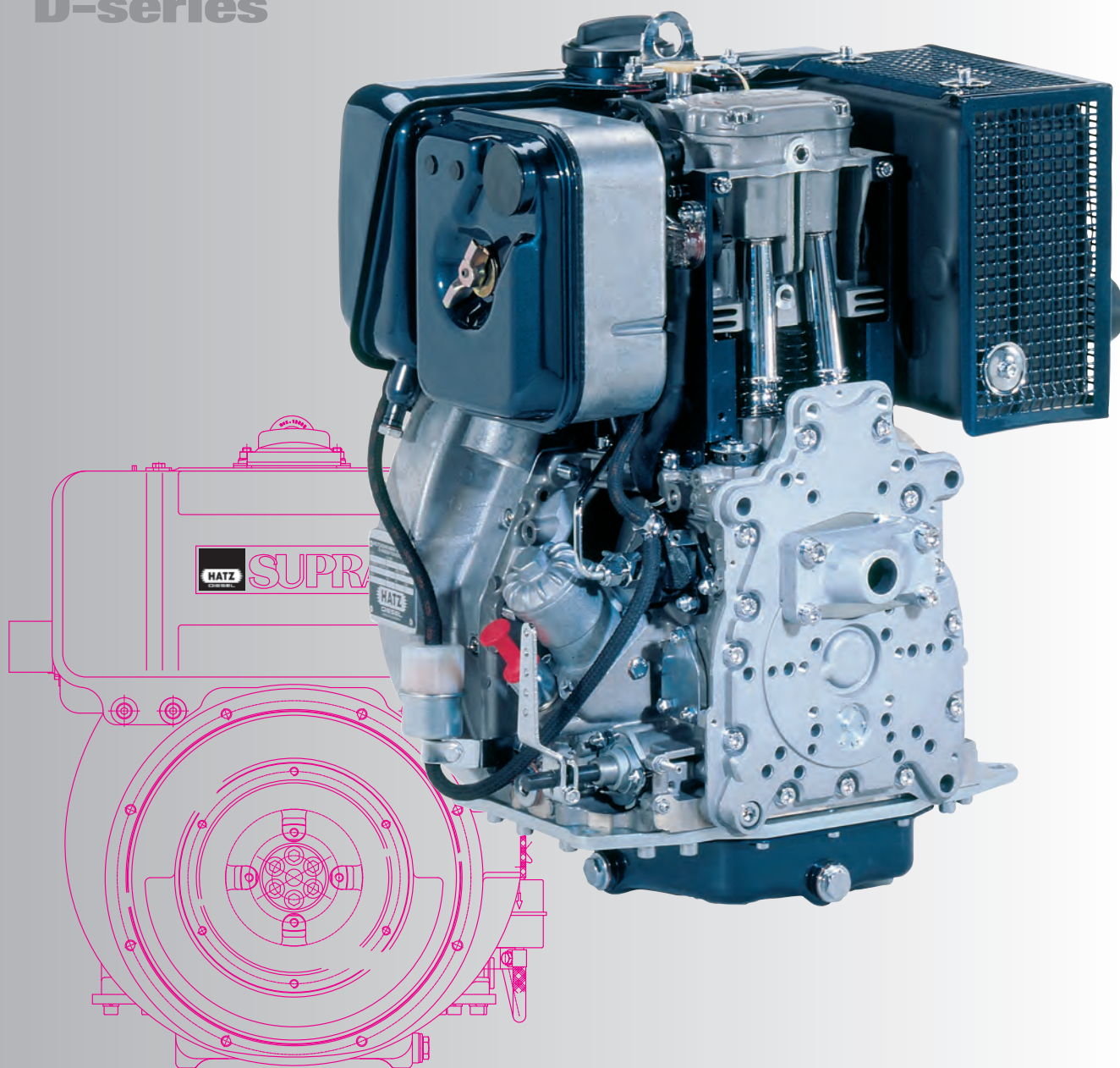




D-series



1D81 • 5.0 - 10.3 kW **1D90** • 5.8 - 11.2 kW

SUPRA

REVOLUTIONARY TECHNIQUE FOR
SINGLE-CYLINDER DIESEL ENGINES

1D81 • 1D90

DESIGN

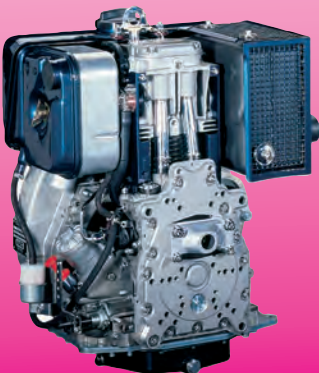
- Aircooled single-cylinder four stroke Diesel engines.
- Vertical cylinder.
- Crankcase in light alloy, diecast. Cylinder of grey cast iron.
- Cylinder head in light alloy.
- Crankshaft and big end in plain bearings.
- Direct injection, multi-hole nozzle.
- Value control by rocker, push-rods, tappets and camshaft.
- Pressure lubrication, with gear-type oil pump. On request, full-flow oil filter.
- Oil sump of sheet metal.
