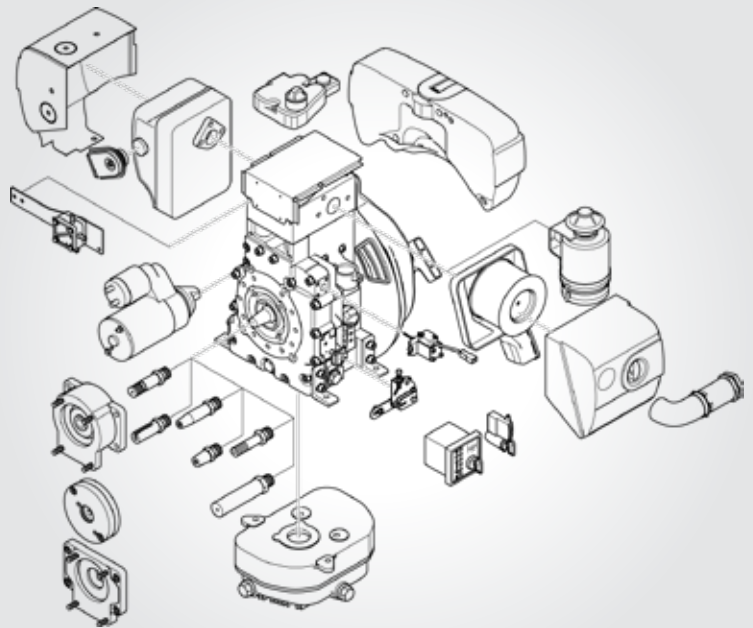


CREATING POWER SOLUTIONS.



1B20
1B30
1B40
1B50

Hatz diesel engines | data sheet



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 optimisations in the area of intake and exhaust components.

Flexibility through additional equipment

The Hatz B-series can be fully customised to the needs of the customer with an almost endless list of accessory parts. Among other things, there are six different output shafts for each type, an electric start with 12 or 24 V as well as various options for fuel tanks and filters, to name but the most important ones.

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.

Environmental aspects

At Hatz protection of the environment is regarded as a key component of the company objectives. For example, the B-series engines have been exclusively produced and marketed for many years in accordance to the specification of the EPA Tier 4 exhaust directive, even in countries where no limits are imposed on exhaust emission. That is why the engines will fulfill the requirements of EU Stage V as well.

One power train – many variants

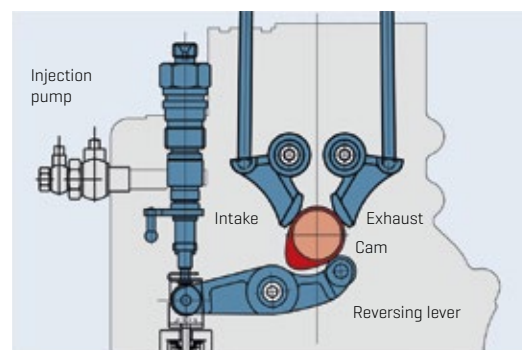
Thanks to the intelligent design of the engines, it is possible to offer various displacements based on the same power train. For the customer, this provides many options for making the best possible use of the existing space on a machine. Additionally this saves both time and money for the development 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 noise package. This is possible thanks to optimisations in the area of intake and exhaust components.

SCS (Single Cam System)

One of the numerous innovations of the B-series is the single cam system, where the injection pump and the two valves are operated by just one cam and rocker arm. This design detail, for which Hatz has applied for a patent, substantially determines the very short overall length of the engine. In addition, the camshaft is driven via a gear wheel which is, at the same time, a component and drive of the oil pump.



Award

The Hatz B-series has been honored with the EUROMOT innovation prize for optimum carburation and emission quality.

