

CREATING POWER SOLUTIONS.



1D42 | 1D42C  
1D50  
1D81 | 1D81C  
1D90 | 1D90V

**Hatz Diesel**



#### **1D42C and 1D81C - SilentPack**

For decades Hatz SilentPacks have been setting benchmarks for quiet and reliable diesel engines. SilentPack is more than just an engine, it is a complete installation solution where the customer no longer has to take care of anything. Position, connect, start.



#### **1D90V/W**

For installations with special requirements regarding outer dimensions, Hatz has also alternatively developed the 1D90 engine with vertical crankshaft. This allows the best possible use of the available installation space, thus avoiding unnecessary power deflections.

# Hatz D-series: The single-cylinder diesel engine with revolutionary engineering

As our customers can confirm, Hatz diesel engines are the most robust and durable in this market segment. Wherever they are installed makes no difference; whether at very low temperatures or in a tropical climate, the Hatz D-series carries out its job reliably. With regular maintenance many thousands of hours are commonplace, using Hatz original spare parts, of course.

## High performance and flexibility

The Hatz D-series is best suited for challenging tasks. It is characterized by high performance and flexibility in particular. With 11.2 kW, the 1D90 engine is the highest performance single-cylinder diesel engine in the world. The engines can be configured as required and in the basic version limited to the basic engine only. By adding the numerous available options, the engines can however also be upgraded to truly high-tech products. With up to four different power take offs on a single engine, the D-series provides more possibilities for the customization of a machine than any other engine on the market.

## Extremely quiet running

Compensation weight on the flywheel side crank arm as well as balance weights cast in the flywheel ensure the special quiet running of the D-series. Optionally available counter-rotating balance shafts even ensure 100% 1st order counter balance.

## Environmental aspects

The Hatz D-series is exclusively produced and marketed to the specification of the strict US exhaust standard of the EPA (Environmental Protection Agency). The D-series is optimized in regard to noise pollution and also offered with the unique SilentPack on demand.

## The SilentPack

The D series is the first single-cylinder diesel engine series which can be equipped with an organically adapted, sound-insulated noise encapsulating housing, the SilentPack. The SilentPack reduces the radiated noise emission by up to 12 dB(A) in a 7 meter radius.

The capsule consists of sheet metal construction with structure-borne sound insulation that is mounted on the engine. All control and service points are accessible from the outside. The sound suppressor is housed in a separate capsule over the flywheel. Due to the cooling air circulation, SilentPack engines – like all other Hatz engines – can be used under virtually all climatic conditions.

## Robust and durable design



Hatz engines are designed for an exceptionally long service life. The best possible materials and components coupled with uncompromising quality assurance contribute to the fact that Hatz engines have been

setting standards in the industry for many years when it comes to robustness and service life. And should, contrary to expectations, a spare part actually be needed, more than 500 service partners in 115 countries are available quickly and dependably with advice and assistance as well as original spare parts.

IFN rating ICFN rating F/IFN/ICFN rating

Sales area [exhaust certificate]	1D42 / 1D42C	1D50	1D81	1D81C	1D90
USA [EPA/CARB constant speed] (r.p.m.)	2000-3000	2500-3050	1500-3000	1500-3000	1500, 2600-3000
USA [EPA 2-speed] (r.p.m.)	2000-3000	2500-3050	2150-3000	2300-3000	2600-3000
USA [EPA variable speed] (r.p.m.)	2000-3000	–	2150-3000	2300-3000	–
All others (non-Epa) (r.p.m.)	1500-3600	1500-3600	1500-3600	1500-3000	1500-3000