- Flywheel fan, charging alternator integrated into flywheel. No V-belt necessary.

CHARACTERISTICS

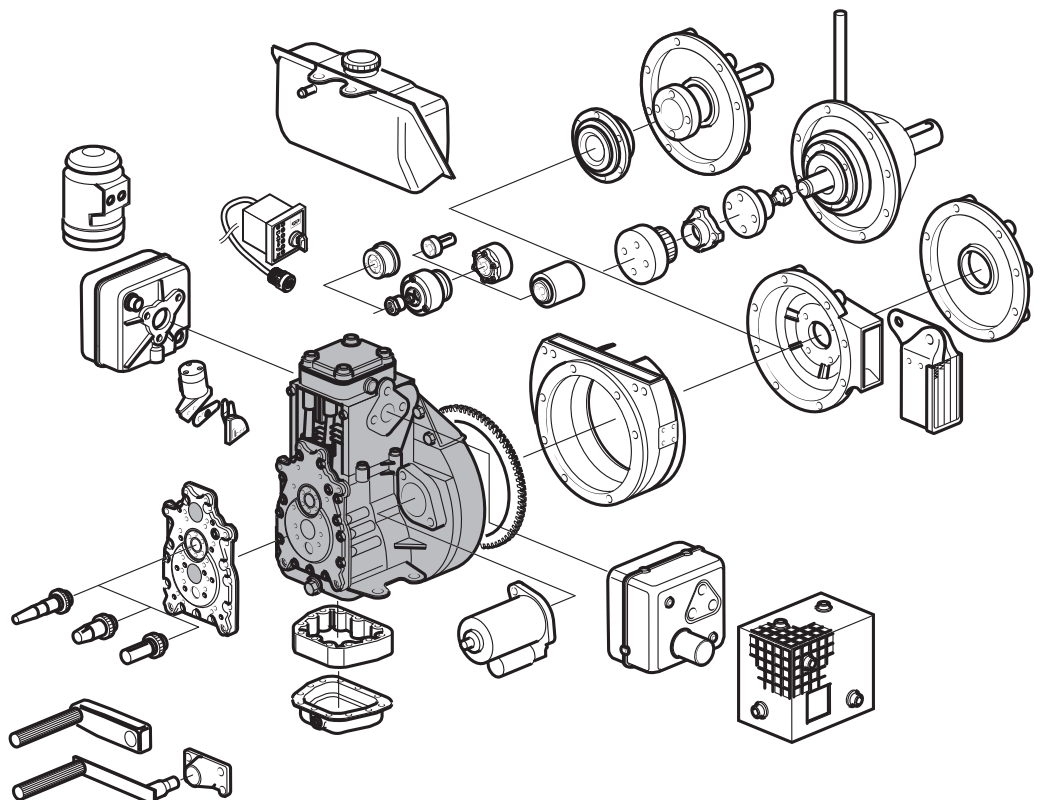
- Denoised: emission of noise reduced to the absolute minimum by means of design features and precision manufacture.
- Low fuel consumption.
- Favourable exhaust gas values – EPA / CARB certified.
- Robust: long life engine.
- Extensive interchangeability of parts within the engine family **D**.
- Reliable: no V-belts.
- Easy to service: automatic injection pump bleeding.
- Friendly to the environment: crankcase breather leads into the intake port.
- Reliable, effortless starting thanks to automatic extra fuel device.
- Handstart or electric start available.