Sales area [Exhaust certificate]		IFN Rating ICFN Rating F/IFN/ICFN Rating			
		1B20	1B30	1B40	1B50
USA [EPA/CARB constant speed]	[rpm]	2250-3000	1800,2500-3600	2250-3300	2600-3600
USA [EPA 2-Speed]	[rpm]	2250-3600	2500-3600	2250-3600	2500-3000
USA [EPA variable speed]	[rpm]	2600-3000	2500-3000	—	2500-3600
All others [Non-EPA]	[rpm]	1500-3600	1500-3600	1500-3600	1500-3600

Technical data, performance table

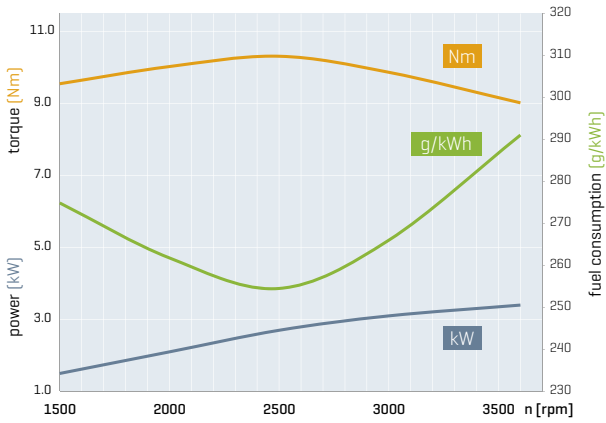
Technical data		1B20	1B30	1B40	1B50	
Type		Air cooled 4-stroke diesel engine				
Cylinder		1				
Injection system		Direct injection				
Position of crank shaft		horizontal	horizontal	horizontal	horizontal	
Exhaust aftertreatment only US EPA Tier 4 final		—	DOC	DOC	DOC	
Bore x stroke [mm / in]		69 x 65 / 2.72 x 2.56	80 x 69 / 3.15 x 2.72	88 x 76 / 3.46 x 2.99	93 x 76 / 3.66 x 2.99	
Engine	Displacement [l / cu in]	0.243 / 0.015	0.347 / 0.021	0.462 / 0.028	0.517 / 0.032	
	Mean piston speed @ 3000 rpm [m/s / ft/min]	6.5 / 1279.53	6.9 / 1358.27	7.6 / 1496.06	7.6 / 1496.06	
	Compression ratio	22:1	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	1.5 / 1.528	1.5 / 1.528
		min. [l / US qts]	0.4 / 0.423	0.6 / 0.634	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 %			
	Installation Data	Combustion air required @ 3000 rpm approx. [kg/h / cfm] ¹	0.42 / 0.21	0.63 / 0.31	0.83 / 0.41	0.94 / 0.46
		Cooling air required @ 3000 rpm approx. [kg/h / cfm] ¹	5.1 / 2.5	7.2 / 3.5	8.8 / 4.3	9.2 / 4.5
Starter [V]		12 [1.0 kW / 1.341 hp] 24 [1.6 kW / 2.146 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 / 61.73	35.0 / 77.16	48.0 / 105.82	51.2 / 112.88	
	Engine with electric start 12 V or 24 V [kg / lb]	32.8 / 72.31	39.8 / 87.74	53.3 / 117.51	56.5 / 124.56	
	L x W x H [mm / in]	304 x 361 x 401 / 11.9 x 14.2 x 15.8	331 x 370 x 430 / 13.0 x 14.6 x 16.9	348.5 x 392 x 480 / 13.7 x 15.4 x 18.9	347 x 392 x 480 / 13.7 x 15.4 x 18.9	