# Technical data, Performance Table

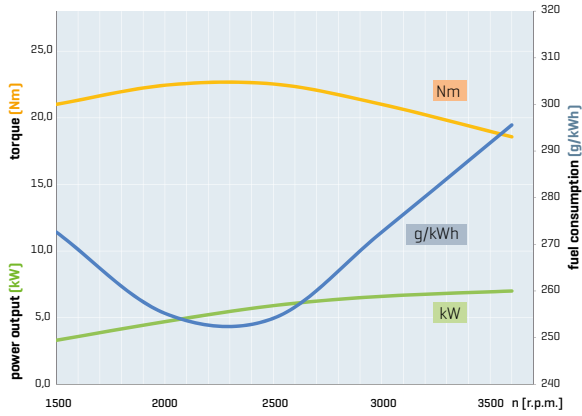
Technical data	1D42	1D42C	1D50	1D81	1D81C	1D90	1D90V
Type	Air cooled 1-cylinder 4-stroke diesel engine with direct injection, horizontal crankshaft (1D90V: vertical crankshaft)						
Bore x stroke (mm / inches)	90 x 70 / 3.54 x 2.76	90 x 70 / 3.54 x 2.76	97 x 70 / 3.82 x 2.76	100 x 85 / 3.94 x 3.35	100 x 85 / 3.94 x 3.35	104 x 85 / 4.09 x 3.35	104 x 85 / 4.09 x 3.35
Displacement (l / cu.in.)	0.445 / 27.2	0.445 / 27.2	0.517 / 31.5	0.667 / 40.7	0.667 / 40.7	0.722 / 44.0	0.722 / 44.0
Average piston speed at 3000 r.p.m. (m/s / ft/min)	7.0 / 1378			8.5 / 1673			
Compression ratio	21.5 : 1	21.5 : 1	20.5 : 1	20.5 : 1	20.5 : 1	20.5 : 1	20.5 : 1
Lub. oil consumption, related to full load	approx. 1 % of fuel consumption						
Oil filling max - min (l / US qts)	1.2 - 0.8 / 1.27 - 0.85	1.2 - 0.8 / 1.27 - 0.85	1.5 - 1.0 / 1.59 - 1.06	1.9 - 1.0 / 2.0 - 1.06	1.9 - 1.0 / 2.0 - 1.06	1.9 - 1.0 / 2.0 - 1.06	1.6 - 0.9 / 1.7 - 0.95
Speed control	approx. 800 r.p.m.						
• Lowest idle speed	approx. 800 r.p.m.						
• Static speed droop	approx. 5% at 3000 r.p.m.						
Amount of combustion air at 3000 r.p.m. approx. <sup>1)</sup> (m <sup>3</sup> /min / cu.ft./min)	0.66 / 23.3	0.66 / 23.3	0.78 / 27.6	1.0 / 35	1.0 / 35	1.1 / 39	1.1 / 39
Amount of cooling air at 3000 r.p.m. approx. (m <sup>3</sup> /min / cu.ft./min)	4.5 / 159	3.8 / 134	5.5 / 195	10.8 / 380	8.4 / 297	10.8 / 380	15 / 530
Mass moment of inertia J (kgm <sup>2</sup> / lb.ft <sup>2</sup> )							
• Standard flywheel	0.24 / 5.67	0.24 / 5.67	0.41 / 9.7	0.51 / 12.05	0.51 / 12.05	0.51 / 12.05	0.51 / 12.05
• Heavy flywheel	0.28 / 7.08	0.28 / 7.08	—	0.63 / 14.9	0.63 / 14.9	0.63 / 14.9	—
Starter	12 V - 2.0 kW — 24 V - 3 kW						
Alternator charging current at 3000/1500 r.p.m.	14 V - approx. 9 A / 4 A — 28 V - approx. 5 A / 2 A			14 V - approx. 16 A / 5 A — 28 V - approx. 9 A / 4 A			
Battery capacity (min / max Ah)	12 V - 45 / 88 Ah — 24 V - 36 / 55 Ah						
Engine with crankhandle start (kg / lbs.)	71 / 156.5	93 / 205.0	80 / 176.4	97 / 213.8	118 / 260.0	98 / 216.0	—
Engine with electric start 12 V or 24 V (kg / lbs.)	78 / 172.0	100 / 220.4	83 / 183.0	105 / 231.4	126 / 277.7	106 / 233.6	106 / 233.6

<sup>1)</sup> For other speeds, there is a linear reduction in the air requirement.