EXHAUST REDUCED TYPES
ON REQUEST

EPA TIER IV
CARB TIER IV

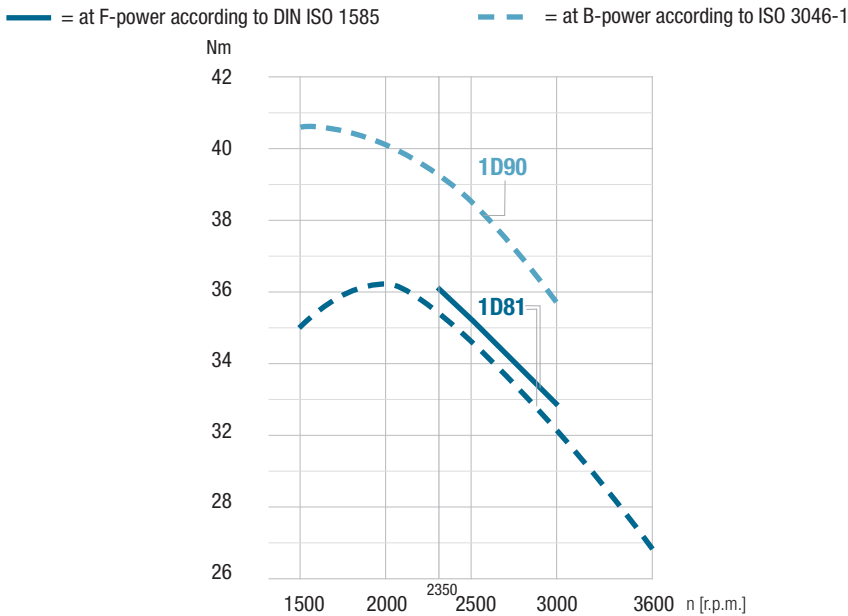


ADDITIONAL EQUIPMENT



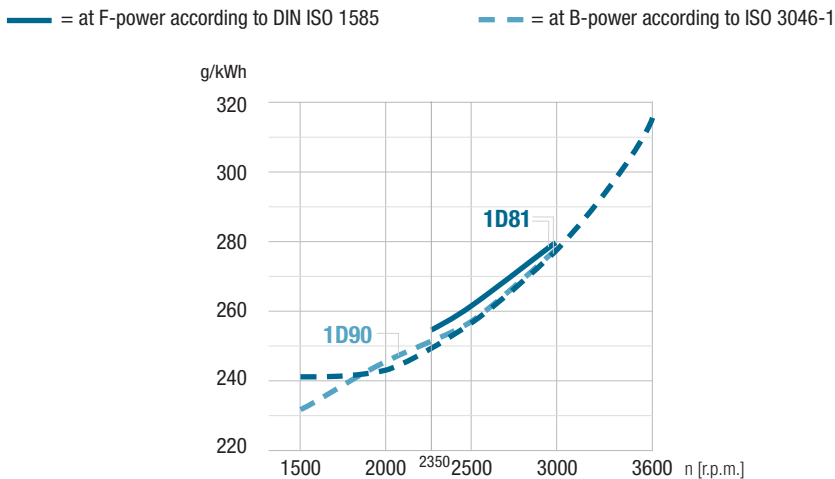
TECHNICAL DATA		1D81.	1D90.
▶ Number of cylinders		1	1
▶ Bore x stroke	mm	100 x 85	104 x 85
	inches	3.94 x 3.35	4.09 x 3.35
▶ Displacement	l	0.667	0.722
	cu.in.	40.7	44.0
▶ Mean piston speed at 3000 r.p.m.	m/s	8.5	8.5
	ft/min	1673	1673
▶ Compression ratio		20.5	20.5
▶ Lub. oil consumption		approx. 1% of fuel consumption, related to full load	
▶ Lub. oil capacity max. / min.	l	1.9 / 1.0	1.9 / 1.0
	US qts	2.0 / 1.06	2.0 / 1.06
▶ Speed control	Idle speed	approx. 800 r.p.m.	
	static speed droop	approx. 5% at 3000 r.p.m.	

