



SUPRA

Revolutionary technique for single-cylinder Diesel engines

1D41 • 1D50

2.6 - 7.9 kW • 3.5 - 10.7 HP

Exhaust reduced types on request

EPA II / CARB II / ECE-R24



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.
- Valve control by rocker, push-rods and tappets.
- Special valve gear, allowing reverse engine rotation, if required (patented).
- 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

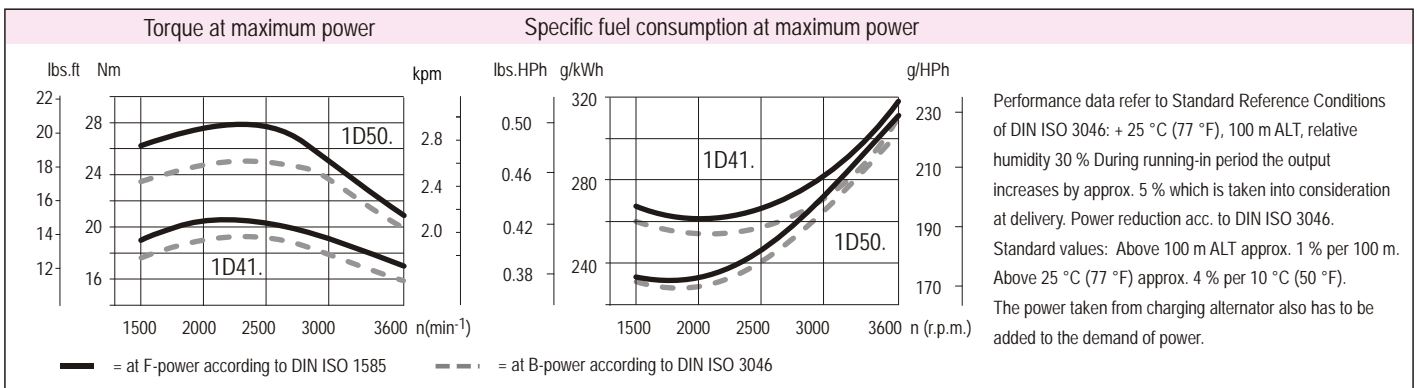
- Denoised: emission of noise reduced to the absolute minimum by means of design features and precision manufacture.
- Low fuel consumption.
- Favourable exhaust emission values. EPA certified.
- Robust: long engine life.
- Extensive interchangeability of parts within the engine family D.
- Reliable: 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.

Engine Type	Dimensions (mm)		
	Length	Width	Height
1D41.	341.5	460	485
1D50.	341.5	460	485

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Technical data		1D41.	1D50.
Number of cylinders		1	1
Bore x stroke	mm	90 x 65	97 x 70
	inches	3.54 x 2.56	3.82 x 2.76
Displacement	l	0.413	0.517
	cu.in.	25.2	31.5
Mean piston speed at 3000 r.p.m.	m/s	6.5	7.0
	ft/min	1279.59	1377.95
Compression ratio		21.0	20.5
Lub. oil consumption		approx. 1% of fuel consumption, related to full load	
Lub. oil capacity max. / min.	l	0.8 / 1.2	1.5 / 1.0
	US qts	0.76 / 1.14	1.42 / 0.95
Speed control	Idle speed	approx. 800 r.p.m.	
	Static speed drop	approx. 5 % at 3000 r.p.m.	



