



D-series



1D41C • 2.4 - 5.2 kW **1D81C** • 4.9 - 9.6 kW

SUPRA **SILENT PACK**

THE ENCAPSULATED SINGLE-CYLINDER DIESEL ENGINE

1D41C • 1D81C

SUPRA

SILENT PACK

Exhaust reduced types on request

EPA II

EPA IV (2008)

CARB II

CARB IV (2009)



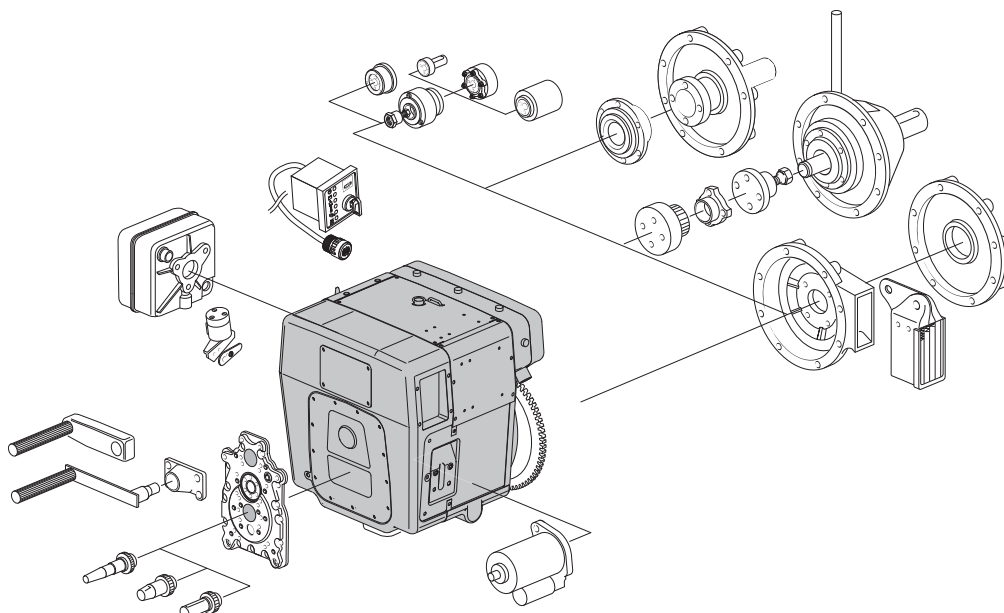
Design

- Aircooled single-cylinder fourstroke Diesel engines.
- Vertical cylinder.
- Crankcase in light alloy, diecasting. Cylinder of grey cast iron.
- Cylinder head in light alloy.
- Crankcase and big end in slide bearings.
- Direct injection, multi-hole nozzle.
- Valve control via camshaft rocker and pushrods.
- Pressure lubrication, with gear oil pump, oil filter in main flow.
- Flywheel fan, charging alternator integrated in the flywheel. No V-belt necessary.
- Standard engine with noise-proof capsule of sheet metal — SUPRA Silent Pack.
- The exhaust System is integrated into the noise-proof capsule including a main- and an end silencer.