TORQUE



▶ Performance data refer to Standard Reference Conditions of ISO 3046-1: + 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.

SPECIFIC FUEL CONSUMPTION



INSTALLATION DATA		1D81.	1D90.
► Combustion air required at 3000 r.p.m. approx. ¹⁾	m ³ / min	1.0	1.1
	cu.ft./min	35	39
► Cooling air required at 3000 r.p.m. approx. ¹⁾	m ³ / min	10.8	10.8
	cu.ft./min	380	380
► Moment of inertia	kgm ²	0.51	0.51
	lb.ft ²	12.05	12.05
► Starter		12 V - 2.0 kW (2.7 HP) — 24 V - 2.5 kW (3.4 HP)	
► Alternator charging current at 3000 / 1500 r.p.m.		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	

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

PERMISSIBLE LOAD ON POWER-TAKE-OFF POINTS

Max. permissible radial load

$$F1 = \frac{477\,000}{L1\text{ (mm)} - 50.5} \text{ (N)}^*$$

$$F2 = \frac{67\,500}{L2\text{ (mm)} - 134} \text{ (N)}$$

$$F3 = \frac{99\,000}{L3\text{ (mm)} - 127} \text{ (N)}$$

*) If belt tension is upwards, outboard bearing is necessary - or contact HATZ

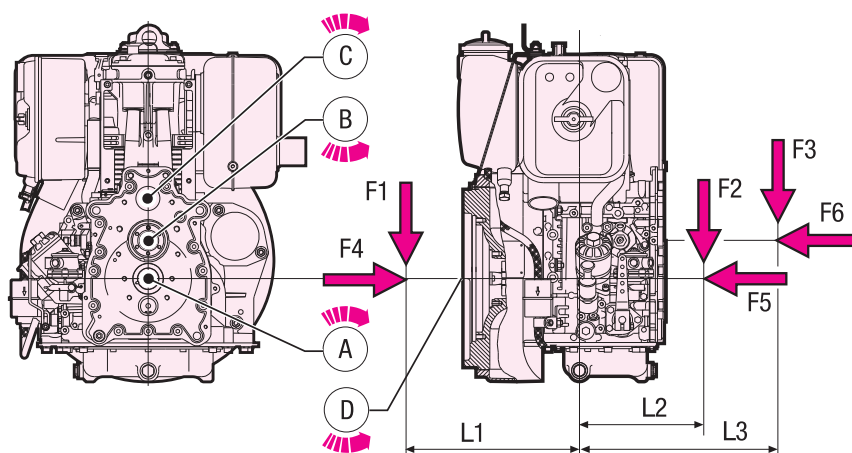
Transmissible torque:

A: 100 %

B: 43 Nm = 6.8 kW at 1500 r.p.m.

C: 21.5 Nm = 6.8 kW at 3000 r.p.m.