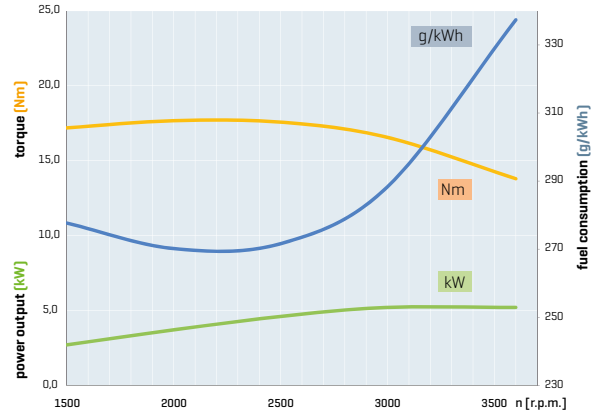
Performance table	(r.p.m.)	1D42	1D42C	1D50	1D81	1D81C	1D90	1D90V
Vehicle power acc. to DIN ISO 1585. (kW / hp)	3600	7.5 / 10.2	— / —	7.9 / 10.7	— / —	— / —	— / —	— / —
	3000	7.2 / 9.8	— / —	7.9 / 10.7	10.3 / 14.0	— / —	— / —	— / —
	2600	6.7 / 9.1	— / —	7.5 / 10.2	9.5 / 12.9	— / —	— / —	— / —
	2300	6.0 / 8.2	— / —	6.7 / 9.1	8.9 / 12.1	— / —	— / —	— / —
Blocked ISO brake horsepower (IFN) for intermittent load acc. to ISO 3046-1. (kW / hp)	3600	7.0 / 9.5	5.2 / 7.1	7.5 / 10.2	10.1 / 13.7	— / —	— / —	— / —
	3000	6.6 / 9.0	5.2 / 7.1	7.5 / 10.2	10.1 / 13.7	9.6 / 13.1	11.2 / 15.2	11.2 / 15.2
	2600	6.1 / 8.3	4.7 / 6.4	6.8 / 9.2	9.3 / 12.6	8.8 / 12.0	10.3 / 14.0	10.3 / 14.0
	2300	5.4 / 7.3	4.2 / 5.7	6.0 / 8.2	8.4 / 11.4	8.1 / 11.0	9.5 / 12.9	9.5 / 12.9
EPA 2-speed	2000	4.7 / 6.4	3.7 / 5.0	5.2 / 7.1	7.6 / 10.3	7.1 / 9.7	8.4 / 11.4	8.4 / 11.4
	1800	4.1 / 5.6	3.3 / 4.5	4.6 / 6.3	6.8 / 9.2	6.5 / 8.8	7.6 / 10.3	7.6 / 10.3
	1500	3.3 / 4.5	2.7 / 3.7	3.7 / 5.0	5.5 / 7.5	5.4 / 7.3	6.4 / 8.7	6.4 / 8.7
ISO standard power output (ICXN) (10% overload permissible). (kW / hp)	3600	6.3 / 8.6	4.7 / 6.4	6.8 / 9.2	— / —	— / —	— / —	— / —
	3000	5.9 / 8.0	4.7 / 6.4	6.7 / 9.1	9.3 / 12.6	8.9 / 12.1	10.2 / 13.9	10.2 / 13.9
	2600	5.5 / 7.5	4.3 / 5.8	6.1 / 8.3	8.4 / 11.4	8.0 / 10.9	9.4 / 12.8	9.4 / 12.8
EPA variable speed; EPA constant speed	2300	4.9 / 6.7	3.8 / 5.2	5.4 / 7.3	7.6 / 10.3	7.4 / 10.1	8.6 / 11.7	8.6 / 11.7
	2000	4.2 / 5.7	3.4 / 4.6	4.7 / 6.4	6.7 / 9.1	6.5 / 8.8	7.7 / 10.5	7.7 / 10.5
ISO standard power output (no overload permissible) acc. to ISO 3046-1. (kW / hp)	1800	3.7 / 5.0	3.0 / 4.1	4.1 / 5.6	6.1 / 8.3	5.9 / 8.0	6.8 / 9.2	6.8 / 9.2
	1500	3.0 / 4.1	2.4 / 3.3	3.3 / 4.5	5.0 / 6.8	4.9 / 6.7	5.8 / 7.9	5.8 / 7.9
For constant speed and constant load (ICFN).								