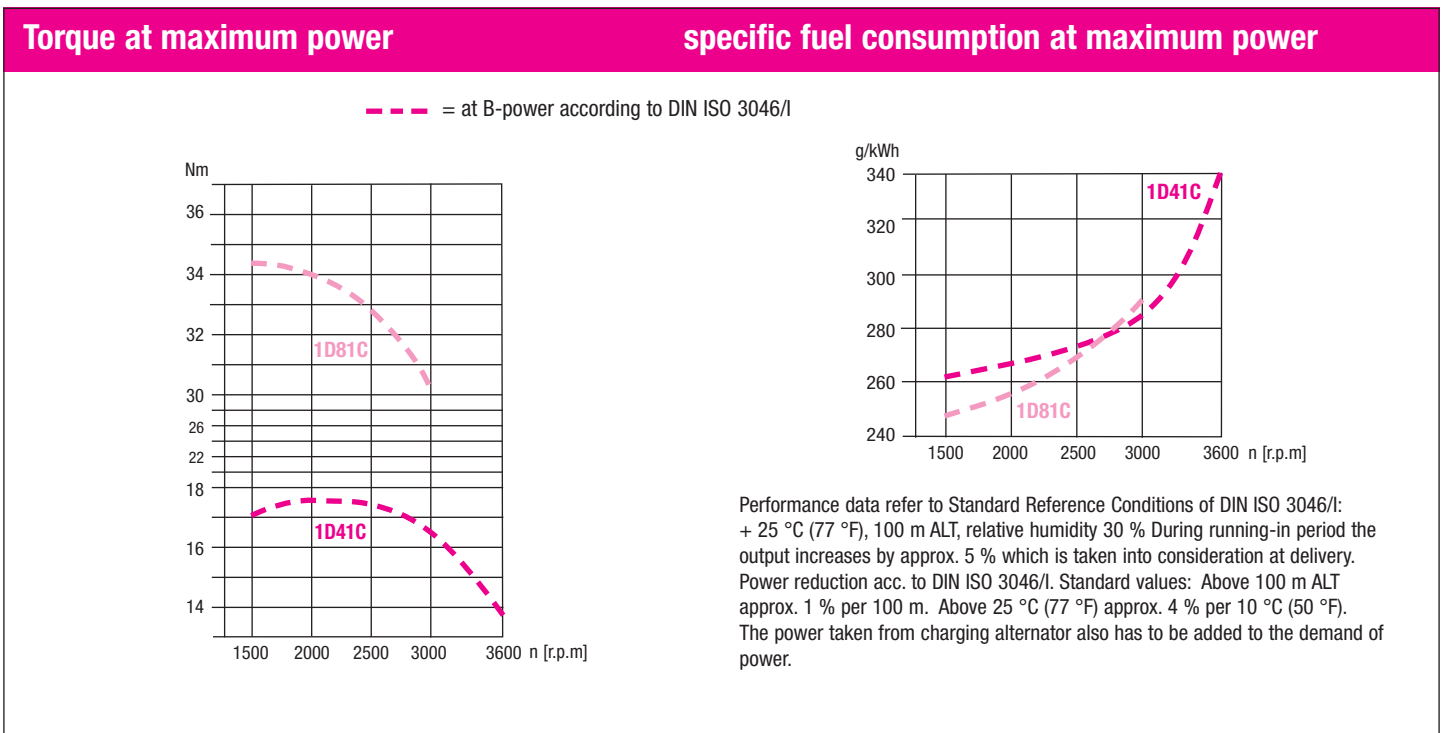
Characteristics

- Although the engine is fully encapsulated, the characteristics of the basic engine are maintained.
 - operation and maintenance points are easy to reach.
 - low fuel consumption
 - Favourable exhaust gas values below — EPA / CARB certified.
 - Robust, long life engine.
 - Extensive interchangeability of parts within the engine family **D**.
 - Reliable: since no V-belts.
 - Easy to Service: because automatic injection pump bleeding.
 - Friendly to the environment: Ventilation of crankcase leads into the intake port.
 - Secure and effortless starting thanks to automatic extra fuel device.
 - Handstart or electric start available.
- The capsule reduces the engine noise by 95 % i.e. 12 SUPRA Silent Packs are as quiet as one non encapsulated engine.
- The capsule increases only slightly the installation volume of the engine.
- The capsule is smaller and more handy than other noise-reduction engine cowlings and it is just as efficient as expensive and heavy encapsulations of machines.
- The SUPRA Silent Packs allow the manufacture of generating sets with a noise power level of 100 dB_A at 3000 r.p.m. (100 L_{WA}).