D: 100 %



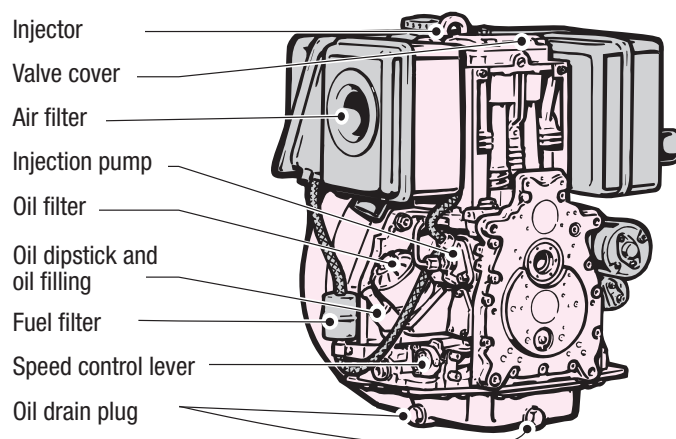
Max. permissible axial force: F4 = 2250 N, F5 = 1350 N, F6 = 900 N

MAINTENANCE AND OPERATING POINTS

For the engine to achieve its maximum life, it is essential for it to be serviced meticulously at regular intervals.

The better the accessibility, the more promptly and conscientiously the engine will be maintained.

Please convince yourself personally that all service and operation points are easily accessible before delivering your machine to the customer.



ELECTRICAL EQUIPMENT

The engine-mounted components, such as starter, alternator and switches, are connected to the instrument box by means of a 2 m cable harness. The engine is started and controlled from this instrument box. Instrument box and cable harness are part of the additional equipment and supplied according to the number of electrical safety features which are required.

If the engine has to be started at temperatures below - 10 °C, it must be equipped with a preheating system (glow plug) (additional equipment). Further additional equipment includes automatic start and stop, remote control etc.

Please ask for drawings and wiring diagrams.

www.hatz-diesel.com

POWER-TAKE-OFF AND SENSE OF ROTATION

- Power-take-off at the flywheel, engine speed (figure 1).
- Power-take-off at the governor side. Crankshaft A at engine speed, camshaft B at 1/2 engine speed, Hydraulic pump drive C at engine speed (fig.2).
- Sense of Rotation see figure 1 and 2.
- Engine can be flange-mounted at governor side and flywheel side.

ENGINE MODELS

- **1D . . S:** counter-clockwise rotation (fig. 1), with 50% balancing of free mass forces.
- **1D . . Z:** counter-clockwise rotation (fig. 1), with 100% balancing of free mass forces. (Referring to free mass forces of first order) (fig. 3).

ENGINE VARIANTS

- Engine with handstart on governor side, heavy flywheel (fig.4).
- Engine with handstart on governor side, standard flywheel (fig.4).
- Engine with electric start 12 V, standard flywheel (fig.5).
- Engine with electric start 24 V, standard flywheel (fig.5).

WEIGHT incl. tank, air filter, and exhaust silencer

	handstart, heavy flywheel		handstart, standard flywheel		electric start 12 V or 24 V, standard flywheel	
	kg	lbs.	kg	lbs.	kg	lbs.
1D81 S	103	227.0	97	213.8	105	231.4
1D81 Z	105	231.4	99	218.2	107	235.8
1D90 S	104	229.2	98	216.0	106	233.6
1D90 Z	106	233.6	100	220.4	108	238.0

MOUNTING OF ENGINE

- For engine speeds above 2300 - 2500 r.p.m. it is recommended to use flexible mounts.