Performance table <i>SPECIAL OUTPUT ON REQUEST</i>			1D41.		1D50.	
	Hatz-Stand.	r.p.m.	kW	HP	kW	HP
Vehicle output acc. to DIN ISO 1585	F	3600	6.4	8.7	7.9	10.7
		3000	6.0	8.2	7.9	10.7
		2600	5.5	7.5	7.5	10.2
		2300	4.9	6.7	6.7	9.1
		2000	4.3	5.9	5.8	7.9
		1800	3.8	5.2	5.1	6.9
		1500	3.0	4.1	4.1	5.6
ISO net brake fuel stop power (IFN) for strong intermittent load acc. to DIN ISO 3046.	B _{si}	3600	6.3	8.6	7.7	10.5
		3000	5.9	8.0	7.6	10.3
		2600	5.4	7.3	7.1	9.7
		2300	4.8	6.5	6.3	8.6
		2000	4.2	5.7	5.5	7.5
		1800	3.7	5.0	4.8	6.5
		1500	3.0	4.1	3.9	5.3
ISO net brake fuel stop power (IFN) for intermittent load acc. to DIN ISO 3046.	B	3600	6.0	8.2	7.3	9.9
		3000	5.6	7.6	7.5	10.2
		2600	5.1	6.9	6.8	9.2
		2300	4.6	6.3	6.0	8.2
		2000	4.0	5.4	5.2	7.1
		1800	3.5	4.8	4.6	6.2
		1500	2.8	3.8	3.7	5.0
ISO-standard power (ICXN) (10% overload permissible) and ISO-standard fuel stop power (no overload permissible) acc. to DIN ISO 3046. For constant speed and constant load (ICFN).	S	3600	5.5	7.5	6.6	9.0
		3000	5.1	6.9	6.8	9.2
		2600	4.6	6.3	6.1	8.3
		2300	4.2	5.7	5.4	7.3
		2000	3.6	4.9	4.7	6.4
		1800	3.2	4.4	4.1	5.6
		1500	2.6	3.5	3.3	4.5

Installation data		1D41.	1D50.
Combustion air required at 3000 r.p.m. approx. ¹⁾	m ³ / min	0.61	0.78
	cu.ft./min	21.6	27.6
Cooling air required at 3000 r.p.m. approx. ¹⁾	m ³ / min	5.5	5.5
	cu.ft./min	195	195
Permanent tilting	max. degrees	30	30
Moment of inertia	kgm ²	0.24 (0.30) ²⁾	0.41
	lb.ft ²	5.67 (7.08) ²⁾	9.7
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. 9 A / 4A – 28 V - approx. 5 A / 2A	
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 2) Variant I (heavy flywheel)

Permissible load on power-take-off points

Max. permissible radial load

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

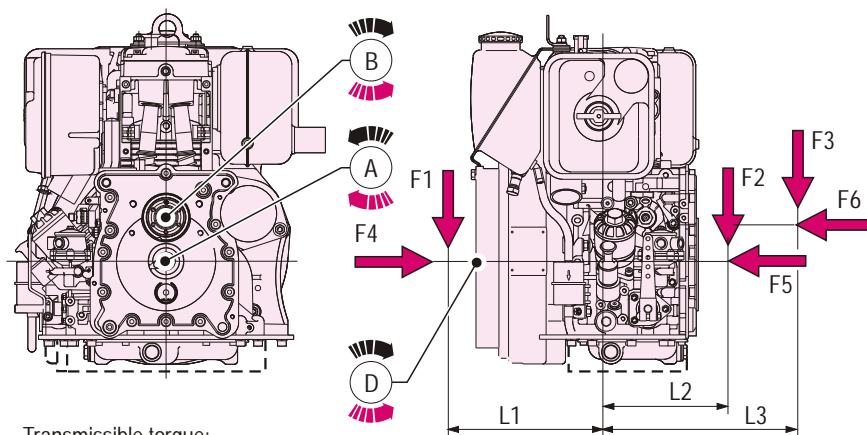
$$F2 = \frac{67\,500}{L2 \text{ (mm)} - 128} \text{ (N)}$$

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

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

Max. permissible axial force

$$F4 = 1260 \text{ N}, F5 = 1080 \text{ N}, F6 = 900 \text{ N}$$



Transmissible torque:

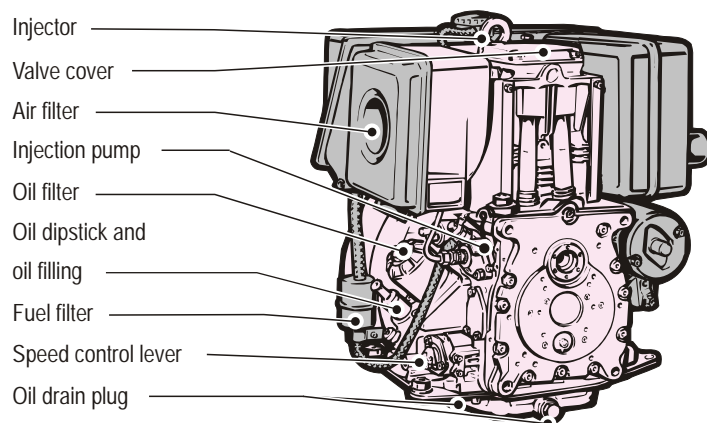
$$A = 100 \%, B = 100 \%, D = 100 \%$$

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 see www.hatz-diesel.de for drawings.