# Power output, torque und fuel consumption

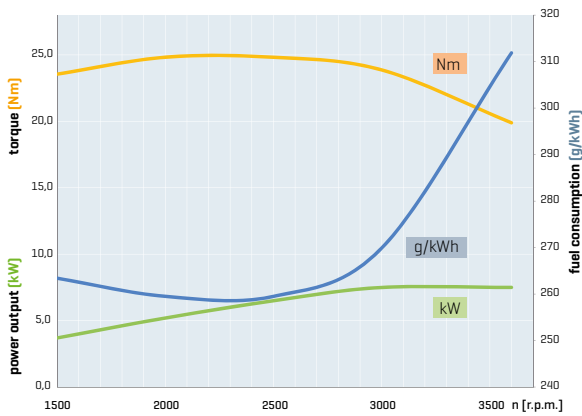
## 1D42



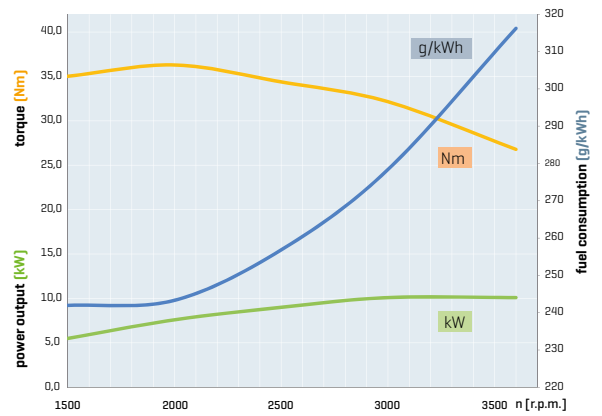
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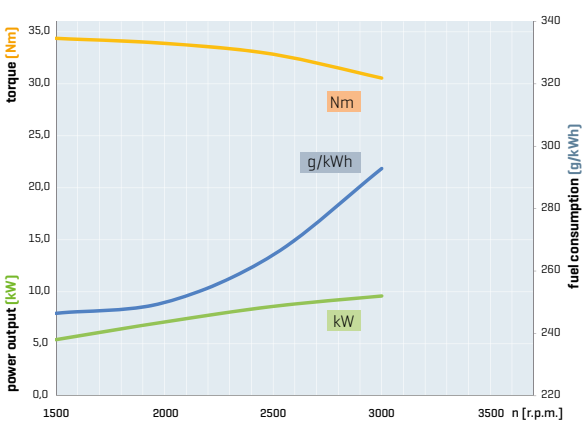
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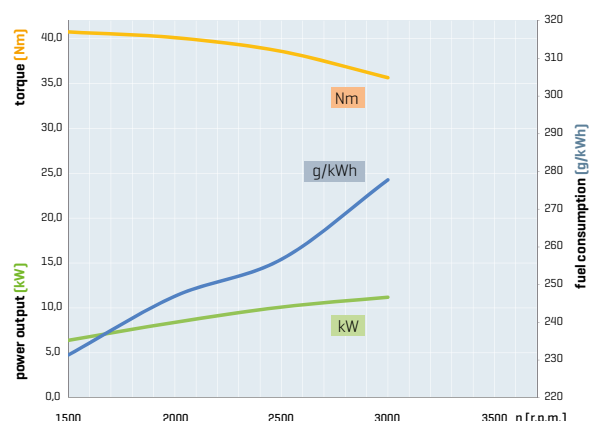
## 1D81



## 1D81C



## 1D90



### Power ratings

Power ratings refer to standard reference conditions of ISO 3046-1 (IFN): + 25 °C (77 °F), 100 kPa, relative humidity 30 %. The specified power is reached during the running-in period, and can be 5 % less on delivery. Power reduction acc. to ISO 3046-1. Standard values: More than 100 m above sea level approx. 1 % per 100 m. Above 25 °C (77 °F) approx. 4 % per 10 °C (50 °F). The power taken from the alternator also has to be added to the power calculation.