SCOPE OF DELIVERY OF ENGINE IN STANDARD EQUIPMENT

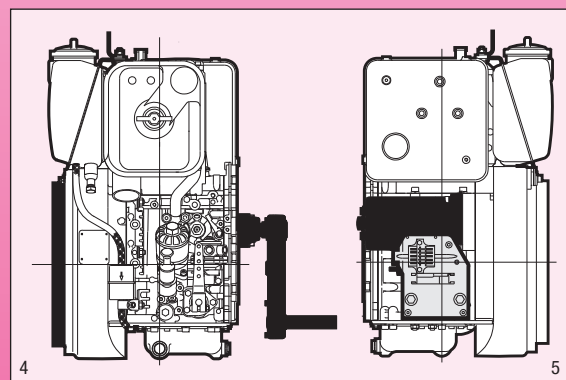
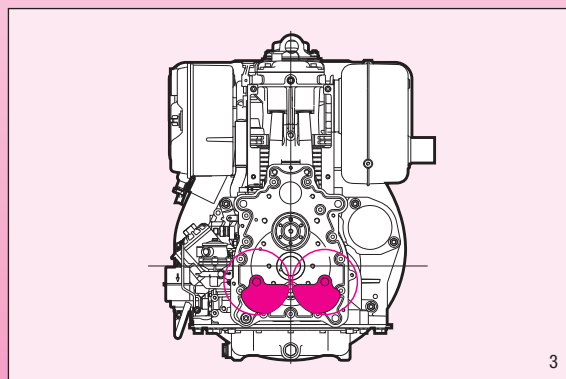
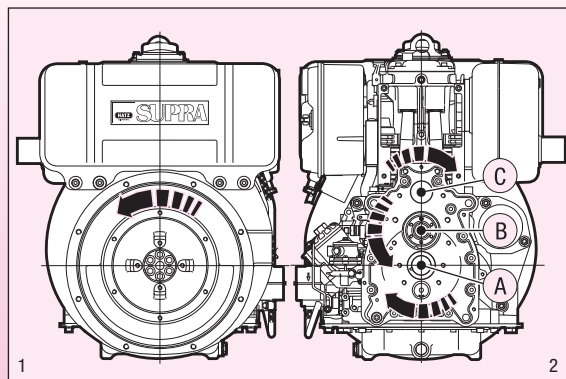
Engine tested for full load on test bench. Engine fitted with flywheel-fan, variable speed governor, dry-type or oil bath air filter, automatic decompression, automatic extra fuel device, automatic bleeding, metering device for start oil, eye-hook for transport of engine (only to carry weight of the engine). Parts made of sheet metal painted black, crankcase of light alloy not painted. No oil in engine.

Additional equipment: Gaskets for 1st maintenance

ADDITIONAL EQUIPMENT

Thanks to the complete programme of additional equipment every engine can be adapted to the special requirements of every application. As a minimum, every engine needs the "additional equipment, necessary for operation".

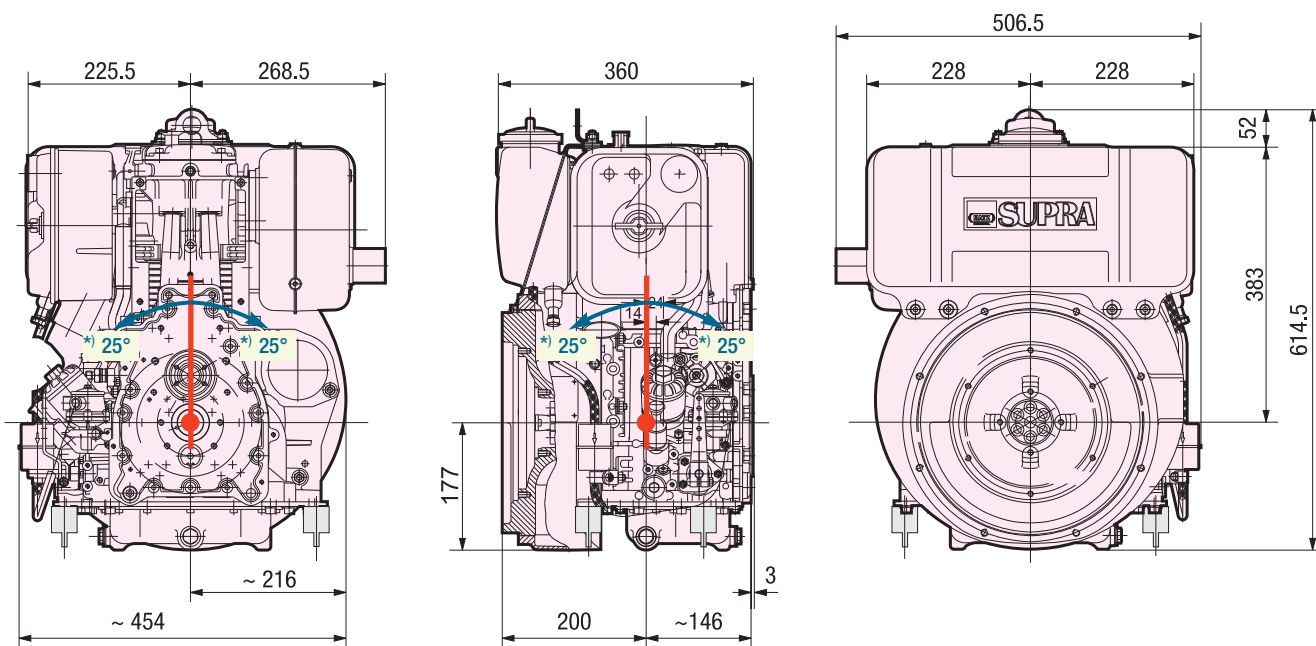
You find out details at our HATZ-contracting partners.



