

Motorenfabrik Hatz GmbH & Co. KG  
Ernst-Hatz-Str. 16  
94099 Ruhstorf a.d. Rott  
Germany  
Phone +49 8531 319-0  
Fax +49 8531 319-418  
marketing@hatz-diesel.de  
www.hatz-diesel.com



1B20 | 1B20V  
1B27  
1B30 | 1B30V  
1B40 | 1B40V  
1B50 | 1B50V

Hatz Diesel

000070252829 E-03.13-1.5 Printed in Germany  
We reserve the right to make all changes that  
serve technical development.

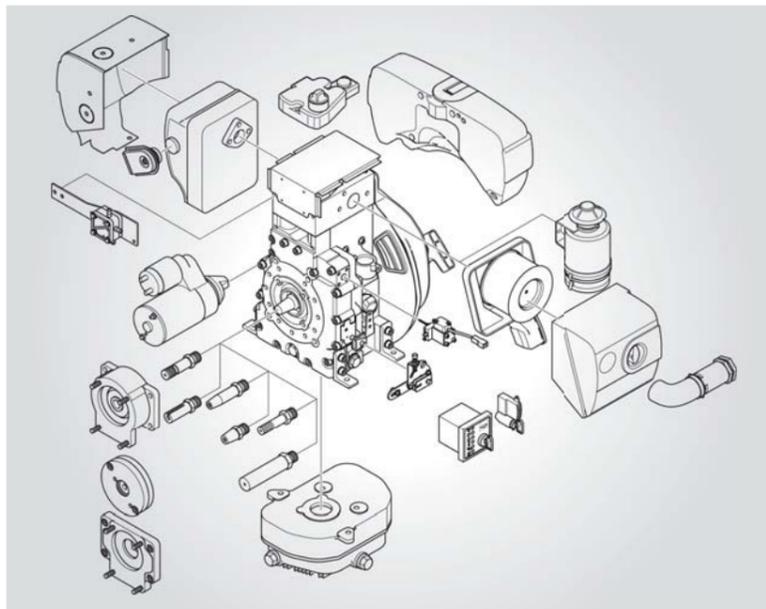


CREATING POWER SOLUTIONS.



**1B20V / 1B30V / 1B40V / 1B50V**

As the only engine manufacturer worldwide, Hatz offers a diesel series with vertical crankshaft. For many applications, such as the prime example of the lawnmower, this design provides major advantages and significantly simplifies installation.



**Flexibility through additional equipment**

The B-series can be fully customized 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 kW 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 B-series has been tried and tested a hundred thousand times in harsh surroundings.

**Environmental aspects**

In our company protection of the environment is regarded as a key component of the company objectives. For example, the B-series engines are exclusively produced and marketed to the specification of the strict EPA Tier IV exhaust directive, even in countries where no limits are imposed on exhaust emission.

**One power train – many variants**

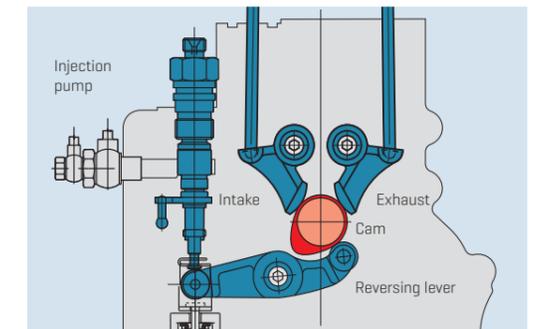
Thanks to the intelligent design of the engines, not only is it possible to offer various displacements based on the same power train but we have also succeeded in bringing the entire series as vertical engines (engine with vertical crankshaft and horizontal cylinder) with the same basic power train onto the market. For the customer, this provides many options for making the best possible use of the existing space on a machine, either height-optimized with the vertical engine, or with the conventional engine with optimum base area.