# Maintenance and operating points

Cold start device

Decompression lever

Injector

Cylinder head cover

Air filter

Engine oil filter

Stop lever

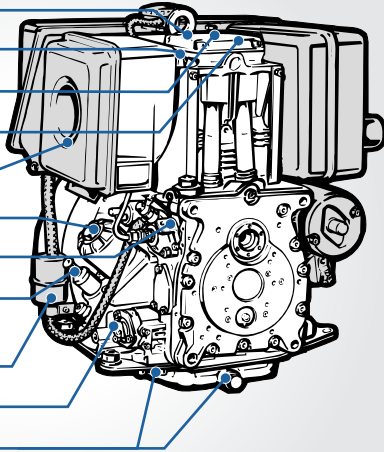
Oil dipstick and

oil filler

Fuel filter

Speed control lever

Oil drain plug



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Cold start device

Decompression lever

Accessible after opening the capsule: Injector, cylinder head cover, air filter

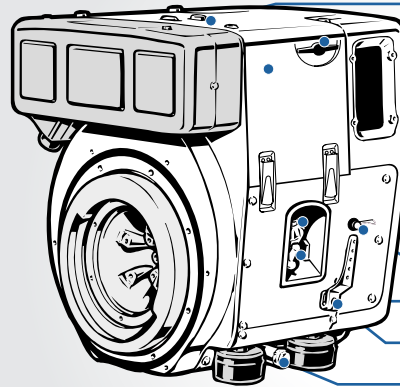
Engine oil filter

Stop lever

Oil dipstick and oil filler

Speed control lever

Oil drain plug



1D42C | 1D81C

Injector

Cylinder head cover

Air filter

Oil filler

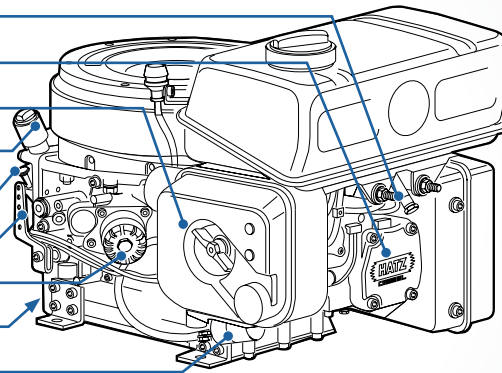
Dipstick

Speed control lever

Engine oil filter

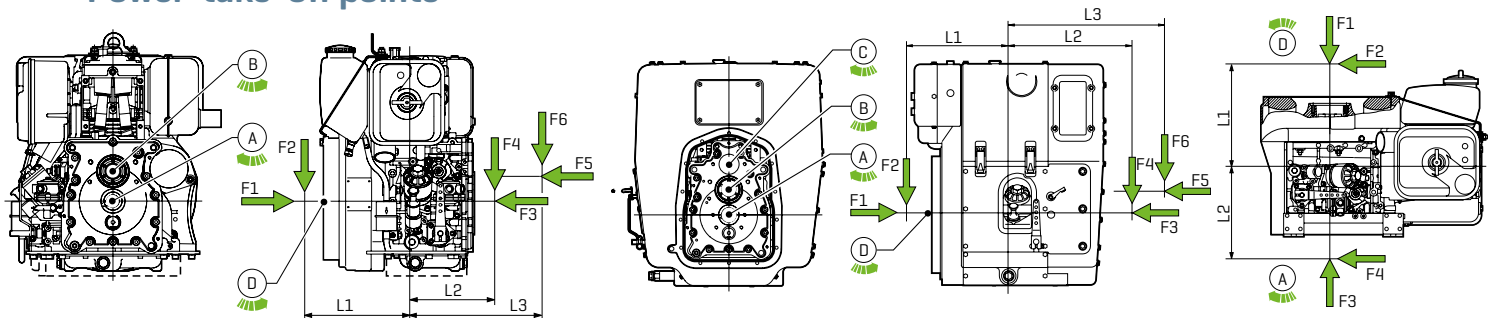
Oil drain plug

Fuel filter