1D41. • 1D50.

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 (figure 2).
- Direction of rotation:
1D41. and 1D50. either counter-clockwise facing flywheel.
- Engine can be flange-mounted at governor side (Standard or SAE flange).

Engine models

- 1D41/50 S: counter-clockwise rotation (figure 1),
50 % balancing of free mass forces.
- 1D41/50 Z: counter-clockwise rotation (figure 1),
100 % balancing of free mass forces of first order.

Engine variants

- Variant I: 1D.. S, Z - heavy flywheel - handstart (fig. 5).
- Variant II: 1D.. S, Z - standard flywheel - handstart (fig. 5).
- Variant XI: 1D.. S, Z - electric start 12 V, standard flywheel (fig. 4).
- Variant XIII: 1D.. S, Z - electric start 24 V, standard flywheel (fig. 4).

Weight incl. tank, air filter and exhaust silencer

	Variant I		Variant II		Variant XI		Variant XIII	
	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
1D41 S	72.5	159.8	68.2	150.4	75.2	165.8	75.2	165.8
1D41 Z	73.9	162.9	69.7	153.7	76.7	169.1	76.7	169.1
1D50 S	73.5	162.0	69.2	152.6	76.2	168.0	76.2	168.0
1D50 Z	74.9	165.1	70.7	155.9	77.7	170.2	77.7	170.2

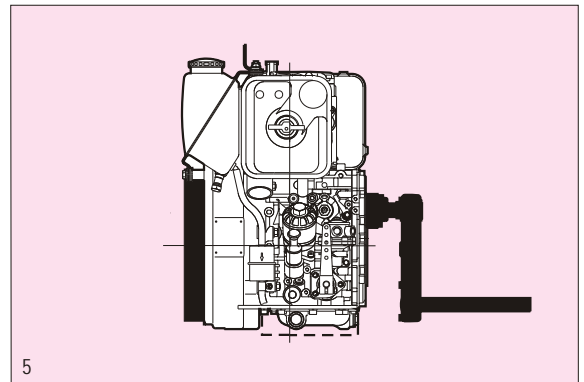
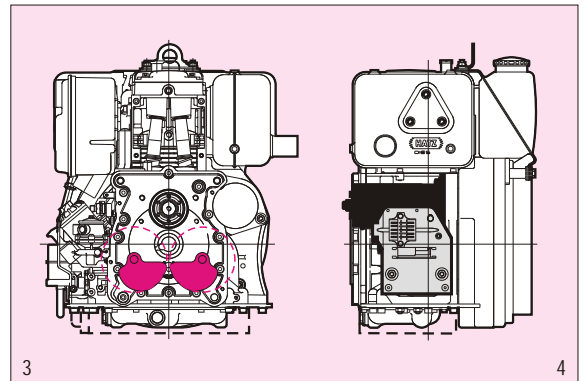
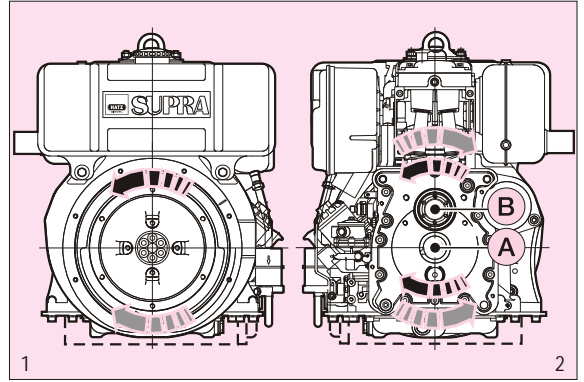
Scope of delivery of engine in standard equipment

Engine tested for full load on test bench. Engine fitted with flywheel-fan, variable speed governor, dry-type or oilbath 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: Tools and gaskets for 1st maintenance

Further equipment included in engine variants:

- Variant I / II: Support for crank handle
- Variant XI: Starter 12 V, 2.0 kW, alternator 14 V, 9 A, cables, oil pressure switch, gearing
- Variant XIII: Starter 24 V, 2.5 kW, alternator 28 V, 5 A, 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".

Mounting of engine

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