Engine output max. [kW / hp] ² [rpm]		1B20	1B30	1B40	1B50
Vehicle output acc. to DIN ISO 1585.	3600	3.5 / 4.7	5.4 / 7.3	7.5 / 10.2	8.5 / 11.6
	3000	3.1 / 4.2	5.0 / 6.8	7.1 / 9.7	8.0 / 10.9
	2600	2.8 / 3.8	4.6 / 6.3	6.6 / 9.0	7.4 / 10.1
	2300	2.5 / 3.4	4.1 / 5.6	6.0 / 8.2	6.6 / 9.0
	2000	2.2 / 3.0	3.6 / 4.9	5.2 / 7.2	5.7 / 7.8
	1800	1.9 / 2.6	3.3 / 4.5	4.6 / 6.3	5.1 / 6.9
	1500	1.6 / 2.2	2.6 / 3.5	3.8 / 5.2	4.2 / 5.7
ISO net brake fuel stop power [IFN] for strong intermittent load acc. to ISO 3046-1. EPA 2-Speed	3600	3.4 / 4.6	5.0 / 6.8	7.3 / 9.9	7.9 / 10.7
	3000	3.1 / 4.2	4.6 / 6.3	6.8 / 9.2	7.6 / 10.3
	2600	2.8 / 3.8	4.2 / 5.7	6.3 / 8.6	6.9 / 9.4
	2300	2.5 / 3.4	3.9 / 5.3	5.7 / 7.8	6.2 / 8.4
	2000	2.1 / 2.9	3.4 / 4.6	4.9 / 6.7	5.3 / 7.2
	1800	1.9 / 2.6	3.0 / 4.1	4.4 / 6.0	4.7 / 6.4
	1500	1.5 / 2.0	2.3 / 3.1	3.5 / 4.8	3.9 / 5.3
ISO-standard power [ICXN] [10% overload permissible] EPA variable speed; EPA constant speed	3600	3.1 / 4.2	4.5 / 6.1	6.5 / 8.8	7.1 / 9.7
	3000	2.8 / 3.8	4.2 / 5.7	6.1 / 8.8	6.8 / 9.2
	2600	2.5 / 3.4	3.8 / 5.2	5.6 / 7.6	6.2 / 8.4
	2300	2.2 / 3.0	3.5 / 4.8	5.1 / 6.9	5.5 / 7.5
	2000	1.9 / 2.6	3.1 / 4.2	4.4 / 6.0	4.8 / 6.5
	1800	1.7 / 2.3	2.7 / 3.7	3.9 / 5.3	4.2 / 5.7
	1500	1.4 / 1.9	2.1 / 2.9	3.2 / 4.4	3.5 / 4.8

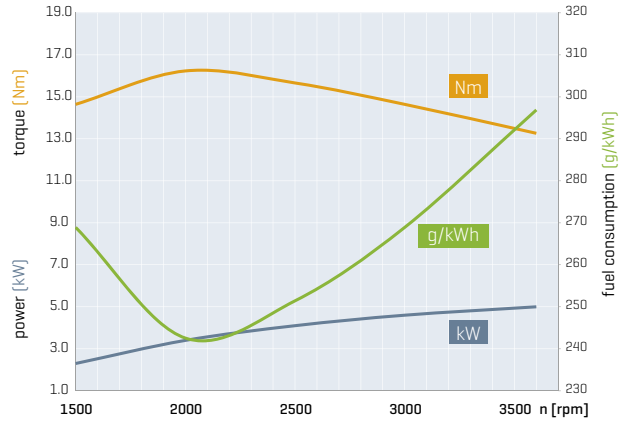
¹ For other rpm there is a linear reduction in the air requirement. ² Performance data for EPA Tier 4 final and CARB on request.

Power output, torque und fuel consumption

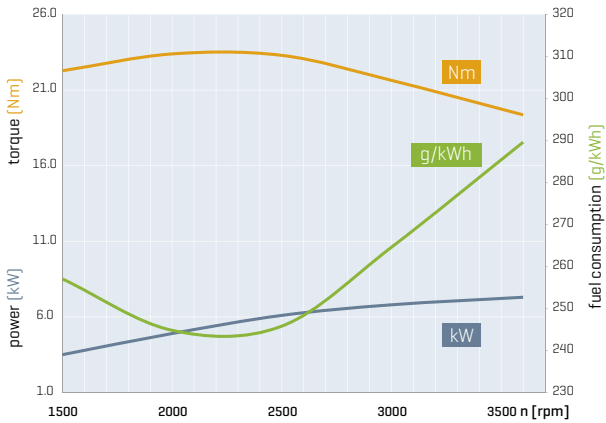
1B20



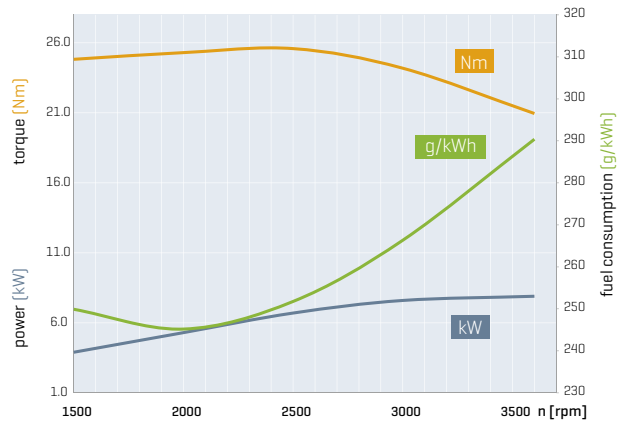
1B30



1B40



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.