1D90V

## Power-take-off points

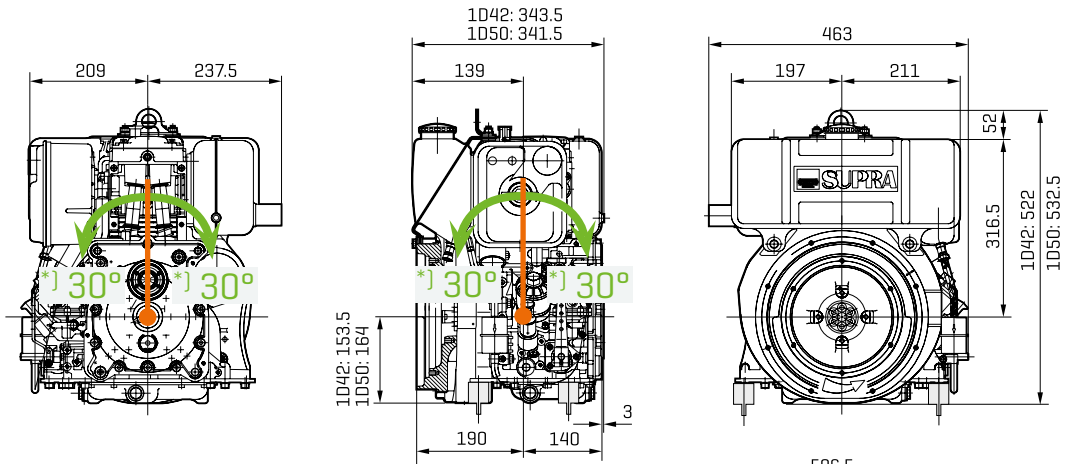


Power take off		1D42/1D42C/1D50	1D81/1D81C/1D90	1D90V
Transferable torque	A	100%	100%	100%
	B	100%	43 Nm [6.8 kW at 1500 r.p.m.]	not available
	C	not available	21.5 Nm [6.8 kW at 3000 r.p.m.]	not available
	D	100%	100%	100%
Permissible load	F1	1260 N	2250 N	2250 N
	F2*	$F2 = \frac{261\,000}{L1\text{ [mm]} - 42}$ [N]	$F2 = \frac{477\,000}{L1\text{ [mm]} - 50.5}$ [N]	$F2 = \frac{477\,000}{L1\text{ [mm]} - 50.5}$ [N]
	F3	1080 N	1350 N	1350 N
	F4	$F4 = \frac{67\,500}{L2\text{ [mm]} - 128}$ [N]	$F4 = \frac{67\,500}{L2\text{ [mm]} - 134}$ [N]	$F4 = \frac{67\,500}{L2\text{ [mm]} - 134}$ [N]
	F5	900 N	900 N	not available
	F6	$F6 = \frac{99\,000}{L3\text{ [mm]} - 127}$ [N]	$F6 = \frac{99\,000}{L3\text{ [mm]} - 127}$ [N]	not available