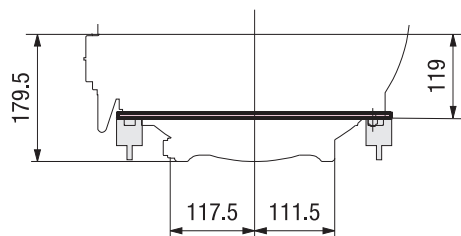
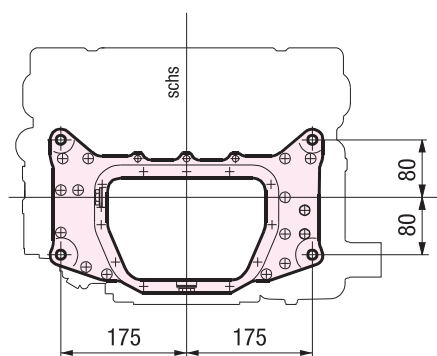
PERFORMANCE TABLE			1D81.		1D90.	
Norm	Hatz-Spec.	r.p.m.	kW*	HP*	kW*	HP*
▶ Vehicle output acc. to DIN ISO 1585.	NF	3000	10.3	14.0	—	—
		2600	9.5	12.9	—	—
		2350	8.9	12.1	—	—
▶ ISO net brake fuel stop power (IFN) for strong intermittent load acc. to ISO 3046-1.	NB _{Si}	3000	10.3	14.0	—	—
		2600	9.5	12.9	—	—
		2300	8.7	12.1	—	—
		2000	7.9	10.7	—	—
		1800	7.1	9.7	—	—
		1500	5.7	7.8	—	—
▶ ISO net brake fuel stop power (IFN) for intermittent load acc. to ISO 3046-1.	NB	3600	10.1	13.7	—	—
		3000	10.1	13.7	11.2	15.2
		2600	9.3	12.6	10.3	14.0
		2300	8.4	11.4	9.5	12.9
		2000	7.6	10.3	8.4	11.4
		1800	6.8	9.2	7.6	10.3
		1500	5.5	7.5	6.4	8.7
▶ ISO-standard power (ICXN) (10% overload permissible) ▶ ISO-standard fuel stop power (no overload permissible) acc. to ISO 3046-1. For constant speed and constant load (ICFN).	NS (NA)	3000	9.3	12.6	10.2	13.9
		2600	8.4	11.4	9.4	12.8
		2300	7.6	10.3	8.6	11.7
		2000	6.7	9.1	7.7	10.5
		1800	6.1	8.3	6.8	9.2
		1500	5.0	6.8	5.8	7.9

* Performance specifications without exhaust certificates. Performance tables with exhaust certificates upon request.