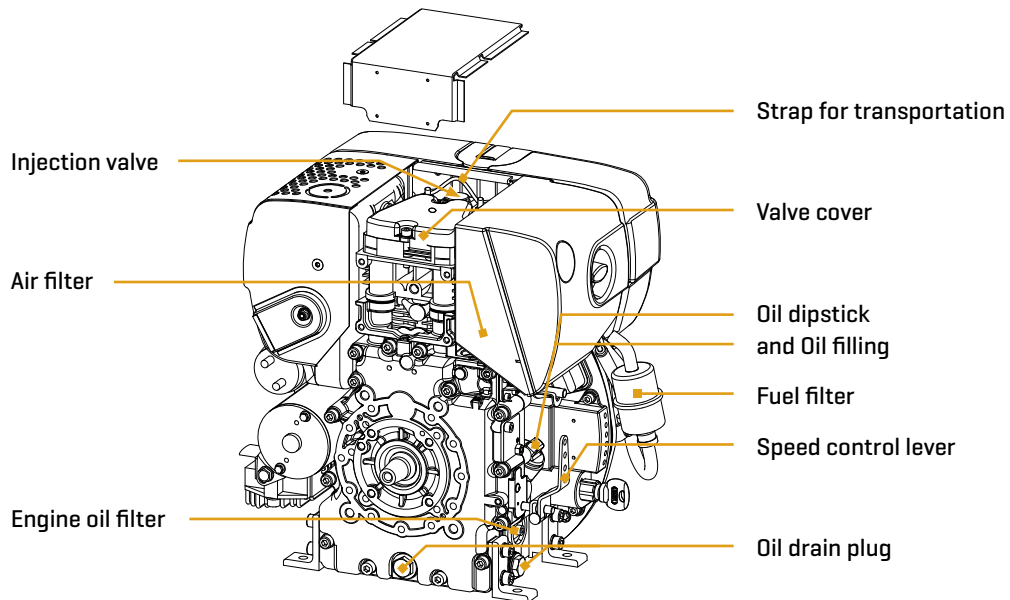
Shaft forms

Selection of available shaft forms

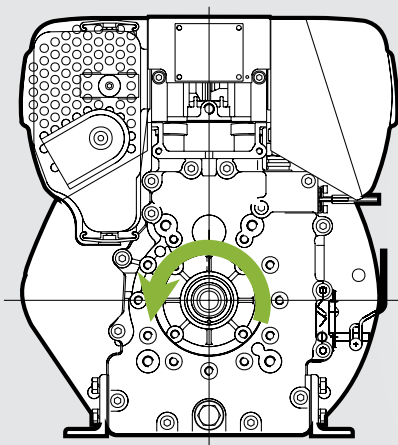
	"7" Cyl. 3/4" ³	"2" ³	"9" Cyl. ⁴
Cylindrical with key way	<p>1B20: ø 19.05 mm / 0.75 in 5/16" - 24 UNF 2B</p>	<p>ø 25.4 mm / 1.0 in 1B30: 7/16" - 20 UNF 2B 1B40/50: 3/8" - 24 UNF 2B</p>	<p>1B20: ø 20 mm / 0.79 in 1B30/1B40/1B50: ø 25 mm / 0.98 in 1B20: M 8 1B30/40/50: M 10</p>
Conical	<p>1B20: ø 25 mm / 0.98 in 1B30/40/50: ø 30 mm / 1.18 in 1B20: 1:5 1:10 M 10 1B20: M 8</p>	<p>1B20: ø 19.83 mm / 0.78 in 1B30/40/50: ø 25.4 mm / 1.0 in 1:5.333 5/16" - 24 UNF 2B</p>	<p>1B20/30: ø 23 mm / 0.91 in 1.5 M 8 1B40/50: 1.5 M 8</p>
Universal	<p>At crankshaft J_{max} = 0.04 kgm²</p>		