**Optional noise package**

Depending on the engine type the current low noise level can be significantly reduced further, even by 2 to 4 dB(A), by a noise package, decreased power and speed. This is possible thanks to optimizations 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 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 1B20V	1B27	1B30 1B30V	1B40 1B40V	1B50 1B50V
USA [EPA/CARB constant speed]	[r.p.m.]	2250-3000	-	2500-3600	2250-3300	3000-3600
USA [EPA 2-Speed]	[r.p.m.]	2250-3600	2850-3600	2500-3600	2250-3600	2500-3600
USA [EPA variable speed]	[r.p.m.]	2900-3600	-	2500-3600	2500-3600	2500-3600
All others (Non-Epa)	[r.p.m.]	1500-3600	1500-3600	1500-3600	1500-3600	1500-3600

# Technical data, Performance Table

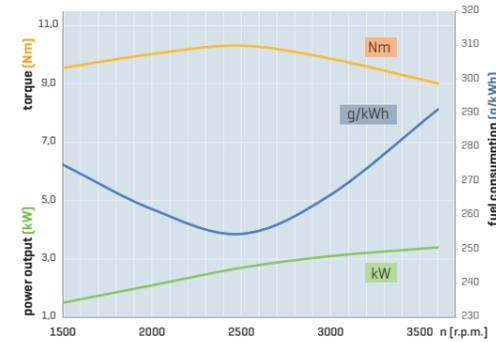
Technical data		1B20 / 1B20V	1B27	1B30 / 1B30V	1B40 / 1B40V	1B50 / 1B50V
Type Air cooled single cylinder 4-stroke diesel engine with direct injection, horizontal crankshaft [variant V with vertical crankshaft]						
Bore x stroke (mm / inches)		69 x 65 / 2.72 x 2.56	74 x 65 / 2.91 x 2.56	80 x 69 / 3.15 x 2.72	88 x 76 / 3.46 x 2.99	93 x 76 / 3.66 x 2.99
Displacement (l / cu.in.)		0.243 / 14.82	0.280 / 17.09	0.347 / 21.18	0.462 / 28.19	0.517 / 31.55
Mean piston speed at 3000 r.p.m. (m/s / ft/min)		6.5 / 1280		6.9 / 1358	7.6 / 1496	
Compression ratio		22 : 1	21.5 : 1	21.5 : 1	20.5 : 1	20.5 : 1
Lub. oil consumption, related to full load		max. 1 % of fuel consumption				
Lub. oil capacity max - min (l / US qts)		0.9 - 0.4 / 0.95 - 0.42		1.1 - 0.6 / 1.16 - 0.63	1.5 - 0.7 / 1.59 - 0.74	
Speed control						
· Idle speed		approx. 1000 r.p.m.				approx. 800 r.p.m.
· static speed droop		approx. 5% at 3000 r.p.m.				
Combustion air required at 3000 r.p.m. approx. <sup>1)</sup> (m <sup>3</sup> /min / cu.ft./min)		0.35 / 12	0.42 / 15	0.52 / 18	0.69 / 24	0.78 / 28
Cooling air required at 3000 r.p.m. approx. <sup>1)</sup> (m <sup>3</sup> /min / cu.ft./min)		4.2 / 148	4.2 / 148	6.0 / 212	7.3 / 257	7.6 / 268
Starter		12 V - 1.0 kW — 24 V - 1.6 kW				
Alternator charging current at 3000/1500 r.p.m.		14 V - 14 A / 7 A — 28 V - 10 A / 5 A				
Battery capacity (min / max Ah)		12 V - 36 / 60 Ah — 24 V - 24 / 44 Ah				
Weight	Engine with recoil start (kg / lbs.)	standard 28.0 / 61.7 V-Version 30.0 / 66.1	29.0 / 63.9 —	35.0 / 77.1 37.0 / 81.6	48.0 / 105.8 —	51.2 / 112.9 —
	Engine with electric start 12 V or 24 V (kg / lbs.)	standard 32.8 / 72.2 V-Version 34.8 / 76.7	33.8 / 74.5 —	39.8 / 87.7 41.8 / 92.1	53.3 / 117.5 55.3 / 121.9	56.5 / 124.6 58.5 / 128.9

<sup>1)</sup> For other r.p.m. there is a linear reduction in the air requirement