Additional equipment



Technical data		1D41C	1D81C
Number of cylinders		1	1
Bore x stroke	mm	90 x 65	100 x 85
	inches	3.54 x 2.56	3.94 x 3.35
Displacement	l	0.413	0.667
	cu. in.	25.2	40.7
Mean piston speed at 3000 r.p.m.	m/s	6.5	8.5
	ft/min	1280	1673
Compression ratio		21.0	20.5
Lub. oil consumption		approx.1% of fuel consumption, related to full load	
Lub. oil capacity max. / min.	l	1.2 / 0.8	1.9 / 1.0
	US qts	1.14 / 0.76	2.0 / 1.06
Speed control	lowest idle speed	approx. 800 r.p.m.	
	static speed droop	approx. 5 % at 3000 r.p.m.	



Performance table	SPECIAL OUTPUT ON REQUEST		1D41C		1D81C	
	Hatz Stand.	r.p.m.	kW	HP	kW	HP
ISO net brake fuel stop power (IFN) for intermittent load acc. to DIN ISO 3046/I.	B	3600	5.2	7.1	–	–
		3000	5.2	7.1	9.6	13.1
		2600	4.7	6.4	8.8	12.0
		2300	4.2	5.7	8.1	11.0
		2000	3.7	5.0	7.1	9.7
		1800	3.3	4.5	6.5	8.8
		1500	2.7	3.7	5.4	7.3
ISO-standard power (ICXN) (10% overload permissible) and ISO-standard fuel stop power (no overload permissible) acc. to DIN ISO 3046/I. For constant speed and constant load (ICFN).	S	3600	4.7	6.4	–	–
		3000	4.7	6.4	8.9	12.1
		2600	4.3	5.8	8.0	10.9
		2300	3.8	5.2	7.4	10.1
		2000	3.4	4.6	6.5	8.8
		1800	3.0	4.1	5.9	8.0
		1500	2.4	3.3	4.9	6.7

Installation data		1D41C	1D81C
Combustion air required at 3000 r.p.m. approx. ¹⁾	m ³ / min	0.61	1.0
	cu.ft./min	21.6	35
Cooling air required at 3000 r.p.m. approx. ¹⁾	m ³ / min	3.8	8.4
	cu.ft./min	134	297
Permanent tilting	max. degrees	30	25
Moment of inertia	kgm ²	0.24 (0.30) ²⁾	0.51 (0.63) ²⁾
	lb.ft ²	5.67 (7.08) ²⁾	12.05 (7.08) ²⁾
Starter motor		12 V - 2.0 kW • 24 V - 2.5 kW	12 V - 2.0 kW • 24 V - 2.5 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	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 ²⁾ Variant I (heavy flywheel)

Permissible load on power-take-off points

Max. permissible radial load

$$F1 = \frac{261\,000}{L1 \text{ (mm)} - 42} \text{ (N)}$$

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

$$F2 = \frac{67\,500}{L2 \text{ (mm)} - 128} \text{ (N)}$$

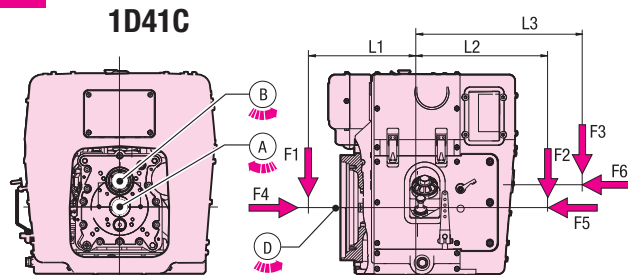
$$F3 = \frac{99\,000}{L3 \text{ (mm)} - 127} \text{ (N)}$$

Max. permissible axial force

F4 = 1260 N • F5 = 1080 N • F6 = 900 N

Transmissible torque:

A: 100%, B: 100%, D: 100%



Max. permissible radial load

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

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

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

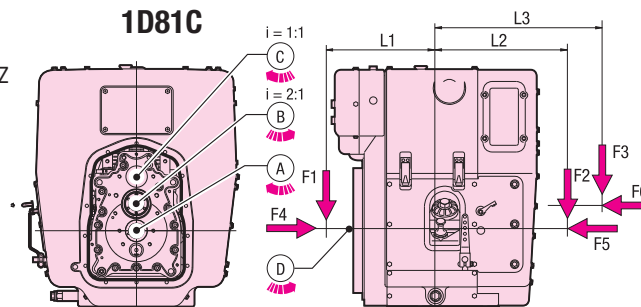
$$F3 = \frac{99\,000}{L3 \text{ (mm)} - 127} \text{ (N)}$$

Max. permissible axial force

F4 = 2250 N • F5 = 1350 N • F6 = 900 N

Transmissible torque:

A: 100% • B: 43.0 Nm = 6.8 kW at 1500 r.p.m.
C: 21.5 Nm = 6.8 kW at 3000 r.p.m. • D: 100%

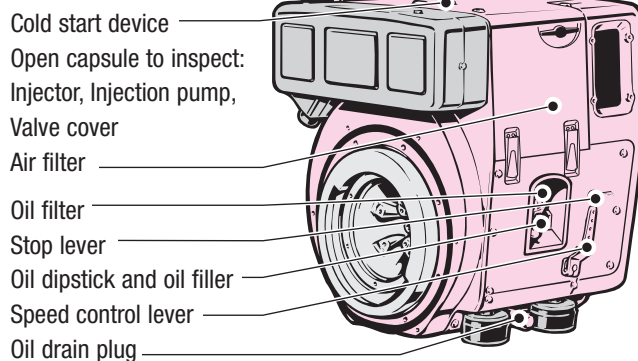


Maintenance and operating points

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 pre-heating 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 with engine speed (figure 2 and 4).
- Power-take-off at the governor side, crankshaft A with engine speed, camshaft B with 1/2 engine speed, hydraulic pump mount C with engine speed (figure 1 and 3).
- Engine is flangeable at flywheel-side, but not self-supporting. (Standard- or SAE-Flange).

Engine models

counter-clockwise (figure 2 and 4),
with 100 % balancing of the free mass forces of the 1st order.

Engine variants

- **Var. I:** Engine with handstart on governor side, heavy flywheel (fig. 5).
- **Var. II:** Engine with handstart on governor side, standard flywheel (fig. 5).
- **Var. XI:** Engine with electric start 12 V, standard flywheel (fig. 6).
- **Var. XIII:** Engine with electric start 24 V, standard flywheel (fig. 6).

Weight incl. air filter and exhaust silencer

	Var. I		Var. II		Var. XI		Var. XIII	
	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
1D41C	97.0	213.8	93.0	205.0	100.0	220.4	100.0	220.4
1D81C	124.0	273.3	118.0	260.0	126.0	277.7	126.0	277.7

Mounting of encapsulated engine

- Flexible engine mountings are obligatory.
Flange-mounted units must also be mounted flexibly.

