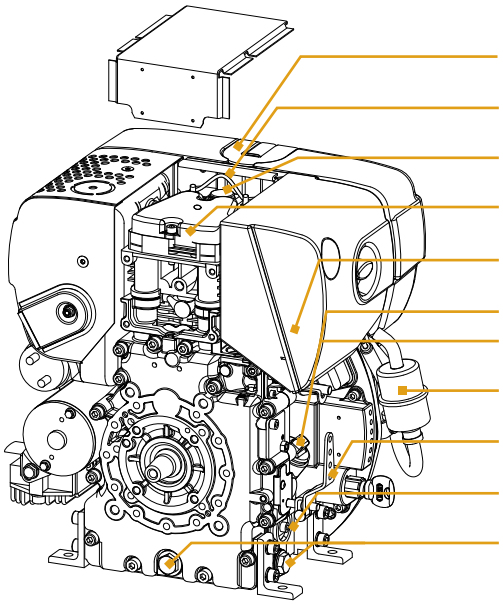
Universal

X crank shaft

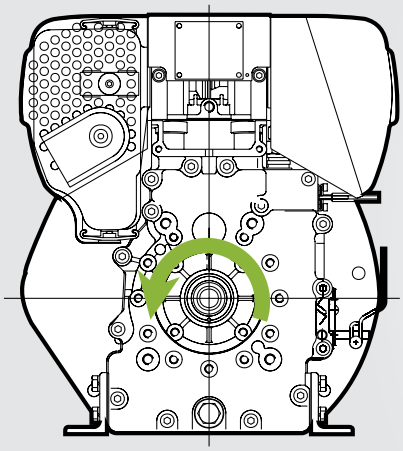


[6] According to LEMA LES 1203-1991 [7] Only for mechanically controlled engine types

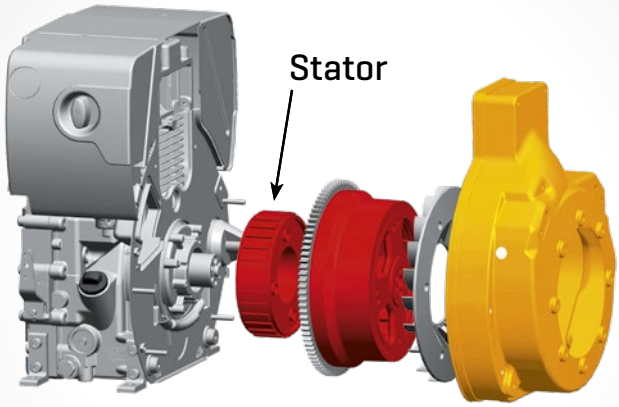
Maintenance and Operating Points



Power-Take-off Points

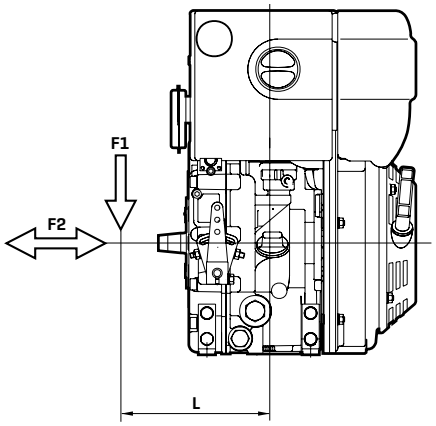


Power-take-off shaft, governor side, with max. engine speed, sense of rotation anti-clockwise.



A permanent magnet alternator from 2 to 7 kW can be mounted on the flywheel side.

Permissible Load on Power-Take-off Points



1B20 / 1B30*E* / 1B30

max. permissible radial force

$$F1 = \frac{60\,000}{L\,[mm] - 70}\ [N]$$

max. permissible axial force

F2 = 800 [N]

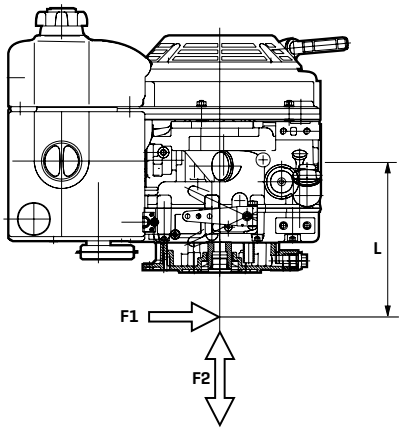
1B40 / 1B50*E* / 1B50

max. permissible radial force

$$F1 = \frac{62\,600}{L\,[mm] - 84}\ [N]$$

max. permissible axial force

F2 = 1200 [N]