³ according to SAE J 609 ⁴ according to LEMA LES 1203-1991

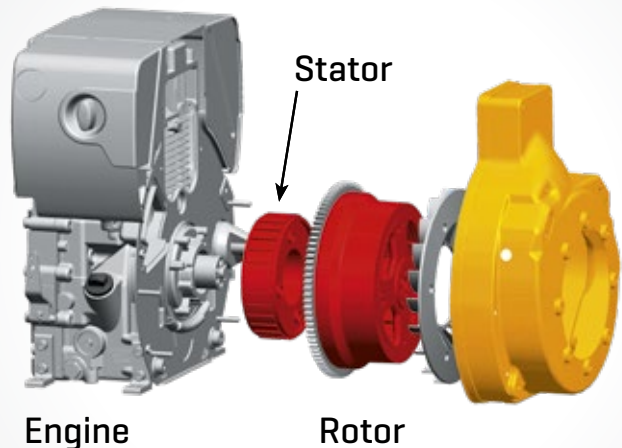
Maintenance and operating points



Power-take-off points



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



Engine

Rotor

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

Permissible load on power-take-off points

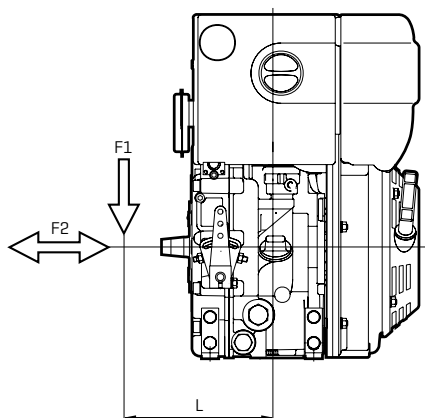
1B20 / 1B30

max. permissible radial force

$$F_1 = \frac{60\,000}{L \text{ [mm]} - 70} \text{ N}$$

max. permissible axial force

$$F_2 = 800 \text{ N}$$



1B40 / 1B50

max. permissible radial force

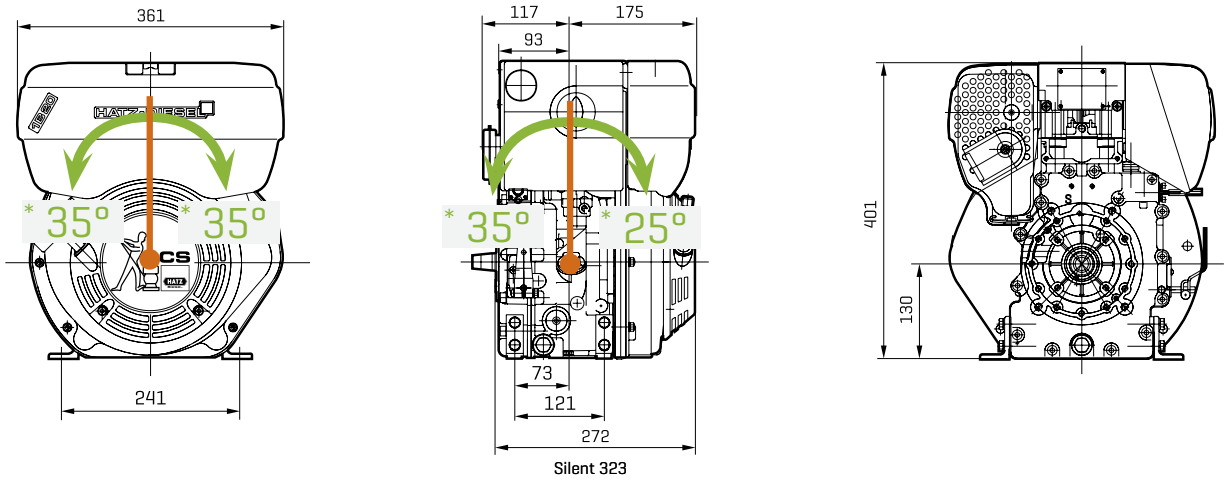
$$F_1 = \frac{62\,600}{L \text{ [mm]} - 84} \text{ N}$$