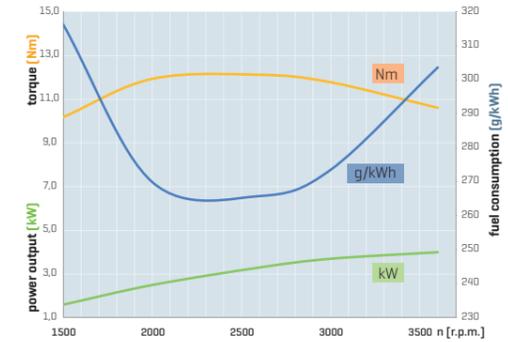
Performance table	(r.p.m.)	1B20 / 1B20V	1B27	1B30 / 1B30V	1B40 / 1B40V	1B50 / 1B50V
Vehicle output acc. to DIN ISO 1585. (kW / HP)	3600	3.5 / 4.8	— / —	5.4 / 7.3	7.5 / 10.2	8.5 / 11.6
	3000	3.1 / 4.2	— / —	5.0 / 6.8	7.1 / 9.7	8.0 / 10.9
	2600	2.8 / 3.8	— / —	4.6 / 6.3	6.6 / 9.0	7.4 / 10.1
	2300	2.5 / 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. (kW / HP)	3600	3.4 / 4.6	4.0 / 5.4	5.0 / 6.8	7.3 / 9.9	7.9 / 10.7
	3000	3.1 / 4.2	3.7 / 5.0	4.6 / 6.3	6.8 / 9.2	7.6 / 10.3
	2600	2.8 / 3.8	3.4 / 4.6	4.2 / 5.7	6.3 / 8.6	6.9 / 9.4
	2300	2.5 / 3.4	3.0 / 4.1	3.9 / 5.3	5.7 / 7.8	6.2 / 8.4
	2000	2.1 / 2.9	2.5 / 3.4	3.4 / 4.6	4.9 / 6.7	5.3 / 7.2
	1800	1.9 / 2.6	2.2 / 3.0	3.0 / 4.1	4.4 / 6.0	4.7 / 6.4
1500	1.5 / 2.0	1.6 / 2.2	2.3 / 3.1	3.5 / 4.8	3.9 / 5.3	
ISO-standard power (ICFN) [10% overload permissible]. (kW / HP)	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	
EPA variable speed; EPA constant speed	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
ISO-standard fuel stop power (no overload permissible) acc. to ISO 3046-1. For constant speed and constant load [ICFN].	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