Scope of delivery of engine in standard equipment

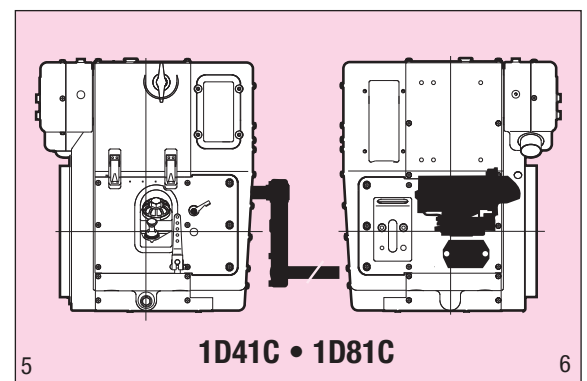
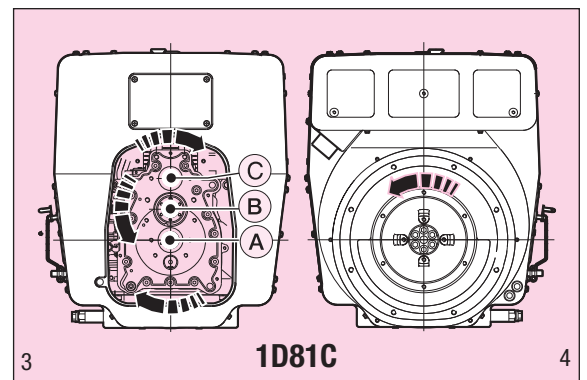
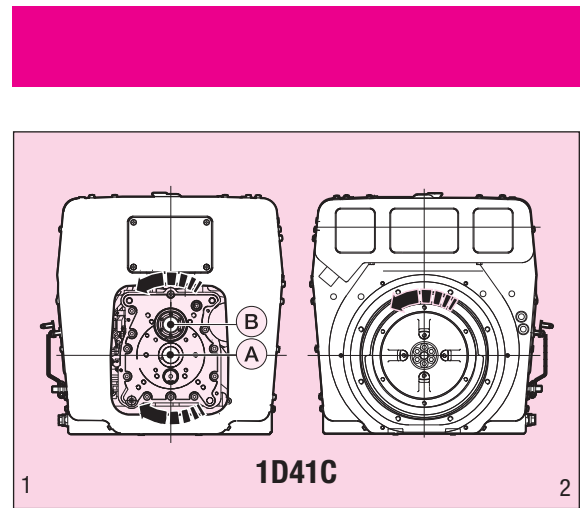
Engine tested for full load on test bench. Engine fitted with flywheel-fan, variable speed governor, dry-type air filter, automatic decompression, automatic extra fuel device, automatic bleeding, metering device for start oil, eye-hook for transport of engine (only to carry weight of the engine).

Painting in HATZ standard colours. No oil in engine.

Additional equipment: Gaskets for 1st maintenance

Further equipment included with engine variants:

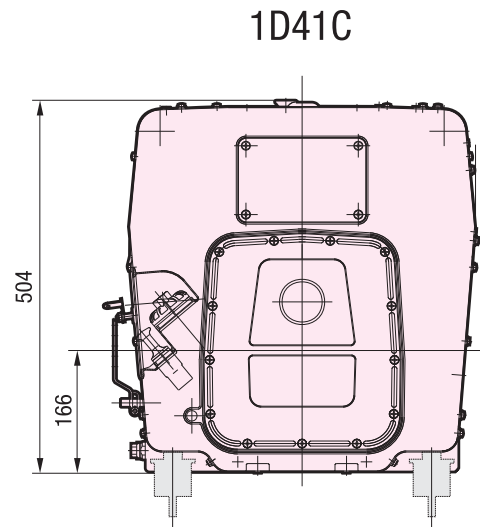
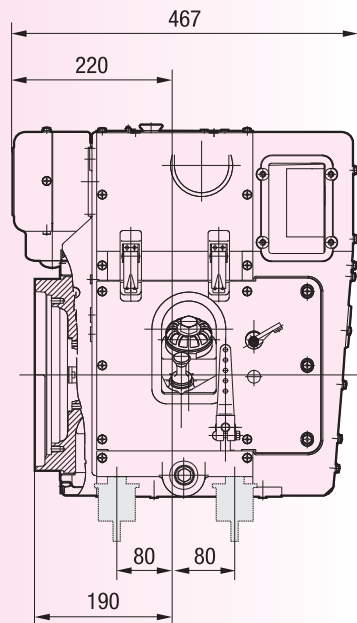
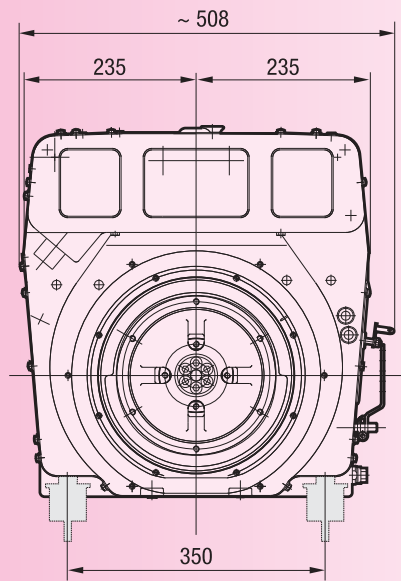
- **Var. I / II:** Support for crank handle
- **Var. XI:** Starter 12 V, 2.0 kW, alternator 14 V, 9 A (1D41C), Starter 12 V, 2.0 kW, alternator 14 V, 16 A (1D81C) cables, oil pressure switch, gearing.
- **Var. XIII:** Starter 24 V, 2.5 kW, alternator 28 V, 5 A (1D41C), Starter 24 V, 2.5 kW, alternator 28 V, 9 A (1D81C) cables, oil pressure switch, gearing.