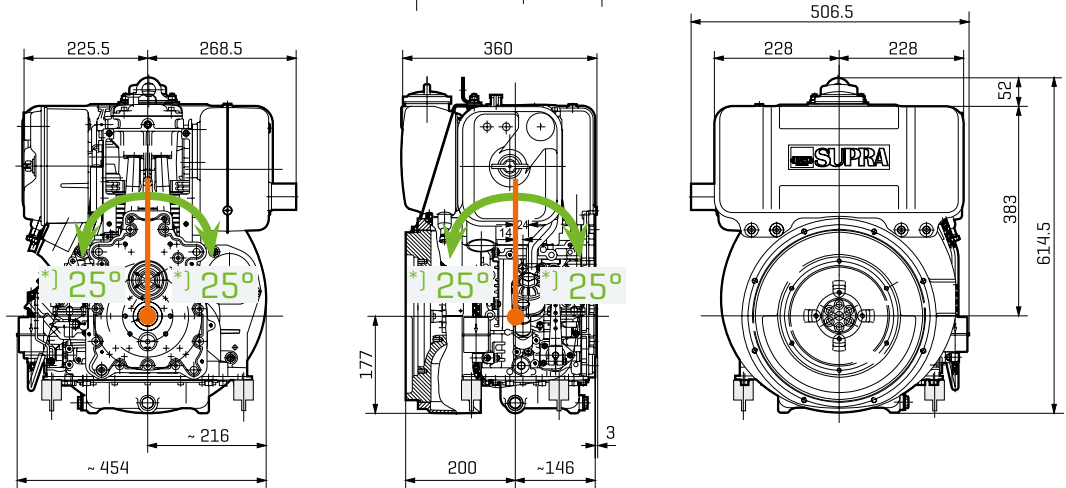
\* If belt tension is upwards, outboard bearing is necessary

# Dimensions

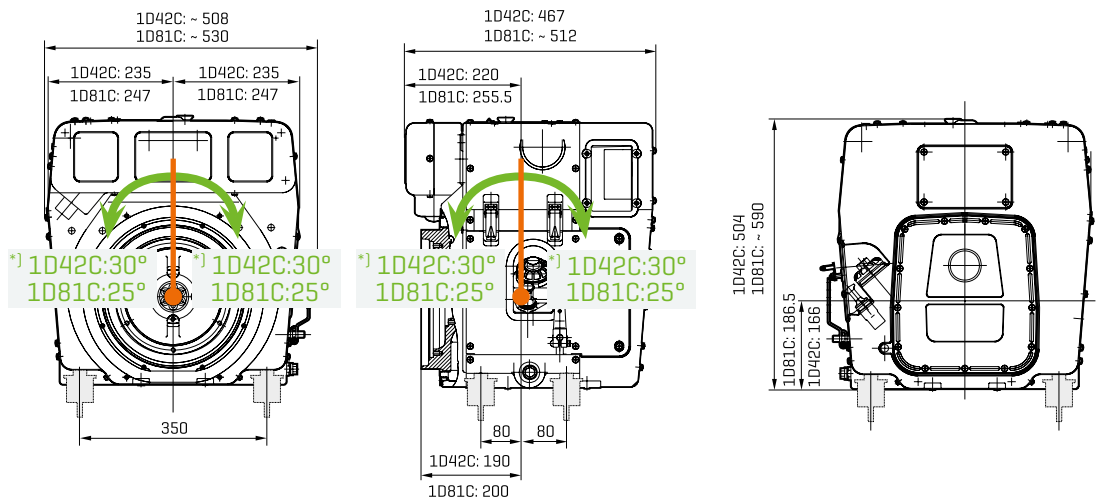
**1D42  
1D50**



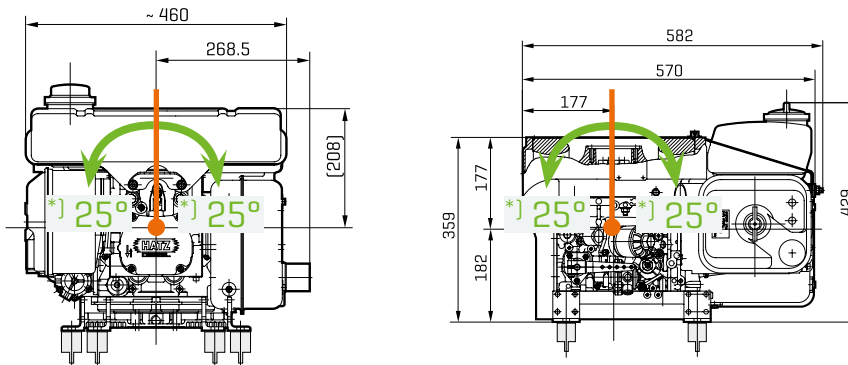
**1D81  
1D90**



**1D42C  
1D81C**



**1D90V**



Spread at outlines  $\pm 3$  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

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