# Power output, torque und fuel consumption

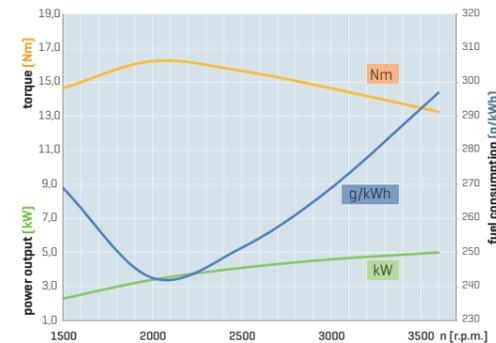
## 1B20 and 1B20V



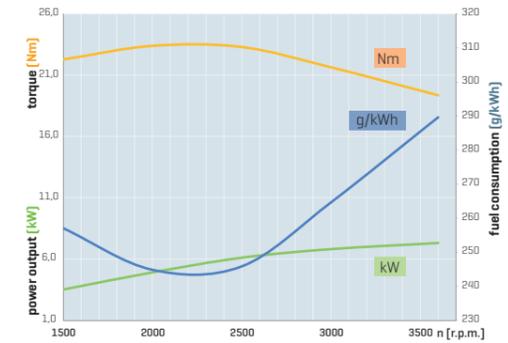
## 1B27



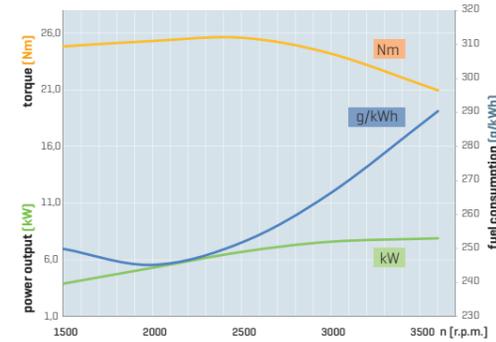
## 1B30 and 1B30V



## 1B40 and 1B40V



## 1B50 and 1B50V



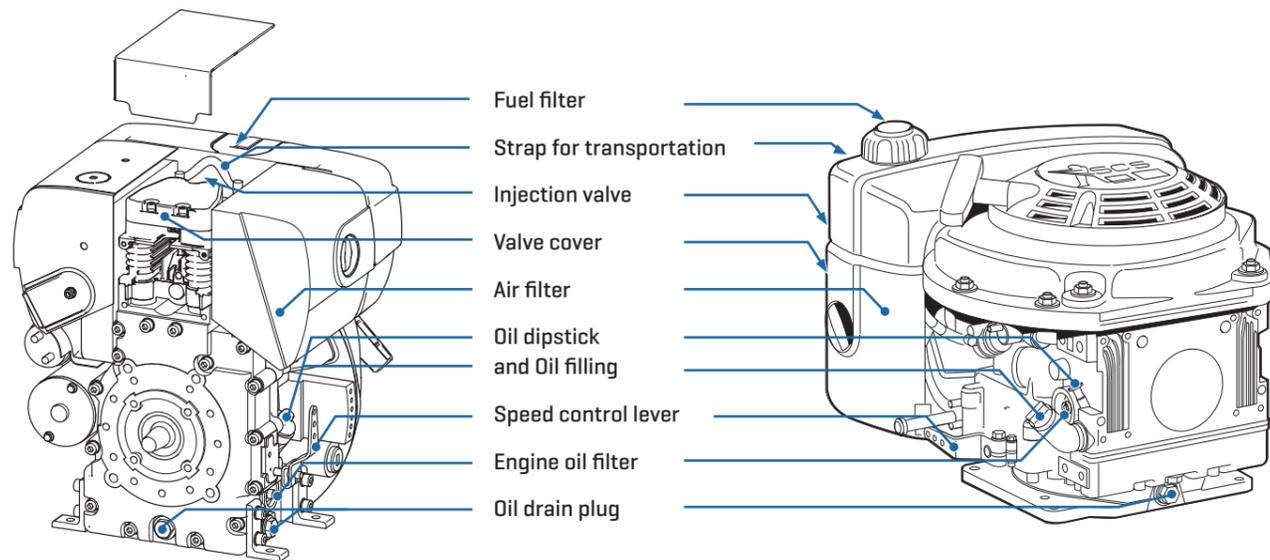
**Performance data**  
Performance data refer to Standard Reference Conditions of ISO 3046-1 (IFN):  
+ 25 °C (77 °F), 100 kPa, relative humidity 30 %.  
During running-in period the output increases by approx. 5 % which is taken into consideration at delivery. Power reduction acc. to ISO 3046-1.  
Standard 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

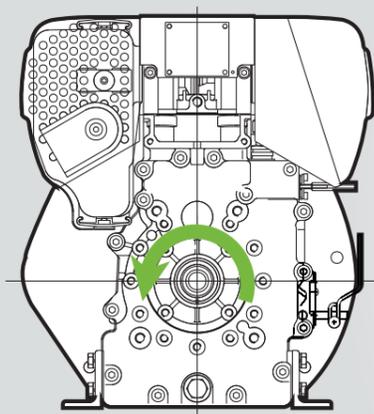
Selection of available shaft forms <sup>1)</sup> according to SAE J 609 <sup>2)</sup> according to LEMA LES 1203-1991

	"7" Cyl. 3/4" <sup>1)</sup>	"2" <sup>1)</sup>	"9" Cyl. <sup>2)</sup>	"1" <sup>1)</sup>	"5" <sup>2)</sup>
<b>Cylindrical with key way</b>					
<b>Conical</b>					
<b>Universal</b>					

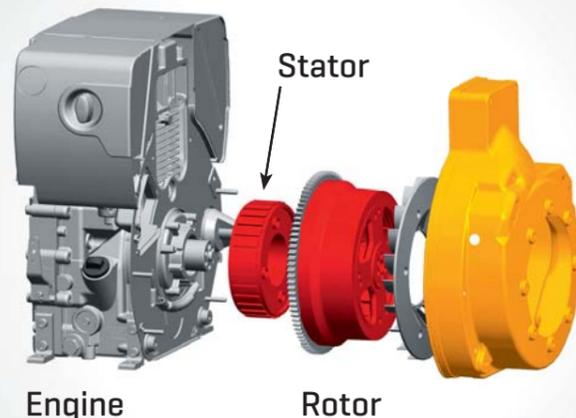
## Maintenance and operating points



## 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 7kW can be mounted on the flywheel side

## Permissible load on power-take-off points

1B20 / 1B27 / 1B30  
1B20V / 1B30V

max. permissible radial force

$$F1 = \frac{60\,000}{L \text{ (mm)} - 70} \text{ (N)}$$

max. permissible axial force

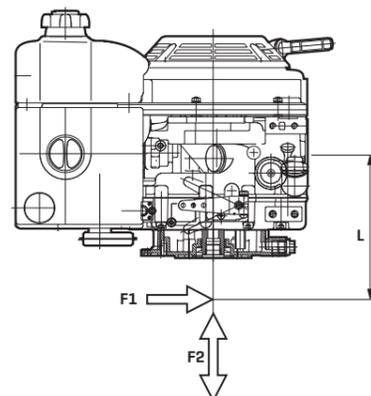
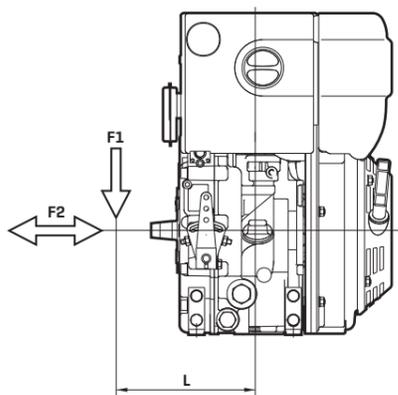
$$F2 = 800 \text{ (N)}$$