max. permissible axial force

$$F_2 = 1200 \text{ N}$$

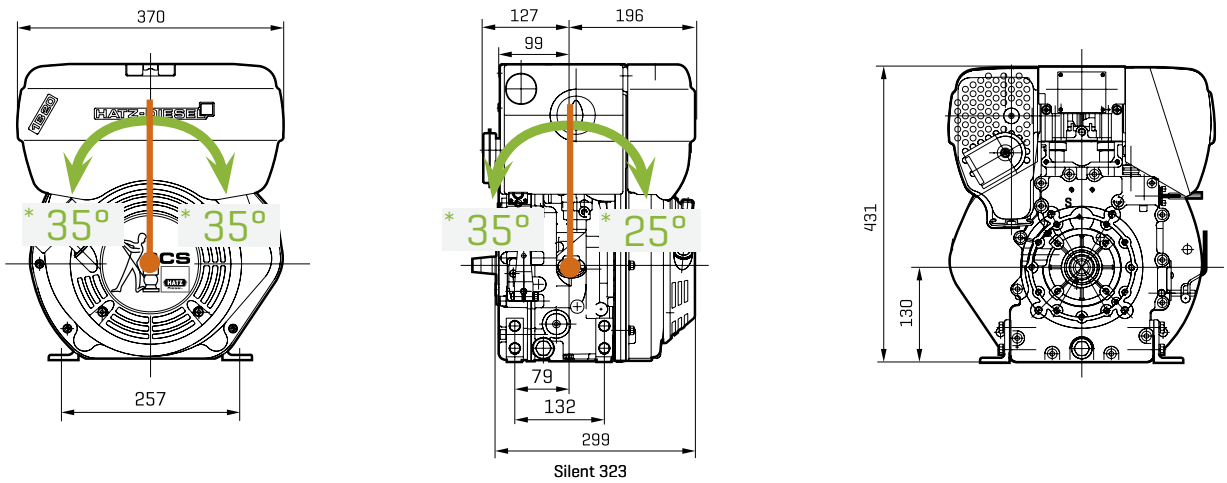
Dimensions [mm]

1B20



Silent 323

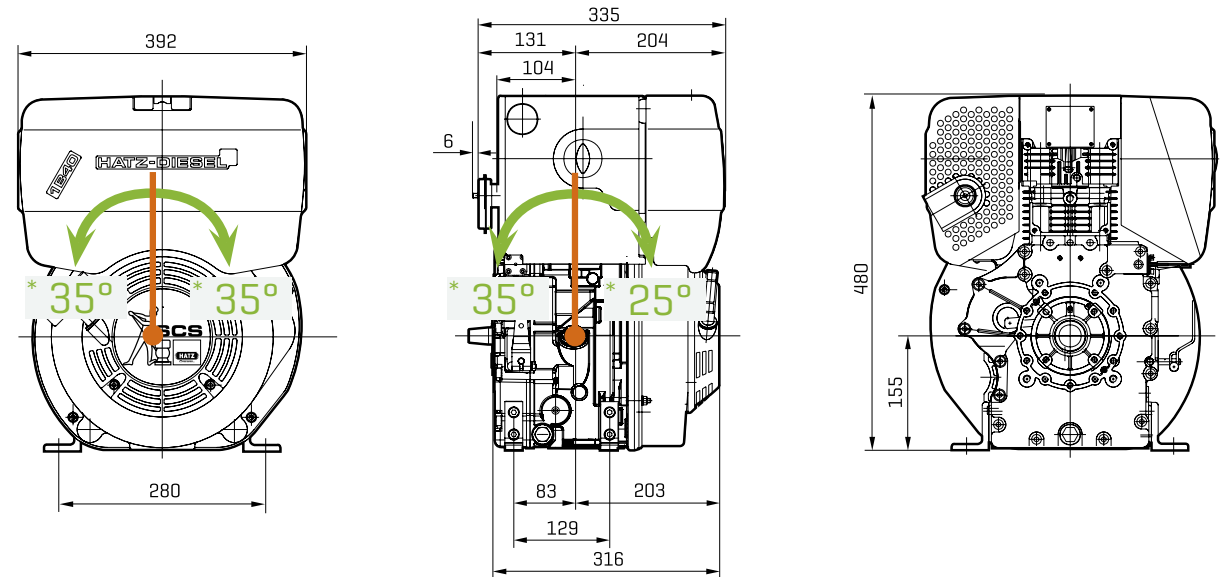
1B30



Silent 323

1B40

1B50



Spread at outlines ± 3 mm due to tolerance.

Drawings with detail and connection measures as PDF resp. DXF are shown under www.hatz-diesel.com.

* max. permanent tilting

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