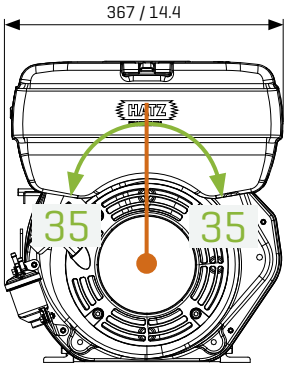


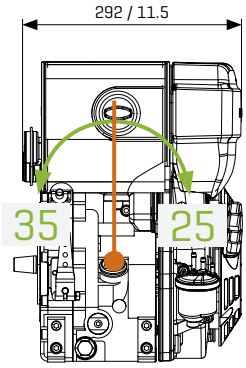
[8] Only for electronically controlled engines [9] Only for mechanically controlled engine types

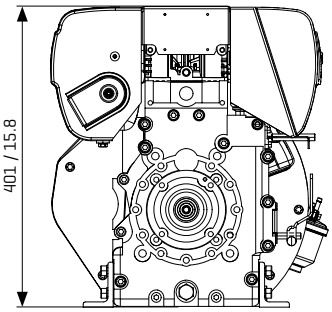
Dimensions [mm / in] and Inclinations[10] [°]

Spread at box dimensions ± 3 millimeters due to tolerance.
Drawings with detail and connection dimensions as PDF and DXF can be found at hatz.com.

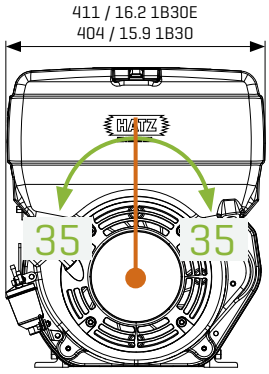
1B20

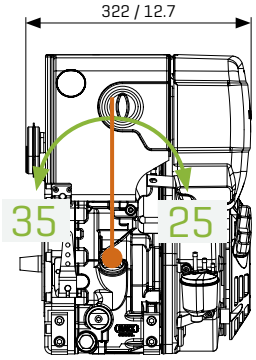


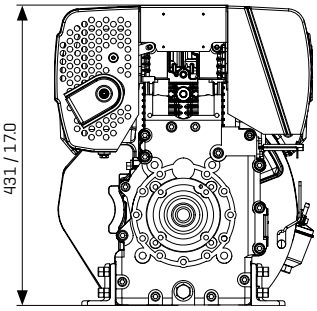




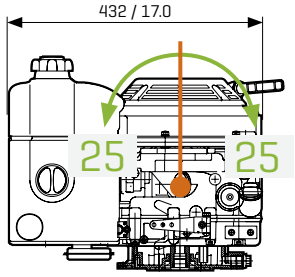
1B30*E* | 1B30

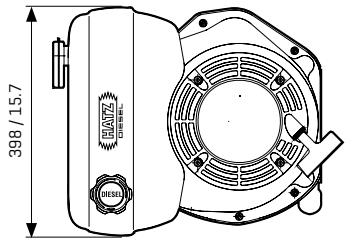


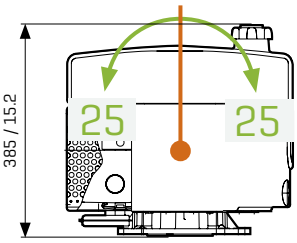




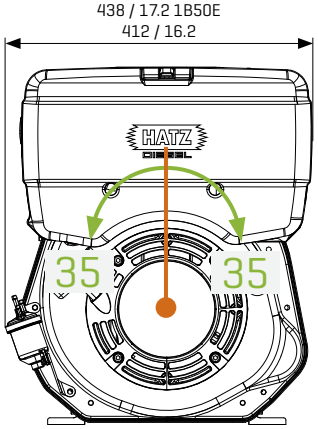
1B30V*E*

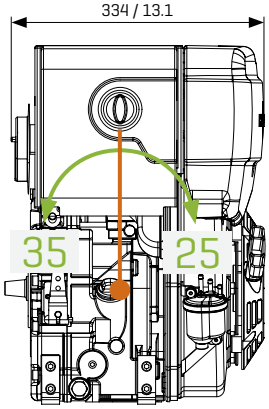


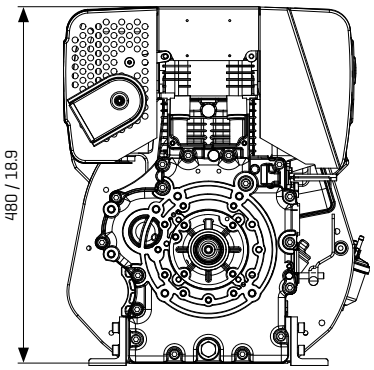




1B40 | 1B50*E* | 1B50







[10] Maximum permanent inclined positions

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HATZ

CREATING POWER SOLUTIONS

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