1B40 / 1B50  
1B40V / 1B50V

max. permissible radial force

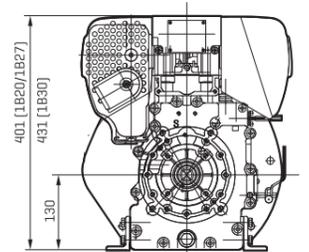
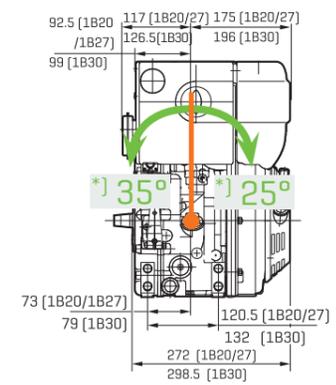
$$F1 = \frac{62\,600}{L \text{ (mm)} - 84} \text{ (N)}$$

max. permissible axial force

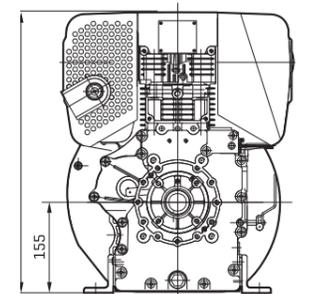
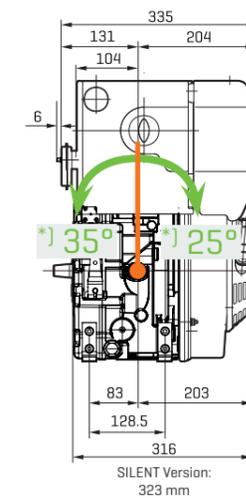
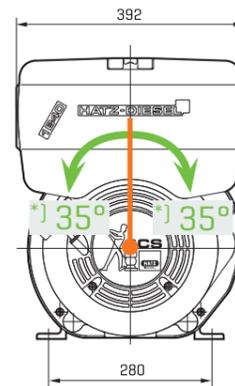
$$F2 = 1200 \text{ (N)}$$


## Dimensions

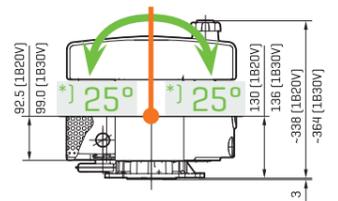
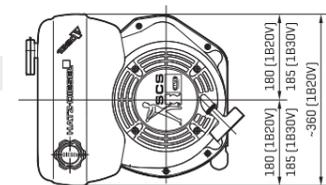
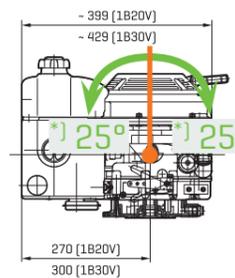
1B20  
1B27  
1B30



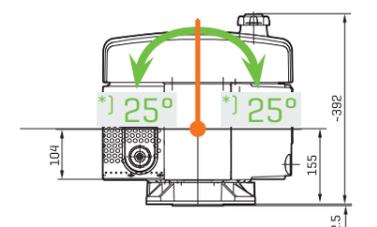
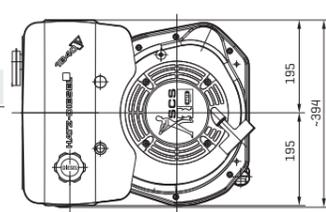
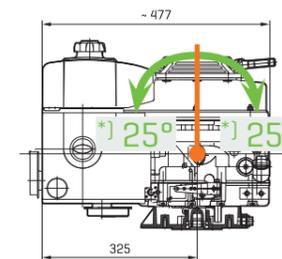
1B40  
1B50



1B20V  
1B30V



1B40V  
1B50V



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](http://www.HATZ-DIESEL.com).

\*] max. permanent tilting