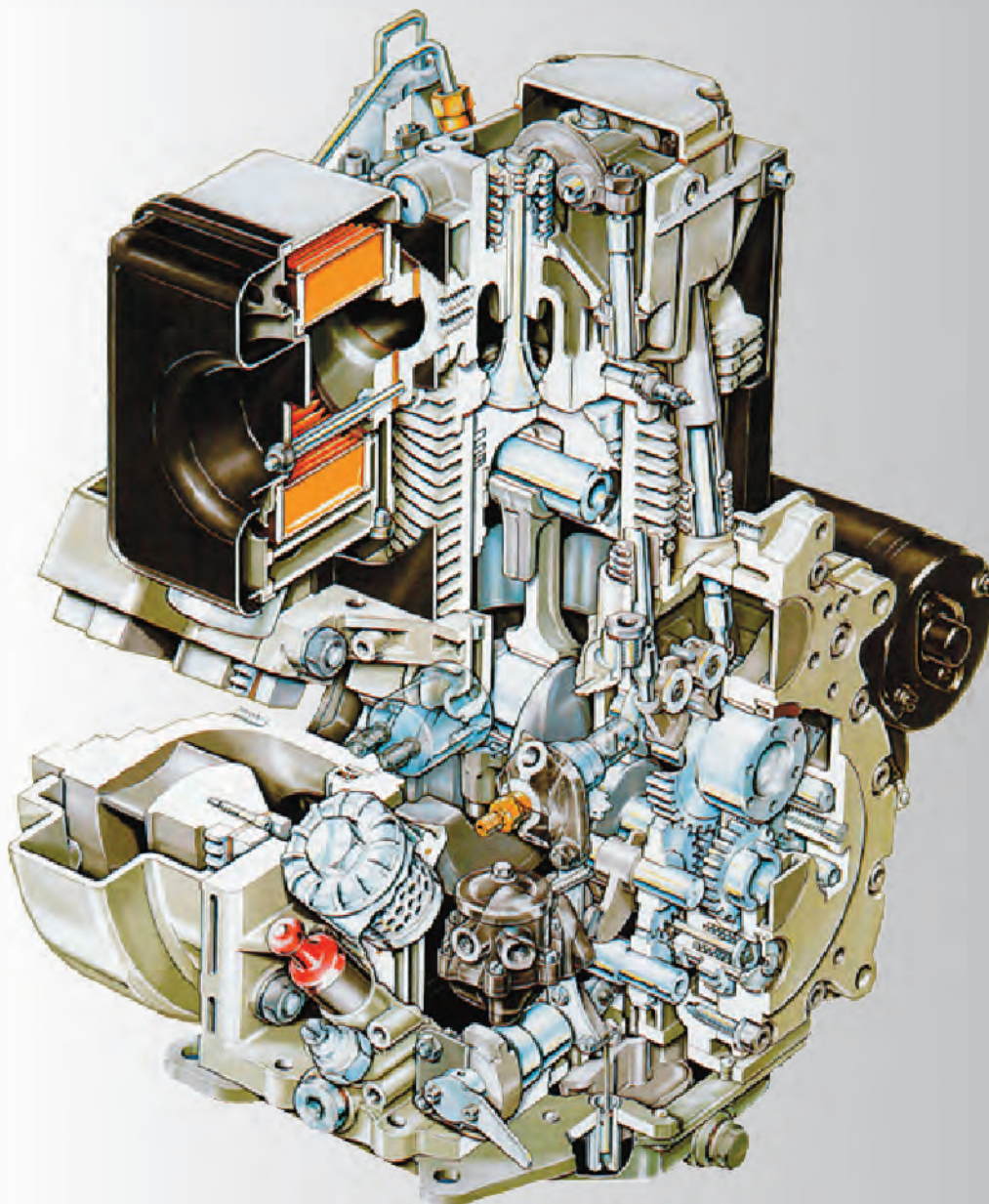
1D81. / 1D90.



^{*)} max. permanent tilting



- Drawings with detailed - and connection measures can either be demanded or downloaded as pdf- resp. dxf-file which are shown in the Internet.



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5 / 700 308 69 - ENG - 06.10 - 1 Printed in Germany
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