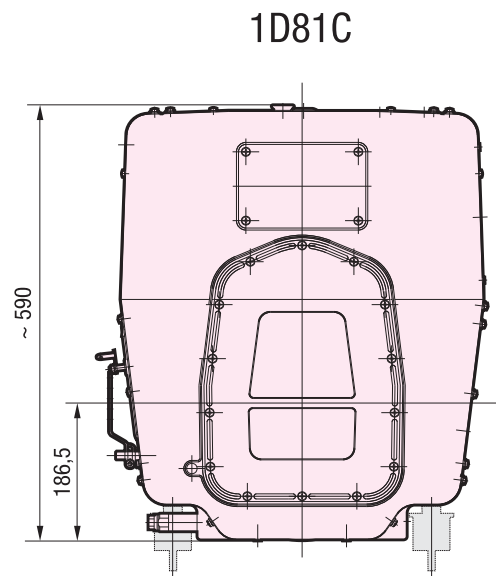
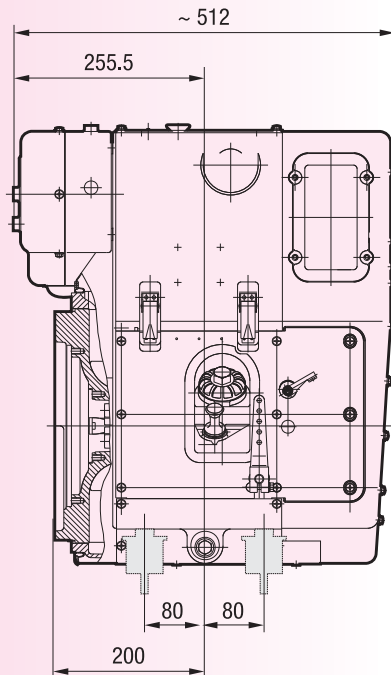
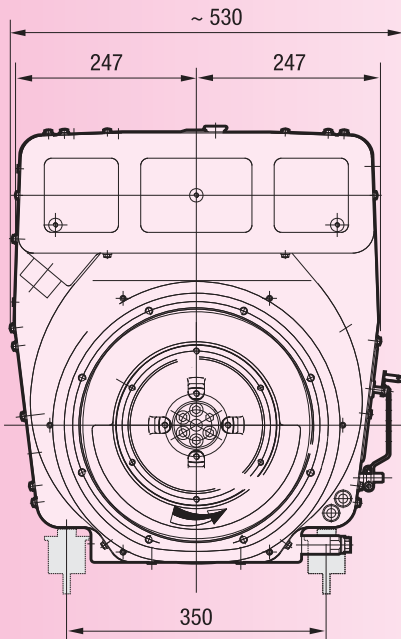
Additional equipment

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“.

Dimensions



1D41C



1D81C

Spread at outlines ± 3 mm due to tolerance.

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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